

Gunnar Birkerts  
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292 Harmon Street, Birmingham, Michigan 48202  
Tel: 544-0900

Robert M. Darvas  
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Associates  
Incorporated  
MECHANICAL & ELECTRICAL  
ENGINEERS  
BLOOMFIELD HILLS, MICHIGAN

Duluth  
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DULUTH, MINNESOTA

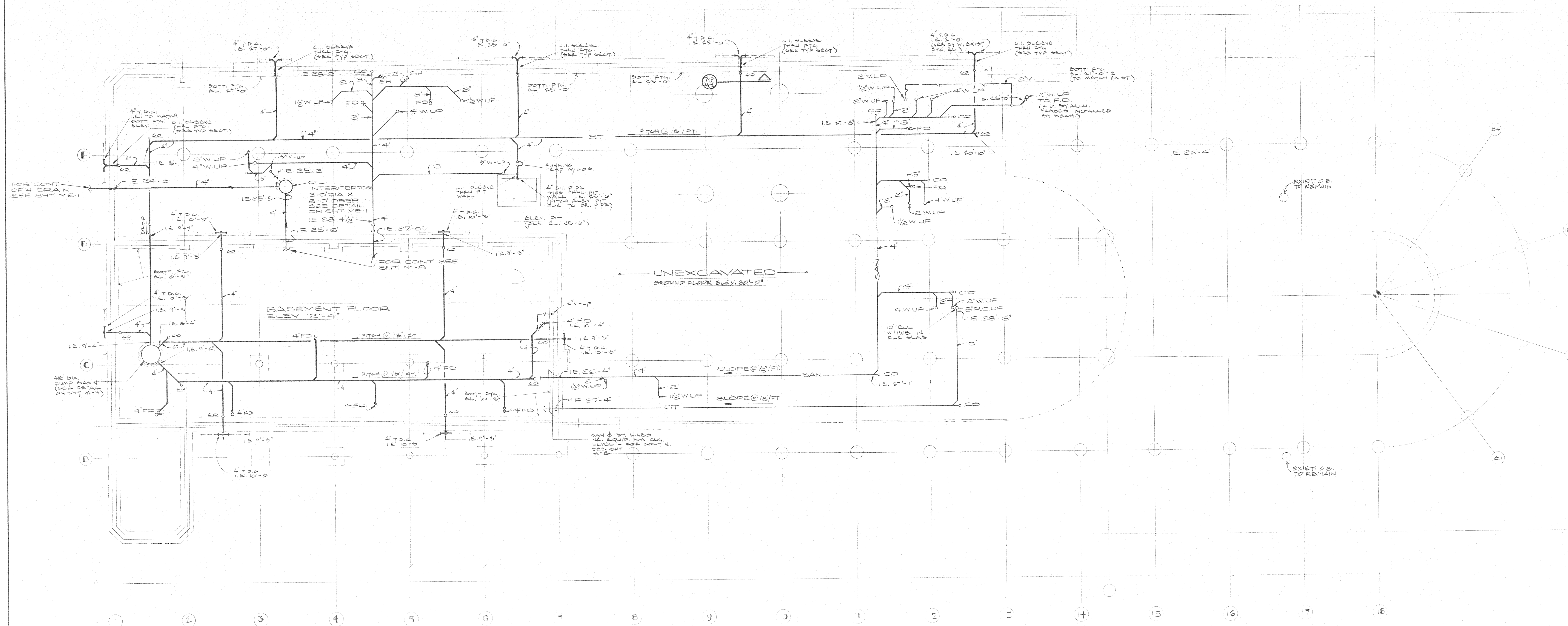
UNEXCAVATED  
DRAINAGE PLAN

DATE: 02/01/98

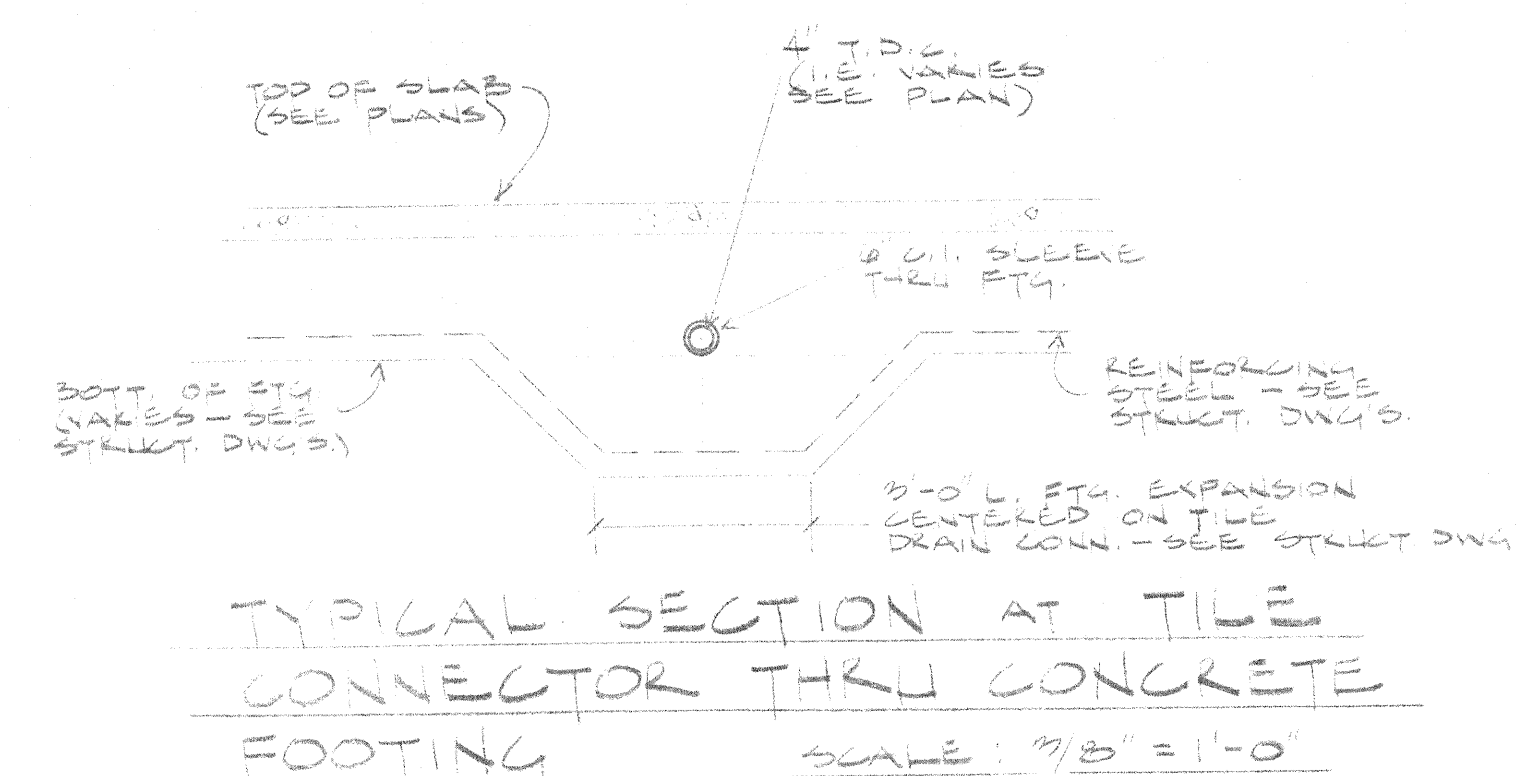
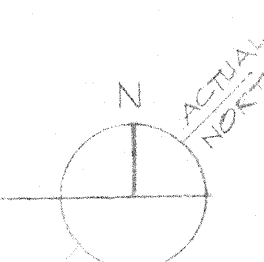
REVISIONS		
ITEM	DATE	BY

DRAWN	CD
CHECKED	SKS
APPROVED	NLS
APPROVED FOR CONSTRUCTION	
DATE	02/01/98
SCALE	1/8" = 1'-0"
PROJECT	

7512 M-2



UNDERGROUND PLAN  
SCALE: 1/8" = 1'-0"



TYPICAL SECTION AT TILE  
CONNECTOR THRU CONCRETE  
FOOTING  
SCALE: 1/8" = 1'-0"



tel 644 0  
292 Harmon street Birmingham Michi

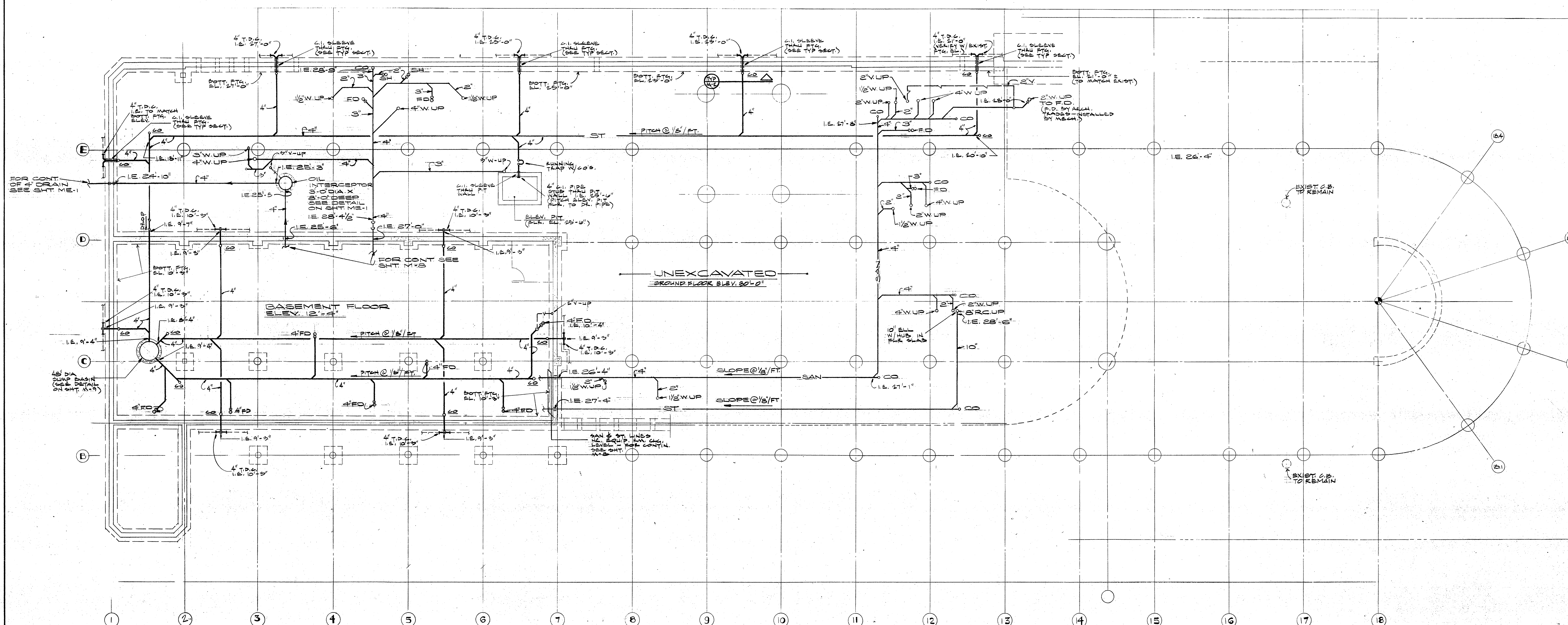
**Hoyem-Basso  
Associates  
Incorporated**  
MECHANICAL & ELECTRICAL  
ENGINEERS  
BLOOMFIELD HILLS, MICHIGAN

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DULUTH, MINNESOTA

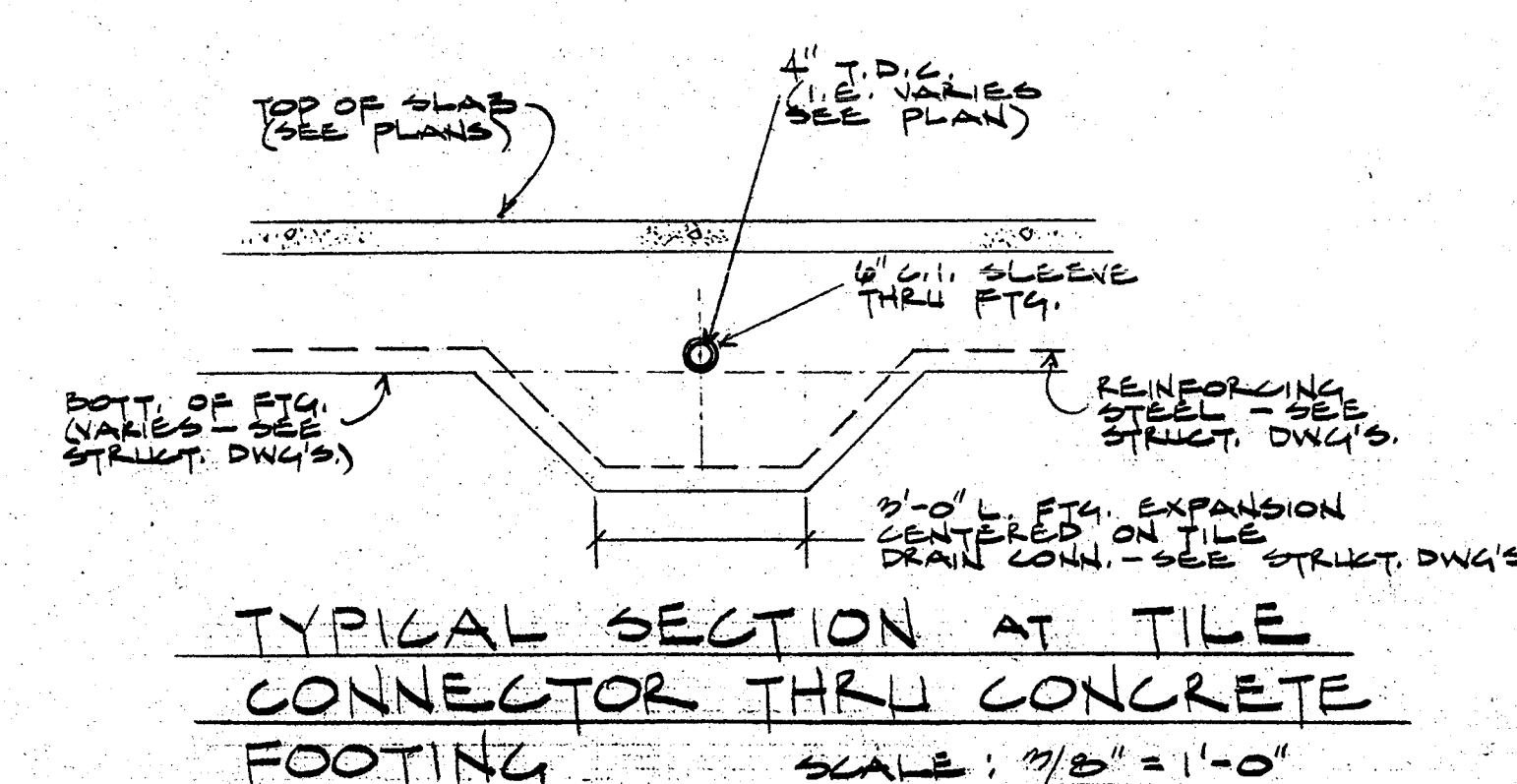
### UNDERGROUND DRAINAGE PLAN

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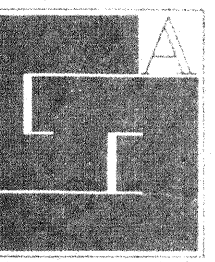
DRAWN	JCD
CHECKED	GRS
APPROVED	VJS
APPROVED FOR CONSTR	
DATE - APRIL 7, 1977	
SCALE - 1/8" = 1'-0"	
PROJECT	
7612	M-2



UNDERGROUND PLAN  
SCALE 1/8" = 1'-0"







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ENGINEERS  
BLOOMFIELD HILLS, MICHIGAN

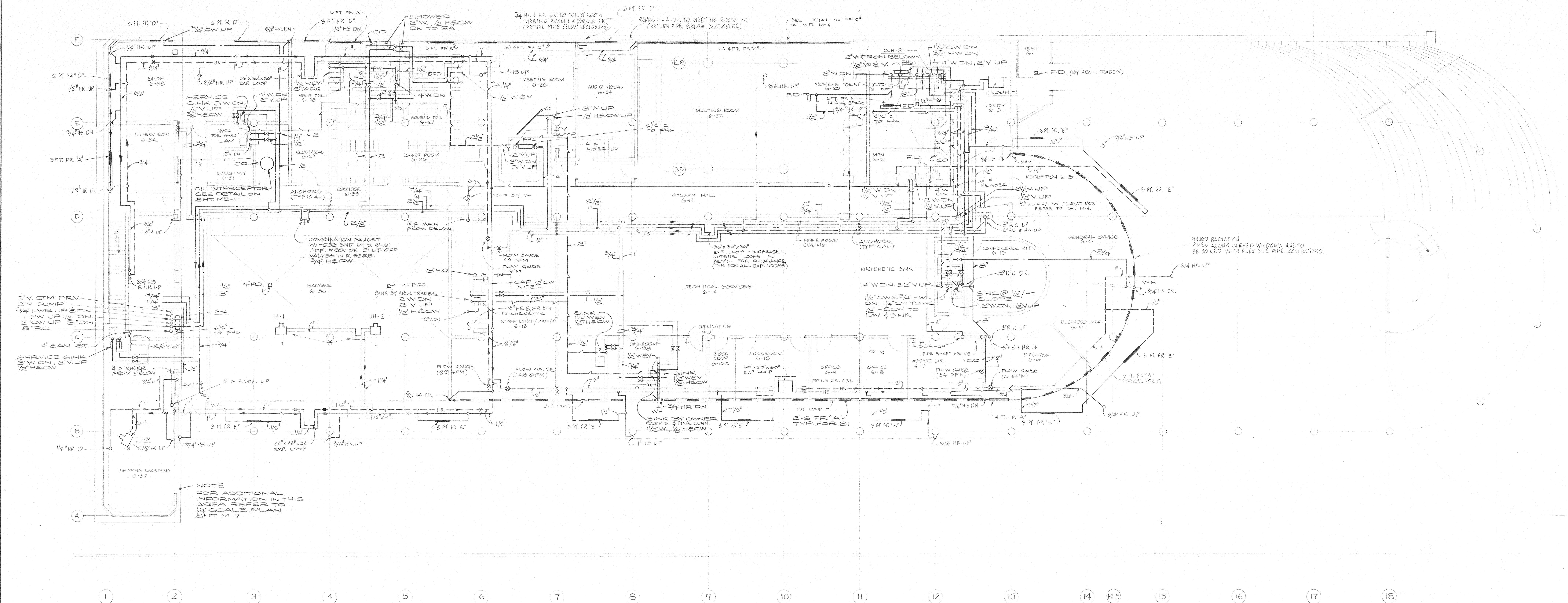
**Duluth Public  
Library**  
DULUTH, MINNESOTA

GROUND FLOOR PLAN  
PIPING

CON. DWG. 10-11-77

REVISIONS		
ITEM	DATE	BY

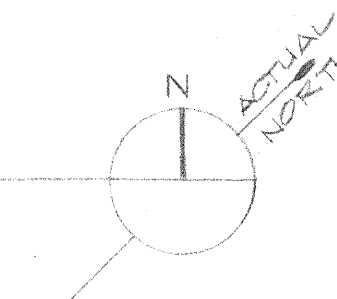
DRAWN	JCD
CHECKED	ERS
APPROVED	VJE
APPROVED FOR CONSTRUCTION	
DATE	APRIL 3, 1977
SCALE	1/8" = 1'-0"
PROJECT	
7812	M-3



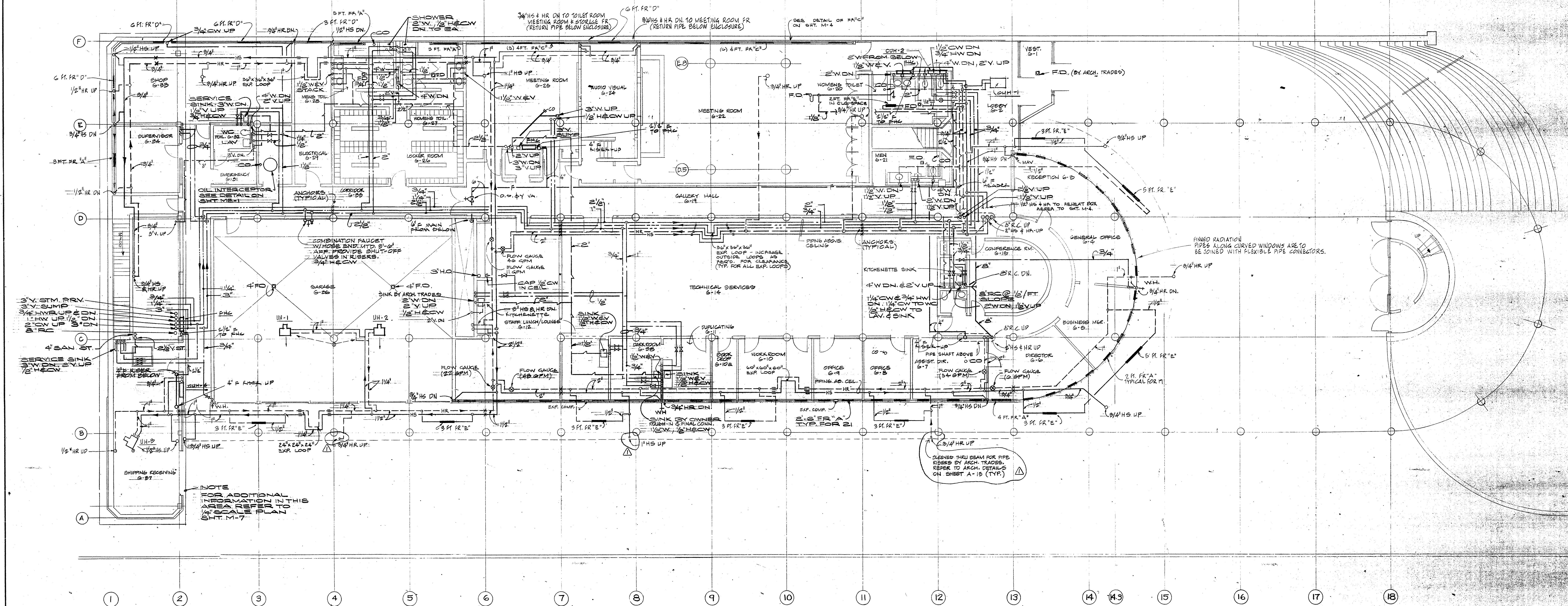
**GENERAL NOTES:**

- Refer to architectural reflected ceiling plans for locations of ceiling mounted diffusers and registers.
- Inlet duct sizes to variable volume boxes are noted on schedule. Refer to schedule sheet M-12.
- Runduct pipe sizes to individual lengths of finned radiation are to be 1/2" unless otherwise noted.
- Refer to mechanical details Sheet M-9 for duct system details and diagrams.
- Flexible duct connection sizes to supply air boots are to be full size of boot inlet. Refer to schedule sheet M-12.
- Maximum length of flexible ducts to be 5'-0" unless otherwise noted.

GROUND FLOOR  
SCALE 1/8" = 1'-0"





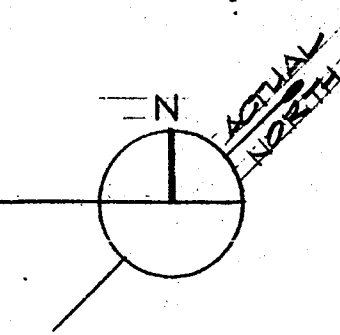


GENERAL NOTES:

1. Refer to architectural reflected ceiling plans for locations of ceiling mounted diffusers and registers.
2. Inlet duct sizes to variable volume boxes are noted on schedule. Refer to schedule Sheet M-12.
3. Runout pipe sizes to individual lengths of finned radiation are to be 1/2" unless otherwise noted.
4. Refer to mechanical details Sheet M-9 for duct system details and diagrams.
5. Flexible duct connection sizes to supply air boots are to be full size of boot inlet. Refer to schedule Sheet M-12.
6. Maximum length of flexible ducts to be 5'-0" unless otherwise noted.

GROUND FLOOR

SCALE 1/8"=1'-0"



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ENGINEERS  
BLOOMFIELD HILLS, MICHIGAN

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Library  
DULUTH, MINNESOTA

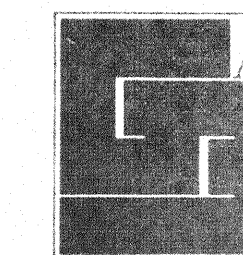
GROUND FLOOR PLAN

11/27/75

NO.	DATE	BY	FOR
1	11/27/75	RD	AS
2	12/11/75	RD	AS

APPROVED  
DATE  
BY





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ENGINEERS  
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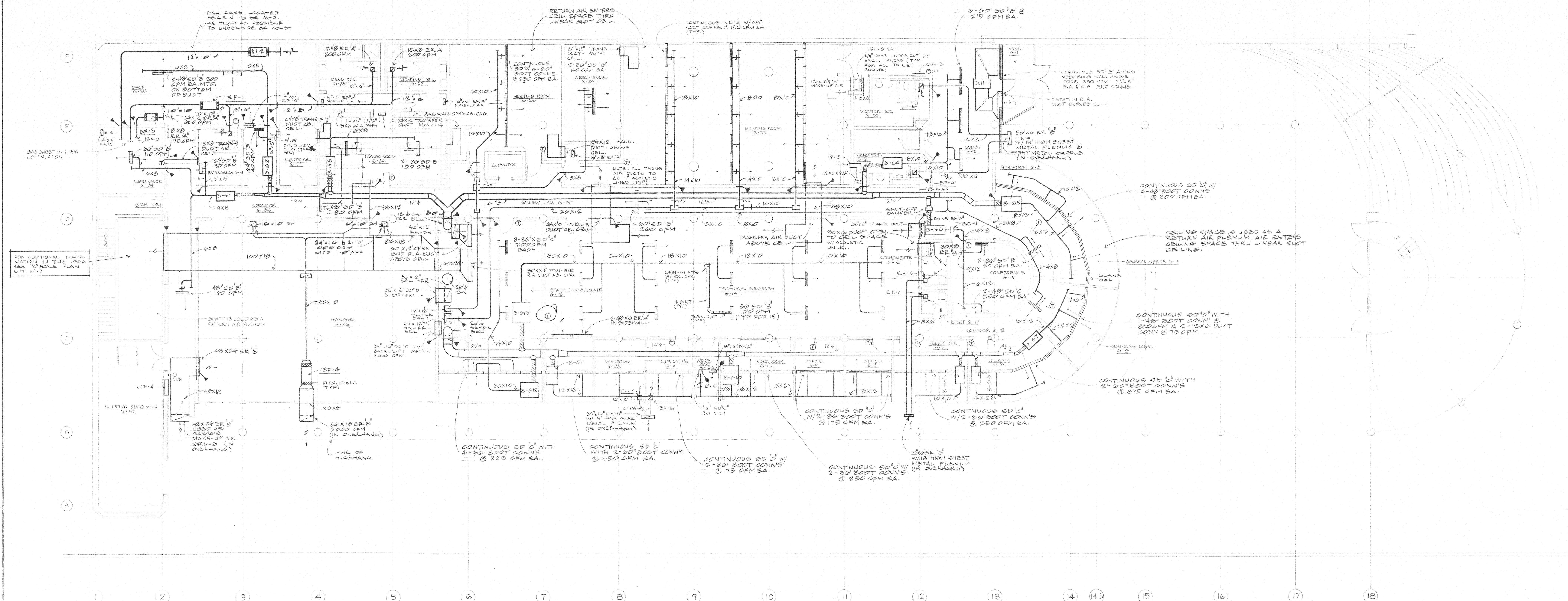
**Duluth Public Library**  
DULUTH, MINNESOTA

GROUND  
FLOOR PLAN  
HV & AC

CDA PW 65-11-2786

REVISIONS		
ITEM	DATE	BY

DRAWN	SS
CHECKED	SAE
APPROVED	NJE
APPROVED FOR CONSTRUCTION	
DATE	APR 7, 1977
SCALE	1/2" = 1'-0"
PROJECT	
7612	M-4

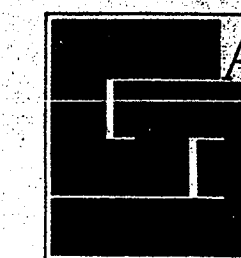


**GENERAL NOTES:**

1. Refer to architectural reflected ceiling plans for locations of ceiling mounted diffusers and registers.
2. Inlet duct sizes to variable volume boxes are noted on schedule. Refer to schedule Sheet M-12.
3. Runout pipe sizes to individual lengths of finned radiation are to be 1/2" unless otherwise noted.
4. Refer to mechanical details Sheet M-9 for duct system details and diagrams.
5. Flexible duct connection sizes to supply air boots are to be full size of boot inlet. Refer to schedule Sheet M-12.
6. Maximum length of flexible ducts to be 5'-0" unless otherwise noted.

DETAIL OF FIN RADIATION FR "C"  
NO SCALE





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ENGINEERS  
BLOOMFIELD HILLS, MICHIGAN

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Public  
Library  
DULUTH, MINNESOTA

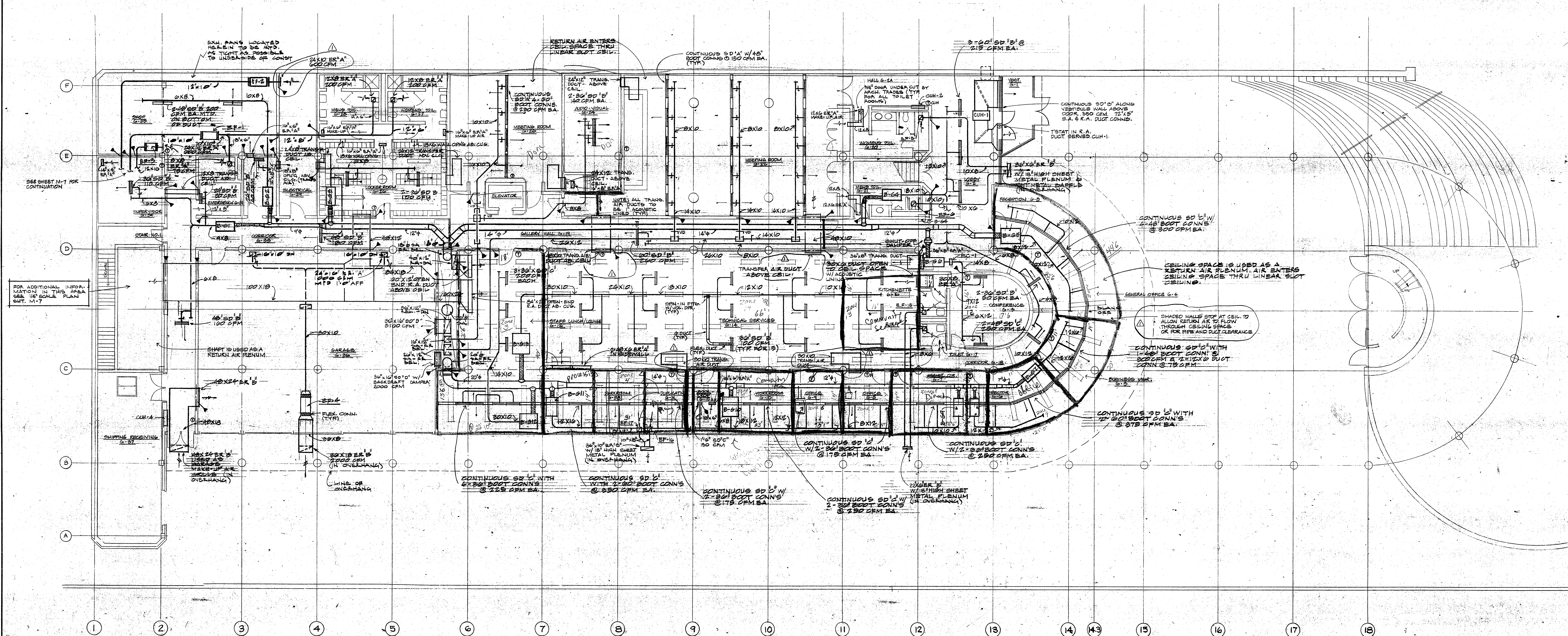
GROUND  
FLOOR PLAN  
HV & AC

EDR LPW 06/95 L-02786

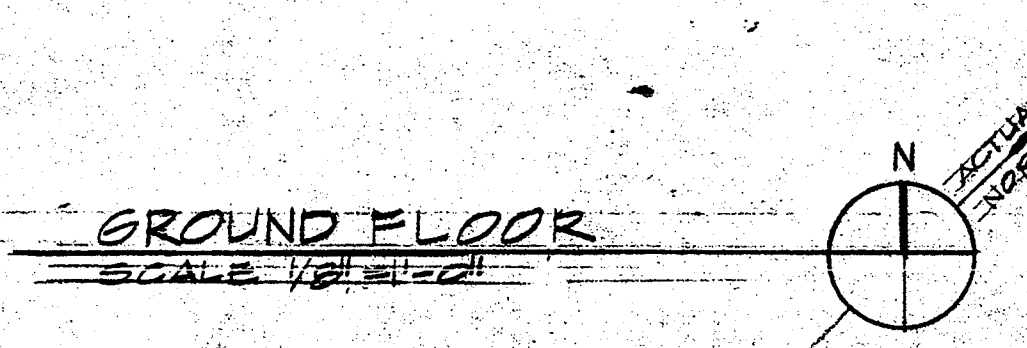
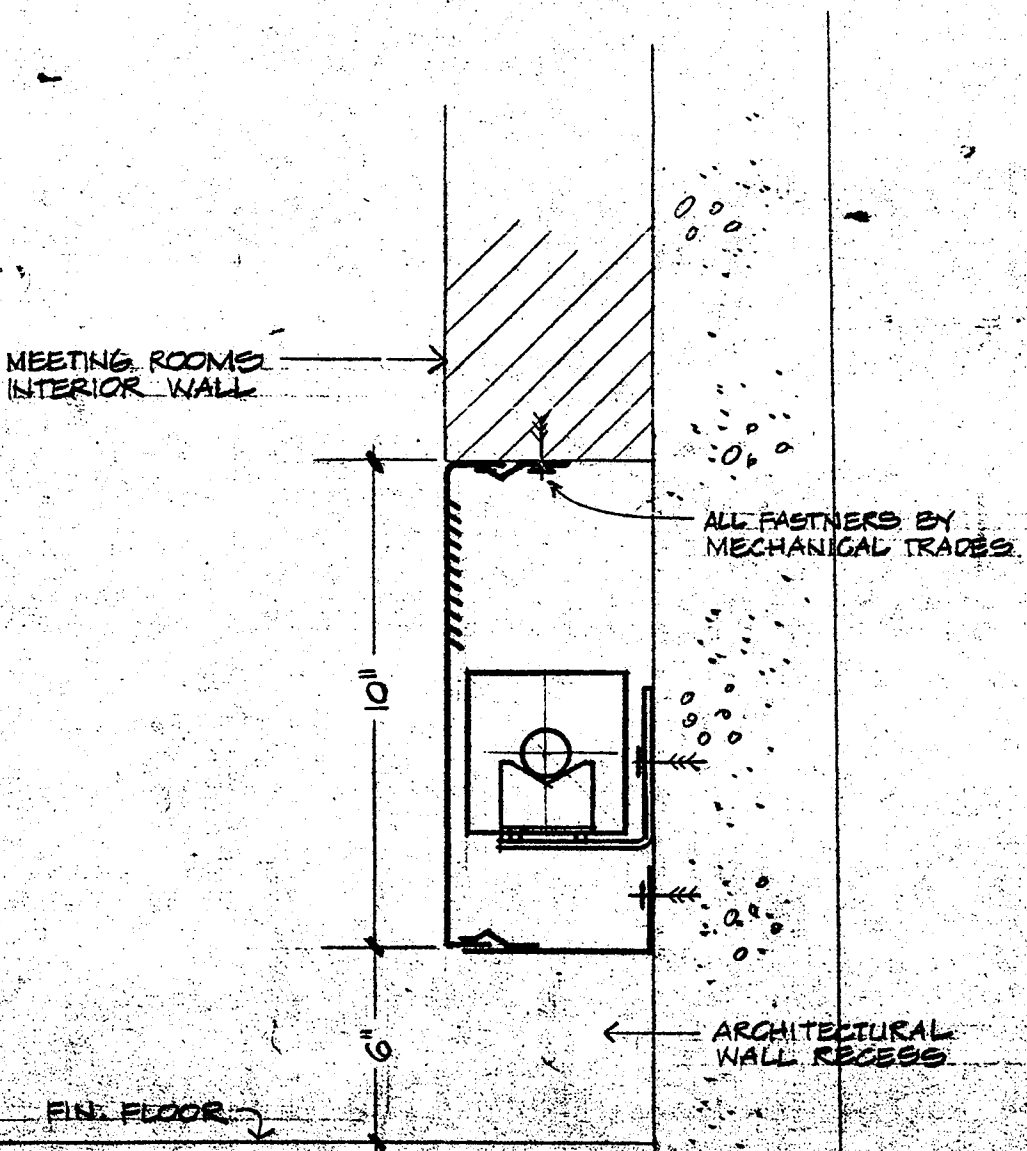
REVISIONS		
ITEM	DATE	BY
ADD. NO. 1	APRIL 23, 1977	GKS

DRAWN: DG  
CHECKED: GKS  
APPROVED: VLS  
FOR REVIEW: T. R. T.  
DATE: APRIL 23, 1977

104



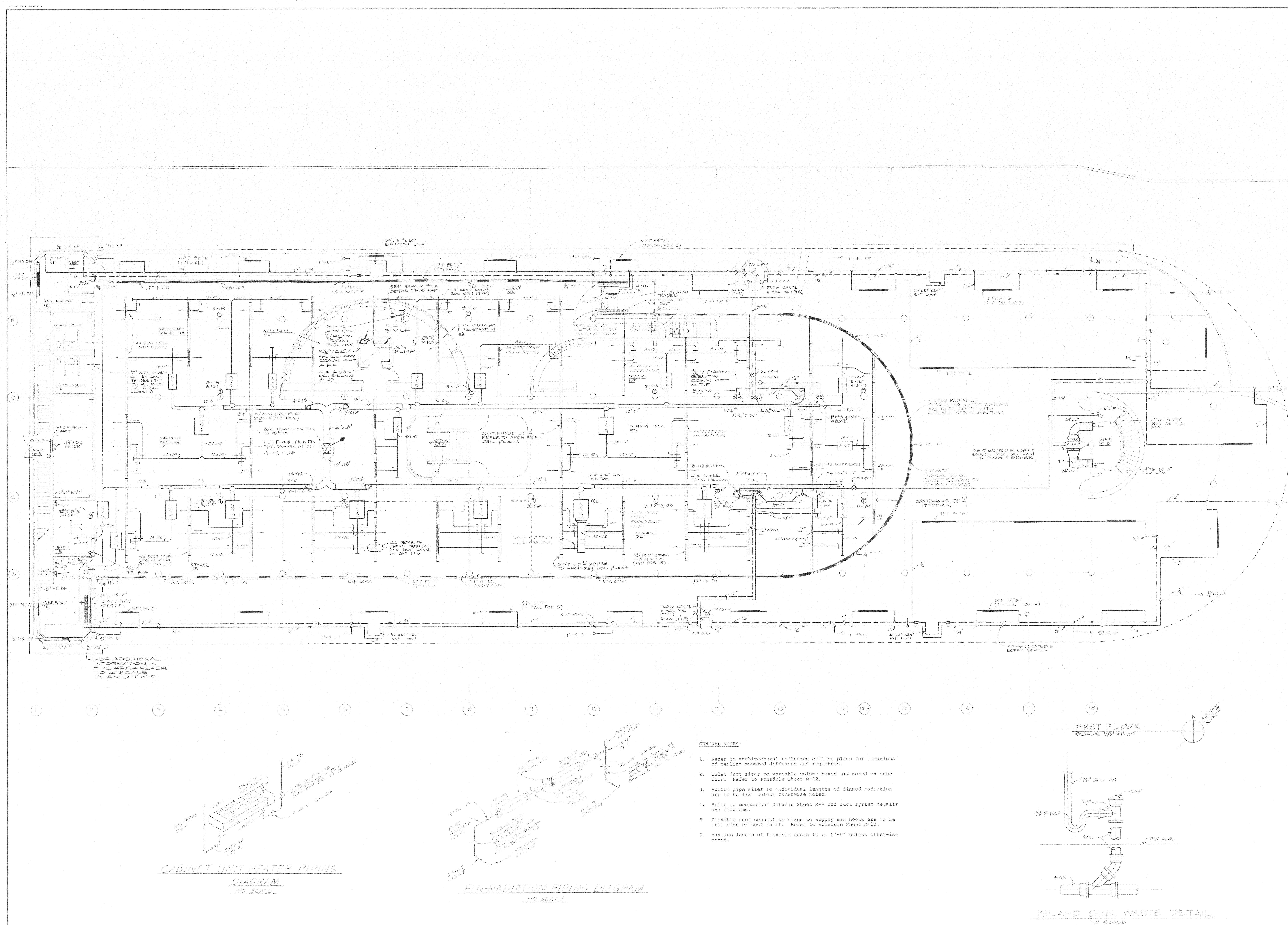
- GENERAL NOTES:
1. Refer to architectural reflected ceiling plans for locations of ceiling mounted diffusers and registers.
  2. Inlet duct sizes for variable volume boxes are noted on schedule. Refer to schedule sheet #12.
  3. Return pipe sizes to individual lengths of fan coil radiators are to be 1/2" unless otherwise noted.
  4. Refer to mechanical details sheet #4 for duct system details and diagrams.
  5. Flexible duct connection sizes to supply air boxes are to be full size of boot inlet. Refer to schedule sheet #12.
  6. Maximum length of flexible ducts to be 5'-0" unless otherwise noted.



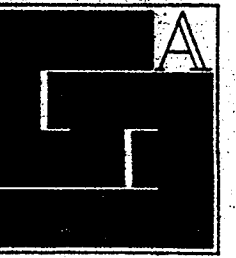


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DRAWN	JW
CHECKED	GRS
APPROVED	VJS
APPROVED FOR CONSTR	
DATE	APRIL 7 1977
SCALE	1/8" = 1'-0"
PROJECT	







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ENGINEERS  
BLOOMFIELD HILLS, MICHIGAN

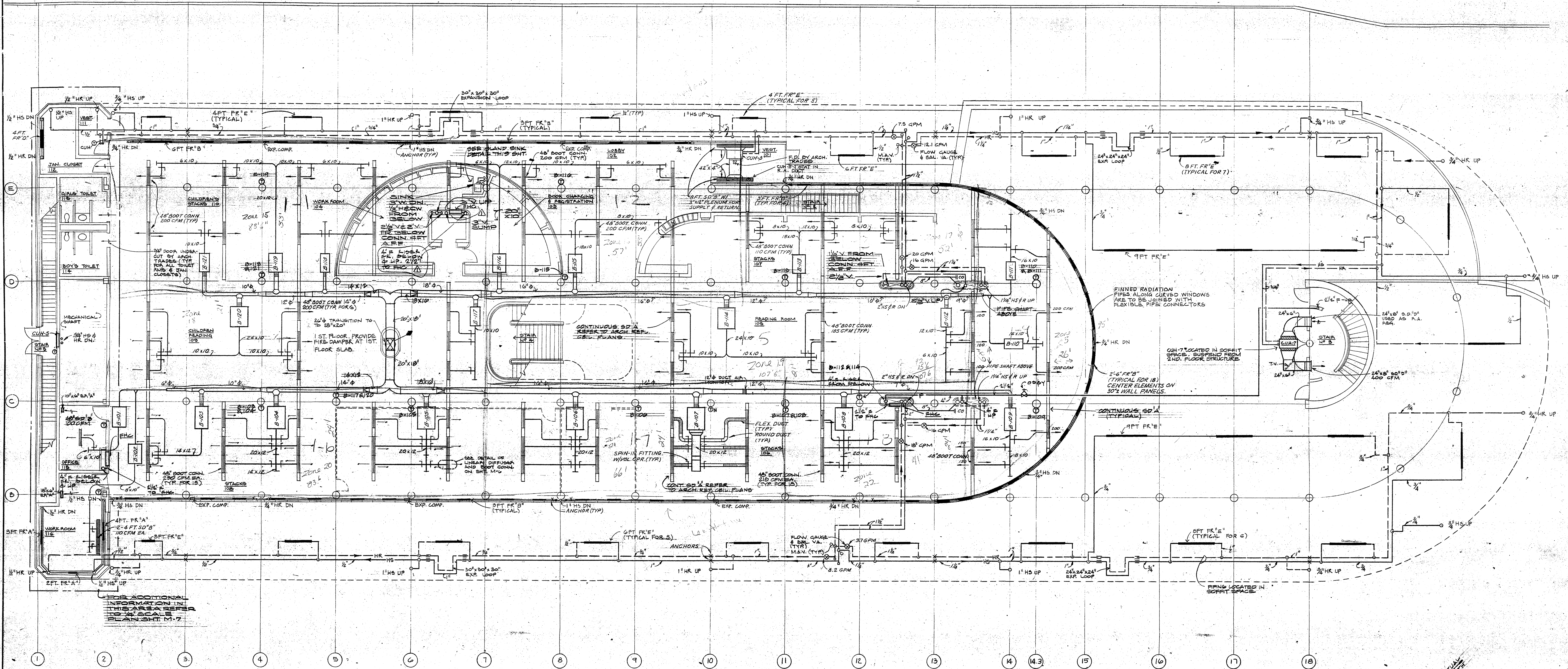
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Public  
Library**  
DULUTH, MINNESOTA

**FIRST FLOOR  
H.V. AC PIPING  
& DETAILS**

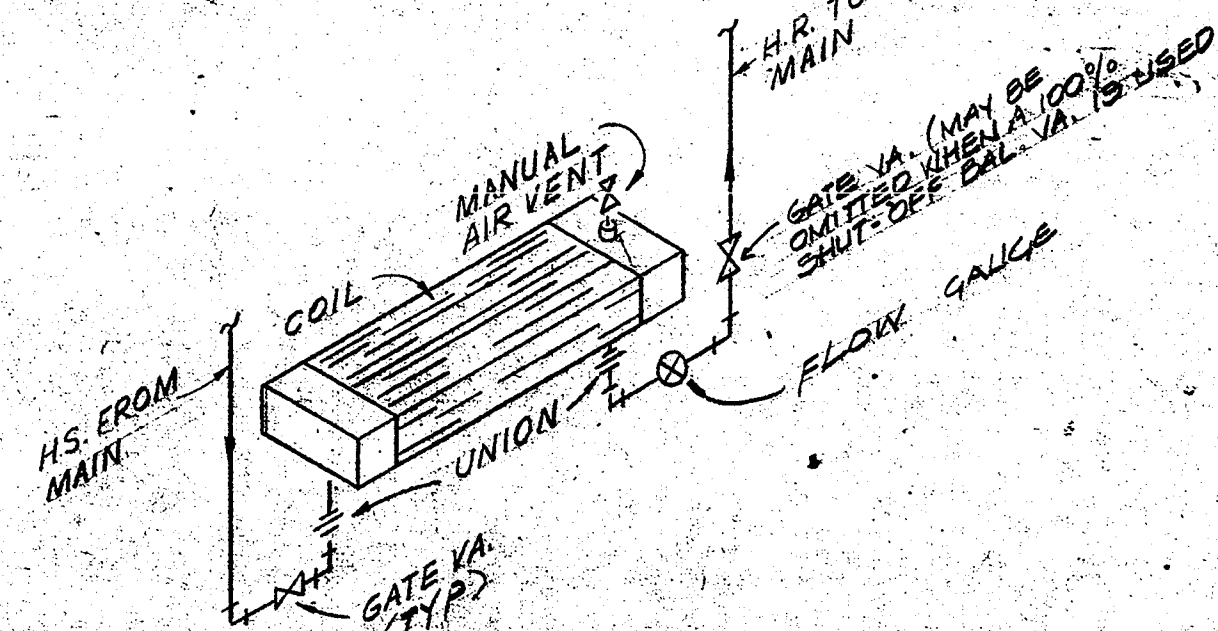
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REVISIONS	ITEM	DATE	BY
ADD. NO. 1	APRIL 29, 1977	ES	

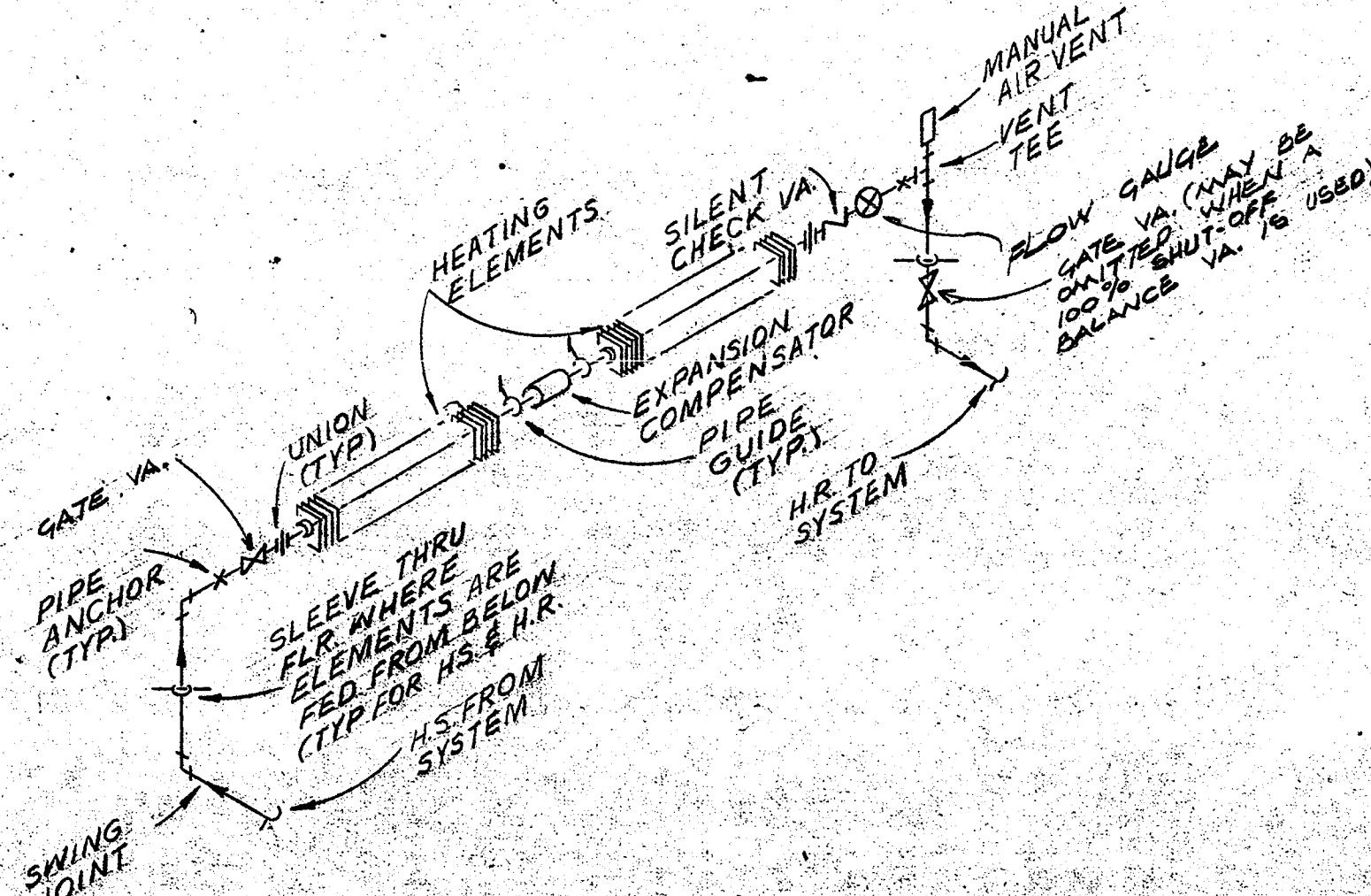
DRAWN: JW  
CHECKED: EKS  
APPROVED: VJD  
FOR DESIGN  
DATE: APRIL 7, 1977  
BY: [Signature]  
7612 M-5



**CABINET UNIT HEATER PIPING  
DIAGRAM  
NO SCALE**



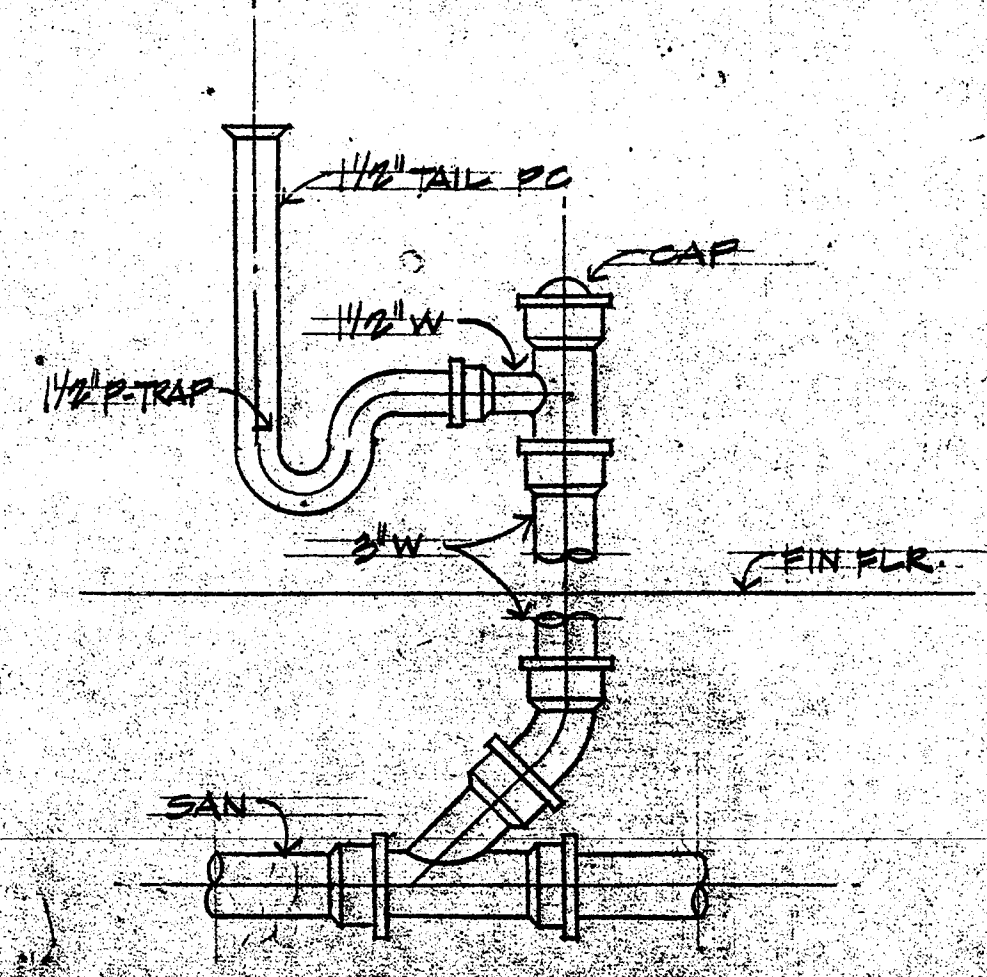
**FIN-RADIATION PIPING DIAGRAM  
NO SCALE**



**GENERAL NOTES:**

1. Refer to architectural reflected ceiling plans for locations of ceiling mounted diffusers and registers.
2. Inlet duct sizes to variable volume boxes are noted on schedule. Refer to schedule sheet M-12.
3. Runout pipe sizes to individual lengths of finned radiation are to be 1/2" unless otherwise noted.
4. Refer to mechanical details sheet M-3 for duct system details and diagrams.
5. Flexible duct connection sizes to supply air boots are to be full size of boot inlet. Refer to schedule sheet M-11.
6. Maximum length of flexible ducts to be 3'-0" unless otherwise noted.

**ISLAND SINK WASTE DETAIL  
NO SCALE**

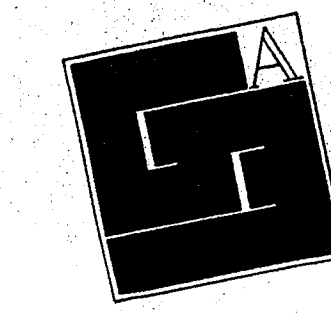




1. Refer to architectural reflected ceiling plans for locations of ceiling mounted diffusers and registers.
2. Inlet duct sizes to variable volume boxes are noted on schedule. Refer to schedule Sheet M-12.
3. Runout pipe sizes to individual lengths of finned radiation are to be 1/2" unless otherwise noted.
4. Refer to mechanical details Sheet M-9 for duct system details and diagrams.
5. Flexible duct connection sizes to supply air boots are to be the size of boot inlet. Refer to schedule Sheet M-12.
6. Maximum length of flexible ducts to be 5'-0" unless otherwise

DETAIL OF FIN RADIATION FR "A" & FR "B"  
NO SCALE (REFER TO ARCH. PLAN A-3)





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Hoyem-Basso  
Associates  
Incorporated  
MECHANICAL & ELECTRICAL ENGINEERS  
BLOOMFIELD HILLS, MICHIGAN

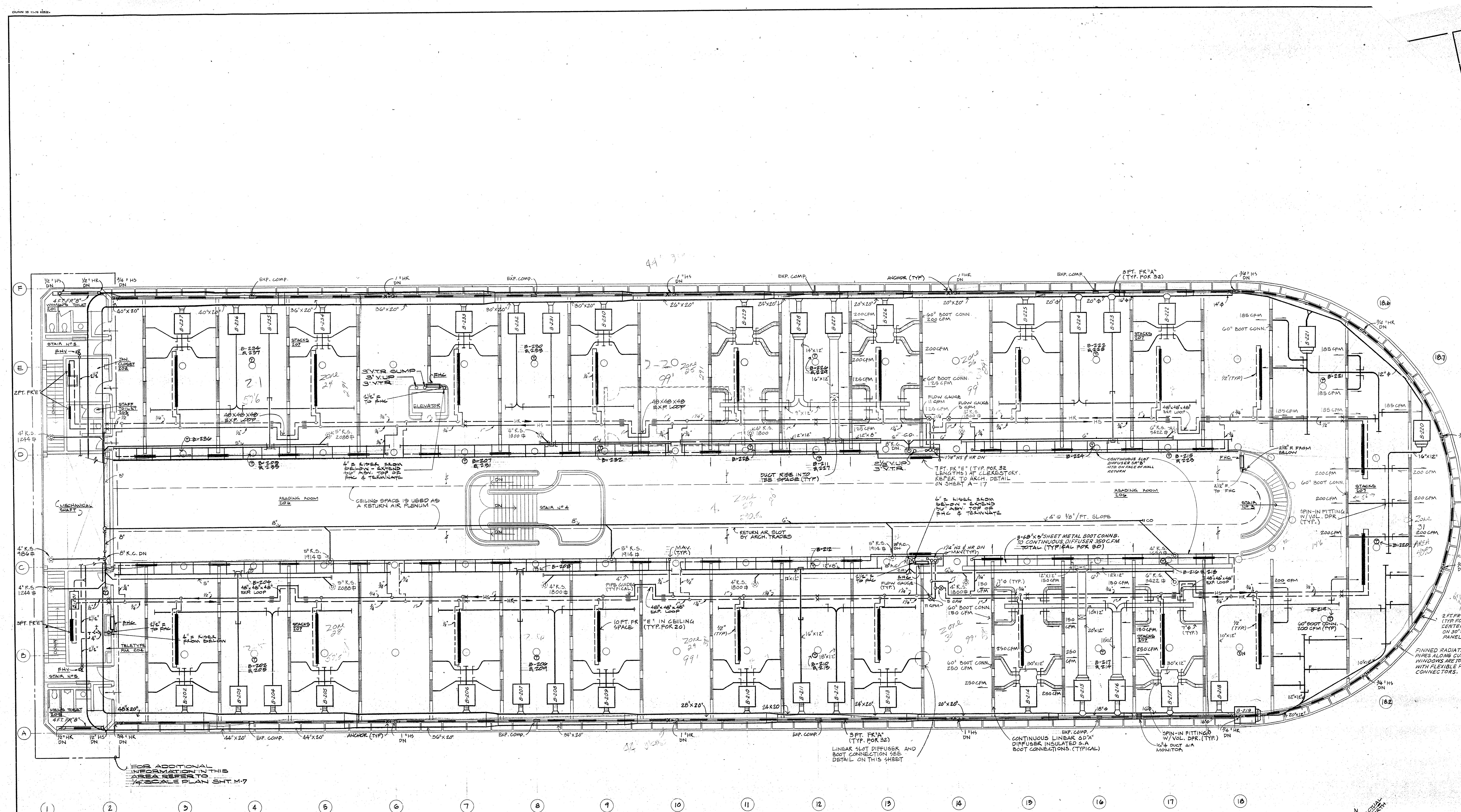
Duluth  
Public  
Library  
DULUTH, MINNESOTA

2ND FLOOR PLAN  
HVAC, PIPING  
& DETAILS

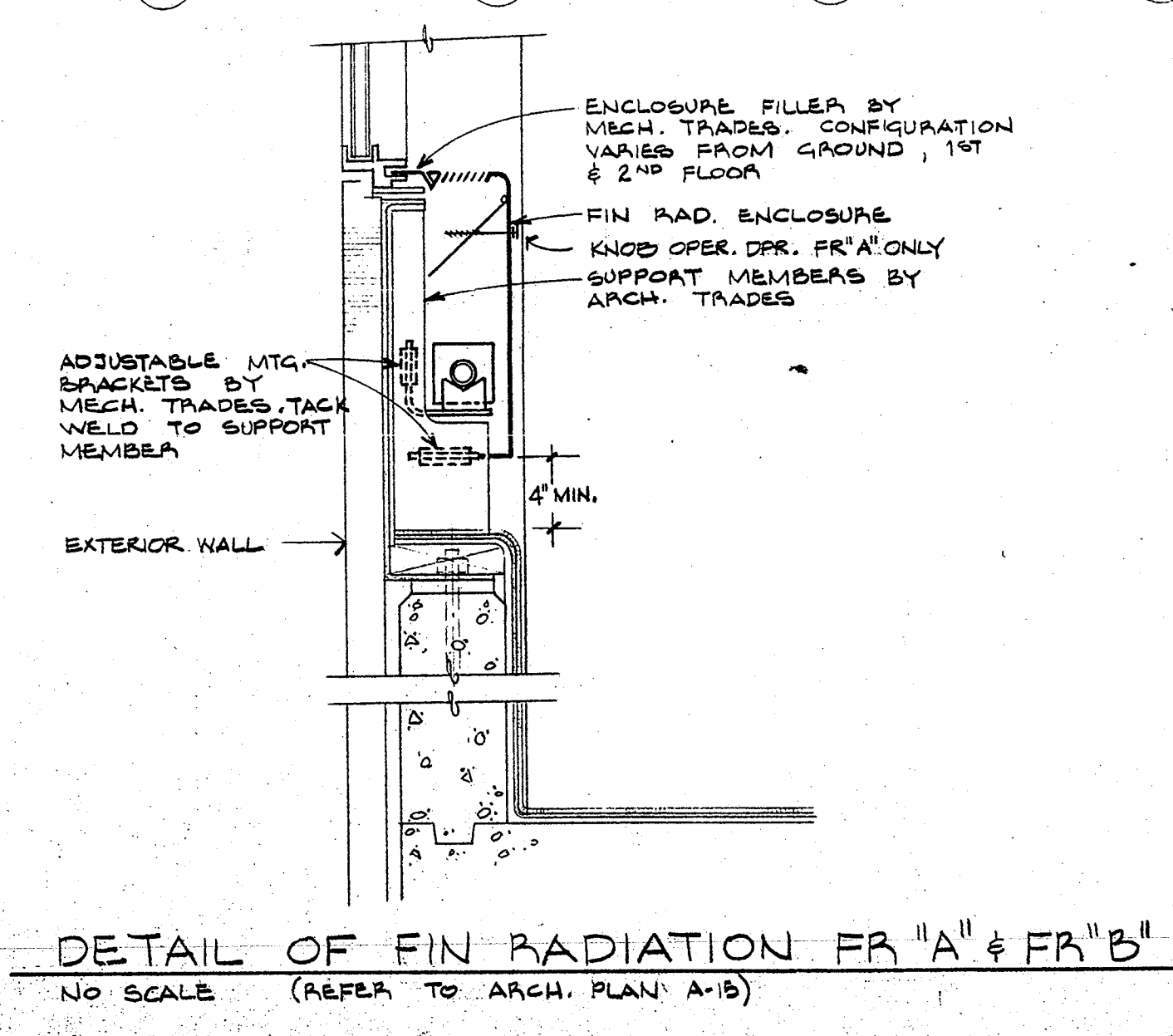
EDN LPW 06-51-02785

REVISIONS		
ITEM	DATE	BY

DRAWN: J.W.  
CHECKED: G.S.  
APPROVED: J.W.S.  
DATE: APRIL 7, 1977  
SCALE: 1/8" = 1'-0"  
PROJECT: 7612  
M-6

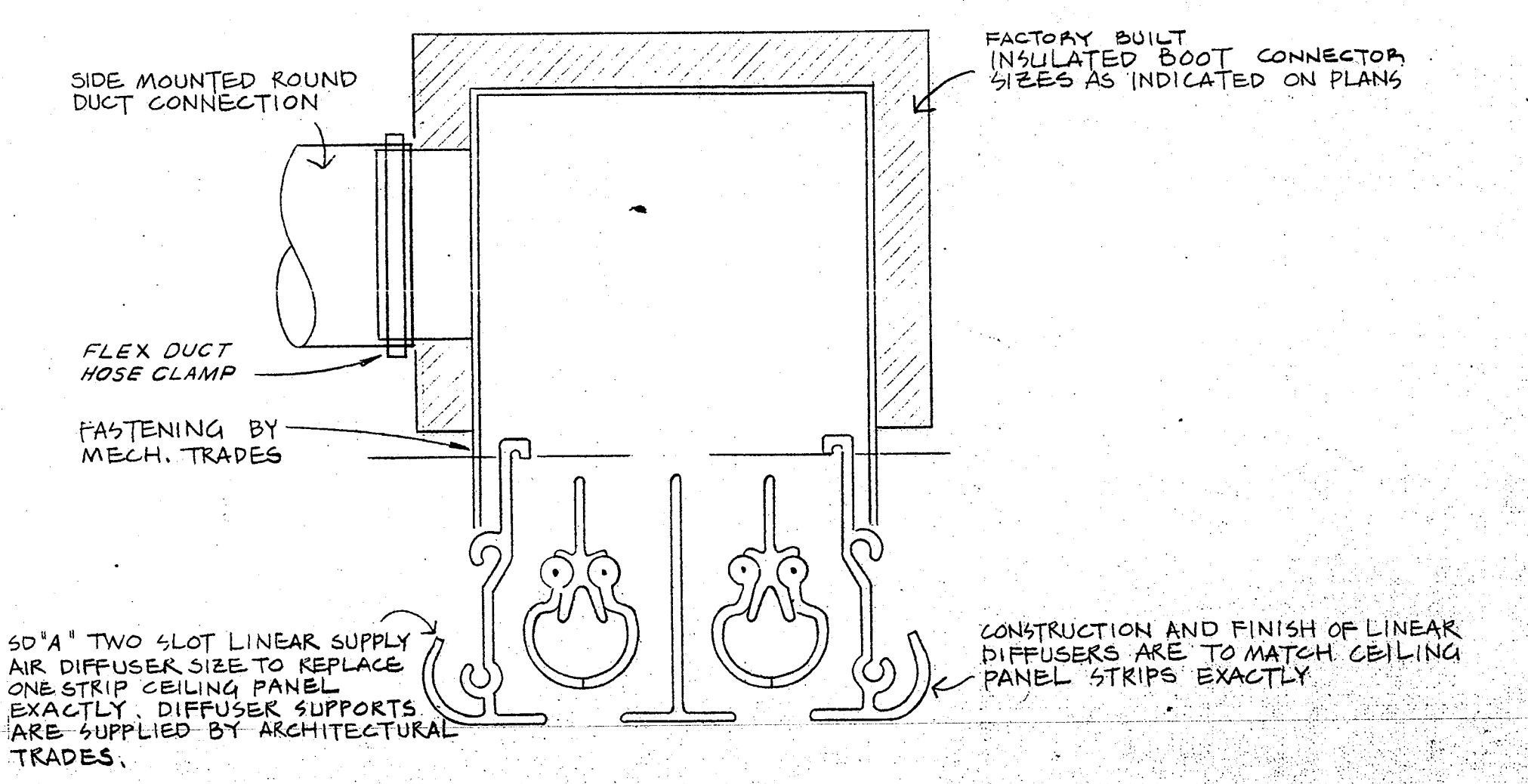


FOR ADDITIONAL  
INFORMATION IN THIS  
AREA REFER TO  
1/4" SCALE PLAN SHT. M-7



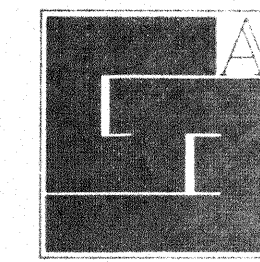
DETAIL OF FIN RADIATION FR "A" & FR "B"  
NO SCALE (REFER TO ARCH. PLAN A-B)

- GENERAL NOTES:
1. Refer to architectural reflected ceiling plans for locations of ceiling mounted diffusers and registers.
  2. Inlet duct sizes to variable volume boxes are noted on schedule. Refer to schedule Sheet M-12.
  3. Runout pipe sizes to individual lengths of finned radiation are to be 1/2" unless otherwise noted.
  4. Refer to mechanical details Sheet M-9 for duct system details and diagrams.
  5. Flexible duct connection sizes to supply air boots are to be full size of boot inlet. Refer to schedule Sheet M-12.
  6. Maximum length of flexible ducts to be 5'-0" unless otherwise noted.



DETAIL OF LINEAR SUPPLY DIFFUSER AND BOOT CONNECTION  
NO SCALE





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**Hoyem-Basso Associates Incorporated**  
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BLOOMFIELD HILLS, MICHIGAN

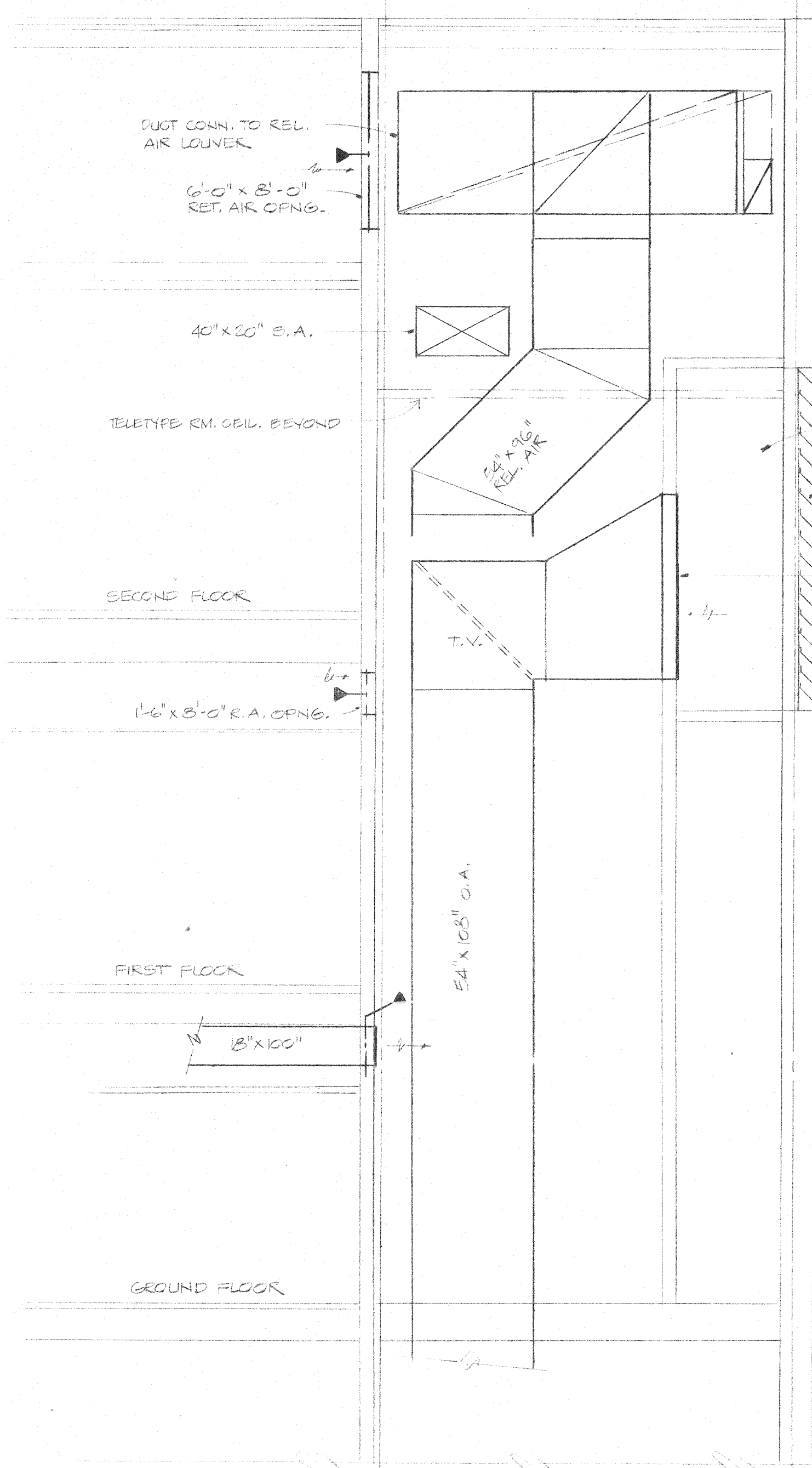
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DULUTH, MINNESOTA

PARTIAL FLOOR PLANS  
FINDING SECTIONS

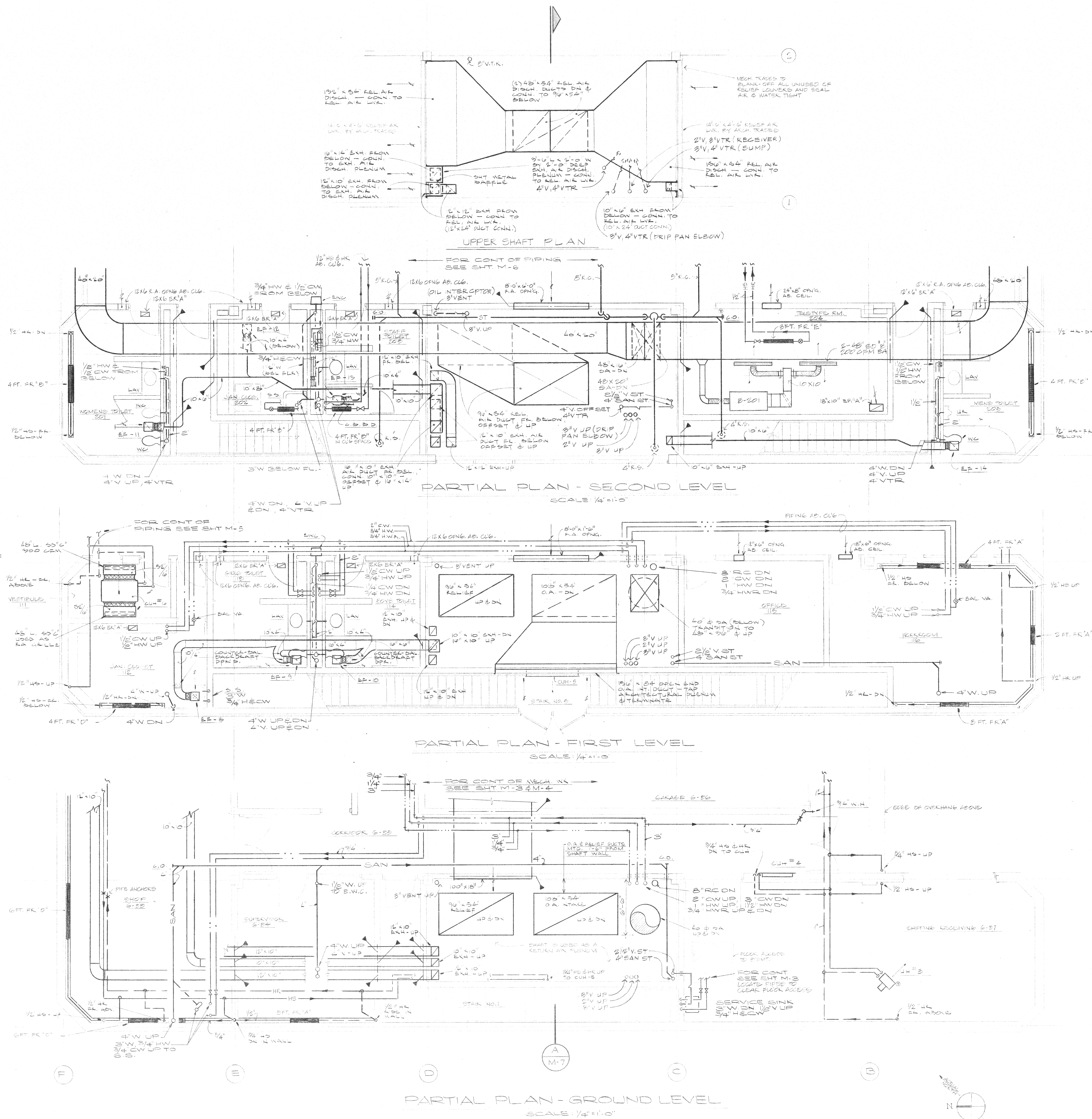
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REVISIONS		
ITEM	DATE	BY

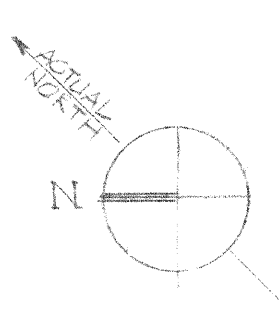
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CHECKED	AS
APPROVED	NJS
DATE	APRIL 7, 1977
SCALE	1/4" = 1'-0"
PROJECT	M-7



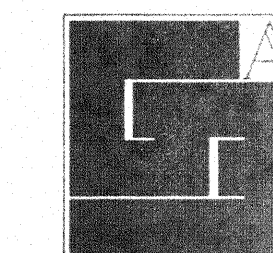
SECTION A-A  
SCALE 1/4" = 1'-0"



PARTIAL PLAN - GROUND LEVEL  
SCALE 1/4" = 1'-0"







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ENGINEERS  
BLOOMFIELD HILLS, MICHIGAN

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Library  
DULUTH, MINNESOTA

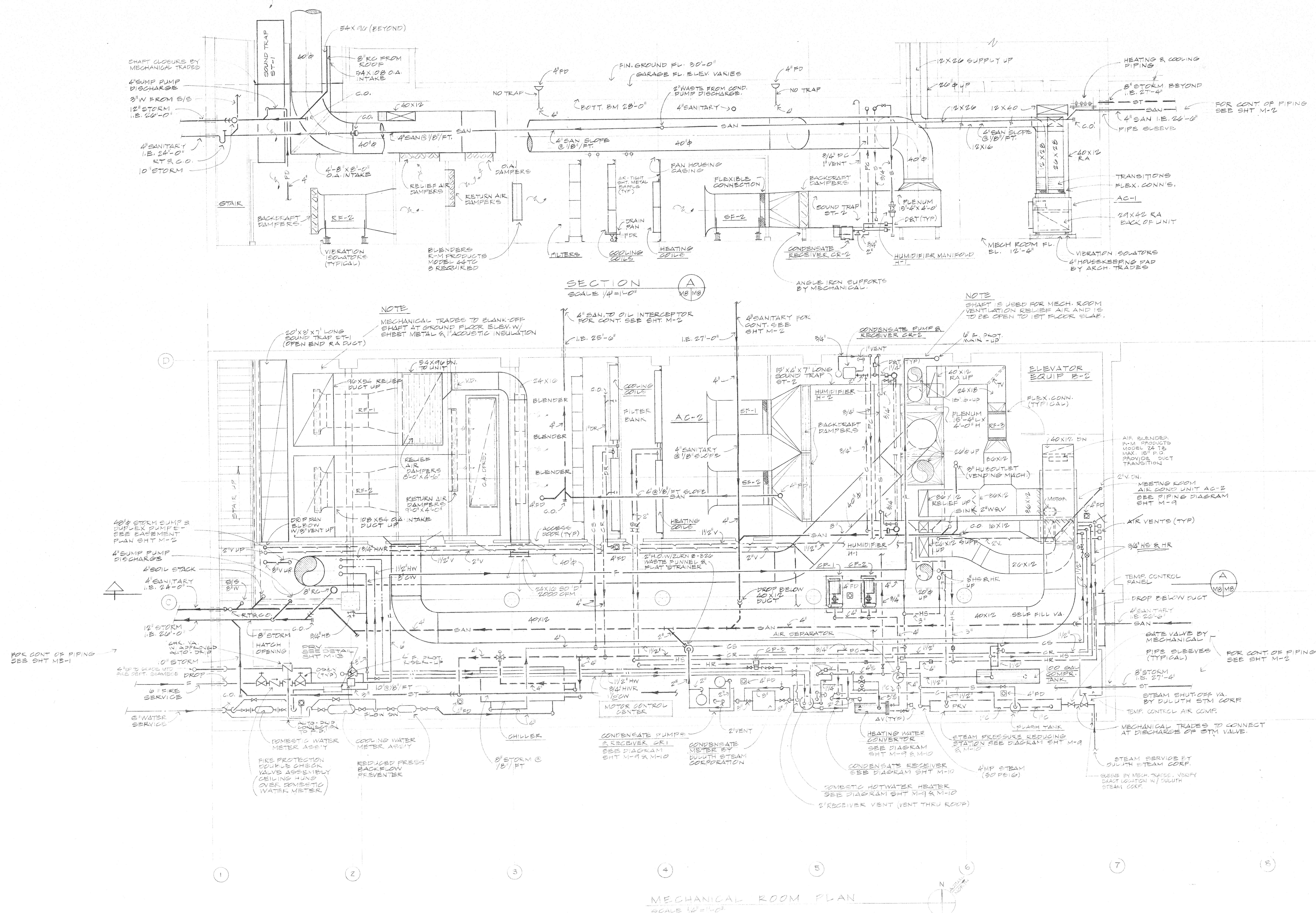
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ROOM PLAN  
& SECTION

DTA PW 91-01-02-01

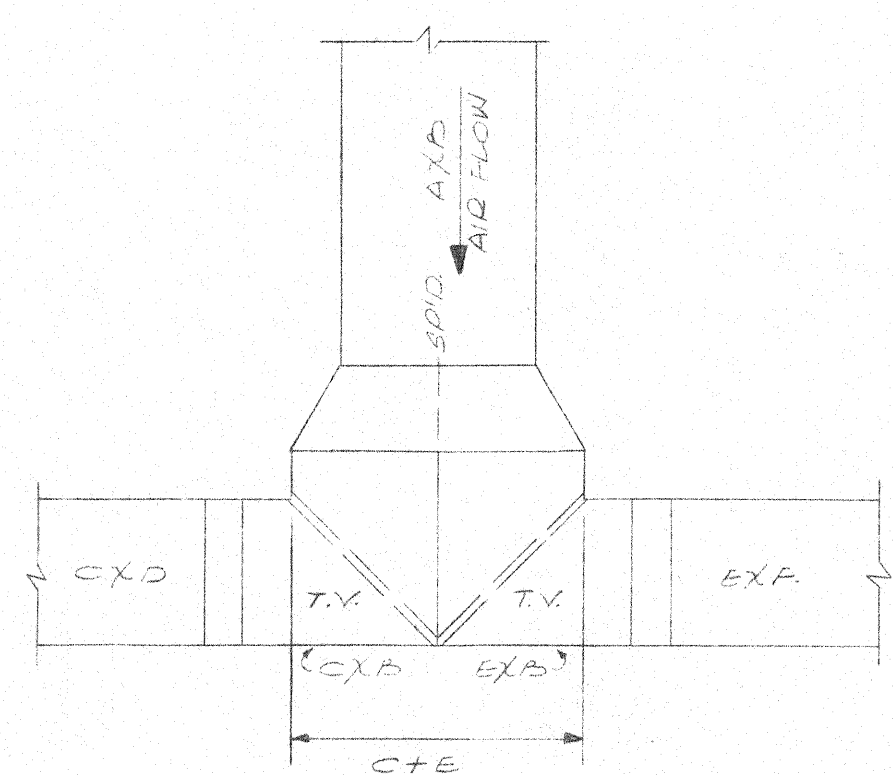
REVISIONS		
ITEM	DATE	BY

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CHECKED GBE  
APPROVED VJB  
FOR CONSTR  
DATE APRIL 7, 1977  
SCALE 1/8" = 1'-0"

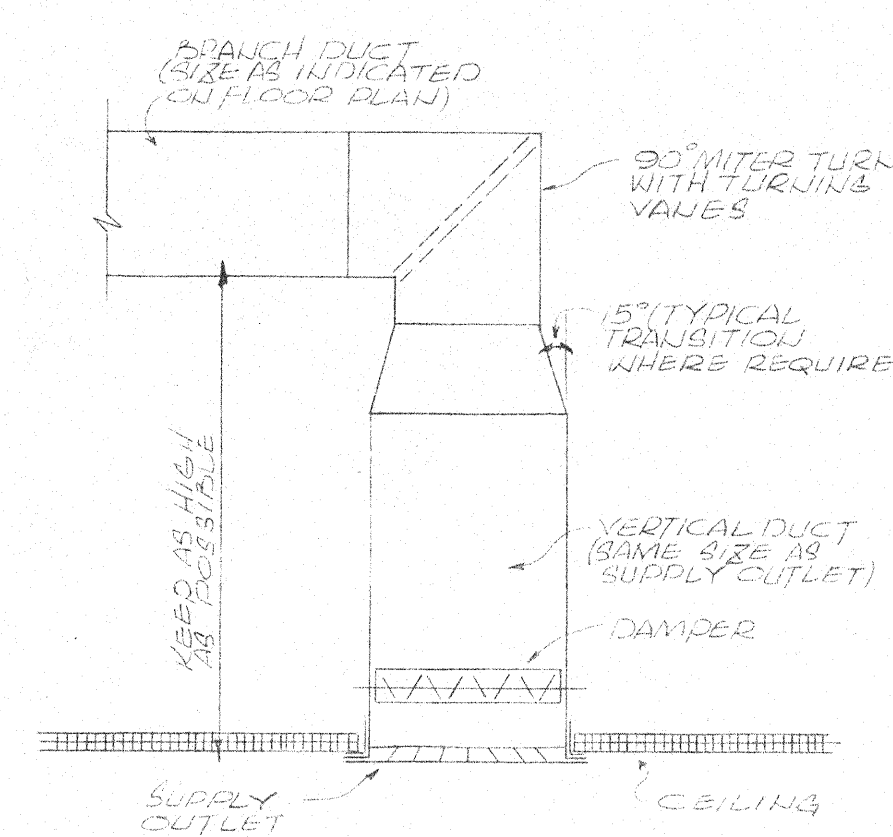
PROJECT  
7612 M-8



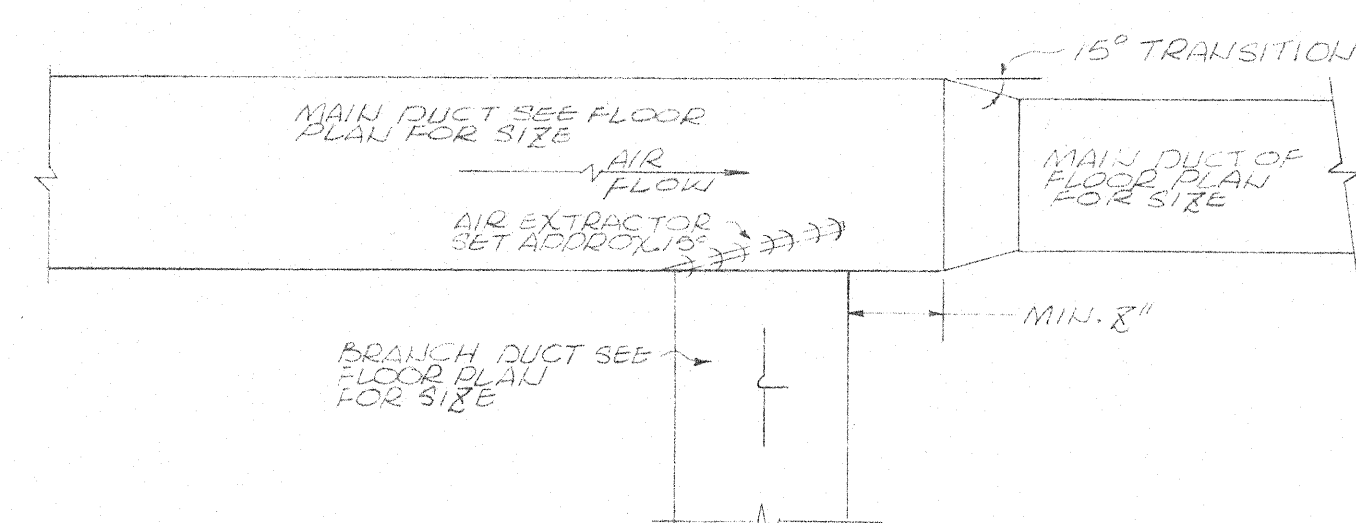




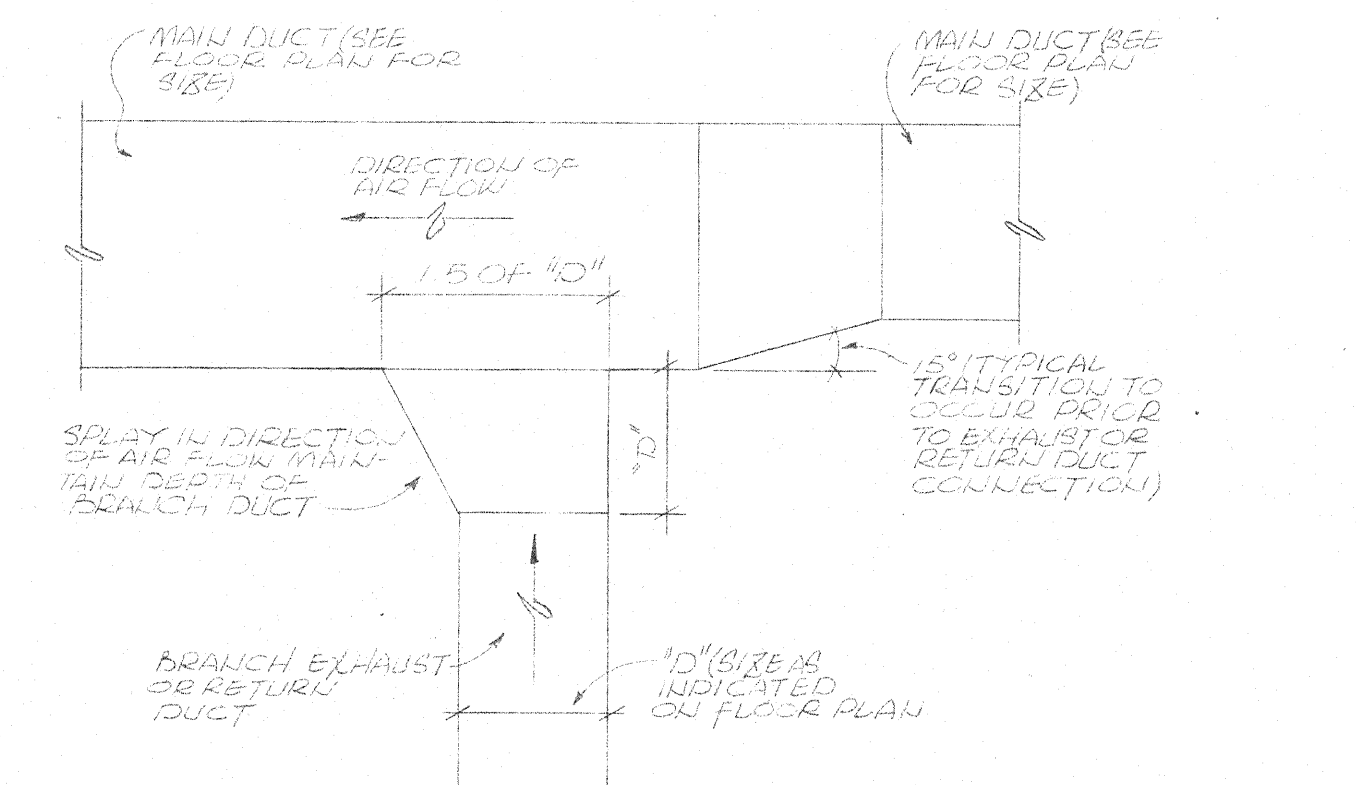
TYPICAL SUPPLY DUCT  
NO SCALE



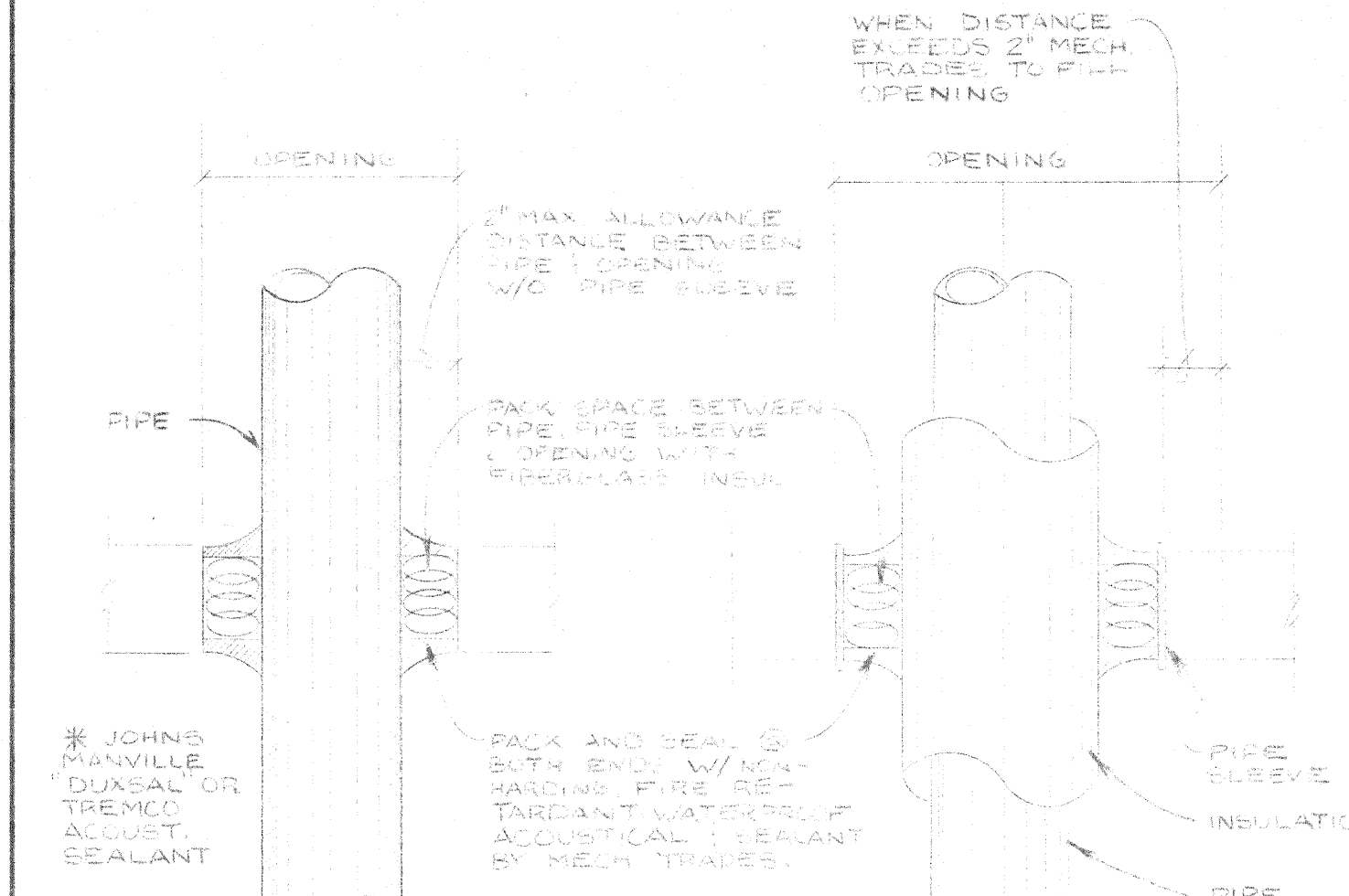
TYPICAL DUCT ARRANGEMENT  
FOR CEILING SUPPLY OUTLETS  
NO SCALE



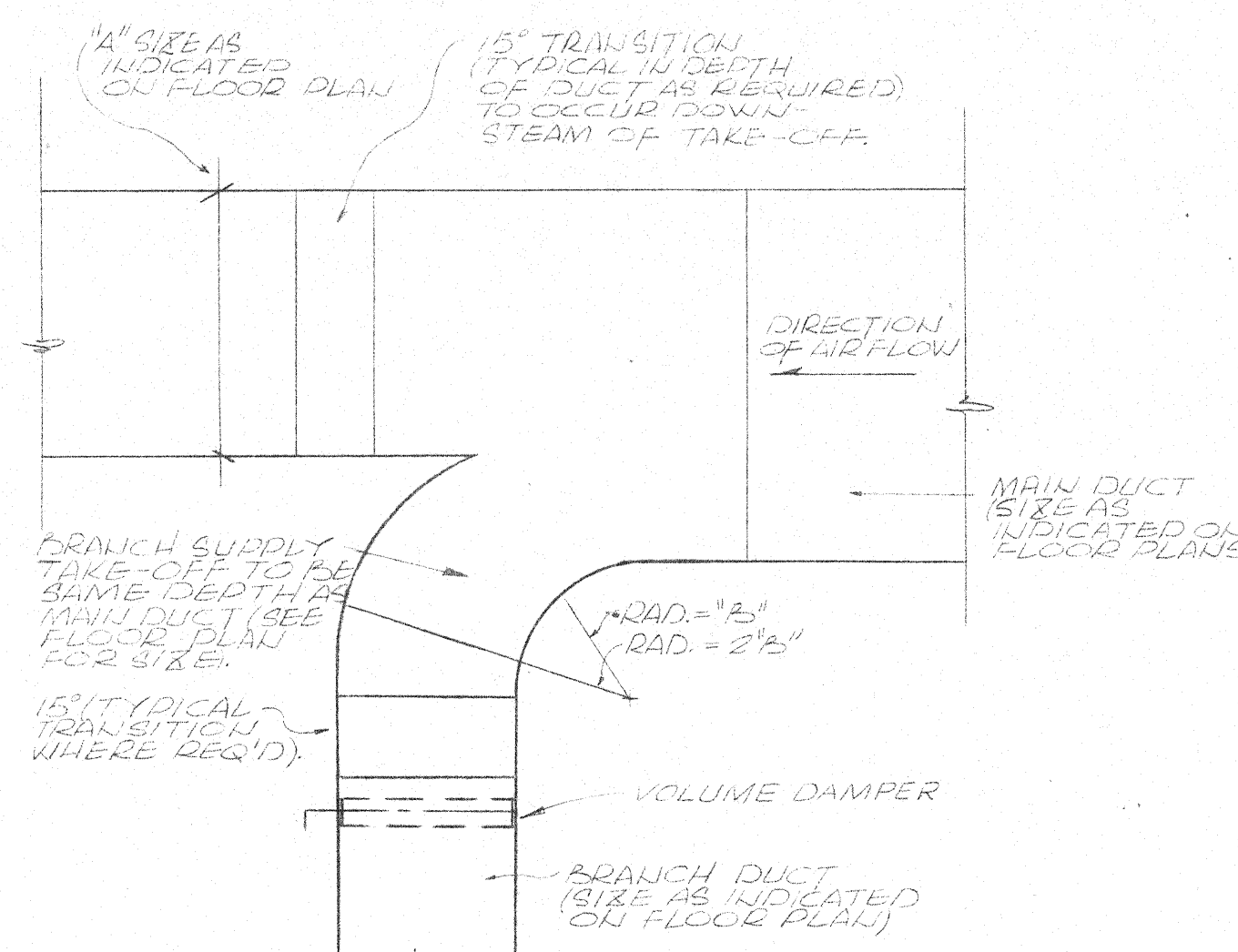
TYPICAL SUPPLY DUCT CONNECTION  
WITH AIR EXTRACTOR  
NO SCALE



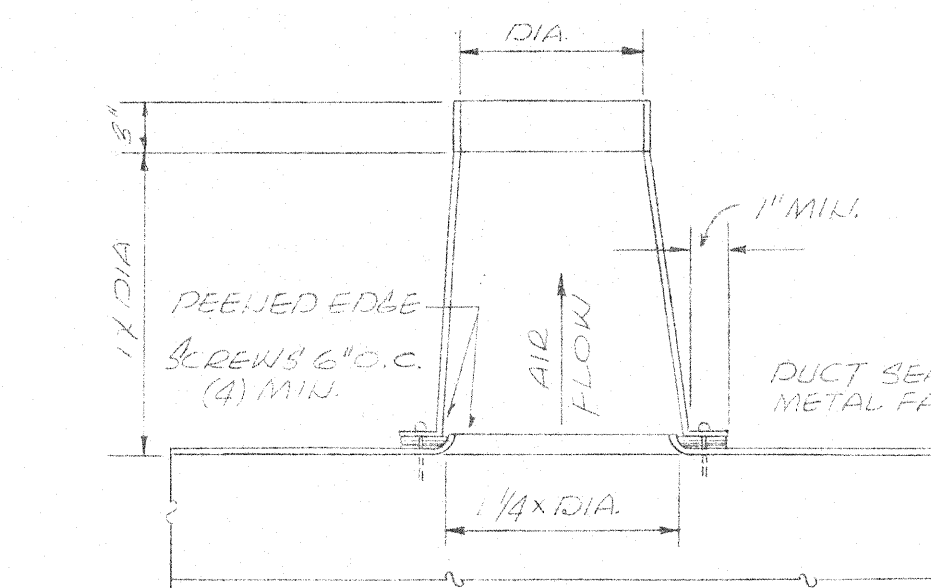
TYPICAL RETURN OR EXHAUST  
AIR DUCT CONNECTION  
NO SCALE



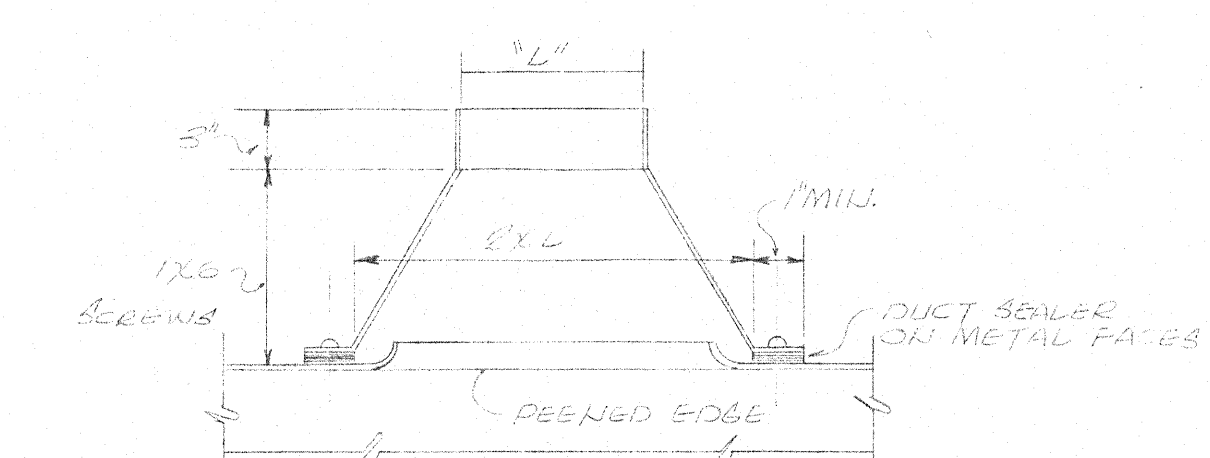
TYPICAL DETAIL OF PIPING PASSING  
THRU OPENING IN SLAB OR WALL  
ABOVE GROUND  
NO SCALE



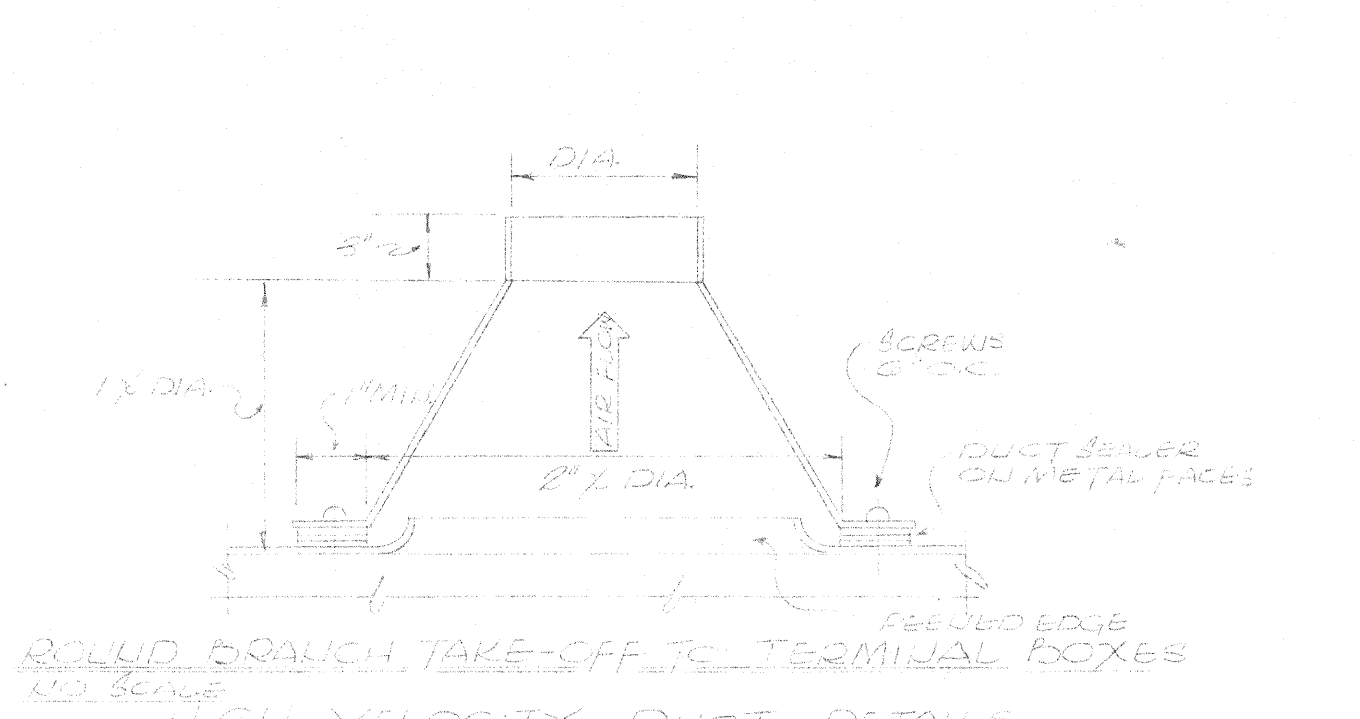
TYPICAL RADIUS TURN ON  
SUPPLY AIR DUCT  
NO SCALE



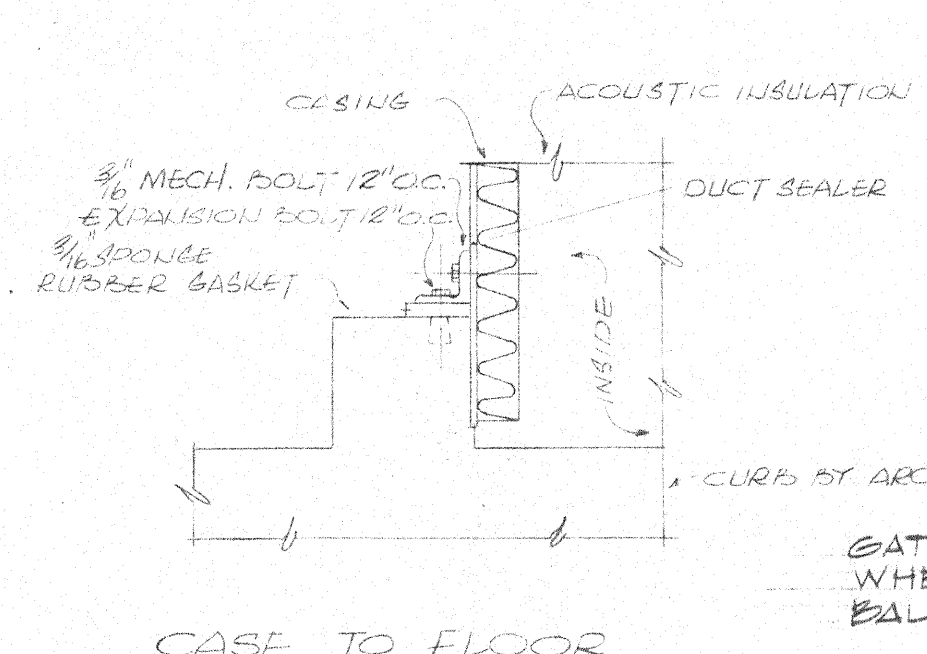
ROUND BRANCH TAKE-OFF  
TO TRUCK LINES  
NO SCALE



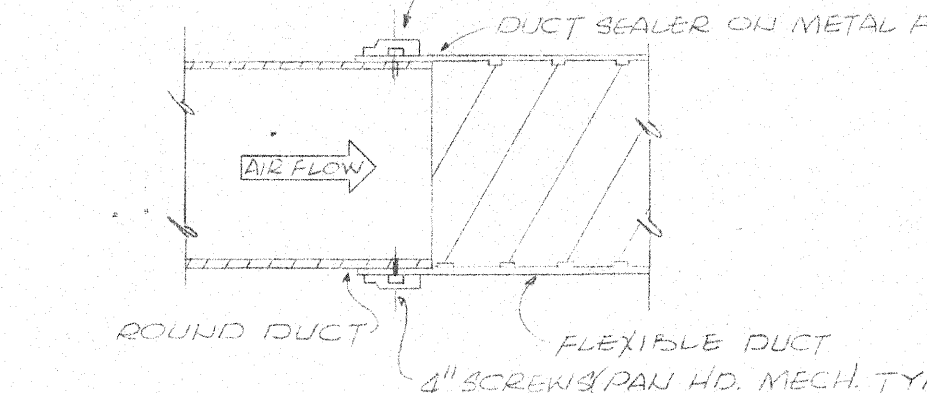
RECTANGULAR BRANCH TAKE-OFF  
HIGH VELOCITY DUCT DETAILS  
NO SCALE



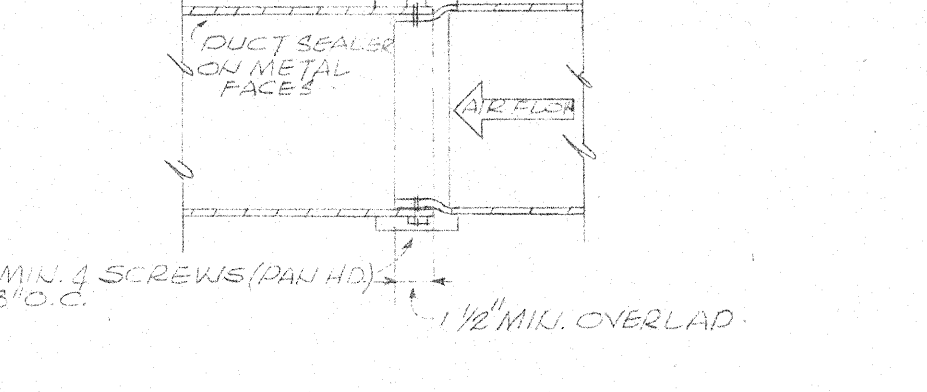
ROUND BRANCH TAKE-OFF TO TERMINAL BOXES  
HIGH VELOCITY DUCT DETAILS  
NO SCALE



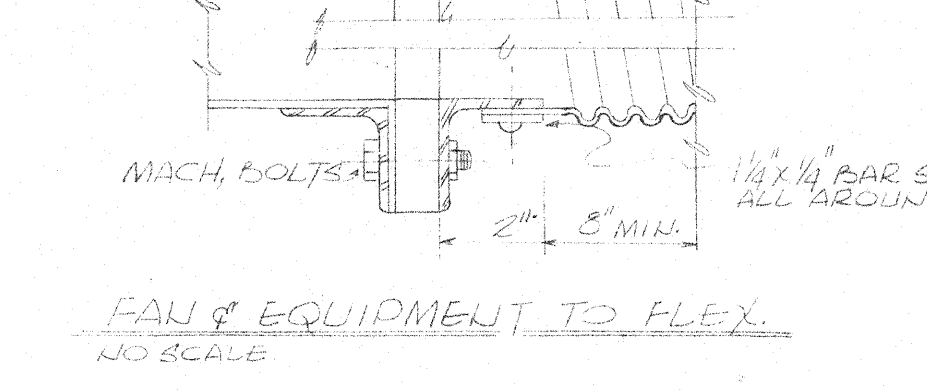
CASE TO FLOOR  
NO SCALE



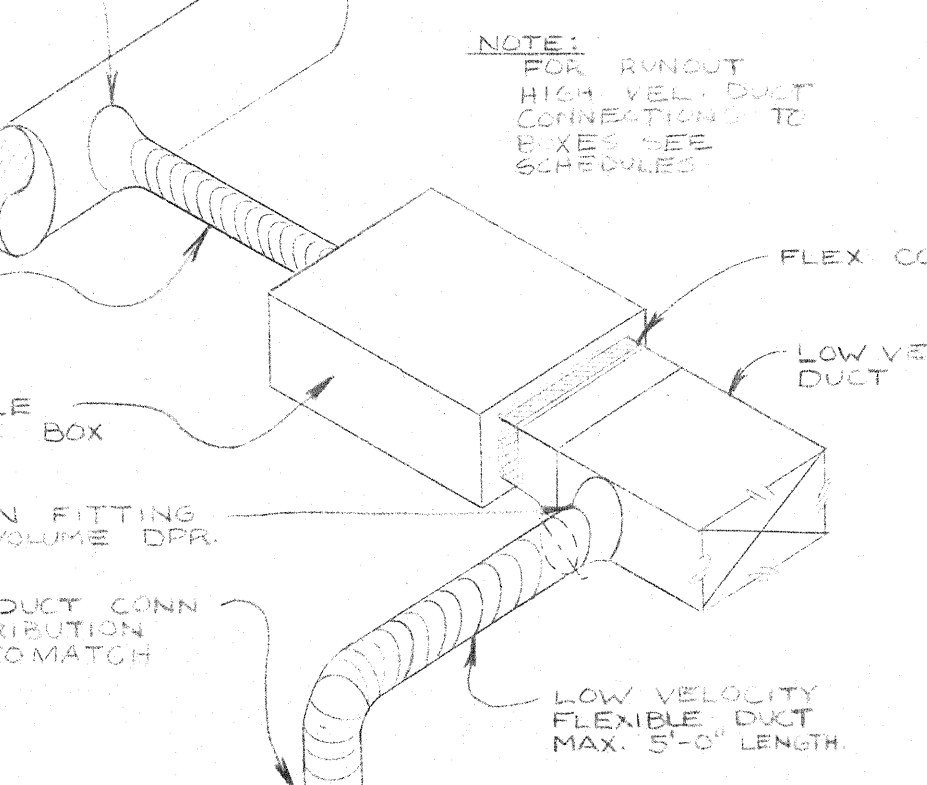
ROUND TO FLEXIBLE  
NO SCALE



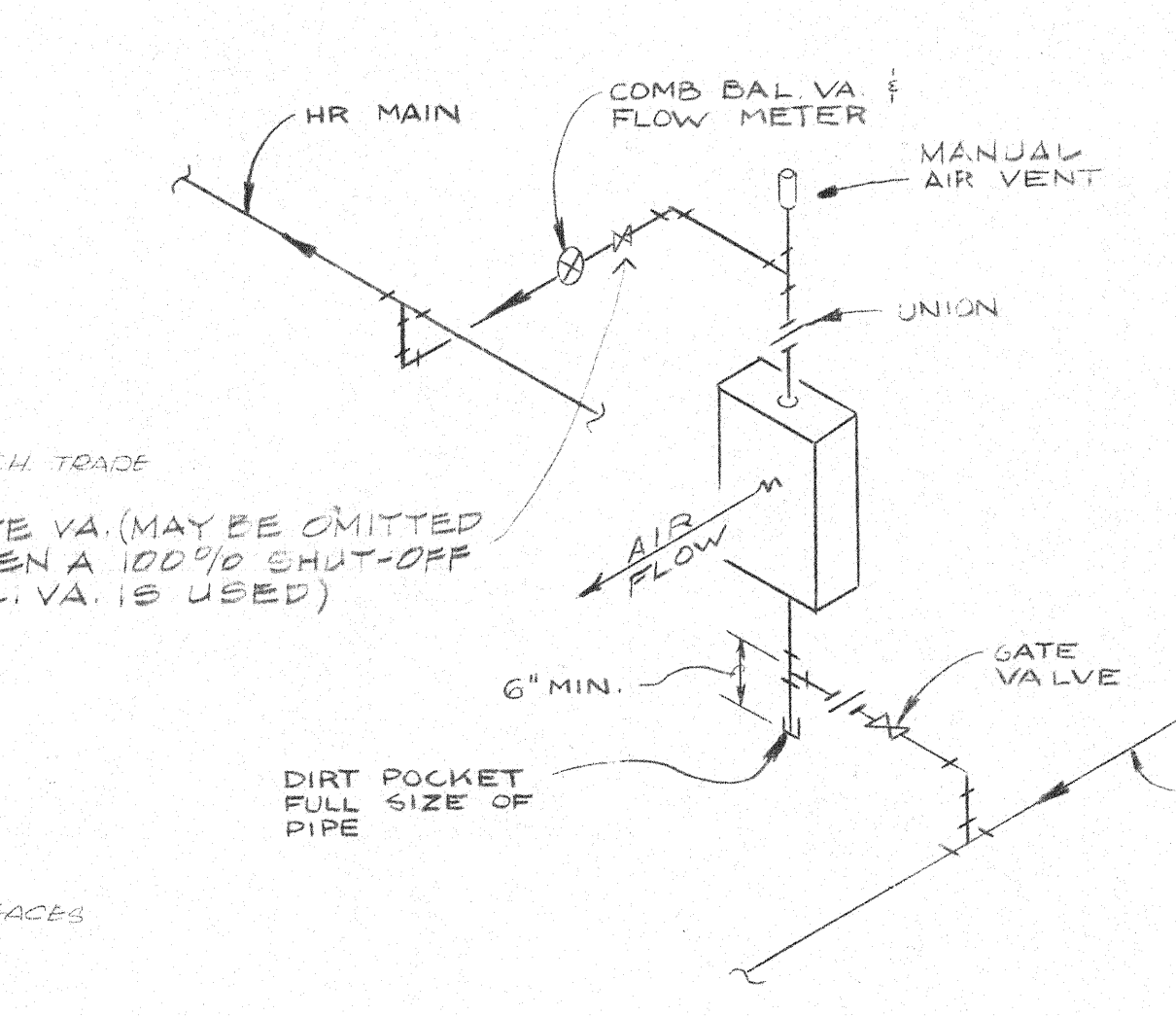
ROUND TO ROUND  
NO SCALE



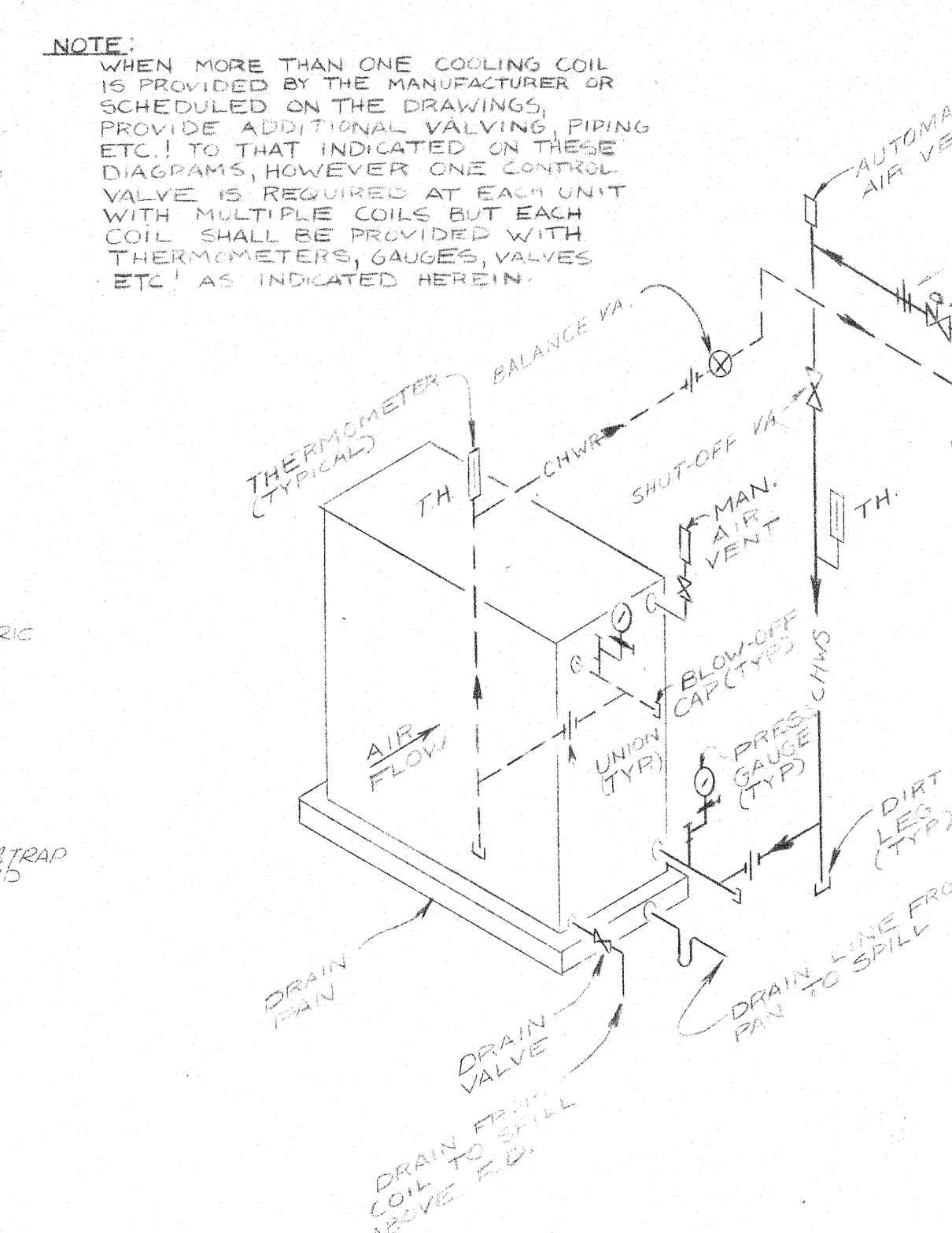
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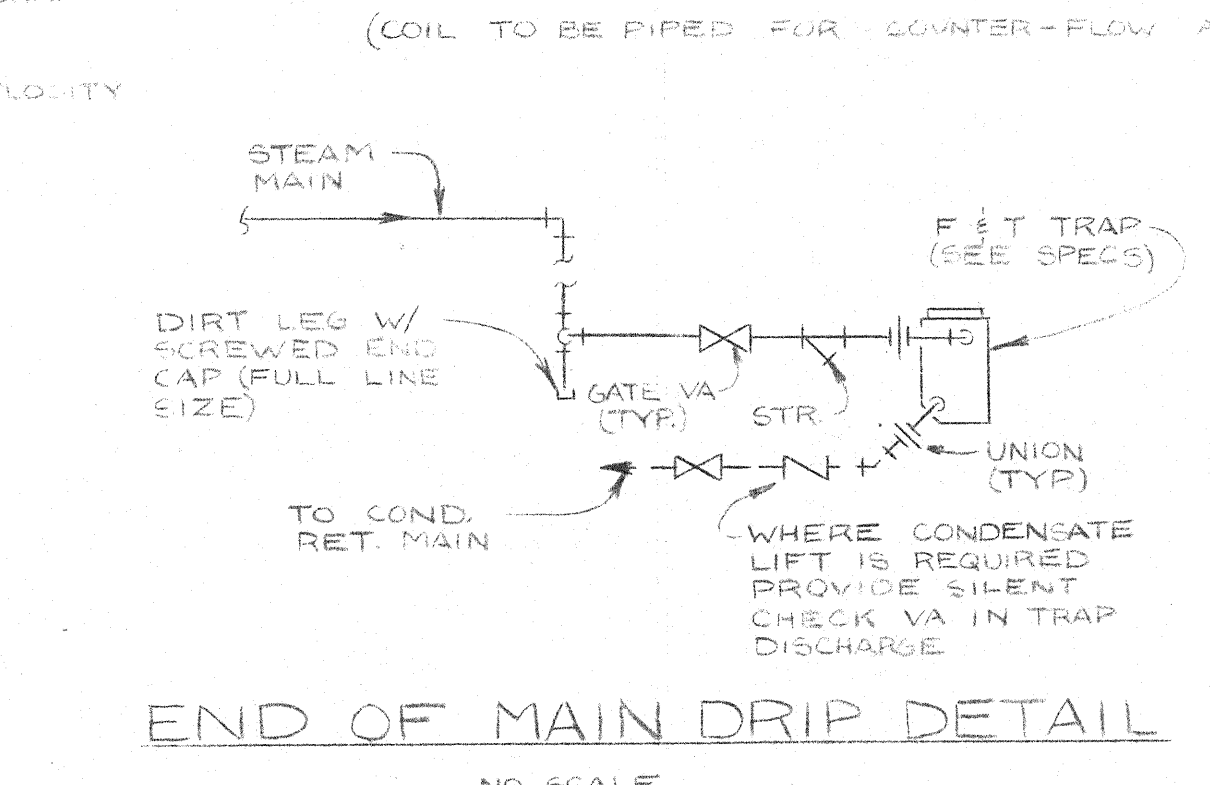
TYPICAL DETAIL OF  
VARIABLE VOLUME BOXES  
NO SCALE



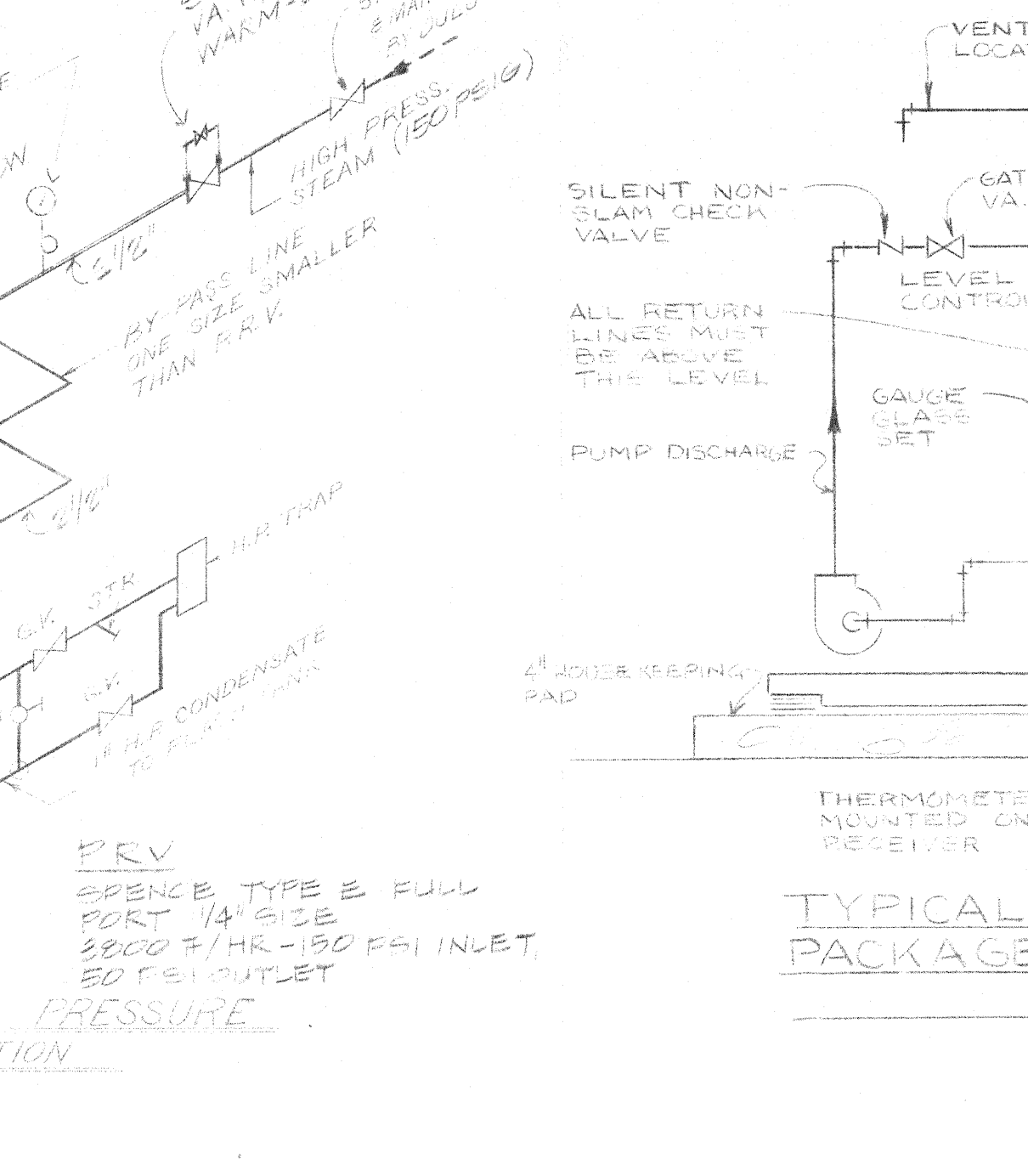
HOT WATER HORIZONTAL  
UNIT HEATER PIPING DIAGRAM  
NO SCALE



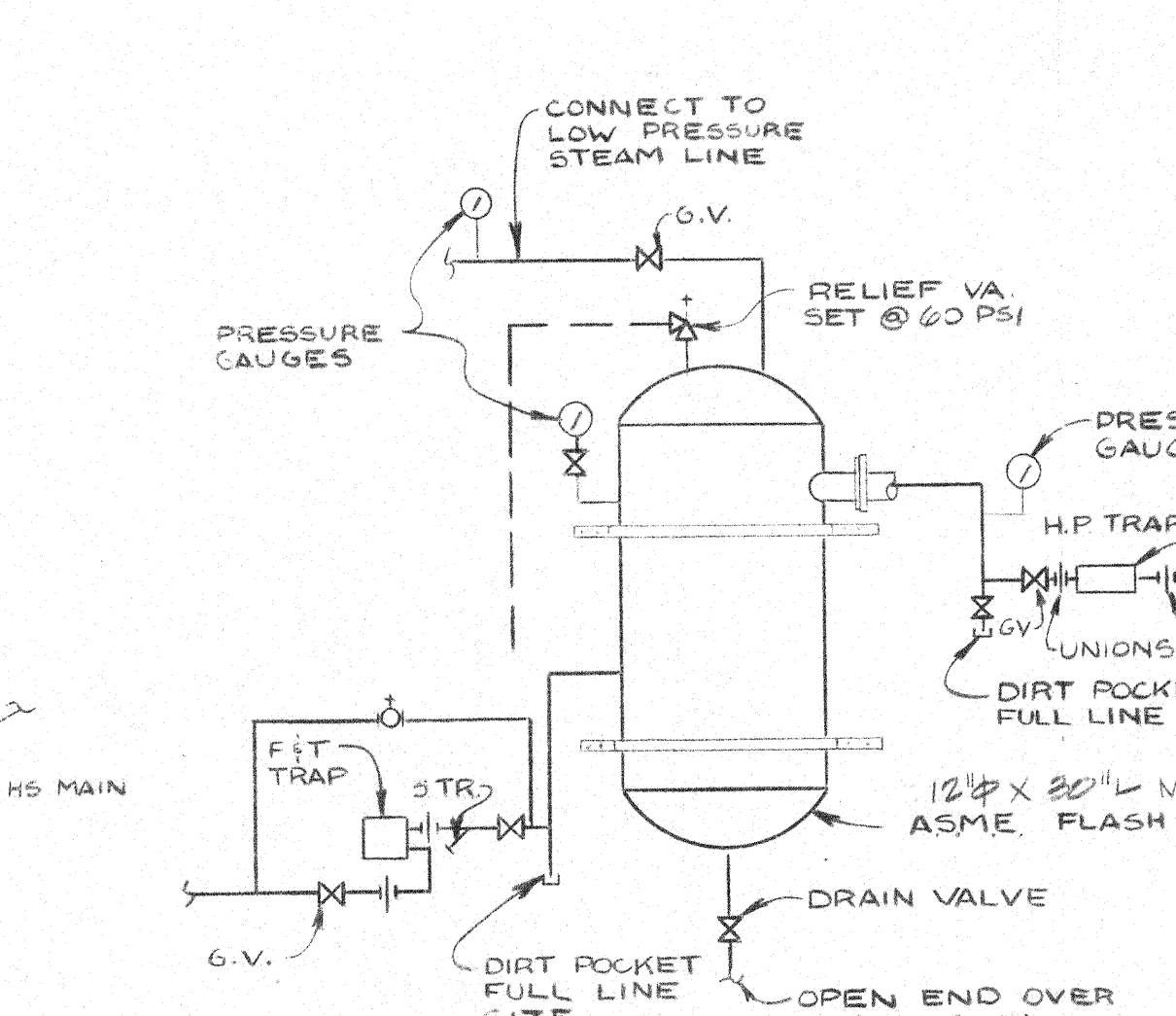
AIR CONDITIONING UNIT AND  
COOLING WATER COIL  
PIPING DIAGRAM  
NO SCALE



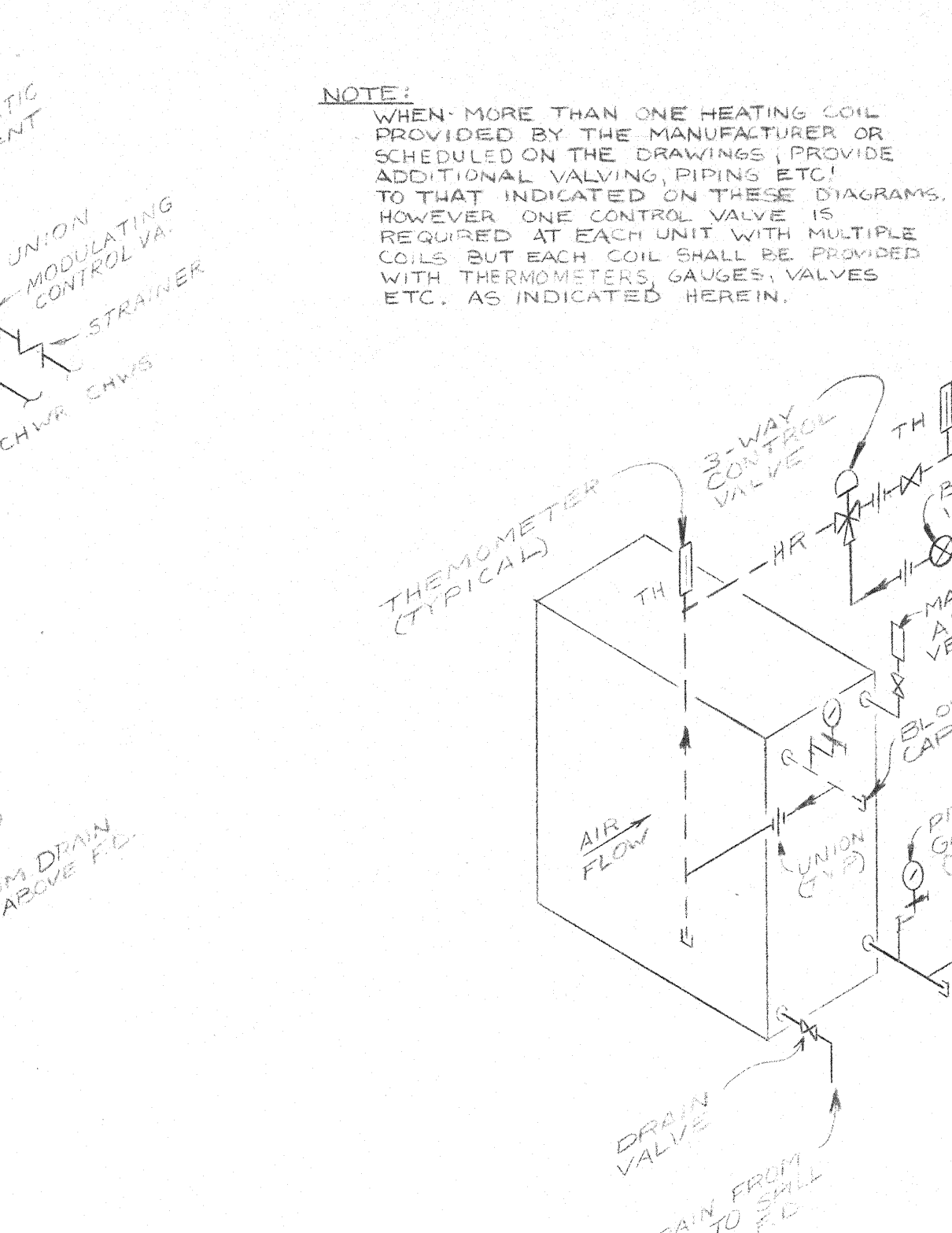
END OF MAIN DRIP DETAIL  
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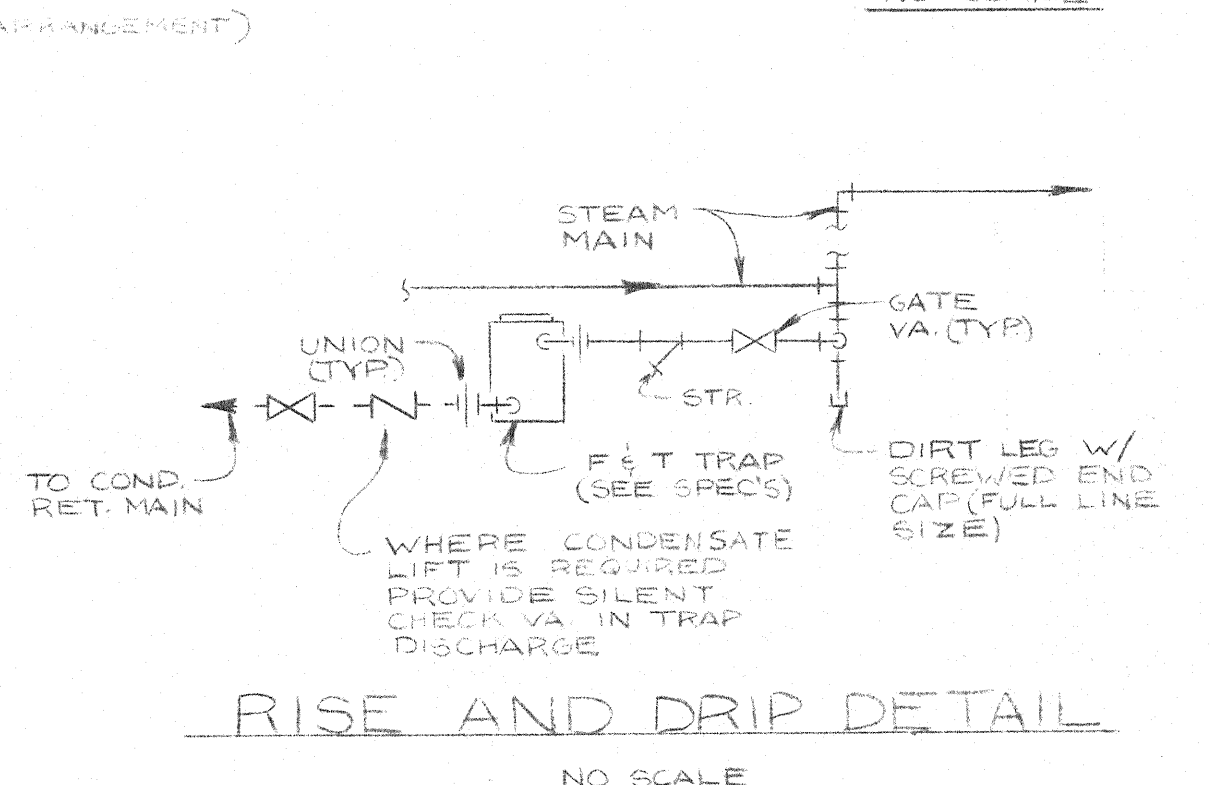
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PACKAGE DUPLEX CONDENSATE  
RETURN PUMP  
NO SCALE



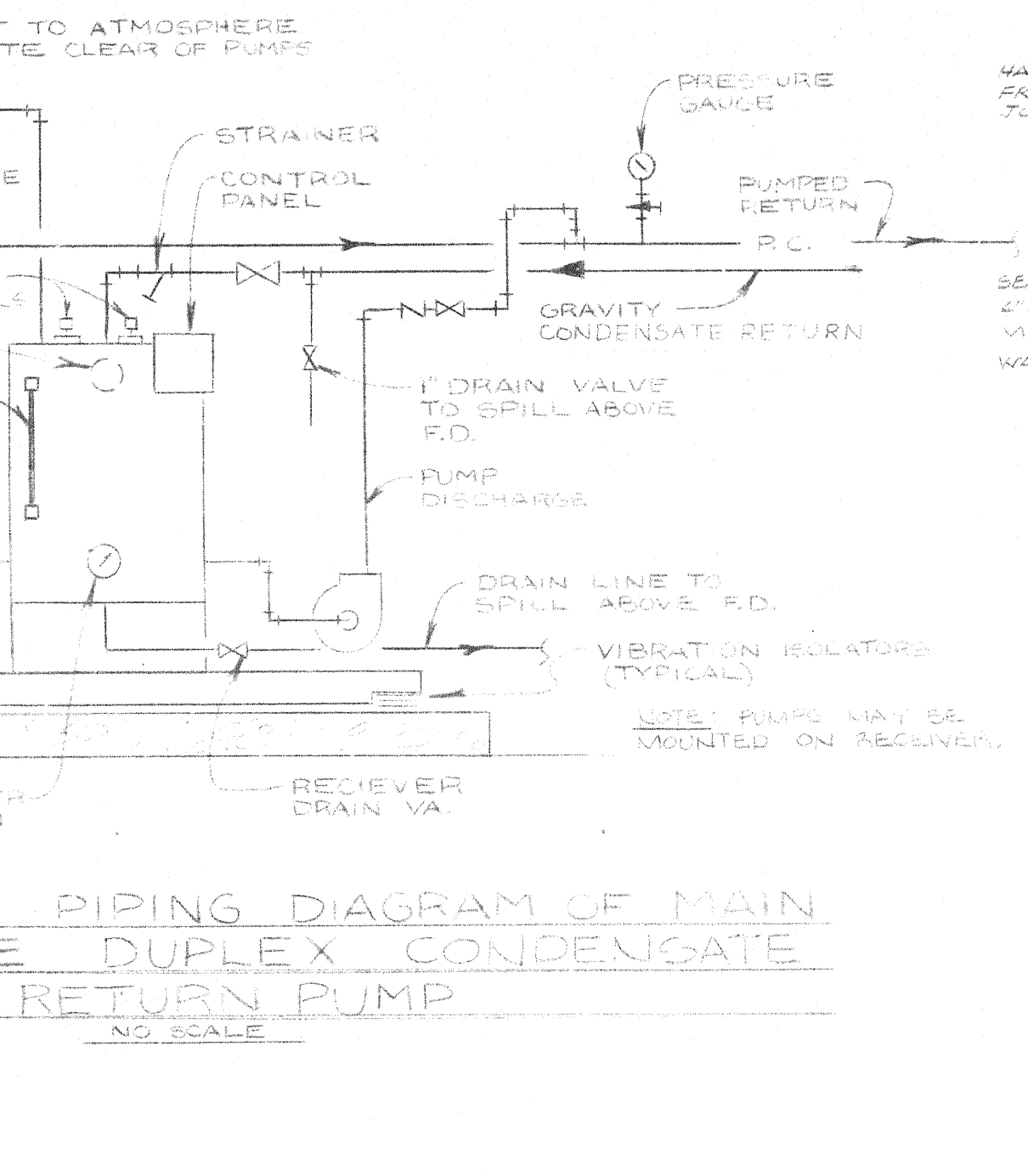
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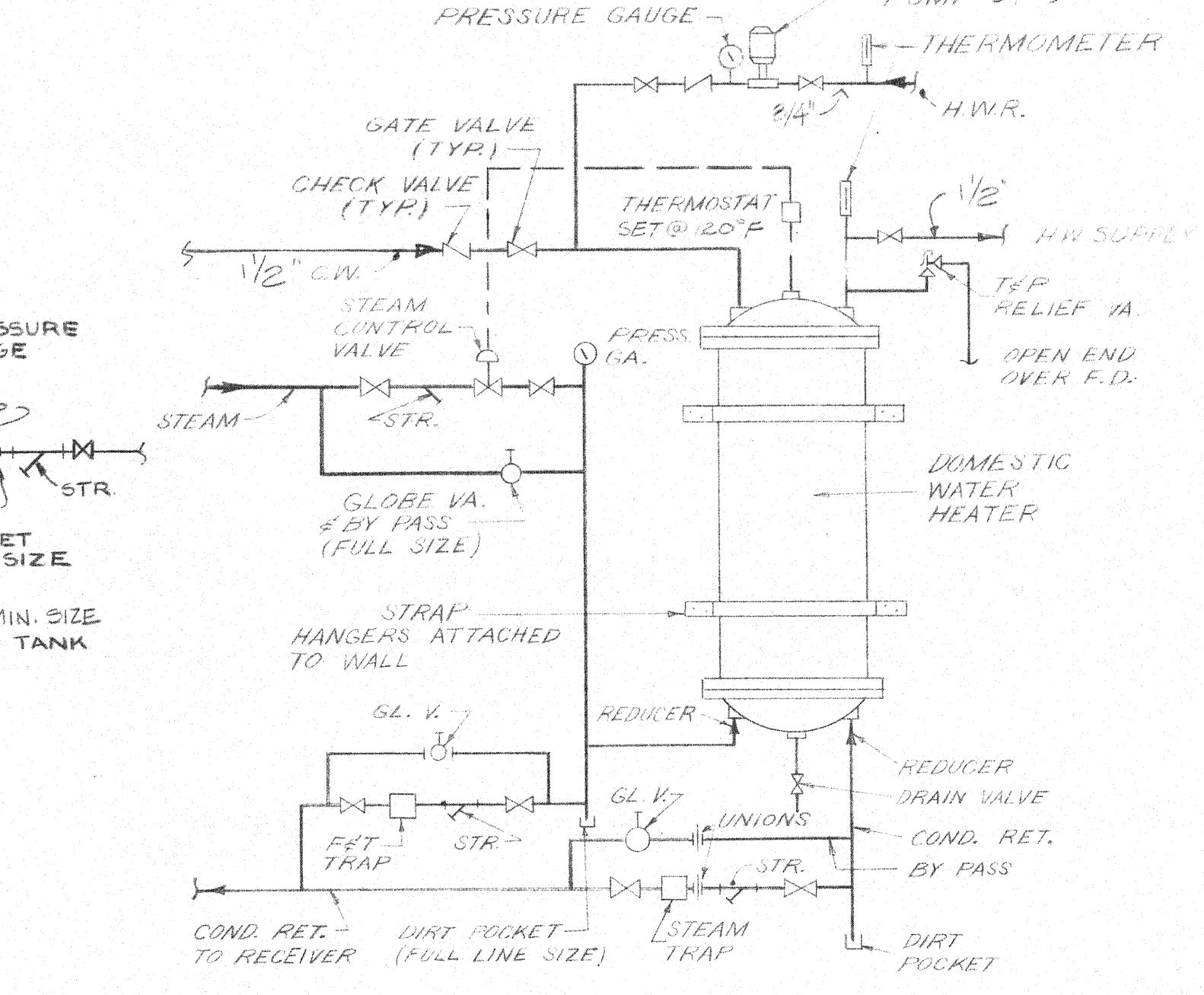
AIR CONDITIONING UNIT  
HOT WATER HEATING COIL PIPING DIAGRAM  
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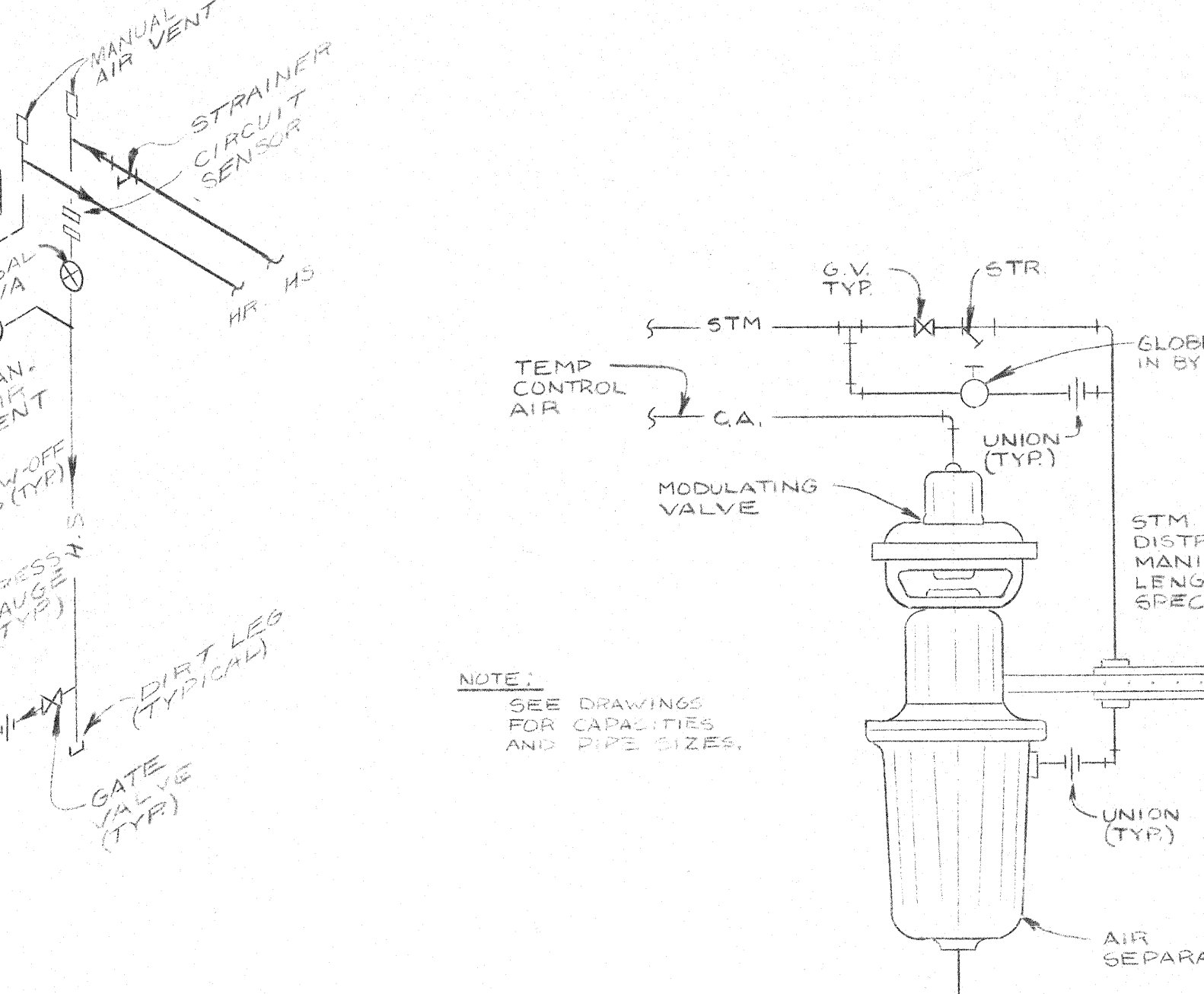
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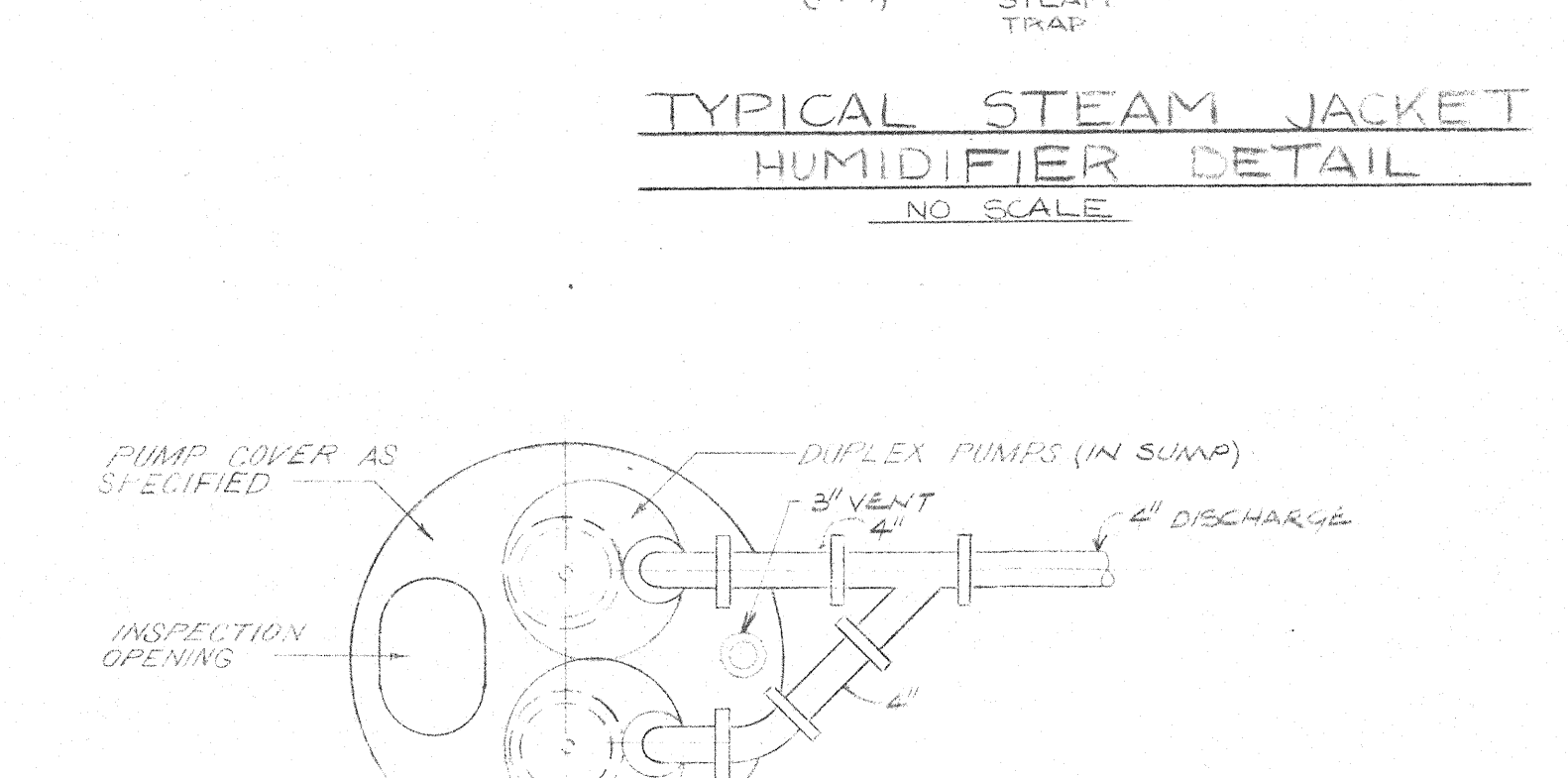
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RETURN PUMP  
NO SCALE



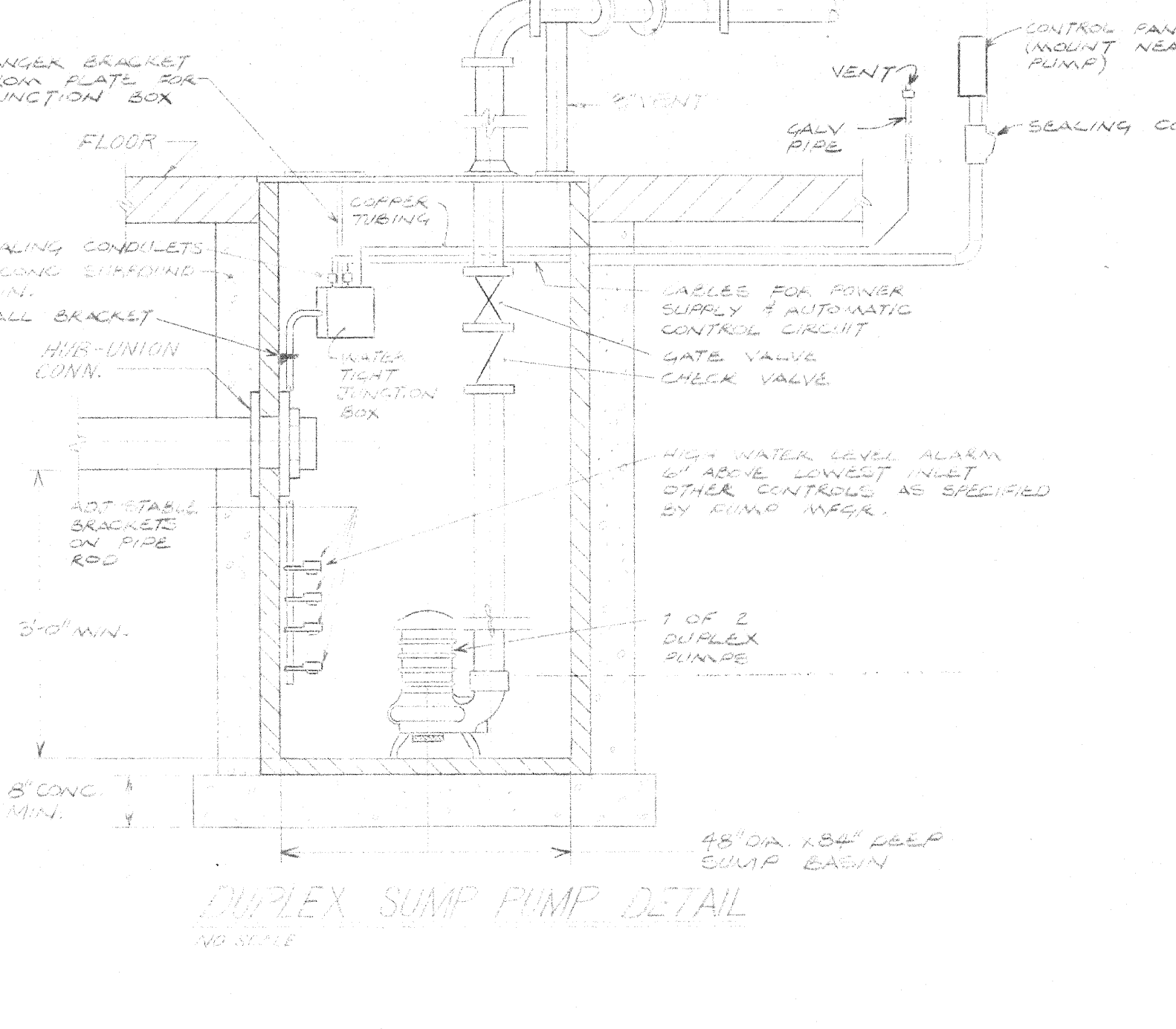
DOMESTIC WATER HEATER  
PIPING DETAIL  
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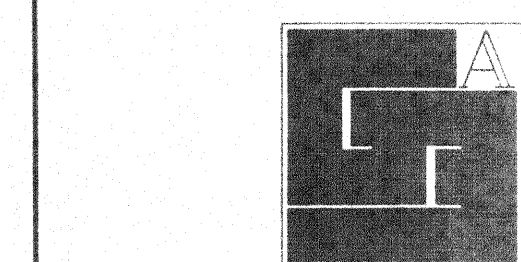
TYPICAL STEAM JACKET  
HUMIDIFIER DETAIL  
NO SCALE



TYPICAL PIPING DIAGRAM OF MAIN  
PACKAGE DUPLEX CONDENSATE  
RETURN PUMP  
NO SCALE



TYPICAL PIPING DIAGRAM OF MAIN  
PACKAGE DUPLEX CONDENSATE  
RETURN PUMP  
NO SCALE



Gunnar Birkerts  
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Associates  
Architects

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ENGINEERS  
BLOOMFIELD HILLS, MICHIGAN

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Library  
DULUTH, MINNESOTA

MECHANICAL  
DETAILS &  
CONNECTIONS

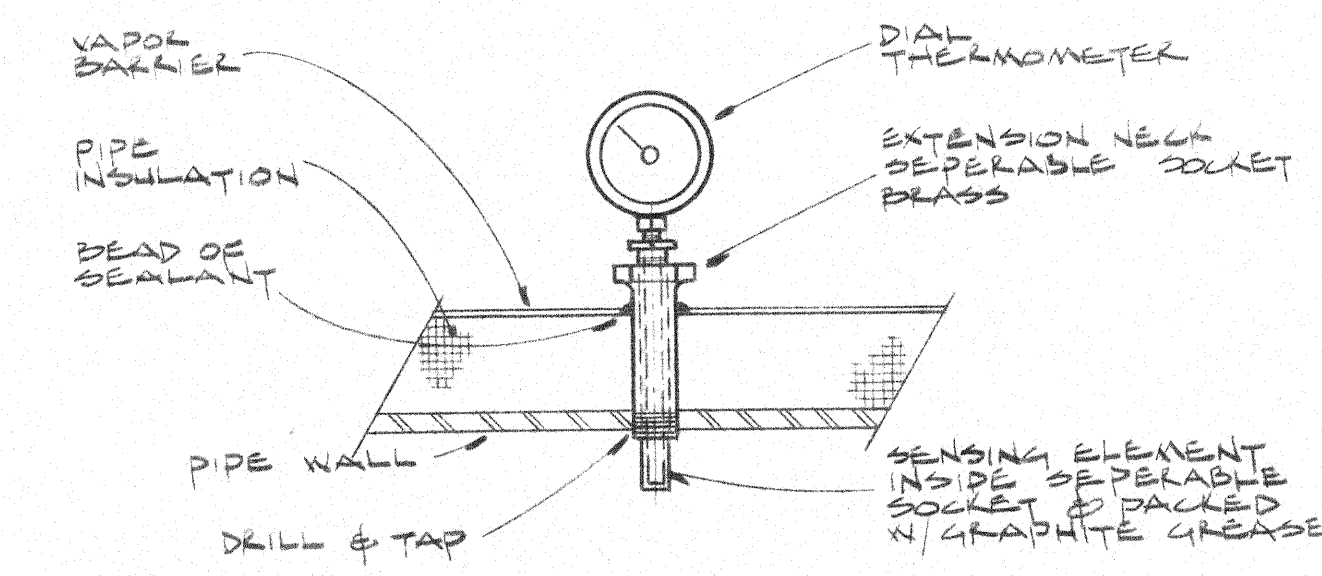
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REVISIONS	ITEM	DATE	BY

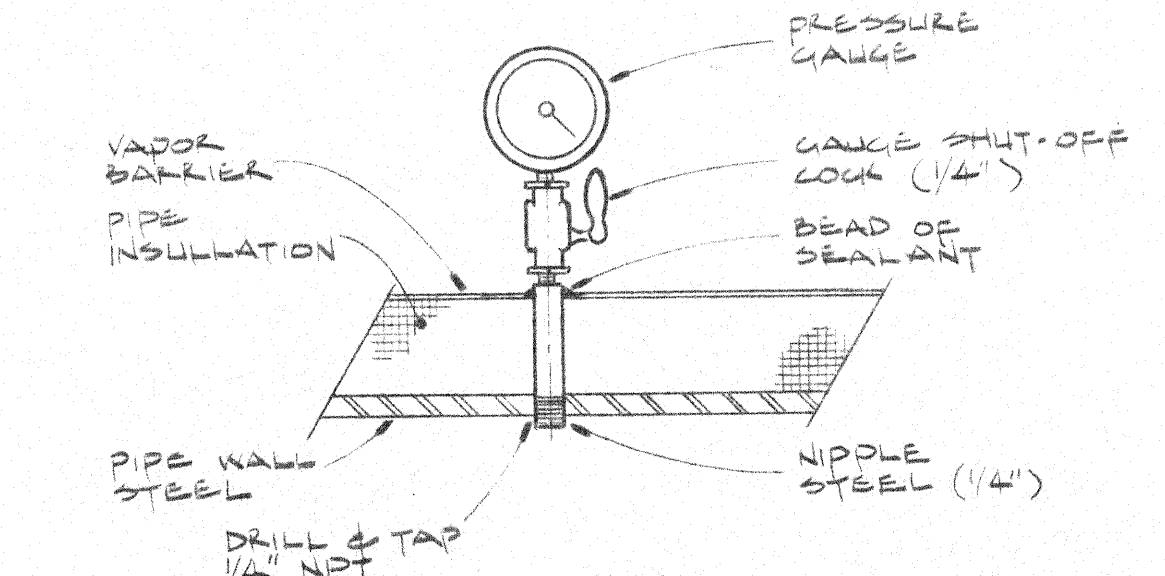
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CHECKED BY  
APPROVED BY  
DATE  
SCALE  
PROJECT

7612 M-9

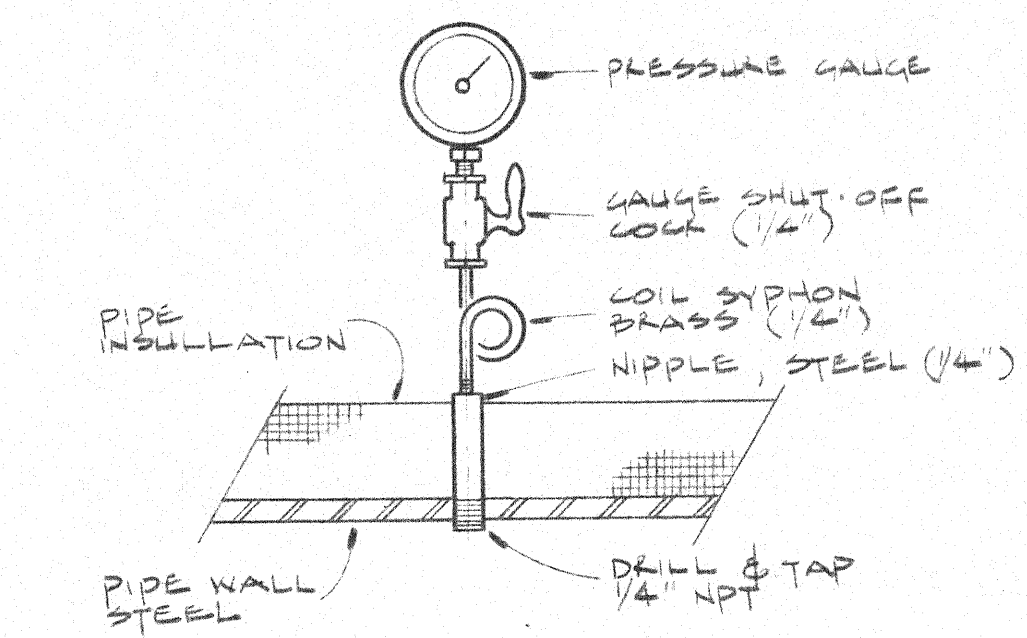




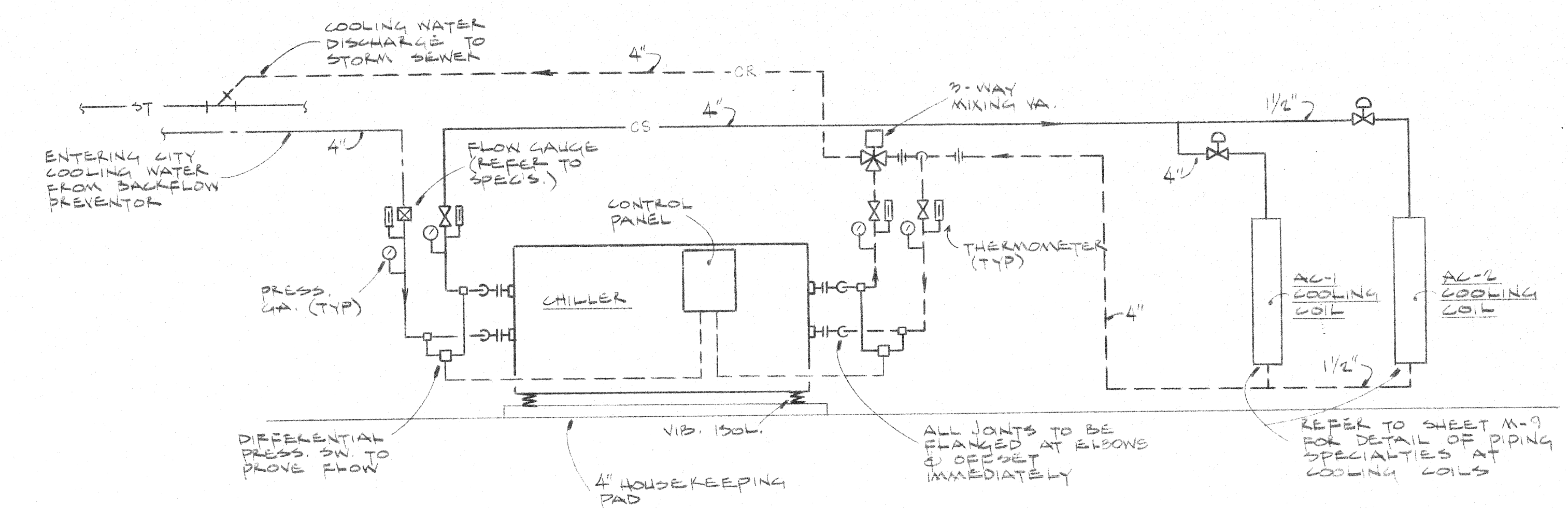
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DETAIL



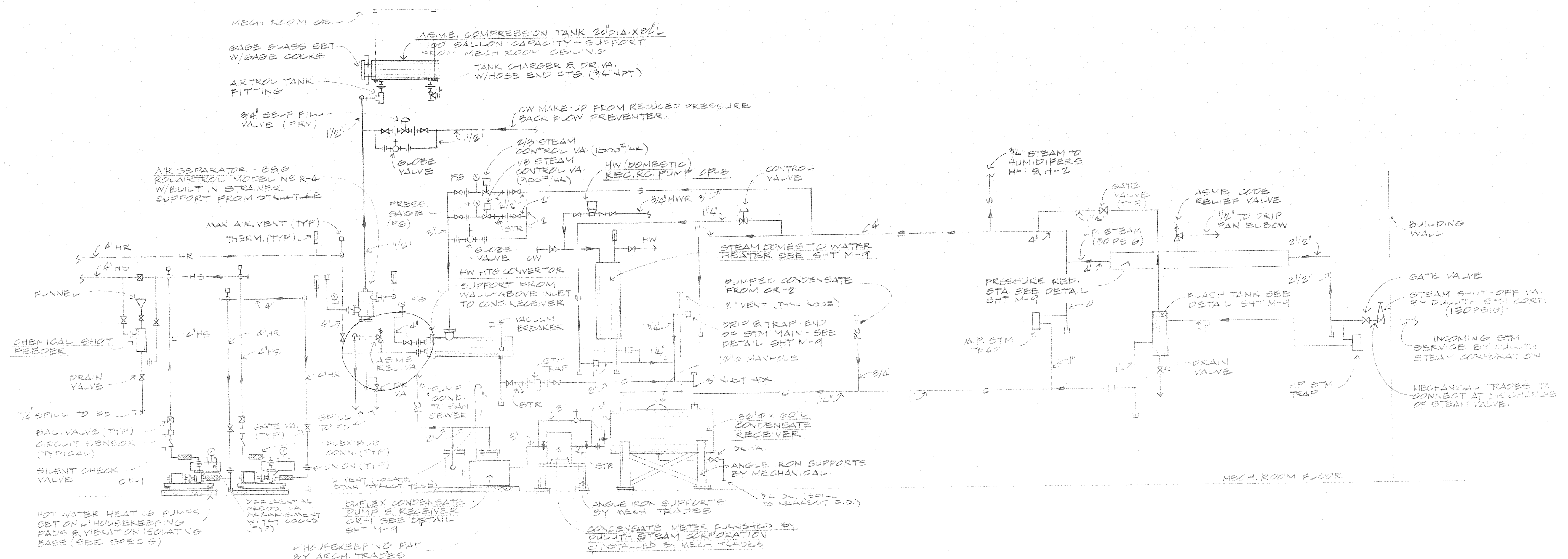
LIQUID PRESSURE GAUGE  
MOUNTING DETAIL



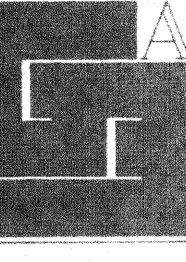
STEAM PRESSURE GAUGE  
MOUNTING DETAIL



CHILLED WATER SYSTEM PIPING DIAGRAM  
NO SCALE



HEATING SYSTEM PIPING DIAGRAM  
NO SCALE



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**Hoyem-Basso  
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Incorporated**  
MECHANICAL & ELECTRICAL  
ENGINEERS  
BLOOMFIELD HILLS, MICHIGAN

**Duluth Public  
Library**  
DULUTH, MINNESOTA

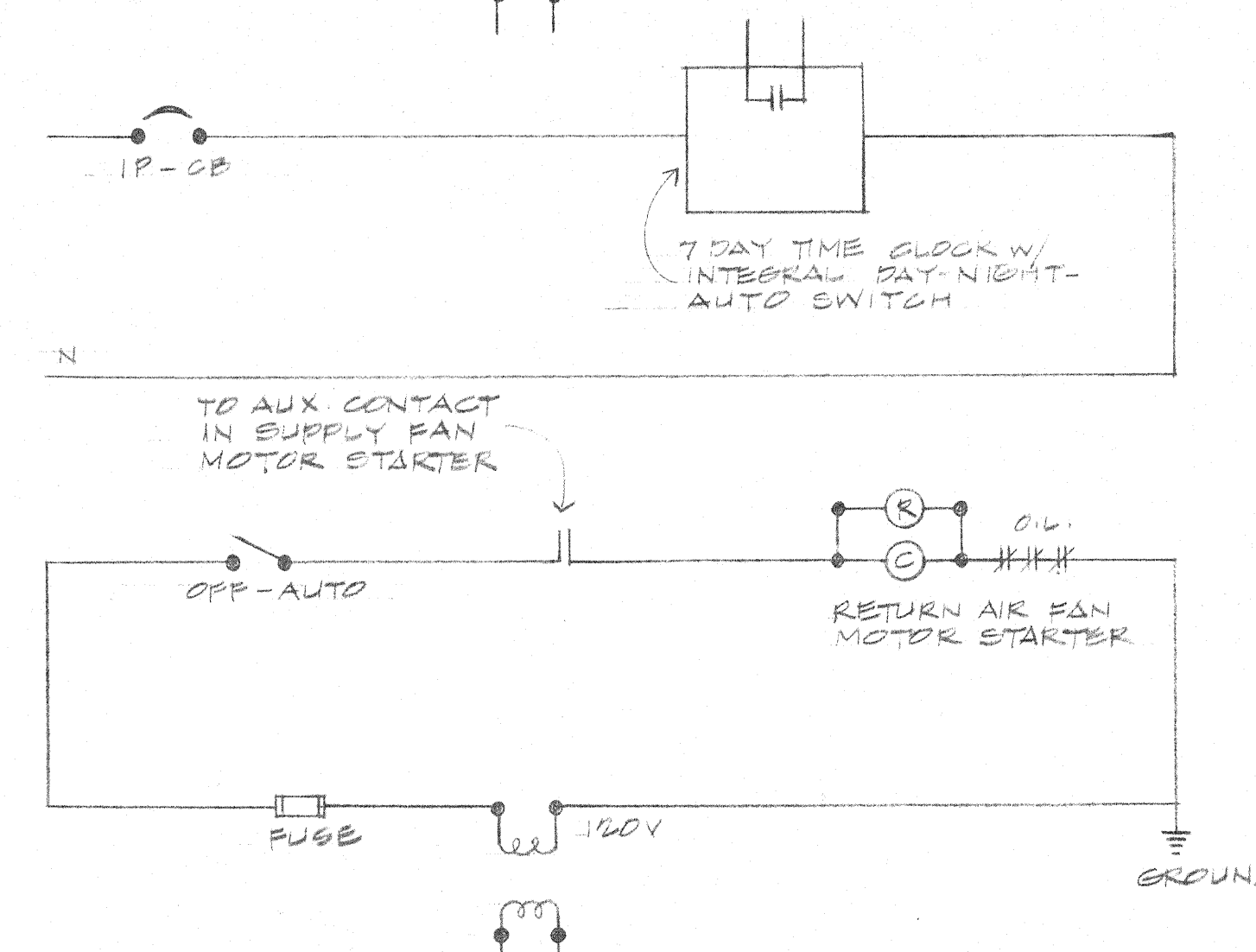
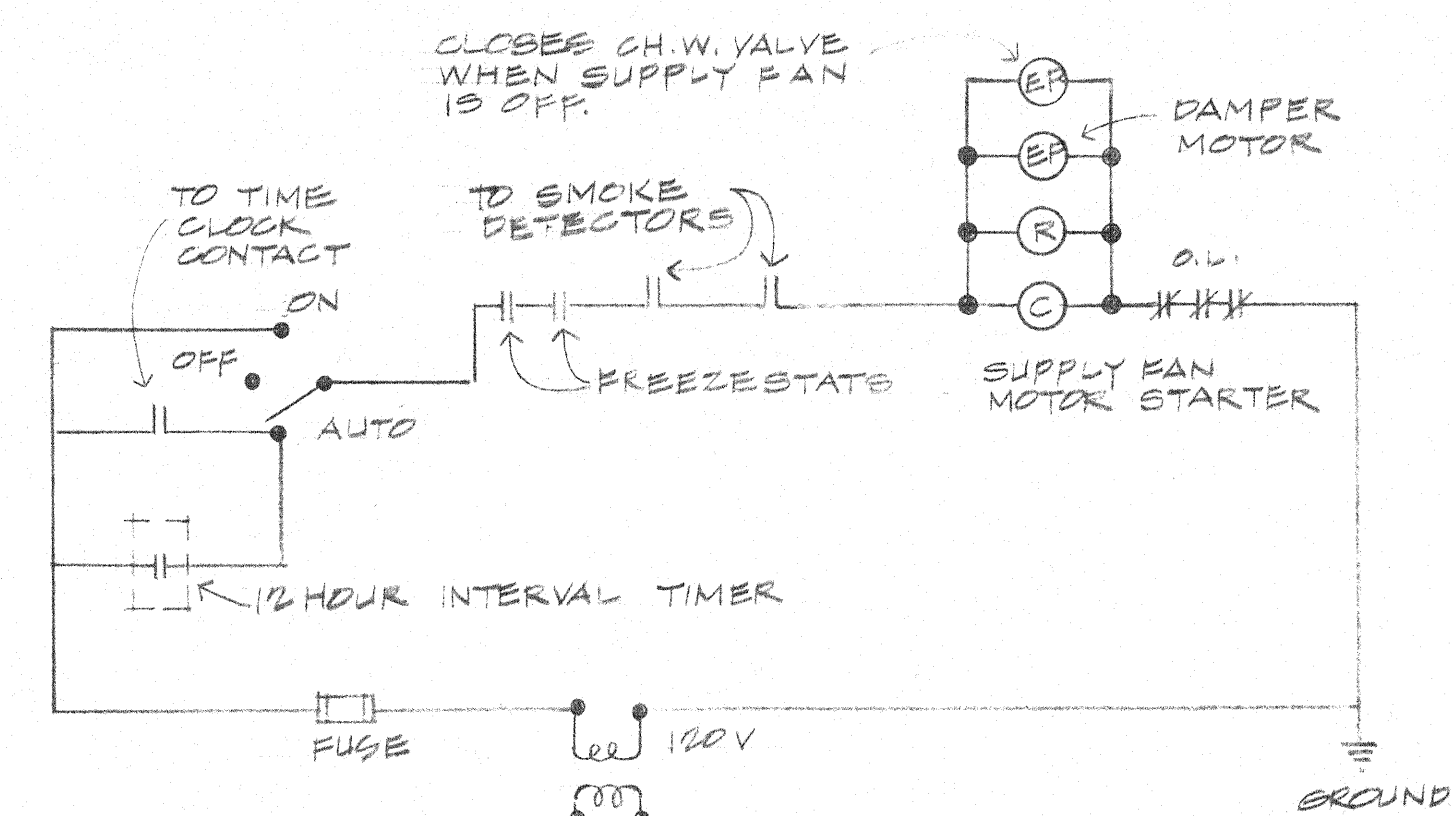
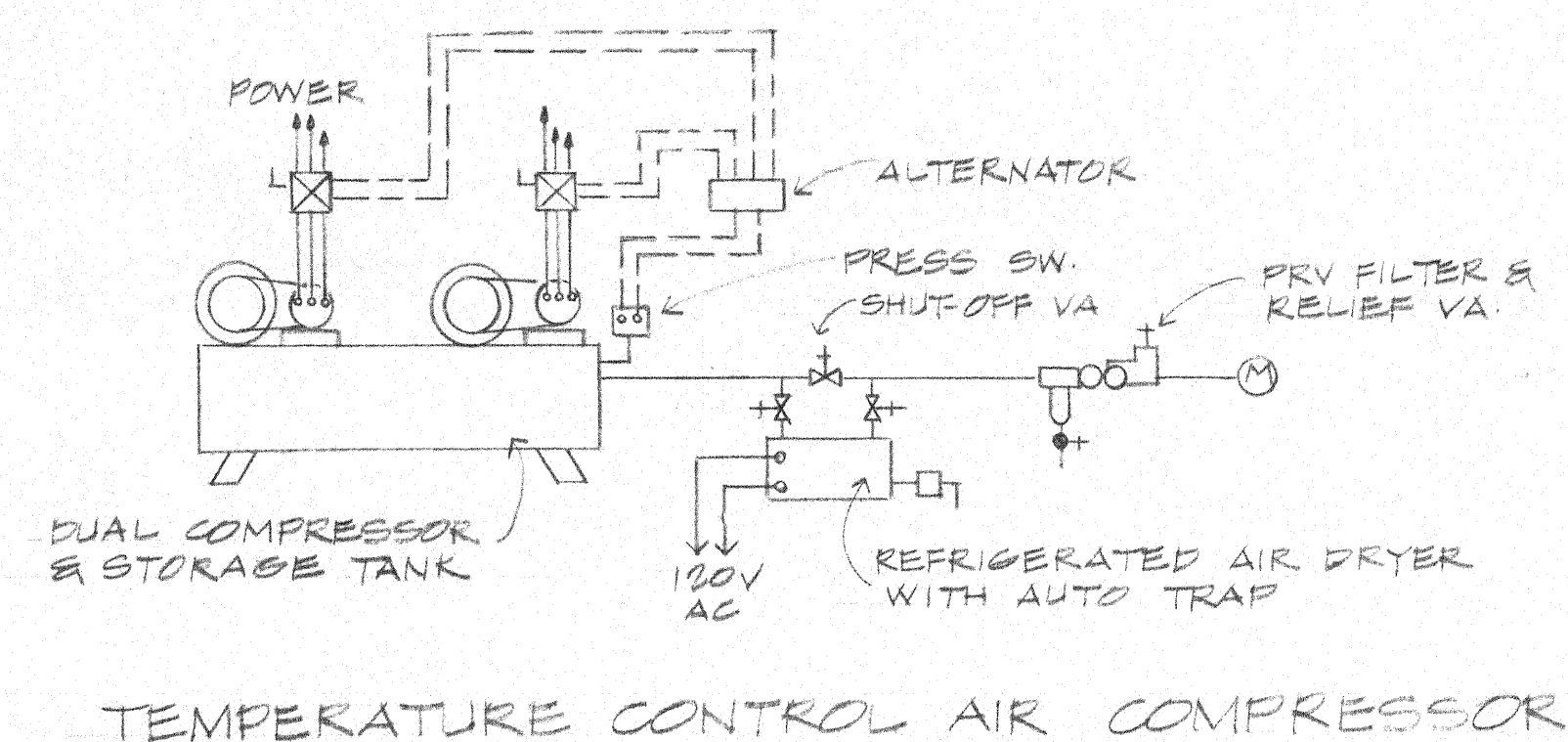
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& DIAGRAMS

EDA LPW 95-01-02/00

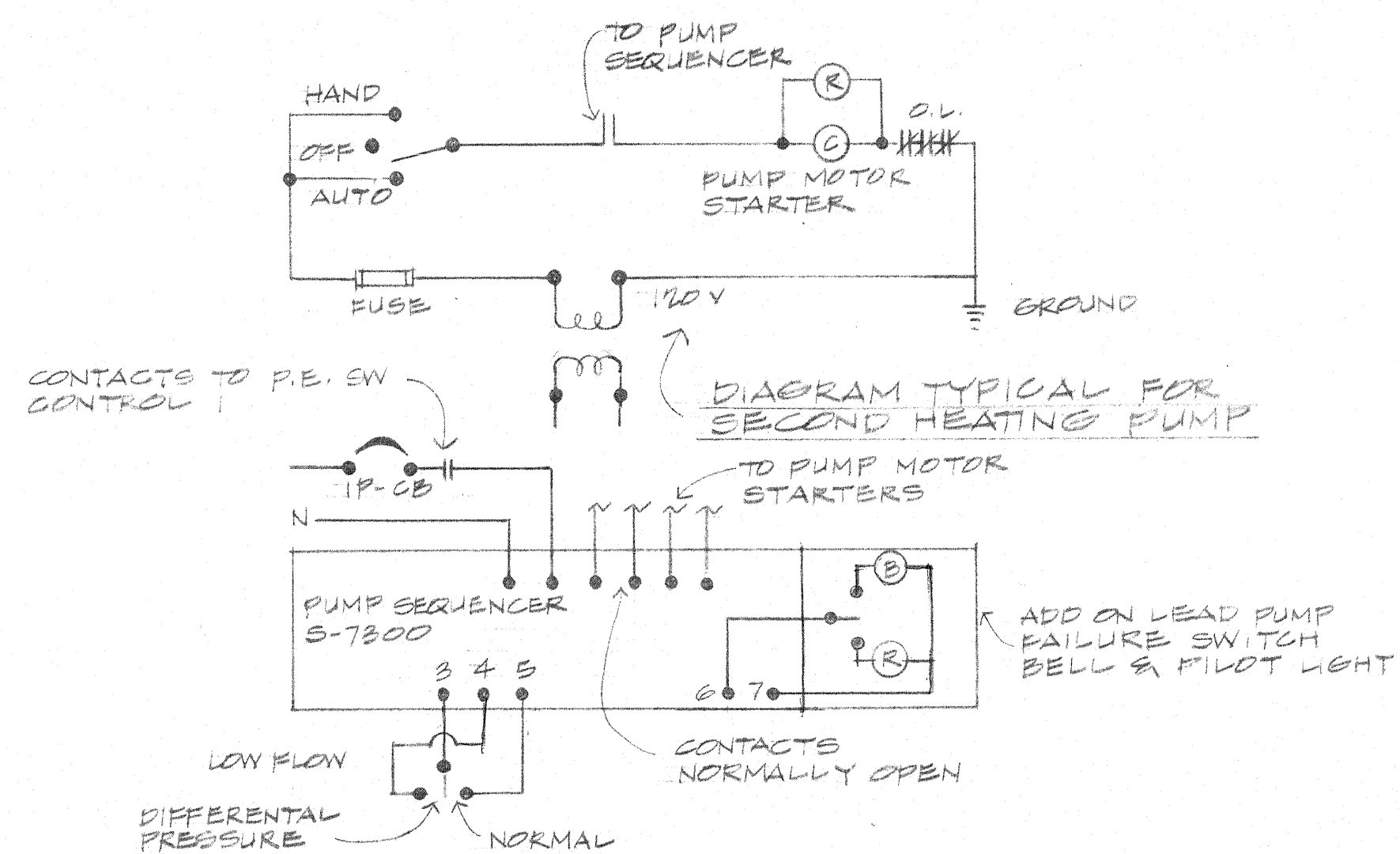
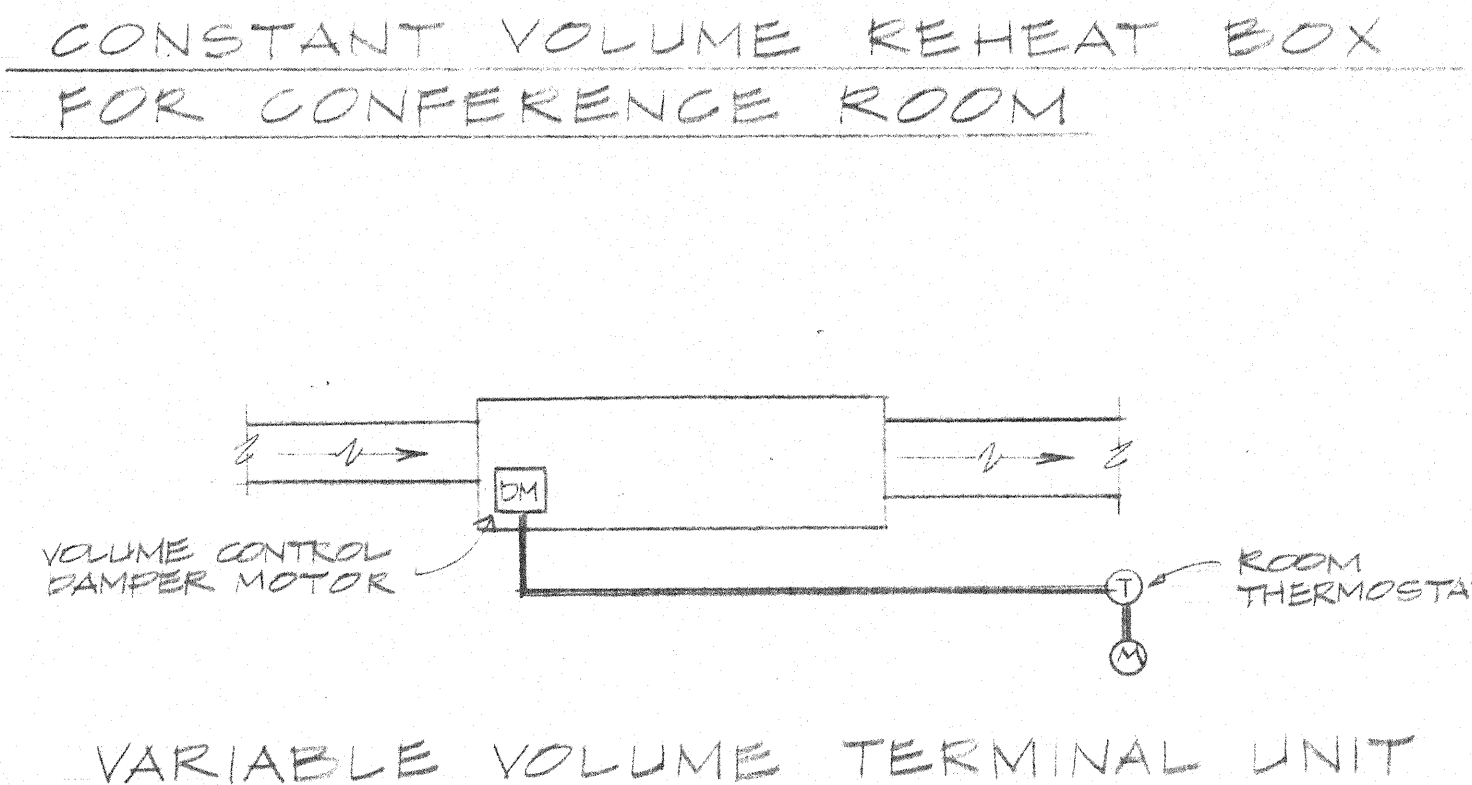
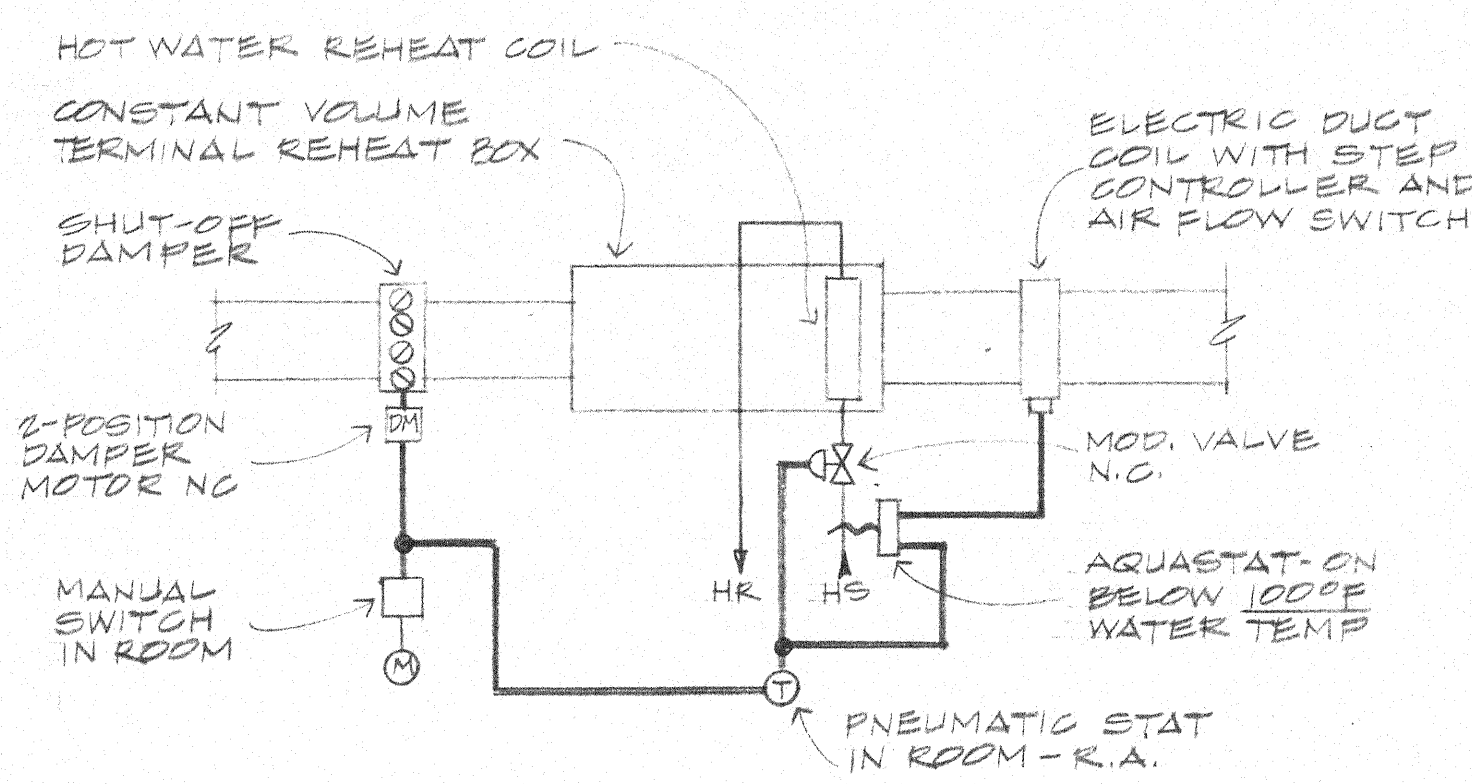
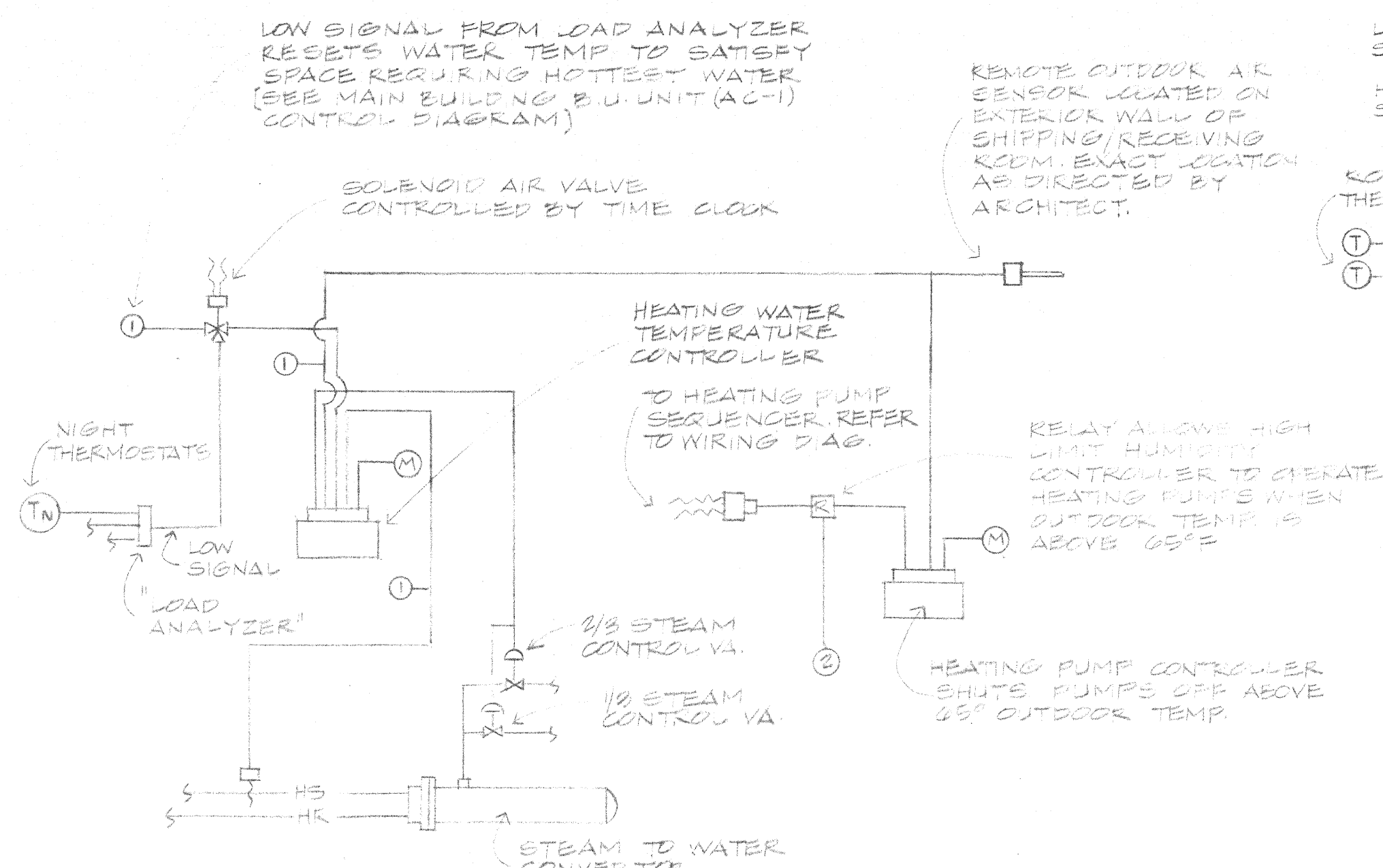
REVISIONS		
ITEM	DATE	BY

DRAWN	ED
CHECKED	EDS
APPROVED	NDS
DESIGNED	EDS
DATE	08/01/95
SCALE	AS NOTED
PROJECT	
7612	M-10

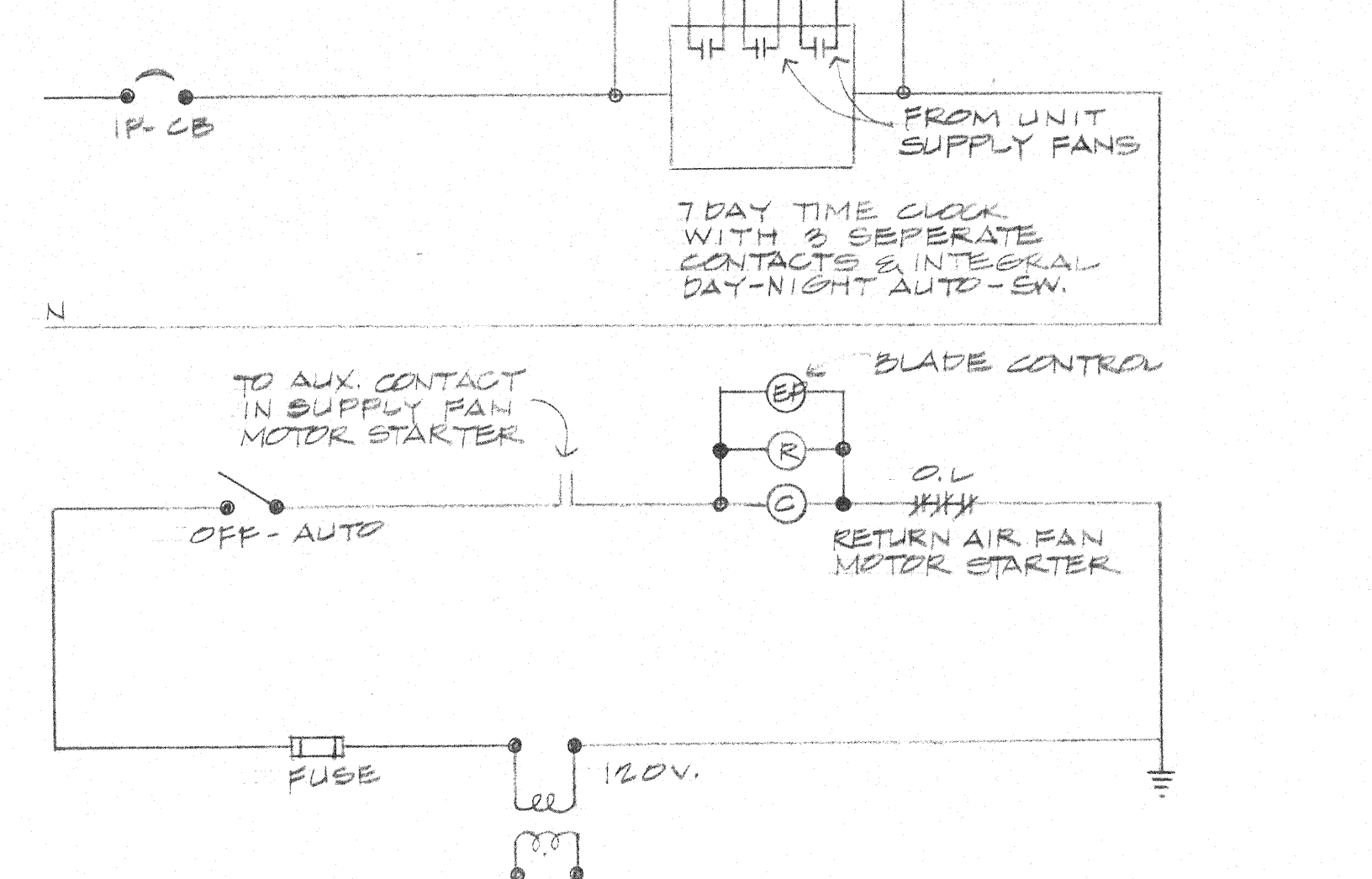
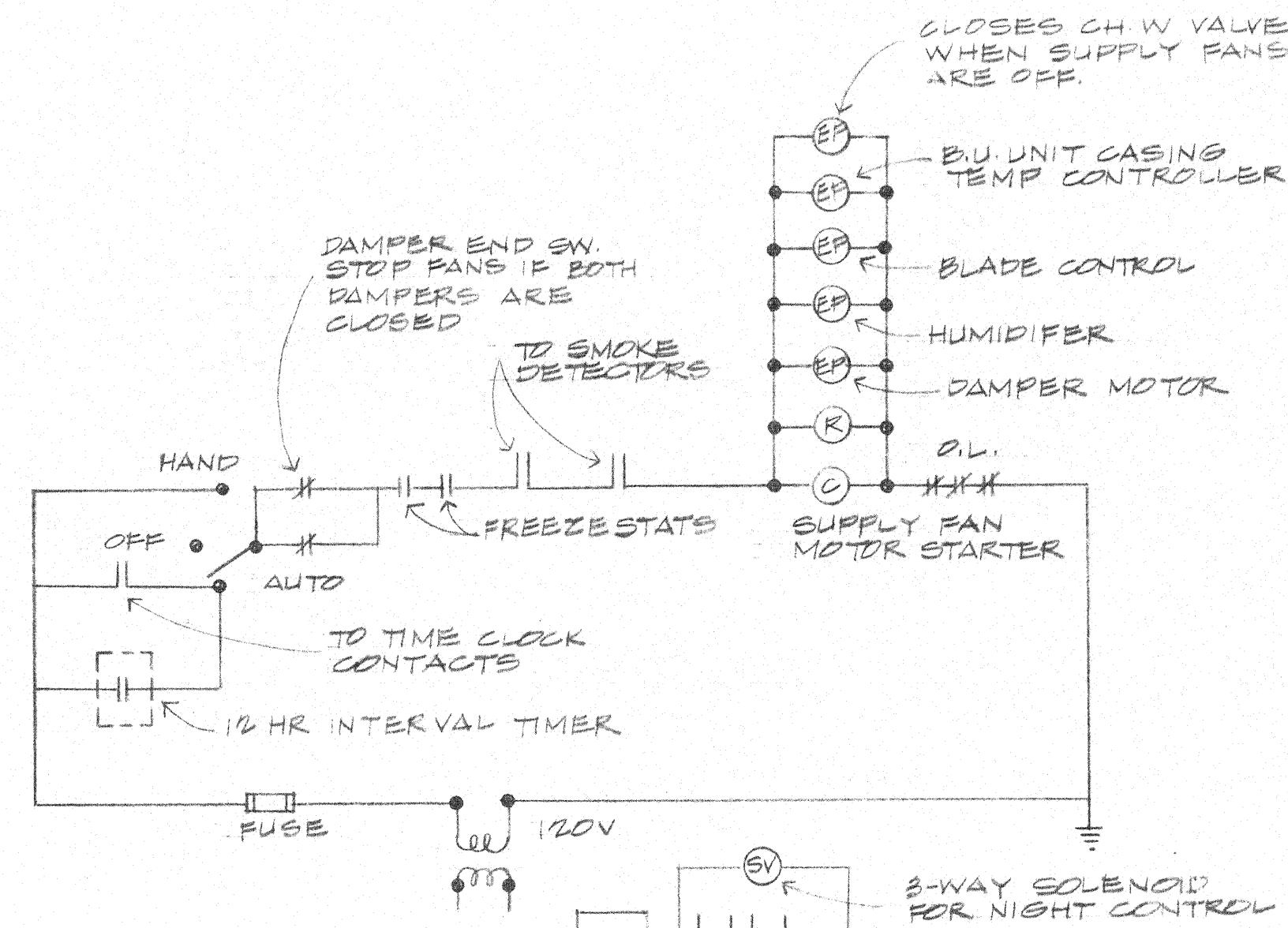
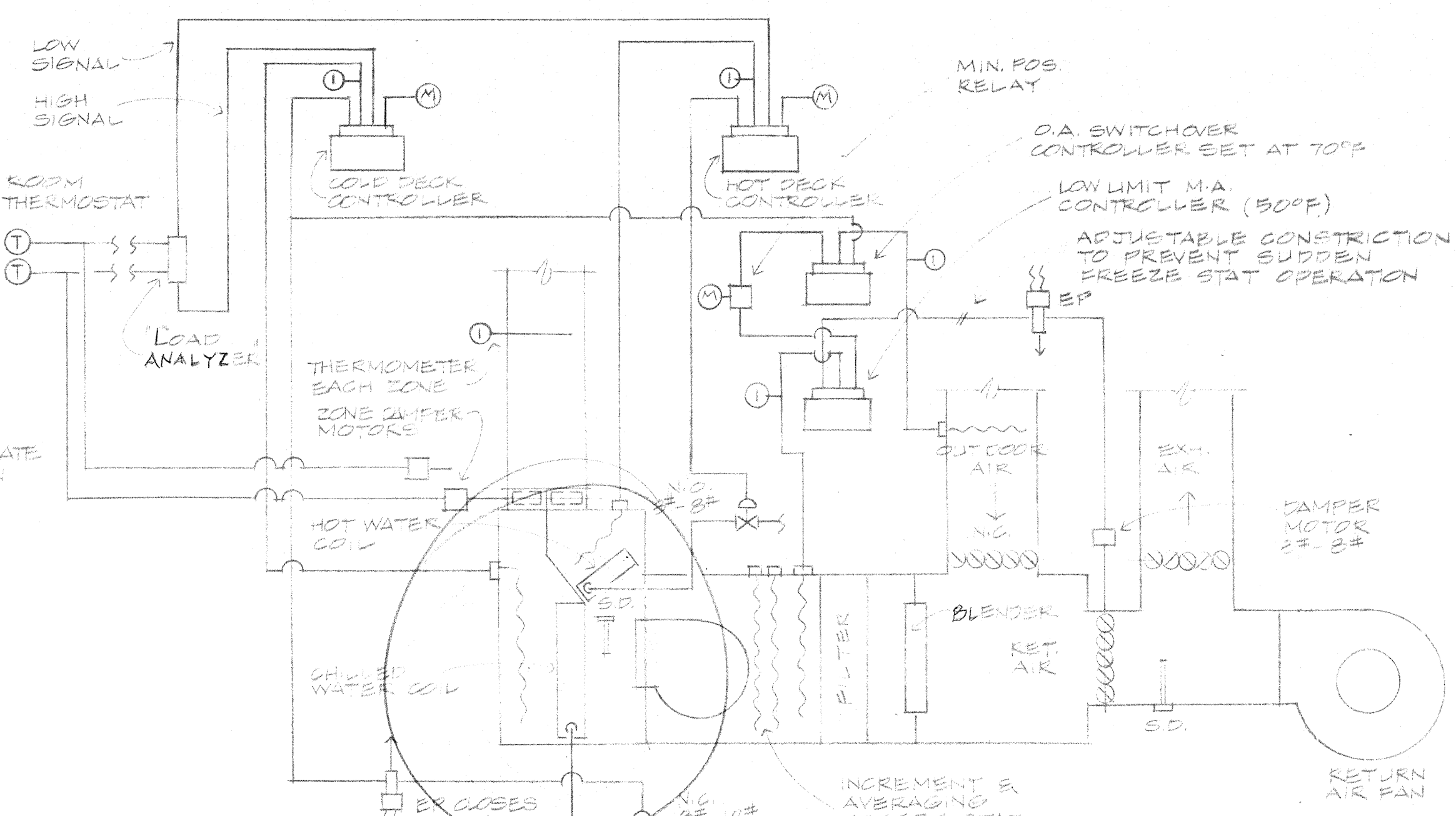




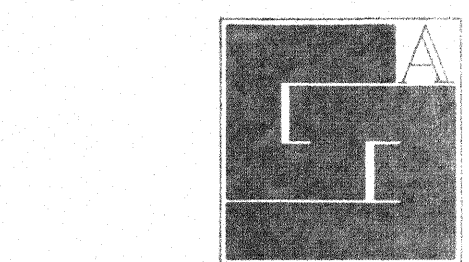
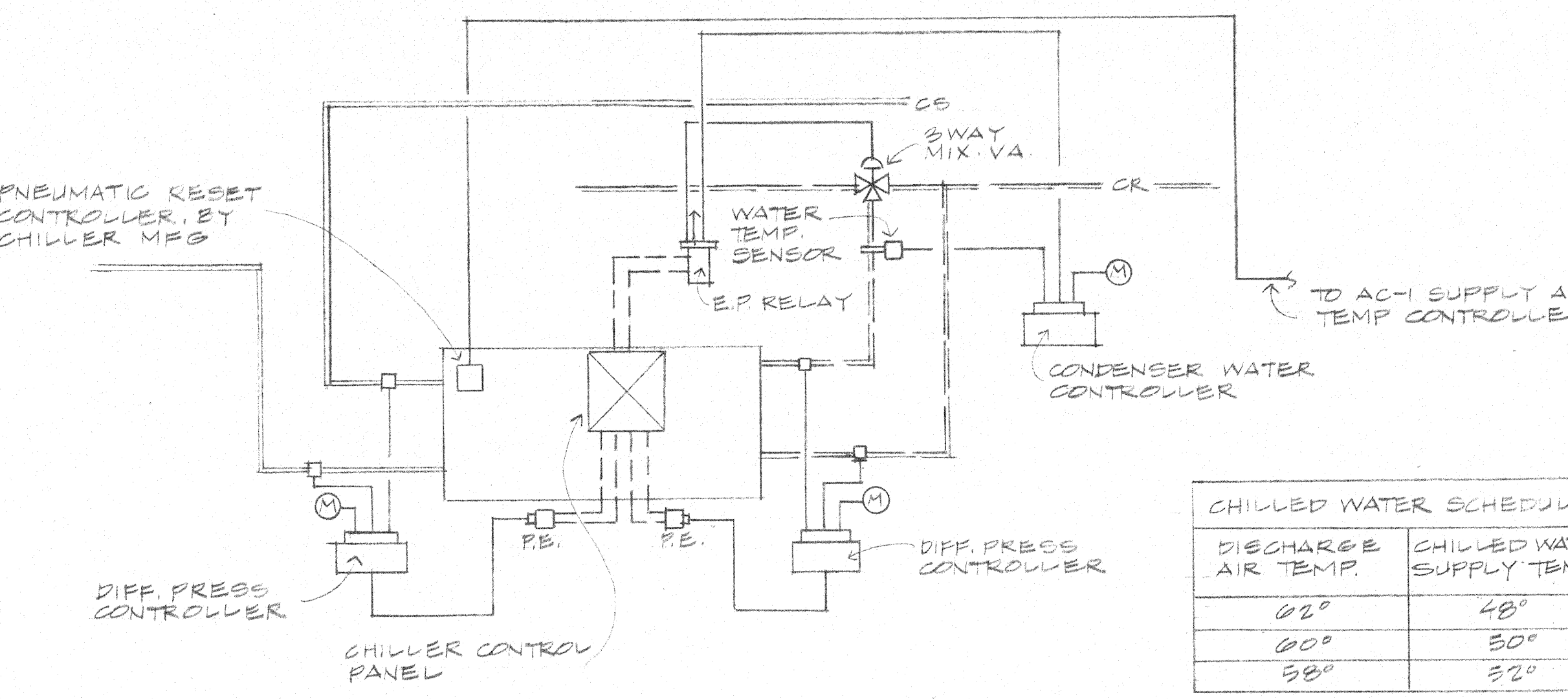
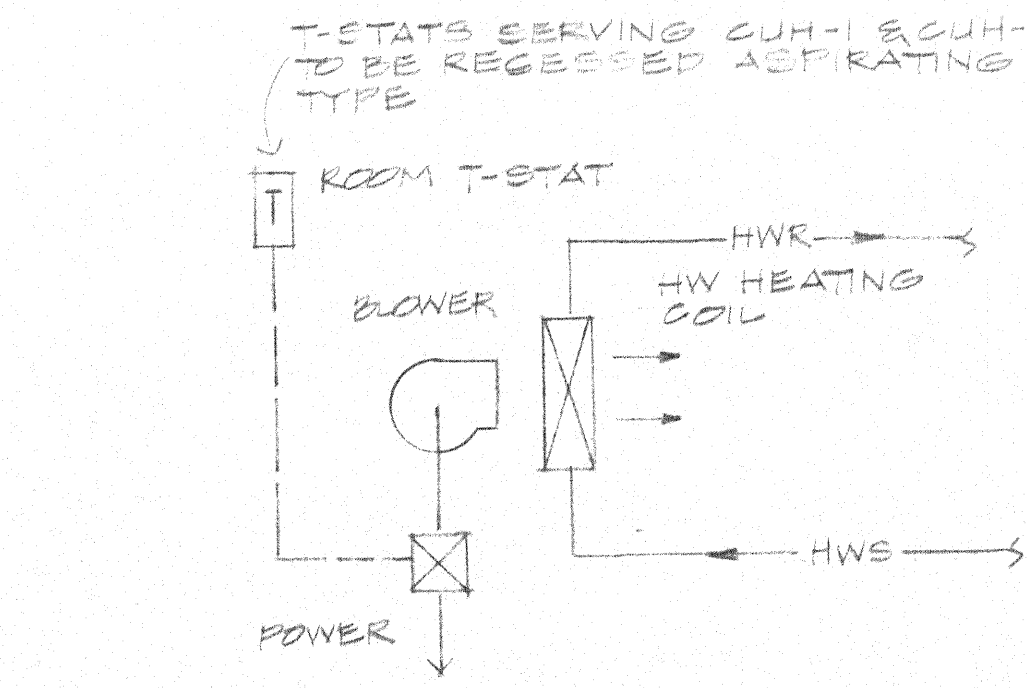
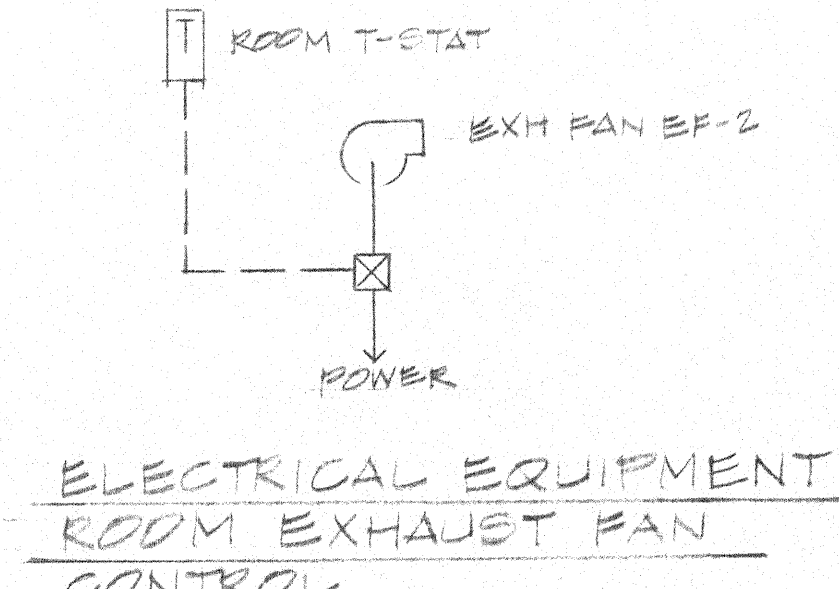
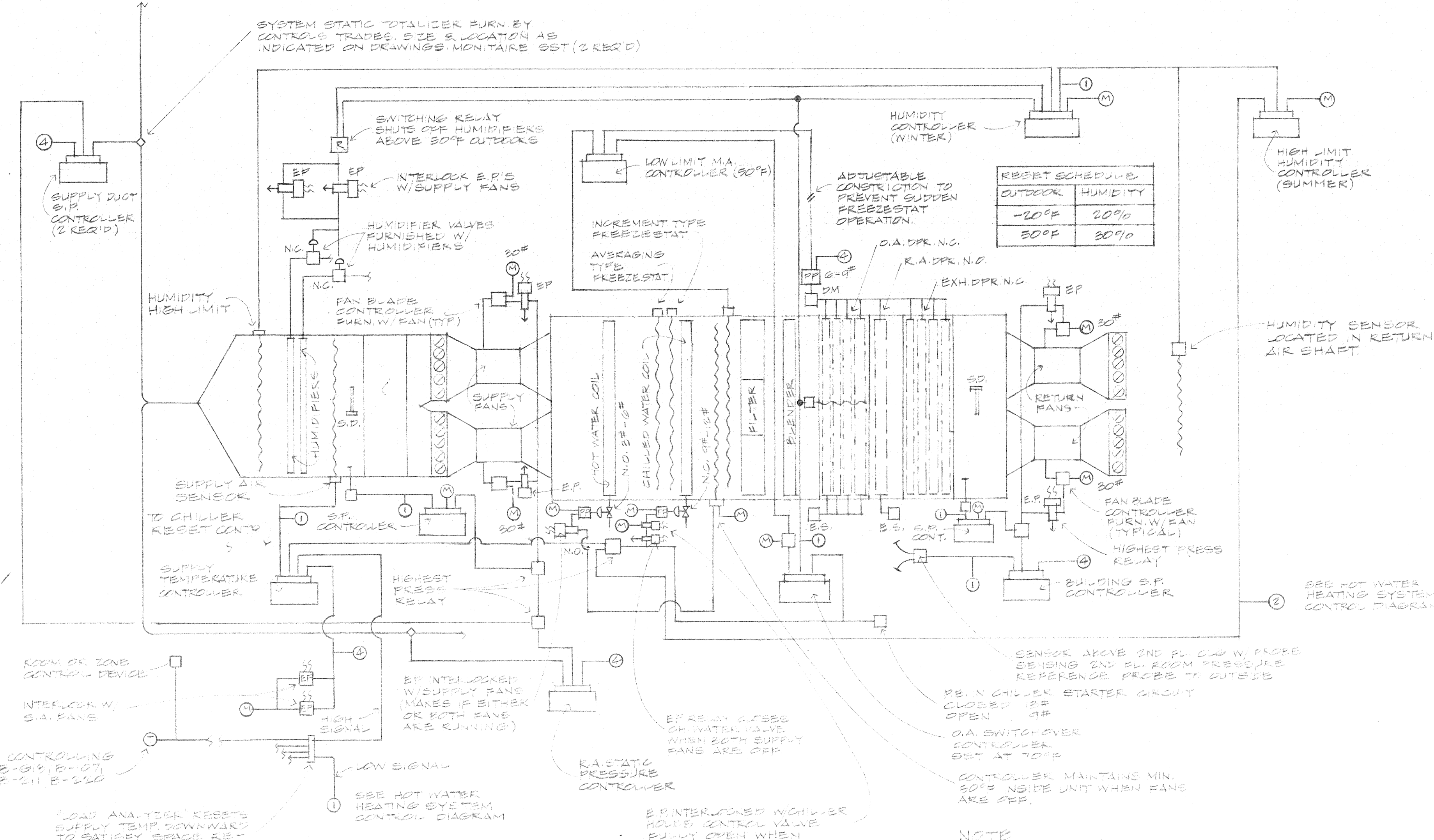
MULTI-ZONE UNIT WIRING DIAGRAM (AC-1)



HEATING PUMP WIRING DIAGRAM



MAIN BUILDING UNIT WIRING DIAGRAM (AC-1)  
(2 SUPPLY FANS AND 2 RETURN FANS REQUIRED)



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TEMPERATURE CONTROL DIAGRAM

REVISIONS	DATE	BY

NOTE: EACH FAN BLADE CONTROLLER HAS A MAX. STEADY STATE AIR CONSUMPTION OF 2.00 STANDARD CUM.  
DRAWN: J.C.  
CHECKED: J.C.  
APPROVED: J.C.  
DATE: 10-1-67  
SCALE: NONE  
PROJECT: M-11



### AIR CONDITIONING UNIT SCHEDULE

		FAN DATA				HEATING COILS										COOLING COILS										FILTER DATA			AREA SERVED	MIN % O.A.	A/F.G. & MODEL NO.	REMARKS
MARK	CFM.	TSP. IN/IN	RPM	MOTOR			MBH	GPM	BAY #	LAT #	MIN. T. FACE AREA	COL ROWS	MAX. AIR FRICTION	MBH TOT	BAY #	BAY #	BAY #	ENT. AIR DB WB DB WB	LYG. AIR DB WB DB WB	COL ROWS	MAX. AIR FRICTION	TYPE	MIN. AREA IN SKEET	WASH. & CLEAN								
				VOLT	B.H.P.	MIN. HP																										
BUILT-UP UNIT AC-1	2 SAKANE @ 2750 CFM EA (REQ'D)	7"	1770	480/34	40	50	1188	60	55	75	88	2	.40	1640	1337	48	67	175	80.5	66.5	58.4	56.7	8	1.0	CARTIDGE	128 SQ. FT. FACE AREA	.25	MAIN BLDG VAV SYSTEM	12	—————	SUPPLY FANS: (EF-1 & EF-2) SIMILAR TO JOT VANE AXIAL MODEL # 20-24-1770 (SERIES 2000)	
AC-2	2450	2 1/4"	1920	480/34	2.00	3	56.7	3	55	70	88	2	.30	85.2	68.4	48	58	20	81.0	69.0	62.0	60.3	4	.70	MED. CAP BOX W/TA MEDIA	18.9	.11	GROUND LEVEL MEETING RM 8-22- AREA	15	TRANE #8 MED. PRESS. MULTI-ZONE CLIMATE CHANGER	2800 CFM. THW COOLING COIL	
												✓				✓	✓	✓			✓											

\* BASED ON (2) COIL BANKS: 8'-0" L. X 8'-3" H. (EA.)

### STEAM HUMIDIFIER SCHEDULE

MARK	CAPACITY LBS/HR	STEAM PRESS. PSIG	ARMSTRONGS MODEL NO.	SYSTEM SERVED	REMARKS
H-1	50	50	5685S 30, 5/28 30	BUILT-UP UNIT AC-1	
H-2	50	50	5685S 30, 5/28 30	"	

### CONVERTOR SCHEDULE

MARK	GPM	ENT	LWT	MBH	LBS/HR STEAM	PORT W/TA SURFACE	DIA. X LENGTH	PRESS. DROP FT.	COIL FACTOR	NO. OF TUBES	REMARKS
CONV-1	200	150	180	2500	2700	56	10 1/4 X 58	1.2	.0005	2	

\* 50 PSIG STEAM AVAILABLE. ALLOW 20 PSIG PRESS. DROP FOR LINE LOSS AND CONTROL VALVE.

### UNIT HEATER SCHEDULE

ALL MOTORS 110V/1/60 UNLESS OTHERWISE NOTED										E.W.T. 180 °F	E.A.T. 60°F			
MARK	MBH	ENCLOSED			FAN		MOTOR HP	R/UNIT SUPPLY	R/UNIT RETURN	GPM	TRANE MODEL NO.	REMARKS		
		L	D	H	RPM	CFM								
CON-1	25	44	9	25	1610	400	1/8	3/4	3/4	1.2	D-34	SIZE 04	64 MOTOR	
	2	15	47	9 1/8	25	1100	300	1/8	7/8	7/8	H-46	SIZE 02		
	3	30	44	9	25	1610	400	1/8	3/4	3/4	2	D-34	SIZE 04	64 MOTOR
	4	25	47	9 1/8	25	1100	300	1/8	3/4	3/4	2	H-46	SIZE 02	
	5	50	66	12	34	775	800	1/2	3/4	3/4	3	H-46	SIZE 08	
	6	25	44	9	25	1610	400	1/8	3/4	3/4	1.2	D-34	SIZE 04	64 MOTOR
	7	20	44	9	25	1010	400	1/8	3/4	3/4	2.0	D-34	SIZE 04	64 MOTOR
UH-1	125	-	-	-	-	1100	6480	1/2	1	1	5	320-S		
UH-2	125	-	-	-	-	1100	6480	1/2	1	1	5	320-S		
UH-3	71	-	-	-	-	1100	2380	1/6	3/4	3/4	3.7	165-S		

### SOUND ATTENUATOR SCHEDULE

MARK	SERVED	CFM	RPM	L	W	H	D.I.L. DB @ 3000 ACTIVE BAND	MAXIMUM ALLIABLE S.P. IN W.G.	MFG. & MODEL NO.	REMARKS
ST-1	AC-1	50,000	820	7'	20"	3'	24	.15	140 TMS	
ST-2	AC-1	55,000	920	7'	15"	4'	24	.15	140 TMS	

### PACKAGE DUPLEX CONDENSATE RETURN PUMP SCHEDULE

MARK	NO. OF PUMPS	GPM	HEAD IN FT.	MIN. HP	R.P.M.	RECEIVER SIZE	NET DELIVER CAPACITY	DOMESTIC MODEL NO.	REMARKS
CR-1	2	23	23	1/3	3500	—	20 GALLON	20022-1/2	
CR-2	1	2	23	1/4	1750	—	9 GALLON	1000	SIMPLEX

### STEAM WATER HEATER SCHEDULE

MARK	G.P.M.	ENT. WATER TEMP.	LYG. WATER TEMP.	SGT. W.T. SURFACE	LBS. / HR. CAP.	AERCO MODEL NO.	REMARKS
—	23	40	120	25	350	1003	

\* 50 PSIG STEAM AVAILABLE. ALLOW 20 PSIG PRESS. DROP FOR LINE LOSS AND CONTROL VALVE.

### ELECTRIC DUCT HEATER SCHEDULE

MARK	CFM	MBH	E.A.T. WAT. OF 1/2 IN.	COIL SIZE	ELECT. CAL. CHARACTERISTICS	CONTROL TYPE	MAX. AIR FRICTION	REMARKS
ED-1	500	5.12	60	6X8	120V-10-000	3	.08	INDUSCO TYPE QUA

### GRILLE, REGISTER & CEILING DIFFUSER SCHEDULE

MARK	TITUS MODEL NO.	CONSTRUCTION	FINISH	REMARKS
SD'A	SPL ML-3700-2 CONTINUOUS	ALUMINUM	TO MATCH CEILING MATERIAL	48"X60" MODEL NO. 100 IN SUPPLY BOOT (SEE PLANS) PROVIDE MDI PLUG-IN BOOT SIZES AS INDICATED
SD'B	ML-3700 MODULAR 2 SLOT	ALUMINUM		
SD'C	ML-3700 MODULAR 3 SLOT	ALUMINUM		
SD'D	272-RSS DBL. DEF. REG.	STEEL	PAINT ENAMEL COLOR SELECT BY ARCHITECT	
ER'A	25-RLS 30" BLADES	STEEL	PAINT ENAMEL COLOR SELECT BY ARCHITECT	
ER'B	50-F 1/2 X 1/2 LOUVERS	ALUMINUM		

### FAN SCHEDULE

MARK	CFM	B.S.P. IN/IN	FAN RPM	T.S. F.P.M.	MOTOR DHP	MIN. HP	MIN. WHEEL DIAMETER	CONTROL	FAN LOCATION	DRIVE	MODEL NO.	APPLICATION	REMARKS
EF-1	475	5/8	1725	4037	1.0	1/8	120	T.G.	SHO. EXH. BELT	DIRECT	EQD-1-A	T.T. EXH. B.E.S. EXH. VENT. EXH. EXHAUST TLT. EXH.	AC-1 SERVICE
2	600	5/8	1820	3875	1.4	1/4	120	T.G.	SHO. EXH. BELT	DIRECT	EQD-10-4	SHO. EXH. EXHAUST TLT. EXH.	AC-1 SERVICE
3	600	5/8	1820	3875	1.4	1/4	120	T.G.	SHO. EXH. BELT	DIRECT	EQD-10-4	SHO. EXH. EXHAUST TLT. EXH.	AC-1 SERVICE
4	2000	1/2	1725	5121	.61	3/4	120	T.G.	SHO. EXH. BELT	DIRECT	EQD-13-A	SHO. EXH. EXHAUST TLT. EXH.	AC-2 SERVICE
5	250	1/4	1550	—	—	1/8	120	L.	SHO. EXH. BELT	DIRECT	EP-27	SHO. EXH. EXHAUST TLT. EXH.	AC-2 SERVICE
6	180	1/4	1550	—	—	1/8	120	L.	SHO. EXH. BELT	DIRECT	EP-25-L	SHO. EXH. EXHAUST TLT. EXH.	AC-2 SERVICE
7	50	1/4	1550	—	—	1/8	120	L.	SHO. EXH. BELT	DIRECT	EP-27	SHO. EXH. EXHAUST TLT. EXH.	AC-2 SERVICE
8	100	3/8	1550	—	—	1/8	120	L.	SHO. EXH. BELT	DIRECT	EP-17	SHO. EXH. EXHAUST TLT. EXH.	AC-2 SERVICE
9	150	3/8	1550	—	—	1/8	120	L.	SHO. EXH. BELT	DIRECT	EP-17	SHO. EXH. EXHAUST TLT. EXH.	AC-2 SERVICE
10	150	3/8	1550	—	—	1/8	120	L.	SHO. EXH. BELT	DIRECT	EP-17	SHO. EXH. EXHAUST TLT. EXH.	AC-2 SERVICE
11	225	1/2	1550	—	—	1/8	120	L.	SHO. EXH. BELT	DIRECT	EP-17	SHO. EXH. EXHAUST TLT. EXH.	AC-2 SERVICE
12	100	3/8	1550	—	—	1/8	120	L.	SHO. EXH. BELT	DIRECT	EP-17	SHO. EXH. EXHAUST TLT. EXH.	AC-2 SERVICE
13	100	3/8	1550	—	—	1/8	120	L.	SHO. EXH. BELT	DIRECT	EP-17	SHO. EXH. EXHAUST TLT. EXH.	AC-2 SERVICE
14	55	1/2	1550	—	—	1/8	120	L.	SHO. EXH. BELT	DIRECT	EP-27	SHO. EXH. EXHAUST TLT. EXH.	AC-2 SERVICE
15	55	1/2	1550	—	—	1/8	120	L.	SHO. EXH. BELT	DIRECT	EP-27	SHO. EXH. EXHAUST TLT. EXH.	AC-2 SERVICE

### CIRCULATING PUMP SCHEDULE

MARK	SYSTEM SERVED	G.P.M.	HEAD IN FT.	MIN. MOTOR HP	BEST. EFF. %	TYPE	MANUFACT. & MODEL NO.	REMARKS
CP-1	HEATING WATER	200	100	10	480V-24	END SUCTION	EGG 1510 SIZE 3/4"	
CP-2	"	"	"	"	"	"	"	
CP-3	DOMESTIC WATER	3	17	1/8	115V-10	IN-LINE	EGG 1" FR	ALL PRONZE BOOSTER

### FIN TUBE RADIATION SCHEDULE

MARK	MBH/L.F.T.	TUBES	FIN W.	FIN H.	ROWS	H	D	FINISH	STERLING MODEL NO.	REMARKS
FR'A	0.80	1"	3 1/4"	3 1/4"	1	14"	4 1/4"	PRIME	444	WITH KNOS DAMPER
FR'B	0.80	1"	3 1/4"	3 1/4"	1	14"	4 1/4"	PRIME	444	NO DAMPER
FR'C	0.70	1"	3 1/4"	3 1/4"	1	10"	4 1/4"	PRIME	444	NO DAMPER
FR'D	0.74	1"	3 1/4"	3 1/4"	1	5 1/4"	3 3/4"	PRIME	444	NO DAMPER
FR'E	0.70	1"	3 1/4"	3 1/4"	1	—	—	—	—	NO DAMPER

\* SPECIAL ENCLOSURE. REFER TO DETAIL ON SHEET M-4

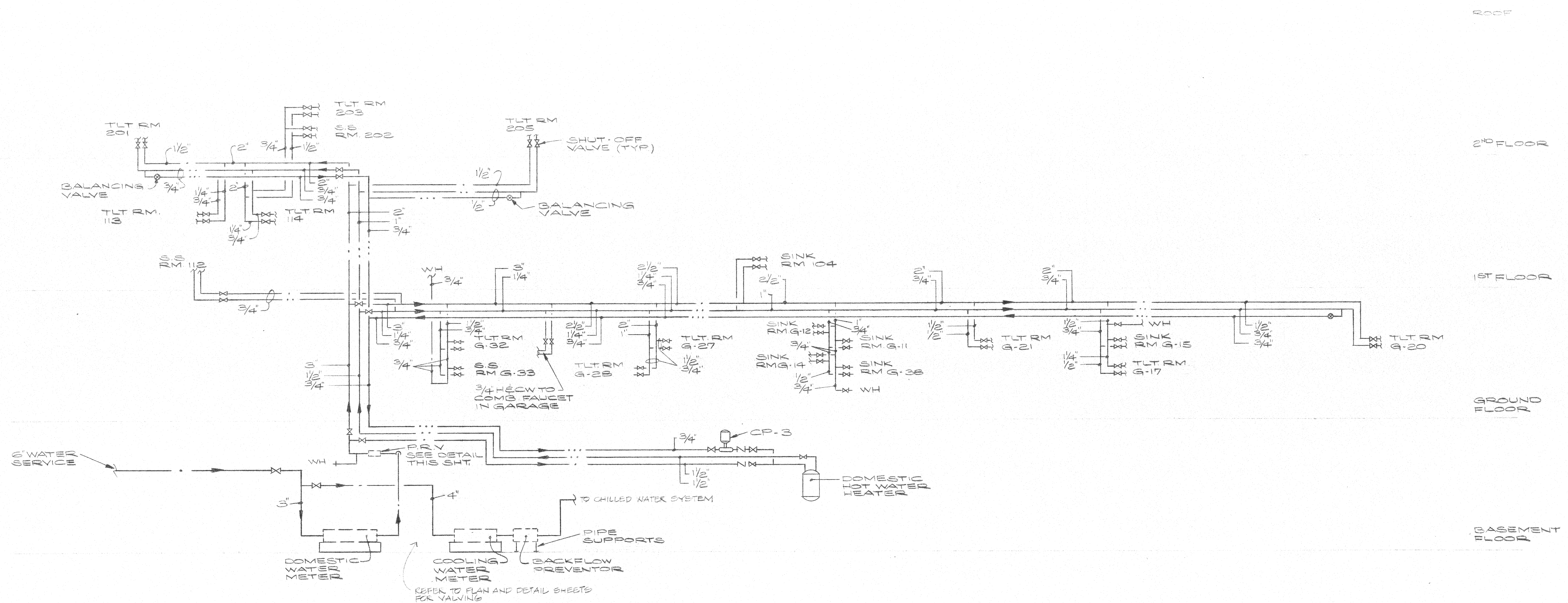
### PACKAGE RECIRCULATING LIQUID CHILLER SCHEDULE

NON-TONS	ACT. TONS	CHILLED WATER SIDE					CONDENSED WATER SIDE					NO. OF COMP. KW	ELECTRICAL CHARACTERISTICS	MFG. & MODEL NO.	
		GPM	ENT. °F	LENT. °F	°F IN. REFR. FACT.	°F IN. REFR. FACT.	GPM	ENT. °F	LENT. °F	°F IN. REFR. FACT.	°F IN. REFR. FACT.				
75	55	300	58	48	20	10005	300	68	51	14	10005	1	61	460V, 34, 60 C.	TRANE CGWA-75C-E

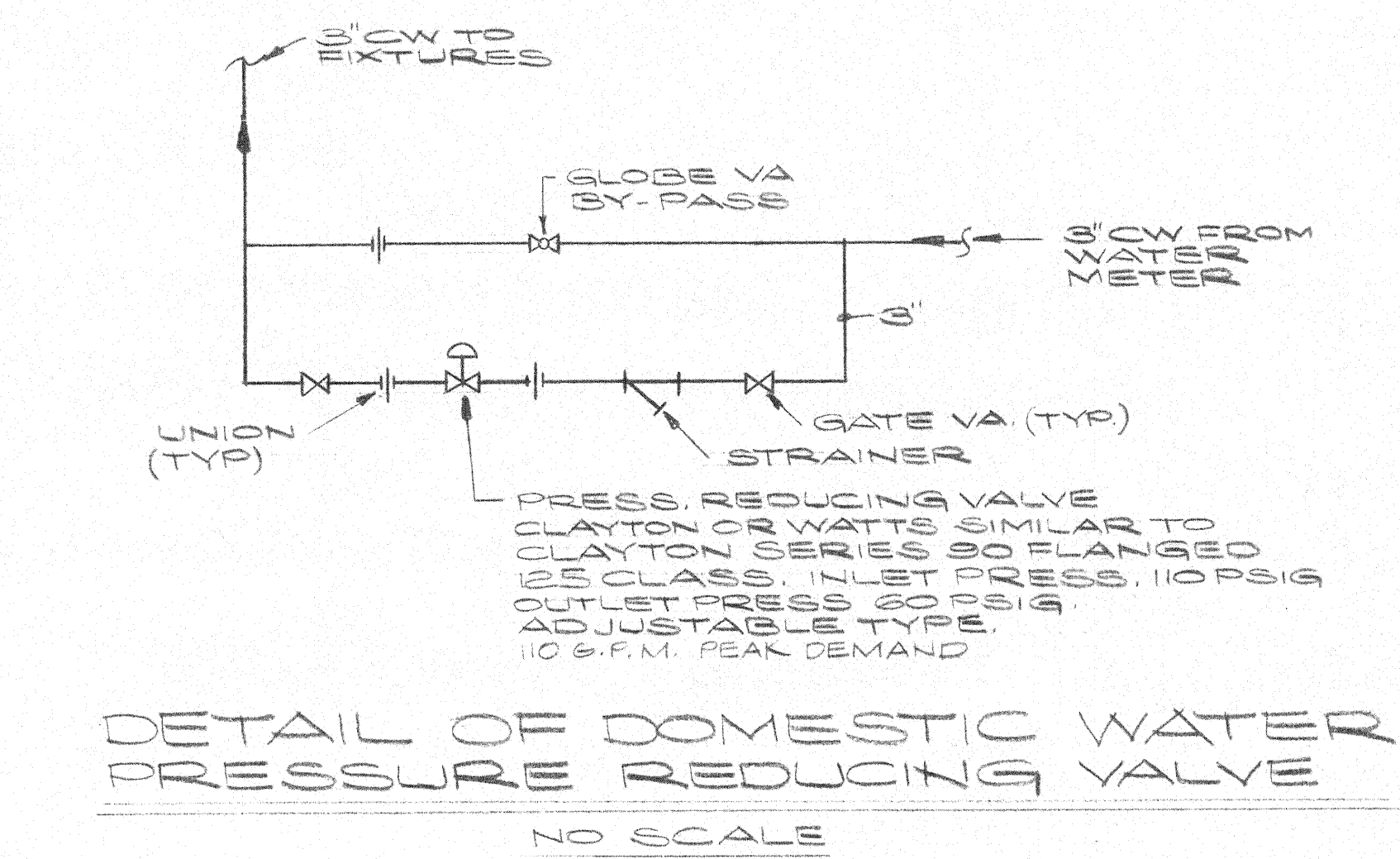
### VARIABLE VOLUME TERMINAL BOX SCHEDULE

ROOM NO. = 802B ROOM ASSIGNMENT RES 1015 WATTS S. COIL NO. TRANS. 802-814								
MARK	MAX. CFM	MIN. CFM	INLET DUCT INLET AIR TO BOX	* MIN. INLET AIR TO OPERATE BOX	OUTLET	RADIATED	T.T.U. MODEL NO.	REMARKS
B-01	820	0	6"φ	0.10"	26	23	HS-V-6A	
B-02	440		7"φ	0.10"	24	22	HS-V-7B	
B-03	330		6"φ	0.10"	23	21	HS-V-6B	
B-04	1000		10"φ	0.10"	26	24	HS-V-10D	
B-05	1200	↓	12"φ	0.10"	28	27	HS-V-12D	
B-06	900	500	7"φ	1.05"	27	24	HSR-7B	CONSTANT VOLUME BOX W/REHEAT COIL
B-07	450	0	7"φ	0.15"	25	22	HS-V-7B	
B-08	750		8"φ	0.15"	26	24	HS-V-8C	
B-09	300		7"φ	0.10"	27	24	HS-V-7B	
B-10	1400		12"φ	0.15"	30	24	HS-V-12D	
B-11	1100		10"φ	0.15"	24	26	HS-V-10D	
B-12	1500		14"φ	0.15"	24	27	HS-V-14B	
B-13	1500		14"φ	0.15"	24	27	HS-V-14B	
B-101	100		4"φ	0.05"	-	-	HS-V-4A	
B-102	220		5"φ	0.10"	23	21	HS-V-5A	
B-103	440		6"φ	0.10"	20	23	HS-V-6C	
B-104	1000		12"φ	0.15"	20	24	HS-V-12D	
B-105	1000		12"φ	0.15"	30	24	HS-V-12D	
B-106	1200		12"φ	0.10"	24	28	HS-V-12D	
B-107	1200		12"φ	0.10"	24	28	HS-V-12D	
B-108	1200		12"φ	0.10"	24	28	HS-V-12D	
B-109	300		7"φ	0.10"	27	24	HS-V-7B	
B-110	400		6"φ	0.15"	23	21	HS-V-6B	
B-111	450		7"φ	0.10"	24	22	HS-V-7B	
B-112	800		8"φ	0.15"	25	25	HS-V-8A	
B-113	800		8"φ	0.10"	25	22	HS-V-8C	
B-114	1110		10"φ	0.15"	24	26	HS-V-10D	
B-115	600		8"φ	0.05"	24	21	HS-V-8C	
B-116	800		9"φ	0.15"	28	25	HS-V-9C	
B-117	555		7"φ	0.10"	24	20	HS-V-7C	
B-118	400		6"φ	0.15"	23	21	HS-V-6B	
B-119	800		9"φ	0.15"	28	25	HS-V-9C	
B-120	1200		12"φ	0.10"	28	27	HS-V-12D	
B-121	400		6"φ	0.15"	23	21	HS-V-6B	
B-201	400		6"φ	0.15"	23	21	HS-V-6B	
B-202	1000		10"φ	0.10"	28	24	HS-V-10D	
B-203	1600		12"φ	0.15"	30	24	HS-V-12D	
B-204	1200		12"φ	0.10"	28	27	HS-V-12D	
B-205	1000		10"φ	0.10"	28	24	HS-V-10D	
B-206	1000		10"φ	0.10"	28	24	HS-V-10D	
B-207	1400		12"φ	0.15"	30	24	HS-V-12D	
B-208	1200		12"φ	0.10"	28	27	HS-V-12D	
B-209	1000		10"φ	0.10"	28	24	HS-V-10D	
B-210	1000		10"φ	0.10"	28	24	HS-V-10D	
B-211	450		10"φ	0.05"	27	24	HS-V-10D	
B-212	1200		12"φ	0.10"	28	27	HS-V-12D	
B-213	1000		10"φ	0.10"	28	24	HS-V-10D	
B-214	1000		10"φ	0.10"	28	24	HS-V-10D	
B-215	1600		12"φ	0.15"	30	24	HS-V-12D	
B-216	1200		12"φ	0.10"	28	27	HS-V-12D	
B-217	1000		10"φ	0.10"	28	24	HS-V-10D	
B-218	800		8"φ	0.05"	24	21	HS-V-8C	
B-219	1400		12"φ	0.15"	30	24	HS-V-12D	
B-220	1200		12"φ	0.10"	28	27	HS-V-12D	
B-221	900		10"φ	0.10"	24	28	HS-V-10D	
B-222	800		9"φ	0.15"	28	25	HS-V-9C	
B-223	400		12"φ	0.15"	30	24	HS-V-12D	
B-224	1000		10"φ	0.10"	28	24	HS-V-10D	
B-225	800		9"φ	0.15"	28	25	HS-V-9C	
B-226	800		9"φ	0.15"	28	25	HS-V-9C	
B-227	1400		12"φ	0.15"	30	24	HS-V-12D	
B-228	750		8"φ	0.15"	28	24	HS-V-8C	
B-229	800		9"φ	0.15"	28	25	HS-V-9C	
B-230	800		9"φ	0.15"	28	25	HS-V-9C	
B-231	1400		12"φ	0.15"	30	24	HS-V-12D	
B-232	750		8"φ	0.15"	28	24	HS-V-8C	
B-233	800		9"φ	0.15"	28	25	HS-V-9C	
B-234	800		9"φ	0.15"	28	25	HS-V-9C	
B-235	1400		12"φ	0.15"	30	24	HS-V-12D	
B-236	1000		10"φ	0.10"	28	24	HS-V-10D	
B-237	800	↓	9"φ	0.15"	28	25	HS-V-9C	

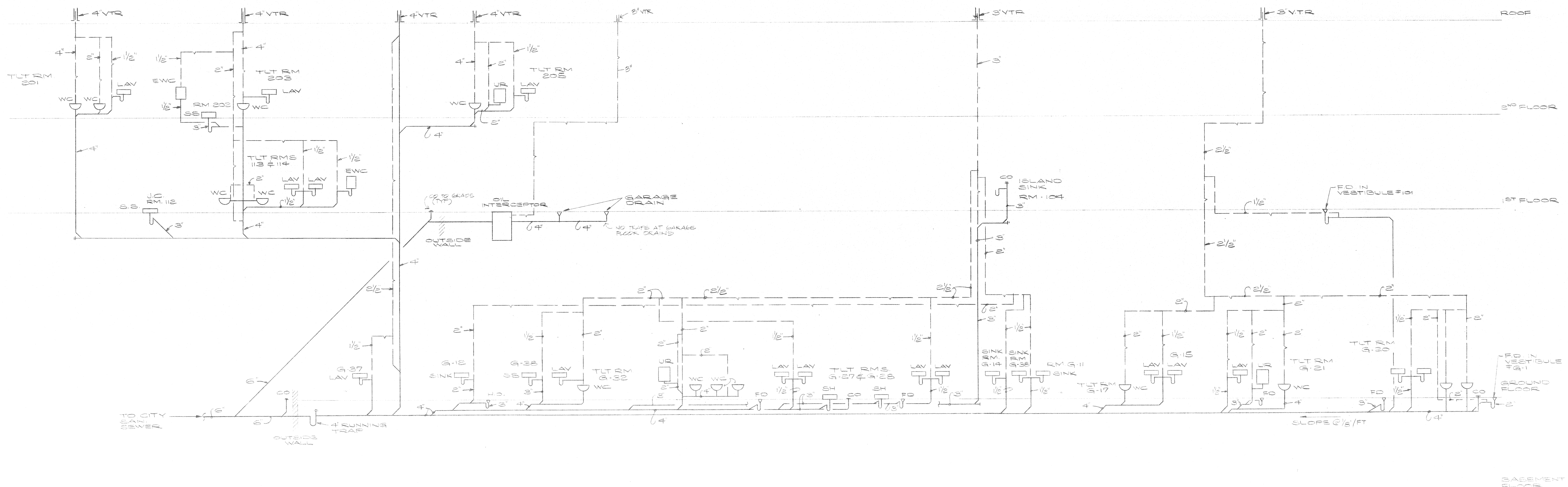




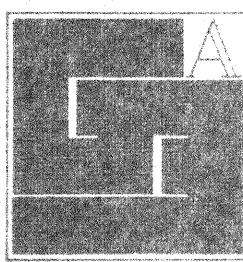
DOMESTIC HOT AND COLD WATER RISER DIAGRAM



DETAIL OF DOMESTIC WATER PRESSURE REDUCING VALVE  
NO SCALE



SANITARY AND VENT RISER DIAGRAM



Gunnar Birkerts  
and  
Associates  
Architects

292 Harmon Street, Birmingham, Michigan

Robert M. Darvas  
&  
Associates  
STRUCTURAL ENGINEERS  
ANN ARBOR, MICHIGAN

Hoyem-Basso  
Associates  
Incorporated  
MECHANICAL & ELECTRICAL  
ENGINEERS  
BLOOMFIELD HILLS, MICHIGAN

Duluth Public  
Library  
DULUTH, MINNESOTA

PLUMBING  
RISER  
DIAGRAMS

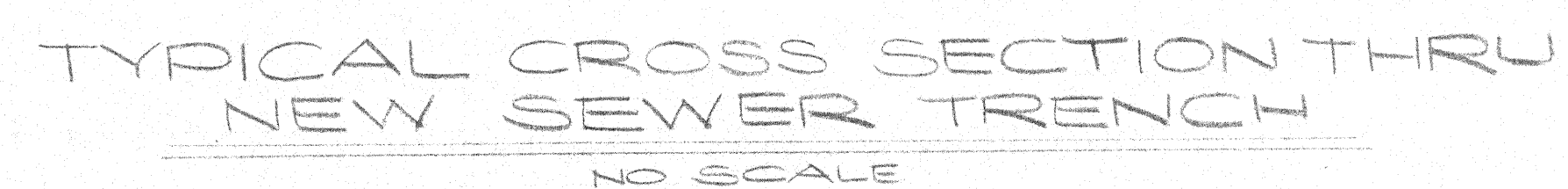
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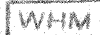










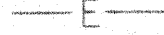


































REVISIONS	DATE	BY

DRAWN	
CHECKED	
APPROVED	
DATE	
SCALE	
PROJECT	

7612 M-13





SYMBOL	ELECTRICAL SYMBOLS LIST
	Fluorescent Lighting Fixture
	Incandescent or Mercury Lighting Fixture
	Night Light
	Watt Hour Meter
	Weatherproof
	Exit Lighting Fixture
	Time Clock
	Photocell
	Single Pole Switch
	Three Way Switch
	Four Way Switch
	Switch with Pilot Light
	Door Switch (2 zone number)
	Rajase Lower Switch
	Underground Electric Service
	Underground Telephone Service
	Duplex Convenience Outlet
	Duplex Receptacle Mtd. above counter etc.
	Floor Outlet (F) Flush (P) Pedestal
	Special Appliance Outlet - As Noted
	Special Single Phase Outlet
	Special Three Phase Outlet
	Special Power Connection
	Junction Box
	Fusible or Non-Fusible Disconnect Switch
	Manual Motor Starter
	Combination Magnetic Motor Starter
	Single Phase Motor
	Three Phase Motor
	Lighting Panelboard (480/277V - 3Ø - 4W)
	Lighting and Receptacle Panelboard 208/120V - 3Ø - 4W
	Power Panelboard
	Distribution Panelboard
	Transformer
	System or Equipment Ground
	Pushbutton (P - Pilot Light)
	Chime
	Fire Alarm Station
	Fire Alarm Bell
	Smoke Detector
	Telephone Backboard
	Telephone Outlet
	Telephone Outlet - Wall Mounted
	T.V. Antenna Outlet
	Fuselage - Ceiling Mounted
	Volume Control
	Clock Outlet
	Microphone Outlet
	Register Outlet

