

ABBREVIATIONS

ABBR	DESCRIPTION
AFF	ABOVE FINISH FLOOR
BD	BALANCING DAMPER
BHP	BREAK HORSE POWER
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
BD	BACKDRAFT DAMPER
CD	CONDENSATE DRAIN LINE
CFM	CUBIC FEET PER MINUTE
CONT.	CONTINUATION, CONTINUOUS, CONTINUED
DB	DRY BULB
DIA	ROUND, DIAMETER
DN	RISER DOWN
ENT	ENTERING
EA	EXHAUST AIR
F	DERGEES FAHRENHEIT
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FSD	COMBINATION FIRE AND SMOKE DAMPER
FT.	FEET
GA	GAUGE
GAL	GALLON
GPM	GALLONS PER MINUTE
GPH	GALLONS PER HOUR
HP	HORSE POWER
HP	HEAT PUMP
IN.	INCHES
INV. ELEV.	INVERT ELEVATION
KVA	KILOVOLT-AMPERE
KW	KILOWATT
KWH	KILOWATT HOUR
LBS	POUNDS
MAX.	MAXIMUM
MIN.	MINIMUM
N/A	NOT APPLICABLE
NC.	NOISE CRITERIA
N.O.	NORMALLY OPEN
N.C.	NORMALLY CLOSED
NTS	NOT TO SCALE
NIC	NOT IN CONTRACT
OSA/ O.A.	OUTSIDE AIR
OB	OPPOSED BLADE DAMPER
P.O.C.	POINT OF CONNECTION
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
QTY.	QUANTITY
RA	RETURN AIR
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SOV	SHUT-OFF VALVE
STR.	STRAINER WITH HOSE END VALVE
TEMP	TEMPERATURE
TSTAT	THERMOSTAT
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
VAV	VARIABLE AIR VOLUME
WB	WET BULB

MECHANICAL LEGEND

DUCTWORK SYMBOLS			PIPING SYMBOLS	
SINGLE	DOUBLE	DESCRIPTION	SYMBOL	DESCRIPTION
		RECTANGULAR DUCT		CHILLED WATER SUPPLY
		ROUND DUCT		CHILLED WATER RETURN
		TAP FOR BRANCH (RECTANGULAR DUCT)		CONDENSER WATER SUPPLY
		TAP FOR BRANCH (ROUND DUCT)		CONDENSER WATER RETURN
		90 DEG. ELBOW W/ TURNING VANES		HEATING WATER SUPPLY
		CURVED ELBOW- MIN. RADIUS R= 1.5 x WIDTH		HEATING WATER RETURN
		FLEXIBLE DUCT CONNECTION		PUMP
		SUPPLY DIFFUSER		REDUCER, CONCENTRIC
		RETURN GRILLE		REDUCER, ECCENTRIC STRAIGHT INVERT
		EXHAUST GRILLE		REDUCER, ECCENTRIC STRAIGHT CROWN
		TEMPERATURE SENSOR		FLOW ARROW
		HUMIDITY SENSOR		PIPE CAP
		SENSOR		VALVE
		SQUARE DUCT RISE		BALL VALVE
		SQUARE DUCT DROP		BUTTERFLY VALVE
		ROUND DUCT RISE		GATE VALVE
		ROUND DUCT DROP		2-WAY CONTROL VALVE
		COMBINATION FIRE AND SMOKE DAMPER		CHECK VALVE
		FIRE DAMPER		PRESSURE REDUCING VALVE
		BALANCING DAMPER		STRAINER WITH HOSE END VALVE
		MOTORIZED DAMPER		BALANCE VALVE & FLOW METER ORIFICE (I.E. CIRCUIT SETTER)
		RISER UP		MANUAL AIR VENT
		RISER DOWN		FLEXIBLE PIPE CONNECTOR
		BREAK		PLUG VALVE
		CONDENSATE DRAIN LINE		UNION
		FLOW ARROW		THERMOMETER
		POINT OF CONNECTION		PRESSURE GAGE WITH COCK
		ROUND, DIAMETER		CIRCUIT SETTER
		EQUIPMENT TAG		CALIBRATED BALANCING / SHUTOFF VALVE
				AIR VENT, AUTOMATIC
				AIR VENT, MANUAL
				AIR SEPARATOR
				PRESSURE SWITCH
				PRESSURE RELIEF VALVE
				THROUGH WALL / GROUND
				SUCTION DIFFUSER
				MOTORIZED BUTTERFLY VALVE

2006 IECC NOTES

DUCT, PLENUM INSULATION AND SEALING:

-DESIGN HEATING AND COOLING LOADS FOR THIS SPACE ARE CALCULATED USING CARRIER BLOCK LOAD BASED ON ASHRAE METHODS.

-ALL EQUIPMENT AND SYSTEMS HAVE BEEN SIZED TO BE NO GREATER THAN NEEDED TO MEET CALCULATED LOADS.

-PER IECC 503.2.7.

ALL SUPPLY AND RETURN DUCTS AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R-5 INSULATION AND WITH A MINIMUM OF R-8 INSULATION FOR ANY DUCTWORK OUTSIDE THE BUILDING. **USE R-8 BETWEEN DUCTS AND BUILDING EXTERIOR WHEN DUCTS ARE PART OF THE BUILDING ASSEMBLY.

ALL JOINTS, LONGITUDINAL AND TRANSVERSE SEAMS AND CONNECTIONS IN DUCTWORK, SHALL BE SECURELY FASTENED AND SEALED WITH WELDS, GASKETS, MASTICS (ADHESIVES), MASTIC-PLUS-EMBEDDED-FABRIC SYSTEMS, OR TAPES LISTED AND LABELED BY UL 181A OR 181B TAPES AND MASTICS.

TAPES AND MASTICS USED TO SEAL DUCTWORK SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A OR UL 181B.

DUCT CONNECTIONS TO FLANGES OF AIR DISTRIBUTION SYSTEM EQUIPMENT SHALL BE SEALED AND MECHANICALLY FASTENED.

UNLISTED DUCT TAPE IS NOT PERMITTED AS A SEALANT ON ANY METAL DUCTS.

DUCTWORK SHALL BE CONSTRUCTED AND ERECTED IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE.

-ALL LONGITUDINAL AND TRANSVERSE JOINTS, SEAMS AND CONNECTIONS OF SUPPLY AND RETURN DUCTS OPERATING AT A STATIC PRESSURE LESS THAN OR EQUAL TO 2 INCHES W.G. (500 Pa) SHALL BE SECURELY FASTENED AND SEALED WITH WELDS, GASKETS, MASTICS (ADHESIVES), MASTIC-PLUS-EMBEDDED-FABRIC SYSTEMS, OR TAPES INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

-PRESSURE CLASSIFICATIONS SPECIFIC TO THE DUCT SYSTEM SHALL BE CLEARLY INDICATED ON THE CONSTRUCTION DOCUMENTS IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE.

TEMPERATURE CONTROLS:

-PER IECC 503.2.4. EACH HEATING AND COOLING SYSTEM SHALL HAVE AT LEAST ONE SOLID-STATE PROGRAMMABLE THERMOSTAT. THE THERMOSTAT SHALL HAVE THE CAPABILITY TO SET BACK OR SHUT DOWN THE SYSTEM BASED ON DAY OF THE WEEK AND TIME OF DAY, AND PROVIDE A READILY ACCESSIBLE MANUAL OVERRIDE THAT WILL RETURN TO THE PRESETBACK OR SHUTDOWN SCHEDULE WITHOUT REPROGRAMMING.

PIPING INSULATION:

PIPING INSULATION:

HOT WATER PIPES:
MIN. 1" INSULATION FOR 1.5" OR SMALLER PIPES
MIN. 2" INSULATION FOR GREATER THAN 1.5" PIPES

CHILLED WATER PIPES:
MIN. 1" INSULATION FOR 1.5" OR SMALLER PIPES
MIN. 1.5" INSULATION FOR GREATER THAN 1.5" PIPES

MECHANICAL GENERAL NOTES

- THE CONTRACTOR SHALL DO ALL NECESSARY CUTTING OF WALLS AND CEILING.
- NO STRUCTURAL MEMBER SHALL BE CUT WITHOUT PERMISSION FROM THE ENGINEER.
- PATCH AROUND ALL OPENINGS TO MATCH EXISTING CONSTRUCTION.
- DUCTWORK CONSTRUCTION AND INSTALLATION INCLUDING SHEET METAL GAUGES, REINFORCEMENT, JOINT SEALING, AIR LEAKAGE AND DETAILS NOT SPECIFICALLY SHOWN ON DRAWINGS SHALL BE IN ACCORDANCE WITH 2006 IMC DUCT CONSTRUCTION STANDARDS.
- INSULATION CONTRACTOR SHALL TAPE ALL JOINTS AND SEAMS ON THE DUCT INSULATION WRAP (INCLUDING NEW AND EXISTING INSULATION PROVIDED UNDER SHELL PACKAGE) TO MAINTAIN A CONSTANT VAPOR BARRIER.
- ALL MATERIALS EXPOSED WITHIN DUCTS OR PLENUMS SHALL HAVE A FLAME-SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE-DEVELOPED RATING OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH THE TEST FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS.
- FLEXIBLE DUCTWORK SHALL COMPLY WITH THE CLASS I REQUIREMENTS OF THE NFPA BULLETIN NO. 90A AND SHALL BE INSULATED WITH 1" FIBERGLASS, SUPPORTED BY HELICALLY WOUND STEEL WIRE WITH REINFORCED METALIZED OUTER JACKET RATED FOR USE IN PLENUMS. ATTACHMENT SHALL BE WITH WORM DRIVE CLAMPS. LENGTH SHALL NOT EXCEED 6'-0"
- TAKE-OFF FITTINGS SHALL BE FLANGED 100% AIRTIGHT TAPS WITH QUADRANT DAMPER. SEE DETAIL.
- TURNING VANES SHALL BE INSTALLED IN ALL MITERED ELBOWS.
- LIGHTING & SPRINKLER HEADS TAKE PRECEDENCE OVER DIFFUSER LOCATION. CONTRACTOR SHALL MAKE NECESSARY ADJUSTMENTS TO DIFFUSERS TO AVOID ANY CONFLICT WITH LIGHTING LAYOUT & SPRINKLER HEADS.
- BRANCH DUCT SERVING DIFFUSERS SHALL BE SAME SIZE AS NECK DIAMETER.
- CONTRACTOR TO COORDINATE ALL FINAL THERMOSTAT LOCATIONS WITH OWNER & ARCHITECT.
- UNITS MAY BE RELOCATED TO PROVIDE NECESSARY CLEARANCES FOR STRUCTURAL MEMBERS, PIPING, DEMISING WALLS, HARD CEILINGS, ETC.
- MOUNTING HEIGHT OF ALL MECHANICAL EQUIPMENT TO BE APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO CONSTRUCTION.
- TEMPORARY FILTERS SHOULD BE INSTALLED ON ALL RETURN AIR OPENINGS IN SPACE DURING CONSTRUCTION
- SMOKE DETECTORS ASSOCIATED WITH SMOKE DAMPERS AND HVAC SHUTOFFS SHALL BE TESTED BY AN APPROVED TESTING AGENCY OR A QUALIFIED THIRD PARTY SPECIAL INSPECTOR. THE SPECIAL INSPECTOR / TESTING AGENCY SHALL BE AN INDEPENDENT THIRD PARTY INDIVIDUAL OR FIRM AND SHALL NOT BE THE INSTALLING CONTRACTOR. A PROFESSIONAL ENGINEER SHALL SUBMIT A FINAL SIGNED AND SEALED REPORT TO THE MECHANICAL INSPECTOR PRIOR TO CITY ISSUANCE OF FINAL INSPECTION APPROVAL OR OCCUPANCY APPROVAL, INCLUDING CONDITIONAL OCCUPANCY APPROVAL.
- CONTRACTOR TO COORDINATE ALL MECHANICAL, PLUMBING AND ELECTRICAL WORK WITH CEILING HEIGHTS. CONTACT ARCHITECT AND ENGINEER WITH ANY DISCREPANCIES PRIOR TO INSTALLATION OF ANY EQUIPMENT.
- WHERE WALLS ABOVE THE CEILING ARE BEING EXTENDED TO THE DECK. CONTRACTOR SHALL PROVIDE MINIMUM OF ONE 18"x18" OPENING WITH SOUND BOOT IN THE WALL ABOVE THE CEILING FOR RETURN PURPOSES. ADDITIONAL OPENINGS TO BE ADDED AS REQUIRED TO MAINTAIN MAXIMUM OF 500 FPM RETURN AIR VELOCITY.
- ALL WIRING AND DUCTWORK ABOVE CEILING TO BE PLENUM RATED PER 2006 IMC 602.
- ALL DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE MOST RECENT SMACNA DUCT STANDARDS. MINIMUM 24 GAUGE.
- HANGERS FOR SHEET METAL DUCTWORK SHALL BE INSTALLED AS REQUIRED BY 2006 IMC.

CODE INFORMATION

- 2006 IBC, 2006 IMC, 2006 IECC, AND AMENDMENTS.
- OUTDOOR AIR VENTILATION PROVIDED AND BASED ON CHAPTER 4, SECTION 403.3.
- ALL ROOFTOP EQUIPMENT SHALL BE PERMANENTLY IDENTIFIED AS TO THE AREA SERVED WITH A RUST PROOF METAL NAMEPLATE PER 2006 IMC.
- DUCT SMOKE DETECTORS REQUIRED BY 2006 IMC SECTION 606 SHALL BE INSTALLED IN THE RETURN AIR DUCT OR PLENUM UPSTREAM OF ANY FILTERS; EXHAUST AIR CONNECTIONS, OUTDOOR AIR CONNECTIONS, OR DECONTAMINATION EQUIPMENT AND APPLIANCES. DETECTORS SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 606.3 AND NFPA 72.

DUCT SIZE 12" GAUGE SUPPORT SPACING
& UNDER 13" 24 GA. 1" x 18 GA. STRAPS @ 10 FT.
TO 30" 30" 24 GA. 1" x 18 GA. STRAPS @ 10 FT.
TO 40" 40" & 22 GA. 1/8" STRAPS @ 10 FT.
OVER 20 GA. 1/8" STRAPS @ 10 FT.

22. ALL FLEXIBLE DUCT RUNOUTS TO CEILING DIFFUSERS AND REGISTERS SHALL BE CASCO SILENTFLEX II. FLEXIBLE ACOUSTIC DUCT WITH PERFORATED INNER CORE FOR SOUND ATTENUATION.



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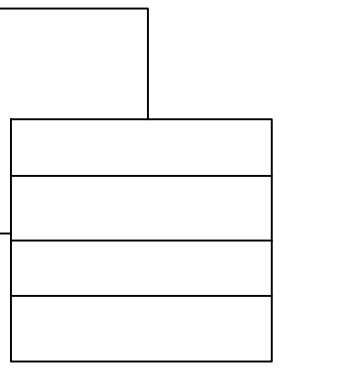
EXPIRES 6-30-2013

GMP-ADDENDUM 1
05/13/11
OWNER REVIEW
07/15/11

July 15, 2011
Construction Documents
r+b job # 0209
U.A. # 08-8826

LABORATORY OF TREE-RING RESEARCH
BRYANT BANNISTER TREE-RING BUILDING
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KEYPLAN



MECHANICAL SCHEDULES

M1.0

esd ENERGY SYSTEMS DESIGN
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PROJECT # 081093.100
DESIGN CONTACT MONTE STURDEVANT

FILE: J:\2008\081093 UofA Tree Ring Laboratory\081093_100 U of A Tree Ring UofA Comments Rev 02_M1_1.dwg

PLOTTED BY: chad.eggink
DATE: 09-29-2011 - 8:29am

EXHAUST TERMINAL BOX SCHEDULE

MARK	MANUFACT.	MODEL/SERIES	INLET SIZE	FACTORY CFM RANGE		DESIGN EXHAUST CFM RANGE		REMARKS
				MIN.	MAX.	MIN.	MAX.	
3-1	NAILOR	30X	12	320	2270	1010	2020	(1)(2)(3)(4)(5)
3-2	NAILOR	30X	12	320	2270	870	1740	(1)(2)(3)(4)(5)
3-3	NAILOR	30X	12	320	2270	1010	2020	(1)(2)(3)(4)(5)
4-1	NAILOR	30X	12	320	2270	1020	2035	(1)(2)(3)(4)(5)
4-2	NAILOR	30X	12	320	2270	1020	2035	(1)(2)(3)(4)(5)
4-3	NAILOR	30X	6	85	580	180	360	(1)(2)(3)(4)(5)
4-4	PHOENIX CONTROLS	CVV	10	50	1000	900	900	(6)(7)(8)(9)
4-5	PHOENIX CONTROLS	CVV	10	50	1000	900	900	(6)(7)(8)(9)

- MAXIMUM 1" W.C. PRESSURE DROP AT MAXIMUM UNIT AIR FLOW
- TAPS AT PRIMARY EXHAUST AIR MAIN SHALL BE ONE SIZE LARGER THAN THE VAV BOX INLET SIZE.
- DDC CONTROLS SUPPLIED BY CONTROLS CONTRACTOR AND FACTORY INSTALLED BY VAV MANUFACTURER.
- PROVIDE CONTROLS ENCLOSURE AND 120V TO 24VAC TRANSFORMER.
- THE EXHAUST BOX SHALL GO TO LOW FLOW CONDITION WHEN LAB IS IN UNOCCUPIED SCHEDULE. EXHAUST SHALL PROVIDE 6 AIR CHANGES DURING OCCUPIED TIME AND 3 AIR CHANGES WHEN UNOCCUPIED. PROVIDE SOUND ATTENUATOR WITH FIBER FREE LINER
- VALVE TO BE CLASS B CORROSIVE.
- PROVIDE WITH SOUND ATTENUATOR.
- FAIL POSITION: FIXED.
- MOUNT VALVE IN VERTICAL POSITION. VALVE TO BE SELF MODULATING TO PROVIDE CONSTANT AIRFLOW.

AIR HANDLING UNIT SCHEDULE

MARK	MANUF.	MODEL NO.	SUPPLY FAN DATA										CHILLED WATER COOLING COIL										REMARKS	
			CFM	E.S.P. / T.S.P.	WHEEL QTY/DIA	FAN RPM	H.P.	MOTOR BRAKE HP (Total)	V-PH	Hz (at design)	O/A MIN/ECON	LAT DB	LAT WB	ENT AIR DB	ENT AIR WB	ENT H ₂ O	LVG H ₂ O	GPM	ΔP (FT)	MAX. FACE VEL. (FPM)	PIPE CONN. SIZE			
AHU-1	ENERGY LABS	-	36,000	3"	4	1648	4015	46	480/3	60 Hz	14,000	50.8	50.7	86	64	44	62	144	8.02	6	0.61	400	302"	
				6"	-						36,000								12					
			RETURN FAN DATA										HOT WATER HEATING COIL										REMARKS	
CFM	E.S.P. / T.S.P.	WHEEL QTY/DIA	FAN RPM	H.P.	MOTOR BRAKE HP (Total)	V-PH	Hz (at design)	ENT. AIR L.V.G. AIR	ENT H ₂ O	LVG H ₂ O	GPM	ΔP (FT)	MAX. FACE VEL. (FPM)	PIPE CONN. SIZE	FILTERS	WEIGHT LBS.								
28,000	2"	4	1238	405	12.8	480/3	60 Hz	60	180	141	55	4.16	2	8	2" - PRE 12" FINAL	34,000								

- ALL DAMPERS TO BE AIRFOIL, LOW LEAKAGE TYPE SUPPLIED BY MANUFACTURER, ACTUATORS SUPPLIED BY BMS.
- FANS TO OPERATE WITH FACTORY MOUNTED ABB VFD. PROVIDE PREMIUM EFFICIENCY INVERTER DUTY RATED MOTORS.
- SMOKE DETECTOR IN SUPPLY AND RETURN DUCT SUPPLIED AND WIRED BY ELECTRICAL CONTRACTOR. MECHANICAL CONTRACTOR TO INSTALL.
- PROVIDE REDUNDANT VFDS IN UNIT WITH DISCONNECT MEANS AND OVERCURRENT PROTECTION. ALL MOTORS TO BE FACTORY WIRED TO VFD/VFD TO BE FACTORY MOUNTED IN NEMA 3R PANEL. VFD TO BE MANUFACTURED BY ABB.
- PROVIDE MERV-8 PREFILTERS (2-SETS) AND MERV-13 FINAL FILTERS. SEE SPECS. PROVIDE MAGNETIC FILTER PRESSURE DIFFERENTIAL GAUGE AT EACH FILTER SECTION.
- FAN PERFORMANCE AT 2500 FEET.
- SEE PLAN AND SPECS FOR ADDITIONAL REQUIREMENTS.
- PROVIDE BALANCING VALVE AT EACH COIL. PROVIDE (2)COILS HIGH.
- SEE SPEC'S FOR WALL CONSTRUCTION. PROVIDE DOUBLE SLOPED S.S DRAIN PANS. SEE DETAIL FOR ADDITIONAL REQUIREMENTS
- OUTDOOR UNIT WITH 4"THICK DOUBLE WALL CONSTRUCTION.
- PROVIDE AIR FLOW MEASURING STATION ON ONE SUPPLY AIR FAN, ONE RETURN AIR FAN AND A HOT WIRE ANEMOMETER AIR MEASURING STATION AT EACH G.A. LOUVER.
- PROVIDE LIGHTS FACTORY MOUNTED TO WALL SWITCH IN ALL SECTIONS. PROVIDE VIEW WINDOW ON ALL DOORS. PROVIDE FACTORY WIRED CONVENIENCE RECEPTACLE.

		OCTAVE BAND FREQUENCY SOUND POWER (dB RE: 10E-12 WATTS)									
SOUND DATA		63	125	250	500	1K	2K	4K	8K	LWA	LW
R/A INLETS	84	84	88	78	73	76	73	62	62	69	87
S/A OUTLET	80	77	77	73	69	66	61	62	59	59	71
CASING RADIATED	83	75	78	74	62	56	52	45	74	85	

HOT WATER PUMP SCHEDULE

MARK	SERVICE	MFGR.	MODEL NO.	TYPE	GPM	HEAD FT.	% EFF.	MOTOR				REMARKS
								H.P.	BRAKE HP.	RPM	V/PH	
HWP-1	HOT WATER	BELL&GOSSETT	2 1/2 BB	FLEX COUPLED END SUCTION	235	75	76	10	6	1750	208/3	(1)(2)(3)
HWP-2	HOT WATER	BELL&GOSSETT	2 1/2 BB	FLEX COUPLED END SUCTION	235	75	76	10	6	1750	208/3	(1)(2)(3)

- TIE PUMP VFD INTO EMS SYSTEM.
- DISCONNECT PROVIDED BY ELECTRICAL CONTRACTOR.
- PROVIDE WITH VARIABLE FREQUENCY DRIVE AND PREMIUM EFFICIENCY INVERTER DUTY MOTOR.

EXHAUST FAN SCHEDULE

MARK	AREA SERVED /LOCATION	MANUFACTURER	MODEL	CFM MAX/MIN	E.S.P.	WEIGHT	MOTOR		DRIVE	REMARKS
							H.P.	V/PH		
LEF-1, 2	LAB EXHAUST	GREENHECK	VEKTOR-H-30	12,000/6,000	2.5	2,500	15	460/3	BELT	(1)
TEF-1	TOILET EXHAUST	GREENHECK	G-123-VG	1,150/-	0.8	11.8	1/2	120/1	DIRECT	(2)

- PROVIDE STANDBY FAN WITH BACKDRAFT DAMPER ON EACH FAN, MOTORIZED MODULATING BYPASS DAMPER, COMMON BYPASS AIR PLENUM FOR BOTH FANS AND ASSOCIATED FACTORY CONTROLS IN NEMA 3 CONTROL PANEL. PROVIDE NEMA 3 MOTOR STARTER FOR EACH FAN AND CONTROLS TRANSFORMER TO CONTROL BYPASS DAMPER. PROVIDE ROOF CURB. FAN MANUFACTURER TO PROVIDE DAMPER ACTUATORS. INTERFACE WITH BUILDING AUTOMATION SYSTEM. DISCHARGE VELOCITY SHALL BE 3,000 FEET PER MINUTE.
- PROVIDE WITH FACTORY ROOF CURB, AUTOMATIC BELT TENSIONER, NEMA 3R COMBINATION MOTOR STARTER AND DISCONNECT. INTERFACE WITH BUILDING AUTOMATION SYSTEM.

SILENCER SCHEDULE

TAG	BASIS OF DESIGN IAC MODEL NUMBER	DIMENSIONS (inches)			AIR FLOW (CFM)	VELOCITY (FPM)	MAX. PD in wg	MINIMUM DYNAMIC INSERTION LOSS, dB								NOTES
		WIDTH OR DIA.	HEIGHT	LENGTH				MAXIMUM SELF GENERATED NOISE, dB								
								OCTAVE BAND CENTER FREQUENCY, HZ								
63	125	250	500	1000	2000	4000	8000									
S1	RD-UHV-FB-L12141	48	60	36	28,000	1400	0.2	3	2	6	13	15	12	9	10	(1)(2)(3)
R1	RED-MHV-FC-L12141	36	72	84	16,800	-933	0.32	8	15	20	31	28	23	19		(1)(2)(3)(4)
R2	RD-MHV-FB-L12141	48	36	108	11,200	-933	0.22	10	16	33	54	55	48	30	22	(1)(2)(3)
LEF1	RNM-HV-FB-L12141	42	24	84	9,400	-1343	0.29	5	6	11	20	21	12	11	11	(1)(3)(5)
C1	VCR-L12141	48	0	96	0			58	51	48	52	58	62	57	40	(1)(3)

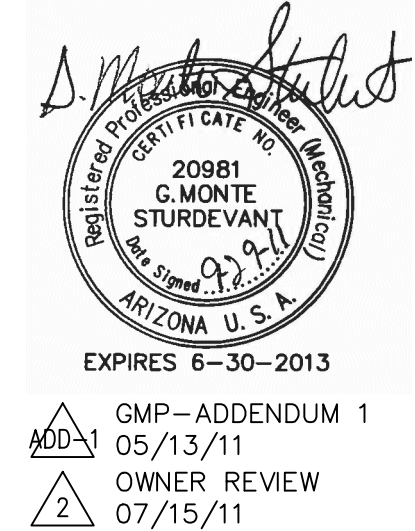
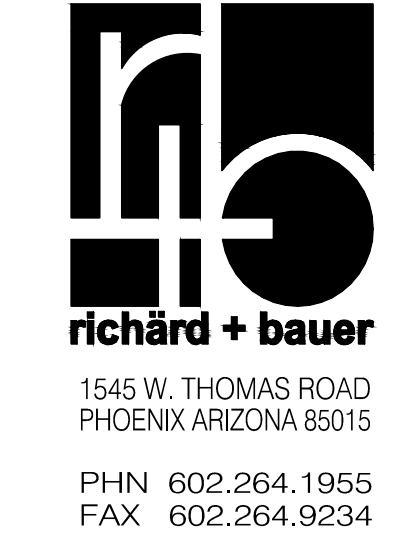
- RD= RECTANGULAR DISSIPATIVE, RNM= RECTANGULAR NO-MEDIA, RED= RECTANGULAR ELBOW DISSIPATIVE.
- GALVANIZED CONSTRUCTION.
- PROVIDE, FOR APPROVAL, ACOUSTICAL CALCULATIONS FOR ALL SYSTEMS WITH SILENCERS TO DEMONSTRATE THAT THE RESULTANT DUCTBORNE FAN SOUND LEVEL, INCLUDING AIRBORNE AND BREAKOUT NOISE, IN THE OCCUPIED SPACES MEET NC30.
- ELBOW SILENCER.
- 304 STAINLESS STEEL CONSTRUCTION.

VAV TERMINAL UNIT SCHEDULE

MARK	MANUFACTURER	MODEL NO.	INLET SIZE	FACTORY CFM RANGE		PRESSURE DROP (IN. WG.)	DESIGN CFM RANGE		HOT WATER COIL			CONTROL VALVE Cv	REMARKS	
				MIN	MAX		MIN	MAX	ROWS	GPM	MBH			
1-1	NAILOR	3001	7	100	710	0.35	0	400	2	0.8	15.1	3/4"	0.36	(1)(2)(3)(4)(5)
1-2	NAILOR	3001	16	480	3730	0.35	720	2800	2	5.3	105.8	1"	2.4	(1)(2)(3)(4)(5)
1-3	NAILOR	3001	16	480	3730	0.35	720	2800	2	5.3	105.8	1"	2.4	(1)(2)(3)(4)(5)
1-4	NAILOR	3001	14	380	2745	0.35	600	2150	2	4.1	81.3	1"	1.8	(1)(2)(3)(4)(5)
2-1	NAILOR	3001	7	100	710	0.35	0	400	2	0.8	15.1	3/4"	0.36	(1)(2)(3)(4)(5)
2-2	NAILOR	3001	7	100	710	0.35	0	400	2	0.8	15.1	3/4"	0.36	(1)(2)(3)(4)(5)
3-1	NAILOR	3001	12	260	2185	0.35	390	1740	2	3.3	65.8	1"	1.5	(1)(2)(3)(4)(5)
3-2	NAILOR	3001	9	170	1300	0.35	260	810	2	1.5	30.6	3/4"	0.67	(1)(2)(3)(4)(5)
3-3	NAILOR	3001	9	170	1300	0.35	260	810	2	1.5	30.6	3/4"	0.67	(1)(2)(3)(4)(5)
3-4	NAILOR	3001	12	260	2185	0.35	880	1760	2	3.3	66.5	1"	1.5	(1)(2)(3)(4)(5)
3-5	NAILOR	3001	12	260	2185	0.35	740	1480	2	2.8	56.0	3/4"	1.3	(1)(2)(3)(4)(5)
3-6	NAILOR	3001	12	260	2185	0.35	880	1760	2	3.3	66.5	1"	1.5	(1)(2)(3)(4)(5)
3-7	NAILOR	3001	6	70	500	0.35	250	250	2	0.5	10.8	3/4"	0.22	(1)(2)(3)(4)(5)
3-8	NAILOR	3001	9	170	1300	0.35	260	810	2	1.5	30.6	3/4"	0.67	(1)(2)(3)(4)(5)
3-9	NAILOR	3001	9	170	1300	0.35	260	810	2	1.5	30.6	3/4"	0.67	(1)(2)(3)(4)(5)
3-10	NAILOR	3001	10	205	1435	0.35	260	975	2	1.8	36.9	3/4"	0.8	(1)(2)(3)(4)(5)
3-11	NAILOR	3001	12	260	2185	0.35	390	1680	2	2.2	63.5	3/4"	1.0	(1)(2)(3)(4)(5)
3-12	NAILOR	3001	10	205	1435	0.35	260	700	2	1.3	26.5	3/4"	0.6	(1)(2)(3)(4)(5)
3-13	NAILOR	3001	7	100	710	0.35	0	300	2	0.6	11.3	3/4"	0.27	(1)(2)(3)(4)(5)
3-14	NAILOR	3001	7	100	710	0.35	0	300	2	0.6	11.3	3/4"	0.27	(1)(2)(3)(4)(5)
3-15	NAILOR	3001	7	100	710	0.35	150	360	2	0.7	13.6	3/4"	0.31	(1)(2)(3)(4)(5)
3-16	NAILOR	3001	7	100	710	0.35	150	400	2	0.8	15.1	3/4"	0.36	(1)(2)(3)(4)(5)
4-1	NAILOR	3001	12	260	2185	0.35	390	1740	2	3.3	65.8	1"	1.5	(1)(2)(3)(4)(5)
4-2	NAILOR	3001	8	150	1000	0.35	260	810	2	1.5	30.6	3/4"	0.67	(1)(2)(3)(4)(5)
4-3	NAILOR	3001	10	205	1435	0.35	260	810	2	1.5	30.6	3/4"	0.67	(1)(2)(3)(4)(5)
4-4	NAILOR	3001	12	260	2185	0.35	740	1480	2	2.8	56.0	3/4"	1.3	(1)(2)(3)(4)(5)
4-5	NAILOR	3001	14	380	2745	0.35	1110	2220	2	4.2	83.9	1"	1.9	(1)(2)(3)(4)(5)
4-6	NAILOR	3001	12	260	2185	0.35	880	1760	2	3.3	66.5	1"	1.5	(1)(2)(3)(4)(5)
4-7	NAILOR	3001	6	70	500	0.35	300	300	2	0.6	11.3	3/4"	0.27	(1)(2)(3)(4)(5)
4-8	NAILOR	3001	10	205	1435	0.35	260	810	2	1.5	30.6	3/4"	0.67	(1)(2)(3)(4)(5)
4-9	NAILOR	3001	8	150	1000	0.35	260	810	2	1.5	30.6	3/4"	0.67	(1)(2)(3)(4)(5)
4-10	NAILOR	3001	12	260	2185	0.35	390	1680	2	3.2	63.5	1"	1.5	(1)(2)(3)(4)(5)
4-11	NAILOR	3001	10	205	1435	0.35	260	700	2	1.3	26.5	3/4"	0.6	(1)(2)(3)(4)(5)
4-12	NAILOR	3001	7	100	710	0.35	0	350	2	0.7	13.2	3/4"	0.31	(1)(2)(3)(4)(5)
4-13	NAILOR	3001	7	100	710	0.35	0	300	2	0.6	11.3	3/4"	0.27	(1)(2)(3)(4)(5)
4-14	NAILOR	3001	8	150	1000	0.35	225	560	2	1.1	21.2	3/4"	0.5	(1)(2)(3)(4)(5)
4-15	NAILOR	3001	7	100	710	0.35	0	400	2	0.8	15.1	3/4"	0.36	(1)(2)(3)(4)(5)

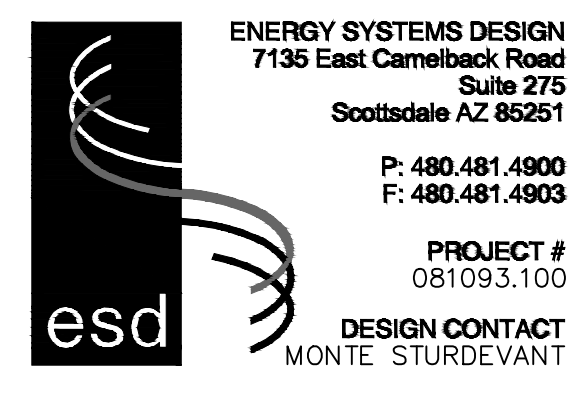
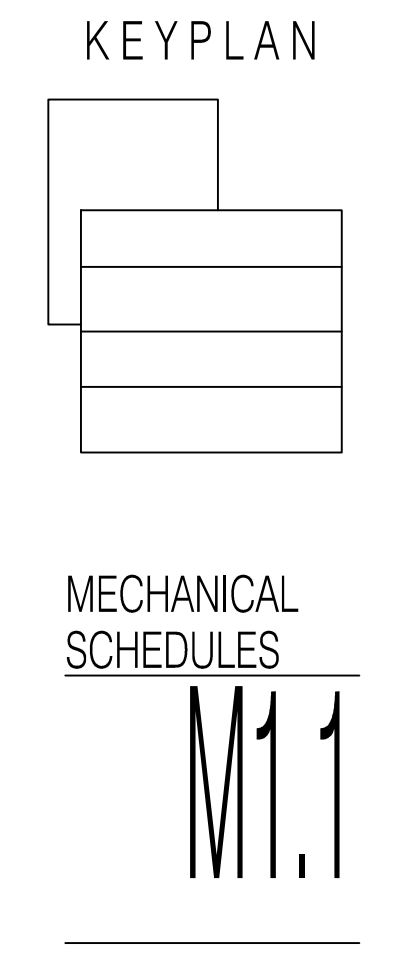
- MAXIMUM PRESSURE DROP AT MAXIMUM UNIT AIR FLOW
- TAPS AT PRIMARY AIR SHALL BE ONE SIZE LARGER THAN THE VAV BOX INLET SIZE.
- DDC CONTROLS SUPPLIED BY CONTROLS CONTRACTOR AND FACTORY INSTALLED BY VAV MANUFACTURER.
- BALANCE MINIMUM AIRFLOW TO 10% OF DESIGN CFM.
- PROVIDE CONTROLS ENCLOSURE AND 277V TO 24VAC TRANSFORMER.

ENTIRE SHEET



July 15, 2011
Construction Documents
r-b job #: 0209
U.A. #: 08-8826

LABORATORY OF TREE-RING RESEARCH
BRYANT BANNISTER TREE-RING BUILDING
The University of Arizona - Tucson, Arizona



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PLOTTED: 09-29-2011 - 8:30am

FAN COIL UNIT SCHEDULE

MARK	MANUF.	MODEL	SIZE	O.A. CFM	DRIVE MAX	BLOWER		ELECTRICAL DATA					COOLING COIL										WEIGHT LBS	REMARKS		
						CFM	E.S.P.	HP	MCA	FLA	MOP	V/PH	SENS. MBH	TOT. MBH	GPM	MIN. ROWS/F.P.L.	PIPE CONN. SIZE	EWT F	EAT F DB	EAT F WB	LWT F	LAT F DB			LAT F WB	WPD (FT)
2-1	CARRIER	42BHE16	16	0	BELT	1500	0.5"	3/4	6.4	5.1	15	277/1	36.0	36.0	4.0	6/12	7/8"	44	80	62	62.0	55.9	52.7	1.0	360	①②③④⑤
2-2	CARRIER	42BHE16	16	0	BELT	1500	0.5"	3/4	6.4	5.1	15	277/1	36.0	36.0	4.0	6/12	7/8"	44	80	62	62.0	55.9	52.7	1.0	360	①②③④⑤
2-3	CARRIER	42BHE16	16	0	BELT	1500	0.5"	3/4	6.4	5.1	15	277/1	36.0	36.0	4.0	6/12	7/8"	44	80	62	62.0	55.9	52.7	1.0	360	①②③④⑤
3-1	CARRIER	42BHE10	10	0	BELT	900	0.5"	1/2	4.5	3.6	15	277/1	22.8	22.8	2.5	6/12	7/8"	44	80	62	62.0	54.5	52.1	1.1	300	①②③④⑤
4-1	CARRIER	42BHE10	10	0	BELT	900	0.5"	1/2	4.5	3.6	15	277/1	22.8	22.8	2.5	6/12	7/8"	44	80	62	62.0	54.5	52.1	1.1	300	①②③④⑤
5-1	CARRIER	42BHE16	16	0	BELT	1500	0.5"	3/4	6.4	5.1	15	277/1	36.0	36.0	4.0	6/12	7/8"	44	80	62	62.0	55.9	52.7	1.0	360	①②③④⑤

① DIRECT DRIVE UNIT WITH ECM MOTOR, STARTER, AND 2" FILTER.
 ② ALL DISCONNECTS BY ELECTRICAL CONTRACTOR.
 ③ ALL CAPACITIES SHOWN ARE DE-RATED FOR AN ELEVATION OF 2500 FEET.
 ④ UNIT TO BE CONTROLLED BY EMS SYSTEM. COORDINATE WITH CONTROLS CONTRACTOR FOR STARTER/CONTACTOR REQUIREMENTS.
 ⑤ PROVIDE INTEGRAL MOTOR AND STARTER ACCESSIBLE THRU MOTOR CONTROL PANEL.

UNIT SHALL HAVE SIDE ACCESS PANELS FOR EASY SERVICE.

PACKAGED STEAM CONVERTER SYSTEM

ENVIROSEP PACKAGED SKID MOUNTED SYSTEM. SYSTEM TO PROVIDE 235 GPM AT 140 F ENTERING WATER TEMPERATURE AND 180 F LEAVING WATER TEMPERATURE USING 40 PSI STEAM INLET PRESSURE. PROVIDE WITH A 1" CONNECTION FOR EXISTING CONDENSATE RETURN FROM TUNNEL AT 40' ABOVE FINISHED FLOOR. STEAM INLET PIPING CONNECTION TO BE BOTTOM AT 60' ABOVE FINISHED FLOOR.

SYSTEM SHALL BE COMPLETE WITH ENVIROSEP ES0804 SHELL AND TUBE HEAT EXCHANGER, CONDENSATE RECEIVER, 40 PSI TO 10PSI 2 1/2" PRESSURE REGULATING VALVE, VACUUM BREAKER/AIR VENT ARRANGEMENT, STEAM TRAP WITH ISOLATION VALVES, STRAINER AND CHECK VALVE, 60 GALLON ATMOSPHERIC CARBON STEEL RECEIVER, PRESSURE GAUGE AND LEVEL GAUGE, HIGH LEVEL ALARM SWITCH, THREE POSITION MECHANICAL ALTERNATOR/FLOAT, TWO ECP-D LOW NPSH DUPLEX VERTICAL STACKED CONDENSATE PUMPS EACH FLOWING 20 GPM AT 40 PSI, 3/4-HP, 480V/3PH TWO VOGT SUCTION ISOLATION VALVES, TWO MUELLER CLASS 600 Y-STRAINERS, TWO VOGT CLASS 800 OUTLET CHECK VALVES, TWO VOGT CLASS 800 OUTLET GLOBE VALVES, DRAIN VALVE AND UL LISTED INDUSTRIAL CONTROL PANEL IN NEMA 1 ENCLOSURE WITH TEMPERATURE CONTROLLER, H-O-A SELECTOR SWITCHES, PUMP RUN AND FAULT PILOT LIGHTS, DISCONNECT PREWIRED TO MOTORS AND MECHANICAL ALTERNATOR WITH REMOTE ALARM CONTACTS AND BACNET OPEN PROTOCOL INTERFACE WITH BUILDING AUTOMATION SYSTEM.

PROVIDE REMOVABLE INSULATION BLANKET ON PUMPS AND RECEIVER. ALL PIPING AND VALVES TO BE FIELD INSULATED.

REFER TO DETAIL ON DRAWINGS FOR ADDITIONAL REQUIREMENTS.

GRILLES/REGISTERS/DIFFUSERS SCHEDULE

MARK	DESCRIPTION	MODULE SIZE	TYPE	MAX. NO. AT DESIGN CFM	OBD	BORDER TYPE	MATERIAL	FINISH	MANUFACTURER	MODEL NO.	REMARKS
CD-1	SUPPLY DIFFUSER	SEE PLANS	ROUND PLAQUE	30	NO	①	HEAVY GA. ALUM.	PER ARCH.	AIR CONCEPTS	SPD	③
CD-2	SUPPLY DIFFUSER	12x12	SQUARE PLAQUE	30	YES	①	STEEL	PER ARCH.	TITUS	OMNI	③
CD-3	SUPPLY DIFFUSER		ROUND CEILING SPOT PUNKAH 4 PACK PANEL	30	YES	①	HEAVY GA. ALUM.	PER ARCH.	SEIHO	PKP 54-1414	③ FOUR 5" NOZZLES
CD-4	SUPPLY DIFFUSER		ROUND CEILING SPOT PUNKAH 2 PACK PANEL	30	YES	①	HEAVY GA. ALUM.	PER ARCH.	SEIHO	PKP 52-146	③ TWO 5" NOZZLES
CD-5	SUPPLY DIFFUSER	24x24	SQUARE LOUVER	30	YES	①	STEEL	PER ARCH.	TITUS	TMSA	③
SG-1	SUPPLY GRILLE	SEE PLANS	ROUND PLAQUE	30	NO	①	HEAVY GA. ALUM.	PER ARCH.	AIR CONCEPTS	SPD	③⑤
SG-2	SUPPLY GRILLE	SEE PLANS	ROUND PLAQUE	30	NO	①	HEAVY GA. ALUM.	PER ARCH.	SEIHO	NT	③
SG-3	SUPPLY GRILLE	SEE PLANS	LOUVERED	30	NO	①	STEEL	PER ARCH.	TITUS	300 RL	③④
SG-4	SUPPLY GRILLE	SEE PLANS	NOZZLE PANEL	30	NO	PANEL	ALUMINUM	PER ARCH.	SEIHO	NT-8-4P	③④
RG-1	RETURN GRILLE	SEE PLANS	ROUND CEILING	30	NO	①	HEAVY GA. ALUM.	PER ARCH.	AIR CONCEPTS	SPD	③
RG-2	RETURN GRILLE	SEE PLANS	LOUVERED	30	NO	①	STEEL	PER ARCH.	TITUS	350 RL	
EG-1	EXHAUST GRILLE	12x12	LOUVERED	30	YES	①	STEEL	PER ARCH.	TITUS	350 RL	
EG-2	EXHAUST GRILLE	SEE PLAN	ROUND EGGCRATE	30	YES	①	ALUMINUM	PER ARCH.	AIR CONCEPTS	REC	

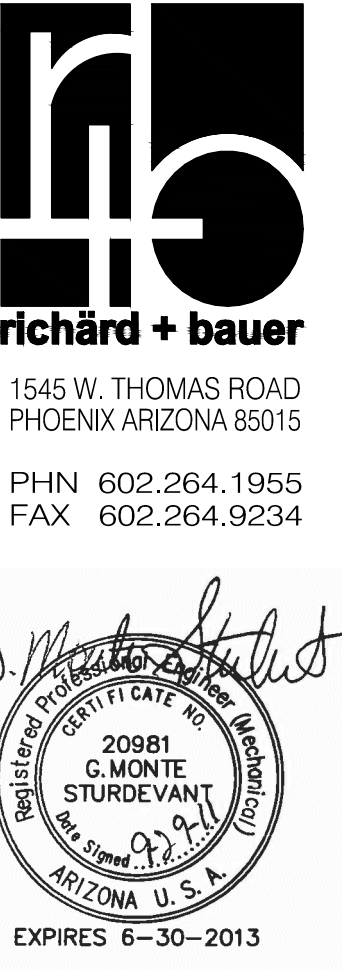
① PROVIDE FRAME STYLE TO SUIT MOUNTING SURFACE. REFER TO ARCHITECTURAL DRAWINGS. HARD CEILING REQUIRE AUXILIARY MOUNTED FRAMES AND STANDARD LAY-IN DIFFUSERS.
 ② CONFIRM FINISH WITH ARCHITECT PRIOR TO ORDERING. PROVIDE COLOR FROM MANUFACTURERS FULL RANGE OF STANDARD COLORS.
 ③ RUNOUTS TO BE SAME SIZE OR LARGER THAN NECK SIZE, UNLESS NOTED OTHERWISE.
 ④ PROVIDE WITH FULL SIZED PLENUM BOX BEHIND WITH DUCT CONNECTIONS.
 ⑤ PROVIDE BLANK OFF IN NECK OF DIFFUSER SO THAT AIRFLOW PATTERN IS 120 DEGREES DOWNWARD WHEN DIFFUSER IS MOUNTED HORIZONTALLY.

PROVIDE NEOPRENE GASKETS BETWEEN AIR DISTRIBUTION DEVICE AND MOUNTING SURFACE.

NOTE: ALL RUNOUTS TO DIFFUSERS SHALL BE SAME SIZE AS DIFFUSER NECK U.N.O.

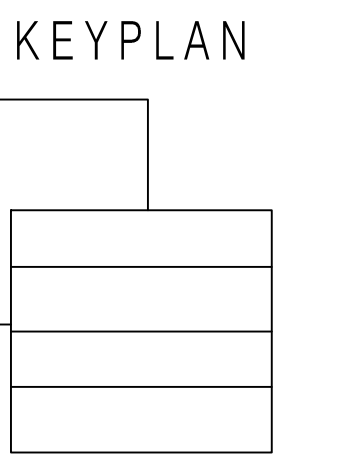
SUPPLY DIFFUSER SCHEDULE: ③
 250 CFM AND BELOW 8" NECK
 251 CFM - 400 CFM 10" NECK
 401 CFM - 600 CFM 12" NECK
 601 CFM - 800 CFM 14" NECK
 801 CFM - 1000 CFM 15" NECK

ATTENTION:
 ALL CEILING MOUNTED AIR TERMINALS OR SERVICES WEIGHING LESS THAN 20 POUNDS SHALL BE POSITIVELY ATTACHED TO THE CEILING SUSPENSION MAIN RUNNERS OR TO CROSS RUNNERS WITH THE SAME CARRYING CAPACITY AS THE MAIN RUNNER.
 TERMINALS OR SERVICES WEIGHING 20 POUNDS, BUT NOT MORE THAN 56 POUNDS, IN ADDITION TO THE ABOVE, SHALL HAVE TWO NUMBER 12 GAGE HANGERS CONNECTED FROM THE TERMINAL OR SERVICE TO THE CEILING SYSTEM HANGERS OR TO THE STRUCTURE ABOVE. THESE WIRES MAY BE SLACK.
 TERMINALS OR SERVICES WEIGHING MORE THAN 56 POUNDS SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURE ABOVE BY APPROVED HANGERS.

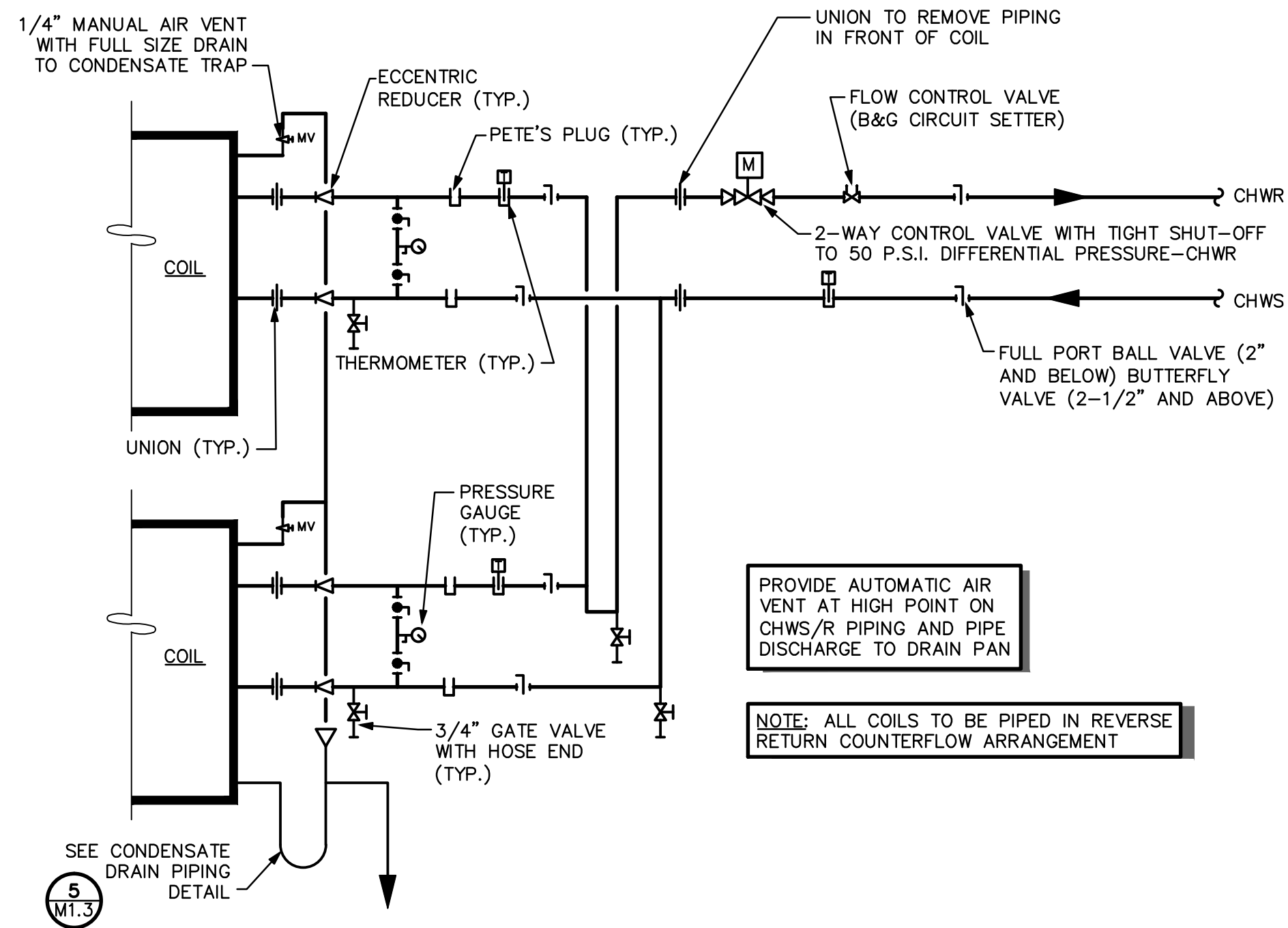


GMP-ADDENDUM 1
 05/13/11
 OWNER REVIEW
 07/15/11
July 15, 2011
Construction Documents
 r+b job # 0209
 U.A. # 08-8826

LABORATORY OF TREE-RING RESEARCH
BRYANT BANNISTER TREE-RING BUILDING
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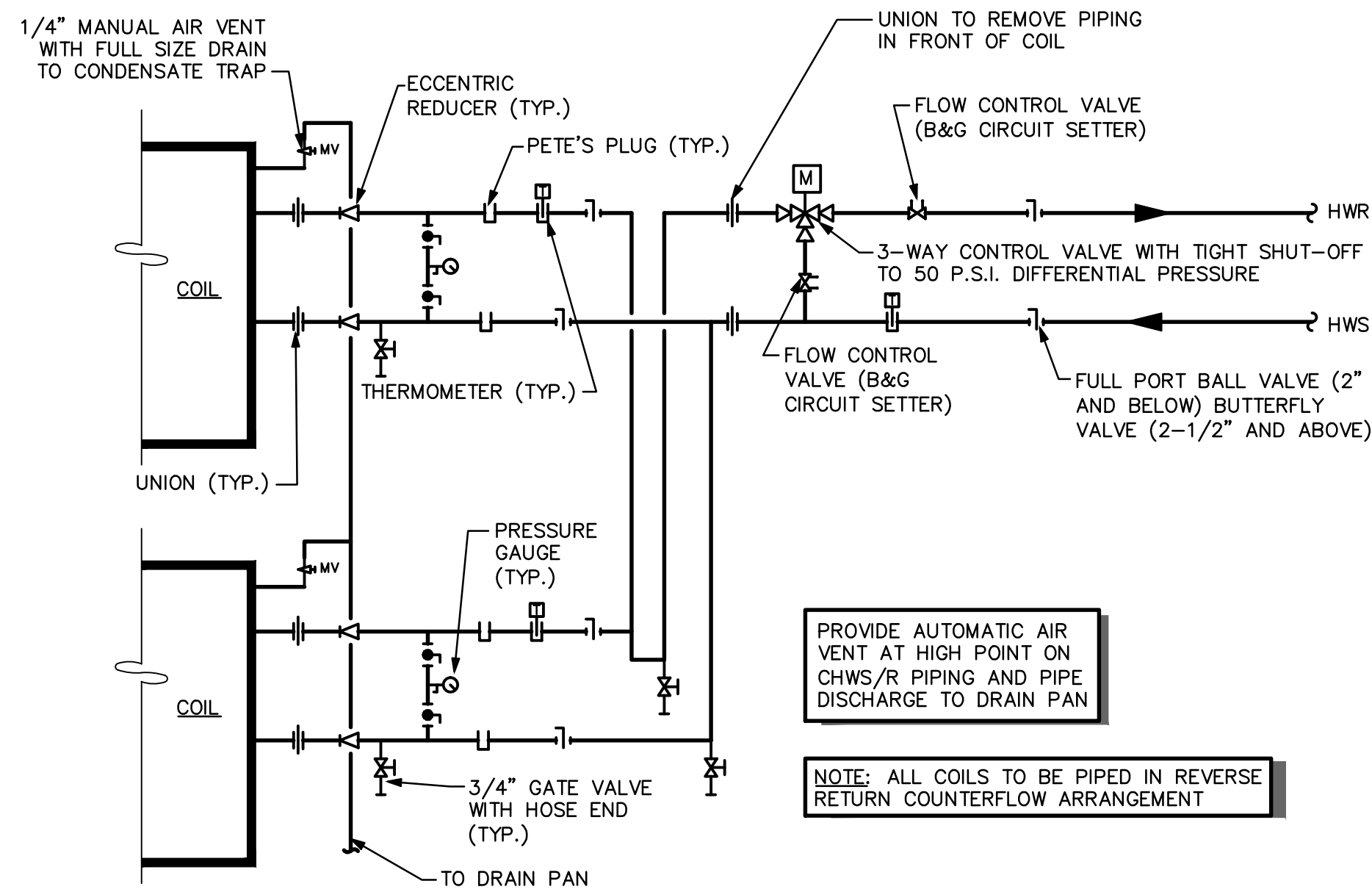
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AHU-1 CHILLED WATER COIL CONNECTION DETAIL

SCALE: NOT TO SCALE

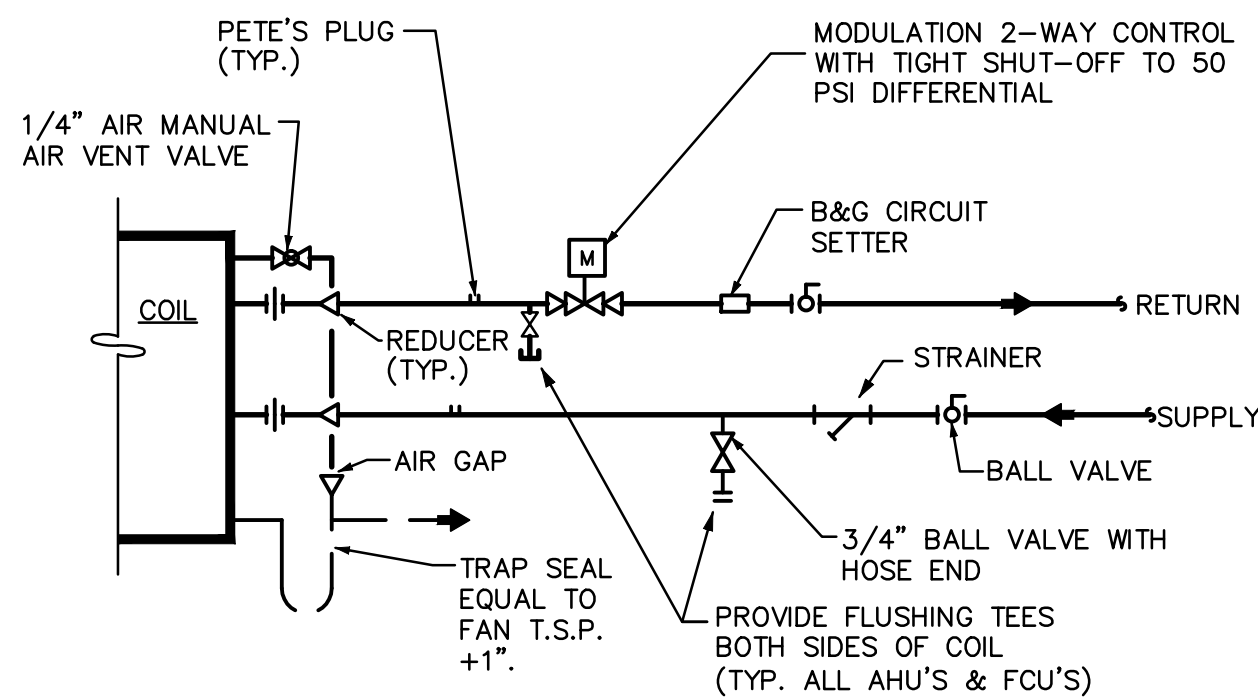
6
M1.3



HEATING HOT WATER COIL CONNECTION DETAIL

SCALE: NOT TO SCALE

7
M1.3

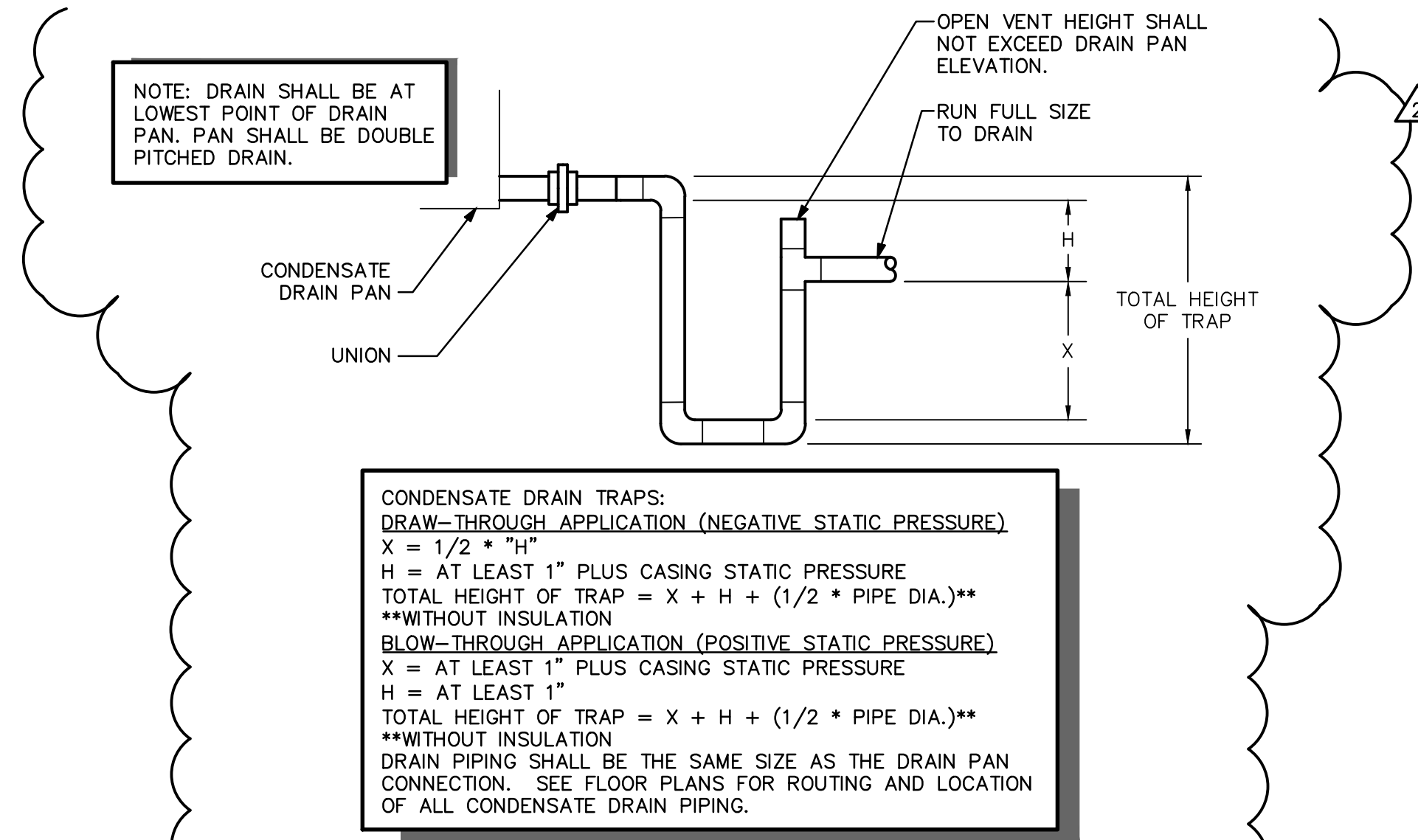


FCU CHILLED WATER COIL CONNECTION DETAIL

SCALE: NOT TO SCALE

8
M1.3

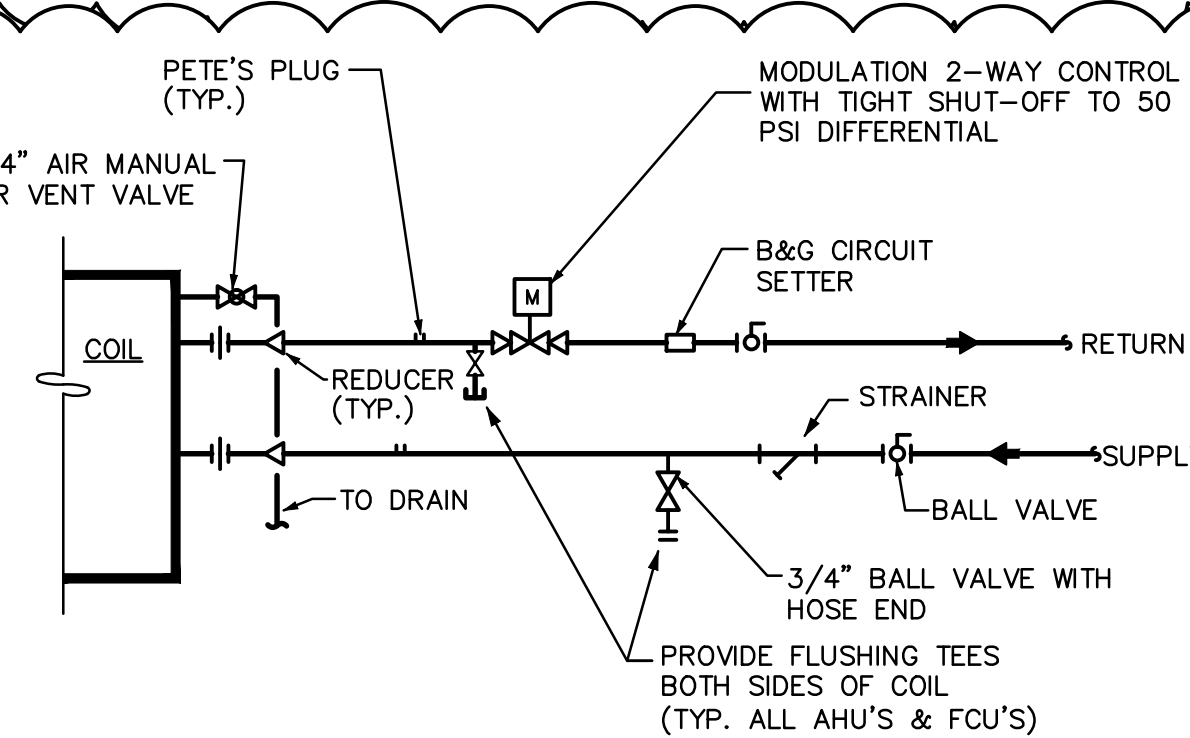
- NOTES:**
- FOR STACKED COIL APPLICATIONS INSTALL CHILLED WATER PIPING IN SUCH A MANNER TO PROVIDE EQUAL PRESSURE DROPS TO ALL COILS PER UNIT. PAY SPECIAL ATTENTION TO PIPING CONFIGURATION.
 - ALL ELBOWS SHALL BE LONG RADIUS. (REDUCED SYSTEM PRESSURE DROPS)
 - AT THE COIL SIDE OF LONG RADIUS ELBOWS (PRIOR TO COIL CONNECTIONS) ADD 'Y'S' WITH 'FULL PORT BALL VALVE SIZE AT 1/2 LINE SIZE OF COIL SERVICE LINES' LABELED ON DETAIL AS 'FULL PORT FLUSH BALL VALVES.' (USES: INITIAL COIL FLUSHING AND FUTURE MEANS TO BACK FLUSH INDIVIDUAL COILS. LOWER FOR COIL DRAINING PURPOSES.)
 - EACH INDIVIDUAL COIL SHALL HAVE FULL PORT ISOLATION VALVES (2 EACH COIL) ON THE HOUSE SIDE OF THE FLUSH VALVE 'Y'S.' (ISOLATION PER COIL)
 - ALL 'Y' STRAINERS SHALL BE FLANGED TYPE (OR OUTFITTED WITH FLANGES). 'Y' STRAINER 'SERVICE FLANGE' THREADED OPENING SHALL BE SAME SIZE AS 'SERVICE LINES TIED TO INLET AND OUTLET OF STRAINER.' OUTFIT SERVICE FLANGE WITH 'SERVICE LINE FULL SIZED CONNECTING NIPPLE' BETWEEN FLANGE AND FULL PORT SERVICE BALL VALVE (DIAMETER REDUCTION SHALL NOT BE ALLOWED HERE). CONNECTING NIPPLE SHALL BE LONG ENOUGH TO ALLOW FOR PROPER INSULATING METHOD. INSTALL INSULATION TO ALLOW FOR ELEMENT SERVICING, WITHOUT NEED FOR INSULATION REPAIR. IN CASES WHERE A SINGLE STRAINER IS INSTALLED SERVICING MULTIPLE AHUS DRAWING MAY INDICATE A SINGLE STRAINER WITH LINE PIPED TO DRAIN. IN THESE INSTANCES, CONTINUE THE DRAIN LINE FULL SIZE TO THE DRAIN. IN CASES WHERE THE STRAINER SERVICE BALL VALVE IS NOT REQUIRED TO BE PIPED TO A DRAIN, FINISH THE OUTLET SIDE OF SERVICE BALL WITH REDUCED PIPE SIZE DOWN STREAM OF BALL VALVE TO 3/4" HOSE-ENDED CONNECTOR WITH CAP.
 - ENSURE THAT THE FULL PORT BALL VALVE SHOWN DOWN STREAM OF STRAINER IS INSTALLED DIRECTLY AFTER THE STRAINER.
 - PETE'S PLUGS BELONG ON 'BOTH' SIDES OF STRAINER (3), AND 'BOTH' SIDES OF CONTROL VALVE (3), AND AT EQUAL DISTANCES FROM BOTH SIDES OF ALL COILS (6). ALL PRESSURE AND TEMPERATURE FITTINGS SHALL BE INSTALLED 'IN-LINE' OF PIPE. SYMMETRICAL LOCATIONS SHALL BE SELECTED TO PROVIDE UNIFORM PRESSURE DROP READINGS (REPRESENTATIVE OF EQUAL PRESSURE DROPS ON BOTH SIDES OF THE COIL). PRESSURE AND TEMPERATURE FITTINGS INSTALLED IN 2" AND SMALLER LINES SHALL UTILIZE AN EXTENSION NECK, TO ACCOMMODATE PROBE INSTALLATION. WHERE IT IS NECESSARY TO ACCOMMODATE ACCESS FOR FREE AND CLEAR INSTALLATION OF PROBES, PRESSURE MEASURING STEMS, THERMOMETERS, ETC. LINES (I.E. CHWS, CHWR, HWS AND HWR, ETC.) SHALL BE INSTALLED IN AN OFFSET MANNER, INSTALLATION SHALL PROVIDE EASY ACCESS AND CLEARANCE TO THE PROBE PORTS, FOR PRESSURE STEM AND TEMPERATURE STEM INSERTION.
 - INSTALL TEMPERATURE CONTROL VALVE WITH FLANGES ON BOTH SIDES OF ACTUATOR AND VALVE ASSEMBLY (ON THE OUTSIDE OF REDUCERS AND EXPANDERS, PIPE IS AT FULL SIZE), ACROSS STRAINER, AND AT COIL P.O.C.'S. FLANGES SHALL BE PLACED TO THE OUTSIDE OF BOTH THE REDUCERS AND EXPANDERS, WHERE PIPE IS FULL SIZE. REDUCERS/EXPANDERS SHALL BE INSTALLED DIRECTLY ADJACENT TO THE ENTERING AND LEAVING SIDES OF THE TEMPERATURE CONTROL VALVE. AT FLANGES UTILIZE DIELECTRIC ISOLATION WHERE DISSIMILAR METALS EXIST.
- FLANGES SHALL BE PROVIDED WITH COMPLETE FLANGE INSULATION KITS INCLUDING:
 - ONE 1/8" THICK STEEL WASHER FOR EACH BOLT.
 - ONE INSULATING WASHER FOR EACH BOLT.
 - ONE FULL LENGTH INSULATING SLEEVE FOR EACH BOLT.
 - ONE INSULATING WASHER FOR EACH BOLT.
- REDUCERS/EXPANDERS AT THE COIL P.O.C. SHALL BE COUPLED TO FLANGES WITHIN 1.5 PIPE DIAMETERS OF THE REDUCERS. SUPPLY SIDE REDUCERS SHALL BE OF THE ECCENTRIC TYPE. CHILLED WATER CONTROL VALVE FURNISHED BY CONTROLS CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR.
- INSTALL FLOW CONTROL VALVE PER MANUFACTURER APPLICATION GUIDELINES OR A MINIMUM OF FIVE PIPE DIAMETERS DOWN STREAM FROM ANY FITTING AND A MINIMUM OF 10 PIPE DIAMETERS DOWNSTREAM FROM A PUMP. A MINIMUM OF 2 PIPE DIAMETERS DOWN STREAM FROM THE BALANCING VALVE SHALL BE FREE OF ANY FITTINGS, WHICHEVER APPLICATION IS MORE RESTRICTIVE. INSTALLATION SHALL PROVIDE EASY ACCESS TO THE PROBE, METERING PORTS, DRAIN PORTS, AND HANDWHEEL.
 - TRAP SEAL DETAIL WITH NOTE APPLIES TO ALL COIL CONDENSATE TRAPS.



CONDENSATE PIPING AT UNIT DETAIL

SCALE: NOT TO SCALE

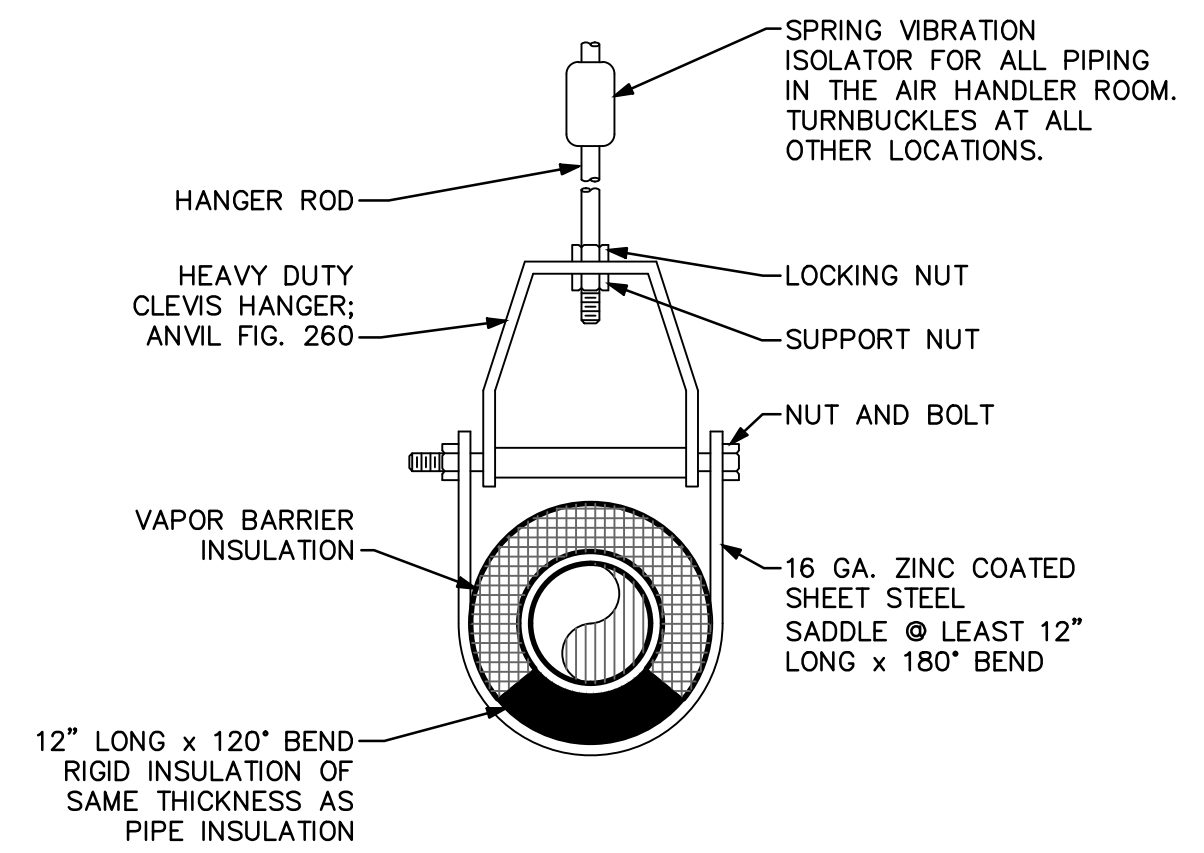
5
M1.3



VAV HOT WATER COIL CONNECTION DETAIL

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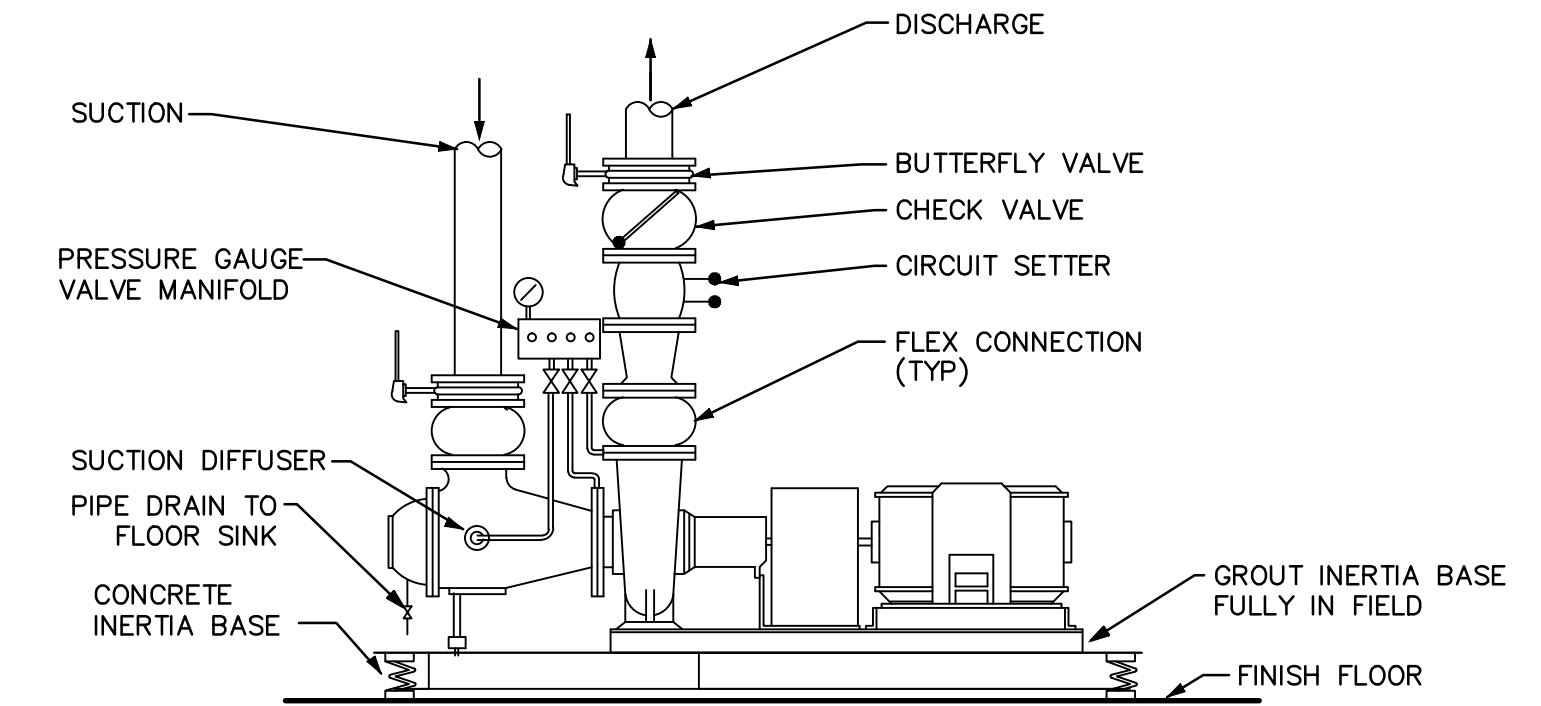
9
M1.3



CLEVIS HANGER DETAIL

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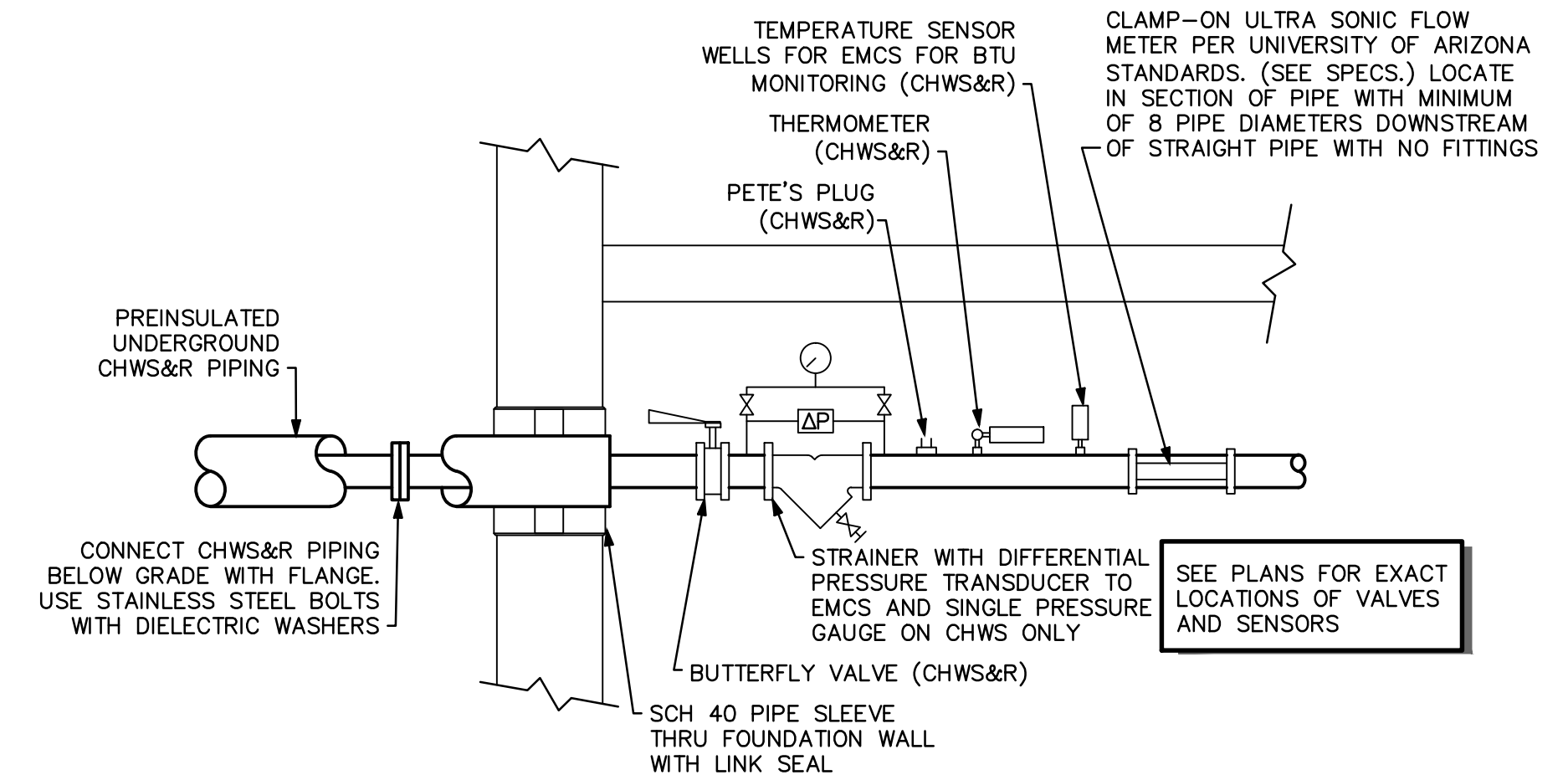
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M1.3



PUMP DETAIL

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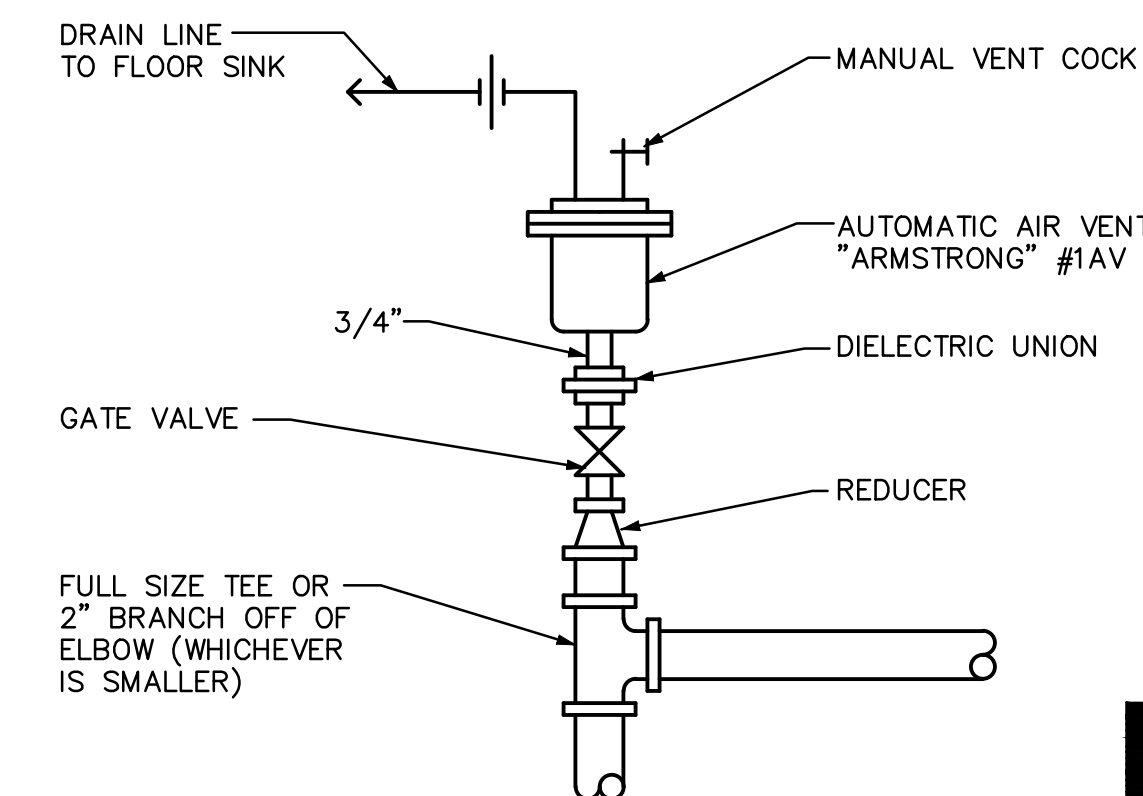
2
M1.3



BUILDING CHILLED WATER PIPE ENTRY DETAIL

SCALE: NOT TO SCALE

3
M1.3



AIR VENT DETAIL

SCALE: NOT TO SCALE

4
M1.3



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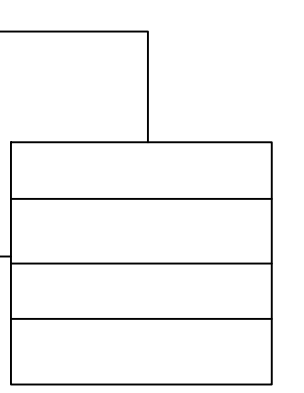
EXPIRES 6-30-2013

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KEYPLAN



MECHANICAL DETAILS

M1.3

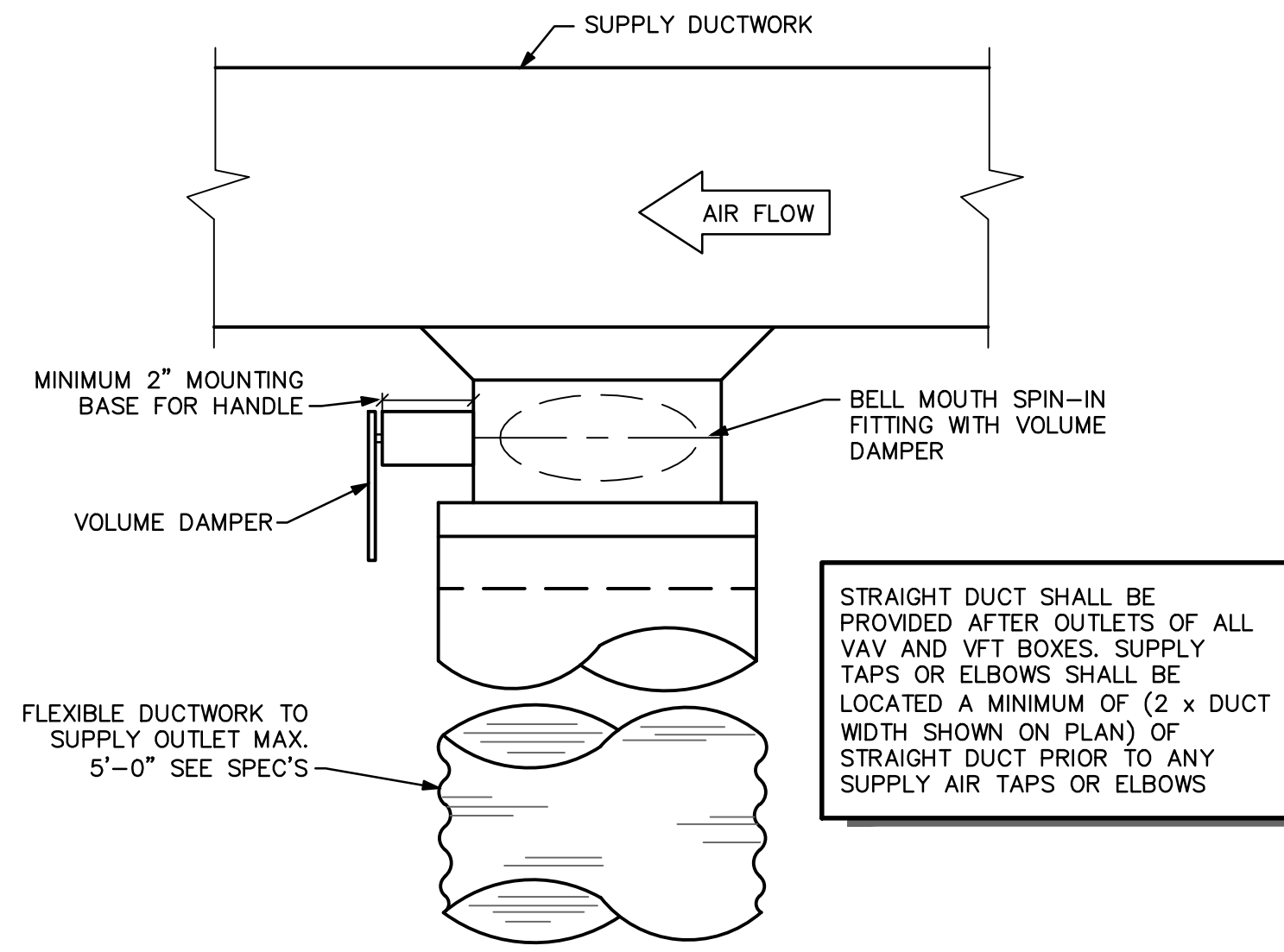
esd ENERGY SYSTEMS DESIGN
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DESIGN CONTACT MONTE STURDEVANT

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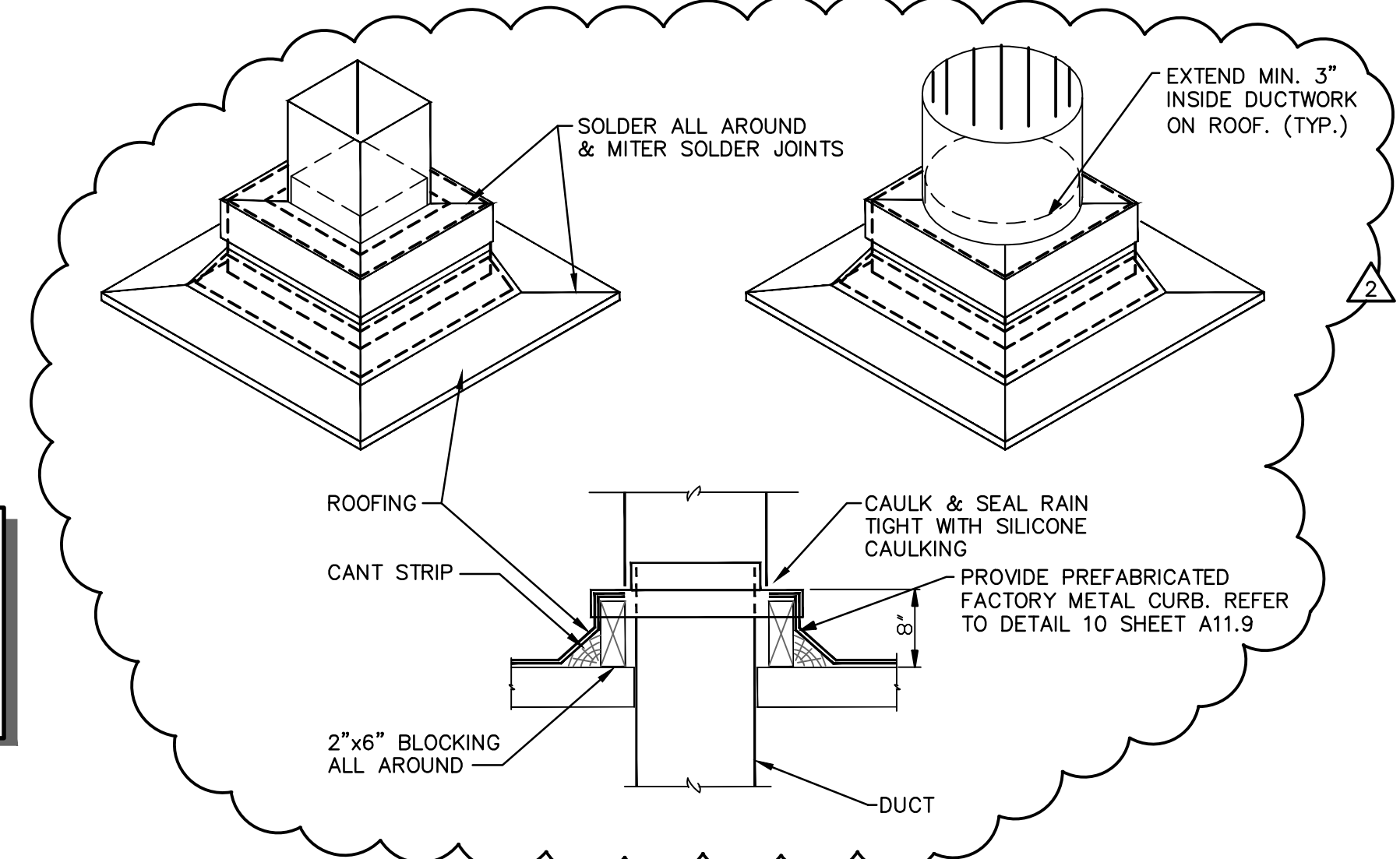
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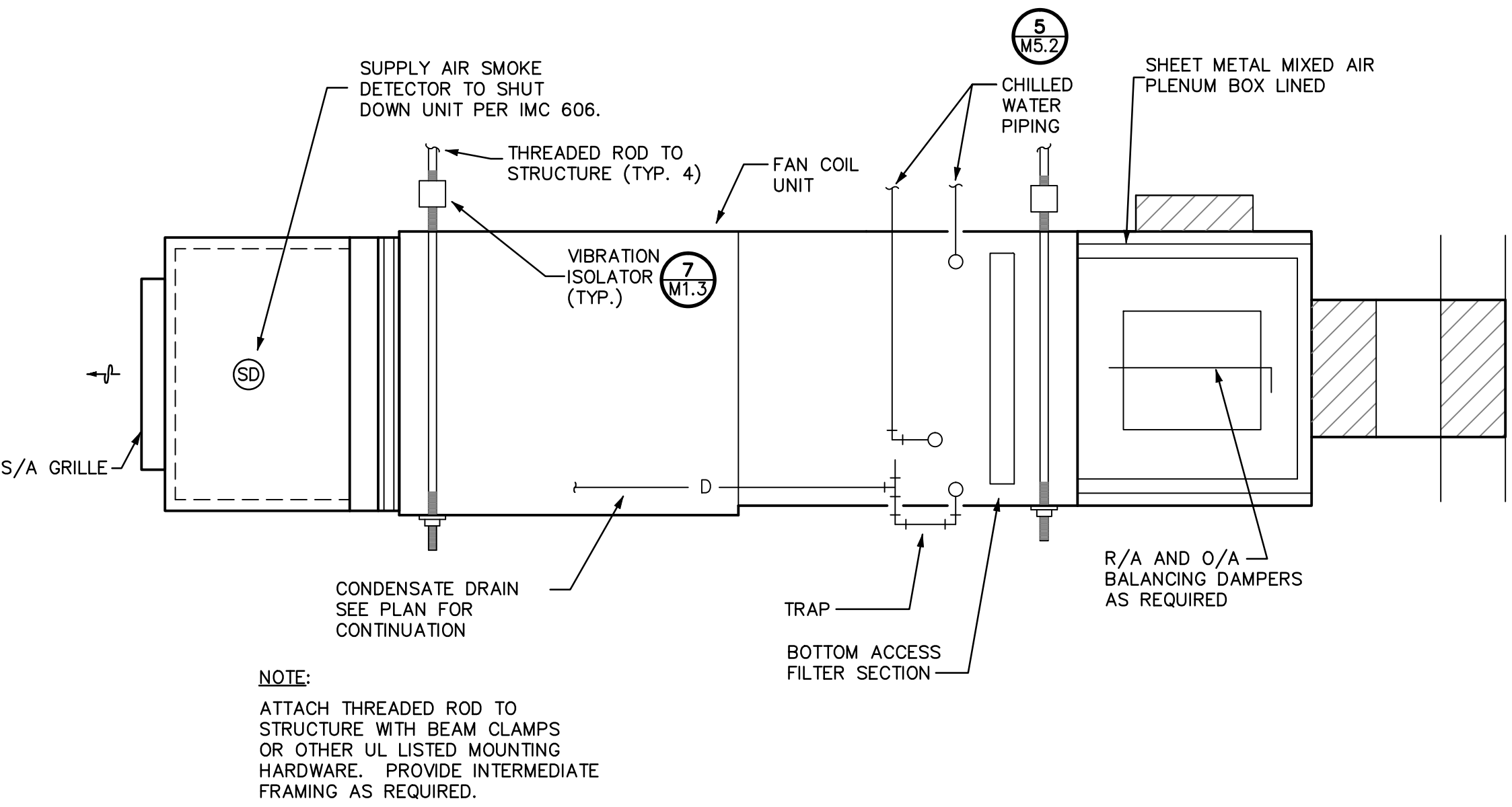
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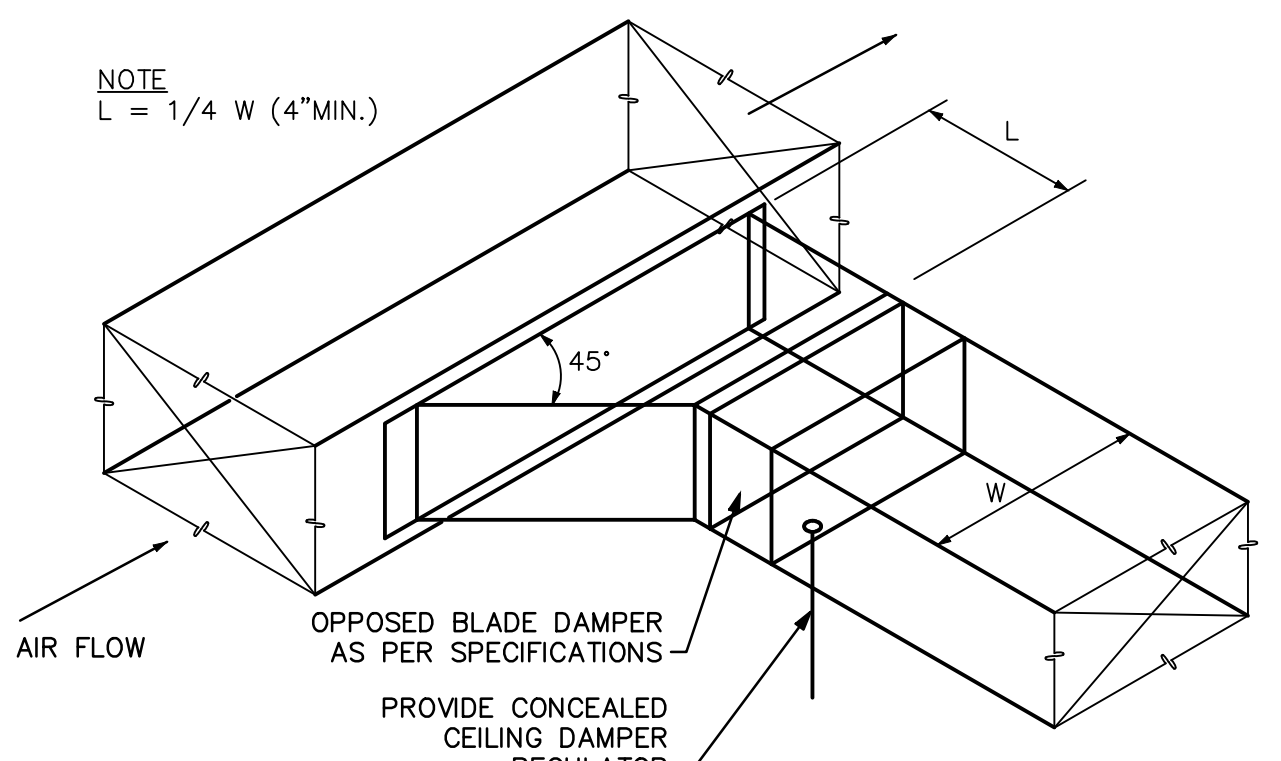
BRANCH DUCT TAKE-OFF DETAIL
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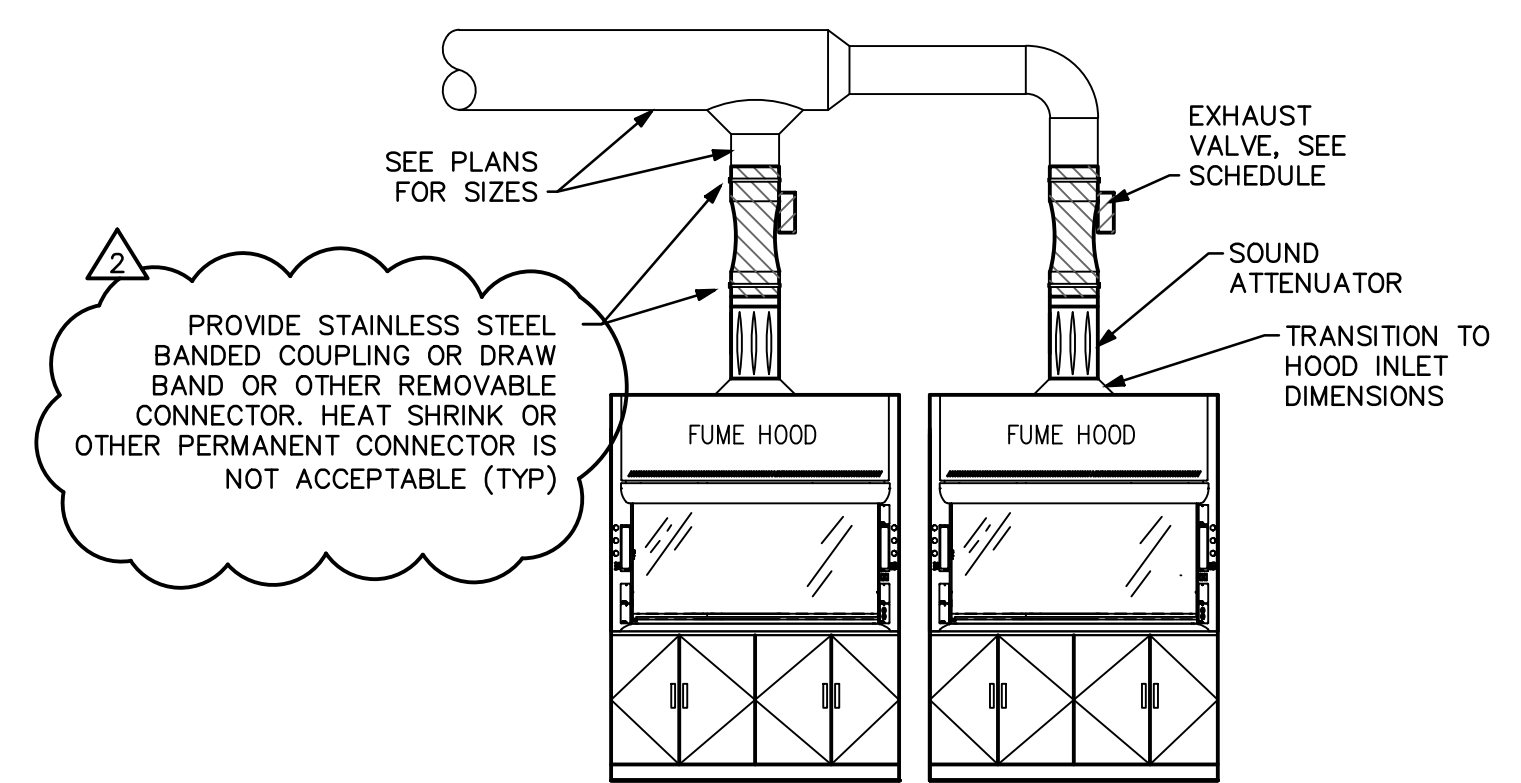
DUCT PENETRATION THRU ROOF
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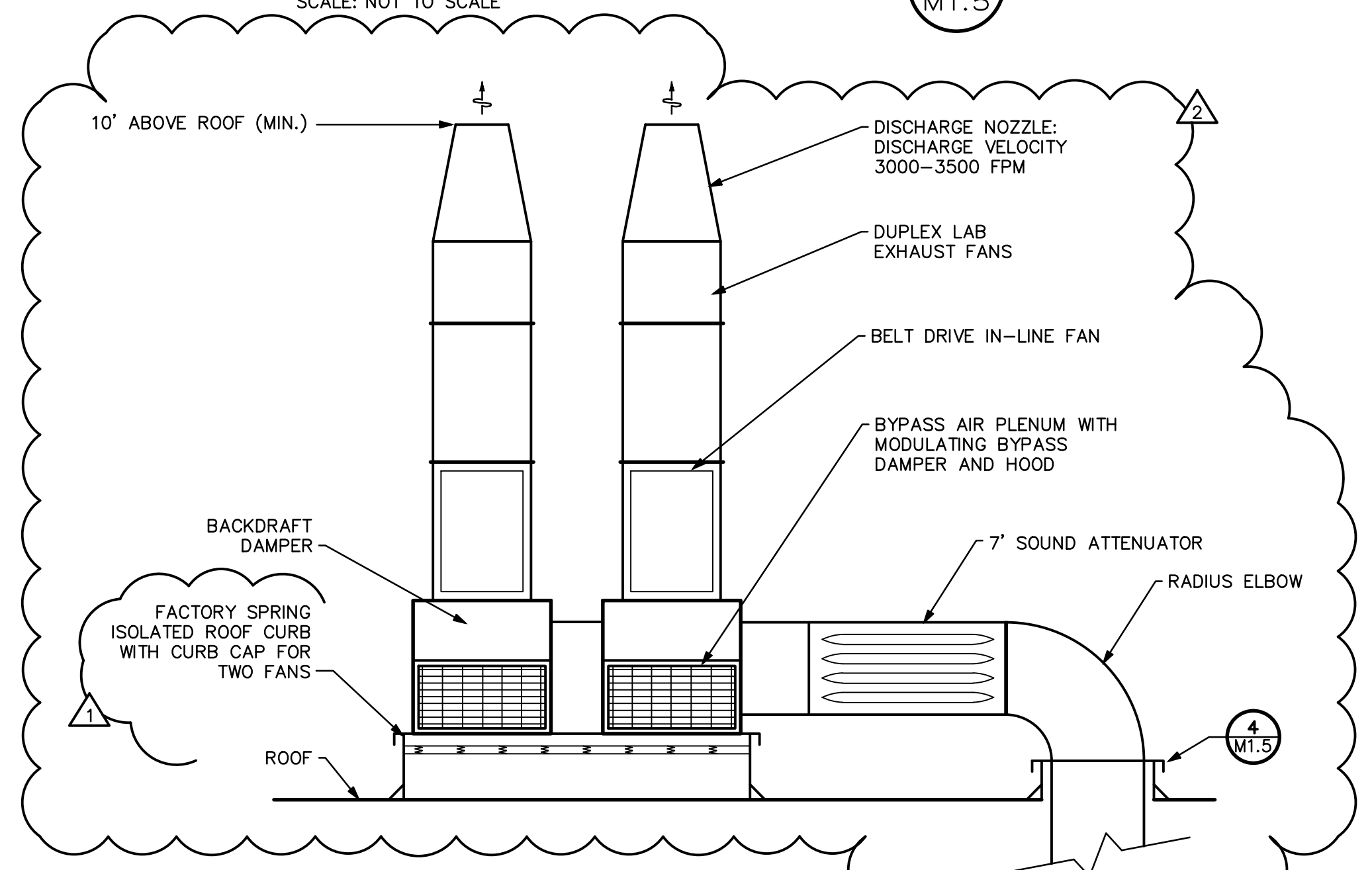
FAN COIL UNIT MOUNTING DETAIL
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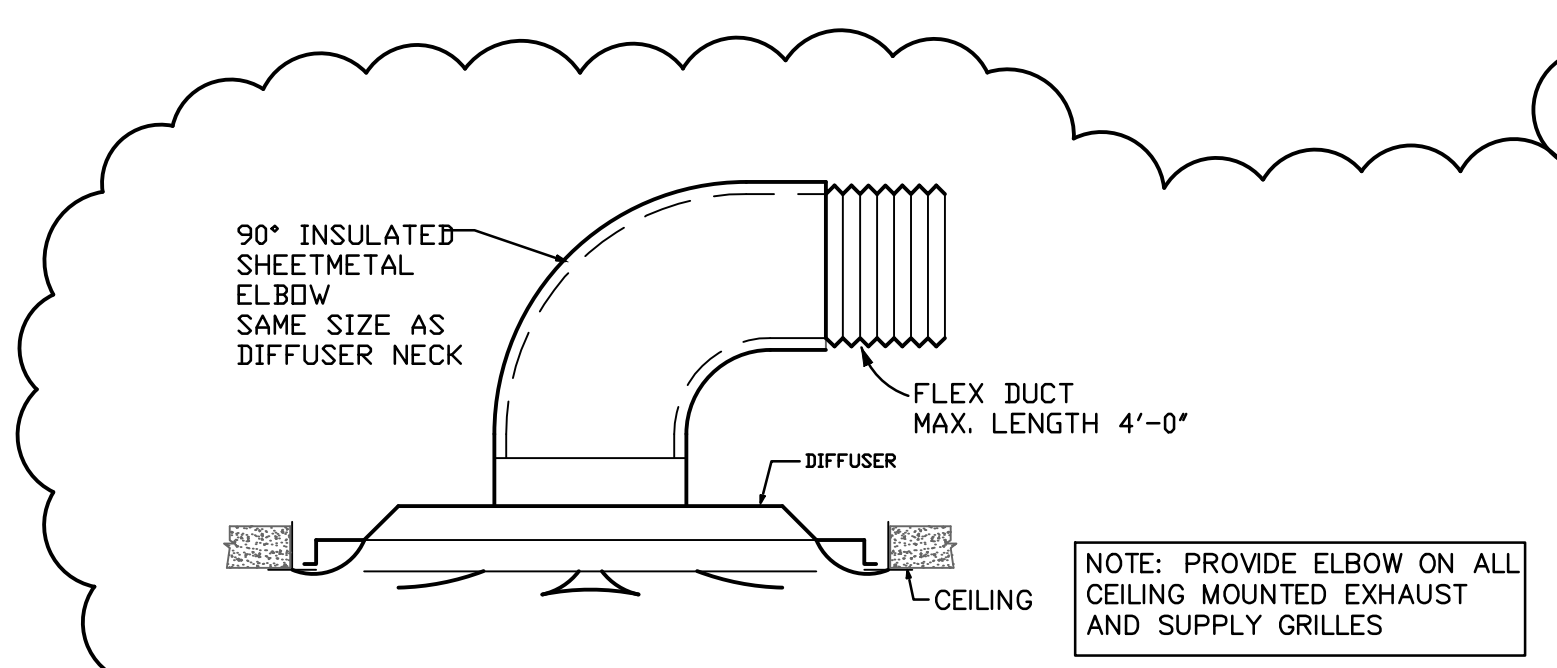
SUPPLY AIR DUCT CONNECTION DETAIL
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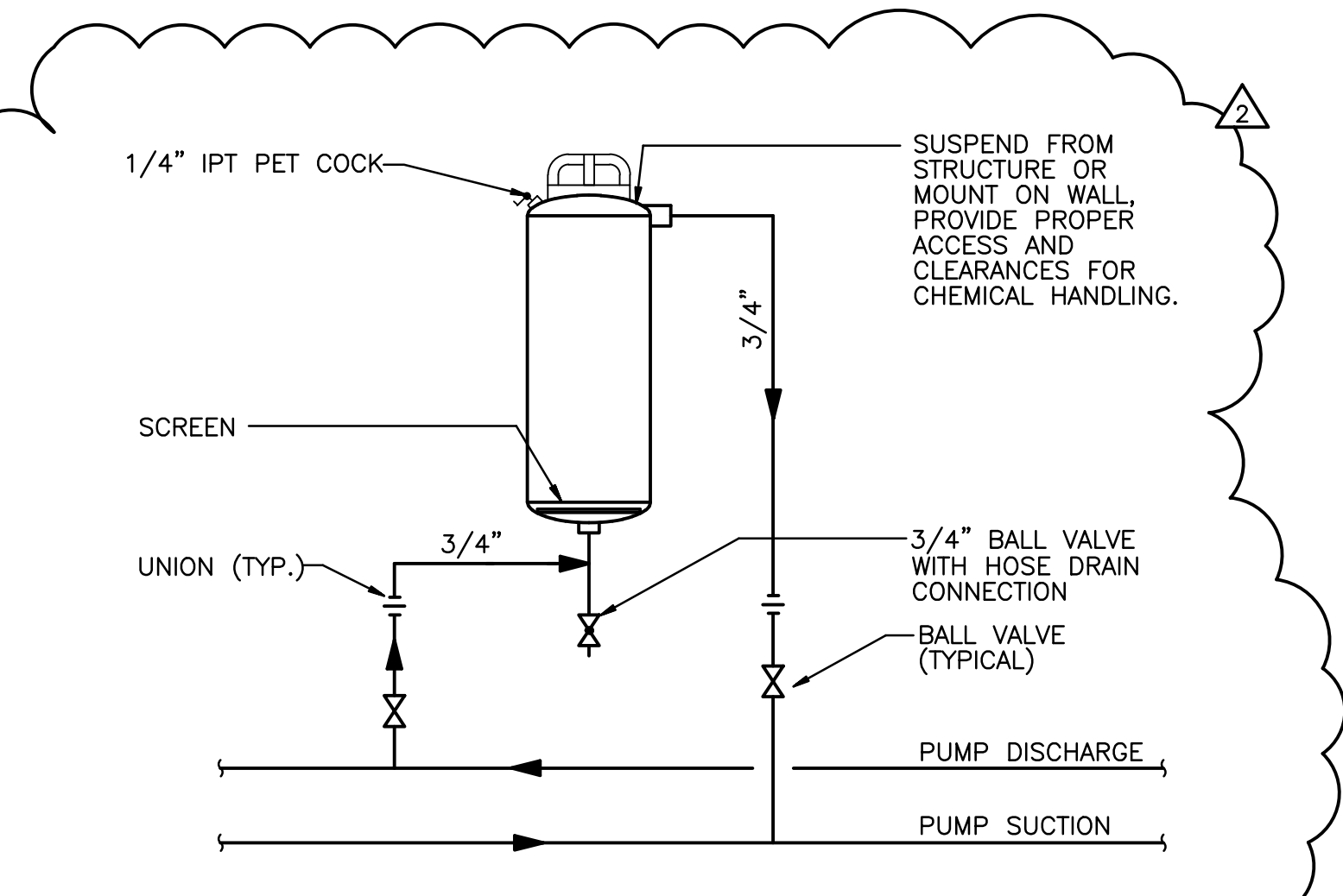
TYPICAL EXHAUST VALVE AND FUME HOOD DETAIL
SCALE: NOT TO SCALE



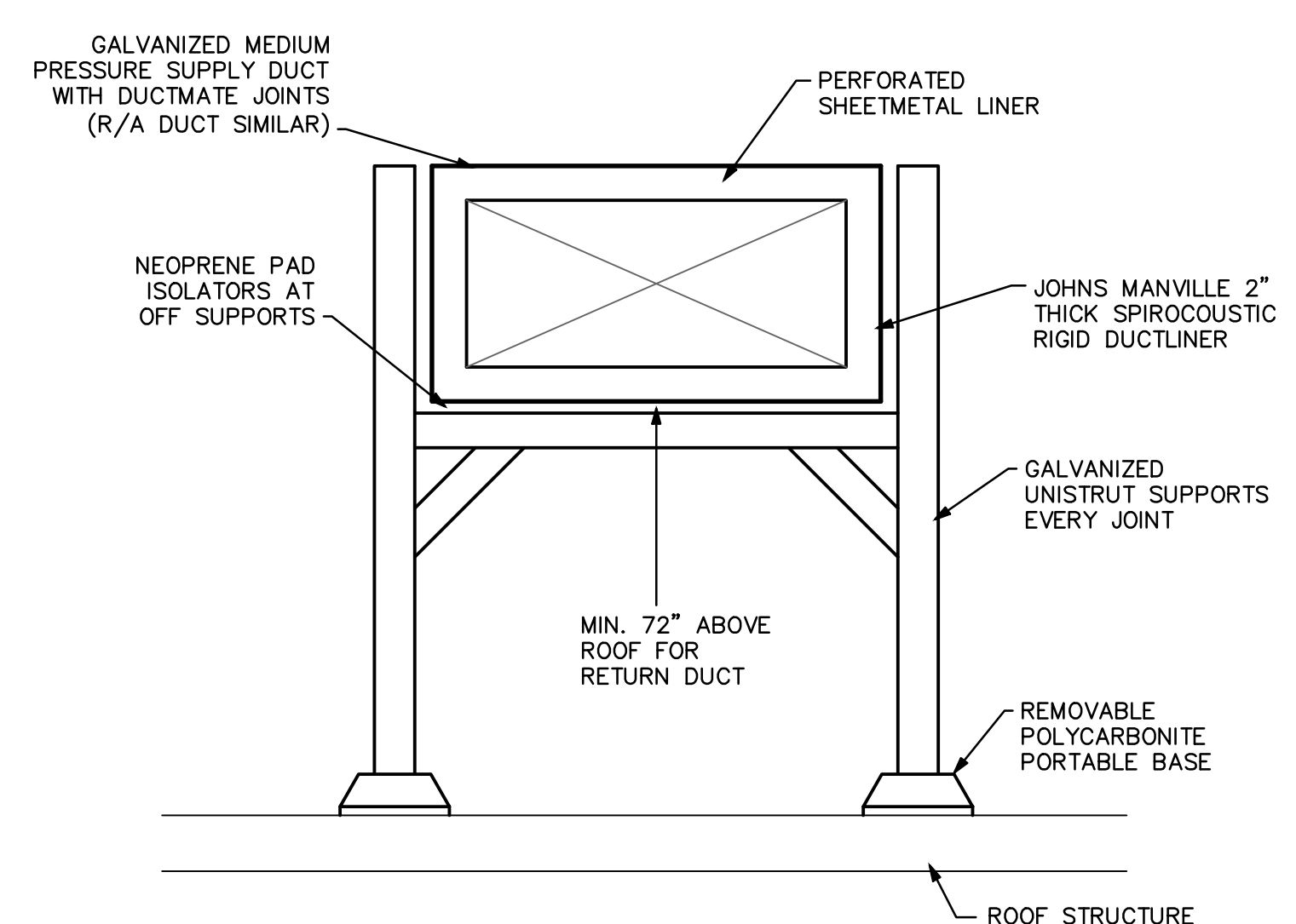
EXHAUST FAN DETAIL
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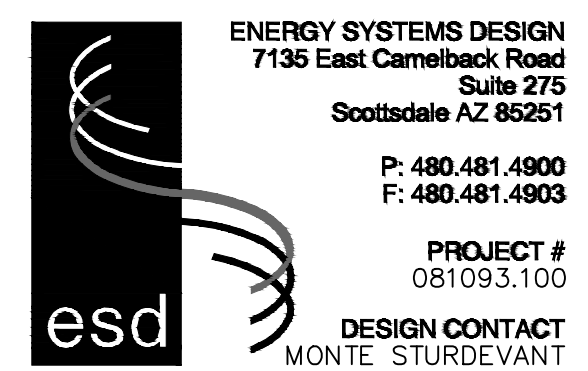
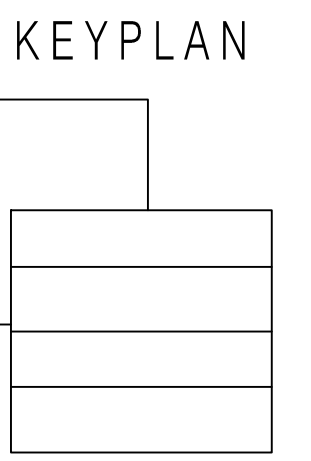
DUCT CONNECTION TO DIFFUSER DETAIL
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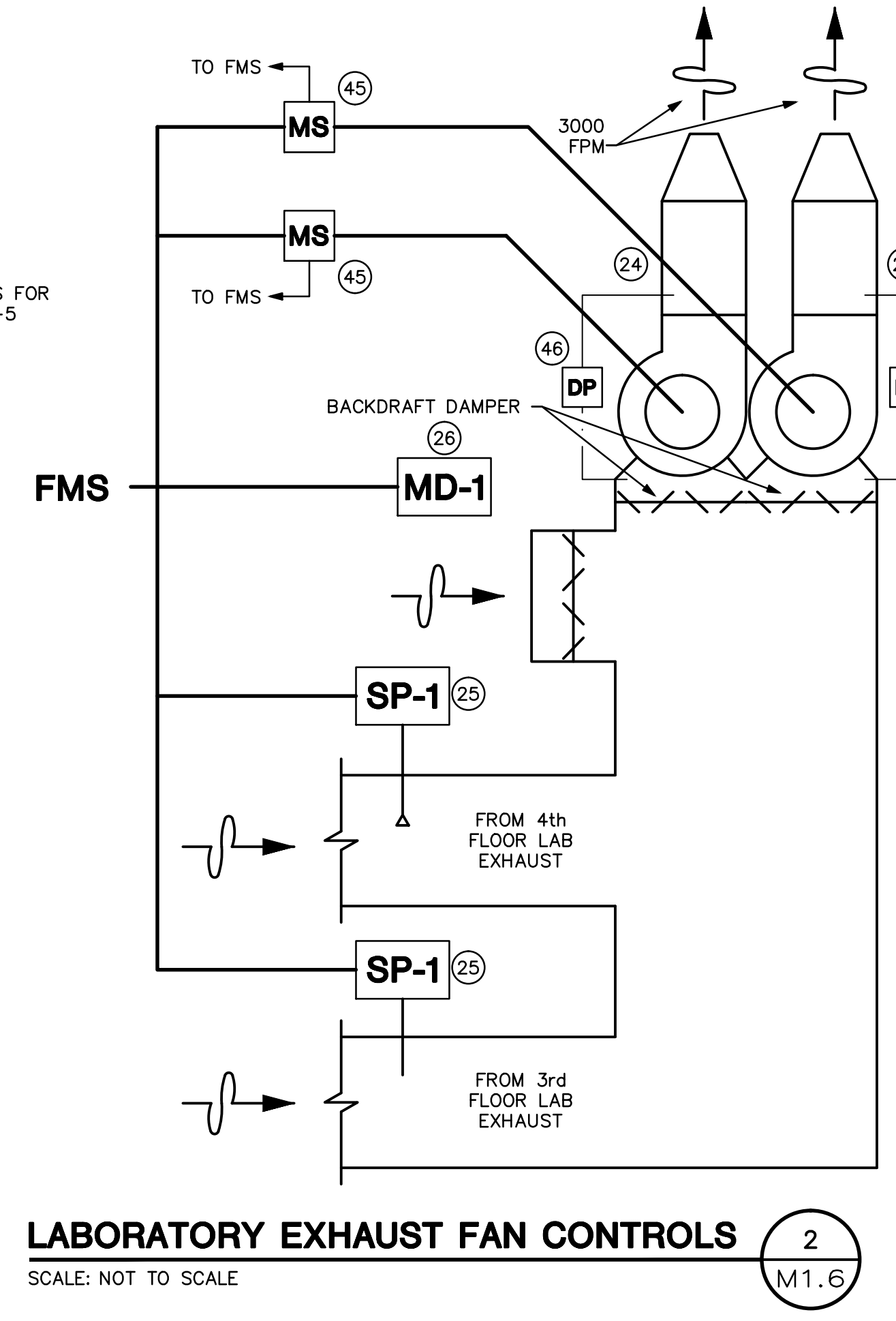
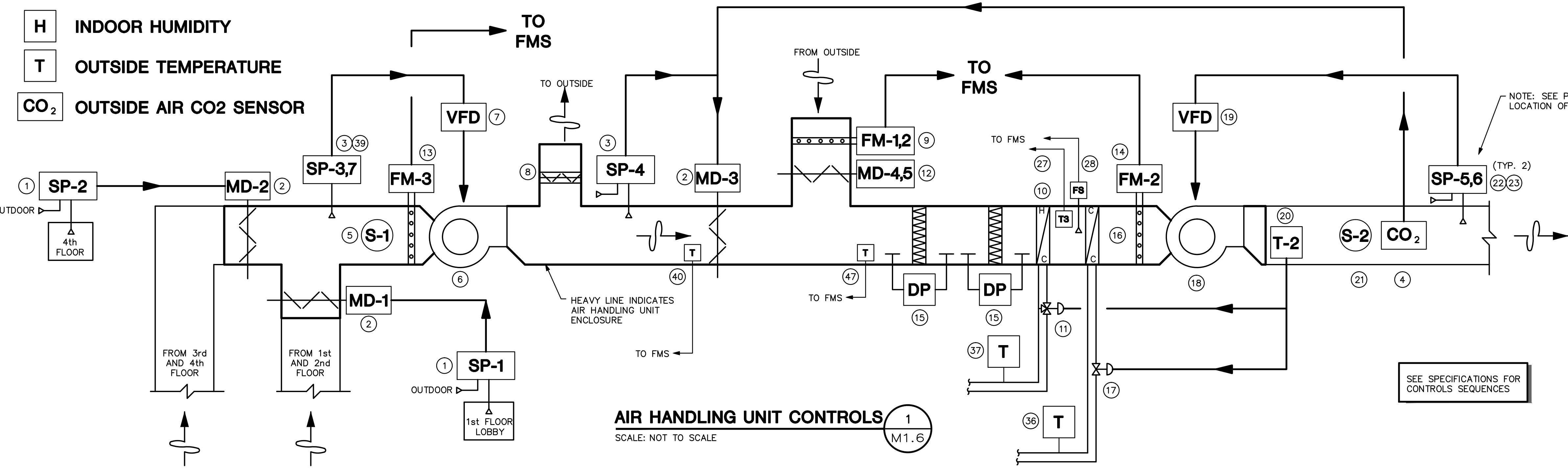


POT FEEDER DETAIL
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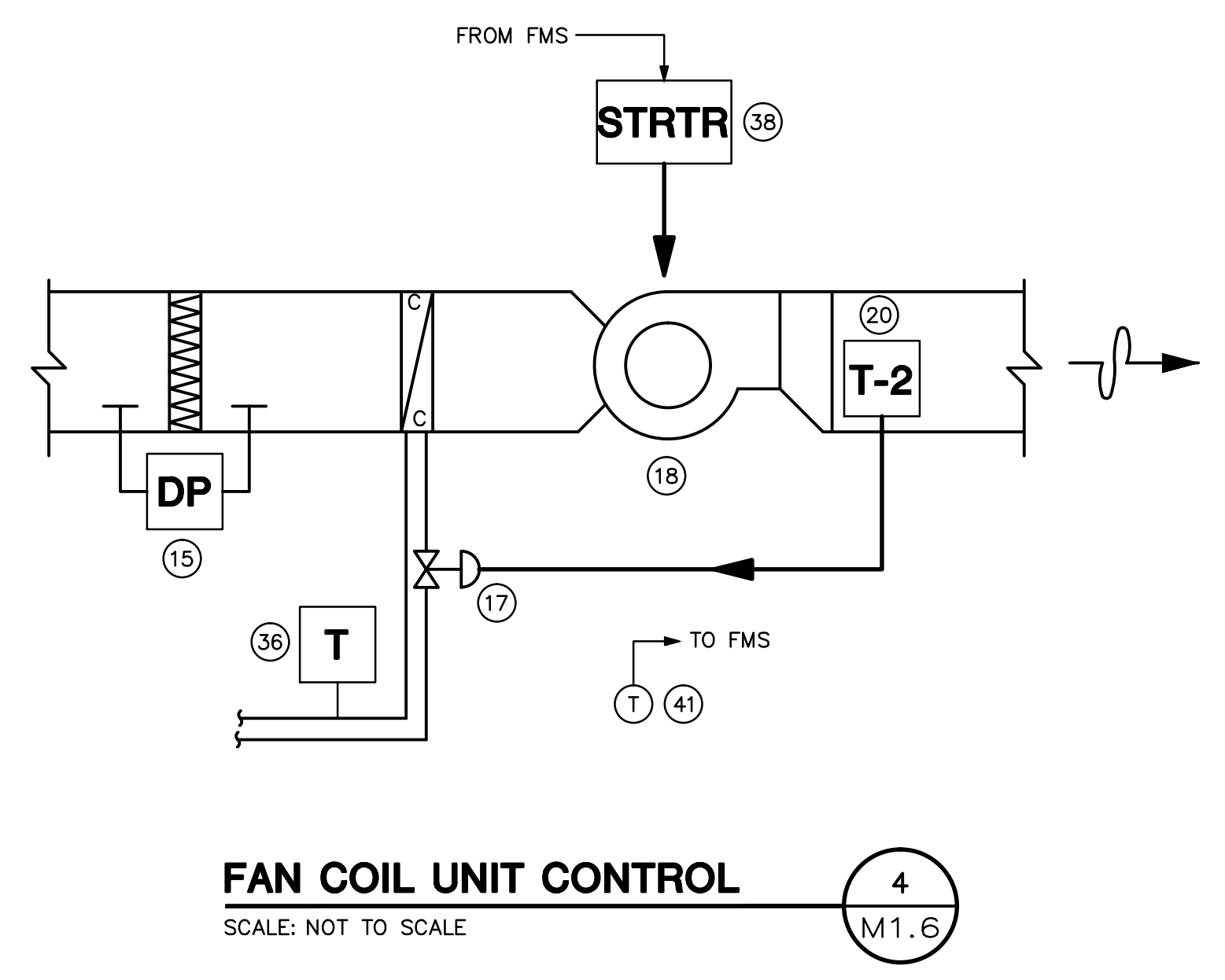
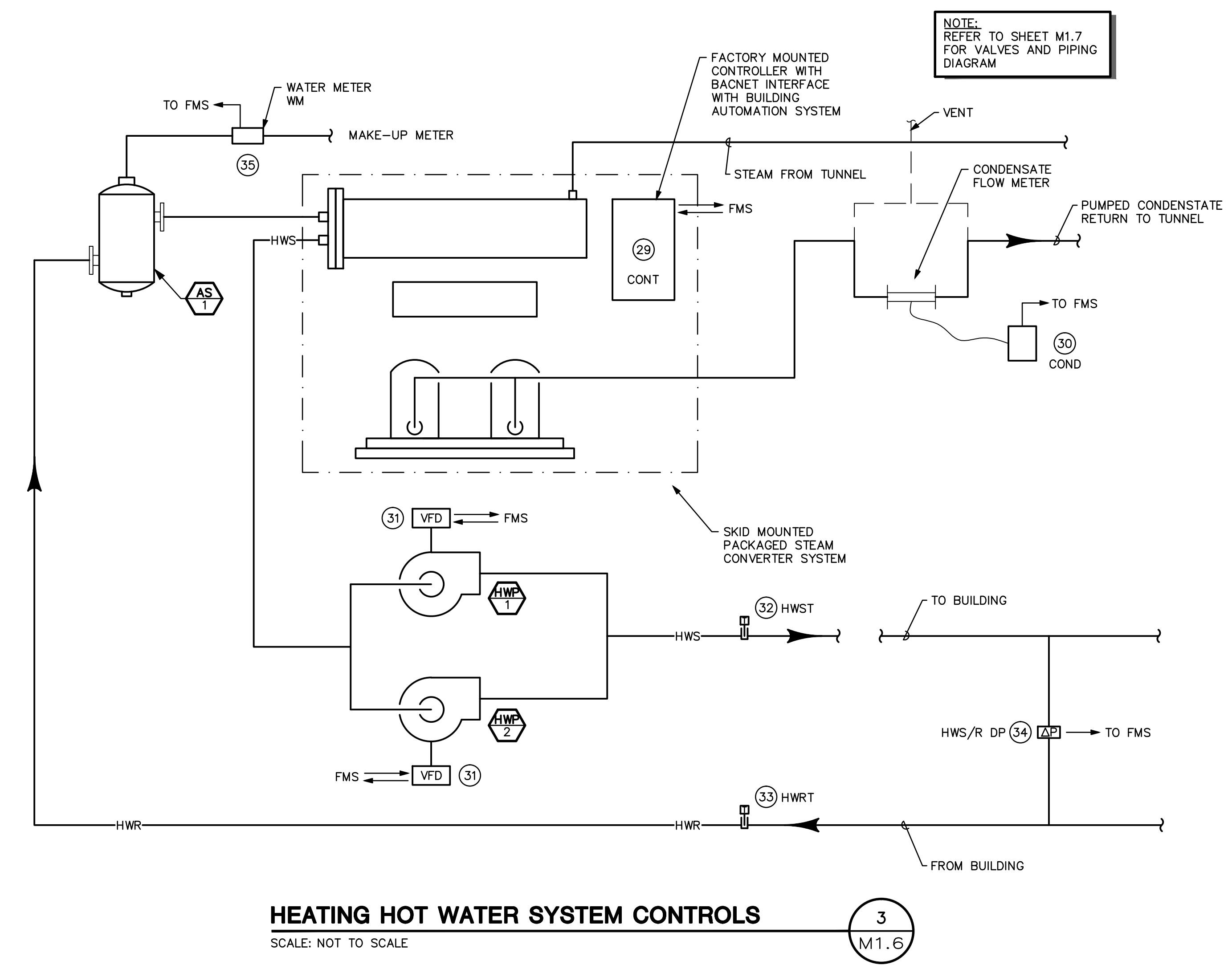


DUCT SUPPORT ON ROOF DETAIL
SCALE: NOT TO SCALE





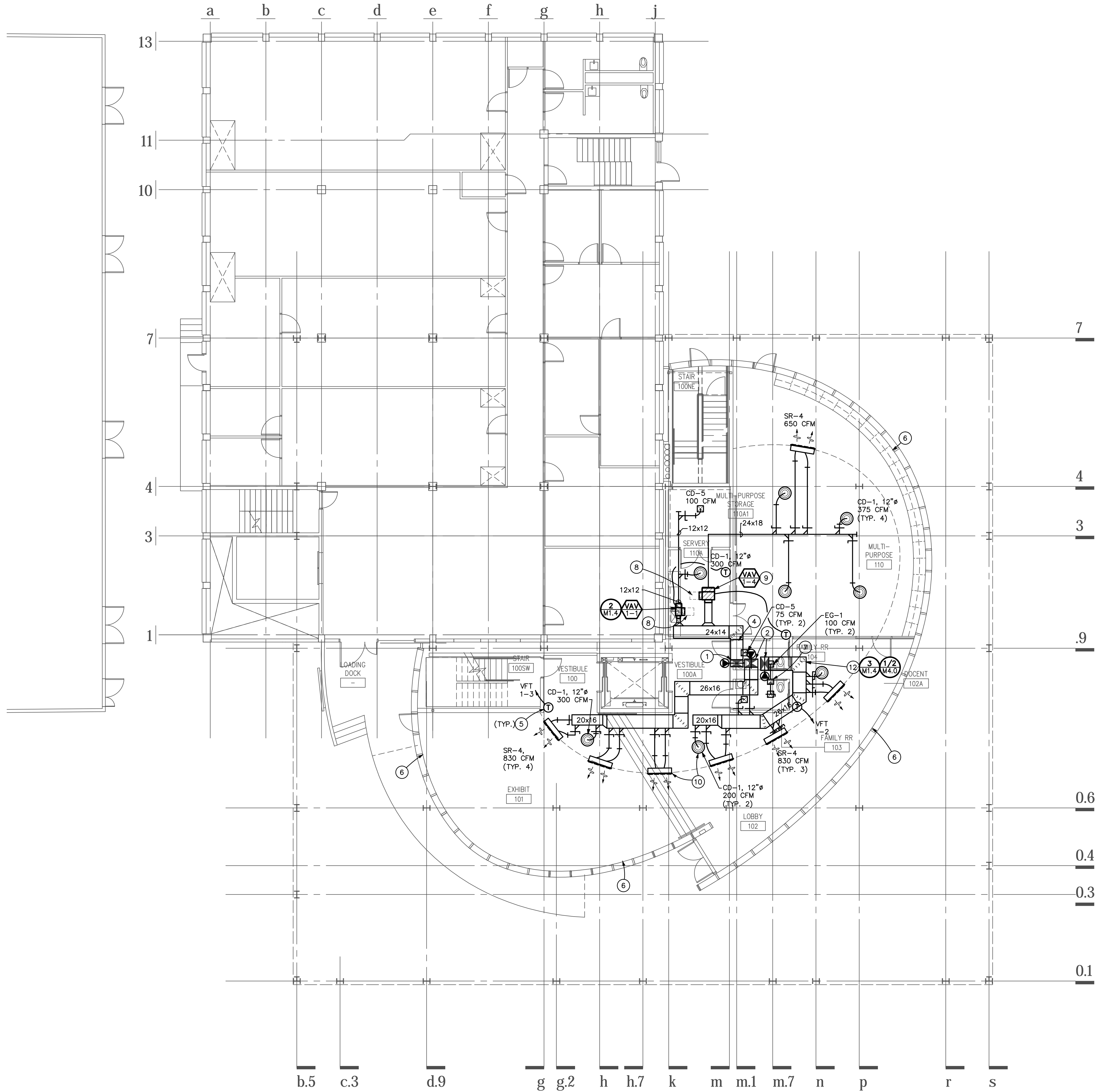
LIST OF COMPONENTS		
NAME	TAG	DESCRIPTION OF COMPONENT
SP-1,2	1	STATIC PRESSURE CONTROLLER IN SPACE (TYP. OF 2)
MD-1,2	2	MOTORIZED RETURN AIR DAMPER
SP-3,4	3	STATIC PRESSURE IN RETURN AIR DUCT
CO2	4	SUPPLY DUCT CO2 SENSOR
S-1	5	SMOKE DETECTOR IN RETURN DUCTWORK
RF-1	6	RETURN AIR FAN
VFD	7	RETURN FAN VFD
BDD	8	BACKDRAFT DAMPER (TYP. 2)
FM-1,2	9	FLOW MONITOR IN OUTSIDE AIR DUCT (TYP. 2)
HC	10	HEATING COIL
CV	11	HEATING COIL CONTROL VALVE - MODULATING
MD-4,5	12	MOTORIZED OUTDOOR AIR DAMPER (OPPOSED BLADE) (TYP. 2)
FM-3	13	FLOW MONITORING STATION FOR RETURN AIR FAN
FM-2	14	AIRFLOW MEASURING DEVICE FOR SUPPLY FAN
DP	15	DP ACROSS FILTERS
CC	16	COOLING COIL
CV	17	COOLING COIL CONTROL VALVES - MODULATING
SF	18	SUPPLY AIR FAN
VFD	19	SUPPLY FAN VFD
T-2	20	TEMPERATURE CONTROLLER IN SUPPLY DUCTWORK
S-2	21	SMOKE DETECTOR IN SUPPLY DUCTWORK
SP-5	22	STATIC PRESSURE CONTROLLER IN SUPPLY DUCTWORK
SP-6	23	HIGH LIMIT STATIC PRESSURE SWITCH
EF	24	LAB EXHAUST FAN TYP. 2)
SP-1,2	25	DUCT STATIC PRESSURE SENSOR (TYP. 2)
MD-1	26	MOTORIZED BYPASS DAMPER
T-3	27	SUPPLY AIR TEMPERATURE DOWNSTREAM OF HEATING COIL
FS	28	FREEZE STAT
CONT	29	SKID MOUNTED STEAM CONVERTER SYSTEM CONTROLLER
COND	30	CONDENSATE FLOW METER
VFD	31	HWP VFD
HWST	32	HEATING HOT WATER SUPPLY TEMPERATURE
HWRT	33	HEATING HOT WATER RETURN TEMPERATURE
HWS/R DP	34	HEATING HOT WATER SYSTEM DIFFERENTIAL PRESSURE
WM	35	WATER METER
T	36	CHWR TEMPERATURE
T	37	HWR TEMPERATURE
STRTR	38	STARTER
SP-7	39	HIGH LIMIT RETURN AIR DUCT STATIC
T	40	RETURN AIR TEMPERATURE SENSOR
T	41	SPACE TEMPERATURE
S	42	OCCUPANCY SENSOR
S/S	43	FAN START/STOP
STATUS	44	FAN STATUS - CURRENT SENSING RELAY
STRTR	45	MOTOR STARTER
DP	46	DIFFERENTIAL PRESSURE FLOW SENSING DEVICE
T	47	MIXED AIR TEMPERATURE SENSOR



ENTIRE SHEET

esd
 ENERGY SYSTEMS DESIGN
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 PROJECT #
 081093.100
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FILE: j:\2008\081093 UofA Tree Ring Laboratory\081093_100 U of A Tree Ring UofA Comments Rev 02\M1.6.dwg
 PLOTTED BY: chad.eggink
 PLOTTED: 09/29/2011 - 8:31am

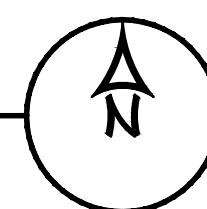


KEYED NOTES

- ① MEDIUM PRESSURE SUPPLY AIR DUCT DOWN FROM ABOVE IN CHASE. OFFSET ABOVE CEILING AS SHOWN.
- ② LOW PRESSURE SUPPLY AIR DUCTS DOWN FROM ABOVE IN CHASE. OFFSET ABOVE CEILING AS SHOWN.
- ③ NOT USED
- ④ ROUTE 24x12 MEDIUM PRESSURE SUPPLY AIR DUCT THROUGH BEAM TO TERMINAL UNIT AS SHOWN.
- ⑤ SPACE MOUNTED TEMPERATURE SENSOR TO CONTROL RESPECTIVE TERMINAL UNIT (TYPICAL).
- ⑥ RETURN AIR TO TRANSFER TO ABOVE CEILING THIS AREA THROUGH GAP BETWEEN CEILING AND EXTERIOR WALL. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS. CONTRACTOR TO MAINTAIN CLEAR RETURN AIR PATH BACK TO CHASE.
- ⑦ 12x10 EXHAUST DUCT UP TO ABOVE IN CHASE.
- ⑧ MAINTAIN MANUFACTURERS REQUIRED CLEARANCES ON ALL MECHANICAL EQUIPMENT (TYPICAL).
- ⑨ VAV UNIT TO BE ACCESSIBLE ABOVE LAY IN CEILING THIS AREA.
- ⑩ PROVIDE REMOTE BALANCING DAMPER ADJUSTMENT FOR ALL BALANCING DAMPERS ABOVE HARD CEILINGS THIS AREA.
- ⑪ PROVIDE PLENUM BOX BEHIND REGISTER AND CONNECT FLEX DUCTS FROM MAIN TO PLENUM AS SHOWN. PROVIDE YOUNG REGULATOR RADIAL DAMPER AT TAP WITH FLEXIBLE STEEL SHAFT AND PLBR TERMINATION ADJUSTER MOUNTED AT FACE OF DIFFUSER FOR BALANCING.
- ⑫ PROVIDE COMBINATION FIRE/SMOKE DAMPERS AT BOTTOM OF SHAFT PENETRATIONS THIS AREA. SEE DETAIL 3/M1.4 AND SHEET M4.0

MECHANICAL FIRST FLOOR PLAN

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



ENTIRE SHEET

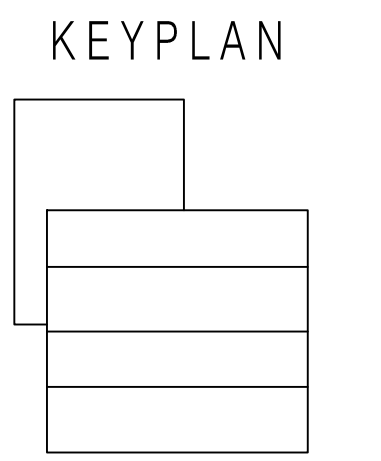
esd ENERGY SYSTEMS DESIGN
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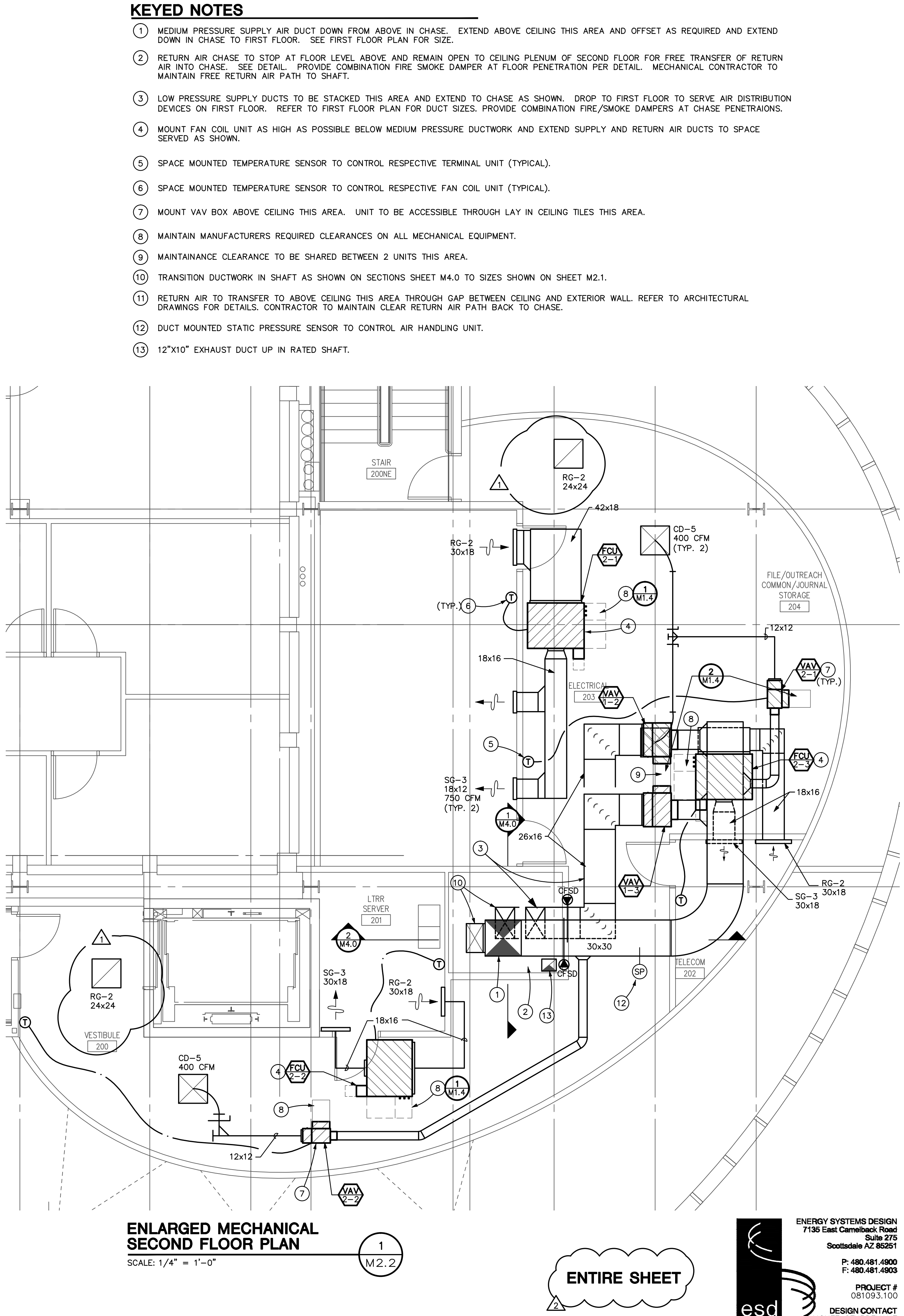
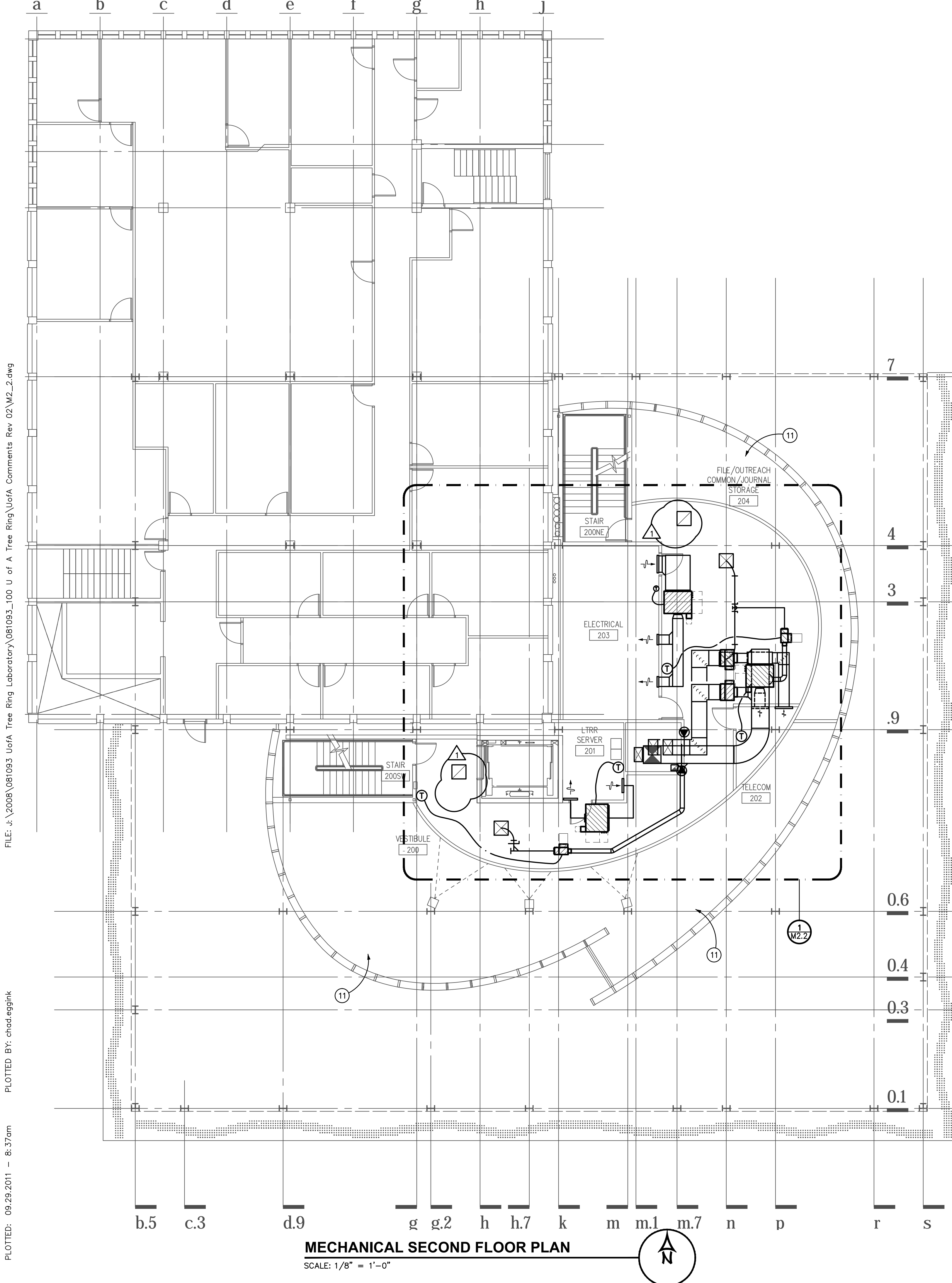
20981
 G. MONTE STURDEVANT
 ARIZONA U.S.A.
 EXPIRES 6-30-2013

GMP-ADDENDUM 1
 05/13/11
 OWNER REVIEW
 07/15/11
July 15, 2011
Construction Documents
 r+b job # 0209
 U.A. # 08-8826

LABORATORY OF TREE-RING RESEARCH
BRYANT BANNISTER TREE-RING BUILDING
 The University of Arizona - Tucson, Arizona



MECHANICAL FLOOR PLAN
M2.1



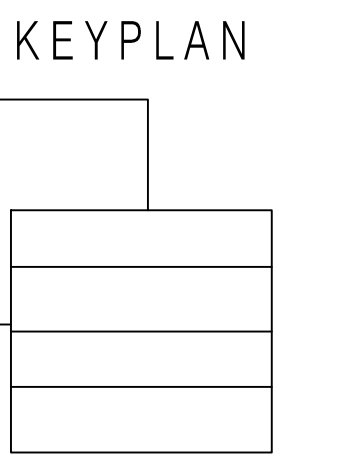
KEYED NOTES

- ① MEDIUM PRESSURE SUPPLY AIR DUCT DOWN FROM ABOVE IN CHASE. EXTEND ABOVE CEILING THIS AREA AND OFFSET AS REQUIRED AND EXTEND DOWN IN CHASE TO FIRST FLOOR. SEE FIRST FLOOR PLAN FOR SIZE.
- ② RETURN AIR CHASE TO STOP AT FLOOR LEVEL ABOVE AND REMAIN OPEN TO CEILING PLENUM OF SECOND FLOOR FOR FREE TRANSFER OF RETURN AIR INTO CHASE. SEE DETAIL. PROVIDE COMBINATION FIRE SMOKE DAMPER AT FLOOR PENETRATION PER DETAIL. MECHANICAL CONTRACTOR TO MAINTAIN FREE RETURN AIR PATH TO SHAFT.
- ③ LOW PRESSURE SUPPLY DUCTS TO BE STACKED THIS AREA AND EXTEND TO CHASE AS SHOWN. DROP TO FIRST FLOOR TO SERVE AIR DISTRIBUTION DEVICES ON FIRST FLOOR. REFER TO FIRST FLOOR PLAN FOR DUCT SIZES. PROVIDE COMBINATION FIRE/SMOKE DAMPERS AT CHASE PENETRAIONS.
- ④ MOUNT FAN COIL UNIT AS HIGH AS POSSIBLE BELOW MEDIUM PRESSURE DUCTWORK AND EXTEND SUPPLY AND RETURN AIR DUCTS TO SPACE SERVED AS SHOWN.
- ⑤ SPACE MOUNTED TEMPERATURE SENSOR TO CONTROL RESPECTIVE TERMINAL UNIT (TYPICAL).
- ⑥ SPACE MOUNTED TEMPERATURE SENSOR TO CONTROL RESPECTIVE FAN COIL UNIT (TYPICAL).
- ⑦ MOUNT VAV BOX ABOVE CEILING THIS AREA. UNIT TO BE ACCESSIBLE THROUGH LAY IN CEILING TILES THIS AREA.
- ⑧ MAINTAIN MANUFACTURERS REQUIRED CLEARANCES ON ALL MECHANICAL EQUIPMENT.
- ⑨ MAINTAINANCE CLEARANCE TO BE SHARED BETWEEN 2 UNITS THIS AREA.
- ⑩ TRANSITION DUCTWORK IN SHAFT AS SHOWN ON SECTIONS SHEET M4.0 TO SIZES SHOWN ON SHEET M2.1.
- ⑪ RETURN AIR TO TRANSFER TO ABOVE CEILING THIS AREA THROUGH GAP BETWEEN CEILING AND EXTERIOR WALL. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS. CONTRACTOR TO MAINTAIN CLEAR RETURN AIR PATH BACK TO CHASE.
- ⑫ DUCT MOUNTED STATIC PRESSURE SENSOR TO CONTROL AIR HANDLING UNIT.
- ⑬ 12"x10" EXHAUST DUCT UP IN RATED SHAFT.



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MECHANICAL FLOOR PLAN
M2.2

FILE: j:\2008\081093 UofA Tree Ring Laboratory\081093_100 U of A Tree Ring UofA Comments Rev 02\M2_2.dwg

PLOTTED BY: chad.eggink

PLOTTED: 09/29/2011 - 8:37am

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

ENLARGED MECHANICAL SECOND FLOOR PLAN
 SCALE: 1/4" = 1'-0"

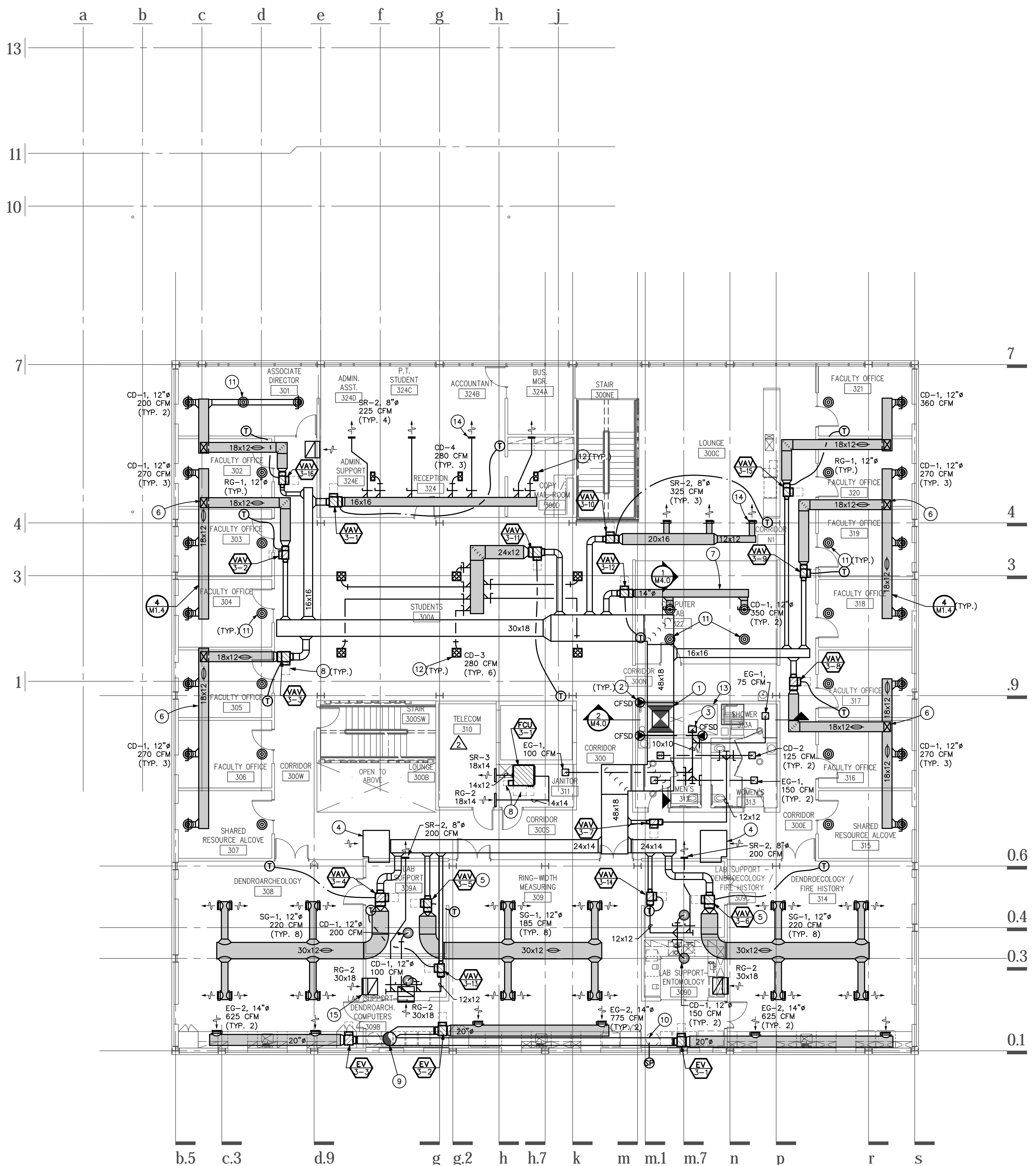
ENTIRE SHEET

ENERGY SYSTEMS DESIGN
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 081093.100
 DESIGN CONTACT
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FILE: J:\2008\081093 UofA Tree Ring Laboratory\081093_100 U of A Tree Ring UofA Comments Rev 02\M2_3.dwg

PLOTTED BY: chad.eggink

PLOTTED: 09/29/2011 - 8:39am

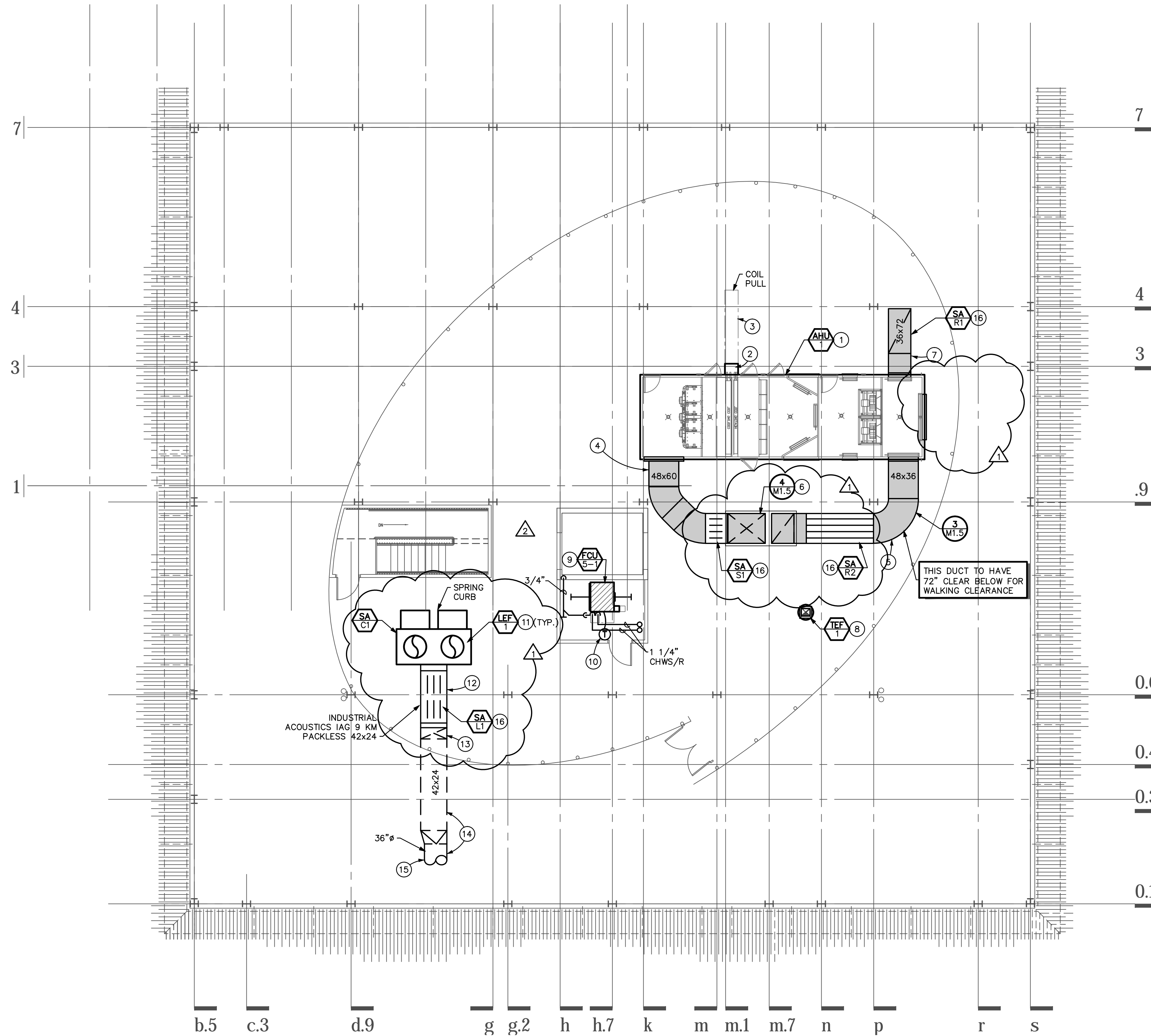


- KEYED NOTES**
- 1 MEDIUM PRESSURE SUPPLY AIR DUCT DOWN FROM ABOVE IN RATED SHAFT.
 - 2 PROVIDE COMBINATION FIRE /SMOKE DAMPER AT SHAFT PENETRATION.
 - 3 12x10 EXHAUST DUCT UP IN RATED SHAFT.
 - 4 48x24 TRANSFER AIR DUCT ABOVE CEILING THIS AREA.
 - 5 MOUNT VAV BOXES ABOVE ACCESSIBLE CEILING THIS AREA. MAINTAIN ALL MANUFACTURER'S REQUIRED CLEARANCES.
 - 6 MOUNT DUCTWORK AS LOW AS POSSIBLE THIS AREA ABOVE OFFICES. SUPPORT FROM CEILING STRUCTURE OF OFFICES, SEE DETAIL
 - 7 DROP DOUBLE WALL LINED SPIRAL DUCT THRU UPPER CEILING STRAIGHT DOWN TO DIFFUSER IN LOWER CEILING THIS AREA.
 - 8 MAINTAIN MANUFACTURER'S REQUIRED CLEARANCES ON ALL BOXES (SHOWN DASHED), TYP.
 - 9 SPIRAL GALVANIZED STEEL EXHAUST DUCT UP TO ABOVE.
 - 10 PROVIDE DUCT STATIC PRESSURE SENSOR IN DUCT THIS LOCATION AND INTERFACE WITH BUILDING AUTOMATION SYSTEM.
 - 11 RG-1, 12" TO TRANSFER RETURN AIR INTO CEILING PLENUM.
 - 12 LOCATE SUPPLY AIR DIFFUSERS IN OPENING IN CEILING THIS AREA. COORDINATE LOCATION WITH FINAL CEILING LAYOUT.
 - 13 RETURN AIR SHAFT DOWN TO 2ND FLOOR CEILING. PROVIDE COMBINATION FIRE/SMOKE DAMPER AT FLOOR BETWEEN 3RD AND 2ND FLOOR. PROVIDE ACCESS PANEL IN TOILET ROOM FOR ACCESS TO DAMPER.
 - 14 MOUNT SUPPLY REGISTER AT EDGE OF CEILING THIS ARE TO SERVE AREA BELOW.
 - 15 PROVIDE RETURN GRILLE HIGH IN WALL WITH BOOT TO PLENUM ABOVE SUPPORT AREAS.

NOTE:
ALL DUCTWORK SHOWN HATCHED IS TO BE DOUBLE WALL SPIRAL LINED WITH 1" FIBERGLASS DUCTLINER WITH PERFORATED SHEET METAL INNER LINER WHERE EXPOSED IN SPACE AND 1 1/2" WHERE CONCEALED. SEE SPECS. ALL OTHER DUCTWORK TO BE WRAPPED WITH FOIL FACED DUCT WRAP INSTALLED NEATLY IN A WORKMAN LIKE MANNER.

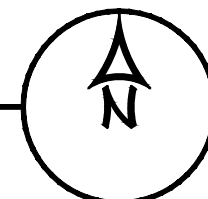
MECHANICAL THIRD FLOOR PLAN
SCALE: 1/8" = 1'-0"

ENTIRE SHEET



MECHANICAL ROOF PLAN

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



KEYED NOTES

- 1 MOUNT AIR HANDLING UNIT ON ROOF CURB. MAINTAIN MANUFACTURERS REQUIRED CLEARANCES.
- 2 CHILLED WATER SUPPLY AND RETURN AND HEATING HOT WATER SUPPLY AND RETURN PIPING UP FROM BELOW INSIDE FACTORY VESTIBULE THIS AREA. MOUNT CONTROL VALVES IN VESTIBULE. SEE DETAILS FOR COIL PIPING.
- 3 MAINTAIN REQUIRED COIL PULL CLEARANCE.
- 4 SIDE DISCHARGE MEDIUM PRESSURE SUPPLY DUCT. DUCT TO BE GALVANIZED DOUBLE WALL DUCT WITH DUCTMATE CONNECTIONS LINED WITH 2" THICK ACOUSTICAL DUCTLINER AND PERFORATED INNER WALL. SEAL ALL SEAMS AND JOINTS WATER TIGHT. TRANSITION FROM UNIT OUTLET TO SIZE SHOWN AND ROUTE DUCTWORK ABOVE ROOF AS SHOWN ON UNISTRUT SUPPORTS WITH REMOVABLE ROOF SUPPORTS.
- 5 SIDE INLET RETURN AIR DUCT. DUCT TO BE GALVANIZED DOUBLE WALL DUCT WITH WITH DUCTMATE CONNECTIONS LINED WITH 2" THICK ACOUSTICAL DUCTLINER AND PERFORATED INNER WALL. SEAL ALL SEAMS AND JOINTS WATER TIGHT. TRANSITION FROM UNIT OUTLET TO SIZE SHOWN AND ROUTE DUCTWORK ABOVE ROOF AS SHOWN ON UNISTRUT SUPPORTS WITH REMOVABLE ROOF SUPPORTS. MAINTAIN MINIMUM 72" CLEAR BELOW RETURN AIR DUCT FOR WALKING CLEARANCE.
- 6 DROP SUPPLY AND RETURN DUCTS THROUGH ROOF INTO CHASE. PROVIDE A SINGLE ROOF CURB AROUND DUCTS AND SEAL WATER TIGHT WITH INSULATED CAP.
- 7 EXTEND RETURN AIR DUCT FROM UNIT OUTLET DOWN THROUGH ROOF TO ABOVE FOURTH FLOOR CEILING. PROVIDE SOUND ATTENUATOR IN ELBOW. PROVIDE ROOF CURB AROUND DUCT PENETRATION AND SEAL WATER TIGHT WITH INSULATED CAP.
- 8 MOUNT TOILET EXHAUST FAN ON ROOF CURB THIS AREA AND CONNECT TO DUCT UP FROM BELOW. SEE DETAIL.
- 9 MOUNT FAN COIL UNIT AS HIGH AS POSSIBLE IN ELEVATOR EQUIPMENT ROOM THIS AREA. MAINTAIN MANUFACTURERS REQUIRED CLEARANCES. DO NOT MOUNT FAN COIL UNIT DIRECTLY ABOVE ELEVATOR EQUIPMENT. EXTEND CHILLED WATER SUPPLY AND RETURN PIPING AS SHOWN. SEAL WALL PENETRATION WATER TIGHT. EXTEND CONDENSATE DRAIN DOWN TO BELOW AS SHOWN. PROVIDE SECONDARY DRAIN PAN UNDER FCU AND ALL PIPING.
- 10 WALL MOUNTED TEMPERATURE SENSOR TO CONTROL FAN COIL UNIT CONTROL VALVE THROUGH BUILDING AUTOMATION SYSTEM.
- 11 MOUNT DUPLEX REDUNDANT LABORATORY EXHAUST FAN ON ROOF CURB THIS AREA. CONNECT LABORATORY EXHAUST DUCTWORK ABOVE ROOF AS SHOWN. SEE DETAIL.
- 12 PROVIDE PACKLESS SOUND ATTENUATOR IN EXHAUST DUCTWORK ABOVE CEILING. SEE SCHEDULE.
- 13 RISE STAINLESS STEEL LABORATORY EXHAUST DUCTWORK THROUGH ROOF INSIDE SCREEN WALL THIS LOCATION. ROUTE ABOVE ROOF TO LAB EXHAUST FAN AS SHOWN.
- 14 STAINLESS STEEL LABORATORY EXHAUST DUCTWORK BELOW ROOF. TRANSITION AS SHOWN.
- 15 SEE SHEET M2.4 FOR CONTINUATION OF LABORATORY EXHAUST DUCTWORK.
- 16 MOUNT SOUND ATTENUATOR IN DUCTWORK. SEE SCHEDULE.

NOTE:
ALL DUCTWORK SHOWN HATCHED IS TO BE DOUBLE WALL SPIRAL LINED WITH 2" FIBERGLASS DUCTLINER WITH PERFORATED SHEET METAL INNER LINER. SEE SPECS. ALL OTHER DUCTWORK TO BE INSTALLED NEATLY IN A WORKMAN LIKE MANNER.

ENTIRE SHEET

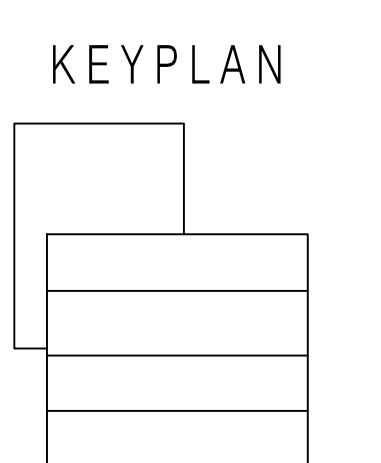
ENERGY SYSTEMS DESIGN
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PROJECT #
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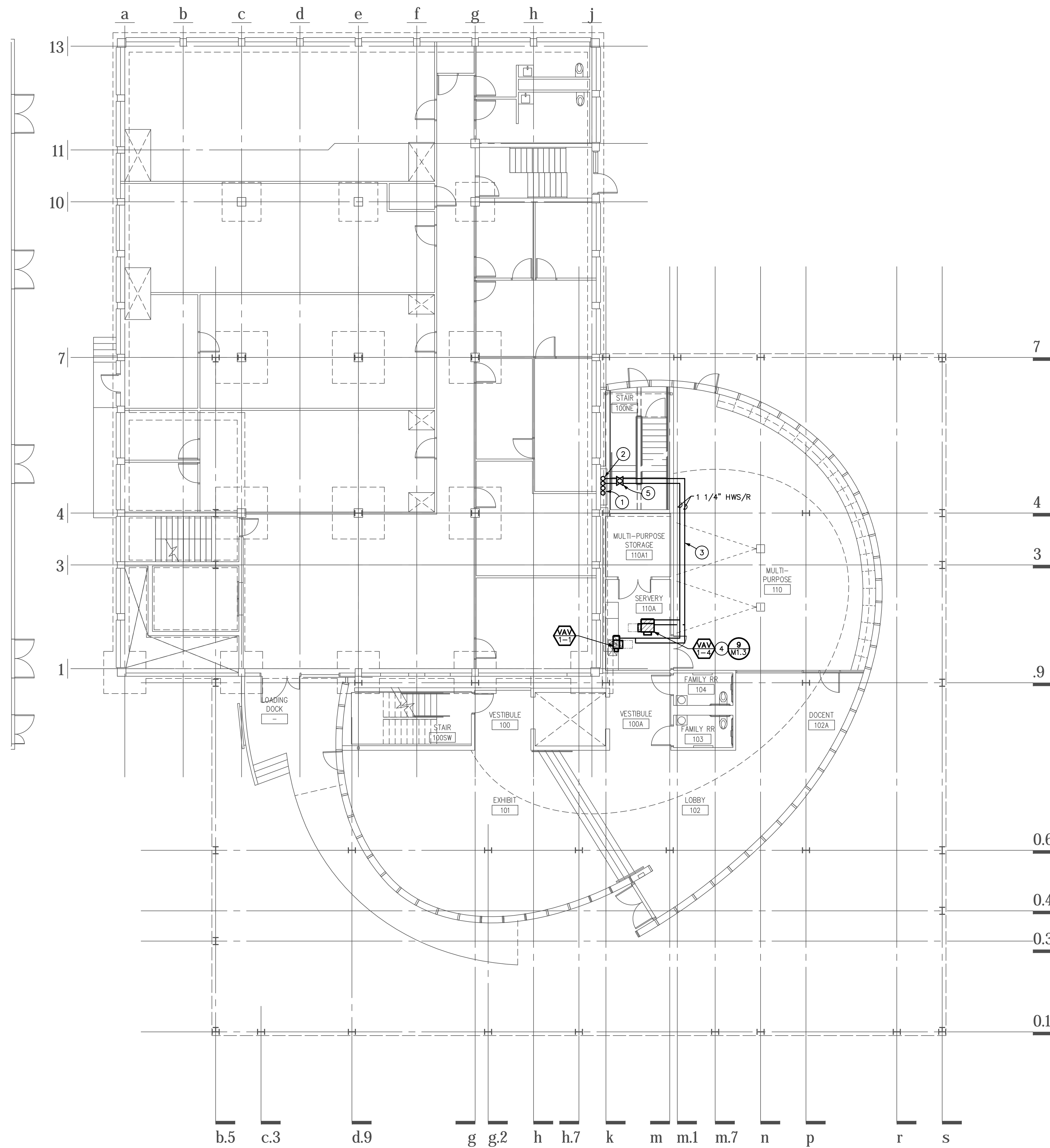
D. Monte Sturdevant
Professional Engineer
2098
G. MONTE STURDEVANT
Arizona U.S.A.
EXPIRES 6-30-2013

GMP-ADDENDUM 1
05/13/11
OWNER REVIEW
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LABORATORY OF TREE-RING RESEARCH
BRYANT BANNISTER TREE-RING BUILDING
The University of Arizona - Tucson, Arizona



MECHANICAL FLOOR PLAN
M2.5

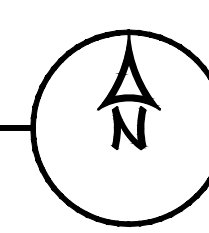


KEYED NOTES

- ① 6" CHWS/R PIPING UP FROM THE BASEMENT. SEE SHEET M3.0 FOR CONTINUATION. EXTEND AS SHOWN.
- ② 4" HWS/R PIPING UP FROM THE BASEMENT. SEE SHEET M3.0 FOR CONTINUATION. EXTEND AS SHOWN.
- ③ EXTEND 1" HWS/R PIPING THRU FIRST FLOOR CEILING SPACE TO VAV UNIT AS SHOWN. SEE DETAIL.
- ④ PROVIDE HWS/R PIPING TO VAV UNITS (TYPICAL). PROVIDE ISOLATION VALVES, CIRCUIT SETTER, AND MODULATING CONTROL VALVE FOR EACH COIL CONNECTION.
- ⑤ PROVIDE SHUTOFF VALVE TO ISOLATE FLOOR.

MECHANICAL 1st FLOOR PIPING PLAN

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



ENTIRE SHEET

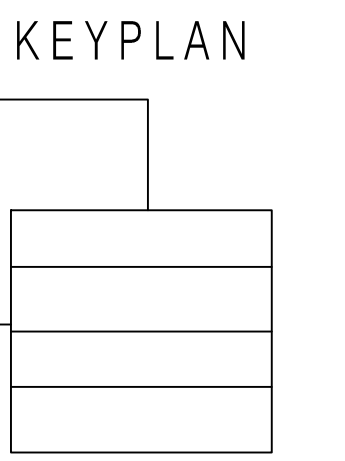
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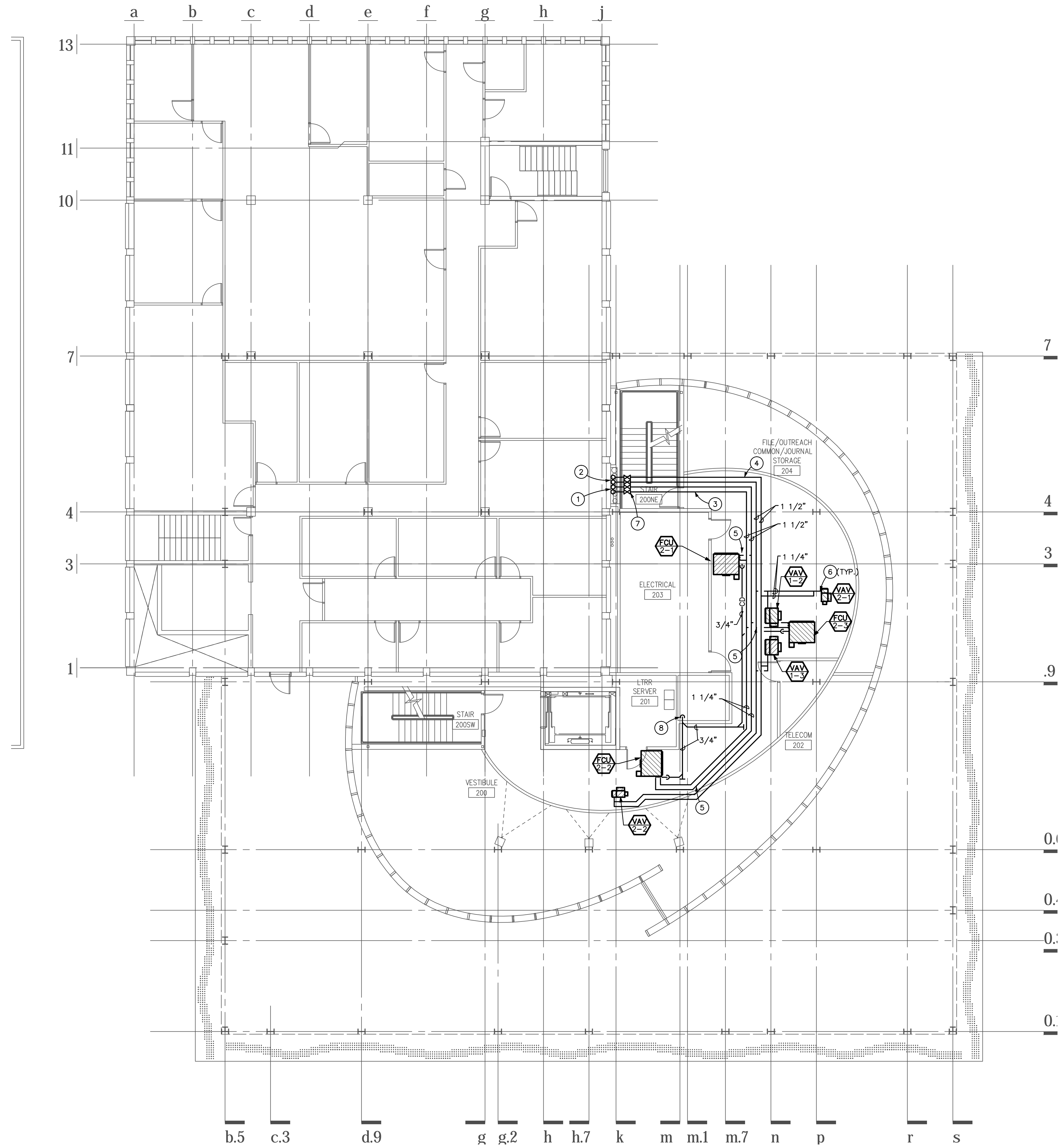
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ADD 1 GMP-ADDENDUM 1
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LABORATORY OF TREE-RING RESEARCH
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MECH 1st FLOOR PIPING PLAN
M3.1

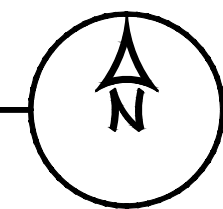


KEYED NOTES

- ① 6" CHWS/R PIPING UP FROM THE BASEMENT. EXTEND AS SHOWN.
- ② 4" HWS/R PIPING UP FROM THE BASEMENT. EXTEND AS SHOWN.
- ③ EXTEND 1 1/2" CHWS/R PIPING THRU SECOND FLOOR CEILING SPACE TO FAN COIL UNITS AS SHOWN.
- ④ EXTEND 1 1/2" HWS/R PIPING THRU SECOND FLOOR CEILING SPACE TO VAV BOXES AS SHOWN.
- ⑤ EXTEND 1 1/4" CHWS/R PIPING TO FAN COIL UNITS SERVING ELECTRICAL AND SERVER ROOMS. PROVIDE ISOLATION VALVES, CIRCUIT SETTER, AND MODULATING CONTROL VALVE AT EACH COIL. SEE DETAIL.
- ⑥ EXTEND 1" HWS/R PIPING TO VAV UNITS SERVING FIRST FLOOR. PROVIDE ISOLATION VALVES, CIRCUIT SETTER, AND MODULATING CONTROL VALVE AT EACH COIL. SEE DETAIL.
- ⑦ PROVIDE SHUTOFF VALVE TO ISOLATE FLOOR. SHUT OFF VALVES TO BE ACCESSIBLE IN STAIRWELL.
- ⑧ EXTEND 3/4" CONDENSATE DRAIN PIPING TO SHAFT DOWN TO FIRST FLOOR. TIE INTO LAVATORY P-TRAP SERVING RESTROOM.

MECHANICAL 2nd FLOOR PIPING PLAN

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



ENTIRE SHEET

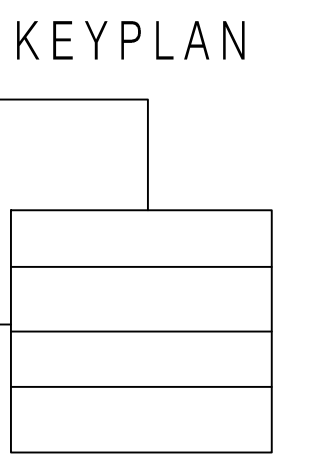
esd
 ENERGY SYSTEMS DESIGN
 7135 East Camelback Road
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 PROJECT #
 081093.100
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 MONTE STURDEVANT

richard + bauer
 1545 W. THOMAS ROAD
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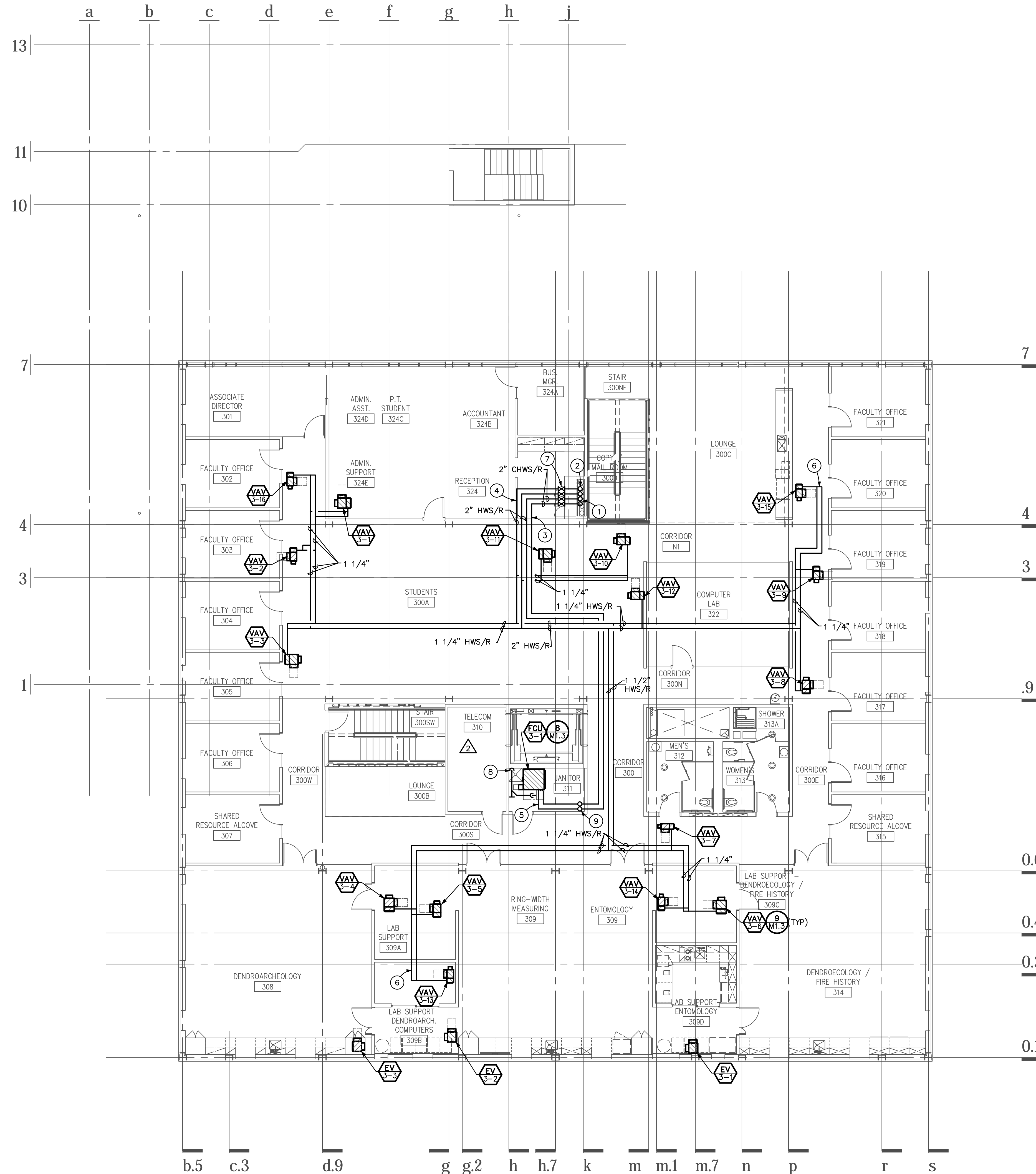
D. Monte Sturdevant
 2008
 G. MONTE STURDEVANT
 REGISTERED PROFESSIONAL ENGINEER
 ARIZONA U.S.A.
 EXPIRES 6-30-2013

ADD 1 GMP-ADDENDUM 1
 05/13/11
 OWNER REVIEW
 07/15/11
July 15, 2011
Construction Documents
 r+b job # 0209
 U.A. # 08-8826

LABORATORY OF TREE-RING RESEARCH
BRYANT BANNISTER TREE-RING BUILDING
 The University of Arizona - Tucson, Arizona



MECH 2nd FLOOR PIPING PLAN
M3.2

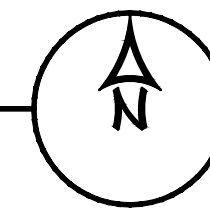


KEYED NOTES

- ① 6" CHWS/R PIPING UP FROM THE BASEMENT. EXTEND AS SHOWN.
- ② 4" HWS/R PIPING UP FROM THE BASEMENT. EXTEND AS SHOWN.
- ③ EXTEND 2" CHWS/R PIPING THRU THIRD FLOOR CEILING SPACE TO FAN COIL UNITS AS SHOWN.
- ④ EXTEND 2" HWS/R PIPING THRU THIRD FLOOR CEILING SPACE TO VAV BOXES AS SHOWN.
- ⑤ EXTEND 1 1/4" CHWS/R PIPING TO FAN COIL UNITS. PROVIDE ISOLATION VALVES, CIRCUIT SETTER, AND MODULATING CONTROL VALVE AT EACH COIL.
- ⑥ EXTEND 1 1/4" HWS/R PIPING TO VAV UNITS SERVING FIRST FLOOR. PROVIDE ISOLATION VALVES, CIRCUIT SETTER, AND MODULATING CONTROL VALVE AT EACH COIL.
- ⑦ PROVIDE SHUTOFF VALVE TO ISOLATE FLOOR
- ⑧ EXTEND 3/4" CONDENSATE DRAIN PIPING FROM FAN COIL UNIT DOWN WALL AND SPILL INTO MOP SINK.

MECHANICAL 3rd FLOOR PIPING PLAN

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



ENTIRE SHEET

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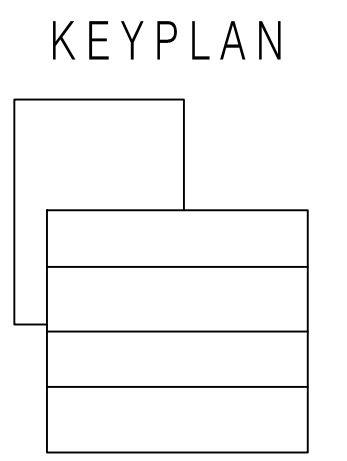


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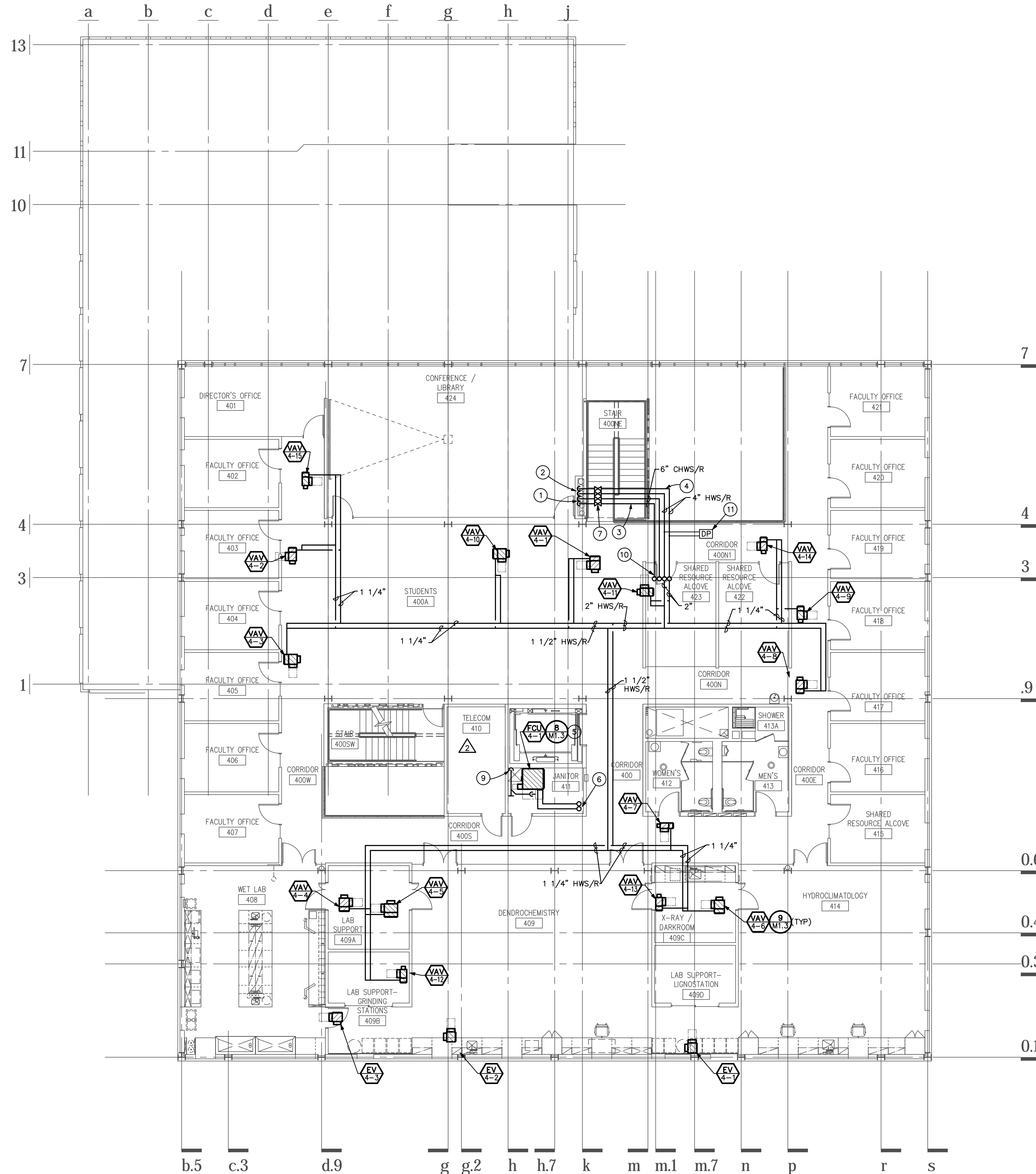


MECH 3rd FLOOR PIPING PLAN
M3.3

FILE: J:\2008\081093 UofA Tree Ring Laboratory\081093_100 U of A Tree Ring UofA Comments Rev 02\M3_4.dwg

PLOTTED BY: chad.eggink

PLOTTED: 09/29/2011 - 8:42am

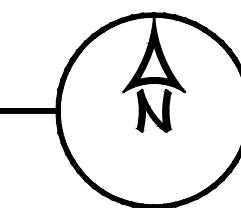


KEYED NOTES

- ① 6" CHWS/R PIPING UP FROM THE BASEMENT. EXTEND AS SHOWN.
- ② 4" HWS/R PIPING UP FROM THE BASEMENT. EXTEND AS SHOWN.
- ③ EXTEND 6" CHWS/R PIPING THRU FOURTH FLOOR CEILING SPACE AS SHOWN.
- ④ EXTEND 4" HWS/R PIPING THRU FOURTH FLOOR CEILING SPACE AS SHOWN.
- ⑤ EXTEND 1 1/4" CHWS/R PIPING TO FAN COIL UNIT. PROVIDE ISOLATION VALVES, CIRCUIT SETTER, AND MODULATING CONTROL VALVE AT EACH COIL.
- ⑥ 1 1/4" CHWS/R DOWN FROM ROOF ABOVE.
- ⑦ PROVIDE SHUTOFF VALVE TO ISOLATE FLOOR. SHUT OFF VALVE TO BE ACCESSIBLE FROM STAIRWELL.
- ⑧ EXTEND 3/4" CONDENSATE DRAIN PIPING FROM FAN COIL UNIT DOWN WALL AND SPILL INTO MOP SINK.
- ⑨ EXTEND 3/4" CONDENSATE DRAIN DOWN FROM UNIT ON ROOF ABOVE AND UNIT ON THIS FLOOR TO MOP SINK.
- ⑩ 6" CHWS/R AND 4" HWS/R TO AHU ON ROOF
- ⑪ DIFFERENTIAL PRESSURE SENSOR TO CONTROL HEATING HOT WATER PUMPS.

MECHANICAL 4th FLOOR PIPING PLAN

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

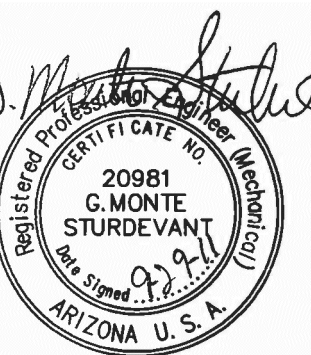


ENTIRE SHEET



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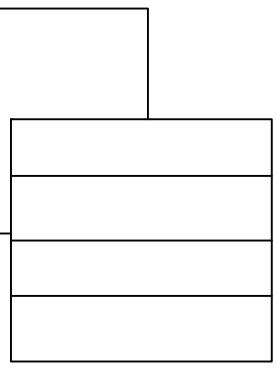


GMP-ADDENDUM 1
05/13/11
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07/15/11

July 15, 2011
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r+b job # 0209
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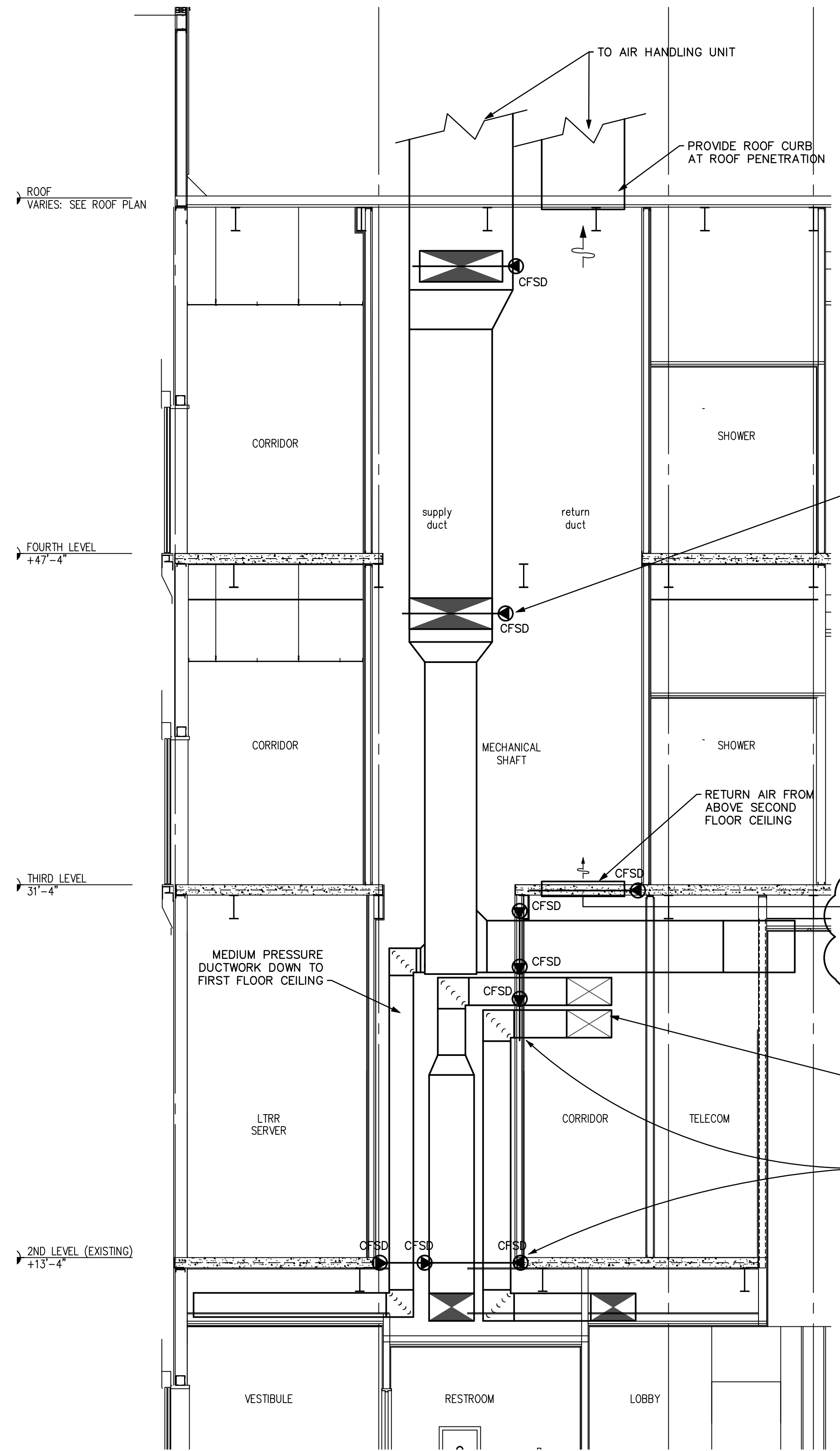
KEYPLAN



MECH 4th FLOOR PIPING PLAN

M3.4

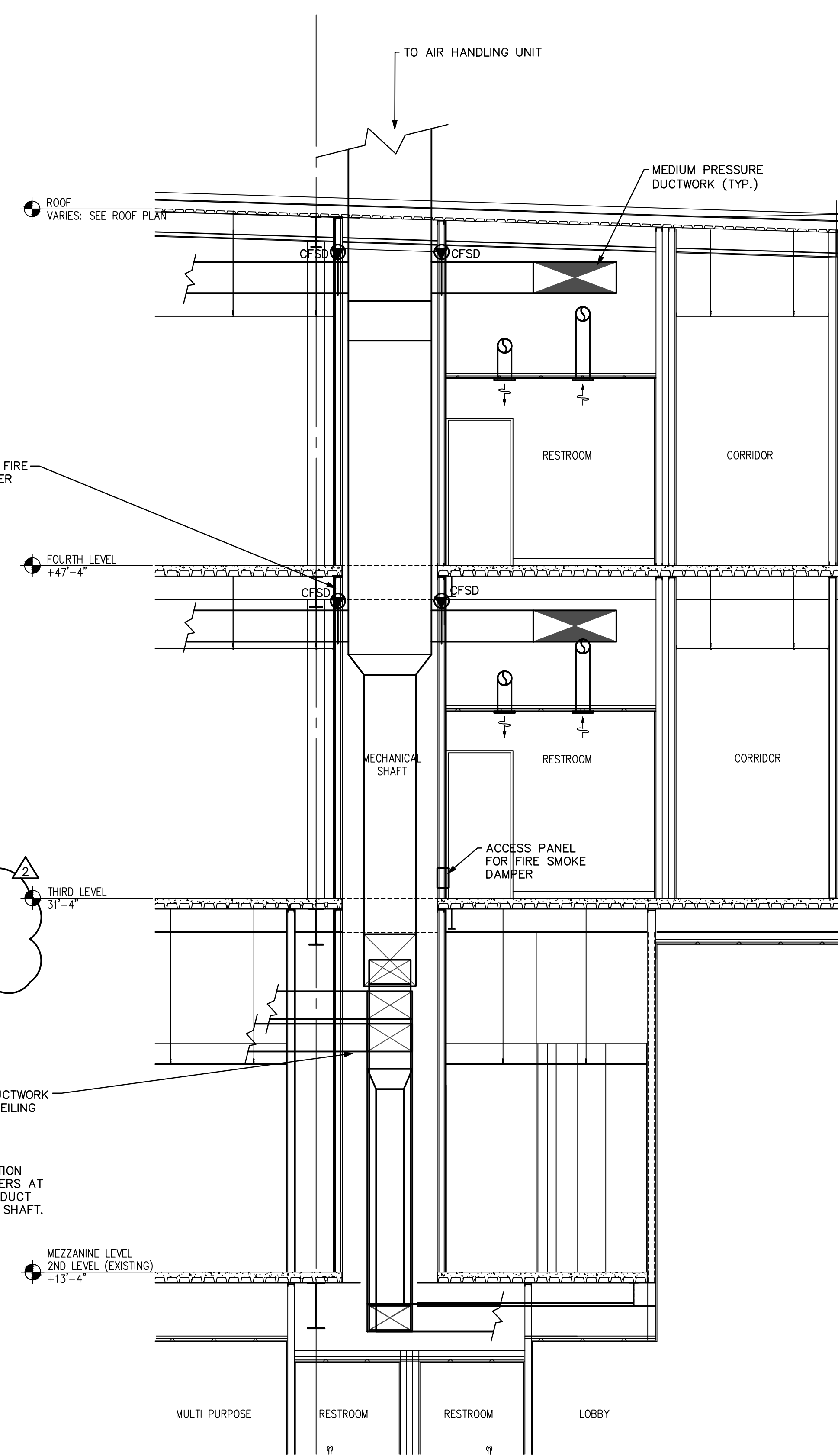
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DESIGN CONTACT MONTE STURDEVANT



MECHANICAL SECTION

SCALE: 1/4" = 1'-0"

2
M4.0



MECHANICAL SECTION

SCALE: 1/4" = 1'-0"

1
M4.0

RETURN AIR FROM FIRST FLOOR AND SECOND FLOOR TO BE ABOVE SECOND FLOOR CEILING. SEE NOTES ON SHEETS M2.1 AND M2.2

3
M1.4

PROVIDE COMBINATION FIRE SMOKE DAMPERS AT WALL AND FLOOR DUCT PENETRATIONS TO SHAFT.

LOW PRESSURE DUCTWORK TO FIRST FLOOR CEILING

