

SHEET TITLE		PROJECT TITLE		SHEET NUMBER		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR		BY		CHECKED BY		DATE		ISSUED FOR	
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ISSUE HISTORY		
Δ	DATE	ISSUED FOR
	2025-11-26	DESIGN DEVELOPMENT
	2024-06-11	95% CD ISSUE
	2024-10-05	BID ISSUE

SHEET TITLE

**MECHANICAL
COVER SHEET**

DRAWING NUMBER

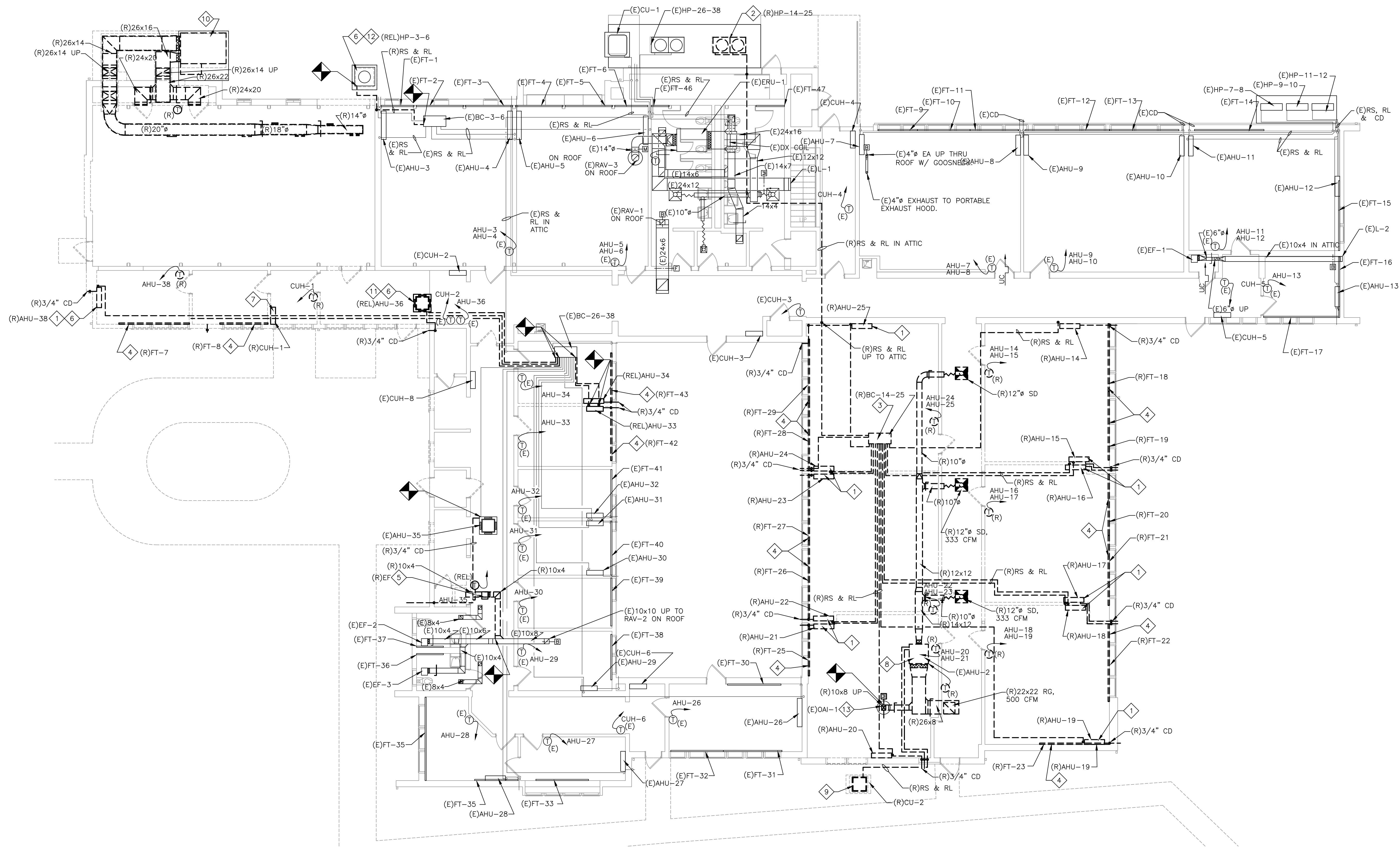
MO01

DEMOLITION GENERAL NOTES:

1. REFER TO MD01 FOR FURTHER GENERAL DEMOLITION NOTES.
2. TEMPORARILY REMOVE AND REINSTALL CEILING TILES AS REQUIRED FOR PIPING WORK ABOVE CEILING.
3. THE GC IS RESPONSIBLE FOR PATCHING ALL EXPOSED SURFACES AS REQUIRED AS A RESULT OF DEMOLITION WORK. THE MC IS RESPONSIBLE FOR PATCHING ALL CONCEALED SURFACES. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

DEMOLITION KEY NOTES:

1. REMOVE VRF INDOOR UNIT IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO, ASSOCIATED, HANGERS & SUPPORTS, REFRIGERANT PIPING, CONDENSATE PIPING, THERMOSTAT AND CONTROLS.
2. REMOVE VRF OUTDOOR HEAT RECOVERY UNIT IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO, ASSOCIATED, REFRIGERANT PIPING, AND CONTROLS. EXISTING CONCRETE PAD TO REMAIN.
3. REMOVE VRF BRANCH CONTROLLER UNIT IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO, ASSOCIATED, HANGERS & SUPPORTS, REFRIGERANT PIPING, CONDENSATE PIPING AND CONTROLS.
4. REMOVE ELECTRIC BASEBOARD AND ASSOCIATED CONTROLS. REFER TO ARCHITECTURAL DRAWINGS FOR PATCHING OF WALLS AND FLOOR.
5. REMOVE INLINE EXHAUST FAN AND ASSOCIATED DUCTWORK TO LIMITS SHOWN, HANGERS & SUPPORTS AND CONTROLS.
6. TEMPORARILY EVACUATE REFRIGERATE SYSTEM, RECHARGE VRF SYSTEM AFTER COMPLETION OF WORK AND STARTUP SYSTEM SO THAT THE EXISTING VRF SYSTEM IS OPERATIONAL.
7. REMOVE ELECTRIC CABINET UNIT HEATER, WALL MOUNTED THERMOSTAT AND ASSOCIATED CONTROLS. REFER TO ARCHITECTURAL DRAWINGS FOR PATCHING OF WALLS AND FLOOR.
8. REMOVE SPLIT SYSTEM AIR HANDLING UNIT IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO, ASSOCIATED, HANGERS & SUPPORTS, REFRIGERANT PIPING, CONDENSATE PIPING, THERMOSTAT AND CONTROLS. REFER TO ARCHITECTURAL DRAWINGS FOR PATCHING OF WALLS.
9. REMOVE SPLIT SYSTEM HEAT PUMP UNIT IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO, ASSOCIATED, CONCRETE PAD, REFRIGERANT PIPING AND CONTROLS. REFER TO ARCHITECTURAL DRAWINGS FOR PATCHING OF WALLS.
10. REMOVE ROOF TOP UNIT IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO, ASSOCIATED, CONCRETE PAD, DUCTWORK AND CONTROLS. REFER TO ARCHITECTURAL DRAWINGS FOR PATCHING OF WALLS.
11. RELOCATE VRF INDOOR TO LOCATION SHOWN ON NEW WORK PLANS. REMOVE ASSOCIATED HANGERS & SUPPORTS, REFRIGERANT PIPING AND CONDENSATE PIPING. RELOCATE ASSOCIATED CONTROL WIRING.
12. RELOCATE VRF OUTDOOR TO LOCATION SHOWN ON NEW WORK PLANS. REMOVE ASSOCIATED, CONCRETE PAD AND REFRIGERANT PIPING. PROVIDE NEW CONTROL WIRING FROM OUTDOOR UNIT TO INDOOR BRANCH CONTROLLER AS REQUIRED FOR RELOCATION.
13. REMOVE DUCT UP ROOF LEVEL. EXISTING ON ROOF CAP TO REMAIN. REMOVE ASSOCIATED ASSOCIATED MOTORIZED DAMPER.



1 MECHANICAL DEMOLITION PLAN
MD101 SCALE: 1/8" = 1'-0"

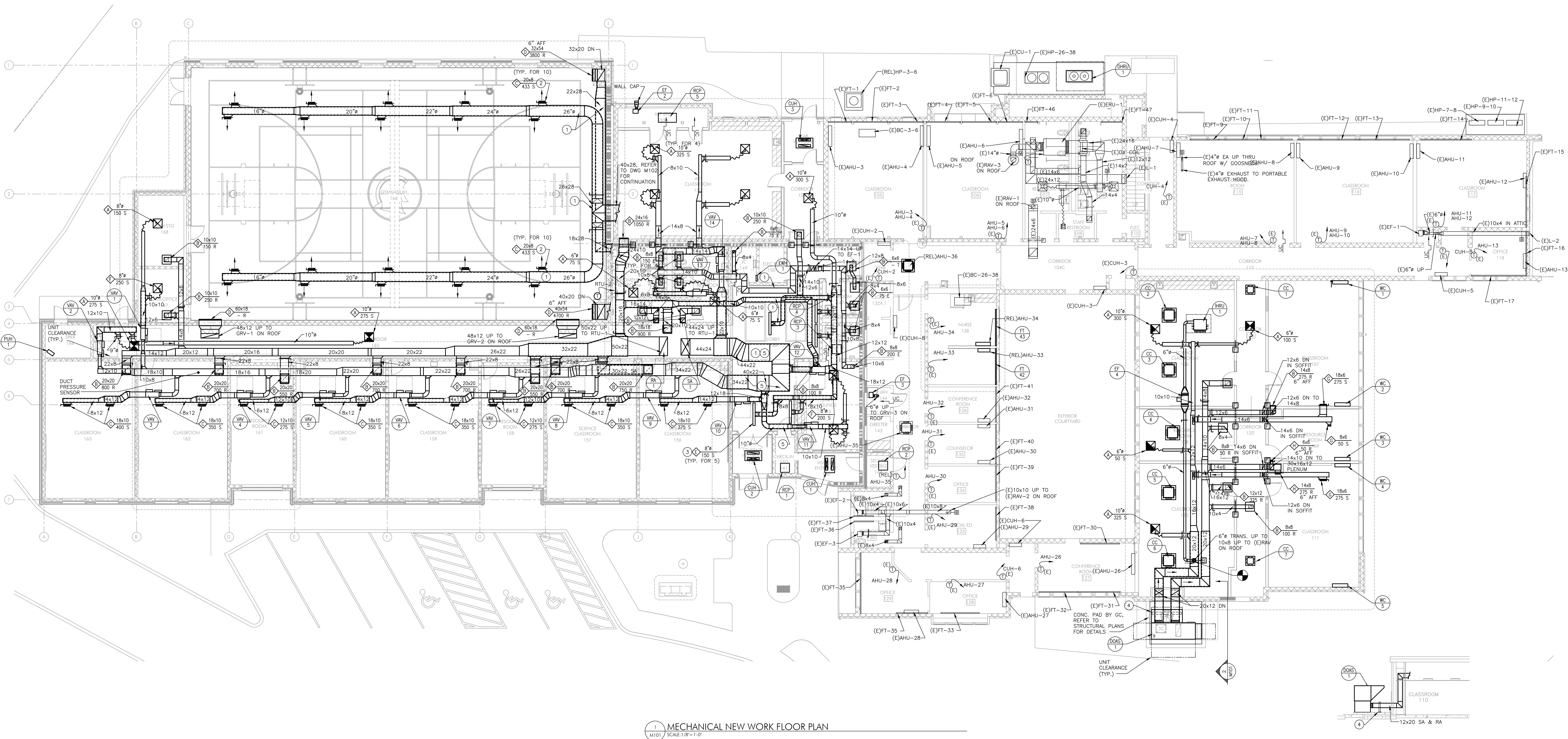
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	2026-10-05	BD ISSUE

SHEET TITLE

- GENERAL NOTES:
1. REFER TO M001 FOR FURTHER GENERAL NOTES.
 2. PROVIDE MINIMUM 1ST 30 FT OF DUCTWORK UPSTREAM AND DOWNSTREAM OF ALL DOAS & RTUs WITH 1" THICK ACOUSTICAL LINING. PROVIDE 1ST 10 FT OF DUCTWORK DOWNSTREAM OF ALL VAVs WITH 1" THICK ACOUSTICAL LINING.
 3. PROVIDE ALL NEW EXTERIOR DUCTWORK AS PRE-MANUFACTURED DUAL-TECH SYSTEM.
 4. PROVIDE ALL EXPOSED DUCTWORK IN PAINTABLE GALVANNEAL SHEET METAL. DUCTWORK SHALL BE SHOP PRIMED AND FIELD PAINTED BY GC IN CUSTOM COLOR CHOSEN BY THE ARCHITECT. ALL EXPOSED DUCTWORK SHALL BE INTERNALLY LINED.
 5. ALL EXTERIOR WALL PENETRATIONS REQUIRED FOR MECHANICAL WORK TO BE MADE BY THE GC. REFER TO THE ARCHITECTURAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

- NEW WORK KEY NOTES:
1. PROVIDE ALL EXPOSED DUCTWORK IN PAINTABLE GALVANNEAL SHEET METAL. SUPPLY AND RETURN DUC SHALL BE INTERNALLY LINED. EXPOSED DUCTWORK FOR RTU-2 SHALL BE DOUBLE WALL DUCT. DUCTWORK SHALL BE SHOP PRIMED AND FIELD PAINTED BY GC IN CUSTOM COLOR CHOSEN BY THE ARCHITECT.
 2. MOUNT GRILLE IN 4 O'CLOCK POSITION IN DIRECTION INDICATED.
 3. PROVIDE SLOT DIFFUSER WITH HORIZONTAL THROW IN OPPOSITE DIRECTION, 2-SLOTS PER DIRECTION. PROVIDE CUSTOM HEIGHT INTERNALLY LINED PLENUM WITH DIFFUSER LEVEL WITH BOTTOM OF CEILING Baffle.
 4. PROVIDE ALL NEW EXTERIOR DUCTWORK AS PRE-MANUFACTURED DUAL-TECH SYSTEM PER DETAIL 8/M502 IN CUSTOM COLOR CHOSEN BY THE ARCHITECT.
 5. PROVIDE DUCTWORK WITH MINIMUM 14 GAUGE SHEET METAL. SUPPORT DUCT PER SMACNA STANDARDS.



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SHEET TITLE

MECHANICAL NEW
WORK DUCT FLOOR
PLAN

DRAWING NUMBER

M101

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MEPP ENGINEER
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Blue Bell, PA 19422
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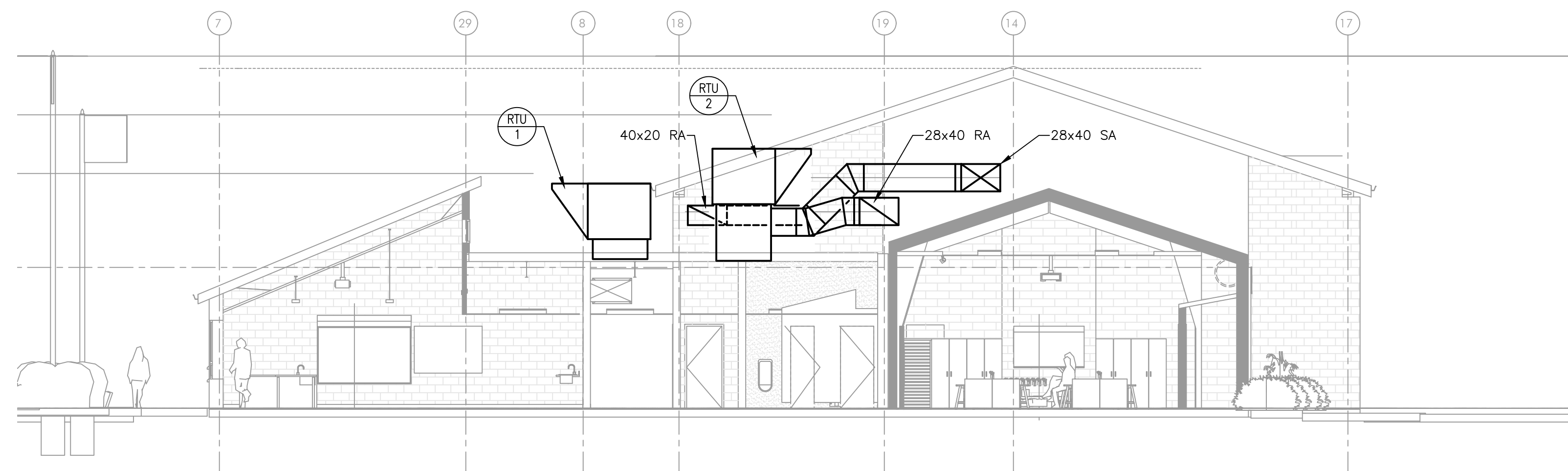
CIVIL ENGINEER
Bohler Engineering
636 Market Street Suite 920
Philadelphia, PA 19102
267-402-3400

GENERAL NOTES:

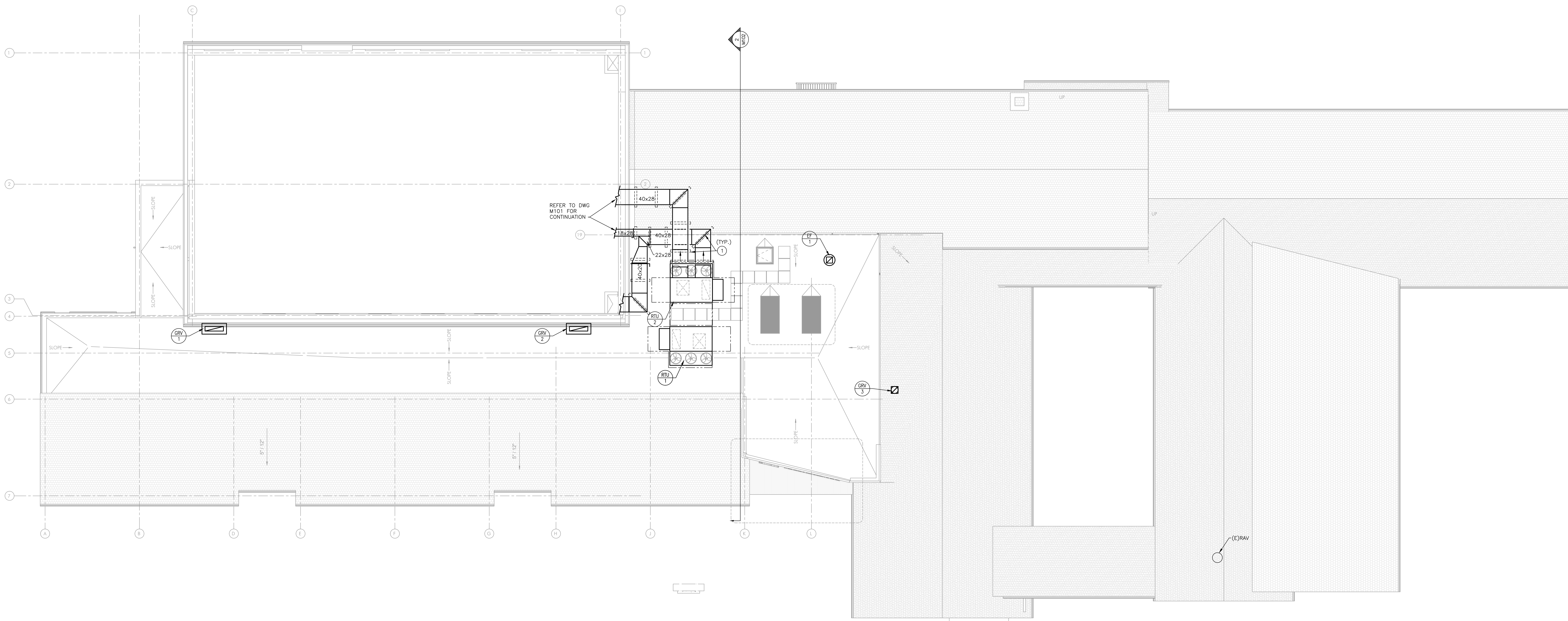
1. REFER TO M001 FOR FURTHER GENERAL NOTES.

NEW WORK KEY NOTES:

1. PROVIDE ALL NEW EXTERIOR DUCTWORK AS PRE-MANUFACTURED DUAL-TECH SYSTEM PER DETAIL 1/M552 IN CUSTOM COLOR CHOSEN BY THE ARCHITECT.



2 MECHANICAL ROOF SECTION
SCALE: 1/8" = 1'-0"



1 MECHANICAL NEW WORK ROOF PLAN
SCALE: 1/8" = 1'-0"

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SHEET TITLE

MECHANICAL NEW
WORK ROOF PLAN

DRAWING NUMBER

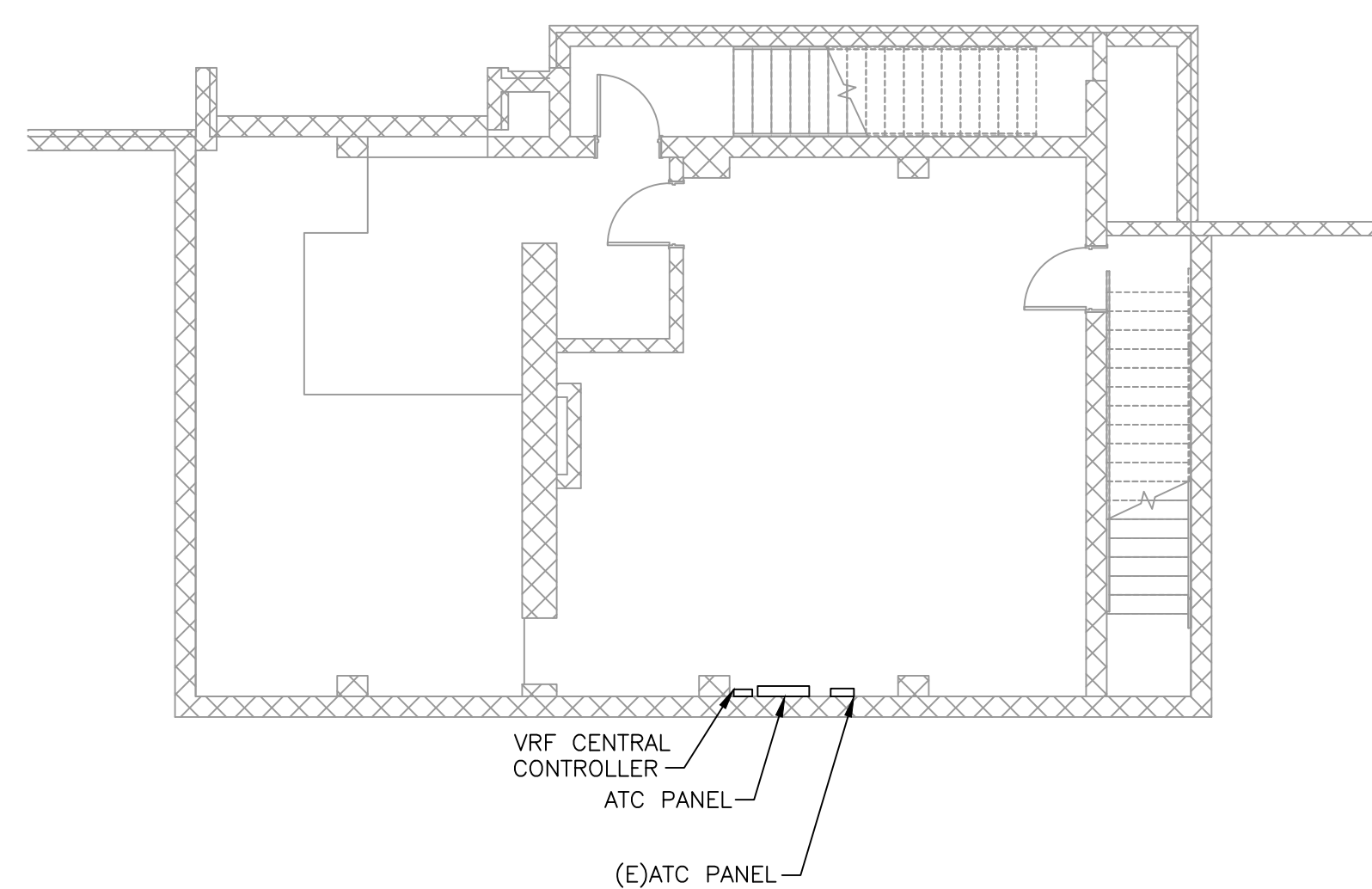
M102

GENERAL NOTES:

1. REFER TO M001 FOR FURTHER GENERAL NOTES.
2. ALL EXTERIOR WALL PENETRATIONS REQUIRED FOR MECHANICAL WORK TO BE MADE BY THE GC. REFER TO THE ARCHITECTURAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. REFER TO DWG M503 FOR ALL VRF SYSTEM REFRIGERANT PIPE SIZING.

NEW WORK KEY NOTES:

1. PROVIDE PIPE SUPPORTS SIMILAR TO MIRO INDUSTRIES MODEL 2.5 FOR PIPING AND CONDUIT. SPACE SUPPORTS PER MANUFACTURER'S RECOMMENDATIONS. ALL EXPOSED REFRIGERANT PIPING SHALL BE COVERED WITH AIREX EPLEXGUARD PVC JACKET.
2. REFRIGERANT PIPING, SIZE PER MANUFACTURERS RECOMMENDATIONS. PROVIDE NEW HANGERS AND SUPPORTS FOR ASSOCIATED VRF UNIT. REFER TO GENERAL NOTE 2.
3. RUN CONDENSATE DOWN IN WALL/ENCLOSURE TO EXTERIOR, W/ ELBOW AND SPILL 4" ABOVE GRADE ONTO CONCRETE SPLASH BLOCK. MAKE PENETRATION THROUGH WALL WEATHER-TIGHT. CONNECT CONDENSATE PIPING TO INDOOR UNITS.
4. PROVIDE ALL INDOOR EXPOSED PIPING AND CONDUIT IN VERTICAL & HORIZONTAL 3-SIDED 4" x 6" 16 GAUGE STEEL PIPE ENCLOSURE FOR FULL LENGTH OF SPACE. PIPE ENCLOSURE SHALL BE JOG INNOVATIONS, INC. SOFT-STEEL SYSTEM IN CUSTOM POWDER-COATED COLOR CHOSEN BY THE ARCHITECT. FIELD VERIFY ALL DIMENSIONS PRIOR TO ORDERING.
5. PROVIDE AND INSTALL EQUIPMENT SUPPORTS SIMILAR TO PATE MODEL ES AND ANCHOR UNIT TO CONC. PAD. REFER TO DWG M502 DETAIL 6 FOR ADDITIONAL REQUIREMENTS.
6. EXTEND 1" CONDENSATE AWAY FROM ENTRANCE AND SPILL TO GRADE ONTO CONCRETE SPLASH BLOCK. (TYPICAL FOR 2 PIPES).





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PACKAGED ROOFTOP UNIT SCHEDULE																																																				
UNIT TAG	AREA SERVED	MAX SUPPLY CFM	MIN SUPPLY CFM	MAX OA CFM	MINIMUM OA CFM	SUPPLY FAN				EXHAUST FAN				D/X COOLING @ 95 °F								HOT GAS REHEAT				HEAT PUMP				ELECTRIC HEAT								ELECTRICAL CHARACTERISTICS				EER	COP	MAXIMUM DIMENSIONS L x W x H	AIRFLOW ARRANGEMENT	OPERATING WEIGHT LBS.	BASIS OF DESIGN MANUFACTURER AND MODEL NO.					
						ESP IN.	TSP IN.	W.C.	BHP	HP	EXHAUST CFM	ESP IN.	TSP IN.	W.C.	BHP	HP	ENT AIR DB °F	LVG AIR WB °F	FACE YEL FTM	GROSS TOTAL MBH	GROSS SENSIBLE MBH	NET TOTAL MBH	NET SENSIBLE MBH	CONDENSER HEAT MOTOR NO.	H.P.	FLA	E.A.	NO.	REL	CAPACITY MBH	DB °F	WB °F	ENT °F	LVG °F	TOTAL CAPACITY (MBH)	ELECTRIC HEAT KW EMERGENCY	ELECTRIC HEAT KW AUXILIARY	EMERGENCY HEAT ENT °F	LVG °F	AUXILIARY HEAT ENT °F	LVG °F							VOLTS	PHASE	CYCLE	MCA	MOCP
RTU-1	CLASSROOMS & OFFICES	8,500	3,500	2,600	2,600	2.75	4.85	11.0	15	2,600	1.0	1.2	0.75	3	79.6	66.0	53.2	52.9	434	325.3	239.5	295.3	209.5	3	0.75	3.4	2	44.9/46.5	—	—	—	51.6	68.5	25.6	45.1	45.1	51.6	68.3	68.5	85.1	208	3	60	327	350	10.0	3.3	138"×101"×60"	DOWNFLOW	3,900	AAON RNA-030	
RTU-2	GYMNASIUM 166	8,500	5,000	2,400	2,600	2.0	4.2	9.2	10	—	—	—	—	79.2	65.7	53.0	52.6	451	322.6	238.6	293.1	213.0	3	0.75	3.4	2	44.9/46.5	154.3	70.0	59.3	53.1	69.8	17.2	45.1	45.1	53.1	69.7	69.8	86.8	208	3	60	301	350	10.0	3.3	138"×101"×60"	DOWNFLOW	3,900	AAON RNA-030		

1. PROVIDE ALL UNITS WITH UNIT MOUNTED NON-FUSED DISCONNECT SWITCH.
2. PROVIDE ALL UNITS WITH FACTORY MOUNTED CONTROLLER WITH BAGNET INTERFACE. REFER TO DWG M401 FOR ADDITIONAL REQUIREMENTS.
3. PROVIDE ALL UNITS WITH INSULATION AND INSULATED BAGNET CONNECTION WITH HIGH GRADE INSULATION.
4. PROVIDE ALL UNITS WITH CONVENIENCE LIGHT AND OUTLET WIRE TO LINE SIDE OF DISCONNECT.
5. PROVIDE ALL UNITS WITH MINIMUM 13 FETTER.
6. PROVIDE RTU-1 WITH 18" CURB WITH VIB-ISO SOUND CLOAK SC-53 SOUND ATTENUATION PANEL AND FILTERATION ISOLATION RAILS.
7. PROVIDE RTU-2 WITH 42" HORIZONTAL DISCHARGE CURB WITH VIB-ISO SOUND CLOAK SC-53 SOUND ATTENUATION PANEL WITH VIBRATION ISOLATION RAILS.
8. PROVIDE ALL UNITS WITH 10" DRIVE HIGH EFFICIENCY FANS WITH 10" DRIVE HIGH EFFICIENCY FANS.
9. PROVIDE RTU-1 COMPLETE WITH VARIABLE SPEED EXHAUST FAN W/ W/PS PRESSURE CONTROL.
10. PROVIDE ALL UNITS WITH VARIABLE CAPACITY LEAD COMPRESSORS.
11. PROVIDE ALL UNITS WITH MINIMUM 350A SCOTR RATING.
12. PROVIDE ALL UNITS WITH VARIABLE SPEED CONDENSER FANS W/ VFD.

DEDICATED OUTSIDE AIR UNIT SCHEDULE																																																									
UNIT TAG	AREA SERVED	SUPPLY CFM	EXHAUST CFM	MINIMUM OA CFM	AIR STREAM	HEAT RECOVERY(SUMMER)				HEAT RECOVERY(WINTER)				SUPPLY FAN				EXHAUST FAN				D/X COOLING @ 95 °F										HOT GAS REHEAT			HEAT PUMP		ELECTRIC HEAT		ELECTRICAL CHARACTERISTICS		EER	COP	MAXIMUM DIMENSIONS L x W x H	AIRFLOW ARRANGEMENT	OPERATING WEIGHT LBS.	BASIS OF DESIGN MANUFACTURER AND MODEL NO.											
						ENTHALPY RECOVERY WHEEL				ENTHALPY RECOVERY WHEEL				NO.	ESP IN. WC	TSP IN. WC	BHP	HP	NO.	ESP IN. WC	TSP IN. WC	BHP	HP	ENT AIR		LVG AIR		FACE VEL FPM	GROSS TOTAL MBH	GROSS SENSIBLE MBH	NET TOTAL MBH	NET SENSIBLE MBH	CONDENSER FAN MOTOR		COMPRESSOR		CAPACITY MBH	LVG AIR									AIR ENT °F	LVG °F	TOTAL CAPACITY (MBH)	ELECTRIC HEAT KW EMERGENCY	ELECTRIC HEAT KW AUXILIARY						
						EAT °F DB	EAT °F WB	LAT °F DB	LAT °F WB	EAT °F DB	EAT °F WB	LAT °F DB	LAT °F WB											DB °F	WB °F	DB °F	WB °F						H.P. EA.	P.L.A. EA.	H.P. EA.	RLA EA.		DB °F	WB °F																		
						DB °F	WB °F	DB °F	WB °F	DB °F	WB °F	DB °F	WB °F											DB °F	WB °F	DB °F	WB °F						DB °F	WB °F	DB °F	WB °F		DB °F	WB °F																		
DOAS-1	CLASSROOMS	1,400	1,400	1,400	OUTDOOR EXHAUST	93.0	76.0	79.9	66.7	0.0	-1.0	48.9	41.8	1	1.25	2.8	1.3	2	1	1.25	1.9	0.8	2	79.9	66.7	52.3	50.8	165	67.3	44.8	63.6	41.0	2	0.33	2.8	1	-	23.7	29.9	70	58.0	48.9	66.7	30.5	15	7.5	208	3	60	77	90	12.7	3.8	134"x79"x44"	DOWNFLOW	1,600	AAON RNA-006-A-A-B

1. PROVIDE FACTORY MOUNTED, NON-FUSED DISCONNECT SWITCH.
2. PROVIDE DIGITAL SCROLL COMPRESSOR.
3. PROVIDE 2 POSITION OUTSIDE AIR & EXHAUST DAMPERS AND HOODS.
4. PROVIDE SUPPLY PLENUM FAN AND EXHAUST FAN WITH CONSTANT VOLUME VFD DRIVE & HIGH EFFICIENCY MOTOR.
5. PROVIDE 1" HOT GAS REHEAT COIL.
6. PROVIDE 2" PLATED REHEAT R FILTERS.
7. PROVIDE 30" HIGH HORIZONTAL DISCHARGE PLenum CURB.
8. PROVIDE BLOWER PROOFING SWITCH.
9. PROVIDE FILTER DRYER SWITCH.
10. PROVIDE 12" DUCT MOUNTED AIR TEMPERATURE SENSORS AND DUCT MOUNTED RETURN AIR TEMPERATURE/HUMIDITY SENSORS.
11. PROVIDE VARIABLE SPEED CONDENSER FANS W/ VFD.
12. PROVIDE CONVEYANCE LIGHT AND OUTLET W/RED 1" LINE SIZE OF DISCONNECT.
13. PROVIDE FACTORY MOUNTED CONTROL PANEL WITH 120VAC INTERFERENCE. REFER TO DWG M402 FOR ADDITIONAL REQUIREMENTS.

ELECTRIC PROPELLER UNIT HEATER SCHEDULE													
PUH No.	AREA SERVED	ELECTRIC HEATER CHARACTERISTICS						FAN CHARACTERISTICS			MOUNT HT.	MAXIMUM DIMENSIONS LxHxT, IN.	BASIS OF DESIGN MANUFACTURER & MODEL NO.
		BTU/HR CAP.	KW	VOLTS	PHASE	HZ	AMPS	CFM	RPM	HP			
PUH-1	SPKR 164	10,236	3.0	208	1	60	14.5	350	1600	1'/100"	8' AFF	14x9x16	BERKO HUHA9320

PROVIDE ALL UNITS COMPLETE WITH UNIT MOUNTED DISCONNECT AND UNIT MOUNTED 24V THERMOSTAT 208V/24V TRANSFORMER AND RELAY.

ELECTRIC WALL HEATER SCHEDULE									
UNIT TAG	AREA SERVED	ELECTRIC HEATER					MOUNT HT	MAXIMUM DIMENSIONS LxWxH, IN.	BASIS OF DESIGN MANUFACTURER AND MODEL NO.
		BTU/HR CAP.	KW	VOLTS	PHASE	AMPS			
EWH-1	JC 149	10,230	3.0	208	1	7.2	2' AFF	11"x5"x12"	BERKO SRA0204DSF

PROVIDE ALL UNITS COMPLETE WITH BUILT-IN DISCONNECT SWITCH & BUILT-IN INTEGRAL THERMOSTAT.
PROVIDE ALL UNITS COMPLETE WITH RECESSED WALL MOUNTING FRAME.

SPLIT SYSTEM CEILING CASSETTE UNIT SCHEDULE													
UNIT TAG	AREA SERVED	TOTAL COOLING CAPACITY BTU/HR	TOTAL COOLING CAPACITY BTU/HR	CORRECTED HEATING CAPACITY (BTU/HR)	ELECTRICAL CHARACTERISTICS				MAXIMUM DIMENSIONS, IN. LxWxH	OPERATING WEIGHT LBS.	BASIS OF DESIGN MANUFACTURER & MODEL NO.	SERVED BY	
				(BTU/HR)	VOLTS	PHASE	CYCLE	MCA	MOP				
CC-1	CORRIDOR 120	300	10,236	13,642	208	1	60	0.4	15	24x24x12	37	DAIKIN FXFZA12AAVJU	OHRI-1
CC-2	SCIENCE CLASSROOM 106	618	23,000	27,000	208	1	60	0.5	15	36x36x10	51	DAIKIN FXFXA24AAVJU	OHRI-1
CC-3	SCIENCE CLASSROOM 106	618	23,000	27,000	208	1	60	0.5	15	36x36x10	51	DAIKIN FXFXA24AAVJU	OHRI-1
CC-4	RESOURCE ROOM 108	618	23,000	27,000	208	1	60	0.5	15	36x36x10	51	DAIKIN FXFXA24AAVJU	OHRI-1
CC-5	CLASSROOM 110	477	18,000	20,000	208	1	60	0.4	15	36x36x10	42	DAIKIN FXFA18AAVJU	OHRI-1
CC-6	CLASSROOM 110	477	18,000	20,000	208	1	60	0.4	15	36x36x10	42	DAIKIN FXFA18AAVJU	OHRI-1
CC-7	CORRIDOR 120	300	10,236	13,642	208	1	60	0.4	15	24x24x12	37	DAIKIN FXZA12AAVJU	OHRI-1

1. PROVIDE ALL UNITS WITH NON-FUSED, UNIT MOUNTED DISCONNECT SWITCH BY THE EC.
2. PROVIDE ALL UNITS COMPLETE W/ WALL MOUNTED HARD-WIRED THERMOSTAT DAIKIN MODEL BRC1NRV71.
3. PROVIDE ALL CC UNITS WITH INTEGRAL CONDENSATE PUMP.

OUTDOOR HEAT RECOVERY UNIT SCHEDULE																						
UNIT TAG	TONS	RATED COOLING CAPACITY BTUH	HEATING CAPACITY BTUH @ F° AMBIENT	HEAT RECOVERY CAPACITY BTUH	COMPRESSOR			CONDENSER FAN MOTOR		ELECTRICAL CHARACTERISTICS				MAX. AMBIENT TEMP. °F	SEER (EER)	HSPF (COP)	MAXIMUM SOLID DIMENSIONS, IN. LxWxH	MAXIMUM PRESSURE LEVEL, ps(a)	OPERATING WEIGHT LBS	BASIS OF DESIGN MANUFACTURER AND MODEL NO.		
					QTY.	H.P. EA.	KW, COMP. # 1/2	QTY.	KW, FAN	FLA EA.	VOLTS	PHASE	CYCLE								MCA	MCCP
0HRU-1	20	228,000	137,029	137,029	2	-	5.54/5.85	2	0.9	-	208	3	60	79.1	90	95	(10.7)	(3.3)	69x31x66	60	1010	DAIKIN REY4Y40AATJ

1. PROVIDE UNIT COMPLETE WITH NON-FUSED, UNIT MOUNTED DISCONNECT SWITCH BY THE EC.
2. PROVIDE UNIT COMPLETE WITH HEAT RECOVERY FOR SIMULTANEOUS HEATING & COOLING.
3. PROVIDE COMPLETE WITH HERO SIMPLE EDGE CLOUD COMMUNICATION ADAPTOR AND INTELLIGENT TOUCH MANAGER DCM601B71 W/ BACNET GATEWAY.
4. PROVIDE UNIT COMPLETE WITH OVER/UNDER VOLTAGE AND PHASE LOSS PROTECTION KIT.

VRF INDOOR HEAT RECOVERY UNIT SCHEDULE												
UNIT TAG	UNITS SERVED	NO. OF PORTS	MAX PORT CAPACITY BTU/H	MAX UNIT CAPACITY BTU/H	ELECTRICAL CHARACTERISTICS				MAXIMUM DIMENSIONS, IN. LxWxH	OPERATING WEIGHT LBS	BASIS OF DESIGN MANUFACTURER AND MODEL NO.	
					VOLTS	PHASE	CYCLE	AMPS				MOPQ
IHRU-1	WC-1 - WC-5, CC-1 - CC-7	8	54,000	290,000	208	1	60	1.9	15	34.2x29x10	115	DAIKIN BSF854AAVJ

1. PROVIDE UNIT COMPLETE WITH NON-FUSED, UNIT MOUNTED DISCONNECT SWITCH BY THE EC
2. PROVIDE UNIT COMPLETE WITH VENTILATED ENCLOSURE.

WALL CASSETTE UNIT SCHEDULE														
UNIT TAG	AREA SERVED	TOTAL SUPPLY CFM	TOTAL COOLING BTU/HR	CORRECTED HEATING OF AMBIENT BUHP	ELECTRICAL CHARACTERISTICS					MAXIMUM DIMENSIONS IN. LxWxH	MAXIMUM WEIGHT LBS.	BASIS OF DESIGN MANUFACTURER & MODEL NO.	SERVED BY	
					VOLTS	PHASE	CYCLE	MCA	MOP					
WC-1	CLASSROOM 107	670	24,000	26,499	208	1	60	0.6	15	45x10x12	36	DAIKIN FXA024AAVJU	OHRRU-1	
WC-2	CLASSROOM 107	670	24,000	26,499	208	1	60	0.6	15	45x10x12	36	DAIKIN FXA024AAVJU	OHRRU-1	
WC-3	RESOURCE RM 109	512	18,000	19,999	208	1	60	0.4	15	45x10x12	36	DAIKIN FXA018AAVJU	OHRRU-1	
WC-4	CLASSROOM 111	670	24,000	26,499	208	1	60	0.6	15	45x10x12	36	DAIKIN FXA024AAVJU	OHRRU-1	
WC-5	CLASSROOM 111	670	24,000	26,499	208	1	60	0.6	15	45x10x12	36	DAIKIN FXA024AAVJU	OHRRU-1	

1. PROVIDE ALL UNITS COMPLETE W/ WALL MOUNTED HARD-WIRED THERMOSTAT DAIKIN MODEL BRC1NRV71.
2. PROVIDE ALL UNITS WITH NON-FUSED, DISCONNECT SWITCH BY THE EC.

SILENCER SCHEDULE																	
TAG	SYSTEM	DIMENSIONS (N.)			CONFIGURATION	AIR FLOW (CFM)	VELOCITY (FPM) (NOTE 2)	PD (IN. WG.)	MINIMUM DYNAMIC INSERTION LOSS, dB							BASIS OF DESIGN MANUFACTURER AND MODEL #.	
		WIDTH	HEIGHT	LENGTH L/C/L					OCTAVE BAND CENTER FREQUENCY, HZ								
									63	125	250	500	1000	2000	4000		8000
SA-1	RTU-1 SUPPLY	44	24	108	ELBOW	8,500	+1159	0.19	9	11	22	42	38	36	30	24	DYNASONICS EFN 24F
RA-1	RTU-1 RETURN	50	22	120	ELBOW	7,100	-929	0.12	11	12	24	46	41	39	32	26	DYNASONICS EFN 24F

NOTES:

1. IDEAL PRESSURE DROP AS DETERMINED PER ASTM E477-20 IN A NVLAP-ACCREDITED ACOUSTICAL LABORATORY.
2. MINIMUM DYNAMIC INSERTION LOSS DETERMINED PER ASTM E477-20 IN A NVLAP-ACCREDITED ACOUSTICAL LABORATORY.
3. PROVIDE ALL ATTENUATORS WITH 14 GAUGE CASING WITH 22 GAUGE PERFORATED LINER.

ELECTRIC VARIABLE AIR VOLUME TERMINAL UNIT SCHEDULE																										
UNIT TAG	AREA SERVED	INLET SIZE (IN)	MAX AIRFLOW CFM	MIN AIRFLOW CFM	MAX RADIANT NC AT 1.0°F P _a	MAX RADIANT NC AT 1.0°F P _a	MAX UNIT PRESSURE DROP IN. WC	ELECTRIC REHEAT COIL					ELECTRICAL CHARACTERISTICS					MAX. DIMENSIONS LxWxH IN.	WEIGHT LBS.	BASIS OF DESIGN MANUFACTURER AND MODEL	SERVED BY RTU					
								AIR		CFM	KW	STEPS	CAPACITY BTU/Hr	VOLTS	PHASE	HZ	MCA					MOP				
								ENT °F	LVG °F																	
VAV-1	GYM OFFICE 167/GYM STG 168	7"ø	400	160	20	20	0.5	55.0	90.1	360	4.0	SCR	13,648	208	3	60	15.1	20	41x12x10	43	PRICE SDVS	RTU-1				
VAV-2	CORRIDOR 165	8"ø	550	165	21	21	0.5	55.0	90.4	500	5.6	SCR	19,107	208	3	60	21.2	25	41x12x10	45	PRICE SDVS	RTU-1				
VAV-3	CLASSROOM 163	8"ø	800	360	20	20	0.5	55.0	90.9	775	8.8	SCR	30,026	208	3	60	24.4	35	41x14x13	51	PRICE SDVS	RTU-1				
VAV-4	CLASSROOM 162	8"ø	700	315	20	20	0.5	55.0	90.0	650	7.2	SCR	24,566	208	3	60	27.2	30	41x14x13	51	PRICE SDVS	RTU-1				
VAV-5	RESOURCE ROOM 161	10"ø	550	150	20	20	0.5	55.0	90.1	450	5.0	SCR	17,050	208	3	60	18.9	20	41x12x10	45	PRICE SDVS	RTU-1				
VAV-6	CLASSROOM 160	10"ø	700	315	20	20	0.5	55.0	90.0	650	7.2	SCR	24,566	208	3	60	27.2	30	41x14x13	51	PRICE SDVS	RTU-1				
VAV-7	CLASSROOM 159	10"ø	700	315	20	20	0.5	55.0	90.0	650	7.2	SCR	24,566	208	3	60	27.2	30	41x14x13	51	PRICE SDVS	RTU-1				
VAV-8	RESOURCE ROOM 158	8"ø	550	150	20	20	0.5	55.0	90.1	450	5.0	SCR	17,060	208	3	60	13.9	20	41x12x10	45	PRICE SDVS	RTU-1				
VAV-9	SCIENCE CLASSROOM 157	10"ø	700	315	20	20	0.5	55.0	90.0	650	7.2	SCR	24,566	208	3	60	27.2	30	41x14x13	51	PRICE SDVS	RTU-1				
VAV-10	SCIENCE CLASSROOM 156	10"ø	750	335	20	20	0.5	55.0	90.1	675	7.5	SCR	25,990	208	3	60	28.4	30	41x14x13	43	PRICE SDVS	RTU-1				
VAV-11	STAFF LOUNGE 145	7"ø	400	160	20	20	0.5	55.0	90.0	250	3.0	SCR	10,236	208	3	60	11.3	15	41x12x10	43	PRICE SDVS	RTU-1				
VAV-12	LOBBY 148	12"ø	1050	315	20	20	0.5	55.0	90.0	950	10.5	SCR	35,826	208	3	60	39.7	40	41x16x15	61	PRICE SDVS	RTU-1				
VAV-13	MEN'S RESTROOM 154/WOMEN'S RESTROOM 155	5"ø	150	100	20	20	0.5	55.0	92.9	100	1.2	SCR	4,094	120	1	60	7.9	15	43x12x8	39	PRICE SDVS	RTU-1				
VAV-14	ART CLASSROOM 153	12"ø	1300	480	20	21	0.5	55.0	90.0	1300	14.4	SCR	49,133	208	3	60	54.5	60	41x16x15	61	PRICE SDVS	RTU-1				

ALL UNITS TO BE PROVIDED WITH NON-FUSED UNIT MOUNTED DISCONNECT SWITCH AND 24V TRANSFORMER
PROVIDE ALL UNITS COMPLETE WITH 1" FIBER GLASS INSULATION.
PROVIDED VAV-3 THRU VAV-10 COMPLETE WITH SEPARATE 3' SOUND ATTENUATOR.

ELECTRIC RADIANT CEILING PANEL SCHEDULE									
UNIT TAG	AREA SERVED	ELECTRICAL CHARACTERISTICS					MAXIMUM DIMENSIONS LxWxH, IN.	BASIS OF DESIGN MANUFACTURER AND MODEL NO.	
		CAPACITY STU/H	WATTS	VOLTS	PHASE	HZ			FLA
RCP-1	CHECK IN STG 141	1,280	375	120	1	60	3.1	24x24x1	BERKO CP-371
RCP-2	SECURE VESTIBULE 142	1,280	375	120	1	60	3.1	24x24x1	BERKO CP-371
RCP-3	STAFF RESTROOM 146	1,280	375	120	1	60	3.1	24x24x1	BERKO CP-371
RCP-4	STAFF RESTROOM 147	1,280	375	120	1	60	3.1	24x24x1	BERKO CP-371
RCP-5	ART STG 153A	2,559	750	120	1	60	6.3	48x24x1	BERKO CP-751

THE UNIT DISCONNECT SWITCHES PROVIDED BY THE EC.
PROVIDE ALL UNITS COMPLETE WITH REMOTE WALL MOUNTED THERMOSTAT.

GRILLES, REGISTERS, & DIFFUSERS SCHEDULE							
TAG	STYLE	CFM	MOUNT	FACE	BASIS OF DESIGN MANUFACTURER & MODEL #	MAX NC	REMARKS
A	LOUVERED FACE DIFFUSER	VARIABLES	AS REQ'D	24x24	KRUEGER SHR	25	1
B	FIXED FACE BAR GRILLE	VARIABLES	AS REQ'D	VARIABLES W/NECK SIZE	KRUEGER S80	25	1, 2
C	SUPPLY GRILLE	VARIABLES	AS REQ'D	VARIABLES W/NECK SIZE	KRUEGER S80	25	1, 3
D	HEAVY DUTY BAR GRILLE	VARIABLES	AS REQ'D	VARIABLES W/NECK SIZE	KRUEGER S480	25	1
E	PLENUM SLOT DIFFUSER	VARIABLES	AS REQ'D	60"L, 3/4", 4"-SLOT	KRUEGER 1975	25	1, 4
F	LOUVERED FACE DIFFUSER	VARIABLES	AS REQ'D	24x24	KRUEGER SHR	25	1
G	SUPPLY REGISTER	VARIABLES	AS REQ'D	VARIABLES W/NECK SIZE	KRUEGER S80	25	1, 3, 6
H	RETURN REGISTER	VARIABLES	AS REQ'D	VARIABLES W/NECK SIZE	KRUEGER S80	25	1, 3, 6

1. REFER TO PLANS FOR QUANTITIES, NECK SIZE, LENGTH, CFM, AND PATTERN.
2. PROVIDE WITH 3P LAY-IN PANEL FOR ACOUSTICAL TILE CEILING INSTALLATIONS.
3. PROVIDE 22.5" DEFLECTION IN HORIZONTAL AND VERTICAL DIRECTIONS UNLESS OTHERWISE NOTED.
4. PROVIDE FOIL FACE INTERNALLY INSULATED PLENUM.
5. PROVIDE THROW REDUCING VANES.
6. PROVIDE COMPLETE WITH INTEGRAL OPPOSED BLADE DAMPER OPERABLE FROM FACE.

ELECTRIC CABINET UNIT HEATER SCHEDULE															
UNIT TAG	AREA SERVED	ELECTRICAL CHARACTERISTICS					ELECTRIC RESISTANCE HEATING COIL				WEIGHT LBS.	BASIS OF DESIGN MANUFACTURER AND MODEL NO.			
		CFM	HP	VOLTS	PHASE	HZ	FLA	CAPACITY BTU/H	ENT AIR °F	LVG AIR °F			KW	MAXIMUM DIMENSIONS LxWxH, IN.	
CUH-1	VISITOR'S ENTRANCE	140	500	1/8	208	3	60	12	13,652	60.0	97.9	4	45x10x27	160	MARLEY CU-945
CUH-2	STUDENT VESTIBULE	139	500	1/8	208	3	60	12	13,652	60.0	97.9	4	45x10x27	160	MARLEY CU-945
CUH-3	VESTIBULE	152	500	1/8	208	3	60	12	13,652	60.0	97.9	4	45x10x27	160	MARLEY CU-945

PROVIDE ALL UNITS COMPLETE WITH UNIT MOUNTED DISCONNECT SWITCH, 1" THROWAWAY FILTERS.
PROVIDE ALL UNITS COMPLETE WITH FRONT INLET & OUTLET ARCHITECTURAL LOUVERED GRILLE AND RECESSED TRIM KIT.
PROVIDE ALL UNITS COMPLETE WITH REMOTE WALL MOUNTED BERKO SMART SERIES PLUS PROGRAMMABLE THERMOSTAT.

ELECTRIC BASEBOARD SCHEDULE										
UNIT TAG	AREA SERVED	ELECTRICAL CHARACTERISTICS						ELEMENT LENGTH FT	MAXIMUM DIMENSIONS LxHx, IN.	BASIS OF DESIGN MANUFACTURER AND MODEL NO.
		CAPACITY BTU/H	KW	VOLTS	PHASE	HZ	FLA			
FT-42	NURSE 138	5,973	1.75	208	1	60	8.4	7	96x5x7	STERLING LBT-7250
FT-43	NURSE 138	5,973	1.75	208	1	60	8.4	7	96x5x7	STERLING LBT-7250

PROVIDE ALL UNITS COMPLETE WITH 6" CONTROL SECTION WITH BUILT-IN DOUBLE-POLE DISCONNECT SWITCH & INTEGRAL SINGLE POLE THERMOSTAT.
PROVIDE ALL UNITS COMPLETE WITH BLANK SECTIONS AND END CAPS AS REQUIRED FOR WALL TO WALL INSTALLATION. FIELD COORDINATE EXACT LENGTH.

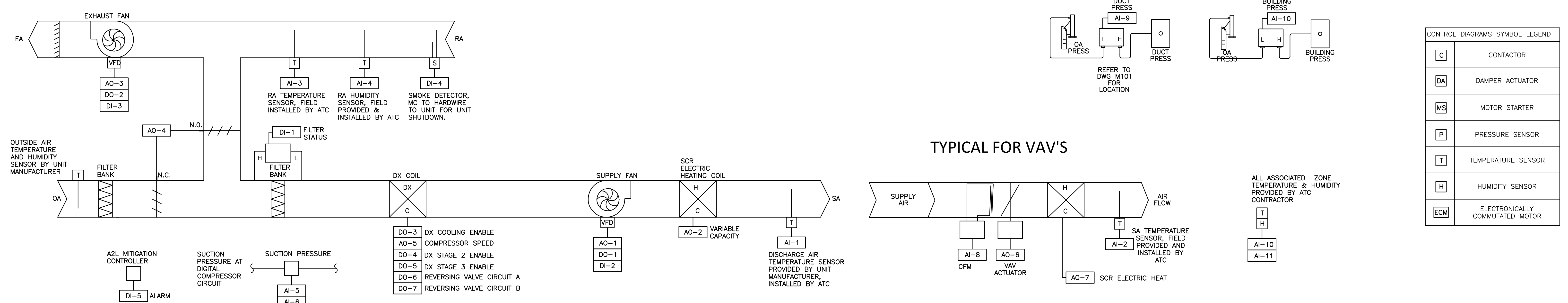
EXHAUST FAN SCHEDULE																
UNIT TAG	LOCATION	SERVICE	CFM	ESP. IN. WC.	FAN RPM	INPUT (BHP) (WATTS)	NOMINAL MOTOR (WATTS)	INLET SONES	DRIVE/DIRECT/V-BELT	ELECTRICAL CHARACTERISTICS			MAXIMUM DIMENSIONS L x W x H, IN.	WEIGHT LBS.	BASIS OF DESIGN MANUFACTURER AND MODEL NO.	REMARKS
										VOLTS	PHASE	CYCLE				
EF-1	ROOF	TOILET ROOMS	1075	0.5	1047	0.17	1/4	7.1	DIRECT	120	1	60	29"x29"H	75	COOK 135C17D (V#)	1
EF-2	CEILING	ART STG 153A	250	0.35	1302	(90)	(90)	3.0	DIRECT	120	1	60	17x12x12	30	COOK GEMINI GC-542	2, 3, 4
EF-3	CEILING	JAN 144	75	0.25	754	(32)	(32)	0.9	DIRECT	120	1	60	16x16x9	15	COOK GEMINI GC-148	2, 3
EF-4	CEILING	IHRU-1 EXHAUST	40	0.3	1131	0.02	1/6	3.6	BELT	120	1	60	22x31x19	140	COOK TGN-B	5

1. PROVIDE UNIT COMPLETE WITH 18" ROOF CURB W/ HINGED BASE & DAMPER TRAY, BACKDRAFT DAMPER, UNIT MOUNTED DISCONNECT SWITCH, EC MOTOR W/ MOUNTED SPEED DIAL.
2. PROVIDE UNIT COMPLETE WITH UNIT MOUNTED DISCONNECT SWITCH & MOTOR MOUNTED SPEED DIAL.
3. PROVIDE UNIT WITH BACKDRAFT DAMPERS, AND HANGER VIBRATION ISOLATION KIT.
4. PROVIDE ALUMINUM WALL CAP COOK WCA-2.
5. PROVIDE UNIT COMPLETE WITH STARTER/DISCONNECT, AMCA A SPARK RESISTANT CONSTRUCTION. BELT GUARD, SPARE BELT AND BOLTED ACCESS DOOR.

GRAVITY RELIEF SCHEDULE										
GRV NO.	LOCATION	AREA SERVED	CFM	S.P. °WC	THROAT OPENING SIZE (IN.)	TYPE	REMARKS	MAXIMUM DIMENSIONS, IN. LxWxH	WEIGHT (LBS)	BASIS OF DESIGN MANUFACTURER AND MODEL NO.
GRV-1	ROOF	GYMNASIUM 166	1200	0.01	12x48	GRAVITY ROOF	W/ B/D	60x28x11	200	COOK GR
GRV-2	ROOF	GYMNASIUM 166	1200	0.01	12x48	GRAVITY ROOF	W/ B/D	60x28x11	200	COOK GR
GRV-3	ROOF	JAN 144	75	0.02	8	GRAVITY ROOF	W/ B/D	19x13x8	30	COOK PR-8

PROVIDE ALL UNITS COMPLETE W/ 18" ROOF CURB, W/ DAMPER TRAY & BACK DRAFT DAMPER.

Δ	DATE	ISSUED FOR
	2025-11-26	DESIGN DEVELOPMENT
	2026-06-11	95% CD ISSUE
	2026-10-05	BID ISSUE



RTU-I SEQUENCE OF OPERATION:

UNIT HAS FACTORY INSTALLED AND WIRED CONTROLLER TO CONTROL ALL FUNCTIONS OF THE UNIT WITH FACTORY INSTALLED BACNET COMMUNICATIONS INTERFACE FOR BMS TO MONITOR, CONTROL AND DISPLAY UNIT STATUS, SETPOINTS AND ALARMS. CONTROLLER SHALL BE FULLY PROGRAMMED PER THE SEQUENCE OF OPERATION BELOW. PROVIDE BACNET INTEGRATION FOR SUPERVISORY CONTROL INTO THE THE NEW BMS BY THE ATC CONTRACTOR.

THE ATC CONTRACTOR SHALL INSTALL THE DISCHARGE AIR TEMPERATURE SENSOR FURNISHED BY THE UNIT MANUFACTURER, PROVIDE COMPLETE INDIVIDUAL UNIT SCHEDULING FUNCTION THROUGH BUILDING SUPERVISORY CONTROLLER. THE BAS WILL EARLY START THE UNIT TO ACHIEVE SPACE TEMPERATURE SETPOINT FOR OCCUPANCY. THE OPERATOR WILL BE ABLE TO ADJUST THE UNIT START/STOP USING THE OPERATOR'S WORKSTATION PROVIDE COMPLETE INDIVIDUAL UNIT SCHEDULING FUNCTION THROUGH BUILDING SUPERVISORY CONTROLLER. THE BAS WILL EARLY START THE UNIT TO ACHIEVE SPACE TEMPERATURE SETPOINT FOR OCCUPANCY. THE OPERATOR WILL BE ABLE TO ADJUST THE UNIT START/STOP USING THE OPERATOR'S WORKSTATION.

A. PROVIDE COMPLETE INDIVIDUAL UNIT SCHEDULING FUNCTION THROUGH BUILDING SUPERVISORY CONTROLLER. THE BAS WILL EARLY START THE UNIT TO ACHIEVE SPACE TEMPERATURE SETPOINT FOR OCCUPANCY. THE OPERATOR WILL BE ABLE TO ADJUST THE UNIT START/STOP USING THE OPERATOR'S WORKSTATION PROVIDE COMPLETE INDIVIDUAL UNIT SCHEDULING FUNCTION THROUGH BUILDING SUPERVISORY CONTROLLER. THE BAS WILL EARLY START THE UNIT TO ACHIEVE SPACE TEMPERATURE SETPOINT FOR OCCUPANCY. THE OPERATOR WILL BE ABLE TO ADJUST THE UNIT START/STOP USING THE OPERATOR'S WORKSTATION.

B. THE ATC CONTRACTOR SHALL INSTALL MANUFACTURER PROVIDED DUCT MOUNTED PRESSURE SENSOR, RETURN AIR TEMPERATURE/HUMIDITY SENSOR AND DISCHARGE AIR TEMPERATURE SENSOR FOR FULL UNIT CONTROL.

C. MORNING WARM-UP: ON OCCUPIED DAYS THE SYSTEM WILL INITIATE MORNING WARM-UP CYCLE 1/2 HOUR BEFORE SCHEDULED OCCUPANCY. THE PROCESS WILL INITIATE SUPPLY FAN AND ENABLE GAS HEAT WITH OUTSIDE AIR DAMPER CLOSED.

D. OCCUPIED MODE: THE ATC SYSTEM SHALL INDEX THE SUPPLY FAN ON TO RUN CONTINUOUSLY WHILE IN OCCUPIED MODE WITH VAV OPERATION. THE OPERATOR WILL BE ABLE TO ADJUST THE UNIT START/STOP TIMES USING THE OPERATOR'S WORKSTATION. THE BAS WILL MONITOR THE STATUS OF THE FAN AND GENERATE AN ALARM IF THE FAN FAILS TO A START/STOP COMMAND. VFD DRIVE SHALL BE CONTROLLED THROUGH THE UNIT CONTROLLER. THE CONTROLLER SHALL MODULATE THE VFD TO MATCH SUPPLY DUCT PRESSURE. PROVIDE NEW DUCT PRESSURE SENSOR LOCATED 2/3RDS DOWN THE SUPPLY DUCT MAIN AT LOCATION SHOWN ON PLANS. ON A FALL IN DISCHARGE AIR STATIC PRESSURE BELOW SETPOINT (T.W.C., ADJUSTABLE), THE SUPPLY FAN SPEED WILL BE INCREASED. ON A RISE IN THE DISCHARGE AIR STATIC PRESSURE ABOVE SETPOINT, THE REVERSE WILL OCCUR.

E. OCCUPANCY OVERRIDE: THE VAV SPACE TEMPERATURE SENSORS WILL HAVE A PUSHBUTTON WHEN PRESSED DURING THE UNOCCUPIED MODE, WILL INDEX THE RTU TO AN OCCUPIED MODE FOR A PERIOD OF 2-HOURS (ADJUSTABLE).

F. UNOCCUPIED MODE: WHEN THE UNIT IS SHUT DOWN BY EITHER A STOP COMMAND OR SYSTEM SAFETY THE UNIT WILL BE SET AS FOLLOWS: SUPPLY FAN WILL BE OFF, OUTDOOR AIR DAMPER CLOSED, RETURN AIR DAMPER OPEN, DX COOLING OFF, THE BAS SHALL POLL ALL ZONE SPACE TEMPERATURES ASSOCIATED WITH THE RTU, THE UNIT SHALL CYCLE IF ANY ZONE TEMPERATURE FALLS BELOW THE UNOCCUPIED SETPOINT IN HEATING MODE (ADJ.) AND ABOVE UNOCCUPIED COOLING MODE (ADJ.) WITH OUTSIDE AIR DAMPER CLOSED. THE UNIT WILL DE-ENERGIZE WHEN THE SPACE TEMPERATURE IS AT LEAST 4 DEGREE F ABOVE THE UNOCCUPIED HEATING SETPOINT.

G. O/A DAMPER: DAMPER SHALL OPEN UPON UNIT ENABLE AND CLOSE UPON UNIT DISABLE. 0-100% DAMPER OPERATION: OCCUPIED PERIODS: OPEN TO A FIXED MINIMUM INTAKE, AND MAXIMUM 100 PERCENT OF THE FAN CAPACITY. CONTROLLER SHALL PERMIT AIR-SIDE ECONOMIZER OPERATION WHEN OUTDOOR AIR IS LESS THAN 60 DEG F. USE MIXED-AIR TEMPERATURE AND SELECT BETWEEN OUTDOOR-AIR AND RETURN-AIR ENTHALPY TO ADJUST MIXING DAMPERS. DURING ECONOMIZER CYCLE OPERATION, MECHANICAL COOLING SHALL BE AVAILABLE TO AID THE ECONOMIZER MODE.

H. BUILDING PRESSURE CONTROL: WHENEVER THE BUILDING PRESSURE RISES ABOVE THE BUILDING PRESSURE SETPOINT BY THE DEADBAND AMOUNT, THE EXHAUST FAN RELAY WILL ENERGIZE AND THE MODULATING SIGNAL WILL ACTIVATE TO CONTROL TO THE BUILDING PRESSURE SETPOINT. IF THE BUILDING PRESSURE FALLS BELOW THE BUILDING PRESSURE SETPOINT BY THE DEADBAND AMOUNT, THE MODULATING SIGNAL WILL MODULATE TOWARDS 0% AS IT ATTEMPTS TO MAINTAIN THE BUILDING PRESSURE SETPOINT. THE EXHAUST FAN RELAY IS ENERGIZED WHENEVER THE MODULATING SIGNAL IS ABOVE 0%, THE EXHAUST FAN SHALL HAVE AN ADJUSTABLE MINIMUM SPEED SETPOINT IN OCCUPIED MODE TO MAINTAIN AIRFLOW.

I. DX COOLING: MODULATION OF COOLING SHALL BE CONFIGURED SUBJECT TO USER ADJUSTABLE MINIMUM RUN TIMES, MINIMUM OFF TIMES, MODULATING UP AND MODULATING DOWN DELAYS.

1. COOLING IS ENABLED WHEN THE TEMPERATURE AT THE MODE ENABLE DISCHARGE AIR SENSOR RISES ONE DEGREE DEADBAND ABOVE THE COOLING SETPOINT. COOLING IS DISABLED WHEN THE MODE ENABLE TEMPERATURE FALLS ONE DEGREE DEAD BAND BELOW THE COOLING SETPOINT.

RTU-I SEQUENCE OF OPERATION (CONT'D):

- DISCHARGE AIR TEMPERATURE RESET: THE DISCHARGE TARGET TEMPERATURE SHALL BE RESET BASED ON THE VAV'S ZONE AIR TEMPERATURE BY INCREASING OR DECREASING DISCHARGE TEMPERATURE BETWEEN A MINIMUM OF 55F (ADJ.) AND MAXIMUM OF 65F (ADJ.).
- THE BAS SHALL POLL SPACE TEMPERATURES ON ALL ZONE VAV BOXES ON THE ASSOCIATED RTU SYSTEM AND DETERMINE THE ZONE THAT IS FURTHEST TO THE HEATING SETPOINT. THE DISCHARGE AIR TEMPERATURE SHALL RISE IN 1 DEGREE INCREMENTS UP TO THE MAXIMUM DISCHARGE AIR TEMPERATURE TO LIMIT THE CRITICAL ZONE FROM REQUIRING REHEAT. THE BAS SHALL LOWER THE DISCHARGE AIR TEMPERATURE IN 1 DEGREE INCREMENTS WHEN ANY ZONE RISES 1 DEGREE ABOVE COOLING SETPOINT. THE CRITICAL ZONE COOLING SETPOINT SHALL TAKE PRIORITY.
- ONCE IN THE COOLING MODE THE UNIT WILL MAINTAIN THE SUPPLY AIR TEMPERATURE AT THE ACTIVE SUPPLY AIR COOLING SETPOINT BY MODULATING THE DIGITAL COMPRESSOR (1.5 - 5.0 VDC OPERATION). A COOLING RELAY MUST BE CONFIGURED.
- THE DIGITAL COMPRESSOR CONTINUES TO MODULATE DURING THE ENTIRE COOLING OPERATION.
- IF ADDITIONAL COOLING IS REQUIRED, FIXED COMPRESSOR STAGES SHALL BE STAGED ON WHILE THE DIGITAL COMPRESSOR CONTINUES TO MODULATE. TO STAGE UP THE EXTRA COMPRESSORS, THE SUPPLY AIR TEMPERATURE NEEDS TO BE ABOVE THE ACTIVE SUPPLY AIR SETPOINT AND THE DIGITAL COMPRESSOR NEEDS TO BE AT 100% FOR A PERIOD OF TIME EQUAL TO THE STAGE UP DELAY. TO STAGE DOWN THE EXTRA COMPRESSORS, THE SUPPLY AIR TEMPERATURE NEEDS TO BE BELOW THE ACTIVE SUPPLY AIR SETPOINT AND THE DIGITAL COMPRESSOR NEEDS TO BE AT 0% FOR A PERIOD OF TIME EQUAL TO THE STAGING DOWN DELAY.
- IF THE ECONOMIZER IS ENABLED IT WILL FUNCTION AS THE FIRST STAGE OF COOLING.
- HEATING DEMAND: HEATING DEMAND: ON A FALL IN DISCHARGE AIR TEMPERATURE BELOW THE HEATING SETPOINT (ADJ.), THE FIRST STAGE OF HEATING SHALL BE ACTIVATED. THE UNIT CONTROLLER SHALL ACTIVATE THE REVERSING VALVE AND MODULATE THE COMPRESSOR TO MAINTAIN THE UNIT DISCHARGE TARGET TEMPERATURE. THE SECOND STAGE OF HEATING WILL ONLY BE ENERGIZED UPON A FURTHER DROP BELOW SETPOINT AND WHEN THE FIRST STAGE OF HEATING HAS BEEN ON LONGER THAN A PRESET TIME PERIOD. THE SCR ELECTRIC HEAT SHALL MODULATE TO MAINTAIN THE UNIT DISCHARGE TARGET SETPOINT (ADJUSTABLE). ON A RISE IN THE SPACE TEMPERATURE ABOVE THE UNOCCUPIED HEATING SETPOINT, THE UNOCCUPIED HEATING SETPOINT DEADBAND OF 3F (63F RESPECTIVELY), THE ASSOCIATED EXHAUST FAN WILL BE OFF.
- DISCHARGE AIR TEMPERATURE RESET: THE DISCHARGE TARGET TEMPERATURE SHALL BE RESET BASED ON THE VAV'S ZONE AIR TEMPERATURE BY INCREASING OR DECREASING DISCHARGE TEMPERATURE BETWEEN A MINIMUM OF 55F (ADJ.) AND MAXIMUM OF 65F (ADJ.).
- THE BAS SHALL POLL SPACE TEMPERATURES ON ALL ASSOCIATED ZONE VAV BOXES ON THE RTU SYSTEM AND DETERMINE THE ZONE THAT IS FURTHEST TO THE HEATING SETPOINT. THE DISCHARGE AIR TEMPERATURE SHALL RISE IN 1 DEGREE INCREMENTS UP TO THE MAXIMUM DISCHARGE AIR TEMPERATURE TO LIMIT THE CRITICAL ZONE FROM REQUIRING REHEAT. THE BAS SHALL LOWER THE DISCHARGE AIR TEMPERATURE IN 1 DEGREE INCREMENTS WHEN ANY ZONE RISES 1 DEGREE ABOVE COOLING SETPOINT. THE CRITICAL ZONE COOLING SETPOINT SHALL TAKE PRIORITY.
- SAFETIES:
 - THE BAS WILL MONITOR THE DISCHARGE AIR TEMPERATURE AND SHUT DOWN THE UNIT AND GENERATE AN ALARM IF IT FALLS BELOW 40 DEGREES F (ADJ.). THE SHUTDOWN WILL REQUIRE A MANUAL RESET AT THE OPERATOR WORKSTATION.
 - DUCT SMOKE DETECTOR: DUCT MOUNTED SMOKE DETECTORS AND SMOKE DAMPER DETECTORS SHALL BE INTEGRATED TO THE MICROPROCESSOR CONTROLLER AS FOLLOWS: THE ATC SHALL WIRE THE DUAL POLE DETECTOR TO THE UNIT CONTROLLER FOR SYSTEM SHUTDOWN AND ALARM AT FRONT END.
 - REFRIGERANT LEAK DETECTION: UPON LEAK DETECTION FROM INTEGRAL A2L REFRIGERANT SENSOR, MANUFACTURER PROVIDED CONTROLS SHALL CLOSE AUTOMATIC SHUTOFF VALVES AND ENABLE INDOOR FAN. AN EXTERNAL SIGNAL SHALL BE SENT TO THE BAS. THE ASSOCIATED DOAS-1 SHALL BE PROGRAMMED TO ENABLE IN OCCUPIED MODE BY THE ATC CONTRACTOR. THE IRR EXHAUST FAN EF-4 SHALL BE ENABLED TO RUN.

D. DISPLAY THE FOLLOWING INFORMATION:

- ROOM #
- OCCUPANCY MODE
- ZONE TEMPERATURE & SETPOINT
- ZONE TEMPERATURE ALARM
- UNIT ON/OFF
- FAN SPEED
- A2L REFRIGERANT LEAK ALARM
- FULL GRAPHICAL REPRESENTATION OF UNIT AND ALL ASSOCIATED POINTS.

VAV WITH ELECTRIC REHEAT SEQUENCE OF OPERATIONS:

- A. ELECTRIC VARIABLE AIR VOLUME BOX: ATC REQUIREMENTS INCLUDE A NEW DDC CONTROL SYSTEM THAT INCLUDE A CONTROLLER. THE ATC CONTRACTOR SHALL FURNISH THE UNIT CONTROLLER TO VAV MANUFACTURER FOR FACTORY MOUNTING. THESE UNITS SHALL BE CONNECTED TO THE BUILDING WIDE COMMUNICATION CABLEING (BUS) AND SHALL INTEGRATE ALL POINTS BACK TO NEW SUPERVISORY CONTROLLER. MOUNT NEW CONTROLLER IN VAV CONTROL ENCLOSURE AND PROVIDE 480V/24V TRANSFORMER FOR POWER.
- B. THE VAV BOX MANUFACTURER WILL PROVIDE THE BOX COMPLETE WITH A CROSS AIRFLOW SENSOR AND WILL MOUNT THE ZONE DDC CONTROLLER AT THEIR FACTORY. PROVIDE SPACE MOUNTED TEMPERATURE SENSOR FOR FULL UNIT CONTROL. WIRE SENSOR BACK TO UNIT FOR FULL INTERGRATION. SENSORS SHALL HAVE OCCUPANCY OVERRIDE BUTTON SET FOR 1 HR INCREMENTS. THIS BUTTON WILL ENABLE THE "OCCUPIED CYCLE" FOR THAT TIME PERIOD.
- C. AIRFLOW SETPOINTS: PROVIDE OPERATOR DEFINABLE, INDEPENDENT HEATING AND COOLING AIRFLOW SETPOINTS, FOR EACH OPERATING MODE.
- D. THE SENSORS WILL BE MOUNTED AT 48" A.F.F. COORDINATED WITH THE ARCHITECTURAL PLANS OR AS DESIGNATED ON THE MECHANICAL DRAWINGS.
- E. PROVIDE SPACE TEMPERATURE SENSORS WITH NO TEMPERATURE DISPLAY AND LOCAL TEMPERATURE OVERRIDE WITH +/-1 DEG F. SPACE TEMPERATURE SENSORS NOT LOCATED IN CORRIDOR AREAS WILL HAVE A LOCAL OCCUPANCY OVERRIDE BUTTON. WHEN THE USER DEPRESSES THE OCCUPANCY OVERRIDE BUTTON, THE LED WILL LIGHT AND THE VAV SYSTEM WILL BE INDEXED INTO THE OCCUPIED MODE OF OPERATION FOR UP TO 3 HOURS. A FURTHER DEPRESSION OF THE OVERRIDE BUTTON WILL ALLOW THE USER TO CANCEL THE OCCUPANCY OVERRIDE. UPON THE EXPIRATION OF THE OVERRIDE, THE VAV SYSTEM WILL BE PLACED INTO ITS SCHEDULED MODE OF OPERATION. TEMPERATURE SETPOINTS SHALL BE ADJUSTABLE FROM THE DDC CONTROL SYSTEM INITIALLY SET AT 72F (ADJ.) FOR HEATING AND 75F (ADJ.) FOR COOLING. TEMPERATURE ADJUSTMENT SHALL BE LOCKED OUT AT THE THERMOSTAT. A COMMUNICATIONS PORT LOCATED ON THE SPACE TEMPERATURE SENSOR WILL ENABLE THE OPERATOR WITH A HAND-HELD DEVICE THE ABILITY TO ACCESS ANY POINT IN THE BUILDING MANAGEMENT SYSTEM.
- F. UNOCCUPIED COOLING MODE: THE VARIABLE AIR VOLUME BOX COOLING SETPOINT IS RESET UPWARD TO THE UNOCCUPIED COOLING SETPOINT. THE ELECTRIC REHEAT DISABLED. IF THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED COOLING TEMPERATURE SETPOINT OF 82F, THE ASSOCIATED AIR HANDLING UNIT WILL CYCLE ON AND THE VARIABLE AIR VOLUME BOX WILL MAINTAIN THE COOLING AIR FLOW SETPOINT TO REDUCE THE SPACE TEMPERATURE BELOW THE UNOCCUPIED COOLING TEMPERATURE SETPOINT DEADBAND OF 3F (78F RESPECTIVELY).
- G. UNOCCUPIED HEATING MODE: THE VARIABLE AIR VOLUME BOX HEATING SETPOINT IS RESET DOWNWARD TO THE UNOCCUPIED HEATING SETPOINT. THE ROOM TEMPERATURE SENSOR WILL MODULATE THE SCR ELECTRIC REHEAT TO MAINTAIN THE SPACE TEMPERATURE ABOVE THE UNOCCUPIED HEATING TEMPERATURE SETPOINT OF 60F (ADJ.). IF THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED HEATING TEMPERATURE SETPOINT OF 60F, THE ASSOCIATED AIR HANDLING UNIT WILL CYCLE ON AND THE VARIABLE AIR VOLUME BOX WILL MAINTAIN THE HEATING AIR FLOW SETPOINT TO RAISE THE SPACE TEMPERATURE ABOVE THE UNOCCUPIED HEATING TEMPERATURE SETPOINT DEADBAND OF 3F (63F RESPECTIVELY). THE ASSOCIATED EXHAUST FAN WILL BE OFF.
- H. MORNING WARM-UP: ON A SIGNAL FROM THE ROOF TOP UNIT BACNET CONTROLLER THE ZONE CONTROLLER WILL DISABLE THE ELECTRIC REHEAT AND REVERSE THE OPERATION OF THE VARIABLE AIR VOLUME BOX AIR DAMPER FOR WARM-UP MODE WITH DAMPER IN FULL OPEN POSITION. ONCE THE WARM-UP MODE IS COMPLETE THE VARIABLE AIR VOLUME BOX WILL REVERT BACK TO NORMAL OPERATION.
- I. OPTIMAL START MODE: THE ZONE WILL CALCULATE HOW LONG IT WILL TAKE TO RETURN FROM ITS UNOCCUPIED STATE TO ITS OCCUPIED SETPOINT BASED ON THE HEATING OR COOLING CAPACITY AND THE OUTSIDE AIR TEMPERATURE. THE SYSTEM WILL NOT START MORE THAN 2 HOURS BEFORE A SCHEDULED OCCUPANCY.
- J. OCCUPIED COOLING MODE: THE SPACE TEMPERATURE SENSOR WILL THROUGH THE ZONE CONTROLLER, PROPORTIONATELY POSITION THE VARIABLE AIR VOLUME BOX AIR DAMPER TO MAINTAIN THE OCCUPIED SPACE TEMPERATURE COOLING SETPOINT. IF THE SPACE TEMPERATURE RISES ABOVE THE OCCUPIED SPACE TEMPERATURE COOLING SETPOINT, THE CONTROLLER WILL MODULATE THE VARIABLE AIR VOLUME BOX AIR DAMPER OPEN UNTIL THE SPACE TEMPERATURE FALLS TO THE OCCUPIED SPACE COOLING SETPOINT OR THE BOX REACHES ITS MAXIMUM AIRFLOW LIMIT.
- K. OCCUPIED HEAT OPERATION: THE SPACE TEMPERATURE SENSOR WILL THROUGH THE ZONE CONTROLLER, PROPORTIONATELY POSITION THE PRIMARY AIR DAMPER AND MODULATE SCR HEATING COIL TO MAINTAIN THE OCCUPIED SPACE TEMPERATURE HEATING SETPOINT. IF THE SPACE TEMPERATURE FALLS BELOW THE OCCUPIED SPACE TEMPERATURE HEATING SETPOINT, THE CONTROLLER WILL MODULATE THE PRIMARY AIR DAMPER CLOSED TO MINIMUM POSITION UNTIL THE SPACE TEMPERATURE RISES TO THE OCCUPIED SPACE HEATING SETPOINT OR THE BOX CLOSSES TO ITS MINIMUM AIRFLOW LIMIT. IF THE SPACE TEMPERATURE CONTINUES TO FALL BELOW THE OCCUPIED SPACE TEMPERATURE SETPOINT, THE CONTROLLER WILL INTERLUDE THE ELECTRIC REHEAT COIL AND OPEN THE PRIMARY AIR DAMPER TO THE REHEAT AIRFLOW POSITION SETPOINT TO MAINTAIN THE OCCUPIED SPACE TEMPERATURE HEATING SETPOINT. THE CONTROLLER SHALL PREVENT THE DISCHARGE AIR TEMPERATURE FROM EXCEEDING 90F (ADJ.).
- L. DUCT MOUNTED DISCHARGE AIR TEMPERATURE SENSOR WILL PROVIDE MONITORING AND CONTROL OF THE REHEAT COIL OPERATION.

ALARMS:

- THE ZONE WILL GENERATE AN ALARM IF THE SPACE TEMPERATURE REMAINS 4°F HIGHER THAN ITS COOLING SETPOINT OR 4°F LOWER THAN ITS HEATING SETPOINT FOR 5 MINUTES. THIS ALARM WILL NOT BE ENABLED UNTIL THE ZONE HAS BEEN RUNNING FOR 30 MINUTES.
- THE ZONE WILL GENERATE AN ALARM IF THE DISCHARGE AIR TEMPERATURE EXCEEDS THE HIGH TEMPERATURE ALARM LIMIT 110°F OR DROPS BELOW THE LOW TEMPERATURE ALARM LIMIT 45°F.
- ZONE HIGH TEMPERATURE ALARM
- ZONE LOW TEMPERATURE ALARM
- COMMUNICATION STATUS ALARM
- SUPPLY AIR TEMPERATURE LOW ALARM

ALARM NOTIFICATION: THE ZONE WILL INDICATE AN ALARM CONDITION BY SHOWING RED ON THE GRAPHIC DISPLAY AND WILL NOTIFY THE USER WITH A PRINTOUT, E-MAIL, SOUNDS, OR OTHER REPORTING ACTIONS, DEPENDING ON USER CONFIGURATION.

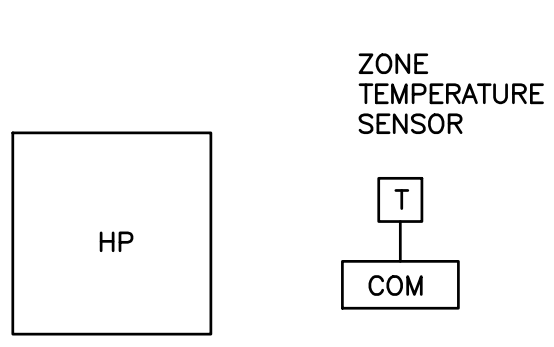
DISPLAY THE FOLLOWING VAV INFORMATION:

- INDIVIDUAL VAV OCCUPANCY STATUS & OVERRIDE
- INDIVIDUAL VAV COMMUNICATION STATUS
- INDIVIDUAL VAV DAMPER POSITION
- INDIVIDUAL VAV MAXIMUM CFM SETPOINT AND OVERRIDE
- INDIVIDUAL VAV MINIMUM CFM SETPOINT AND OVERRIDE
- INDIVIDUAL VAV CFM
- RTU SUPPLY TEMPERATURE
- INDIVIDUAL VAV DISCHARGE AIR TEMPERATURE & HIGH LIMIT SETPOINT.
- INDIVIDUAL VAV ROOM TEMPERATURE
- INDIVIDUAL VAV ROOM TEMPERATURE HEATING & COOLING SET POINT.
- INDIVIDUAL VAV ROOM TEMPERATURE HEATING & COOLING SET POINT OVERRIDE.
- INDIVIDUAL VAV SCR HEATING COIL COMMAND AND OVERRIDE
- FULL GRAPHICAL REPRESENTATION OF UNIT AND ALL ASSOCIATED POINTS.

ROOFTOP UNIT POINTS LIST											
POINT TAG	POINT DESCRIPTION	INPUTS				OUTPUTS				REMARKS	
		SAFETY SHUT DOWN	DIGITAL	ANALOG		DIGITAL	ANALOG				
DI-1	FILTER STATUS										
DO-1	SUPPLY FAN ENABLE		X								
DI-2	SUPPLY FAN STATUS		X							X	
AO-1	SUPPLY FAN SPEED							X			
AO-2	SCR ELECTRIC HEATER							X			
AI-1	SUPPLY AIR TEMPERATURE			X					X		
DO-2	SUPPLY FAN ENABLE						X				
DI-3	SUPPLY FAN STATUS		X							X	
AO-3	SUPPLY FAN SPEED							X			
AO-4	ECONOMIZER							X			
DO-3	DX COOLING ENABLE							X			
AO-5	COMPRESSOR SPEED								X		
DO-4	DX STAGE 2 ENABLE							X			
DO-5	DX STAGE 3 ENABLE							X			
DO-6	REVERSING VALVE CIRCUIT A							X			
DO-7	REVERSING VALVE CIRCUIT B							X			
AI-2	VAV SUPPLY AIR TEMPERATURE			X							
AI-3	RETURN AIR TEMPERATURE			X							
AI-4	RETURN AIR HUMIDITY				X						
DI-4	RETURN AIR SMOKE DETECTOR	X	X							X	
AI-5	SUCTION PRESSURE 1			X							
AI-6	SUCTION PRESSURE 2			X							
COM	CRITICAL ZONE TEMPERATURE			X						X	
AI-7	VAV SUPPLY AIR TEMPERATURE			X							
AO-6	VAV ACTUATOR							X			
AI-8	VAV CFM					X					
AI-9	DUCT PRESSURE		X								
AI-10	ZONE TEMPERATURE				X						
AI-11	ZONE HUMIDITY			X							
AO-7	VAV REHEAT COIL							X			
DI-5	A2L ALARM	X								X	

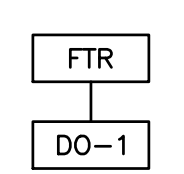
RTU-I CONTROLS

NO SCALE



VRF SEQUENCE OF OPERATION:

- A. VRF SYSTEM SHALL BE OPERATED BY MANUFACTURER CONTROLS. THE CONTROLLER SHALL INDEX THE INDOOR UNIT SUPPLY FAN TO RUN CONTINUOUSLY WHILE IN OCCUPIED MODE. ALL NEW UNITS SHALL BE INTEGRATED INTO THE OPERATOR'S WORKSTATION UTILIZING THE BACNET INTERFACE PROVIDED BY THE UNIT MANUFACTURER. ZONE THERMOSTATS SHALL BE PROGRAMMED TO NOT DISPLAY INDOOR TEMPERATURE.
- B. THE INTEGRAL CONDENSATE PUMP SAFETY SWITCH ON SPLIT SYSTEM HP UNITS SHALL BE WIRED TO ASSOCIATED UNIT. UPON CONDENSATE PUMP FAILURE VAV PUMP SAFETY SWITCH, UNIT SHALL BE DISABLED.
- C. VRF REFRIGERANT LEAK DETECTION: UPON LEAK DETECTION FROM INTEGRAL A2L REFRIGERANT SENSOR, MANUFACTURER PROVIDED CONTROLS SHALL CLOSE AUTOMATIC SHUTOFF VALVES AND ENABLE INDOOR FAN. AN EXTERNAL SIGNAL SHALL BE SENT TO THE BAS. THE ASSOCIATED DOAS-1 SHALL BE PROGRAMMED TO ENABLE IN OCCUPIED MODE BY THE ATC CONTRACTOR. THE IRR EXHAUST FAN EF-4 SHALL BE ENABLED TO RUN.
- D. DISPLAY THE FOLLOWING INFORMATION:
- ROOM #
 - OCCUPANCY MODE
 - ZONE TEMPERATURE & SETPOINT
 - ZONE TEMPERATURE ALARM
 - UNIT ON/OFF
 - FAN SPEED
 - A2L REFRIGERANT LEAK ALARM
 - FULL GRAPHICAL REPRESENTATION OF UNIT AND ALL ASSOCIATED POINTS.



FTR SEQUENCE OF OPERATION:

THE ELECTRIC FINNED TUBE RADIATION OPERATED BY MANUFACTURER CONTROLS. PROVIDE COMPLETE INDIVIDUAL UNIT SCHEDULING FUNCTION THROUGH THE BMS TO ENABLE BASED ON OCCUPANCY. PROVIDE RELAY INTERLOCK TO ENABLE THE FINNED TUBE WHENEVER THE OUTSIDE AIR TEMPERATURE IS 40 DEGREES F AND LOWER (ADJUSTABLE) AND IN OCCUPIED MODE.

VRF CONTROLS

NO SCALE

FTR CONTROLS

NO SCALE

NETWORK TREE

NO SCALE

ISSUE HISTORY

Δ	DATE	ISSUED FOR
	2025-11-26	DESIGN DEVELOPMENT
	2024-06-11	95% CD ISSUE
	2026-10-05	BD ISSUE

SHEET TITLE

MECHANICAL CONTROLS

DRAWING NUMBER

M401

PROJECT TEAM

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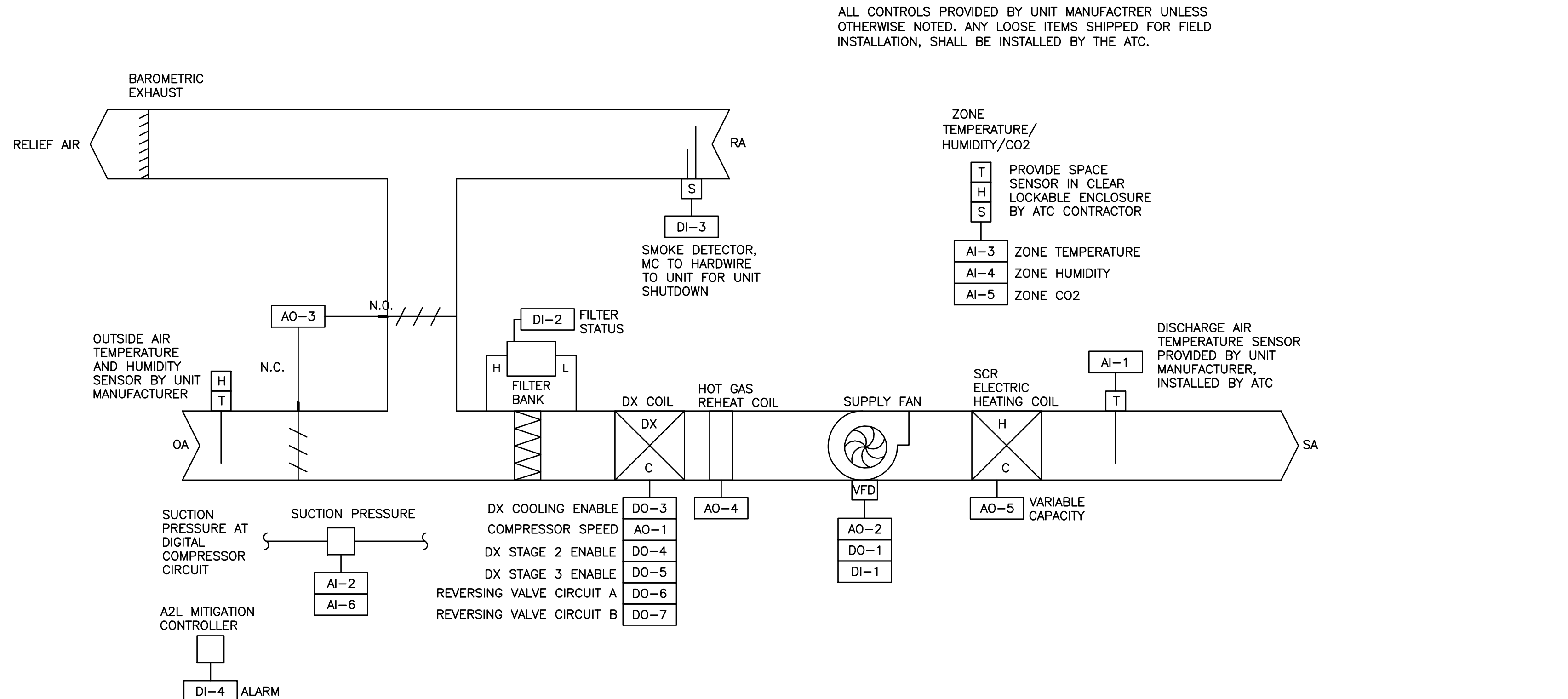
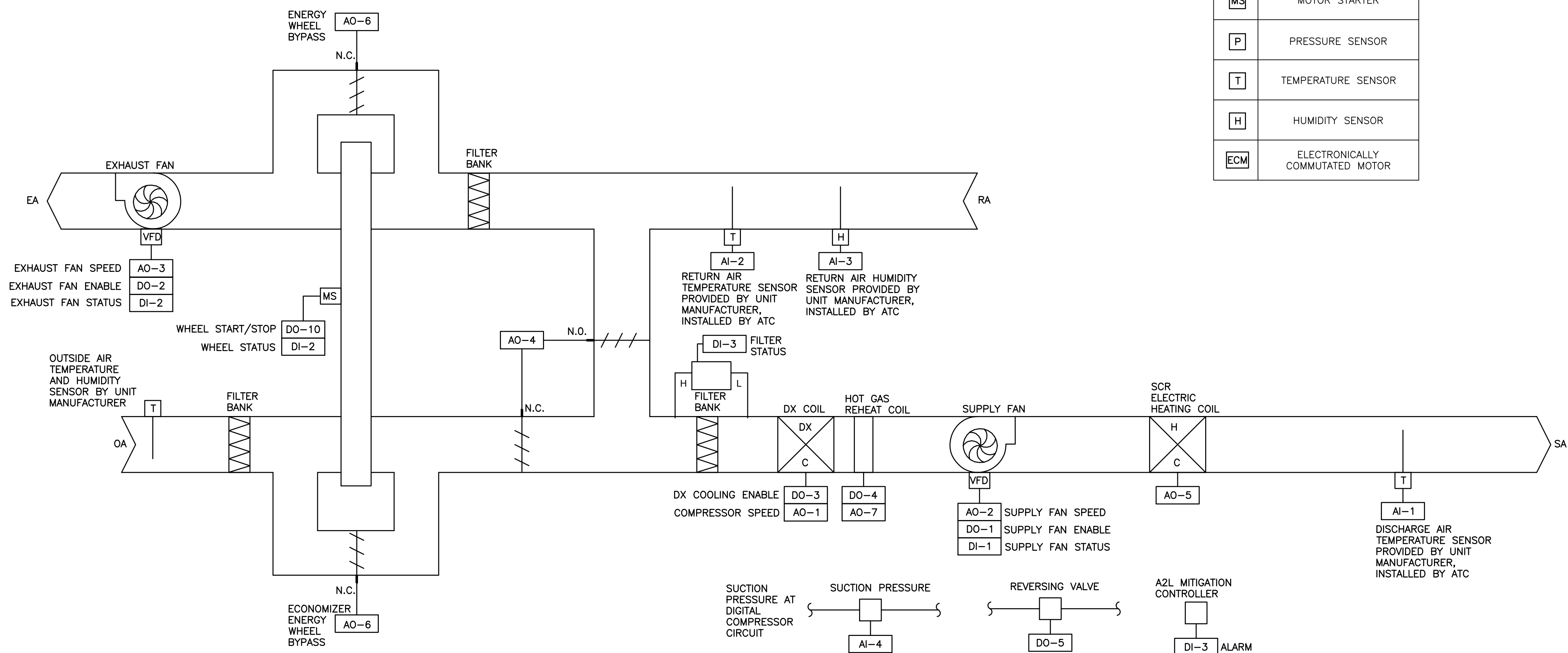
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CONTROL DIAGRAMS SYMBOL LEGEND	
C	CONTACTOR
DA	DAMPER ACTUATOR
MS	MOTOR STARTER
P	PRESSURE SENSOR
T	TEMPERATURE SENSOR
H	HUMIDITY SENSOR
ECM	ELECTRONICALLY COMMUTATED MOTOR



SEQUENCE OF OPERATION: RTU-2

UNIT HAS FACTORY INSTALLED AND WIRED CONTROLLER TO CONTROL ALL FUNCTIONS OF THE UNIT WITH FACTORY INSTALLED BACNET COMMUNICATIONS INTERFACE FOR BMS TO MONITOR, CONTROL AND DISPLAY UNIT STATUS, SETPOINTS AND ALARMS. CONTROLLER SHALL BE FULLY PROGRAMMED PER THE SEQUENCE OF OPERATION BELOW. PROVIDE BACNET INTEGRATION FOR SUPERVISORY CONTROL INTO THE NEW BMS BY THE ATC CONTRACTOR.

THE ATC CONTRACTOR SHALL INSTALL THE DISCHARGE AIR TEMPERATURE SENSOR FURNISHED BY THE UNIT MANUFACTURER. PROVIDE COMPLETE INDIVIDUAL UNIT SCHEDULING FUNCTION THROUGH BUILDING SUPERVISORY CONTROLLER. THE BAS WILL EARLY START THE UNIT TO ACHIEVE SPACE TEMPERATURE SETPOINT FOR OCCUPANCY. THE OPERATOR WILL BE ABLE TO ADJUST THE UNIT START/STOP USING THE OPERATORS WORKSTATION.

- SINGLE ZONE VAV:** THE UNIT SHALL BE CONFIGURED FOR SINGLE ZONE VAV OPERATION AND SHALL BE PROVIDED WITH VFD DRIVES. ZONE TEMPERATURE SHALL BE CONTROLLED VIA A SEQUENCED DAT RESET AND FAN SPEED CONTROL. THE UNIT CONTROLLER SHALL USE ZONE TEMPERATURE TO AUTOMATICALLY SELECT HEATING OR COOLING MODE. HEATING AND COOLING DEMAND SHALL BE CALCULATED THROUGH INDEPENDENT HEATING AND COOLING PID OUTPUTS. THESE PIDS SHALL HAVE INDIVIDUALLY ADJUSTABLE INTERVAL, BIAS, AND PROPORTIONAL, INTEGRAL AND, DERIVATIVE PARAMETERS CAREFULLY TUNED IN EACH APPLICATION FOR SLOW ACTION TO AVOID HUNTING OF FAN SPEED DRIVES. THE DISCHARGE AIR TEMPERATURE SHALL FIRST BE RESET DEPENDING ON ZONE HEATING OR COOLING DEMAND WITH FAN OPERATING AT MIN AIRFLOW/SPEED. THEN SUPPLY AIR FAN WILL MODULATE THROUGH ITS MIN AND MAX SPEED RANGE TO MAINTAIN THE ZONE TEMPERATURE SETPOINT AS DESCRIBED BELOW.
- OCCUPIED MODE:** SUPPLY FAN SHALL RUN CONTINUOUSLY WITH OA DAMPER IN ITS MINIMUM POSITION. THE UNIT CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE THE HEATING AND COOLING TO MAINTAIN ITS HEATING AND COOLING SPACE SETPOINT. THE OPERATOR WILL BE ABLE TO ADJUST THE UNIT START/STOP TIMES USING THE OPERATORS WORKSTATION. THE BAS WILL MONITOR THE STATUS OF THE FAN AND GENERATE AN ALARM IF THE FAN FAILS TO A START/STOP COMMAND. THE OUTDOOR AIR DAMPER SHALL HAVE PROPORTIONAL CONTROL WHICH SHALL MODULATE THE DAMPER PROPORTIONALLY WITH FAN SPEED TO MAINTAIN MINIMUM OUTSIDE AIRFLOW THROUGHOUT THE RANGE OF FAN AIRFLOW.
- DEMAND CONTROLLED VENTILATION:** UNIT SHALL HAVE ACTIVATE THE CO2 DEMAND CONTROL VENTILATION CYCLE. THIS CYCLE SHALL MODULATE THE OUTSIDE AIR DAMPER BETWEEN MINIMUM AND MAXIMUM SETPOINTS TO MAINTAIN A MAXIMUM CO2 SETPOINT OF 1600 PPM (ADJ.). AS THE LEVEL OF CO2 INCREASES ABOVE THE MINIMUM CO2 LEVEL SETPOINT OF 500 PPM (ADJ.), THE ECONOMIZER MINIMUM POSITION WILL BEGIN TO BE RESET HIGHER. THE ECONOMIZER MINIMUM POSITION WILL BE PROPORTIONALLY RESET HIGHER AS THE CO2 RISES WITHIN THE RANGE SET BY THE MINIMUM CO2 LEVEL SETPOINT AND THE MAXIMUM CO2 LEVEL SETPOINT. IF THE CO2 LEVEL REACHES THE HIGH CO2 LEVEL SETPOINT, THE ECONOMIZER MINIMUM POSITION WILL BE RESET TO THE MAXIMUM RESET POSITION SET BY BALANCER. THE MAXIMUM RESET POSITION SETPOINT IS THE HIGHEST THE ECONOMIZER MINIMUM POSITION CAN BE RESET TO DURING CO2 CONTROL OPERATION. THIS SETPOINT IS USER-ADJUSTABLE AND DOES NOT KEEP THE ECONOMIZER FROM OPENING FURTHER DURING ECONOMIZER OPERATION.
- ECONOMIZER MODE:** BAS CONTROLLER SHALL PERMIT AIR-SIDE ECONOMIZER OPERATION WHEN OUTDOOR AIR IS LESS THAN 65 DEG F BUT GREATER THAN 55 DEG F. ECONOMIZER SHALL ONLY OPERATE WHEN THE ROOM IS IN THE COOLING MODE WITH OUTSIDE RELATIVE HUMIDITY BETWEEN 40% AND 50%. WHEN CONDITIONS FOR ECONOMIZER COOLING ARE SATISFIED THE OUTDOOR AIR DAMPER WILL MODULATE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE TO ITS TARGET. ON A RISE IN DISCHARGE AIR TEMPERATURE ABOVE TARGET THE OUTDOOR AIR DAMPER WILL MODULATE OPEN. THE REVERSE WILL OCCUR ON A FALL IN DISCHARGE AIR TEMPERATURE BELOW TARGET.
- UNOCCUPIED MODE:** WHEN THE UNIT IS SHUT DOWN BY EITHER A STOP COMMAND OR SYSTEM SAFETY THE UNIT WILL BE SET AS FOLLOWS: SUPPLY FAN WILL BE OFF, OUTDOOR AIR DAMPER CLOSED, RETURN AIR DAMPER OPEN, DX COOLING OFF, UNIT SHALL CYCLE IF SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED SETPOINT IN HEATING MODE (ADJ.) AND ABOVE UNOCCUPIED COOLING MODE (ADJ.) WITH OUTSIDE AIR DAMPER CLOSED. THE UNIT WILL DE-ENERGIZE WHEN THE SPACE TEMPERATURE IS AT LEAST 4 DEGREE F ABOVE THE UNOCCUPIED HEATING SETPOINT. UNOCCUPIED COOLING IS IDENTICAL TO THE OCCUPIED OPERATION EXCEPT ONLY ONE STAGE OF COOLING IS THE ACTIVE STAGE.
- DX COOLING:** ON A RISE IN SPACE TEMPERATURE ABOVE THE COOLING SETPOINT (ADJ.), THE FIRST STAGE OF COOLING SHALL BE ACTIVATED. THE UNIT CONTROLLER SHALL MODULATE THE COMPRESSOR TO MAINTAIN THE UNIT DISCHARGE TARGET TEMPERATURE. THE DISCHARGE TARGET TEMPERATURE SHALL BE RESET BASED ON SPACE TEMPERATURE SETPOINT BEING MAINTAINED BY INCREASING OR DECREASING DISCHARGE TEMPERATURE. MODULATION OF COOLING SHALL BE CONFIGURED SUBJECT TO USER ADJUSTABLE MINIMUM RUN TIMES, MINIMUM OFF TIMES, MODULATING UP AND MODULATING DOWN DELAYS.
- REHEAT:** REHEAT IS ALWAYS CONTROLLED TO THE ACTIVE SUPPLY AIR TEMPERATURE SETPOINT.
- COIL SUCCTION TEMPERATURE SETPOINT RESET:** DURING DEHUMIDIFICATION THE SYSTEM WILL AUTOMATICALLY RESET THE COIL SUCCTION TEMPERATURE SETPOINT WITHIN A ± 5 DEG RANGE BASED ON THE SPACE OR RETURN AIR HUMIDITY SENSOR CONDITION CHANGING $\pm 5\%$ FROM THE HUMIDITY SETPOINT.
- MORNING WARM-UP:** ON OCCUPIED DAYS THE SYSTEM WILL INITIATE MORNING WARM-UP CYCLE 1/2 HOUR BEFORE SCHEDULED OCCUPANCY. THE PROCESS WILL INITIATE SUPPLY FAN AND GAS FURNACE HEAT TO REACH OCCUPIED SETPOINT WITHOUT OUTDOOR AIR DAMPER OPEN.
- HEATING DEMAND:** ON A FALL IN DISCHARGE AIR TEMPERATURE BELOW THE HEATING SETPOINT (ADJ.), THE FIRST STAGE OF HEATING SHALL BE ACTIVATED. THE UNIT CONTROLLER SHALL ACTIVATE THE REVERSING VALVE AND MODULATE THE COMPRESSOR TO MAINTAIN THE UNIT DISCHARGE TARGET TEMPERATURE. THE SCR ELECTRIC HEATING WILL ONLY BE ENERGIZED UPON A FURTHER DROP BELOW SETPOINT AND WHEN THE FIRST STAGE OF HEATING HAS BEEN ON LONGER THAN A PRESET TIME PERIOD. THE SCR ELECTRIC HEAT SHALL MODULATE TO MAINTAIN THE UNIT DISCHARGE TARGET SETPOINT (ADJUSTABLE). ON A DECREASE IN DEMAND FOR HEATING THE ELECTRIC SHALL BE CYCLED OFF.

RTU-2 CONTROLS
NO SCALE

EXHAUST FAN POINTS LIST											
POINT TAG	POINT DESCRIPTION	DIGITAL	INPUTS		DIGITAL	OUTPUTS		REMARKS			
			SAFETY SHUT DOWN	STATUS		ON/OFF	MODULATE				
DI-1	EXHAUST FAN STATUS	X									
DO-1	EXHAUST FAN START/STOP				X						

- EXHAUST FAN (EF-1, 2) SEQUENCE OF OPERATION:
- A. THE EXHAUST FAN SHALL OPERATE ON BUILDING OCCUPANCY SCHEDULE WITH ASSOCIATED RTU-1.
- B. OCCUPIED MODE: THE EXHAUST FAN SHALL START.
- C. UNOCCUPIED MODE: THE FAN SHALL STOP.
- D. THE BMS SHALL MONITOR THE STATUS OF THE EXHAUST FAN (VIA CS) AND GENERATE AN ALARM IF THE FAN FAILS TO RESPOND TO A START/STOP COMMAND.
- EXHAUST FAN (EF-3) SEQUENCE OF OPERATION:
- A. PROVIDE 120V RELAY AND INTERLOCK WIRING WITH LIGHTING OCCUPANCY SENSOR/LIGHT SWITCH.
- EXHAUST FAN (EF-4) SEQUENCE OF OPERATION:
- A. THE EXHAUST FAN SHALL OPERATE UPON LEAK DETECTION SIGNAL FROM AZL REFRIGERANT SENSOR IN IHU AND RECEIVE AN ENABLE SIGNAL FROM VRF SYSTEM ENABLE EXHAUST FAN.
- B. THE BMS SHALL MONITOR THE STATUS OF THE EXHAUST FAN (VIA CS) AND GENERATE AN ALARM IF THE FAN FAILS TO RESPOND TO A START/STOP COMMAND.

EF CONTROLS
NO SCALE

DOAS-2 POINTS LIST											
POINT TAG	POINT DESCRIPTION	DIGITAL	INPUTS		DIGITAL	OUTPUTS		REMARKS			
			SAFETY SHUT DOWN	STATUS		ON/OFF	MODULATE				
DI-1	SUPPLY FAN STATUS										
DI-2	EXHAUST FAN STATUS	X									
DO-1	SUPPLY FAN ENABLE				X						
DO-2	EXHAUST FAN ENABLE				X						
DO-3	DX COOLING ENABLE				X						
DO-4	COMPRESSOR SPEED					X					
DO-5	HOT GAS REHEAT ENABLE				X						
DO-6	SUPPLY FAN SPEED					X					
DO-7	EXHAUST FAN SPEED					X					
DO-8	MIXED AIR DAMPER					X					
DO-9	SCR ELECTRIC HEAT					X					
DI-3	RETURN AIR HUMIDITY			X							
COM	OUTSIDE AIR TEMPERATURE			X							
COM	OUTSIDE AIR HUMIDITY			X							
AI-4	SUCTION PRESSURE		X								
DI-3	FILTER STATUS				X						
DO-6	ENERGY RECOVERY BYPASS DAMPER					X					
DO-7	HOT GAS REHEAT RESET SIGNAL					X					
DI-3	AZL ALARM	X									

DOAS-1 SEQUENCE OF OPERATION:

UNIT HAS FACTORY INSTALLED AND WIRED CONTROLLER TO CONTROL ALL FUNCTIONS OF THE UNIT WITH FACTORY INSTALLED BACNET COMMUNICATIONS INTERFACE FOR BMS TO MONITOR, CONTROL AND DISPLAY UNIT STATUS, SETPOINTS AND ALARMS. CONTROLLER SHALL BE FULLY PROGRAMMED PER THE SEQUENCE OF OPERATION BELOW. PROVIDE BACNET INTEGRATION FOR SUPERVISORY CONTROL INTO THE NEW BMS BY THE ATC CONTRACTOR.

PROVIDE COMPLETE INDIVIDUAL UNIT SCHEDULING FUNCTION THROUGH THE UNITARY CONTROLLER. THE OPERATOR WILL BE ABLE TO ADJUST THE UNIT START/STOP USING THE CONTROLLER INTERFACE. PROVIDE ALL CONTROLLER PROGRAMMING AS NOTED BELOW.

- OCCUPIED MODE:** THE ATC SYSTEM SHALL INDEX THE SUPPLY FAN, EXHAUST FAN ON TO RUN CONTINUOUSLY AT CONSTANT VOLUME WHILE IN OCCUPIED MODE. THE OUTDOOR AIR DAMPER WILL BE FULL OPEN AND THE RETURN AIR DAMPER WILL BE FULL CLOSED DURING THE OCCUPIED MODE. THE BAS WILL MONITOR THE STATUS OF THE FANS AND WHEEL AND GENERATE AN ALARM IF THE FAN OR WHEEL FAILS TO A START/STOP COMMAND.
- UNOCCUPIED MODE:** WHEN THE UNIT IS SHUT DOWN BY EITHER A STOP COMMAND OR SYSTEM SAFETY THE UNIT WILL BE SET AS FOLLOWS: SUPPLY FAN AND EXHAUST FAN AND ENERGY WHEEL WILL BE OFF, OUTDOOR AIR DAMPER CLOSED, RETURN AIR DAMPER OPEN, DX COOLING OFF.
- DX COOLING:** MODULATION OF COOLING SHALL BE CONFIGURED SUBJECT TO USER ADJUSTABLE MINIMUM RUN TIMES, MINIMUM OFF TIMES, MODULATING UP AND MODULATING DOWN DELAYS. COOLING IS ENABLED WHEN THE TEMPERATURE AT THE MODE ENABLE DISCHARGE AIR SENSOR RISES ONE DEGREE DEADBAND ABOVE THE COOLING SETPOINT. COOLING IS DISABLED WHEN THE MODE ENABLE TEMPERATURE FALLS ONE DEGREE DEAD BAND BELOW THE COOLING SETPOINT. MAINTAIN A CONSTANT DISCHARGE AIR TEMPERATURE OF 70 DEG F (ADJ.) IN COOLING MODE AND 75 DEG F (ADJ.) IN HEATING MODE.
- DEHUMIDIFICATION:** WHEN THE RETURN HUMIDITY SENSOR RISES ABOVE 55% RH (ADJ.), BAS SHALL ENABLE HOT GAS RE-HEAT AND MODULATE DIGITAL COMPRESSOR TO MAINTAIN DISCHARGE AIR TEMPERATURE SETTING (ADJ.) LOGIC MUST BE SET TO MAKE COOLING OR DEHUMIDIFICATION THE PRIORITY.
- REHEAT:** REHEAT IS ALWAYS CONTROLLED TO THE ACTIVE SUPPLY AIR TEMPERATURE SETPOINT.
- COIL SUCCTION TEMPERATURE SETPOINT RESET:** DURING DEHUMIDIFICATION THE SYSTEM WILL AUTOMATICALLY RESET THE COIL SUCCTION TEMPERATURE SETPOINT WITHIN A ± 5 DEG RANGE BASED ON THE RETURN AIR HUMIDITY SENSOR CONDITION CHANGING $\pm 5\%$ FROM THE HUMIDITY SETPOINT.
- THE CONTROLLER SHALL PERMIT AIR-SIDE ECONOMIZER OPERATION TO ACT AS THE FIRST STAGE OF COOLING WHEN OUTDOOR AIR IS LESS THAN 70 DEG F (ADJ.) BUT GREATER THAN 60 DEG F. ECONOMIZER SHALL ONLY OPERATE WHEN THE SYSTEM IS IN THE COOLING MODE WITH OUTSIDE RELATIVE HUMIDITY BETWEEN 40% AND 50%. WHEN CONDITIONS FOR ECONOMIZER COOLING ARE SATISFIED THE ENERGY EXCHANGER BYPASS DAMPER WILL MODULATE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE TO ITS TARGET. ON A RISE IN DISCHARGE AIR TEMPERATURE ABOVE TARGET, THE OUTDOOR AIR DAMPER WILL MODULATE OPEN TO OUTSIDE AIR CM SETPOINT. THE REVERSE WILL OCCUR ON A FALL IN DISCHARGE AIR TEMPERATURE BELOW TARGET. THE ENERGY EXCHANGER BYPASS DAMPER WILL REMAIN CLOSED IF THE UNIT IS NOT IN THE ECONOMIZER COOLING MODE.**
- MORNING WARM-UP:** THE DOAS UNIT WILL REMAIN OFF DURING MORNING WARM-UP MODE AND THE ZONE UNITS WILL PERFORM ALL MORNING WARM-UP.
- HEATING DEMAND:** ON A FALL IN DISCHARGE AIR TEMPERATURE BELOW THE HEATING SETPOINT (ADJ.), THE FIRST STAGE OF HEATING SHALL BE ACTIVATED. THE UNIT CONTROLLER SHALL ACTIVATE THE REVERSING VALVE AND MODULATE THE COMPRESSOR TO MAINTAIN THE UNIT DISCHARGE TARGET TEMPERATURE OF 70 DEG F (ADJ.). THE SECOND STAGE OF HEATING WILL ONLY BE ENERGIZED UPON A FURTHER DROP BELOW SETPOINT AND WHEN THE FIRST STAGE OF HEATING HAS BEEN ON LONGER THAN A PRESET TIME PERIOD. THE 2ND STAGE SCR ELECTRIC HEAT SHALL MODULATE TO MAINTAIN THE UNIT DISCHARGE TARGET SETPOINT. ON A DECREASE IN DEMAND FOR HEATING THE SECOND STAGE SHALL BE CYCLED OFF. ON A RISE IN SPACE TEMPERATURE ABOVE ONE DEGREE DEADBAND (ADJ.) DISABLE THE HEAT UNTIL SUPPLY AIR TEMPERATURE IS ONE DEGREE DEADBAND BELOW SETPOINT.
- WHEN THE DAT IS ABOVE 68F (ADJ.), HEATING IS DISABLED.**
- LOW TEMPERATURE PROTECTION:** AN SUPPLY AIR TEMPERATURE SENSOR DIRECTLY AFTER THE HEATING COIL DE-ENERGIZES THE SUPPLY & EXHAUST FAN WHEN TEMPERATURES BELOW 40 DEGREES F ARE SENSED. ALL DAMPERS (OA DAMPER SHALL CLOSED/RA DAMPER SHALL OPEN). AFTER THE TEMPERATURE RISES 5 DEGREES ABOVE THE LOW TEMPERATURE SETTING, THE UNIT WILL RESET AND THE UNIT WILL RESUME ITS NORMAL CONTROL SEQUENCE.
- WHEN ANY OF THE UNIT'S AZL SENSORS DETECT AN AZL REFRIGERANT LEAK OR CONTROLLER DOES NOT DETECT A SENSOR CONNECTION, THE CONTROLLER SHALL ENABLE THE SUPPLY FAN, DISABLE THE COMPRESSORS AND ENABLE THE AZL ALARM. THE ATC CONTRACTOR SHALL RECEIVE THE AZL ALARM AND DISPLAY ON OPERATOR WORKSTATION.**

DOAS-1 CONTROLS
NO SCALE

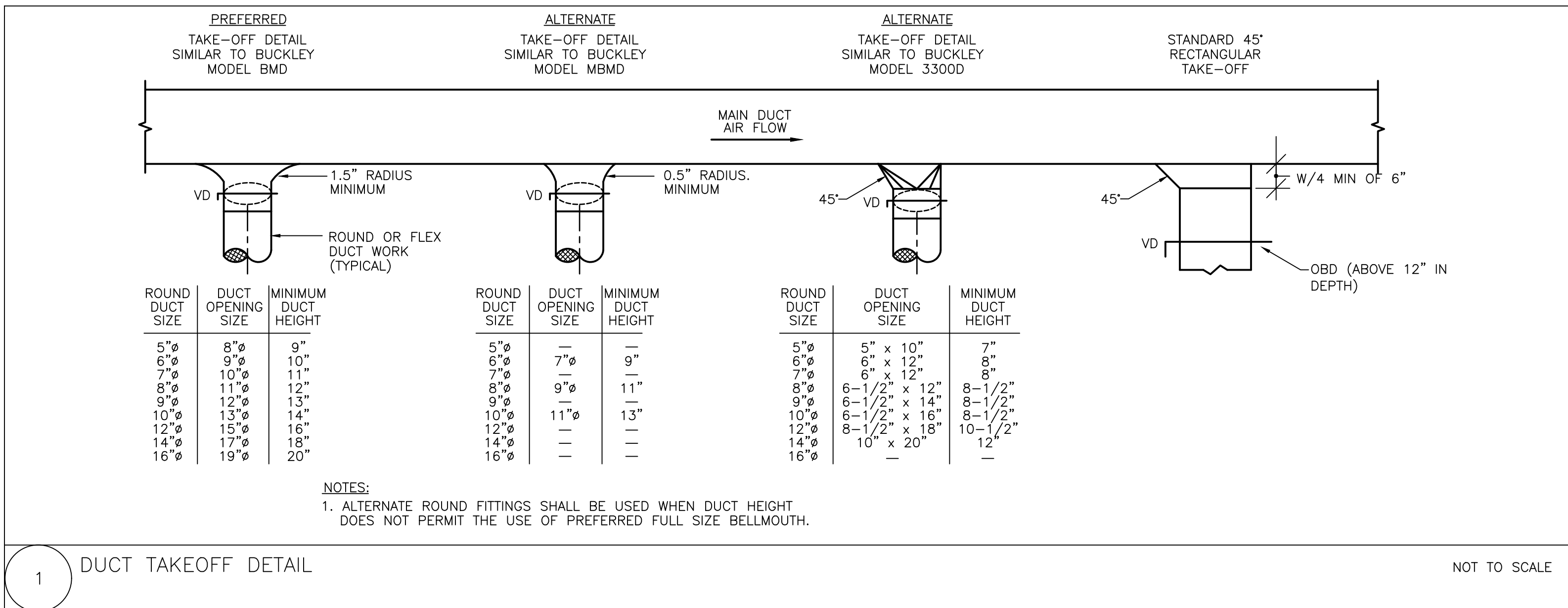
ISSUE HISTORY

DATE	ISSUED FOR
2025-11-26	DESIGN DEVELOPMENT
2026-06-11	95% CD ISSUE
2026-10-05	BD ISSUE

SHEET TITLE

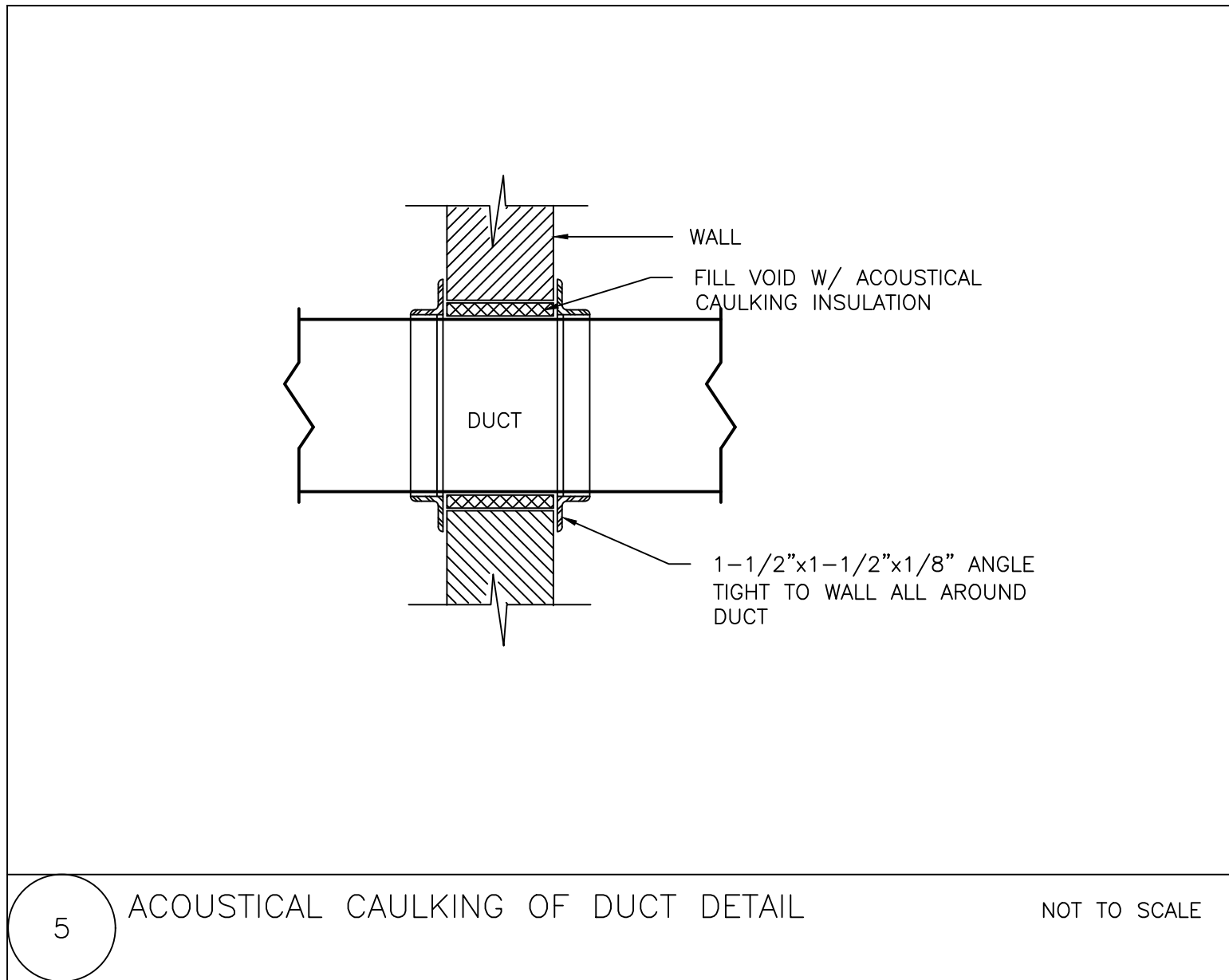
MECHANICAL
CONTROLS

DRAWING NUMBER
M402



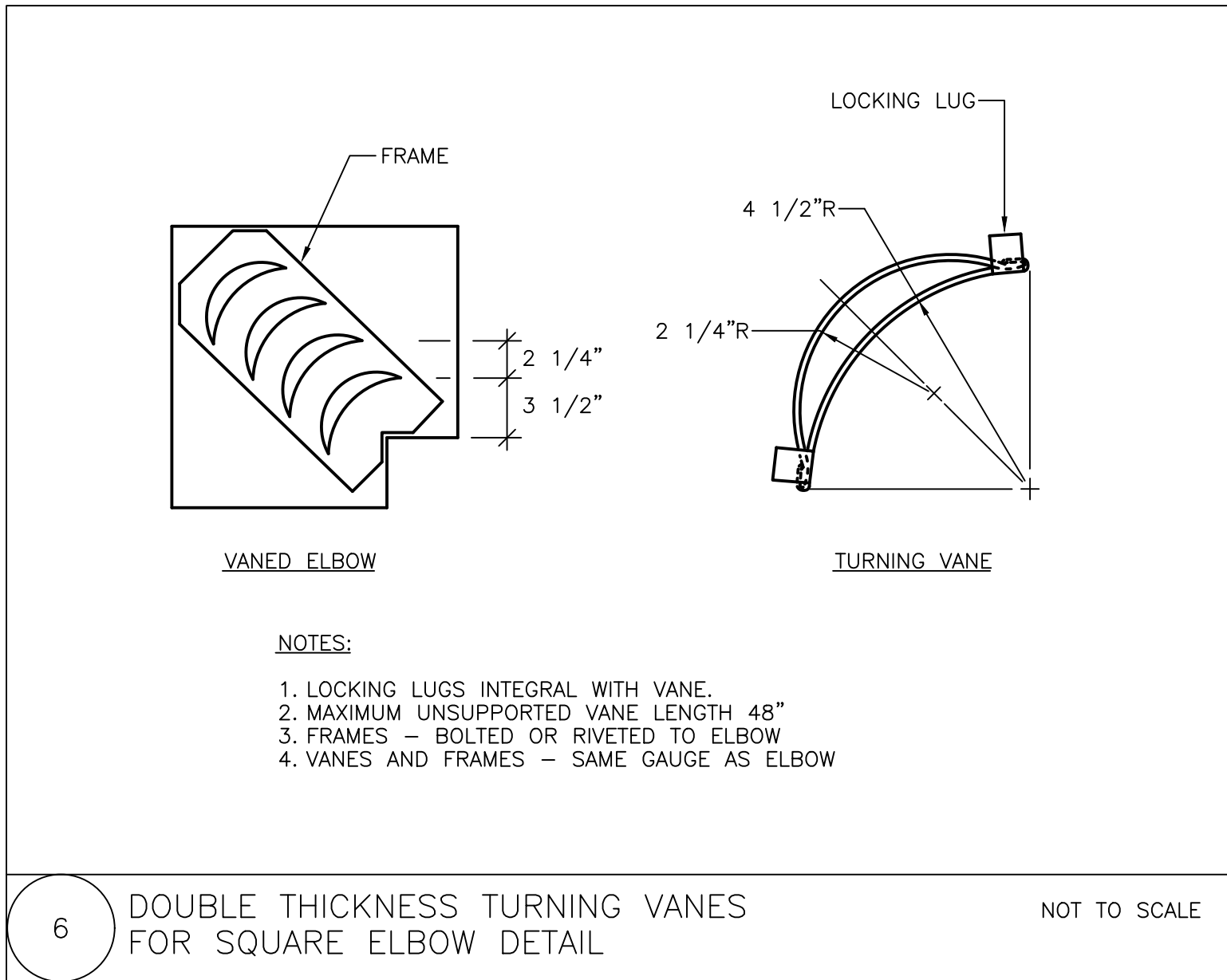
1 DUCT TAKEOFF DETAIL

NOT TO SCALE



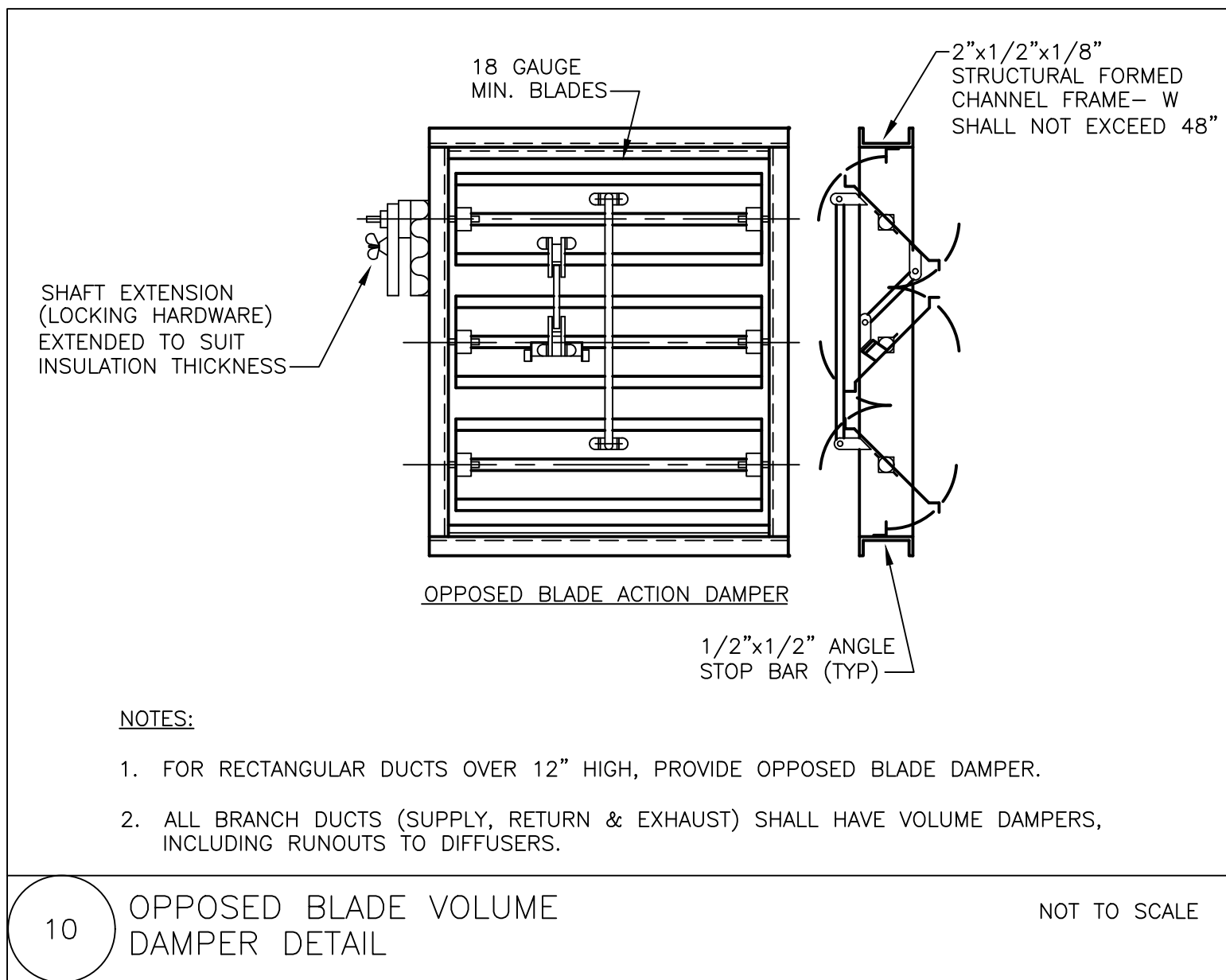
5 ACOUSTICAL CAULKING OF DUCT DETAIL

NOT TO SCALE



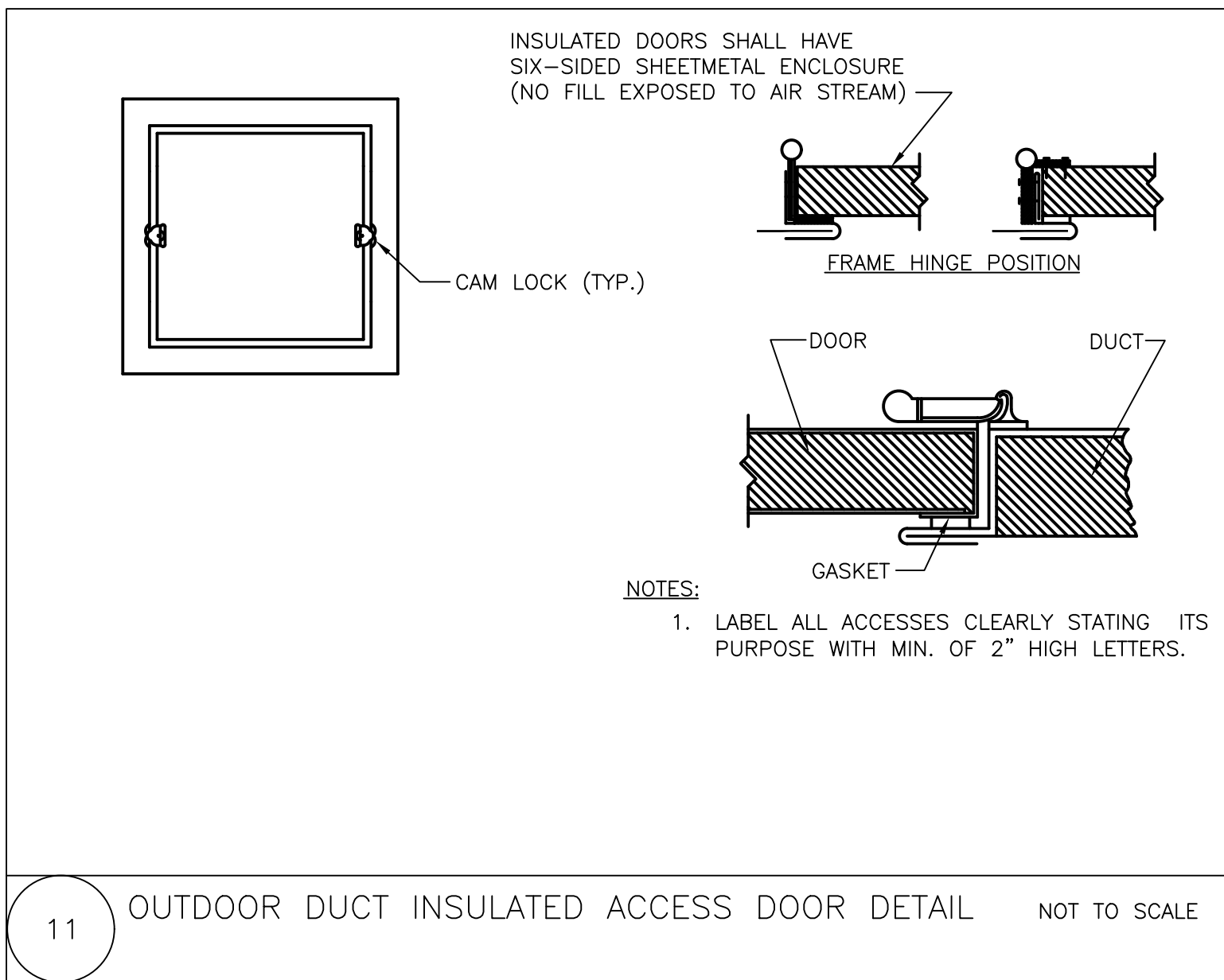
6 DOUBLE THICKNESS TURNING VANES FOR SQUARE ELBOW DETAIL

NOT TO SCALE



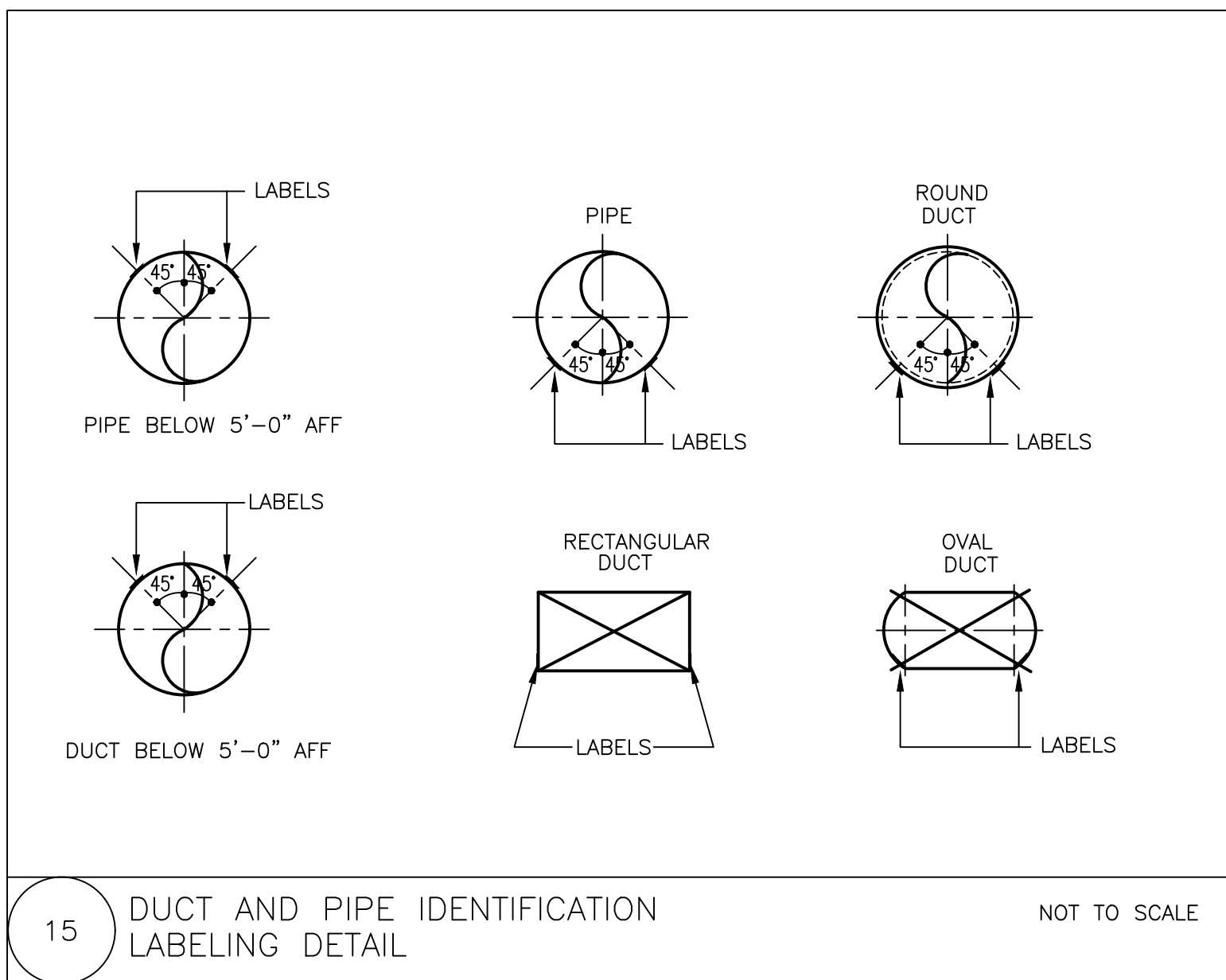
10 OPPOSED BLADE VOLUME DAMPER DETAIL

NOT TO SCALE



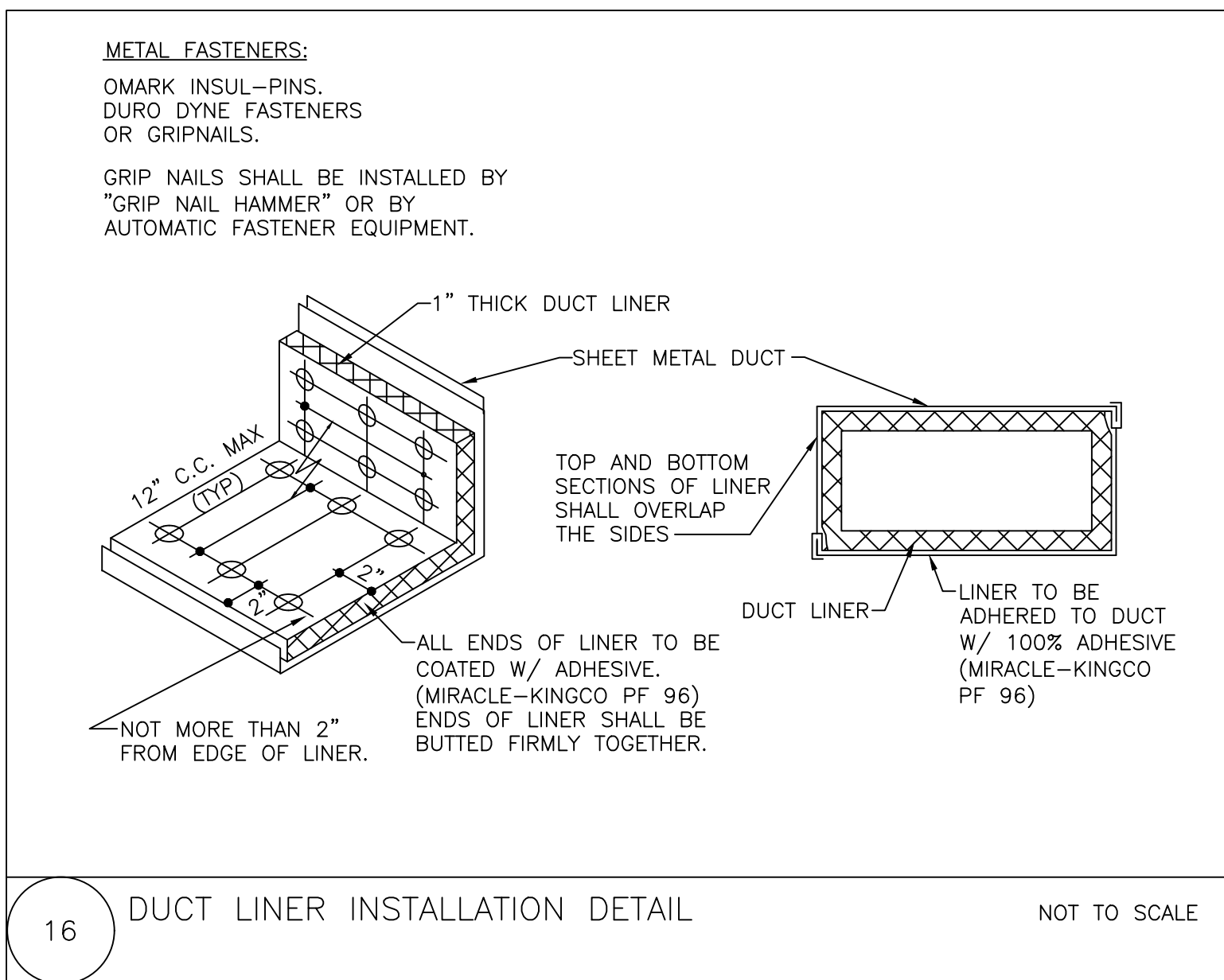
11 OUTDOOR DUCT INSULATED ACCESS DOOR DETAIL

NOT TO SCALE



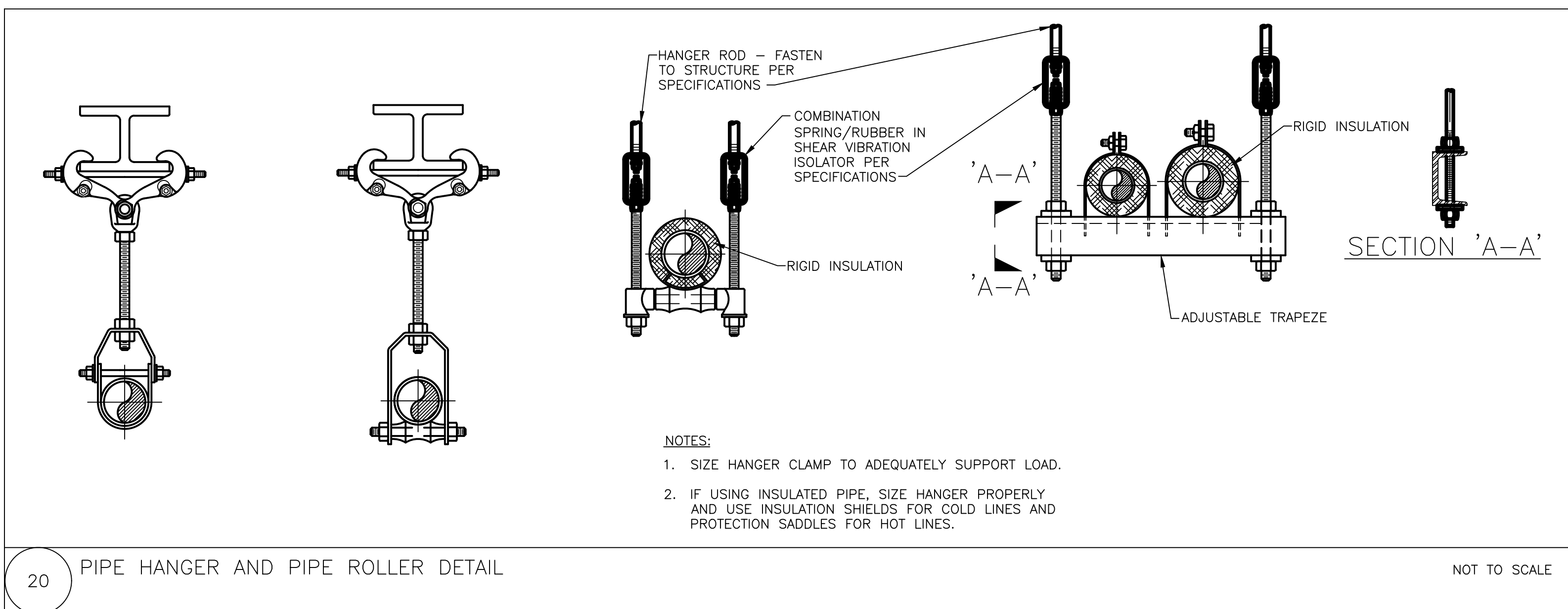
15 DUCT AND PIPE IDENTIFICATION LABELING DETAIL

NOT TO SCALE



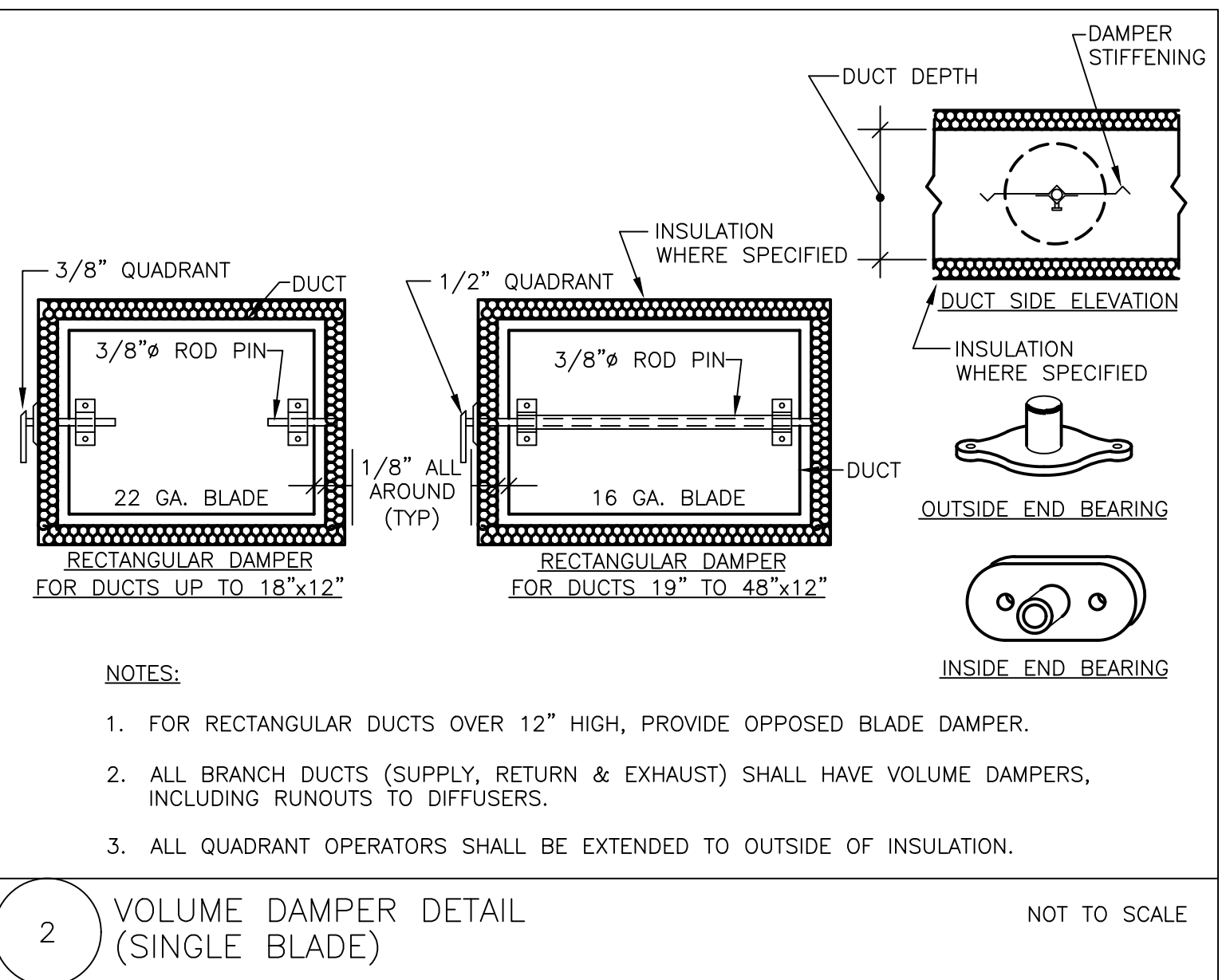
16 DUCT LINER INSTALLATION DETAIL

NOT TO SCALE



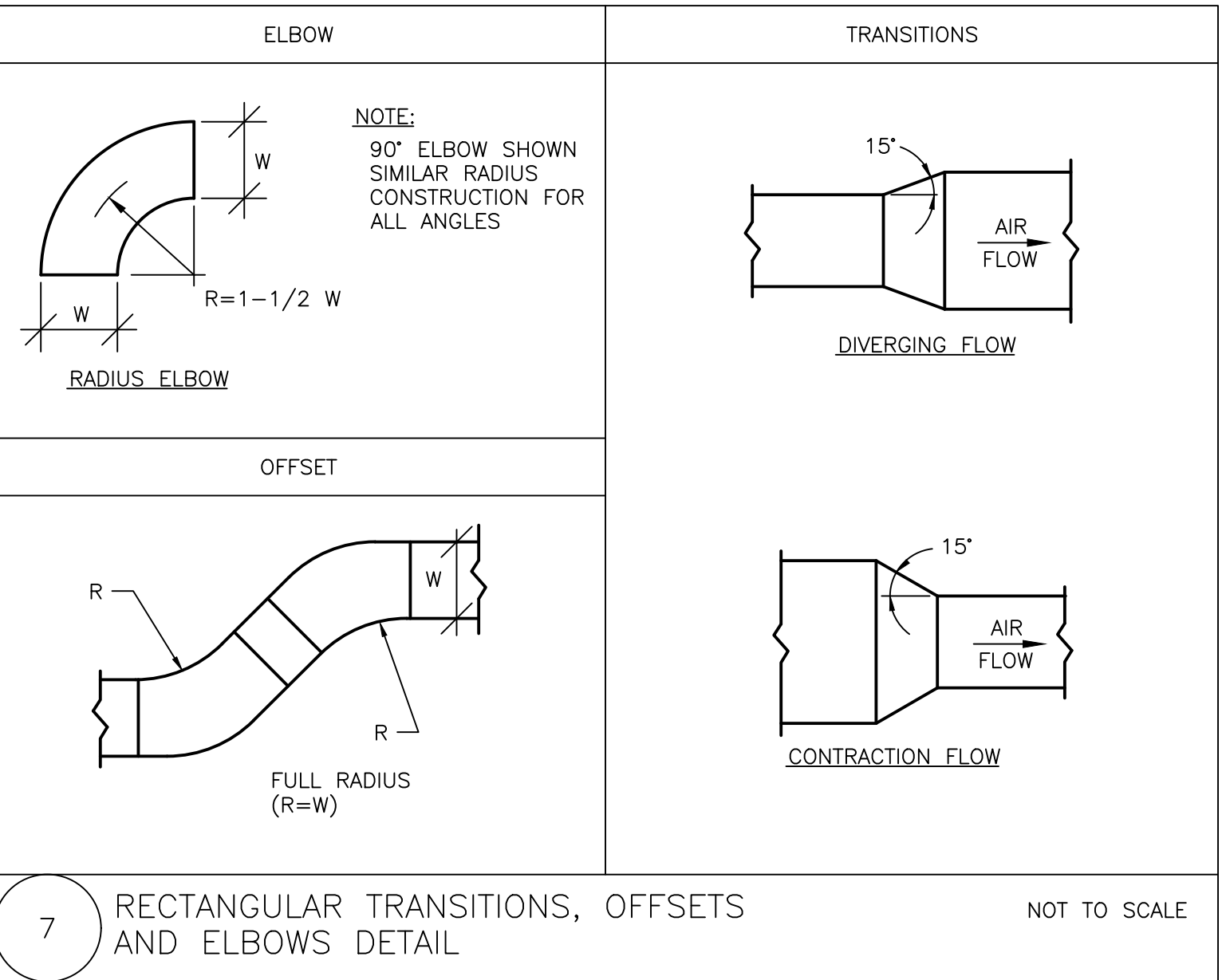
20 PIPE HANGER AND PIPE ROLLER DETAIL

NOT TO SCALE



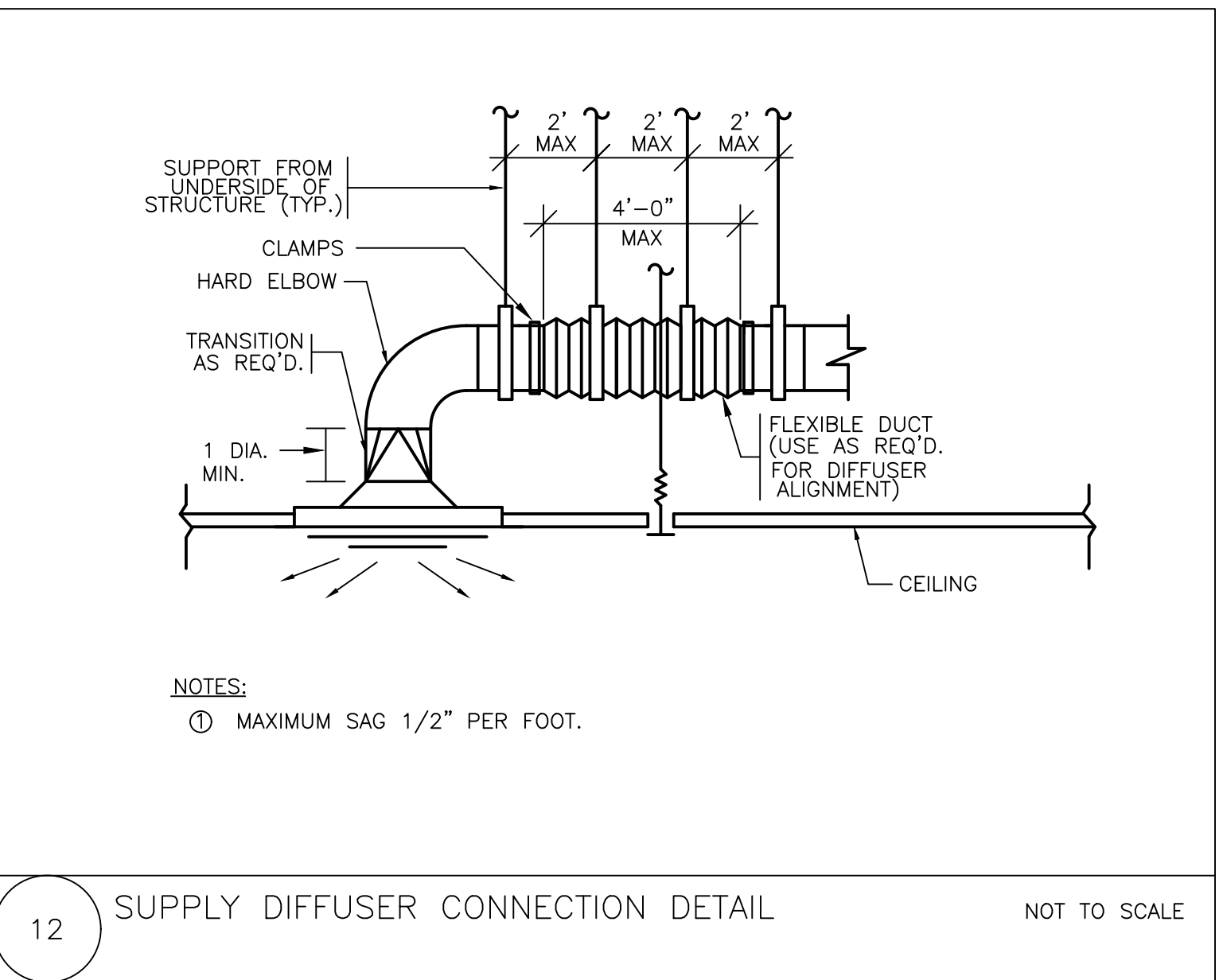
2 VOLUME DAMPER DETAIL (SINGLE BLADE)

NOT TO SCALE



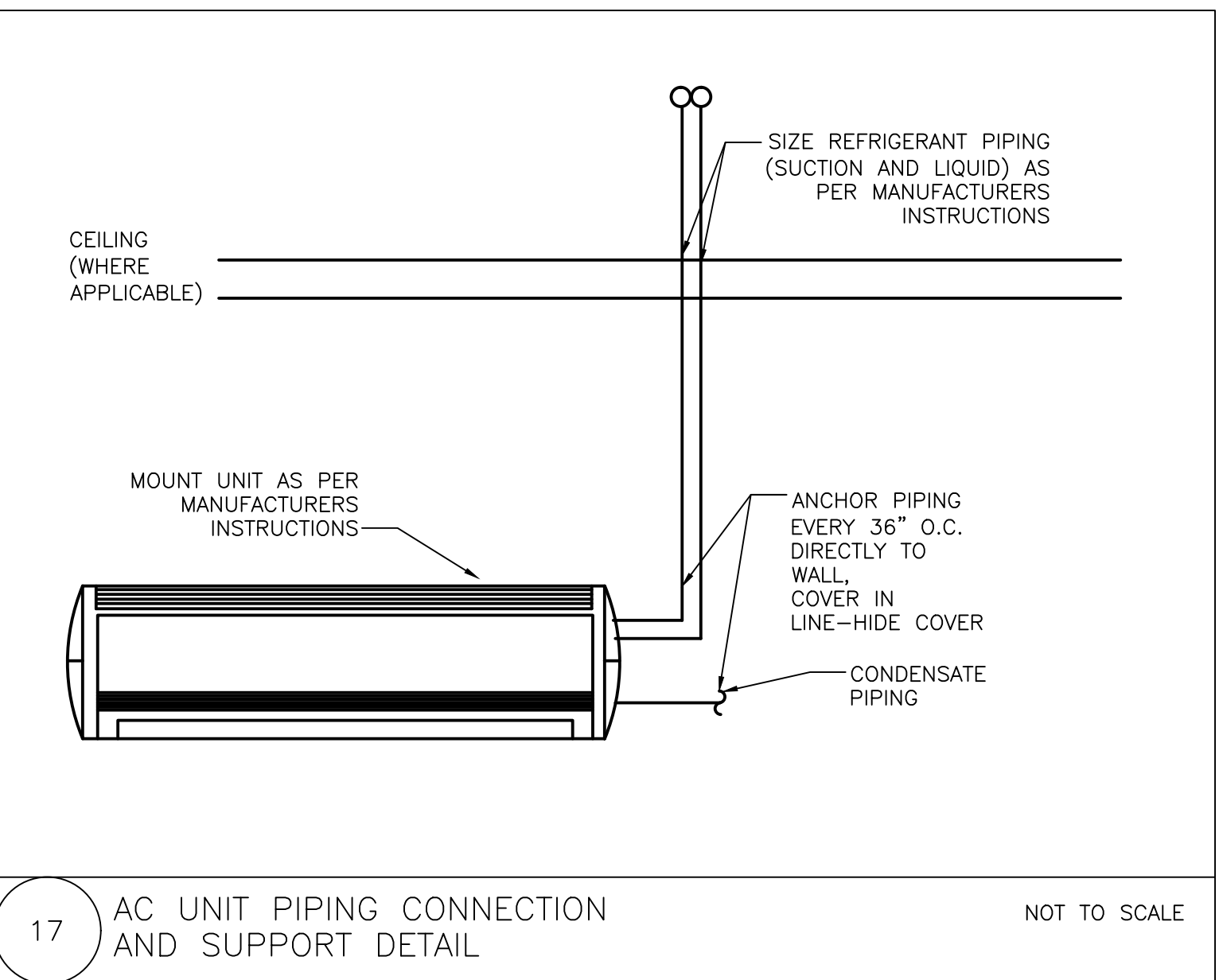
7 RECTANGULAR TRANSITIONS, OFFSETS AND ELBOWS DETAIL

NOT TO SCALE



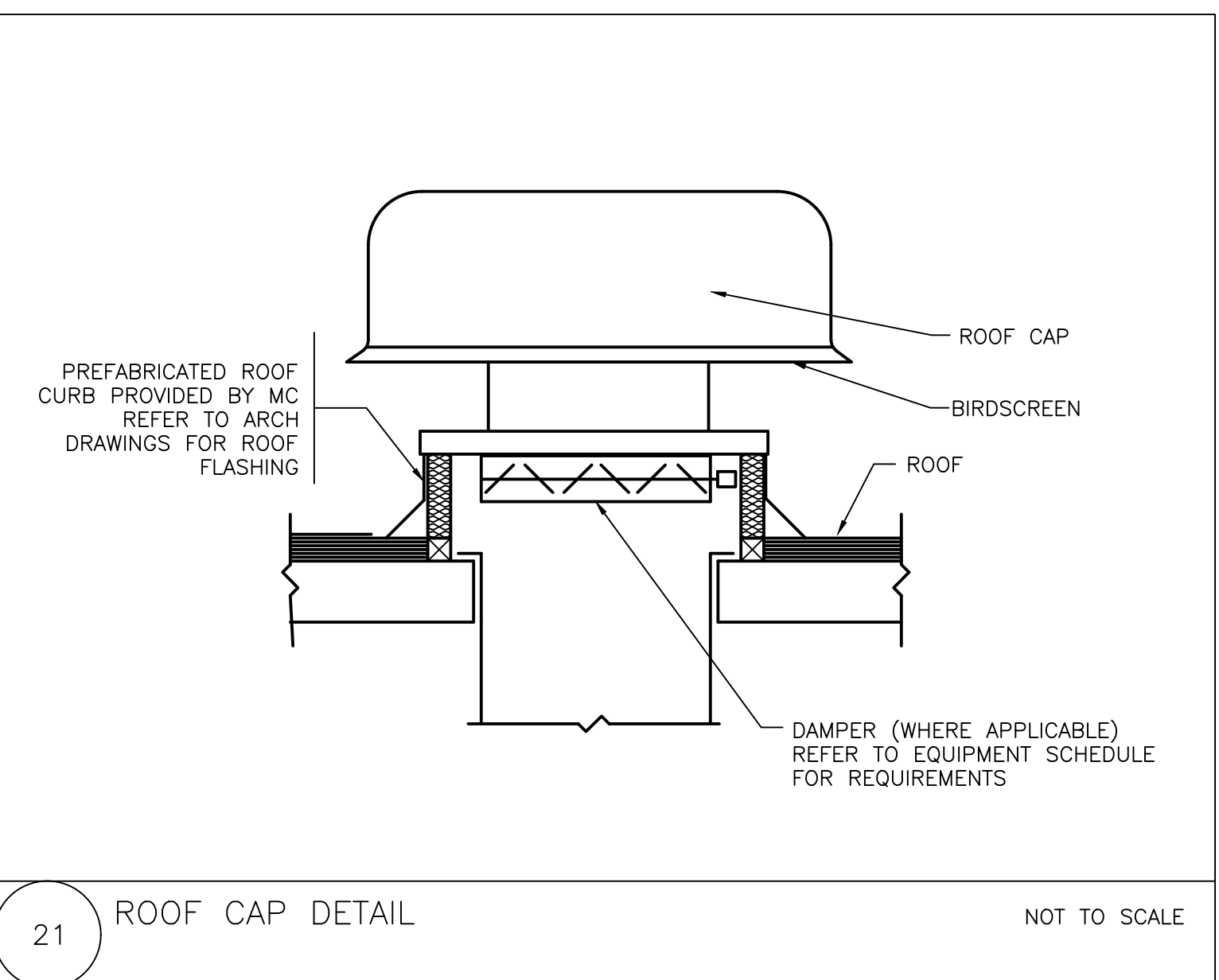
12 SUPPLY DIFFUSER CONNECTION DETAIL

NOT TO SCALE



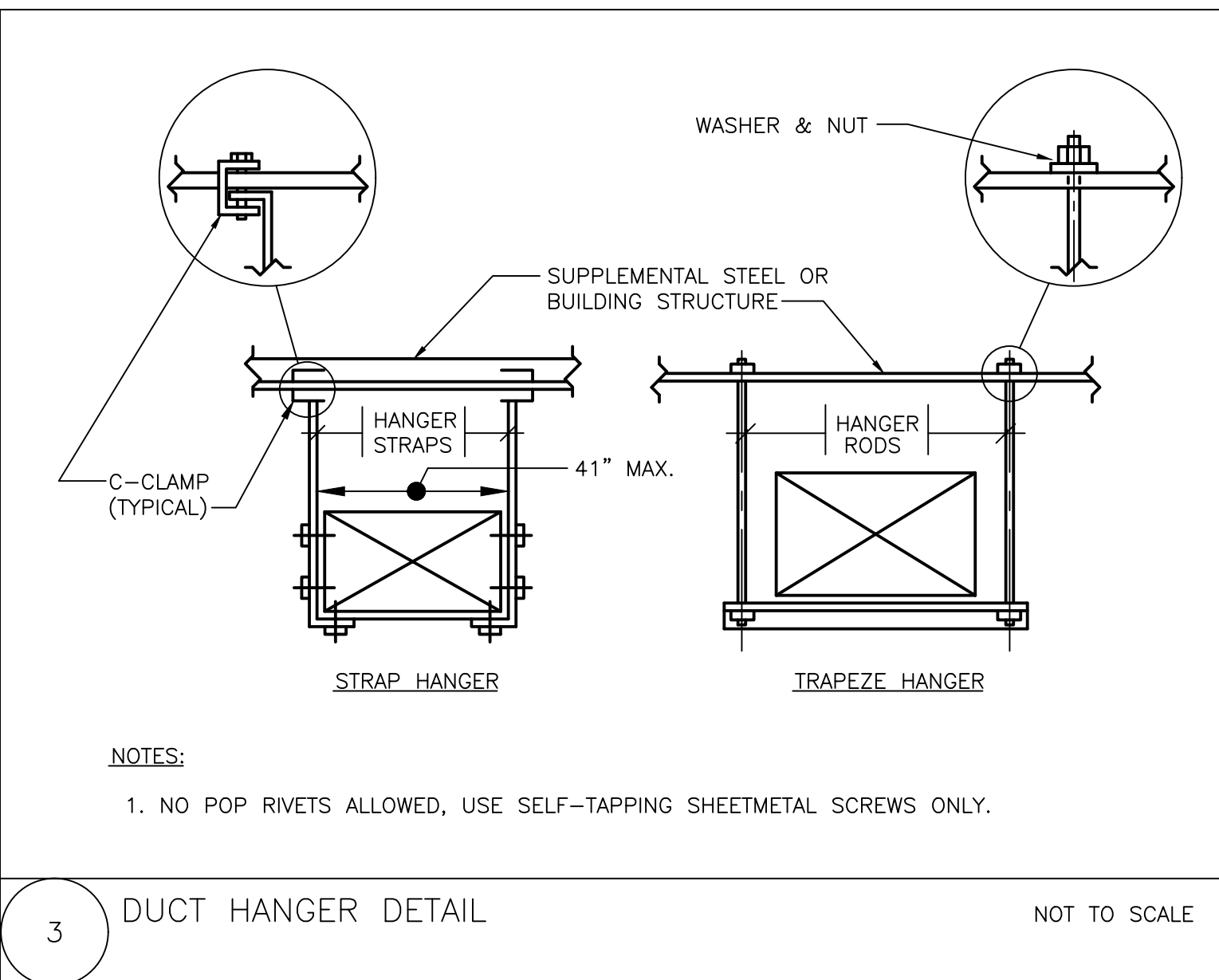
17 AC UNIT PIPING CONNECTION AND SUPPORT DETAIL

NOT TO SCALE



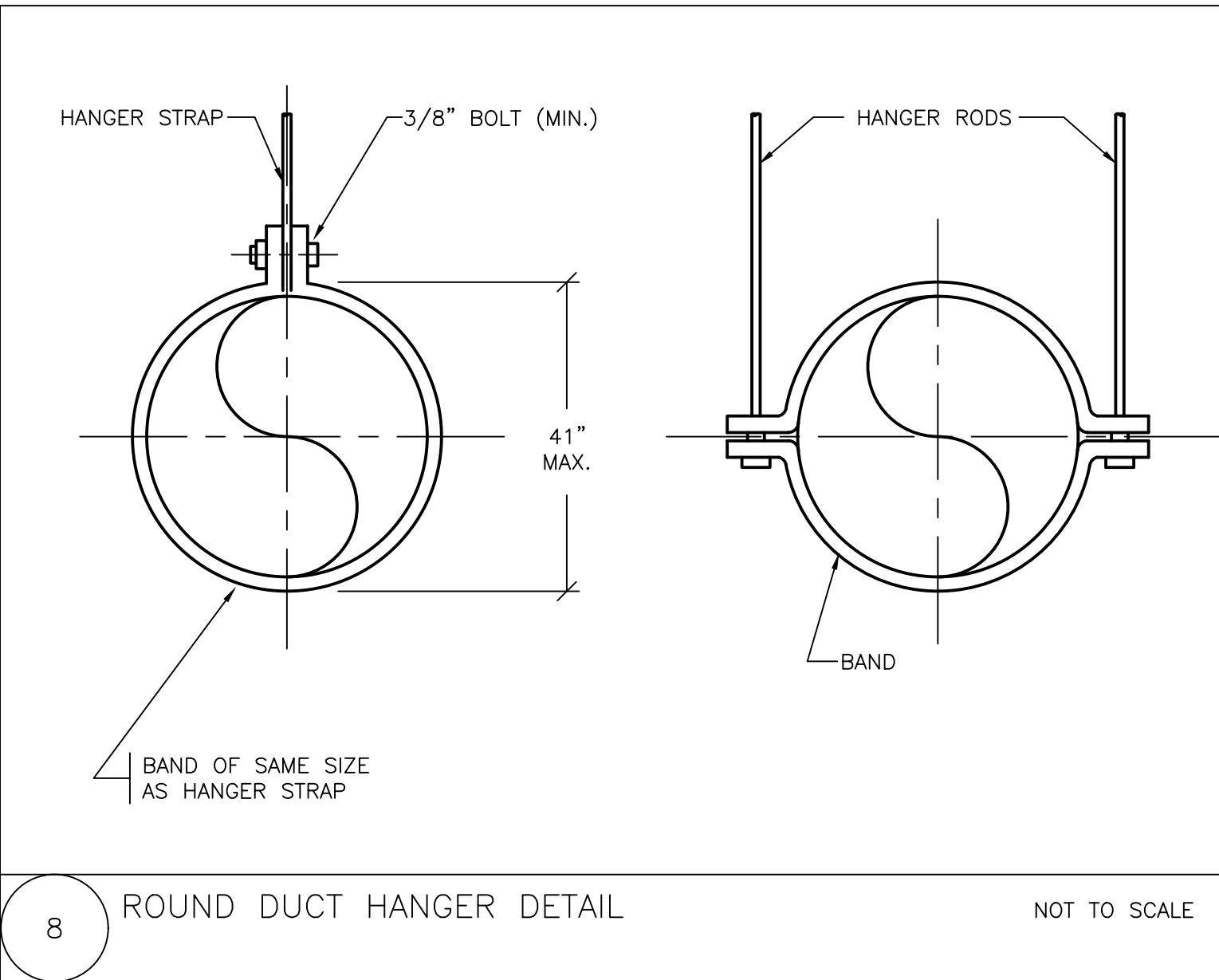
21 ROOF CAP DETAIL

NOT TO SCALE



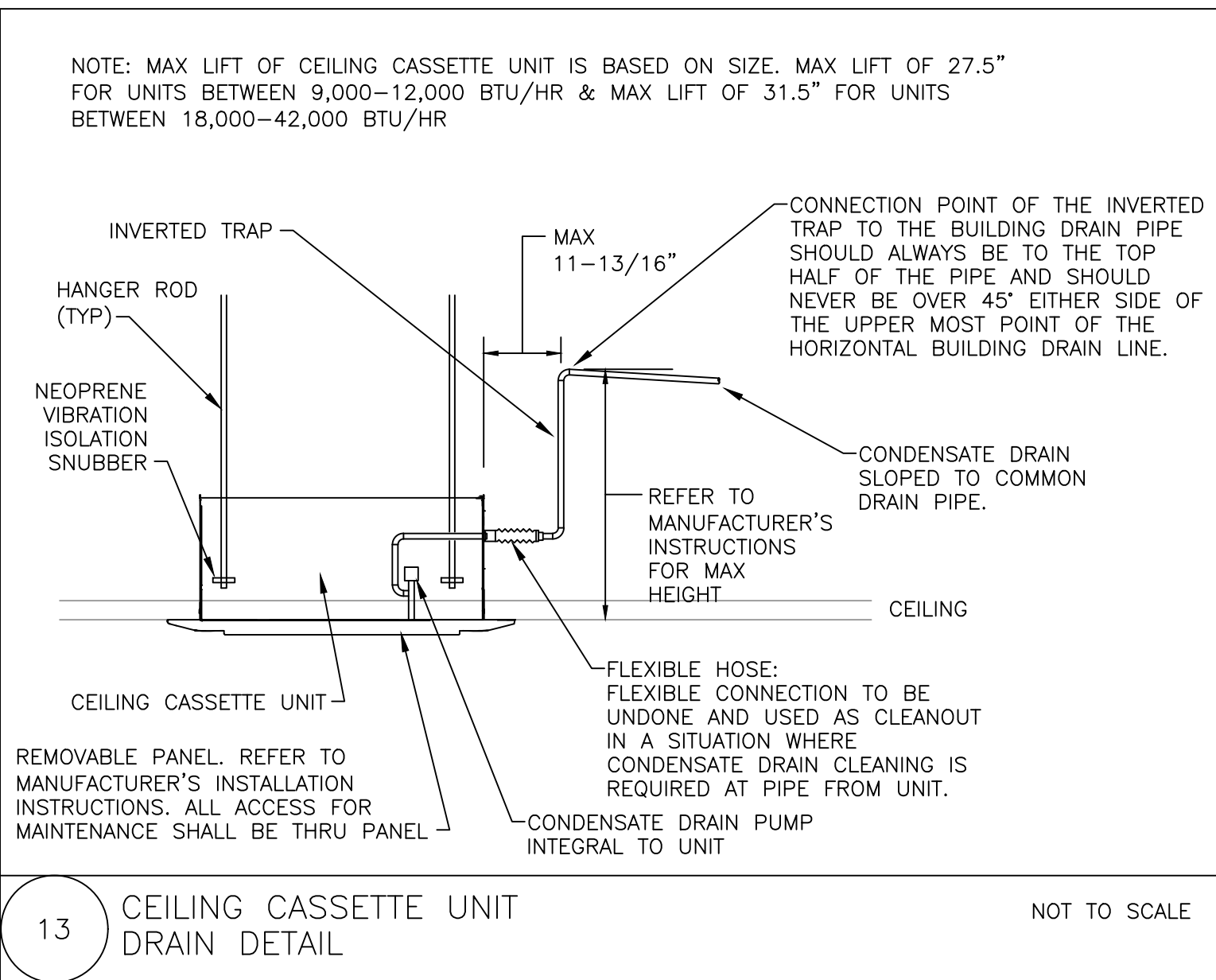
3 DUCT HANGER DETAIL

NOT TO SCALE



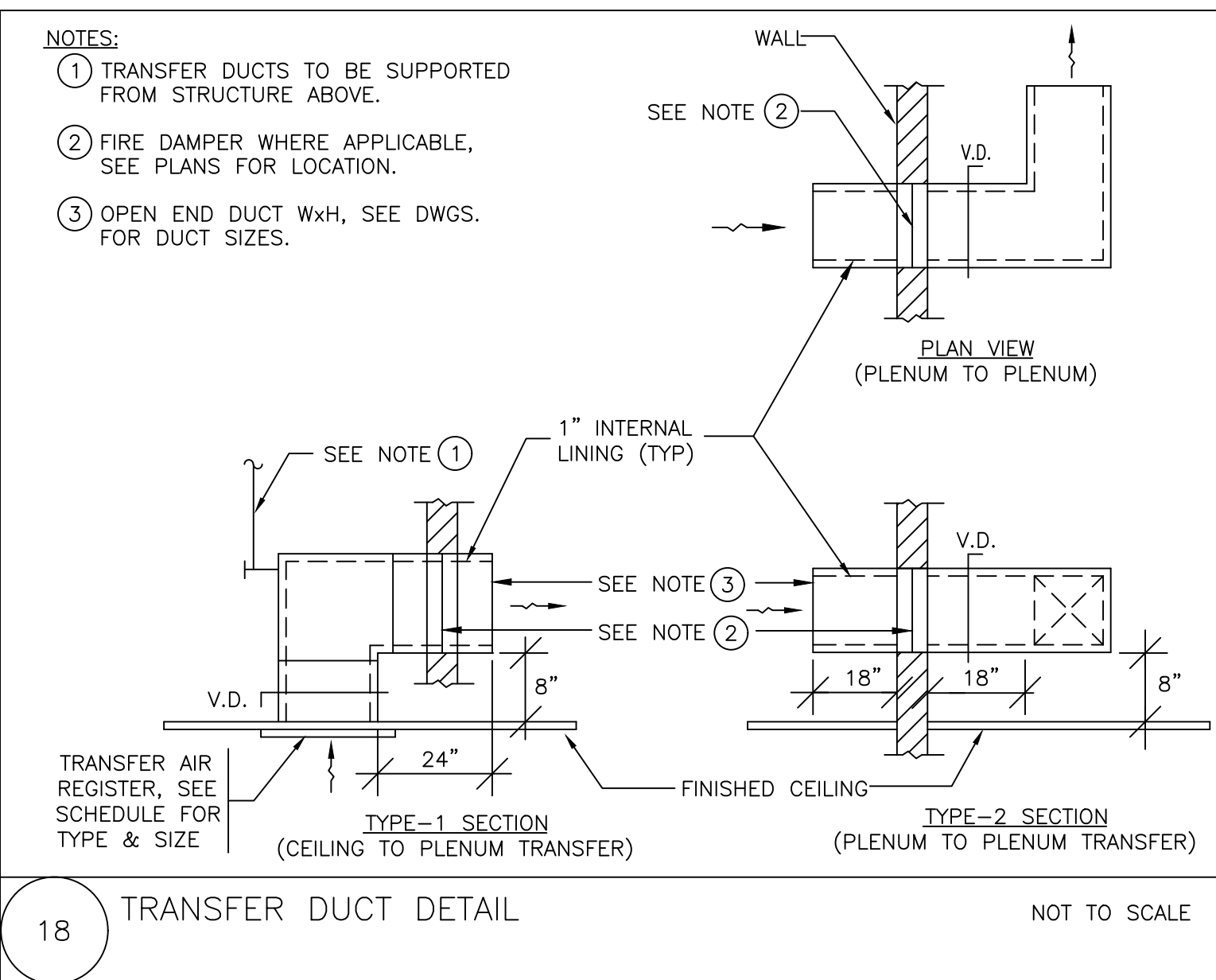
8 ROUND DUCT HANGER DETAIL

NOT TO SCALE



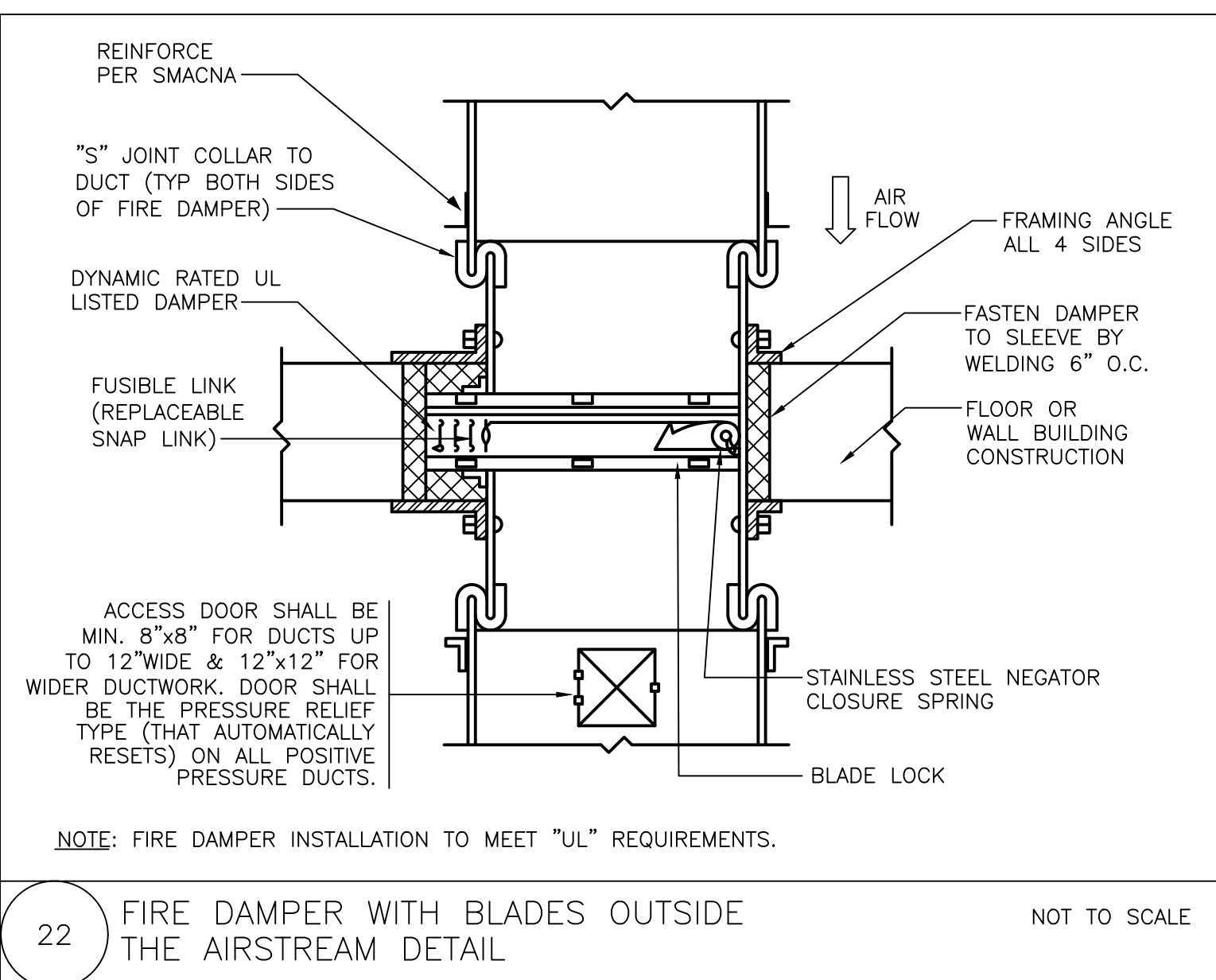
13 CEILING CASSETTE UNIT DRAIN DETAIL

NOT TO SCALE



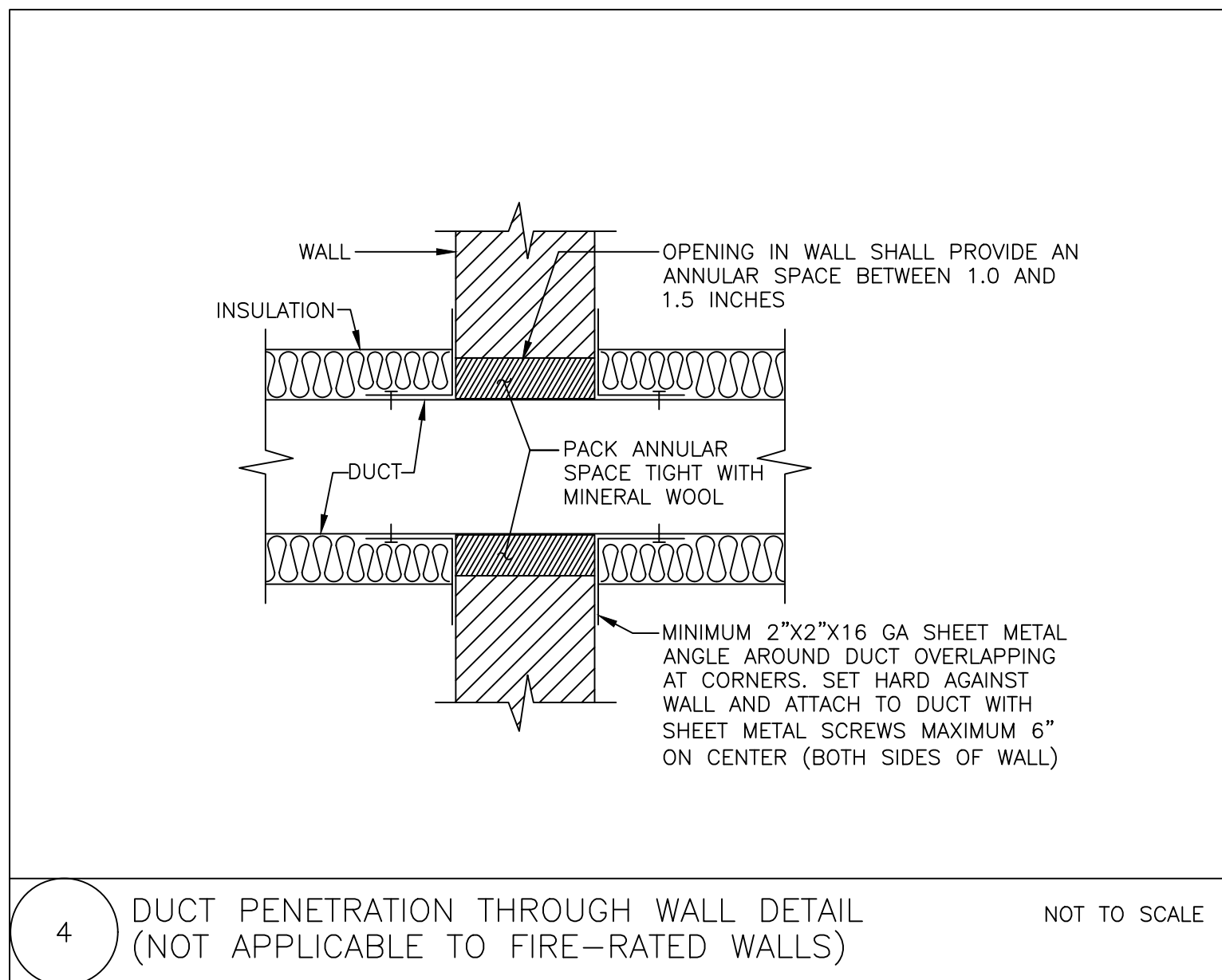
18 TRANSFER DUCT DETAIL

NOT TO SCALE



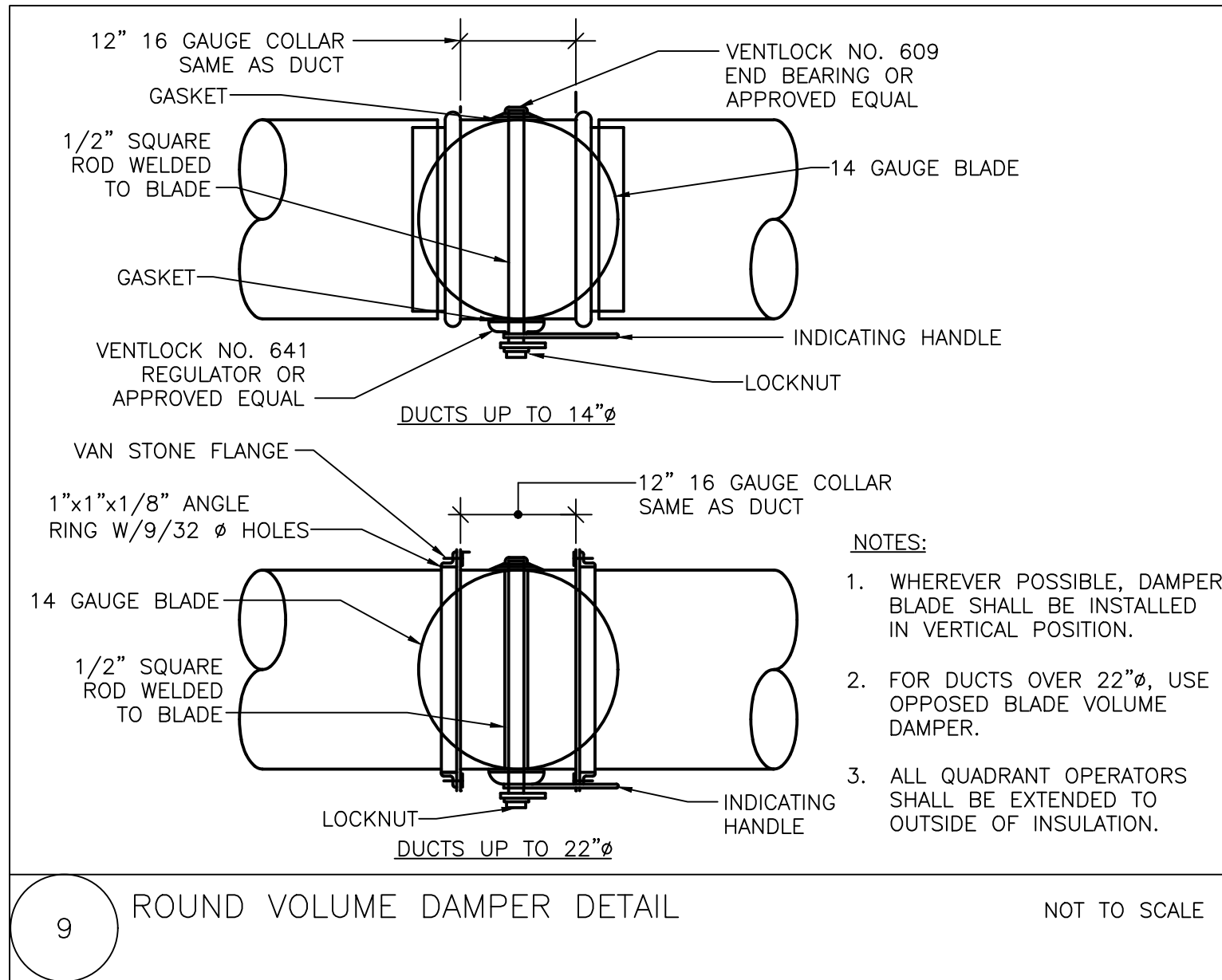
22 FIRE DAMPER WITH BLADES OUTSIDE THE AIRSTREAM DETAIL

NOT TO SCALE



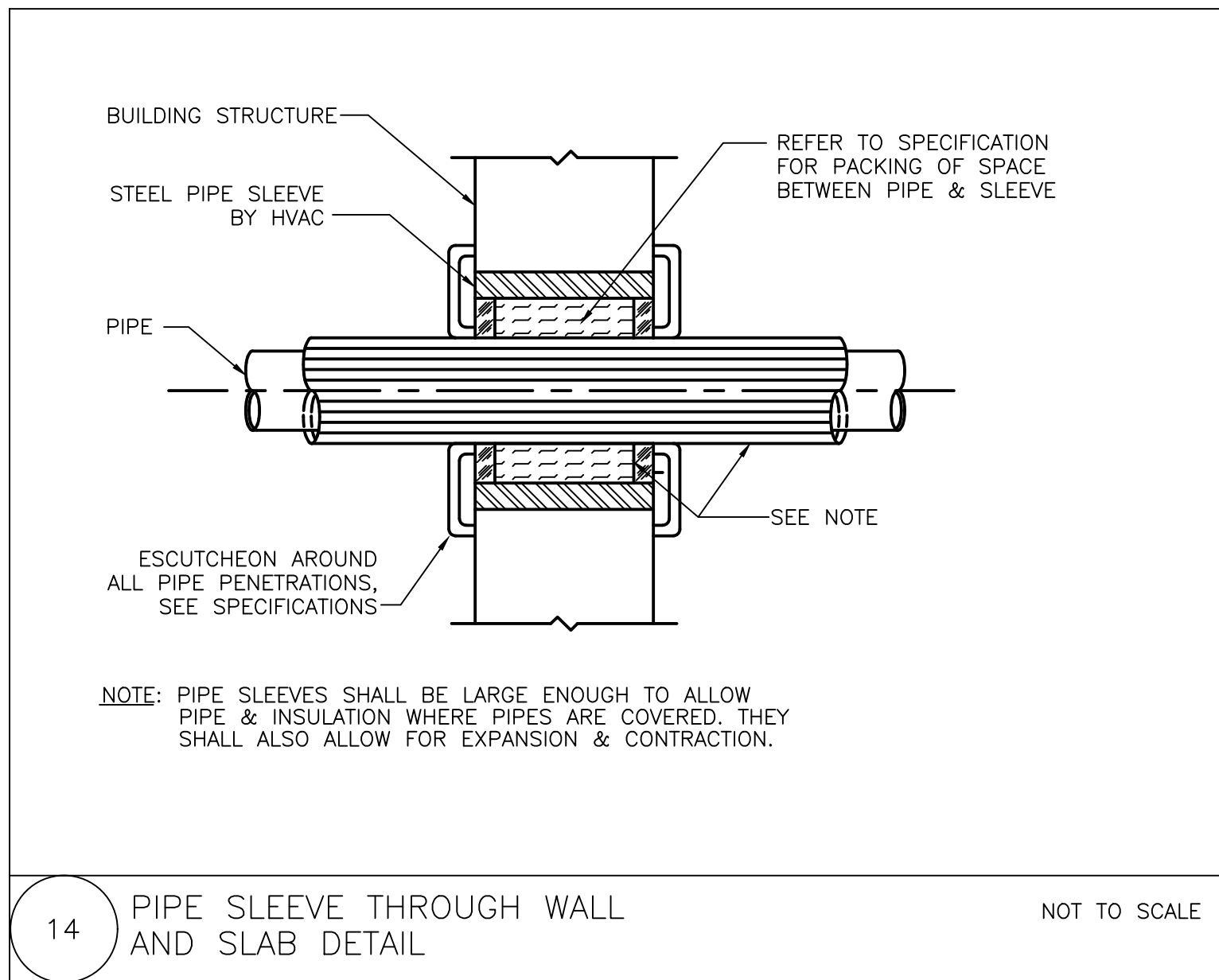
4 DUCT PENETRATION THROUGH WALL DETAIL (NOT APPLICABLE TO FIRE-RATED WALLS)

NOT TO SCALE



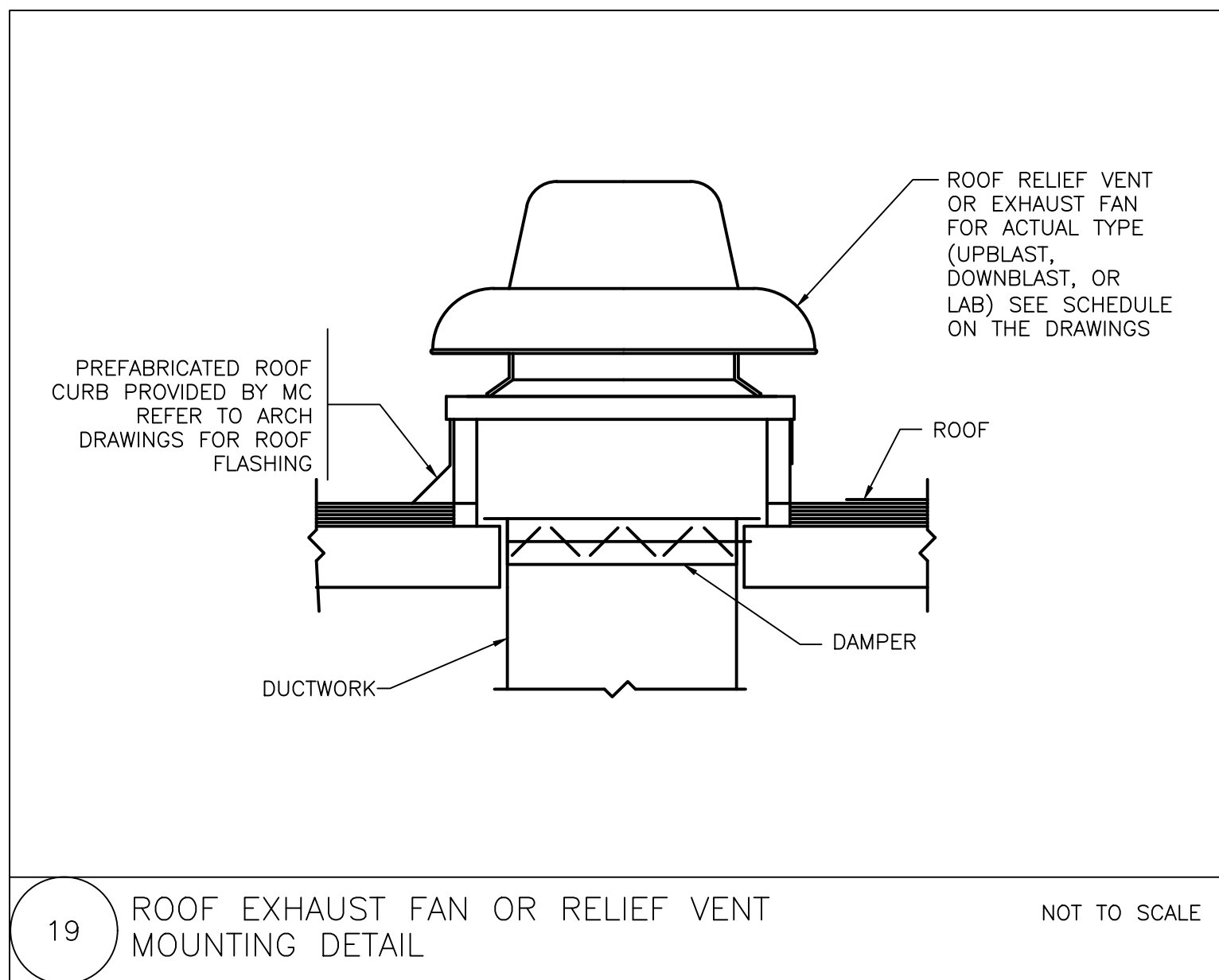
9 ROUND VOLUME DAMPER DETAIL

NOT TO SCALE



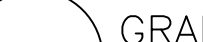
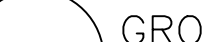
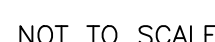
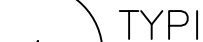
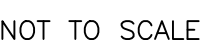
14 PIPE SLEEVE THROUGH WALL AND SLAB DETAIL

NOT TO SCALE



19 ROOF EXHAUST FAN OR RELIEF VENT MOUNTING DETAIL

NOT TO SCALE



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