23-AIR HANDLING UNIT SCHEDULE

					SUPPLY FAN ARRAY								EXHAUST FAN AT ECONOMIZER CONDITIONS								PREFILTER X 2		ELECTRICAL CHARACTERISTICS					
MARK	MANUFACTURER	MODEL	NOMINAL TONNAGE	OUTSIDE AIRFLOW	FAN QUANTITY	TOTAL AIRFLOW	FAN TYPE	TOTAL STATIC PRESSURE	EXTERNAL STATIC PRESSURE	RPM	ELECTRICAL CHARACTERISTICS HP	VFD	BHP	FAN QUANTITY	AIRFLOW	FAN TYPE	TOTAL STATIC PRESSURE	EXTERNAL STATIC PRESSURE	RPM	ELECTRICAL CHARACTERISTICS HP	VFD	BHP	TYPE	MERV	FLA	MCA	MOCP	VOLTAGE	Ø	NOTES
RTU-CR1	TRANE	OADF020C3	20	2500 CFM	1	7000 CFM	DIRECT DRIVE	4.23 in-wg	1.95 in-wg	2092	7.5	Yes	6.8	1	4900 CFM	DIRECT DRIVE	2.44 in-wg	1.00 in-wg	1566	5	Yes	2.85	PLEATED	8	50.7 A	54.6 A	60.0 A	460 V	3	1,2,3,5,6,7,8,11,12
RTU-CR2	TRANE	OAND360A4	30	5150 CFM	2	11000 CFM	DIRECT DRIVE	3.87 in-wg	2.00 in-wg	2308	15	Yes	10.01	1	7700 CFM	DIRECT DRIVE	2.24 in-wg	1.00 in-wg	1981	7.5	Yes	5.5	PLEATED	8	84.8 A	90.3 A	110.0 A	460 V	3	1,2,3,5,6,7,8,10,11,12
RTU-CR3	TRANE	OANG055C3	55	6600 CFM	2	14000 CFM	DIRECT DRIVE	4.42 in-wg	1.75 in-wg	2123	20	Yes	16.4	1	9800 CFM	DIRECT DRIVE	2.41 in-wg	1.00 in-wg	1860	10	Yes	8.86	PLEATED	8	134.4 A	139.3 A	150.0 A	460 V	3	1,2,3,5,6,7,8,10,11,12
RTU-GYM	TRANE	YHJ240A4SBH	20	2400 CFM	2	6000 CFM	BC PLENUM	1.99 in-wg	1.50 in-wg	1416	6	Yes	3.7	1	3000 CFM	BC PLENUM	0.25 in-wg	0.20 in-wg	1040	0.75	No	0.75	PLEATED	8	47.9 A	57.0 A	70.0 A	460 V	3	2,3,4,6,7,9,11,12
RTU-OFFICE	TRANE	YSJ120A4S0H	10	600 CFM	1	3000 CFM	BC PLENUM	1.68 in-wg	1.50 in-wg	1385	3	Yes	1.81	1	1500 CFM	BC PLENUM	0.25 in-wg	0.20 in-wg	1075	0.87	No	0.87	PLEATED	8	24.1 A	32.0 A	40.0 A	460 V	3	2,3,5,6,7,8,11,12

23-AIR HANDLING UNIT COOLING COIL / HEATING COIL CHARACTERISTICS

	DX COOLING										GAS HEATING							
	COOLING CAPACITY		ENTERING AIR		LEAVING AIR						CAPACITY		DRY BULB TEMPERATURE		ALLOWABLE GAS PRESSURE			
MARK	TOTAL	SENSIBLE	DRY BULB	WET BULB	DRY BULB	WET BULB	DESIGN AMBIENT TEMPERATURE	REFRIGERANT TYPE	IEER	TURN DOWN RATIO	INPUT	OUTPUT	EAT	LAT	MAXIMUM	MINIMUM	TURNDOWN RATIO	NOTES
RTU-CR1	226,600 Btu/h	174,300 Btu/h	76.0 °F	63.8 °F	53.0 °F	52.5 °F	95.0 °F	R-454B	14.71	5:1 DIGITAL SCROLL	300,000 Btu/h	243,000 Btu/h	5.0 °F	65.0 °F	14 in-wg	7 in-wg	10:1	1,2,3,5,6,7,8,11,12
RTU-CR2	301,800 Btu/h	244,900 Btu/h	75.7 °F	63.6 °F	55.1 °F	54.2 °F	95.0 °F	R-454B	14.49	5:1 DIGITAL SCROLL	500,000 Btu/h	405,000 Btu/h	5.0 °F	65.0 °F	14 in-wg	7 in-wg	10:1	1,2,3,5,6,7,8,10,11,12
RTU-CR3	592,800 Btu/h	392,600 Btu/h	75.9 °F	63.8 °F	53.1 °F	50.3 °F	95.0 °F	R-454B	13.54	5:1 DIGITAL SCROLL	800,000 Btu/h	648,000 Btu/h	5.0 °F	65.0 °F	14 in-wg	7 in-wg	20:1	1,2,3,5,6,7,8,10,11,12
RTU-GYM	237,090 Btu/h	163,610 Btu/h	80.0 °F	67.0 °F	54.9 °F	53.9 °F	95.0 °F	R-410A	16.4	4:1	400,000 Btu/h	324,000 Btu/h	34.8 °F	90.0 °F	14 in-wg	7 in-wg	10:1	2,3,4,6,7,9,11,12
RTU-OFFICE	119,290 Btu/h	83,230 Btu/h	80.0 °F	67.0 °F	54.5 °F	53.9 °F	95.0 °F	R-410A	15.1	3:1	240,000 Btu/h	194,400 Btu/h	52.0 °F	110.9 °F	14 in-wg	7 in-wg	2:1	2,3,5,6,7,8,11,12

23-AIR HANDLING UNIT ENERGY RECOVERY SECTIONS

		SUMMER AIR TEMPERATURES									WINTER AIR TEMPERATURES									
		SUPPLY AIR		EXHAUST AIR						SUMMER ENERGY RECOVERY EFFECTIVENESS	SUPPLY AIR				EXHAUST AIR				WINTER ENERGY RECOVERY EFFECTIVENESS	
		ENTERING		LEAVING		ENTERING		LEAVING			ENTERING		LEAVING		ENTERING		LEAVING			
MARK	AIRFLOW	DRY BULB	WET BULB	DRY BULB	WET BULB	DRY BULB	WET BULB	DRY BULB	WET BULB		DRY BULB	WET BULB	DRY BULB	WET BULB	DRY BULB	WET BULB	DRY BULB	WET BULB		NOTES
RTU-CR1	2500 CFM	89.0 °F	72.0 °F	77.9 °F	65.2 °F	75.0 °F	63.0 °F	80.6 °F	66.8 °F	77%	4.0 °F	3.0 °F	56.5 °F	49.2 °F	70.0 °F	58.0 °F	44.6 °F	41.6 °F	73%	1,2,3,5,6,7,8,11,12
RTU-CR2	5150 CFM	89.0 °F	72.0 °F	76.5 °F	64.4 °F	75.0 °F	63.0 °F	83.3 °F	68.4 °F	85%	4.0 °F	3.0 °F	62.8 °F	53.0 °F	70.0 °F	58.0 °F	32.8 °F	32.3 °F	83%	1,2,3,5,6,7,8,10,11,12
RTU-CR3	6600 CFM	89.0 °F	72.0 °F	76.9 °F	64.7 °F	75.0 °F	63.0 °F	83.0 °F	68.3 °F	82%	4.0 °F	3.0 °F	60.8 °F	51.6 °F	70.0 °F	58.0 °F	33.7 °F	33.3 °F	79%	1,2,3,5,6,7,8,10,11,12

23-AIR HANDLING UNIT REHEAT COIL CHARACTERISTICS

MARK	MAXIMUM AIRFLOW	HEATING COIL CAPACITY (BTU/H)	REHEAT COIL EAT(F)	REHEAT COIL LAT(F)	AMBIENT DB	HEATING SOURCE
RTU-GYM	6000 CFM	191,180 Btu/h	49.93	79.03	70 °F	HGRH

NOTES:

1. VARIABLE SPEED ENERGY RECOVERY WHEEL.
2. COMBINED MOTOR CHARACTERISTICS ARE SHOWN FOR REFERENCE ONLY.
3. PROVIDE SINGLE POINT ELECTRICAL CONNECTION.
4. SINGLE-ZONE VAV WITH CO2 SENSOR FOR DEMAND CONTROL VENTILATION.
5. MULTIZONE VAV APPLICATION.
6. INSULATED CURB.
7. POWERED EXHAUST.
8. VERTICAL SUPPLY AND RETURN DUCT CONNECTIONS.
9. HORIZONTAL SUPPLY AND VERTICAL RETURN DUCT CONNECTIONS.
10. ROOF CURB VIBRATION ISOLATION RAIL EQUAL TO KINETICS KSR 2.0.
11. MANUFACTURER MUST PROVIDE UNITS WITH A MINIMUM EFFICIENCY IEER TO COMPLY WITH ASHRAE 90.1-2019 TABLE 6.8.1-1.
12. CARBON MONOXIDE DETECTORS BY OTHERS. WIRE TO RTU TO SHUT DOWN UNIT UPON CO DETECTION.

23-EXHAUST FAN SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	AIRFLOW	ESP	RPM	HP	MCA	MOCP	Ø	VOLTAGE	NOTES
EF-1	GREENHECK	G-130-VG	ROOFTOP	980 CFM	0.6 in-wg	1042	0.25	4.8 A	15 A	1	115 V	1,3,4
EF-2	GREENHECK	G-080-VG	ROOFTOP	220 CFM	0.5 in-wg	1528	0.1	1.9 A	15 A	1	115 V	2,3,4
EF-3	GREENHECK	G-095-VG	ROOFTOP	575 CFM	0.6 in-wg	1607	0.166	3.5 A	15 A	1	115 V	1,3,4
EF-4	GREENHECK	CSP-A250	CEILING MOUNTED	80 CFM	0.4 in-wg	714	0.025	0.7 A	15 A	1	115 V	1
EF-5	GREENHECK	G-080-VG	ROOFTOP	320 CFM	0.5 in-wg	1703	0.1	1.9 A	15 A	1	115 V	1,3,4
EF-6	GREENHECK	G-080-VG	ROOFTOP	220 CFM	0.5 in-wg	1528	0.1	1.9 A	15 A	1	115 V	2,3,4
EF-7	GREENHECK	G-090-VG	ROOFTOP	460 CFM	0.5 in-wg	1535	0.1	1.9 A	15 A	1	115 V	1,3,4
EF-8	GREENHECK	G-097-VG	ROOFTOP	140 CFM	0.5 in-wg	1210	0.1	4.8 A	15 A	1	115 V	1,3,4

NOTES:

1. FAN IS CONTROLLED BY BAS. SEE CONTROL SCHEMATICS AND SEQUENCES.
2. ELECTRICAL CONTRACTOR TO INTEGRATE WITH OCCUPANCY SENSOR FOR FAN CONTROL.
3. PROVIDE DAMPER TRAY AND BACKDRAFT DAMPER IN CURB.
4. MANUFACTURER TO PROVIDE INTEGRAL VARIABLE SPEED MOTOR WITH SOFT START AND THERMAL OVERLOADS.

23-ELECTRIC HEATER SCHEDULE

				HEATING COIL	ELECTRICAL CHARACTERISTICS				
MARK	MANUFACTURER	MODEL	SUPPLY FAN AIRFLOW	TOTAL HEATING CAPACITY	TYPE	AMPS	Ø	VOLTAGE	WATTS	NOTES
EH-1	QMARK	AWH4000	100 CFM	13649 Btu/h	WALL	19.2 A	1	208 V	4000 W	1,2
EH-2	QMARK	AWH4000	100 CFM	5118 Btu/h	WALL	7.2 A	1	208 V	1500 W	1,2
EH-3	QMARK	AWH4000	100 CFM	5118 Btu/h	WALL	7.2 A	1	208 V	1500 W	1,2
EH-4	QMARK	AWH4000	100 CFM	5118 Btu/h	WALL	7.2 A	1	208 V	1500 W	1,2

NOTES:

1. MANUFACTURER SHALL PROVIDE UNIT MOUNTED DISCONNECT SWITCH AND THERMOSTAT.
2. RECESSED MOUNTED.

23-SPLIT DX AIR CONDITIONING UNIT SCHEDULE

			SUPPLY FAN	COOLING COIL			ELECTRICAL CHARACTERISTICS		
MARK	MANUFACTURER	MODEL	AIRFLOW	TOTAL COOLING CAPACITY	SENSIBLE COOLING CAPACITY	MCA	VOLTAGE	Ø	NOTES
AC-109	MITSUBISHI ELECTRIC	PKA-A12HA7	425 CFM	12000 Btu/h	10560 Btu/h	1.0 A	208 V	1	1
AC-122	MITSUBISHI ELECTRIC	PKA-A12HA7	425 CFM	12000 Btu/h	10560 Btu/h	1.0 A	208 V	1	1
AC-125	MITSUBISHI ELECTRIC	PKA-A24KA7	775 CFM	24000 Btu/h	18480 Btu/h	1.0 A	208 V	1	1,2
AC-314	MITSUBISHI ELECTRIC	PKA-A12HA7	425 CFM	12000 Btu/h	10560 Btu/h	1.0 A	208 V	1	1
AC-315A	MITSUBISHI ELECTRIC	PKA-A12HA7	425 CFM	12000 Btu/h	10560 Btu/h	1.0 A	208 V	1	1
AC-514	MITSUBISHI ELECTRIC	PKA-A12HA7	425 CFM	12000 Btu/h	10560 Btu/h	1.0 A	208 V	1	1
AC-515	MITSUBISHI ELECTRIC	PKA-A12HA7	425 CFM	12000 Btu/h	10560 Btu/h	1.0 A	208 V	1	1

23-CONDENSING UNIT SCHEDULE

			SEER2	REFRIGERANT TYPE	TOTAL CAPACITY	ELECTRICAL CHARACTERISTICS				NOTES
MARK	MANUFACTURER	MODEL				VOLTAGE	Ø	MCA	MOCP	
CU-109	MITSUBISHI ELECTRIC	PUY-A12NKA7(-BS)	20.8	R-410A	12,000 Btu/h	208 V	1	11.0 A	28.0 A	1
CU-122	MITSUBISHI ELECTRIC	PUY-A12NKA7(-BS)	20.8	R-410A	12,000 Btu/h	208 V	1	11.0 A	28.0 A	1
CU-125	MITSUBISHI ELECTRIC	PUZ-A24NHA7	21.3	R-410A	24,000 Btu/h	208 V	1	19.0 A	26.0 A	1,2
CU-314	MITSUBISHI ELECTRIC	PUY-A12NKA7(-BS)	20.8	R-410A	12,000 Btu/h	208 V	1	11.0 A	28.0 A	1
CU-315A	MITSUBISHI ELECTRIC	PUY-A12NKA7(-BS)	20.8	R-410A	12,000 Btu/h	208 V	1	11.0 A	28.0 A	1
CU-514	MITSUBISHI ELECTRIC	PUY-A12NKA7(-BS)	20.8	R-410A	12,000 Btu/h	208 V	1	11.0 A	28.0 A	1
CU-515	MITSUBISHI ELECTRIC	PUY-A12NKA7(-BS)	20.8	R-410A	12,000 Btu/h	208 V	1	11.0 A	28.0 A	1

NOTES:

1. MANUFACTURER TO PROVIDE LOW AMBIENT KIT FOR OPERATION DOWN TO 0 DEGREES F AND CONDENSATE PUMP. ALL REFRIGERANT PIPING SIZED AND PROVIDED BY UNIT MANUFACTURER AND INSTALLED BY CONTRACTOR. MANUFACTURER TO PROVIDE INTEGRAL THERMOSTAT WITH UNIT. INDOOR UNIT IS POWERED FROM THE OUTDOOR UNIT. MANUFACTURER TO PROVIDE UNIT THAT CAN COVER DISTANCE BETWEEN INDOOR AND OUTDOOR UNIT (REFRIGERANT LINES).
2. HEAT PUMP UNIT.

23-AIR DEVICE SCHEDULE

	BASIS OF DESIGN									
MARK	MANUFACTURER	MODEL	DIFFUSER TYPE	MAXIMUM AIRFLOW	MAXIMUM PRESSURE DROP	MAXIMUM SOUND	BLADE SPACING	DIFFUSER PATTERN	CONNECTION SIZE (INCH)	FACE SIZE (INCH)	NOTES
ECG-1	PRICE	80	EGG CRATE GRILLE	720 CFM	0.085 in-wg	20	1/2" X 1/2"	0	12" X 12"	14"X14"	
ECG-2	PRICE	80	EGG GRATE GRILLE	1440 CFM	0.085 in-wg	23	1/2" X 1/2"	0	24" X 12"	24" X 12"	
EG-1	PRICE	530	LOUVERED FACE RETURN GRILLE	155 CFM	0.100 in-wg	25	3/4"	45	8" X 6"	8" X 6"	1
EG-2	PRICE	530	LOUVERED FACE RETURN GRILLE	980 CFM	0.062 in-wg	23	1/2"	45	24" x 14"	24" X 14"	1
HDRG-1	PRICE	96	HEAVY DUTY RETURN GYM GRILLE	2790 CFM	0.040 in-wg	24	3/8"	45	24" X 36"	24" X 36"	1
RG-2	PRICE	535	LOUVERED FACE RETURN GRILLE	300 CFM	0.097 in-wg	24	3/4"	0	12" X 8"	12" X 8"	
SD-1	PRICE	SPD	SQUARE PLAQUE DIFFUSER	110 CFM	0.065 in-wg	22	N/A	0	6Ø	24x24	
SD-2	PRICE	SPD	SQUARE PLAQUE DIFFUSER	240 CFM	0.115 in-wg	27	N/A	0	8Ø	24x24	
SD-3	PRICE	SPD	SQUARE PLAQUE DIFFUSER	420 CFM	0.146 in-wg	26	N/A	0	10Ø	24x24	
SD-7	PRICE	SPD	SQUARE PLAQUE DIFFUSER	175 CFM	0.192 in-wg	22	N/A		6Ø	12X12	
SG-2	PRICE	520	LOUVERED FACE SUPPLY GRILLE	145 CFM	0.094 in-wg	20	3/4"	DOUBLE DEFLECTION	6" X 6"	6" X 6"	2,3
SG-5	PRICE	520	LOUVERED FACE SUPPLY GRILLE	310 CFM	0.096 in-wg	23	3/4"	DOUBLE DEFLECTION	12" X 6"	12" X 6"	2,3

NOTES:

1. MANUFACTURER TO PROVIDE FACTORY PRIME-COATED WALL GRILLES. FIELD-PAINTED TO MATCH ADJACENT.
2. PROVIDE INTEGRAL DAMPERS.
3. MANUFACTURER TO PROVIDE FACTORY PRIME-COATED DUCT MOUNTED GRILLES, FIELD-PAINTED, COLOR SELECTED BY ARCHITECT.

23-HVAC SHEET LIST

SHEET NUMBER	SHEET NAME
M001	MECHANICAL SCHEDULES AND LEGENDS
M002	MECHANICAL SCHEDULES
M003	VENTILATION SCHEDULES
M004	MECHANICAL DETAILS
M101	MECHANICAL DUCTWORK PLAN AREA A
M102	MECHANICAL DUCTWORK PLAN AREA B
M103	MECHANICAL DUCTWORK PLAN AREA C
M104	MECHANICAL PIPING PLAN
M301	MECHANICAL ROOF PLAN
M401	AHU SECTIONS
M501	CONTROL SCHEMATICS - AIRSIDE

ABBREVIATIONS

ACU	AIR CONDITIONING UNIT
ACH	AIR CHANGES PER HOUR
AFUE	ANNUAL FUEL EFFICIENCY RATIO
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT
AO	ANALOG OUTPUT
B	BOILER
BACNET	COMMUNICATION PROTOCOL FOR BUILDING AUTOMATION NETWORKS
BAS	BUILDING AUTOMATION SYSTEM
BI	BINARY INPUT
BO	BINARY OUTPUT
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNITS / HOUR
CAV	CONSTANT AIR VOLUME
CDD	COOLING DEGREE DAYS
CFC	CHLOROFLUOROCARBON
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
COP	COEFFICIENT OF PERFORMANCE
CRAC	COMPUTER ROOM AIR CONDITIONER
CV	CONSTANT VOLUME
DA	DISCHARGE AIR
DB	DRY BULB
DCV	DEMAND CONTROLLED VENTILATION
DDC	DIRECT DIGITAL CONTROL
DH	DUCT HEATER
DP	DIFFERENTIAL PRESSURE
DX	DIRECT EXPANSION
EAT	ENTERING AIR TEMPERATURE
ECM	ELECTRONICALLY COMMUTATED MOTOR
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EH	ELECTRIC HEATER
EMS	ENERGY MANAGEMENT SYSTEM
ESCO	ENERGY SERVICE COMPANY
EUH	ELECTRIC UNIT HEATER
EWT	ENTERING WATER TEMPERATURE
FCU	FAN COIL UNIT
FLA	FULL LOAD AMPS
FMS	FACILITY MANAGEMENT SYSTEM
FPM	FEET PER MINUTE
FW	FEED WATER
GPM	GALLONS PER MINUTE
GUI	GRAPHICAL USER INTERFACE
HCFC	HYDROCHLOROCFUOROCARBON
HEPA	HIGH EFFICIENCY PARTICULATE ARRESTING
HFC	HYDROFLUOROCARBON
HGRH	HOT GAS REHEAT
HL	HIGH LIMIT
HR	HEAT RECOVERY
HRU	HEAT RECOVERY UNIT
HRV	HEAT RECOVERY VENTILATOR
HSPF	HEATING SEASONAL PERFORMANCE FACTOR
HVAC	HEATING VENTILATION AND AIR CONDITIONING
HX	HEAT EXCHANGER
I/O	INPUT OUTPUT
IAQ	INDOOR AIR QUALITY
IR	INFRA-RED
LAT	LEAVING AIR TEMPERATURE
LHV	LOWER HEATING VALUE
LL	LOW LIMIT
LON	LOCAL OPERATING NETWORK
LP	LOW PRESSURE
LRA	LOCKED ROTOR AMPS
LWBT	LEAVING WET BULB TEMPERATURE
M&V	MEASUREMENT AND VERIFICATION
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MCC	MOTOR CONTROL CENTER
MUA	MAKE-UP AIR UNIT
MZ	MULTI-ZONE
NC	NORMALLY CLOSED
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NO	NORMALLY OPEN
NPSH	NET POSITIVE SUCTION HEAD
OA	OUTSIDE AIR
OAP	OUTSIDE AIR PERCENTAGE
OAT	OUTSIDE AIR TEMPERATURE
ODP	OPEN DRIP PROOF
OWS	OPERATOR WORK STATION
PC	PERFORMANCE CONTRACTING
PE	PROFESSIONAL ENGINEER
PH	PRE-HEAT
PID	PROPORTIONAL INTEGRAL DERIVATIVE
PRV	PRESSURE RELIEF VALVE
PRV	PRESSURE REDUCING VALVE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
RA	RETURN AIR
RF	RETURN FAN
RH	REHEAT
RH	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
RTD	RESISTANCE TEMPERATURE DETECTOR
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SAT	SUPPLY AIR TEMPERATURE
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SF	SUPPLY FAN
SHR	SENSIBLE HEAT RATIO
SP	SET POINT
SP	STATIC PRESSURE
T	THERMOSTAT
TEV	THERMOSTATIC EXPANSION VALVE
TOD	TIME OF DAY
TXV	THERMOSTATIC EXPANSION VALVE
UH	UNIT HEATER
UV	ULTRAVIOLET
UV	UNIT VENTILATOR
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
VSD	VARIABLE SPEED DRIVE
VSP	VARIABLE SPEED PUMP(ING)
WB	WET BULB
WC	WATER COLUMN
YTD	YEAR TO DATE

GENERAL PROJECT NOTES

A. DRAWINGS ARE SCHEMATIC IN NATURE AND SHOW DESIGN INTENT. IF CHANGES ARE MADE DUE TO DIFFERING FIELD CONDITIONS, SUGGESTED CHANGES ARE TO BE SUBMITTED TO ARCHITECT FOR APPROVAL PRIOR TO CHANGES BEING MADE.
B. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF FIRE-RATED WALLS.
C. REPAIR ANY WORK DAMAGED AS A RESULT OF WORK BY THIS CONTRACT.
D. CONTRACTOR SHALL BE RESPONSIBLE TO SECURE AND PAY FOR FOR ALL MATERIALS, LABOR, LICENSES, PERMITS, INSPECTIONS, FEES, FINAL CLEANUP, AND QUALITY OF WORKMANSHIP AND MATERIALS REQUIRED TO PERFORM WORK DESCRIBED IN CONTRACT.
E. CONTRACTOR SHALL VERIFY AND SATISFY THAT ALL EQUIPMENT FURNISHED WILL PROPERLY FIT IN THE SPACE PROVIDED, THAT IT WILL FUNCTION PROPERLY, AND THAT ALL PARTS OF EQUIPMENT REQUIRING SERVICE ARE READILY ACCESSIBLE IN COMPLIANCE WITH THE MECHANICAL CODE.
F. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL CUTTING AND PATCHING OF WALLS, FLOORS, AND ROOFS REQUIRED FOR DEMOLITION OF EXISTING AND INSTALLATION OF NEW HVAC COMPONENTS. ALL OPENINGS IN WALLS, FLOORS OR CEILINGS SHALL BE PROPERLY SEALED.
G. ALL WORK SHALL BE PERFORMED AND INSTALLED PER THE REQUIREMENTS OF ALL FEDERAL, STATE AND LOCAL CODES, LAWS, REGULATIONS, INSPECTION AGENCIES, UTILITY COMPANIES AND OTHER AUTHORITIES HAVING JURISDICTION.
H. CONTRACTOR SHALL REVIEW EACH SUBMITTAL AND CHECK FOR COORDINATION WITH OTHER WORK OF THE CONTRACT AND FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS. CONTRACTOR IS RESPONSIBLE FOR ANY CHANGES TO PRICE AND SCHEDULE AFFECTING ANY TRADE RESULTING FROM USE OF NON-BASIS OF DESIGN EQUIPMENT. EQUIPMENT SCHEDULES SHOW BASIS OF DESIGN.
I. OUTDOOR DESIGN CONDITIONS: SUMMER: 89 DB, 72 WB. WINTER: 4 DB.
J. GENERAL ROOM DESIGN CONDITIONS: SUMMER: 75 DB, 30-60% RH. WINTER: 70 DB.
K. ALL EQUIPMENT AND COMPONENTS INSTALLED IN AN AIR PLENUM SHALL BE PLENUM RATED.
L. COORDINATE LOCATIONS OF ALL HVAC EQUIPMENT AND ACCESSORIES WITH OTHER TRADES.
M. LOCATE WALL OPENINGS FOR DUCTS, GRILLES, AIR TRANSFER OPENINGS, PIPING, ETC. CENTERED BETWEEN FRAMING MEMBERS WHEN POSSIBLE.
N. FOR ALL ROOF-MOUNTED MECHANICAL EQUIPMENT, THE CONTRACTOR SHALL PROVIDE THE CURB, CUT THE ROOF OPENING, AND PROVIDE ROOFING AND ROOF FLASHING AROUND CURB SO THAT ROOF WARRANTY IS MAINTAINED. ALL ROOF PENETRATIONS SHALL BE COORDINATED WITH ALL TRADES. TOPS OF ROOF CURBS SHALL BE 12" ABOVE TOP LAYER OF ROOF INSULATION OR MEMBRANE AND SUPPORTED ON STRUCTURE UNLESS NOTED OTHERWISE.
O. ALL TRANSFER AIR DUCTS SHALL HAVE INTERIOR DUCT LINING. REFER TO THE SPECIFICATIONS FOR DUCT LINING REQUIREMENTS.
P. ALL DUCT FITTINGS SHALL BE LO-LOSS FITTINGS. ROUND TAPS INTO SQUARE DUCT SHALL BE CONICAL OR BELLMOUTH. SQUARE ELBOWS AND SQUARE OR RECTANGULAR SPLITTERS SHALL USE TURNING VANES. NON-SQUARE ELBOWS SHALL HAVE A MINIMUM RADIUS OF 1.5 TIMES THE RADIUS OF THE DUCT. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIRMENTS.
Q. WHEN PENETRATING A NON-FIRE RATED WALL OR FLOOR WITH DUCTWORK OR PIPING, SEAL ANNULAR SPACE BETWEEN WALL/FLOOR AND MECHANICAL MATERIALS WITH NON-COMBUSTIBLE FIBERGLASS INSULATION AND JOINT SEALANTS APPROPRIATE FOR SIZE AND DEPTH AND SOUND ATTENUATION CONSIDERATION. REFER TO ARCHITECTURAL SPECIFICATIONS FOR NON FIRE RATED JOINT SEALANTS.
R. BALANCE AIR HANDLING UNIT MINIMUM OUTSIDE AIR TO THE OUTSIDE AIRFLOWS INDICATED ON THE VENTILATION SCHEDULE.
S. LOCATE ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH STRAIGHT SECTION OF PIPE OR DUCT UP AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR ACCURACY.
T. WHEN ABOVE A GYPSUM CEILING, PROVIDE HARD DUCT CONNECTION AT AIR DEVICE AND USE SHEETMETAL SCREWS AND DUCT SEALANT. DO NOT USE FLEX OR WIRE TIE AT FINAL AIR DEVICE CONNECTION WHEN ABOVE A HARD CEILING.
U. THE USE OF FLEXIBLE DUCTWORK SHALL BE LIMITED TO AIR DEVICE CONNECTIONS AND BE A MAXIMUM OF 60" IN LENGTH.
V. ALL 90° ELBOWS SHALL BE SHEET METAL.
W. TURNING VANES SHALL BE INSTALLED IN ALL MITERED SUPPLY DUCT TURNS.
X. MAINTAIN REQUIRED CLEARANCES FROM EXHAUST AND VENT LOCATIONS TO OUTSIDE AIR INTAKE AND OPERABLE DOORS & WINDOWS.
Y. PROVIDE DUCT LINER PER SPECIFICATIONS FOR ALL SUPPLY AND RETURN DUCT WITHIN 10' OF CONNECTION TO ALL AIR HANDLING EQUIPMENT INCLUDING ROOFTOP UNITS.
Z. THERMOSTATS SHALL BE MOUNTED WITH BOTTOM AT 44" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED ON THERMOSTAT INSTALLATION DETAIL ON ELECTRICAL SHEETS.
AA. DUCTS CONNECTING TO INLET AND DISCHARGE OF VAV BOXES SHALL BE SAME SIZE AS BOX CONNECTION. UNLESS NOTED OTHERWISE.

SYMBOLS AND ABBREVIATIONS LEGEND

(THERE MAY BE SYMBOLS LISTED IN THIS LEGEND THAT ARE NOT USED IN THIS SET OF DRAWINGS)

PIPING SYMBOLS DESCRIPTION

—COND— CONDENSATE DRAIN PIPING
—RS/L— REFRIGERANT SUCTION/LIQUID PIPING
(X) KEYNOTE NOTE

DUCTWORK SYMBOLS

LINEAR DIFFUSER
SUPPLY DIFFUSER
RETURN GRILLE
EXHAUST GRILLE
VAV BOX (WITH CLEARANCE BOX SHOWN)
BALANCING DAMPER
BACKDRAFT DAMPER
SMOKE DAMPER
FIRE DAMPER
MOTORIZED CONTROL DAMPER
INTERNALLY LINED DUCTWORK
FABRIC DUCTWORK
FLEXIBLE DUCTWORK

CONTROL SYMBOLS

T THERMOSTAT
CO2 CARBON DIOXIDE SENSOR
H HUMIDITY SENSOR
VOC VOC SENSOR
T/H COMBINATION THERMOSTAT / HUMIDITY SENSOR
CO CARBON MONOXIDE SENSOR

0'-1" REFERENCE LINE

COPYRIGHT
STEED HAMMOND PAUL, INC
ALL RIGHTS RESERVED

STATE OF OHIO
JACOB A. FAIOLA
84724
REGISTERED
PROFESSIONAL ENGINEER

SHP
512 PLUM STREET, SUITE 700
CINCINNATI, OH 45202 · 513.381.2112

DAYTON REGIONAL STEM SCHOOL
K-5 BUILDING
2850 DONATION CIRCLE, KETTERING, OH 45240

DAYTON REGIONAL STEM SCHOOL
1724 WOODMAN DRIVE, KETTERING, OH 45420

ISSUANCES

04-05-24	SCHEMATIC DESIGN
06-28-24	GMP/PERMIT

MECHANICAL SCHEDULES AND LEGENDS

COMM NO. 2024026.01

M001

6/28/2024 11:46:43 AM C:\Users\kshah\Documents_LFile24\2024026\01 MEP_Dayton STEM K5_kshahP9APC.rvt

23-VARIABLE AIR VOLUME ELECTRIC BOX SCHEDULE

MARK	MANUFACTURER	MODEL	HEATER CONTROL	INLET SIZE	MINIMUM CFM	DESIGN CFM	HEATING CFM	APPLIED HEATING LOAD	HEATER SIZE	ELECTRIC HEAT AIR TEMPERATURE (°F) ENTERING	ELECTRIC HEAT AIR TEMPERATURE (°F) LEAVING	VOLTS	PHASE	NOTES
VV-1	PRICE	SDV5000	SCR	8"	222	740	370	3.5 kW	3.5 kW	55	85	277 V	1	ALL
VV-2	PRICE	SDV5000	SCR	12"	552	1840	920	8.7 kW	9.0 kW	55	85	480 V	3	ALL
VV-3	PRICE	SDV5000	SCR	8"	201	670	460	4.4 kW	4.5 kW	55	85	277 V	1	ALL
VV-4	PRICE	SDV5000	SCR	10"	269	895	448	4.2 kW	4.5 kW	55	85	277 V	1	ALL
VV-5	PRICE	SDV5000	SCR	8"	186	620	310	2.9 kW	3.0 kW	55	85	277 V	1	ALL
VV-6	PRICE	SDV5000	SCR	8"	231	770	385	3.7 kW	4.0 kW	55	85	277 V	1	ALL
VV-7	PRICE	SDV5000	SCR	4"	120	400	247	2.3 kW	2.5 kW	55	85	277 V	1	ALL
VV-8	PRICE	SDV5000	SCR	4"	69	230	205	1.9 kW	2.0 kW	55	85	277 V	1	ALL
VV-9	PRICE	SDV5000	SCR	10"	335	1115	558	5.3 kW	5.5 kW	55	85	277 V	1	ALL
VV-10	PRICE	SDV5000	SCR	8"	282	940	470	4.5 kW	4.5 kW	55	85	277 V	1	ALL
VV-11	PRICE	SDV5000	SCR	4"	21	70	35	0.3 kW	0.5 kW	55	85	277 V	1	ALL
VV-12	PRICE	SDV5000	SCR	8"	216	720	360	3.4 kW	3.5 kW	55	85	277 V	1	ALL
VV-13	PRICE	SDV5000	SCR	4"	15	50	25	0.2 kW	0.5 kW	55	85	277 V	1	ALL
VV-14	PRICE	SDV5000	SCR	6"	153	510	255	2.4 kW	2.5 kW	55	85	277 V	1	ALL
VV-15	PRICE	SDV5000	SCR	8"	231	770	385	3.7 kW	4.0 kW	55	85	277 V	1	ALL
VV-16	PRICE	SDV5000	SCR	8"	216	720	360	3.4 kW	3.5 kW	55	85	277 V	1	ALL
VV-17	PRICE	SDV5000	SCR	4"	21	70	35	0.3 kW	0.5 kW	55	85	277 V	1	ALL
VV-18	PRICE	SDV5000	SCR	8"	240	800	480	4.6 kW	5.0 kW	55	85	277 V	1	ALL
VV-19	PRICE	SDV5000	SCR	4"	54	180	90	0.9 kW	1.0 kW	55	85	277 V	1	ALL
VV-20	PRICE	SDV5000	SCR	14"	648	2160	1080	10.3 kW	10.5 kW	55	85	480 V	3	ALL
VV-21	PRICE	SDV5000	SCR	8"	216	720	360	3.4 kW	3.5 kW	55	85	277 V	1	ALL
VV-22	PRICE	SDV5000	SCR	4"	54	180	90	0.9 kW	1.0 kW	55	85	277 V	1	ALL
VV-23	PRICE	SDV5000	SCR	8"	216	720	360	3.4 kW	3.5 kW	55	85	277 V	1	ALL
VV-24	PRICE	SDV5000	SCR	8"	240	800	485	4.6 kW	5.0 kW	55	85	277 V	1	ALL
VV-25	PRICE	SDV5000	SCR	14"	702	2340	1245	11.8 kW	12.0 kW	55	85	480 V	3	ALL
VV-26	PRICE	SDV5000	SCR	8"	216	720	360	3.4 kW	3.5 kW	55	85	277 V	1	ALL
VV-27	PRICE	SDV5000	SCR	8"	276	920	460	4.4 kW	4.5 kW	55	85	277 V	1	ALL
VV-28	PRICE	SDV5000	SCR	4"	38	125	118	1.1 kW	1.5 kW	55	85	277 V	1	ALL
VV-29	PRICE	SDV5000	SCR	4"	72	240	202	1.9 kW	2.0 kW	55	85	277 V	1	ALL
VV-30	PRICE	SDV5000	SCR	12"	404	1345	673	6.4 kW	6.5 kW	55	85	480 V	3	ALL
VV-31	PRICE	SDV5000	SCR	8"	228	760	380	3.6 kW	4.0 kW	55	85	277 V	1	ALL
VV-32	PRICE	SDV5000	SCR	4"	60	200	100	0.9 kW	1.0 kW	55	85	277 V	1	ALL
VV-33	PRICE	SDV5000	SCR	4"	30	100	50	0.5 kW	0.5 kW	55	85	277 V	1	ALL
VV-34	PRICE	SDV5000	SCR	4"	57	190	95	0.9 kW	1.0 kW	55	85	277 V	1	ALL
VV-35	PRICE	SDV5000	SCR	4"	18	60	30	0.3 kW	0.5 kW	55	85	277 V	1	ALL
VV-36	PRICE	SDV5000	SCR	6"	144	480	240	2.3 kW	2.5 kW	55	85	277 V	1	ALL
VV-37	PRICE	SDV5000	SCR	8"	231	770	385	3.7 kW	4.0 kW	55	85	277 V	1	ALL
VV-38	PRICE	SDV5000	SCR	8"	216	720	360	3.4 kW	3.5 kW	55	85	277 V	1	ALL
VV-39	PRICE	SDV5000	SCR	8"	240	800	480	4.6 kW	5.0 kW	55	85	277 V	1	ALL
VV-40	PRICE	SDV5000	SCR	4"	30	100	50	0.5 kW	0.5 kW	55	85	277 V	1	ALL
VV-41	PRICE	SDV5000	SCR	4"	90	300	150	1.4 kW	1.5 kW	55	85	277 V	1	ALL
VV-42	PRICE	SDV5000	SCR	14"	648	2160	1080	10.3 kW	10.5 kW	55	85	480 V	3	ALL
VV-43	PRICE	SDV5000	SCR	8"	216	720	360	3.4 kW	3.5 kW	55	85	277 V	1	ALL
VV-44	PRICE	SDV5000	SCR	4"	60	200	100	0.9 kW	1.0 kW	55	85	277 V	1	ALL
VV-45	PRICE	SDV5000	SCR	8"	216	720	360	3.4 kW	3.5 kW	55	85	277 V	1	ALL
VV-46	PRICE	SDV5000	SCR	8"	240	800	485	4.6 kW	5.0 kW	55	85	277 V	1	ALL
VV-47	PRICE	SDV5000	SCR	4"	86	285	143	1.4 kW	1.5 kW	55	85	277 V	1	ALL
VV-48	PRICE	SDV5000	SCR	5"	120	400	363	3.4 kW	3.5 kW	55	85	277 V	1	ALL
VV-49	PRICE	SDV5000	SCR	4"	68	225	113	1.1 kW	1.5 kW	55	85	277 V	1	ALL
VV-50	PRICE	SDV5000	SCR	4"	68	225	113	1.1 kW	1.5 kW	55	85	277 V	1	ALL
VV-51	PRICE	SDV5000	SCR	4"	62	205	103	1.0 kW	1.0 kW	55	85	277 V	1	ALL
VV-52	PRICE	SDV5000	SCR	4"	60	200	100	0.9 kW	1.0 kW	55	85	277 V	1	ALL
VV-53	PRICE	SDV5000	SCR	6"	90	300	255	2.4 kW	2.5 kW	55	85	277 V	1	ALL
VV-54	PRICE	SDV5000	SCR	4"	105	350	175	1.7 kW	2.0 kW	55	85	277 V	1	ALL
VV-55	PRICE	SDV5000	SCR	8"	216	720	360	3.4 kW	3.5 kW	55	85	277 V	1	ALL
Grand total: 55														

NOTES:

1. PROVIDE DISCONNECT SWITCH INTEGRAL TO VAV BOX.
2. PROVIDE HEATER CAPACITY PER HEATER SIZE COLUMN, THE "APPLIED HEATING LOAD" COLUMN DENOTES THE HEAT REQUIRED TO MEET TARGET LAT OF 85 F.
3. PROVIDE WITH SCR CONTROL.
4. UL & ETL CERTIFIED ASSEMBLIES.
5. DO NOT PROVIDE LESS THAN THE MANUFACTURER'S RECOMMENDED CFM PER KW OF ELECTRIC HEATER.

23-MECHANICAL/ELECTRICAL COORDINATION SCHEDULE

MARK	SPECIFICATION SECTION	STARTING MEANS TYPE	STARTING MEANS PROVIDED BY	STARTING MEANS INSTALLED BY	STARTING MEANS LOCATION	DISCONNECTING MEANS TYPE	DISCONNECTING MEANS PROVIDED BY	DISCONNECTING MEANS INSTALLED BY	DISCONNECTING MEANS LOCATION
AC-109	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 26	DIV. 26	NEAR UNIT
AC-122	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 26	DIV. 26	NEAR UNIT
AC-125	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 26	DIV. 26	NEAR UNIT
AC-314	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 26	DIV. 26	NEAR UNIT
AC-315A	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 26	DIV. 26	NEAR UNIT
AC-514	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 26	DIV. 26	NEAR UNIT
AC-515	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 26	DIV. 26	NEAR UNIT
CU-109	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 26	DIV. 26	NEAR UNIT
CU-122	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 26	DIV. 26	NEAR UNIT
CU-125	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 26	DIV. 26	NEAR UNIT
CU-314	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 26	DIV. 26	NEAR UNIT
CU-315	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 26	DIV. 26	NEAR UNIT
CU-514	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 26	DIV. 26	NEAR UNIT
CU-515	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 26	DIV. 26	NEAR UNIT
EF-1	23	N/A	N/A	N/A	N/A	MRTS	DIV. 26	DIV. 26	NEAR UNIT
EF-2	23	N/A	N/A	N/A	N/A	MRTS	DIV. 26	DIV. 26	NEAR UNIT
EF-3	23	N/A	N/A	N/A	N/A	MRTS	DIV. 26	DIV. 26	NEAR UNIT
EF-4	23	N/A	N/A	N/A	N/A	MRTS	DIV. 26	DIV. 26	NEAR UNIT
EF-5	23	N/A	N/A	N/A	N/A	MRTS	DIV. 26	DIV. 26	NEAR UNIT
EF-6	23	N/A	N/A	N/A	N/A	MRTS	DIV. 26	DIV. 26	NEAR UNIT
EF-7	23	N/A	N/A	N/A	N/A	MRTS	DIV. 26	DIV. 26	NEAR UNIT
EF-8	23	N/A	N/A	N/A	N/A	MRTS	DIV. 26	DIV. 26	NEAR UNIT
EH-1	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 23	DIV. 23	INTEGRAL TO UNIT
EH-2	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 23	DIV. 23	INTEGRAL TO UNIT
EH-3	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 23	DIV. 23	INTEGRAL TO UNIT
EH-4	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 23	DIV. 23	INTEGRAL TO UNIT
RTU-CR1	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 23	DIV. 23	INTEGRAL TO UNIT
RTU-CR2	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 23	DIV. 23	INTEGRAL TO UNIT
RTU-CR3	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 23	DIV. 23	INTEGRAL TO UNIT
RTU-GYM	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 23	DIV. 23	INTEGRAL TO UNIT
RTU-OFFICE	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	DISCONNECT SWITCH	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-1	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-2	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-3	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-4	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-5	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-6	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-7	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-8	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-9	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-10	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-11	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-12	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-13	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-14	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-15	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-16	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-17	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-18	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-19	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-20	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-21	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-22	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-23	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-24	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-25	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-26	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-27	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-28	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-29	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-30	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-31	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-32	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-33	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-34	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-35	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-36	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-37	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-38	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-39	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-40	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-41	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-42	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-43	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-44	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-45	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-46	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-47	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-48	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-49	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-50	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-51	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-52	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-53	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-54	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT
VV-55	23	CONTROL PANEL	DIV. 23	DIV. 23	INTEGRAL TO UNIT	MRTS	DIV. 23	DIV. 23	INTEGRAL TO UNIT

COPYRIGHT
STEED HAMMOND PAUL, INC
ALL RIGHTS RESERVED

STATE OF OHIO
JACOB A FAIOLA
84724
REGISTERED
PROFESSIONAL ENGINEER

SHP
312 PLUM STREET, SUITE 700
CINCINNATI, OH 45202 · 513.381.2112

DAYTON REGIONAL STEM SCHOOL
K-5 BUILDING
2850 DONATION CIRCLE, KETTERING, OH 45240

DAYTON REGIONAL STEM SCHOOL
1724 WOODMAN DRIVE, KETTERING, OH 45420

ISSUANCES

04-05-24	SCHEMATIC DESIGN
06-28-24	GMP/PERMIT

MECHANICAL SCHEDULES

COMM NO. 2024026.01

M002

0'-1" REFERENCE LINE

6/28/2024 11:46:43 AM C:\Users\kshah\Documents_LFile24\202402601 MEP_Dayton STEM K5_kshahP9APC.rvt

ASHRAE Standard 62.1-2019

By SHP

Ventilation Calculations for Cooling Design

System Zone Room	Box Type	Vpz cfm	Vfan cfm	Vdz cfm	Vpz-min cfm	Voz-clg cfm	Zd	Ep	Er	Fa	Fb	Fc	Evz	
Alternative 1														
120 VESTIBULE	VAV Reheat	397	397	397	119	16	0.137	1.00	0.00	1.00	1.00	1.00	1.000	
120B CORRIDOR	VAV Reheat	148	148	148	123	62	0.500	1.00	0.00	1.00	1.00	1.00	0.866	*
121B STORAGE	VAV Reheat	28	28	28	8	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
123 CUSTODIAL WORKROOM	VAV Reheat	264	264	264	129	64	0.500	1.00	0.00	1.00	1.00	1.00	0.866	*
123A OFFICE	VAV Reheat	78	78	78	23	10	0.437	1.00	0.00	1.00	1.00	1.00	0.929	
124 MECHANICAL	VAV Reheat	318	318	318	95	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
126 RR	VAV Reheat	8	8	8	3	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
127 FAMILY RR	VAV Reheat	9	9	9	3	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
128 RR	VAV Reheat	8	8	8	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
129 RR	VAV Reheat	8	8	8	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
200 MULTI-USE COLLABORATIO	VAV Reheat	1,691	1,691	1,691	1,691	846	0.500	1.00	0.00	1.00	1.00	1.00	0.866	*
201 KINDERGARTEN CLASSROC	VAV Reheat	614	614	614	614	307	0.500	1.00	0.00	1.00	1.00	1.00	0.866	*
202 KINDERGARTEN CLASSROC	VAV Reheat	614	614	614	614	307	0.500	1.00	0.00	1.00	1.00	1.00	0.866	*
203 STORAGE	VAV Reheat	27	27	27	8	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
204 KINDERGARTEN CLASSROC	VAV Reheat	614	614	614	614	307	0.500	1.00	0.00	1.00	1.00	1.00	0.866	*
205 RR	VAV Reheat	7	7	7	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
206 RR	VAV Reheat	7	7	7	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
207 RR	VAV Reheat	6	6	6	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
318 CUSTODIAL	VAV Reheat	15	15	15	4	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
519 CENTRAL STORAGE	VAV Reheat	54	54	54	16	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
120C CORRIDOR	VAV Reheat	517	517	517	155	54	0.349	1.00	0.00	1.00	1.00	1.00	1.000	
120A CORRIDOR	VAV Reheat	552	552	552	212	106	0.500	1.00	0.00	1.00	1.00	1.00	0.866	*
RTU-1-CR		5,984	5,683	5,984	4,442	2,079							0.866	
404 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
405 SMALL GROUP (MENTAL HE/	VAV Reheat	229	229	229	69	29	0.423	1.00	0.00	1.00	1.00	1.00	1.000	
409 RR	VAV Reheat	6	6	6	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
410 RR	VAV Reheat	6	6	6	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
500A CORRIDOR	VAV Reheat	241	241	241	177	88	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
500B CORRIDOR	VAV Reheat	64	64	64	60	30	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
500C MULTI-USE COLLABORATI	VAV Reheat	2,049	2,049	2,049	2,049	1,025	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
500D CORRIDOR	VAV Reheat	32	32	32	25	13	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
501 PRINCIPAL OFFICE	VAV Reheat	98	98	98	30	15	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
502 STEM CLASSROOM	VAV Reheat	737	737	737	737	369	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*

Project Name:
Dataset Name: DAYTON STEM.TRC

ASHRAE Standard 62.1-2019

By SHP

Ventilation Calculations for Cooling Design

System Zone Room	Box Type	Vpz cfm	Vfan cfm	Vdz cfm	Vpz-min cfm	Voz-clg cfm	Zd	Ep	Er	Fa	Fb	Fc	Evz	
Alternative 1														
502A BREAK OUT ROOM	VAV Reheat	40	40	40	29	15	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
503 TEACHER WORKROOM	VAV Reheat	465	465	465	152	76	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
503A CONF	VAV Reheat	38	38	38	27	13	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
503B RR	VAV Reheat	7	7	7	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
504 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
505 STORAGE	VAV Reheat	30	30	30	9	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
506 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
507 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
508 OFFICE	VAV Reheat	40	40	40	24	12	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
509 SMALL GROUP (INTERVENTI	VAV Reheat	181	181	181	62	31	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
510 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
511 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
512 SMALL GROUP (TITLE 1)	VAV Reheat	158	158	158	71	36	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
513 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
516 SPECIALS CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
517 CENTRAL SERVING	VAV Reheat	967	967	967	290	114	0.392	1.00	0.00	1.00	1.00	1.00	1.000	
517A STORAGE	VAV Reheat	19	19	19	6	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
517B LOCKER ROOM	VAV Reheat	17	17	17	17	8	0.500	1.00	0.00	1.00	1.00	1.00	0.927	*
517C RR	VAV Reheat	9	9	9	3	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
518 CUSTODIAL	VAV Reheat	9	9	9	3	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
520 RR	VAV Reheat	7	7	7	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
521 RR	VAV Reheat	6	6	6	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
522 RR	VAV Reheat	6	6	6	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
523 RR	VAV Reheat	6	6	6	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
RTU-2-CR		11,178	11,086	11,178	9,563	4,728							0.927	
300B CORRIDOR	VAV Reheat	64	64	64	58	29	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
300C MULTI-USE COLLABORATI	VAV Reheat	2,069	2,069	2,069	2,069	1,035	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
300D CORRIDOR	VAV Reheat	33	33	33	25	13	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
301 AP OFFICE	VAV Reheat	101	101	101	30	15	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
302 STEM CLASSROOM	VAV Reheat	737	737	737	737	369	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
302A BREAK OUT ROOM	VAV Reheat	42	42	42	29	15	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
303 TEACHER WORKROOM	VAV Reheat	481	481	481	152	76	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
303A CONF	VAV Reheat	39	39	39	27	13	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*

Project Name:
Dataset Name: DAYTON STEM.TRC

ASHRAE Standard 62.1-2019

By SHP

Ventilation Calculations for Cooling Design

System Zone Room	Box Type	Vpz cfm	Vfan cfm	Vdz cfm	Vpz-min cfm	Voz-clg cfm	Zd	Ep	Er	Fa	Fb	Fc	Evz	
Alternative 1														
303B RR	VAV Reheat	7	7	7	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
304 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
305 STORAGE	VAV Reheat	31	31	31	9	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
306 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
307 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
308 OFFICE	VAV Reheat	41	41	41	24	12	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
309 SMALL GROUP (MENTAL HE/	VAV Reheat	172	172	172	62	31	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
310 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
311 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
312 SMALL GROUP (TITLE 1)	VAV Reheat	185	185	185	91	46	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
313 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
315 TECH OFFICE	VAV Reheat	36	36	36	17	9	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
315B TECH HELP DESK	VAV Reheat	50	50	50	28	14	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
316 SERVING	VAV Reheat	360	360	360	108	42	0.390	1.00	0.00	1.00	1.00	1.00	1.000	
317 MEDIA CENTER	VAV Reheat	1,103	1,103	1,103	827	414	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
319 RR	VAV Reheat	7	7	7	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
320 RR	VAV Reheat	6	6	6	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
321 RR	VAV Reheat	6	6	6	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
322 RR	VAV Reheat	6	6	6	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
400 MULTI-USE COLLABORATIO	VAV Reheat	2,318	2,318	2,318	2,292	1,146	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
401 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
402 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
403 STORAGE	VAV Reheat	24	24	24	7	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
406 SMALL GROUP (INTERVENTI	VAV Reheat	234	234	234	70	29	0.413	1.00	0.00	1.00	1.00	1.00	1.000	
407 RR	VAV Reheat	6	6	6	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
408 RR	VAV Reheat	6	6	6	2	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
300A CORRIDOR	VAV Reheat	252	252	252	180	90	0.500	1.00	0.00	1.00	1.00	1.00	0.947	*
RTU-3-CR		14,128	13,968	14,128	12,567	6,251							0.947	
100 RECEPTION AREA	VAV Reheat	342	342	342	103	50	0.483	1.00	0.00	1.00	1.00	1.00	0.664	
100A CORRIDOR	VAV Reheat	16	16	16	11	5	0.500	1.00	0.00	1.00	1.00	1.00	0.650	*
100B CORRIDOR	VAV Reheat	79	79	79	58	29	0.500	1.00	0.00	1.00	1.00	1.00	0.650	*
101 CONF	VAV Reheat	207	207	207	62	30	0.479	1.00	0.00	1.00	1.00	1.00	0.668	
102 CONF	VAV Reheat	46	46	46	28	14	0.500	1.00	0.00	1.00	1.00	1.00	0.650	*

Project Name:
Dataset Name: DAYTON STEM.TRC

ASHRAE Standard 62.1-2019

By SHP

Ventilation Calculations for Cooling Design

System Zone Room	Box Type	Vpz cfm	Vfan cfm	Vdz cfm	Vpz-min cfm	Voz-clg cfm	Zd	Ep	Er	Fa	Fb	Fc	Evz	
Alternative 1														
103 WORKROOM	VAV Reheat	82	82	82	37	19	0.500	1.00	0.00	1.00	1.00	1.00	0.650	*
104 OFFICE	VAV Reheat	95	95	95	28	12	0.437	1.00	0.00	1.00	1.00	1.00	0.710	
105 OFFICE	VAV Reheat	95	95	95	28	12	0.437	1.00	0.00	1.00	1.00	1.00	0.710	
106 OFFICE	VAV Reheat	93	93	93	28	12	0.447	1.00	0.00	1.00	1.00	1.00	0.700	
107 STORAGE	VAV Reheat	17	17	17	5	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
108 OFFICE	VAV Reheat	70	70	70	21	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
110 SHARED OFFICE	VAV Reheat	389	389	389	117	41	0.353	1.00	0.00	1.00	1.00	1.00	0.794	
111 CONF	VAV Reheat	124	124	124	37	18	0.480	1.00	0.00	1.00	1.00	1.00	0.667	
112 STORAGE	VAV Reheat	22	22	22	7	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
113 CLINIC	VAV Reheat	273	273	273	82	36	0.440	1.00	0.00	1.00	1.00	1.00	0.707	
113A RR	VAV Reheat	9	9	9	3	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
114 RR	VAV Reheat	9	9	9	3	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
121A STORAGE	VAV Reheat	19	19	19	6	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
RTU-OFFICE		1,985	1,894	1,985	663	278							0.650	
121 MULTIPURPOSE ROOM	None	5,300	5,300	5,300	2,377	2,377	1.000	1.00	0.00	1.00	1.00	1.00	0.448	*
RTU-GYM		5,300	5,300	5,300	2,377	2,377							0.448	
109 ELEC		46	46	46	0	0							1.000	
122 TECH		165	165	165	0	0							1.000	
124A LIFE SAFETY ROOM		71	71	71	0	0							1.000	
125 MAIN ELEC		427	427	427	0	0							1.000	
314 ELEC		162	162	162	0	0							1.000	
315A TECH		166	166	166	0	0							1.000	
514 ELEC		162	162	162	0	0							1.000	
515 TECH		167	167	167	0	0							1.000	
Z_Mini Split System		1,366	1,366	1,366	0	0							1.000	

Project Name:
Dataset Name: DAYTON STEM.TRC

ASHRAE Standard 62.1-2019

By SHP

Ventilation Calculations for Heating Design

System Zone Room	Box Type	Vpz cfm	Vfan cfm	Vdz cfm	Vpz-min cfm	Voz-htg cfm	Zd	Ep	Er	Fa	Fb	Fc	Evz	
Alternative 1														
120 VESTIBULE	VAV Reheat	199	199	199	199	16	0.082	1.00	0.00	1.00	1.00	1.00	1.000	
120B CORRIDOR	VAV Reheat	123	123	123	123	62	0.500	1.00	0.00	1.00	1.00	1.00	0.932	*
121B STORAGE	VAV Reheat	14	14	14	14	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
123 CUSTODIAL WORKROOM	VAV Reheat	132	132	132	132	64	0.488	1.00	0.00	1.00	1.00	1.00	0.945	
123A OFFICE	VAV Reheat	39	39	39	39	10	0.262	1.00	0.00	1.00	1.00	1.00	1.000	
124 MECHANICAL	VAV Reheat	159	159	159	159	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
126 RR	VAV Reheat	4	4	4	4	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
127 FAMILY RR	VAV Reheat	4	4	4	4	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
128 RR	VAV Reheat	4	4	4	4	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
129 RR	VAV Reheat	4	4	4	4	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
200 MULTI-USE COLLABORATIO	VAV Reheat	1,691	1,691	1,691	1,691	846	0.500	1.00	0.00	1.00	1.00	1.00	0.932	*
201 KINDERGARTEN CLASSROC	VAV Reheat	614	614	614	614	307	0.500	1.00	0.00	1.00	1.00	1.00	0.932	*
202 KINDERGARTEN CLASSROC	VAV Reheat	614	614	614	614	307	0.500	1.00	0.00	1.00	1.00	1.00	0.932	*
203 STORAGE	VAV Reheat	14	14	14	14	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
204 KINDERGARTEN CLASSROC	VAV Reheat	614	614	614	614	307	0.500	1.00	0.00	1.00	1.00	1.00	0.932	*
205 RR	VAV Reheat	4	4	4	4	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
206 RR	VAV Reheat	4	4	4	4	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
207 RR	VAV Reheat	3	3	3	3	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
318 CUSTODIAL	VAV Reheat	7	7	7	7	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
519 CENTRAL STORAGE	VAV Reheat	27	27	27	27	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
120C CORRIDOR	VAV Reheat	259	259	259	259	54	0.209	1.00	0.00	1.00	1.00	1.00	1.000	
120A CORRIDOR	VAV Reheat	276	276	276	276	106	0.384	1.00	0.00	1.00	1.00	1.00	1.000	
RTU-1-CR		4,807	4,807	4,807	4,807	2,079							0.932	
404 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
405 SMALL GROUP (MENTAL HE/	VAV Reheat	114	114	114	114	29	0.254	1.00	0.00	1.00	1.00	1.00	1.000	
409 RR	VAV Reheat	3	3	3	3	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
410 RR	VAV Reheat	3	3	3	3	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
500A CORRIDOR	VAV Reheat	177	177	177	177	88	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
500B CORRIDOR	VAV Reheat	60	60	60	60	30	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
500C MULTI-USE COLLABORATI	VAV Reheat	2,049	2,049	2,049	2,049	1,025	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
500D CORRIDOR	VAV Reheat	25	25	25	25	13	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
501 PRINCIPAL OFFICE	VAV Reheat	49	49	49	49	15	0.311	1.00	0.00	1.00	1.00	1.00	1.000	
502 STEM CLASSROOM	VAV Reheat	737	737	737	737	369	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*

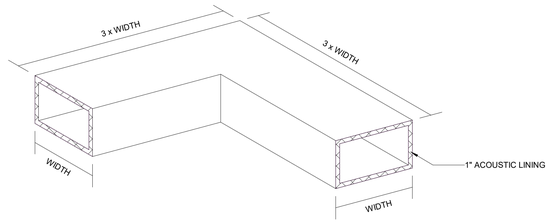
Project Name:
Dataset Name: DAYTON STEM.TRC

ASHRAE Standard 62.1-2019

By SHP

Ventilation Calculations for Heating Design

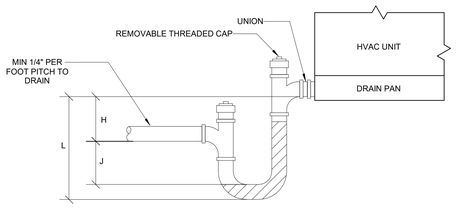
System Zone Room	Box Type	Vpz cfm	Vfan cfm	Vdz cfm	Vpz-min cfm	Voz-htg cfm	Zd	Ep	Er	Fa	Fb	Fc	Evz	
Alternative 1														
502A BREAK OUT ROOM	VAV Reheat	29	29	29	29	15	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
503 TEACHER WORKROOM	VAV Reheat	232	232	232	232	76	0.326	1.00	0.00	1.00	1.00	1.00	1.000	
503A CONF	VAV Reheat	27	27	27	27	13	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
503B RR	VAV Reheat	4	4	4	4	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
504 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
505 STORAGE	VAV Reheat	15	15	15	15	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
506 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
507 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
508 OFFICE	VAV Reheat	24	24	24	24	12	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
509 SMALL GROUP (INTERVENTI	VAV Reheat	91	91	91	91	31	0.340	1.00	0.00	1.00	1.00	1.00	1.000	
510 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
511 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
512 SMALL GROUP (TITLE 1)	VAV Reheat	79	79	79	79	36	0.450	1.00	0.00	1.00	1.00	1.00	1.000	
513 CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
516 SPECIALS CLASSROOM	VAV Reheat	714	714	714	714	357	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
517 CENTRAL SERVING	VAV Reheat	483	483	483	483	114	0.235	1.00	0.00	1.00	1.00	1.00	1.000	
517A STORAGE	VAV Reheat	10	10	10	10	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
517B LOCKER ROOM	VAV Reheat	17	17	17	17	8	0.500	1.00	0.00	1.00	1.00	1.00	0.975	*
517C RR	VAV Reheat	5	5	5	5	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
518 CUSTODIAL	VAV Reheat	4	4	4	4	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
520 RR	VAV Reheat	4	4	4	4	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
521 RR	VAV Reheat	3	3	3	3	0	0.000	1.00	0.00	1.00	1.00	1.00	1.000	
522 RR	VAV Reheat	3	3	3	3	0	0.000	1.00	0.00



REFER TO FLOOR PLANS FOR DUCT WIDTH

1 M004 TRANSFER DUCT - ACOUSTIC LINED ELBOW

1/8" = 1'-0"



NOTES:

1. PROVIDE CONDENSATE TRAP FOR ALL COOLING COILS.
2. CONDENSATE PIPE SIZE SHOULD MATCH UNIT CONDENSATE CONNECTION SIZE.

DRAIN PAN TRAPPING FOR SECTION UNDER NEGATIVE PRESSURE

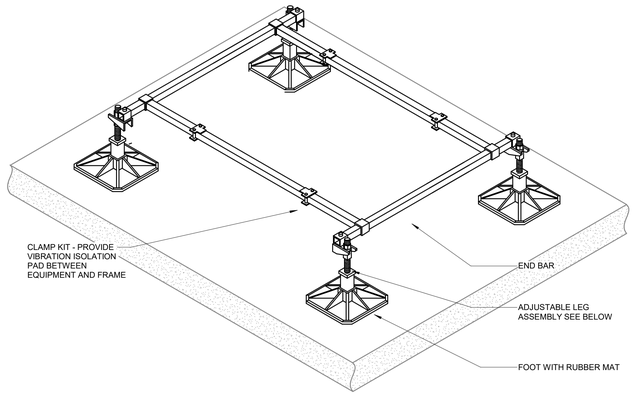
L = H + J + PIPE DIAMETER WHERE:
H = 1 INCH FOR EACH INCH OF NEGATIVE PRESSURE PLUS 1 INCH
J = 1/2 H

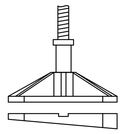
DRAIN PAN TRAPPING FOR SECTION UNDER POSITIVE PRESSURE

L = H + J + PIPE DIAMETER WHERE:
H = 1/2 INCH (MINIMUM)
J = 1/2 INCH PLUS THE UNIT POSITIVE STATIC PRESSURE AT COIL DISCHARGE (LOADED FILTERS)

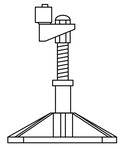
4 M004 CONDENSATE TRAP PIPING

NOTE: CONTRACTOR TO PROVIDE WIND LOADING CALCULATIONS PER LOCAL CODE WITH ASSISTANCE OF MANUFACTURER TO DESIGN SUPPORT STRUCTURES



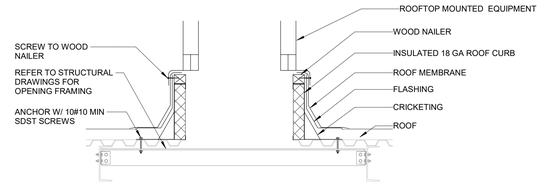


RUBBER FOOT MAT AVAILABLE FOR SLOPED ROOFS



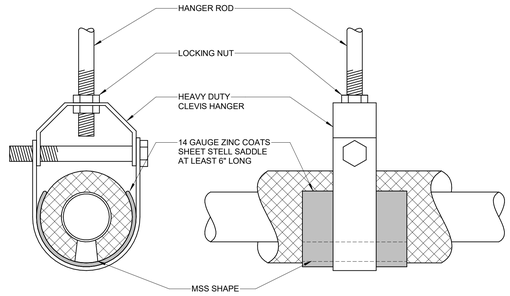
STANDARD LEG ASSEMBLY

2 M004 DUCTLESS CONDENSING UNIT MOUNTING DETAIL

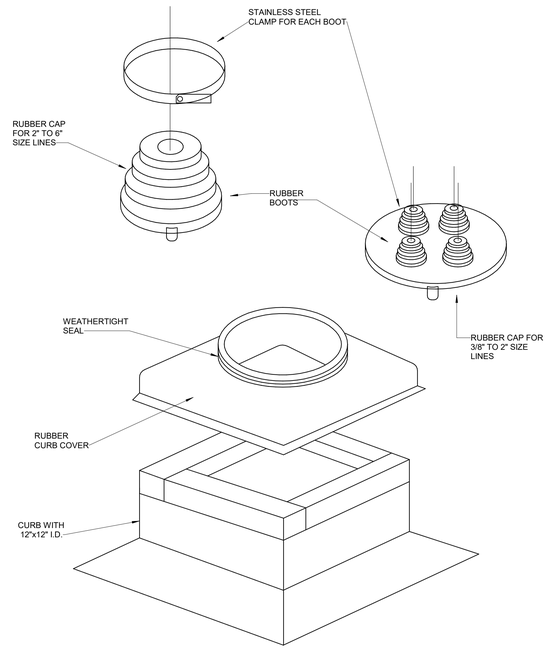


3 M004 ROOF MOUNTED EQUIPMENT DETAIL

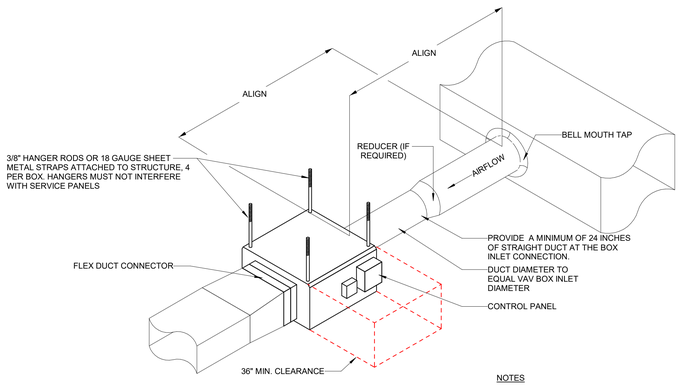
NTS



5 M004 PIPE HANGER (6" AND SMALLER)



6 M004 REFRIGERANT PIPING PIPE ROOF PENETRATION DETAIL



NOTES

1. LOCATE BOX TO PROVIDE EASY ACCESS FOR SERVICE AND MAINTAIN MANUFACTURER REQUIRED SERVICE CLEARANCE. COORDINATE WITH OTHER TRADES.
2. ALL DUCTWORK SIZES PER PLAN.
3. FOR VAV BOXES, PROVIDE A MINIMUM OF 36 INCHES OF CLEARANCE IN FRONT OF CONTROL PANEL/CONTROLLER. ORDER LEFT OR RIGHT HAND BOXES AS NECESSARY TO MAXIMIZE THE AVAILABLE CLEARANCE SPACE.

7 M004 VAV BOX WITH ELECTRIC REHEAT COIL

COPYRIGHT
STEED HAMMOND PAUL, INC
ALL RIGHTS RESERVED

STATE OF OHIO
JACOB A FAIOLA
84724
REGISTERED
PROFESSIONAL ENGINEER

SHP
312 PLUM STREET, SUITE 700
CINCINNATI, OH 45202 · 513.651.2112

DAYTON REGIONAL STEM SCHOOL
K-5 BUILDING
2850 DONATION CIRCLE, KETTERING, OH 45240

DAYTON REGIONAL STEM SCHOOL
1724 WOODMAN DRIVE, KETTERING, OH 45420

ISSUANCES

04-05-24	SCHEMATIC DESIGN
06-28-24	GMP/PERMIT

MECHANICAL DETAILS

COMM NO. 2024026.01

M004

C:\Users\kshah\Documents_LFile24\202402601 MEP_Dayton STEM K5_kshahP9APC.rvt
6/28/2024 11:46:44 AM

0'-1" REFERENCE LINE

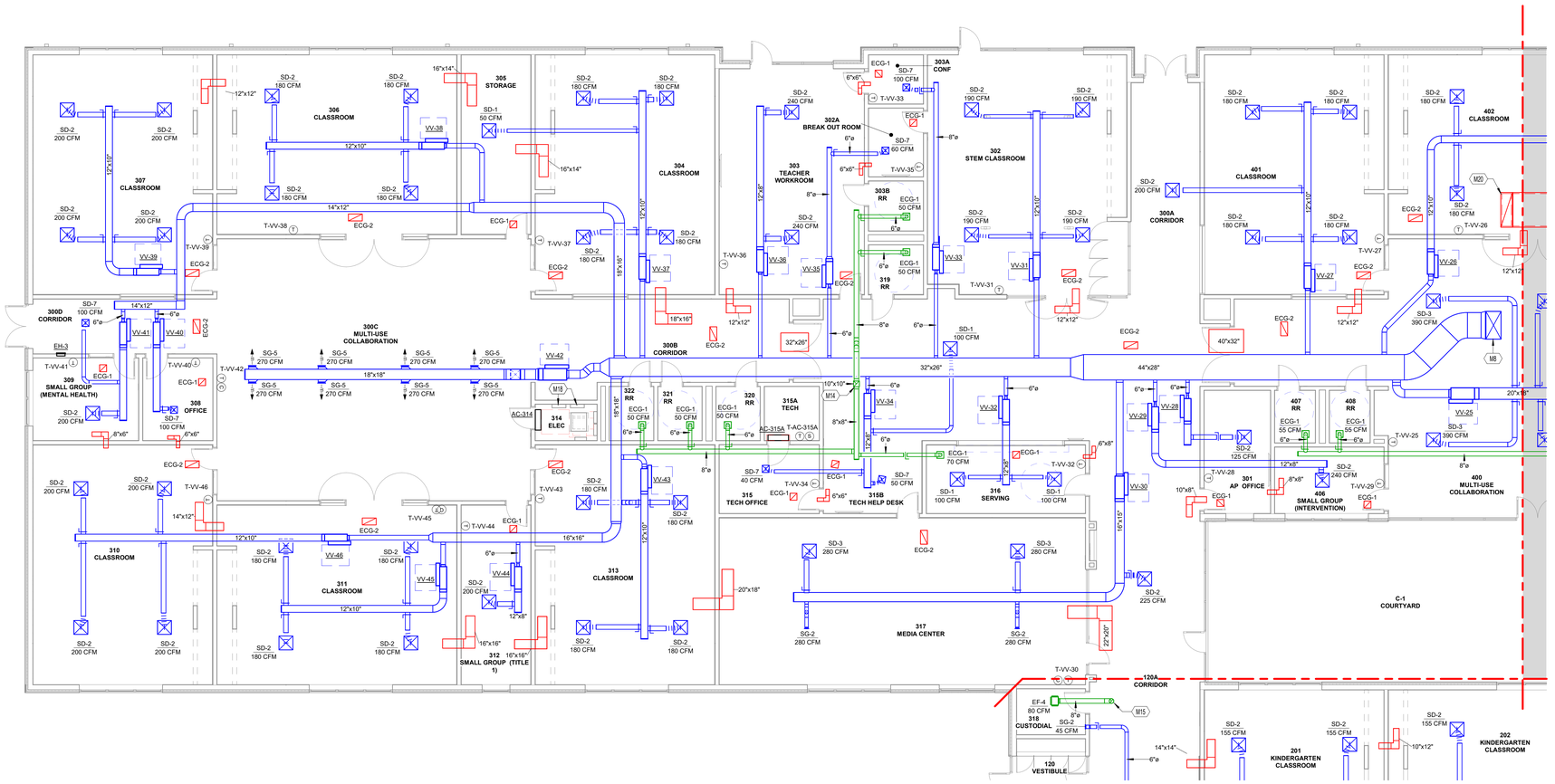
COPYRIGHT
STEED HAMMOND PAUL, INC
ALL RIGHTS RESERVED

GENERAL DUCT PLAN NOTES:

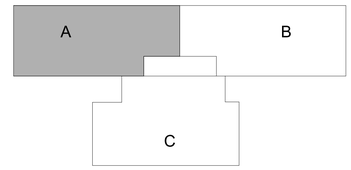
A. INLET AND DISCHARGE DUCTS CONNECTING TO VAV BOXES ARE TO BE THE SAME SIZE AS VAV BOX INLET AND DISCHARGE RESPECTIVELY UNLESS NOTED OTHERWISE.
B. DUCTS SERVING DIFFUSERS AND GRILLES ARE TO BE THE SAME SIZE AS DIFFUSER NECK SIZE OR GRILLE FACE UNLESS NOTED OTHERWISE.
C. VAV BOX CONTROLLER ACCESS IS SHOWN AS A HASHED BOX.
D. AIR TRANSFER DUCTS ARE 14" X 14" UNLESS NOTED OTHERWISE. CONTRACTOR TO PROVIDE ADDITIONAL TRANSFER OPENINGS ABOVE CEILING AS NEEDED FOR AIR RETURN.
E. DO NOT ROUTE DUCTWORK OVER ELECTRICAL EQUIPMENT.
F. PROVIDE AT LEAST 3 STRAIGHT DUCT DIAMETERS AT INLET OF VAV BOXES.
G. DO NOT USE FLEXIBLE DUCTWORK AT INLET OF VAV BOX.
H. PROVIDE VOLUME CONTROL DAMPERS IN RUN-OUT DUCT TO ALL SUPPLY AIR DEVICES.
I. ALL DUCT DIMENSIONS SHOWN ARE INTERNAL DIMENSIONS.

KEYNOTES

M8	SUPPLY AIR DUCT UP TO RTU-CR3
M14	EXHAUST AIR DUCT UP TO EXHAUST FAN ON ROOF.
M15	8" ROUND EXHAUST AIR DUCT UP TO ROOF.
M18	TEMPERATURE CONTROL PANEL REQUIRING 120 V POWER. COORDINATE WITH TCC AND EC.
M20	OPEN ELBOW UP



1 M101 DUCTWORK PLAN AREA A
1/8" = 1'-0"



KEY PLAN
NTS

0'-1" REFERENCE LINE

SHP
312 PLUM STREET, SUITE 700
CINCINNATI, OH 45202 · 513.381.2112

DAYTON REGIONAL STEM SCHOOL
K-5 BUILDING
2850 DONATION CIRCLE, KETTERING, OH 45240
DAYTON REGIONAL STEM SCHOOL
1724 WOODMAN DRIVE, KETTERING, OH 45420

ISSUANCES

04-05-24	SCHEMATIC DESIGN
06-28-24	GMP/PERMIT

MECHANICAL DUCTWORK PLAN AREA A

COMM NO. 2024026.01

M101

STATE OF OHIO
JACOB A FAIOLA
84724
REGISTERED
PROFESSIONAL ENGINEER

6/28/2024 11:46:47 AM C:\Users\kshah\Documents_LFile\24\2024026\01 MEP_Dayton STEM K5_kshahP9APC.rvt

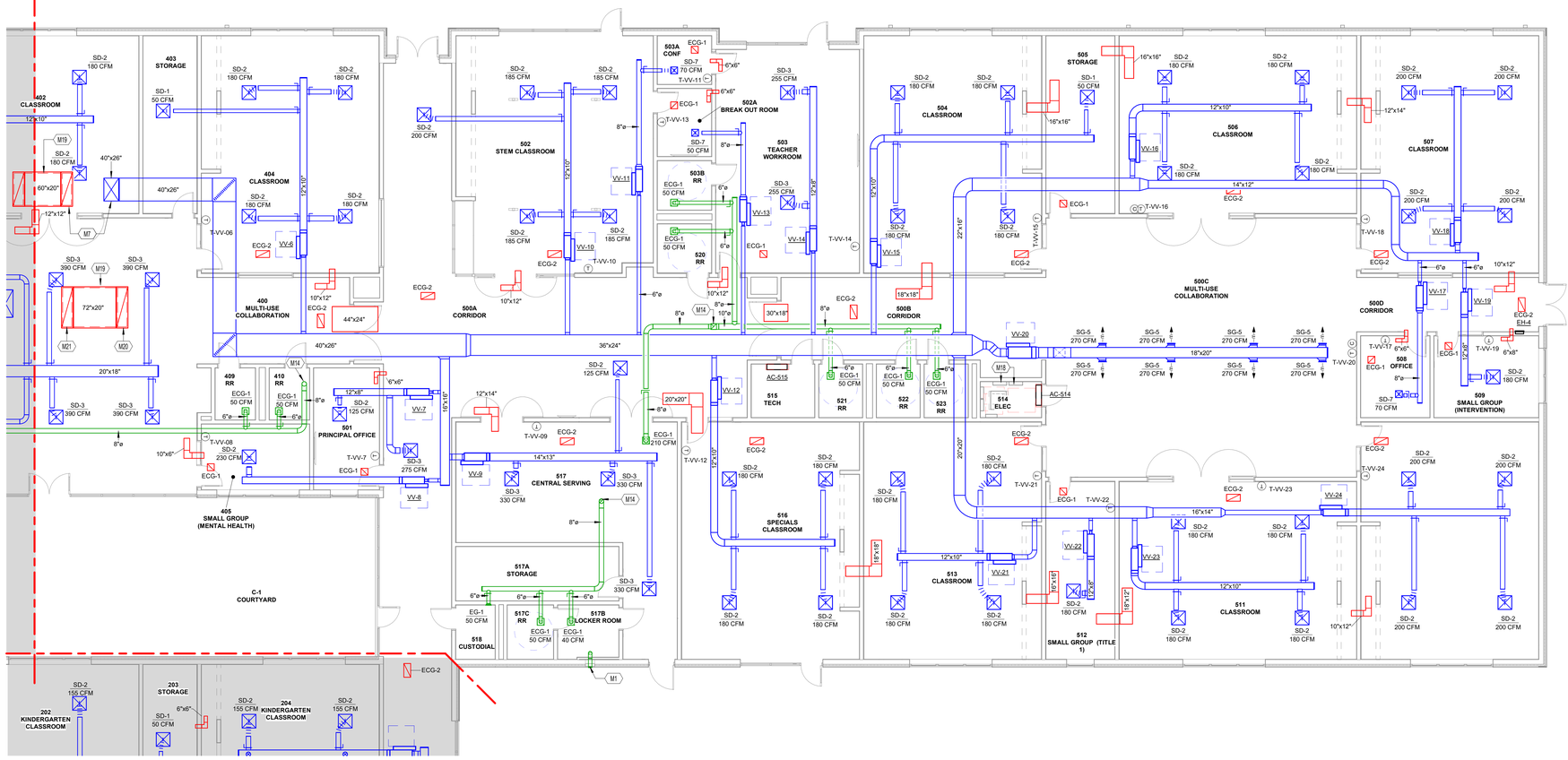
COPYRIGHT
STEED HAMMOND PAUL, INC
ALL RIGHTS RESERVED

GENERAL DUCT PLAN NOTES:

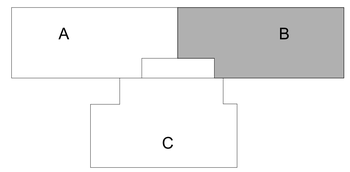
A. INLET AND DISCHARGE DUCTS CONNECTING TO VAV BOXES ARE TO BE THE SAME SIZE AS VAV BOX INLET AND DISCHARGE RESPECTIVELY UNLESS NOTED OTHERWISE.
B. DUCTS SERVING DIFFUSERS AND GRILLES ARE TO BE THE SAME SIZE AS DIFFUSER NECK SIZE OR GRILLE FACE UNLESS NOTED OTHERWISE.
C. VAV BOX CONTROLLER ACCESS IS SHOWN AS A HASHED BOX.
D. AIR TRANSFER DUCTS ARE 14" X 14" UNLESS NOTED OTHERWISE. CONTRACTOR TO PROVIDE ADDITIONAL TRANSFER OPENINGS ABOVE CEILING AS NEEDED FOR AIR RETURN.
E. DO NOT ROUTE DUCTWORK OVER ELECTRICAL EQUIPMENT.
F. PROVIDE AT LEAST 3 STRAIGHT DUCT DIAMETERS AT INLET OF VAV BOXES.
G. DO NOT USE FLEXIBLE DUCTWORK AT INLET OF VAV BOX.
H. PROVIDE VOLUME CONTROL DAMPERS IN RUN-OUT DUCT TO ALL SUPPLY AIR DEVICES.
I. ALL DUCT DIMENSIONS SHOWN ARE INTERNAL DIMENSIONS.

KEYNOTES

M1	PROVIDE PAINTABLE ALUMINIUM VENT CAP APPROVED FOR USE WITH DRYER EXHAUST. PAINT TO MATCH ADJACENT WALL SURFACE.
M7	SUPPLY AND RETURN AIR DUCT UP TO RTU-CR2
M14	EXHAUST AIR DUCT UP TO EXHAUST FAN ON ROOF.
M18	TEMPERATURE CONTROL PANEL REQUIRING 120 V POWER. COORDINATE WITH TCC AND EC.
M19	PROVIDE 2" ACOUSTICAL DUCT LINER FOR RETURN AIR DUCT MAIN.
M20	OPEN ELBOW UP
M21	RETURN AIR DUCT UP TO RTU-CR3



1 M102 DUCTWORK PLAN AREA B
1/8" = 1'-0"



KEY PLAN
NTS

0'-1" REFERENCE LINE

JACOB A FAIOLA
84724
REGISTERED
PROFESSIONAL ENGINEER
STATE OF OHIO

SHP
512 PLUM STREET, SUITE 700
CINCINNATI, OH 45202 · 513.381.2112

DAYTON REGIONAL STEM SCHOOL
K-5 BUILDING
2850 DONATION CIRCLE, KETTERING, OH 45240

DAYTON REGIONAL STEM SCHOOL
1724 WOODMAN DRIVE, KETTERING, OH 45420

ISSUANCES

04-05-24	SCHEMATIC DESIGN
06-28-24	GMP/PERMIT

MECHANICAL DUCTWORK PLAN AREA B

COMM NO. 2024026.01

M102

6/28/2024 11:46:50 AM C:\Users\kshah\Documents_LF\le24\202402601 MEP_Dayton STEM K5_kshahP9APC.rvt

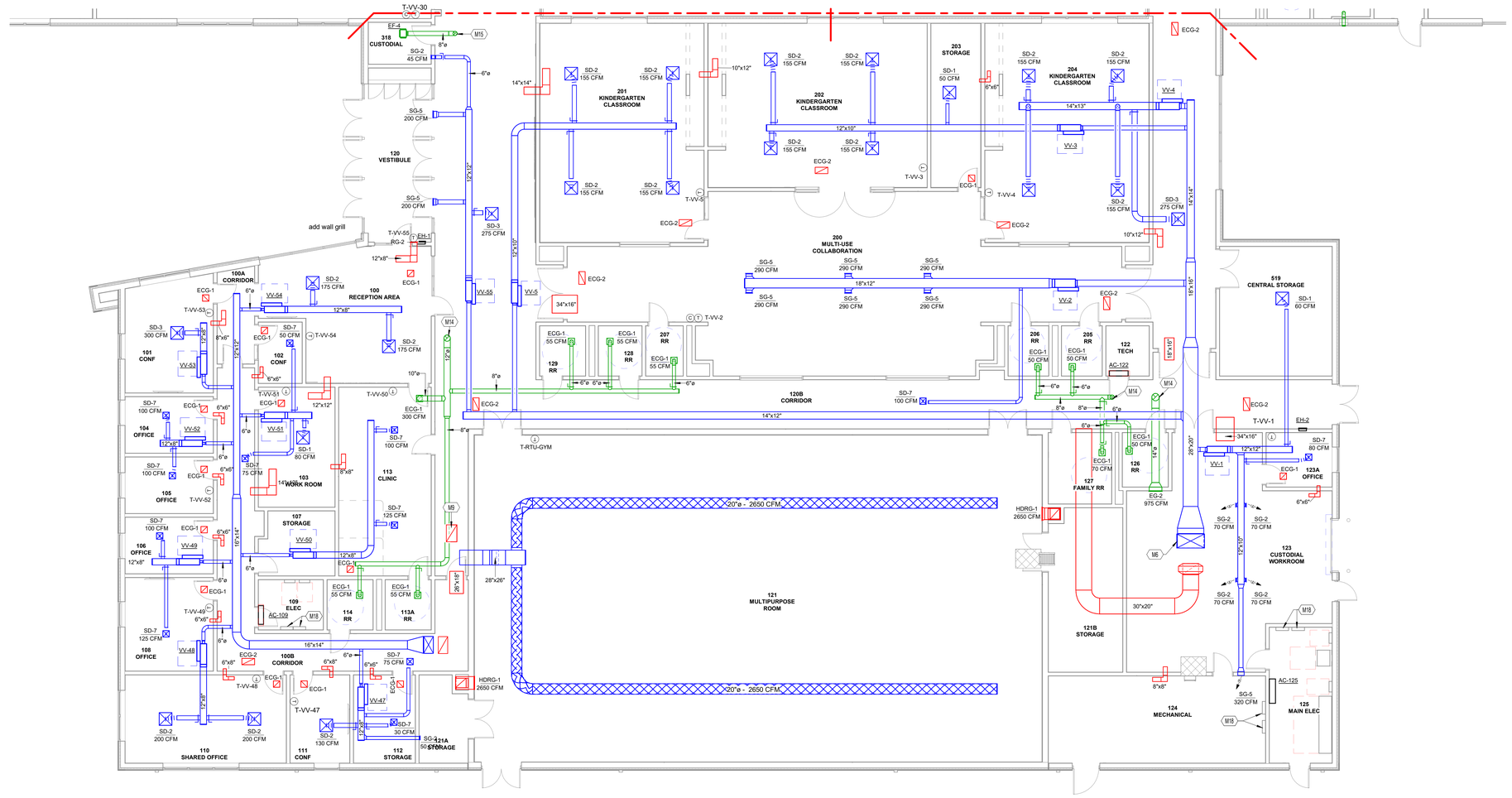
COPYRIGHT
STEED HAMMOND PAUL, INC
ALL RIGHTS RESERVED

GENERAL DUCT PLAN NOTES:

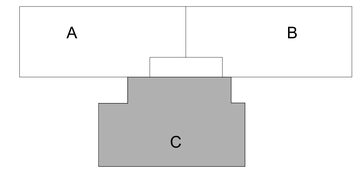
A. INLET AND DISCHARGE DUCTS CONNECTING TO VAV BOXES ARE TO BE THE SAME SIZE AS VAV BOX INLET AND DISCHARGE RESPECTIVELY UNLESS NOTED OTHERWISE.
B. DUCTS SERVING DIFFUSERS AND GRILLES ARE TO BE THE SAME SIZE AS DIFFUSER NECK SIZE OR GRILLE FACE UNLESS NOTED OTHERWISE.
C. VAV BOX CONTROLLER ACCESS IS SHOWN AS A HASHED BOX.
D. AIR TRANSFER DUCTS ARE 14" X 14" UNLESS NOTED OTHERWISE. CONTRACTOR TO PROVIDE ADDITIONAL TRANSFER OPENINGS ABOVE CEILING AS NEEDED FOR AIR RETURN.
E. DO NOT ROUTE DUCTWORK OVER ELECTRICAL EQUIPMENT.
F. PROVIDE AT LEAST 3 STRAIGHT DUCT DIAMETERS AT INLET OF VAV BOXES.
G. DO NOT USE FLEXIBLE DUCTWORK AT INLET OF VAV BOX.
H. PROVIDE VOLUME CONTROL DAMPERS IN RUN-OUT DUCT TO ALL SUPPLY AIR DEVICES.
I. ALL DUCT DIMENSIONS SHOWN ARE INTERNAL DIMENSIONS.

KEYNOTES

M6	SUPPLY AND RETURN AIR DUCT UP TO RTU-CR1
M9	RETURN AIR DUCT UP TO RTU-GYM
M14	EXHAUST AIR DUCT UP TO EXHAUST FAN ON ROOF.
M15	8" ROUND EXHAUST AIR DUCT UP TO ROOF.
M18	TEMPERATURE CONTROL PANEL REQUIRING 120 V POWER. COORDINATE WITH TCC AND EC.



1 M103 DUCTWORK PLAN AREA C
1/8" = 1'-0"



KEY PLAN
NTS

0'-1" REFERENCE LINE

SHP
312 PLUM STREET, SUITE 700
CINCINNATI, OH 45202 · 513.651.2112

DAYTON REGIONAL STEM SCHOOL
K-5 BUILDING
2850 DONATION CIRCLE, KETTERING, OH 45240

DAYTON REGIONAL STEM SCHOOL
1724 WOODMAN DRIVE, KETTERING, OH 45420

ISSUANCES

04-05-24	SCHEMATIC DESIGN
06-28-24	GMP/PERMIT

MECHANICAL DUCTWORK PLAN AREA C

COMM NO. 2024026.01

M103

6/28/2024 11:46:52 AM C:\Users\kshah\Documents_LFile24\2024026801 MEP_Dayton STEM K5_kshahP9APC.rvt

GENERAL PIPING PLAN NOTES:

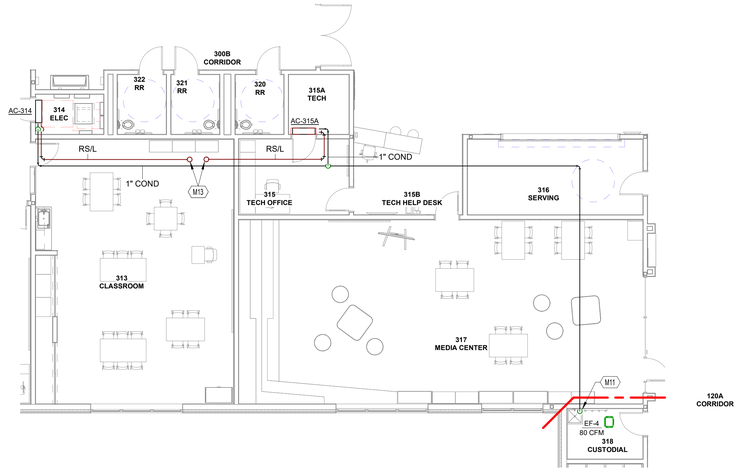
A. DO NOT ROUTE PIPING OVER ELECTRICAL EQUIPMENT.
B. CONDENSATE PIPING IS 1" UNLESS NOTED OTHERWISE.

KEYNOTES

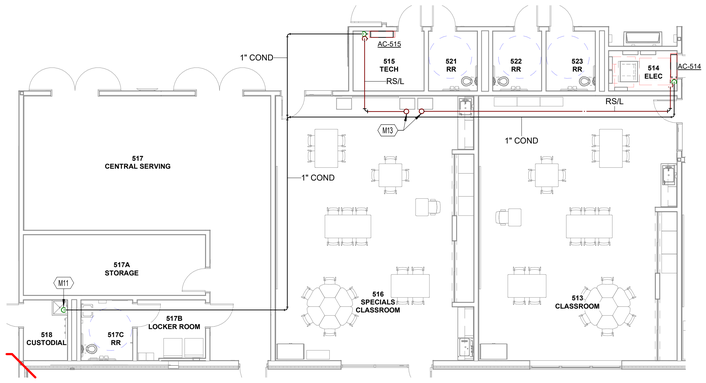
M11 ROUTE 1" CONDENSATE PIPING TO DISCHARGE INTO MOP SINK.

M12 ROUTE 1" CONDENSATE PIPING THROUGH WALL TO DISCHARGE INTO FLOOR DRAIN AT THIS APPROXIMATE LOCATION.

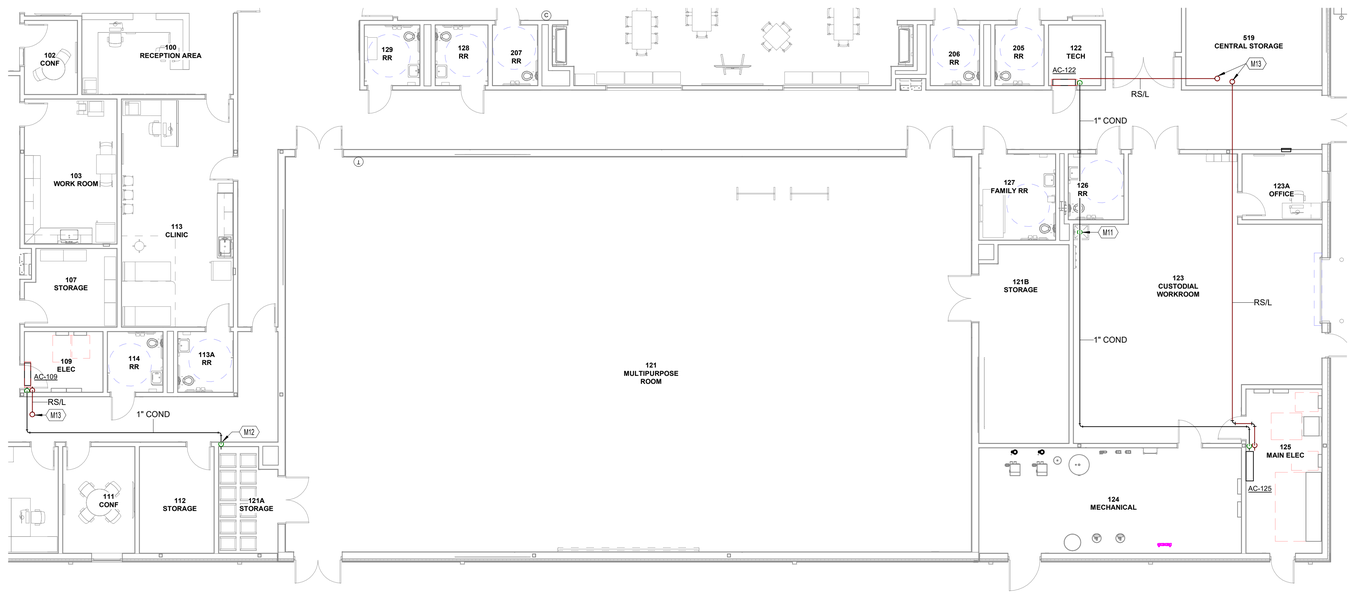
M13 REFRIGERANT LINESETS UP TO ROOF.



1 M104 MECHANICAL PIPING PLAN AREA A
1/8" = 1'-0"



2 M104 MECHANICAL PIPING PLAN AREA B
1/8" = 1'-0"



3 M104 MECHANICAL PIPING PLAN AREA C
1/8" = 1'-0"

COPYRIGHT
STEED HAMMOND PAUL, INC
ALL RIGHTS RESERVED

STATE OF OHIO
JACOB A FAIOLA
84724
REGISTERED
PROFESSIONAL ENGINEER

SHP
312 PLUM STREET - SUITE 700
CINCINNATI, OH 45202 - 513.651.2112

DAYTON REGIONAL STEM SCHOOL
K-5 BUILDING
2850 DONATION CIRCLE, KETTERING, OH 45240

DAYTON REGIONAL STEM SCHOOL
1724 WOODMAN DRIVE, KETTERING, OH 45420

ISSUANCES

04-05-24	SCHEMATIC DESIGN
06-28-24	GMP/PERMIT

MECHANICAL PIPING PLAN

COMM NO. 2024026.01

M104

C:\Users\kshahn\Documents_LFile\24\2024026\01 MEP_Dayton STEM K5_kshahP9APC.rvt

6/28/2024 11:46:54 AM

0'-1" REFERENCE LINE

GENERAL DUCT PLAN NOTES:

A. INLET AND DISCHARGE DUCTS CONNECTING TO VAV BOXES ARE TO BE THE SAME SIZE AS VAV BOX INLET AND DISCHARGE RESPECTIVELY UNLESS NOTED OTHERWISE.
B. DUCTS SERVING DIFFUSERS AND GRILLES ARE TO BE THE SAME SIZE AS DIFFUSER NECK SIZE OR GRILLE FACE UNLESS NOTED OTHERWISE.
C. VAV BOX CONTROLLER ACCESS IS SHOWN AS A HASHED BOX.
D. AIR TRANSFER DUCTS ARE 14" X 14" UNLESS NOTED OTHERWISE. CONTRACTOR TO PROVIDE ADDITIONAL TRANSFER OPENINGS ABOVE CEILING AS NEEDED FOR AIR RETURN.
E. DO NOT ROUTE DUCTWORK OVER ELECTRICAL EQUIPMENT.
F. PROVIDE AT LEAST 3 STRAIGHT DUCT DIAMETERS AT INLET OF VAV BOXES.
G. DO NOT USE FLEXIBLE DUCTWORK AT INLET OF VAV BOX.
H. PROVIDE VOLUME CONTROL DAMPERS IN RUN-OUT DUCT TO ALL SUPPLY AIR DEVICES.
I. ALL DUCT DIMENSIONS SHOWN ARE INTERNAL DIMENSIONS.

KEYNOTES

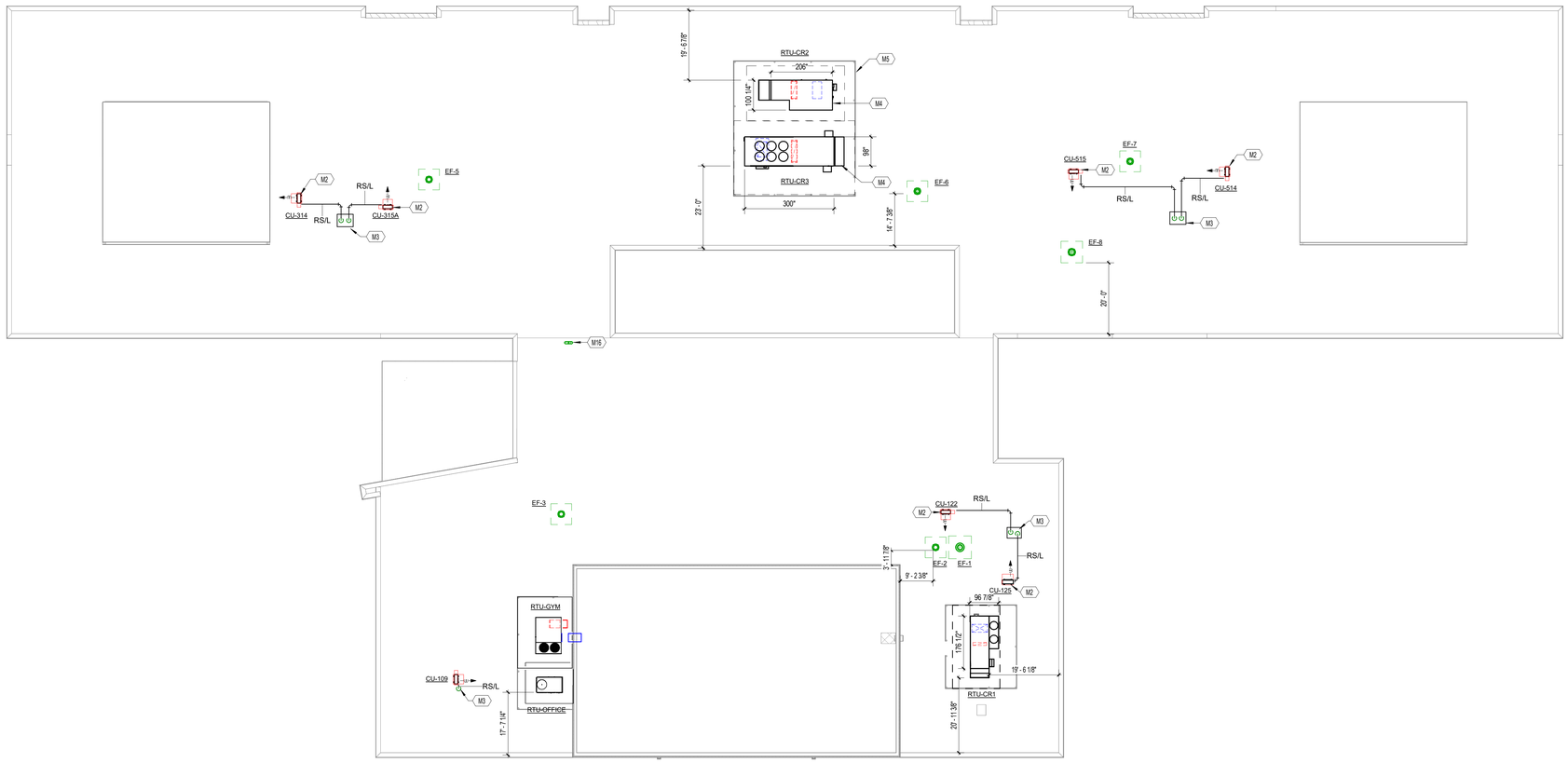
M2 INSTALL CONDENSING UNIT ON MOUNTING SUPPORTS PER DETAIL 2/M004.

M3 ROUTE PIPING DOWN WITHIN THE PIPING CURB.

M4 INSTALL UNIT ON VIBRATION ISOLATION RAIL EQUAL TO KINETICS KSR 2.0. ISOLATION RAIL TO BE INSTALLED ON ROOF CURB.

M5 COORDINATE WITH ARCHITECT AND STRUCTURAL ENGINEER FOR PRECISE LOCATION OF ROOF-MOUNTED HVAC EQUIPMENT. VERIFY COORDINATION WITH STRUCTURAL STEEL BELOW AND ROOF INSULATION. IF NOT BASIS-OF-DESIGN EQUIPMENT IS PURCHASED, ANY ADDITIONAL SCOPE REQUIRED FOR COORDINATION IS THE RESPONSIBILTY OF THE CONTRACTOR.

M16 TERMINATE EXHAUST AIR DUCT WITH GOOSENECK.



1 M301 ROOF LEVEL
1/16" = 1'-0"

COPYRIGHT
STEED HAMMOND PAUL, INC
ALL RIGHTS RESERVED

STATE OF OHIO
JACOB A FAIOLA
84724
REGISTERED
PROFESSIONAL ENGINEER

SHP
512 PLUM STREET, SUITE 700
CINCINNATI, OH 45202 · 513.651.2112

DAYTON REGIONAL STEM SCHOOL
K-5 BUILDING
2850 DONATION CIRCLE, KETTERING, OH 45240

DAYTON REGIONAL STEM SCHOOL
1724 WOODMAN DRIVE, KETTERING, OH 45420

ISSUANCES

04-05-24	SCHEMATIC DESIGN
06-28-24	GMP/PERMIT

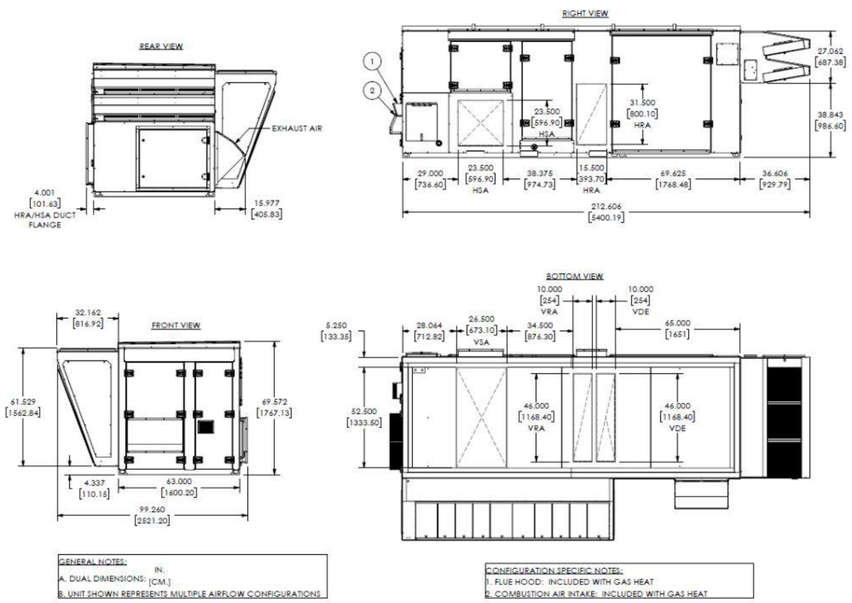
MECHANICAL ROOF PLAN

COMM NO. 2024026.01

M301

6/28/2024 11:46:56 AM C:\Users\kshah\Documents_LFile\24102402601 MEP_Dayton STEM K5_kshahP9APC.rvt

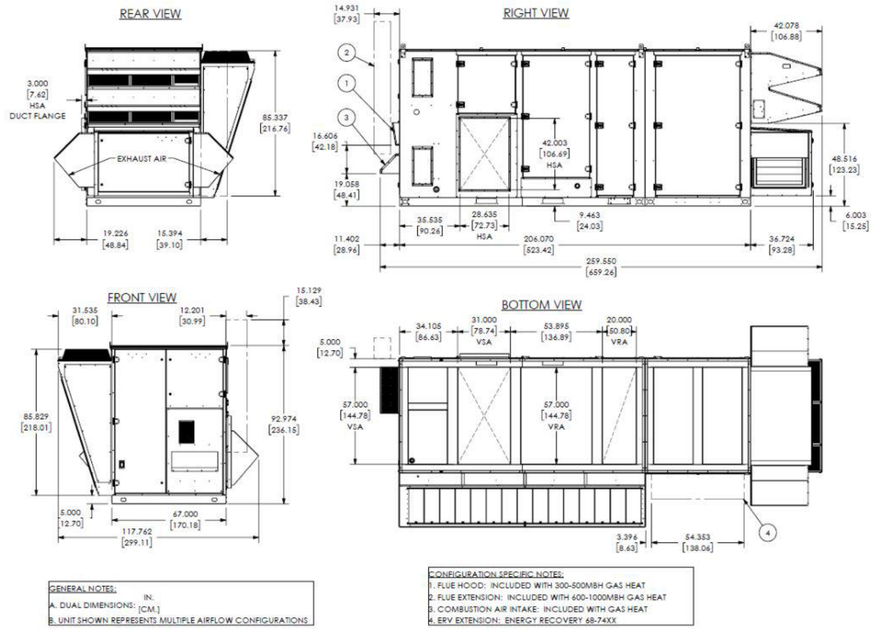
0'-1" REFERENCE LINE



GENERAL NOTES:
A. DUAL DIMENSIONS: IN. [CM.]
B. UNIT SHOWN REPRESENTS MULTIPLE AIRFLOW CONFIGURATIONS

CONFIGURATION SPECIFIC NOTES:
1. FLUE HOOD: INCLUDED WITH GAS HEAT
2. COMBUSTION AIR INTAKE: INCLUDED WITH GAS HEAT

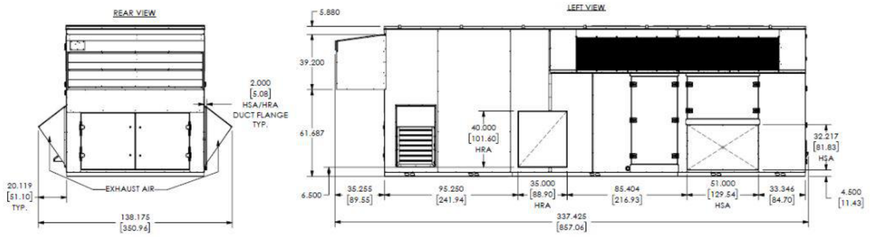
RTU-CR1



GENERAL NOTES:
A. DUAL DIMENSIONS: IN. [CM.]
B. UNIT SHOWN REPRESENTS MULTIPLE AIRFLOW CONFIGURATIONS

CONFIGURATION SPECIFIC NOTES:
1. FLUE HOOD: INCLUDED WITH 300-500MBH GAS HEAT
2. FLUE EXTENSION: INCLUDED WITH 600-1000MBH GAS HEAT
3. COMBUSTION AIR INTAKE: INCLUDED WITH GAS HEAT
4. ERV EXTENSION: ENERGY RECOVERY 68-74XX

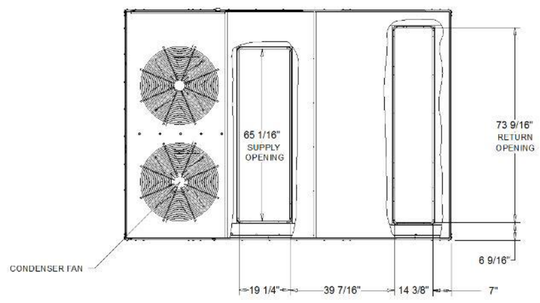
RTU-CR2



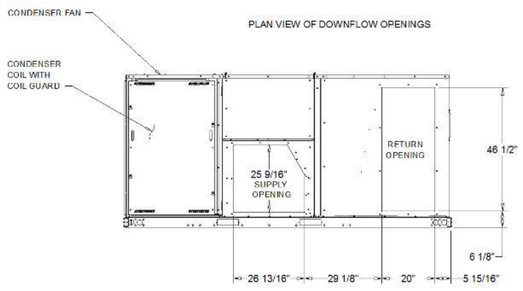
GENERAL NOTES:
A. DUAL DIMENSIONS: IN. [CM.]
B. UNIT SHOWN REPRESENTS MULTIPLE AIRFLOW CONFIGURATIONS

CONFIGURATION SPECIFIC NOTES:
1. FLUE HOOD: INCLUDED WITH GAS HEAT
2. COMBUSTION AIR INTAKE: INCLUDED WITH GAS HEAT

RTU-CR3

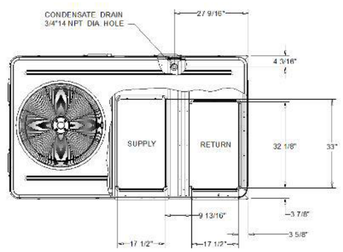


PLAN VIEW OF DOWNFLOW OPENINGS

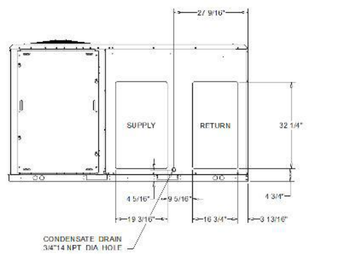


HORIZONTAL AIR FLOW OPENING

RTU-GYM



PLAN VIEW OF DOWNFLOW OPENINGS



HORIZONTAL AIR FLOW OPENING

RTU-OFFICE

COPYRIGHT
STEED HAMMOND PAUL, INC
ALL RIGHTS RESERVED

STATE OF OHIO
JACOB A FAIOLA
84724
REGISTERED
PROFESSIONAL ENGINEER

SHP
312 PLUM STREET, SUITE 700
CINCINNATI, OH 45202 · 513.651.2112

DAYTON REGIONAL STEM SCHOOL
K-5 BUILDING
2850 DONATION CIRCLE, KETTERING, OH 45240

DAYTON REGIONAL STEM SCHOOL
1724 WOODMAN DRIVE, KETTERING, OH 45420

ISSUANCES

04-05-24	SCHEMATIC DESIGN
06-28-24	GMP/PERMIT

AHU SECTIONS

COMM NO. 2024026.01

M401

0'-1" REFERENCE LINE

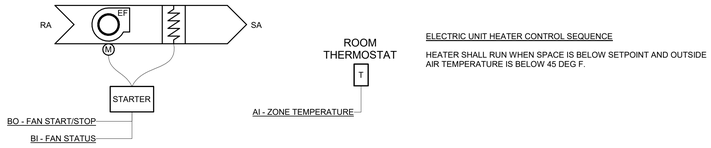
6/28/2024 11:46:56 AM C:\Users\kshahi\Documents_LFile\24120240260l MEP_Dayton STEM K5_kshahiP9APC.rvt

A. MANUFACTURER-PROVIDED CONTROLLER SHALL STAGE AND MODULATE FANS, VALVES, COMPRESSORS, BURNERS, AND DAMPERS ACCORDING TO MANUFACTURER'S STANDARD CONTROL SEQUENCE TO ACHIEVE SETPOINTS SHOWN ON DRAWINGS AND THE FOLLOWING. THE UNIT WILL RUN TO MAINTAIN 55 F (ADJ) SUPPLY AIR TEMPERATURE SETPOINT DURING OCCUPIED HOURS.
B. SCHEDULES SHALL BE ADJUSTABLE FROM THE BAS.
C. SUPPLY AIR TEMPERATURE SETPOINT CONDITIONS SHALL BE ADJUSTABLE FROM THE BAS.
D. OUTDOOR AIR CONDITIONS SHALL BE INPUT TO THE UNIT FROM THE BAS. THERE WILL BE ONE OUTDOOR AIR TEMPERATURE SENSOR PROVIDING INPUT TO THE SYSTEM.
E. TO OPTIMIZE COMFORT AND MINIMIZE ENERGY USE THE SYSTEM SHALL USE:
   1. OPTIMAL START ALGORITHM FOR MORNING WARM-UP AND COOL-DOWN.
   2. SUPPLY AIR TEMPERATURE RESET
   3. SUPPLY AIRFLOW MODULATION TO MAINTAIN CONSTANT SUPPLY AIR STATIC PRESSURE OF 0.7 IN.WG. (ADJ). UNIT SHALL RESET STATIC PRESSURE SETPOINT SO THAT ONE VAV BOX IS ALWAYS 100% OPEN.
   4. DRY-BULB ECONOMIZER
F. THE UNIT WILL SHUTDOWN UPON DETECTION OF SMOKE IN THE RETURN DUCT.
G. ALL MONITORING AND CONTROL POINTS AVAILABLE FROM THE ROOFTOP UNIT CONTROLLER SHALL BE VISIBLE AT THE BAS USER INTERFACE. ENERGY RECOVERY CONTROL SEQUENCES
H. DEHUMIDIFICATION MODE CONTROL / COOLING COIL: IF RELATIVE HUMIDITY REACHES 60%, THE UNIT SHALL GO INTO DEHUMIDIFICATION MODE. THE COOLING COIL DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE RESET TO 52°F (ADJ.) DURING DEHUMIDIFICATION..
I. OUTDOOR, EXHAUST, AND RETURN AIR DAMPERS: THE OUTDOOR AND EXHAUST AIR DAMPERS SHALL OPEN WHEN AIR HANDLING UNIT IS IN OCCUPIED MODE. THE OUTDOOR, EXHAUST, AND RETURN AIR DAMPERS SHALL MODULATE TO MAINTAIN OUTDOOR AIRFLOW SHOWN IN SCHEDULE
J. OPERATING MODE SHALL BE INPUT FROM THE BAS.
K. ECONOMIZER MODE (OCCUPIED OR UNOCCUPIED):
   1. ENTHALPY WHEEL SHALL STOP.
   2. BYPASS DAMPERS AROUND ENTHALPY WHEEL SHALL OPEN.
   3. IF OUTSIDE AIR TEMPERATURE IS BETWEEN 69 DEG F AND 55 DEG F, UNIT SHALL BE 100% OUTSIDE AIR.
   4. IF OUTSIDE AIR TEMPERATURE IS LESS THAN 55 DEG F, UNIT SHALL MODULATE OUTDOOR, EXHAUST, AND RETURN AIR DAMPERS TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN UNIT MODULATES OUTDOOR AIR PERCENTAGE TO MINIMUM, UNIT SHALL COME OUT OF ECONOMIZER MODE.

1 M501 MULTI-ZONE VAV ROOFTOP UNIT SEQUENCE

A. MANUFACTURER-PROVIDED CONTROLLER SHALL STAGE AND MODULATE FANS, VALVES, COMPRESSORS, BURNERS, AND DAMPERS ACCORDING TO MANUFACTURER'S STANDARD CONTROL SEQUENCE TO ACHIEVE SETPOINTS SHOWN ON DRAWINGS AND THE FOLLOWING. SPACE STATIC PRESSURE SETPOINT SHALL BE 0.05 IN. W.G. (ADJ) POSITIVE. CARBON DIOXIDE SETPOINT SHALL BE 700 PPM.
B. SCHEDULES SHALL BE ADJUSTABLE FROM THE BAS.
C. SUPPLY AIR TEMPERATURE SETPOINT CONDITIONS SHALL BE ADJUSTABLE FROM THE BAS.
D. OUTDOOR AIR CONDITIONS SHALL BE INPUT TO THE UNIT FROM THE BAS. THERE WILL BE ONE OUTDOOR AIR TEMPERATURE SENSOR PROVIDING INPUT TO THE SYSTEM.
E. TO OPTIMIZE COMFORT AND MINIMIZE ENERGY USE THE SYSTEM SHALL USE:
   1. OPTIMAL START ALGORITHM FOR MORNING WARM-UP AND COOL-DOWN.
   2. SUPPLY AIR TEMPERATURE RESET
   3. DRY-BULB ECONOMIZER
F. THE UNIT WILL SHUTDOWN UPON DETECTION OF SMOKE IN THE RETURN DUCT.
G. ALL MONITORING AND CONTROL POINTS AVAILABLE FROM THE ROOFTOP UNIT CONTROLLER SHALL BE VISIBLE AT THE BAS USER INTERFACE. ENERGY RECOVERY CONTROL SEQUENCES
H. DEHUMIDIFICATION MODE CONTROL / COOLING COIL: IF RELATIVE HUMIDITY REACHES 60%, THE UNIT SHALL GO INTO DEHUMIDIFICATION MODE.
I. OUTDOOR, EXHAUST, AND RETURN AIR DAMPERS: THE OUTDOOR AND EXHAUST AIR DAMPERS SHALL OPEN WHEN AIR HANDLING UNIT IS IN OCCUPIED MODE.. THE OUTDOOR, EXHAUST, AND RETURN AIR DAMPERS SHALL MODULATE TO MAINTAIN OUTDOOR AIRFLOW SHOWN IN SCHEDULE. THE OUTDOOR AND EXHAUST AIR DAMPERS SHALL BE CLOSED WHEN AIR HANDLING UNIT IS IN UNOCCUPIED MODE.
J. OPERATING MODE SHALL BE INPUT FROM THE BAS.
K. ECONOMIZER MODE (OCCUPIED OR UNOCCUPIED):
   1. IF OUTSIDE AIR TEMPERATURE IS BETWEEN 69 DEG F AND 55 DEG F AND SPACE IS IN COOLING MODE, UNIT SHALL BE 100% OUTSIDE AIR.
   2. IF OUTSIDE AIR TEMPERATURE IS LESS THAN 55 DEG F AND SPACE IS IN COOLING MODE, UNIT SHALL MODULATE OUTDOOR, EXHAUST, AND RETURN AIR DAMPERS TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT. WHEN UNIT MODULATES OUTDOOR AIR PERCENTAGE TO MINIMUM, UNIT SHALL COME OUT OF ECONOMIZER MODE.

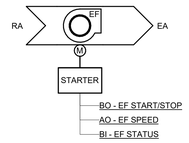
2 M501 SINGLE-ZONE VAV ROOFTOP UNIT SEQUENCE



ELECTRIC UNIT HEATER CONTROL SEQUENCE

HEATER SHALL RUN WHEN SPACE IS BELOW SETPOINT AND OUTSIDE AIR TEMPERATURE IS BELOW 45 DEG F.

3 M501 ELECTRIC UNIT HEATER CONTROL SCHEMATIC



GENERAL EXHAUST FAN CONTROL SEQUENCE

EXHAUST FAN SHALL RUN WHEN ASSOCIATED ROOF TOP UNIT IS RUNNING IN OCCUPIED MODE.

4 M501 EXHAUST FAN CONTROL SCHEMATIC

SPACE SETPOINTS

SPACE TYPE	OCCUPIED		UNOCCUPIED		RELATIVE HUMIDITY MAXIMUM		
	HEATING	COOLING	HEATING	COOLING	OCCUPIED	UNOCCUPIED	SUMMER UNOCCUPIED
TECHNOLOGY ROOM	65	70	65	70	50%	60%	65%
ELECTRICAL ROOM	N/A	80	N/A	80	50%	60%	65%
VESTIBULE	60	N/A	60	85	N/A	N/A	N/A
ALL OTHER	70	75	65	80	50%	60%	65%

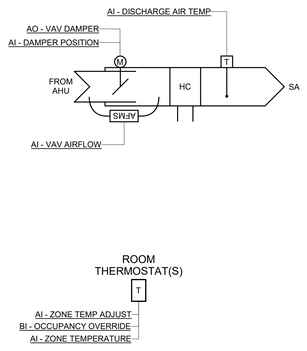
NOTE:
1. PROVIDE DOOR SWITCH FOR EXTERIOR DOORS. IF DOOR IS OPEN SPACE DEADBAND IS 55 - 90.

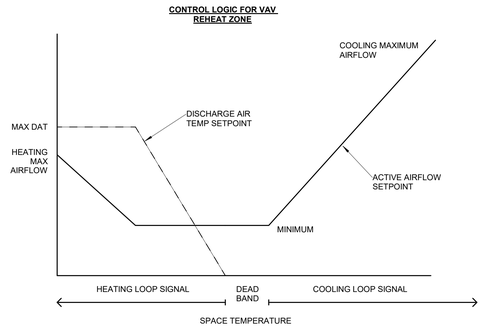
MISCELLANEOUS CONTROL POINTS

DESCRIPTION	*TYPE*
RM 122 (TECH) TEMPERATURE ALARM	BI
RM 315A (TECH) TEMPERATURE ALARM	BI
RM 515 (TECH) TEMPERATURE ALARM	BI
CP-1: ENABLE (OCCUPIED)	BO
CP-2: ENABLE (OCCUPIED)	BO
BUILDING ELECTRICITY METER	AI
BUILDING GAS METER	AI
BUILDING WATER METER	AI
RM 123 CARBON MONOXIDE ALARM	BI
RM 404 CARBON MONOXIDE ALARM	BI
RM 400 CARBON MONOXIDE ALARM	BI
RM 121 CARBON MONOXIDE ALARM	BI
RM 111 CARBON MONOXIDE ALARM	BI
RM 124 CARBON MONOXIDE ALARM	BI

NOTE:
A. CONTRACTOR SHALL PROVIDE AND INSTALL ELECTRICITY, GAS, AND WATER METERS FOR INTEGRATION WITH BAS.
B. INTEGRATE CARBON MONOXIDE SENSORS WITH BAS AND FIRE ALARM SYSTEM.

VAV BOX CONTROL SEQUENCE
A. OCCUPIED MODE:
   1. NORMAL: BOX SHALL SUPPLY MINIMUM FLOW IF SPACE CONDITIONING IS SATISFIED.
   2. COOLING MODE: AVAILABLE WHEN UNIT IS IN NORMAL OCCUPIED MODE AND SPACE TEMPERATURE IS ABOVE THE COOLING SETPOINT.
      a. AS SPACE TEMPERATURE RISES ABOVE THE COOLING SETPOINT THE AIRFLOW SHALL RISE LINEARLY TO IT MAXIMUM AIRFLOW AS DESIGNATED ON THE DRAWINGS.
      b. THE ELECTRIC HEAT SHALL BE OFF.
   3. HEATING MODE: AVAILABLE WHEN UNIT IS IN NORMAL OCCUPIED MODE AND SPACE TEMPERATURE IS BELOW THE HEATING SET POINT.
      a. FIRST STAGE: MODULATE THE ELECTRIC HEAT TO MAINTAIN A LEAVING AIR TEMPERATURE AS SCHEDULED ON DRAWINGS.
      b. SECOND STAGE: MODULATE AIRFLOW TO HEATING CFM ON VAV BOX SCHEDULE.
B. UNOCCUPIED MODE:
   1. OCCUPANCY OVERRIDE BUTTON SHALL ALLOW FOR UNIT TO RETURN TO OCCUPIED SET POINTS FOR 60 MINUTES.
   2. IF SPACE TEMPERATURE DROPS BELOW THE SET POINT THE BOX SHALL SUPPLY MAXIMUM AIRFLOW AND THE ELECTRIC HEAT SHALL BE 100% ON. ONCE THE SPACE TEMPERATURE RISES ABOVE 65 DEG F (ADJ) THE ELECTRIC HEAT SHALL SHUT OFF AND THE BOX DAMPER SHALL CLOSE.
   3. IF THE SPACE TEMPERATURE RISES ABOVE THE SET POINT THE BOX SHALL SEND A CALL FOR COOLING TO THE BAS. THE BOX SHALL SUPPLY MAXIMUM AIRFLOW. ONCE THE SPACE TEMPERATURE DROPS BELOW 80 DEG F (ADJ) THE CALL FOR COOLING WILL REMOVE AND THE BOX DAMPER SHALL CLOSE.
C. MORNING WARM-UP/COOL-DOWN MODE:
   1. IF SPACE TEMPERATURE IS OUTSIDE OF ITS OCCUPIED SET POINT THE BOX SHALL SUPPLY MAXIMUM AIRFLOW.
   2. IF SPACE TEMPERATURE IS BELOW ITS OCCUPIED HEATING SET POINT THE ELECTRIC HEAT SHALL BE 100% ON.
D. UPON POWER FAILURE DAMPER SHALL REMAIN IN LAST CONTROLLED POSITION.
E. MULTIPLE THERMOSTATS: FOR VAV BOXES SERVING MULTIPLE THERMOSTATS, VAV BOX SHALL RESPOND TO THE AVERAGE OF ASSOCIATED THERMOSTATS. ALL INDIVIDUAL CONTROL POINTS FOR EACH THERMOSTAT SHALL BE DISPLAYED ON USER INTERFACE, IN ADDITION TO AVERAGE TEMPERATURE READING.





5 M501 VAV BOX CONTROL SCHEMATIC

COPYRIGHT
STEED HAMMOND PAUL, INC
ALL RIGHTS RESERVED

STATE OF OHIO
JACOB A FAIOLA
84724
REGISTERED
PROFESSIONAL ENGINEER

SHP
312 PLUM STREET, SUITE 700
CINCINNATI, OH 45202 513.381.2112

DAYTON REGIONAL STEM SCHOOL
K-5 BUILDING
2850 DONATION CIRCLE, KETTERING, OH 45240
DAYTON REGIONAL STEM SCHOOL
1724 WOODMAN DRIVE, KETTERING, OH 45420

ISSUANCES

06-28-24	GMP/PERMIT

CONTROL SCHEMATICS - AIRSIDE

COMM NO. 2024026.01

M501

C:\Users\kshah\Documents_LFile24\2024026\01 MEP_Dayton STEM K5_kshahP9APC.rvt
6/28/2024 11:46:56 AM

0'-1" REFERENCE LINE