REMOTE CONDENSING UNIT (RCU) SCHEDULE

DWG LABEL	LOCATION	SERVES	MODEL NO.	REFRIG.	SUCTION (°F)	LIQUID (°F)	SUCTION SIZE	LIQUID SIZE	NOMINAL CAPACITY	COOLING CAPACITY	COMPRESSOR QTY & TYPE	FAN CONDENSER QTY & DRIVE TYPE	ELECTRICAL				NET WEIGHT (LBS)	NOTES
													EER	MCA	MOP	V/PH		
RCU-C-1	MECH YARD	EXISTING UV	4TTR4030	R-410A	45.0	110	3/8"	3/4"	2.5 TONS	30000 Btu/h	1 SCROLL	1 DIRECT	12.2	17.0	25	208/2ø	160	1-9
RCU-C-2	MECH YARD	EXISTING UV	4TTR4030	R-410A	45.0	110	3/8"	3/4"	2.5 TONS	30000 Btu/h	1 SCROLL	1 DIRECT	12.2	17.0	25	208/2ø	160	1-9

NOTES:
1. DESIGN BASIS: TRANE
2. PROVIDE MOTOR STARTER AND NEMA 3R DISCONNECT.
3. PROVIDE DEFROST CONTROLS.
4. PROVIDE LOW AMBIENT OPERATION BELOW 60°F.
5. PROVIDE INTERNAL THERMAL PROTECTION.
6. PROVIDE BRAZED TUBING REFRIGERANT LINE SETS AND COUPLINGS.
7. FIELD CHARGE REFRIGERANT FOR SUPPLY LINE, CONDENSER AND COILS.
8. VERIFY LINE SIZES WITH MANUFACTURER.
9. PROVIDE 4" CONCRETE PAD.

FAN COIL UNIT (FCU) SCHEDULE

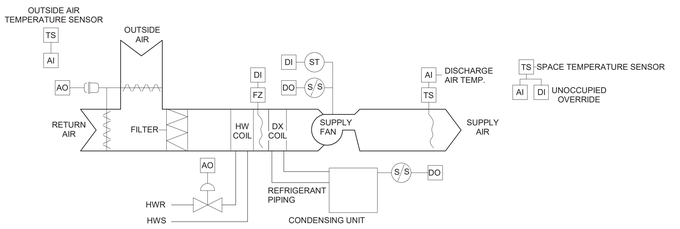
EQUIP NO.	LOCATION	MODEL NO.	SA CFM	MIN. OA	HEATING DATA				HW COIL		SUPPLY FAN		ELECTRICAL					NOTES
					NO. ROW	EAT (°F)	LAT (°F)	CAP. (MBH)	GPM	WPD (FT HD)	ESP (IN. WG.)	RPM	MOTOR SIZE (HP)	V/PH	FLA	MCA	MOP	
FCU-C-E13	GYM OFFICE E13	FCBB040	150	20	2	60.1	116.6	9.2	0.5	1.2	0.00	740	0.01	120V/1ø	2.2	2.8	15	1-7

NOTES:
1. DESIGN BASIS: TRANE
2. CEILING CABINET UNIT
3. PROVIDE 1" MERV13 FILTER.
4. HOT WATER COIL CONDITIONS: EWT=160°F, LWT=120°F
5. PROVIDE NEMA 1 DISCONNECT SWITCH.
6. VERIFY PIPE AND ELECTRICAL LEFT/RIGHT HAND CONNECTIONS PRIOR TO ORDERING.
7. PROVIDE RETURN AIR BOTTOM INLET, FRONT GRILLE OUTLET AND BACK FRESH AIR DUCT COLLAR.

SARGENT BUILDING/EQUIPMENT VENTILATION CALCULATIONS

EQUIPMENT NUMBER	ZONE ID				MINIMUM VENTILATION RATES								
	ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Az - AREA (SF)	Pz - ZONE OCCU. #/1000 FT	ZONE OCCU.	Rp (CFM/ Person)	RpP	Ra (CFM/SF)	RaA	Vbz (CFM)	EZ	Voz (CFM)
EXG UVs	6	LIBRARY/MEDIA CENTER	Media center	1821	25	46	10	460	0.12	219	679	0.9	760
EXG UVs	6A	WORK ROOM	Office Space	98	5	1	5	5	0.06	6	11	0.9	20
FCU-C-E13	E13	GYM OFFICE	Office Space	146	5	1	5	4	0.06	9	12	0.8	20

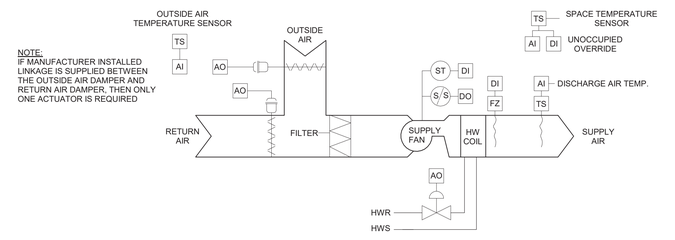
NOTES:
Rp = PEOPLE OUTDOOR AIR RATE, Ra = AREA OUTDOOR AIR RATE, Vbz = BREATHING ZONE OUTDOOR AIRFLOW ,
Ez = AIR DISTRIBUTION CONFIGURATION, Voz = ZONE OUTDOOR AIRFLOW



UNIT VENTILATOR - HOT WATER (VALVE CONTROL) AND DX COOLING - SEQUENCE OF OPERATIONS:

1. OCCUPIED MODE:
   a. SUPPLY FAN AND ASSOCIATED EXHAUST FAN SHALL RUN CONTINUOUSLY.
   b. THE OUTSIDE AIR DAMPER SHALL OPEN TO THE POSITION REQUIRED TO MAINTAIN THE MINIMUM OUTSIDE AIR QUANTITY INDICATED. OUTSIDE AIR DAMPER SHALL NEVER BE POSITIONED BELOW THIS MINIMUM POSITION EXCEPT IN CASE OF ALARM.
   c. WHEN THE SPACE TEMPERATURE IS AT OR BELOW THE HEATING SETPOINT, THE 2-WAY CONTROL VALVE SHALL MODULATE TO MAINTAIN SPACE HEATING SETPOINT SUBJECT TO DISCHARGE HIGH LIMIT OF 110 DEG. F (ADJUSTABLE) AND DISCHARGE LOW LIMIT OF 70 DEG. F (ADJUSTABLE).
   d. WHEN THE SPACE TEMPERATURE RISES 3 DEG. F (ADJUSTABLE) ABOVE THE SPACE HEATING SETPOINT, AND THE OUTSIDE AIR TEMPERATURE IS LOWER THAN THE SPACE TEMPERATURE, THE OUTSIDE AIR DAMPER SHALL MODULATE OPEN AND THE ASSOCIATED RELIEF HOOD DAMPER SHALL OPEN TO MAINTAIN THE OCCUPIED SETPOINT. THIS SHALL BE DONE SUBJECT TO DISCHARGE LOW LIMIT OF 55 DEG. F (ADJUSTABLE), AND WITH THE HEATING VALVE FULLY CLOSED.
   e. WHEN THE SPACE TEMPERATURE IS 3 DEG. F (ADJUSTABLE) ABOVE THE COOLING SETPOINT, AND THE OUTSIDE AIR CANNOT COOL THE SPACE, THE RESPECTIVE CONDENSING UNIT SHALL BE CYCLED TO MAINTAIN SPACE TEMPERATURE WITH THE HEATING VALVE FULLY CLOSED. USE 5 DEG. F (ADJUSTABLE) DEADBAND BETWEEN HEATING AND COOLING SETPOINTS.
2. UNOCCUPIED MODE:
   a. SUPPLY FAN AND ASSOCIATED EXHAUST FAN SHALL BE OFF.
   b. THE OUTSIDE AIR DAMPER AND ASSOCIATED RELIEF HOOD DAMPER SHALL BE FULLY CLOSED.
   c. WHERE SPACE HAS FINNED TUBE RADIATION, RADIATION SHALL PROVIDE FIRST STAGE UNOCCUPIED HEATING.
   d. ON DROP IN SPACE TEMPERATURE BELOW THE UNOCCUPIED SETPOINT, CYCLE THE FAN ON AND COIL CONTROL VALVE FULL OPEN AS REQUIRED TO MAINTAIN REDUCED SPACE TEMPERATURE. USE 5 DEG. F (ADJUSTABLE) DEADBAND AS REQUIRED TO MINIMIZE SHORT CYCLING.
   e. A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO OCCUPIED MODE FOR 1 HOUR (ADJUSTABLE). AT EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN TO THE SCHEDULE.
3. WARM-UP MODE:
   a. THE UNIT SHALL START PER AN OPTIMUM START PROGRAM.
   b. THE OUTSIDE AIR DAMPER AND ASSOCIATED RELIEF HOOD DAMPER SHALL BE FULLY CLOSED, AND THE ASSOCIATED EXHAUST FAN SHALL BE OFF.
   c. THE SUPPLY FAN SHALL RUN AND THE CONTROL VALVE SHALL MODULATE TO MAINTAIN OCCUPIED SETPOINT.
4. PURGE VENTILATION MODE:
   a. PROVIDE GLOBAL INITIATION OF PURGE VENTILATION MODE AT THE OPERATOR'S WORKSTATION SUCH THAT ONE INITIATION STARTS OR STOPS PURGE VENTILATION MODE FOR ALL EQUIPMENT SO PROGRAMMED. PROVIDE FOR GLOBAL ADJUSTMENT OF THE BELOW DESCRIBED SCHEDULING AND PERCENTAGE VENTILATION CHANGES, AND ALSO FOR LOCAL ADJUSTMENT AWAY FROM GLOBAL SETPOINTS. IF GLOBAL SETPOINTS ARE SUBSEQUENTLY RE-ADJUSTED, PROVIDE WARNING WITH A LIST OF UNITS WITH LOCAL OVERRIDES, BUT DO NOT RE-ADJUST LOCAL OVER-RIDE SETPOINTS GLOBALLY.
   b. PROVIDE A PURGE VENTILATION MODE WITH INCREASED VENTILATION AS POSSIBLE WITHIN THE LIMITS OF THE EQUIPMENT. OPERATE WITH ALL THREE MODES DESCRIBED ABOVE WITH THE FOLLOWING MODIFICATIONS TO THE OCCUPIED PERIOD.
   c. START OCCUPIED VENTILATION MODE 1 HOUR (ADJ) EARLIER AND END IT 4 HOURS (ADJ) LATER.
   d. INCREASE VENTILATION AS POSSIBLE BY 100% (ADJ) WHERE 0% INCREASE IS THE MINIMUM VENTILATION DESCRIBED ABOVE AND 100% IS 100% OUTSIDE AIR WITH NO RETURN AIR.
   e. MAINTAIN OCCUPIED SPACE TEMPERATURE AND INCREASED VENTILATION AS POSSIBLE WITHIN HEATING CAPACITY CONSTRAINTS OF LOCAL AND PLANT HEATING CAPACITY. IF SPACE TEMPERATURE DROPS MORE THAN 2 DEG. F (ADJ) BELOW SPACE HEATING SETPOINT WITH THE HEATING VALVE 100% OPEN, MODULATE VENTILATION RATE BACK TO MINIMUM SPECIFIED VENTILATION RATE DESCRIBED ABOVE WITH HEATING VALVE AT 100% OPEN.
5. SAFETIES:
   a. A SEPARATE LOW LIMIT FREEZE STAT WITH AUTOMATIC RESET SHALL BE INSTALLED WITH SENSING ELEMENT SERPENTINED ACROSS THE FACE OF THE COIL WHENEVER COIL FREEZE-UP CONDITIONS ARISE (36 DEG. F ADJUSTABLE) THE SUPPLY FAN SHALL STOP, THE OUTSIDE AIR DAMPER SHALL CLOSE 100%, AND CONTROL VALVE SHALL OPEN 100%. AN ALARM SHALL ALSO BE ACTIVATED.
   b. UPON FAILURE OF THE FAN, AS SENSED BY THE CURRENT SENSING STATUS SWITCH, ACTIVATE AN ALARM.

4 UV - Hot Water - Valve Control and DX Cooling
NTS



FAN COIL UNIT - HOT WATER - VALVE CONTROL - SEQUENCE OF OPERATIONS:

1. OCCUPIED MODE:
   a. SUPPLY FAN AND ASSOCIATED EXHAUST FAN SHALL RUN CONTINUOUSLY.
   b. THE OUTSIDE AIR DAMPER SHALL OPEN TO THE POSITION REQUIRED TO MAINTAIN THE MINIMUM OUTSIDE AIR QUANTITY AS INDICATED. OUTSIDE AIR DAMPER SHALL NEVER BE POSITIONED BELOW THIS MINIMUM POSITION EXCEPT IN CASE OF ALARM.
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   d. ON DROP IN SPACE TEMPERATURE BELOW THE UNOCCUPIED SETPOINT, CYCLE THE FAN AND COIL CONTROL VALVE FULL OPEN AS REQUIRED TO MAINTAIN REDUCED SPACE TEMPERATURE. USE 5 DEG. F (ADJUSTABLE) DEADBAND TO MINIMIZE SHORT CYCLING.
   e. A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO OCCUPIED MODE FOR 1 HOUR (ADJUSTABLE). AT EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN TO THE SCHEDULE.
3. WARM-UP MODE:
   a. THE UNIT SHALL START PER AN OPTIMUM START PROGRAM.
   b. THE OUTSIDE AIR DAMPER AND THE ASSOCIATED RELIEF HOOD DAMPER SHALL BE FULLY CLOSED AND THE ASSOCIATED EXHAUST FAN SHALL BE OFF.
   c. THE SUPPLY FAN SHALL RUN AND THE CONTROL VALVE SHALL MODULATE TO MAINTAIN OCCUPIED SETPOINT.
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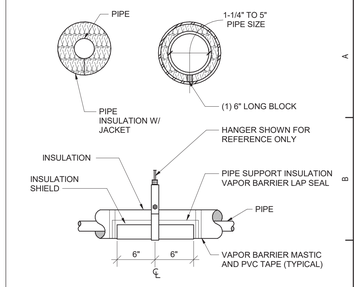
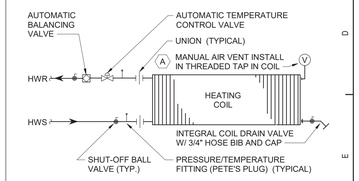
   b. UPON FAILURE OF THE FAN, AS SENSED BY THE CURRENT SENSING STATUS SWITCH, ACTIVATE AN ALARM.

5 FCU - Hot Water - Valve Control - With Outside Air
NTS



1 Pipe Insulation
NTS



A WHERE COIL IS SUPPLIED FROM OVERHEAD PIPING, PROVIDE MANUAL AIR VENT AT HIGH POINT IN HOT WATER SUPPLY PIPING.

2 FCU/UV Hot Water Piping Schematic
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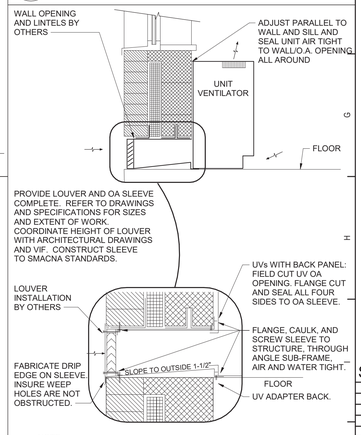

NOTE:
COORDINATE INSTALLATION OF SLEEVE, LOUVER, AND UV WITH WALL.

(Low Back Intake, Adapter Back Not Required)

3 Floor Mounted UV OA Intake Detail
NTS

TEMPERATURE CONTROLS SYMBOLS LIST

AI	ANALOG IN
AO	ANALOG OUT
COM	COMMUNICATIONS PORT
CS	AIRBORNE CONTAMINANT SENSOR
DI	DIGITAL IN
	DAMPER MOTOR
DO	DIGITAL OUT
EMCS	ENERGY MANAGEMENT CONTROL SYSTEM
F	FLOW (WATER/AIR)
FM	FLOW METER
FS	AIR FLOW SENSOR
FZ	FREEZE STAT
H	HUMIDITY SENSOR
HL	HIGH LIMIT
KWH	KILOWATT HOUR METER
LL	LOW LIMIT
M/S	MANUAL SWITCH STOP / START
P	PRESSURE SENSOR
ΔP	DIFFERENTIAL PRESSURE
PS	POSITION SENSOR
S/S	STOP / START
SD	SMOKE DETECTOR
ST	STATUS
START	STARTER
T	ADJUSTABLE THERMOSTAT
TS	TEMPERATURE SENSOR
VFD	VARIABLE FREQUENCY DRIVE
WS	WATER SENSOR
%	PERCENT
ES	END SWITCH
BS	BOILER SWITCH

S.E.D. Control No. 13-02-00-01-0-008-020

Rev. No.:	Date:	Description:

BEACON CITY SCHOOL DISTRICT — WHERE EXCELLENCE IS THE STANDARD

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Tetra Tech Engineers, Architects & Landscape Architects, P.C.

BID SET

TETRA TECH ARCHITECTS & ENGINEERS

Beacon City School District
Beacon, New York

Reconstruction to:
Sargent Elementary School

Details, Schedules and Controls

Drawn By:	Date:	Drawing Number:
JPF1/pgm	10/28/2022	CM500
Project No.: 279180-22004		