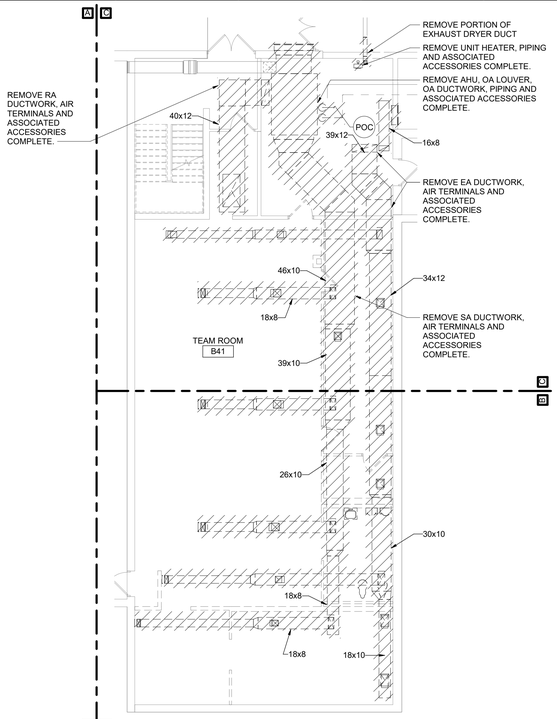
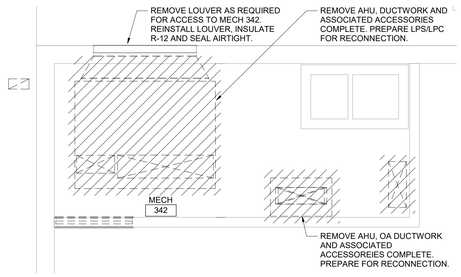
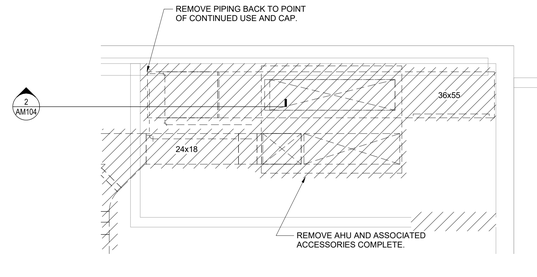


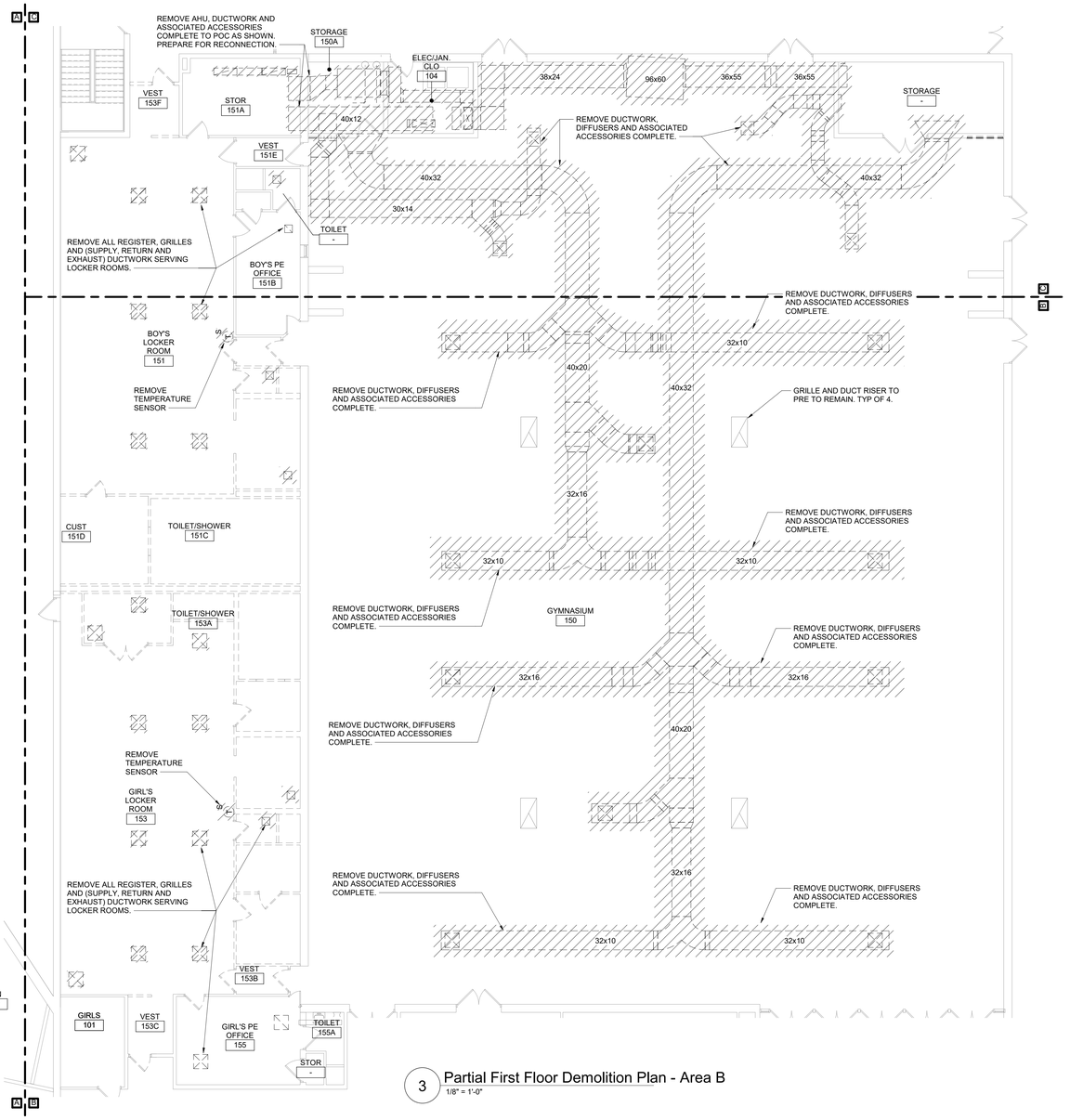
4 Partial Basement Demolition Plan - Area B
1/8" = 1'-0"



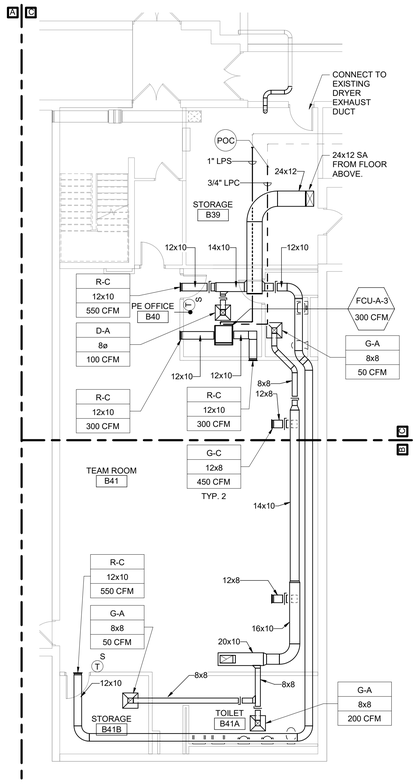
2 Mezzanine Enlarged Demolition Plan - Mech 342
1/4" = 1'-0"



1 Mezzanine Enlarged Demolition Plan - Mech 341
1/4" = 1'-0"



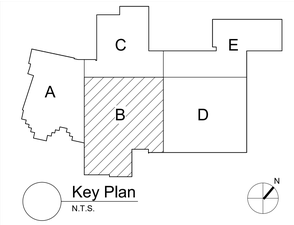
3 Partial First Floor Demolition Plan - Area B
1/8" = 1'-0"



5 Partial Basement Demolition Plan - Area B
1/8" = 1'-0"

General Notes

A. REFER TO AM050 FOR GENERAL NOTES.



Key Plan
N.T.S.

S.E.D. Control No. 62-18-01-06-0-007-019

Rev. No.:	Date:	Description:

WALLKILL CENTRAL SCHOOL DISTRICT

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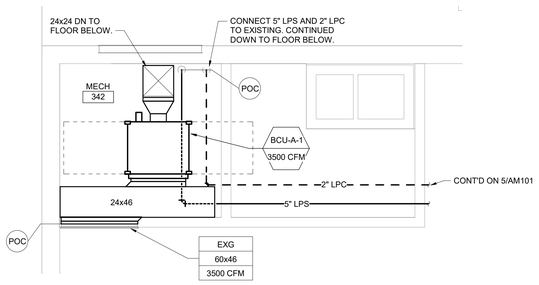
TETRA TECH ARCHITECTS & ENGINEERS

Wallkill Central School District
Wallkill, New York

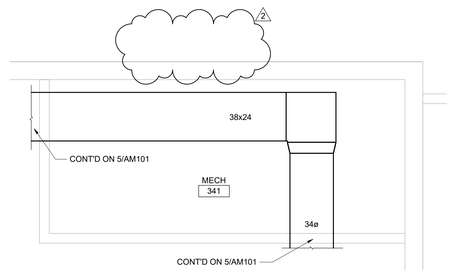
Reconstruction to:
Wallkill Senior High School

Basement and First Floor Partial Plans - Area B & C

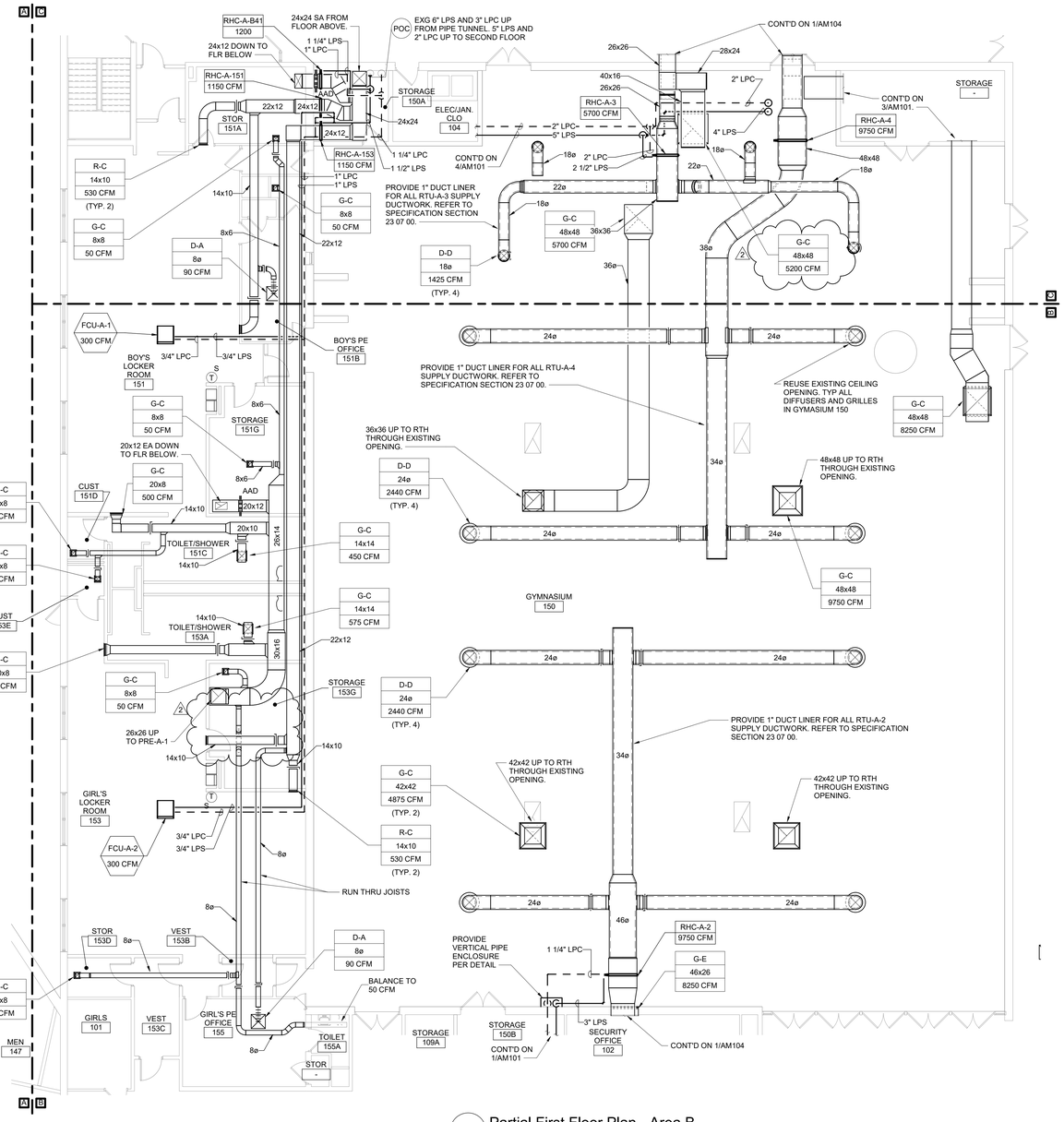
Drawn By:	Date:	Drawing Number:
JPF1/pgm	06/30/2023	AM100
Project No.: 17597-22002		



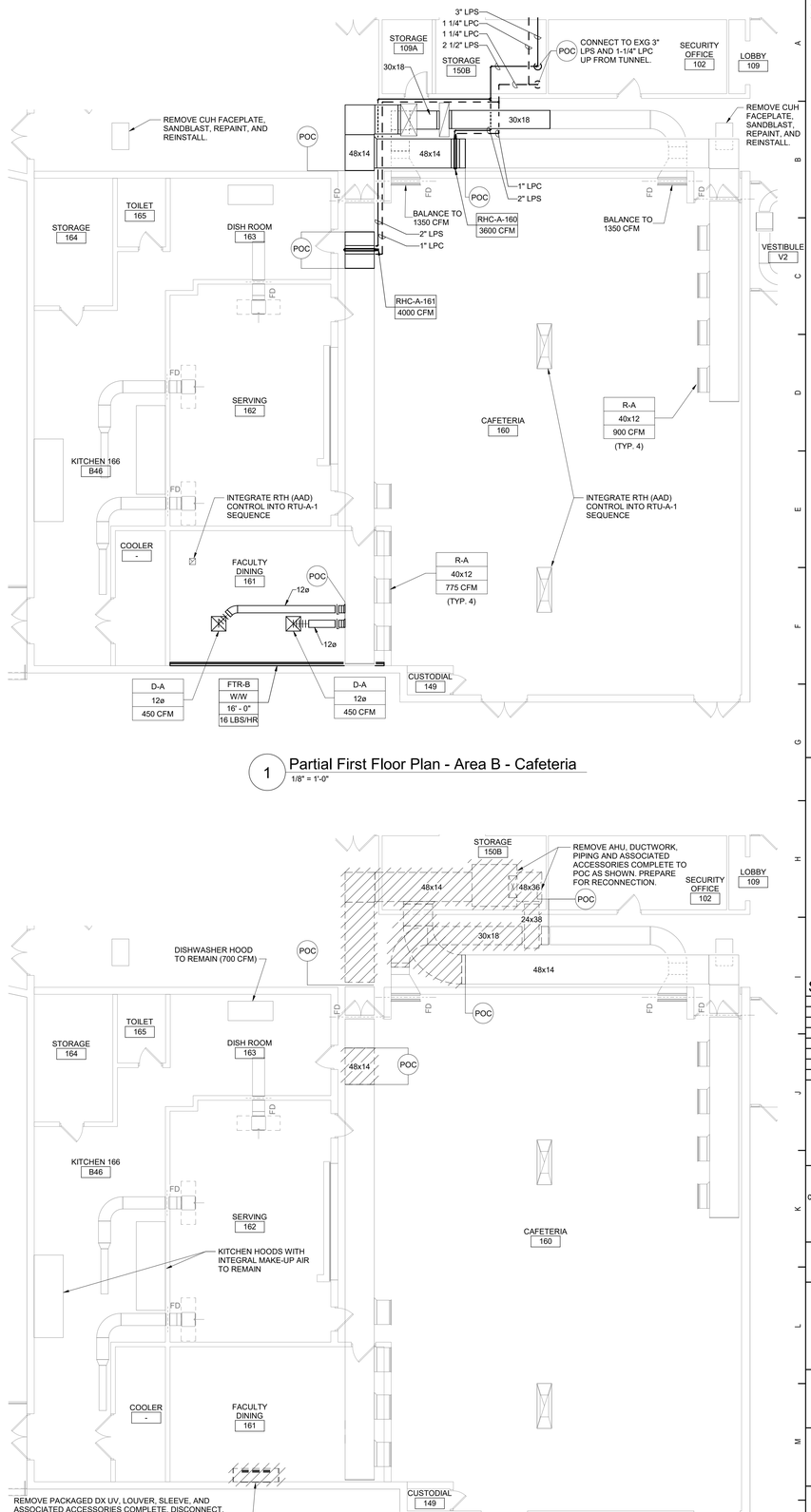
4 Enlarged Plan - Mech 342
1/4" = 1'-0"



3 Enlarged Plan - Mech 341
1/4" = 1'-0"



5 Partial First Floor Plan - Area B
1/8" = 1'-0"

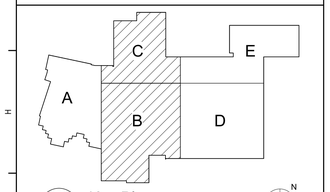


1 Partial First Floor Plan - Area B - Cafeteria
1/8" = 1'-0"

2 Partial First Floor Demolition Plan - Area B - Cafeteria
1/8" = 1'-0"

General Notes

A. REFER TO AM050 FOR GENERAL NOTES.



Key Plan
N.T.S.

S.E.D. Control No. 62-18-01-06-0-007-019

Rev. No.:	Date:	Description:
2	11/16/23	SED ADD NO. 2

WALLKILL CENTRAL SCHOOL DISTRICT

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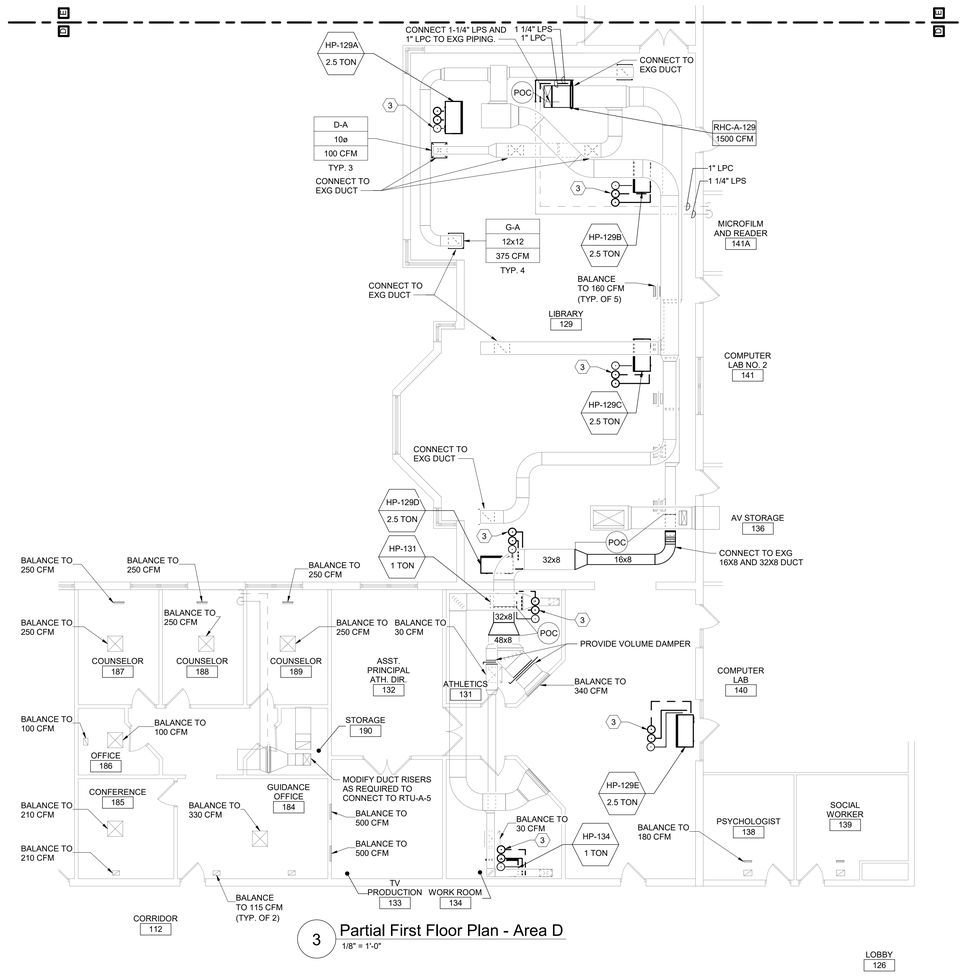
TETRA TECH ARCHITECTS & ENGINEERS

Wallkill Central School District
Wallkill, New York

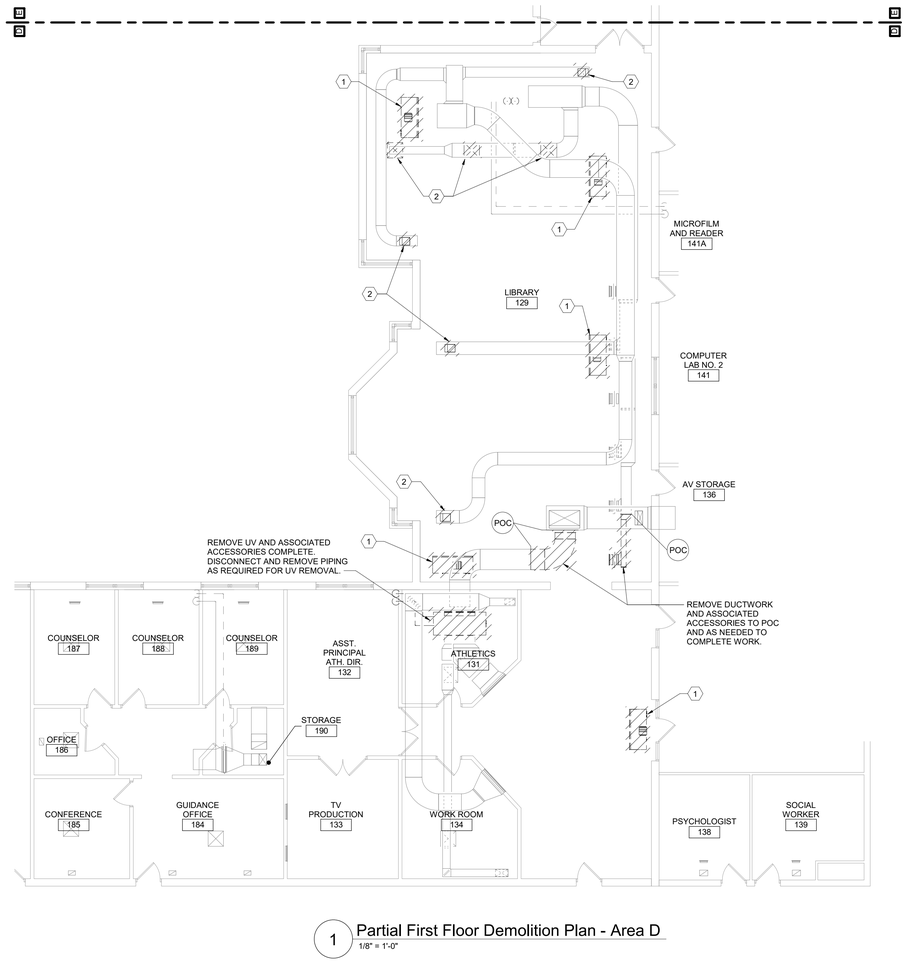
Reconstruction to:
Wallkill Senior High School

First Floor Partial Plans - Areas B & C

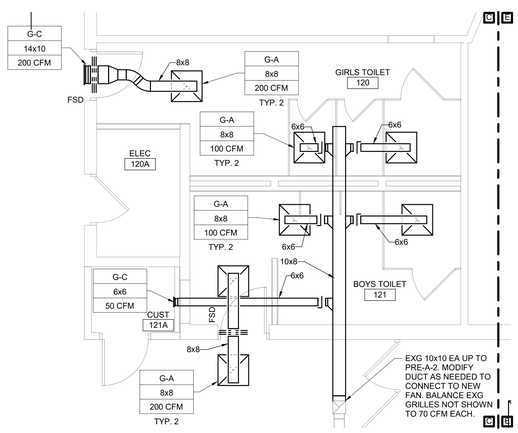
Drawn By:	Date:	Drawing Number:
JPF1/pgm	06/30/2023	AM101
Project No.: 17597-22002		



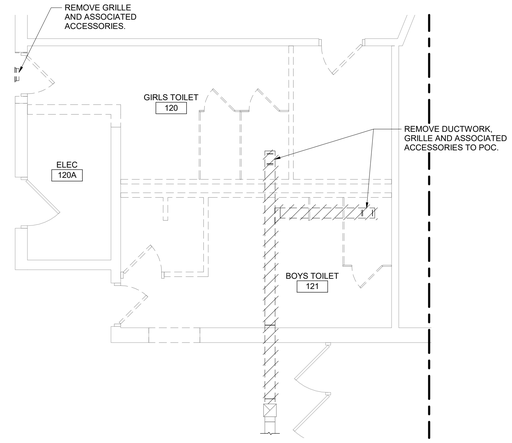
3 Partial First Floor Plan - Area D
1/8" = 1'-0"



1 Partial First Floor Demolition Plan - Area D
1/8" = 1'-0"



4 Partial First Floor Plan - Area B - Toilet Rooms
1/4" = 1'-0"



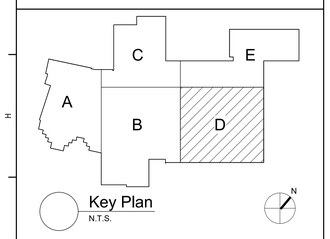
2 Partial First Floor Demolition Plan - Area B - Toilet Rooms
1/4" = 1'-0"

General Notes

A. REFER TO AM050 FOR GENERAL NOTES.

Keyed Notes

1. REMOVE AC UNIT AND ASSOCIATED ACCESSORIES COMPLETE. DISCONNECT, EVACUATE AND RECLAIM REFRIGERANT. DISPOSE OF REFRIGERANT IN ACCORDANCE WITH ASHRAE 15. REMOVE IN-LINE FAN ABOVE CEILING AND ASSOCIATED FLEXIBLE DUCTWORK.
2. REMOVE CEILING DIFFUSER/GRILLE. DUCT TO REMAIN. PEPARE FOR RECONNECTION.
3. RS AND RL UP TO RCU ON ROOF. VERIFY LINE SIZES WITH UNIT MANUFACTURER. PROVIDE 1" CD UP TO ROOF. SEE DETAIL 11/AM500 FOR ADDITIONAL INFORMATION.



Key Plan
N.T.S.

S.E.D. Control No. 62-18-01-06-0-007-019

Rev. No.:	Date:	Description:

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Wallkill Central School District
Wallkill, New York

Reconstruction to:
Wallkill Senior High School

First Floor Plans - Partial Areas B & D

Drawn By:	Date:	Drawing Number:
JPF1/pgm	06/30/2023	AM102
Project No.: 17597-22002		

REMOVE PRE AND ASSOCIATED ACCESSORIES COMPLETE. ROOF CURB TO REMAIN. REFER TO CAP DETAIL ON AM500.

REMOVE PRE AND ASSOCIATED ACCESSORIES COMPLETE. ROOF CURB TO REMAIN. REFER TO CAP DETAIL ON AM500.

4 AM104

3 AM104

REMOVE PRE AND ASSOCIATED ACCESSORIES COMPLETE. ROOF CURB TO REMAIN. REFER TO CAP DETAIL ON AM500.

REMOVE PRE AND ASSOCIATED ACCESSORIES COMPLETE. PREPARE FOR RECONNECTION.

REMOVE PRE AND ASSOCIATED ACCESSORIES COMPLETE. PREPARE FOR RECONNECTION.

REMOVE PRE AND ASSOCIATED ACCESSORIES COMPLETE. ROOF CURB TO REMAIN. REFER TO CAP DETAIL ON AM500.

REMOVE PRE AND ASSOCIATED ACCESSORIES COMPLETE. PREPARE FOR RECONNECTION.

REMOVE PRE AND ASSOCIATED ACCESSORIES COMPLETE. PREPARE FOR RECONNECTION.

6 AM104

REMOVE PRE AND ASSOCIATED ACCESSORIES COMPLETE. REFER TO ARCH DRAWINGS FOR INFILL DETAILS.

REMOVE RTH AND ASSOCIATED ACCESSORIES COMPLETE. ROOF CURB TO REMAIN. REFER TO CAP DETAIL ON AM500.

REMOVE PRE AND ASSOCIATED ACCESSORIES COMPLETE. PREPARE OPENING FOR REUSE.

REMOVE PRE AND ASSOCIATED ACCESSORIES COMPLETE. PREPARE OPENING FOR REUSE.

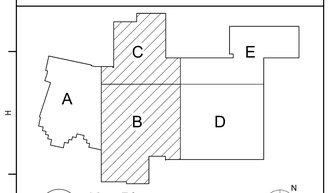
5 AM104

REMOVE PRE, CURB, AND ASSOCIATED ACCESSORIES COMPLETE. PREPARE OPENING FOR REUSE.

1 Partial Roof Demolition Plan - Areas B & C
1/8" = 1'-0"

General Notes

A. REFER TO AM050 FOR GENERAL NOTES.



Key Plan
N.T.S.

S.E.D. Control No. 62-18-01-06-0-007-019

Rev. No.:	Date:	Description:

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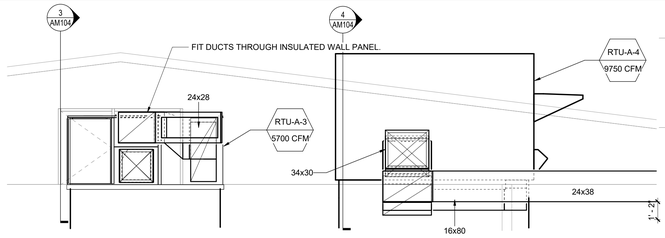
Wallkill Central School District
Wallkill, New York

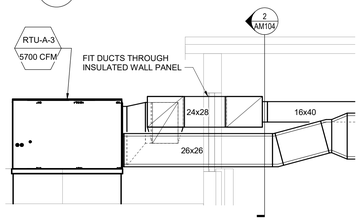
Reconstruction to:
Wallkill Senior High School

Partial Roof Demolition Plan - Areas B & C

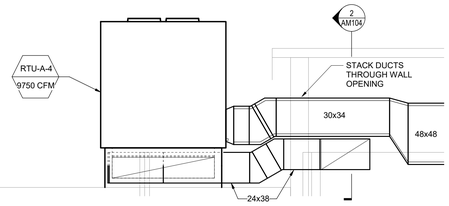
Drawn By:	Date:	Drawing Number:
JPF1/pgm	06/30/2023	AM103
Project No.: 17597-22002		



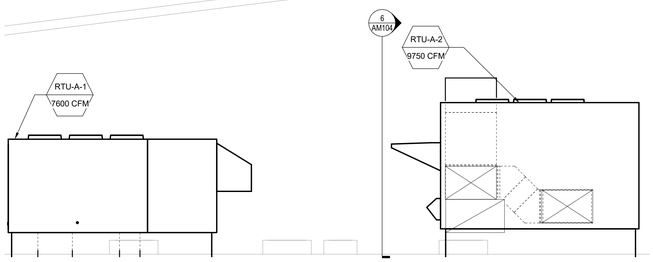
2 RTU-A-3 and RTU-A-4 Section
1/4" = 1'-0"



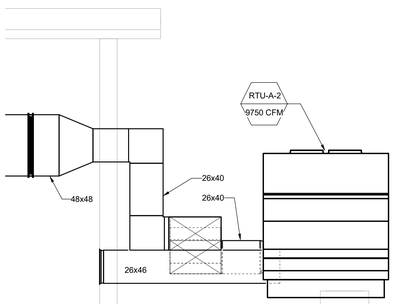
3 RTU-A-3 Section
1/4" = 1'-0"



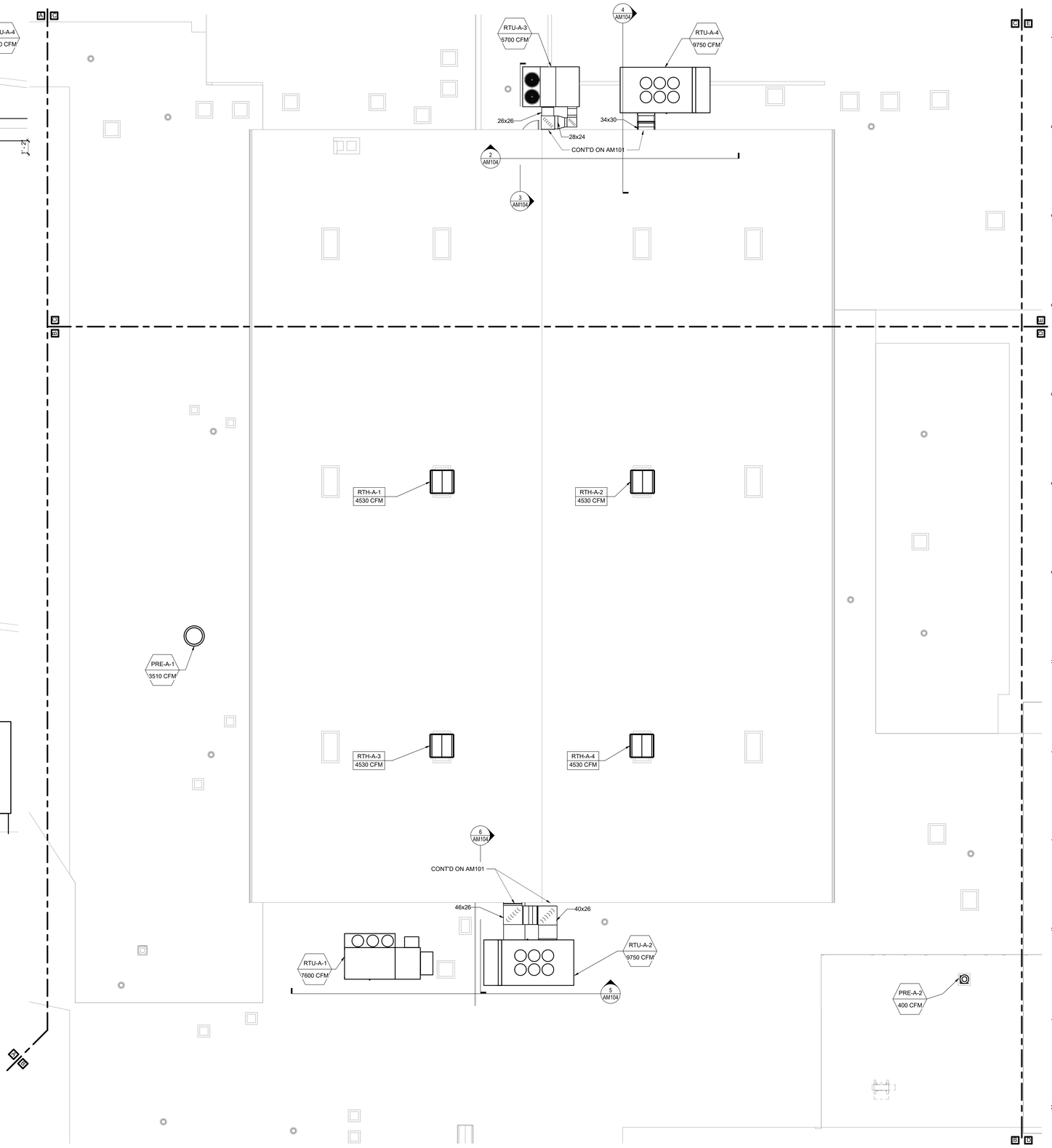
4 RTU-A-4 Section
1/4" = 1'-0"



5 RTU-A-1 and RTU-A-2 Section
1/4" = 1'-0"



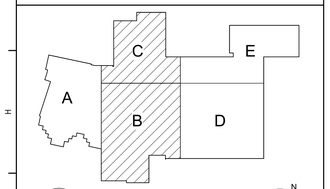
6 RTU-A-2 Section
1/4" = 1'-0"



1 Partial Roof Plan - Areas B & C
1/8" = 1'-0"

General Notes

A. REFER TO AM050 FOR GENERAL NOTES.



Key Plan
N.T.S.

S.E.D. Control No. 62-18-01-06-0-007-019

Rev. No.:	Date:	Description:

WALLKILL CENTRAL SCHOOL DISTRICT

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ARCHITECTS & ENGINEERS

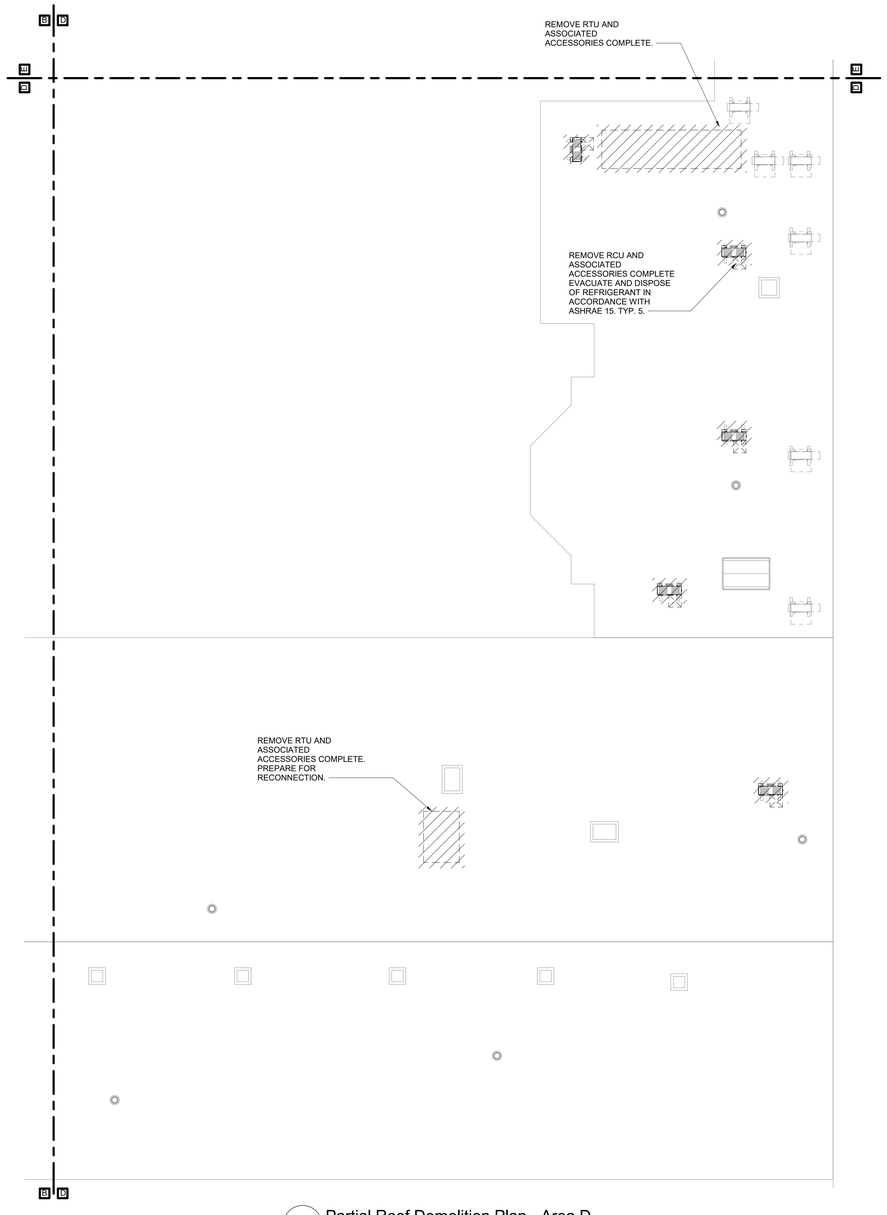
Wallkill Central School District
Wallkill, New York

Reconstruction to:
Wallkill Senior High School

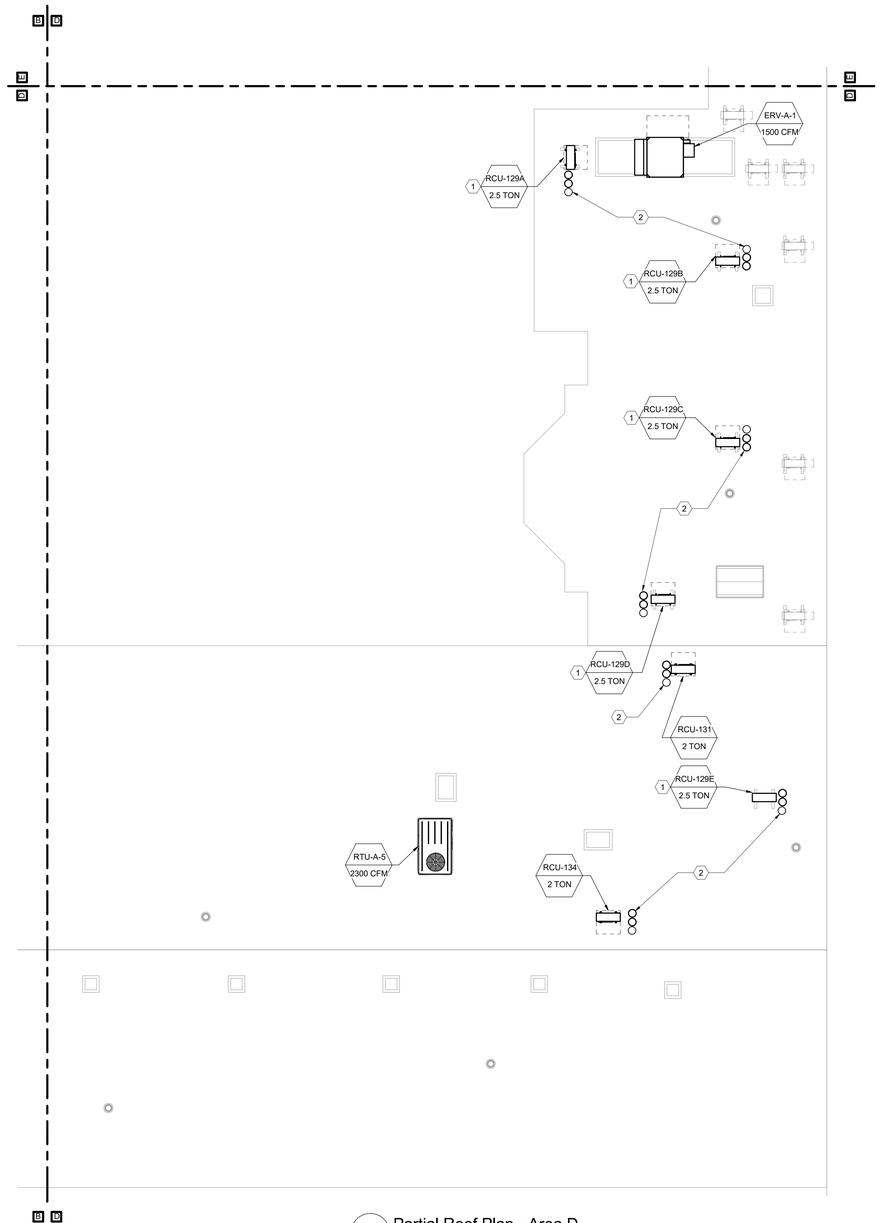
Roof Plan - Areas B & C

Drawn By:	Date:	Drawing Number:
JPF1/pgm	06/30/2023	AM104

Project No.:
17597-22002



2 Partial Roof Demolition Plan - Area D
1/8" = 1'-0"



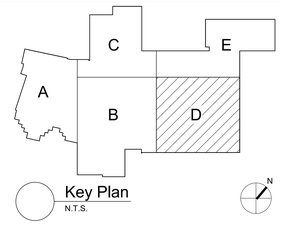
1 Partial Roof Plan - Area D
1/8" = 1'-0"

General Notes

A. REFER TO AM050 FOR GENERAL NOTES.

Keyed Notes

1. INSTALL CONDENSING UNIT ON EXISTING SUPPORTS SYSTEM.
2. RS/RL UP TO RCU. VERIFY LINE SIZE WITH UNIT MANUFACTURER. 1" CD UP FROM BELOW. SEE DETAIL 11/AM500 FOR ADDITIONAL INFORMATION.



S.E.D. Control No. 62-18-01-06-0-007-019

Rev. No.:	Date:	Description:

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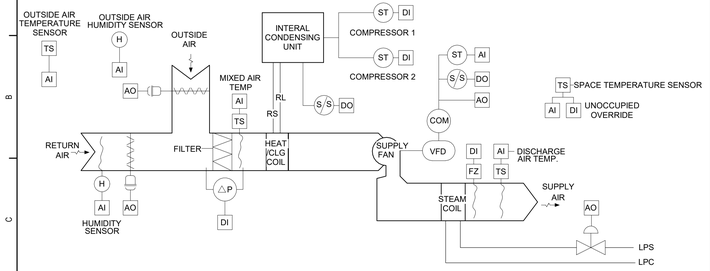
Wallkill Central School District
Wallkill, New York

Reconstruction to:
Wallkill Senior High School

Roof Plans - Partial Area D

Drawn By:	Date:	Drawing Number:
JPF1/pgm	06/30/2023	AM105

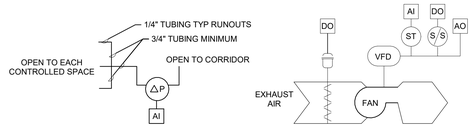
Project No.: 17597-22002



AIR HANDLING UNIT - STEAM REHEAT (VALVE CONTROL) AND DX COOLING - SEQUENCE OF OPERATIONS:

1. OCCUPIED MODE:
   a. SUPPLY FAN AND ASSOCIATED EXHAUST FANS SHALL RUN CONTINUOUSLY. THE SUPPLY FAN SHALL RUN AT THE FREQUENCY DETERMINED BY THE BALANCING CONTRACTOR. OPEN THE OUTSIDE AIR DAMPER AS REQUIRED TO MAINTAIN THE MINIMUM OUTDOOR AIR QUANTITY INDICATED.
   b. WHEN THE SPACE TEMPERATURE IS AT OR BELOW THE HEATING SETPOINT AND THE OUTDOOR AIR TEMPERATURE IS 40°F (ADJ.) OR ABOVE, OPERATE HEAT PUMP HEATING SYSTEM AT LOWEST CAPACITY REQUIRED TO MEET THE HEATING TEMPERATURE SETPOINT.
   c. WHEN THE SPACE TEMPERATURE IS AT OR BELOW THE HEATING SETPOINT AND THE OUTDOOR AIR TEMPERATURE IS BELOW 40°F (ADJ.), MODULATE THE STEAM CONTROL VALVE AT REHEAT COIL AS REQUIRED TO MEET THE HEATING TEMPERATURE SETPOINT.
   d. WHEN THE SPACE TEMPERATURE RISES 3 DEG. F (ADJUSTABLE) ABOVE THE SPACE HEATING SETPOINT. AND THE OUTSIDE AIR ENTHALPY IS LOWER THAN THE SPACE ENTHALPY, THE OUTSIDE AIR DAMPER SHALL MODULATE OPEN AND THE ASSOCIATED RELIEF DAMPER SHALL OPEN TO MAINTAIN THE OCCUPIED SETPOINT. THIS SHALL BE DONE SUBJECT TO 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. THE SUPPLY AND ASSOCIATED EXHAUST FAN SHALL BE OFF.
   b. THE OUTSIDE AIR DAMPER AND THE ASSOCIATED RELIEF 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 HEATING SETPOINT, CYCLE THE FAN ON AND COIL CONTROL VALVE FULL OPEN AS REQUIRED TO MAINTAIN REDUCED SPACE TEMPERATURE. USE 5 DEG. F (ADJUSTABLE) DEADBAND TO MINIMIZE SHORT CYCLING.
   e. WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED ECONOMIZER COOLING SETPOINT, ALLOW ECONOMIZER COOLING WITH THE HEATING VALVE FULLY CLOSED AND THE MECHANICAL COOLING DISABLED.
   f. 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 DAMPER SHALL BE FULLY CLOSED, THE RETURN AIR DAMPER SHALL BE FULLY OPEN, AND THE ASSOCIATED EXHAUST FAN SHALL BE OFF.
   c. THE SUPPLY FAN SHALL RUN AND THE HEATING CONTROL VALVE SHALL MODULATE TO MAINTAIN OCCUPIED SETPOINT.
4. SAFETIES:
   a. DIFFERENTIAL PRESSURE ACROSS THE AIR FILTERS SHALL GENERATE AN ALARM WHENEVER THE DIFFERENTIAL PRESSURE EXCEEDS IT'S ADJUSTABLE SETPOINT.
   b. A SEPARATE LOW LIMIT FREEZE STAT WITH AUTOMATIC RESET SHALL BE INSTALLED WITH SENSING ELEMENT SERPENTINED ACROSS THE FACE OF THE COIL; WHENEVER FREEZE-UP CONDITIONS ARISE (36 DEG. F ADJUSTABLE) THE SUPPLY FAN SHALL STOP, THE OUTSIDE AIR DAMPER SHALL CLOSE 100%, THE HEATING CONTROL VALVE SHALL OPEN 100% AND AN ALARM SHALL BE ACTIVATED.

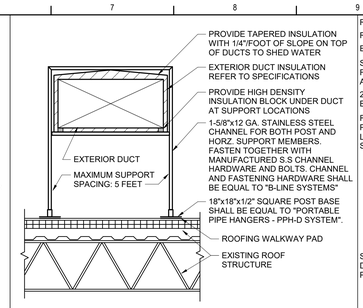
19 RTU - Heat Pump/Steam Reheat - 2-Way Valve Control - RTU-A-5
NTS



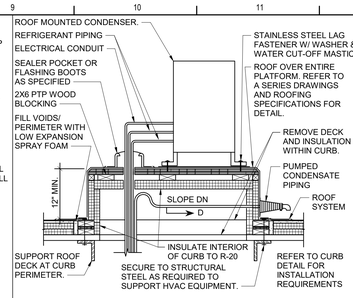
EXHAUST/RELIEF FAN - VARIABLE SPEED - SEQUENCE OF OPERATIONS:

1. OCCUPIED MODE:
   a. OPEN THE FAN DAMPER. PROVIDE A DIFFERENTIAL PRESSURE SENSOR MEASURING THE DIFFERENCE BETWEEN THE AVERAGE SPACE PRESSURE IN SPACES SERVED BY THE ASSOCIATED VENTILATION EQUIPMENT AND THE ADJACENT CORRIDOR AIR PRESSURE. MODULATE THE EXHAUST/RELIEF FAN VSD AS REQUIRED TO MAINTAIN THE OCCUPIED SPACES AT A SLIGHT POSITIVE PRESSURE OF +0.01 TO +0.05"WG (ADJUSTABLE) RELATED TO THE ADJACENT CORRIDOR. THE EXHAUST/RELIEF FAN SPEED SHALL NOT EXCEED THE MAXIMUM SPEED DETERMINED BY THE AIR BALANCER TO DELIVER THE ECONOMIZER (MAXIMUM) CFM AS SCHEDULED FOR THE RELIEF/EXHAUST FAN.
2. UNOCCUPIED MODE:
   a. THE FAN SHALL BE OFF AND AUTOMATIC AIR DAMPER SHALL BE CLOSED.
3. WARM-UP MODE:
   a. THE FAN SHALL BE OFF AND AUTOMATIC AIR DAMPER SHALL BE CLOSED.
4. SAFETIES:
   a. UPON A FAILURE OF THE FAN, AS SENSED BY A CURRENT SENSING STATUS SWITCH, AN ALARM SHALL BE ACTIVATED.

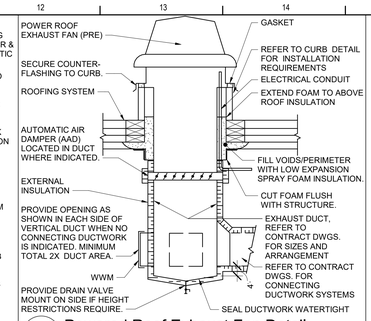
20 Variable Speed Exhaust/Relief Fan
NTS



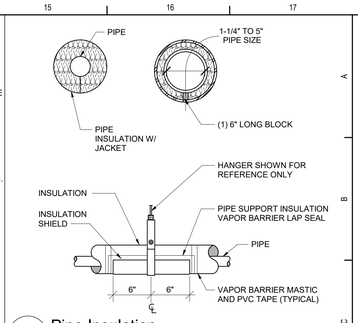
15 Roof Monted Duct Support Detail
NTS



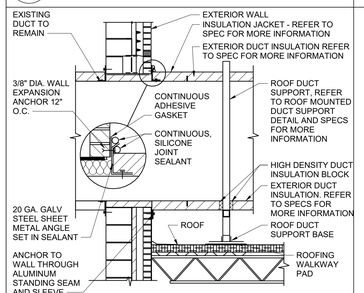
11 3 Ton Capacity and Under Condensing Unit Mounting Detail
NTS



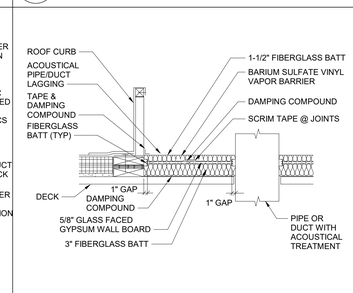
6 Powered Roof Exhaust Fan Detail
NTS



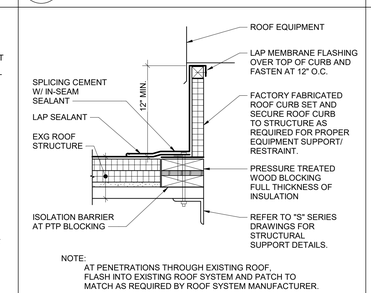
1 Pipe Insulation
NTS



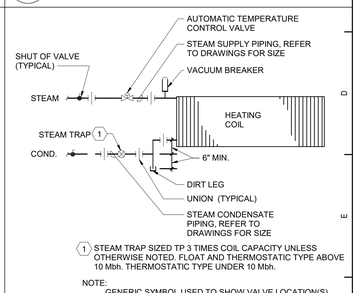
16 Exterior Wall Duct Penetration Detail
NTS



12 Acoustically Lined Roof Curb Detail
NTS



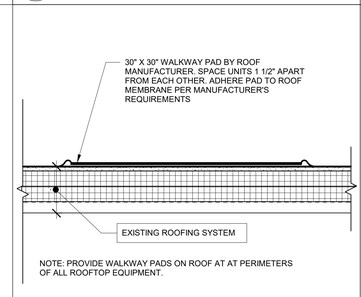
7 Equipment Curb
NTS



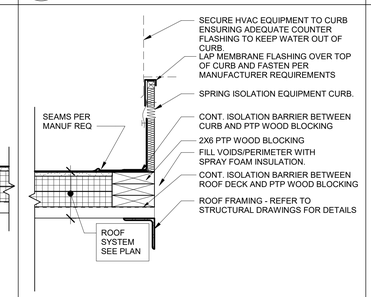
(1) STEAM TRAP SIZED TP 3 TIMES COIL CAPACITY UNLESS OTHERWISE NOTED. FLOAT AND THERMOSTATIC TYPE ABOVE 10 Mbh. THERMOSTATIC TYPE UNDER 10 Mbh.

NOTE:
GENERIC SYMBOL USED TO SHOW VALVE LOCATION(S) REFER TO SPECIFICATIONS FOR EXACT VALVE TYPE.

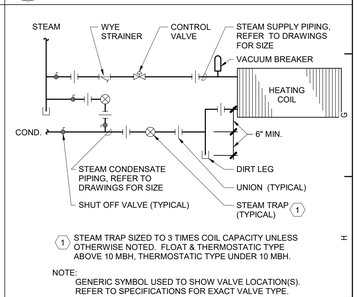
2 Cabinet Heater Steam Piping Detail
NTS



13 Walkway Pad Detail
NTS



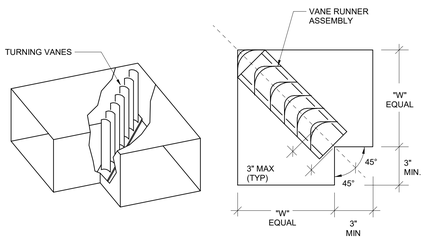
8 Equipment Curb - Spring
NTS



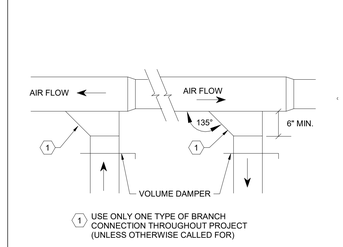
(1) STEAM TRAP SIZED TO 3 TIMES COIL CAPACITY UNLESS OTHERWISE NOTED. FLOAT & THERMOSTATIC TYPE ABOVE 10 MBH, THERMOSTATIC TYPE UNDER 10 MBH.

NOTE:
GENERIC SYMBOL USED TO SHOW VALVE LOCATION(S). REFER TO SPECIFICATIONS FOR EXACT VALVE TYPE.

3 Steam Coil Piping Schematic
NTS

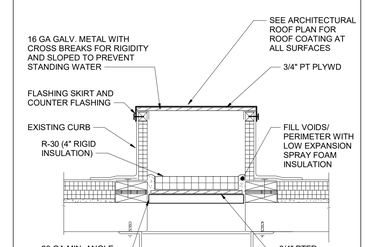


17 Duct Turning Vanes
12" = 1'-0"

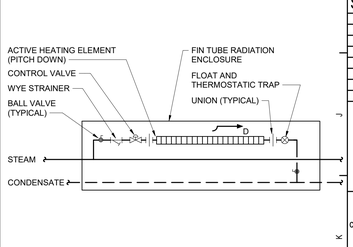


(1) USE ONLY ONE TYPE OF BRANCH CONNECTION THROUGHOUT PROJECT (UNLESS OTHERWISE CALLED FOR)

14 Duct Detail
NTS



9 Roof Curb Cap Detail
NTS

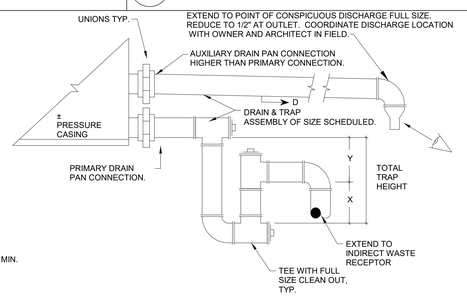


4 Steam Fin Tube Radiation Piping Schematic (Valve Control)
NTS

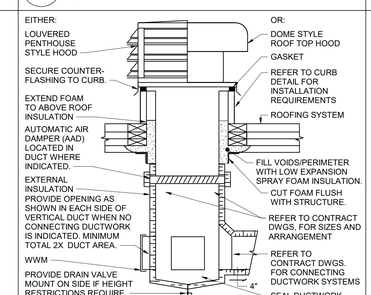
COIL CAPACITY	TRAP SIZE NPS
0-3 TON	3/4"
3-10 TON	1"
10-100 TON	1 1/4"
OVER 100	1 1/2"

NOTE:
1. "X" MUST BE 1-1/2" PLUS CASING STATIC PRESSURE; MINIMUM 2"
2. "Y" MUST BE 1-1/2" MINUS CASING STATIC PRESSURE; MINIMUM 2"

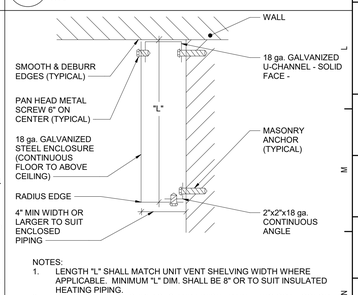
EXAMPLE: CASING At (-1") Wg.
X = 1-1/2" + (-1) = 1/2"; USE 2" MIN.
Y = 1-1/2" - (-1) = 2-1/2""



18 Drain Pan / AC Condensate Trap and Auxiliary Drain Detail
12" = 1'-0"



10 Roof Top Hood Detail
NTS



NOTES:
1. LENGTH "L" SHALL MATCH UNIT VENT SHELVING WIDTH WHERE APPLICABLE. MINIMUM "L" DIM. SHALL BE 8" OR TO SUIT INSULATED HEATING PIPING.
2. PRIME ALL METAL SURFACES AND FINISH. PAINT TWO COAT COLOR PER ARCHITECT.

5 Vertical Piping Enclosure Detail
NTS

S.E.D. Control No. 62-18-01-06-0-007-019

Rev. No.:	Date:	Description:

WALLKILL CENTRAL SCHOOL DISTRICT

complex world | CLEAR SOLUTIONS

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

BID SET

TETRA TECH ARCHITECTS & ENGINEERS

Wallkill Central School District
Wallkill, New York

Reconstruction to:
Wallkill Senior High School

Details and Controls

Drawn By:	Date:	Drawing Number:
JPF1/pgm	06/30/2023	AM500

Project No.: 17597-22002

FAN (F-, PRE-, PWE-) SCHEDULE

DWG LABEL	SERVES	TYPE	MODEL NO.	FAN DATA							ELECTRICAL			NOTES
				CFM	SP (IN WG)	SONES	RPM	TIP SPEED (FPM)	OPENING (SQ. IN.)	DRIVE	BHP	HP	FLA	V/PH	
PRE-A-1	LOCKER RMS B41, 151, 153	CENTRIFUGAL DOWNBLAST	210C	3510	0.75	10.9	843	4630	25.5x25.5	DIRECT	0.77	2	0 A	208 V/3ø	1-5
PRE-A-2	TOILET RMS	CENTRIFUGAL DOWNBLAST	90ACEM	490	0.35	6.8	1547	3710	13.5x13.5	DIRECT	0.07	1/8	1.9 A	120 V/1ø	1,3,4,5,6

NOTES:
1. DESIGN BASIS: LOREN COOK
2. REUSE EXISTING ROOF CURB. PROVIDE CURB ADAPTER.
3. PROVIDE EC MOTOR, STARTED AND NEMA 1 DISCONNECT.
4. PROVIDE MOTORIZED AUTOMATIC AIR DAMPER (AAD) AND ACTUATOR WITHIN CURB.
5. SONES, TIP SPEED AND BHP ARE MAXIMUM ALLOWABLE. CFM, SP AND OPENING ARE MINIMUM ALLOWABLE.
6. PROVIDE 14" ROOF CURB.

BLOWER COIL UNIT (BCU) SCHEDULE

EQUIPMENT FURNISHED BY OWNER, INSTALLED BY MECHANICAL CONTRACTOR

DWG LABEL	UNIT LOCATION	SERVES	DESIGN BASIS: TRANE MODEL	SUPPLY FAN							ELECTRICAL DATA				WEIGHT (LBS)	NOTES
				FAN ARR.	MAX SA (CFM)	MIN. SA (CFM)	DISCH. ARR.	ESP (IN WG)	RPM	BHP	HP	V/PH	MCA	MOP		
BCU-A-1	MECH 342	LOCKER RMS B41, 151, 153	BCHE090	DIRECT CENTRIFUGAL	3500	1100	END	1.00	1091	1.9	3.0	208/3	14 A	25 A	300	1-4

NOTES:
1. DESIGN BASIS: TRANE
2. GASKETED ACCESS DOORS AND MODULAR SECTIONS WITH DOUBLE WALLED 1" 1.5 PCF INSULATED PANELS.
3. PROVIDE 2" MERV8 FILTER
4. PROVIDE EC MOTOR WITH DISCONNECT SWITCH.

PACKAGED ROOFTOP UNIT (RTU) SCHEDULE

EQUIPMENT FURNISHED BY OWNER, INSTALLED BY MECHANICAL CONTRACTOR

DWG LABEL	UNIT LOCATION	SERVES	MODEL	SUPPLY FAN								ELECTRICAL DATA			WEIGHT (LBS)	HEATING DATA			HEAT PUMP			COOLING DATA									REFRIGERANT DATA - R410A			NOTES
				FAN ARR.	SA (CFM)	EVENT OA (CFM)	CLRM OA (CFM)	DISCH. ARR.	ESP (IN WG)	RPM	BHP	HP	V/PH	MCA	MOP		EAT (°F)	LAT (°F)	MBH	AMBIENT DB (°F)	AMBIENT WB (°F)	COP @47F	NO. ROWS	EDB (°F)	EWB (°F)	LDB (°F)	LWB (°F)	TC (MBH)	SC (MBH)	APD (IN WG)	AMB (°F)	EER	COMPRESSOR DESCRIPTION	
RTU-A-1	ROOF - AREA B	CAFETERIA 161 & 162	VXE-212-52C-25A	DIRECT PLENUM	7600	4900	4900	DOWN	0.75	1802	6.1	7.5	208/3	155 A	200 A	5200	59.3	76.0	137.3	40.0	36.2	3.21	6	78.2	68.3	54.1	53.9	347.2	201.5	0.55	90.0	9.7	(1) 15T INVERTER SCROLL, (1) 14T SCROLL	1-8, 11
RTU-A-2	ROOF - AREA B	MAIN GYM 150	VX-312-20I-I-I1	DIRECT PLENUM	9750	3600	1500	SIDE	1.50	1471	3.1	5.0	208/3	161 A	200 A	5200	NO HEATING COIL						4	80.6	69.4	56.4	56.3	414.4	255.1	0.24	90.0	10.4	(1) 15T INVERTER SCROLL, (1) 15T SCROLL	1-6, 9, 11
RTU-A-3	ROOF - AREA C	WRESTLING GYM 150	WHJ150A3	BC PLENUM	5700	1150	500	SIDE	1.00	1135	1.9	3.1	208/3	72 A	90 A	2200	60.0	84.3	128.2	40.0	36.2	3.34	6	79.5	67.6	59.4	58.5	162.0	123.0	0.77	90.0	12.3	(1) 5T SCROLL, (1) 7.5T SCROLL	1-5, 10-11, 13
RTU-A-4	ROOF - AREA B	MAIN GYM 150	VX-312-20I-I-I1	DIRECT PLENUM	9750	3600	1500	SIDE	1.50	1471	3.1	5.0	208/3	161 A	200 A	5200	NO HEATING COIL						4	80.6	69.4	56.4	56.3	414.4	255.1	0.24	90.0	10.4	(1) 15T INVERTER SCROLL, (1) 15T SCROLL	1-6, 9, 11
RTU-A-5	ROOF - AREA D	GUIDANCE SUITE	WHC074H3	BC PLENUM	2300	360	360	DOWN	1.00	1085	0.8	2.8	208/3	42 A	50 A	1200	61.0	87.7	66.2	40.0	36.2	3.5	3	78.7	64.6	52.7	52.6	75.1	60.8	0.00	95.0	12.1	(2) SCROLL	3-5, 11-14

NOTES:
1. GASKETED ACCESS DOORS AND MODULAR SECTIONS WITH DOUBLE WALLED 2" R-13 GALVANIZED STEEL PANELS WITH THERMAL BREAK.
2. PROVIDE 2" MERV8 PRE-FILTER AND MERV13 FILTERS BEFORE COILS
3. PROVIDE 120V/1PH (FLA=8A) GFI SERVICE OUTLET FOR SEPARATE POWER.
4. PROVIDE FACTORY-INSTALLED SUPPLY AND EXHAUST FAN VFDs.
5. PROVIDE NEMA 3R UNIT DISCONNECT SWITCH FOR UNIT.
6. DESIGN BASIS: VALENT
7. FOR RTU-A-1, PROVIDE HIGH EFFICIENCY ENERGY WHEEL:
   A. VENTILATION: 4900 CFM, PD: 1.0 in-wg
      a. SUMMER= EDB:88.0°F, EWB:72.6°F, LDB: 79.3°F, LWB: 68.8°F, 72.4% TOTAL EFFECTIVENESS
      b. WINTER= EDB:8.7°F, EWB:4.0°F, LDB: 53.5°F, LWB: 38.0°F, 73.6% TOTAL EFFECTIVENESS
   B. EXHAUST: 4900 CFM, ENTERING SUMMER: 76.3°F/67.4°F, ENTERING WINTER: 69.8°F/47.0°F, PD: 1.0 in-wg
8. PROVIDE DIRECT PLENUM EXHAUST FAN, 4,900 CFM, ESP=0.5 IN WG, 1302 RPM, 2.3 BHP, 3 HP
9. PROVIDE SPRING ISOLATED 40" ROOF CURB.
10. PROVIDE 24" ROOF CURB.
11. PROVIDE ACOUSTICALLY LINED CURB PER DETAIL.
12. PROVIDE CURB ADAPTER.
13. DESIGN BASIS: TRANE, WITH INSULATED SINGLE-WALL PANELS
14. PROVIDE 2" MERV13 COILS, LOW LEAK OA DAMPER, ECONOMIZER HOOD AND 0.65kW EXHAUST FAN.

ROOFTOP HOOD (RTH) SCHEDULE

DWG LABEL	SERVES	MODEL NO.	TYPE	CFM	VENT SIZE (IN x IN)	HOOD SIZE (IN x IN)	HOOD HEIGHT (IN)	FREE AREA (S.F.)	VELOCITY (FPM)	SP (IN WG)	HOOD FINISH	NOTES
RTH-A-1	MAIN GYM 150	28x28GR	RELIEF	5430	28x28	52x51	18.75	5.44	1000	0.10	KYNAR	1-3
RTH-A-2	MAIN GYM 150	28x28GR	RELIEF	5430	28x28	52x51	18.75	5.44	1000	0.10	KYNAR	1-3
RTH-A-3	MAIN GYM 150	28x28GR	RELIEF	5430	28x28	52x51	18.75	5.44	1000	0.10	KYNAR	1-3
RTH-A-4	MAIN GYM 150	28x28GR	RELIEF	5430	28x28	52x51	18.75	5.44	1000	0.10	KYNAR	1-3

NOTES:
1. DESIGN BASIS: LOREN COOK
2. REUSE EXISTING (30x30, VIF) CURB. PROVIDE CURB ADAPTER.
3. PROVIDE MOTORIZED AUTOMATIC AIR DAMPER (AAD) AND ACTUATOR WITHIN CURB ADAPTER.

HEAT PUMP (HP) SCHEDULE

DWG LABEL	LOCATION	DESIGN MAKE: MITSHUBISHI MODEL:	UNIT TYPE	NOMINAL CAPACITY (MBH)		SUPPLY FAN CAPACITY (CFM)	SUPPLY AIRFLOW	FAN SPEED	SOUND PRESSS. (dBA)	PIPE SIZE		V/PH	NOTES
				COOLING	HEATING					GAS	LIQUID		
HP-129A	LIBRARY 129	TPCAA0301KA70A	CEILING SUSPENDED	30	32	565-600-635-705	600	MED	35-37-39-41	5/8"	3/8"	208 V/1ø	1-4
HP-129B	LIBRARY 129	TPCAA0301KA70A	CEILING SUSPENDED	30	32	565-600-635-705	600	MED	35-37-39-41	5/8"	3/8"	208 V/1ø	1-4
HP-129C	LIBRARY 129	TPCAA0301KA70A	CEILING SUSPENDED	30	32	565-600-635-705	600	MED	35-37-39-41	5/8"	3/8"	208 V/1ø	1-4
HP-129D	LIBRARY 129	TPCAA0301KA70A	CEILING SUSPENDED	30	32	565-600-635-705	600	MED	35-37-39-41	5/8"	3/8"	208 V/1ø	1-4
HP-129E	LIBRARY 129	TPCAA0301KA70A	CEILING SUSPENDED	30	32	565-600-635-705	600	MED	35-37-39-41	5/8"	3/8"	208 V/1ø	1-4
HP-131	ATHLETICS 131	TPCAA0241KA70A	CEILING SUSPENDED	24	26	530-565-600-670	530	LOW	33-35-37-40	5/8"	3/8"	208 V/1ø	1-4
HP-134	WORK ROOM 134	TPCAA0241KA70A	CEILING SUSPENDED	24	26	530-565-600-670	530	LOW	33-35-37-40	5/8"	3/8"	208 V/1ø	1-4

NOTES:
1. NOMINAL COOLING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 80/67°F (DB/WB), OUTDOOR OF 95/75°F (DB/WB).
2. NOMINAL HEATING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 70/60°F (DB/WB), OUTDOOR OF 17/15°F (DB/WB).
3. PROVIDE INTEGRAL CONDENSATE PUMP.
4. POWER TO HEAT PUMP FED FROM RCU. PROVIDE TOGGLE DISCONNECT.

REMOTE CONDENSING UNIT (RCU) SCHEDULE

DWG LABEL	LOCATION	DESIGN MAKE: MITSHUBISHI MODEL:	NOMINAL CAPACITY				ELECTRICAL DATA			NOTES
			COOLING (BTU/h)	EER	HEATING (BTU/h)	COP @ 47F	V/PH	MOP	MCA	
RCU-129A	ROOF - AREA D	TRUZH0301HA10NA	30000	9.4	32000	3.72	208 V/1ø	40 A	24 A	1-3,5
RCU-129B	ROOF - AREA D	TRUZH0301HA10NA	30000	9.4	32000	3.72	208 V/1ø	40 A	24 A	1-3,5
RCU-129C	ROOF - AREA D	TRUZH0301HA10NA	30000	9.4	32000	3.72	208 V/1ø	40 A	24 A	1-3,5
RCU-129D	ROOF - AREA D	TRUZH0301HA10NA	30000	9.4	32000	3.72	208 V/1ø	40 A	24 A	1-3,5
RCU-129E	ROOF - AREA D	TRUZH0301HA10NA	30000	9.4	32000	3.72	208 V/1ø	40 A	24 A	1-3,5
RCU-131	ROOF - AREA D	TRUZH0241HA10NA	24000	12.5	26000	3.71	208 V/1ø	28 A	11 A	1-2,4-5
RCU-134	ROOF - AREA D	TRUZH0241HA10NA	24000	12.5	26000	3.71	208 V/1ø	28 A	11 A	1-2,4-5

NOTES:
1. NOMINAL COOLING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 80/67°F (DB/WB), OUTDOOR OF 95/75°F (DB/WB).
2. NOMINAL HEATING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 70/60°F (DB/WB), OUTDOOR OF 17/15°F (DB/WB).
3. REUSE EXISTING ROOF CURBS. PROVIDE INTERMEDIATE SUPPORTS AS REQUIRED.
4. PROVIDE STRUT SUPPORT SYSTEM (DESGIN BASIS: QUICK SLING).
5. PROVIDE NEMA 3R DISCONNECT.

ENERGY RECOVERY UNIT (ERV) SCHEDULE

EQUIPMENT FURNISHED BY OWNER, INSTALLED BY MECHANICAL CONTRACTOR

DWG LABEL	LOCATION	SERVES	DESIGN BASIS: RENEW AIRE MODEL:	SUPPLY		EXHAUST		SUPPLY/OUTSIDE AIR DATA						EXHAUST/RETURN AIR DATA				ENTHALPY EFFECTIVENESS		ELECTRICAL DATA								WEIGHT (LBS)	NOTES
				AIRFLOW	ESP (" WC)	AIRFLOW	ESP (" WC)	SUMMER CONDITIONS (°F)				WINTER CONDITIONS (°F)		SUMMER (°F)		WINTER (°F)		SUMMER	WINTER	MOTOR QTY	BHP	MOTOR SIZE	MOP	MCA	VOLT	PH			
								EAT DB	EAT WB	LAT DB	LAT WB	EAT DB	EAT WB	LAT DB	LAT WB	EAT DB	EAT WB	LAT DB	LAT WB										
ERV-A-1	ROOF - AREA D	LIBRARY 129	HE3XRTV	1500	1.00	1500	1.00	88.0	72.6	0.0	0.0	8.7	4.0	0.0	0.0	76.3	67.4	69.8	47.0	59.1 %	74.8 %	2	1.21, 1.41	2 hp	20 A	16 A	208 V	3	970	1-5

NOTES:
1. PROVIDE DOUBLE WALL CONSTRUCTION, HINGED ACCESS DOORS, LOW LEAK OUTSIDE AND EXHAUST AIR DAMPERS, 2" MERV8.
2. PROVIDE STARTER AND INTEGRAL NEMA 3 NON-FUSED DISCONNECT SWITCH. PROVIDE SINGLE POINT CONNECTION.
3. PROVIDE ONBOARD VFDS AND TEFC MOTORS.
4. PROVIDE CONTROL TRANSFORMER.
5. PROVIDE 24" ROOF CURB.

REHEAT COIL (RHC) SCHEDULE

DWG LABEL	SERVES	LOCATION	EQUIP SERVED	DESIGN MAKE: PRECISION COILS MODEL:	DUCT SIZE (IN x IN)	FACE AREA (SF)	FACE VELOCITY (FPM)	TUBE WALL THICKNESS (IN)	AIRSIDE DATA						STEAM INLET PRESS. (PSI)	COND. FLOW RATE (LB/HR)	NOTES
									NO. ROWS	AIRFLOW (CFM)	APD (IN. WC)	EAT (°F)	LAT (°F)	HEAT CAP. (MBH)			
RHC-A-129	LIBRARY 129	LIBRARY 129	ERV-A-1	D5WB	34x12	2.83	529	0.020	1	1500	0.11	50.0	86.5	59.4	3.0	61.5	1
RHC-A-B41	TEAM ROOM B41	STORAGE 150A	BCU-A-1	D5WB	24x12	2.00	600	0.020	1	1200	0.10	65.0	89.4	31.8	3.0	32.9	1
RHC-A-151	BOY'S LOCKER 151	STORAGE 150A	BCU-A-1	D5WB	24x12	2.00	575	0.020	1	1150	0.10	65.0	89.9	31.1	3.0	32.2	1
RHC-A-153	GIRL'S LOCKER 153	STORAGE 150A	BCU-A-1	D5WB	24x12	2.00	575	0.020	1	1150	0.10	65.0	89.9	31.1	3.0	32.2	1
RHC-A-3	WRESTLING GYM 150	MEZZANINE ABOVE 150	RTU-A-3	D5WB	36x36	9.00	633	0.020	1	5700	0.12	53.6	85.0	215.4	3.0	223.4	1
RHC-A-2	MAIN GYM 150	MEZZANINE ABOVE 150	RTU-A-2	D5WB	48x48	16.00	609	0.020	1	9750	0.17	44.2	85.0	431.4	3.0	446.9	1
RHC-A-160	CAFETERIA 160	CORRIDOR 109	RTU-A-1	D5WB	48x18	6.00	600	0.020	1	3600	0.11	57.5	85.0	107.4	3.0	111.3	1
RHC-A-161	CAFETERIA 160, 161	CAFETERIA 160	RTU-A-1	D5WB	48x18	6.00	667	0.020	1	4000	0.15	57.5	85.0	119.3	3.0	123.6	1
RHC-A-4	MAIN GYM 150	MEZZANINE ABOVE 150	RTU-A-4	D5WB	48x48	16.00	609	0.020	1	9750	0.17	44.2	85.0	431.4	3.0	446.9	1

NOTES:
1. COILS SHALL HAVE SAME SIDE CONNECTIONS.

FAN COIL UNIT (FCU) SCHEDULE

DWG LABEL	UNIT LOCATION	DESIGN BASIS: TRANE MODEL	SUPPLY FAN					ELECTRICAL DATA			WEIGHT (LBS)	HEATING DATA			COIL DATA			NOTES
			SA (CFM)	RPM	ESP	BHP	HP	V/PH	MCA	MOP		EAT (F)	LAT (F)	MBH	LB/HR	STEAM PRESSURE (PSIG)		
FCU-A-1	LOCKER RM 151	FFEB030	300	1057	N/A	0.03	1/8	120 V/1	2.75	15	78	65	91.6	8.6	9	3		1,2,3
FCU-A-2	LOCKER RM 153	FFEB030	300	1057	N/A	0.03	1/8	120 V/1	2.75	15	78	65	91.6	8.6	9	3		1,2,3
FCU-A-3	TEAM RM B41	FFCB030	300	1420	0.25	0.07	1/8	120 V/1	2.75	15	81	65	91.6	8.6	9	3		1,2,3

NOTES:
1. DESIGN BASIS: TRANE
2. PROVIDE 2" MERV8 FILTER
3. PROVIDE EC MOTOR WITH DISCONNECT SWITCH.

HIGH SCHOOL 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)
PRE-A-1	B40	OFFICE	OFFICE SPACE	115	5	1	5	5	0.06	7	12	0.8	15
	B40A	TOILET	TOILET/SHOWER	50	1	1	50	50	0	0	50	1	50
	B41	TEAM ROOM	LOCKER	1581	0	0	0	0	0.5	791	791	1	790
	B41A	TOILET	TOILET/SHOWER	199	3	3	50	150	0	0	150	1	150
	B41B	STORAGE	Occupiable storage rooms for liquids or gels	123	2	1	5	5	0.12	15	20	1	20
	151	BOYS LOCKER	LOCKER	1422	0	0	0	0	0.5	711	711	1	710
	151A	STORAGE	Occupiable storage rooms for liquids or gels	177	2	1	5	5	0.12	21	26	1	25
	151B	BOY'S PE OFFICE	OFFICE SPACE	154	5	1	5	5	0.06	9	14	0.8	20
	151B	TOILET	TOILET/SHOWER	50	1	1	50	50	0	0	50	1	50
	151C	TOILET	TOILET/SHOWER	251	3	3	50	150	0	0	150	1	150
	151E	JAN	JANITOR'S CLOSET	30	1	1	50	50	0	0	50	1	50
	151G	STORAGE	Occupiable storage rooms for liquids or gels	236	2	1	5	5	0.12	28	33	1	35
	153E	JAN	JANITOR'S CLOSET	30	1	1	50	50	0	0	50	1	50
	153	GIRLS LOCKER	LOCKER	1466	0	0	0	0	0.5	733	733	1	735
	153A	TOILET	TOILET/SHOWER	251	3	3	50	150	0	0	150	1	150
	153D	STORAGE	Occupiable storage rooms for liquids or gels	50	2	1	5	5	0.12	6	11	1	10
	155	GIRL'S PE OFFICE	OFFICE SPACE	215	5	2	5	10	0.06	13	23	0.8	30
	155A	TOILET	TOILET/SHOWER	34	1	1	50	50	0	0	50	1	50
PRE-A-2	120	GIRLS TOILET	TOILET/SHOWER	121	3	3	50	150	0	0	150	1	150
	120A	JAN	JANITOR'S CLOSET	45	1	1	50	50	0	0	50	1	50
	121	BOYS TOILET	TOILET/SHOWER	121	3	3	50	150	0	0	150	1	150
	175	TOILET	TOILET/SHOWER	30	1	1	50	50	0	0	50	1	50
	190A	BOYS TOILET	TOILET/SHOWER	28	1	1	50	50	0	0	50	1	50

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

HIGH SCHOOL BUILDING/EQUIPMENT VENTILATION CALCULATIONS

EQUIPMENT NUMBER	ZONE ID				MINIMUM VENTILATION RATES									DESIGN	
	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)	Vpz (CFM)	Zp
RTU-A-1	160	CAFETERIA	Cafeteria/fast-food dining	3637	100	364	8	2730	0.18	655	3385	0.8	4240	6700	0.63
	161	FACULTY DINING	Cafeteria/fast-food dining	544	100	55	8	413	0.18	98	510	0.8	640	900	0.71
RTU-A-5	138	PSYCOLOGIST	Office space	162	5	1	5	5	0.06	10	15	0.8	20	180	0.11
	139	SOCIAL WORKER	Office space	185	5	1	5	5	0.06	11	16	0.8	30	200	0.15
	133	TV PRODUCTION	Office space	226	5	2	5	10	0.06	14	24	0.8	30	500	0.06
	185	CONFERENCE	Conference/meeting	163	50	9	5	45	0.06	10	55	0.8	70	230	0.30
	186	OFFICE	Office space	73	5	1	5	5	0.06	4	9	0.8	20	100	0.20
	184	GUIDANCE OFFICE	Office space	386	5	2	5	10	0.06	23	33	0.8	50	330	0.15
	187	COUNSELOR	Office space	158	5	1	5	5	0.06	9	14	0.8	20	250	0.08
	188	COUNSELOR	Office space	158	5	1	5	5	0.06	9	14	0.8	20	250	0.08
	189	COUNSELOR	Office space	158	5	1	5	5	0.06	9	14	0.8	20	260	0.08

NOTES:
Rp = PEOPLE OUTDOOR AIR RATE, Ra = AREA OUTDOOR AIR RATE, Vbz = BREATHING ZONE OUTDOOR AIRFLOW , Ez = AIR DISTRIBUTION CONFIGURATION, Voz = ZONE OUTDOOR AIRFLOW
Vpz = ZONE PRIMARY AIRFLOW, Zpz = PRIMARY OUTDOOR AIR FRACTION, Vps = SYSTEM PRIMARY AIRFLOW, Vot = OUTDOOR AIR INTAKE FLOW,
Vou = UNCORRECTED OUTDOOR AIR INTAKE, D = OCCUPANT DIVERSITY, Ev = SYSTEM VENTILATION EFFICIENCY

SYSTEM VALUES RTU-A-1			
Vps	7600	(UNCORRECTED OA) Vou	3895
(CORRECTED OA) Vot	4860	D	1.00
OA%	64	Ev	0.80
ADDITIONAL OA%	25		

SYSTEM VALUES RTU-A-5			
Vps	2300	(UNCORRECTED OA) Vou	195
(CORRECTED OA) Vot	250	D	1.00
OA%	11	Ev	0.78
ADDITIONAL OA%	28		

S.E.D. Control No. 62-18-01-06-0-007-019

Rev. No.:	Date:	Description:

WALLKILL CENTRAL SCHOOL DISTRICT

complex world | CLEAR SOLUTIONS

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

BID SET

TETRA TECH ARCHITECTS & ENGINEERS

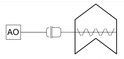
Wallkill Central School District
Wallkill, New York

Reconstruction to:
Wallkill Senior High School

Schedules

Drawn By:	Date:	Drawing Number:
JPF1/pgm	06/30/2023	AM600

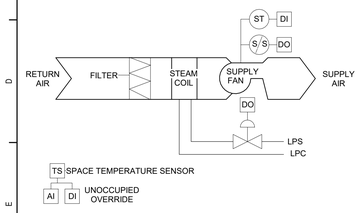
Project No.: 17597-22002



ROOF TOP HOOD - RELIEF - SEQUENCE OF OPERATIONS:

1. INTERLOCK THE OPERATION OF THE ROOFTOP HOODS WITH THEIR ASSOCIATED HEATING AND/OR COOLING EQUIPMENT.
2. OCCUPIED MODE:
   a. WHERE SPACE HAS AN EXHAUST FAN, AUTOMATIC AIR DAMPER SHALL REMAIN CLOSED UNITL THE OUTSIDE AIR DAMPER ON ASSOCAITED HEATING AND/OR COOLING EQUIPMENT OPENS PAST ITS MINIMUM POSITION. ONCE OPEN, INTERLOCK THE DAMPER WITH THE OUTSIDE AIR DAMPER.
   b. WHERE THERE IS NO EXHAUST FAN, MODULATE THE AUTOMATIC AIR DAMPER OPEN AS THE ASSOCIATED HEATING AND/OR COOLING EQUIPMENT OUTSIDE AIR DAMPER MODULATES OPEN.
3. UNOCCUPIED MODE:
   a. AUTOMATIC AIR DAMPER SHALL BE CLOSED.
4. WARM-UP MODE:
   a. AUTOMATIC AIR DAMPER SHALL BE CLOSED.

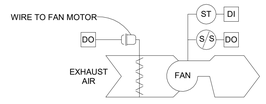
6 Roof Top Hood - Relief
NTS



CABINET UNIT HEATER - STEAM - VALVE CONTROL - SEQUENCE OF OPERATIONS:

1. OCCUPIED MODE:
   a. WHEN THE SPACE TEMPERATURE IS AT OR BELOW THE HEATING SETPOINT, CYCLE THE SUPPLY FAN ON AND THE CONTROL VALVE FULL OPEN TO MAINTAIN SPACE SETPOINT.
2. UNOCCUPIED MODE:
   a. ON DROP IN SPACE TEMPERATURE BELOW THE UNOCCUPIED SETPOINT, CYCLE THE SUPPLY FAN ON AND THE CONTROL VALVE FULL OPEN TO MAINTAIN SPACE UNOCCUPIED SETPOINT.
3. WARM-UP MODE:
   a. THE UNIT SHALL START PER AN OPTIMAL START PROGRAM.
4. SAFETIES:
   a. UPON FAILURE OF THE FAN, AS SENSED BY A CURRENT SENSING STATUS SWITCH, GENERATE AN ALARM AT THE OWS.

7 CUH - Steam - Valve Control
NTS

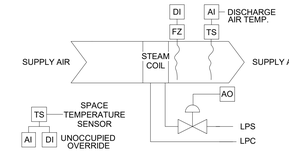


EXHAUST FAN - CONSTANT SPEED - SEQUENCE OF OPERATIONS:

INTERLOCK THE OPERATION OF THE EXHAUST FANS AND AUTOMATIC DAMPERS WITH THEIR RESPECTIVE HEATING AND COOLING EQUIPMENT.

1. OCCUPIED MODE:
   a. OPEN THE AUTOMATIC AIR DAMPER AND RUN THE EXHAUST FAN.
2. UNOCCUPIED MODE:
   a. TURN OFF THE EXHAUST FAN AND CLOSE THE AUTOMATIC AIR DAMPER.
3. WARM-UP MODE:
   a. TURN OFF THE EXHAUST FAN AND CLOSE THE AUTOMATIC AIR DAMPER.
4. SAFETIES:
   a. UPON A FAILURE OF THE FAN, AS SENSED BY A CURRENT SENSING STATUS SWITCH, ACTIVATE AN ALARM.

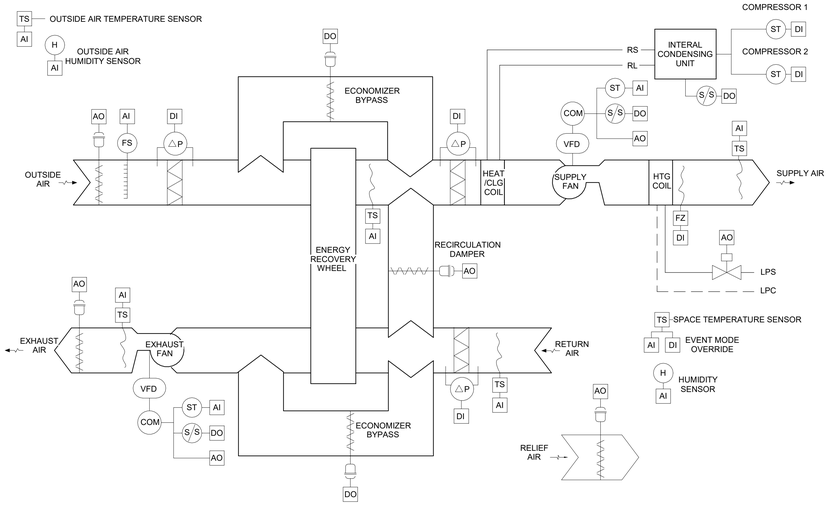
8 Exhaust Fan - Constant Speed
NTS



DUCT MOUNTED HEATING COIL - STEAM - SEQUENCE OF OPERATIONS:

1. HEATING MODE:
   a. WHEN THE SPACE TEMPERATURE IS AT OR BELOW THE HEATING SETPOINT AND THE RELATED FAN SYSTEM HAS BEEN ENABLED, 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).
2. SAFETIES:
   a. A SEPARATE LOW LIMIT FREEZE STAT WITH AUTOMATIC RESET SHALL BE INSTALLED WITH THE 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 THE CONTROL VALVE SHALL OPEN 100%. AN ALARM SHALL BE ACTIVATED.

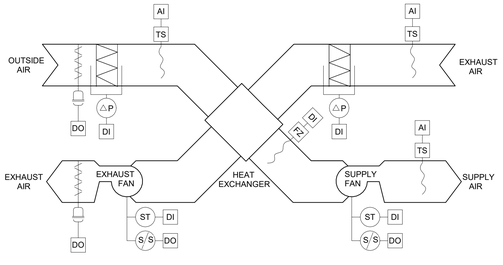
9 Duct Mounted Heating Coil - Steam - Valve Control
NTS



ROOFTOP UNIT - STEAM REHEAT(2-WAY VALVE CONTROL) AND DX COOLING W/ENERGY RECOVERY - SEQUENCE OF OPERATIONS:

1. OCCUPIED MODE:
   a. SUPPLY FAN AND EXHAUST FAN SHALL RUN CONTINUOUSLY. MODULATE THE FAN VARIABLE FREQUENCY DRIVE AS REQUIRED TO MAINTAIN REQUIRED MINIMUM VENTILATION, HEATING SETPOINT OF 70°F (ADJ.), AND COOLING SETPOINT OF 75°F (ADJ.). MODULATE THE SPEED OF THE SUPPLY FAN VARIABLE FREQUENCY DRIVE AS A FUNCTION OF THE DEVIATION FROM THE SETPOINTS AS REQUIRED, PROPORTIONAL TO THE LARGEST PERCENTAGE OPEN POSITION OF THE HEATING COIL VALVE OR OUTSIDE AIR DAMPER. MODULATE THE SPEED OF THE EXHAUST FAN VARIABLE FREQUENCY DRIVE PROPORTIONALLY WITH THE OUTSIDE AIR REQUIREMENT. ALL TEMPERATURE SETPOINTS ARE TO BE ADJUSTABLE AT THE OWS. RUN SUPPLY FAN AT THE (FULL AIRFLOW) FREQUENCY DETERMINED BY THE BALANCING CONTRACTOR FOR MECHANICAL COOLING.
   b. OPERATE THE ENERGY RECOVERY WHEEL. WHEEL ENERGY ECONOMIZER BYPASS DAMPERS SHALL BE CLOSED.
   c. DETERMINE THE FLOW RATE OF OUTSIDE AIR BY DIRECT MEASUREMENT OF AIRFLOW RATE VIA AIR FLOW MEASURING DEVICES LOCATED AT THE INTAKE TO THE RTU. REFER TO SECTION 23 09 00 FOR DETAILS OF DESIGN MAKE FLOW SENSORS. CALIBRATE THESE SENSORS WITH THE BALANCING CONTRACTOR AND MANUFACTURER AS PART OF SYSTEM COMMISSIONING WORK.
   d. PROVIDE TWO DISTINCT OCCUPANCY MODES: CLASS AND EVENT MODES. MODULATE THE RETURN AND OUTSIDE AIR DAMPERS TO THE POSITION REQUIRED TO MAINTAIN THE MINIMUM OUTSIDE AIR QUANTITY AS SCHEDULED FOR EACH MODE. NEVER POSITION DAMPERS BELOW THESE MINIMUM FLOWRATES DURING OCCUPANCY EXCEPT IN CASE OF ALARM. PROVIDE FOR EVENT MODE / CLASS MODE SCHEDULING AND TOGGLING AT THE OWS. PROVIDE PUSH BUTTON IN SPACE TO OVERRIDE (ANY) MODE TO EVENT MODE FOR A PERIOD OF ONE HOUR. NEVER POSITION THE OUTSIDE AIR DAMPER BELOW THIS MINIMUM POSITION DURING THE OCCUPANCY CYCLE EXCEPT IN CASE OF ALARM.
   e. WHEN THE SPACE TEMPERATURE IS AT OR BELOW THE HEATING SETPOINT AND THE OUTDOOR AIR TEMPERATURE IS 40°F (ADJ.) OR ABOVE, OPERATE HEAT PUMP HEATING SYSTEM AT LOWEST CAPACITY REQUIRED TO MEET THE HEATING TEMPERATURE SETPOINT.
   f. WHEN THE SPACE TEMPERATURE RISES 3 DEG. F (ADJUSTABLE) ABOVE THE SPACE HEATING SETPOINT, AND THE OUTSIDE AIR ENTHALPY IS LOWER THAN THE SPACE ENTHALPY, THE OUTSIDE AIR DAMPER SHALL MODULATE OPEN AND THE ASSOCIATED RELIEF DAMPER SHALL OPEN TO MAINTAIN THE OCCUPIED SETPOINT. THIS SHALL BE DONE SUBJECT TO LOW LIMIT OF 55 DEG. F (ADJUSTABLE), AND WITH THE HEATING VALVE FULLY CLOSED.
   g. 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.
   h. OPERATE MECHANICAL COOLING SYSTEM AT LOWEST CAPACITY REQUIRED TO MEET THE COOLING TEMPERATURE SETPOINT.
2. UNOCCUPIED MODE:
   a. THE ENERGY RECOVERY WHEEL AND EXHAUST FAN SHALL BE OFF. OUTSIDE AIR, EXHAUST AIR AND ENERGY WHEEL ECONOMIZER BYPASS DAMPERS SHALL BE CLOSED. RECIRCULATION DAMPER SHALL BE OPEN.
   b. IN HEATING MODE, MODULATE THE SUPPLY FAN SPEED AND HOT WATER COIL VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT 65°F (ADJ.).
   c. IN COOLING MODE, DISALLOW THE MECHANICAL COOLING SYSTEM BUT PROVIDE ECONOMIZER COOLING. ON CALL FOR COOLING, OPEN THE OUTSIDE AIR, EXHAUST AIR, ENERGY WHEEL ECONOMIZER BYPASS AND (RTH) RELIEF AIR DAMPERS, CLOSE THE RECIRCULATION DAMPER AND ENABLE THE SUPPLY AND EXHAUST FANS. RUN FANS AT THE SPEED REQUIRED TO MAINTAIN THE COOLING TEMPERATURE SETPOINT. WHEN UNOCCUPIED COOLING SETPOINT IS REACHED, DISABLE THE FANS AND CLOSE THE DAMPERS.
   d. WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 34 DEG. F (ADJ.), POSITION THE HEATING THREE-WAY CONTROL VALVE 100% (ADJ.) OPEN TO COIL.
3. WARM-UP MODE:
   a. THE UNIT SHALL START PER AN OPTIMUM START PROGRAM.
   b. RUN THE SUPPLY FAN CONTINUOUSLY AT FULL SPEED (60 HZ.), AND MODULATE THE HEATING VALVE, ECONOMIZER COOLING OR MECHANICAL COOLING AS REQUIRED TO MAINTAIN TEMPERATURE SETPOINTS AT THE OCCUPIED LEVEL. MAINTAIN THE OUTSIDE AIR, (RTH) RELIEF AIR, SUPPLY AIR, ENERGY WHEEL ECONOMIZER BYPASS AND RECIRCULATION AIR DAMPERS IN THE UNOCCUPIED POSITION AND EXHAUST FAN AND ENERGY WHEEL OFF UNTIL MORNING WARM-UP (COOL DOWN) HAS BEEN ACCOMPLISHED. WHEN MORNING WARM-UP HAS BEEN ACCOMPLISHED, SLOWLY MODULATE DAMPERS TO THEIR PROPER OCCUPIED MODE POSITION. AVOID SUDDEN TEMPERATURE SWINGS AND ACTIVATION OF THE LOW TEMPERATURE LIMIT. TIMING OF WARMUP MODE SHALL INSURE AT LEAST ONE FULL AIR CHANGE "PURGE" BEFORE THE BEGINNING OF THE OCCUPIED PERIOD SCHEDULED.
4. SAFETIES:
   a. PROVIDE FILTER DIFFERENTIAL PRESSURE SWITCHES ACROSS EACH FILTER BANK; ALARM THE OWS WHEN THE FILTERS (AND WHICH FILTER BANK) EXCEED THEIR DIFFERENTIAL PRESSURE LIMIT.
   b. SENSE THE STATUS OF THE FAN VIA FEEDBACK FROM VSD. WHEN THE SPEED COMMAND AND FEEDBACK STATUS DO NOT AGREE, GENERATE AN ALARM AT THE OWS.
   c. SENSE THE STATUS OF THE RCU VIA STATUS SENSORS ACROSS COMPRESSORS. WHEN THE RCU COMMAND AND COMPRESSOR STATUS DO NOT AGREE, GENERATE AN ALARM AT THE OWS.
   d. PROVIDE COIL FREEZE PROTECTION VIA ANALOG TEMPERATURE SENSOR AT EXPECTED FREEZE LOCATION, AND "LOWEST FOOT" STYLE MANUAL RESET FREEZESTAT. WHENEVER FREEZE-UP CONDITIONS ARISE (36 DEG. F ADJUSTABLE) STOP THE SUPPLY AND EXHAUST FANS, FULLY CLOSE THE OUTSIDE AIR AND EXHAUST AIR DAMPERS, FULLY OPEN THE RECIRCULATION DAMPER, POSITION THE HEATING THREE-WAY CONTROL VALVE FULLY OPEN TO COIL AND ACTIVATE ALARM.
   e. FIRE ALARM SHUTDOWN.

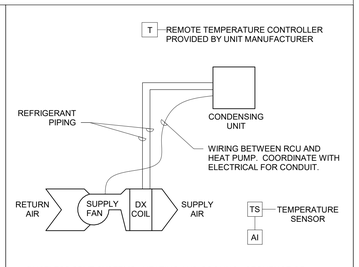
4 Rooftop Unit - Heat Pump/Steam Reheat - 2-Way Valve Control W/ERW - RTU-A-1
NTS



ENERGY RECOVERY UNIT - FIXED CORE PLATE HEAT EXCHANGER - SEQUENCE OF OPERATIONS:

1. OCCUPIED MODE:
   a. RUN THE SUPPLY AND EXHAUST FANS CONTINUOUSLY.
   b. FULLY OPEN THE OUTSIDE AIR AND EXHAUST AIR DAMPERS.
2. UNOCCUPIED MODE:
   a. THE SUPPLY AND EXHAUST FANS SHALL BE OFF.
   b. THE OUTSIDE AIR DAMPER AND EXHAUST AIR DAMPER SHALL BE FULLY CLOSED.
3. SAFETIES / OTHER CONTROL FUNCTIONS:
   a. PROVIDE AN ALARM IN CASE OF DISCHARGE AIR TEMPERATURE LOW/HIGH LIMITS.
   b. PROVIDE AN ALARM IN CASE OF SUPPLY OR EXHAUST FAN FAILURE.
   c. AN AUTOMATIC RESET LOW LIMIT SHALL BE INSTALLED WITH SENSING ELEMENT SERPENTINED ACROSS THE ERV CORE SUPPLY OUTLET. WHENEVER FREEZE-UP CONDITIONS ARISE (36 DEG. F ADJUSTABLE), STOP THE SUPPLY FAN, FULLY CLOSE THE OUTSIDE AIR DAMPER, RUN THE EXHAUST FAN AND FULLY OPEN THE EXHAUST AIR DAMPER. GENERATE AN ALARM AT THE OWS.
   d. A DIFFERENTIAL PRESSURE SWITCH SHALL BE PROVIDED FOR EACH FILTER, AND AN ALARM SHALL BE GENERATED WHEN THE PRESSURE DROP ACROSS THE FILTER EXCEEDS THE PREDETERMINED SET POINT.

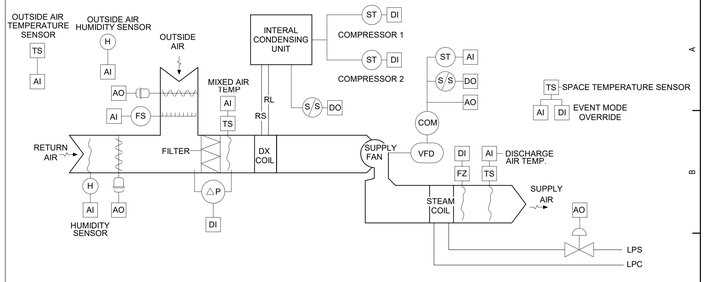
5 Energy Recovery Unit - Cube
NTS



DUCTLESS SPLIT SYSTEMS - HEATING AND COOLING - SEQUENCE OF OPERATIONS:

1. UNITS SHALL BE CONTROLLED WITH THE UNIT PROVIDED CONTROL AND THERMOSTAT.
2. MONITOR ROOM TEMPERATURE BY A SPACE TEMPERATURE SENSOR.
3. GENERATE AN ALARM WHEN THE TEMPERATURE GOES ABOVE OR BELOW ROOM TEMPERATURE RANGE (ADJUSTABLE).

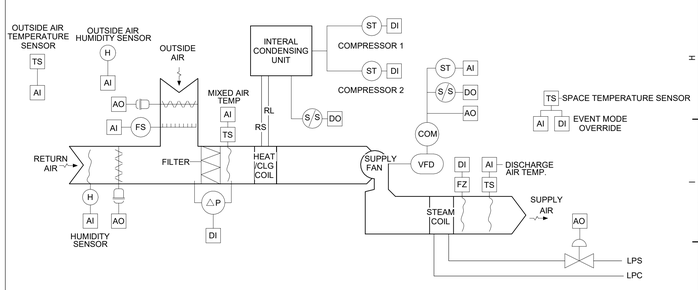
3 Ductless Split System - Heating and Cooling HP
NTS



AIR HANDLING UNIT - STEAM REHEAT (VALVE CONTROL) AND DX COOLING - SEQUENCE OF OPERATIONS:

1. OCCUPIED MODE:
   a. SUPPLY FAN AND ASSOCIATED EXHAUST FANS SHALL RUN CONTINUOUSLY. THE SUPPLY FAN SHALL RUN AT THE FREQUENCY DETERMINED BY THE BALANCING CONTRACTOR.
   b. DETERMINE THE FLOW RATE OF OUTSIDE AIR BY DIRECT MEASUREMENT OF AIRFLOW RATE VIA AIR FLOW MEASURING DEVICES LOCATED AT THE INTAKE TO THE RTU. REFER TO SECTION 23 09 00 FOR DETAILS OF DESIGN MAKE FLOW SENSORS. CALIBRATE THESE SENSORS WITH THE BALANCING CONTRACTOR AND MANUFACTURER AS PART OF SYSTEM COMMISSIONING WORK.
   c. PROVIDE TWO DISTINCT OCCUPANCY MODES: CLASS AND EVENT MODES. MODULATE THE RETURN AND OUTSIDE AIR DAMPERS TO THE POSITION REQUIRED TO MAINTAIN THE MINIMUM OUTSIDE AIR QUANTITY AS SCHEDULED FOR EACH MODE. NEVER POSITION DAMPERS BELOW THESE MINIMUM FLOWRATES DURING OCCUPANCY EXCEPT IN CASE OF ALARM. PROVIDE FOR EVENT MODE / CLASS MODE SCHEDULING AND TOGGLING AT THE OWS. PROVIDE PUSH BUTTON IN SPACE TO OVERRIDE (ANY) MODE TO EVENT MODE FOR A PERIOD OF ONE HOUR. NEVER POSITION THE OUTSIDE AIR DAMPER BELOW THIS MINIMUM POSITION DURING THE OCCUPANCY CYCLE EXCEPT IN CASE OF ALARM.
   d. WHEN THE SPACE TEMPERATURE IS AT OR BELOW THE HEATING SETPOINT AND THE OUTDOOR AIR TEMPERATURE IS 40°F (ADJ.) OR ABOVE, OPERATE HEAT PUMP HEATING SYSTEM AT LOWEST CAPACITY REQUIRED TO MEET THE HEATING TEMPERATURE SETPOINT.
   e. WHEN THE SPACE TEMPERATURE IS AT OR BELOW THE HEATING SETPOINT AND THE OUTDOOR AIR TEMPERATURE IS BELOW 40°F (ADJ.), MODULATE THE STEAM CONTROL VALVE AT REHEAT COIL AS REQUIRED TO MEET THE HEATING TEMPERATURE SETPOINT.
   f. WHEN THE SPACE TEMPERATURE RISES 3 DEG. F (ADJUSTABLE) ABOVE THE SPACE HEATING SETPOINT, AND THE OUTSIDE AIR ENTHALPY IS LOWER THAN THE SPACE ENTHALPY, THE OUTSIDE AIR DAMPER SHALL MODULATE OPEN AND THE ASSOCIATED RELIEF DAMPER SHALL OPEN TO MAINTAIN THE OCCUPIED SETPOINT. THIS SHALL BE DONE SUBJECT TO LOW LIMIT OF 55 DEG. F (ADJUSTABLE), AND WITH THE HEATING VALVE FULLY CLOSED.
   g. 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. THE SUPPLY AND ASSOCIATED EXHAUST FAN SHALL BE OFF.
   b. THE OUTSIDE AIR DAMPER AND THE ASSOCIATED RELIEF 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 HEATING SETPOINT, CYCLE THE FAN ON AND COIL CONTROL VALVE FULL OPEN AS REQUIRED TO MAINTAIN REDUCED SPACE TEMPERATURE. USE 5 DEG. F (ADJUSTABLE) DEADBAND TO MINIMIZE SHORT CYCLING.
   e. WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED ECONOMIZER COOLING SETPOINT, ALLOW ECONOMIZER COOLING WITH THE HEATING VALVE FULLY CLOSED AND THE MECHANICAL COOLING DISABLED.
   f. 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 DAMPER SHALL BE FULLY CLOSED, THE RETURN AIR DAMPER SHALL BE FULLY OPEN, AND THE ASSOCIATED EXHAUST FAN SHALL BE OFF.
   c. THE SUPPLY FAN SHALL RUN AND THE HEATING CONTROL VALVE SHALL MODULATE TO MAINTAIN OCCUPIED SETPOINT.
4. SAFETIES:
   a. DIFFERENTIAL PRESSURE ACROSS THE AIR FILTERS SHALL GENERATE AN ALARM WHENEVER THE DIFFERENTIAL PRESSURE EXCEEDS IT'S ADJUSTABLE SETPOINT.
   b. A SEPARATE LOW LIMIT FREEZE STAT WITH AUTOMATIC RESET SHALL BE INSTALLED WITH SENSING ELEMENT SERPENTINED ACROSS THE FACE OF THE COIL; WHENEVER FREEZE-UP CONDITIONS ARISE (36 DEG. F ADJUSTABLE) THE SUPPLY FAN SHALL STOP, THE OUTSIDE AIR DAMPER SHALL CLOSE 100%, THE HEATING CONTROL VALVE SHALL OPEN 100% AND AN ALARM SHALL BE ACTIVATED.

1 RTU - Steam - Valve Control and DX Cooling - RTU-A-2, A-4
NTS



AIR HANDLING UNIT - STEAM REHEAT (VALVE CONTROL) AND DX COOLING - SEQUENCE OF OPERATIONS:

1. OCCUPIED MODE:
   a. SUPPLY FAN AND ASSOCIATED EXHAUST FANS SHALL RUN CONTINUOUSLY. THE SUPPLY FAN SHALL RUN AT THE FREQUENCY DETERMINED BY THE BALANCING CONTRACTOR.
   b. DETERMINE THE FLOW RATE OF OUTSIDE AIR BY DIRECT MEASUREMENT OF AIRFLOW RATE VIA AIR FLOW MEASURING DEVICES LOCATED AT THE INTAKE TO THE RTU. REFER TO SECTION 23 09 00 FOR DETAILS OF DESIGN MAKE FLOW SENSORS. CALIBRATE THESE SENSORS WITH THE BALANCING CONTRACTOR AND MANUFACTURER AS PART OF SYSTEM COMMISSIONING WORK.
   c. PROVIDE TWO DISTINCT OCCUPANCY MODES: CLASS AND EVENT MODES. MODULATE THE RETURN AND OUTSIDE AIR DAMPERS TO THE POSITION REQUIRED TO MAINTAIN THE MINIMUM OUTSIDE AIR QUANTITY AS SCHEDULED FOR EACH MODE. NEVER POSITION DAMPERS BELOW THESE MINIMUM FLOWRATES DURING OCCUPANCY EXCEPT IN CASE OF ALARM. PROVIDE FOR EVENT MODE / CLASS MODE SCHEDULING AND TOGGLING AT THE OWS. PROVIDE PUSH BUTTON IN SPACE TO OVERRIDE (ANY) MODE TO EVENT MODE FOR A PERIOD OF ONE HOUR. NEVER POSITION THE OUTSIDE AIR DAMPER BELOW THIS MINIMUM POSITION DURING THE OCCUPANCY CYCLE EXCEPT IN CASE OF ALARM.
   d. WHEN THE SPACE TEMPERATURE IS AT OR BELOW THE HEATING SETPOINT AND THE OUTDOOR AIR TEMPERATURE IS 40°F (ADJ.) OR ABOVE, OPERATE HEAT PUMP HEATING SYSTEM AT LOWEST CAPACITY REQUIRED TO MEET THE HEATING TEMPERATURE SETPOINT.
   e. WHEN THE SPACE TEMPERATURE IS AT OR BELOW THE HEATING SETPOINT AND THE OUTDOOR AIR TEMPERATURE IS BELOW 40°F (ADJ.), MODULATE THE STEAM CONTROL VALVE AT REHEAT COIL AS REQUIRED TO MEET THE HEATING TEMPERATURE SETPOINT.
   f. WHEN THE SPACE TEMPERATURE RISES 3 DEG. F (ADJUSTABLE) ABOVE THE SPACE HEATING SETPOINT, AND THE OUTSIDE AIR ENTHALPY IS LOWER THAN THE SPACE ENTHALPY, THE OUTSIDE AIR DAMPER SHALL MODULATE OPEN AND THE ASSOCIATED RELIEF DAMPER SHALL OPEN TO MAINTAIN THE OCCUPIED SETPOINT. THIS SHALL BE DONE SUBJECT TO LOW LIMIT OF 55 DEG. F (ADJUSTABLE), AND WITH THE HEATING VALVE FULLY CLOSED.
   g. 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. THE SUPPLY AND ASSOCIATED EXHAUST FAN SHALL BE OFF.
   b. THE OUTSIDE AIR DAMPER AND THE ASSOCIATED RELIEF 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 HEATING SETPOINT, CYCLE THE FAN ON AND COIL CONTROL VALVE FULL OPEN AS REQUIRED TO MAINTAIN REDUCED SPACE TEMPERATURE. USE 5 DEG. F (ADJUSTABLE) DEADBAND TO MINIMIZE SHORT CYCLING.
   e. WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED ECONOMIZER COOLING SETPOINT, ALLOW ECONOMIZER COOLING WITH THE HEATING VALVE FULLY CLOSED AND THE MECHANICAL COOLING DISABLED.
   f. 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 DAMPER SHALL BE FULLY CLOSED, THE RETURN AIR DAMPER SHALL BE FULLY OPEN, AND THE ASSOCIATED EXHAUST FAN SHALL BE OFF.
   c. THE SUPPLY FAN SHALL RUN AND THE HEATING CONTROL VALVE SHALL MODULATE TO MAINTAIN OCCUPIED SETPOINT.
4. SAFETIES:
   a. DIFFERENTIAL PRESSURE ACROSS THE AIR FILTERS SHALL GENERATE AN ALARM WHENEVER THE DIFFERENTIAL PRESSURE EXCEEDS IT'S ADJUSTABLE SETPOINT.
   b. A SEPARATE LOW LIMIT FREEZE STAT WITH AUTOMATIC RESET SHALL BE INSTALLED WITH SENSING ELEMENT SERPENTINED ACROSS THE FACE OF THE COIL; WHENEVER FREEZE-UP CONDITIONS ARISE (36 DEG. F ADJUSTABLE) THE SUPPLY FAN SHALL STOP, THE OUTSIDE AIR DAMPER SHALL CLOSE 100%, THE HEATING CONTROL VALVE SHALL OPEN 100% AND AN ALARM SHALL BE ACTIVATED.

2 RTU - Heat Pump/Steam Reheat - 2-Way Valve Control - RTU-A-3
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. 62-18-01-06-0-007-019

Rev. No.:	Date:	Description:

WALLKILL CENTRAL SCHOOL DISTRICT

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

BID SET

TETRA TECH ARCHITECTS & ENGINEERS

Wallkill Central School District
Wallkill, New York

Reconstruction to:
Wallkill Senior High School

Controls

Drawn By:	Date:	Drawing Number:
JPF1/pgm	06/30/2023	AM700

Project No.: 17597-22002