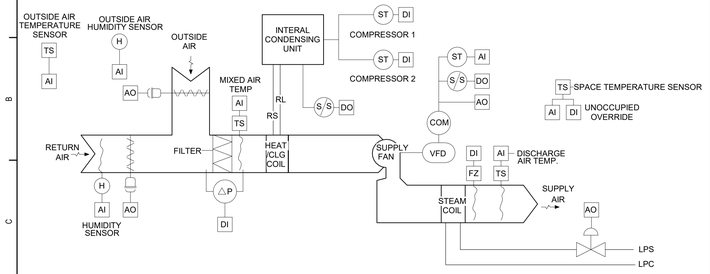
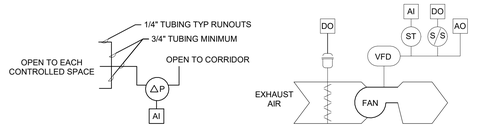


AIR HANDLING UNIT - STEAM REHEAT (VALVE CONTROL) AND DX COOLING - SEQUENCE OF OPERATIONS:

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.

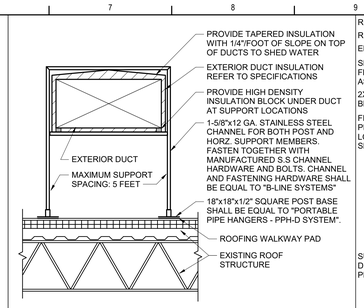
19 RTU - Heat Pump/Steam Reheat - 2-Way Valve Control - RTU-A-5
NTS



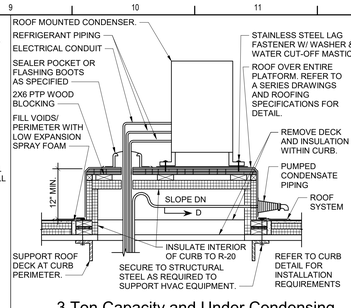
EXHAUST/RELIEF FAN - VARIABLE SPEED - SEQUENCE OF OPERATIONS:

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.

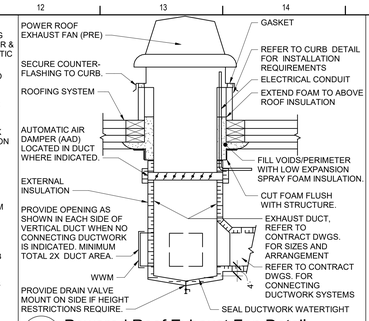
20 Variable Speed Exhaust/Relief Fan
NTS



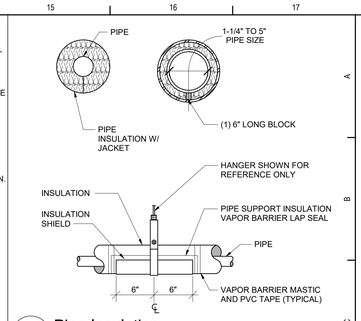
15 Roof Monted Duct Support Detail
NTS



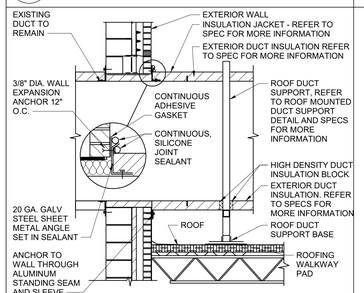
11 3 Ton Capacity and Under Condensing Unit Mounting Detail
NTS



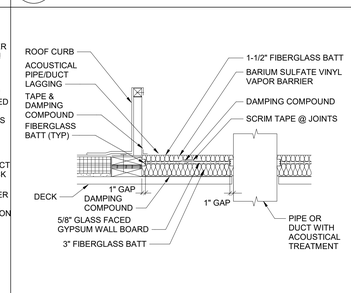
6 Powered Roof Exhaust Fan Detail
NTS



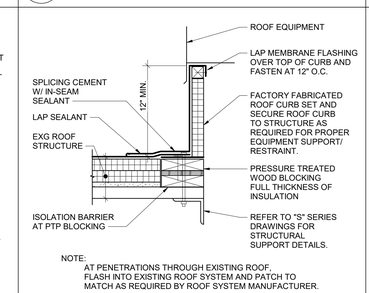
1 Pipe Insulation
NTS



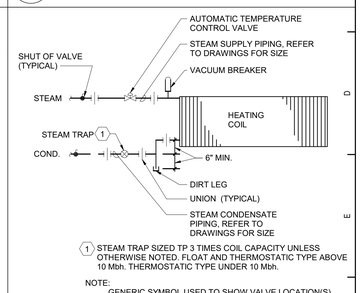
16 Exterior Wall Duct Penetration Detail
NTS



12 Acoustically Lined Roof Curb Detail
NTS



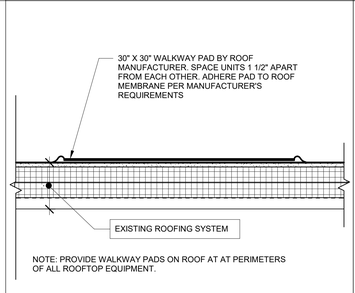
7 Equipment Curb
NTS



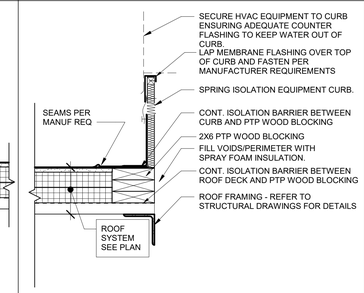
1 STEAM TRAP SIZED TP 3 TIMES COIL CAPACITY UNLESS OTHERWISE NOTED. FLOAT AND THERMOSTATIC TYPE ABOVE 10 Mbh. THERMOSTATIC TYPE UNDER 10 Mbh.

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

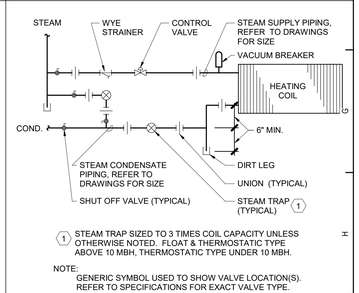
2 Cabinet Heater Steam Piping Detail
NTS



13 Walkway Pad Detail
NTS



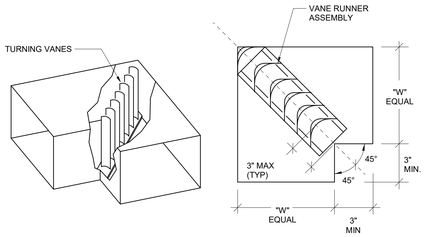
8 Equipment Curb - Spring
NTS



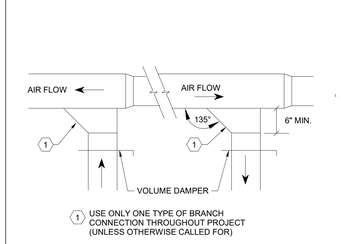
1 STEAM TRAP SIZED TO 3 TIMES COIL CAPACITY UNLESS OTHERWISE NOTED. FLOAT & THERMOSTATIC TYPE ABOVE 10 MBH, THERMOSTATIC TYPE UNDER 10 MBH.

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

3 Steam Coil Piping Schematic
NTS

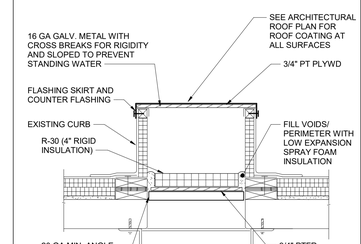


17 Duct Turning Vanes
12" = 1'-0"

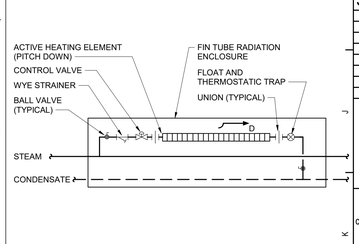


1 USE ONLY ONE TYPE OF BRANCH CONNECTION THROUGHOUT PROJECT (UNLESS OTHERWISE CALLED FOR)

14 Duct Detail
NTS



9 Roof Curb Cap Detail
NTS

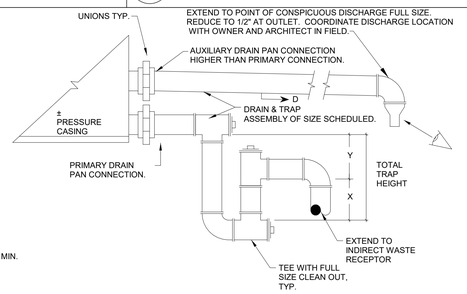


4 Steam Fin Tube Radiation Piping Schematic (Valve Control)
NTS

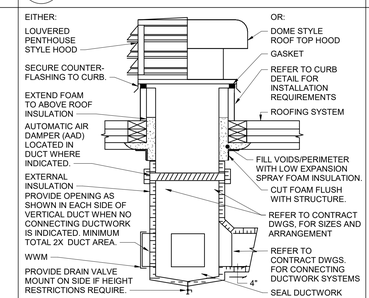
COIL CAPACITY	TRAP SIZE NPS
0-3 TON	3/4"
3-10 TON	1"
10-100 TON	1 1/4"
OVER 100	1 1/2"

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"

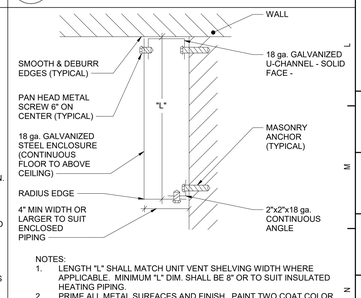
EXAMPLE: CASING At (-1") Wg.
X = 1-1/2" + (-1) = 1/2"; USE 2" MIN.
Y = 1-1/2" - (-1) = 2-1/2""



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

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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

Details and Controls

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

Project No.: 17597-22002