SHEETMETAL LEGEND

- SUPPLY DUCT (UP & DN)
- RETURN DUCT (UP & DN)
- EXHAUST DUCT (UP & DN)
- 12"x10" — RECTANGULAR DUCTWORK (WIDTH X DEPTH)
- 12"/10" — FLAT OVAL DUCTWORK (WIDTH X DEPTH)
- 10"ø — ROUND DUCTWORK (SIZE, DIAMETER)
- VANED ELBOW (PROVIDE ALL SQUARE OR RECTANGULAR ELBOWS WITH VANES)
- RADIUS ELBOW (I.D. RADIUS IS DUCT WIDTH)
- VOLUME DAMPER (SINGLE OR OPPOSED BLADE) AS SPECIFIED
- AD — ACCESS DOOR (BOTTOM SHOWN)
- ACCESS DOOR (SIDE SHOWN)
- ACOUSTIC LINED DUCTWORK (SIZE INDICATES INSIDE DUCT DIMENSIONS)
- AUTOMATIC TEMPERATURE CONTROL DAMPER (OPPOSED BLADE TYPE)
- FLEXIBLE DUCTWORK (MAXIMUM LENGTH NOT TO EXCEED 36 INCHES)
- TRANSITION WITH FLAT SIDE
- TRANSITION ON CENTER
- RECTANGULAR TO ROUND TRANSITION
- BRANCH TAKE-OFF WITH VOLUME DAMPER
- ROUND TAP TO RECTANGULAR DUCT (BELL MOUTH) & VOLUME DAMPER
- RECTANGULAR TO ROUND TAP (HETO) & VOLUME DAMPER
- SMOKE DAMPER, FIRE DAMPER, OR COMBINATION FIRE/SMOKE DAMPER WITH ACCESS DOOR

PIPING LEGEND

HWS	HOT WATER SUPPLY (BELOW 250° F)
HWR	HOT WATER RETURN (BELOW 250° F)
CWS	CHILLED WATER SUPPLY
CWR	CHILLED WATER RETURN
HPWS	HEAT PUMP WATER SUPPLY
HPWR	HEAT PUMP WATER RETURN
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
RHG	REFRIGERANT HOT GAS
DTWS	DUAL TEMP WATER SUPPLY
DTWR	DUAL TEMP WATER RETURN
GS	GLYCOL SUPPLY
GR	GLYCOL RETURN
MUW	MAKE UP WATER
CD	CONDENSATE DRAIN
CS	CONDENSER WATER SUPPLY TO TOWER
CR	CONDENSER WATER RETURN FROM TOWER

VALVE LEGEND

- BALL VALVE
- DRAIN VALVE WITH CAP
- BUTTERFLY VALVE
- CHECK VALVE
- TRIPLE DUTY VALVE
- PRESSURE REDUCING VALVE
- CALIBRATED BALANCING VALVE

SPECIALTY LEGEND

- Y-LINE STRAINER
- THERMOMETER
- PRESSURE GAUGE W/ NEEDLE VALVE
- T — THERMOSTAT (48" AFF)
- C — CARBON DIOXIDE SENSOR (48" AFF)
- S — DUCT MOUNTED SMOKE DETECTOR
- POINT OF DISCONNECTION
- CONNNECT TO EXISTING

DRAWING NUMBER WHERE DETAIL IS DRAWN — A1 / H501 — DETAIL NUMBER

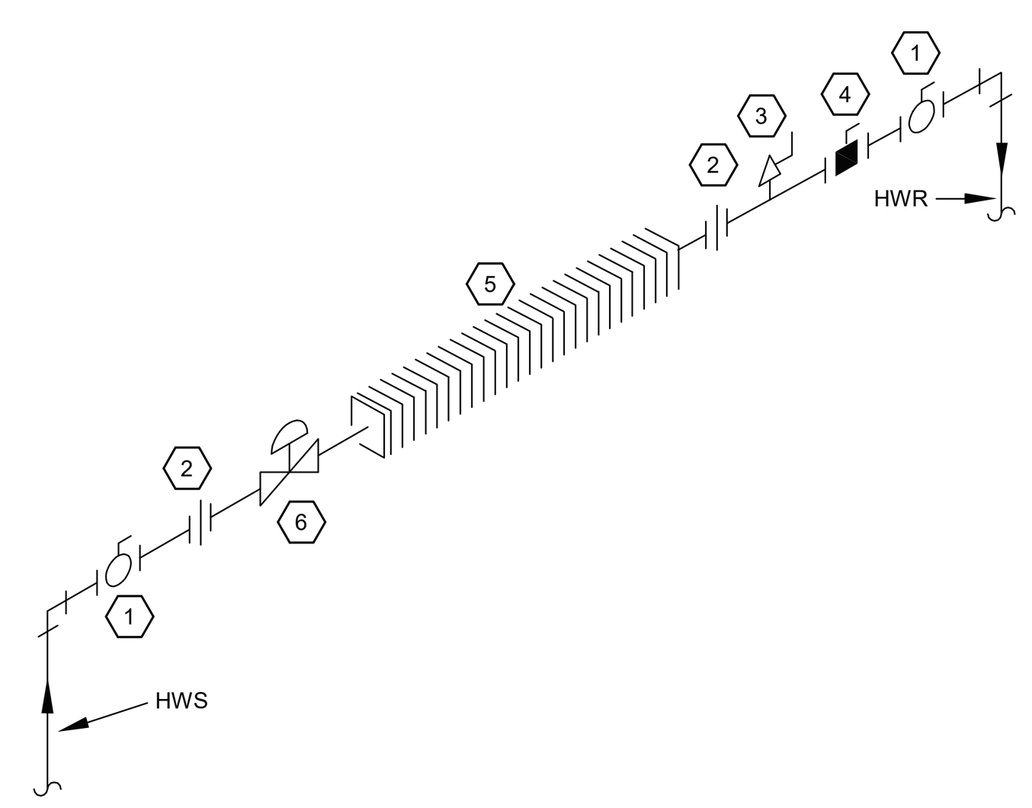
DETAIL INDICATION

DRAWING NUMBER WHERE SECTION IS DRAWN — A / H001 — SECTION NUMBER — DIRECTION OF VIEW

SECTION INDICATION

ABBREVIATION LEGEND

ABBREVIATION	DESCRIPTION
A	
ACC	AIR-COOLED CONDENSER
ACCU	AIR-COOLED CONDENSING UNT
AD	ACCESS DOOR
AF	AIR FILTER
AFF	ABOVE FINISHED FLOOR
AFM	AIR FLOW MEASURING DEVICE
AHU	AIR HANDLING UNIT
APD	AIR PRESSURE DROP
AV	AUTOMATIC AIR VENT
B	
BTUH	BRITISH THERMAL UNITS PER HOUR
C	
CC	COOLING COIL
CCCT	CLOSED CIRCUIT COOLER
CD	CEILING DIFFUSER
CEF	CEILING EXHAUST FAN
CFM	CUBIC FEET PER MINUTE
CO	CLEAN OUT
CONT	CONTINUED
CR	CEILING RETURN
CT	COOLING TOWER
CUH	CABINET UNIT HEATER
D	
DB	DECIBELS
DBT	DRY BULB TEMPERATURE
DIA	DIAMETER
DPT	DEW POINT TEMPERATURE
DX	DIRECT EXPANSION
E	
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EFT	ENTERING FLUID TEMPERATURE
EG	EXHAUST GRILLE
EHC	ELECTRIC HEATING COIL
ER	EXHAUST REGISTER
ERC	ENERGY RECOVERY COIL
ERP	ELECTRIC RADIANT PANEL
ET	EXPANSION TANK
EWT	ENTERING WATER TEMPERATURE
EX	EXISTING
F	
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FD/SD	COMBINATION FIRE/SMOKE DAMPER
FF	FINAL FILTER
FL	FLOOR
FPM	FEET PER MINUTE
FT	FEET
G	
GAL	GALLONS
GPM	GALLONS PER MINUTE
GR	GLYCOL SUPPLY
GRV	GRAVITY ROOF VENTILATION
GS	GLYCOL SUPPLY
H	
H	HUMIDIFIER
HC	HEATING COIL
HGT	HEIGHT
HP	HORSEPOWER OR HEAT PUMP
HRU	HEAT RECOVERY UNIT
HX	HEAT EXCHANGER
IN	INCH
KW	KILOWATT
L	
LAT	LEAVING AIR TEMPERATURE
LBS/HR	POUNDS PER HOUR
LD	LINEAR DIFFUSER
LFT	LEAVING FLUID TEMPERATURE
LPC	LOW PRESSURE CONDENSATE RETURN
LPS	LOW PRESSURE STEAM (15 PSIG AND BELOW)
LSD	LINEAR SLOT DIFFUSER
LWT	LEAVING WATER TEMPERATURE
M	
MAX	MAXIMUM
MBH	ONT THOUSAND BRITISH THERMAL UNITS PER HOUR
MC	MECHANICAL CONTRACTOR
MD	MOTORIZED DAMPER
MIN	MINIMUM
MPC	MEDIUM PRESSURE CONDENSATE RETURN
MPS	MEDIUM PRESSURE STEAM (16-59 PSIG)
N	
NIC	NOT IN CONTRACT
NOM	NOMINAL
O	
OA	OUTSIDE AIR
P	
P	PUMP
PC	PUMPED CONDENSATE
PD	PRESSURE DROP
PRV	PRESSURE REDUCING VALVE OR POWER ROOF VENTILATOR
PSIG	POUND PER SQUARE INCH - GAUGE
R	
RA	RETURN AIR
RF	RETURN FAN
RG	RETURN GRILLE
RH	REHEAT COIL
RM	ROOM
ROTV	ROTARY VENTILATOR
RPM	REVOLUTIONS PER MINUTE
RR	RETURN REGISTER
RTU	ROOF-TOP UNIT
S	
SA	SUPPLY AIR
SD	SMOKE DAMPER
SF	SUPPLY FAN
SP	STATIC PRESSURE
SR	SUPPLY REGISTER
T	
TO	TRANSFER OPENING
U	
UNO	UNLESS NOTED OTHERWISE
UV	UNIT VENTILATOR
V	
VA	VENTILATION AIR
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
VP	VACUUM PUMP
VR	VACUUM STEAM CONDENSATE RETURN
W	
WBT	WET BULB TEMPERATURE
WG	WATER GAUGE
WMS	WIRE MESH SCREEN
WPD	WATER PRESSURE DROP



1. BALL VALVE
2. UNION
3. MANUAL AIR VENT
4. CALIBRATED BALANCING VALVE
5. FINNED ELEMENT
6. TWO-WAY CONTROL VALVE (ELECTRIC OR PNEUMATIC AS SPECIFIED)

5 / M001 — Hot Water Fin Radiation Piping Detail — 1/8" = 1'-0"

DIFFUSER AND GRILLE SCHEDULE

TAG	TYPE	FACE SIZE	NECK SIZE	MOUNTING	MANUFACTURERS NAILOR	REMARKS
SD-1	SUPPLY DIFFUSER	24x24	SEE PLAN	LAY-IN	RNS	
RG-1	RETURN GRILLE	NECK +2"	SEE PLAN	LAY-IN	61EC	

ENERGY CONSERVATION CODE COMPLIANCE STATEMENT:

TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGMENT THE PLANS AND SPECIFICATIONS COMPLY WITH THE LATEST EDITION OF THE ENERGY CONSERVATION CODE OF NEW YORK STATE.

THE HVAC SYSTEM WAS DESIGNED IN ACCORDANCE WITH THE 2020 NEW YORK STATE ENERGY CONSERVATION CODE CHAPTER 4 (COMMERCIAL ENERGY EFFICIENCY), ACCEPTABLE PRACTICE FOR COMMERCIAL BUILDINGS METHOD. THE HEAT AND COOLING LOAD CALCULATIONS WERE PERFORMED IN ACCORDANCE WITH ASHRAE HANDBOOK OF FUNDAMENTALS CHAPTER 17 AND 18, AND APPROPRIATE EXTERIOR DESIGN ZONE CONDITIONS.

HEAT PUMP SCHEDULE

TAG	ASSOCIATED CONDENSING UNIT	UNIT STYLE	SERVICE	CFM (LOW-HIGH)	OA CFM	EXT S.P.	COOLING OAT (F)	COOLING EAT DB	COOLING EAT WB	COOLING MAXIMUM (MBH)	COOLING MINIMUM (MBH)	HEATING OAT (F)	HEATING EAT DB	HEATING MAXIMUM (MBH)	ELECTRICAL VOLTS	ELECTRICAL PH	ELECTRICAL MCA	MANUFACTURERS TRANE / MITSUBISHI	REMARKS
NRHS-HP-1	NRHS-CU-1	CEILING CASSETTE	SECURITY OFFICE	230 - 335	15	0	95	80	67	9.0	4.8	5	70	11.0	208	1	0.25	NTXCKS09A112AA	1,2,3,4

REMARKS:
1. PROVIDE UNIT MOUNTED DISCONNECT, WALL MOUNTED WIRED CONTROLLER, INTEGRAL CONDENSATE LIFT PUMP AND OUTSIDE AIR KIT.
2. PROVIDE BACnet INTERFACE FOR CONNECTION TO BMS.
3. PROVIDE INDOOR UNIT WITH AUXILIARY HEAT RELAY KIT TO ENABLE ZONE FINNED RADIATION AS SECOND STAGE OF HEATING.
4. OUTDOOR UNIT SHALL SUPPLY POWER TO INDOOR UNIT.

AIR COOLED CONDENSING UNIT SCHEDULE

TAG	SERVICE	NOMINAL TONS	SUCTION TEMP (F)	COOLING OAT (F)	HEATING OAT (F)	SEER	ELECTRICAL VOLTS	ELECTRICAL PH	ELECTRICAL MCA	ELECTRICAL MOCP	MANUFACTURERS TRANE / MITSUBISHI	REMARKS
NRHS-CU-1	NRHS-HP-1	0.75	45	95	5	20.2	208	1	14	24	NTXSKH09A112AA	1,2

REMARKS:
1. PROVIDE UNIT MOUNTED DISCONNECT.
2. PROVIDE ALL ACCESSORIES FOR OPERATION DOWN TO -13F.

NON-POWERED ROOF VENTILATORS SCHEDULE

TAG	SERVICE	MAX. CFM	HOOD VELOCITY (FPM)	THROAT SIZE (")	CURB CAP SIZE (")	S.P. DROP AT MAX. CFM (")	HOOD H (")	HOOD L (")	HOOD W (")	MANUFACTURERS COOK	REMARKS
NRHS-GIV-1	INTAKE	690	500	8 DIA.	18x18	0.375	8	18 DIA.	18 DIA.	PR	1

REMARKS:
1. PROVIDE 24" TALL INSULATED ROOF CURB.

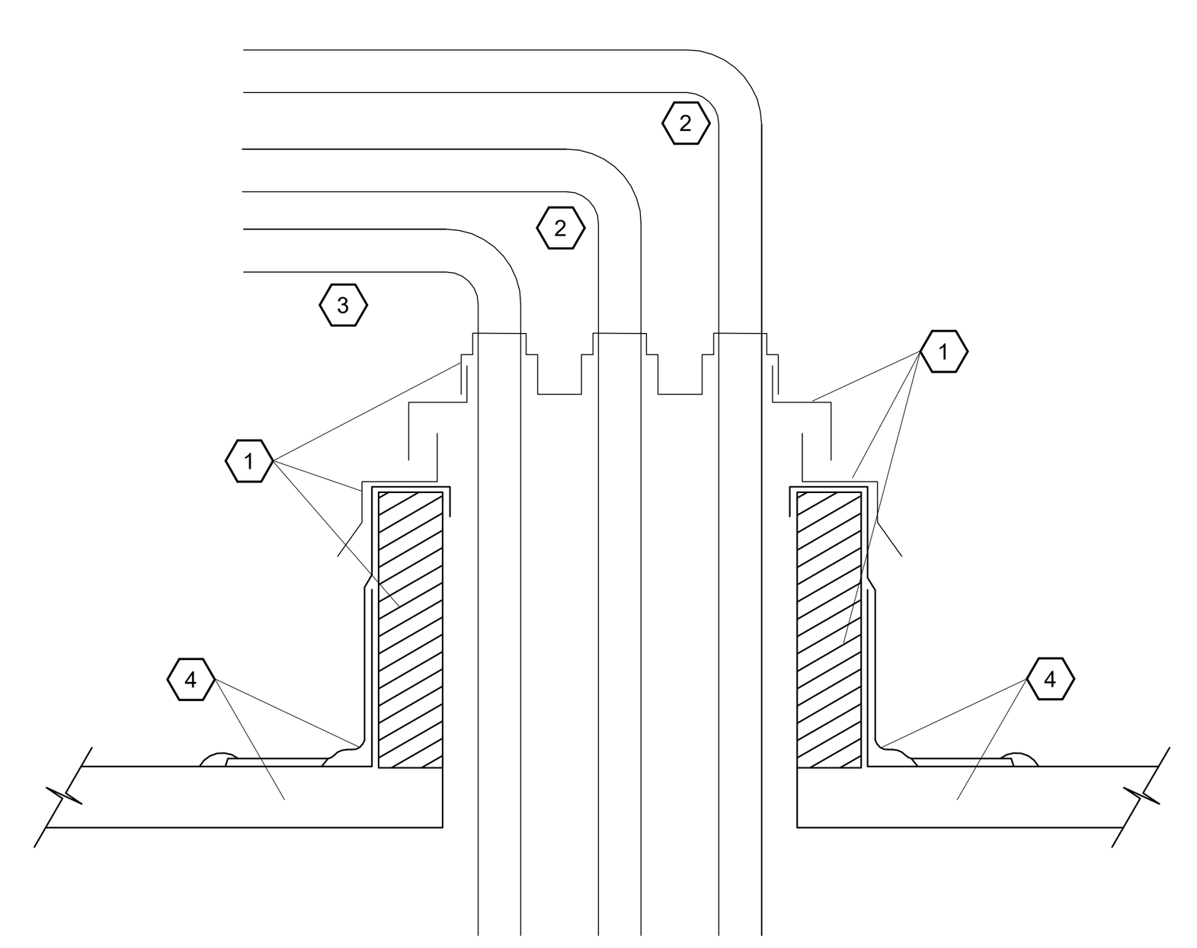
HOT WATER WALL FIN RADIATION SCHEDULE

TAG	BTU/FT	HEATING ELEMENT EWT	HEATING ELEMENT PIPE SIZE	HEATING ELEMENT FIN SIZE	HEATING ELEMENT FINS/FT	HEATING ELEMENT ROWS	ENCLOSURE DEPTH	ENCLOSURE HGT.	ENCLOSURE MTG/HT	ENCLOSURE OUTLET	ENCLOSURE CRADLES	MANUFACTURERS STERLING	REMARKS
NRHS-FT-1	1170	170	3/4"	3-5/8" X 4-1/4"	50	1	5-5/16"	24	28	SLOPE TOP	2	JVB-S24	1,2

REMARKS:
1. COPPER / ALUMINUM ELAMENT.
2. PROVIDE ALL NECESSARY MOUNTING AND TRIM ACCESSORIES.

VENTILATION SCHEDULE

ROOM	ROOM NUMBER	OCCUPANCY CATEGORY	AREA (SF)	PEOPLE OUTDOOR AIR RATE (Rp) (CFM/PERSON)	AREA OUTDOOR AIR RATE (Ra) (CFM/SF)	DEFAULT VALUES OCCUPANT DENSITY (#/1000 SF)	DEFAULT VALUES NUMBER OF OCCUPANTS	OUTSIDE AIRFLOWS (CFM) CODE MIN. PEOPLE	CODE MIN. AREA	CODE MIN. COMBINED (Vbz)	DIST. EFF. (Ez)	ZONE OA MIN. (Voz)	DESIGN
SECURITY OFFICE		OFFICE SPACE	102	5	0.06	5	1	5	6	11	0.8	14	15

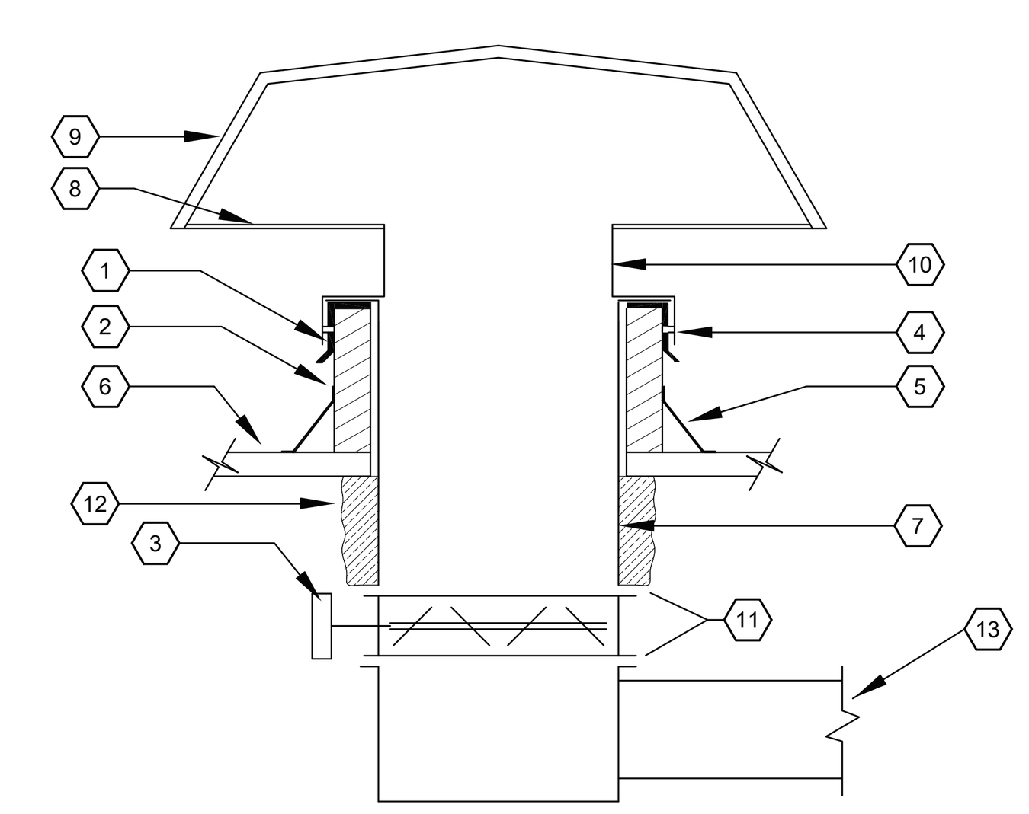


1. PROVIDE STRAIGHT SIDED INSULATED CURB (MIN. 24" HIGH), COVER, CAP AND CLAMPS AS MANUFACTURED BY PORTALS PLUS OR APPROVED EQUAL.
2. REFRIGERANT PIPE; QTY PER PLANS
3. ELECTRICAL CONDUIT; QTY PER PLANS
4. ROOF FLASHING AND ROOF DECK

NOTE:
EACH COMPLETE PIPE PORTAL SHALL INCLUDE A BASE WITH A MOLDED SEALING RING ON A COLLARED OPENING AND AN EPDM COMPRESSION MOLDED RUBBER CAP. THE CAP AND BASE SHALL BE LOCKED WITH A "WEATHER TIGHT PRESSURE SEAL". THE PORTAL SHALL INCLUDE STAINLESS STEEL CLAMP SEALING UNITS. THE PIPE PORTAL SHALL INCLUDE A PREFABRICATED ROOF CURB, A LAMINATED ACRYLIC COATED ABS COVER WITH PRE-PUNCHED MOUNTING HOLES AND A DOUBLE MOLDED SEALING RING ON THE COLLARED OPENING.

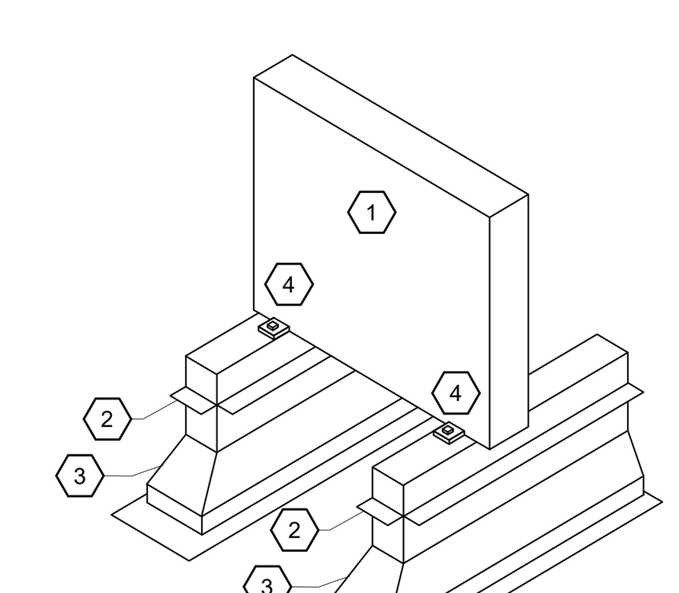
CONTRACTOR TO VERIFY CURB DIMENSIONS IN FIELD.

3 / M001 — Roof Piping Penetration At Condensing Unit Detail — N.T.S.



1. CAP FLASHING
2. ROOF CURB MIN. 24" HIGH. ROOF CURB TO BE PROVIDED FOR INSTALLATION ON SLOPED ROOF. COORDINATE WITH ARCHITECTURAL DRAWINGS.
3. INSULATED/THERMALLY BROKEN MOTORIZED DAMPER. TAMCO OR EQUAL.
4. LAG TO CURB
5. ROOF FLASHING
6. ROOF
7. DUCT TO BE FULL SIZE OF CURB OPENING
8. BIRD SCREEN
9. HOOD
10. 12" BASE ON INTAKES
11. FLANGED CONNECTION
12. DUCT INSULATION
13. SEE PLAN FOR DUCT SIZE AND CONTINUATION

2 / M001 — Fresh Air Intakes And Air Relief Vents — N.T.S.



1. AIR COOLED CONDENSING UNIT
2. COUNTER FLASHING OVER TREATED WOOD NAILER
3. WELDED GALVANIZED STEEL EQUIPMENT RAIL (MIN. 24" HIGH), MIN. 18 GAGE AS MANUFACTURED BY GREENHECK OR APPROVED EQUAL.
4. FASTEN CONDENSING UNIT TO EQUIPMENT RAIL. COORDINATE SPACING PRIOR TO INSTALLATION.

NOTE: EQUIPMENT RAIL FURNISHED BY MC AND TURNED OVER TO GC FOR INSTALLATION. COORDINATE SIZE AND LAYOUT WITH GC.

PROVIDE PROFESSIONAL ENGINEER STAMPED AND SIGNED ENGINEERING CALCULATIONS AND DETAILS OF WIND RESTRAINT SYSTEMS TO MEET TOTAL DESIGN LATERAL FORCE REQUIREMENTS FOR SUPPORT AND RESTRAINT OF MECHANICAL SYSTEMS.

WIND RESTRAINT ENGINEERING CALCULATIONS AND DETAILS SHALL PROVIDE THE QUANTITY OF ATTACHMENTS AND SIZE/TYPE OF ATTACHMENTS FOR THE MOUNTING OF SUPPORT RAIL TO THE BUILDING STRUCTURE, AND FOR ATTACHMENT OF THE EQUIPMENT TO THE SUPPORT RAIL.

SUBMIT WIND FORCE LEVEL (FP) CALCULATIONS FROM APPLICABLE BUILDING CODE. SUBMIT PRE- APPROVED RESTRAINT SELECTIONS, INSTALLATION DETAILS, PLANS INDICATING LOCATIONS OF RESTRAINTS AND MANUFACTURER'S PRODUCT DATA.

WIND RESTRAINT DESIGN CRITERIA:

ULTIMATE DESIGN WIND SPEED, V	126 MPH
EXPOSURE CATEGORY	B
RISK CATEGORY	III
HEIGHT & EXPOSURE ADJUSTMENT COEFFICIENT	N/A (1)

(1) BUILDING HEIGHT LESS THAN 60 FT.

1 / M001 — Roof Mounted Condensing Unit Support - Single Unit — N.T.S.

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Project Title

CITY SCHOOL DISTRICT OF NEW ROCHELLE
NEW ROCHELLE HIGH SCHOOL
2023 CAPITAL PROJECT - PHASE 1

STATE OF NEW YORK · CURTIS BENEDETTO · 089636 · LICENSED PROFESSIONAL ENGINEER
EXP:11/30/2025

#	DATE	DESCRIPTION
1	11/13/2024	BID ADDENDUM 1

Drawn By:	JM
Checked By:	CB
Proj. #:	66-11-00-01-0-001-030
CSArch Proj. #:	188-2301.01
Issued for Bid:	10/14/2024

Sheet Title: Mechanical Legends, Details and Schedules

Sheet No. NRHS M001

CONSTRUCTION DOCUMENTS

C:\REVIT Local Files\022_NEW ROCHELLE HS MEP Model_jmaguire@gpinet.com.rvt