MECHANICAL SYMBOLS - GENERAL

	NEW PIPING, DUCTWORK, OR EQUIPMENT
	EXISTING PIPING, DUCTWORK, OR EQUIPMENT TO REMAIN
—x—x—x—	EXISTING PIPING, DUCTWORK, OR EQUIPMENT TO BE REMOVED
☐	NEW EQUIPMENT
☐ ER	EXISTING EQUIPMENT TO BE REMOVED
☐ E	EXISTING EQUIPMENT TO REMAIN
☐ ERR	EXISTING EQUIPMENT TO BE REMOVED AND RELOCATED
☐ RE	RELOCATED POSITION OF EXISTING EQUIPMENT
	CONTINUATION FOR DUCTWORK OR PIPING
AHU 3-2	TYPE OF EQUIPMENT (AIR HANDLING UNIT) UNIT NUMBER (2ND AIR HANDLER ON THE 3RD FLOOR)
◕	POINT OF CONNECTION (OF NEW WORK TO EXISTING WORK)
◑	POINT OF DISCONNECTION (TO REMOVE AND PATCH EXISTING WORK)
#	DRAWING NOTE TAG
1	REVISION SYMBOL
A B	SECTION DESIGNATION ON DRAWING WHERE SECTION IS CUT A - SECTION DESIGNATION B - DRAWING NO.
T	THERMOSTAT OR TEMPERATURE SENSOR TO BE WALL OR DUCT MOUNTED.REFER TO PLANS FOR LOCATION.
SC	SPEED CONTROLLER
Ts	HIGH TEMPERATURE SENSOR. REFER TO PLANS FOR LOCATION.
H	HUMIDISTAT OR HUMIDITY SENSOR TO BE WALL OR DUCT MOUNTED. REFER TO PLANS FOR LOCATION.
S P	ELECTRIC ON/OFF THERMALLY PROTECTED SWITCH WITH PILOT LIGHT
SD	SMOKE DETECTOR
SD	DUCT MOUNTED SMOKE DETECTOR
BG	EMERGENCY BREAK GLASS SWITCH FOR EQUIPMENT SHUTDOWN
CO2	CARBON DIOXIDE OCCUPANCY DETECTOR
CO	CARBON MONOXIDE DETECTOR
LD	LEAK DETECTOR
TC	TIME CLOCK
	THERMOSTAT/SENSOR WIRING FROM SENSING DEVICE TO CONTROLLED DEVICE
AFMS	AIRFLOW MEASURING STATION
SP	STATIC PRESSURE SENSOR
⊠	STARTER / DISCONNECT SWITCH
⊠	STARTER
	DISCONNECT

MECHANICAL SYMBOLS - DUCTWORK

18X12	18X12	DUCT SIZE (FIRST FIGURE INDICATES HORIZONTAL SIZE)
18 ∅	18 ∅	ROUND DUCT DIAMETER
⊠	⊠	SUPPLY DUCT UP
		SUPPLY DUCT DOWN
		RETURN OR EXHAUST DUCT UP
		RETURN OR EXHAUST DUCT DOWN
		ACOUSTICAL LINING IN DUCT
		TRANSITION FROM RECTANGULAR TO ROUND OR OVAL DUCT
AD		ACCESS DOOR IN DUCT
R	R	SLOPING RISE IN DUCT IN DIRECTION OF ARROW
D	D	SLOPING DROP IN DUCT IN DIRECTION OF ARROW
		MITERED ELBOW WITH TURNING VANES
		RADIUS ELBOW (INNER RADIUS = WIDTH)
		DUCT SPLIT
		90° BRANCH TAP (USE 45° BOOT, OR CONICAL TAP FOR BRANCH SERVING A SINGLE DIFFUSER/REGISTER ONLY)
		45° BRANCH TAP
		SPLIT (SUPPLY) OR CONVERGENCE (RETURN/EXHAUST) RADIUS ELBOW TYPE
		SPLIT (SUPPLY) OR CONVERGENCE (RETURN/EXHAUST) MITERED ELBOW TYPE WITH TURNING VANES
		SPLIT (SUPPLY) OR CONVERGENCE (RETURN/EXHAUST) BULLHEAD TYPE
		OFFSET (WITH RADIUS ELBOWS)
		SUPPLY REGISTER
		RETURN OR EXHAUST REGISTER
VD	VD	VOLUME DAMPER
FD	FD	FIRE DAMPER W/DUCT ACCESS DOOR (FD/AD)
M	M	MOTORIZED DAMPER W/DUCT ACCESS DOOR
FSD	FSD	COMBINATION FIRE/SMOKE DAMPER W/DUCT ACCESS DOOR
SMD	SMD	SMOKE DAMPER W/DUCT ACCESS DOOR
FXC	FXC	FLEXIBLE CONNECTION
		FLEXIBLE DUCT
	VD VD 4'-0" MAX.	SUPPLY SIDEWALL LINEAR DIFFUSER (W/SHEET METAL PLENUM W/1" LINING & BRANCH CONN FOR EVERY 4' OF LINEAR DIFFUSER)
	VD	MODULAR LINEAR DIFFUSER WITH PLENUM

MECHANICAL SYMBOLS - DUCTWORK (CONTINUED)

⊠	VD	BRANCH TAKEOFF TO CEILING DIFFUSER/REGISTER
⊠		SUPPLY CEILING DIFFUSER (4-WAY BLOW)
		SUPPLY CEILING DIFFUSER (3-WAY BLOW)
		SUPPLY CEILING DIFFUSER (2-WAY BLOW)
		SUPPLY CEILING DIFFUSER (1-WAY BLOW)
⧄		RETURN CEILING GRILLE OR REGISTER
VAV-B(500)		TERMINAL BOX (CV, VAV, FP). DESIGNATION INDICATES TYPE, BOX SIZE,AND CFM. QUANTITY (REFER TO SCHEDULES).
VAV-B(500)		TERMINAL BOX WITH REHEAT COIL (CV, VAV, FP). DESIGNATION INDICATESTYPE, BOX SIZE AND CFM. QUANTITY
L		DOOR LOUVER
U		UNDERCUT DOOR
H C		COIL HC=HEATING COIL CC=COOLING COIL PHC=PREHEAT COIL
# SQ.FT.		TRANSFER GRILLES ON BOTH SIDES OF WALL/PARTITION AND SQ. FT. OPENING SIZE
# SQ.FT.		TRANSFER OPENING IN WALL/PARTITION AND SQ. FT. OPENING SIZE
		FAN (RISER)
		CEILING MOUNTED INLINE EXHAUST FAN (WITH FLEX CONNECTION AT INLET& OUTLET)

NEW YORK STATE CODES & STANDARDS

- 2020 BUILDING CODE OF NEW YORK STATE
- 2017 NATIONAL ELECTRICAL CODE (NFPA-70)
- 2020 PLUMBING CODE OF NEW YORK STATE
- 2020 MECHANICAL CODE OF NEW YORK STATE
- 2020 FUEL GAS CODE OF NEW YORK STATE
- 2020 FIRE CODE OF NEW YORK STATE
- LOCAL FIRE DEPARTMENT/FIRE MARSHAL
- ALL OTHER LOCAL AUTHORITIES HAVING JURISDICTION

NEW YORK STATE ENERGY CODES

- 2020 ENERGY CONSERVATION CODE OF NEW YORK STATE AMENDED BY NYSTRETCH ENERGY CODE 2020, VERSION 1.0, DATED JULY 2019

REFERENCE STANDARDS

APPLICABLE REFERENCE STANDARDS SHALL BE AS REFERENCED BY ALL STATE AND LOCAL CODES. THE LIST BELOW IS FOR QUICK REFERENCE AND DOES NOT INCLUDE ALL APPLICABLE REFERENCE STANDARDS.

- 2017 NFPA 70 - NATIONAL ELECTRICAL CODE
- 2016 NFPA 72 - NATIONAL FIRE ALARM AND SIGNALING CODE
- 2015 NFPA 720- STANDARD FOR THE INSTALLATION OF CARBON MONOXIDE (CO) DETECTION AND WARNING EQUIPMENT

MECHANICAL DRAWINGS LIST

Sheet Number	Sheet Name
M-001	MECHANICAL COVER SHEET
M-002	MECHANICAL GENERAL NOTES
M-101	MECHANICAL FIRST FLOOR PLAN
M-102	MECHANICAL SECOND FLOOR PLAN
M-103	MECHANICAL ROOF PLAN
M-201	MECHANICAL DETAILS
M-202	MECHANICAL DETAILS 2
M-301	MECHANICAL SCHEDULES
M-401	MECHANICAL SPECIFICATIONS

MECHANICAL ABBREVIATIONS

ACU	AIR CONDITIONING UNIT
AD	ACCESS DOOR
AHU	AIR HANDLING UNIT
ATC	AUTOMATIC TEMPERATURE CONTROL
B(500)	DIFFUSER TYPE - REFER TO SCHEDULE
BMS	BUILDING MANAGEMENT SYSTEM
BTU	BRITISH THERMAL UNIT
CC	COOLING COIL
CFM	CUBIC FEET PER MINUTE
CG	CEILING GRILLE
CHWP	CHILLED WATER PUMP
CP	CONDENSATE PUMP
CR	CEILING REGISTER
CUH	CABINET UNIT HEATER
CV	CONSTANT VOLUME
CWP	CONDENSER WATER PUMP
DC	DRY COOLER
DX	DIRECT EXPANSION
E	EXISTING
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
EG	EXHAUST GRILLE
ER	EXISTING EQUIPMENT TO REMOVED
ERR	EXISTING EQUIPMENT TO REMOVED AND RELOCATED
EWT	ENTER WATER TEMPERATURE
FXC	FLEXIBLE CONNECTION
FC	FAN COIL
FD	FIRE DAMPER WITH ACCESS DOOR
FLA	FULL LOAD AMPS
FPI	FIN PER INCH
FTR	FIN TUBE RADIATION
GPM	GALLONS PER MINUTE
GX	GENERAL EXHAUST
HWP	HOT WATER PUMP
HX	HEAT EXCHANGER
HZ	HERTZ
IU	INDUCTION UNIT
KW	KILOWATT
KX	KITCHEN EXHAUST
LAT	LEAVING AIR TEMPERATURE
MBH	THOUSAND BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MD	MOTORIZED DAMPER
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NK	NECK SIZE
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OAI	OUTSIDE AIR INTAKE
OED	OPEN END DUCT
PPH	POUNDS PER HOUR
PH	PHASE
PSI	POUND PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
RE	RELOCATED POSITION OF EXISTING EQUIPMENT
RF	RETURN FAN
SD	SMOKE DETECTOR
TD	TRANSFER DUCT
TAO	TRANSFER AIR OPENING
TR	TOP REGISTER
TX	TOILET EXHAUST
TYP	TYPICAL
VN	VENT
V	VOLTS
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
WMS	WIRE MESH SCREEN

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THIS DRAWING IS THE PROPERTY OF THE ENGINEER. IT HAS BEEN SPECIFICALLY PREPARED FOR THE OWNER FOR THIS PROJECT AT THIS SITE AND IS NOT TO BE USED FOR ANY OTHER PURPOSE, LOCATION OR OWNER WITHOUT WRITTEN CONSENT OF THE ENGINEER.

#	Description	Date

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Issued for:

FOR PERMIT

Job Number:	24-6337M
Date:	9/26/24
Drawn By:	PA

Sheet Title:
MECHANICAL COVER SHEET

Sheet Number:
M-001

MECHANICAL GENERAL NOTES

1. THESE DRAWINGS ARE GENERALLY DIAGRAMMATIC AND ARE INTENDED TO CONVEY THE SCOPE OF WORK AS WELL AS INDICATE GENERAL ARRANGEMENT OF EQUIPMENT, DUCTWORK AND PIPING. THE CONTRACTOR SHALL ADHERE TO THESE DRAWINGS AS CLOSELY AS POSSIBLE. HOWEVER, THE RIGHT IS RESERVED TO VARY THE RUNS OF DUCTWORK AND PIPING AND TO MAKE OFFSETS, WHERE NECESSARY, TO ACCOMMODATE CONDITIONS ARISING AT THE JOB SITE. THE CONTRACTOR SHALL PREPARE SHOP DRAWINGS TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL. NO WORK SHALL BE PERFORMED PRIOR TO RECEIPT OF EQUIPMENT, DUCTWORK, AND PIPING FABRICATION SHOP DRAWING APPROVAL.

2. THE DRAWINGS AND SPECIFICATIONS SHALL BE INTERPRETED SO AS TO REQUIRE THE MOST SUBSTANTIAL AND COMPREHENSIVE PERFORMANCE OF THE WORK, CONSISTENT WITH THE INTENT AND REQUIREMENTS OF THE CONTRACT DOCUMENTS, AND SUCH WORK SHALL BE PERFORMED BY THE CONTRACTOR WITHOUT EXTRA COST TO THE OWNER. IN THE CASE OF A DISCREPANCY WITHIN THE CONTRACT DOCUMENTS, THE WORST CASE OR HIGHEST COST SHALL APPLY FOR BIDDING PURPOSES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCY VIA RFI PRIOR TO PERFORMING THE ASSOCIATED WORK.

3. ANY MATERIAL, WORK, OR INCIDENTAL ACCESSORIES OR MINOR DETAILS NOT SHOWN BUT NECESSARY TO MAKE THE WORK COMPLETE IN ALL RESPECTS AND READY FOR OPERATION, EVEN IF NOT PARTICULARLY SHOWN ON THE DRAWINGS, SHALL BE PROVIDED BY THE CONTRACTOR WITHOUT ADDITIONAL EXPENSE TO THE OWNER.

4. DUCT SIZES SHOWN ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS. WHERE ACOUSTICALLY LINED DUCT IS SPECIFIED, OUTER DUCT DIMENSIONS SHALL BE INCREASED TO ACCOMMODATE LINING.

5. WHERE WORK IS INDICATED TO BE BY OTHER CONTRACTORS, FOR EXAMPLE: "BY GENERAL CONSTRUCTION CONTRACTOR", THIS WORK IS NOT IN THE HVAC/MECHANICAL CONTRACT. EACH CONTRACTOR WILL BE RESPONSIBLE FOR CLOSE COORDINATION WITH OTHER CONTRACTORS' WORK.

6. REFER TO APPROPRIATE SPECIFICATION SECTION FOR EQUIPMENT SELECTION PARAMETERS WHERE DRAWINGS DO NOT CONTAIN EQUIPMENT SCHEDULES.

7. FOR AIR SYSTEMS, THE MECHANICAL CONTRACTOR SHALL INCLUDE IN BID PRICING SUPPLYING AND INSTALLING BRANCH VOLUME DAMPERS FOR ALL SUPPLY, RETURN, AND EXHAUST BRANCH DUCTWORK, REGARDLESS IF VOLUME DAMPERS ARE NOT SHOWN IN CONTRACT DOCUMENTS. ALL VOLUME DAMPERS SHALL BE ADJUSTABLE HANDLE TYPE FOR LAY-IN ACCESSIBLE CEILING OR CABLE OPERATED FOR CONCEALED TYPE OF CEILING. ALL BRANCH DUCT VOLUME DAMPERS SERVING DIFFUSERS IN GYPSUM BOARD CEILINGS (OR OTHERWISE INACCESSIBLE) SHALL BE REMOTELY (CORD OR CABLE) OPERABLE THROUGH THE FACE OF THE DIFFUSER.

8. INSTALL THERMOSTATS, FAN SPEED CONTROLLERS, AND OTHER ROOM OCCUPANT ADJUSTABLE CONTROL DEVICES 4'-0" ABOVE FINISHED FLOOR OR AS DIRECTED OTHERWISE BY ARCHITECT. COORDINATE EXACT LOCATIONS WITH THE ARCHITECTURAL PLANS. DEVICE COLORS TO BE SELECTED BY THE ARCHITECT. MANUFACTURER'S LOGO SHALL NOT BE EXPOSED.

9. AC UNITS SHOWN ON DRAWINGS ARE SCHEMATIC. SEE AC UNIT DETAIL ON DETAIL SHEET FOR ACTUAL TYPICAL ARRANGEMENT REQUIRED.

10. WHERE PIPING CONNECTIONS FOR EQUIPMENT SUCH AS PUMPS, AC UNITS, COILS, ETC. DIFFER FROM THE LINE SIZE PIPING, IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO FURNISH AND INSTALL THE NECESSARY REDUCER/EXPANDER FITTINGS TO ENABLE CONNECTION BETWEEN THE PIPING SYSTEM AND THE EQUIPMENT.

11. PROVIDE UL LISTED AND LABELED FIRE DAMPERS AT ALL DUCT PENETRATIONS THROUGH FIRE RATED WALLS AND FLOORS, REGARDLESS IF FIRE DAMPERS ARE NOT SHOWN IN CONTRACT DOCUMENTS. PROVIDE 1-1/2 HOUR RATED FIRE DAMPERS AT WALLS/FLOORS WITH 2 HOUR OR LESS RATING. PROVIDE 3 HOUR RATED FIRE DAMPERS AT WALLS/FLOORS WITH 3 HOUR OR MORE RATING. ALL FIRE DAMPERS SHALL BE TYPE "B" WITH SHUTTER OUT OF AIRSTREAM, AND SHALL BE RATED FOR DYNAMIC AIRFLOW CONDITIONS 2,000 FT/MIN AND 4.0 IN-WC. PROVIDE ACCESS DOORS IN DUCTWORK, 18"x18" UNLESS OTHERWISE NOTED. COORDINATE WITH GENERAL CONTRACTOR FOR LOCATIONS AND SIZES OF ACCESS DOORS IN GENERAL CONSTRUCTION.

12. PROVIDE FIRESTOPPING FOR ALL DUCT AND PIPE PENETRATIONS THROUGH FIRE RATED PARTITIONS.

13. THE MECHANICAL CONTRACTOR SHALL INCLUDE IN BID PRICING SUPPLYING AND INSTALLING THERMOSTATS FOR ANY EQUIPMENT THAT REQUIRES CONTROL, SUCH AS VAV BOXES, FCU, FANS, HEATERS, FINNED TUBE RADIATION, RTU'S, ETC., REGARDLESS IF THERMOSTATS ARE NOT SHOWN IN CONTRACT DOCUMENTS. ALL THERMOSTATS SHALL BE DIRECT DIGITAL PROGRAMMABLE TYPE, UNLESS OTHERWISE NOTED. PROVIDE ONE THERMOSTAT FOR EACH FAN COIL UNIT, FAN UNIT, VAV, FPB, ENTRANCE HEATER, BASEBOARD RADIATION, ETC. THERMOSTAT LOCATIONS SHALL BE AS SHOWN ON PLANS AND/OR WHERE DIRECTED AND APPROVED BY THE ARCHITECT AND ENGINEER.

14. BORDER TYPES AND METHOD OF ATTACHMENT FOR ALL DIFFUSERS, GRILLES, AND REGISTERS SHALL BE COORDINATED WITH THE ARCHITECTURAL CEILING DETAILS AND SPECIFICATIONS.

15. REFER TO SPECIFICATIONS FOR ACOUSTIC LINING REQUIREMENTS NOT SHOWN ON THE DRAWINGS.

16. THE MECHANICAL CONTRACTOR SHALL INCLUDE IN BID PRICING SUPPLYING AND INSTALLING CONDENSATE PIPING FOR ALL COOLING TYPE EQUIPMENT REGARDLESS IF CONDENSATE PIPING IS NOT SHOWN IN CONTRACT DOCUMENTS. ALL CONDENSATE PIPING SHALL BE INSULATED AND ROUTED TO NEAREST DRAIN OR JANITORS CLOSET. IF NO CONDENSATE PIPING IS SHOWN, CONTRACTOR MUST REQUEST CONDENSATE PIPING ROUTING THRU RFI PROCESS DURING BIDDING.

17. GENERAL NOTES, SYMBOLS, ABBREVIATIONS, AND DETAILS ARE APPLICABLE TO ALL HVAC/MECHANICAL DRAWINGS.

MECHANICAL GENERAL NOTES

18. RELOCATE EXISTING WORK THAT INTERFERES WITH WORK OF THIS CONTRACT.

19. COORDINATE THIS WORK WITH THAT OF OTHER TRADES.

20. DIMENSIONS SHOWN ON PLAN ARE HORIZONTAL. DIMENSIONS SHOWN IN ELEVATION ARE VERTICAL, EXCEPT IN WAY OF STRUCTURAL STEEL, DIMENSIONS ARE MEASURED PERPENDICULAR TO FLANGE.

21. PRODUCT INSTALLATION SHALL ADHERE TO MANUFACTURERS' RECOMMENDATIONS.

22. PROVIDE ACCESS PANELS IN DUCTWORK IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS FOR ALL CONCEALED EQUIPMENT THAT REQUIRES PERIODIC SERVICE, INCLUDING AIR CONDITIONING UNITS, FANS, CONDENSATE PUMPS, FIRE DAMPERS, COMBINATION FIRE/SMOKE DAMPERS, AND DUCT MOUNTED SMOKE DETECTORS. COORDINATE WITH GENERAL CONTRACTOR FOR LOCATIONS AND SIZES OF ACCESS DOORS IN GENERAL CONSTRUCTION.

23. PROVIDE HANGERS, INSERTS, ANCHORS, SUPPLEMENTAL STEEL & SUPPORTS AS REQUIRED TO SUPPORT DUCTWORK, PIPING AND EQUIPMENT FROM STRUCTURE.

24. SCHEDULE WORK OF THIS SECTION TO AVOID INTERFERING WITH EXISTING OPERATIONS IN THE FACILITY.

25. COORDINATE ALL ROOF PENETRATIONS WITH THE WORK OF OTHER SECTIONS AND WITH FLASHING REQUIREMENTS. COORDINATE ALL ROOF PENETRATION LOCATIONS WITH THE OWNER/LANDLORD. NOTIFY THE OWNER/LANDLORD PRIOR TO STARTING WORK AND VERIFY COMPLIANCE WITH BOND AND WARRANTY OF THE ROOF.

26. RUN DUCTS AND PIPING CONCEALED, UNLESS OTHERWISE SPECIFIED, AND CLEAR OF CEILING INSERTS.

27. PROVIDE CLEARANCE IN FRONT OF ALL ELECTRIC CONTROL PANELS PER N.E.C. AND EQUIPMENT MANUFACTURERS' REQUIREMENTS.

28. ALL MOTOR STARTERS FOR HVAC EQUIPMENT SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED/WIRED BY THE ELECTRICAL CONTRACTOR, UNLESS OTHERWISE NOTED.

29. ALL DISCONNECT SWITCHES FOR HVAC EQUIPMENT SHALL BE FURNISHED, INSTALLED, AND WIRED BY THE ELECTRICAL CONTRACTOR, UNLESS INTEGRAL TO HVAC EQUIPMENT OR OTHERWISE NOTED.

30. USE FLAT TRANSVERSE SEAM FOR DUCTWORK WHERE SPACE AVAILABLE DICTATES.

31. BRANCH DUCTS TO INDIVIDUAL DIFFUSERS AND REGISTERS SHALL BE THE SAME SIZE AS THE DIFFUSER OR REGISTER NECK, UNLESS OTHERWISE NOTED.

32. ALL DUCTWORK AND PIPING SHALL BE INSTALLED TIGHT TO BOTTOM OF STRUCTURAL MEMBERS UNLESS OTHERWISE NOTED OR ABSOLUTELY REQUIRED BY FIELD CONDITIONS.

33. DO NOT INSTALL DUCTWORK OR PIPING DIRECTLY UNDER AND PARALLEL TO THE WEB OF STRUCTURAL MEMBERS. OFFSET IN ORDER TO ALLOW FUTURE DUCTWORK AND PIPING TO CROSS OVER IN BETWEEN STRUCTURAL MEMBERS.

34. BRANCH DUCTS TO INDIVIDUAL DIFFUSERS AND REGISTERS SHALL BE PROVIDED WITH VOLUME DAMPERS, WHETHER OR NOT THE VOLUME DAMPERS ARE SHOWN ON PLAN.

35. VOLUME DAMPERS LOCATED ABOVE INACCESSIBLE CEILINGS SHALL BE CABLE OPERATED TYPE, WITH CABLE OPERATORS LOCATED IN ACCESSIBLE LOCATIONS AND CLEARLY LABELED FOR DIFFUSER OR REGISTER SERVED.

36. CONDENSATE DRAIN (CD) AND CONDENSATE PUMP DISCHARGE (PD) PIPING SHALL BE RIGID COPPER, TYPE L, MINIMUM 3/4" NOMINAL PIPE SIZE, BRAZED OR SOLDERED, WITH 1" INSULATION, UNLESS OTHERWISE NOTED ON DRAWINGS.

37. NEW HVAC AIR EQUIPMENT MAY BE USED BY CONTRACTORS DURING CONSTRUCTION FOR TEMPORARY HEATING, COOLING, AND VENTILATION, ONLY UNDER THE FOLLOWING CONDITIONS:
37.1. CONTRACTOR TO PROVIDE TEMPORARY FILTERS IN EACH UNIT DURING CONSTRUCTION, WHICH SHALL BE REPLACED WITH NEW CLEAN FILTERS AFTER GENERAL CONSTRUCTION IS COMPLETED.
37.2. CONTRACTOR TO PROVIDE FILTER FABRIC AT ALL RETURN AND EXHAUST REGISTERS, GRILLES, AND OPENINGS DURING CONSTRUCTION.
37.3. THE WARRANTY PERIOD FOR ALL EQUIPMENT SHALL NOT BEGIN UNTIL CONSTRUCTION IS COMPLETED. IF THE EQUIPMENT MANUFACTURER'S WARRANTY PERIOD BEGINS WHILE THE UNIT USED DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH EXTENDING THE WARRANTY TO PROVIDE THE FULL PERIOD OF COVERAGE TO THE OWNER.
37.4. IF NEW PERMANENT HVAC AIR EQUIPMENT INSTALLED UNDER THIS PROJECT WILL NOT BE OPERATED BY THE CONTRACTOR DURING CONSTRUCTION, ALL OPEN OR INCOMPLETE DUCTWORK SHALL BE CAPPED AIRTIGHT WITH WITH HEAVY POLYETHYLENE PLASTIC. AFTER THE INSTALLATION OF DUCTWORK, REGISTERS, GRILLES, AND DIFFUSERS, THE CONTRACTOR SHALL BLANK OFF ALL REGISTERS, GRILLES, AND DIFFUSERS WITH HEAVY POLYETHYLENE PLASTIC AND TAPE AIR TIGHT, IN AREAS THAT ARE UNDER CONSTRUCTION, UNTIL WORK IS COMPLETE IN THOSE AREAS.
37.5. IF THE ABOVE CONDITIONS ARE NOT MET, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY NECESSARY TEMPORARY HEATING, COOLING, AND VENTILATION EQUIPMENT, DUCTWORK, CONTROLS, PIPING, AND POWER AT HIS OWN EXPENSE.
37.6. IF PERMANENT HVAC EQUIPMENT IS USED DURING CONSTRUCTION BUT NOT PROPERLY PROTECTED AS DESCRIBED ABOVE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING OUT DUST AND DEBRIS FROM DUCTWORK AND EQUIPMENT, AS WELL AS ANY NECESSARY REPAIR OR REPLACEMENT OF DAMAGED EQUIPMENT AT HIS OWN EXPENSE.
37.7. WHEN GENERAL CONSTRUCTION IS COMPLETE, VACUUM CLEAN ALL DIFFUSERS, REGISTERS, GRILLES, AND HVAC EQUIPMENT IN THE PROJECT AREA OR SERVING THE PROJECT AREA. REMOVE ANY CONSTRUCTION DEBRIS.

38. DRAWINGS ARE DIAGRAMMATIC, THEREFORE DETERMINE EXACT LOCATIONS OF SYSTEMS AND COMPONENTS IN FIELD.

MECHANICAL GENERAL NOTES

39. COORDINATE WORK OF THIS SECTION WITH THAT OF OTHER SECTIONS.

40. READ SPECIFICATIONS FOR REQUIREMENTS PERTAINING TO THESE DOCUMENTS.

41. RUN ALL PIPING CONCEALED ALONG THE PATH INDICATED ON THESE DRAWINGS. ALL PIPING SHALL BE INSTALLED ABOVE CEILINGS AND COORDINATED WITH ARCH. DWGS.

42. ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

43. VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS.

44. ACCESS PANELS SHALL BE PROVIDED AT ALL LOCATIONS REQUIRED TO CLEAN FINS, ACCESS HEATERS, VALVES AND ALL CONCEALED MECHANICAL EQUIPMENT.

45. SUPPORT ALL EQUIPMENT & PIPING FROM BLDG. STRUCTURE TO PROVIDE A VIBRATION FREE INSTALLATION. NOTIFY ARCHITECT AND ENGINEER OF ALL WEIGHTS AND METHODS OF SUPPORT.

46. ALL MATERIALS AND EQUIPMENT SHALL BE NEW.

47. INSULATE PIPING AS SPECIFIED. PERFORM TESTS SPECIFIED BEFORE INSULATING.

48. ALL MOTORS SUPPLIED SHALL BE PREMIUM EFFICIENCY IN AGREEMENT WITH ELECTRIC COMPANY REQUIREMENTS.

49. COORDINATE ALL HVAC WORK AND EQUIPMENT WITH STRUCTURAL MEMBERS, FIRE PROTECTION PIPING, PLUMBING PIPING, LIGHT FIXTURES, ELECTRICAL EQUIPMENT AND OWNER'S EQUIPMENT.

50. COORDINATE WITH THE ARCHITECTURAL DRAWINGS AS TO THE SIZE AND LOCATION OF ANY ARCHITECTURAL ACCESS DOORS REQUIRED FOR ANY CONCEALED HVAC DEVICE. PROVIDE ACCESS DOOR AT ALL FIRE AND SMOKE DAMPERS (FD/SD).

51. ALL MECHANICAL WORK SHALL BE DONE IN A NEAT, WORKMANLIKE MANNER, ACCORDING TO ALL STANDARDS & CODES WHICH ARE APPLICABLE, ALL WORK SHALL BE DONE IN ACCORDANCE W/ ALL LOCAL, STATE & FEDERAL CODES HAVING JURISDICTION.

52. GUARANTEE: THE MECHANICAL CONTRACTOR SHALL GUARANTEE ALL DUCTWORK & EQUIPMENT, ETC. TO BE FREE OF DEFECTS FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE BY THE OWNER. ALL DEFECTS SHALL BE REPAIRED DURING THIS PERIOD WITH NO ADDITIONAL COST TO THE OWNER.

53. WORKMANSHIP: ONLY THE BEST WORKMANSHIP DONE IN ACCORDANCE WITH PRESENT STANDARDS WILL BE ACCEPTABLE. ANY WORK INSTALLED & ADJUDGED TO BE BELOW STANDARDS SHALL BE REMOVED & REPLACED AT THE CONTRACTORS EXPENSE.

54. PROVIDE ALL MATERIALS AND LABOR NECESSARY TO INSTALL A FULLY FUNCTIONING SYSTEM AS SHOWN ON THESE DRAWINGS.

55. ALL THERMOSTATS, CONTROLS, ETC. SHALL BE MOUNTED NO MORE THAN 48" ABOVE FINISHED FLOOR.

56. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL TEMPERATURE CONTROLS.

57. PROVIDE FIRE STOP MATERIAL WHERE REQUIRED. PROVIDE IN ALL WALLS AND CEILINGS AFTER WORK IS COMPLETE. FIRE STOPPING MATERIAL SHOULD BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.

58. PROVIDE FLEXIBLE DUCT CONNECTIONS ON ALL AIR HANDLING UNITS AND EXHAUST FANS. PROVIDE VIBRATION ISOLATION ON ALL EQUIPMENT.

59. WHERE PIPES ARE NOT INDICATED TO BE IN ARCH. ENCLOSURE (ON ARCH. DWGS.) PROVIDE MATCHING PIPE/VALVE COVERS.

60. ALL DUCTWORK SHALL BE CONSTRUCTED, SUPPORTED AND INSTALLED PER SMACNA.

61. WHERE CEILING TYPE IS AN INACCESSIBLE TYPE (I.E. SHEETROCK), PROVIDE VOLUME DAMPER AS SHOWN IN DETAIL SHEET.

62. COORDINATE ALL WALL ROOF PENETRATIONS WITH STRUCTURAL DRAWINGS AND ROOF STRUCTURE. LOCATIONS SHOWN ARE APPROXIMATE AND SHOULD BE VERIFIED IN FIELD AND ADJUSTED AS REQUIRED.

63. MECHANICAL CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF MECHANICAL LAYOUTS BASED ON ACTUAL FIELD CONDITIONS.

64. RUN ALL DUCTWORK, PIPING, MECHANICAL EQUIPMENT AS TIGHT AS POSSIBLE TO STRUCTURAL FRAMING AND DECKING.

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Job Number: 24-6337M
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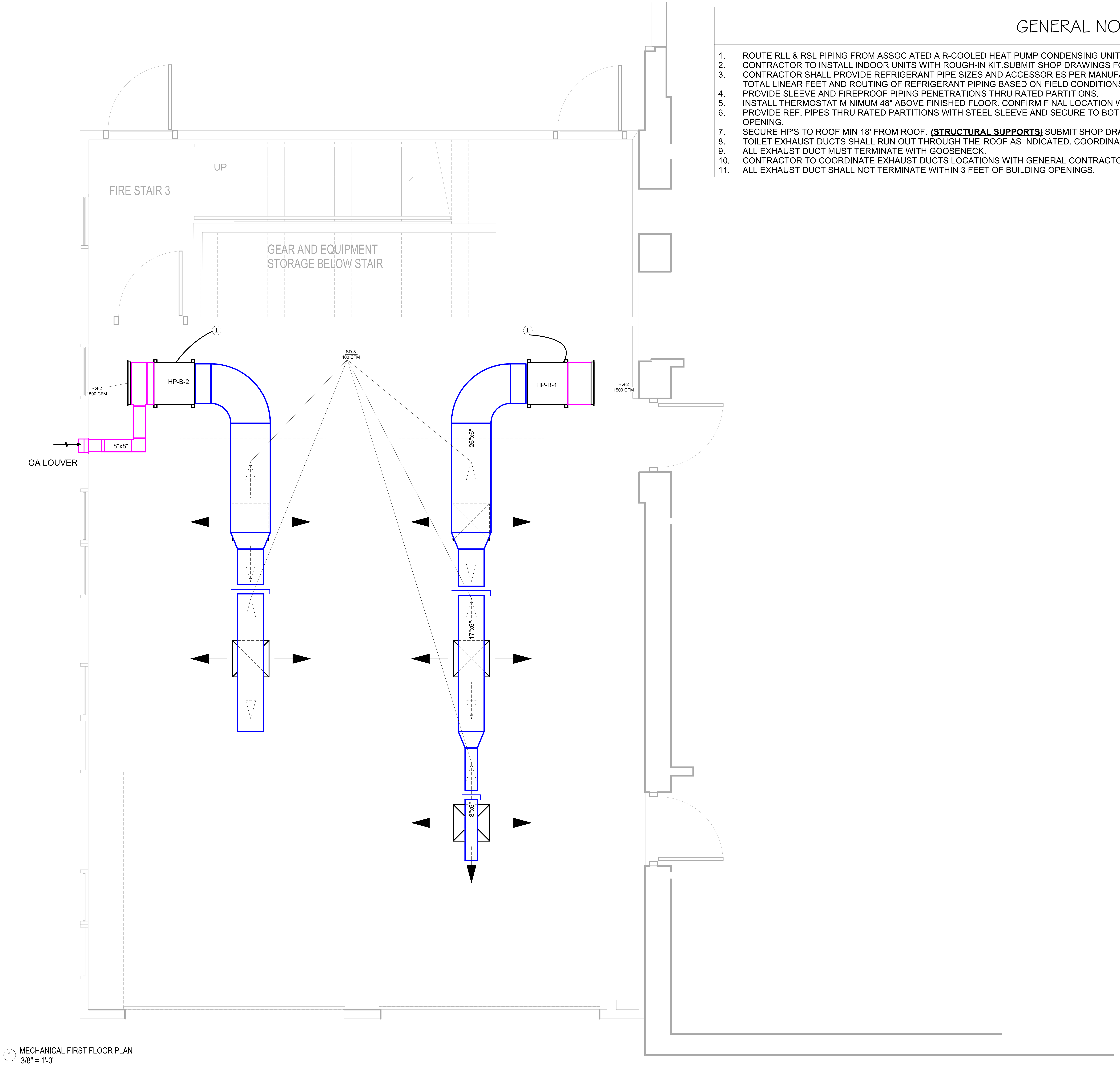
Sheet Title:
MECHANICAL GENERAL NOTES

Sheet Number:

M-002



① MECHANICAL FIRST FLOOR PLAN
3/8" = 1'-0"

GENERAL NOTES

1. ROUTE RLL & RSL PIPING FROM ASSOCIATED AIR-COOLED HEAT PUMP CONDENSING UNIT (LOCATED ON ROOF) TO INDOOR VRF BRANCH BOX .
2. CONTRACTOR TO INSTALL INDOOR UNITS WITH ROUGH-IN KIT.SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO INSTALL.
3. CONTRACTOR SHALL PROVIDE REFRIGERANT PIPE SIZES AND ACCESSORIES PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR SHALL CALCULATE TOTAL LINEAR FEET AND ROUTING OF REFRIGERANT PIPING BASED ON FIELD CONDITIONS.
4. PROVIDE SLEEVE AND FIREPROOF PIPING PENETRATIONS THRU RATED PARTITIONS.
5. INSTALL THERMOSTAT MINIMUM 48" ABOVE FINISHED FLOOR. CONFIRM FINAL LOCATION WITH ARCHITECT PRIOR TO INSTALL.
6. PROVIDE REF. PIPES THRU RATED PARTITIONS WITH STEEL SLEEVE AND SECURE TO BOTH SIDES. FIREPROOF ANNULAR SPACE BETWEEN SLEEVE AND WALL OPENING.
7. SECURE HP'S TO ROOF MIN 18' FROM ROOF. **(STRUCTURAL SUPPORTS)** SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO INSTALL.
8. TOILET EXHAUST DUCTS SHALL RUN OUT THROUGH THE ROOF AS INDICATED. COORDINATE ROUTING WITH OTHER TRADES.
9. ALL EXHAUST DUCT MUST TERMINATE WITH GOOSENECK.
10. CONTRACTOR TO COORDINATE EXHAUST DUCTS LOCATIONS WITH GENERAL CONTRACTOR IN FIELD.
11. ALL EXHAUST DUCT SHALL NOT TERMINATE WITHIN 3 FEET OF BUILDING OPENINGS.

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STATE OF NEW YORK
JAMES E. QUILL
078809
LICENSED PROFESSIONAL ENGINEER
James E. Quill

#	Description	Date

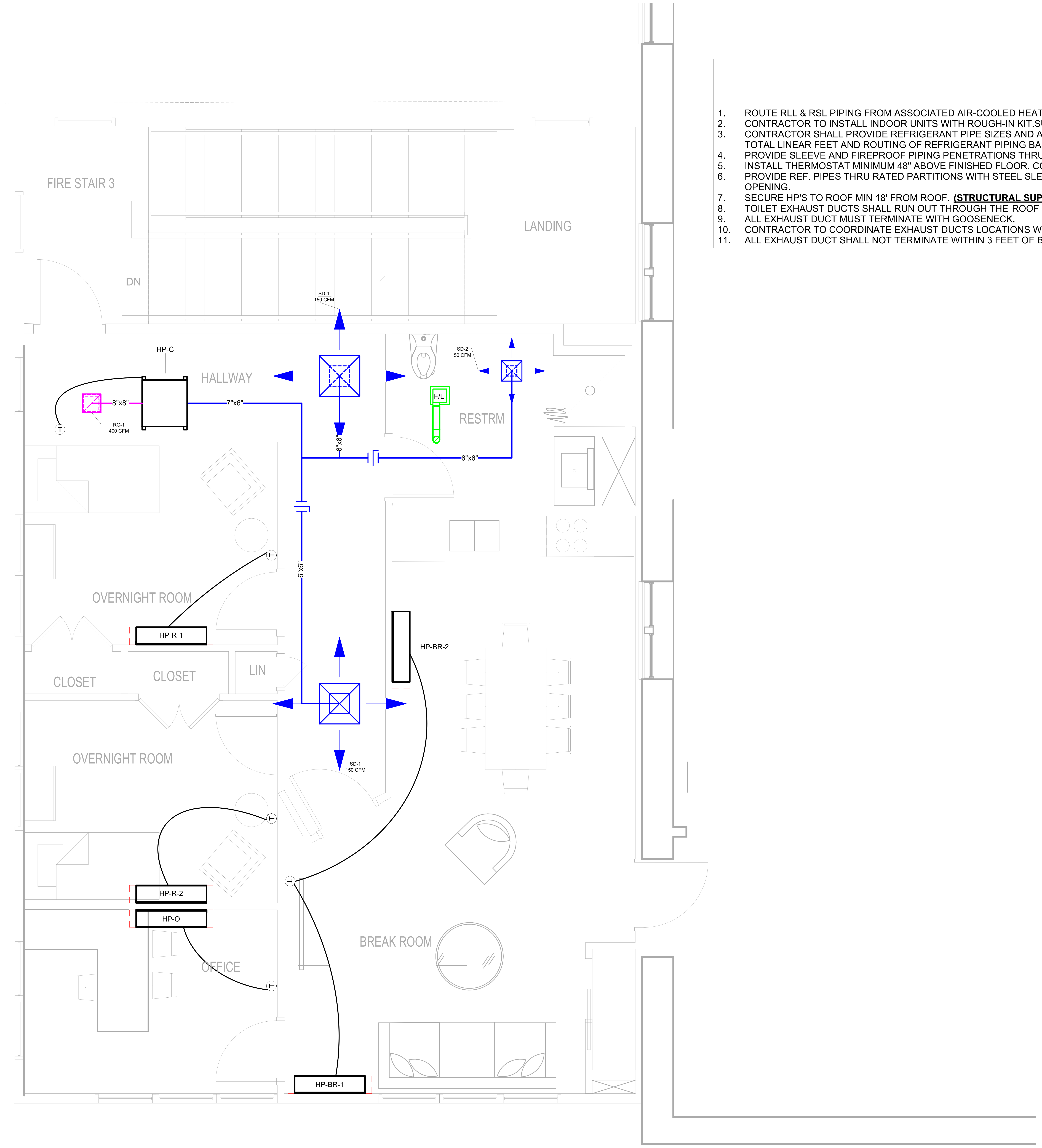
Project Location:
CROTON-ON-HUDSON
HARMON FIREHOUSE
30 Wayne Street,
Croton-On-Hudson, NY 10520

Issued for:
FOR PERMIT

Job Number: 24-6337M
Date: 9/26/24
Drawn By: PA

Sheet Title:
MECHANICAL FIRST
FLOOR PLAN

Sheet Number:
M-101



1 MECHANICAL SECOND FLOOR PLAN
3/8" = 1'-0"

GENERAL NOTES

1. ROUTE RLL & RSL PIPING FROM ASSOCIATED AIR-COOLED HEAT PUMP CONDENSING UNIT (LOCATED ON ROOF) TO INDOOR VRF BRANCH BOX .
2. CONTRACTOR TO INSTALL INDOOR UNITS WITH ROUGH-IN KIT.SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO INSTALL.
3. CONTRACTOR SHALL PROVIDE REFRIGERANT PIPE SIZES AND ACCESSORIES PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR SHALL CALCULATE TOTAL LINEAR FEET AND ROUTING OF REFRIGERANT PIPING BASED ON FIELD CONDITIONS.
4. PROVIDE SLEEVE AND FIREPROOF PIPING PENETRATIONS THRU RATED PARTITIONS.
5. INSTALL THERMOSTAT MINIMUM 48" ABOVE FINISHED FLOOR. CONFIRM FINAL LOCATION WITH ARCHITECT PRIOR TO INSTALL.
6. PROVIDE REF. PIPES THRU RATED PARTITIONS WITH STEEL SLEEVE AND SECURE TO BOTH SIDES. FIREPROOF ANNULAR SPACE BETWEEN SLEEVE AND WALL OPENING.
7. SECURE HP'S TO ROOF MIN 18' FROM ROOF. **(STRUCTURAL SUPPORTS)** SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO INSTALL.
8. TOILET EXHAUST DUCTS SHALL RUN OUT THROUGH THE ROOF AS INDICATED. COORDINATE ROUTING WITH OTHER TRADES.
9. ALL EXHAUST DUCT MUST TERMINATE WITH GOOSENECK.
10. CONTRACTOR TO COORDINATE EXHAUST DUCTS LOCATIONS WITH GENERAL CONTRACTOR IN FIELD.
11. ALL EXHAUST DUCT SHALL NOT TERMINATE WITHIN 3 FEET OF BUILDING OPENINGS.

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Issued for:

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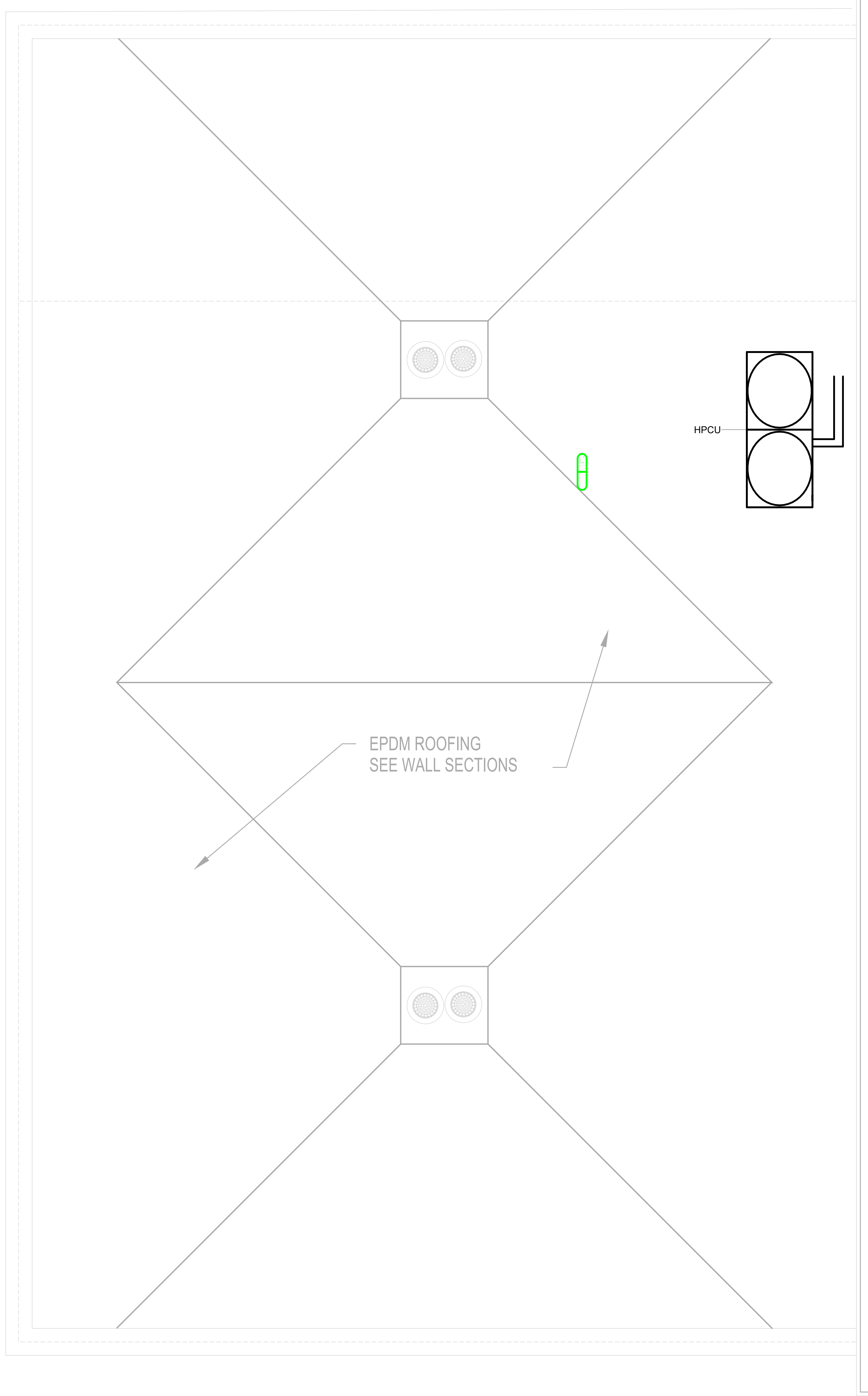
Job Number: 24-6337M
Date: 9/26/24
Drawn By: PA

Sheet Title:

MECHANICAL SECOND FLOOR PLAN

Sheet Number:

M-102



1 MECHANICAL ROOF PLAN
3/8" = 1'-0"

GENERAL NOTES

1. ROUTE RLL & RSL PIPING FROM ASSOCIATED AIR-COOLED HEAT PUMP CONDENSING UNIT (LOCATED ON ROOF) TO INDOOR VRF BRANCH BOX .
2. CONTRACTOR TO INSTALL INDOOR UNITS WITH ROUGH-IN KIT.SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO INSTALL.
3. CONTRACTOR SHALL PROVIDE REFRIGERANT PIPE SIZES AND ACCESSORIES PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR SHALL CALCULATE TOTAL LINEAR FEET AND ROUTING OF REFRIGERANT PIPING BASED ON FIELD CONDITIONS.
4. PROVIDE SLEEVE AND FIREPROOF PIPING PENETRATIONS THRU RATED PARTITIONS.
5. INSTALL THERMOSTAT MINIMUM 48" ABOVE FINISHED FLOOR. CONFIRM FINAL LOCATION WITH ARCHITECT PRIOR TO INSTALL.
6. PROVIDE REF. PIPES THRU RATED PARTITIONS WITH STEEL SLEEVE AND SECURE TO BOTH SIDES. FIREPROOF ANNULAR SPACE BETWEEN SLEEVE AND WALL OPENING.
7. SECURE HP'S TO ROOF MIN 18' FROM ROOF. **(STRUCTURAL SUPPORTS)** SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO INSTALL.
8. TOILET EXHAUST DUCTS SHALL RUN OUT THROUGH THE ROOF AS INDICATED. COORDINATE ROUTING WITH OTHER TRADES.
9. ALL EXHAUST DUCT MUST TERMINATE WITH GOOSENECK.
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Issued for:
FOR PERMIT

Job Number:	24-6337M
Date:	9/26/24
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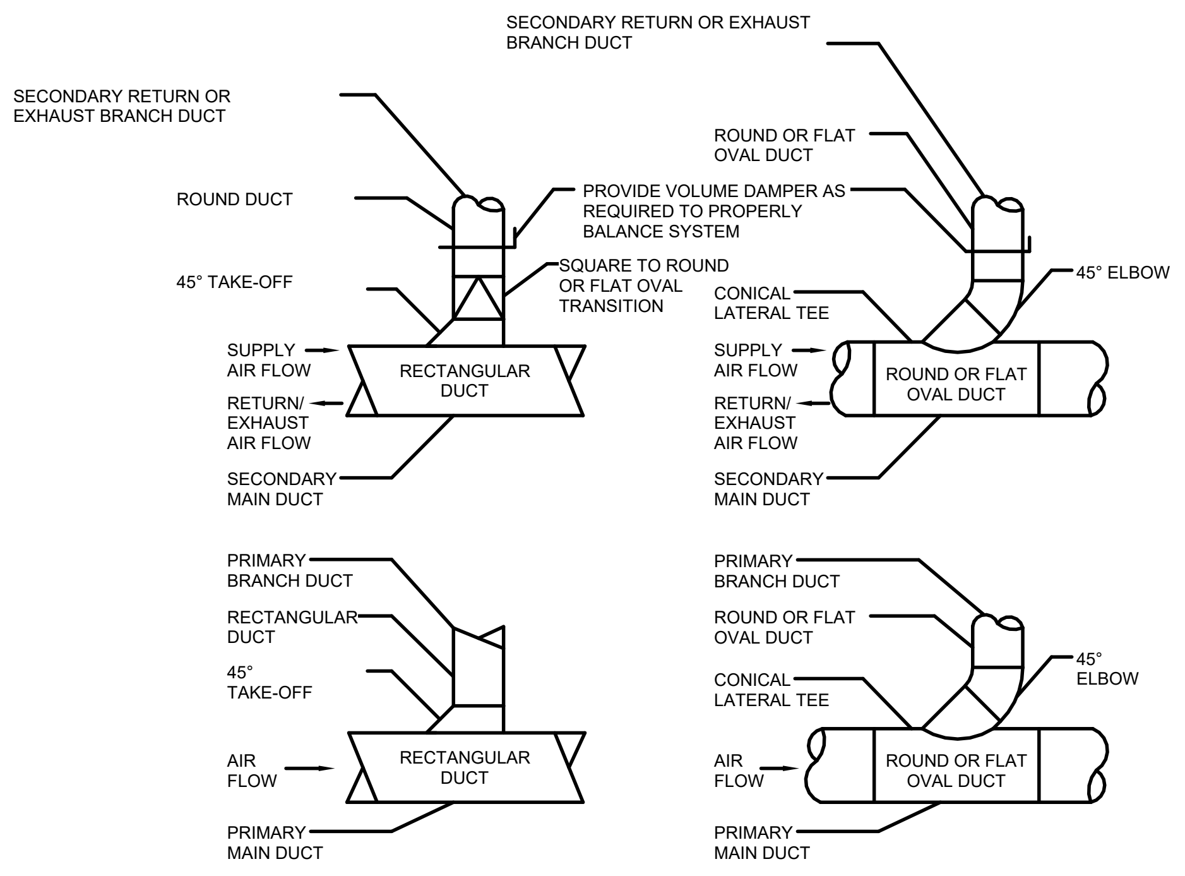
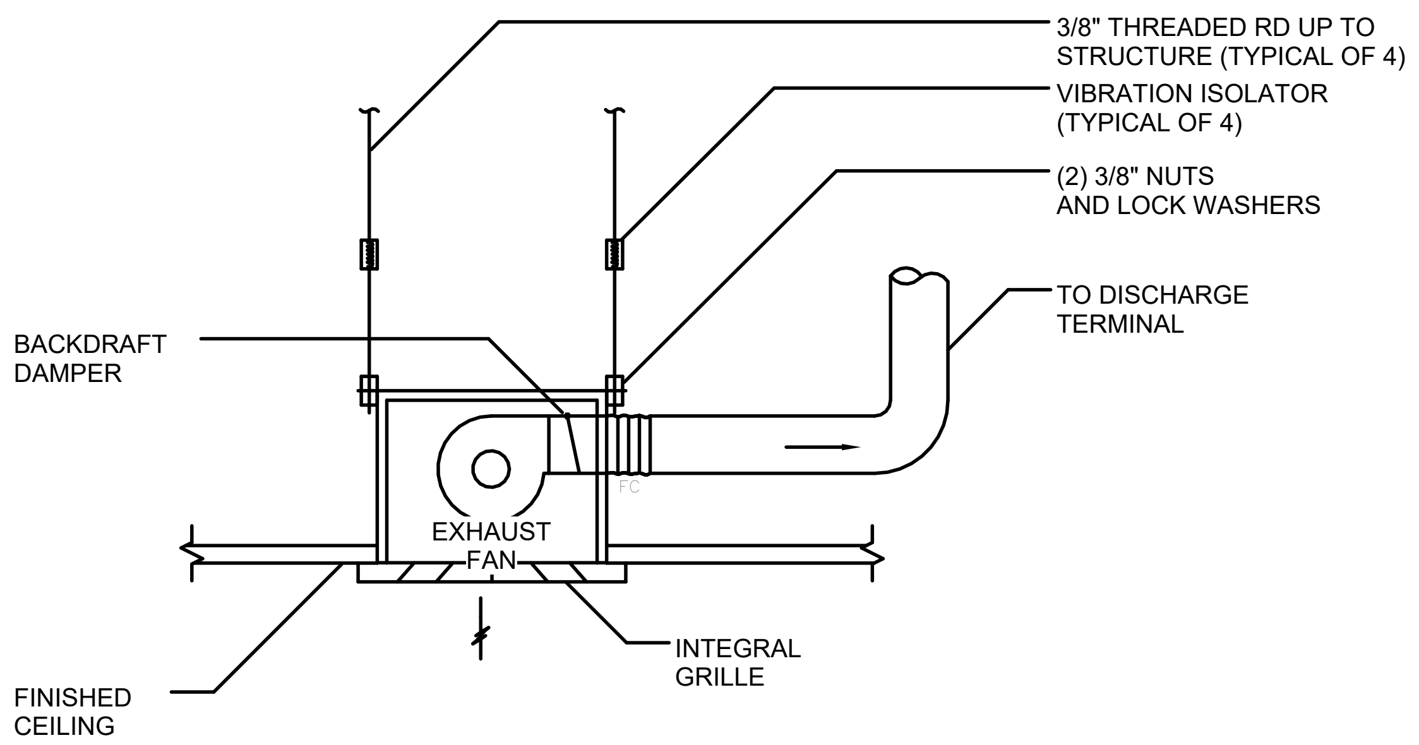
Sheet Title:
MECHANICAL ROOF PLAN

Sheet Number:
M-103



BRANCH DUCT TAKE-OFF DETAIL

NTS



CEILING EXHAUST FAN

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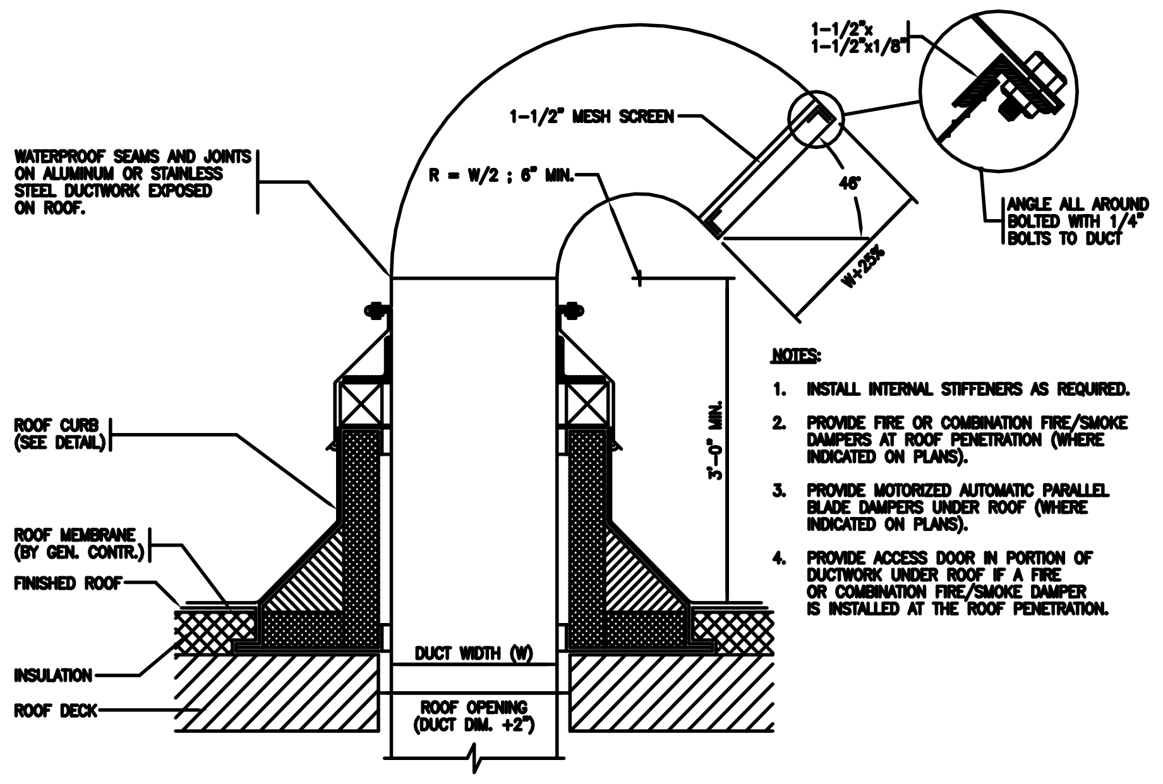
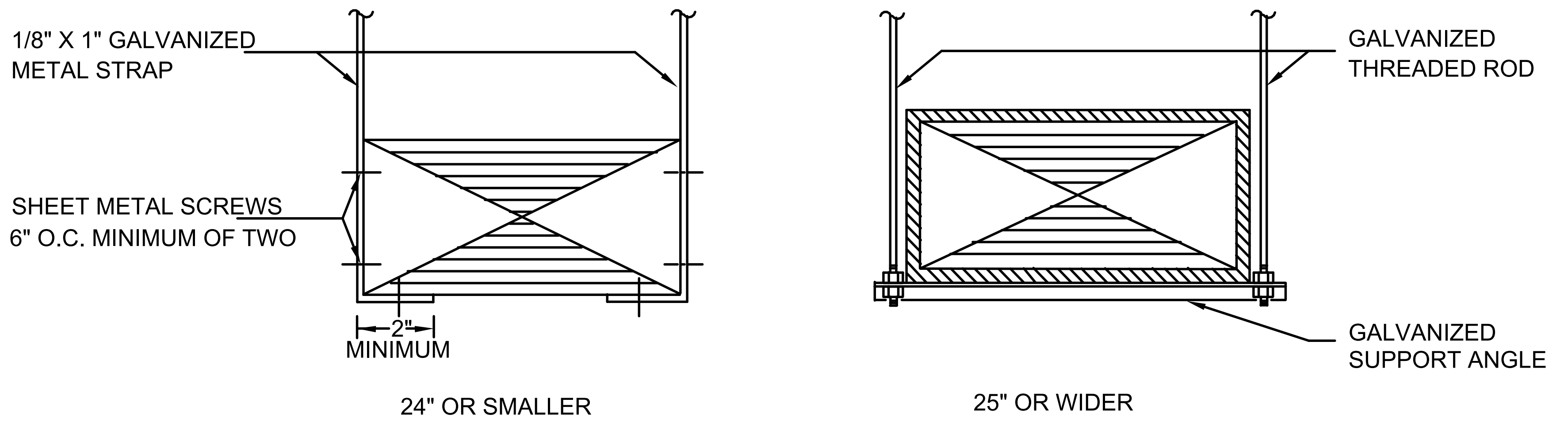


NOTES:

1. INSTALL INTERNAL STIFFENERS AS REQUIRED.
2. PROVIDE FIRE OR COMBINATION FIRE/SMOKE DAMPERS AT ROOF PENETRATION (WHERE INDICATED ON PLANS).
3. PROVIDE MOTORIZED AUTOMATIC PARALLEL BLADE DAMPERS UNDER ROOF (WHERE INDICATED ON PLANS).
4. PROVIDE ACCESS DOOR IN PORTION OF DUCTWORK UNDER ROOF IF A FIRE OR COMBINATION FIRE/SMOKE DAMPER IS INSTALLED AT THE ROOF PENETRATION.

GOOSENECK INSTALLATION



24" OR SMALLER

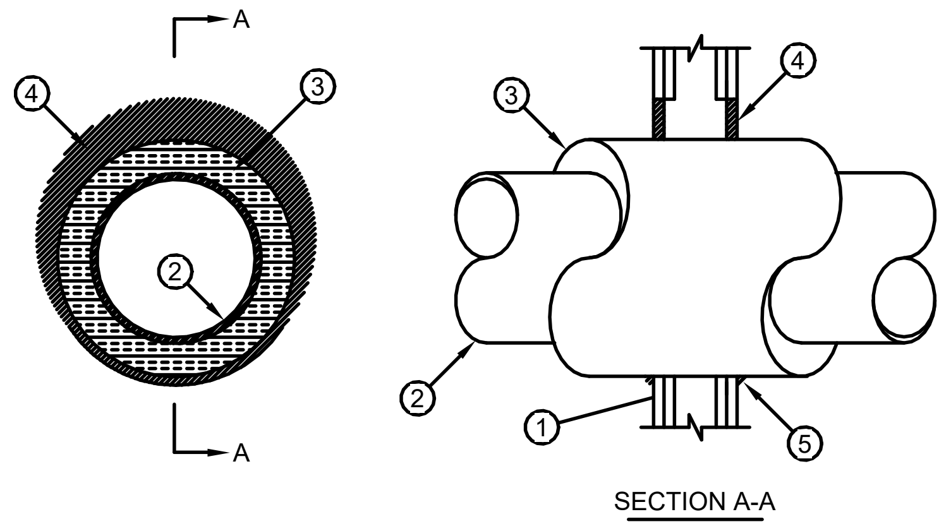
25" OR WIDER

DUCT WIDTH	ROD DIA.	SUPPORT ANGLE OR EQUIV. CHANNEL	MAXIMUM SPACING	MAXIMUM AREA *
25" TO 30"	3/8"	1 1/2" X 1 1/2" X 1/8"	8'-0" O.C.	4 SQ. FT.
31" TO 42"	3/8"	1 1/2" X 1 1/2" X 1/8"	6'-0" O.C.	10 SQ. FT.
43" TO 60"	1/2"	1 1/2" X 1 1/2" X 1/8"	6'-0" O.C.	10 SQ. FT.
61" TO 84"	1/2"	2" X 2" X 1/4"	4'-0" O.C.	-------
85" AND UP	1/2"	2" X 2" X 1/4"	4'-0" O.C.	-------

* REDUCE SPACING TO NEXT SMALLER INTERVAL IF DUCT AREA EXCEEDS MAXIMUM

DUCT SUPPORT

N.T.S.



1. WALL ASSEMBLY -- FOR 1 OR 2 HR FIRE-RATED GYPSUM BOARD/STUD WALL ASSEMBLY SEE ARCH DWGS A150-159 AND A600.
2. THROUGH PENETRANTS -- ONE METALLIC PIPE OR TUBING TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. PIPE OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:
   - A. STEEL PIPE -- NOM 12 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   - B. IRON PIPE -- NOM 12 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
   - C. COPPER TUBING -- NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
   - D. COPPER PIPE -- NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
3. PIPE COVERING* -- NOM 1, 1-1/2 OR 2 IN. THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN 3.5 PCF) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY-APPLIED SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL FASTENERS OR WITH BUTT TAPE SUPPLIED WITH THE PRODUCT. SEE PIPE AND EQUIPMENT COVERING -- MATERIALS (BRGU) CATEGORY IN THE BUILDING MATERIAL DIRECTORY FOR THE NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED. THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT ON THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, THE SIZE AND TYPE OF THROUGH PENETRANT AND THE PIPE COVERING THICKNESS, AS SHOWN IN THE TABLE BELOW:

+INDICATES PENETRANT TYPE AS ITEMIZED IN ITEM 2.

3A. PIPE COVERING* -- (NOT SHOWN) -- AS AN ALTERNATE TO ITEM 3, MAX 2 IN. THICK CYLINDRICAL CALCIUM SILICATE (MIN 14 PCF) UNITS SIZED TO THE OUTSIDE DIAM OF THE PIPE OR TUBE MAY BE USED. PIPE INSULATION SECURED WITH STAINLESS STEEL BANDS OR MIN 8 AWG STAINLESS STEEL WIRE SPACED MAX 12 IN. OC. WHEN THE ALTERNATE PIPE COVERING IS USED, THE T RATING SHALL BE DETERMINED FROM THE TABLE ABOVE. SEE PIPE AND EQUIPMENT COVERING -- MATERIALS (BRGU) CATEGORY IN THE BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

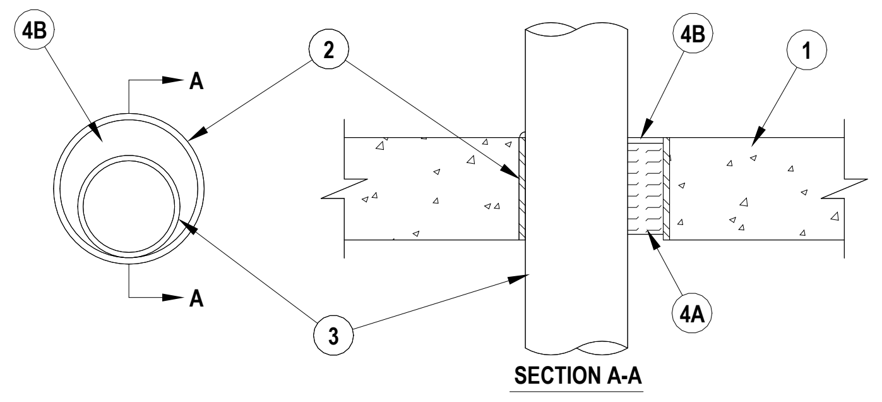
4. FILL, VOID OR CAVITY MATERIAL* -- SEALANT -- MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL . AT THE POINT CONTACT LOCATION BETWEEN PIPE COVERING AND GYPSUM BOARD, A MIN 1/2 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PIPE COVERING/GYPSUM BOARD INTERFACE ON BOTH SURFACES OF WALL.

E-015;HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- FS-ONE SEALANT

*BEARING THE UL CLASSIFICATION MARK

DETAIL OF PIPE PENETRATIONS THROUGH 1 & 2 HR WOOD FRAME ASSEMBLIES UL/cUL SYSTEM NO. F-C-1059

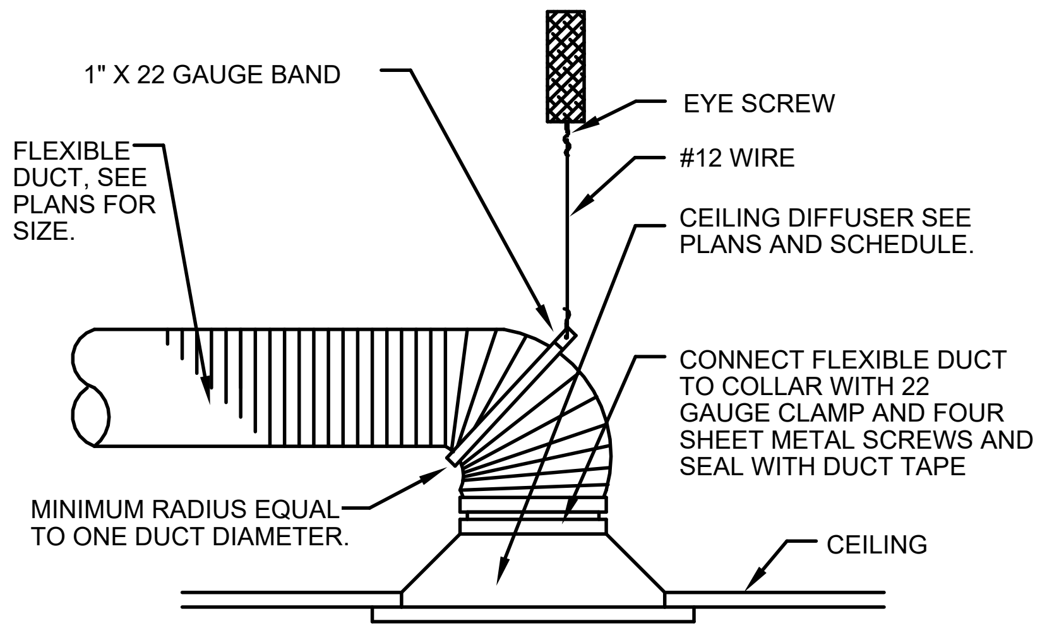
N.T.S.



1. FLOOR OR WALL ASSEMBLY - MIN 4-1/2 IN. THICK REINFORCED CONCRETE. FLOOR OR UL CLASSIFIED CONCRETE BLOCKS. MAX DIAM OF OPENING IS 6 IN.
2. METALLIC SLEEVE - (OPTIONAL) NOM 6 IN. (152 MM) DIAM (OR SMALLER) SCHEDULE 40 (OR HEAVIER) STEEL SLEEVE CAST OR GROUTED INTO FLOOR OR WALL ASSEMBLY, FLUSH WITH FLOOR OR WALL SURFACES.
3. THROUGH-PENETRANT - ONE METALLIC PIPE OR CONDUIT TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE, TUBE OR CONDUIT AND PERIPHERY OF OPENING SHALL BE MIN 0 IN. (0 MM) (POINT CONTACT) TO MAX 5-3/8 IN. (137 MM). PIPE OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR CONDUITS MAY BE USED:
   - A. STEEL PIPE - NOM 4 IN. (102 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   - B. IRON PIPE - NOM 4 IN. (102 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
   - C. COPPER PIPE - NOM 4 IN. (102 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
   - D. COPPER TUBING - NOM 4 IN. (102 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
   - E. CONDUIT - NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL CONDUIT.
   - F. CONDUIT - NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING (EMT).
4. FIRESTOP SYSTEM - THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
   - A. PACKING MATERIAL - MIN 4 IN. (102 MM) THICKNESS OF MIN 4 PCF (64 KG/M3) MINERAL WOOL BATT INSULATION FIRMLY PACKED INTO OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.
   - B. FILL, VOID OR CAVITY MATERIAL* - SEALANT - MIN 1/4 IN. (6 MM) THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH TOP SURFACE OF FLOOR OR WITH BOTH SURFACES OF WALL. FOR 3 HR RATED ASSEMBLIES, A MIN 1/4 IN. (6 MM) DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE CONCRETE/PIPE INTERFACE AT THE POINT CONTACT LOCATION ON THE TOP SURFACE OF FLOOR AND ON BOTH SURFACES OF WALL.
     HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - FS-ONE SEALANT OR CP604 SELF-LEVELING FIRESTOP SEALANT. CP604 SHALL BE USED IN FLOOR APPLICATIONS ONLY. WHEN CP604 IS USED, F RATING IS 2 HR.

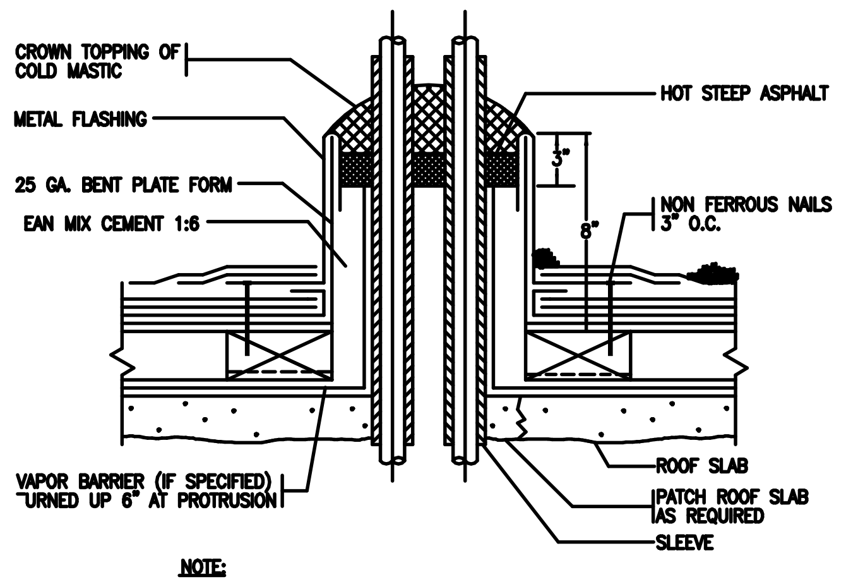
DETAIL OF PIPE PENETRATIONS THROUGH 2 & 3 HR CONCRETE & CMU ASSEMBLIES UL/cUL SYSTEM NO. C-AJ-1184

N.T.S.



CEILING DIFFUSER INSTALLATION

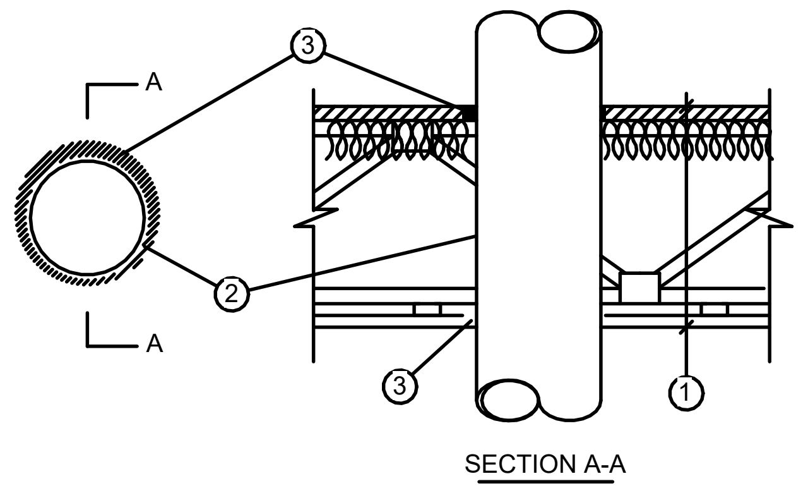
N.T.S.



NOTE:
SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR THE ROOF CONSTRUCTION.

PIPING THROUGH ROOF

NOT TO SCALE



1. FLOOR-CEILING ASSEMBLY - 1 HR FIRE-RATED TRUSSED LUMBER JOIST FLOOR-CEILING ASSEMBLY.

2. THROUGH PENETRANTS -- ONE METALLIC TUBING, PIPE OR CONDUIT TO BE INSTALLED CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. ANNULAR SPACE BETWEEN PIPE OR CONDUIT AND EDGE OF OPENING TO BE MIN 1/4 IN. AND MAX 3/4 IN. PIPE, TUBING OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR-CEILING ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, TUBING OR CONDUIT MAY BE USED:
   - A. STEEL PIPE -- NOM 6 IN. DIAM (OR SMALLER) SCHEDULE 40 (OR HEAVIER) STEEL PIPE.
   - B. IRON PIPE -- NOM 6 IN. DIAM (OR SMALLER) CAST OR DUCTILE PIPE.
   - C. CONDUIT -- NOM 4 IN. DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR NOM 6 IN. DIAM (OR SMALLER) STEEL CONDUIT.
   - D. STEEL FLEXIBLE METAL CONDUIT + -- NOM 2 IN. DIAM (OR SMALLER) STEEL FLEXIBLE METAL CONDUIT. SEE FLEXIBLE METAL CONDUIT (DXUZ) CATEGORY IN THE ELECTRICAL CONSTRUCTION MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS.
3. FILL, VOID OR CAVITY MATERIAL* -- SEALANT -- MIN 5/8 IN. THICKNESS OF SEALANT APPLIED WITHIN ANNULAR SPACE, FLUSH WITH THE BOTTOM SURFACE OF GYPSUM WALLBOARD OR LOWER TOP PLATE FOR 1 HR FLOORS RESPECTIVELY. MIN. 3/4 IN. THICKNESS OF SEALANT APPLIED WITHIN ANNULAR SPACE, FLUSH WITH TOP SURFACE OF FLOOR.

DETAIL OF PIPE PENETRATIONS THROUGH 2 & 3 HR CONCRETE & CMU ASSEMBLIES UL/cUL SYSTEM NO. C-AJ-1184

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Issued for:
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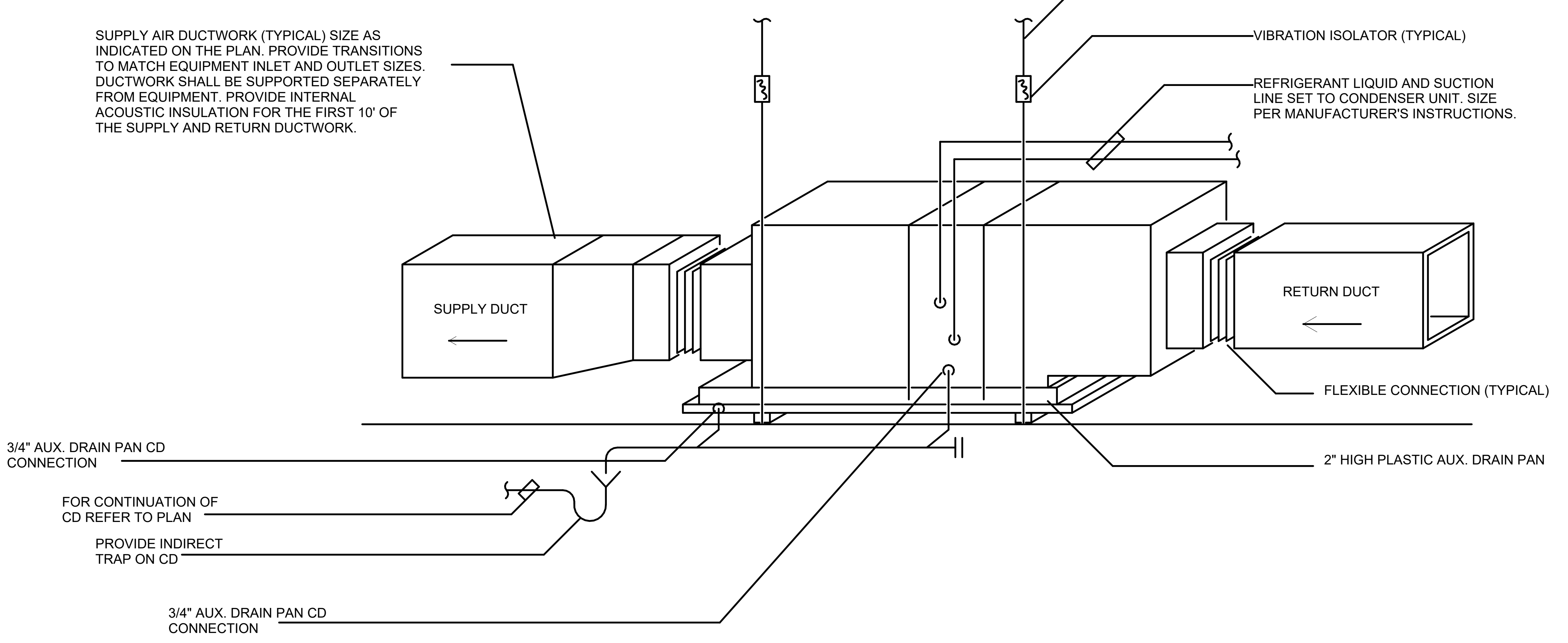
Job Number:	24-6337M
Date:	9/26/24
Drawn By:	PA

Sheet Title:
MECHANICAL DETAILS

Sheet Number:
M-201



SPLIT-SYSTEM HEAT PUMP UNIT DETAIL

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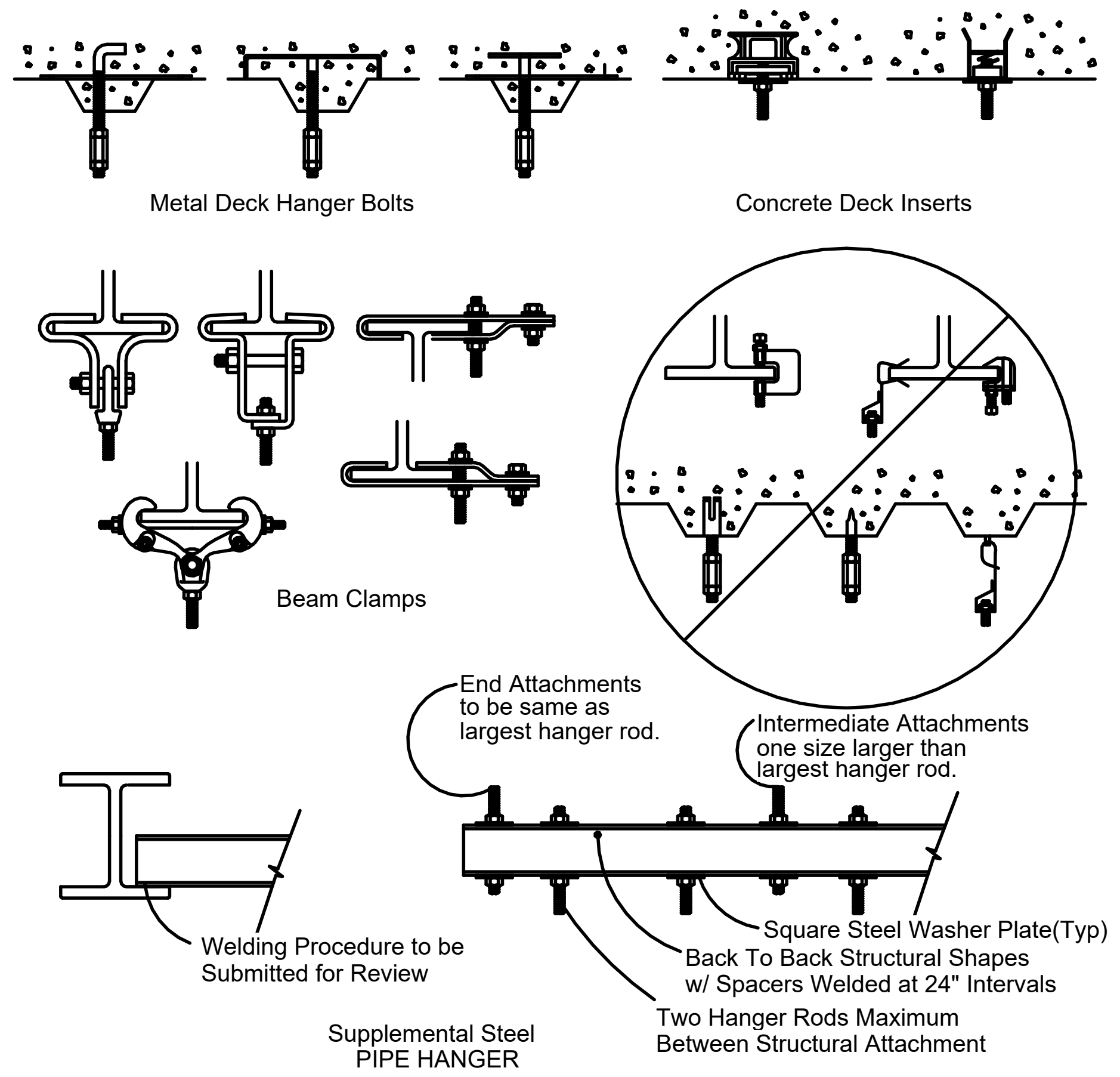
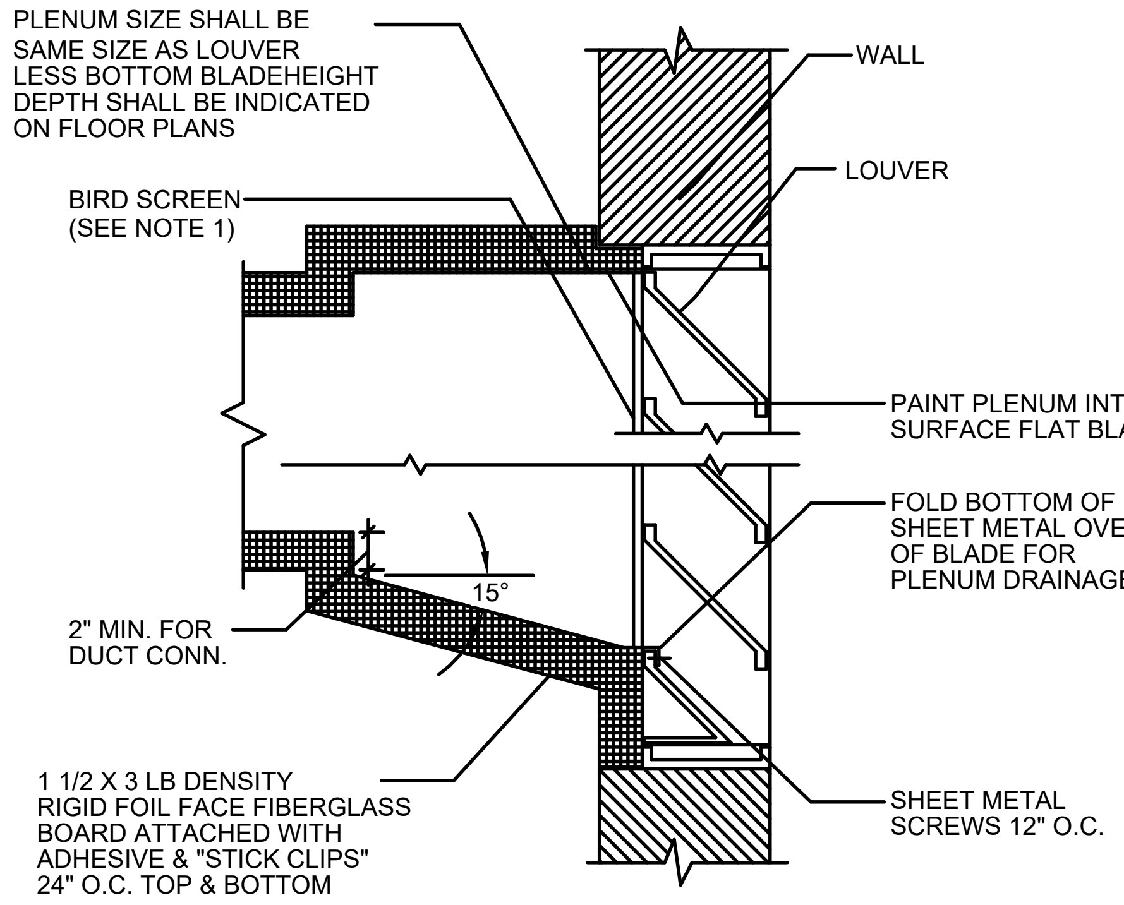


HANGER SCHEDULE		
PIPE SIZE	ROD SIZE	MAX. SPACING
up to 1 1/4"	3/8" DIA.	8' Steel
up to 1 1/4"	3/8" DIA.	6' Copper & Brass
1 1/2" & 2"	3/8" DIA.	10'
2 1/2" & 3"	1/2" DIA.	10'
4" & 5"	5/8" DIA.	10'
6"	3/4" DIA.	10'
8", 10", 12"	7/8" DIA.	10'
14" & 16"	1" DIA.	10'
18"	1 1/8" DIA.	10'

ATTACHMENT DETAIL

N.T.S.

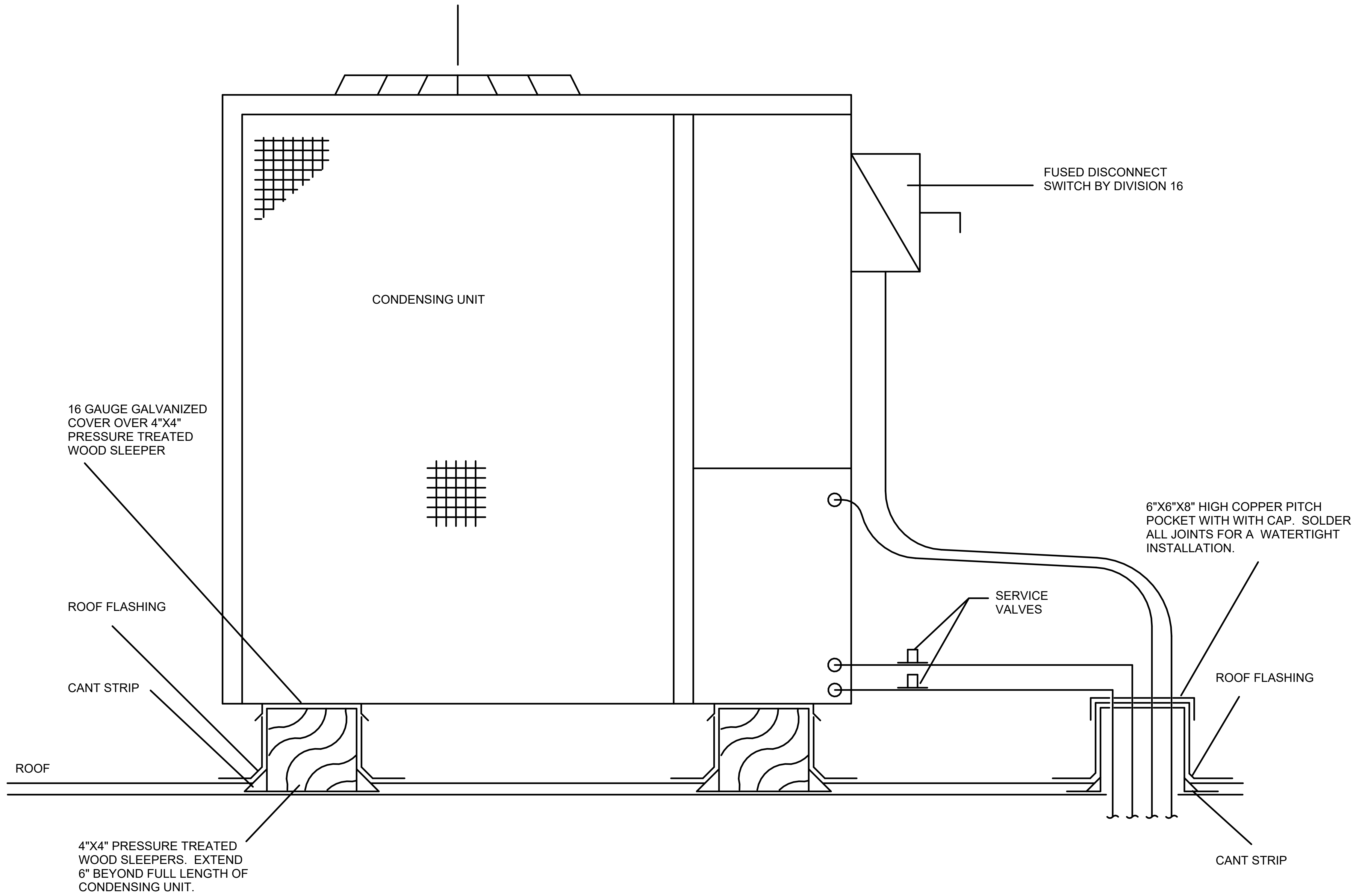


NOTES:

1. COVER INSIDE FACE OF LOUVER WITH 1/2" MESH ALUMINUM BIRD SCREEN SCREWED IN PLACE.
2. INSULATE UNUSED PORTION OF LOUVER WITH 1 1/2" GLASS FIBER INSULATING BOARD.
3. SEAL ALL PLENUM SEAMS WATERTIGHT WITH SILICONE SEALANT.
4. TYPICAL FOR SUPPLY AND EXHAUST PLENUMS.
5. PROVIDE ACCESS DOOR IN PLENUM. DOOR SHALL BE FIELD COORDINATED FOR ACCESS. DOOR SIZE SHALL BE 36" HIGH x 18" WIDE. REFER TO SPEC FOR DOORCONSTRUCTION.

INTAKE AND EXHAUST LOUVER PLENUM INSTALLATION DETAIL

N.T.S.



ROOFTOP CONDENSING UNIT DETAIL

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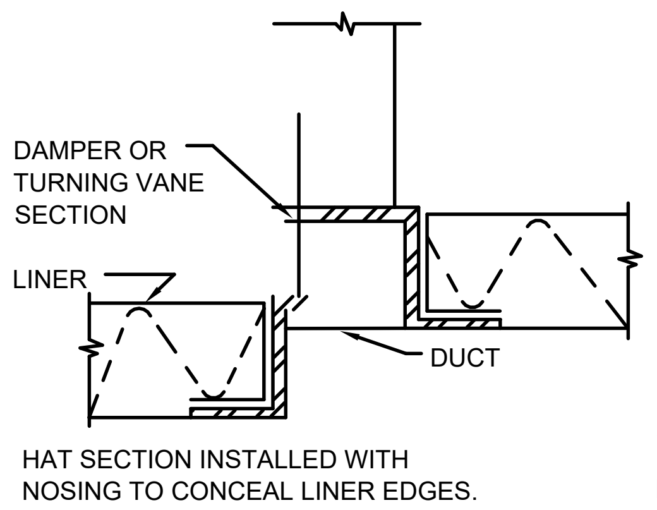
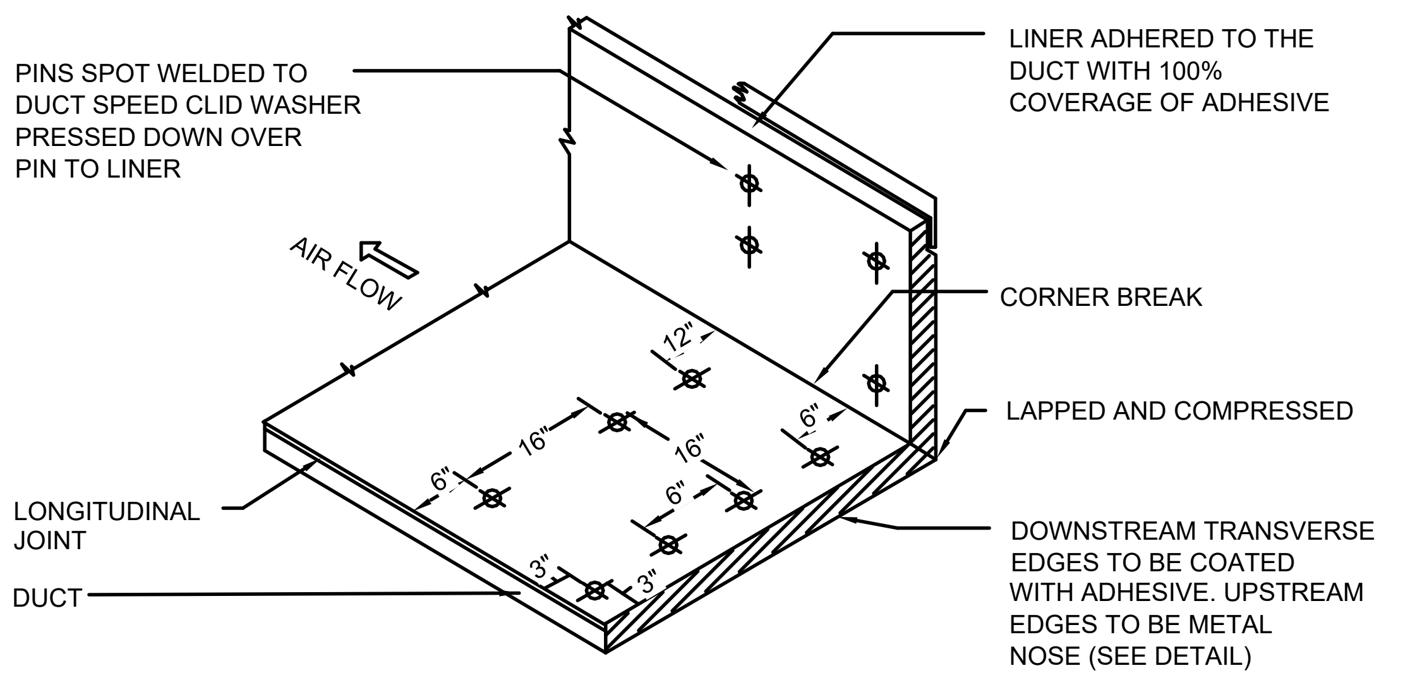
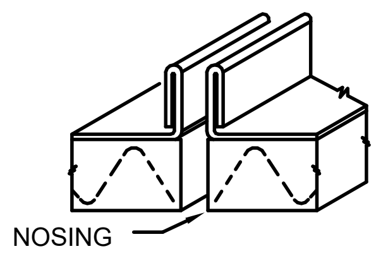
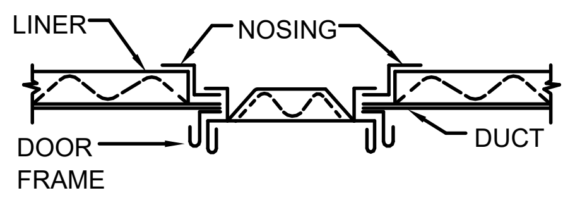


DETAIL AT DAMPERS AND TURNING VANES

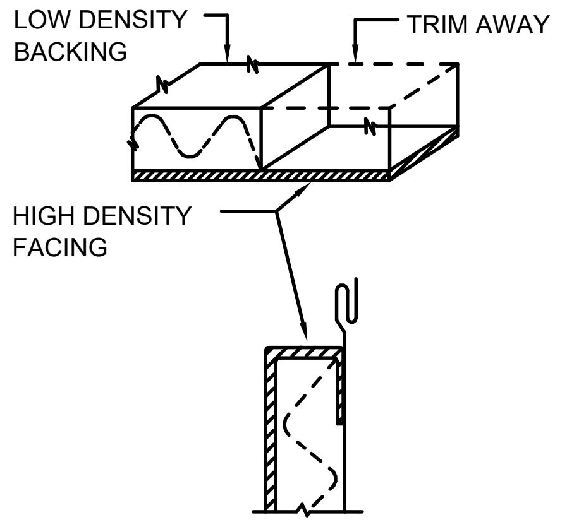




NOTE:
ENTERING, BUTTING & TRAILING EDGES OF LINER AT TRANSVERSE JOINTS TO BE COVERED BY NOSING



ACCESS DOOR NOSING DETAIL



NOTE:
FOLD OVER HIGH DENSITY FACING ON ALL LONGITUDINAL JOINTS & SECURE WITH MECH. FASTENERS

LONGITUDINAL JOINT DETAIL

GENERAL NOTES:

1. NOSING ATTACHED TO DUCT BY RIVETS, SCREWS OR WELDS. 48", SAME GAUGE AS DUCT

TRANSVERSE JOINT DETAIL ACOUSTICAL DUCT LINER DETAIL

N.T.S.

Engineer:

Atlantic Consulting & Engineering
525 John Street
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Stamp

JAMES E. QUILL
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James E. Quill

THIS DRAWING IS THE PROPERTY OF THE ENGINEER. IT HAS BEEN SPECIFICALLY PREPARED FOR THE OWNER FOR THIS PROJECT AT THIS SITE AND IS NOT TO BE USED FOR ANY OTHER PURPOSE, LOCATION OR OWNER WITHOUT WRITTEN CONSENT OF THE ENGINEER.

#	Description	Date

Project Location:
CROTON-ON-HUDSON
HARMON FIREHOUSE
30 Wayne Street,
Croton-On-Hudson, NY 10520

Issued for:
FOR PERMIT

Job Number: 24-6337M
Date: 9/26/24
Drawn By: PA

Sheet Title:
MECHANICAL DETAILS 2

Sheet Number:
M-202

DX MULTI ZONE HEAT PUMP SPLIT SYSTEM SCHEDULE (HYPER - HEATING)

Tag no.	Serves	Manufacturer	Model	Cooling	Heating	Airflow	EDB	EWB	Air filter	Electrical Data				Tag no.	EAT	Electrical Data				Refrigerant Piping		Refrigerant	EER	Weight	Manufacturer	Model no	Remarks
				MBH	MBH	CFM	F	F		Volts	Phase	MCA	MOCP		F	Volts	Phase	MCA	MOCP	Liquid	Vapor	type		lbs			
HP-B-1	1ST FLOOR BAY 1	Mitsubishi	PEFY-P54NMAU-E4	54	60	1200	75	67	PP Honeycomb fabric	208	1	4.38	15	HPCU-1	95	208	3	70	110	7/8	1-1/8	R-410A	10	777	Mitsubishi	PURY-EP168TNU-A1	1,2,3,4,5,6,7,8,9,10
HP-B-2	1ST FLOOR BAY 2	Mitsubishi	PEFY-P48NMHU-E-OA	72	43	900	75	67	PP Honeycomb fabric	208	1	4.38	15												Mitsubishi	CMB-P108NU-JA2	11,12
HP-C	2ND FLOOR COMMON AREA	Mitsubishi	PEFY-P06NMAU-E4	6	6.7	300	75	67	PP Honeycomb fabric	208	1	1.75	15														
HP-BR-1	BREAKROOM	Mitsubishi	PKFY-P06NLMU-ER1.TH	6	6.7	150	75	67	PP Honeycomb fabric	208	1	0.24	15														
HP-BR-2	BREAKROOM	Mitsubishi	PKFY-P06NLMU-ER1.TH	6	6.7	150	75	67	PP Honeycomb fabric	208	1	0.24	15														
HP-R-1	ROOM 1	Mitsubishi	PKFY-P06NLMU-ER1.TH	6	6.7	150	75	67	PP Honeycomb fabric	208	1	0.24	15														
HP-R-2	ROOM 1	Mitsubishi	PKFY-P06NLMU-ER1.TH	6	6.7	150	75	67	PP Honeycomb fabric	208	1	0.24	15														
HP-O	OFFICE	Mitsubishi	PKFY-P08NLMU-ER1.TH	8	9	160	75	67	PP Honeycomb fabric	208	1	0.24	15														

NOTES:

1. Provide integral disconnect switch
2. Provide with safety switch shutoff
3. Provide with manufacturer recommended wireless controller
4. Provide manufacturer recommeded filter
5. all indoor wall unit condensation line to be connected to nearest plumbing
6. Provide condensing unit with integral disconnect switch
7. Condensing unit shall be mounted on roof
8. Confirm Refrigerant pipe size and specialties per manufacturer recommendations
9. Provide Hyper heating type.
10.Outdoor unit powers the indoor unit.
11.VRF HEAT RECOVERY BRANCH CIRCUIT CONTROLLER TO BE INSTALLED IN SECOND FLOOR CEILING NOT ON ROOF.
12. Include Diamondback Ball Valves BV-Series, 700PSIG working pressure, full port, 410A rated.

FAN SCHEDULE

TAG NO.	LOCATION	SERVES	AIRFLOW (CFM)	TYPE	ELECTRICAL DATA				CONTROL	MANUFACTURER	MODEL	REMARKS
					W	V	PH	Hz				
F/L	See Dwg's	Toilets	50	CEILING FAN	1050	120	1	60	-	PANASONIC	FV-0510VSL1	1,2,3

NOTES:

1. Provide with factory mounted disconnect switch
2. Provide fan with backdraft damper
3. Provide with speed controller

Engineer:

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Job Number: 24-6337M
Date: 9/26/24
Drawn By: PA

Sheet Title:
MECHANICAL
SCHEDULES

Sheet Number:

M-301

MECHANICAL (HVAC) SPECIFICATIONS

GENERAL

SCOPE

THE GENERAL SCOPE OF THE HVAC WORK IS TO REMOVE EXISTING SYSTEMS, MODIFY THE EXISTING SYSTEMS, AND PROVIDE NEW SYSTEMS AS INDICATED ON THESE DOCUMENTS

THE WORK TO BE DONE UNDER THIS DIVISION OF THE SPECIFICATIONS INCLUDE THE FURNISHING OF ALL EQUIPMENT, SUPPLIES, LABOR, SUPERVISION AND ALL MATERIALS NOT SPECIFICALLY MENTIONED BUT NECESSARY OR REQUIRED TO PROVIDE COMPLETE AND FULLY OPERATIONAL HVAC SYSTEMS. IT IS THE INTENTION OF THE SPECIFICATIONS AND DRAWINGS TO CALL FOR FINISHED WORK, TESTED AND READY FOR OPERATION.

IT IS THE INTENT THAT ALL MECHANICAL WORK AND MATERIALS NECESSARY TO COMPLETE THE ENTIRE PROJECT IN ACCORDANCE WITH THE CONTRACT PLANS AND SPECIFICATIONS, WHETHER SPECIFICALLY MENTIONED HERE OR NOT, SHALL BE FURNISHED. ALL WORK AND MATERIALS NECESSARY TO FULFILL THIS INTENT SHALL BE SUPPLIED UNDER THE MECHANICAL SPECIFICATIONS WITHOUT ADDITIONAL COST TO THE OWNER.

DEFINITIONS

'FURNISH' OR 'PROVIDE' - TO FURNISH, ERECT, INSTALL AND CONNECT UP COMPLETE AND READY FOR OPERATION PARTICULAR WORK REFERRED TO, UNLESS SPECIFICALLY INDICATED OR SPECIFIED OTHERWISE.

'WORK' - LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND ALL OTHER ITEMS CUSTOMARILY FURNISHED AND/OR REQUIRED FOR PROPER AND COMPLETE INSTALLATION OF WORK.

'EXPOSED' - NOT INSTALLED UNDERGROUND OR 'CONCEALED' AS DEFINED ABOVE.

'INDICATE' OR 'SHOWN' - AS INDICATED OR SHOWN ON DRAWINGS OR SPECIFIED WITH SPECIFICATIONS.

'PIPING' - PIPE, FITTINGS, FLANGES, VALVES, CONTROLS, HANGERS, TRAPS, DRAINS, INSULATION AND ITEMS CUSTOMARILY OR REQUIRED IN CONNECTION WITH OR RELATING TO SUCH PIPING.

'SUPPLY' - TO PURCHASE, PRODUCE, ACQUIRE AND DELIVER COMPLETE WITH ALL RELATED ITEMS.

'INSTALL' - TO ERECT, MOUNT AND CONNECT UP COMPLETE WITH ALL RELATED ACCESSORIES.

'NOTED' - AS INDICATED ON DRAWINGS AND/OR SPECIFIED.

CODES, RULES, PERMITS AND FEES

THIS CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS AND PAY ALL STATE AND LOCAL TAXES, FEES AND OTHER COSTS IN CONNECTION WITH HIS WORK; FILE ALL NECESSARY PLANS, PREPARE ALL DOCUMENTS AND OBTAIN ALL NECESSARY APPROVALS OF ALL STATE AND LOCAL DEPARTMENTS HAVING JURISDICTION; OBTAIN ALL REQUIRED CERTIFICATES OF INSPECTION FOR HIS WORK AND DELIVERY OF SAME TO THE OWNER BEFORE REQUEST FOR ACCEPTANCE AND FINAL PAYMENT FOR THE WORK.

THIS CONTRACTOR SHALL INCLUDE IN THE WORK, WITHOUT EXTRA COST TO THE OWNER, ANY LABOR, MATERIALS, SERVICES, APPARATUS, DRAWINGS (IN ADDITION TO CONTRACT DRAWINGS AND DOCUMENTS), IN ORDER TO COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES AND REGULATIONS WHETHER OR NOT SHOWN ON THE DRAWINGS AND/OR SPECIFIED.

THIS CONTRACTOR SHALL PERFORM AND FILE ALL TESTS IN ACCORDANCE WITH THE CURRENT REGULATIONS OF THE STATE AND LOCAL AUTHORITIES. HE SHALL FURNISH AND INSTALL SIGNS REQUIRED BY THE STATE AND LOCAL AUTHORITIES.

ALL MATERIALS FURNISHED AND ALL WORK INSTALLED SHALL COMPLY WITH THE RULES AND RECOMMENDATIONS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS, WITH ALL REQUIREMENTS OF LOCAL UTILITIES COMPANIES, WITH THE RECOMMENDATIONS OF THE FIRE INSURANCE RATING ORGANIZATION HAVING JURISDICTION.

ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE CURRENT STATE BUILDING CODE, INCLUDING THE MOST CURRENTLY ADOPTED SUPPLEMENT AND APPLICABLE AMENDMENTS, STATE FIRE SAFETY CODE, NATIONAL BUILDING CODE, (INTERNATIONAL RESIDENTIAL CODE, INTERNATIONAL MECHANICAL CODE,) INTERNATIONAL PLUMBING CODE, N.F.P., A.D.A., UL., NEMA, O.S.H.A. AND WITH ALL REQUIREMENTS OF ALL GOVERNMENTAL DEPARTMENTS HAVING JURISDICTION. REQUIREMENTS OF THE ABOVE SHALL TAKE PRECEDENCE OVER PLANS AND SPECIFICATIONS.

INSURANCE

THE MECHANICAL CONTRACTOR SHALL FURNISH STATUTORY COMPENSATION INSURANCE CERTIFICATES FOR PERSONAL AND PROPERTY DAMAGE DISABILITY/LIABILITY AS REQUIRED BY THE OWNER AND/OR AS HEREINBEFORE DESCRIBED.

GUARANTEE AND SERVICE

THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE OF THE INSTALLATION. IN ADDITION, THE CONTRACTOR SHALL PROVIDE, FREE OF CHARGE, ONE YEAR'S MAINTENANCE GUARANTEE ON MAINTAINED SERVICE AND ADJUSTMENT OF ALL EQUIPMENT IN THIS CONTRACT.

ALL COMPRESSORS TO HAVE (5) FIVE YEAR EXTENDED WARRANTEES.

DRAWINGS AND INTENT

DRAWINGS ARE INTENDED AS WORKING DRAWINGS FOR GENERAL LAYOUT OF THE VARIOUS HVAC SYSTEMS. HOWEVER, LAYOUT OF EQUIPMENT, ACCESSORIES, SPECIALTIES, DUCTWORK, AND PIPING SYSTEMS ARE DIAGRAMMATIC UNLESS SPECIFICALLY DIMENSIONED, AND DO NOT NECESSARILY INDICATE EVERY REQUIRED PIPE, VALVE, FITTINGS, TRAP, ELBOW, TRANSITION, OFFSETS, OR SIMILAR ITEMS REQUIRED FOR A COMPLETE INSTALLATION.

EXAMINATION OF PREMISES - SPECIAL NOTE: NO CONSIDERATION OR ALLOWANCE WILL BE GRANTED FOR FAILURE TO VISIT SITE, OR ANY ALLEGED MISUNDERSTANDING OF MATERIAL TO BE FURNISHED, OR WORK TO BE DONE; IT BEING THAT TENDER OF PROPOSAL INDICATED WITH ITS AGREEMENT TO ITEMS AND CONDITIONS REFERRED TO HEREIN OR INDICATED ON AFOREMENTIONED DRAWINGS.

MEASUREMENTS

ALL MEASUREMENTS TAKEN AT THE BUILDING SHALL TAKE PRECEDENCE OVER SCALE DIMENSIONS. EVERY PART OF THE PLANS SHALL BE FITTED TO THE ACTUAL CONDITIONS AT THE BUILDING. IF IN CONFLICT WITH SCALE DIMENSIONS, CONTACT ARCHITECT FOR CLARIFICATION.

TEMPORARY SERVICES

THE HVAC CONTRACTOR IS TO COORDINATE WITH THE GENERAL CONTRACTOR, PRIOR TO PERFORMING WORK REQUIRING INTERRUPTION OF EXISTING SERVICES, THE CONTRACTOR SHALL SECURE FROM THE OWNER, APPROVAL OF THE PROPOSED OPERATION.

WORK SHALL BE ARRANGED FOR CONTINUOUS PERFORMANCE WHENEVER POSSIBLE. THE MECHANICAL CONTRACTOR SHALL PROVIDE TEMPORARY SERVICES AND/OR CONNECTIONS WHERE REQUIRED AND/OR SCHEDULE AND PERFORM OVERTIME WORK FOR ANY OPERATION WHICH REQUIRED SHUTDOWN OF THE FACILITIES AT NO ADDITIONAL COST TO THE OWNER.

THE AREA OF CONSTRUCTION AND/OR ADJACENT SPACES MAY BE OCCUPIED DURING THE CONSTRUCTION PERIOD. THE CONTRACTOR IS TO TAKE ALL NECESSARY MEASURES AND PROVIDE ALL MATERIALS TO ENSURE A SAFE ENVIRONMENT FOR THE FACILITY'S OCCUPANTS.

CONTINUITY OF EXISTING SYSTEMS

WHEREVER AN EXISTING SYSTEM IS REMOVED, PARTIALLY REMOVED, OR MODIFIED THE REMAINING SYSTEM IS TO FUNCTION FULLY AS BEFORE.

MAINTAIN CONTINUITY OF THE EXISTING AIR SYSTEMS, HYDRONIC SYSTEMS, AND CONTROL SYSTEMS TO THE AREAS NOT AFFECTED BY THIS ALTERATION.

SCAFFOLDING, RIGGING AND HOISTING

UNLESS OTHERWISE SPECIFIED, CONTRACTOR SHALL FURNISH ALL SCAFFOLDING, RIGGING, HOISTING AND SERVICES NECESSARY FOR ERECTION AND DELIVERY INTO THE PREMISES OF ANY EQUIPMENT AND APPARATUS FURNISHED.

THE CONTRACTOR SHALL REMOVE SAME FROM PREMISES WHEN NO LONGER REQUIRED.

HOUSEKEEPING

THIS CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING STOCK OF MATERIALS AND EQUIPMENT STORED ON PREMISES, AT LOCATIONS DESIGNATED FOR SUCH USE, IN A NEAT AND ORDERLY MANNER.

THIS CONTRACTOR SHALL AT ALL TIMES, KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIAL OR RUBBISH CAUSED BY HIS EMPLOYEES AT WORK. HE SHALL REMOVE HIS RUBBISH AND SURPLUS MATERIALS FROM THE JOB SITE AT THE END OF EACH WORK DAY AND SHALL LEAVE THE PREMISES AND HIS WORK IN A CLEAN AND ORDERLY CONDITION.

ALL MATERIAL SCHEDULED FOR REMOVAL IS TO BE DISPOSED OF IN A MANNER MEETING ALL FEDERAL, STATE, AND LOCAL REGULATIONS.

PROTECTION OF MATERIALS AND EQUIPMENTS

CLOSE PIPE OPENINGS WITH CAPS OR PLUGS DURING INSTALLATION.

PROVIDE TEMPORARY CLOSURES ON OPEN ENDED DUCTS DURING CONSTRUCTION PERIOD. TIGHTLY COVER AND PROTECT FIXTURES AND EQUIPMENT AGAINST DIRT, WATER AND CHEMICAL OR MECHANICAL INJURY.

AT COMPLETION OF ALL WORK, FIXTURES, EXPOSED MATERIALS AND EQUIPMENT SHALL BE THOROUGHLY CLEANED.

WORK NOT INCLUDED

ALL ELECTRICAL WORK
CUTTING AND PATCHING
LINTELS AND STRUCTURAL FRAMING
ALL CONCRETE WORK
ALL PAINTING

THIS CONTRACTOR SHALL FURNISH THE GENERAL CONTRACTOR WITH THE SIZES AND LOCATIONS OF CHASES AND OPENINGS WHICH OCCUR IN WALLS, PARTITIONS, FLOORS, ROOFS, ETC., REQUIRED FOR THE INSTALLATION OF THE WORK CALLED FOR UNDER THIS CONTRACT. THIS WORK WILL BE DONE BY THE GENERAL CONTRACTOR, EXCEPT CUTTING REQUIRED FOR THE INSTALLATION OF HANGERS.

SHOP DRAWINGS

PRIOR TO DELIVERY TO THE JOB SITE, BUT SUFFICIENTLY IN ADVANCE OF REQUIREMENTS NECESSARY TO ALLOW ENGINEER AMPLE TIME FOR REVIEW, CONTRACTOR SHALL SUBMIT FOR APPROVAL, FIVE (5) COPIES OF EACH SHOP DRAWING.

INDICATE ON EACH SUBMISSION:

1. PROJECT NAME AND LOCATION
2. ARCHITECT AND ENGINEER
3. ITEM IDENTIFICATION
4. APPROVAL STAMP OF PRIME CONTRACTOR

ALL DUCTWORK SHOP DRAWINGS AND COORDINATION DRAWINGS SHALL BE SUBMITTED ON 3/8 IN SCALE DRAWINGS AND SHALL INCLUDE LOCATIONS AND SIZES OF EXISTING EQUIPMENT ALONG WITH NEW WORK. DRAWINGS SHALL INDICATE LOCATIONS OF HANGERS, SUPPORTS, EXPANSION JOINTS, GUIDES, ANCHORS AND ANCHOR LOADS.

COORDINATION DRAWINGS SHALL INDICATE ALL MEP EQUIPMENT, DUCTS AND PIPES AND PERTINENT ARCHITECTURAL ITEMS. MOUNTING HEIGHTS SHALL BE NOTED.

SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:

1. DUCTWORK LAYOUT, SHEET METAL DETAILS/STANDARDS
2. PIPING SHOP DRAWINGS
3. COORDINATION DRAWINGS

SUBMITTALS

PRIOR TO DELIVERY TO THE JOB SITE, BUT SUFFICIENTLY IN ADVANCE OF REQUIREMENTS NECESSARY TO ALLOW ENGINEER AMPLE TIME FOR REVIEW, CONTRACTOR SHALL SUBMIT FOR APPROVAL, FIVE (5) COPIES OF EACH SHOP DRAWING.

INDICATE ON EACH SUBMISSION:

1. PROJECT NAME AND LOCATION
2. ARCHITECT AND ENGINEER
3. ITEM IDENTIFICATION
4. APPROVAL STAMP OF PRIME CONTRACTOR

SUBMIT SUBMITTALS ON THE FOLLOWING:

1. PIPING MATERIALS
2. PIPING SPECIALTIES
3. PIPING INSULATIONS
4. DUCT MATERIALS
5. DUCTWORK SPECIALTIES
6. DUCTWORK INSULATORS
7. AIR OUTLETS (RGD)
8. HEATING EQUIPMENT
9. AIR CONDITIONING EQUIPMENT
10. FANS
11. CONTROLS
12. HYDRONIC SYSTEMS BALANCING REPORTS
13. AIR SYSTEMS BALANCING REPORTS

EQUIPMENT DEVIATION

THE PLANS AND/OR SPECIFICATIONS INDICATE THE NAME, MODEL NUMBER OR TYPE OF EQUIPMENT OR MATERIALS SPECIFIED TO SET THE STANDARD OF THE EQUIPMENT FOR THE PROJECT. THE ENGINEER WILL ENTERTAIN THE USE OF OTHER MANUFACTURER'S EQUIPMENT OF LIKE FUNCTIONS AND EQUAL QUALITY. FINAL ACCEPTANCE OF SUBSTITUTES IS AT THE ENGINEER'S DISCRETION. SHOULD THE BIDDER DESIRE TO USE EQUIPMENT OR MATERIALS OR A MANUFACTURER OTHER THAN THOSE SPECIFIED OR SHOWN, HE SHALL ATTACH A RIDER TO THE BID FORM LISTING THE DEDUCTIONS AND/OR ADDITIONS TO HIS BASE BID, TOGETHER WITH THE MANUFACTURE'S NAME AND MODEL NUMBERS OF THE EQUIPMENT OR MATERIALS HE PROPOSED TO FURNISH AS 'SUBSTITUTES'. IF NO SUBSTITUTE INFORMATION IS FURNISHED, IT WILL BE EXPRESSLY UNDERSTOOD THAT ALL EQUIPMENT AND MATERIALS NAMED WILL BE FURNISHED IN FULL ACCORDANCE WITH THE PLANS AND/OR SPECIFICATIONS.

RECORD DRAWINGS

CONTRACTOR SHALL KEEP ACCURATE RECORD OF ALL DEVIATIONS IN WORK AS ACTUALLY INSTALLED FROM WORK INDICATED PAYING PARTICULAR ATTENTION TO DIMENSIONING OUTSIDE UNDERGROUND UTILITY LINES, THEIR OFFSETS AND VALVES.

AT THE CLOSE-OUT OF THE PROJECT THE CONTRACTOR IS TO DELIVER TO THE OWNER TWO SETS OF “AS-BUILT” DRAWINGS COPIES OF ALL APPROVED SHOP DRAWINGS.

OWNER'S INSTRUCTIONS AND SYSTEM OPERATION

THE CONTRACTOR IS TO INSTRUCT THE OWNER, OR HIS REPRESENTATIVE, ON THE OPERATION AND MAINTENANCE PROCEDURES FOR ALL OF THE INSTALLED SYSTEMS AND EQUIPMENT. IN ADDITION TO THE VERBAL INSTRUCTIONS, THESE INSTRUCTIONS SHALL BE WRITTEN IN LAYMAN'S LANGUAGE AND SHALL BE INSERTED IN VINYL-COVERED THREE-RING LOOSE LEAF BINDER. THIS INFORMATION IN BINDER SHALL BE FIRST SENT TO AND APPROVED BY THE ARCHITECT/ENGINEER BEFORE TURNING OVER TO OWNER.

INSTALLATIONS

SLEEVES

PROVIDE NO. 22 GA. GALVANIZED IRON SLEEVES EXTENDED THROUGH CONSTRUCTION AT ALL PENETRATIONS THROUGH CEILINGS, WALLS AND PARTITIONS.

FOR INSULATED PIPING THE SLEEVE IS TO BE SIZED TO ALLOW INSULATION TO PASS THROUGH SLEEVE, PROVIDE 1/2 INCH SPACE BETWEEN PIPE AND/OR INSULATION AND SLEEVE.

FIRE SEAL ALL SLEEVES IN ACCORDANCE WITH BUILDING CODE AND APPLICABLE SECTIONS OF THE NFPA.

EXPANSION ANCHORS

SUSPEND HANGERS FROM EXPANSION ANCHORS IN SOLID CONCRETE SLABS SIMILAR TO HILTI HDI. PROVIDE HANGER IN PLACE WITH DOUBLE NUTS.

PROVIDE PROTECTION SHIELDS IN INSULATED PIPING. INSTALL HANGERS OVER INSULATION AND SHIELDS.

WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING HANGER RODS IN REQUIRED LOCATIONS, PROVIDE ADDITIONAL STEEL FRAMING AS REQUIRED AND REVIEWED.

HANGERS AND SUPPORTING

PIPE HANGING AND SUPPORTING - PIPING SHALL NOT BE SUPPORTED BY OTHER PIPING, BUT SHALL BE SUPPORTED WITH PIPE HANGERS SUITABLE FOR THE SIZE OF PIPE AND PROPER STRENGTH AND QUALITY AT PROPER INTERVALS SO THAT THE PIPING CANNOT BE MOVED ACCIDENTALLY FROM THE INSTALLED POSITION AS FOLLOWS:

PROVIDE CLEVIS HANGERS	AT CENTER OF CENTER SPACING (UNLESS OTHERWISE NOTED)
1/2 INCH PIPE OR TUBING	6 FEET
3/4 INCH OR 1 INCH PIPE OR TUBING	8 FEET
1-1/4 INCH OR LARGER (HORIZONTAL)	10 FEET
1-1/4 INCH OR LARGER (VERTICAL)	EVERY FLOOR LEVEL

DUCT HANGING AND SUPPORTING - DUCTWORK SHALL NOT BE SUPPORTED BY OTHER DUCTWORK OR PIPING, BUT SHALL BE SUPPORTED WITH HANGERS OF TYPE AND AT SPACING AS PER SMACNA STANDARDS.

VIBRATION AND SEISMIC CONTROL

QUIET OPERATION - ALL WORK SHALL OPERATE UNDER ALL CONDITIONS OF LOAD WITHOUT ANY SOUND OR VIBRATION WHICH IS OBJECTIONABLE IN THE OPINION OF THE ENGINEER. IN CASE OF MOVING MACHINERY, SOUND OR VIBRATION NOTICEABLE OUTSIDE OF ROOM IN WHICH IT IS INSTALLED, OR ANNOYING INSIDE ITS OWN ROOM, WILL BE CONSIDERED OBJECTIONABLE BY THE ENGINEER AND SHALL BE REMEDIED IN APPROVED MANNER BY THE CONTRACTOR AT HIS EXPENSE.

PROVIDE FLEXIBLE PIPE CONNECTIONS AT ALL PIPING CONNECTED TO MOVING EQUIPMENT.

PROVIDE FLEXIBLE DUCT CONNECTIONS AT ALL DUCTWORK CONNECTED TO MOVING EQUIPMENT. FLEXIBLE CONNECTIONS SHALL BE 29 OZ. NEOPRENE COATED FIBERGLASS, 6" WIDE. BURNING PROPERTIES SHALL CONFORM TO NFPA 90A. FASTEN TO DUCTWORK PER MANUFACTURER'S RECOMMENDATIONS. FABRIC SHALL NOT BE STRESSED OTHER THAN BY AIR PRESSURE. ALLOW AT LEAST ONE INCH SLACK TO INSURE THAT NO VIBRATION IS TRANSMITTED.

PROVIDE VIBRATION ISOLATION SPRINGS OR PADS AT MOUNTING AND SUPPORTS FOR ALL EQUIPMENT CAPABLE OF TRANSMITTING VIBRATIONS.

SEISMIC RESTRAINTS

SEISMIC RESTRAINTS DESIGNED AND CONSTRUCTED FOR LATERAL FORCES IN ANY DIRECTION SHALL BE PROVIDED FOR ALL MECHANICAL EQUIPMENT IN ACCORDANCE WITH THE STATE BUILDING CODE.

SEISMIC RESTRAINTS SHALL NOT BE REQUIRED FOR THE FOLLOWING:

1. PIPING IN BOILER AND MECHANICAL ROOMS LESS THAN 1-1/4 INCH INSIDE DIAMETER.
2. ALL OTHER PIPING LESS THAN 2-1/2 INCH INSIDE DIAMETER.
3. RECTANGULAR AIR-HANDLING DUCTS LESS THAN 6 SQUARE FEET IN CROSS-SECTIONAL AREA.
4. ROUND AIR-HANDLING DUCTS LESS THAN 28 INCHES IN DIAMETER.
5. PIPING SUSPENDED BY INDIVIDUAL HANGERS 12 INCHES OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE SUPPORT FOR THE HANGER.
6. DUCTS SUSPENDED BY HANGERS 12 INCHES OR LESS IN LENGTH FROM THE TOP OF THE DUCT TO THE BOTTOM OF THE SUPPORT FOR THE HANGER.

SEISMIC RESTRAINT FOR DUCTWORK; PROVIDE REQUIRED BRACING MATERIAL. DUCTWORK SHALL BE SUPPORTED AND BRACED TO RESIST ALL DIRECTIONAL (TRANSVERSE, LONGITUDINAL AND VERTICAL) FORCES EQUAL TO 10 PERCENT OF THE WEIGHT OF THE DUCT SYSTEM.

IDENTIFICATION

ALL IDENTIFICATION LABELING IS TO COMPLY WITH ASME A13.1

ALL PIPING IS TO BE LABELED WITH INDICATIONS OF SERVICE AND DIRECTION OF FLOW.

ALL DUCTWORK IS TO BE LABELED WITH INDICATIONS OF SERVICE, DIRECTION OF FLOW AND ASSOCIATED SYSTEM DESIGNATION.

ALL EQUIPMENT IS TO HAVE PERMANENT LABELS INDICATING EQUIPMENT DESIGNATION.

PIPING INSTALLATION

SIZES AND APPROXIMATE LOCATION OF PIPING SYSTEMS ARE SHOWN ON THE DRAWINGS. CHECK CAREFULLY WITH THE ARCHITECTURAL DRAWINGS, DRAWINGS SHOWING WORK OF OTHER TRADES, AND EXISTING FIELD CONDITIONS TO MAKE SURE THAT THERE WILL BE NO CONFLICT BETWEEN THESE TRADES AND THE PIPING SYSTEMS. PIPES SHALL BE OFFSET AS REQUIRED TO CLEAR STRUCTURAL MEMBERS AND EXISTING FIELD CONDITIONS.

PIPING TO BE INSTALLED WITH PROPER PITCH TO LOW POINTS. PROVIDE DRAIN VALVES AT ALL LOW POINTS AND AIR VENTS AT ALL HIGH POINTS OF THE PIPING SYSTEM.

INSTALL PIPING TO ALLOW FOR PIPE EXPANSION.

DUCT INSTALLATION

SIZES AND APPROXIMATE LOCATION OF ALL DUCTS ARE SHOWN ON THE DRAWINGS. CHECK CAREFULLY WITH THE ARCHITECTURAL DRAWINGS, DRAWINGS SHOWING WORK OF OTHER TRADES, AND EXISTING FIELD CONDITIONS TO MAKE SURE THAT THERE WILL BE NO CONFLICT BETWEEN THESE TRADES AND THE DUCTS. DUCTS SHALL BE OFFSET AS REQUIRED TO CLEAR STRUCTURAL MEMBERS AND EXISTING FIELD CONDITIONS; IF NECESSARY, THE DIMENSIONS OF THE DUCT MAY BE ALTERED PROVIDED THE CROSS-SECTIONAL AREA IS IN NO CASE REDUCED. DUCTS IN UNCONDITIONED SPACE ARE REQUIRED TO BE INSULATED TO R-8 OR HIGHER

FIELD QUALITY CONTROL

PERFORM THE FOLLOWING FIELD TESTS AND INSPECTIONS ACCORDING TO SMACNA'S "HVAC AIR DUCT LEAKAGE TEST MANUAL" AND PREPARE TEST REPORTS:

DISASSEMBLE, REASSEMBLE AND SEAL SEGMENTS OF SYSTEMS TO ACCOMMODATE LEAKAGE TESTING AND FOR COMPLIANCE WITH TEST REQUIREMENTS.

CONDUCT TESTS AT STATIC PRESSURES EQUAL TO MAXIMUM DESIGN PRESSURE OF SYSTEM OR SECTION BEING TESTED. IF PRESSURE CLASSES ARE NOT INDICATED, TEST ENTIRE SYSTEM AT MAXIMUM SYSTEM DESIGN PRESSURE. DO NOT PRESSURIZE SYSTEMS ABOVE MAXIMUM DESIGN OPERATING PRESSURE. GIVE SEVEN DAYS ADVANCE NOTICE FOR TESTING.

MAXIMUM ALLOWABLE LEAKAGE: COMPLY WITH REQUIREMENTS FOR LEAKAGE CLASS 3 FOR ROUND AND FLAT-OVAL DUCTS, LEAKAGE CLASS 12 FOR RECTANGULAR DUCTS IN PRESSURE CLASSES LOWER THAN AND EQUAL TO 2-INCH WG (500 PA) (BOTH POSITIVE AND NEGATIVE PRESSURES), AND LEAKAGE CLASS 6 FOR PRESSURE CLASSES FROM 2- TO 10- WG (500 TO 2500 PA).

REMAKE LEAKING JOINTS AND RETEST UNTIL LEAKAGE IS EQUAL TO OR LESS THAN MAXIMUM ALLOWABLE.
AIR LEAKAGE TESTING NOT TO EXCEED 3 ACH50 IS REQUIRED FOR 7+ DWELLING UNITS. PROVIDE TESTING PROCEDURE DETAILS PER ECCCNYS R402.4.1.3.

MATERIALS

DISSIMILAR METALS

WHENEVER DISSIMILAR PIPING MATERIALS ARE CONNECTED THE TWO SHALL BE SEPARATED WITH AN 'INSULATION' CONNECTION (DIELECTRIC) FITTING.

PIPING

CONDENSATION DRAIN PIPING

TYPE DWV COPPER TUBING WITH DWV SWEAT FITTINGS OR PVC (EXCEPT IF LOCATED IN A SPACE USED AS AN AIR PLENUM)

REFRIGERANT PIPING

TYPE ACR SERVICE COPPER TUBING MEETING ASTM B280: HARD DRAWN (ANY SIZE) OR SOFT DRAWN (1-5/8" ID OR SMALLER), OR AS PER MANUFACTURER'S RECOMMENDATIONS.

PIPE INSULATION

THE FOLLOWING PIPING SYSTEMS ARE TO BE INSULATEDWITH R-3:
- CONDENSATION DRAIN PIPING
- REFRIGERANT SUCTION LINE PIPING

CONDENSATE DRAIN PIPING INSULATION

INSULATE WITH 1/2" THICK HEAVY DENSITY FIBERGLASS 25 ASJ WITH VAPOR BARRIER AND LAP ADHESIVE JACKET. INSULATION ON FITTINGS SHALL BE FIBERGLASS WITH PRE-MOLDED JACKET.

REFRIGERANT PIPING INSULATION

INSULATE SUCTION LINE WITH ARMAFLEX INSULATION. MINIMUM INSULATION THICKNESS SHALL BE 1".

DUCTWORK

SHEET METAL DUCTWORK

ALL DUCTWORK SHALL BE CONSTRUCTED OF #1 QUALITY SHEETS OF GALVANIZED STEEL FREE OF CRACKS OR BLEMISHES. WHEN PITTSBURGING OR SNAP LOCKING A JOINT, THE GALVANIZED STEEL SHALL NOT BE CHIPPED OFF. ALL PARTS OF THE SHEET METAL DUCT SYSTEM SHALL BE OF THE GAGE, CONSTRUCTION, HANGING METHOD, AND INSTALLED IN STRICT ACCORDANCE WITH THE CURRENT EDITION OF THE SMACNA STANDARDS, INCLUDING DUCT LEAKAGE REQUIREMENTS.

EXPOSED DUCTWORK (FLAT OVAL)

PROVIDE DOUBLE WALL INSULATED FLAT OVAL DUCTWORK AND FITTINGS AS MANUFACTURED BY McGill AIRFLOW LLC, SERIES ACOUSTIC-K27, PAINTABLE GALVANIZED STEEL FOR THE DIMENSIONS INDICATED ON FLOOR PLANS. FLAT OVAL TRAVERSE JOINTS, LONGITUDINAL SEAMS IN COMPLIANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE", CHAPTER 3, "ROUND, OVAL AND FLEXIBLE DUCT FOR STATIC PRESSURE CLASS UNLESS OTHERWISE INDICATED AND UL-181. PROVIDE MANUFACTURER RECOMMENDED ACOUSTI-LINE INSULATION WITH ANTIMICROBIAL COATING EPA REGISTERED IN COMPLIANCE WITH ASTM C1071, ASTM G21 AND G22.

ALL EXPOSED DUCTWORK SHALL BE PREPARED FOR PAINTING. (PAINTING BY OTHERS)

DUCT INSULATION

SOUND (ACOUSTIC) INSULATION

PROVIDE INTERNAL SOUND INSULATION IN ALL DUCTS WITHIN 10'-0" OF THE DISCHARGE OF THE PACKAGED DX/GAS UNITS AND WHERE INDICATED ON THE DRAWINGS. THE DUCTWORK SHALL BE LINED WITH JOHNS MANVILLE PERMACOTE LINACOUSTIC. THICKNESS, UNLESS SPECIFIED OTHERWISE, SHALL BE 1". LINER SHALL BE APPLIED TO DUCT IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND SMACNA GUIDELINES, LATEST EDITION. WHERE SOUND INSULATION IS INDICATED, DUCTWORK SIZES DENOTED ARE THE INSIDE DIMENSIONS AFTER THE INSULATION HAS BEEN INSTALLED. PROVIDE LINED DUCTWORK WITH EXTERNAL INSULATION TO MAINTAIN R-VALUE AS INDICATED BELOW.

THERMAL INSULATION

COVER ALL CONCEALED UNLINED SUPPLY AIR AND OUTSIDE AIR DUCTWORK WITH FIBERGLASS DUCT WRAP HAVING A MIN. R-12, EQUAL TO JOHNS MANVILLE R-SERIES MICROLITE WITH F.R.G. VAPOR BARRIER. ALL SUPPLY DUCTS, LOCATED IN ATTIC SHALL BE INSULATED TO MINIMUM R-8. COVER ALL EXPOSED UNLINED SUPPLY AIR AND OUTSIDE AIR DUCTWORK WITH RIGID FIBERGLASS BOARD INSULATION HAVING MIN. R-6. PROVIDE ALL TAPE, MASTICS, SEALANTS, MOUNTING PINS, AND ETC. TO INSTALL INSULATION AS RECOMMENDED BY THE MANUFACTURER.

THERMAL INSULATION SCHEDULE

INSULATE DUCTS IN COMPLIANCE WITH THE INTERNATIONAL ENERGY CONSERVATION CODE. COMMERCIAL DUCTWORK SHALL BE INSULATED TO R-6 WHEN IN UNCONDITIONED SPACES AND R-8 WHEN LOCATED OUTSIDE THE BUILDING. COMMERCIAL DUCTWORK IN CONDITIONED SPACES DOES NOT REQUIRE INSULATION. RESIDENTIAL DUCTS OUTSIDE THE BUILDING ENVELOPE SHALL BE INSULATED TO A MINIMUM OF R-8. RESIDENTIAL DUCTWORK INSIDE THE BUILDINGS THERMAL ENVELOPE DOES NOT REQUIRE INSULATION. ALL EXTERIOR DUCTS TO BE INSULATED TO A MINIMUM OR R-8.

DUCT SEALING

SEAL ALL DUCTWORK IN COMPLIANCE WITH THE INTERNATIONAL ENERGY CONSERVATION CODE , AMENDED BY NYSTRETCH ENERGY CODE 2020, VERSION 1.0, DATED JULY 2019

COMMERCIAL DUCTS, SEAL ALL LONGITUDINAL AND TRANSVERSE JOINTS, SEAMS AND CONNECTIONS.

RESIDENTIAL DUCTS, VERIFY DUCT LEAKAGE WITH POST CONSTRUCTION OR ROUGH-IN TEST. RESIDENTIAL DUCT LEAKAGE VERIFICATION NOT REQUIRED IF AIR HANDLER AND ALL DUCTS ARE LOCATED WITHIN "CONDITIONED SPACE."

DUCT INSULATION - EXTERIOR DUCTWORK

EXTERIOR DUCTWORK SHOULD FIRST BE WRAPPED WITH 1-1/2" THICK RIGID FIBERGLASS INSULATION, COVERED WITH #907 MASTIC, WEATHERPROOF MEMBRANE APPLIED AND WRAPPED FOR THE ENTIRE LENGTH, THEN RE-APPLY MASTIC AS FINAL SEALING AGENT.

DUCT ACCESSORIES

VOLUME DAMPERS

SINGLE BLADE OR OPPOSED BLADE MULTI-LOUVER TYPE AS DETAILED IN SMACNA STANDARDS. PROVIDE END BEARING FOR ALL DAMPERS. QUADRANT OR OTHER OPERATOR FOR EXTERNALLY INSULATED DUCT SHALL HAVE STAND-OFF MOUNT SO OPERATION IS CLEAR OF THE INSULATION. PROVIDE VOLUME DAMPER IN DUCTWORK AT ALL RUN-OUT DUCT TO EACH CEILING DIFFUSER, AT ALL BRANCH DUCTS AND WHERE INDICATED.

SMOKE AND/OR FIRE DAMPERS

PROVIDE SMOKE AND/OR FIRE DAMPERS AS REQUIRED, WHETHER INDICATED OR NOT, AT ALL FIRE AND SMOKE RATED PARTITIONS. REVIEW ARCHITECTURAL PLANS FOR DESIGNATIONS. FIRE DAMPERS SHALL BE RUSKIN IBD 2, VERTICAL OR HORIZONTAL, STYLE B OR STYLE C FOR ROUND DUCTS, OR EQUAL. EACH SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH NFPA 90A LATEST EDITION AND BEAR U.L. LABEL AND SHALL CONFORM TO BULLETIN #UL-555. INSTALL IN ALL RATED WALLS AND CEILINGS AS REQUIRED AND/OR INDICATED ON DRAWINGS. PROVIDE STATIC TYPE FIRE DAMPER FOR TRANSFER DUCTS ONLY AND DYNAMIC TYPE FOR ALL OTHER LOCATIONS.

DUCT ACCESS DOORS

PROVIDE ACCESS DOORS, SIZED AND LOCATED FOR MAINTENANCE WORK, UPSTREAM WHERE POSSIBLE, FOR EACH DUCT MOUNTED SMOKE DETECTOR AND EACH FIRE DAMPER OR DEVICE WITHIN THE DUCT THAT REQUIRES SERVICE OR INSPECTION. ACCESS SECTIONS IN INSULATED DUCTS SHALL BE DOUBLE-WALL, INSULATED. REFER TO SMACNA STANDARDS. PROVIDE LOCK TYPE 2 (DOOR LATCH, NOT SASH LOCK).

COMMERCIAL APPLICATIONS

MOTORIZED DAMPERS

PROVIDE MOTORIZED SHUTOFF DAMPERS ON EXHAUST AND OUTDOOR AIR SUPPLY OPENINGS IN COMPLIANCE WITH THE IECC.

AMCA RATED, MINIMUM OF 0.1084 INCH THICK, GALVANIZED-STEEL FRAMES WITH HOLES FOR DUCT MOUNTING MINIMUM OF 0.0635 INCH THICK, GALVANIZED-STEEL DAMPER BLADES WITH MAXIMUM BLADE WIDTH OF 8 INCHES.

PROVIDE OPPOSED BLADE TYPE FOR MODULATING DAMPERS AND PARALLEL TYPE FOR TWO POSITION OPEN/CLOSE LOCATIONS.

EQUIPMENT

REFER TO PLANS AND EQUIPMENT SCHEDULES

TESTING AND BALANCING

GENERAL

COMPLETELY TEST AND BALANCE HOT AND CHILLED WATER SYSTEMS AND ALL SUPPLY, RETURN AND EXHAUST AIR SYSTEMS AND PROVE THE CAPACITIES OF THE SYSTEM AND THE SYSTEM COMPONENTS. SUBMIT RESULTS TO ENGINEER FOR APPROVAL

GENERAL PIPE TEST

UNLESS OTHERWISE NOTED, TEST ALL PIPING HYDROSTATICALLY AT NOT LESS THAN 200 PSIG (# PER SQUARE INCH PRESSURE) FOR TWO HOURS AND ALL DEFECTIVE MATERIAL SHALL BE REPLACED. BEFORE MAKING FINAL APPROVAL, THE SUBCONTRACTOR SHOULD PRODUCE A WRITTEN STATEMENT, SIGNED BY A REPRESENTATIVE OF THE OWNER'S UNDERWRITER, THAT THE WORK HAS BEEN COMPLETED AND TESTED IN ACCORDANCE WITH APPROVED SPECIFICATIONS AND PLANS. UNLESS OTHERWISE NOTED, PERFORM PRESSURE TESTS AND OBTAIN APPROVAL OF TEST RESULTS BEFORE STARTING CLEANING OR CONCEALING OF PIPE UNDER INSULATION OR OTHER FINISH. INSULATION REMOVAL AND REINSTALLATION WHICH IS REQUIRED BECAUSE INSULATION WAS INSTALLED PRIOR TO TESTING SHALL BE DONE BE THE CONTRACTOR AT NO EXTRA COST.

TESTS ARE SATISFACTORY ONLY WHEN JOISTS SHOW NO VISIBLE LEAKS AND TEST PRESSURE REMAINS CONSTANT AFTER CONTINUOUS TEST PERIOD. REPAIR LEAKS, AND REMOVE AND REPLACE DEFECTIVE PIPE, FITTINGS AND JOISTS WITH NEW MATERIAL, UNTIL ACCEPTED BY ARCHITECT AND INSPECTING AUTHORITY. WICKING, CAULKING, COMPOUNDING, PEENING, OR OTHER MAKESHIFT TYPE OF REPAIRS ARE NOT PERMITTED. REPEAT TESTS AFTER REPAIRS UNTIL SYSTEMS ARE PROVEN TIGHT.

REFRIGERANT PIPE TEST

TEST FOR LEAKS BY FILLING SYSTEM WITH DRY NITROGEN. COMPRESSOR SUCTION AND DISCHARGE VALVES SHALL BE CLOSED. EXPANSION VALVES SHALL BE PLUGGED. USE SEPARATE PUMP OR AVAILABLE GAS CYLINDER PRESSURE TO PRESSURIZE SYSTEM.

MAXIMUM TEST PRESSURE SHALL NOT EXCEED 120% OF FOLLOWING MINIMUM TEST PRESSURE:

A. REFRIGERANT HIGH SIDE PIPING: 250 PSIG
B. REFRIGERANT LOW SIDE PIPING

APPLY SOAPY WATER MIXTURE AND VISUALLY INSPECT EACH PIPE JOINT, VALVE PACKING AND BONNET, FLANGE, SIGHT GLASS, FITTING AND PIECE OF EQUIPMENT FOR LEAKAGE, LIQUID LEAK DETECTOR SHALL NOT BE USED EXCEPT WITH PRIOR WRITTEN APPROVAL FROM ARCHITECT. AFTER PRESSURE TESTS HAVE BEEN COMPLETED AND ACCEPTED, EVACUATE SYSTEMS TO ATMOSPHERE AND PROCEED WITH EVACUATION TESTS.

AIR SYSTEMS BALANCING

PROCURE THE SERVICES OF A CERTIFIED BALANCING CO. TO PERFORM THE TESTING AND BALANCING OF THE AIR SYSTEMS.

COMPLETELY TEST AND BALANCE ALL SUPPLY, RETURN AND EXHAUST AIR SYSTEMS AND PROVE THE CAPACITIES OF THE SYSTEM AND THE SYSTEM COMPONENTS. BALANCE THE GRILLES, REGISTERS, DIFFUSERS AND EQUIPMENT TO OBTAIN THE RESULTS INDICATED ON THE DWGS. SUBMIT A BALANCING REPORT INDICATING THE RESULTS TO ENGINEER FOR APPROVAL.

CONTROLS

GENERAL

PROVIDE ALL TEMPERATURE, OPERATION AND SAFETY CONTROLS, LOW VOLTAGE CONTROL WIRING, HARDWARE, SOFTWARE, AND ACCESSORIES NECESSARY TO ACHIEVE A FULLY OPERATIONAL HVAC CONTROL SYSTEM. POWER WIRING SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.

PROVIDE A PROGRAMMABLE THERMOSTAT(S) IN COMPLIANCE WITH THE INTERNATIONAL ENERGY CONSERVATION CODE INCLUDING SETBACK (55°F HEAT, 85° COOL) DEADBAND (5°F COMMERCIAL) AND TIMECLOCK (7 DAY COMMERCIAL)

SEQUENCE OF OPERATION

PROVIDE ALL TEMPERATURE, OPERATION AND SAFETY CONTROLS, LOW VOLTAGE CONTROL WIRING, HARDWARE, SOFTWARE, AND ACCESSORIES NECESSARY TO ACHIEVE A FULLY OPERATIONAL HVAC CONTROL SYSTEM. POWER WIRING SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.

ENERGY RECOVERY UNIT (ERV-1):

THE ERV-1 SHALL RUN CONTINUOUSLY. THE SUPPLY FAN SHALL RUN CONTINUOUSLY AND MODULATE TO MAINTAIN DISCHARGE PRESSURE SETPOINT, THE EXHAUST FAN SHALL RUN CONTINUOUSLY, OUTDOOR/EXHAUST DAMPER SHALL MODULATE OPEN AND THE DX COOLING AND DIRECT GAS FIRED HEATING SYSTEM SHALL RUN TO MAINTAIN DISCHARGE SETPOINT (70°F ADJ).

SMOKE DETECTOR: WHEN SMOKE IS DETECTED BY SMOKE DETECTOR, THE UNIT WILL SHUTOFF AND ALARM SIGNAL SHALL BE TRANSMITTED TO THE FIRE ALARM SYSTEM. THE OUTSIDE/EXHAUST AIR DAMPER SHALL CLOSE AND THE SUPPLY/EXHAUST FANS ASSOCIATED WITH THE UNIT SHALL BE TURNED OFF.

VRF SPLIT SYSTEM HEAT PUMPS HP'S/HPCU'S:

THE SYSTEMS SHALL ENABLE TO START/STOP VIA ITS DEDICATED WALL MOUNTED DIGITAL PROGRAMMABLE CONTROLLER. DURING "ON" MODE THE ASSOCIATED THERMOSTAT SHALL ENERGIZE THE COMPRESSOR AND SUPPLY FAN TO MAINTAIN ROOM SET POINT OF 75°F ADJUSTABLE.

UNITS SHALL SHUT OFF UPON SAFETY FLOW SWITCH LEVEL IS ACTIVATED.

ELECTRIC HEATERS (EUH'S, EWH'S, EKH'S):

THE ELECTRIC HEATER SHALL ENABLE START/STOP BY ITS DEDICATED THERMOSTAT AND RUN TO MAINTAIN SPACE SETPOINT.

RADIANT HEATING:

REFER TO RADIANT DIAGRAM AND CONTROL DWG M301

AIR CURTAIN UNIT (ACU'S):

THE UNIT SHALL START/STOP BY ITS DEDICATED INTELLISWITCH DIGITAL CONTROLLER PLUS MODE INCLUDING ASSOCIATED INTERFACE WITH DOOR SWITCH (SET SPEED), THERMOSTAT, ELECTRIC HEATER/LOW FAN SPEED.

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