ABBREVIATIONS

ABV.	ABOVE
AC	AIR CONDITIONER
ACT	AIR CURTAIN
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AL	ACOUSTICAL LINING
ALD	AUTOMATIC LOUVER DAMPER (MOTORIZED)
ATC	AUTOMATIC TEMPERATURE CONTROL
B.D.D.	BACK DRAFT DAMPER
BMS	BUILDING MANAGEMENT SYSTEM
BOD	BOTTOM OF DUCT
BOIL	BOILER
BHP	BRAKE HORSE POWER
BRD	BAROMETRIC RELIEF DAMPER
BTU	BRITISH THERMAL UNIT
CC	COOLING COIL
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CG	CEILING GRILLE
CO2	CARBON DIOXIDE
CHW	CHILLED WATER
CHWLG	CHILLED WATER LOW GRADE (RADIANT SYSTEM)
CO	CLEAN OUT
COD	CABLE OPERATED VOLUME DAMPER
CDP	CONDENSATE DRAIN PIPING
CWP	CONDENSER WATER
CP	CONDENSATE PUMP RETURN
CAV	CONSTANT AIR VOLUME TERMINAL
DN	DOWN
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
EHC	ELECTRIC HEATING COIL
ET	EXPANSION VESSEL/EXPANSION TANK
EWT	ENTERING WATER TEMPERATURE
EXTK	EXPANSION TANK
FC	FLEXIBLE CONNECTION
FC	FAN COIL UNIT
FD/AD	FIRE DAMPER/ACCESS DOOR
FD/GA	FIRE DAMPER/GRILLE ACCESS
FTR	FIN TUBE RADIATOR

ABBREVIATIONS

FL	FLOOR
FLA	FULL LOAD AMPS
FSD	FIRE SMOKE DAMPER
FSD/AD	FIRE SMOKE DAMPER/ACCESS DOOR
FSD/GA	FIRE SMOKE DAMPER/GRILLE ACCESS
FFSD/AD	FLOOR FIRE SMOKE DAMPER/ACCESS DOOR
GPM	GALLONS PER MINUTE
GX	GENERAL EXHAUST
SPF	STAIR PRESSURIZATION FAN
HC	HEATING COIL
HHW	HEATING HOT WATER
HP	HORSE POWER
HTEX	HEAT EXCHANGER
ID	INSIDE DIMENSION
KW	KILOWATT
KX	KITCHEN EXHAUST
LAT	LEAVING AIR TEMPERATURE
LED	LINEAR EXHAUST DIFFUSER
LRD	LINEAR RETURN DIFFUSER (CEILING, WALL, SILL, OR FLOOR)
LSD	LINEAR SUPPLY DIFFUSER (CEILING, WALL, SILL, OR FLOOR)
LTHW	LOW TEMPERATURE HOT WATER
LVL	LEVEL
LWS	LOUVER WITH WIRE SCREEN
LWT	LEAVING WATER TEMPERATURE
MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
MBTU	BRITISH THERMAL UNIT (1000 BTU)
MIN	MINIMUM
MD	MOTORIZED DAMPER
NC	NORMALLY CLOSED
NFA	NET FREE AREA
NIC	NOT IN THIS CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAT	OUTSIDE AIR TEMPERATURE
OBD	OPPOSED BLADE DAMPER
OED	OPEN ENDED DUCT
P	PUMP
PHC	PRE-HEAT COIL

ABBREVIATIONS

PHX	PLATE & FRAME HEAT EXCHANGE
PSI	POUNDS PER SQUARE INCH (GAUGE)
RA	RETURN AIR
RF	RETURN FAN
RHC	REHEAT COIL
RPM	REVOLUTIONS PER MINUTE
RR	RETURN REGISTER
SA	SUPPLY AIR
SCHW	SECONDARY CHILLED WATER
SD	SMOKE DAMPER
SD/ALD	SMOKE DAMPER AND AUTOMATIC LOUVER COMBINATION
SF	SUPPLY FAN
SG	SUPPLY GRILLE
ST	SOUND TRAP
SEF	SMOKE EXHAUST FAN
TOD	TOP OF DUCT
TF	TRANSFER FAN
TG	TOP GRILLE
TR	TOP REGISTER
TD	TRANSFER DUCT
TRX	TRASH EXHAUST
TX	TOILET EXHAUST
UH	UNIT HEATER
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
VRV	VARIABLE REFRIGERANT VOLUME
WMS	WIRE MESH SCREEN
(300)	CUBIC FEET OF AIR PER MINUTE OR GALLONS PER MINUTE

GENERAL MECHANICAL NOTES

1. SHOULD THERE BE ANY DISCREPANCIES BETWEEN CONTRACT DOCUMENTS AND SPECIFICATIONS THE GREATER QUALITY OR QUANTITY OF WORK SHALL BE PERFORMED. THIS WORK MUST BE SUBMITTED IN WRITING TO ENGINEER PRIOR TO FINAL BID APPROVAL. NO EXTRAS SHALL BE ALLOWED AFTER THAT TIME. THIS SHALL ALSO PERTAIN TO ANY DISCREPANCIES IN THE CONTRACT DOCUMENTS OR BETWEEN TRADES.
2. NO MODIFICATIONS TO THE SPECIFICATIONS, CONSTRUCTION DOCUMENTS, OR INTENT OF THE SCOPE OF WORK SHALL BE ALLOWED WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE ENGINEER. ALL MODIFICATIONS, CHANGE ORDERS, ALTERNATES AND VALUE ENGINEERING SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT AND ENGINEER FOR REVIEW.
3. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF ALL TRADES RESPONSIBLE FOR FINAL CONNECTION OR ALL EQUIPMENT.
4. CONTRACTORS ARE RESPONSIBLE UNDERSTANDING AND BEING EDUCATED ON THE REQUIREMENTS TO OBTAIN NGBS NET ZERO CERTIFICATION AND PHIUS CERTIFICATION, AS WELL AS ALL PREREQUISITE CERTIFICATIONS NEEDED TO OBTAIN PHIUS. RESPONSIBILITY OF THE GENERAL CONTRACTOR AND TRADES TO PROVIDE REQUIRED FIELD TESTING REQUIRED TO OBTAIN CERTIFICATIONS. ALSO, ANY MODIFICATIONS NEEDED TO SYSTEMS AFTER INITIAL TESTING TO PASS RETESTING IF REQUIRED.
5. IECC 2021 MECHANICAL COMCHECK PERFROMED AND IS IN COMPLIANCE. REFERENCE JOB NAME JOHN GRACE ARMS IN COMCHECK DATABASE FOR REFERENCE

△

HVAC GENERAL NOTES

1. COORDINATE DUCTWORK WITH EXISTING AND NEW SITE CONDITIONS, EQUIPMENT MANUFACTURE AND ALL OTHER TRADES TO PREVENT INTERFERENCES. RESIZE AND FIELD ROUT AS REQUIRED, USE EQUIVALENT DUCT SIZING.
2. PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURER RECOMMENDATIONS AND CODE REQUIREMENTS.
3. ALL CORING THROUGH FLOORS SHALL BE DONE BY MECHANICAL CONTRACTOR.
4. ALL DUCTWORK SHALL BE ROUTED AS HIGH AS POSSIBLE, UNLESS OTHERWISE NOTED ON THE DRAWINGS. COORDINATE ROUTING WITH OTHER TRADES TO PREVENT INTERFERENCES.
5. BALANCE HVAC SYSTEMS AND DISTRIBUTION INCLUDING SUPPLY, RETURN AND OUTDOOR AIR TO INDICATED FLOW RATES, REFER TO VENTILATION SCHEDULE AND HVAC PLAN. IF NOT INDICATED ON DRAWING OR DETAIL PROVIDE PROPER EQUIPMENT ON THE FIELD TO PROPERLY BALANCE SYSTEMS.
6. DUCT SIZES TO DIFFUSERS SHALL MATCH NECK OR DIMENSIONS REQUIRED, REFER TO SCHEDULES.
7. ALL CONCEALED SUPPLY AIR DUCTWORK SHALL BE INSULATED PER SPECIFICATIONS.
8. SEAL ALL PENETRATIONS THROUGH WALLS PER SPECIFICATION.
9. COORDINATE EXACT LOCATION OR DIFFUSERS AND RETURN GRILLS WITH ARCHITECTURAL AND ELECTRICAL REFLECTED CEILING PLANS.
10. COORDINATE THERMOSTAT LOCATIONS WITH ARCHITECT.
11. PROVIDE SPIN-IN DAMPERS AT ALL ROUND BRANCH DUCT CONNECTIONS TO DIFFUSERS. PROVIDE MANUAL VOLUME DAMPERS AS EACH BRANCH DUCT AT CONNECTION TO MAIN AS WELL AS IN EACH DUCT AFTER BRANCH DUCT SPLITS. THESE ARE NOT INDICATED ON PLANS BUT ARE REQUIRED. CONTRACTOR TO DETERMINE PROPER LOCATIONS TO PROPERLY BALANCE THE SYSTEM.

GENERAL PIPING NOTES:

1. COORDINATE NEW PIPING WITH EXISTING SITE CONDITIONS, EQUIPMENT, MANUFACTURER, AND ALL OTHER TRADES TO PREVENT INTERFERENCES.
2. PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURER RECOMMENDATIONS AND CODE REQUIREMENTS.
3. ALL CORING THROUGH FLOORS AND FLOOR TRENCHING SHALL BE BY MECHANICAL CONTRACTOR.
4. ALL PIPING SHALL BE ROUTED AS HIGH AS POSSIBLE, COORDINATE ALL ROUTING WITH OTHER TRADES TO PREVENT INTERFERENCES.
5. BALANCE WATER SYSTEMS TO INDICATED FLOW RATES REQUIRED BY MANUFACTURER OF EQUIPMENT IN EQUIPMENT SCHEDULES.
6. ALL PIPING SHALL BE INSULATED PER SPECIFICATIONS.
7. ALL PIPING SHALL BE CONCEALED IN WALLS OR CEILINGS SPACE.
8. SEAL ALL PENETRATIONS THROUGH WALLS. REFER TO SPECIFICATIONS.
9. EXPANSION LOOPS (JOINTS) AND GUIDES ARE TO BE USED ON ALL HOT WATER AND HOT WATER RETURN PIPING.

GENERAL SHEET MECHANICAL NOTES

1. SEE M-001 FOR ADDITIONAL NOTES
2. THE DRAWINGS ARE DIAGRAMMATIC AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS AND COORDINATION WITH OTHER TRADES WILL BE REQUIRED. PROVIDE ADDITIONAL FITTINGS AND OFFSETS THAT MAY BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS AND ANY OTHER EXISTING SPACE CONSTRAINTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH ALL TRADES FOR UTILIZATION OF SPACE CONSTRAINTS.
3. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR LOCATION OF LIGHTS, CEILING DROPS AND ELEVATIONS.
4. THE CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL EXISTING ABOVE CEILING EQUIPMENT INCLUDING STRUCTURAL TO AVOID INTERFERENCES.
5. ALL SUPPLY DUCT WORK SHALL BE INSULATED PER SPECIFICATIONS.
6. ROUND DUCT BRANCH CONNECTIONS TO DIFFUSERS TO BE SAME SIZE AS DIFFUSER NECK.
7. PROVIDE DUCT TAP WITH VOLUME DAMPER AT EACH BRANCH TO DIFFUSER DUCT CONNECTION, SPIN -IN FITTINGS MAY BE USED WHERE ROUND DUCTS ARE CONNECTING TO RECTANGULAR DUCTS.
8. BALANCING THE AIR SYSTEM IS REQUIRED REFER TO HVAC SPECIFICATIONS, NOTES AND DRAWINGS.

MECHANICAL KEYED SHEET NOTES

1. KITCHEN EXHAUST HOODS PROVIDED BY ARCHITECT, TRADES TO COORDINATE EXHAUST CONNECTIONS SIZE AND CFM WITH HOOD MANUFACTURER. INSTALL EXHAUST DUCT PER MANUFACTURERS RECOMMENDATIONS, INSTALL CEILING RADIATION DAMPER PER CODE. EXHAUST ROUTING CAN NOT TIE INTO ERV EXHAUST SYSTEM, ROUTE IN MANNER THAT IT DOES NOT INTERFERE WITH ERV DUCT WORK.
2. TRANSISTION TO SUPPY/RETURN GRILL FOR INLAY OF WINDOW GRILL HEIGHT WILL BE 12" X WIDTH OF EXISTING WINDOW OPENING.
3. ALL REFRIGERATION LINE SETS RUNNING ALONG EXPOSED EXTERIOR BRICK HAS TO HAVE UV RESISTANT PLASTIC COVERS. COLOR TO MATCH BRICK AS APPROVED BY ARCHITECT.
4. ERV EXHAUST DUCT TO SIDE WALL, TERMINATE WITH VENT CAP, BUILT IN BACKDRAFT DAMPER AND BIRD SCREEN. INSTALL DUCT IN TRUSS SPACE WHICH IS NOT KNOWN AT THIS TIME AND NEEDS TO COORDINATE WITH TRUSS MANUFACTURER.
5. ERV OUTSIDE AIR DUCT TO SIDEWALL TERMINATE WITH OA LOUVER, INSULATE DUCT FROM LOUVER TO ERV UNIT. COORDINATE DUCT ROUTING WITH TRUSS MANUFACTURER AND ARCHITECTURAL DRAWINGS, ALSO INCLUDE RADIATION DAMPER.
6. REFRIGERANT PIPING UP TO ROOF THROUGH PITCH BOX TO ASSOCIATED CONDENSER. ADHERE TO MANUFACTURER REQUIREMENTS FOR TOTAL LENGTH OF PIPING FOR HEAT PUMP SYSTEM, DO NOT EXCEED LENGTH. ROUTE NEEDED POWER AND CONTROL WIRING FROM HEAT PUMP CONDENSER IN SAME LOCATION WITH REFRIGERANT PIPING.
7. PROVIDE RETURN AIR FILTER AND RETURN GRILL COMBINATION AND PROVIDE FILTER (MERV 8) AT REQUIRED SIZE.
8. 4 " DRYER EXHAUST TO ROOF OR SIDE WALL, TERMINATE WITH VENT CAP WITH INTEGRAL BACKDRAFT DAMPER. COORDINATE LOCATION WITH OTHER TRADES AND EQUIPMENT TO AVOID INTERFERENCE.
9. FAN COIL UNIT TO BE HANG ABOVE CEILING WITH PROPER ACCESS PANEL AND CLEARANCE PROVIDED. COORDINATE CONDENSATE DRAIN ROUTING TO NEAREST MECHANICAL FLOOR DRAIN.
10. THERMOSTAT LOCATION, PROVIDE PROPER CONTROL WIRING BACK TO FAN COIL UNIT.
11. ERV UNIT, TO BE INTERLOCKED WITH FAN COIL UNIT, SEE MANUFACTURER REQUIREMENTS FOR WIRING.
12. EXHAUST FAN AND LIGHT COMBO UNIT, ROUTE 6 IN DUCT WORK TO EXHAUST PORT OF THE ERV UNIT. UNIT TO BE CONTROLLED OCCUPANCY, REFER TO ELECTRICAL.

HVAC SYMBOLS (DUCTWORK)

	RECTANGULAR DUCT SUPPLY
	RECTANGULAR DUCT RETURN
	RECTANGULAR DUCT EXHAUST
	ROUND DUCT SUPPLY
	ROUND DUCT RETURN
	ROUND DUCT EXHAUST
	DUCT WITH ACOUSTIC LINING
	DUCT WRAPPED WITH FIRE RATED INSULATION
X" TH	BRANCH DUCT WITH RADIUSED SIDE SPLIT - RECTANGULAR DUCT
	BRANCH DUCT TAP, SINGLE BOOT - RECTANGULAR DUCT
	BRANCH DUCT TAP, DOUBLE BOOT - RECTANGULAR DUCT
	BRANCH DUCT TAP, SINGLE BOOT - ROUND & FLAT OVAL DUCT
	BRANCH DUCT TAP, DOUBLE BOOT - ROUND & FLAT OVAL DUCT
	FLEXIBLE DUCT
	FLEXIBLE CONNECTION
AD	ACCESS DOOR
C.O.	CLEAN OUT
	DUCT THROUGH BEAM PENETRATION
	AUTOMATIC DAMPER - OPPOSED BLADE
	AUTOMATIC DAMPER - PARALLEL BLADE
FSD	FIRE SMOKE DAMPER
FD	FIRE DAMPER
BD.D	BACKDRAFT DAMPER
BR.D	BAROMETRIC DAMPER
A2	SQUARE CEILING DIFFUSER (SHADED SECTORS INDICATE BLANK OFFS)
B2	ROUND CEILING DIFFUSER (SHADED SECTORS INDICATE BLANK OFFS)
C2	ROUND FLOOR DIFFUSER (UFAD)
	REGISTER - SIDEWALL/CEILING/FLOOR - SUPPLY
	REGISTER/GRILLE - SIDEWALL/CEILING/FLOOR - RETURN/EXHAUST
	WALL TRANSFER GRILLES
	LINEAR DIFFUSER/GRILLE - SUPPLY/RETUN/EXHAUST
	PLENUM FOR LINEAR DIFFUSER/GRILLE
SD	DUCT SMOKE DETECTOR
FS	DUCT FIRESTAT
AFS	AIRFLOW STATION
TR.D.	ACOUSTIC TRANSFER DUCT
	TERMINAL UNIT - VAV BOX - WITH/WITHOUT HEATING COIL
	TERMINAL UNIT - FAN COIL UNIT
	UNIT HEATER
	DUCT MOUNTED COIL
	DUCT MOUNTED HUMIDIFIER

HVAC SYMBOLS (PIPING)

	PIPE TURNING UP
	PIPE TURNING DOWN
	SLOPE RISE IN DIRECTION OF FLOW
	SLOPE DROP IN DIRECTION OF FLOW
	PIPE THROUGH BEAM PENETRATION
	WALL SLEEVE WITH WATER STOP
	ELBOW
	TEE
	BRANCH PIPE TOP CONNECTION
	BRANCH PIPE BOTTOM CONNECTION
	REDUCER/INCREASER CONCENTRIC
	REDUCER/DECREASER ECCENTRIC
	UNION (SCREWED)
	UNION (FLANGED)
	BLIND FLANGE
	END CAP
	BUTTERFLY VALVE
	PIPE ANCHOR
	BALL VALVE - MANUAL (LEVER HANDLE)
	BALL VALVE - MANUAL (TEE HANDLE)
	BALL VALVE - MOTORIZED
	ISOLATION VALVE (SEE SPEC FOR TYPE)
	BALANCING VALVE
	GLOBE VALVE
	TRIPLE DUTY VALVE
	PIPE GUIDE
	FLOWSETTER VALVE (BALANCING)
	CARTRIDGE FLOW BALANCER
	PRESSURE REDUCING VALVE
	PLUG VALVE
	CHECK VALVE (SWING TYPE)
	CHECK VALVE (SILENT TYPE, CENTER GUIDED)
	PRESSURE INDEPENDENT CONTROL VALVE (PICV)
	2 WAY CONTROL VALVE
	3 WAY CONTROL VALVE (MIXING TYPE)
	3 WAY CONTROL VALVE (DIVERTING TYPE)
S	SOLENOID VALVE
	RELIEF VALVE
BFP	BACKFLOW PREVENTOR
RPZ	BACKFLOW PREVENTER (RPZ TYPE)
	AIR VENT (AUTOMATIC)
	TEMPERATURE GAUGE (DUCT MOUNTED)
	PRESSURE GAUGE W/ PIGTAIL AND PETCOCK

HVAC SYMBOLS (PIPING)

	SIGHTGLASS
	FILTER-DRYER
LD	LEAK DETECTOR, PROBE TYPE
LD	LEAK DETECTOR, CABLE TYPE
M	METER
	AIR VENT (MANUAL)
	STRAINER WITH BLOW OFF
FS	FLOW SWITCH
	Y-STRAINER
	DRAIN VALVE WITH CAPPED HOSE END
	DUPLEX BASKET STRAINER
	TEMPERATURE GAUGE
	PRESSURE GAUGE W/ PIGTAIL AND PETCOCK
	FLEXIBLE COUPLING
	PIPE IN PIPE (FUEL OIL)
	HEAT TRACED PIPE
AS	AIR SEPARATOR
ET	EXPANSION TANK
	CHEM SHOT FEEDER
	PLATE AND FRAME HEAT EXCHANGER
	PUMP
	FLEX CONNECTORS

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KEY PLANS

SHEET TITLE

MECHANICAL SYMBOLS AND ABBREVIATIONS

SCALE: AS NOTED

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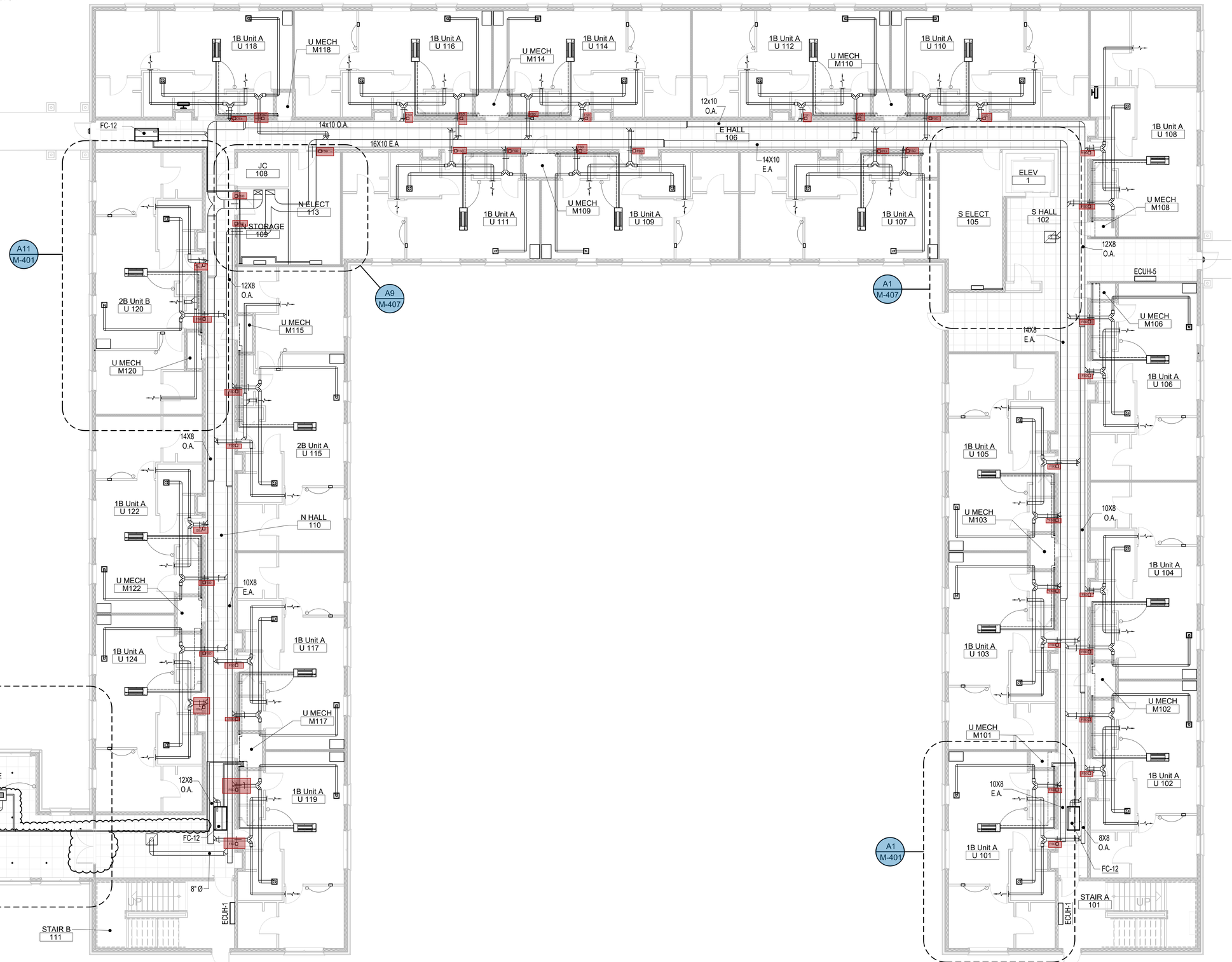
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SHEET NO. M-001

5/18/2025 7:51:49 PM

1. SEE SHEET NOTES AND SHEET KEYED NOTES ON M-001



A1 FIRST FLOOR - ADDITION MECHANICAL HVAC PLAN

M-102 SCALE" ⅛" = 1'-0"

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FIRST FLOOR - ADDITION MECHANICAL HVAC PLAN

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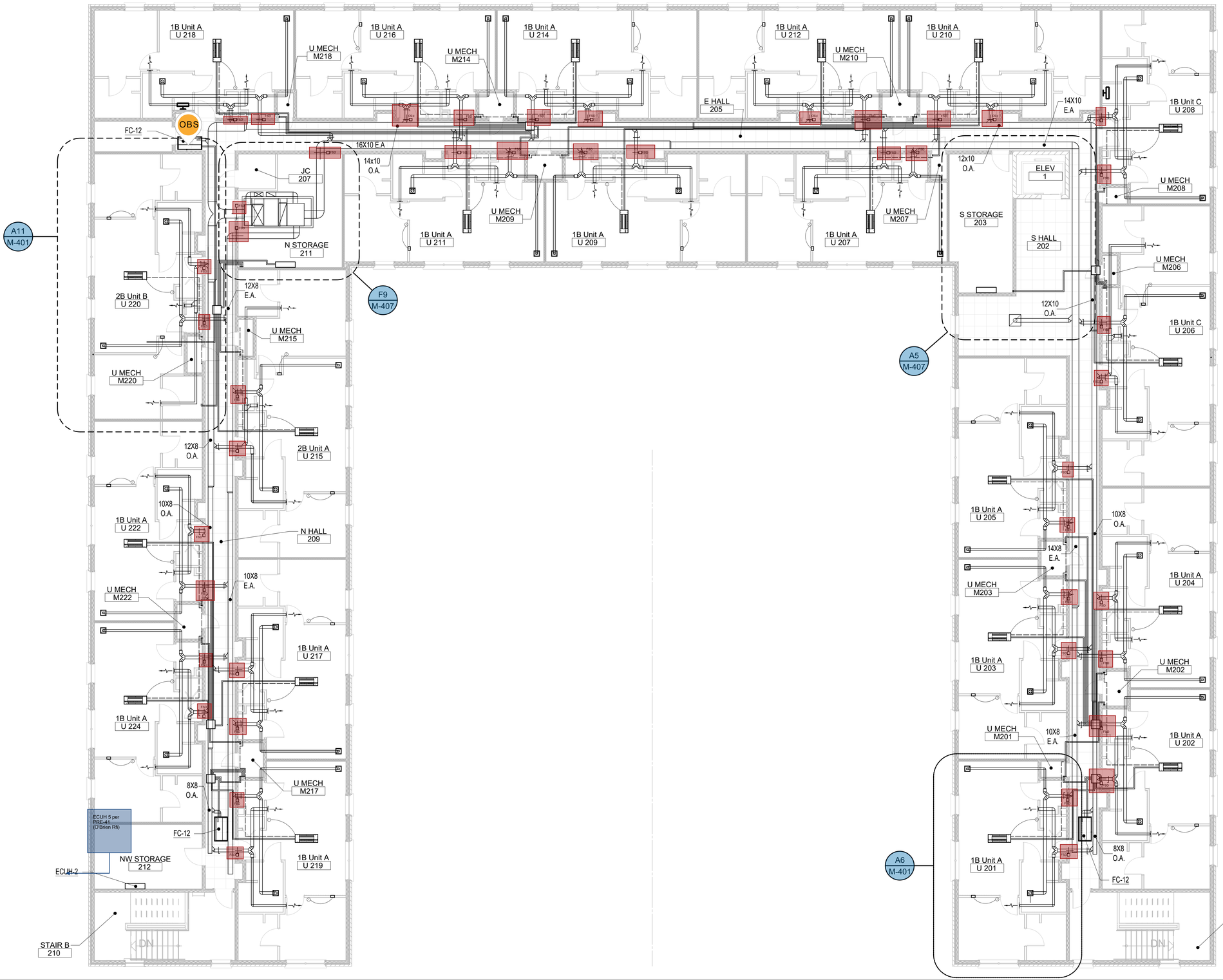
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3/10/2025 8:26:38 PM

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A1 SECOND FLOOR - ADDITION MECHANICAL HVAC PLAN

M-104 SCALE: 1/8" = 1'-0"

12/19/2024 6:22:22 PM

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SECOND FLOOR - ADDTION MECHANICAL HVAC PLAN

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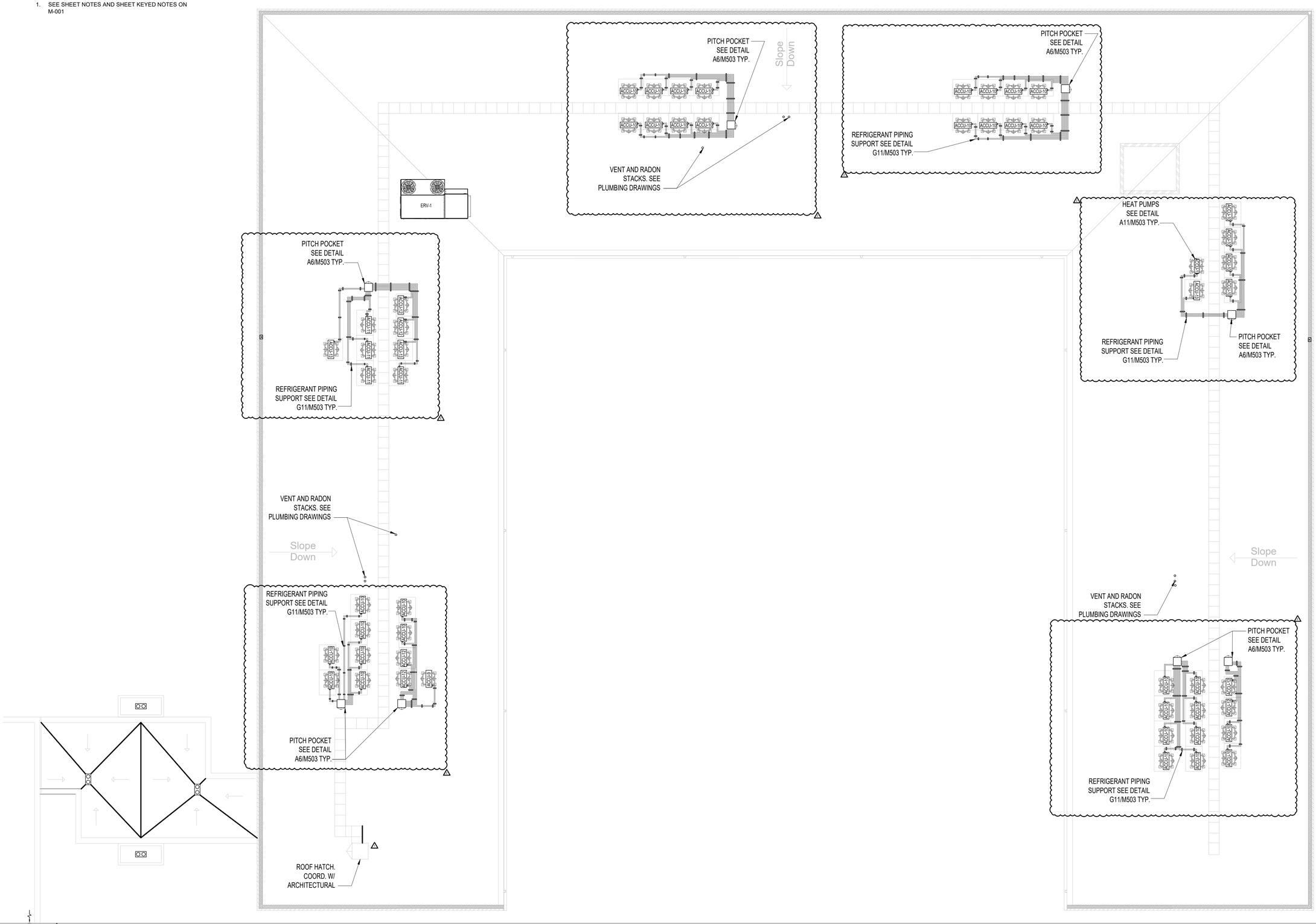
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1. SEE SHEET NOTES AND SHEET KEYED NOTES ON M-001



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SHEET TITLE

ROOF - ADDITION MECHANICAL PLAN

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△BULLETIN 12	9.23.26

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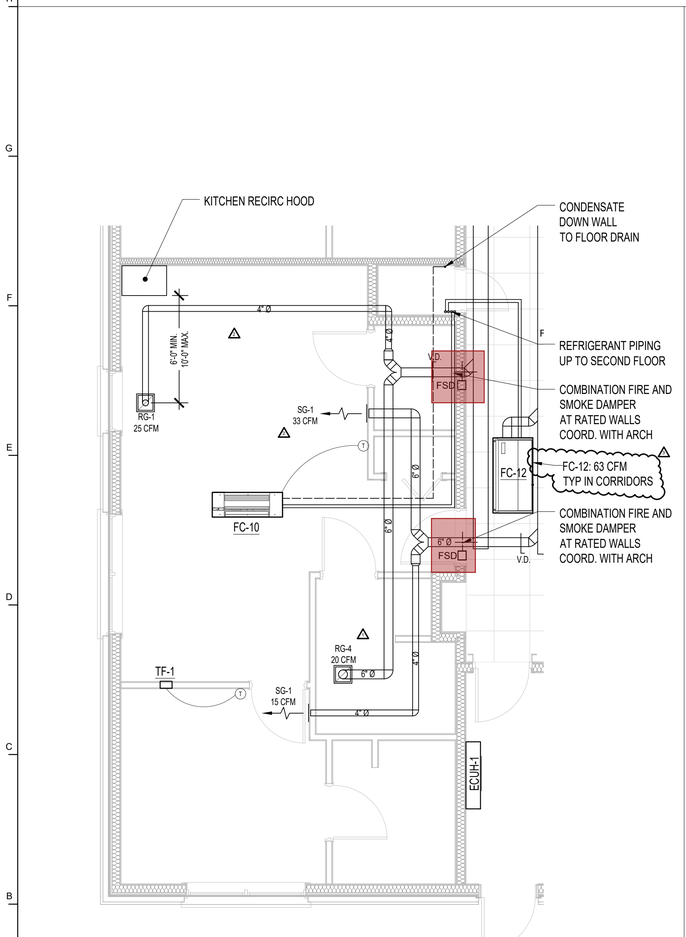
M-106
SHEET NO.

A1 | **ROOF - ADDITION MECHANICAL PLAN**

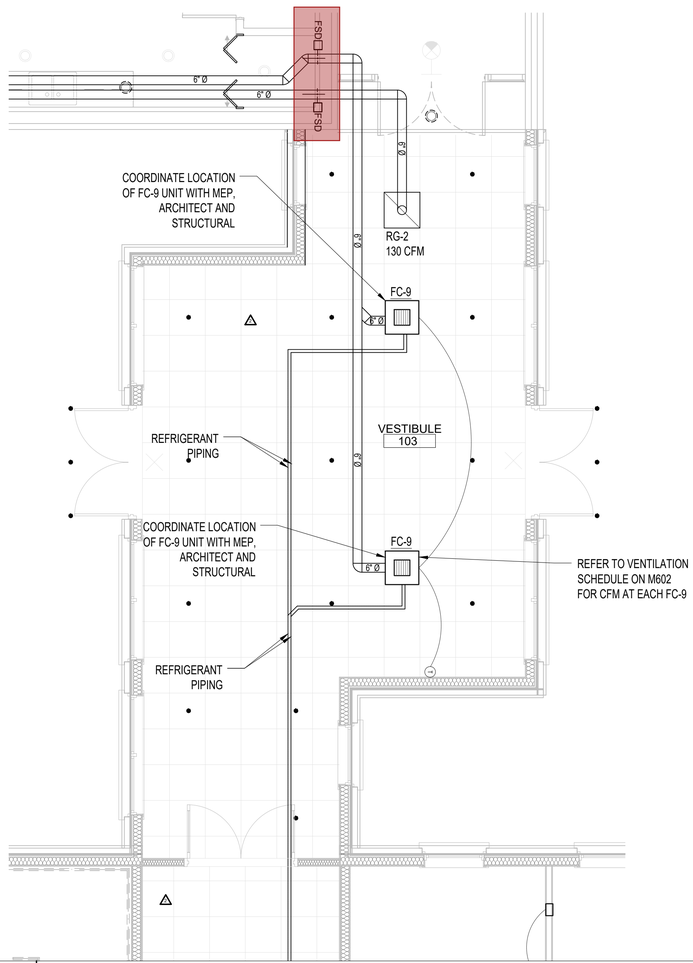
M-106 | SCALE" ⅛" = 1'-0"

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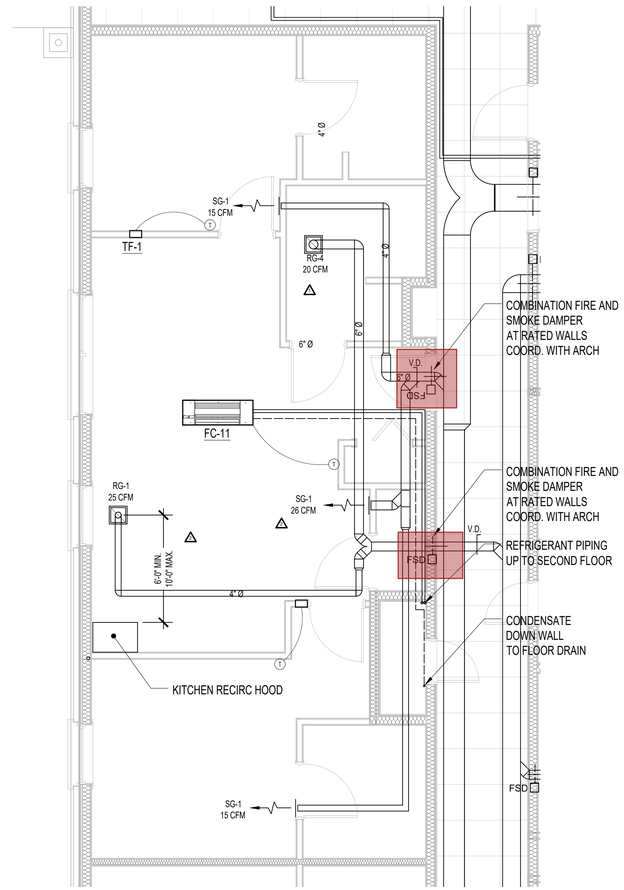
1. SEE SHEET NOTES AND SHEET KEYED NOTES ON M-001



A6 | **1B UNIT A - HVAC PLAN**
M-401 | 1/4" = 1'-0"



A6 | **ENLARGED HVAC PLAN**
M-401 | 1/4" = 1'-0"



A11 | **2B UNIT B (A SIM) - HVAC PLAN**
M-401 | 1/4" = 1'-0"

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KEY PLANS

SHEET TITLE
MECHANICAL HVAC ENLARGED PLANS

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△BULLETIN 1	2.19.25
△BULLETIN 2	3.05.25
△BULLETIN 3	5.19.25

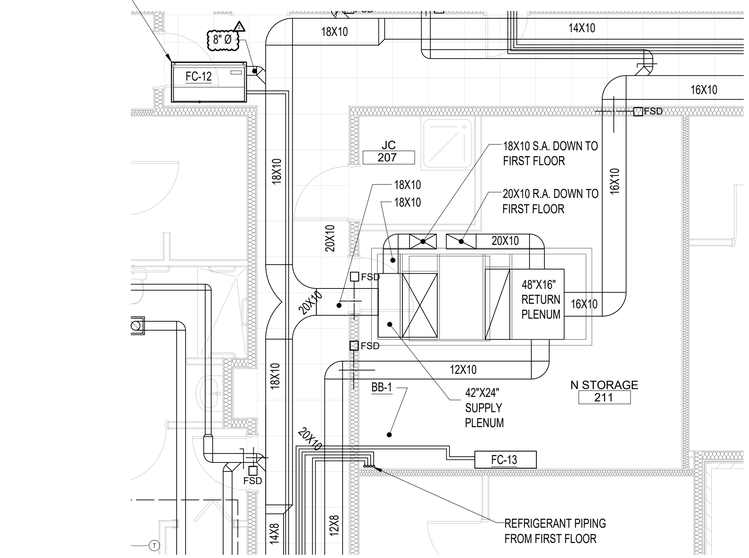
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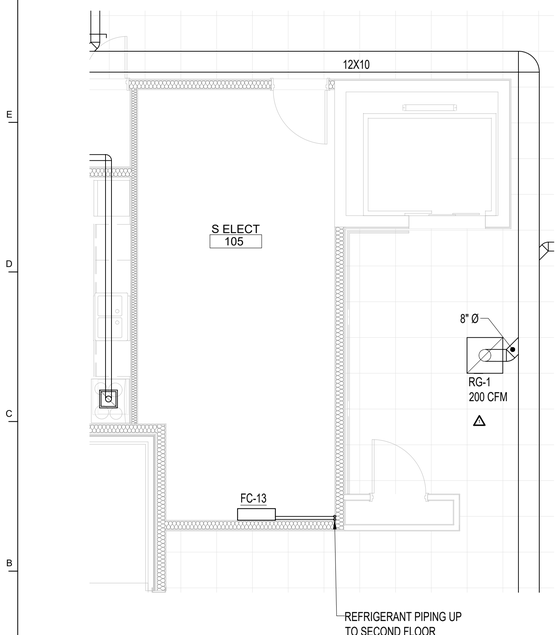
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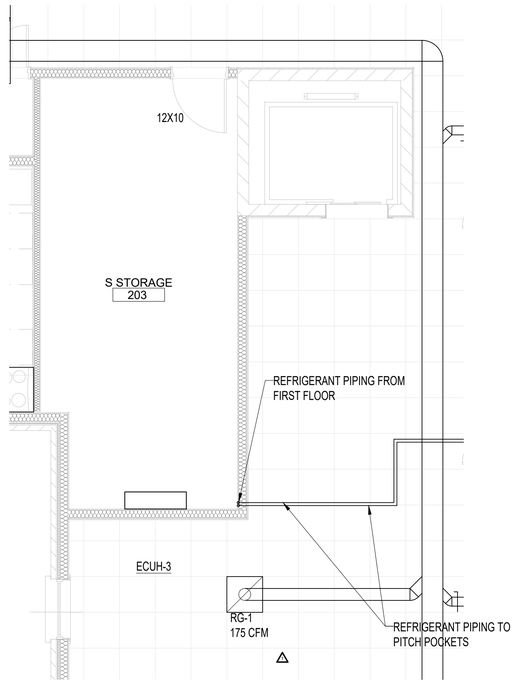
F9 ENLARGED SECOND FLOOR HVAC PLAN

M-407 | 1/4" = 1'-0"



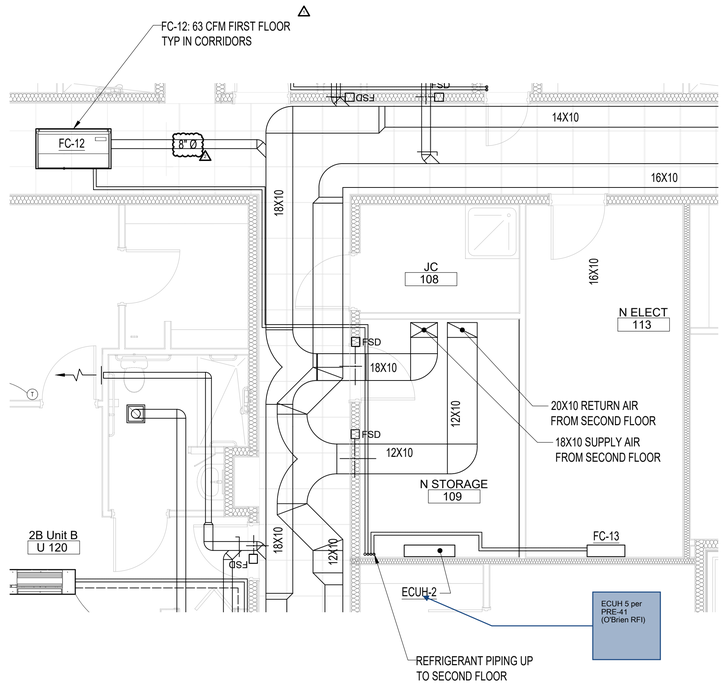
A1 ENLARGED HVAC PLANS

M-407 | 1/4" = 1'-0"



A5 ENLARGED HVAC PLANS

M-407 | 1/4" = 1'-0"



A9 ENLARGED FIRST FLOOR HVAC PLAN

M-407 | 1/4" = 1'-0"

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NO. 6201059975
LICENSED PROFESSIONAL ENGINEER

KEY PLANS

SHEET TITLE

MECHANICAL HVAC ENLARGED PLANS

SCALE: AS NOTED

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△BULLETIN 3	5.19.25
△BULLETIN 6	12.03.25

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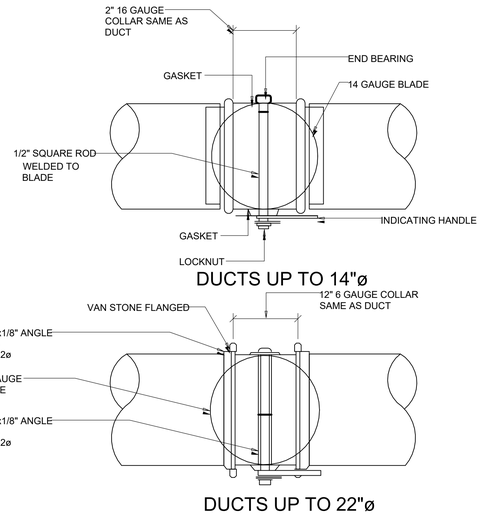
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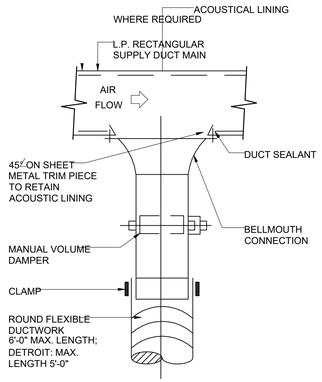
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NOTES:
1. WHEREVER POSSIBLE, DAMPER BLADE SHALL, BE INSTALLED IN VERTICAL POSITION.
2. FOR DUCTS OVER 22ø USE OPPOSED BLADE VOLUME DAMPER.
3. ALL QUADRANT OPERATORS SHALL BE EXTENDED TO OUTSIDE OF INSULATION

G1 ROUND VOLUME DAMPER

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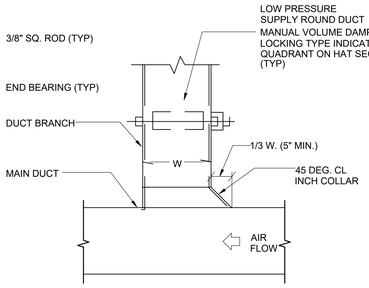


NOTES:

1. FLEXIBLE DUCT CONNECTIONS ARE ONLY PERMITTED IN AREAS WITH PNC-35 OR GREATER.

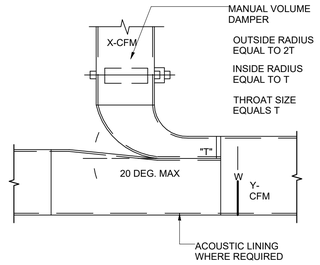
G6 LOW PRESSURE SUPPLY CONNECTION DETAILS

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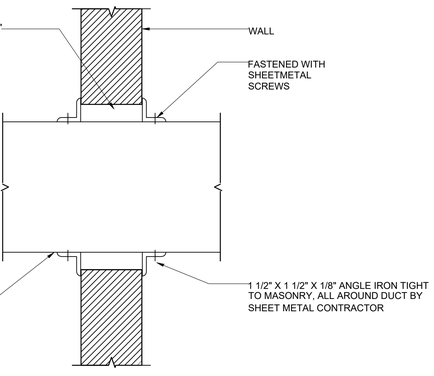
NOTES:

1. FURNISH THIS TYPE CONNECTION WHEN SINGLE-LINE DUCTWORK IS INDICATED AS THIS FOR BRANCHES WITH LESS THAN 25% OF THE TOTAL AIR FLOW.



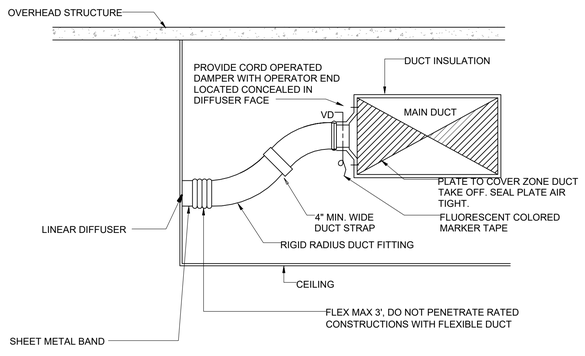
NOTES:

1. FURNISH THIS TYPE CONNECTION WHEN SINGLE-LINE DUCTWORK IS INDICATED AS THIS FOR BRANCHES WITH LESS THAN 25% OF THE TOTAL AIR FLOW.
2. THIS TYPE OF CONNECTION MUST BE USED WHEN W 36 IN.
3. T=X (BRANCH DUCT)x W
   Y (TOTAL CFM)



A1 DUCT PENETRATION - NON RATED WALL

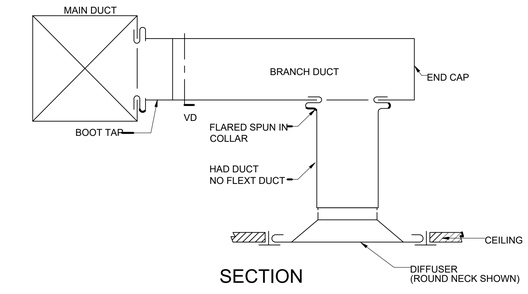
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NOTE:
1. FLEX DUCT INSTALLED PER MANUFACTURERS LISTING.

A6 LINEAR DIFFUSER DETAIL

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A11 CEILING DIFFUSER DETAIL

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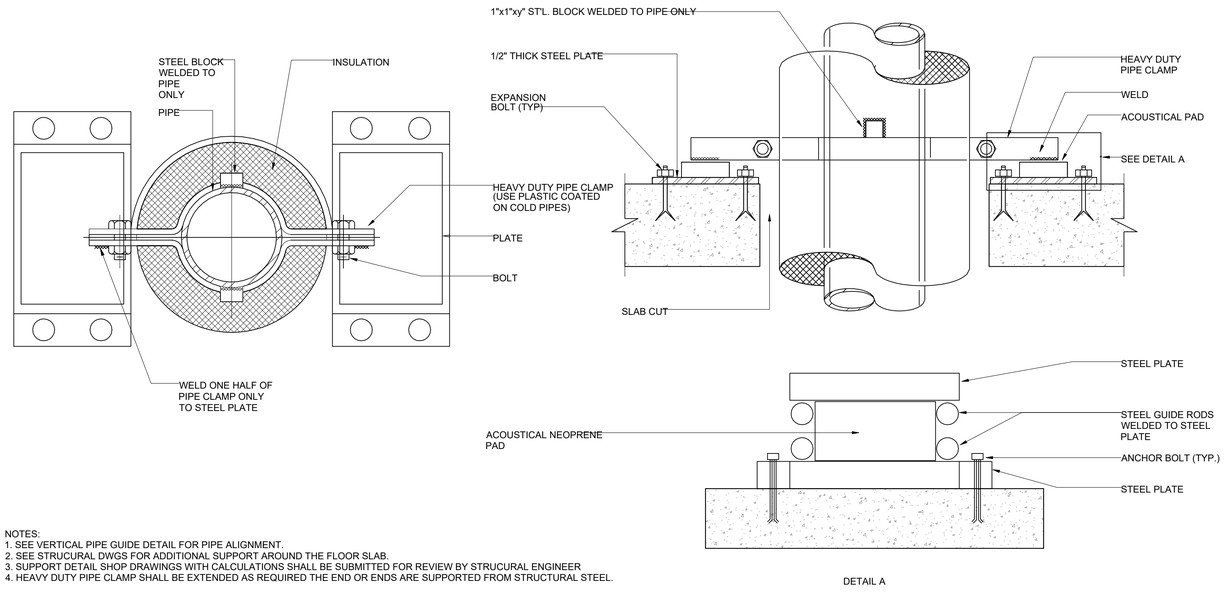
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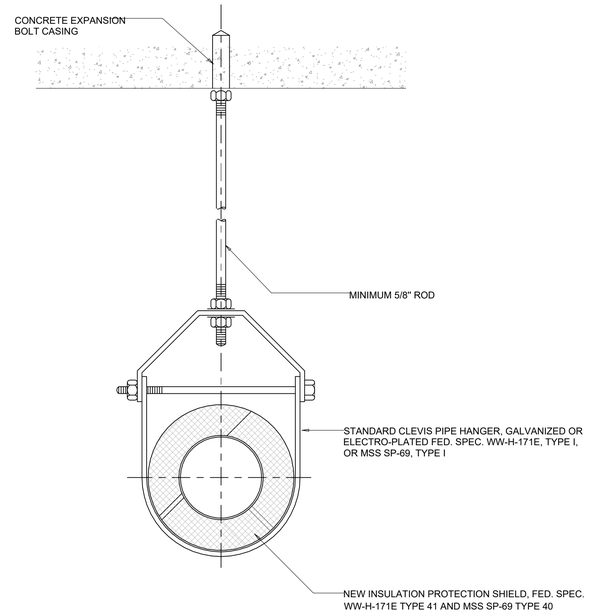
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NOTES:
1. SEE VERTICAL PIPE GUIDE DETAIL FOR PIPE ALIGNMENT.
2. SEE STRUCURAL DWGS FOR ADDITIONAL SUPPORT AROUND THE FLOOR SLAB.
3. SUPPORT DETAIL SHOP DRAWINGS WITH CALCULATIONS SHALL BE SUBMITTED FOR REVIEW BY STRUCURAL ENGINEER
4. HEAVY DUTY PIPE CLAMP SHALL BE EXTENDED AS REQUIRED THE END OR ENDS ARE SUPPORTED FROM STRUCTURAL STEEL.

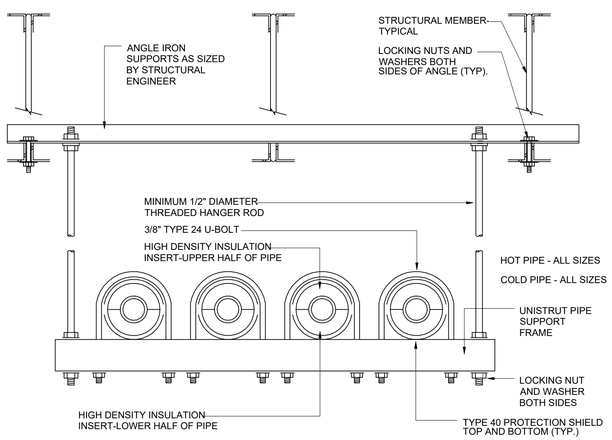
G1 VERTICAL PIPE SUPPORT

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G11 SUPPORT SYSTEM FOR INSULATED PIPES

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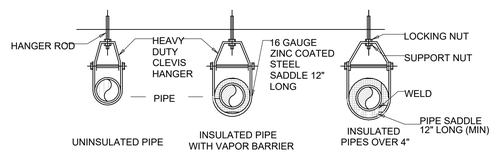


INDIVIDUAL PIPE HANGER ROD & SPACING SCHEDULE											
NOMINAL PIPE OR TUBE SIZE-INCHES	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8	--
HANGER ROD SIZE-INCHES	3/8	3/8	3/8	3/8	1/2	1/2	5/8	5/8	7/8	7/8	--
MAXIMUM SPACING BETWEEN INCHES	6	7	9	10	11	12	14	16	17	19	--
MAXIMUM SPACING BETWEEN CU, TUBE SUPPORT IN FEET	6	6	8	9	10	10	12	14	14	16	--

NOTES:
1. TRAPEZE SPACING SHALL BE BASED ON SPACING OF SMALLEST PIPE ON TRAPEZE.
2. TRAPEZE SHALL BE DESIGNED WITH A FACTOR OF SAFETY 5 FOR CENTER OF SPAN CONCENTRATED LOAD.
3. METHOD OF HANGING, TYPE OF INSERT, BEAM CLAMP, ROD, ETC. MUST BE APPROVED BY STRUCTURAL ENGINEER PER SHOP DRAWINGS.
4. FOR ALL UNINSULATED COPPER PIPING, HANGERS SHALL MATCH IN MATERIAL TYPE SO AS TO AVOID DISSIMILAR METAL CORROSION. THE USE OF NEOPRENE OR PVC SADDLES IS UNACCEPTABLE.

A1 TRAPEZE PIPE HANGERS

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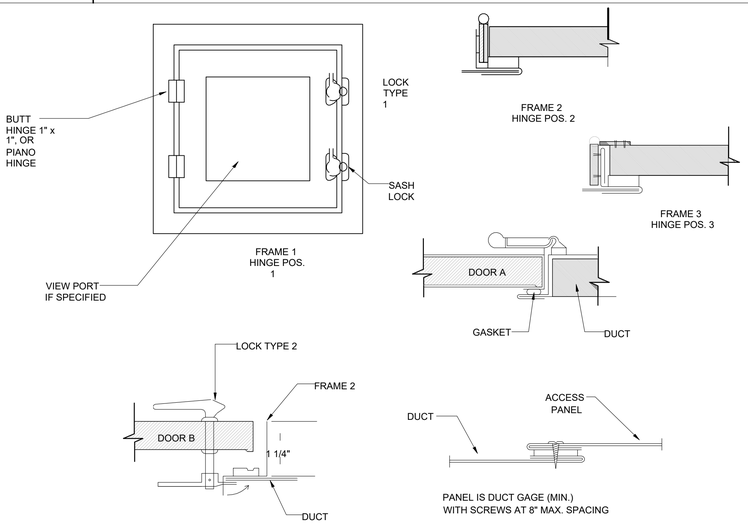


INDIVIDUAL PIPE HANGER ROD & SPACING SCHEDULE											
NOMINAL PIPE OR TUBE SIZE-INCHES	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8	--
HANGER ROD SIZE-INCHES	3/8	3/8	3/8	3/8	1/2	1/2	5/8	5/8	7/8	7/8	--
MAXIMUM SPACING BETWEEN PIPE SUPPORT-FEET	6	7	9	10	11	12	14	16	17	19	--
MAXIMUM SPACING BETWEEN CU, TUBE SUPPORT-FEET	6	6	8	9	10	10	12	14	14	16	--

NOTES:
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4. FOR ALL UNINSULATED COPPER PIPING, HANGERS SHALL MATCH IN MATERIAL TYPE SO AS TO AVOID DISSIMILAR METAL CORROSION. THE USE OF NEOPRENE OR PVC SADDLES IS UNACCEPTABLE.

A6 TYPICAL CLEVIS HANGER SUPPORTS

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	DOOR SIZE	NO. HINGES	NO. LOCKS	METAL GAGE		
				FRAME	DOOR	BACK
2" W.G. STATIC AND LESS	12" x 12" 16" x 20" 24" x 24"	2 2 3	1-S 2-S 2-S	24 22 22	26 24 22	26 26 26
3" W.G. STATIC	12" x 12" 16" x 20" 24" x 24"	2 2 3	1-S 1-S, 1-T, 1-B 2-S, 1-T, 1-B	22 20 20	22 20 20	26 26 24
4" W.G. TO 10" W.G.	12" x 12" 16" x 20" 24" x 24"	2 3 3	1-S,1-T,1-B 2-S, 1-T, 1-B 2-S, 2-T, 2-B	20 18 18	20 18 18	26 24 24
S = SIDE OPPOSITE HINGES, T = TOP, B = BOTTOM						

A11 DUCT ACCESS DOORS

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KEY PLANS

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MECHANICAL TYPICAL DETAILS

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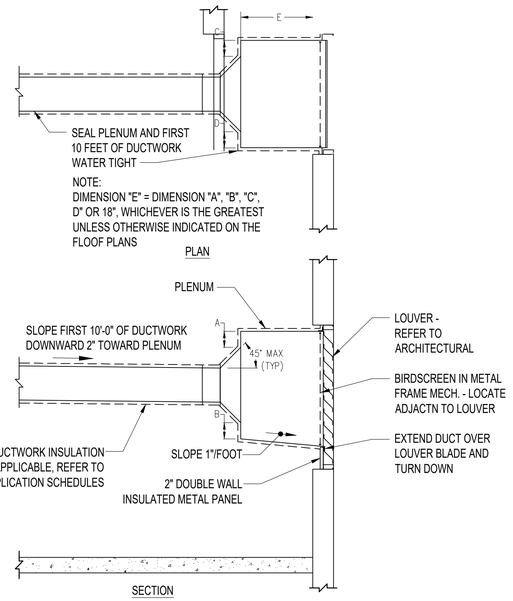
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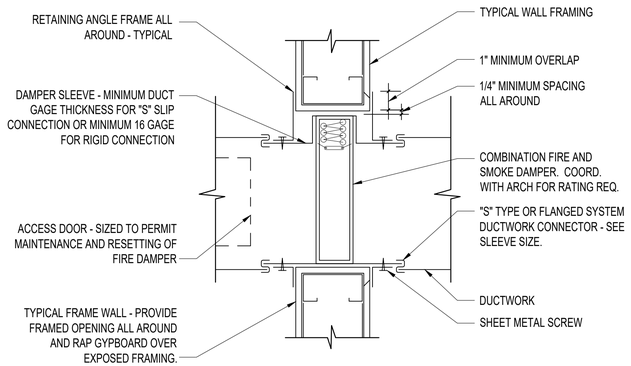
NOTE:

1. DUCTWORK INSULATION ON OA AND EA INCLUDING PLENUM TO BE FIBERGLASS BLANKET 2.25 LB/CU FT AT 1.5 INCHES THICK, IN ALL MECHANICAL ROOMS
2. DIMENSION "E" = DIMENSION "A", "B", "C",D" OR 18", WHICHEVER IS THE GREATESTUNLESS OTHERWISE INDICATED ON THE FLOOR PLANS
3. MOTORIZED DAMPER AT ERV



G1 INTAKE AND EXHAUST OUTDOOR LOUVER DETAIL

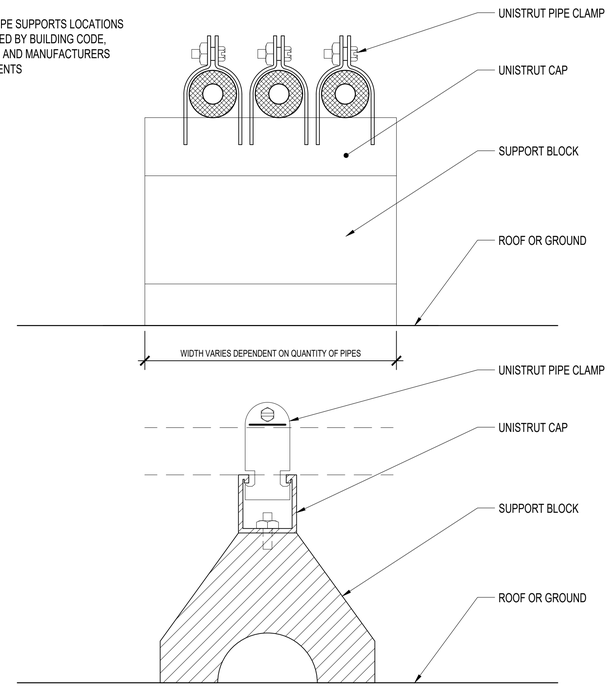
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G6 DUCT THROUGH FIRE PARTITION

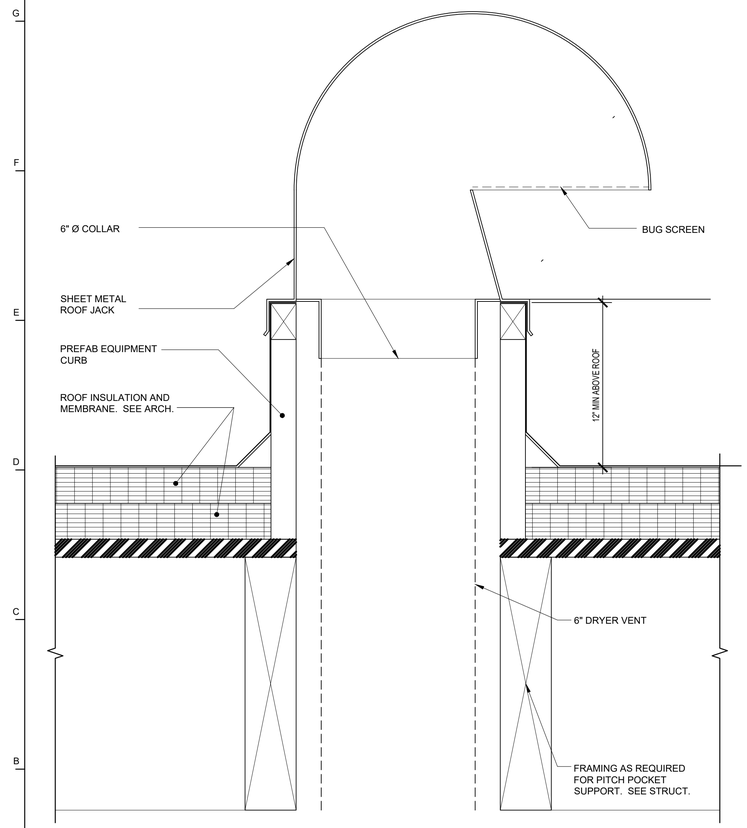
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NOTE:
PROVIDE PIPE SUPPORTS LOCATIONS AS REQUIRED BY BUILDING CODE, LOCAL AHJ AND MANUFACTURERS REQUIREMENTS



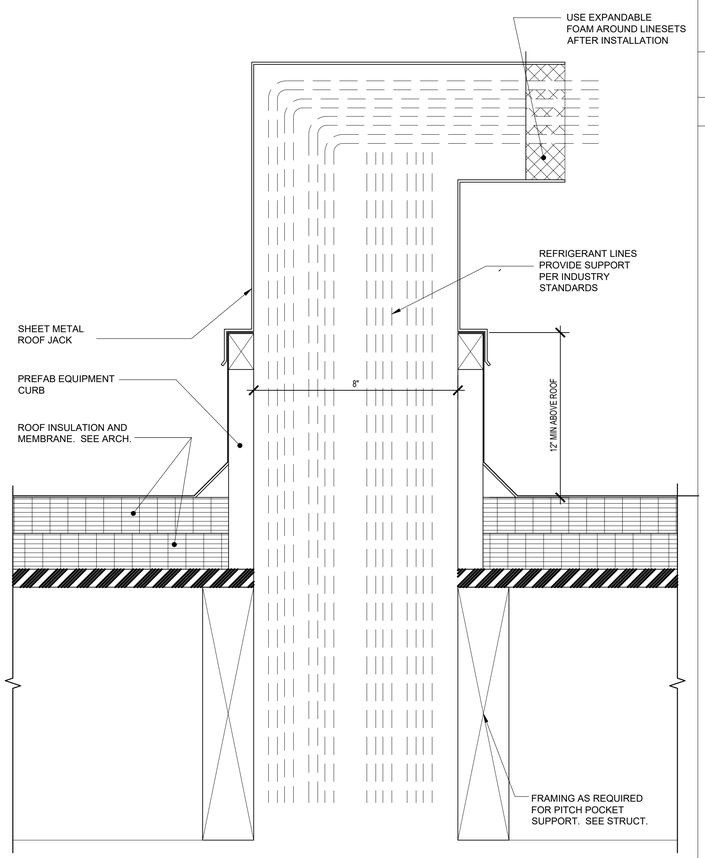
G11 PIPING SUPPORT DETIAL

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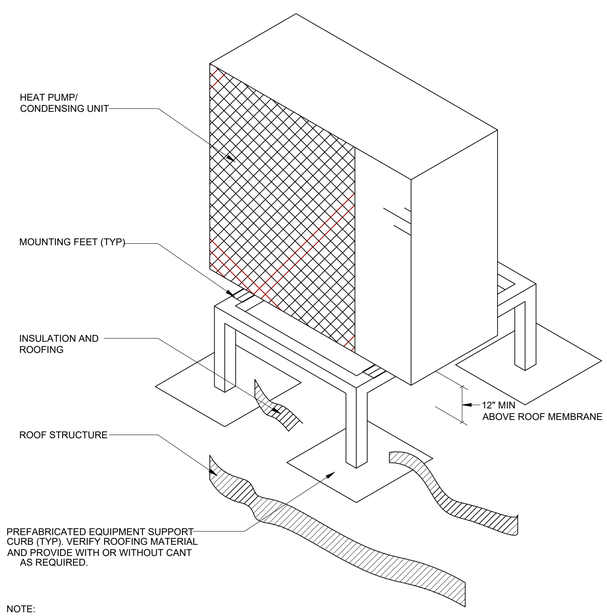
A1 DRYER VENT ROOF PENETRATION

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A6 REFRIGERANT LINE ROOF PENETRATION

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NOTE:
COORDINATE WITH EQUIPMENT MANUFACTURER FOR SUPPORT REQUIRED

A11 HEAT PUMP/CONDENSING UNIT ROOF RAILS

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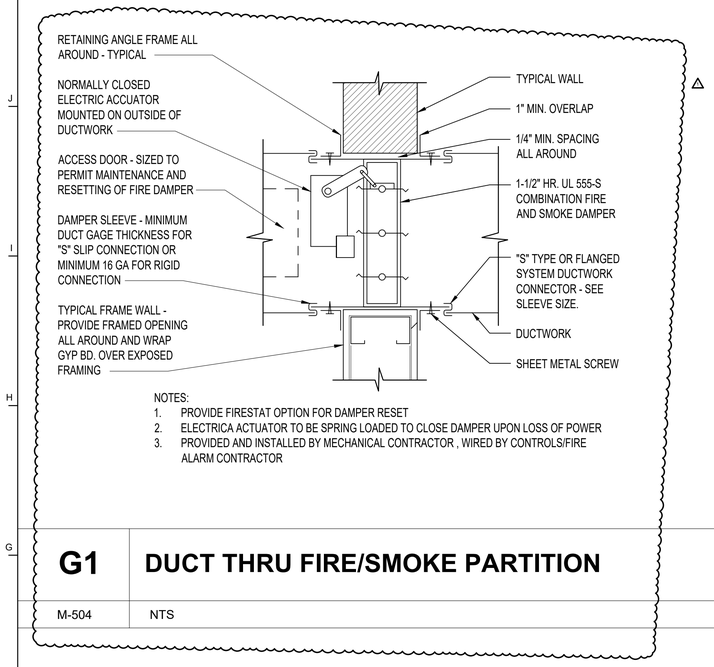
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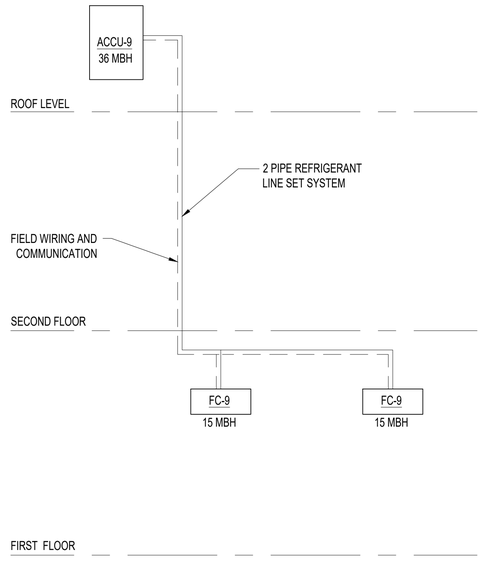
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NOTES:
1. PROVIDE FIRESTAT OPTION FOR DAMPER RESET
2. ELECTRICA ACTUATOR TO BE SPRING LOADED TO CLOSE DAMPER UPON LOSS OF POWER
3. PROVIDED AND INSTALLED BY MECHANICAL CONTRACTOR , WIRED BY CONTROLS/FIRE ALARM CONTRACTOR

G1 DUCT THRU FIRE/SMOKE PARTITION

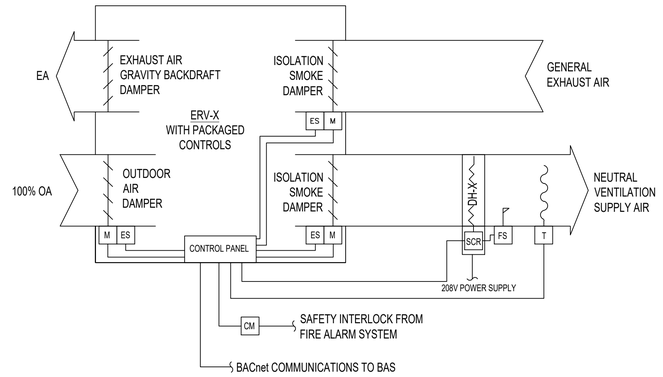
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MULTI-ZONE HEAT PUMP SYSTEM

G6 DESIGN SYSTEM BUILDER DIAGRAM - VESTIBULE

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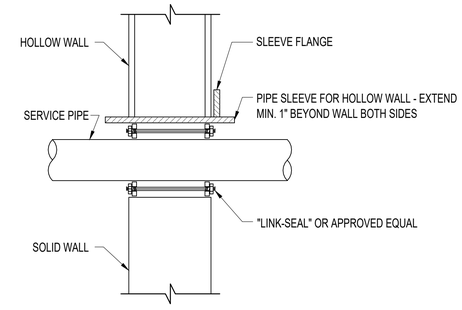
1. ERV SHALL BE SUPPLIED TO INCLUDE DAMPERS, FIRE ALARM INTERFACE CONTROLS AND ELECTRIC DUCT HEATER CONTROLS. UNIT SUPPLIED WITH 208V AND SEPARATE 120V FOR CONTROL PANEL. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FIELD WIRING REQUIRED FOR OPERATION AND CONTROL OF ERV.
2. CONTRACTOR SHALL PROVIDE ALL FIRE ALARM COMPONENTS AND WIRING TO TIE ERV INTO FIRE ALARM PANEL. COORDINATE WITH FIRE ALARM CONTRACTOR FOR SEQUENCE AND FINAL TIE INTO FIRE ALARM SYSTEM.

SEQUENCE OF OPERATION:

1. ERV SHALL MAINTAIN A NEUTRAL AND CONSTANT DISCHARGE AIR TEMPERATURE AND CFM FOR BUILDING VENTILATION REQUIREMENTS.
2. SUPPLY FAN AND EXHAUST FAN SPEEDS TO BE SET AT CONSTANT SPEED TO ACHIEVE CFM RATING REQUIRED, SEE DRAWING AND VENTILATION SCHEDULE FOR SETPOINTS.
3. DUCT ELECTRIC COIL SCR SHALL BE MODULATED BY A DUCT MOUNTED TEMPERATURE SENSOR TO MAINTAIN A DISCHARGE AIR TEMPERATURE OF 60 DEGREES F, TEMPERATURE TO BE ADJUSTABLE.
4. DUCT SMOKE DETECTORS SHALL DEACTIVATE ERV UNIT THRU FIRE ALARM SYSTEM CONTROL MODULE.

G11 DEDICATED OA SUPPLY UNIT ERV-X

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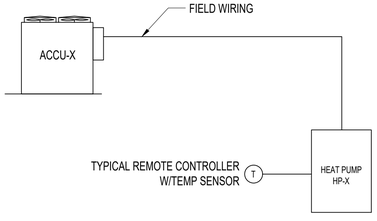


D11 PIPE SLEEVE THRU EXTERIOR WALL

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APARTMENT UNIT HEAT PUMP SEQUENCE OF OPERATION:

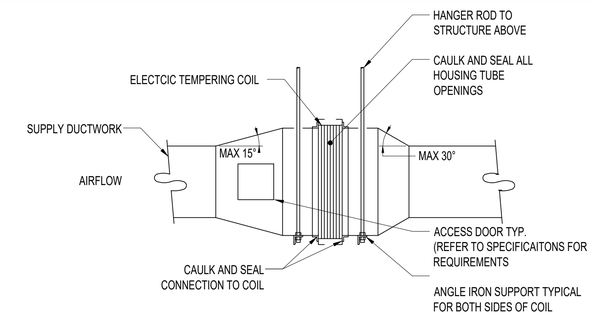
1. INDIVIDUAL FAN COIL UNITS OCCUPIED MODE: FAN OPERATION SHALL BE CYCLED ON/OFF AS REQUIRED TO ACHIEVE OCCUPIED COOLING SETPOINT OF 73F (LOCALLY ADJUSTABLE) AND HEATING SETPOINT OF 70F (LOCALLY ADJUSTABLE). ROOM THERMOSTAT/CONTROLLER SHALL CONTROL COMMUNICATION TO FCU COOLING AND HEATING DEMAND REQUIREMENTS TO CONTROL ASSOCIATED CONDENSING UNIT MODE OF OPERATION.
2. INDIVIDUAL FAN COIL UNITS UNOCCUPIED MODE: FAN OPERATION SHALL BE CYCLED ON/OFF AS REQUIRED TO ACHIEVE OCCUPIED COOLING SETPOINT OF 78F (LOCALLY ADJUSTABLE) AND HEATING SETPOINT OF 65F (LOCALLY ADJUSTABLE). ROOM THERMOSTAT/CONTROLLER SHALL CONTROL COMMUNICATION TO FCU COOLING AND HEATING DEMAND REQUIREMENTS TO CONTROL ASSOCIATED CONDENSING UNIT MODE OF OPERATION.
3. WHEN APPLICABLE WHEN HEAT PUMP FCU IS IN HEATING MODE, FCU CONTROLLER SHALL ACTIVATE ASSOCATED DUCT HEATER, FOR BACK UP HEATING OPERATION. THERMOSTAT SHALL CYCLE FAN AND HEATER OPERATION IN HEATING MODE TO MAINTAIN MIMIMUM DISCHARGE AIR OF 60F (FIELD ADJUSTABLE). THIS OPERATION IS TO PREVENT FREEZING IN THE EVENT HEAT PUMP IS NOT PROPERLY OPERATING OR IS IN ALARM.
4. COORDINATE WITH FIRE ALARM CONTRACTOR AND PROVIDE REQUIRED DEVISES AND WIRING TO TIE FAN COIL UNIT AND OR BRANCH BOX TO FIRE ALARM DEVICE REQUIRED TO DEACTIVATE PROPER FAN COIL UNIT UPON ACTIVATION OR GENERAL ALARM.



APARTMENT HEAT PUMP DIAGRAM

A1 APARTMENT HEAT PUMP AND VRF SYSTEM DETAILS AND NOTES

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A11 DUCT MOUNTED TEMPERING COIL DETAIL

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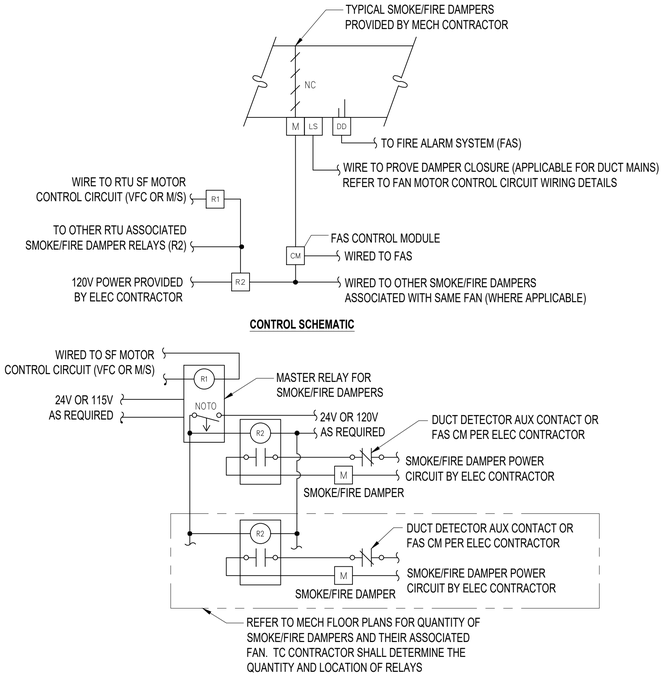
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CONTROL SCHEMATIC

CONTROL WIRING

NOTES:
1. REFER TO FLOOR PLANS FOR QUANTITY 7 LOCATION OF THE SMOKE/FIRE DAMPERS AND ASSOCIATED HEAT PUMP UNIT
2. ELECTRICAL CONTRACT SHALL PROVIDE 120V POWER REQUIREMENT FOR SMOKE/FIRE DAMPER ACTUATOR(S)
3. TC CONTRACTOR SHALL PROVIDE CONTROL RELAY IN ENCLOSURE FOR SMOKE/FIRE DAMPER CONTROL. IF MULTIPLE POWER CIRCUITS ARE USED FOR SMOKE/FIRE DAMPERS ASSOCIATED WITH COMMON FAN, MULTIPLE CONTROL RELAYS SHALL BE USED AND WIRED IN PARALLEL.
4. SMOKE/FIRE DAMPERS SHALL BE SHIPPED AS AN ASSEMBLY FOR INSTALLATION ON SITE AND BEAR THE UL LISTING LABEL

SEQUENCE OF OPERATION

1. SMOKE/FIRE DAMPERS SHALL BE HARDWIRE INTERLOCKED TO ASSOCIATE FAN CONTROLS AND SHALL OPEN WHEN FAN IS ACTIVATED AND CLOSE WHEN FAN IS DEACTIVATED.
2. WHEN PRODUCTS OF COMBUSTION ARE DETECTED AT DUCT SMOKE/FIRE DETECTOR, FIRE ALARM SYSTEM SHALL CLOSE RESPECTIVE SMOKE/FIRE DAMPERS AND DEACTIVATE ASSOCIATED FAN
3. WHERE APPLICABLE, FIRE/SMOKE/FIRE DAMPER LIMIT (ES) SWITCH SHALL BE HARDWIRE INTERLOCKED TO RESPECTIVE FAN CONTROL CIRCUIT TO PREVENT FAN FROM OPERATING UNTIL DAMPER(S) ARE PROVEN OPEN.

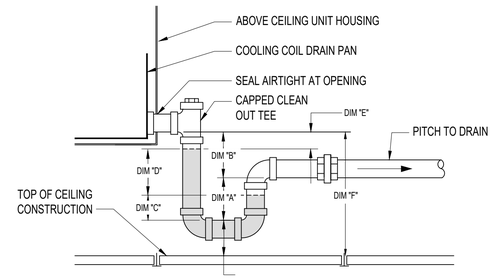
A1 DOAS 1 SMOKE/FIRE CONTROL WIRING

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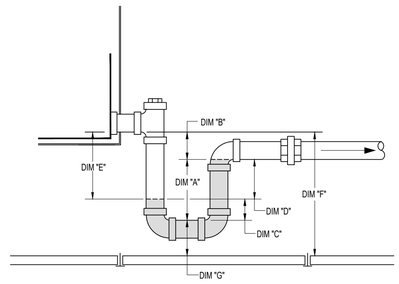
TRAP DIMENSION TABLE

TYPE OF SYSTEM		DIMENSIONS "A" (INCHES) MIN.	DIMENSIONS "B" (INCHES)	DIMENSIONS "C" (INCHES) (TRAP SEAL)	DIMENSIONS "D" (INCHES)	DIMENSIONS "E" (INCHES)	DIMENSIONS "F" (INCHES) DRAIN PIPE SIZE (INCHES)			
							1 1/2"	2"	2 1/2", 3"	4"
DRAW THROUGH	-2.1 TO -3	3.5	3.5	2	3	2	10.0	11.0	12.0	13.0
	UP TO -2	3.0	3.0	2	2	2	9.0	10.0	11.0	12.0
BLOW THROUGH	UP TO +2	4.0	2.0	2	2	4	9.0	10.0	11.0	12.0
	+2.1 TO +3	5.0	2.0	2	3	5	10.0	11.0	12.0	13.0

NOTES: A. REFER TO TERMINAL DEVICES USED FOR COOLING, COMPUTER ROOM AIR CONDITIONING UNITS, FAN COIL UNITS SPLIT SYSTEM AIR CONDITIONING UNIT ETC. FOR (-) OR (+) STATIC PRESSURE AT COIL DRAIN PAN
B. DIMENSION "G" IS MIN: 3" FOR UP TO 1 1/2" DRAIN PIPE
4" FOR 2" DRAIN PIPE
5" FOR 2 1/2" OR 3" DRAIN PIPE
6" FOR 4" DRAIN PIPE



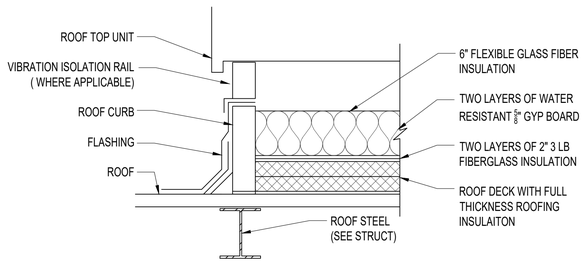
DRAW THROUGH



BLOW THROUGH

E6 CONDENSATE DRAIN PAN TRAP DETAIL (ABOVE CEILING UNITS)

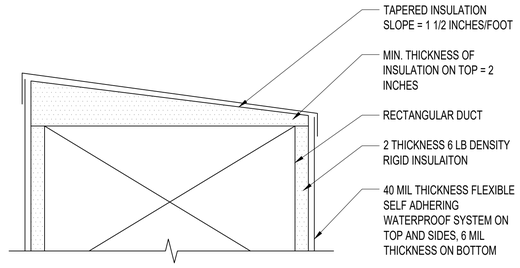
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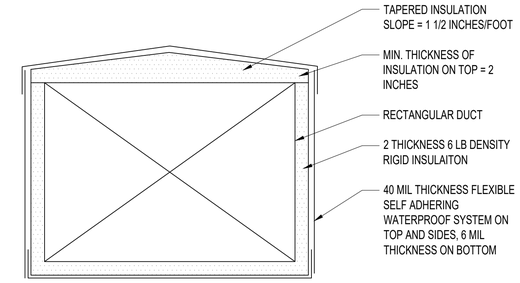
NOTE: ALL DUCT, PIPING, OR ELECTRICAL CONNECTIONS TO UNIT BELOW CURB SHALL HAVE FLEXIBLE CONNECTIONS. CUT INSULATION, GYP BOARD, ROOFING INSULATION, AND METAL DECKING PENETRATIONS TIGHT TO ITEM PENETRATING ROOF. PACK ALL PENETRATION OPENINGS WITH FLEXIBLE GLASS FIBER

A6 ROOF TOP UNIT CURB DETAIL

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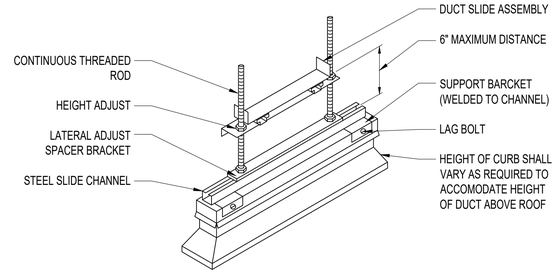
SOPED IN ONE DIRECTION
OPTIONAL FOR DUCTS 30" AND SMALLER



SOPED IN TWO DIRECTIONS

E11 OUTDOOR DUCT INSULATION DETAIL

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A11 DUCT MOUNTING PEDESTAL DETAIL

M-505 | NTS

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REGISTRATION SEAL



KEY PLANS

SHEET TITLE
MECHANICAL
TYPICAL DETAILS

SCALE: AS NOTED

ISSUED FOR	DATE
PERMIT	10.20.24
△BULLETIN 3	5.19.25

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FILE NO. 21026.00

SHEET NO. M-505

5/18/2025 7:49:40 PM

ENERGY RECOVERY VENTILATOR & FAN SCHEDULE

IDENTIFIER	SERVICE	LOCATION	DESIGN AIR FLOW (CFM)		SUPPLY FAN			EXHAUST FAN			HEAT EXCHANGER										ELECTRICAL DATA			DIMENSIONS (IN)			WEIGHT (LBS)	BASIS OF DESIGN		NOTES
											SUMMER						WINTER													
			OUTDOOR AIR	EXHAUST AIR	QTY.	ESP (IN. WC)	MOTO R (HP)	QTY.	ESP (IN. WC)	MOTOR (HP)	EAT (°F)		LAT (°F)		RA (°F)		SENSIBLE EFFECTIVENESS %	LATENT EFFECTIVENESS %	EAT DB (°F)	LAT DB (°F)	RA (°F)	SENSIBLE EFFECTIVENESS %	LATENT EFFECTIVENESS %	MCA	MOCP	VOLTS/PH/HZ	L	W	H		MANUFACTURER	MODEL	
											DB	WB	DB	WB	DB	WB					DB WB									
ERV -1	Addition – Floor 1 & 2	Roof	2180	1890	1	1.4	1.7	1	1.3	1.9	90	△			75	△	73.4% △		0	△	70	△	77.0% △	56	70	240/3/60	156 1/4	65 1/4	69	3227	Ventacity	VS3000RTe	1, 3, 4, 6, 7
ERV -2	Residential units	Residential units	50-100	50-100	1	.1-.4	1	1	.1-.4		95						60%			32		84%		△		120/1/60	28 ½"	23"	8 7/8"		Panasonic	Intelli-Balance PV-10VEC2	1, 3
ERV -3	Hallways & Library Room	Various	60-200	60-200	1	0.4	1	1	0.4		95						61%			32		86%				120/1/60	27 ½"	30 ½"	19 ½"		Panasonic	Intelli-Balance PV-20VEC1	1, 3
ERV -4	Community Room (Gym)	Existing Roof	892	720	1	0.85	0.77	2	0.85	0.70	90.7	73.4	80.3	68.8	75.0	62.5	66.2%	44.4	0	46.3	51.3	68.2	66.0	11.3	15	208-230/1/60	81 7/8"	22"	58 ½"	261-415	RenewAire	HE10-3RTH-S15AA-DGFT-L	1, 2, 3
TF - 1	Addition	Residential Units	60	0	1	0.03																				120/1/60	3"	15 3/4	7 3/4		Tjernlund	AS1	5

NOTES:
1. Refer to manufacturer cut sheets for effectiveness for various cfm and temperature ranges.
2. Refer to manufacturer cut sheet for roof mounting detail and curb dimensions. △
3. Provide access panel in location to access filters and units for proper maintenance and service.
4. Coordinate with architectural and electrical for placement in ceiling and routing of duct work. Refer to additional details and control sequence..
5. Provide 24v relay/transformer FC24 and provide necessary wiring to a 24v adjustable thermostat that meets PHIUS requirements. Coordinate location and finish with other trades and architectural plans.
6. Provide and install roof as required refer to architectural and structural drawings.
7. Unit comes pre packaged with electric pre heater at 480V 3P, MOP 30A, MCA 32.7A. Requires separate circuit △

HEAT PUMP - FCU SCHEDULE

IDENTIFIER	SERVICE	TYPE	CONDENSING UNIT	SUPPLY FAN				SOUND PRESSURE LEVEL (dBA)	COOLING				HEATING	ELECTRICAL DATA				DIMENSIONS (IN)			WEIGHT (LBS)	BASIS OF DESIGN		NOTES
				SPEED	AIR FLOW (CFM)	OUTSIDE AIR (CFM)	ESP (IN WC)		TON	TOTAL MBH	SENSIBLE MBH	SHR	TOTAL MBH	VOLTAGE	PHASE	MCA	MOCP	W	H	D		MANUFACTURER	MODEL	
FC -1	Residential units, library, offices,	Ducted	ACCU -1		317		0.2	30	0.75	9			12.5	208	1	0.74	15	31 1/8	7 7/8	27 9/16	42	Mitsubishi	SEZ-KD09NA4R1.TH	1, 2
FC -2	Residential units, Corridors, Mechanical	Ducted	ACCU -2		388		0.2	33	1	12			15	208	1	0.90	15	39	7 7/8	27 9/16	50	Mitsubishi	SEZ-KD12NA4R1.TH	1, 2
FC -3	Residential units, Laundry	Ducted	ACCU -3		529		0.2	33	1.25	15			18	208	1	1.11	20	39	7 7/8	27 9/16	54	Mitsubishi	SEZ-KD15NA4R1.TH	1, 2
FC -4	Residential units, Custodial	Ducted	ACCU -4		635		0.2	38	1.5	18			21.6	208	1	1.13	20	46 7/8	7 7/8	27 9/16	62	Mitsubishi	SEZ-KD18NA4R1.TH	1, 2
FC -5	Prep Space	Wall Mounted	ACCU -5		701			34	1.87	22.4			21.2	208	1	1	20	43 5/16	12 13/16	9 3/8	37	Mitsubishi	MSZ-GS24NA	1, 2
FC -6	Community Gym, Reading Room	Wall Mounted	ACCU -6		775			39	2.5	30			32	208	1	1	35	48 1/16	14 3/8	11 5/8	46	Mitsubishi	PKA-A30KA8	1, 2, 3
FC - 7	Offices, Hot Room	Wall Mounted	ACCU -7		437			36	0.75	9			9.6	208	1	1	15	36 7/16	12 11/16	9 3/16	29	Mitsubishi	MUZ-FS09NA	1, 2
FC - 8	Corridors - Existing	Wall Mounted	ACCU - 8		514			46	1.5	19			24	208	1	1	20	36 7/16	12 11/16	9 3/16	29	Mitsubishi	MUZ-FS15NA	1, 2
FC – 9	Addition - Lobby	Ceiling Mount	ACCU – 9		570-880			38	2.5	30			34	208	1	1	40	33 1/16	11 3/4	33 1/16	57	Mitsubishi	PLA-A30EA8	1,2,3
FC – 10	Residential Units – Living Area	Ceiling Mount	ACCU – 10		325			38	0.75	9			12	208	1	1	15	43 3/8	7 5/16	14 3/16	34	Mitsubishi	MLZ-KP09NA2	1,3,4,5,6
FC – 11	Residential Units – Living Area	Ceiling Mount	ACCU - 11		350			40	0.5	6			7.2	208	1	1	15	43 3/8	7 5/16	14 3/16	34	Mitsubishi	MLZ-KP12NA2	1,3,4,5,6
FC - 12	Corridor - Addition	Ceiling Mount	ACCU - 12		530-670			35	2.0	24			28	208	1	1	27	50 3/8	9 1/16	26 3/4	31	Mitsubishi	PCA-A24KA8	1,2,3
FC - 13	Mechanical & Storage Rooms	Wall Mount	Various		117-437			40	0.5	9			14	208	1	1	15	36 7/16	12	9 3/16	29	Mitsubishi	MSZ-FS06NA	1,2,3,4,5

NOTES:
1. Utilize Mitsubishi Touch MA Controller PAR-CT01MAU-SB, provide routing to location on mechanical drawings and associated wiring per manufacturer specifications.
2. Receive power and communication from associated ACCU on roof. Mechanical contractor to coordinate install and routing.
3. PROVIDE CONDENSATE PUMP IF REQUIRED FOR ROUTING OF CONDENSATE DRAIN TO NEAREST AVAILABLE FLOOR DRAIN, REFER TO MANUFACTURER SPECIFICATIONS.
4. INCLUDE SYSTEM CONTOL INTERFERENCE, TEMPERATURE SENSOR AND ALL CONTROLS TO ALLOW OPERATION IN MULTI-ZONE SETUP.
5. PROVIDE ALL WIRING AND PIPING NEEDED TO CONNECT TO BRANCH BOX AS SHOWN ON DRAWINGS.
6. INCLUDE GRILLE MLP-448WU AS REQUIRED.

ELECTRIC DUCT HEATER SCHEDULE+B33:AR58B33:A33:CM62

IDENTIFIER	MANUFACTURER	MODEL	QUANTITY	DESCRIPTION	NOTES
DH - 1	RenewAire	EK-1212005SCCHR--21-1SV-N	1	Ducted electric heater	1,2,3,4
DH - 2	RenewAire	EK-XXXX010SCCHL--21-1S-N	1	Ducted electric heater	1,2,3,5

NOTES:
1. Voltage for heater is 208/230/1/60, coordinate with electrical contractor.
2. Provide duct thermostat sensor kit for SCR control. Install per manufacturer specifications for location and wiring. Duct temperature sensor to be in supply side of duct work.
3. Interlock duct heater with fan proof from ERV, do not run duct heater without supply fan running.
4. Protect heater and heater control panel from elements, Refer to mechanical details.
5. Match duct size on drawing to duct heater size to fit properly in duct layout, model number with xxxx designates duct work dimensions.

OUTDOOR HEAT PUMP UNIT SCHEDULE

IDENTIFIER	TYPE	LOCATION	SERVICE	COOLING		HEATING		Refrigerant Type	ELECTRICAL DATA			DIMENSIONS (IN.)			WEIGHT (LBS)	BASIS OF DESIGN		NOTES
				TOTAL MBH	EER	TOTAL MBH	COP @ 47° F		MOCP	RLA	VOLTS/PH/HZ	H	W	D		MFGR.	MODEL	
ACCU -1	Heat Pump Air Cooled Condenser	Roof	FC -1	9	13	12	4.03	R410A	24	13	208/230/1/60	34 5/8	38 9/16	13	129	Mitsubishi	SUZ-KA09NAHZ	1, 2, 3, 4
ACCU -2	Heat Pump Air Cooled Condenser	Roof	FC -2	12	13	15	3.90	R410A	24	13	208/230/1/60	34 5/8	38 9/16	13	129	Mitsubishi	SUZ-KA12NAHZ	1, 2, 3, 4
ACCU -3	Heat Pump Air Cooled Condenser	Roof	FC -3	15	12.5	18	2.70	R410A	31	16	208/230/1/60	34 5/8	38 9/16	13	131	Mitsubishi	SUZ-KA15NAHZ	1, 2, 3, 4
ACCU -4	Heat Pump Air Cooled Condenser	Roof	FC -4	18	13.1	21.6	3.40	R410A	31	16	208/230/1/60	34 5/8	38 9/16	13	131	Mitsubishi	SUZ-KA18NAHZ	1, 2, 3, 4
ACCU -5	Heat Pump Air Cooled Condenser	Roof	FC -5	22.4	12.6	21.2	4.03	R410A	20	13.6	208/230/1/60	34 5/8	33 1/16	13	120	Mitsubishi	MUZ-GS24NAHZ	1,2, 3, 4
ACCU -6	Heat Pump Air Cooled Condenser	Roof	FC -6	30	12.8	32	3.38	R410A	40	18	208/230/1/60	52 11/16	41 5/16	14 3/16	261	Mitsubishi	PUZ-HA30NKA	1,2, 3, 4
ACCU -7	Heat Pump Air Cooled Condenser	Roof	FC -7	09	16	9.6	4.54	R410A	15	10	208/230/1/60	21 5/8	31 1/2	11 1/4	82	Mitsubishi	MUZ-FS09NA	1,2, 3, 4
ACCU - 8	Heat Pump Air Cooled Condenser	Roof	FC - 8	15	14	16	4.06	R410A	20	17	208/230/1/60	34 5/8	33 1/16	13	117	Mitsubishi	MUZ-FS15NA	1,2, 3, 4
ACCU – 9	Heat Pump Air Cooled Condenser	Roof	FC – 9	30	14.1	24	4.1	R410A	40	18	208/230/1/60	52 43/64	41 11/32	12 63/64	261	Mitsubishi	PUZ-HA30NKA	1, 2, 4, 5
ACCU – 10	Heat Pump Air Cooled Condenser	Roof	FC – 10	9	12.5	14	4.1	R410A	24	10	208/230/1/60	34 5/8	38 1/16	13	129	Mitsubishi	SUZ-KA09NAHZ	1, 2, 4, 5
ACCU - 11	Heat Pump Air Cooled Condenser	Roof	FC – 11	12	12.7	18	3.8	R410A	24	10	208/230/1/60	34 5/8	33 1/16	13	129	Mitsubishi	SUZ-KA12NAHZ	1, 2, 4, 5
ACCU - 12	Heat Pump Air Cooled Condenser	Roof	FC – 12	24	12.5	28	3.71	R410A	27	9	208/230/1/60	37 1/8	37 13/32	13	190	Mitsubishi	PUZ-HA24NHA1-R1	1, 2, 4, 5
ACCU – 13	Heat Pump Air Cooled Condenser	Roof	FC - 13	9	19	14	4.68	R410A	15	9.2	208/230/1/60	21 5/8	31 1/2	11 1/4	82	Mitsubishi	MUZ-FS06NA	1, 2, 4, 5
ACCU -14	Heat Pump Air Cooled Condenser	Roof	FC - 13	36	15	42	4.0	R410A	86		208/230/1/60	52 11/16	41 11/32	13	278	Mitsubishi	MXZ-SM36NAMHZ2	1, 2, 4, 5. 6

NOTES:
1. 12 IN CONDENSER STAND TO BE SUPPLIED QSMS1201M
2. UTILIZE MICROPARTICULATE FILTER PM2.5 (part number MAC-EMF615FT-E)
3. INSTALL 2-PIECE WIND BAFFLE WB-PA3
4. PROVIDE ALL NECESSARY LINE SETS AT CORRECT SIZE TO CONNECT TO INDOOR UNIT.
5. INSTALL WIND BAFFLE LOW AMBIENT KIT
6. PIPE TO BRANCH BOX (BB-1) PART NUMBER PAC-MKA52BC. SUPPORT BRANCH BOX VIA ALL THREAD AND MOUNTING APPROVED BY STRUCTURAL. POWER FOR BRANCH BOX FROM OUTDOOR UNIT, REFER TO MANUFACTURER SPECIFICATIONS FOR WIRING, PIPING PRACTICES AND MOUNTING.

DIFFUSER AND GRILLE SCHEDULE

IDENTIFIER	TYPE	SYSTEM	LOCATION	FRAME	DAMPER	MAX NC	MANUF	MODEL #	REMARKS
TG -1	Wall mounted transfer grill	Wall Transfer Return	Apartments		N		Price	520Z	Baked White Enamel, 2, 3
SG -1	Soffit supply air register	Supply Air	Various		Y		Price	540 Series	White Finish, 2, 3,
SG -2	Ceiling supply air 24x24 face	Supply Air	Various		Y		Price	ASCD	Baked White Enamel,1, 2, 3
SG -3	Supply air register	Supply Air	Community Space		Y		Price	99-L-A-B12	2, 3
RG -1	Filter housed return grille	Return Air	Apartments		N		Price	535FF-HL	White B12, 2, 3, 4, 8
RG -2	Ceiling return air 24x24 face	Return Air	Various		N		Price	PDDR Series	White finish, 2, 3,
RG -3	Return air register	Return Air	Community Space		N		Price	97--L-A-B12	2, 3
RG-4	Exhaust return grille	Return Air	Apartments		N		Price	530-535	White B12, 2, 3, 4
R-1	Intake & Exhaust Register	OA & Exhaust	Exterior		Y		Primex	WCX	2, 3, 5, 6
L-1	Intake & Exhaust Register	OA & Exhaust	Exterior		N		Louver & Damper	ACL Series	2, 3, 5, 7

1. FRONT BLADES PARALLEL TO SHORT DIMENSION
2. COORDINATE INSTALL LOCATION WITH ARCHITECTUAL PLANS. FOR LAYIN DIFFUSERS COORDINATE WITH REFLECTED CEILING PLAN FOR PROPER MOUNTING.
3. COORDINATE NECK SIZE WITH MECHANICAL DRAWING DUCT SIZING.
4. SURFACE MOUNTING (SM) FOR SOFFIT OR CEILING INSTALLATION
5. PAINT TO MATCH EXTERIOR BRICK
6. IF USED AS INTAKE REMOVE DAMPER
7. INTERGRATE BIRD SCREEN OPTION FROM MANUFACTURER
8. WHEN LOCATED IN KITCHEN PROVIDE MERV3 1 IN FILTER TO FIT. SIZE TO BE 10IN X 10IN IN KITCHEN AREA AND LOCATED WITH 6FT FROM HOOD SYSTEM.

ELECTRIC UNIT HEATER SCHEDULE

Tag	Location	Type	CFM	Power	Voltage	Phase	Mounting Height	Length	Width	Height	Weight (lbs)	Manufacturer	Model	Remarks
ECUH -1	Addition Stairwells	Wall Mounted	500	6.0 KW	208 V	1	6" ABOVE FF	45 "	9 3/4 "	26 3/8 "	160	Qmark	CU945	CU945-06-20-1-B-F-2B-2-C-S-S-P-K-O-W, 1, 2
ECUH -2	109 and Corridor 212 △	Wall Mounted	250	5.0 KW	208 V	1	6" ABOVE FF	35 "	9 3/4 "	26 3/8 "	120	Qmark	CU935	CU935-05-20-1-B-F-2B-2-C-S-S-P-K-O-W, 1, 2
ECUH -3	Vestibules - West B & East A	Wall Mounted	250	6.0KW	208 V	1	6" ABOVE FF	35 "	9 3/4 "	26 3/8 "	120	Qmark	CU935	CU935-06-20-1-B-F-2B-2-C-S-S-P-K-O-W 1, 2
ECUH -4	~~East Vestibule B~~, Unoccupied rooms 280 & 380	Wall Mounted	250	7.0KW	208 V	1	6" ABOVE FF	35 "	9 3/4 "	26 3/8 "	120	Qmark	CU935	CU935-07-20-1-B-F-2B-2-C-S-S-P-K-O-W 1, 2
ECUH -5	Existing room 281 & Addition Entrance	Wall Mounted	250	3.0 KW	208 V	1	6" ABOVE FF	35 "	9 3/4 "	26 3/8 "	120	Qmark	CU935	CU935-03-20-1-B-F-2B-2-C-S-S-P-K-O-W 1, 2
CCU-1	West Vestibule A - 120	Ceiling Mounted	3903	20 KW	208 V	1	Ceiling Height	20 1/4"	75"	16 ¾"	364	Powered Aire	CHD-E-2-72	3, 4, 5, 6

1.

1. SURFACE MOUNT ELECTRIC CABINET HEATERS TO BLOCK OR BRICK WALL WITH PROPER CLEARANCE PER MANUFACTURER SPECIFIACTIONS.
2. INTERNAL MOUNTED THERMOSTAT, VERIFY FIELD DETTING TO 60 DEGREES.
3. SUPPLY 24V LINE THERMOSTAT WITH LOCKABLE COVER
4. SUPPORT VIA MANUFACTUER SPECIFICATIONS, SUBMIT MOUNTING AND SUPPORT STRATEGY TO STRUCTUREAL ENGINEER PRIOR TO INSTALLATION FOR APPROVAL.
5. WHITE IN COLOR.
6. COORDINATE WITH ARCHITECT AND FINISH CONTRACTOR OPENING NEEDED IN CEILING TO PROVIDE PROPER REVEAL.

10/11/2025 6:27:53 AM

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Developed by
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REGISTRATION SEAL

STATE OF MICHIGAN
STEPHEN M. HENNARD
ENGINEER
NO. 6201059975
LICENSED PROFESSIONAL ENGINEER

KEY PLANS

SHEET TITLE

MECHANICAL SCHEDULES

SCALE: AS NOTED

ISSUED FOR	DATE
PERMIT	10.20.24
△BULLETIN 1	2.19.25
△BULLETIN 5	10.13.25

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FILE NO. 21026.00

SHEET NO. M-601

Apartment/Room Notation	Occupancy Classification	Floor Area (SF)	Quantity	Code Occupent Density / 1000SF	Calculated Occupancy	Number of Plumbing Fixtures	TABLE 403.3 2015 Michigan Mech Code & ASHRE 62.2 Requirements						Design Air Balance				
							Outdoor Air			Calculated Min outdoor air required (cfm)	Zone Air Dist. Eff.	Calculated Min Exhaust Air (cfm)	Minimum room supply air (cfm)	Minimum exhaust air (cfm)	Minimum unit %OA	Outdoor ventilation air (cfm) delivered to space	Supply Air Units
							CFM / SF	CFM / PERSON	CFM / FIXTURE OF SF								
H	Private Dwelling - 1 bedroom, 1 bathroom, living areas	462	1		2			15		38	0.8	0	see plan	50		50	FC 1
G	Private Dwelling - 1 bedroom, 1 bathroom, living areas	469	1		2			15		38	0.8	0	see plan	50		50	FC 1
F	Private Dwelling - 1 bedroom, 1 bathroom, living areas	682	1		2			15		56	0.8	0	see plan	50		60	FC 3
M	Private Dwelling - 1 bedroom, 1 bathroom, living areas	678	1		2			15		56	0.8	0	see plan	50		60	FC 3
C	Private Dwelling - 1 bedroom, 1 bathroom, living areas	484	1		2			15		38	0.8	0	see plan	50		50	FC 1
D	Private Dwelling - 1 bedroom, 1 bathroom, living areas	487	1		2			15		38	0.8	0	see plan	50		50	FC 1
E	Private Dwelling - 1 bedroom, 1 bathroom, living areas	500	1		2			15		38	0.8	0	see plan	50		50	FC 2
B	Private Dwelling - 1 bedroom, 1 bathroom, living areas	607	1		2			15		56	0.8	0	see plan	50		60	FC 3
A	Private Dwelling - 1 bedroom, 1 bathroom, living areas	800	1		2			15		56	0.8	0	see plan	50		60	FC 4
J	Private Dwelling - 1 bedroom, 1 bathroom, living areas	495	1		2			15		38	0.8	0	see plan	50		50	FC 1
K	Private Dwelling - 1 bedroom, 1 bathroom, living areas	513	1		2			15		38	0.8	0	see plan	50		50	FC 1
L	Private Dwelling - 1 bedroom, 1 bathroom, living areas	714	1		2			15		56	0.8	0	see plan	50		60	FC 3
X	Private Dwelling - 1 bedroom, 1 bathroom, living areas	660	1		2			15		56	0.8	0	see plan	50		60	FC 3
W	Private Dwelling - 1 bedroom, 1 bathroom, living areas	713	1		2			15		56	0.8	0	see plan	50		60	FC 3
N, O	Private Dwelling - 2 bedroom, 1 bathroom, living areas	812	1		3			15		56	0.8	0	see plan	50		60	FC 4
Y	Private Dwelling - 2 bedroom, 1 bathroom, living areas	876	1		3			15		56	0.8	0	see plan	50		60	FC 4
Z	Private Dwelling - 2 bedroom, 1 bathroom, living areas	795	1		3			15		56	0.8	0	see plan	50		60	FC 4
141	Breakroom	487	1	25	13	1	0.06	5		110	0.8		701			100	FC 5
131 / 131A	Laundry	628	1	20	13	1	0.06	7.5		160			529	150		150	FC 3
133	Storage	178	1				0.06						437			50	FC 7
132	Breakroom	1096	1	25	28		0.06	5		241			775	175		250	FC 6
140	Conference/meeting	2377	1	50	119		0.06	5		886			1550		100	900	ERV 3, FC 6 (2)
130	Office	212	1	5	1		0.06	5		19			437			50	FC 7
150	Electrical Room	121	1		0												FC 3
151	Storage	414	1		0												FC 3
142, 143	Toilet	78	1		0	1			70			70	0				
101 - 110	Cooridor	3831	1				0.06			230	0.8	0	257	400		350	FC 8
202	Office	274	1	5	2		0.06	5		29			160		16	40	FC 3
201	Cooridor	528	1				0.06			32	0.8	0	260	45	18	40	FC 3
103	Lobby	1040	1	10	11		0.06	7.5		166			1040		18	175	FC 9
1B Unit A & C	Private Dwelling - 1 bedroom, 1 bathroom, living areas		19		2			15		38	0.8	0	See plan	45		48	FC 10 & FC 11
2B Unit A,B & C	Private Dwelling - 2 bedroom, 1 bathroom, living areas		2		3			15		56	0.8	0	See plan	45		△56	FC 10 & FC 11
Various	Cooridor	3156	1				0.06			189	0.8	0	900	200		190	FC 12
105	Electrical room		1														FC 13
113	Electrical room		1														FC 13
109	Storage		1											△			FC 13
115	Mechanical room		1														FC 13
108	Storage		1														FC 13
	Total For Floor 1													**1145**		**1214**	
											△						
1B Unit A & C	Private Dwelling - 1 bedroom, 1 bathroom, living areas		18		2			15		38	0.8	0	See plan	45△		48	FC 10 & FC 11
2B Unit A,B & C	Private Dwelling - 2 bedroom, 1 bathroom, living areas		3		3			15		56	0.8	0	See plan	45		△56	FC 10 & FC 11
Various	Cooridor	2610	1		0		0.06			157	0.8	0	900	175		162	FC 12
203	Storage		1		0												FC 13
208	Storage		1		0									△			FC 13
211	Mechanical room		1		0												FC 13
207	Storage		1		0												FC 13
	Total For Floor 2										△			**1120△**		**1194**	

△

VIBRATION ISOLATOR APPLICATION SCHEDULE

EQUIPMENT TYPE	EQUIPMENT CATEGORY	HORESPOWER AND OTHER	RPM	EQUIPMENT LOCATION						KEYED NOTES
				SLAB ON GRADE			UP TO 40 FT (12M) FLOOR SPAN			
				BASE TYPE	ISOLATOR TYPE	MIN. DEFL., IN. (MM)	BASE TYPE	ISOLATOR TYPE	MIN. DEFL., IN. (MM)	
SUSPEND HEAT PUMPS, FAN COILS, LOCATED INDOORS	ALL	ALL	ALL				A OR B	8a or 8b	1.50 (38)	NOTES 1, 3, 4
BASE MOUNTED CONDENSING UNITS	ALL ALL	≤1HP >1HP	ALL ALL	A OR B A OR B	2 2	0.25 (6) 0.25 (6)	A OR B A OR B	2 4	.25 (64) 2.50 (64)	NOTES 3
SUSPEND DUCTED ROTATING EQUIP.	SMALL FANS, FAN-POWERED BOXES	≤600 CFM >600 CFM	ALL ALL				A A	8a or 8b 8a or 8b	0.50 (13) 0.75 (19)	NOTES 3, 4

NOTES:

1. THRUST RESTRAINTS: PROVIDE THRUST RESTRAINTS BETWEEN FAN DISCHARGE AND DUCT (IN PAIRS, LOCATED ON THE CENTER LINE OF THE DISCHARGE OUTLET OF THE FAN, BRIDGING THE FLEXIBLE DUCT CONNECTOR) FOR ALL FAN HEADS, FOR AXIAL AND CENTRIFUGAL FANS UNITS OPERATING AT 2 INCHES OR GREATER TOTAL STATIC PRESSURE AND AS SHOWN ON DRAWINGS. SPRING DEFLECTION SHALL BE SAME AS THE SUPPORT ISOLATORS.
2. PIPING RISER ISOLATION: PROVIDE PIPE RISER RESILIENT ANCHORS, SPRING MOUNTS AND RESILIENT PIPE GUIDES CAPABLE OF DISTRIBUTING THE LOADS WITHIN THE BUILDING DESIGN LIMITS AT THE SUPPORT POINTS.
3. HORIZONTAL PIPING VIBRATION ISOLATION: PROVIDE TYPE 8a OR 8b SPRING HANGERS FOR PIPING CONNECTED TO VIBRATION ISOLATED EQUIPMENT FOR ALL PIPING IN MECHANICAL ROOMS OR THE FOLLOWING MINIMUM HORIZONTAL DISTANCES FROM THE ISOLATED EQUIPMENT: UP TO 6" - 50 FEET (1 1/2" MINIMUM DEFLECTION). 8" AND LARGER - 100 FEET (2 1/2" MINIMUM DEFLECTION), WHICHEVER IS GREATER, AND AS SHOWN ON DRAWINGS. THE FIRST 4 HANGERS FROM THE ISOLATED EQUIPMENT SHALL BE TYPE 8b.
4. DUCTWORK VIBRATION ISOLATION: PROVIDE TYPE 8a OR 8b SPRING HANGERS FOR DUCTWORK WITH A CROSS SECTION OF 2 SQUARE FEET OR GREATER CONNECTED TO AIR HANDLING UNITS, RETURN OR RELIEF FANS, AND VIBRATION ISOLATED EQUIPMENT, WHICHEVER IS GREATER, AND AS SHOWN ON DRAWINGS (3/4" MINIMUM DEFLECTION)

BASE TYPES:

BASE TYPE A - NO BASE, ISOLATORS ATTACHED DIRECTLY TO EQUIPMENT
BASE TYPE B - STRUCTURAL STEEL RAILS OR BASE
BASE TYPE C - CONCRETE INERTIA BASE
BASE TYPE D - CURB - MOUNTED ALUMINUM BASE WITH 1" DEFL. SPRING ISOLATORS
BASE TYPE E - CURB - MOUNTED STEEL BASE WITH ADJUSTABLE 1", 2" OR 3" DEFL. SPRING ISOLATORS

ISOLATOR TYPES:

ISOLATOR TYPE 1a - ELASTOMERIC ISOLATION PAD
ISOLATOR TYPE 1b - ELASTOMERIC ISOLATION PAD WITH STEEL LOAD BEARING PLATE
ISOLATOR TYPE 2 - ELASTOMERIC FLOOR ISOLATOR
ISOLATOR TYPE 3 - FREE STANDING SPRING FLOOR ISOLATOR
ISOLATOR TYPE 4 - RESTRAINED SPRING ISOLATOR
ISOLATOR TYPE 5 - THRUST RESTRAINT
ISOLATOR TYPE 6 - AIR SPRING
ISOLATOR TYPE 7 - ELASTORMERIC HANGERS
ISOLATOR TYPE 8a - SPRING HANGERS
ISOLATOR TYPE 8b - SPRING HANGERS WITH VERTICAL - LIMIT STOP

DUCT SYSTEM INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES)							FIELD APPLIED JACKET MATERIAL		KEYED NOTES
	FIBERGLASS BLANKET .75 LB/CU FT.	FIBERGLASS BLANKET 1.0 LB/CU FT.	FIBERGLASS BOARD 2.25 LB/CU FT.	FIBERGLASS BOARD 6.0 LB/CU FT.	FLEXIBLE ELASTOMERIC	ASTM E2336 2-HOUR FIRE RATED BLANKET	2-HOUR FIRE RATED BLANKET	ALUMINUM	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	
DUCT SYSTEMS LOCATED INDOORS										
SUPPLY AIR, EXCEPT AS NOTED BELOW		1.5								a
RECTANGULAR SUPPLY AIR IN MECHANICAL ROOMS			1.5							
OUTSIDE AIR AND MIXED AIR, EXCEPT AS NOTED BELOW		1.5								

GENERAL NOTES:
1. THE FOLLOWING PLENUMS, DUCTS AND DUCT ACCESSORIES NOT REQUIRING INSULATION

a. DOUBLE WALL METAL DUCTS WITH SUFFICIENT INSULATION TO MEET ASHRAE 62.2
b. EXPOSED SUPPLY DUCT IN CONDITIONED SPACE SERVED BY THAT SYSTEM
c. FACTORY-INSULATED FLEXIBLE DUCTS
d. FLEXIBLE CONNECTORS
e. VIBRATION - CONTROL DEVICES
f. FACTORY - INSULATED ACCESS PANELS AND DOORS.

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REGISTRATION SEAL

STATE OF MICHIGAN
STEPHEN M. HENNARD
ENGINEER
No. 6201059975
LICENSED PROFESSIONAL ENGINEER

KEY PLANS

SHEET TITLE

MECHANICAL VENTILATION SCHEDULE

SCALE: AS NOTED

ISSUED FOR	DATE
PERMIT	10.20.24
△BULLETIN 1	2.19.25
△BULLETIN 2	3.05.25
△BULLETIN 3	5.19.25

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