

- AHU-# Air Handler Unit
- ASHP-# Air Source Heat Pump
- B-# Boiler
- BB-# Branch Box
- BD Backdraft Damper
- CUH-# Cabinet Unit Heater
- DH-# Dehumidifier
- EF-# Exhaust Fan
- ERV-# Energy Recovery Ventilator
- ET-# Expansion Tank
- FTR Finned Tube Radiator
- H-# Humidifier
- HWS Hot Water Supply
- HWR Hot Water Return
- MD Motorized Zone Damper
- MUA-# Makeup Air
- P-# Circulating Pump
- SF-# System Feeder
- TH-# Thermostat/Humidistat
- TYP Typical
- UH-# Unit Heater
- VD Volume Damper
- WH-# Water Heater
- 2-way Motorized Valve
- 3-way Motorized Mixing Valve
- 3-way Motorized Diverting Valve
- Thermostatic Mixing Valve
- Pressure Relief Valve
- Check Valve
- Isolation Ball Valve
- Manual Air Vent
- Drain/Purge Connection
- Exhaust Register
- Return Register
- Supply Register
- Duct Riser
- Duct Drop
- # x # Duct Dimensions (in)
- # R Round Duct (in)

- XX=Register Type
 - CFM=Airflow (CFM)
 - A=Register Length (in)
 - B=Register Width (in)
- (REGISTER SIZING BASED ON 50% FA)

- Floor Supply
- Wall Supply
- Ceiling Supply
- Floor Return
- Wall Return
- Ceiling Return
- Floor Intake
- Wall Intake
- Ceiling Intake
- Roof Intake
- Floor Exhaust
- Wall Exhaust
- Ceiling Exhaust
- Roof Exhaust

1. THE INSTALLING CONTRACTOR SHALL EXAMINE ALL SPECIFICATIONS, DRAWINGS, AND FEATURES OF BUILDING CONSTRUCTION WHICH MAY AFFECT HIS WORK AND BE GOVERNED BY THESE SPECIFICATIONS. INCLUDING THE GENERAL CONDITIONS AND PARTICULAR INSTRUCTIONS TO ALL CONTRACTORS AND SUPPLIERS.
2. ALL WORK SHALL BE EXECUTED AND INSPECTED IN STRICT ACCORDANCE WITH ALL LOCAL CODES AND/OR STATE CODES, LAWS, ORDINANCES, RULES AND REGULATIONS APPLICABLE TO THIS PARTICULAR CLASS OF WORK, AND EACH CONTRACTOR SHALL INCLUDE IN HIS PRICE ALL SERVICE CHARGES, FEES, PERMITS, ROYALTIES, TAXES, AND OTHER SIMILAR COSTS IN CONNECTION THEREWITH.
3. PRIOR TO FABRICATION OF DUCTWORK, CONTRACTOR SHALL EXAMINE AND VERIFY ALL CONDITIONS ABOVE AND BELOW THE CEILING WHICH MAY INTERFERE WITH THE WORK SHOWN AND NOTIFY THE SCHOOL ADMINISTRATOR OF ANY CONFLICT ENCOUNTERED. THE CONTRACTOR SHALL PROVIDE ALL OFFSETS, ETC. WHICH MAY BE REQUIRED, WITHOUT ADDITIONAL COST TO THE OWNER.
4. ALL SHEET METAL CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS. FLEX DUCT SHALL BE LIMITED TO NO MORE THAN 6 FEET. ALL BRANCH RUN-OUTS SHALL BE EQUIPPED WITH VOLUME DAMPERS TO PROVIDE PROPER BALANCING OF THE SYSTEM.
5. ALL DUCTS/VENTS SHALL BE INSULATED TO MEET ALL FEDERAL, STATE, AND LOCAL ENERGY CODES. THE DUCTS/VENTS SHALL ALSO BE SUPPORTED WITH 1" WIDE, 16 GAUGE GALVANIZED STEEL BAND, OR AN APPROVED SUPPORT SYSTEM.
6. ALL MECHANICAL ROOM EQUIPMENT SHALL BE INSTALLED WITH PROPER EQUIPMENT LABELING, CLEANLY WRAPPED INSULATION, AND IN AN ORGANIZED CONFIGURATION.
7. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED WITH THE UTMOST CARE AND CONSIDERATION TO PREVENT ANY NOISE AND VIBRATION MIGRATION TO THE LIVING SPACE. THIS IS TO INCLUDE BUT NOT LIMITED TO ALL HEATING, COOLING AND VENTILATION EQUIPMENT AS WELL AS ASSOCIATED DUCT WORK. ALL MOVING/VIBRATING EQUIPMENT SHALL BE RESILIENTLY SUPPORTED, WHICH MAY INCLUDE ISOLATION DAMPERS.
8. ENSURE ALL REGISTER BOXES ARE PROPERLY SEALED DURING THE CONSTRUCTION PHASE TO PREVENT MATERIAL, DIRT AND DEBRIS FROM ENTERING INTO DUCTED SYSTEMS.
9. ALL INTAKE AND EXHAUST TERMINATIONS SHALL BE EXECUTED IN STRICT ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL CODES, AND THE EQUIPMENT MANUFACTURER RECOMMENDATIONS.
10. ALL INTAKE AND EXHAUST TERMINATIONS SHALL BE INSTALLED MINIMUM 12 INCHES ABOVE PUBLISHED SNOW LINE.
11. ALL AIR TERMINATIONS TO INCLUDE BIRD / INSECT SCREEN WHERE ALLOWED BY CODE TO PREVENT INSECT AND CRITTER INTRUSION INTO THE BUILDING.
12. ERV AND BATH EXHAUST DUCTWORK TO BE GALVANIZED STEEL WITH FLEX DUCT ALLOWED FOR THE FIRST 6 FEET.
13. ALL SUPPLY REGISTERS SHALL BE BASED ON AIR VELOCITIES OF 500 FPM. ALL RETURN REGISTERS SHALL BE BASED ON AIR VELOCITIES OF 400 FPM. ADEQUATE FREE AREA AT THE REGISTER SHALL BE PROVIDED TO ENSURE THESE VELOCITIES ARE MET.
14. REGISTER SIZES SHOWN ON DRAWINGS ARE BASED ON A 50% FREE AREA UNLESS OTHERWISE NOTED. PLEASE REFER TO RGD LEGEND FOR SPECIFICS REGARDING AIRFLOW AND MANUFACTURER SELECTION. COORDINATE WITH OWNER ON FINAL REGISTER TYPE.
15. AIR TERMINATIONS AND LOUVERS SHALL BE SIZED AND INSTALLED TO PREVENT WATER (RAIN OR SNOW) AND INSECT INTRUSION INTO THE DUCTWORK/BUILDING. THE VELOCITY OF AIR THROUGH AN INTAKE OR EXHAUST LOUVER/TERMINATION SHALL BE KEPT AT 500 FPM OR LESS. THE MATERIAL OF THE TERMINATION SHALL BE SELECTED BY THE SCHOOL ADMINISTRATOR (RECOMMEND STAINLESS STEEL OR ALUMINUM). MULTIPLE INTAKES OR EXHAUSTS CAN BE GROUPED TOGETHER WHERE ALLOWED BY CODE TO FORM A SINGLE TERMINATION FOR EACH.
16. ALL THERMOSTATS AND HUMIDISTATS SHALL BE MOUNTED IN ACCORDANCE WITH THE AMERICAN DISABILITY ACT (ADA). THE EXACT LOCATION SHALL BE VERIFIED BY THE SCHOOL ADMINISTRATOR.
17. ALL CONDENSATE DRAINS SHALL BE PITCHED AT A MINIMUM SLOPE OF 1/4" PER LINEAR FOOT TO A WASTE WATER DRAIN. IF ACCESS TO A WASTE WATER DRAIN IS NOT AVAILABLE THEN A CONDENSATE PUMP SHALL BE PROVIDED BY THE CONTRACTOR WITHOUT ANY ADDITIONAL COST TO THE OWNER.

2 MECHANICAL NOTES
NTS

1. ATTIC SPACES HOUSING MECHANICAL EQUIPMENT TO BECOME PART OF THE BUILDING THERMAL ENVELOPE. ATTIC ROOF RAFTERS SHALL BE INSULATED WITH CLOSED CELL SPRAY FOAM, ASSUMED R-49 AT CEILINGS AND R-21 AT GABLE WALLS.
2. CATHEDRAL CEILING RAFTER BAYS LOCATED AT THE COMPUTER LAB AND ART ROOM SHALL BE INSULATED WITH CLOSED CELL SPRAY FOAM, ASSUMED R-49. EXISTING SOFFIT VENTS AND RIDGE VENTS SHALL BE SEALED.
3. THE EXISTING DRY PIPE FIRE SPRINKLER SYSTEM PIPING SHALL BE ADJUSTED TO ACCOMMODATE THE ATTIC INSULATION CHANGES AND NEW MECHANICAL EQUIPMENT.

3 DESIGN CRITERIA NOTES
NTS

HEATING SYSTEM

THE HEATING SYSTEM WILL BE CONTROLLED USING INDOOR ZONE THERMOSTATS AND OUTDOOR AIR TEMPERATURE SENSORS.

SPACE HEATING: SPACE HEATING SHALL BE PROVIDED BY INVERTER DRIVEN MINI-SPLIT AIR SOURCE HEAT PUMPS. THESE HEAT PUMPS SHALL EACH BE CONNECTED TO DUCTED AND DUCTLESS INDOOR UNITS (SEE SHEET M-500 FOR EQUIPMENT GROUPING). THE HEAT PUMPS SHALL MODULATE THEIR OUTPUT ACCORDING TO OUTDOOR TEMPERATURE AND DISTANCE FROM INDOOR SETPOINT. INDOOR ZONE THERMOSTATS SHALL DETERMINE WHETHER THERE IS A HEATING CALL.

SUPPLEMENTAL BACK-UP HEAT SHALL BE PROVIDED TO THE BUILDING THROUGH ELECTRIC DUCT HEATERS AND CEILING RECESSED CABINET UNIT HEATERS.

AIR CONDITIONING SYSTEM

THE BUILDING WILL BE EQUIPPED WITH COOLING, FRESH AIR, AND BATHROOM VENTILATION. THE SYSTEM WILL BE CONTROLLED ACTIVELY AND AUTOMATICALLY.

COOLING: COOLING WILL BE PROVIDED BY INVERTER DRIVEN MINI-SPLIT AIR SOURCE HEAT PUMPS, WHICH WILL BE CONNECTED TO THE SAME DUCTED AND DUCTLESS UNITS MENTIONED IN THE HEATING DESCRIPTION. THE COOLING SYSTEM WILL BE CONTROLLED BY THE SAME PROGRAMMABLE THERMOSTATS AS ALSO MENTIONED IN THE HEATING DESCRIPTION. HEAT PUMPS WILL BE LOCATED OUTSIDE MOUNTED TO EQUIPMENT STANDS ON GRADE AND POSITIONED AT VARIOUS LOCATIONS AROUND THE BUILDING (SEE SHEET M-3.0 FOR GENERAL LOCATIONS). THE FINAL LOCATION MUST BE VERIFIED WITH THE OWNER. ALL MANUFACTURER CLEARANCES SHALL BE MAINTAINED.

VENTILATION SYSTEM

FRESH AIR: FRESH AIR WILL BE PROVIDED TO THE BUILDING THROUGH A SERIES OF ENERGY RECOVERY VENTILATOR (ERV) UNITS. AN ERV UNIT WILL ALSO SIMULTANEOUSLY EXHAUST THE BATHROOMS. SELECT ERV UNITS WILL BE EQUIPPED WITH AN ELECTRIC DUCT HEATER TO PROVIDE SPACE NEUTRAL HEATING AIR. THE ERV UNITS WILL INCLUDE ELECTRONICALLY COMMUTATED MOTOR (ECM) FANS AND THE CO2 CONTROL OPTION. ERV UNITS SET TO RUN CONTINUOUSLY AT LOW FAN SPEED WITH A HIGH FAN SPEED CALL ENGAGED ON HIGH LIMIT CO2 LEVEL (ADJUSTABLE).

4 MECHANICAL CONTROL LOGIC
NTS

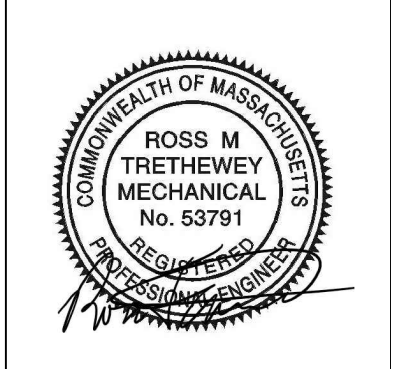
1 MECHANICAL LEGEND
NTS



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CHILMARK SCHOOL

8 STATE ROAD
CHILMARK, MA 02535



LEGEND, NOTES & CONTROL LOGIC
Scale: NONE
DWN:MMW

M-0.0

GENERAL NOTES

THE FOLLOWING DESCRIPTION PROVIDES A SEQUENCE OF OPERATION FOR THE HVAC SYSTEM. ALL TEMPERATURES LISTED ARE THE BASIS OF DESIGN, HOWEVER, EVERY TEMPERATURE SHALL BE MADE ADJUSTABLE BY THE BUILDING FACILITIES MANAGER FOR COMFORT AND ENERGY SAVING REASONS.

GENERAL SEQUENCE OF OPERATION

- VRF AIR SOURCE HEAT PUMPS WILL MODULATE THEIR OUTPUT TO MAINTAIN PRESET ROOM TEMPERATURES
- ALL AIR HANDLING UNITS TO BE CONTROLLED BY WALL MOUNTED HONEYWELL VISION PRO TH8321 THERMOSTATS (WIFI ENABLED)
- ALL AIR HANDLING UNITS WILL BE CONNECTED TO OUTDOOR AIR SOURCE HEAT PUMP UNITS VIA REFRIGERANT LINESETS TO PROVIDE HEATING AND COOLING
- SELECT AIR HANDLER UNITS TO INCLUDE SUPPLEMENTAL ELECTRIC DUCT HEATER
- COMMON HALLWAY SPACES TO INCLUDE SUPPLEMENTAL CEILING MOUNTED CABINET HEATERS
- ERV UNITS WILL VENTILATE THE WHOLE BUILDING AND PROVIDE BALANCED FRESH AIR
- ALL BATHROOM VENTILATION PROVIDED THROUGH ERV UNIT

SPACE HEATING

IF SPACE AIR TEMPERATURE DROPS BELOW 70 DEG F IN ANY ZONE (ADJUSTABLE FROM ZONE THERMOSTAT) A HEATING CALL WILL BE ACTIVATED IN THE CORRESPONDING ZONE. STAGED SYSTEMS SHALL HAVE AN ADJUSTABLE TEMPERATURE DELAY.

1. AIR HANDLER UNIT (HEAT PUMP SOURCED)
 - a. FIRST STAGE HEATING VIA THERMOSTAT INTERFACE KIT W1 CALL SHALL BE ENGAGED ON (SETPOINT -1 DEG F) AND POWERED OFF (SETPOINT +1 DEG F). UPON A FIRST STAGE HEAT CALL, THE OUTDOOR COMPRESSOR SHALL VARY THE FLOW OF REFRIGERANT TO THE INDOOR AIR HANDLER UNIT EVAPORATOR COIL. THIS DESCRIPTION SHOULD BE FOLLOWED FOR ALL AIR HANDLER UNITS.
 - b. IF THE UNIT IS UNABLE TO MEET HEATING DEMAND, THE THERMOSTAT INTERFACE KIT WILL ENERGIZE A W2 CALL AND A SECOND STAGE OF HEATING SHALL BECOME INITIATED. SECOND STAGE HEATING SHALL BE ENGAGED ON (SETPOINT -3 DEG F) AND POWERED OFF (SETPOINT +3 DEG F). DURING A SECOND STAGE HEATING CALL, THE INDOOR UNIT WILL OPERATE AT FULL CAPACITY. THIS DESCRIPTION SHOULD BE FOLLOWED FOR ALL AIR HANDLER UNITS.
 - c. THIRD STAGE HEATING CALL VIA THERMOSTAT INTERFACE KIT W3 SHALL BE ENGAGED ON (SETPOINT -5 DEG F) AND POWERED OFF (SETPOINT +5 DEG F). UPON A THIRD STAGE HEATING CALL, THE ELECTRIC DUCT HEATER SHALL BE ENERGIZED. THIS DESCRIPTION SHOULD BE FOLLOWED FOR ZONES 1 THROUGH 5.
2. CEILING MOUNTED CABINET UNIT HEATERS (ELECTRIC)
 - a. FIRST STAGE HEATING CALL SHALL BE ENGAGED ON (SETPOINT -1 DEG F) AND POWERED OFF (SETPOINT +1 DEG F). UPON A FIRST STAGE HEATING CALL, THE GROUPED CABINET UNIT HEATERS SHALL BE ENERGIZED. THIS DESCRIPTION SHOULD BE FOLLOWED FOR ZONES 11 THROUGH 13.

SPACE COOLING

IF SPACE AIR TEMPERATURE RISES ABOVE 75 DEG F IN ANY ZONE (ADJUSTABLE FROM ZONE THERMOSTAT) A COOLING CALL WILL BE ACTIVATED IN THE CORRESPONDING ZONE.

1. AIR HANDLER UNIT (HEAT PUMP SOURCED)
 - a. FIRST STAGE COOLING VIA THERMOSTAT INTERFACE KIT Y1 CALL SHALL BE ENGAGED ON (SETPOINT +1 DEG F). UPON FIRST STAGE COOLING CALL, THE OUTDOOR COMPRESSOR SHALL MODULATE ITS OUTPUT TO MATCH THE COOLING DEMAND PROVIDING A VARIABLE FLOW OF REFRIGERANT TO THE INDOOR AIR HANDLER UNIT EVAPORATOR COIL. THIS DESCRIPTION SHOULD BE FOLLOWED FOR ALL AIR HANDLER UNITS.
 - b. IF THE UNIT IS UNABLE TO MEET THE COOLING DEMAND, THE THERMOSTAT INTERFACE KIT WILL ENERGIZE A Y2 CALL AND A SECOND STAGE OF COOLING SHALL BECOME INITIATED. SECOND STAGE COOLING SHALL BE ENGAGED ON (SETPOINT +3 DEG F) AND POWERED OFF (SETPOINT -3 DEG F). DURING A SECOND STAGE COOLING CALL, THE INDOOR UNIT WILL OPERATE AT FULL CAPACITY UNTIL THE SETPOINT TEMPERATURE IS MET. THIS DESCRIPTION SHOULD BE FOLLOWED FOR ALL AIR HANDLER UNITS.

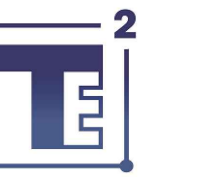
ENERGY RECOVERY VENTILATOR (ERV) SYSTEM

THE BUILDING WILL HAVE QTY. 7 ERV'S TO VENTILATE THE WHOLE BUILDING AND PROVIDE BALANCED FRESH AIR. ALL ERV'S TO INCLUDE EC MOTOR (ECM) OPTION AND WALL MOUNT DIGITAL TIME CLOCK (TC7D-W)

1. CO2 CONTROLLER
 - a. ERV UNITS 1 THROUGH 6 TO INCLUDE WALL MOUNT CO2 CONTROLLER (RENEWAIRE CO2-W)
 - b. ERV UNITS 1 THROUGH 6 SUPPLY/EXHAUST FANS SHALL OPERATE AT LOW SPEED CONTINUOUSLY DURING OCCUPIED HOURS (ADJUSTABLE) AND ENGAGE HIGH FAN SPEED ON PRESET HIGH CO2 LEVEL (ADJUSTABLE)
 - c. THE CO2 CONTROLLER WILL ADJUST THE SUPPLY FAN SPEED TO MAINTAIN THE ROOM OR RETURN AIR CO2 LEVEL AT A SETPOINT (500 PPM, ADJUSTABLE). THE CO2 SETPOINT IS ENTERED AND ADJUSTED FROM THE UNIT CONTROLLER DISPLAY. THE MINIMUM AND MAXIMUM FAN SPEED COMMANDS ARE ADJUSTABLE. IF THE MEASURED CO2 LEVEL EXCEEDS 100 PPM (ADJUSTABLE) FOR MORE THAN 60 SEC (ADJUSTABLE) A CO2 ALARM WILL BE SET TO TRUE AND HIGH FAN SPEED IS INITIATED.
2. DIGITAL TIME CLOCK CONTROLLER
 - a. ERV UNIT 7 SHALL OPERATE AT LOW SPEED CONTINUOUSLY AND ENGAGE HIGH FAN SPEED DURING OCCUPIED HOURS (ADJUSTABLE)
3. ERV ELECTRIC DUCT HEATERS
 - a. ERV UNITS 6 AND 7 TO INCLUDE ELECTRIC DUCT HEATER (RENEWAIRE RHD8240-12)
 - b. ELECTRIC DUCT HEATERS USE OPEN COIL, ELECTRIC RESISTANCE HARDWARE TO PROVIDE AN ADJUSTABLE HEAT OUTPUT. AN AIRFLOW SENSOR IS PROVIDED, CHECKING FOR MINIMUM AIRFLOW. THE CONTROLLER OPERATES ON 24 VAC PROVIDED BY AN ON-BOARD TRANSFORMER. THE CONTROLLER HAS A POTENTIOMETER TO SET THE DESIRED OUTPUT AIR TEMPERATURE BETWEEN 32 DEG F AND 108 DEG F FROM THE UNIT. HEAT OUTPUT IS MODULATED BY THE CONTROLLER WHICH PULSES CURRENT TO THE HEATING COIL. THE ELECTRONIC CONTROLLER MODULATES THE HEATERS CAPACITY ACCORDING TO THE QUANTITY OF AIR FLOWING THROUGH THE HEATER. WITH NORMAL AIRFLOW, THE CONTROLLER WILL OPERATE AT FULL POWER. WHEN THE AIRFLOW DROPS BELOW THE MINIMUM AIRFLOW (30 CFM PER KW) THE CONTROLLER WILL STILL OPERATE, BUT AT A REDUCED POWER. IT WILL ALSO SAFELY SHUT DOWN THE HEATER IN THE CASE OF A TOTAL LOSS OF AIRFLOW.

1 HVAC SEQUENCE OF OPERATION

NTS

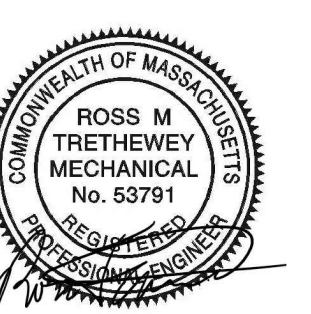


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12.23.20	SD MECHANICAL SET
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02.19.21	CD MECHANICAL SET

CHILMARK SCHOOL

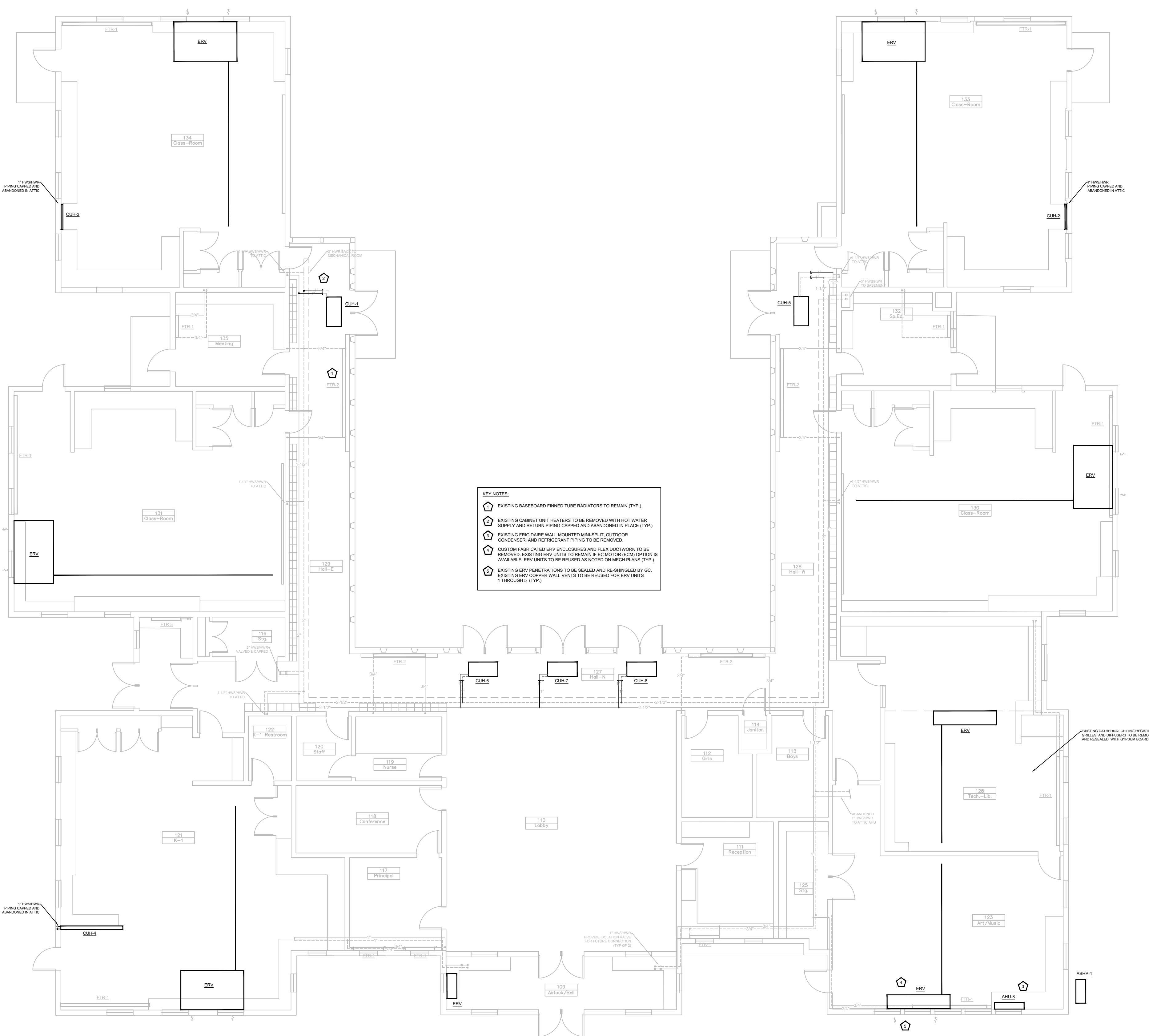
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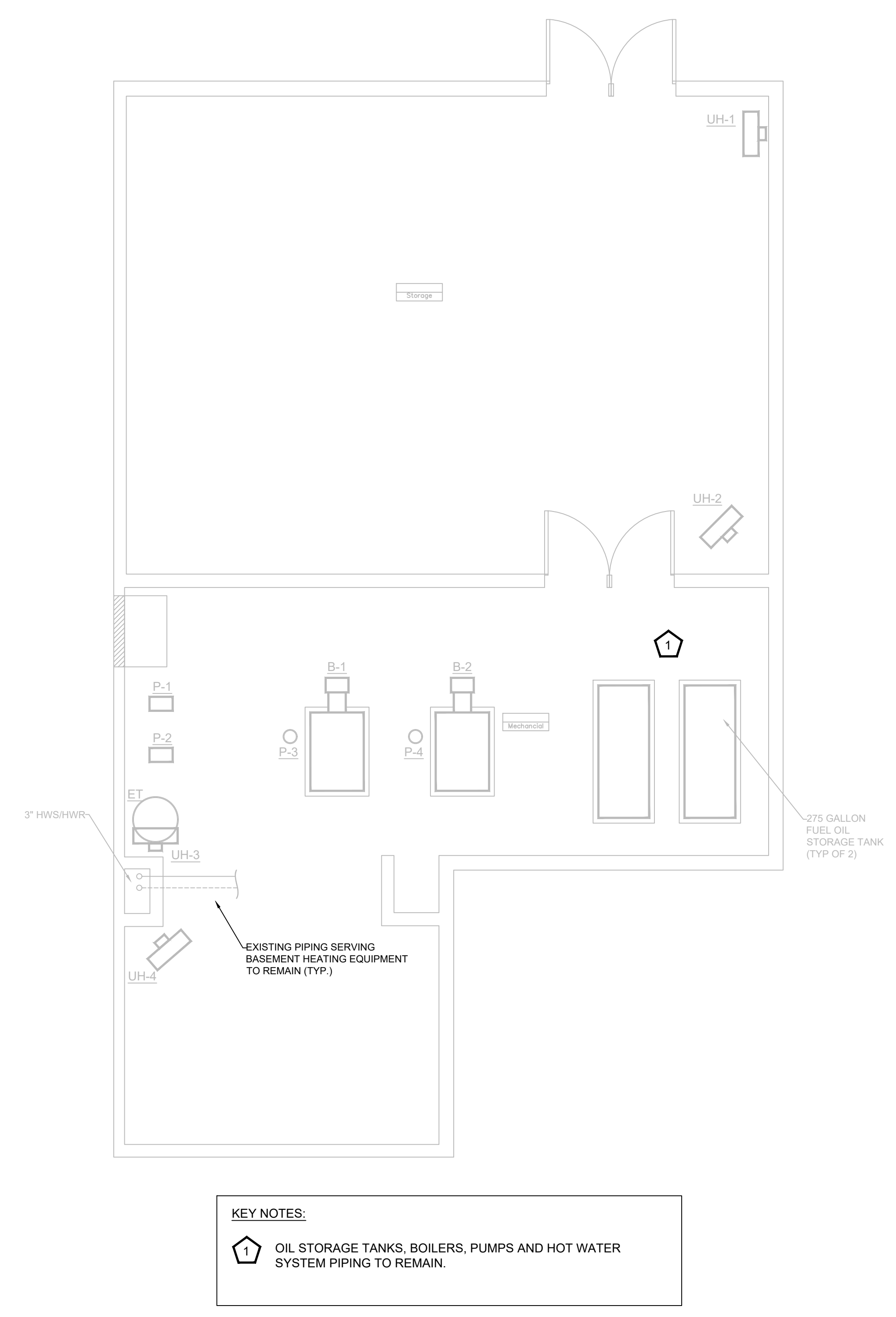
HVAC SEQUENCE OF OPERATION
Scale: NONE

DWN: MW

M-0.1



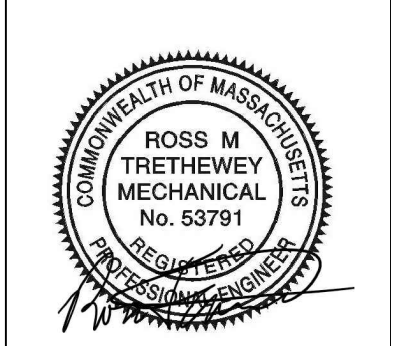
1 FIRST FLOOR DEMO PLAN
 1/8" = 1'-0"



2 BASEMENT DEMO PLAN
 1/4" = 1'-0"

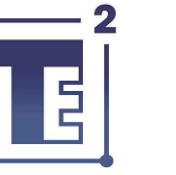
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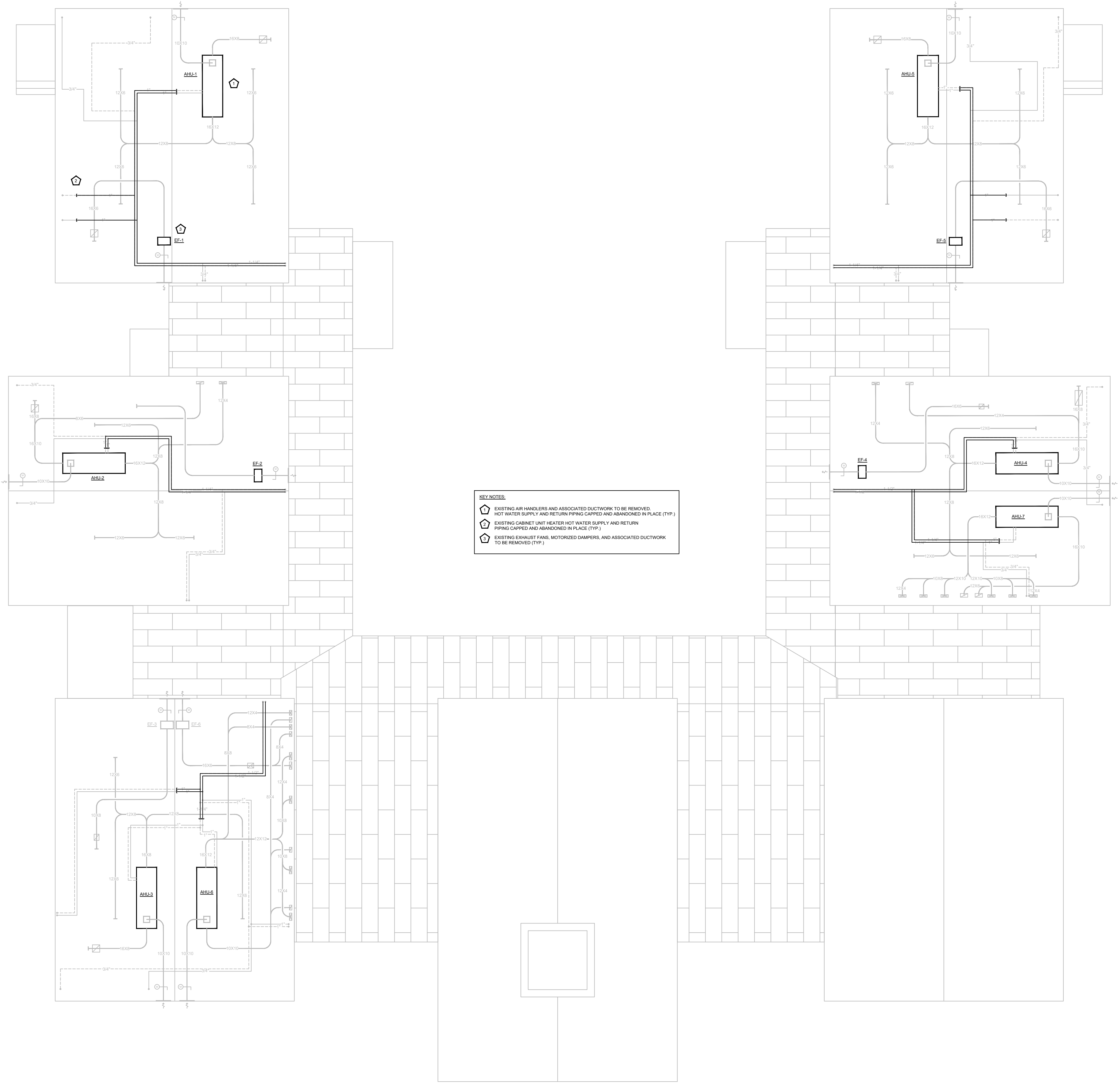


FIRST FLOOR AND BASEMENT
 HVAC DEMO PLAN
 Scale: as noted
 DWN: MW

M-1.0

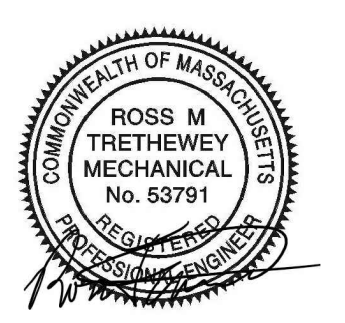


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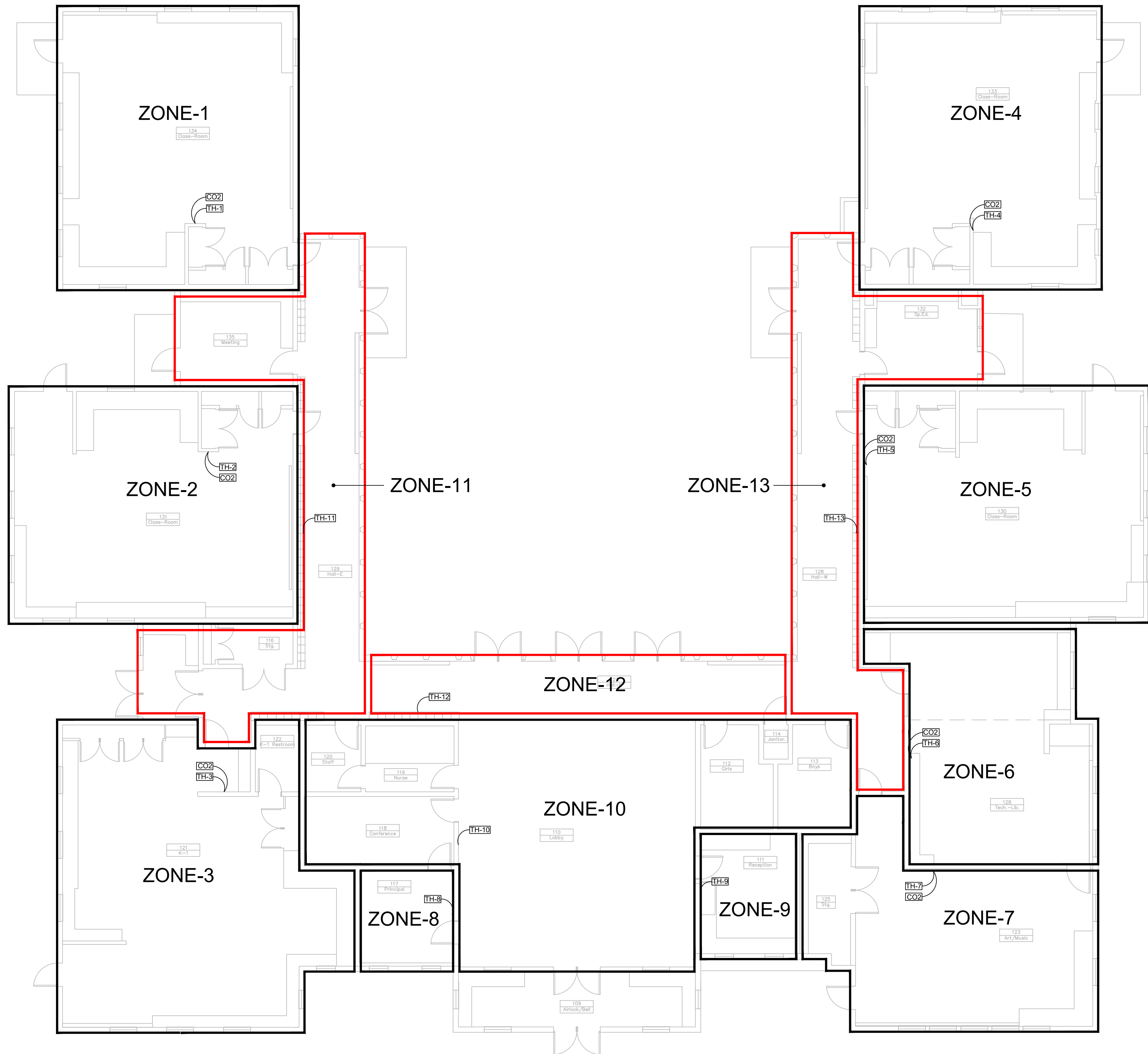
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ATTIC/ROOF
 HVAC DEMO PLAN
 Scale: as noted
 DWN: MW



1 ATTIC/ROOF DEMO PLAN
 1/8" = 1'-0"

M-1.1



ZONE PLAN LEGEND

X: ZONE #
 T-X: THERMOSTAT
 TH-X: THERMOSTAT/HUMIDISTAT
 CO2: WALL MOUNT CO2 SENSOR

 AIR ZONE
 HEAT ONLY ZONE

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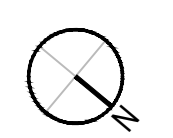
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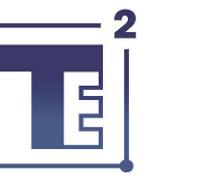
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FIRST FLOOR ZONE PLAN
 Scale: as noted
 DWN: MW

1 FIRST FLOOR ZONE PLAN
 1/8" = 1'-0"

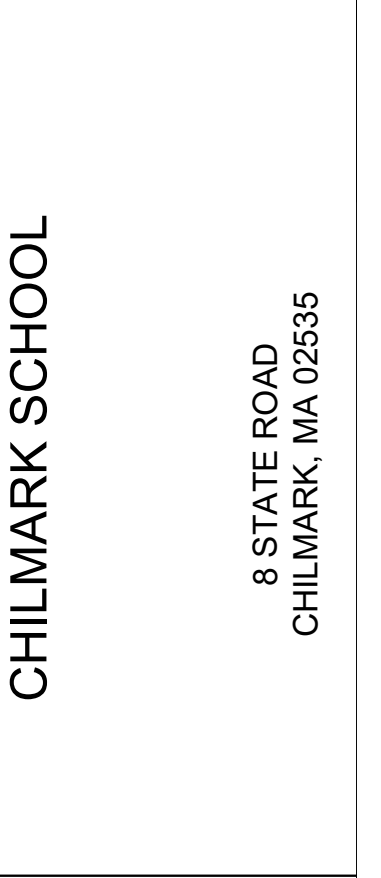




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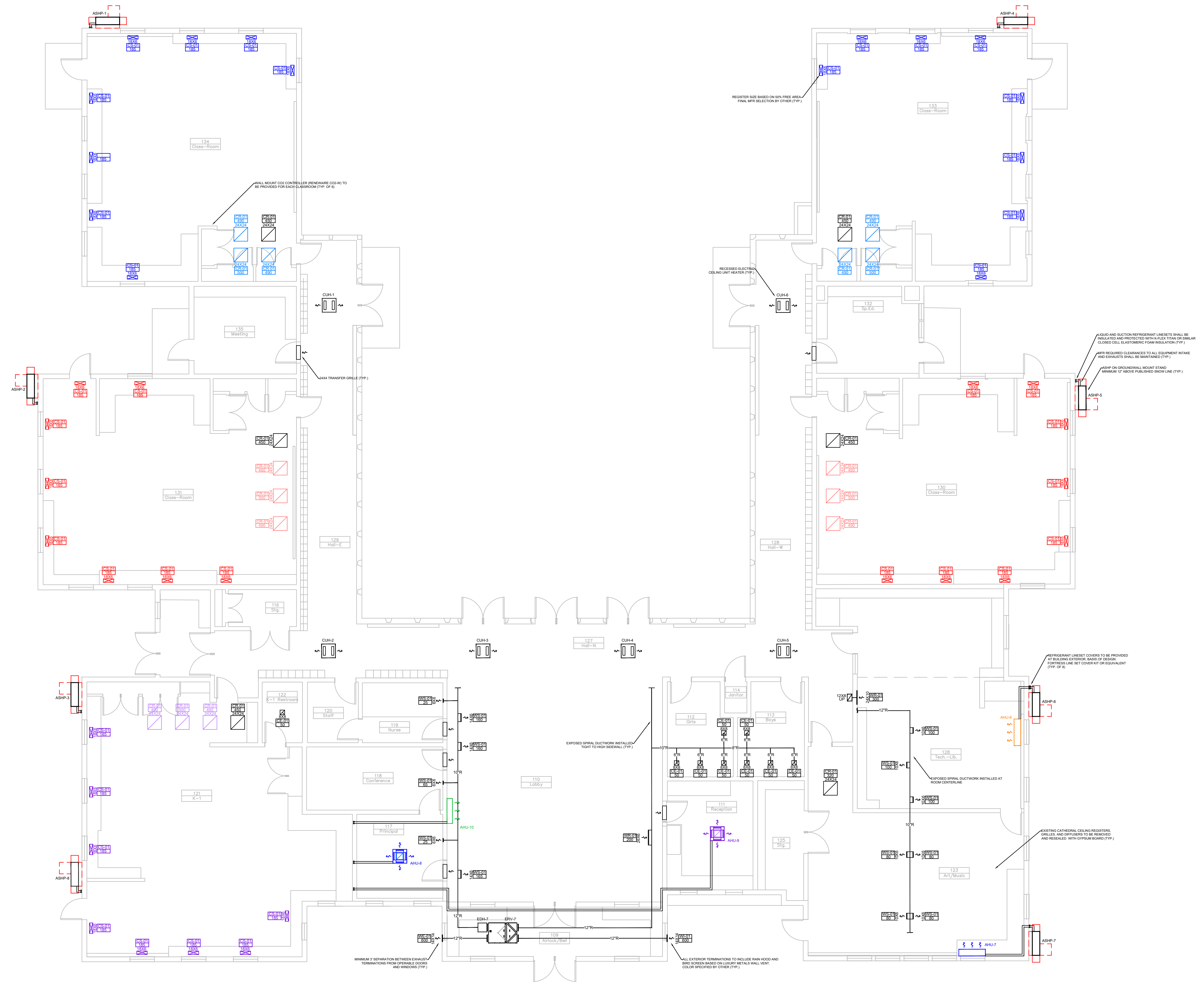
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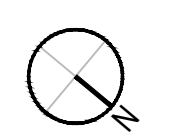
FIRST FLOOR MECHANICAL PLAN
 Scale: as noted

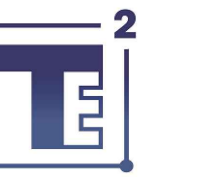
DWN: MW

M-3.0



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



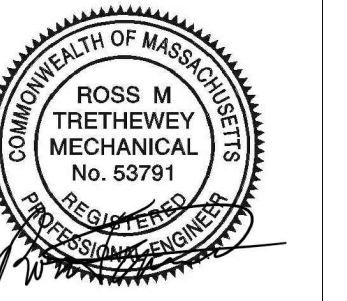


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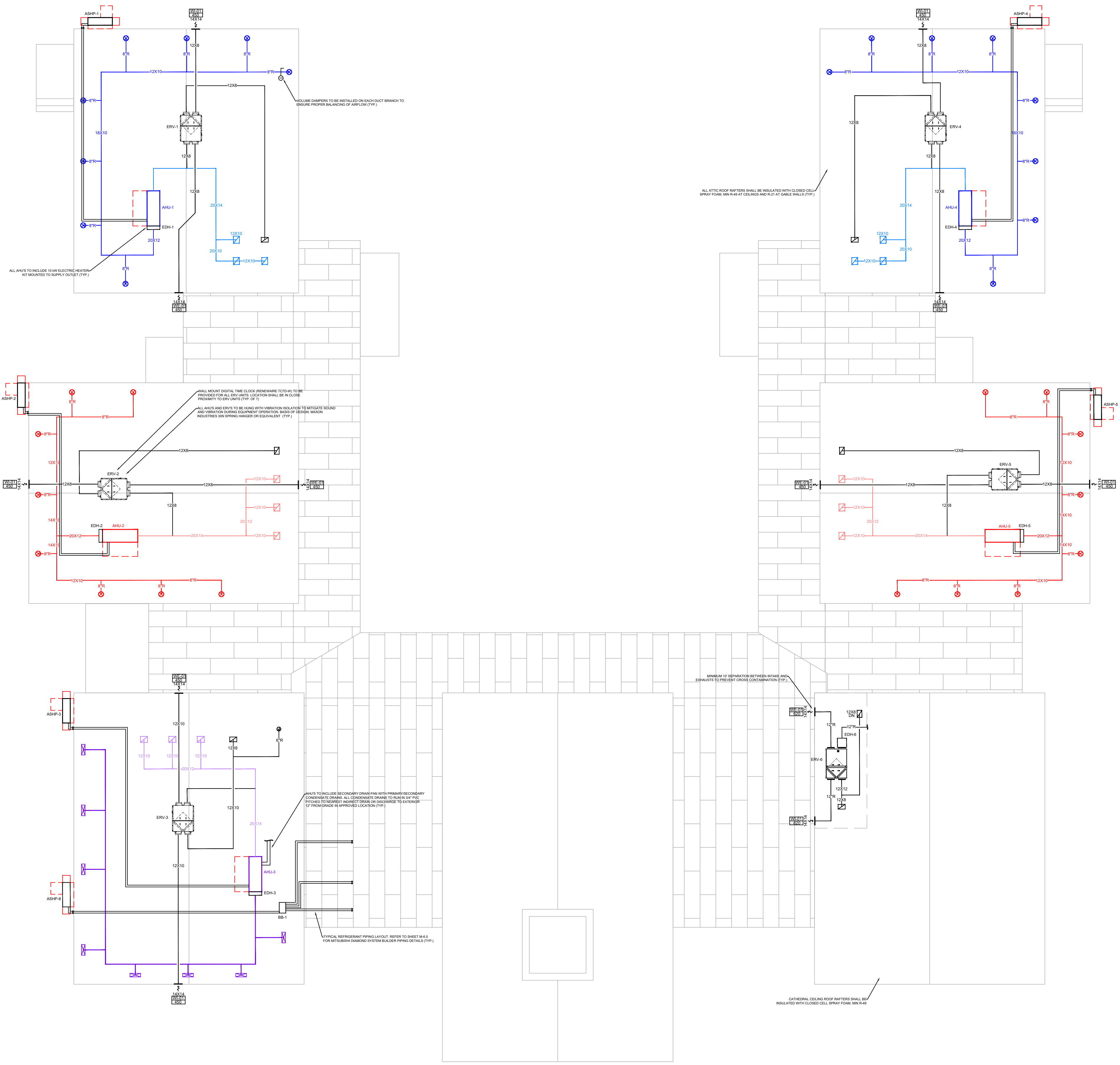
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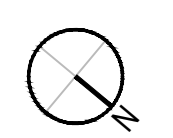
ATTIC MECHANICAL PLAN
 Scale: as noted

DWN: MW

M-3.1

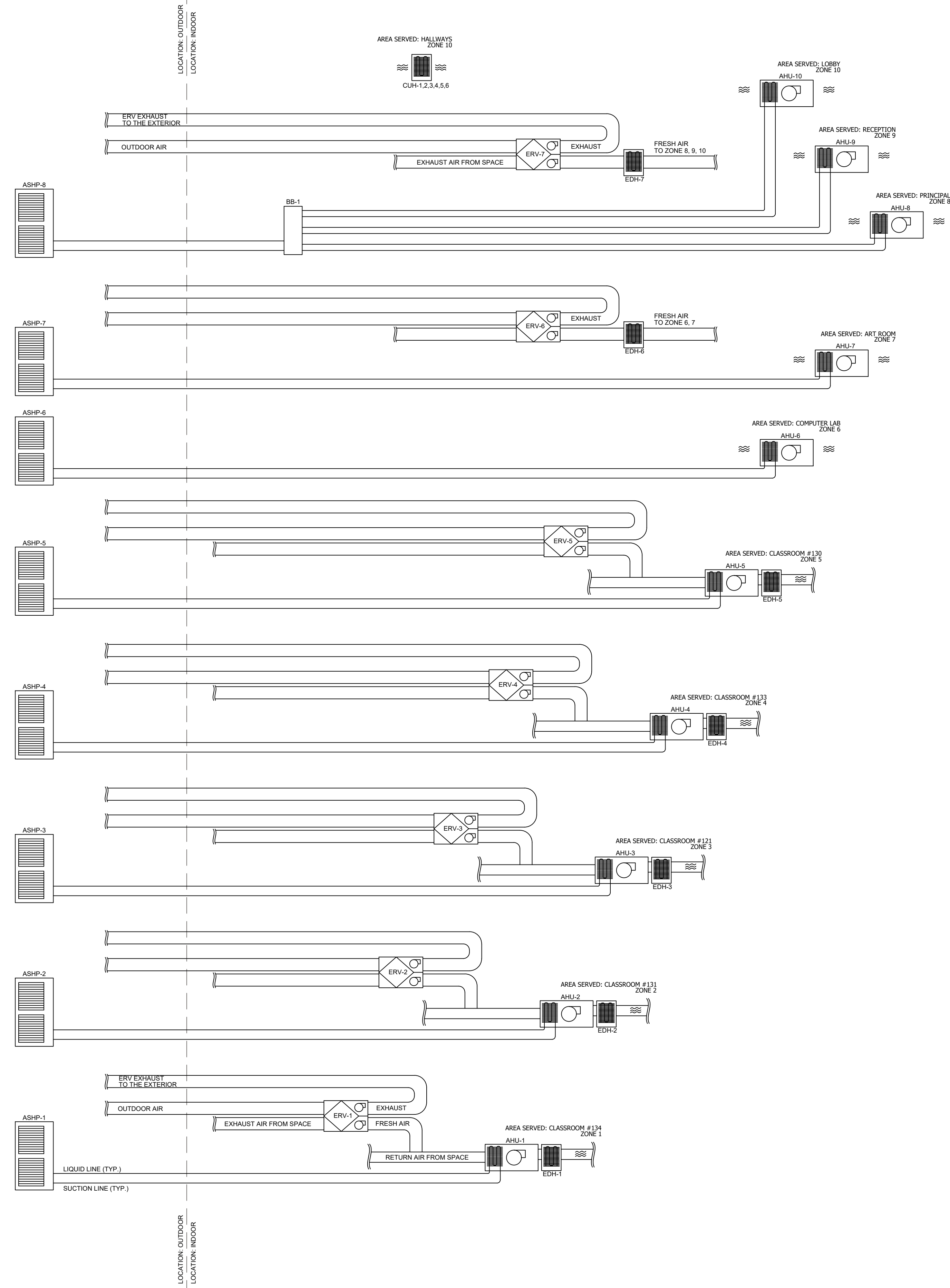


1 ATTIC MECHANICAL PLAN
 1/8" = 1'-0"





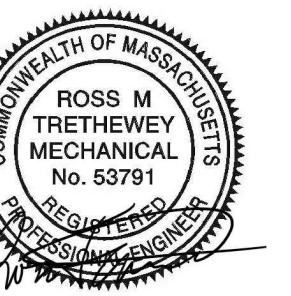
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MECHANICAL CONCEPTUAL SCHEMATIC
 Scale: NONE

DWN: MW

1 MECHANICAL CONCEPTUAL SCHEMATIC
 NTS

M-4.0

AIR SOURCE HEAT PUMP SCHEDULE							
UNIT #	SERVICE	NOMINAL COOLING CAPACITY (BTUH)	NOMINAL HEATING CAPACITY (BTUH)	ELECTRICAL	BASIS OF DESIGN		NOTES
					MFR	MODEL	
ASHP-1	HEAT/COOL	42,000	48,000	208/230 VAC, 60 Hz, 1-PH, MCA 37	mitsubishi	PUZ-HA42NKA1	
ASHP-2	HEAT/COOL	42,000	48,000	208/230 VAC, 60 Hz, 1-PH, MCA 37	mitsubishi	PUZ-HA42NKA1	
ASHP-3	HEAT/COOL	42,000	48,000	208/230 VAC, 60 Hz, 1-PH, MCA 37	mitsubishi	PUZ-HA42NKA1	
ASHP-4	HEAT/COOL	42,000	48,000	208/230 VAC, 60 Hz, 1-PH, MCA 37	mitsubishi	PUZ-HA42NKA1	
ASHP-5	HEAT/COOL	42,000	48,000	208/230 VAC, 60 Hz, 1-PH, MCA 37	mitsubishi	PUZ-HA42NKA1	
ASHP-6	HEAT/COOL	30,000	32,000	208/230 VAC, 60 Hz, 1-PH, MCA 28	mitsubishi	PUZ-HA30NKA	
ASHP-7	HEAT/COOL	30,000	32,000	208/230 VAC, 60 Hz, 1-PH, MCA 28	mitsubishi	PUZ-HA30NKA	
ASHP-8	HEAT/COOL	42,000	48,000	208/230 VAC, 60 Hz, 1-PH, MCA 42	mitsubishi	MXZ-5C42NAHZ2	

NOTES:
 - PROVIDE CONDENSATE DRAIN/PUMP FOR EACH INDOOR UNIT
 - UNIT TO BE MOUNTED OFF THE GROUND WITH VIBRATION ISOLATION BASED ON THE QUICK-SLING QSMS 1800 OR APPROVED EQUAL
 - OUTDOOR REFRIGERANT LINESETS TO BE WRAPPED IN UV RESISTANT, FIRE RATED, AND ANTI-MICROBIAL INSULATION PROTECTION BASED ON AIREX-FLEX GUARD OR EQUAL
 - REFRIGERANT LINESET PENETRATION THROUGH BUILDING EXTERIOR SEALED BY AIREX TITAN FS OR SS MODEL SERIES DEPENDING ON WALL CONSTRUCTION
 - OUTDOOR HEAT PUMPS TO BE LOCATED WITH PROPER CLEARANCES AND MUST PREVENT RE-CIRCULATION OF AIR. COORDINATE WITH MANUFACTURER AND SCHOOL ADMINISTRATOR

AIR HANDLER SCHEDULE								
UNIT #	TYPE	SERVICE	NOMINAL COOLING CAPACITY (BTUH)	NOMINAL HEATING CAPACITY (BTUH)	ELECTRICAL	BASIS OF DESIGN		NOTES
						MFR	MODEL	
AHU-1	VERTICAL	CLASSROOM #134	42,000	48,000	208/230 VAC, 60 Hz, 1-PH, 5.6 A	mitsubishi	PVA-A42AA7	PROVIDE 5" THICK MERV 13 FILTER BOX, TRION AIR BEAR SUPREME 2000
AHU-2	VERTICAL	CLASSROOM #131	42,000	48,000	208/230 VAC, 60 Hz, 1-PH, 5.6 A	mitsubishi	PVA-A42AA7	PROVIDE 5" THICK MERV 13 FILTER BOX, TRION AIR BEAR SUPREME 2000
AHU-3	VERTICAL	K1 CLASSROOM	42,000	48,000	208/230 VAC, 60 Hz, 1-PH, 5.6 A	mitsubishi	PVA-A42AA7	PROVIDE 5" THICK MERV 13 FILTER BOX, TRION AIR BEAR SUPREME 2000
AHU-4	VERTICAL	CLASSROOM #133	42,000	48,000	208/230 VAC, 60 Hz, 1-PH, 5.6 A	mitsubishi	PVA-A42AA7	PROVIDE 5" THICK MERV 13 FILTER BOX, TRION AIR BEAR SUPREME 2000
AHU-5	VERTICAL	CLASSROOM #130	42,000	48,000	208/230 VAC, 60 Hz, 1-PH, 5.6 A	mitsubishi	PVA-A42AA7	PROVIDE 5" THICK MERV 13 FILTER BOX, TRION AIR BEAR SUPREME 2000
AHU-6	WALL MOUNT	COMPUTER LAB	30,000	32,000	208/230 VAC, 60 Hz, 1-PH, 1.0 A	mitsubishi	PKA-A30KA7	
AHU-7	WALL MOUNT	ART ROOM	30,000	32,000	208/230 VAC, 60 Hz, 1-PH, 1.0 A	mitsubishi	PKA-A30KA7	
AHU-8	CEILING CASSETTE	PRINCIPALS OFFICE	11,100	13,600	208/230 VAC, 60 Hz, 1-PH, 1.0 A	mitsubishi	SLZ-KF12NATH	
AHU-9	CEILING CASSETTE	RECEPTION	11,100	13,600	208/230 VAC, 60 Hz, 1-PH, 1.0 A	mitsubishi	SLZ-KF12NATH	
AHU-10	WALL MOUNT	LOBBY/Common	22,500	27,600	208/230 VAC, 60 Hz, 1-PH, 1.0 A	mitsubishi	MSZ-GL24NA	

NOTES:
 - ALL DUCTWORK TO BE INCLUDED WITH 1/2" ACCOUSTICAL DUCT LINER TO MEDIATE NOISE AND VIBRATION FOR FIRST 15 FEET
 - ALL DUCTED AIR HANDLERS TO BE INCLUDED WITH AIR FILTRATION (PROGRESSIVE MEDIA FILTERS)
 - PRICING OPTION SHALL BE INCLUDED FOR EACH SYSTEM TO BE REMOTELY MONITORED
 - AIR HANDLERS TO INCLUDE THERMOSTAT INTERFACE KIT FOR THIRD PARTY 'SMART' THERMOSTAT
 - AIR HANDLERS TO INCLUDE SECONDARY DRAIN PANS WITH PRIMARY AND SECONDARY CONDENSATE DRAIN
 - WATER BUG SENSORS SHALL BE LOCATED IN SECONDARY DRAIN PANS TO SHUT DOWN THE CORRESPONDING EQUIPMENT AND NOTIFY THE FACILITIES MANAGER IN EVENT OF A WATER LEAK
 - ALL AIR HANDLERS TO BE INSTALLED WITH VIBRATION ISOLATION (RESILIENTLY SUPPORTED) TO MINIMIZE SOUND AND VIBRATIONS INTO THE SPACE

ELECTRIC DUCT HEATER SCHEDULE									
UNIT #	TYPE	KW	DUCT SIZE (IN)	AIRFLOW (CFM)	PRESSURE DROP (IN WG)	ELECTRICAL	BASIS OF DESIGN		NOTES
							MFR	MODEL	
EDH-1	MOUNTED	10	MATCH AHU-1	1480	0.20	240 VAC, 1-PH, 60 Hz, 42 A	mitsubishi	EH10-MPA-L(B)	MOUNTED TO AIR OUTLET CONNECTION OF MULTI-POSITION AHU
EDH-2	MOUNTED	10	MATCH AHU-2	1480	0.20	240 VAC, 1-PH, 60 Hz, 42 A	mitsubishi	EH10-MPA-L(B)	MOUNTED TO AIR OUTLET CONNECTION OF MULTI-POSITION AHU
EDH-3	MOUNTED	10	MATCH AHU-3	1480	0.20	240 VAC, 1-PH, 60 Hz, 42 A	mitsubishi	EH10-MPA-L(B)	MOUNTED TO AIR OUTLET CONNECTION OF MULTI-POSITION AHU
EDH-4	MOUNTED	10	MATCH AHU-4	1480	0.20	240 VAC, 1-PH, 60 Hz, 42 A	mitsubishi	EH10-MPA-L(B)	MOUNTED TO AIR OUTLET CONNECTION OF MULTI-POSITION AHU
EDH-5	MOUNTED	10	MATCH AHU-5	1480	0.20	240 VAC, 1-PH, 60 Hz, 42 A	mitsubishi	EH10-MPA-L(B)	MOUNTED TO AIR OUTLET CONNECTION OF MULTI-POSITION AHU
EDH-6	MOUNTED	8	12"R	620	0.20	240 VAC, 1-PH, 60 Hz, 33 A	renewaire	RHD8240-12	
EDH-7	MOUNTED	8	12"R	600	0.20	240 VAC, 1-PH, 60 Hz, 33 A	renewaire	RHD8240-12	

NOTES:
 1) PROVIDE UNIT WITH THE FOLLOWING FACTORY SUPPLIED OPTIONS, CONTRACTOR TO FIELD INSTALL AS REQUIRED
 - AIRFLOW PRESSURE SWITCH
 - INTERLOCKING DISCONNECT SWITCH
 - UNIT TO OPERATE AS SUPPLEMENTAL BACKUP HEATER

REGISTER, GRILLE, DIFFUSER (RGD) SCHEDULE						
TAG #	TYPE	LOCATION	AIRFLOW (CFM)	BASIS OF DESIGN		NOTES
				MANUFACTURER	MODEL	
WS-01	SUPPLY	WALL	SEE PLANS	HART & COOLEY	821	
CS-01	SUPPLY	CEILING	SEE PLANS	HART & COOLEY	821	REUSE EXISTING AND MATCH IF APPLICABLE
CR-01	RETURN	CEILING	SEE PLANS	HART & COOLEY	PFG	REUSE EXISTING AND MATCH IF APPLICABLE
CE-01	EXHAUST	CEILING	SEE PLANS	HART & COOLEY	ARE	REUSE EXISTING AND MATCH IF APPLICABLE
WE-01	EXHAUST	EXTERIOR	SEE PLANS	LUXURY METALS	12"R WALL VENT, COPPER	REUSE EXISTING AND MATCH IF APPLICABLE
WI-01	INTAKE	EXTERIOR	SEE PLANS	LUXURY METALS	12"R WALL VENT, COPPER	REUSE EXISTING AND MATCH IF APPLICABLE

NOTES:
 - ALL SUPPLY REGISTERS SHALL BE BASED ON AIR VELOCITIES OF 500 FPM
 - ALL RETURN REGISTERS SHALL BE BASED ON AIR VELOCITIES OF 400 FPM
 - CONTRACTOR TO COORDINATE RGD SIZING AND FINISHED MOUNTING SURFACE, OFFSET DISTANCE, MATERIAL, FRAMING, AND COLOR WITH SCHOOL ADMINISTRATOR
 - ALL INTAKE AND EXHAUST TERMINATIONS SHALL BE SIZED AND INSTALLED TO PREVENT WATER AND INSECT INTRUSION INTO THE DUCTWORK/BUILDING
 - AIR VELOCITIES THROUGH ALL INTAKE AND EXHAUST TERMINATIONS SHALL BE KEPT TO 500 FPM OR LESS
 - MINIMUM OF TEN FEET OF SEPARATION BETWEEN INTAKE AND EXHAUST TERMINATIONS. EXHAUST TERMINATIONS MUST BE AT LEAST THREE FEET FROM ANY BUILDING OPENING (OPERABLE WINDOW/DOOR)
 - ALL INTAKE AND EXHAUST TERMINATIONS TO BE LOCATED AT LEAST A FOOT ABOVE THE PUBLISHED LOCAL SNOW GRADE
 - EXHAUST TERMINATION TYPES AND LOCATION SHALL BE CHOSEN TO PREVENT EXHAUST AIR FROM BEING DIRECTED ONTO WALKWAYS OR OCCUPIED AREAS
 - ALL INTAKE AND EXHAUST TERMINATIONS TO INCLUDE BACKDRAFT DAMPERS, RAIN HOOD, AND INSECT SCREEN WHERE ALLOWED BY CODE

HEATING AND COOLING ZONES							
FLOOR	ZONE #	AREA SERVED	UNIT #	HEATING EMITTER	COOLING EMITTER	MANUFACTURER (AS STANDARD)	NOTES
FIRST	1	CLASSROOM #134	TH-1	AHU-1	AHU-1	HONEYWELL TH8321	
FIRST	2	CLASSROOM #131	TH-2	AHU-2	AHU-2	HONEYWELL TH8321	
FIRST	3	K1 CLASSROOM	TH-3	AHU-3	AHU-3	HONEYWELL TH8321	
FIRST	4	CLASSROOM #133	TH-4	AHU-4	AHU-4	HONEYWELL TH8321	
FIRST	5	CLASSROOM #130	TH-5	AHU-5	AHU-5	HONEYWELL TH8321	
FIRST	6	COMPUTER LAB	TH-6	AHU-6	AHU-6	HONEYWELL TH8321	
FIRST	7	ART ROOM	TH-7	AHU-7	AHU-7	HONEYWELL TH8321	
FIRST	8	PRINCIPALS OFFICE	TH-8	AHU-8	AHU-8	HONEYWELL TH8321	
FIRST	9	RECEPTION	TH-9	AHU-9	AHU-9	HONEYWELL TH8321	
FIRST	10	LOBBY	TH-10	AHU-10	AHU-10	HONEYWELL TH8321	
FIRST	11	EAST HALL	TH-11	CUH-1.2	-	HONEYWELL TH8321	GROUPED CABINET UNIT HEATERS ON THERMOSTAT
FIRST	12	LOBBY HALL	TH-12	CUH-3.4	-	HONEYWELL TH8321	GROUPED CABINET UNIT HEATERS ON THERMOSTAT
FIRST	13	WEST HALL	TH-13	CUH-5.6	-	HONEYWELL TH8321	GROUPED CABINET UNIT HEATERS ON THERMOSTAT

NOTES:
 - FINAL THERMOSTAT LOCATIONS TO BE DETERMINED BY SCHOOL ADMINISTRATOR
 - ALL THERMOSTATS TO BE PROVIDED WITH WI-FI COMMUNICATION FOR REMOTE MONITORING. SYSTEM SHALL BE ABLE TO BE CONTROLLED BY AN APP THROUGH SMART DEVICE (PHONE, TABLET, PC)
 - ALL AHU'S TO BE PROVIDED WITH THERMOSTAT INTERFACE MODULE MADE TO WORK WITH THIRD PARTY THERMOSTAT

VENTILATION SCHEDULE							
UNIT #	SERVICE	AIRFLOW (CFM)	STATIC PRESSURE (IN W.G.)	ELECTRICAL	BASIS OF DESIGN		NOTES
					MFR	MODEL	
ERV-1	ENERGY RECOVERY VENTILATOR	450	0.35	120 VAC, 60 Hz, 1-PH, 8 A	renewaire	EV450IN	EXISTING ERV UNIT TO BE REUSED IF ECM OPTION EQUIPPED. VERIFY IN FIELD.
ERV-2	ENERGY RECOVERY VENTILATOR	450	0.35	120 VAC, 60 Hz, 1-PH, 8 A	renewaire	EV450IN	EXISTING ERV UNIT TO BE REUSED IF ECM OPTION EQUIPPED. VERIFY IN FIELD.
ERV-3	ENERGY RECOVERY VENTILATOR	450	0.35	120 VAC, 60 Hz, 1-PH, 8 A	renewaire	EV450IN	EXISTING ERV UNIT TO BE REUSED IF ECM OPTION EQUIPPED. VERIFY IN FIELD.
ERV-4	ENERGY RECOVERY VENTILATOR	450	0.35	120 VAC, 60 Hz, 1-PH, 8 A	renewaire	EV450IN	EXISTING ERV UNIT TO BE REUSED IF ECM OPTION EQUIPPED. VERIFY IN FIELD.
ERV-5	ENERGY RECOVERY VENTILATOR	450	0.35	120 VAC, 60 Hz, 1-PH, 8 A	renewaire	EV450IN	EXISTING ERV UNIT TO BE REUSED IF ECM OPTION EQUIPPED. VERIFY IN FIELD.
ERV-6	ENERGY RECOVERY VENTILATOR	620	0.50	120 VAC, 60 Hz, 1-PH, 18 A	renewaire	HE-1XINH	
ERV-7	ENERGY RECOVERY VENTILATOR	600	0.50	120 VAC, 60 Hz, 1-PH, 18 A	renewaire	HE-1XINH	

NOTES:
 - ALL FAN SIZES MUST BE VERIFIED BASED ON FINAL DUCT ROUTING
 - ALL ERV UNITS TO INCLUDE EC MOTOR OPTION IF NOT ALREADY PROVIDED. UPGRADE ERV UNIT AS NECESSARY.
 - ALL ERV UNITS TO INCLUDE WALL MOUNT DIGITAL TIME CLOCK (RENEWAIRE TC7D-W)
 - ERV UNITS 1 THROUGH 6 TO INCLUDE WALL MOUNT CO2 CONTROLLER (RENEWAIRE CO2-W)
 - ERV UNITS 1 THROUGH 6 SHALL OPERATE AT LOW SPEED CONTINUOUSLY DURING OCCUPIED HOURS AND ENGAGE HIGH FAN SPEED UPON HIGH CO2 DETECTION
 - ERV UNIT 7 SHALL OPERATE AT LOW SPEED CONTINUOUSLY AND ENGAGE HIGH FAN SPEED DURING OCCUPIED HOURS
 - VOLUME DAMPERS TO BE INSTALLED ON THE EXHAUST BRANCH FROM EACH ERV EXHAUST POINT TO ENSURE PROPER AIRFLOW BALANCING. BATH EXHAUSTS WITH MULTIPLE EXHAUST POINTS SHALL ALSO INCLUDE VOLUME DAMPERS ON EACH BRANCH TO BALANCE AIRFLOW.
 - ALL FANS TO BE INSTALLED WITH VIBRATION ISOLATION (RESILIENTLY SUPPORTED) TO MINIMIZE SOUND AND VIBRATION INTO THE SPACE

CABINET UNIT HEATER SCHEDULE								
UNIT #	LOCATION	TYPE	KW	AIRFLOW (CFM)	ELECTRICAL	BASIS OF DESIGN		NOTES
						MFR	MODEL	
CUH-1	CEILING	RECESSED MOUNT	5	300	240 VAC, 1-PH, 60 Hz, 21 A	QMARK	CDF552	
CUH-2	CEILING	RECESSED MOUNT	5	300	240 VAC, 1-PH, 60 Hz, 21 A	QMARK	CDF552	
CUH-3	CEILING	RECESSED MOUNT	5	300	240 VAC, 1-PH, 60 Hz, 21 A	QMARK	CDF552	
CUH-4	CEILING	RECESSED MOUNT	5	300	240 VAC, 1-PH, 60 Hz, 21 A	QMARK	CDF552	
CUH-5	CEILING	RECESSED MOUNT	5	300	240 VAC, 1-PH, 60 Hz, 21 A	QMARK	CDF552	
CUH-6	CEILING	RECESSED MOUNT	5	300	240 VAC, 1-PH, 60 Hz, 21 A	QMARK	CDF552	

NOTES:
 - DISCONNECT SWITCH AND ALL INTERLOCK RELAYS SHALL BE INSTALLED WITHIN THE HEATER ENCLOSURE

DATE	DESCRIPTION
12.23.20	SD MECHANICAL SET
01.22.21	DD MECHANICAL SET
02.19.21	CD MECHANICAL SET

CHILMARK SCHOOL
 8 STATE ROAD
 CHILMARK, MA 02535



MECHANICAL SCHEDULE
 Scale: NONE
 DWN: MW

Indoor Units: 3 / 2 to 5
 Capacity: 48 / 21 to 54
 * Connectable capacity is not actual capacity.
 Total Pipe Length: 183.9 / 492.0 feet
 Furthest Actual: 120.0 / 262.0 feet
 Furthest Equiv.: 124.9 / 262.0 feet

Correction Factors

Outdoor Unit Capacity:	1.00	1.00
Temperature:	1.02	0.99
Piping Length:	0.93	0.98
Defrosting:	-	0.95
User Derate:	1.00	1.00
Total Derate:	0.95	0.92

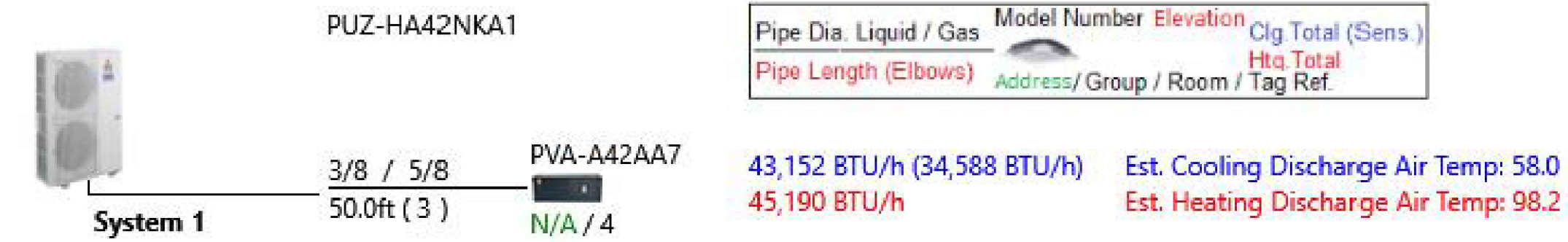
Additional Refrigerant: 9.5 lb
 Total Refrigerant Amount: 20.1 lb

Conditions (°F)

Cooling
 Indoor DB 80.0 Humidity 51.8% Indoor WB 67.0
 Outdoor DB 91.0

Heating
 Indoor DB 70.0
 Outdoor DB 6.0 Humidity 72.8% Outdoor WB 5.0

1 TYPICAL HORIZONTAL AIR HANDLER UNIT PIPING CONFIGURATION (SINGLE ZONE)
 SCALE: NONE



Indoor Units: 3 / 2 to 5
 Capacity: 48 / 21 to 54
 * Connectable capacity is not actual capacity.
 Total Pipe Length: 183.9 / 492.0 feet
 Furthest Actual: 120.0 / 262.0 feet
 Furthest Equiv.: 124.9 / 262.0 feet

Correction Factors

Outdoor Unit Capacity:	1.00	1.00
Temperature:	1.02	0.99
Piping Length:	0.93	0.98
Defrosting:	-	0.95
User Derate:	1.00	1.00
Total Derate:	0.95	0.92

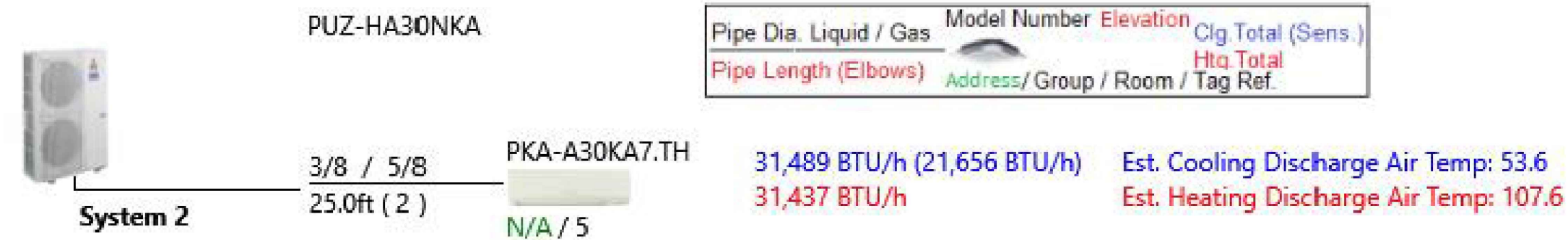
Additional Refrigerant: 9.5 lb
 Total Refrigerant Amount: 20.1 lb

Conditions (°F)

Cooling
 Indoor DB 80.0 Humidity 51.8% Indoor WB 67.0
 Outdoor DB 91.0

Heating
 Indoor DB 70.0
 Outdoor DB 6.0 Humidity 72.8% Outdoor WB 5.0

2 TYPICAL WALL MOUNTED AIR HANDLER UNIT PIPING CONFIGURATION (SINGLE ZONE)
 SCALE: NONE



Indoor Units: 3 / 2 to 5
 Capacity: 48 / 21 to 54
 * Connectable capacity is not actual capacity.
 Total Pipe Length: 183.9 / 492.0 feet
 Furthest Actual: 120.0 / 262.0 feet
 Furthest Equiv.: 124.9 / 262.0 feet

Correction Factors

Outdoor Unit Capacity:	1.00	1.00
Temperature:	1.02	0.99
Piping Length:	0.93	0.98
Defrosting:	-	0.95
User Derate:	1.00	1.00
Total Derate:	0.95	0.92

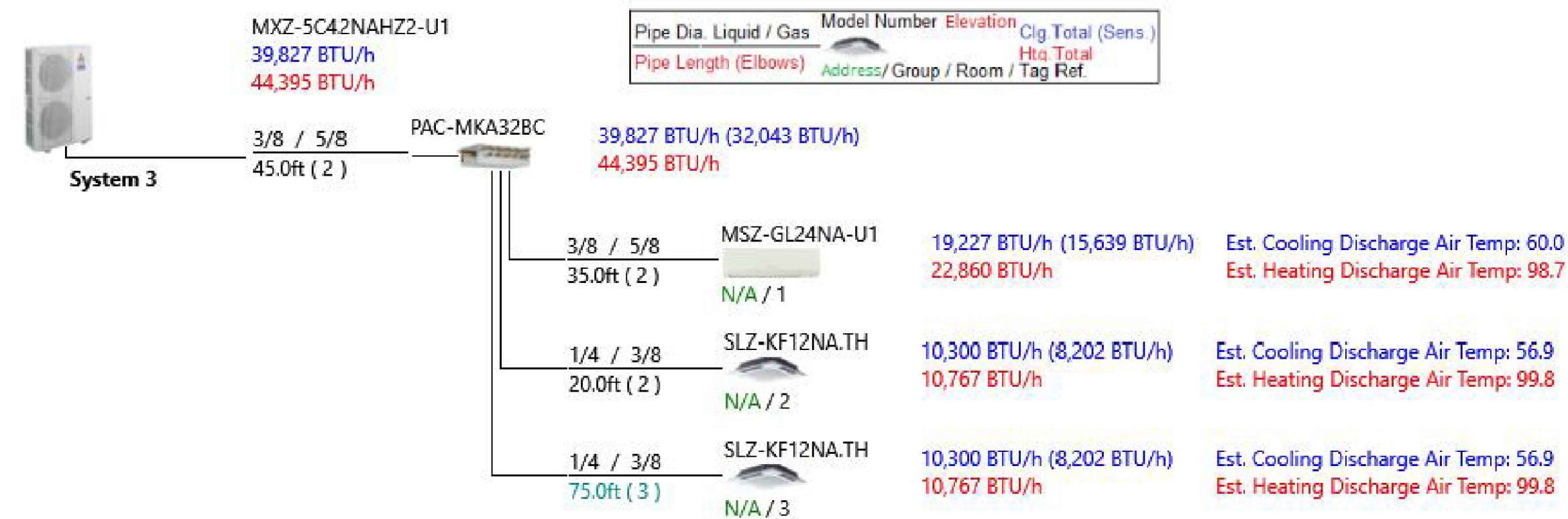
Additional Refrigerant: 9.5 lb
 Total Refrigerant Amount: 20.1 lb

Conditions (°F)

Cooling
 Indoor DB 80.0 Humidity 51.8% Indoor WB 67.0
 Outdoor DB 91.0

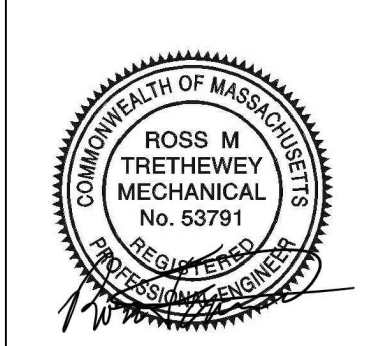
Heating
 Indoor DB 70.0
 Outdoor DB 6.0 Humidity 72.8% Outdoor WB 5.0

3 MULTI-ZONE AIR HANDLER UNIT PIPING CONFIGURATION
 SCALE: NONE

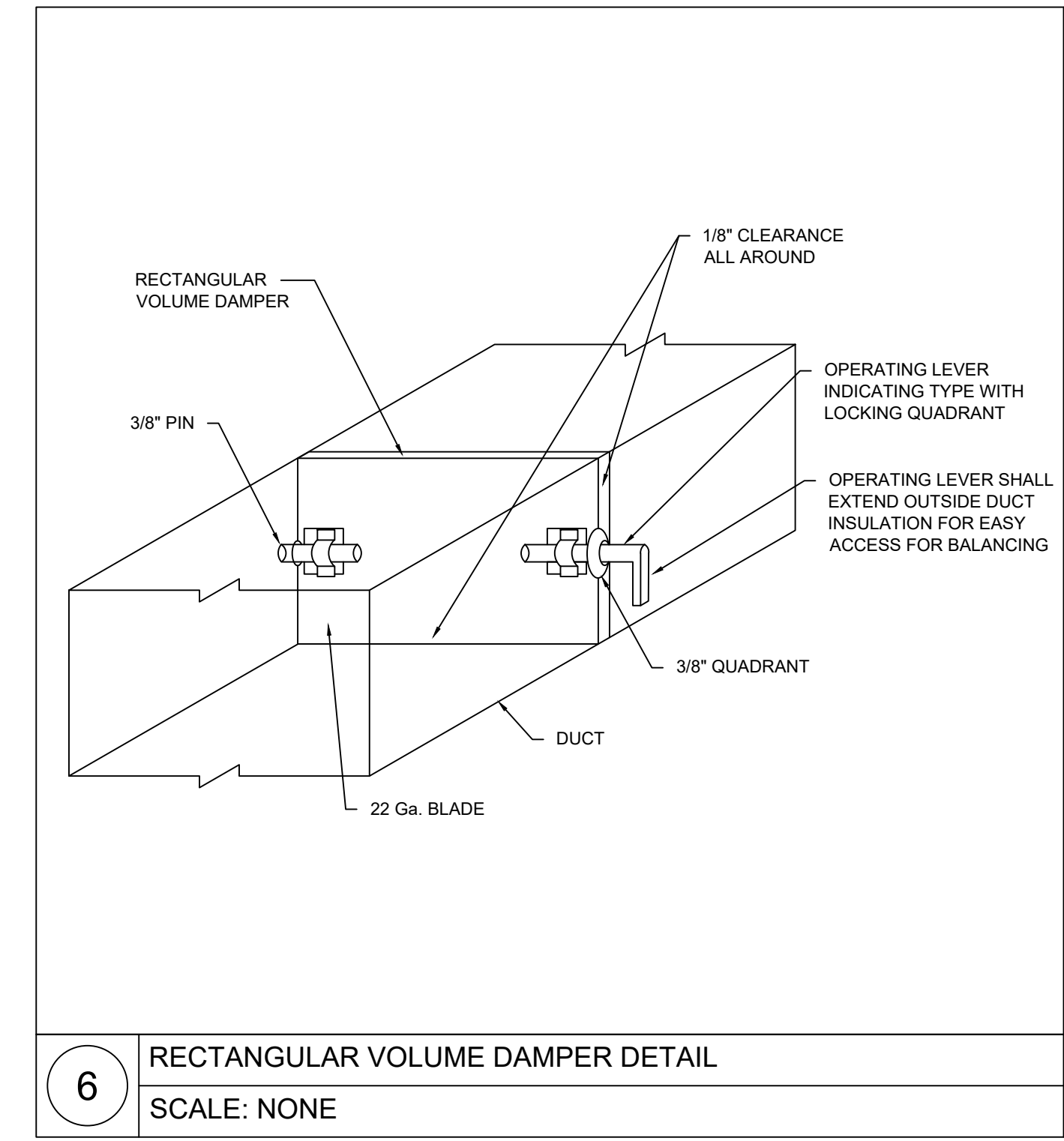
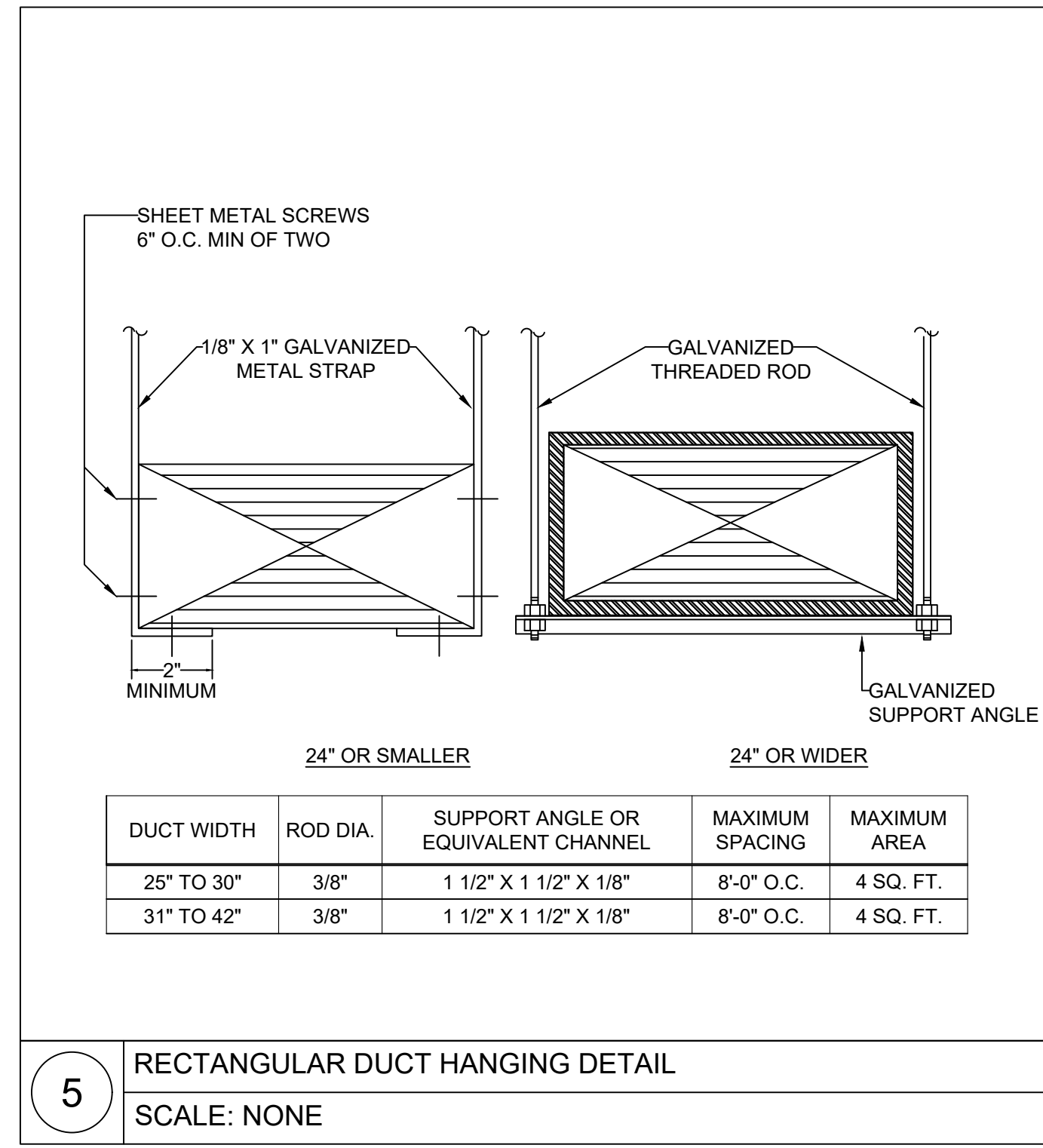
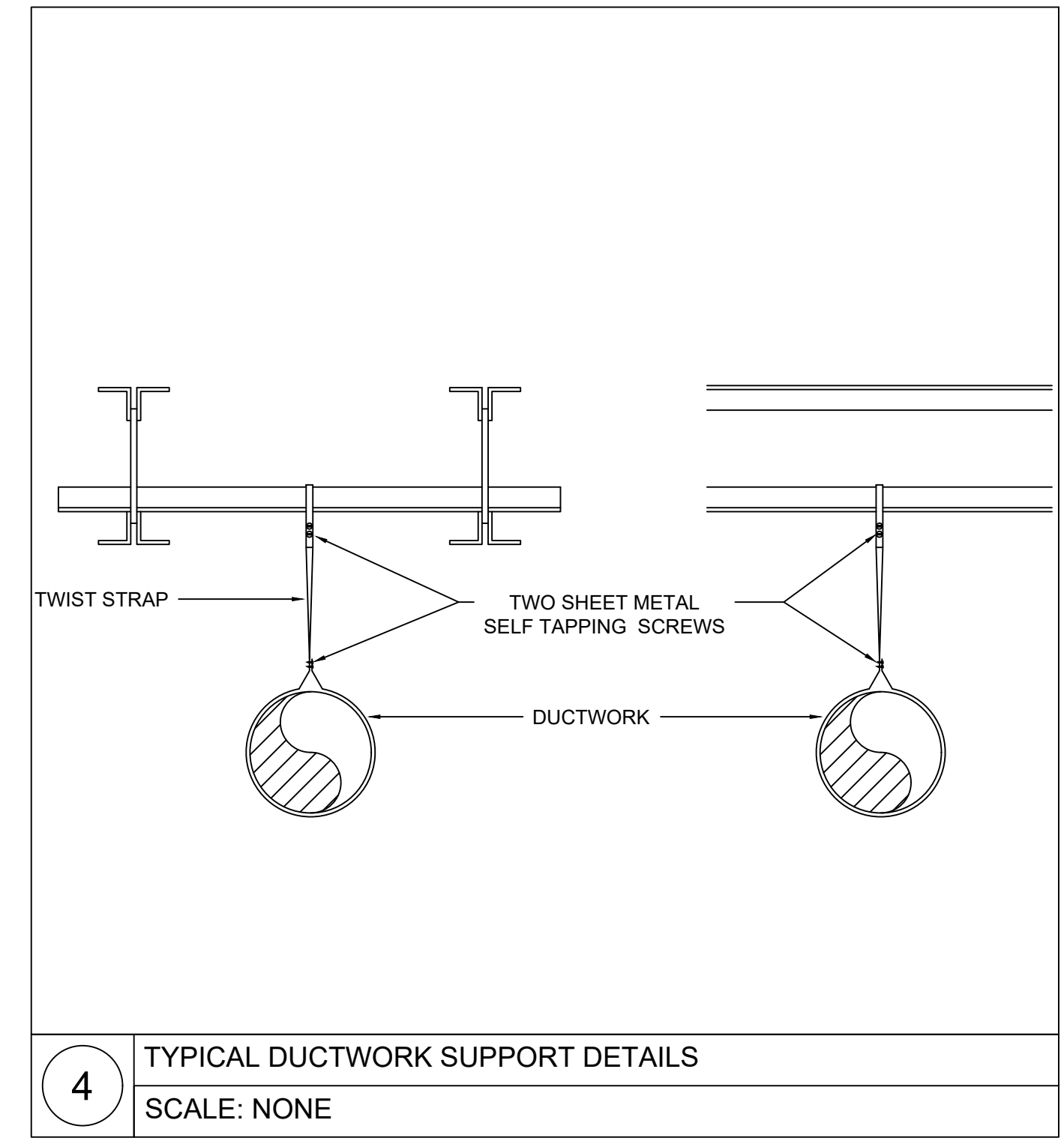
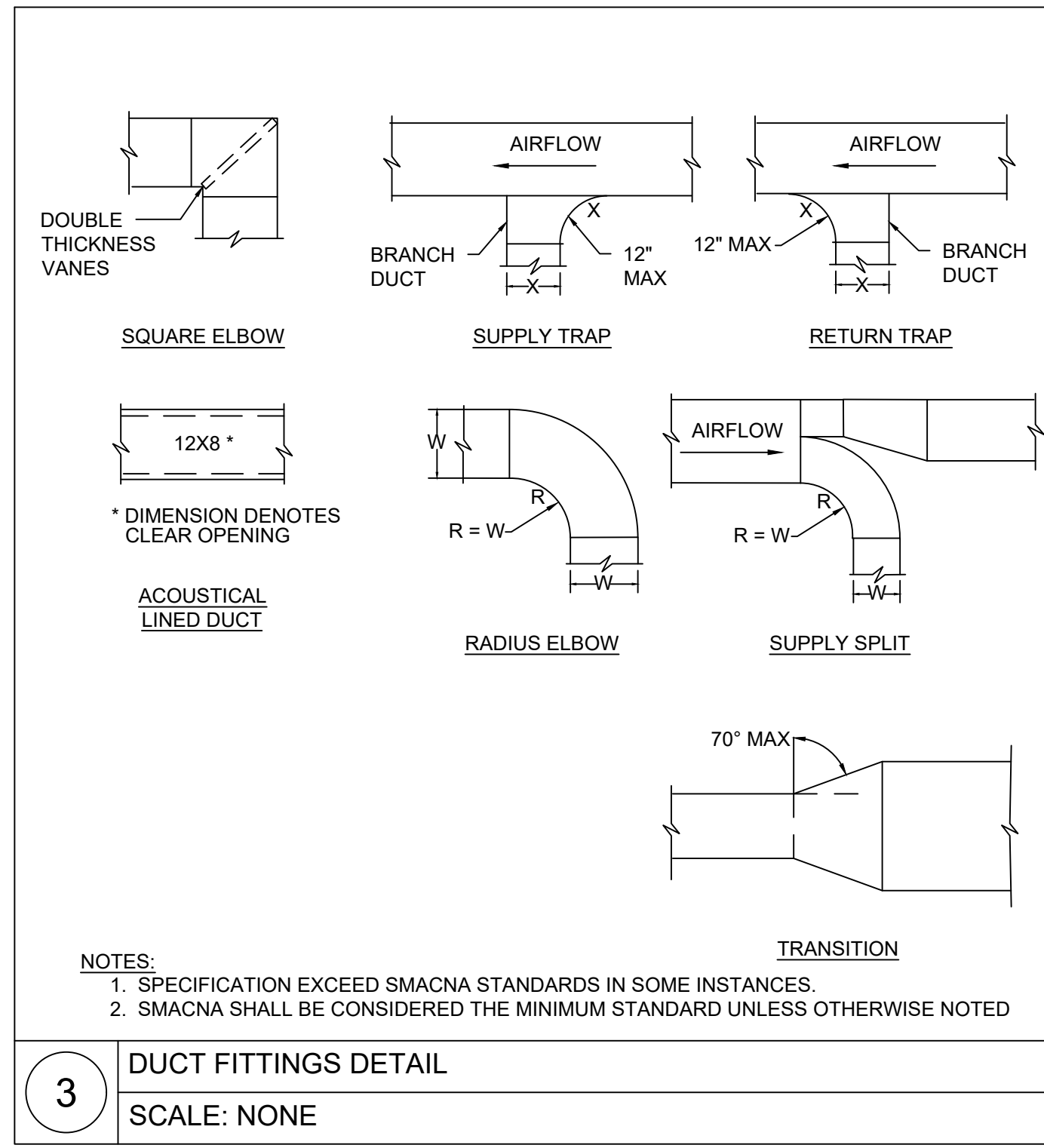
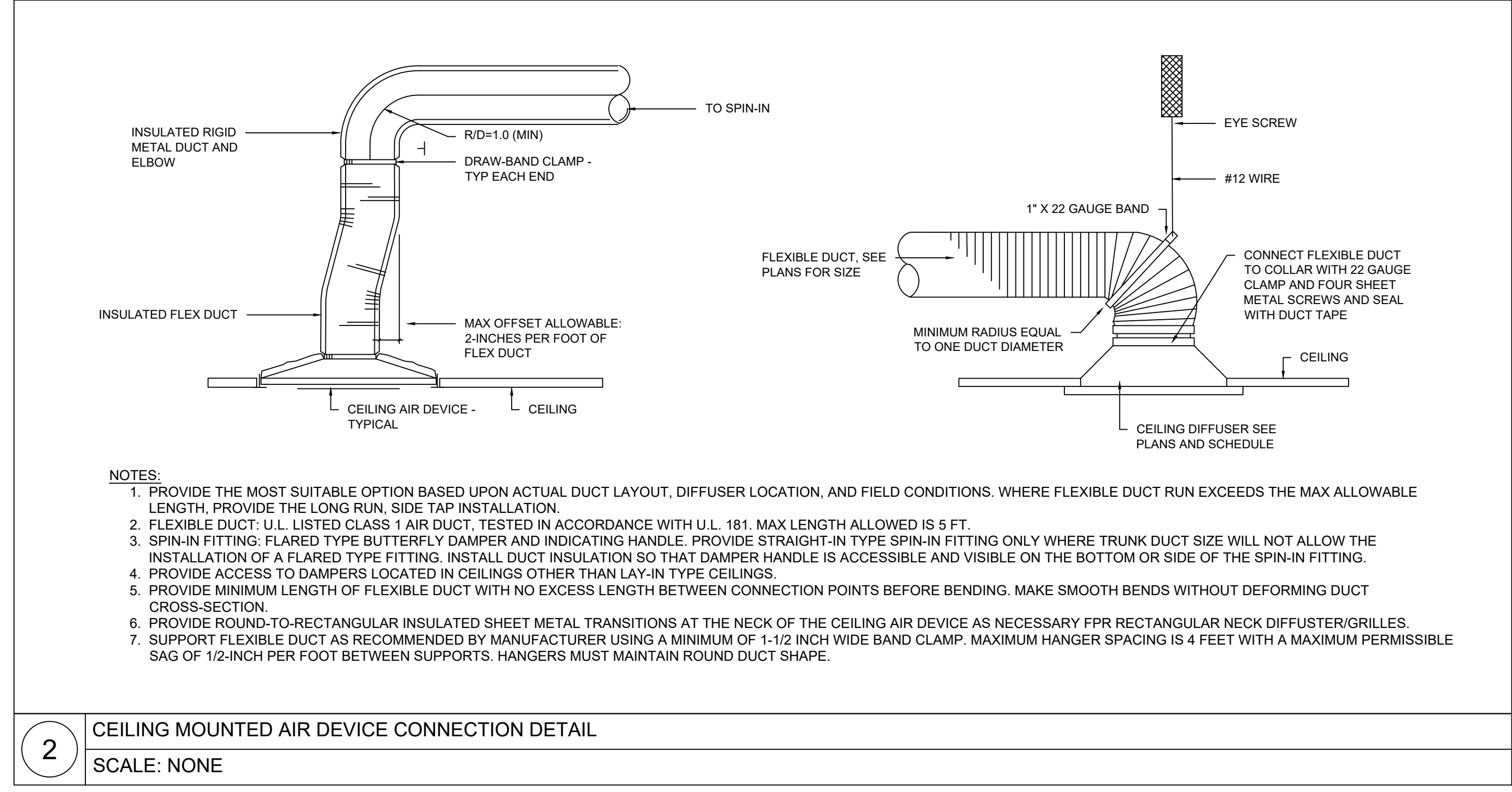
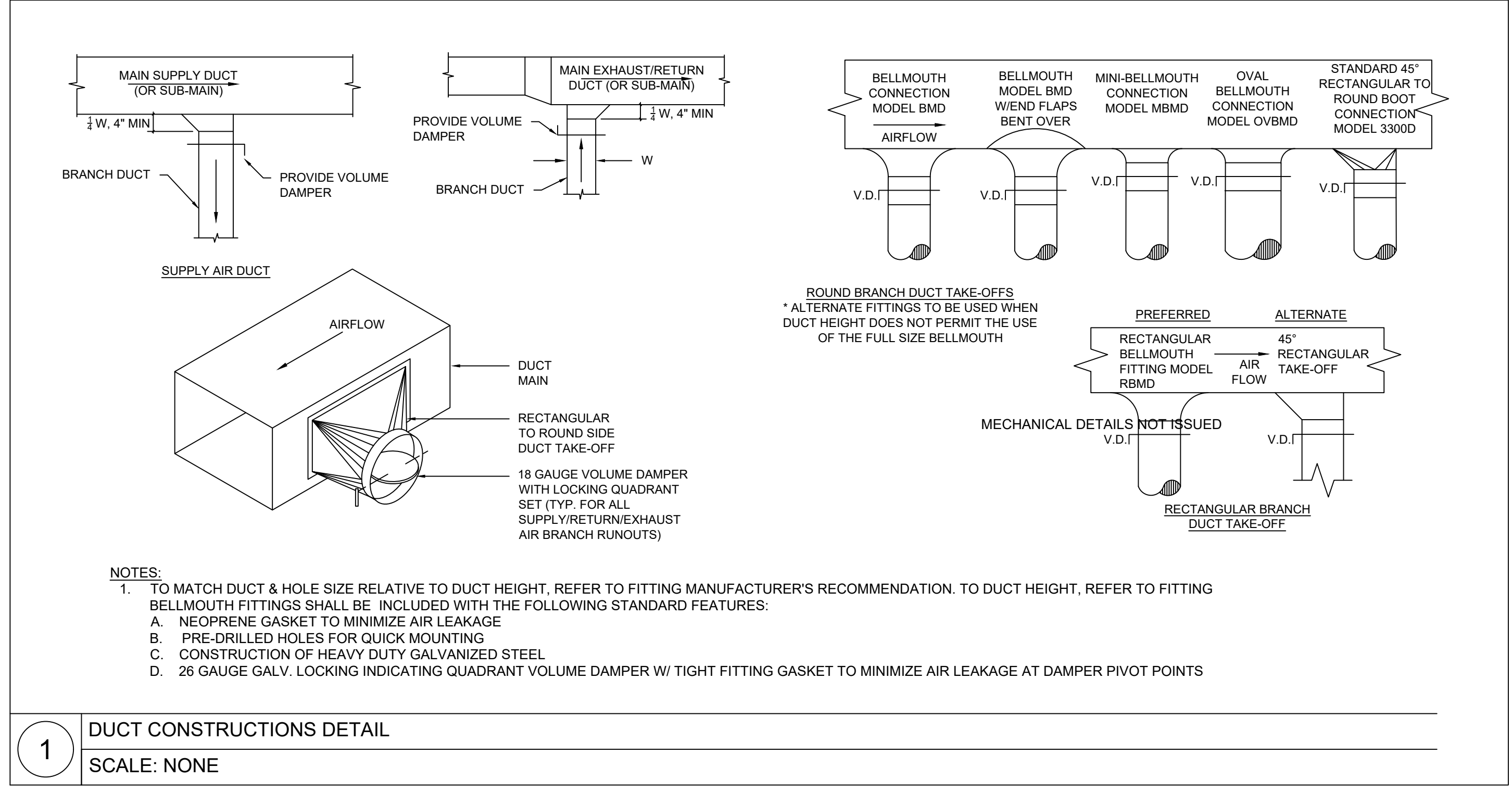


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CHILMARK SCHOOL
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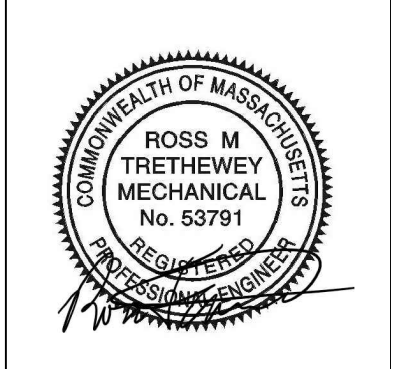
HVAC PIPING DETAILS
 Scale: NONE
 DWN: MW



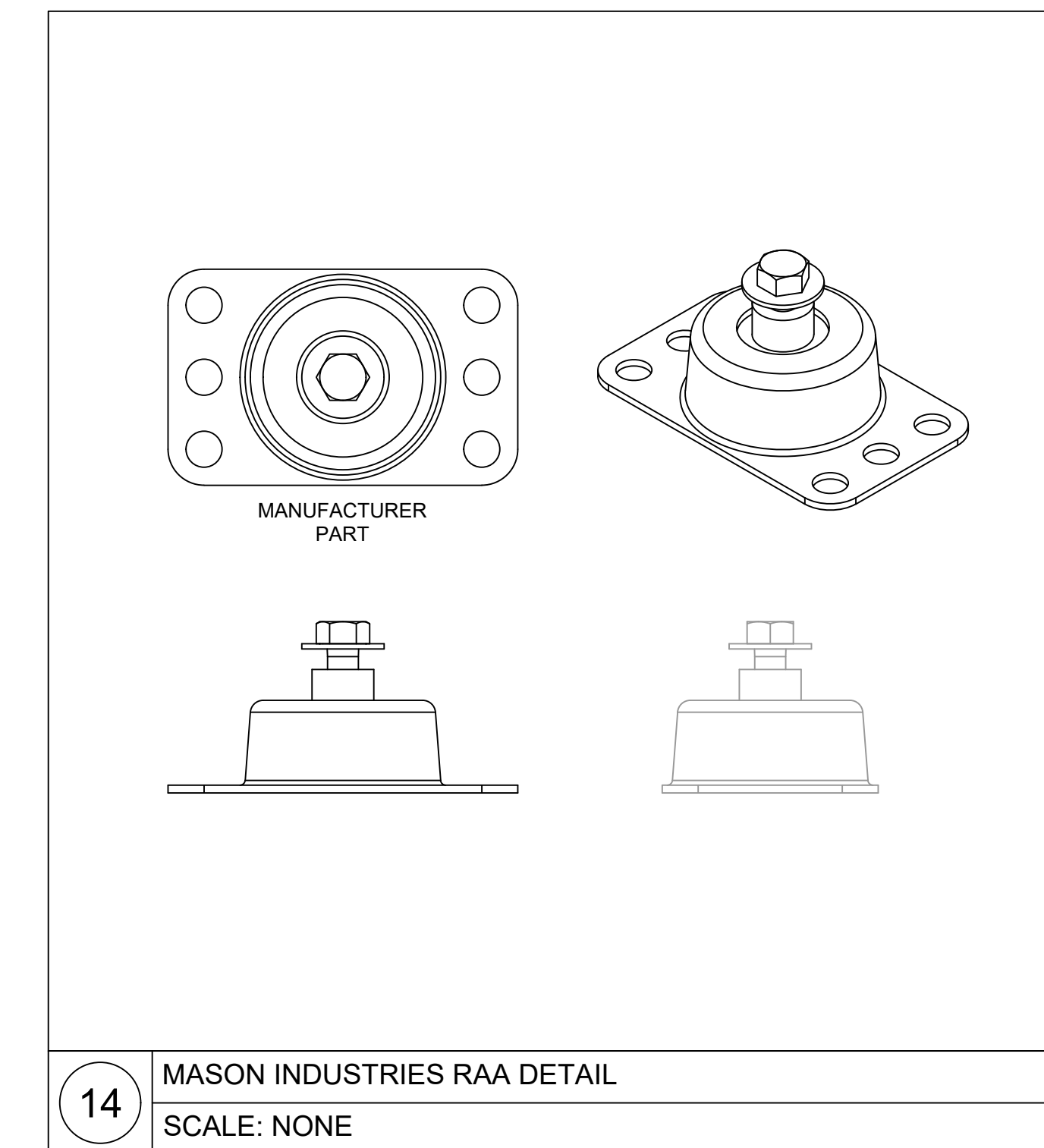
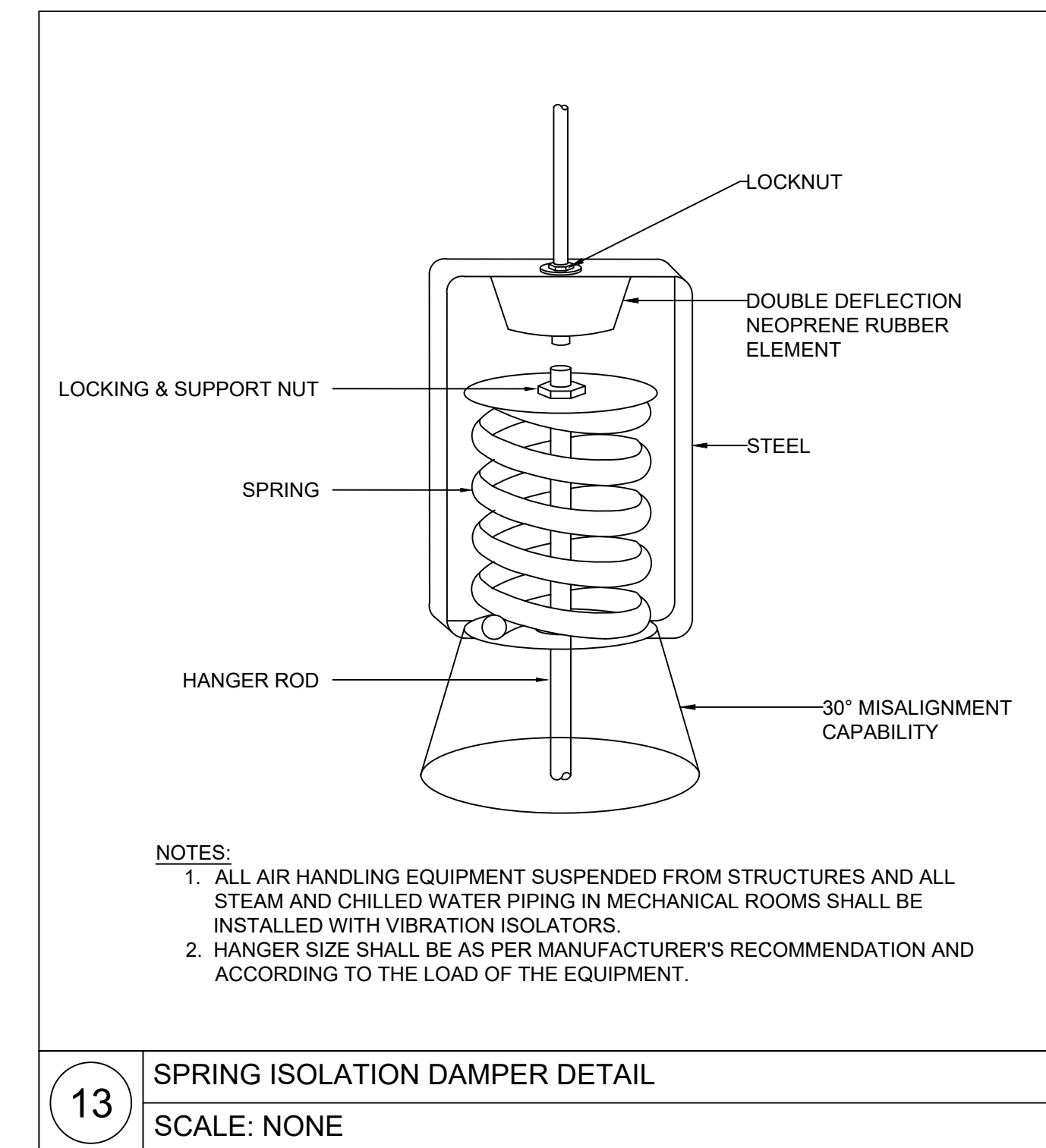
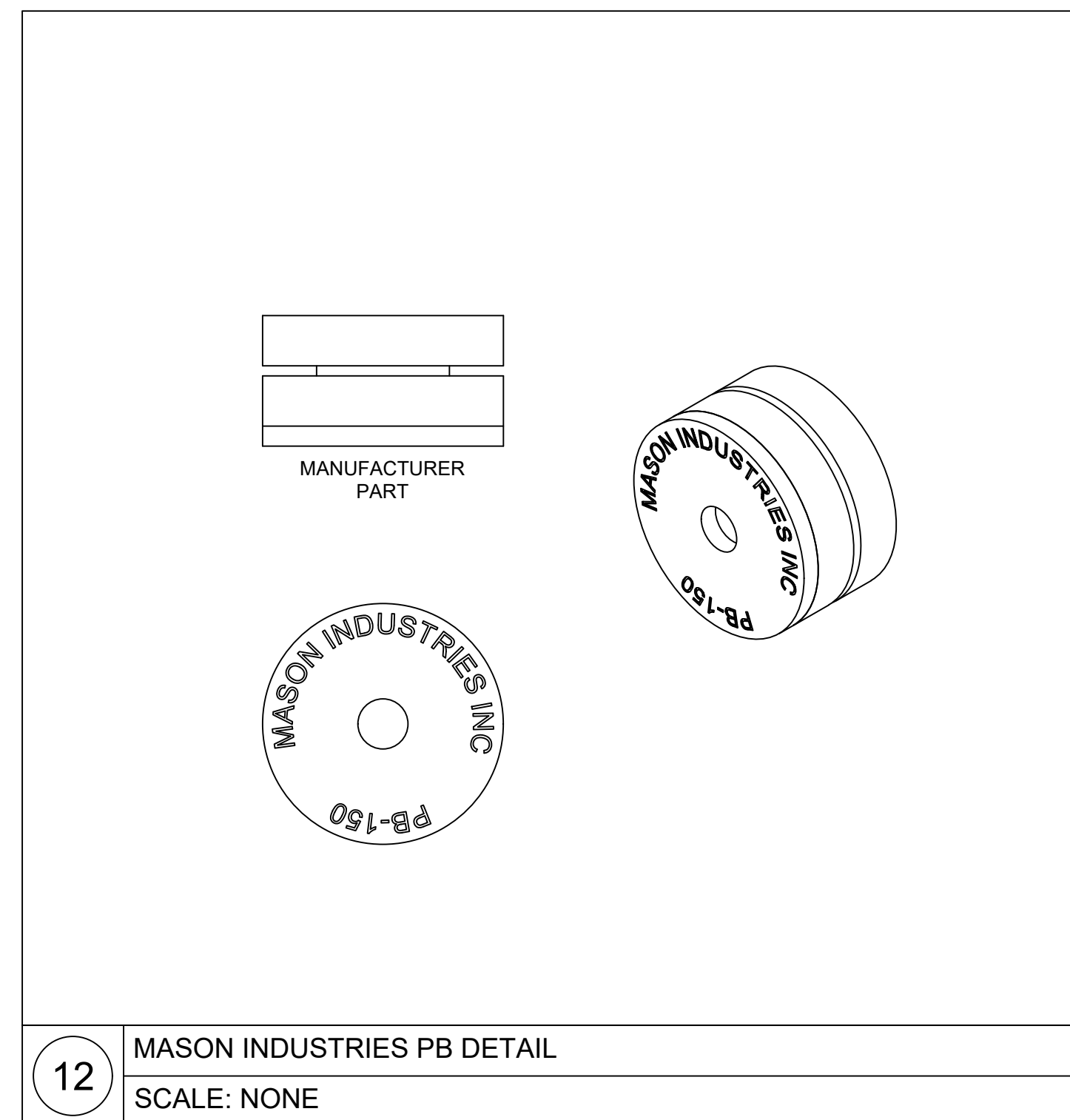
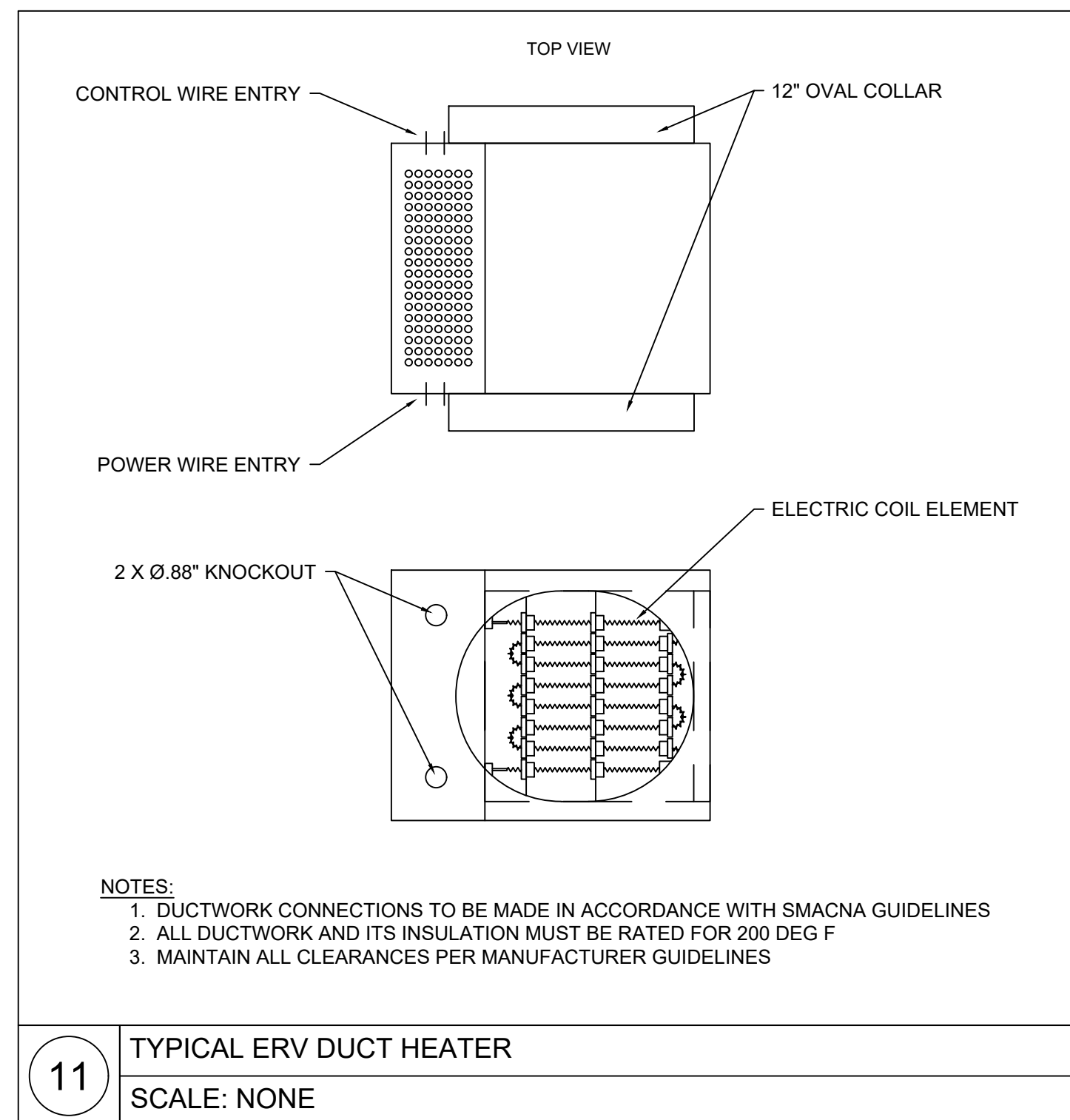
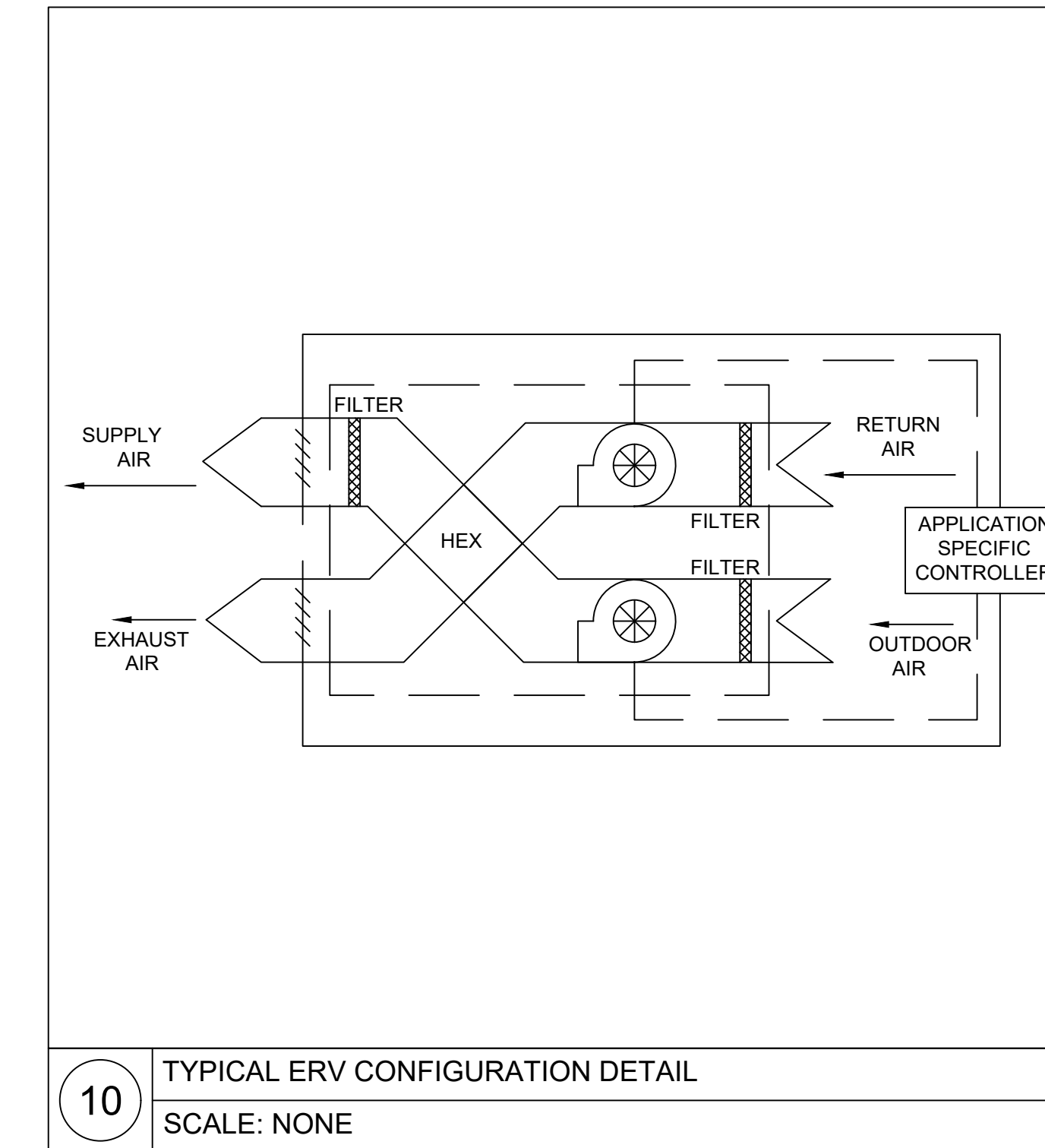
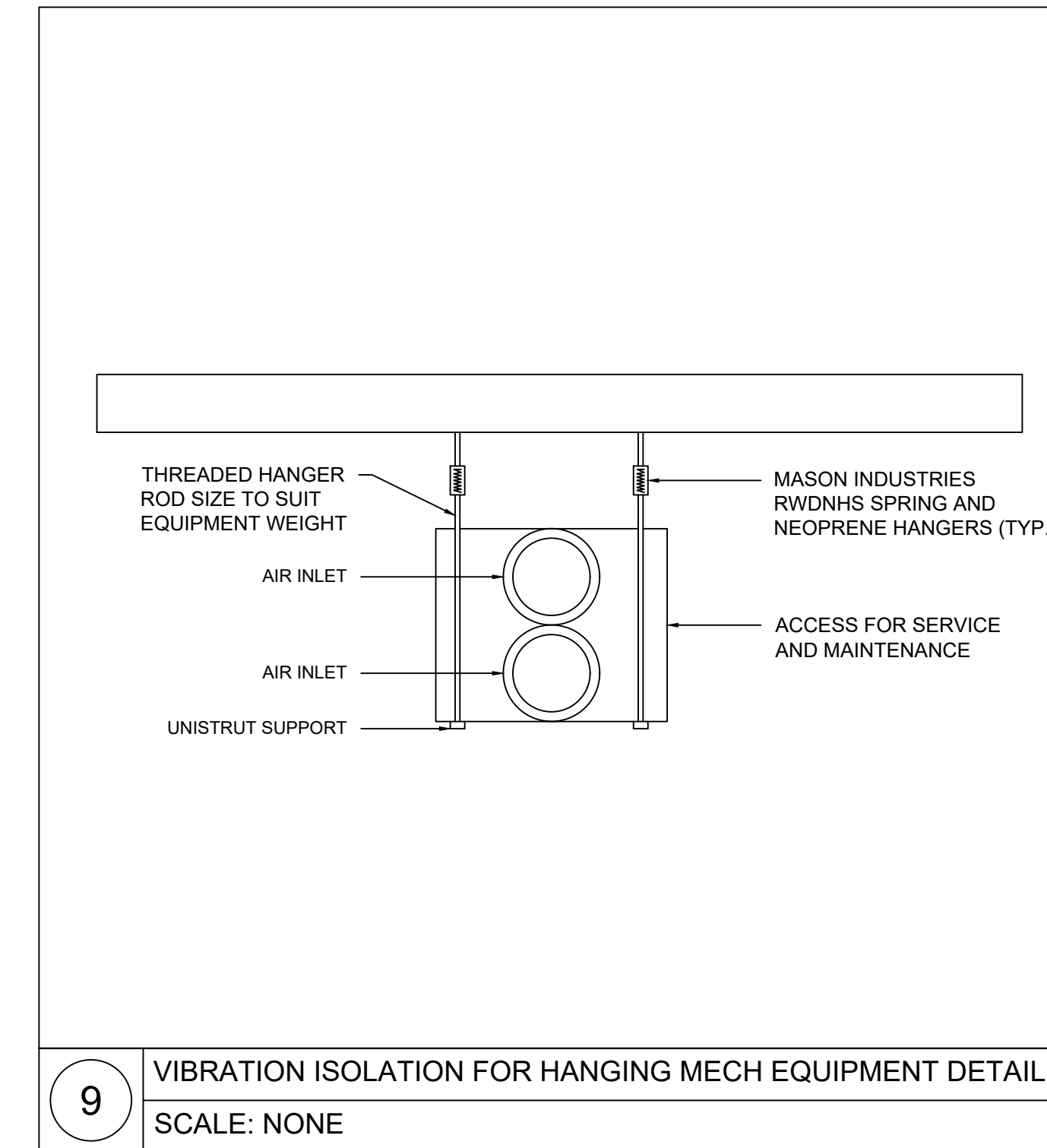
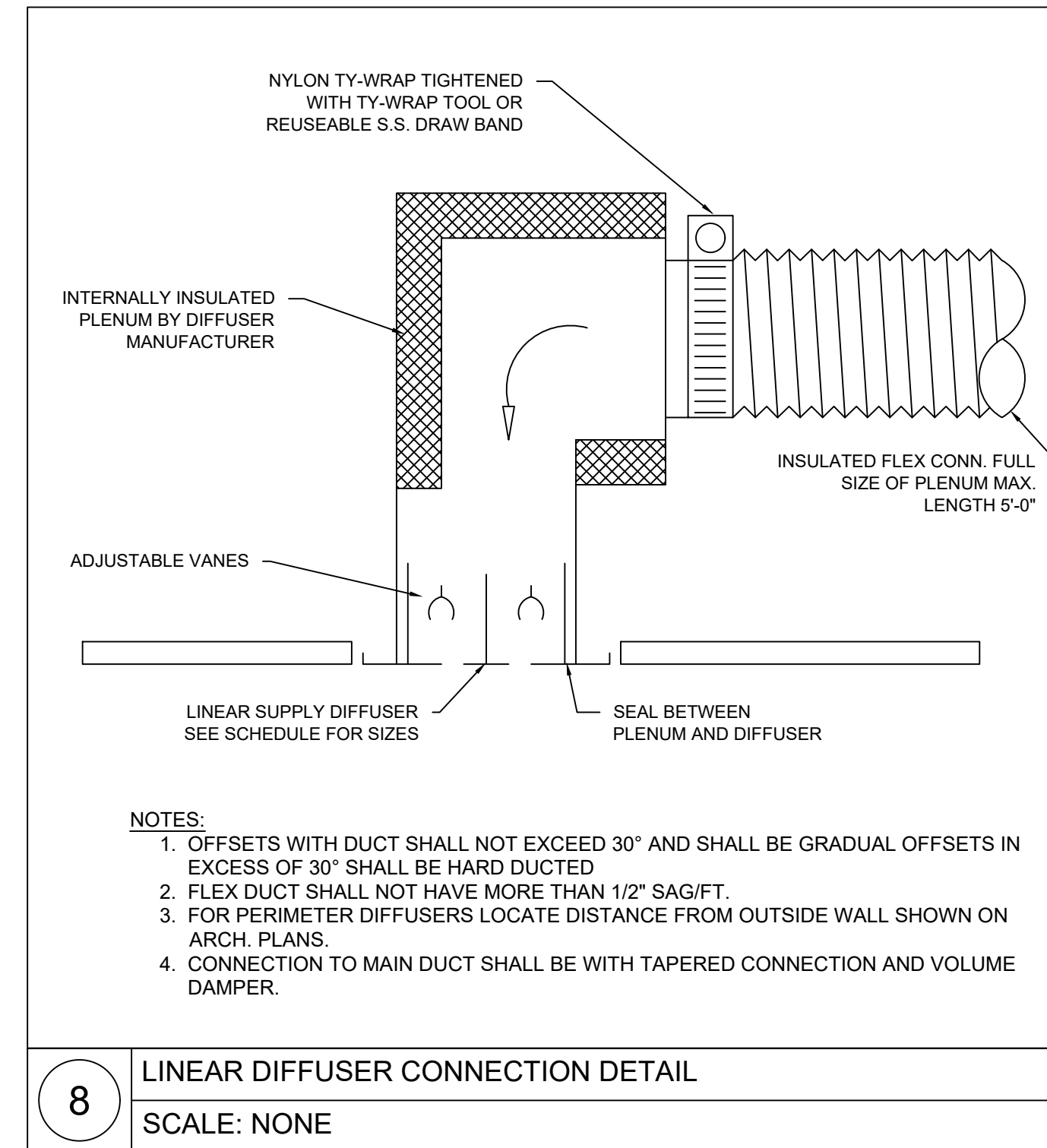
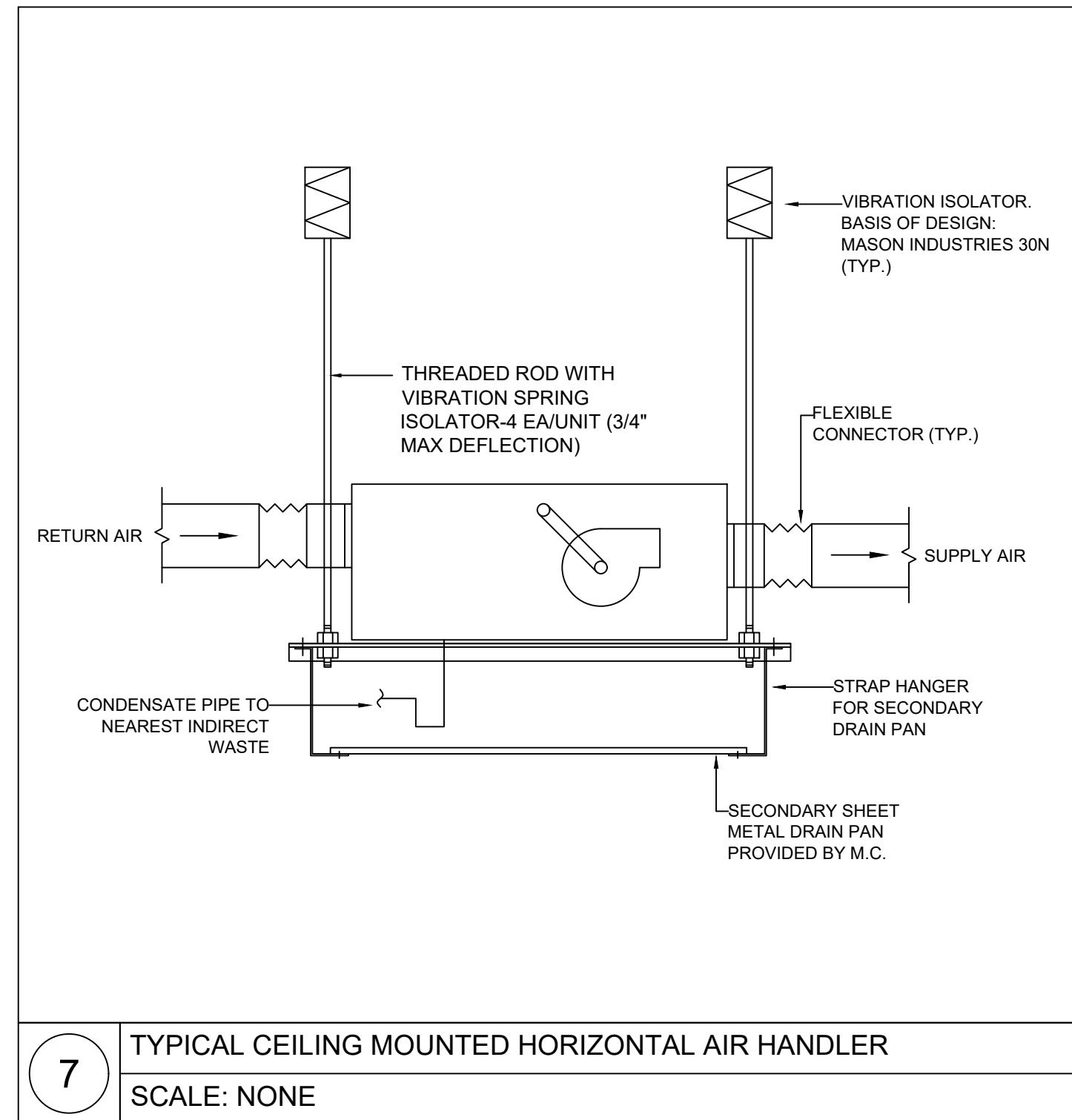
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MECHANICAL DETAILS
 Scale: NONE



DWN: MW



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MECHANICAL DETAILS
 Scale: NONE



DWN: MW