MECHANICAL LEGEND

SYMBOL	DESCRIPTION
PLAN-VIEW LINE TYPES	
	WORK SHOWN FADED INDICATES EXISTING WORK TO REMAIN OR NEW WORK BY OTHERS AS APPLICABLE
	WORK SHOWN BOLD-DASHED INDICATES SELECTIVE DEMOLITION WORK
	WORK SHOWN BOLD-CONTINUOUS INDICATES NEW WORK
DRAWING SET APPEARANCE	
TO BETTER COMMUNICATE SCOPE TO PERMIT AGENCIES AND CONTRACTORS, EACH DRAWING IN THIS DRAWING SET HAS BEEN CREATED IN BOTH "COLOR" AND "BLACK AND WHITE". THERE EXISTS A COLOR LAYER WITHIN EACH DRAWING WHERE VISIBILITY IS CONTROLLED THROUGH THE PDF LAYER MANAGER. THIS LAYER VISIBILITY CAN BE TOGGLED DISPLAYING EITHER "COLOR" OR "BLACK AND WHITE". TO MAINTAIN SCOPE BASED SHADING WHEN PRINTING TO PAPER, BLACK AND WHITE NEEDS TO BE VISIBLE. FOR FURTHER INSTRUCTIONS, REFER TO CONTRACTOR RESOURCES ON OUR WEBSITE AND DOWNLOAD "DRAWING COLOR INSTRUCTIONS". WWW.KLHENGRS.COM - CONTRACTOR RESOURCES (RIGHT HAND SIDE OF PAGE).	
PIPING LINE TYPES	
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
HPWS	HEAT PUMP WATER SUPPLY
HPWR	HEAT PUMP WATER RETURN
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
CD	CONDENSATE DRAIN
	SUPPLY MAIN OR BRANCH
	RETURN MAIN OR BRANCH
MECHANICAL PIPING ACCESSORIES	
MBV	MANUAL BALANCING VALVE
	UNION
	TEMPERATURE & PRESSURE TEST PORT
	FLOW DIRECTION
	Y-STRAINER
MECHANICAL AIR DEVICES	
CD	CEILING DIFFUSER
CD-10"Ø	2'x2' SQUARE CEILING DIFFUSER WITH 10" NECK
MECHANICAL DUCTWORK	
UP	SUPPLY DUCT WITH ELBOW TURNED UP
DN	SUPPLY DUCT WITH ELBOW TURNED DOWN
UP	RETURN DUCT WITH ELBOW TURNED UP
DN	RETURN DUCT WITH ELBOW TURNED DOWN
UP	EXHAUST DUCT WITH ELBOW TURNED UP
DN	EXHAUST DUCT WITH ELBOW TURNED DOWN
24X12 SA	SUPPLY DUCT
24X12 RA	RETURN DUCT
24X12 EA	EXHAUST DUCT
24X12 OA	OUTSIDE AIR DUCT
	1" LINED DUCTWORK
	FLEXIBLE DUCTWORK CONNECTION
	BRANCH TAKEOFF
	REDUCER, CONCENTRIC
	REDUCER, NONCONCENTRIC

MECHANICAL LEGEND

SYMBOL	DESCRIPTION
MECHANICAL DUCTWORK ACCESSORIES	
	DUCT WITH MANUAL VOLUME DAMPER
	ROUND ELBOW WITH TURNING VANES
	ELBOW WITH TURNING VANES
MECHANICAL STATS & SENSORS	
T	LOW VOLTAGE THERMOSTAT
T	LOW VOLTAGE THERMOSTAT WITH LOCKABLE GUARD
L	LINE VOLTAGE THERMOSTAT
MECHANICAL MISCELLANOUS	
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
AI	ANALOG INPUT
AO	ANALOG OUTPUT
I	HARD WIRE INTERLOCK
	POINT OF DEMOLITION TO EXISTING (FIELD VERIFY EXISTING UTILITY SERVICE TYPE, PRIOR TO TERMINATING CONNECTION)

DEMOLITION GENERAL NOTES

A. REMOVE EXISTING DUCTWORK, CONTROLS, AND MISCELLANEOUS HVAC EQUIPMENT NOT INTENDED FOR REUSE. FIELD VERIFY THE EXACT SCOPE PRIOR TO BID. COORDINATE ALL DEMOLITION WORK WITH THE OWNER AND GENERAL CONTRACTOR.

NEW WORK GENERAL NOTES

A. PROVIDE ALL LABOR, MATERIAL, AND EQUIPMENT NECESSARY TO COMPLETELY FURNISH, INSTALL, AND PLACE INTO OPERATION, ALL SYSTEMS SHOWN ON THE DRAWINGS AND DELINEATED IN THE SPECIFICATIONS IN ACCORDANCE WITH ALL STATE AND LOCAL CODES AND ORDINANCES. REPORT ANY KNOWN DISCREPANCIES TO THE ARCHITECT/ENGINEER PRIOR TO INSTALLATION.
B. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF CEILING DIFFUSERS, REGISTERS AND GRILLES.
C. DO NOT SCALE DRAWINGS; REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONED LOCATIONS OF WALLS, DOORS, WINDOWS, AND CABINETRY.
D. COORDINATE WORK AND SPACE REQUIREMENTS IN CEILING SPACES WITH OTHER TRADES PRIOR TO INSTALLATION.
E. COORDINATE LOCATIONS AND ORIENTATION OF ROOF MOUNTED EQUIPMENT WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS.
F. COORDINATE WALL LOUVERS WITH ARCHITECTURAL ELEVATIONS AND DETAILS.
G. PROVIDE VOLUME DAMPERS AT ALL SUPPLY, RETURN, AND EXHAUST DUCT BRANCH TAKE-OFFS.
H. PROVIDE TURNING VANES IN ALL 90 DEGREE MITERED ELBOWS. OMIT TURNING VANES IN ACOUSTIC LINED RETURN DUCT ELBOWS.
I. PROVIDE FLEXIBLE DUCT ON INLET TO EACH CEILING DIFFUSER. CUT FLEXIBLE DUCTS TO LENGTH NEEDED AND INSTALL WITHOUT KINKS OR SHARP BENDS (BENDS WITH CENTERLINE RADIUS LESS THAN DUCT DIAMETER). SUPPORT FLEXIBLE DUCTS WITH MINIMUM 1" WIDE METAL STRAPS OR SADDLES.
J. SIZES OF ACOUSTIC LINED DUCTS ARE NET INSIDE DIMENSION. INCREASE SHEET METAL SIZE ACCORDINGLY.
K. RUNOUTS TO CEILING DIFFUSERS ARE THE SAME SIZE AS THE DIFFUSER NECK UNLESS NOTED OTHERWISE.
L. INSTALL ALL EQUIPMENT WITH CODE REQUIRED AND MANUFACTURER RECOMMENDED MINIMUM CLEARANCES FOR SERVICE, ACCESS, AND FIRE PROTECTION.
M. MAINTAIN A MINIMUM OF 10 FEET BETWEEN ALL OUTSIDE AIR INTAKES AND ALL EXHAUST, VENT, AND FLUE OUTLETS.
N. ALL MATERIALS EXPOSED WITHIN PLENUMS SHALL BE NON-COMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE-DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTME E 84.
O. ALL FLOOR PENETRATIONS SHALL BE COORDINATED WITH THE CONCRETE RIBS IN THE FLOOR STRUCTURE.

STANDARD HVAC ABBREVIATIONS

AAV	AUTOMATIC AIR VENT	HD	HEAD	RO	REVERSE OSMOSIS
ACCESS	ACCESSORIES	HOA	HAND/OFF/AUTOMATIC	RPM	REVOLUTIONS PER MINUTE
AD	ACCESS DOOR	HP	HORSEPOWER	RS	REFRIGERANT SUCTION
AFF	ABOVE FINISHED FLOOR	HPR	HIGH PRESSURE RETURN (STEAM CONDENSATE)	SA	SUPPLY AIR
AMP	AMPERE	HSTAT	HUMIDISTAT	SAT	SUPPLY AIR TEMPERATURE
AP	ACCESS PANEL	HTG	HEATING	SC	SHADING COEFFICIENT
APD	AIR PRESSURE DROP	HWR	HEATING HOT WATER RETURN	SCD	SMOKE CONTROL DAMPER
ARI	AIR CONDITIONING AND REFRIGERATION INSTITUTE	HWS	HEATING HOT WATER SUPPLY	SD	SMOKE DETECTOR
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	HZ	HERTZ	SENS	SENSIBLE HEAT
BAS	BUILDING AUTOMATION SYSTEM	I/O	INPUT/OUTPUT	SP	STATIC PRESSURE
BD	BACKDRAFT DAMPER	IAQ	INDOOR AIR QUALITY	TAB	TESTING, ADJUSTING, BALANCE
BHP	BRAKE HORSEPOWER	IN HG	INCHES OF MERCURY	TDH	TOTAL DYNAMIC HEAD
BTU	BRITISH THERMAL UNIT	IN WC	INCH WATER COLUMN	TDS	TOTAL DISSOLVED SOLIDS
BTUH	BRITISH THERMAL UNIT PER HOUR	IN WG	INCH WATER GAUGE	TSP	TOTAL STATIC PRESSURE
CD	CEILING DIFFUSER	IPLV	INTERGRATED PART LOAD VALUE	TSTAT	THERMOSTAT
CFH	CUBIC FEET PER HOUR	INST	INSTALLED	UL	UNDERWRITERS LABORATORY
CFM	CUBIC FEET PER MINUTE	KW	KILOWATT	VAV	VARIABLE AIR VOLUME
CHWR	CHILLED WATER RETURN	KWH	KILOWATT HOUR	VFD	VARIABLE FREQUENCY DRIVE
CHWS	CHILLED WATER SUPPLY	LAT	LEAVING AIR TEMPERATURE	WB	WET-BULB (TEMPERATURE)
CI	CAST IRON	LBS/HR	POUNDS PER HOUR	WG	WATER GAGE
CLG	COOLING	LF	LINEAR FOOT (FEET)	WPD	WATER SIDE PRESSURE DROP
CO	CARBON MONOXIDE	LPR	LOW PRESSURE RETURN (STEAM CONDENSATE)	WIRE	WIRED
CO2	CARBON DIOXODE	LPS	LOW PRESSURE STEAM		
COP	COEFFICIENT OF PERFORMANCE	LWT	LEAVING WATER TEMPERATURE		
CV	CONSTANT VOLUME	MAX	MAXIMUM		
CWR	CONDENSER WATER RETURN	MBH	1000 BTUH		
CWS	CONDENSER WATER SUPPLY	MCA	MINIMUM BRANCH CIRCUIT AMPACITY		
DB	DECIBELS	MERV	MINIMUM EFFICIENCY REPORTING VALUE		
DB	DRY-BULB TEMPERATURE	MIN	MINIMUM		
DC	DISCONNECT	MOD	MOTOR OPERATED DAMPER		
DDC	DIRECT DIGITAL CONTROLS	MPR	MEDIUM PRESSURE RETURN (STEAM CONDENSATE)		
DEG	DEGREE DELTA(CHANGE IN TEMPERATURE)	MPS	MEDIUM PRESSURE STEAM		
DIA	DIAMETER	MRI	MAGNETIC RESONANCE IMAGING		
DIW	DEIONIZED WATER	MVD	MANUAL VOLUME DAMPER		
DP	DEW POINT TEMPERATURE	NA	NOT APPLICABLE		
DX	DIRECT EXPANSION	NC	NOISE CRITERIA		
EA	EXHAUST AIR	NC	NORMALLY CLOSED		
EAT	ENTERING AIR TEMPERATURE	NO	NORMALLY OPEN		
EER	ENERGY EFFICIENCY RATIO	NTS	NOT TO SCALE		
EG	EXHAUST GRILLE	OA	OUTSIDE AIR		
EMERG	EMERGENCY POWER	OCP	OVER CURRENT PROTECTION		
ESP	EXTERNAL STATIC PRESSURE	PD	PRESSURE DROP		
EWT	ENTERING WATER TEMPERATURE	PPM	PARTS PER MILLION		
EX.	EXISTING	PRS	PRESSURE REGULATING (VALVE) STATION		
F	FAHRENHEIT	PRV	PRESSURE REGULATING VALVE		
F&T	FLOAT AND THERMOSTATIC	PSI	POUNDS PER SQUARE INCH		
FA	FREE AREA	PSIA	POUNDS PER SQUARE INCH – ABSOLUTE		
FD	FIRE DAMPER	PSIG	POUNDS PER SQUARE INCH – GAGE		
FLA	FULL LOAD AMPERES	RA	RETURN AIR		
FPM	FEET PER MINUTE	RAT	RETURN AIR TEMPERATURE		
FPS	FEET PER SECOND	RH	RELATIVE HUMIDITY		
FT	FEET	RL	REFRIGERANT LIQUID LINE		
FURN	FURNISHED	RLA	RUN LOAD AMPERE		
GA	GAUGE				
GAL	GALLONS				
GPM	GALLONS PER MINUTE				

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MECHANICAL COVER SHEET

M000

2407.003

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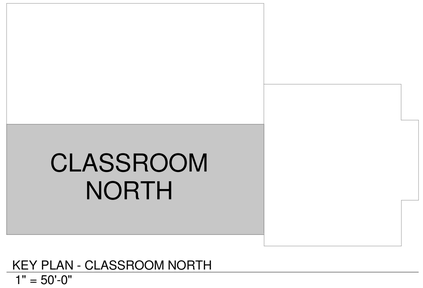
MECHANICAL DEMOLITION FIRST FLOOR PLAN

M101

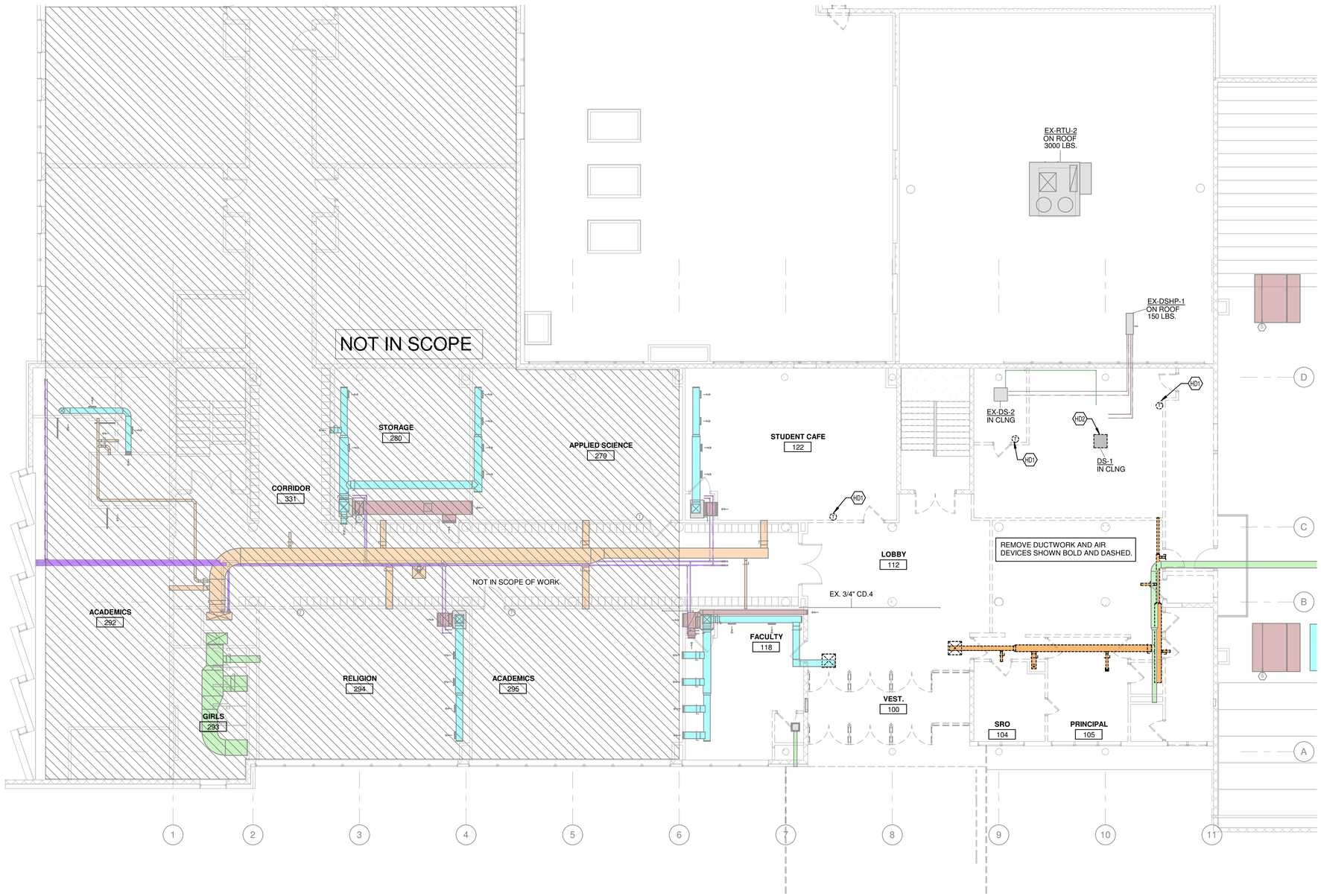
2407.003

KEYED NOTES

HD1	REMOVE AND RELOCATE EXISTING WALL MOUNTED THERMOSTAT. EXTEND OR PROVIDE NEW LOW VOLTAGE CONTROL WIRING AS REQUIRED. SEE NEW WORK PLANS.
HD2	RELOCATE EXISTING DUCTLESS CEILING CASSETTE UNIT. REWORK REFRIGERANT AND CONDENSATE PIPING TO ACCOMMODATE NEW UNIT LOCATION. SEE NEW WORK PLANS.



KEY PLAN - CLASSROOM NORTH
1" = 50'-0"



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

N

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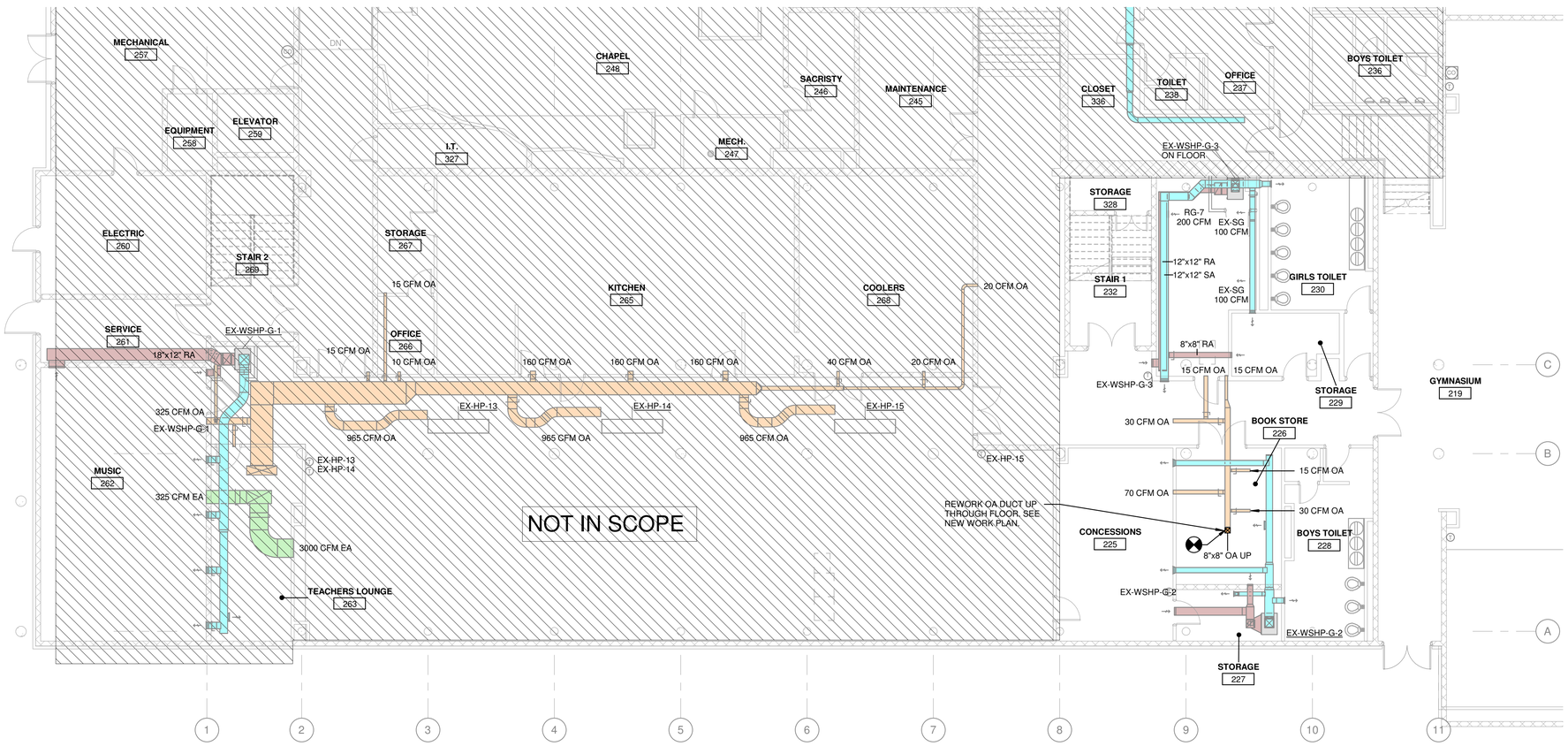

1 MECHANICAL PLAN - UPPER GROUND FLOOR - OVERALL
1/8" = 1'-0"

KEY PLAN - CLASSROOM NORTH
1" = 50'-0"

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MECHANICAL DUCTWORK GROUND FLOOR PLAN

M300

2407.003

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MECHANICAL DUCTWORK FIRST FLOOR PLAN

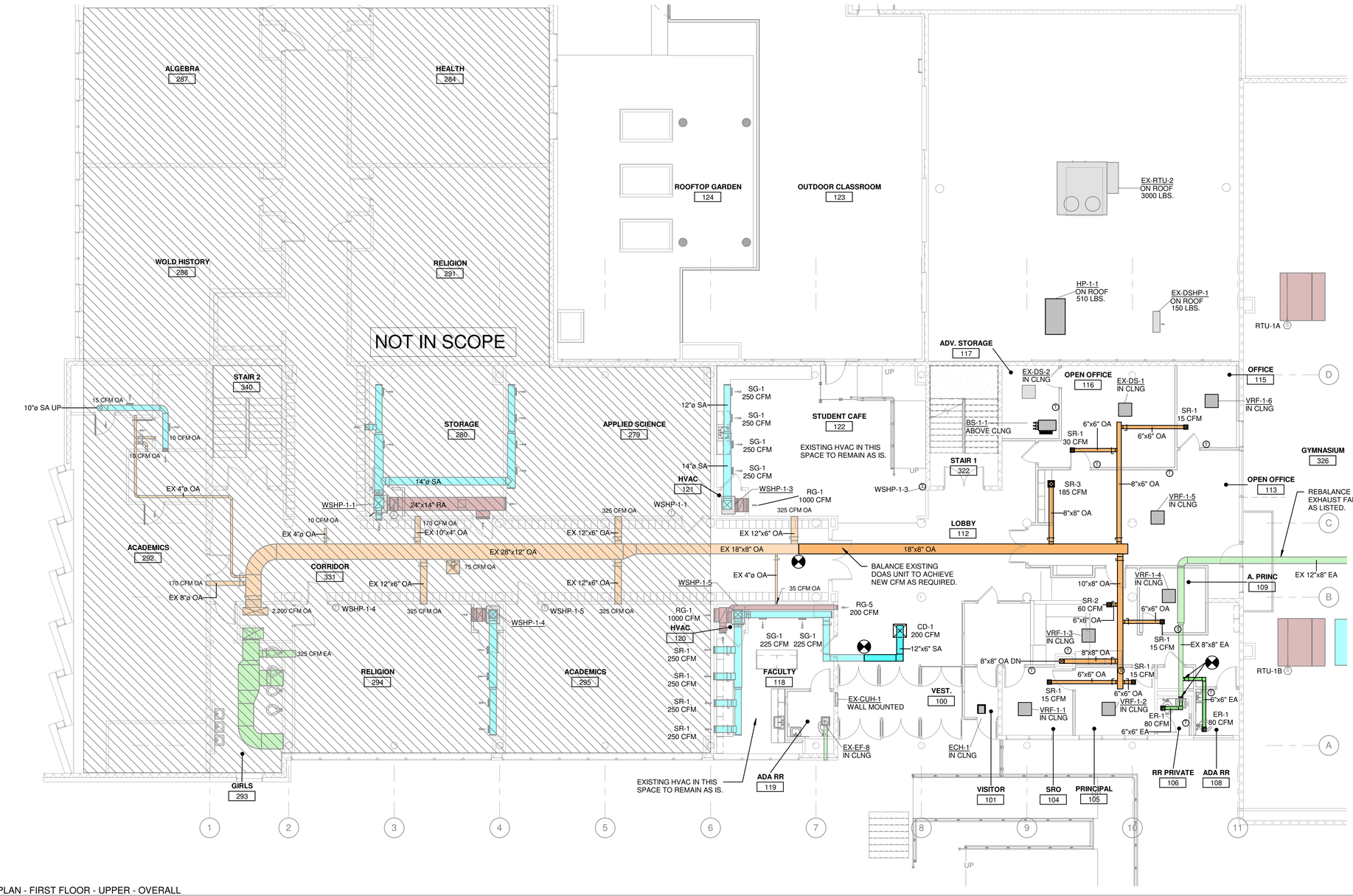
M301

2407.003

KEYED NOTES

CLASSROOM NORTH

KEY PLAN - CLASSROOM NORTH
1" = 50'-0"



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

N

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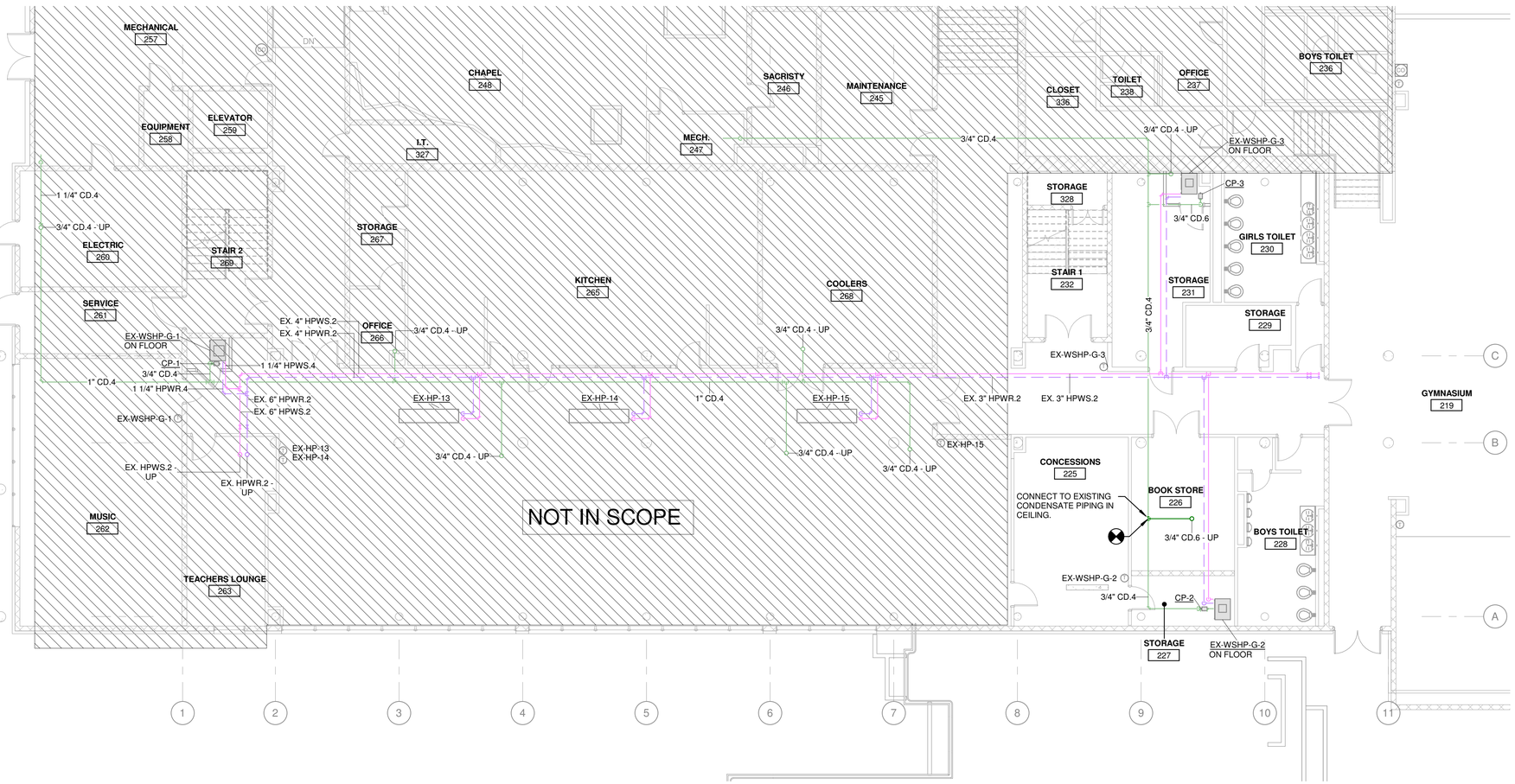
KEYED NOTES

CLASSROOM NORTH

KEY PLAN - CLASSROOM NORTH
1" = 50'-0"



1 MECHANICAL PIPING PLAN - EXST. GROUND FLOOR - OVERALL
1/8" = 1'-0"

N

MECHANICAL PIPING GROUND FLOOR PLAN

M400

2407.003

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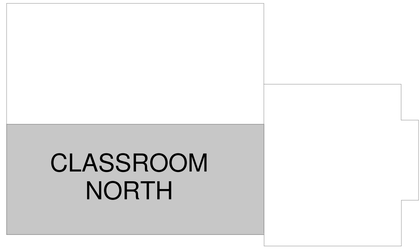
KEYED NOTES

H1	CONNECT NEW FIN TUBE RADIATION TO EXISTING HOT WATER PIPING ALONG EXTERIOR WALL. PROVIDE NEW SHUTOFF VALVES AND NEW TWO-POSITION CONTROL VALVE. COORDINATE SIZE AND LOCATION IN FIELD WITH EXISTING HOT WATER PIPING THROUGH FLOOR FROM BELOW.



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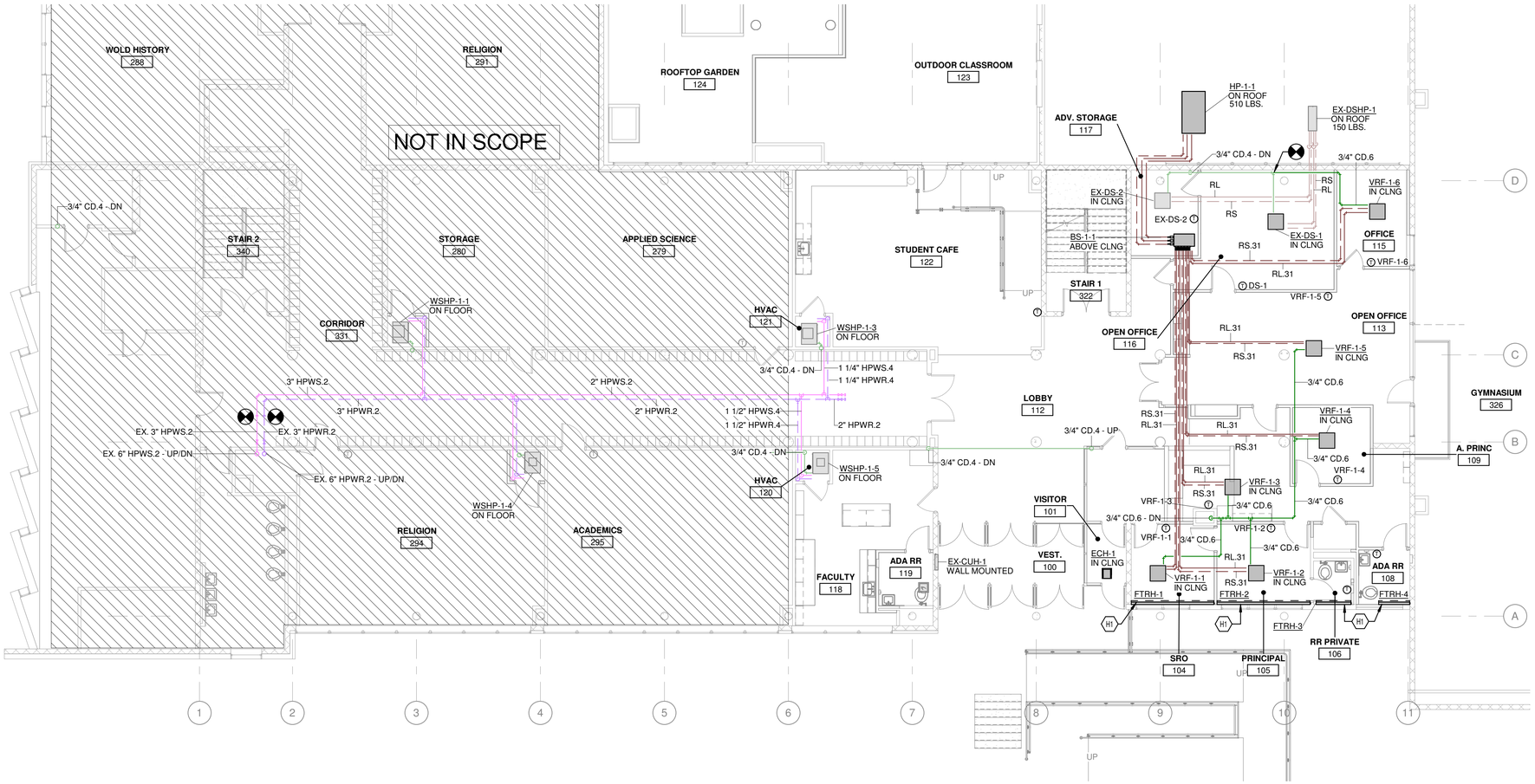

1 MECHANICAL PIPING PLAN - FIRST FLOOR - UPPER - OVERALL
1/8" = 1'-0"

N

MECHANICAL PIPING FIRST FLOOR PLAN

M401

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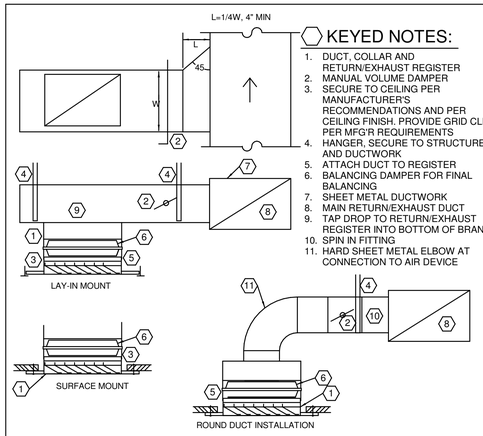
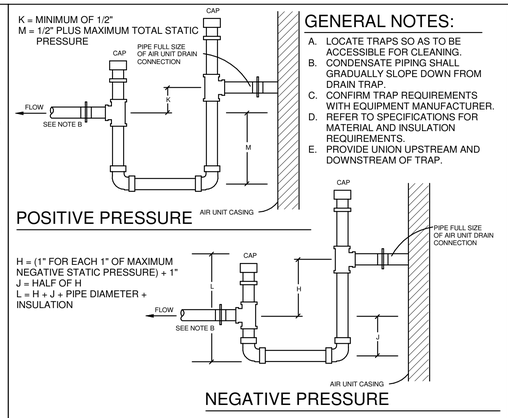


KEYED NOTES:

1. DUCT, COLLAR AND RETURN/EXHAUST REGISTER
2. MANUAL VOLUME DAMPER
3. SECURE TO CEILING PER MANUFACTURER'S RECOMMENDATIONS AND PER CEILING FINISH, PROVIDE GRID CLIPS PER MFG'R REQUIREMENTS
4. HANGER, SECURE TO STRUCTURE AND DUCTWORK
5. ATTACH DUCT TO REGISTER
6. BALANCING DAMPER FOR FINAL BALANCING
7. SHEET METAL DUCTWORK
8. MAIN RETURN/EXHAUST DUCT
9. TAP DROP TO RETURN/EXHAUST REGISTER INTO BOTTOM OF BRANCH
10. SPIN IN FITTING
11. HARD SHEET METAL ELBOW AT CONNECTION TO AIR DEVICE

233713.00-21 - RETURN/EXHAUST REGISTER INSTALLATION

SCALE: NONE



GENERAL NOTES:

A. LOCATE TRAPS SO AS TO BE ACCESSIBLE FOR CLEANING.
B. CONDENSATE PIPING SHALL GRADUALLY SLOPE DOWN FROM DRAIN TRAP.
C. CONFIRM TRAP REQUIREMENTS WITH EQUIPMENT MANUFACTURER.
D. REFER TO SPECIFICATIONS FOR MATERIAL AND INSULATION REQUIREMENTS.
E. PROVIDE UNION UPSTREAM AND DOWNSTREAM OF TRAP.

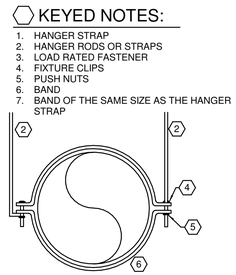
NOTE: OUTDOOR UNITS AND UNITS LOCATED IN UNCONDITIONED SPACES WHICH PROVIDE COOLING IN THE WINTER MUST HAVE HEAT TRACE ON THE CONDENSATE PIPING.

232113.23-05 - CONDENSATE DRAIN TRAP POSITIVE & NEGATIVE

SCALE: NONE

KEYED NOTES:

1. HANGER STRAP
2. HANGER RODS OR STRAPS
3. LOAD RATED FASTENER
4. FIXTURE CLIPS
5. PUSH NUTS
6. BAND
7. BAND OF THE SAME SIZE AS THE HANGER STRAP



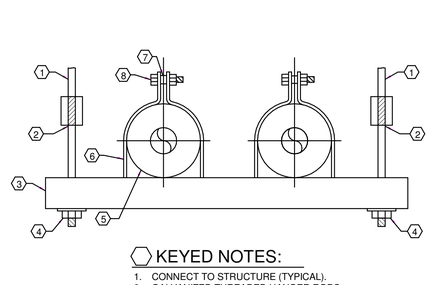
GENERAL NOTES:

A. HANGERS MUST NOT DEFORM DUCT SHAPE

HANGER SIZES FOR ROUND DUCT					
DUCT DIAMETER	ROUND HANGERS	STRAP SIZE	MAXIMUM SPACING	HANGER ROD	NUMBER OF HANGERS
UP THRU 10"	12 GAUGE WIRE	1"x22 GAUGE	10'-0"	1/4"	1
11" THRU 18"	8 GAUGE WIRE	1"x22 GAUGE	10'-0"	1/4"	1
19" THRU 24"	———	1"x22 GAUGE	10'-0"	1/4"	1
25" THRU 36"	———	1"x20 GAUGE	10'-0"	3/8"	1
37" THRU 50"	———	2"x20 GAUGE	10'-0"	3/8"	2
51" THRU 84"	———	2"x16 GAUGE	10'-0"	3/8"	2

233113.00-09 - ROUND DUCT HANGERS

SCALE: NONE

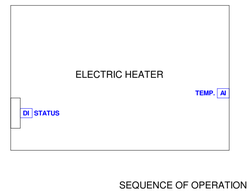


KEYED NOTES:

1. CONNECT TO STRUCTURE (TYPICAL).
2. GALVANIZED THREADED HANGER RODS (TYPICAL). SEE SPECIFICATIONS.
3. UNISTRUT.
4. PLATED NUT & WASHER (TYPICAL).
5. CONTINUOUS INSULATION AS SPECIFIED, (TYPICAL).
6. CHANNEL MOUNTED CLAMPING SYSTEM (TYPICAL).
7. SPACER SIZED TO PREVENT COMPRESSION OF INSULATION.
8. PLATED DOUBLE NUT AND WASHER.

230529.00-02 - REFRIGERANT PIPING SUPPORT

SCALE: NONE



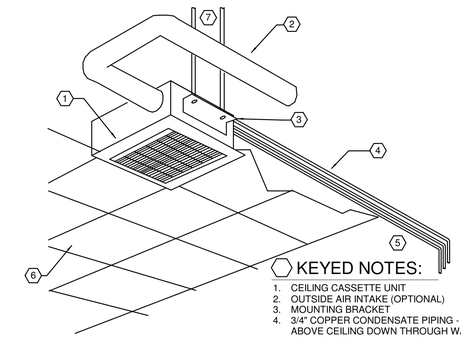
GENERAL NOTES:

1. ALL ANALOG INPUTS (AI) SHALL BE CONFIGURED BY USER FOR HIGH AND LOW LIMITS ALARM.
2. PROVIDE ALARM FOR ALL STATUS MISMATCHES WHERE DO DOES NOT EQUAL DI.
3. ALL POINTS SHALL BE TRENDED AND HAVE RUN TIME TOTALIZATION.
4. TEMPERATURE CONTROL CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH MANUFACTURER AND PROVIDE POINTS AS NOTED.
5. EQUIPMENT SHALL HAVE BACNET CARD TO COMMUNICATE WITH CONTROLS OVER BACNET

SEQUENCE OF OPERATION
A. ELECTRIC HEATER
1. Heater shall modulate to maintain temperature setpoint.
2. Disable electric heat above 60 degrees outside temperature (adjustable).
3. Control and monitoring points shall include but not be limited to the following:
   a. Heater Status (DI)
   b. Temperature (AI)

23T-249 - ELECTRIC HEATER

SCALE: NONE

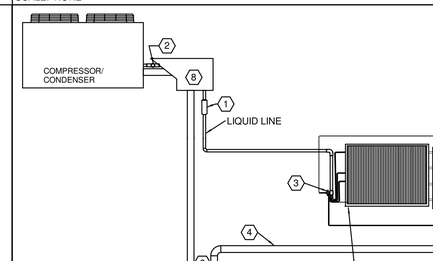


KEYED NOTES:

1. CEILING CASSETTE UNIT
2. OUTSIDE AIR INTAKE (OPTIONAL)
3. MOUNTING BRACKET
4. 3/4" COPPER CONDENSATE PIPING - RUN ABOVE CEILING DOWN THROUGH WALL. DRIP TO MOP SINK, NEAREST FLOOR DRAIN, OR BUILDING EXTERIOR
5. REFRIGERANT PIPING, INSULATATE SUCTION AND LIQUID LINES, RUN ABOVE CEILING, DOWN THROUGH WALL, THEN TO RESPECTIVE OUTDOOR CONDENSING UNIT.
6. ACOUSTIC CEILING
7. GALVANIZED ALL-THREAD ROD WITH VIBRATION ISOLATOR (TYPICAL)

238126.00-07 - DUCTLESS AIR CONDITIONING UNIT CLNG OA

SCALE: NONE



KEYED NOTES:

1. FIELD SUPPLIED FILTER DRIER, UNLESS PROVIDED INTERNALLY BY THE EQUIPMENT MANUFACTURER.
2. SIGHT GLASS
3. EXPANSION VALVE
4. SUCTION LINE W/FLEXIBLE CLOSED CELL ELASTOMER INSULATION
5. EXPANSION VALVE THERMAL BULB
6. TRAP FOR LONG VERTICAL RUNS (PER MFG. RECOMMENDATIONS)
7. EXPANSION VALVE EQUALIZER LINE
8. PROVIDE APPROPRIATELY SIZED DOG HOUSE CONSTRUCTION FOR ROOF PENETRATIONS.

GENERAL NOTES:

A. PIPE SIZES SHALL BE PER MFGR'S RECOMMENDATIONS.
B. PROVIDE 4" CONCRETE PAD ALL EXTERIOR UNITS ON GRADE.
C. PIPING LAYOUT AND CONFIGURATION SHALL BE INSTALLED PER MFGR'S RECOMMENDATIONS.
D. REFRIGERANT SPECIALTIES ARE SHOWN FOR SCHEMATIC PURPOSES ONLY AND SHALL BE COORDINATED PER MFGR'S INSTALLATION INSTRUCTIONS.
E. PROVIDE LOCKING-TYPE TAMPER RESISTANT CAPS ON ALL OUTDOOR REFRIGERANT CIRCUIT ACCESS PORTS.

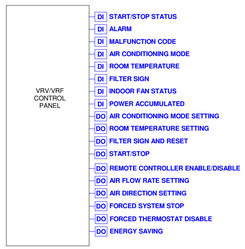
232313.00-03 - REFRIGERANT PIPING A

SCALE: NONE

GENERAL NOTES:

1. ALL ANALOG INPUTS (AI) SHALL BE CONFIGURED BY USER FOR HIGH AND LOW LIMITS ALARM.
2. PROVIDE ALARM FOR ALL STATUS MISMATCHES WHERE DO DOES NOT EQUAL DI.
3. ALL POINTS SHALL BE TRENDED AND HAVE RUN TIME TOTALIZATION.
4. TEMPERATURE CONTROL CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH MANUFACTURER AND PROVIDE POINTS AS NOTED.
5. EQUIPMENT SHALL HAVE BACNET CARD TO COMMUNICATE WITH CONTROLS OVER BACNET

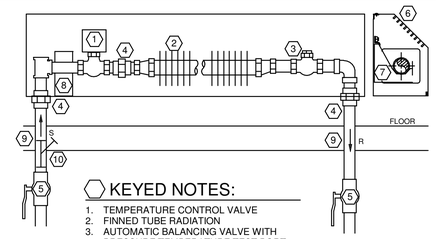
VRV/VRF MANUFACTURER SHALL FURNISH THE EQUIPMENT PROGRAMMING AND DIAGNOSTIC SOFTWARE AND LEAVE IT ONSITE FOR THE OWNER



SEQUENCE OF OPERATION
A. AIR COOLED VRF/VRV SYSTEMS
1. AIR COOLED VRF/VRV Interface
   a. The Air Cooled VRF/VRV control panel shall be furnished by the manufacturer and installed by the contractor. The thermostats shall be furnished by the manufacturer and installed and wired by the mechanical contractor.
   b. The BAS system contractor is responsible to coordinate with the VRF/VRV supplier for proper coordination and interfacing of all specified data points, including any and all incidental programming required for proper display/commanding of the data points specified in equipment spec as well as all additional points listed in this section.
   c. The BAS contractor is to do a point-by-point verification of all read/write points between the VRF/VRV control panel and the DDC system. The point-by-point verification is to be done in conjunction with the equipment supplier. The equipment supplier is to provide a trained technician to work in conjunction with the BAS contractor for the point-by-point verification.
2. Control and monitoring points shall include but not be limited to the following:
   a. Start/Stop Status (DI)
   b. Alarm (DI)
   c. Malfunction Code (DI)
   d. Air Conditioning Mode (DI)
   e. Room Temperature (DI)
   f. Filter Sign (DI)
   g. Indoor Fan Status (DI)
   h. Power Accumulated (DI)
   i. Air Conditioning Mode Setting (DO)
   j. Room Temperature Setting (DO)
   k. Filter Sign and Reset (DO)
   l. Start/Stop (DO)
   m. Remote Controller Enable/Disable (DO)
   n. Air Flow Rate Setting (DO)
   o. Air Direction Setting (DO)
   p. Forced System Stop (DO)
   q. Forced Thermostat Disable (DO)
   r. Energy Saving (DO)

23T-252 - VRF/VRV PANEL INTEGRATION POINTS

SCALE: NONE

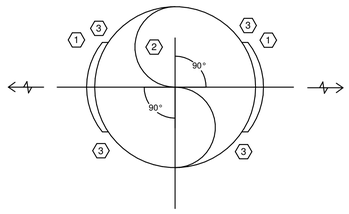


KEYED NOTES:

1. TEMPERATURE CONTROL VALVE
2. FINNED TUBE RADIATION
3. AUTOMATIC BALANCING VALVE WITH PRESSURE/TEMPERATURE TEST PORT
4. UNION
5. SHUTOFF VALVE, ABOVE CEILING OR IN CONCEALED ACCESSIBLE LOCATION (BALL VALVE)
6. 16 GA. BAKED ENAMEL COVER.
7. WALL BRACKET, INSTALL PER MANUFACTURER'S RECOMMENDATION
8. PROVIDE PIPING COVER AS REQUIRED ON INLET AND OUTLET
9. PROVIDE 1" FIBERGLASS INSULATION ON PIPING OUTSIDE ENCLOSURE
10. STRAINER

238236.00-03 - FINNED TUBE DETAIL UPFLOW

SCALE: NONE



KEYED NOTES:

1. SPIRAL SUPPLY DUCT MOUNTED GRILLE WITH ADJUSTABLE, DOUBLE DEFLECTION LOUVER AND SCOOP DAMPER. (TO BE SIZED AS SCHEDULED)
2. SUPPLY DUCT
3. SEAL JOINTS BETWEEN COLLAR AND MAIN DUCT

233713.00-24 - ANGLED REGISTER INSTALLATION 0 DEGREES

SCALE: NONE

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Issued: 4.18.2025 PERMIT & BID

Revised:

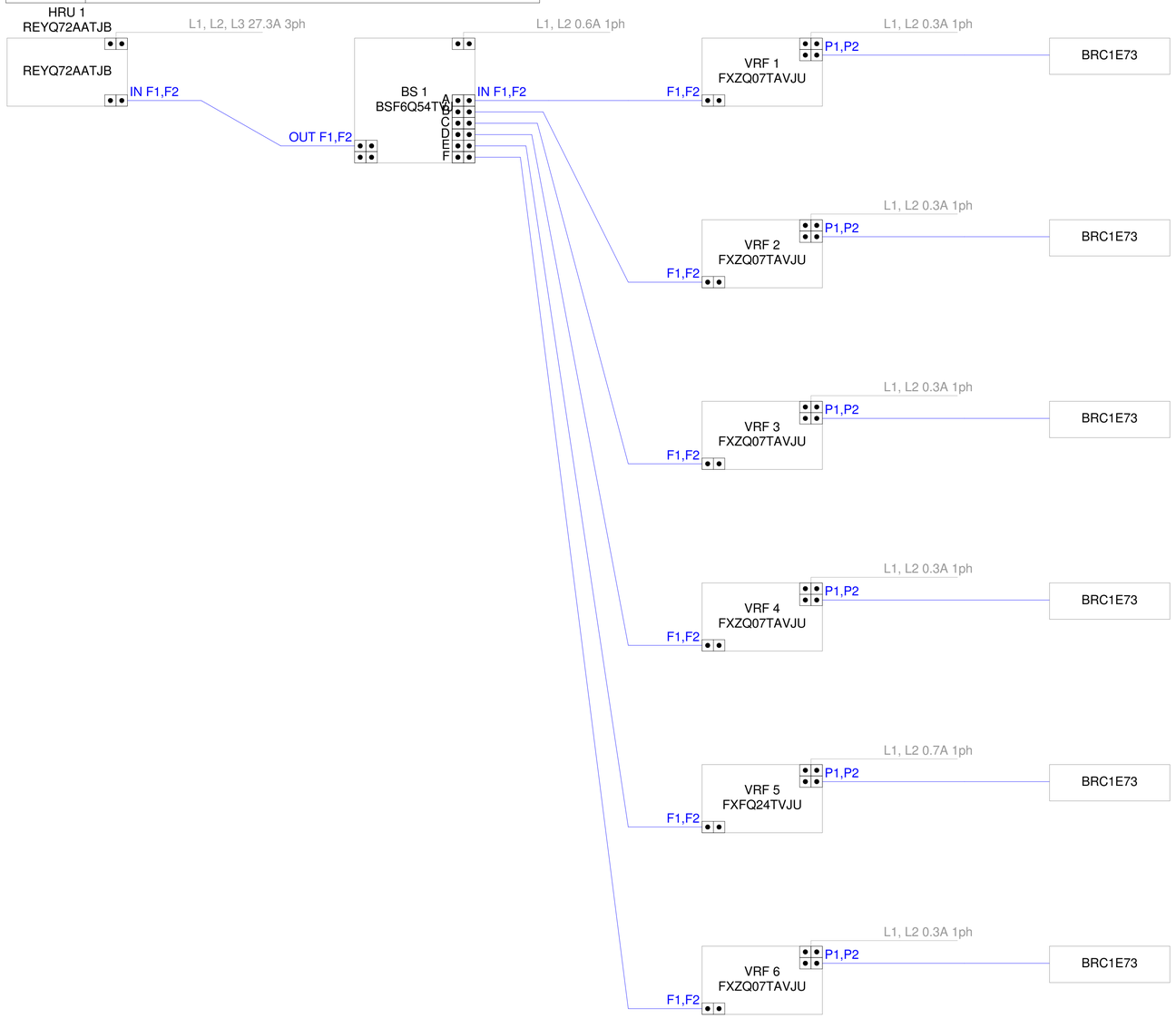
#	Date	Description

MECHANICAL DETAILS

M501

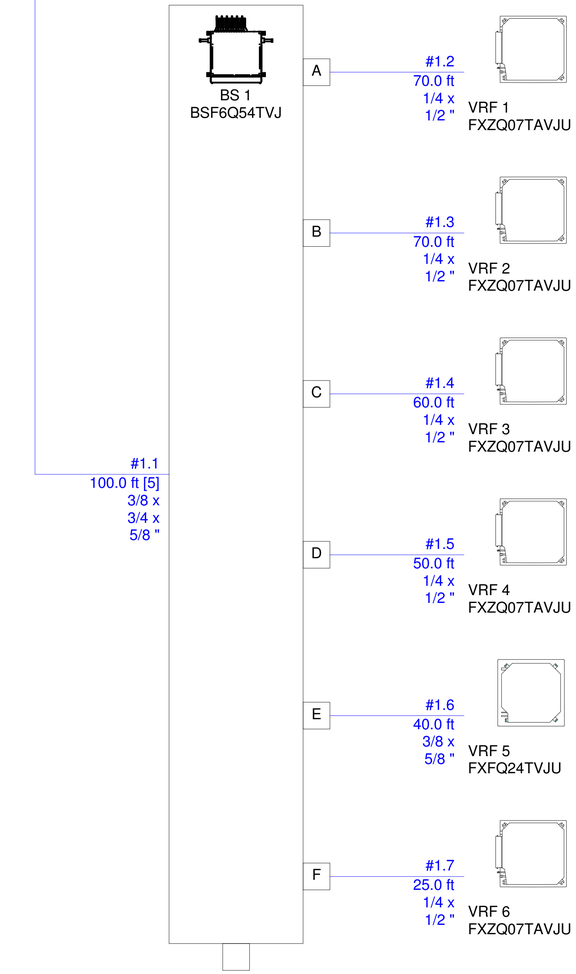
2407.003

Client	USA
Project	NCC Lobby
Title	Wiring schematics HRU 1 Air cooled heat recovery VRV EMERION-B-(208-230V) REYQ72AATJB
Date	04/15/2025
Drawing No	



Client	USA
Project	NCC Lobby
Title	Piping schematics HRU 1 Air cooled heat recovery VRV EMERION-B-(208-230V) REYQ72AATJB
Date	04/15/2025
Drawing No	

HRU 1
REYQ72AATJB



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Issued: 4.18.2025 PERMIT & BID

Revised:

#	Date	Description

MECHANICAL DETAILS

M502

2407.003

HVAC ACCESSORIES

ACCESSORIES:

1. MOTOR DAMPER
2. ECONOMIZER
3. ROOF CURB
4. HAIL GUARDS
5. INTAKE HOOD
6. VIBRATION ISOLATION
7. FLAT FILTER
8. FILTER/MIXING BOX
9. ACCESS DOOR
10. FLEX CONNECTIONS
11. MOUNTING COLLAR
12. HOT GAS BYPASS
13. FACE/BYPASS DAMPER
14. CONDENSATE PUMP
15. MOTOR GUARD
16. GREASE TRAP
17. DUCT FLANGES
18. BASE RAIL
19. HUMIDIFIER
20. CO2 SENSORS
21. ECON POWERED EXHAUST
22. ECON BAROMETRIC RELIEF
23. HOT GAS REHEAT COIL
24. SHAFT GROUNDING BRUSHES

HVAC DIFFUSERS AND REGISTERS SCHEDULE

TAG	MANUFACTURER	MODEL	FACE	MOUNTING	MATERIAL	FINISH	DAMPER TYPE	BORDER STYLE	REMARKS	DESCRIPTION
CD-1	TITUS	OMNI	24"x24"	CEILING	STEEL	STANDARD WHITE	OPPOSED BLADE	SURFACE MOUNT		
ER-1	TITUS	350RL	8"x8"	CEILING	STEEL	STANDARD WHITE	OPPOSED BLADE	SURFACE MOUNT		
SR-1	TITUS	350FL	6"x6"	CEILING	STEEL	STANDARD WHITE	OPPOSED BLADE	SURFACE MOUNT		
SR-2	TITUS	350FL	6"x6"	CEILING	STEEL	STANDARD WHITE	OPPOSED BLADE	SURFACE MOUNT		
SR-3	TITUS	350FL	10"x10"	CEILING	STEEL	STANDARD WHITE	OPPOSED BLADE	SURFACE MOUNT		

HOT WATER FINNED TUBE SCHEDULE

		PRODUCT				GENERAL		HEATING				HYDRONICS	MISC	
MARK	DESCRIPTION	MANUFACTURER	MODEL	OPERATING WEIGHT (LBS)	SECTION NUMBER	AREA SERVED	STATUS	CALC HTG MBH	EWMT	LWMT	WMS (GPM)	FLUID TYPE	MTG TYPE	ACCESSORIES
FTRH-1	HOT WATER FINNED TUBE	MODINE	S-012-18-N	--	23 82 36.00	--	NEW	5	140	120	0.5	WATER	--	10'-8" LENGTH
FTRH-2	HOT WATER FINNED TUBE	MODINE	S-012-18-N	--	23 82 36.00	--	NEW	5	140	120	0.5	WATER	--	12'-0" LENGTH
FTRH-3	HOT WATER FINNED TUBE	MODINE	S-012-18-N	--	23 82 36.00	--	NEW	5	140	120	0.5	WATER	--	4'-6" LENGTH
FTRH-4	HOT WATER FINNED TUBE	MODINE	S-012-18-N	--	23 82 36.00	--	NEW	5	140	120	0.5	WATER	--	4'-0" LENGTH

HVAC LOAD SCHEDULE

THE HEATING AND COOLING LOAD CALCULATIONS ARE BASED ON THE RTS (RADIANT TIME SERIES) METHOD. ASSUMPTIONS AND EXECUTION OF THESE METHODS ARE PER ASHRAE 183-2007 STANDARD FOR PEAK COOLING AND HEATING LOAD CALCULATIONS IN BUILDINGS EXCEPT LOW-RISE RESIDENTIAL BUILDINGS.

COOLING LOAD BREAKDOWN -
SUMMER DESIGN DB TEMP: 81 F
SUMMER DESIGN WB TEMP: 61 F

HEATING LOAD BREAKDOWN -
WINTER DESIGN DB TEMP: -50 F

CROOF SENSIBLE HEAT GAIN FROM ROOF
CWALL SENSIBLE HEAT GAIN FROM EXTERIOR WALLS
CPART SENSIBLE HEAT GAIN FROM PARTITIONS
CGLASS SENSIBLE HEAT GAIN FROM GLAZING
CSOLAR SENSIBLE HEAT GAIN FROM SOLAR GAIN THROUGH GLAZING
CLIGHTS SENSIBLE HEAT GAIN FROM INTERIOR LIGHTING
CEQUIP SENSIBLE HEAT GAIN FROM PLUG LOADS, COMPUTERS, ETC.
CPSENS SENSIBLE HEAT GAIN FROM PEOPLE

CSSENS TOTAL SENSIBLE HEAT GAIN TO SPACE
CFAN SENSIBLE HEAT GAIN FROM AIR HANDLER FAN
COAS SENSIBLE HEAT GAIN FROM OUTDOOR VENTILATION AIR
CTSENS TOTAL SENSIBLE HEAT GAIN
CPLAT LATENT HEAT GAIN FROM PEOPLE
COAL LATENT HEAT GAIN FROM OUTDOOR VENTILATION AIR
CTLAT TOTAL LATENT HEAT GAIN
CTOT TOTAL HEAT GAIN (SENSIBLE + LATENT)

HROOF HEAT LOSS FROM ROOF
HWALL HEAT LOSS FROM EXERIOR WALLS
HPART HEAT LOSS FROM PARTITIONS
HGLASS HEAT LOSS FROM GLAZING
HSLAB HEAT LOSS FROM SLAB
HSPACE TOTAL SENSIBLE HEAT LOSS FROM SPACE
HOA HEAT LOSS FROM OUTDOOR VENTILATION AIR
HTOT TOTAL HEAT LOSS

EQUIPMENT NAME	ZONE	CROOF	CWALL	CPART	CGLASS	CSOLAR	CLIGHTS	CEQUIP	CPSENS	CSSENS	CFAN	COAS	CTSENS	CPLAT	COAL	CTLAT	CTOT	HROOF	HWALL	HPART	HGLASS	HSLAB	HSPACE	HOA	HTOT
EX-WSHP-1-3	1	0	0.13	0	0.46	14.52	3.36	3.1	7.5	29.07	0	0	29.07	6	0	6	35.07	0	1.88	0	8.79	0	10.67	0	10.67
EX-WSHP-1-5	2	0	0.12	0	0.67	5.76	6.47	0.84	5.25	19.11	0	0	19.11	4.2	0	4.2	23.31	0	1.78	0	12.97	0	14.75	0	14.75
EX-DS-2	11	0	0.07	0	0.1	3.18	1.43	0.67	0.5	5.95	0	0	5.95	0.4	0	0.4	6.35	0	1.07	0	1.92	0	2.99	0	2.99
EX-DS-1	12	0	0	0	0.04	1.27	0.49	0	0.25	2.05	0	0	2.05	0.2	0	0.2	2.25	0	0	0	0.77	0	0.77	0	0.77
VRF-1	4	0	0.06	0	0.09	0.78	0.49	0.58	0.25	2.25	0.04	0	2.29	0.2	0	0.2	2.49	0	0.84	0	1.76	0	2.6	0	2.6
VRF-2	5	0	0.06	0	0.14	1.17	0.78	0.83	0.25	3.22	0.06	0	3.28	0.2	0	0.2	3.48	0	0.82	0	2.64	0	3.46	0	3.46
VRF-3	7	0	0.03	0	0.09	0.78	0.33	2.45	0.25	3.93	0.07	0	4	0.2	0	0.2	4.2	0	0.43	0	1.76	0	2.19	0	2.19
VRF-4	8	0	0	0	0	0	0.12	0.67	0.25	1.04	0.02	0	1.06	0.2	0	0.2	1.26	0	0	0	0	0	0	0	0
VRF-5	9	0	0	0	0	0	2.54	1.44	7.5	11.48	0.21	0	11.69	6	0	6	17.69	0	0	0	0	0	0	0	0
VRF-6	10	0	0.03	0	0.04	1.18	0.54	0.62	0.25	2.65	0.05	0	2.7	0.2	0	0.2	2.9	0	0.5	0	0.71	0	1.21	0	1.21

HVAC VENT SCHEDULE

NUMBER	NAME	AREA	LEVEL	CEILING HEIGHT	AIR CHANGES	OA CHANGES	# OF PEOPLE	OA PER PERSON	OA PER SQFT	REQ SA	ACT SA	REQ OA	ACT OA	ACT RETURN	ACT EXH	CRIT OAN	PRESSURE	% OPERABLE	NATURAL VENTILATION
100	VEST.	151	FIRST FLOOR - UPPER	9 2/5	0	0	0	0	0.06	235	235	9	9	235	0	0	NEUTRAL	0	--
101	VISITOR	35	FIRST FLOOR - UPPER	9 2/5	0	0	0	0	0.06	10	10	2	2	10	0	0	NEUTRAL	0	--
104	SRO	97	FIRST FLOOR - UPPER	8 4/5	0	0	1	5	0.06	110	110	11	11	110	0	0	NEUTRAL	0	--
105	PRINCIPAL	126	FIRST FLOOR - UPPER	8 4/5	0	0	1	5	0.06	155	155	13	13	155	0	0	NEUTRAL	0	--
106	RR	26	FIRST FLOOR - UPPER	8 4/5	0	0	0	0	0	10	10	0	0	0	80	0	NEGATIVE	0	--
107	STOR	18	FIRST FLOOR - UPPER	8 9/10	0	0	1	5	0.06	20	20	6	6	20	0	0	NEUTRAL	0	--
108	ADA RR	47	FIRST FLOOR - UPPER	8 4/5	0	0	0	0	0	175	175	0	0	0	80	0	POSITIVE	0	--
110 (1)	PA	23	FIRST FLOOR - UPPER	8 4/5	0	0	1	5	0.06	55	55	6	6	55	0	0	NEUTRAL	0	--
112 (1)	LOBBY	723	FIRST FLOOR - UPPER	8 4/5	0	0	11	5	0.06	315	315	98	98	315	0	0	NEUTRAL	0	--
113 (1)	OPEN OFFICE	497	FIRST FLOOR - UPPER	9 1/5	0	0	30	5	0.12	560	560	210	210	560	0	0	NEUTRAL	0	--
115 (1)	OFFICE	105	FIRST FLOOR - UPPER	8 9/10	0	0	1	5	0.06	130	130	11	11	130	0	0	NEUTRAL	0	--
116	OPEN OFFICE	280	FIRST FLOOR - UPPER	8 9/10	0	0	2	5	0.06	295	295	27	27	295	0	0	NEUTRAL	0	--
117 (1)	ADV. STORAGE	96	FIRST FLOOR - UPPER	8 9/10	0	0	1	5	0.06	100	100	11	11	100	0	0	NEUTRAL	0	--
118 (1)	FACULTY	314	FIRST FLOOR - UPPER	8 9/10	0	0	10	5	0.12	365	365	88	88	365	0	0	NEUTRAL	0	--
119	ADA RR	42	FIRST FLOOR - UPPER	8 4/5	0	0	0	0	0	15	15	0	0	0	80	0	NEGATIVE	0	--
122	STUDENT CAFE	657	FIRST FLOOR - UPPER	8 7/10	0	0	30	5	0.12	1420	1420	229	229	1420	0	0	NEUTRAL	0	--

TOTAL AREA: 3237 SF

VRF INDOOR UNIT SCHEDULE

		PRODUCT				GENERAL				AIRFLOW					COOLING						HEATING			ELECTRICAL	MISC	
MARK	DESCRIPTION	MANUFACTURER	MODEL	OPERATING WEIGHT (LBS)	SECTION NUMBER	AREA SERVED	FED FROM	STATUS	INDOOR EQUIP STYLE	SA (CFM)	OA (CFM)	ESP (IN. W.C.)	SF SPEED (RPM)	SF MTR SPEED (RPM)	DESIGN ESP (IN. W.C.)	NOM CLG CAP (TON)	TOTAL CALC CLG MBH	CALC SENS CLG MBH	EAT DB CLG	EAT WB CLG	LAT DB CLG	LAT WB CLG	CALC HTG MBH	EAT HTG	LAT HTG	EMERGENCY	ACCESSORIES
VRF-1-1	VRF INDOOR UNIT	DAIKIN	FXZQ07TAVJU	35	23 81 26.00	--	--	NEW	CASSETTE	110	--	0.75	--	--	--	0.6	2.49	2.29	76	64	55	54	2.6	70	90	NO	--
VRF-1-2	VRF INDOOR UNIT	DAIKIN	FXZQ07TAVJU	35	23 81 26.00	--	--	NEW	CASSETTE	165	--	0.75	--	--	--	0.6	3.48	3.28	76	64	55	54	3.46	70	90	NO	--
VRF-1-3	VRF INDOOR UNIT	DAIKIN	FXZQ07TAVJU	35	23 81 26.00	--	--	NEW	CASSETTE	195	--	0.75	--	--	--	0.6	4.2	4	76	64	55	54	2.19	70	90	NO	--
VRF-1-4	VRF INDOOR UNIT	DAIKIN	FXZQ07TAVJU	35	23 81 26.00	--	--	NEW	CASSETTE	55	--	0.75	--	--	--	0.6	1.26	1.06	76	64	55	54	--	70	90	NO	--
VRF-1-5	VRF INDOOR UNIT	DAIKIN	FXZQ24TAVJU	50	23 81 26.00	--	--	NEW	CASSETTE	560	--	0.75	--	--	--	2	17.69	11.69	76	64	55	54	--	70	90	NO	--
VRF-1-6	VRF INDOOR UNIT	DAIKIN	FXZQ07TAVJU	35	23 81 26.00	--	--	NEW	CASSETTE	130	--	0.75	--	--	--	0.6	2.9	2.7	76	64	55	54	1.21	70	90	NO	--

	ELECTRICAL																										PRODUCT
CONNECTION MARK	ELECTRIC CONNECTION SUMMARY	CH TYPE	CH FURNISHED BY	CH INSTALLED BY	CH WIRED BY	MC TYPE	MC FURNISHED BY	MC INSTALLED BY	MC WIRED BY	DC TYPE	DC FURNISHED	DC INSTALLED BY	DC WIRED BY	FA SHUTDOWN	FAULT CURRENT	MARK
VRF-1-1	VRF-1-1 - 208V/1PH, 0.3 MCA, 15A OCP	LOW	HC	HC	HC	MG	MFR	MFR	MFR	--	EC	EC	EC	NONE	VRF-1-1: 2410	VRF-1-1
VRF-1-2	VRF-1-2 - 208V/1PH, 0.3 MCA, 15A OCP	LOW	HC	HC	HC	MG	MFR	MFR	MFR	--	EC	EC	EC	NONE	VRF-1-2: 2090	VRF-1-2
VRF-1-3	VRF-1-3 - 208V/1PH, 0.3 MCA, 15A OCP	LOW	HC	HC	HC	MG	MFR	MFR	MFR	--	EC	EC	EC	NONE	VRF-1-3: 2599	VRF-1-3
VRF-1-4	VRF-1-4 - 208V/1PH, 0.3 MCA, 15A OCP	LOW	HC	HC	HC	MG	MFR	MFR	MFR	--	EC	EC	EC	NONE	VRF-1-4: 2192	VRF-1-4
VRF-1-5	VRF-1-5 - 208V/1PH, 0.7 MCA, 15A OCP	LOW	HC	HC	HC	MG	MFR	MFR	MFR	--	EC	EC	EC	NONE	VRF-1-5: 2379	VRF-1-5
VRF-1-6	VRF-1-6 - 208V/1PH, 0.3 MCA, 15A OCP	LOW	HC	HC	HC	MG	MFR	MFR	MFR	--	EC	EC	EC	NONE	VRF-1-6: 1921	VRF-1-6

VRF OUTDOOR, AIR COOLED UNIT SCHEDULE

	PRODUCT					GENERAL		COOLING				HEATING			DESIGN CONDITIONS			ELECTRICAL	MISC	
MARK	DESCRIPTION	MANUFACTURER	MODEL	OPERATING WEIGHT (LBS)	SECTION NUMBER	AREA SERVED	STATUS	NOM CLG CAP (TON)	TOTAL CALC CLG MBH	CALC SENS CLG MBH	MIN SEER	MIN EER	MIN IEER	CALC HTG MBH	MIN COP	NOM HTG CAP (KW)	SUM OAT DB	SUM OAT WB	WIN OAT DB	EMERGENCY	ACCESSORIES
HP-1-1	VRF OUTDOOR, AIR COOLED UNIT	DAIKIN	REYQ72AAT JB	510	23 81 26.00	ADMIN. OFFICE	NEW	4.5	52.2	--	--	12.2	21.0	58.5	3.8	--	93	80	-50	NO	--

	ELECTRICAL																										PRODUCT
CONNECTION MARK	ELECTRIC CONNECTION SUMMARY	CH TYPE	CH FURNISHED BY	CH INSTALLED BY	CH WIRED BY	MC TYPE	MC FURNISHED BY	MC INSTALLED BY	MC WIRED BY	DC TYPE	DC FURNISHED	DC INSTALLED BY	DC WIRED BY	FA SHUTDOWN	FAULT CURRENT	MARK
HP-1-1	HP-1-1 - 208V/3PH, 27.3 MCA, 30A OCP	LOW	HC	HC	HC	MG	MFR	MFR	MFR	--	EC	EC	EC	NONE	HP-1-1: 3090	HP-1-1

VRF BRANCH SELECTOR BOX SCHEDULE

	PRODUCT					GENERAL		ELECTRICAL																	PRODUCT
MARK	DESCRIPTION	MANUFACTURER	MODEL	OPERATING WEIGHT (LBS)	SECTION NUMBER	AREA SERVED	STATUS	CONNECTION MARK	ELECTRIC CONNECTION SUMMARY	CH TYPE	CH FURNISHED BY	CH INSTALLED BY	CH WIRED BY	MC TYPE	MC FURNISHED BY	MC INSTALLED BY	MC WIRED BY	DC TYPE	DC FURNISHED	DC INSTALLED BY	DC WIRED BY	FA SHUTDOWN	FAULT CURRENT	MARK
BS-1-1	VRF BRANCH SELECTOR BOX	DAIKIN	BSFQ054TVJ	73	23 81 26.00	ADMIN. OFFICE	NEW	BS-1-1	BS-1-1 - 208V/1PH, 0.6 MCA, 15A OCP	LOW	HC	HC	HC	MG	MFR	MFR	MFR	--	EC	EC	EC	NONE	BS-1-1: 3242	BS-1-1

ELECTRIC UNIT HEATER SCHEDULE

	PRODUCT					GENERAL		HEATING	ELECTRICAL	MISC	ELECTRICAL																PRODUCT
MARK	DESCRIPTION	MANUFACTURER	MODEL	OPERATING WEIGHT (LBS)	SECTION NUMBER	AREA SERVED	STATUS	CALC HTG MBH	EMERGENCY	ACCESSORIES	CONNECTION MARK	ELECTRIC CONNECTION SUMMARY	CH TYPE	CH FURNISHED BY	CH INSTALLED BY	CH WIRED BY	MC TYPE	MC FURNISHED BY	MC INSTALLED BY	MC WIRED BY	DC TYPE	DC FURNISHED	DC INSTALLED BY	DC WIRED BY	FA SHUTDOWN	FAULT CURRENT	MARK
ECH-1	ELECTRIC UNIT HEATER	QMARK	EFF1500	23	23 82 39.00	VISITOR-101	NEW	5	NO	--	ECH-1	ECH-1 - 120V/1PH, 1.5KW HTG, 12.5A FLA	LOW	HC	HC	HC	MG	MFR	MFR	MFR	--	EC	EC	EC	NONE	ECH-1: 1414	ECH-1

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Issued: 4.18.2025 PERMIT & BID

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MECHANICAL SCHEDULES

M601

2407.003

COMcheck Software Version 4.1.5.5
Mechanical Compliance Certificate

Project Information

Energy Code:	90.1 (2010) Standard
Project Title:	NCC Lobby Renovation
Location:	Newport, Kentucky
Climate Zone:	4a
Project Type:	Alteration

Construction Site:	Owner/Agent:	Designer/Contractor:
13 Carothers Road Newport, KY 41071		

Mechanical Systems List

Quantity	System Type & Description
1	HP-1-1 VRF Condensing Unit, Air Cooled w/ Heat Recovery Heat Pump Heating Mode: Capacity = 59 kBtu/h, Proposed Efficiency = 13.00 HSPF, Required Efficiency = 7.70 HSPF Cooling Mode: Capacity = 52 kBtu/h, Proposed Efficiency = 14.80 SEER, Required Efficiency: 13.00 SEER Fan System: None SYSTEM VERIFICATION REQUIRED.
1	VRF-1,2,3,4,6 Cooling: 5 each - VRF Zone Fan Unit, Capacity = 7 kBtu/h No minimum efficiency requirement applies Fan System: FAN SYSTEM 1 -- Compliance (Motor nameplate HP method) : Passes Fans: FAN 1 Supply, Constant Volume, 195 CFM, 0.1 motor nameplate hp SYSTEM VERIFICATION REQUIRED.
1	HVAC System 3 Cooling: 1 each - VRF Zone Fan Unit, Capacity = 24 kBtu/h No minimum efficiency requirement applies Fan System: FAN SYSTEM 2 -- Compliance (Motor nameplate HP method) : Passes Fans: FAN 2 Supply, Constant Volume, 560 CFM, 0.2 motor nameplate hp SYSTEM VERIFICATION REQUIRED.

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 90.1 (2010) Standard requirements in COM*check* Version 4.1.5.5 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

________________ ________________ ____________
Name - Title   Signature   Date

COMcheck Software Version 4.1.5.5
Inspection Checklist

Energy Code: 90.1 (2010) Standard

Requirements: 100.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
4.2.2,6.4.4.2.1,6.7.2 [PR2][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
4.2.2,8.4.1.1,8.4.1.2,8.7 [PR6][2]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the electrical systems and equipment and document where exceptions are claimed. Feeder connectors sized in accordance with approved plans and branch circuits sized for maximum drop of 3%.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.7.2.4 [PR5][1]	Detailed instructions for HVAC systems commissioning included on the plans or specifications for projects >=50,000 ft2.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

Section # & Req.ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
6.4.3.8 [FO9][3]	Freeze protection and snow/ice melting system sensors for future connection to controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

Section # & Req.ID	Mechanical Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
6.4.1.4,6.4.1.5 [ME1][2]	HVAC equipment efficiency verified. Non-NAECA HVAC equipment labeled as meeting 90.1.	Efficiency:_____	Efficiency:_____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Mechanical Systems list for values.*
6.4.3.4.1 [ME3][3]	Stair and elevator shaft vents have motorized dampers that automatically close.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.4.3.4.2, 6.4.3.4.3 [ME4][3]	Outdoor air and exhaust systems have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Check gravity dampers where allowed.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.4.5 [ME39][3]	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.4.3.4.4 [ME5][3]	Ventilation fans >0.75 hp have automatic controls to shut off fan when not required.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.9 [ME6][1]	Demand control ventilation provided for spaces >500 ft2 and >40 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Systems with heat recovery.
6.4.3.10 [ME40][2]	Single zone HVAC systems with fan motors >=5 hp have variable airflow controls. Air conditioning equipment with a cooling capacity >=110,000 Btu/h has variable airflow controls.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values.*
6.4.3.10 [ME40][2]	Single zone HVAC systems with fan motors >=5 hp have variable airflow controls. Air conditioning equipment with a cooling capacity >=110,000 Btu/h has variable airflow controls.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values.*
6.4.3.10 [ME40][2]	Single zone HVAC systems with fan motors >=5 hp have variable airflow controls. Air conditioning equipment with a cooling capacity >=110,000 Btu/h has variable airflow controls.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values.*
6.4.4.1.1 [ME7][3]	Insulation exposed to weather protected from damage. Insulation outside of the conditioned space and associated with cooling systems is vapor retardant.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Section # & Req.ID	Mechanical Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
6.4.4.1.2 [ME8][2]	HVAC ducts and plenums insulated. Where ducts or plenums are installed in or under a slab, verification may need to occur during Foundation Inspection.	R-_____	R-_____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** R-3.5 for runouts 10 ft to air terminals/outlets.
6.4.4.1.3 [ME9][2]	HVAC piping insulation thickness. Where piping is installed in or under a slab, verification may need to occur during Foundation Inspection.	_____ in.	_____ in.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** null.
6.4.4.1.4 [ME41][3]	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.4.4.2.1 [ME10][2]	Ducts and plenums sealed based on static pressure and location.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.4.2.2 [ME11][3]	Ductwork operating >3 in. water column requires air leakage testing.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.4.4.2.2 [ME11][3]	Ductwork operating >3 in. water column requires air leakage testing.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.4.4.2.2 [ME11][3]	Ductwork operating >3 in. water column requires air leakage testing.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.2.3 [ME19][3]	Dehumidification controls provided to prevent reheating, recooling, mixing of hot and cold airstreams or concurrent heating and cooling of the same airstream.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.5.3.3 [ME42][3]	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values.*
6.5.3.3 [ME42][3]	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values.*
6.5.3.3 [ME42][3]	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values.*
6.5.4.1 [ME25][3]	HVAC pumping systems >10 hp designed for variable fluid flow.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Section # & Req.ID	Mechanical Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
6.5.6.1 [ME56][1]	Exhaust air energy recovery on systems meeting Table 6.5.6.1.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.5.7.1.1 [ME32][2]	Kitchen hoods >5,000 cfm have make up air >=50% of exhaust air volume.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.7.1.2 [ME46][3]	Conditioned supply air to space with a kitchen hood shall not exceed the greater of a) supply flow required to meet space heating or cooling, or b) hood exhaust flow minus the available air transfer from available spaces.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.7.1.2 [ME46][3]	Conditioned supply air to space with a kitchen hood shall not exceed the greater of a) supply flow required to meet space heating or cooling, or b) hood exhaust flow minus the available air transfer from available spaces.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.7.1.5 [ME49][3]	Approved field test used to evaluate design air flow rates and demonstrate proper capture and containment of kitchen exhaust systems.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.7.2 [ME33][1]	Fume hoods exhaust systems >=15,000 cfm have VAV hood exhaust and supply systems, direct make-up air or heat recovery.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.8.1 [ME34][2]	Unenclosed spaces that are heated use only radiant heat.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

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MECHANICAL ENERGY COMPLIANCE

M701

2407.003

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
8.4.2 (EL10)[2]	At least 50% of all 125 volt 15- and 20-Amp receptacles are controlled by an automatic control device.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
10.4.1 (EL9)[2]	Electric motors meet requirements where applicable.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
6.4.3.1.2 (FI3)[3]	Thermostatic controls have a 5 °F deadband.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.2 (FI20)[3]	Temperature controls have setpoint overlap restrictions.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.3.1 (FI21)[3]	HVAC systems equipped with at least one automatic shutdown control.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.3.2 (FI22)[3]	Setback controls allow automatic restart and temporary operation as required for maintenance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.5 (FI5)[3]	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.7 (FI6)[3]	When humidification and dehumidification are provided to a zone, simultaneous operation is prohibited.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.7.2.1 (FI7)[1]	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.7.2.2 (FI8)[3]	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.7.2.3 (FI9)[1]	An air and/or hydronic system balancing report is provided for HVAC systems serving zones >5,000 ft2 of conditioned area.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.7.2.4 (FI10)[1]	HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
10.4.3 (FI24)[2]	Elevators are designed with the proper lighting, ventilation power, and standby mode.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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