MECHANICAL DEMOLITION NOTES

1. THE MECHANICAL CONTRACTOR SHALL REVIEW THE DRAWINGS AND SPECIFICATIONS FOR DEMOLITION REQUIREMENTS AND LAYOUT HIS WORK IN A COMPATIBLE AND COMPLEMENTARY MANNER. REMOVE ALL EQUIPMENT, DUCTWORK, SUPPORTS, CONTROLS, ACCESSORIES, ETC..., AND MECHANICAL ITEMS MADE OBSOLETE BY THESE ALTERATIONS AS SHOWN IN THE MECHANICAL DRAWINGS. ALL ITEMS TO BE REMOVED OR MODIFIED MAY NOT BE SHOWN, HOWEVER, THIS CONTRACTOR SHALL REMOVE ANY MECHANICAL WORK AS REQUIRED BY THE CONSTRUCTION OR AS DIRECTED BY THE OWNER OR THE ENGINEER. SURVEY THE AFFECTED AREAS BEFORE SUBMITTING A BID.
2. SCHEDULING OF DEMOLITION - COORDINATE SCHEDULING OF MECHANICAL DEMOLITION WORK WITH THE OWNER AND GENERAL CONTRACTOR SO AS TO MINIMIZE DISRUPTION OF THE OWNER'S USE OF THE FACILITIES AND MAINTAIN THE CONSTRUCTION SEQUENCE OF THE GENERAL CONTRACTOR. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INSTRUCTIONS CONCERNING PHASING AND SEQUENCE OF WORK.
3. EXISTING MECHANICAL SYSTEMS - VERIFY CONDITION OF EXISTING MECHANICAL SYSTEMS TO BE REUSED SO THAT COMPLETE, FULLY OPERATIONAL AND RELIABLE SYSTEMS ARE OBTAINED AT THE COMPLETION OF THE WORK. NOTIFY ARCHITECT/ENGINEER OF ANY SYSTEMS FOUND TO BE OF QUESTIONABLE CONDITION.
4. ALL EXISTING MECHANICAL EQUIPMENT AND DEVICES SHALL REMAIN UNLESS SPECIFICALLY NOTED TO BE REMOVED.
5. DEMOLISHED MATERIALS - UNLESS SPECIFICALLY REQUESTED BY THE OWNER, ALL DEMOLISHED MECHANICAL MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.
6. CUTTING AND PATCHING - PERFORM CUTTING AND PATCHING FOR MECHANICAL WORK SO AS TO MINIMIZE DAMAGE TO CEILINGS, FLOORS AND WALLS. REFER TO ARCHITECTURAL DRAWINGS AND GENERAL SPECIFICATIONS SECTIONS FOR SPECIFIC RESPONSIBILITIES REGARDING CUTTING AND PATCHING.
7. THESE DRAWINGS ARE COMPILED BY THE ARCHITECT/ENGINEER FROM THE OWNER'S AS-BUILT RECORD DRAWINGS AND LIMITED FIELD VERIFICATION OF EXISTING CONDITIONS FOR THE PURPOSE OF INDICATING THE WORK REQUIRED AND ARE BELIEVED TO BE CORRECT. NOTWITHSTANDING, THE CONTRACTOR SHALL VERIFY ALL DUCTWORK, EQUIPMENT LOCATIONS, DIMENSIONS AND ALL FIELD CONDITIONS AFFECTING HIS WORK.
8. WHERE MECHANICAL SYSTEMS PASS THROUGH THE DEMOLITION AREAS TO SERVE OTHER PORTIONS OF THE PREMISES, THEY SHALL REMAIN OR BE SUITABLY RELOCATED AND THE SYSTEM RESTORED TO NORMAL OPERATION. ADVISE THE ARCHITECT/ENGINEER IMMEDIATELY IF SUCH CONDITIONS ARE UNCOVERED BEFORE PROCEEDING WITH ADDITIONAL WORK.
9. PROTECT ALL EXISTING LIFE SAFETY SYSTEMS, FIRE ALARM AND PUBLIC ADDRESS SYSTEMS AND MAINTAIN THEM IN OPERATION THROUGHOUT THE PROGRESS OF THE WORK. NOTIFY THE OWNER AND ARCHITECT/ENGINEER IN WRITING OF SHUTDOWNS ARE REQUIRED PRIOR TO ANY OUTAGE OF SERVICE. WHERE THE DURATION OF A PROPOSED OUTAGE CANNOT BE TOLERATED BY THE OWNER, PROVIDE TEMPORARY CONNECTIONS AS REQUIRED MAINTAINING SERVICE.
10. SURVEY THE EFFECTED AREAS BEFORE SUBMITTING A BID AS ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DEPICTED ON THE DRAWINGS AND SOME UNUSUAL CONDITIONS EXIST.
11. IF ANY UNUSUAL STRUCTURAL OR ARCHITECTURAL CONDITIONS ARE ENCOUNTERED DURING DEMOLITION, CONTACT THE ARCHITECT/ENGINEER.
12. REMOVE AIR CONDITIONING, REFRIGERATION, AND OTHER EQUIPMENT CONTAINING REFRIGERANTS WITHOUT RELEASING CHLOROFLUOROCARBON REFRIGERANTS TO THE ATMOSPHERE IN ACCORDANCE WITH THE CLEAN AIR ACT AMENDMENT OF 1990. RECOVER ALL REFRIGERANTS PRIOR TO REMOVING AIR CONDITIONING, REFRIGERATION, AND OTHER EQUIPMENT CONTAINING REFRIGERANTS AND DISPOSE OF IN ACCORDANCE WITH THE PARAGRAPH ENTITLED "DISPOSAL OF OZONE DEPLETING SUBSTANCE (ODS)." TURN IN SALVAGED CLASS I ODS REFRIGERANTS AS SPECIFIED IN PARAGRAPH, "SALVAGED MATERIALS AND EQUIPMENT."

MECHANICAL LEGEND

(X)	INDICATES EXISTING
(T)	THERMOSTAT / TEMPERATURE SENSOR
(SD)	DUCT SMOKE DETECTOR
	INDICATES TO DEMOLISH
	EXTENT OF DEMOLITION
	POINT OF CONNECTION
	CEILING SUPPLY AIR DIFFUSER / GRILLE
	CEILING RETURN AIR / TRANSFER AIR GRILLE
	CEILING EXHAUST AIR GRILLE
	MANUAL VOLUME DAMPER
M	MOTORIZED DAMPER
	RETURN, EXHAUST OR TRANSFER AIR FLOW
	SUPPLY AIR FLOW
AIR TYPE DESIGNATOR / AIRFLOW, CFM	DIFFUSER / REGISTER / GRILLE TAG
C	CONDENSATE PIPING
(X)C	CONDENSATE PIPING - EXISTING
R	REFRIGERANT LINE-SET PIPING
(X)R	REFRIGERANT LINE-SET PIPING - EXISTING

NOTE: ALL ITEMS LISTED MAY NOT BE USED IN THIS PROJECT.

ENERGY SUMMARY

ENERGY REQUIREMENTS:
THE FOLLOWING DATA SHALL BE CONSIDERED MINIMUM AND ANY SPECIAL ATTRIBUTE REQUIRED TO MEET THE ENERGY CODE SHALL ALSO BE PROVIDED. EACH DESIGNER SHALL FURNISH THE REQUIRED PORTIONS OF THE PROJECT INFORMATION FOR THE PLAN DATA SHEET. IF PERFORMANCE METHOD, STATE THE ANNUAL ENERGY COST FOR THE STANDARD REFERENCE DESIGN VS ANNUAL ENERGY COST FOR THE PROPOSED DESIGN.

CLIMATE ZONE:	3A
METHOD OF COMPLIANCE:	
X PRESCRIPTIVE ([2018 NCECC][ENERGY CODE])	
PERFORMANCE (([2018 NCECC][ENERGY CODE]))	
PRESCRIPTIVE (ASHRAE 90.1)	
PERFORMANCE (ASHRAE 90.1)	
THERMAL ENVELOPE	
ROOF CEILING ASSEMBLY (EACH ASSEMBLY) (EXISTING)	
DESCRIPTION OF ASSEMBLY:	INSIDE SURFACE RESISTANCE, METAL DECKING, BOARD INSULATION, BUILT-UP ROOFING OUTSIDE SURFACE RESISTANCE
U-VALUE OF TOTAL ASSEMBLY:	0.034 BTU/HR/SF/F
R-VALUE OF INSULATION:	R-30 (HR-SF-F)/BTU
SKYLIGHTS IN EACH ASSEMBLY:	-
U-VALUE OF SKYLIGHT:	-
TOTAL SQ.FT OF SKYLIGHTS IN EA. ASSEMBLY:	-
EXTERIOR WALLS (EACH ASSEMBLY)	
DESCRIPTION OF ASSEMBLY:	INSIDE SURFACE RESISTANCE, METL PANEL, 2-1/2" SPRAY FOAM INSULAITON, METAL PANEL, OUTSIDE SURFACE RESISTANCE
U-VALUE OF TOTAL ASSEMBLY:	0.058 BTU/HR/SF/F
R-VALUE OF INSULATION:	R-17 (HR-SF-F)/BTU
OPENINGS (WINDOWS OR DOORS WITH GLAZING)	
U-VALUE OF TOTAL ASSEMBLY	0.45 BTU/HR/SF/F
SHADING COEFFICIENT:	0.29
PROJECTION FACTOR:	<0.5
DOOR R-VALUES:	R-3 (HR-SF-F)/BTU
WALLS BELOW GRADE (EACH ASSEMBLY)	
DESCRIPTION OF ASSEMBLY:	N/A
U-VALUE OF TOTAL ASSEMBLY:	N/A
R-VALUE OF INSULATION:	N/A
FLOORS OVER UNCONDITIONED SPACE (EACH ASSEMBLY)	
DESCRIPTION OF ASSEMBLY:	4" CONCRETE SLAB
U-VALUE OF TOTAL ASSEMBLY:	0.23 BTU/HR/SF/F
R-VALUE OF INSULATION:	N/A
FLOORS SLAB ON GRADE	
DESCRIPTION OF ASSEMBLY:	N/A
U-VALUE OF TOTAL ASSEMBLY:	N/A
R-VALUE OF INSULATION:	N/A
HORIZONTAL/VERTICAL REQUIREMENT	N/A
SLAB HEATED:	N/A

MECHANICAL SUMMARY

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

CLIMATE ZONE	3A - WARM/HUMID
WINTER DRY BULB:	23 °F
SUMMER DRY BULB	93 °F
INTERIOR DESIGN CONDITIONS	
WINTER DRY BULB	70 °F
SUMMER DRY BULB	75 °F
RELATIVE HUMIDITY	60°RH*
	*DESIGN- NOT CONTROLLED
BUILDING HEATING LOAD:	151.2 MBH
BUILDING COOLING LOAD:	182.4 MBH
MECHANICAL SPACING CONDITIONING SYSTEM	
UNITARY	
DESCRIPTION OF UNIT:	SEE SCHEDULES
HEATING EFFICIENCY:	SEE SCHEDULES
COOLING EFFICIENCY:	SEE SCHEDULES
SIZE CATEGORY OF UNIT:	SEE SCHEDULES
BOILER	
SIZE CATEGORY, IF OVERSIZED STATE REASON:	N/A
CHILLER	
SIZE CATEGORY, IF OVERSIZED STATE REASON:	N/A
LIST EQUIPMENT EFFICIENCIES:	SEE SCHEDULES

MECHANICAL SPECIFICATIONS

PART 1 GENERAL

1.1 SCOPE OF WORK: THESE DRAWINGS AND SPECIFICATIONS DESCRIBE THE SCOPE OF WORK REQUIRED FOR PROJECT MECHANICAL HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS. CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIAL REQUIRED FOR COMPLETE, FULLY FUNCTIONING MECHANICAL SYSTEMS COMPLYING WITH THE INTENT OF THE DRAWINGS AND SPECIFICATIONS.

1.2 CONTRACTOR: THE WORD "CONTRACTOR" AS USED HEREIN SHALL MEAN THE HVAC INSTALLER UNLESS OTHERWISE QUALIFIED.

1.3 DRAWINGS: DRAWINGS ARE DIAGRAMMATIC AND MAY NOT COMPLETELY DESCRIBE EVERY DETAIL OF THE INSTALLATION. HOWEVER, CONTRACTOR IS RESPONSIBLE FOR FURNISHING COMPLETE SYSTEMS INCLUDING ALL REQUIRED EQUIPMENT AND ACCESSORIES TO OBTAIN FULLY FUNCTIONING HVAC SYSTEMS.

1.4 CODE COMPLIANCE: COMPLY WITH THE LATEST EDITIONS OF THE FOLLOWING STANDARDS AND CODES, INSOFAR AS THEY APPLY:

A. NORTH CAROLINA STATE BUILDING CODE, LATEST EDITION AND REVISIONS

B. LOCAL JURISDICTION REQUIREMENTS: INCLUDE ALL WORK TO COMPLY WITH CODES WHETHER INDICATED ON DRAWINGS OR NOT. NOTIFY ENGINEER OF DISCREPANCIES BETWEEN DRAWINGS AND CODES PRIOR TO BEGINNING WORK.

1.5 PERMITS AND INSPECTIONS: OBTAIN ALL PERMITS, LICENSES, INSPECTIONS, ETC., REQUIRED FOR THE WORK AND PAY FOR SAME. FURNISH A FINAL CERTIFICATE OF INSPECTION AND APPROVAL FROM THE AUTHORITY HAVING JURISDICTION PRIOR TO ACCEPTANCE OF THE WORK.

1.6 MANUFACTURER'S RECOMMENDATIONS: INSTALL ALL EQUIPMENT IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

1.7 WORKMANSHIP: UTILIZE SKILLED MECHANICS TO OBTAIN A HIGH QUALITY PROFESSIONAL FINISH INSTALLATION WHEN COMPLETED. WORK OF UNACCEPTABLE QUALITY SHALL BE REMOVED AND REWORKED AT NO ADDITIONAL COST. ENGINEER SHALL BE THE JUDGE OF WORKMANSHIP AND THEIR OPINION WILL BE FINAL. IN ADDITION, ANY EXISTING CONSTRUCTION DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE ENGINEER BY THE CONTRACTOR AT NO ADDITIONAL COST.

1.8 SUPERVISION: PROVIDE SKILLED SUPERINTENDENTS TO SUPERVISE THE WORK FROM THE BEGINNING TO COMPLETION AND FINAL INSPECTION.

1.9 PROGRESS OF WORK: PERFORM WORK IN ACCORDANCE WITH SCHEDULE AND REQUIREMENTS OF THE OWNER. UNDER NO CIRCUMSTANCES SHALL THIS CONTRACTOR DELAY THE OVERALL PROJECT SCHEDULE.

1.10 COORDINATION: COORDINATE MECHANICAL WORK WITH THE WORK OF OTHER TRADES. LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE UNLESS SPECIFICALLY DIMENSIONED. LAYOUT MECHANICAL WORK SO AS NOT TO INTERFERE WITH THE WORK OF OTHER TRADES. VERIFY ACTUAL BUILDING STRUCTURE PRIOR TO DUCT FABRICATION AND ADJUST ARRANGEMENT AS REQUIRED. INCLUDE ALL OFFSETS IN DUCTS, FITTINGS, PIPING, ETC. AS REQUIRED TO PROPERLY INSTALL EQUIPMENT.

1.11 EQUIPMENT LOCATIONS: DETERMINE EXACT EQUIPMENT AND MATERIALS LOCATIONS TO PROVIDE BEST ARRANGEMENT AND TO FACILITATE PROPER MAINTENANCE AND SERVICING OF EQUIPMENT.

1.12 LISTING AND LABELING: ALL EQUIPMENT SHALL BE LABELED OR LISTED BY UL OR OTHER APPROVED TESTING AGENCY WHERE REQUIRED.

1.13 STORAGE SPACE: CONSULT WITH THE OWNER REGARDING JOB SITE STORAGE FOR MECHANICAL MATERIALS TO BE INSTALLED UNDER THIS PROJECT. STORAGE SPACE MUST BE SECURED AND CONTRACTOR'S REPRESENTATIVE MUST BE ON JOB BEFORE ANY MATERIAL MAY BE RECEIVED.

1.14 CLEANUP: REMOVE ALL DEBRIS GENERATED IN THE ACCOMPLISHMENT OF WORK UNDER THIS PROJECT. CLEAN, REPLACE OR REPAIR ALL SURFACES SOILED OR DAMAGED DURING THE COURSE OF THE WORK. REMOVE DEBRIS DAILY SO TO MAINTAIN SAFE WORKING CONDITIONS.

1.15 ELECTRICAL WORK

A. PERFORM ELECTRICAL WORK FOR MECHANICAL EQUIPMENT IN COMPLIANCE WITH PROJECT ELECTRICAL REQUIREMENTS. ELECTRICAL WORK FOR MECHANICAL EQUIPMENT NOT SPECIFICALLY INDICATED TO BE PROVIDED BY THE ELECTRICAL CONTRACTOR IN THE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AS PART OF HIS WORK.

B. ELECTRICAL DRAWINGS ARE BASED ON ELECTRICAL CHARACTERISTICS INDICATED IN DRAWING MECHANICAL EQUIPMENT SCHEDULES. ANY EQUIPMENT FURNISHED BY THE MECHANICAL CONTRACTOR WHICH DOES NOT MATCH THE ELECTRICAL CHARACTERISTICS INDICATED IN THE DRAWING SCHEDULES SHALL BE COORDINATED WITH THE ELECTRICAL CONTRACTOR. ANY ADDITIONAL COSTS FOR ELECTRICAL INSTALLATION REQUIRED FOR EQUIPMENT NOT MATCHING THE DRAWING SCHEDULES SHALL BE BORNE BY THE MECHANICAL CONTRACTOR.

C. LOW VOLTAGE CONTROL WIRING FOR MECHANICAL SYSTEMS SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR.

1.16 SUBMITTALS: SUBMIT ONE (1) ELECTRONIC COPY OF DESCRIPTIVE DATA FOR MECHANICAL EQUIPMENT AND MATERIALS INCLUDING GRILLES AND DAMPERS FOR APPROVAL BY THE ENGINEER. CLEARLY IDENTIFY ALL ITEMS.

1.17 OPERATING AND MAINTENANCE MANUALS: SUBMIT TWO COPIES OF COMPLETE OPERATING AND MAINTENANCE INSTRUCTIONS FOR ALL EQUIPMENT, INCLUDING NECESSARY CUT SHEETS, CHARTS, WRITTEN INSTRUCTIONS, WIRING DIAGRAMS, FINAL AS-BUILT DRAWINGS WITH BALANCED AIRFLOWS INDICATED, ETC. BIND IN SUITABLE HARD BACK RING BINDERS, PROPERLY INDEXED, AND DELIVER TO THE OWNER PRIOR TO BUILDING OCCUPANCY. IN ADDITION, AFFIX A FOLDER WITH TYPICAL "OWNER'S INSTRUCTIONS" AND "MAINTENANCE INFORMATION" INSIDE THE MECHANICAL EQUIPMENT AS APPLICABLE. THE FOLDER SHALL ALSO INCLUDE A COMPLETE STARTUP LOG FOR THE EQUIPMENT.

1.18 RECORD DRAWINGS: MAINTAIN ONE SET OF "RED-LINED" RECORD DRAWINGS ON SITE AT ALL TIMES AND PROVIDE DRAWINGS TO ENGINEER PRIOR TO FINAL INSPECTION.

1.19 WARRANTY: WARRANTY THE MATERIALS AND WORKMANSHIP COVERED BY THESE DRAWINGS AND SPECIFICATIONS FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER. REPAIR AND/OR REPLACE ANY PARTS OF ANY SYSTEM THAT MAY PROVE TO BE DEFECTIVE AT NO ADDITIONAL COST TO THE OWNER WITHIN THE WARRANTY PERIOD. PROVIDE 5 YEAR WARRANTY FOR ALL AIR CONDITIONING COMPRESSORS. FURNISH WARRANTY CERTIFICATES FOR ALL MECHANICAL EQUIPMENT. WARRANTY TO COMMENCE UPON DATE OF ACCEPTANCE OF WORK BY OWNER.

1.20 EXISTING BUILDINGS AND CONSTRUCTION

A. WORK UNDER THIS CONTRACT IS TO BE PERFORMED IN AN EXISTING BUILDING. BUILDING LAYOUT INDICATED IS DEVELOPED FROM EXISTING RECORD DOCUMENTS AND LIMITED FIELD VERIFICATION FOR THE PURPOSES OF DESCRIBING THE WORK. VERIFY ALL EXISTING CONDITIONS AND ADJUST WORK AS REQUIRED TO SUIT ACTUAL FIELD CONDITIONS.

B. PERFORM ALL WORK IN ACCORDANCE WITH SAFETY REGULATIONS.

C. DO NOT CUT ANY STRUCTURAL MEMBERS WITHOUT EXPRESS WRITTEN INSTRUCTIONS FROM ENGINEER. PROVIDE CUTTING AND PATCHING FOR EXISTING FINISHES AS REQUIRED.

D. COORDINATE INSTALLATION OF NEW MECHANICAL SYSTEMS WITH EXISTING BUILDING SYSTEMS. ADJUST ARRANGEMENTS AS REQUIRED TO ACCOMMODATE INTERFERENCES.

PART 2 MATERIALS

2.1 EQUIPMENT

A. MODELS AS SCHEDULED ON THE DRAWINGS. MANUFACTURERS INDICATED ARE INTENDED TO ESTABLISH THE QUALITY AND TYPE OF EQUIPMENT DESIRED. COMPARABLE EQUIPMENT WILL BE CONSIDERED FOR APPROVAL BY THE ENGINEER.

B. INCLUDE ALL ACCESSORIES INDICATED OR AS RECOMMENDED BY THE MANUFACTURER FOR PROPER OPERATION.

2.2 DUCTWORK

A. DUCT CONSTRUCTION (SINGLE WALL): GALVANIZED STEEL CONSTRUCTED, BRACED, SUPPORTED AND INSTALLED ACCORDING TO SMACNA HVAC DUCT CONSTRUCTION STANDARDS, 1" PRESSURE CLASS, SEAL CLASS A. SEAL USING APPROVED TYPE DUCT SEALING MASTIC OR TAPE DIPPED IN OR BRUSHED WITH ADHESIVE ("HARDCAST" DT-TAPE W/FTA-20 ADHESIVE OR "UNITED MCGILL" MTD TAPE W/MTD-20 ADHESIVE). "DUCT TAPE" IS UNACCEPTABLE FOR DUCT SEALING. "DUCT-MATE" OR EQUAL TRANSVERSE JOINT CONNECTION METHODS WILL BE ACCEPTABLE ONLY IF A LETTER FROM THE MANUFACTURER IS PRESENTED TO THE ENGINEER STATING THAT THE CONTRACTOR'S INSTALLATION METHODS ARE APPROVED BY THE MANUFACTURER AND THAT ALL MANUFACTURER'S RECOMMENDATIONS WILL BE FOLLOWED. THERE WILL BE NO EXCEPTIONS TO THIS STIPULATION.

B. DUCT SIZES INDICATED ARE INSIDE FREE AREA DIMENSIONS. DUCT DIMENSIONS SHALL BE ADJUSTED TO SUIT FIELD CONDITIONS USING EQUIVALENT SIZE PER ASHRAE STANDARD. RECTANGULAR OR ROUND DUCTWORK MAY BE USED AT CONTRACTOR OPTION PROVIDED EQUIVALENT SIZE PER ASHRAE STANDARD IS USED.

C. BRANCH DUCTS: PROVIDE MANUFACTURED TAKE-OFF FITTINGS WITH EXTRACTOR AND VOLUME DAMPER WITH LOCKING QUADRANT OPERATOR AND INSULATION GUARD, GENERAL ENVIRONMENT CORPORATION OR EQUAL, FOR ALL BRANCH RUNOUTS TO SUPPLY REGISTERS AND DIFFUSERS. UNLESS OTHERWISE NOTED, MATCH SUPPLY BRANCH DUCT SIZE TO DIFFUSER SIZE.

D. ELBOWS: ALL SQUARE BENDS OR ELBOW FITTINGS SHALL BE FITTED WITH APPROVED TYPE DOUBLE THICKNESS TURNING VANES.

E. FLEXIBLE DUCT: FACTORY INSULATED, R-8, MINIMUM, UL 181 CLASS 1. MAXIMUM FLEX DUCT RUNOUT LENGTH NOT TO EXCEED 5' UNLESS OTHERWISE NOTED. INSTALL AND SUPPORT FLEXIBLE DUCTS IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

F. FLEXIBLE CONNECTIONS: PROVIDE FLEXIBLE CONNECTOR, VENTFABRICS OR EQUAL, AT ALL MECHANICAL EQUIPMENT CONNECTIONS TO DUCT SYSTEM.

2.3 AIR DISTRIBUTION

A. DIFFUSERS AND REGISTERS: MODELS AS SCHEDULED ON THE DRAWINGS. MANUFACTURERS INDICATED ARE INTENDED TO ESTABLISH THE QUALITY AND TYPE OF EQUIPMENT DESIRED. COMPARABLE EQUIPMENT WILL BE CONSIDERED FOR APPROVAL BY THE ENGINEER. INCLUDE FINISH AND ACCESSORIES AS INDICATED.

2.4 PIPING

A. REFRIGERANT PIPING: TYPE ACR COPPER WITH WROUGHT COPPER FITTINGS AND BRAZED JOINTS. SIZE & INSTALL IN STRICT ACCORDANCE W/ REFRIGERATION EQUIPMENT MANUFACTURER RECOMMENDATIONS.

B. REFRIGERANT ACCESSORIES: PROVIDE FOR EACH REFRIGERANT CIRCUIT:
1. SIGHT GLASS WITH MOISTURE INDICATOR, FILTER DRYER, SOLENOID VALVE AND EXPANSION VALVE.
2. GAUGES, CHARGING VALVES, RELIEF VALVES, LOW LIMIT CONTROLS, AND SPECIALTIES REQUIRED FOR A COMPLETE AND SAFE INSTALLATION.
3. ALL ACCESSORIES AS RECOMMENDED BY THE REFRIGERATION EQUIPMENT MANUFACTURER.
4. VALVES AND SPECIALTIES SHALL BE AS MADE BY MUELLER, HENRY, ALCO, OR EQUAL.

C. CONDENSATE PIPING: SCH 40 PVC W/ SOLVENT WELD JOINTS. PROVIDE TRAP AT COOLING COIL DRAIN CONNECTION. PROVIDE CLEANOUTS AT CHANGE IN DIRECTION. EXTEND CONDENSATE PIPING TO APPROVED DISCHARGE LOCATION.

2.5 INSULATION

A. DUCT INSULATION: R-8 MINIMUM, 2" FIBERGLASS BLANKET INSULATION, ASTM C553, TYPE II, 0.75 PCF CLASS F-1, ASTM 84E FLAME SPREAD/SMOKE DEVELOPED RATING LESS THAN 25/50. PROVIDE WITH FACTORY APPLIED ALL-PURPOSE, LAMINATED GLASS-FIBER-REINFORCED, FLAME-RETARDANT KRAFT PAPER AND ALUMINUM FOIL JACKET. INSTALL ON ALL CONCEALED HVAC SUPPLY, RETURN, MAKE-UP AIR DUCTS AND PLENUMS.

B. REFRIGERANT PIPING INSULATION: ELASTOMERIC CLOSED CELL PIPE INSULATION, ARMAFLEX AP OR EQUAL, 1½" THICK. PROTECT ALL EXTERIOR, EXPOSED PIPE INSULATION WITH CORRUGATED ALUMINUM JACKET.

C. CONDENSATE DRAIN PIPING INSULATION: ELASTOMERIC CLOSED CELL PIPE INSULATION, ARMAFLEX AP OR EQUAL, 1/2" THICK.

2.6 CONTROLS

A. FURNISH ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR A COMPLETE AND OPERATING, UTILIZING DIGITAL CONTROLS AS SHOWN ON THE DRAWINGS AND AS DESCRIBED HEREIN. DRAWINGS ARE DIAGRAMMATIC ONLY. DDC SYSTEM MUST INTEGRATE TO THE EXISTING HONEYWELL LON NIAGARA SYSTEM.

B. SAFETY DEVICES: PROVIDE DUCT SMOKE DETECTORS AND CONTROL INTERLOCKS FOR FAN SHUTDOWN IN EVENT OF FIRE AS INDICATED OR AS REQUIRED BY CODE.

C. TOILET EXHAUST: SEE DRAWING SCHEDULES AND DETAILS.

2.7 SUPPORTS

A. HANGERS, SUPPORTS, AND ANCHORS: SUPPORT AND FASTEN ALL DUCTWORK, PIPING, EQUIPMENT, ETC., SECURELY IN PLACE USING APPROVED STEEL HANGERS AND FASTENERS. CHAIN, STRAP, PERFORATED STRAP, WIRE HANGERS, OR WOOD PLUGS ARE PROHIBITED.

B. INCLUDE STEEL SUPPORTS, ANCHORS, FRAMES, BRACING, PLATES, BOLTS, NUTS, WASHERS, ETC. INCIDENTAL TO INSTALLATION OF WORK.

C. PROVIDE AUXILIARY STRUCTURAL MEMBERS WHERE REQUIRED BETWEEN MEMBERS OF THE STRUCTURE.

2.8 REFRIGERANT: FURNISH A FULL CHARGE OF REFRIGERANT FOR EACH SYSTEM AND MAINTAIN THE CHARGE FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE AND REPLACE ANY THAT MAY BE LOST (UNLESS LOSS IS DETERMINED TO BE CAUSED BY THE OWNER).

PART 3 EXECUTION

3.1 PREPARATION: REVIEW CONSTRUCTION DOCUMENTS AND VERIFY ARRANGEMENT WITH FIELD CONDITIONS. COORDINATE PROPOSED MECHANICAL EQUIPMENT AND SYSTEMS WITH ASSOCIATED WORK OF OTHER TRADES.

3.2 INSTALLATION: INSTALL ALL MECHANICAL WORK IN ACCORDANCE WITH CODE, MANUFACTURER'S RECOMMENDATIONS AND GOOD INDUSTRY PRACTICE. ARRANGE WORK TO ALLOW EASY ACCESS TO EQUIPMENT FOR SERVICE AND MAINTENANCE.

3.3 DUCTWORK: LAYOUT DUCTWORK TO AVOID INTERFERENCES AND MAXIMIZE USABLE SPACE IN THE BUILDING.

3.4 PIPING: ROUTE PIPING NEATLY, PARALLEL TO BUILDING WALLS. WHERE REQUIRED, SLOPE PIPING FOR PROPER DRAINAGE.

3.5 DUCT INSULATION: INSTALL BLANKET INSULATION TIGHT AND SMOOTH. OVERLAP JOINTS 3 INCHES. SEAL JOINTS, BREAKS, AND PUNCTURES WITH VAPOR BARRIER COMPOUND.

3.6 PIPING INSULATION: INSTALL INSULATION NEATLY. APPLY ADHESIVE TO BOTH FACES OF JOINT TO OBTAIN FULLY ADHERED, VAPOR TIGHT INSTALLATION. FINISH ALL INSULATION EXPOSED TO WEATHER WITH MANUFACTURE APPROVED WEATHERPROOF COATING.

3.7 CONTROLS: INSTALL AND WIRE ALL CONTROLS COMPLETE TO OBTAIN INTENDED SEQUENCE OF OPERATION.

3.8 HANGERS AND SUPPORTS: HANG AND SUPPORT EQUIPMENT, DUCTS AND PIPING IN A SUBSTANTIAL MANNER FROM THE BUILDING STRUCTURE. SPACE HANGERS IN ACCORDANCE WITH CODE AND SO AS TO AVOID EXCESS DEFLECTION OR SAG. PROVIDE SEISMIC DESIGN HANGERS WHERE REQUIRED. NO PORTION OF THE STRUCTURE SHALL BE OVER STRESSED BY THE HANGING OPERATION OR BY THE FINAL SUPPORTS. ATTACHMENTS DEEMED INADEQUATE BY THE ENGINEER SHALL BE REWORKED AS DIRECTED. PROVIDE VIBRATION ISOLATION FOR MOVING MACHINERY.

3.9 REFRIGERANT PIPING TESTS: PLACE REFRIGERANT PIPING UNDER A TEST PRESSURE USING ANHYDROUS CARBON DIOXIDE OR NITROGEN BEFORE DEHYDRATING WITH A VACUUM PUMP TO A VACUUM OF 26 INCHES HG. SEE CONDENSING UNIT, COMPRESSOR OR COMPRESSOR UNIT NAME PLATE FOR TEST PRESSURES. MAINTAIN VACUUM FOR A MINIMUM OF 24 HOURS. REFRIGERATION COMPRESSOR SHALL NOT BE USED FOR THIS PURPOSE. AFTER SYSTEM IS VACUUM TESTED, CHARGE WITH SYSTEM REFRIGERANT AND LEAK TEST ENTIRE CIRCUIT WITH ELECTRONIC TESTER.

3.10 LABELS: LABEL ALL EQUIPMENT AND DEVICES WITH BAKELITE ENGRAVED PLATES SCREWED IN PLACE. "TAPEWRITER" AND ADHESIVE LABELS ARE UNACCEPTABLE.

3.11 START-UP: VERIFY INSTALLATION IS COMPLETE AND READY FOR START-UP. START-UP ALL EQUIPMENT IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS USING FACTORY CERTIFIED MECHANICS. AFTER START-UP, VERIFY AND DOCUMENT THAT EQUIPMENT IS OPERATING PROPERLY WITHIN MANUFACTURER'S SPECIFIED TOLERANCES.

3.12 TESTING AND BALANCING: BALANCE AIR FLOWS TO OBTAIN AIR QUANTITIES SHOWN ON DRAWINGS. ADJUST DAMPERS FOR ALL AIR OUTLETS AND RECORD VELOMETER READINGS WHICH CORRESPOND TO DESIGN FLOW RATES AT EACH OUTLET. RECORD DESIGN AND FINAL READINGS ON APPROVED FORMS. SUBMIT TWO COPIES FOR REVIEW AND APPROVAL BY ENGINEER. UPON COMPLETION OF ALL BALANCING AND TESTING, SCHEDULE A TIME FOR ENGINEER TO PERFORM RANDOM CHECKING OF TYPICAL OUTLETS. CONTRACTOR SHALL PROVIDE TECHNICIANS AND MEASURING DEVICES FOR THIS TESTING.

3.13 COMMISSIONING: DEMONSTRATE AND DOCUMENT OPERATION OF ALL MECHANICAL SYSTEMS INSTALLED UNDER THIS CONTRACT IN THE PRESENCE OF THE ENGINEER. INCLUDE ALL TESTS, TRIAL OPERATIONS, ETC. AS REQUIRED TO PROVE THAT ALL SYSTEMS ARE IN COMPLETE SERVICEABLE CONDITION AND WILL FUNCTION AS INTENDED. ALL COSTS OF COMMISSIONING SHALL BE BORNE BY THIS CONTRACTOR.

3.14 TRAINING: TRAIN OWNER PERSONNEL IN THE PROPER OPERATION AND MAINTENANCE OF MECHANICAL SYSTEMS. PROVIDE WRITTEN DOCUMENTATION INCLUDING NAMES OF OWNER PERSONNEL ATTENDING TRAINING.

3.15 CLEAN-UP: CLEAN ALL EQUIPMENT AND DEVICES AND INSTALL NEW FILTERS IN EQUIPMENT IMMEDIATELY PRIOR TO OWNER ACCEPTANCE AND OCCUPANCY.

MECHANICAL GENERAL NOTES

VRF DELEGATED DESIGN SUBMITTAL:

1. INCLUDE DESIGN CALCULATIONS FOR SELECTING WIND RESTRAINT ANCHORING TO EXISTING ROOF STRUCTURE FOR HEAT PUMPS.
2. INCLUDE DESIGN CALCULATIONS WITH CORRESPONDING DIAGRAM OF REFRIGERANT PIPING AND TUBING SIZING FOR EACH SYSTEM INSTALLED.
3. INCLUDE CALCULATIONS SHOWING THAT SYSTEM TRAVEL DISTANCE FOR REFRIGERANT PIPING AND CONTROLS CABLING ARE WITHIN HORIZONTAL AND VERTICAL TRAVEL DISTANCES SET BY MANUFACTURER. PROVIDE A COMPARISON TABLE FOR EACH SYSTEM INSTALLED.

ABBREVIATIONS

Term	Abbreviation
ABOVE FINISHED FLOOR	AFF
ABOVE SEA LEVEL	ASL
ACROSS THE LINE	ACL
AIR CONDITION(-ING, -ED)	AIR COND
AIR-HANDLING UNIT	AHU
AMBIENT	AMB
AMERICAN NATIONAL STANDARDS INSTITUTE	ANSI
AMPERE (AMP, AMPS)	AMP
APPARATUS DEW POINT	ADP
APPROXIMATE	APPROX
ATMOSPHERE	ATM
AVERAGE	AVG
BRAKE HORSEPOWER	BHP
BROWN & SHARPE WIRE GAGE	B&S
BRITISH THERMAL UNIT	BTU
BUILDING	BLDG
CELSIUS	°C
CHILLED WATER RETURN	CHWR
CHILLED WATER SUPPLY	CHWS
COEFFICIENT, VALVE FLOW	CV
COMPRESSOR	COMP
CONDENS(-ER, -ING, -ATION)	COND
CONNECTION	CONN
COEFFICIENT OF PERFORMANCE FACTOR	COP
COOLING LOAD	CLG LOAD
CUBIC FEET	CU FT
CUBIC INCH	CU IN
CUBIC FEET PER MINUTE	CFM
CFM, STANDARD CONDITIONS	SCFM
DECIBEL	DB
DEGREE	DEG OR °
DEW-POINT TEMPERATURE	DPT
DIAMETER	DIA
DIAMETER, INSIDE	ID
DIAMETER, OUTSIDE	OD
DIFFERENCE OR DELTA	DIFF
DRY-BULB TEMPERATURE	DBT
ENERGY EFFICIENCY RATING	ERR
EFFICIENCY	EFF
ELEVATION	EL
ENTERING	ENT
ENTERING WATER TEMPERATURE	EWT
ENTERING AIR TEMPERATURE	EAT
EXTERNAL AMBIENT TEMPERATURE	EAT
FACE VELOCITY	FVEL
FAHRENHEIT	°F
FEET PER MINUTE	FPM
FEET PER SECOND	FPS
FOOT OR FEET	FT
GAGE OR GAUGE	GA
GALLONS	GAL
GALLONS PER HOUR	GPH
GALLONS PER MINUTE	GPM
GALLONS PER DAY	GPD
GRAINS	GR
HEAD	HD
HEIGHT	HGT
HIGH-PRESSURE STEAM	HPS
HORSEPOWER	HP
HOUR(S)	HR
HUMIDITY, RELATIVE	RH
INTERGRATED PART LOAD VALUES	IPLV
INCH	IN.
IRON PIPE SIZE	IPS
KILOVOLT-AMP	KVA
KILOWATT	KW
KILOWATT HOUR	KWH
LEAVING AIR TEMPERATURE	LAT
LEAVING WATER TEMPERATURE	LWT
LENGTH	LG
LINEAR FEET	LF
LOW-PRESSURE STEAM	LPS
MAXIMUM	MAX
MEDIUM-PRESSURE STEAM	MPS
MILES PER HOUR	MPH
MINIMUM	MIN.
MINUTE	MIN
MANUFACTURER	MFR
NOISE CRITERIA	NC
NON-STANDARD PART LOAD	NPLV
NORMALLY OPEN	NO
NORMALLY CLOSED	NC
NOT APPLICABLE	N/A
NOT IN CONTACT	N I C
NOT TO SCALE	NTS
NUMBER	NO
ON CENTER	OC
OUNCE	OZ
OUTSIDE AIR	OA
PARTS PER MILLION	PPM
PERCENT	%
POUNDS	LBS
POUNDS PER SQUARE FOOT	PSF
PRESSURE	PRESS
QUANTITY	QTY
RATED LOAD AMPS	RLA
RECIRCULATE	RECIRC
REFRIGERANT (12, 22, ETC.)	R12, R22
RELATIVE HUMIDITY	RH
RETURN AIR	RA
REVOLUTIONS PER MINUTE	RPM
REVOLUTIONS PER SECOND	RPS
SAFETY FACTOR	SF
SECOND	S
SHADING COEFFICIENT	SC
SPECIFICATION	SPEC
SQUARE	SQ
STANDARD	STD
STATIC PRESSURE	SP
SUPPLY	SPLY
SUPPLY AIR	SA
TEMPERATURE	TEMP
TEMPERATURE DIFFERENCE	TD
THERMOSTAT	T STAT
TONS OF REFRIGERATION	TONS
TO BE DETERMINED	TBD
TOTAL DYNAMIC HEAD	TDH
U-FACTOR	U
VARIABLE AIR VOLUME	VAV
VELOCITY	VEL
VENTILATION, VENT	VENT
VERTICAL	VERT
VOLT	V
VOLT AMPERE	VA
VOLUME	VOL
WATER PRESSURE DROP	WPD
WATT	W
WATT-HOUR	WH
WEIGHT	WT
WET BULB	WB
YARD	YD
YEAR	YR

NOTE: ALL ABBREVIATIONS MAY NOT BE USED IN PROJECT.

22169
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REV	DESCRIPTION	BY	CR#	APPROVAL	DATE
0	ISSUED FOR CONSTRUCTION	GRM		DMH	08/03/23

REVISIONS

SIGNATURES		DATE
DRAWN	GRM	08/03/23
CHECKED	DMH	08/03/23
ENGRG	DMH	08/03/23
ENGRG		

REFERENCE DRAWINGS: N/A

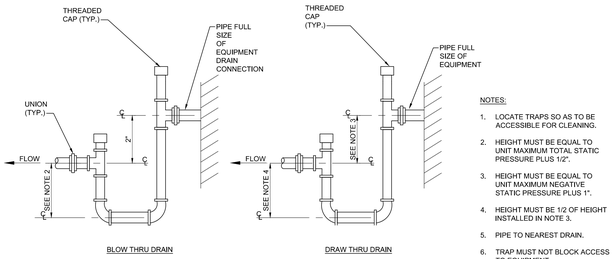
SCALE N/A
ALL SURF. 63
UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS ± .__ FRACTIONS ± .__
3 PLACE DECIMALS ± .__ ANGLES ± .__

GNF Global Nuclear Fuel
A Joint Venture of GE, Toshiba, & Hitachi
Wilmington, NC

RED OFFICE HVAC MOD.'S
MECHANICAL SPECIFICATIONS, NOTES, LEGEND & SUMMARIES

ISSUE DATE	DWG NO.	REV.
08/03/23	6001e23	0

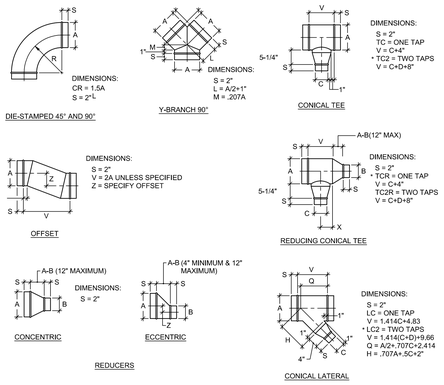
CONTROLLED BY: --- ISSUED TO: N/A FILE NAME --------.dwg PIXEL --- SH NO. M1 CONT ON M2



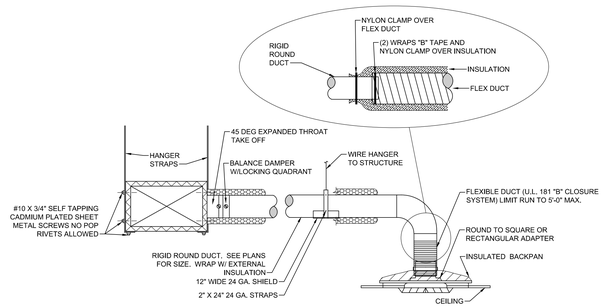
NOTES:

1. LOCATE TRAPS SO AS TO BE ACCESSIBLE FOR CLEANING.
2. HEIGHT MUST BE EQUAL TO UNIT MAXIMUM TOTAL STATIC PRESSURE PLUS 1/2".
3. HEIGHT MUST BE EQUAL TO UNIT MAXIMUM NEGATIVE STATIC PRESSURE PLUS 1".
4. HEIGHT MUST BE 1/2 OF HEIGHT INSTALLED IN NOTE 3.
5. PIPE TO NEAREST DRAIN.
6. TRAP MUST NOT BLOCK ACCESS TO EQUIPMENT
7. PROVIDE UNIONS AT INLET AND OUTLET OF TRAP.

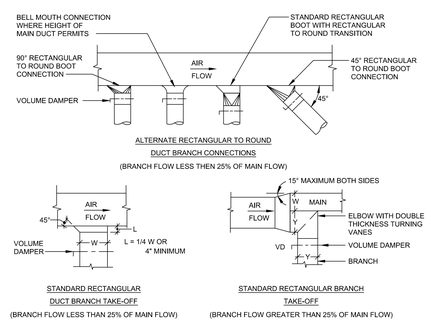
F8 CONDENSATE DRAIN DETAIL
NOT TO SCALE



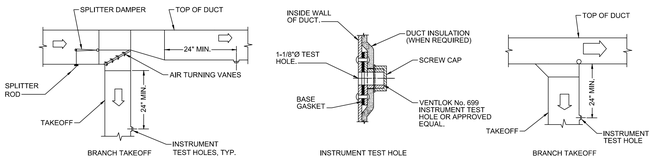
F6 ROUND DUCT FITTINGS
NOT TO SCALE



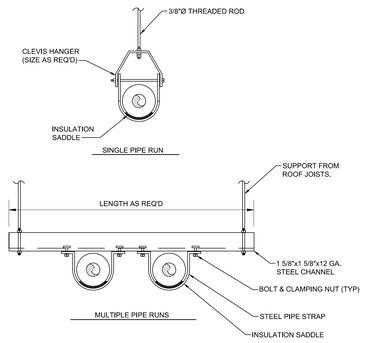
F4 TYPICAL DIFFUSER CONNECTION DETAIL
NOT TO SCALE



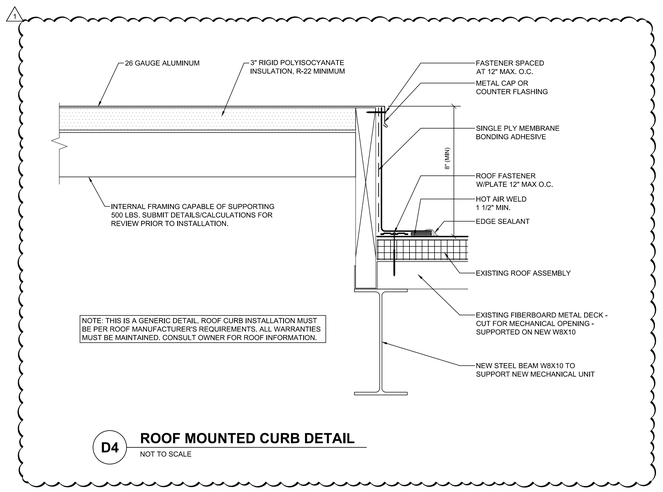
F2 DUCT FITTING DETAILS
NOT TO SCALE



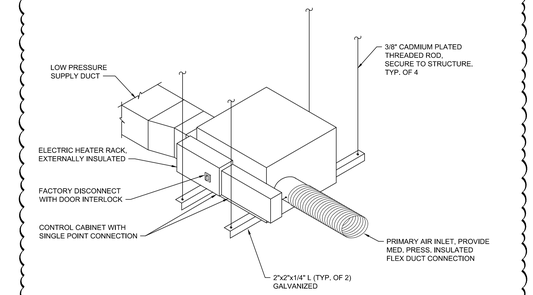
D7 LOW PRESSURE DUCT DETAIL
NOT TO SCALE



D6 PIPE SUPPORT DETAIL
NOT TO SCALE

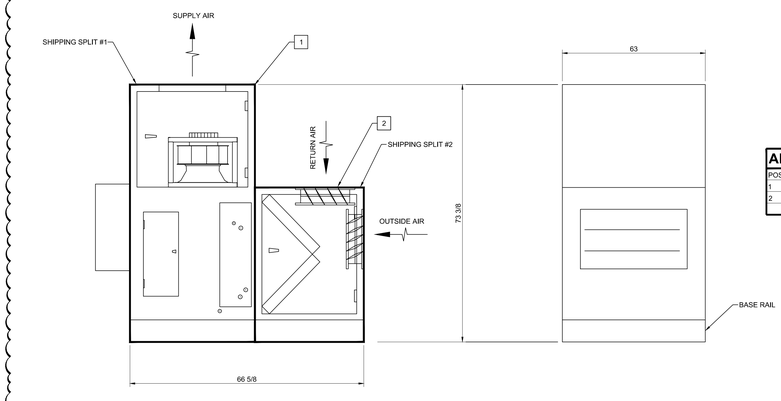


D4 ROOF MOUNTED CURB DETAIL
NOT TO SCALE



NOTE:
MAINTAIN MANUFACTURERS RECOMMENDED CLEARANCE AND VERIFY INSTALLATION INSTRUCTIONS FOR HANGING SO THAT ALL NECESSARY ACCESS PANELS ARE NOT OBSTRUCTED.

B8 TYPICAL SINGLE DUCT TERMINAL w/ELECTRIC HEAT DETAIL
NOT TO SCALE



AH04-2125			
POSITION NUMBER	MODULE	LENGTH	WEIGHT
1	BASE UNIT	35-5/8	804.38
2	AIR MIXING SECTION	31	386.30
	INSTALLED UNIT WEIGHT		1190.68

B5 AIR HANDLER UNIT ELEVATION (AHU- #)
NOT TO SCALE

REV	DESCRIPTION	BY	CR#	APPROVAL	DATE
1	REVISED MECHANICAL EQUIPMENT	GRM		DMH	12/04/23
0	ISSUED FOR CONSTRUCTION	GRM		DMH	08/03/23

REVISIONS

SIGNATURES		DATE
DRAWN	GRM	08/03/23
CHECKED	DMH	08/03/23
ENGRG	DMH	08/03/23
ENGRG		

REFERENCE DRAWINGS: N/A

SCALE N/A — ALL SURF. 63

UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS ± .xx — FRACTIONS ± x/xx
3 PLACE DECIMALS ± .xxx — ANGLES ± x°xx'

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Wilmington, NC

RED OFFICE HVAC MOD.'S
MECHANICAL
DETAILS

ISSUE DATE 08/03/23 | DWG NO. 6001e23 | REV. 1
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AIR HANDLING UNIT SCHEDULE

DRAWING CODE	LOCATION	DESIGN BASIS MFR	MODEL	SYSTEM TYPE	CONFIG.	COOLING COIL AIRFLOW (CFM)	COOLING COIL VELOCITY (FPM)	COOLING COIL PD (IN-H2O)	COOLING COIL EAT (DB/WB) (°F)	COOLING COIL LAT (DB/WB) (°F)	COOLING COIL COOLING (MBH) TOTAL	COOLING COIL COOLING (MBH) SENSIBLE	SUPPLY FAN SUPPLY AIRFLOW (CFM)	SUPPLY FAN OUTSIDE AIRFLOW (CFM)	SUPPLY FAN TSP (IN WG)	SUPPLY FAN BRAKE HP	SUPPLY FAN MOTOR HP	SUPPLY FAN RPM	SUPPLY FAN MOTOR TYPE	ELECTRICAL SUPPLY FAN VOLTAGE (V/PH/HZ)	ELECTRICAL SUPPLY FAN FLA (A)	ELECTRICAL SUPPLY FAN MCA (A)	ELECTRICAL SUPPLY FAN MOP (A)	WEIGHT (LBS)	NOTES	ACCESSORIES
AH04-2125	MECH ROOM	TRANE	UCCAM10	AIR CONDITIONER	NOTE 6	4,000	410	0.735	78.6/66.7	52.5/51.7	180.1	114.2	4,000	800	4.10	3.2	-	2,191	ODP	460/3/60	6.4	7.9	15	1,195	1 - 6	A - K

NOTES:
1. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.
2. COIL, DRAIN AND MOTOR SIDE ACCESS TO BE FIELD CONFIRMED PRIOR TO SUBMITTING FOR APPROVAL.
3. MAXIMUM COIL FACE VELOCITY SHALL NOT EXCEED SCHEDULED VALUES.
4. ALL CONTROLS SENSORS, ACTUATORS, WIRING AND UNIT MOUNTED VFDS PROVIDED AND INSTALLED BY AHU AND HEAT PUMP MANUFACTURER. CONTROLLER SHALL BE BACNET MS/TP.
5. PROVIDE OPEN SPRING -FLEX ISOLATORS WITH 1-INCH DEFLECTION.
6. REFER TO PLANS AND SECTION FOR UNIT ARRANGEMENTS.

ACCESSORIES:
A. COOLING COIL SECTION SHALL BE PROVIDED WITH AN INSULATED, DOUBLE WALL, 304 STAINLESS STEEL DRAIN PAN WITH POSITIVE DRAINAGE MEETING INDOOR AIR QUALITY (IAQ) IN ACCORDANCE WITH ASHRAE 62.1.
B. COPPER COIL, ALUMINUM FIN, 304 STAINLESS STEEL COIL CASING FOR COOLING COIL .
C. UNIT PANELS SHALL BE MINIMUM 2" DOUBLE WALL FOAM R-13 CONSTRUCTION WITH ASHRAE 111 CLASS 6 CASING LEAKAGE.
D. AHU PANELS SHALL BE PROVIDED WITH A MID-SPAN, NO-THRU-METAL, INTERNAL THERMAL BREAK. GALVANIZED STEEL EXTERIOR, 304 STAINLESS STEEL INTERIOR.
E. PROVIDE 2" MERV 8 PLEATED MEDIA FILTERS, THREE SETS OF EACH TYPE. PROVIDE ONE SET IN UNIT, PROVIDE ONE SET FOR INSTALLATION AFTER SYSTEM IS BALANCED AND BUILDING IS CLEANED, AND ONE SET FOR TURN OVER TO OWNER.
F. HINGED ACCESS DOORS AND PIPING CONNECTIONS ON OPPOSITE SIDE.
G. 2 INCH ANGLE FILTER MIXING BOX.
H. DIRECT DRIVE AC TYPE FAN MOTOR.
I. EVAPORATOR COIL PERFORMANCE SHALL BE MATCHED WITH VRF HEAT PUMP.
J. PROVIDE PAC-AH001-1, QUANTITY OF 2 LEV KITS LOCATED ON PLANS (208V, 0.06A).
K. PROVIDE 120V CIRCUIT FOR TRANE BACNET CONTROL POWER.

SINGLE DUCT TERMINAL UNIT SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	ALTERNATE APPROVED MANUFACTURERS	PRIMARY AIRFLOW COOLING MAX (CFM)	PRIMARY AIRFLOW COOLING MIN (CFM)	PRIMARY AIRFLOW HEATING (CFM)	PRIMARY AIRFLOW INLET DIA. (IN)	PRIMARY AIRFLOW COOLING INLET VELOCITY (FT/MIN)	PRIMARY AIRFLOW AIR PRESSURE DROP (IN H2O)	HEATING COIL CAPACITY (KW)	HEATING COIL REHEAT COIL LOAD (MBH)	HEATING COIL ELECTRIC HEATER STAGES	HEATING COIL EAT (°F)	HEATING COIL LAT (°F)	HEATING COIL VOLTAGE (V/PH/HZ)	HEATING COIL FLA	HEATING COIL MCA	HEATING COIL MOCP	NOISE CRITERIA DISCH (NC)	NOISE CRITERIA RAD (NC)	OPERATING WEIGHT (LB)	UNIT SERVED FROM	NOTES	ACCESSORIES
VAV4-01	TRANE	VCEF08	PRICE, TITUS	400	400	400	8	1,146	0.03	5.0	17.1	1	55.0	94.3	460/3/60	6.0	7.5	15	16.0	15.0	67	AH04-2125	1,2	A,B,C,D,E,F,G
VAV4-02	TRANE	VCEF10	PRICE, TITUS	1,010	510	510	10	1,852	0.03	6.5	22.2	1	55.0	95.1	460/3/60	7.8	9.8	15	21.0	20.0	81	AH04-2125	1,2	A,B,C,D,E,F,G
VAV4-03	TRANE	VCEF05	PRICE, TITUS	235	140	170	5	1,723	0.01	2.0	6.8	1	55.0	92.0	460/3/60	2.4	3.0	15	21.0	-	67	AH04-2125	1,2	A,B,C,D,E,F,G
VAV4-04	TRANE	VCEF04	PRICE, TITUS	95	60	85	4	1,089	0.01	1.0	3.4	1	55.0	92.0	460/3/60	1.2	1.5	15	-	-	67	AH04-2125	1,2	A,B,C,D,E,F,G
VAV4-05	TRANE	VCEF04	PRICE, TITUS	85	65	85	4	974	0.01	1.0	2.2	1	55.0	92.0	460/3/60	1.2	1.5	15	-	-	67	AH04-2125	1,2	A,B,C,D,E,F,G
VAV4-06	TRANE	VCEF08	PRICE, TITUS	665	360	360	8	1,905	0.06	4.5	15.4	1	55.0	94.3	460/3/60	5.4	6.8	15	24.0	20.0	67	AH04-2125	1,2	A,B,C,D,E,F,G
VAV4-07	TRANE	VCEF08	PRICE, TITUS	600	300	300	8	1,719	0.05	3.5	12.0	1	55.0	91.7	460/3/60	4.2	5.3	15	22.0	19.0	67	AH04-2125	1,2	A,B,C,D,E,F,G
VAV4-08	TRANE	VCEF05	PRICE, TITUS	235	120	125	5	1,723	0.01	1.5	5.1	1	55.0	92.8	460/3/60	1.8	2.3	15	21.0	-	67	AH04-2125	1,2	A,B,C,D,E,F,G
VAV4-09	TRANE	VCEF08	PRICE, TITUS	550	250	250	8	1,576	0.04	3.0	10.2	1	55.0	92.8	460/3/60	3.6	4.5	15	20.0	18.0	67	AH04-2125	1,2	A,B,C,D,E,F,G

NOTES:
1 REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.
2 CONTROLS BY DDC CONTRACTOR.

ACCESSORIES:
A FACTORY MOUNTED DISCONNECT
B ROUND AIR VALVE
C ELECTRIC COIL AS SCHEDULED
D 480/24 VOLT TRANSFORMER
E FOIL-FACED INSULATION
F SCR MODULATED ELECTRIC HEAT
G AIRFLOW SWITCH

VARIABLE REFRIGERANT FLOW OUTDOOR UNIT SCHEDULE

DRAWING CODE	INDOOR UNIT(S)	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	NOMINAL COOLING TOTAL (MBH)	NOMINAL COOLING OAT (°F)	NOMINAL HEATING TOTAL (MBH)	NOMINAL HEATING OAT (°F)	MIN EER	MIN IEER	ELECTRICAL MODULE 1 VOLTAGE (V/PH/HZ)	ELECTRICAL MODULE 1 MCA (A)	ELECTRICAL MODULE 1 MOCP (A)	ELECTRICAL MODULE 2 VOLTAGE (V/PH/HZ)	ELECTRICAL MODULE 2 MCA (A)	ELECTRICAL MODULE 2 MOCP (A)	REFRIGERANT MODULE 1 TYPE	REFRIGERANT MODULE 1 ORIGINAL CHARGE - ODU (LBS-OZ)	REFRIGERANT MODULE 2 TYPE	REFRIGERANT MODULE 2 ORIGINAL CHARGE - ODU (LBS-OZ)	WEIGHT (LBS)	NOTES	ACCESSORIES
HP04-2125	AH04-2125	MITSUBISHI	TUHYP1924BN40AB	192.0	95.0	216.0	47.0	12.4	25.0	460/3/60	15.0	20	460/3/60	15.0	20	R-410A	21-9	R-410A	21-9	1,240	1 THRU 7	A

NOTES:
1 REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.
2 MAXIMUM COOLING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 80/67°F (DB), OUTDOOR OF 93°F (DB)
3 MAXIMUM HEATING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 70°F (DB), OUTDOOR OF 23°F (DB)
4 PROVIDE MANUFACTURER'S EXTENDED PARTS WARRANTY PERIOD OF TEN (10) YEARS FROM DATE OF START-UP.
5 ALL CONTROLS SENSORS, ACTUATORS, WIRING AND UNIT MOUNTED VFDS PROVIDED AND INSTALLED BY AHU AND HEAT PUMP MANUFACTURER. CONTROLLER SHALL BE BACNET MS/TP.
6 ROOF MOUNTING STAINLESS STEEL HARDWARE TO SECURE UNITS TO EXISTING ROOF PLATFORM TO MEET SEISMIC AND WIND CODE REQUIREMENTS WITH PE STAMP CALCULATIONS.
7 PROVIDE TRAINING PER SPECIFICATIONS ONCE COMMISSIONING IS COMPLETE.

ACCESSORIES: A MANUFACTURERS STANDARD SEACOAST COATING PROTECTION

POWER VENTILATOR SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	ALTERNATE APPROVED MANUFACTURERS	FAN TYPE	FAN WHEEL	SERVICE	DRIVE TYPE	DAMPER	MOTOR ENCLOSURE	CAPACITIES AIRFLOW (CFM)	CAPACITIES ESP (IN. WG.)	CAPACITIES FAN RPM	ELECTRICAL MOTOR TYPE	ELECTRICAL MOTOR SIZE (HP)	ELECTRICAL V/PH/HZ	ELECTRICAL FLA (A)	ELECTRICAL MCA (A)	ELECTRICAL MOCP (A)	SONES	WEIGHT (LBS.)	NOTES	ACCESSORIES
PV04-2128	GREENHECK	G-090-VG	TWIN CITY, PENNBARRY	CENTRIFUGAL VENTILATORS - ROOF DOWNBLAST	ALUMINUM HUB AND BLADES	EXHAUST	DIRECT	BACKDRAFT	TENV	490	0.38	1,451	ECM	1/10	120/1/60	1.4	2.0	15	6.6	35	1,2,3	A,B,C

1 REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.
2 CONTROLLED VIA OCCUPANCY SENSOR. REFER TO ELECTRICAL PLANS.
3 REUSE EXISTING CURB. PROVIDE CURB ADAPTOR AS REQUIRED.

ACCESSORIES:
A BIRDSCREEN
B GRAVITY DAMPER
C COATED WITH PERMATECTOR, CONCRETE GRAY-RAL 7023 OR APPROVED EQUAL.

DIFFUSERS, REGISTERS AND GRILLES SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	ALTERNATE APPROVED MANUFACTURERS	TYPE	SERVICE	AIRFLOW RANGE (CFM) / NECK SIZE (W x D) (IN.) / BRANCH CONN. SIZE (Ø or W x D) (IN.)									MATERIAL	FINISH	MOUNTING	NOTES	ACCESSORIES
S1	PRICE	ASPD	METALAIRE, TITUS	SQUARE PLAQUE CEILING DIFFUSER	SUPPLY	0 - 100	101 - 230	231 - 350	351 - 450						ALUMINUM	WHITE	T-BAR	1,2,3	A
						6 x 6	9 x 9	12 x 12	15 x 15										
						6	8	10	12										
R1	PRICE	630	METALAIRE, TITUS	FIXED FACE GRILLE	RETURN	0 - 70	71 - 100	101 - 200	201 - 375	376 - 500	501 - 600	601 - 850	851 - 1000	1001 - 1600	ALUMINUM	WHITE	T-BAR	1,2,3	-
						8 x 8	8 x 8	14 x 14	14 x 14	14 x 14	18 x 18	18 x 18	20 x 20	36 x 18					
						6	8	8	10	12	12	14	16	18					
E1	PRICE	630	METALAIRE, TITUS	FIXED FACE GRILLE	EXHAUST	0 - 100	101 - 200	201 - 350	351 - 500	501 - 600	601 - 850	851 - 1300			ALUMINUM	WHITE	T-BAR	1,2,3	-
						8 x 8	14 x 14	14 x 14	14 x 14	18 x 18	18 x 18	28 x 20							
						6	8	10	12	12	14	16							
E2	PRICE	630	METALAIRE, TITUS	GRILLE, 45° DEFLECTION	EXHAUST	0 - 100									ALUMINUM	WHITE	CEILING SURFACE	1,2,3	-
						6 x 6													
						6													

NOTES:
1 REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.
2 DUCT BRANCH CONNECTION SIZE TO BE EQUAL TO THE BRANCH CONNECTIONS SIZE STATED IN SCHEDULE UNLESS NOTED OTHERWISE ON PLANS.
3 PAINT ALL VISIBLE DUCTWORK THROUGH GRILLES AND REGISTERS FLAT BLACK.

ACCESSORIES: A VOLUME DAMPER

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23551 DAVID M. HAHN 12/04/2023

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NC# P-0506

REV	DESCRIPTION	BY	CR#	APPROVAL	DATE
1	REVISED MECHANICAL EQUIPMENT	GRM		DHM	12/04/23
0	ISSUED FOR CONSTRUCTION	GRM		DMH	08/03/23

REVISIONS

REFERENCE DRAWINGS	
N/A	

SIGNATURES		DATE
DRAWN	GRM	08/03/23
CHECKED	DMH	08/03/23
ENGRG	DMH	08/03/23
ENGRG		

SCALE N/A
ALL SURF. 63
UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS ± .__ FRACTIONS ± .__
3 PLACE DECIMALS ± .__ ANGLES ± .__

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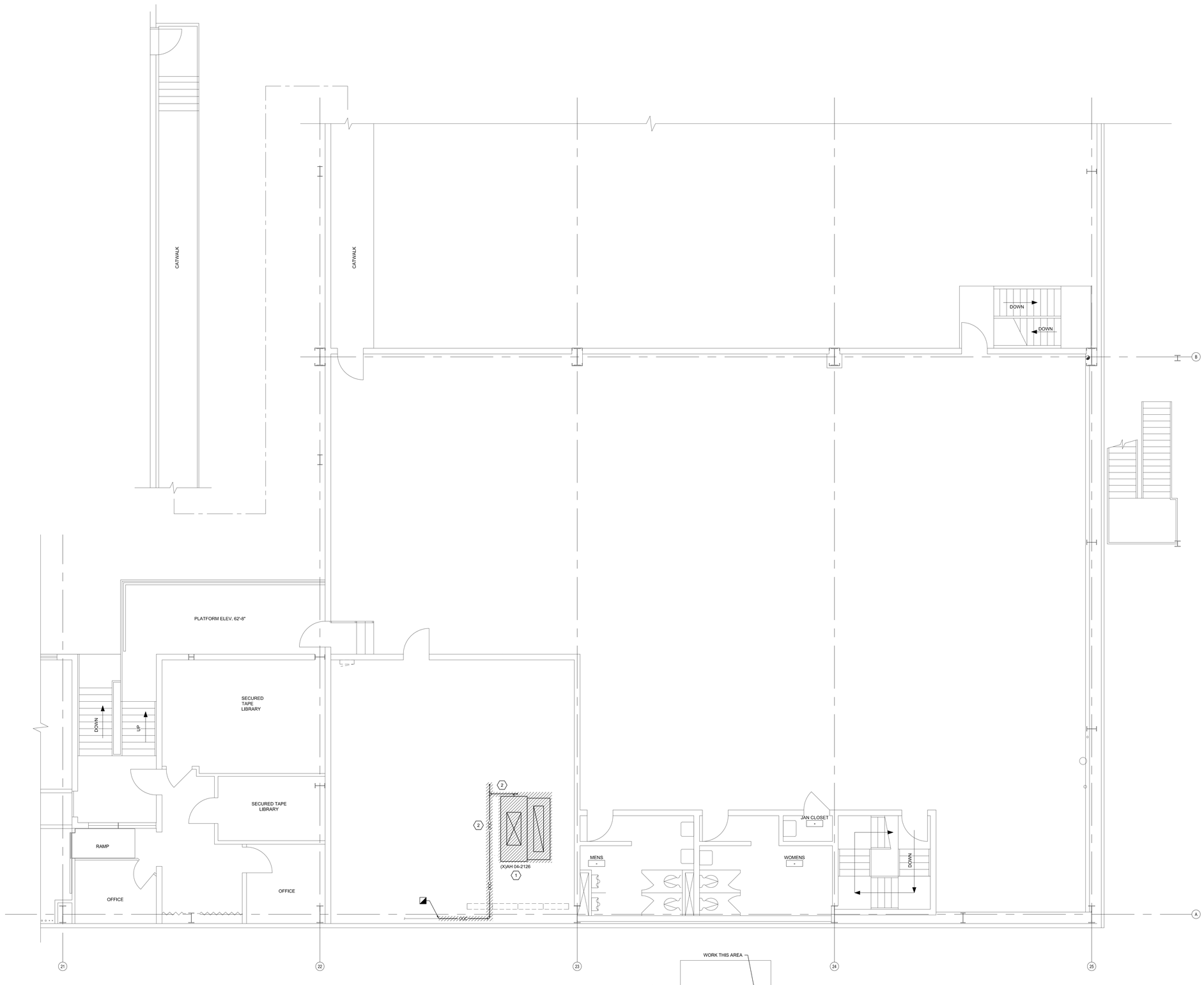
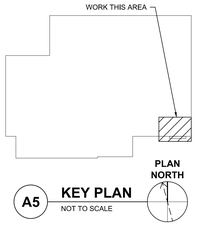
RED OFFICE HVAC MOD.'S
MECHANICAL
SCHEDULES

ISSUE DATE 08/03/23 | DWG NO. 6001e23 | REV. 1
CONTROLLED BY: --- | ISSUED TO: N/A | FILE NAME --------.dwg | PIXEL --- | SH NO. M3 | CONT ON M4

MECHANICAL DEMOLITION KEYED NOTES

1. REMOVE AND DISPOSE OF EXISTING AIR HANDLER, CONTROLS, DUCTWORK, DRAIN PAN, SUPPORTS, CONDENSATE PIPING FROM AIR HANDLER TO EXTENT SHOWN. INSULATION AND OTHER COMPONENTS MADE OBSOLETE BY THIS DEMOLITION. MECHANICAL CONTRACTOR MUST COORDINATE WITH GENERAL CONTRACTOR ON THE ABATEMENT OF ANY HAZARDOUS MATERIALS PRIOR TO DEMOLITION.
2. REMOVE AND DISPOSE OF EXISTING CONDENSATE PIPING INCLUDING BUT NOT LIMITED TO PIPING, INSULATION, HANGERS, SUPPORTS, ANCHORS, INSERTS, ETC. TO EXTENT SHOWN. TAKE NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING ITEMS TO REMAIN IN PLACE.





A8 PARTIAL FLOOR PLAN - DEMOLITION
1/4" = 1'-0"
0 2' 4' 8'
PLAN NORTH

A5 KEY PLAN
NOT TO SCALE
PLAN NORTH

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23551 DAVID M. HAHN
08/02/2023

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NC# P-0506

REFERENCE DRAWINGS
N/A

REV	DESCRIPTION	BY	CR#	APPROVAL	DATE
0	ISSUED FOR CONSTRUCTION	GRM		DMH	08/03/23

REVISIONS

SIGNATURES		DATE
DRAWN	GRM	08/03/23
CHECKED	DMH	08/03/23
ENGRG	DMH	08/03/23
ENGRG		

SCALE AS NOTED
UNLESS OTHERWISE SPECIFIED
ALL SURF 63
2 PLACE DECIMALS ± .--
3 PLACE DECIMALS ± .---
FRACTIONS ± .--
ANGLES ± .--

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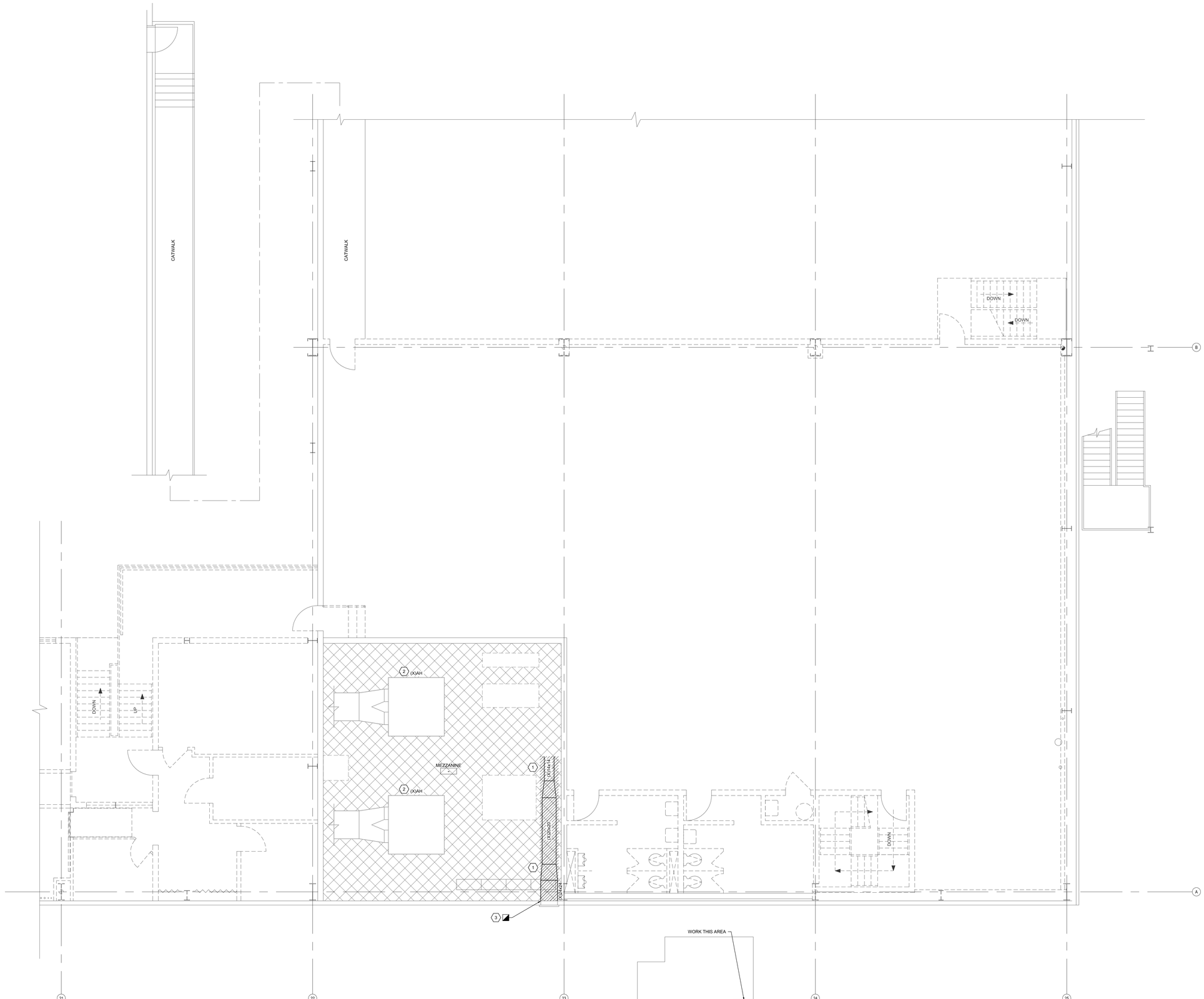
RED OFFICE HVAC MOD.'S
MECHANICAL PARTIAL
SECOND FLOOR PLAN – DEMO

ISSUE DATE 08/03/23
DWG NO. 6001e23
REV. 0
CONTROLLED BY ---
ISSUED TO N/A
FILE NAME --------.dwg
PIXEL ----
SH NO. M4
CONT SH M5

MECHANICAL DEMOLITION KEYED NOTES

1. REMOVE AND DISPOSE OF EXISTING OUTSIDE AIR DUCTWORK INCLUDING BUT NOT LIMITED TO DUCTWORK, HANGERS, SUPPORTS, ANCHORS, INSERTS, INSULATION AND ACCESSORIES. PREPARE REMAINING DUCT OPENING FOR DUCT CAP. TAKE NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING ITEMS TO REMAIN IN PLACE.
2. EXISTING EQUIPMENT AND ASSOCIATED DUCT TO REMAIN.
3. PREPARE FOR NEW DUCT ATTACHMENT. EXISTING LOUVER TO REMAIN.



A8 MEZZANINE PLAN - DEMOLITION
1/4" = 1'-0"
0 2" 4" 8"
PLAN NORTH

A5 KEY PLAN
NOT TO SCALE
PLAN NORTH

REV	DESCRIPTION	BY	CR#	APPROVAL	DATE
1	REVISED MECHANICAL EQUIPMENT	GRM		DMH	12/04/23
0	ISSUED FOR CONSTRUCTION	GRM		DMH	08/03/23

REVISIONS

SIGNATURES		DATE
DRAWN	GRM	08/03/23
CHECKED	DMH	08/03/23
ENGR'G	DMH	08/03/23
ENGR'G		

REFERENCE DRAWINGS: N/A

SCALE AS NOTED — UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS ± .xx — FRACTIONS ± 1/xx
3 PLACE DECIMALS ± .xxx — ANGLES ± 1°xx'
ALL SURF. 63

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12/04/2023

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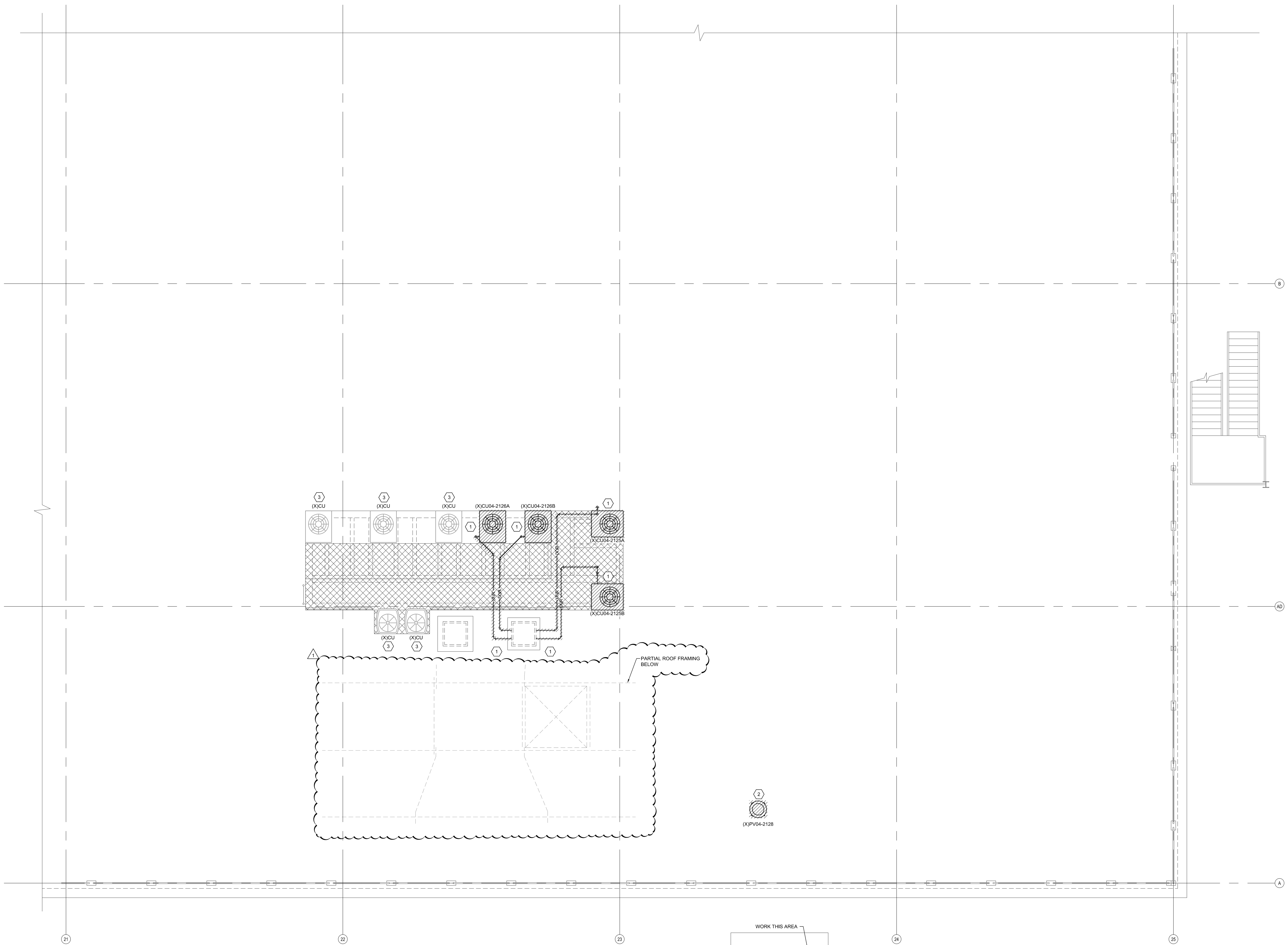
RED OFFICE HVAC MOD.'S
MECHANICAL PARTIAL
MEZZANINE PLAN – DEMO

ISSUE DATE	DWG NO.	REV.
08/03/23	6001e23	1

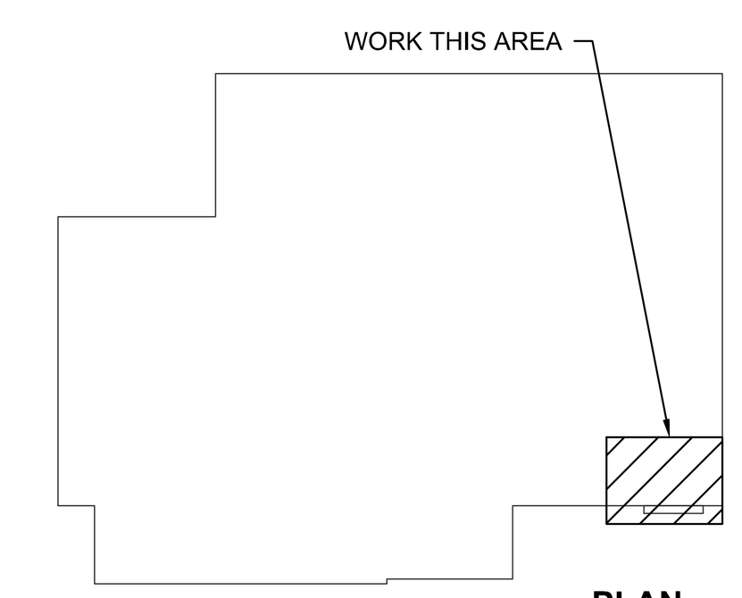
CONTROLLED BY: — — — | ISSUED TO: N/A | FILE NAME: — — — — — .dwg | PIXEL: — — — | SH NO. M5 | CONT ON: M6

MECHANICAL DEMOLITION KEYED NOTES

1. REMOVE AND DISPOSE OF EXISTING CONDENSING UNIT, MOUNTING HARDWARE, REFRIGERANT PIPING, SUPPORTS AND INSULATION AND OTHER COMPONENTS MADE OBSOLETE BY THIS DEMOLITION. SEAL ALL LEGACY OPENINGS WEATHER-TIGHT. TAKE NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING ITEMS TO REMAIN IN PLACE.
2. REMOVE AND DISPOSE OF EXISTING EXHAUST FAN INCLUDING BUT NOT LIMITED TO EXHAUST FAN, DUCT, CONTROLS, ANCHORS, INSERTS, ETC.. ROOF CURB TO REMAIN AND BE PREPARED FOR INSTALLATION OF NEW FAN. TAKE NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING ITEMS TO REMAIN IN PLACE.
3. EXISTING EQUIPMENT AND ASSOCIATED REFRIGERANT PIPING TO REMAIN.



A8 **ROOF PLAN - DEMOLITION**
1/4" = 1'-0"
0 2' 4' 8'
PLAN NORTH



A5 **KEY PLAN**
NOT TO SCALE
PLAN NORTH

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REV	DESCRIPTION	BY	CR#	APPROVAL	DATE
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0	ISSUED FOR CONSTRUCTION	GRM		DMH	08/03/23

REVISIONS

REFERENCE DRAWINGS	
N/A	

SIGNATURES		DATE
DRAWN	GRM	08/03/23
CHECKED	DMH	08/03/23
ENGRG	DMH	08/03/23
ENGRG		

SCALE AS NOTED
ALL SURF. 63
UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS ± .__ FRACTIONS ± .__
3 PLACE DECIMALS ± .__ ANGLES ± .__

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RED OFFICE HVAC MOD.'S
MECHANICAL PARTIAL
ROOF PLAN – DEMO

ISSUE DATE	DWG NO.	REV.
08/03/23	6001e23	1

CONTROLLED BY:	ISSUED TO:	FILE NAME	PIXEL	SH NO.	CONT ON
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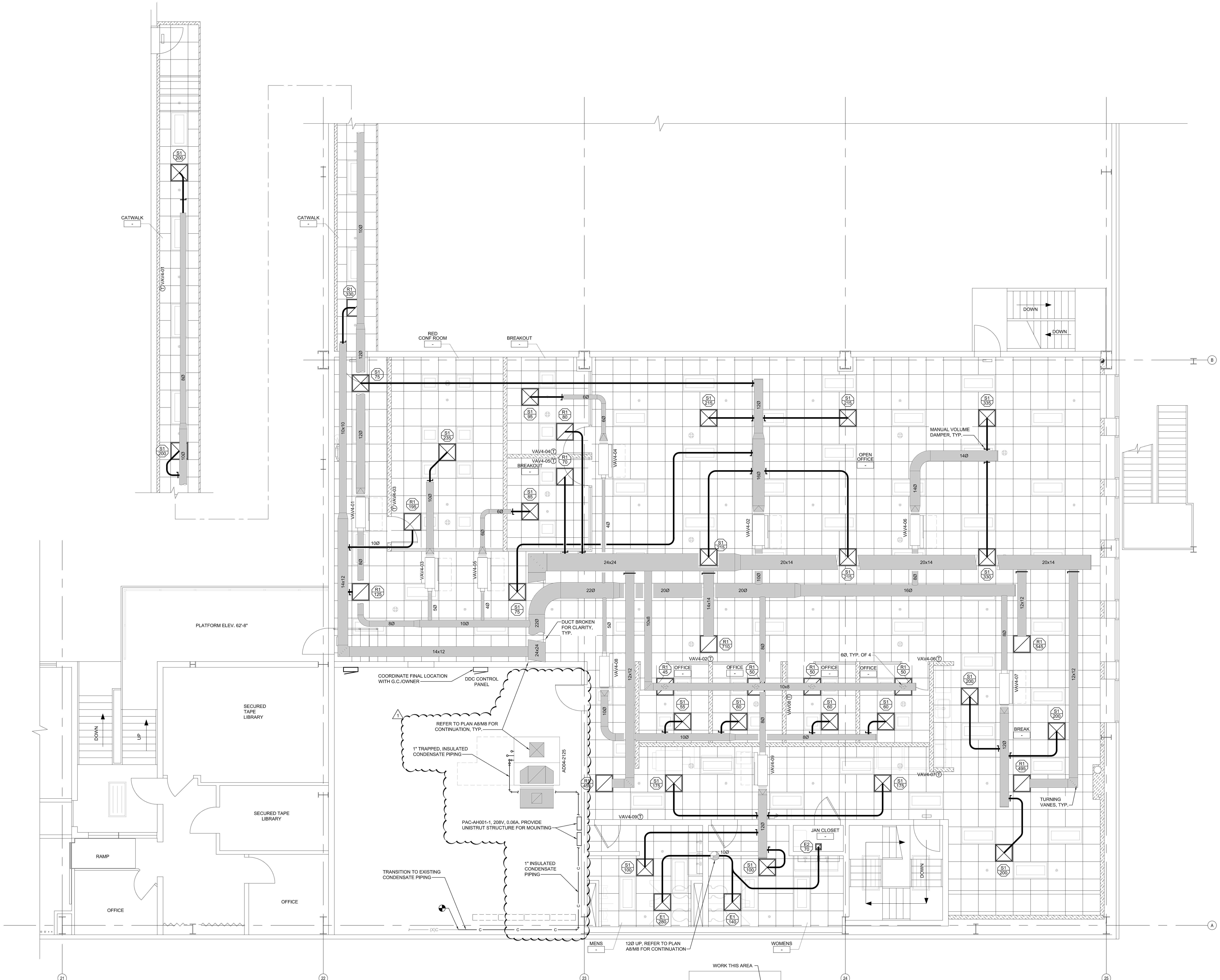
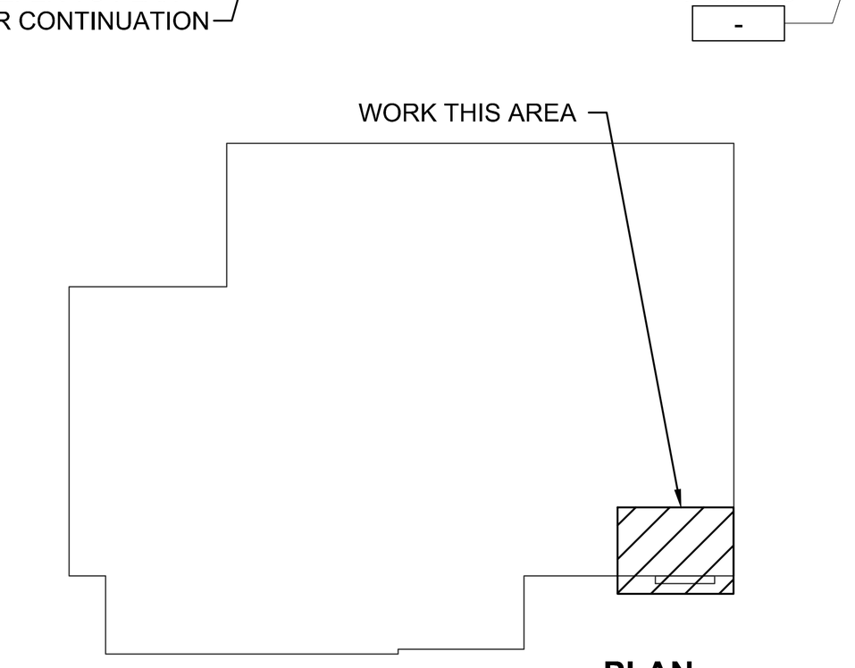


A8 **PARTIAL FLOOR PLAN - HVAC**
1/4" = 1'-0"
PLAN NORTH



A5 **KEY PLAN**
NOT TO SCALE
PLAN NORTH

REV	DESCRIPTION	BY	CR#	APPROVAL	DATE
1	REVISED MECHANICAL EQUIPMENT	GRM		DMH	12/04/23
0	ISSUED FOR CONSTRUCTION	GRM		DMH	08/03/23

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NC# P-0506

REFERENCE DRAWINGS
N/A

SIGNATURES		DATE
DRAWN	GRM	08/03/23
CHECKED	DMH	08/03/23
ENGRG	DMH	08/03/23
ENGRG		

SCALE AS NOTED
UNLESS OTHERWISE SPECIFIED
ALL SURF. 63
2 PLACE DECIMALS ± .__ FRACTIONS ± .__
3 PLACE DECIMALS ± .__ ANGLES ± .__

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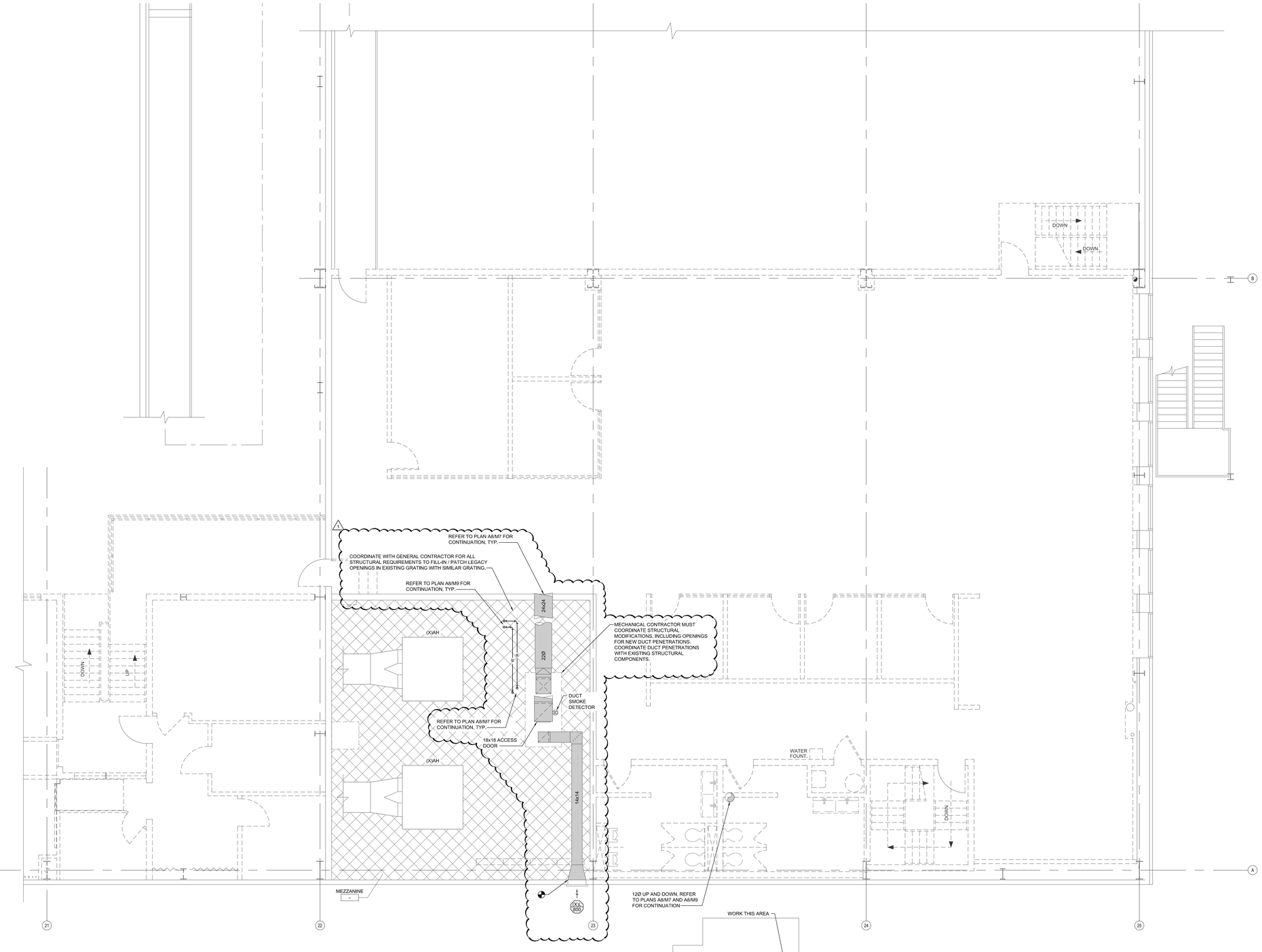
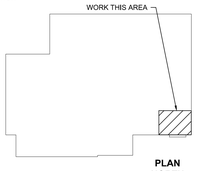
RED OFFICE HVAC MOD.'S MECHANICAL PARTIAL SECOND FLOOR PLAN – HVAC

ISSUE DATE 08/03/23
DWG NO. 6001e23
REV. 0
CONTROLLED BY: ---
ISSUED TO: N/A
FILE NAME -------.dwg
PIXEL ---
SH NO. M7
CONT ON M8





A8 MEZZANINE PLAN - HVAC
1/4" = 1'-0"
0 2' 4' 8'
PLAN NORTH

A5 KEY PLAN
NOT TO SCALE
PLAN NORTH

REV	DESCRIPTION	BY	CR#	APPROVAL	DATE
1	REVISED MECHANICAL EQUIPMENT	GRM		DMH	12/04/23
0	ISSUED FOR CONSTRUCTION	GRM		DMH	08/03/23

REVISIONS

SIGNATURES		DATE
DRAWN	GRM	08/03/23
CHECKED	DMH	08/03/23
ENGRG	DMH	08/03/23
ENGRG		

SCALE AS NOTED
UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS ± .__ FRACTIONS ± .__
3 PLACE DECIMALS ± .___ ANGLES ± .__
ALL SURF 63

REFERENCE DRAWINGS: N/A

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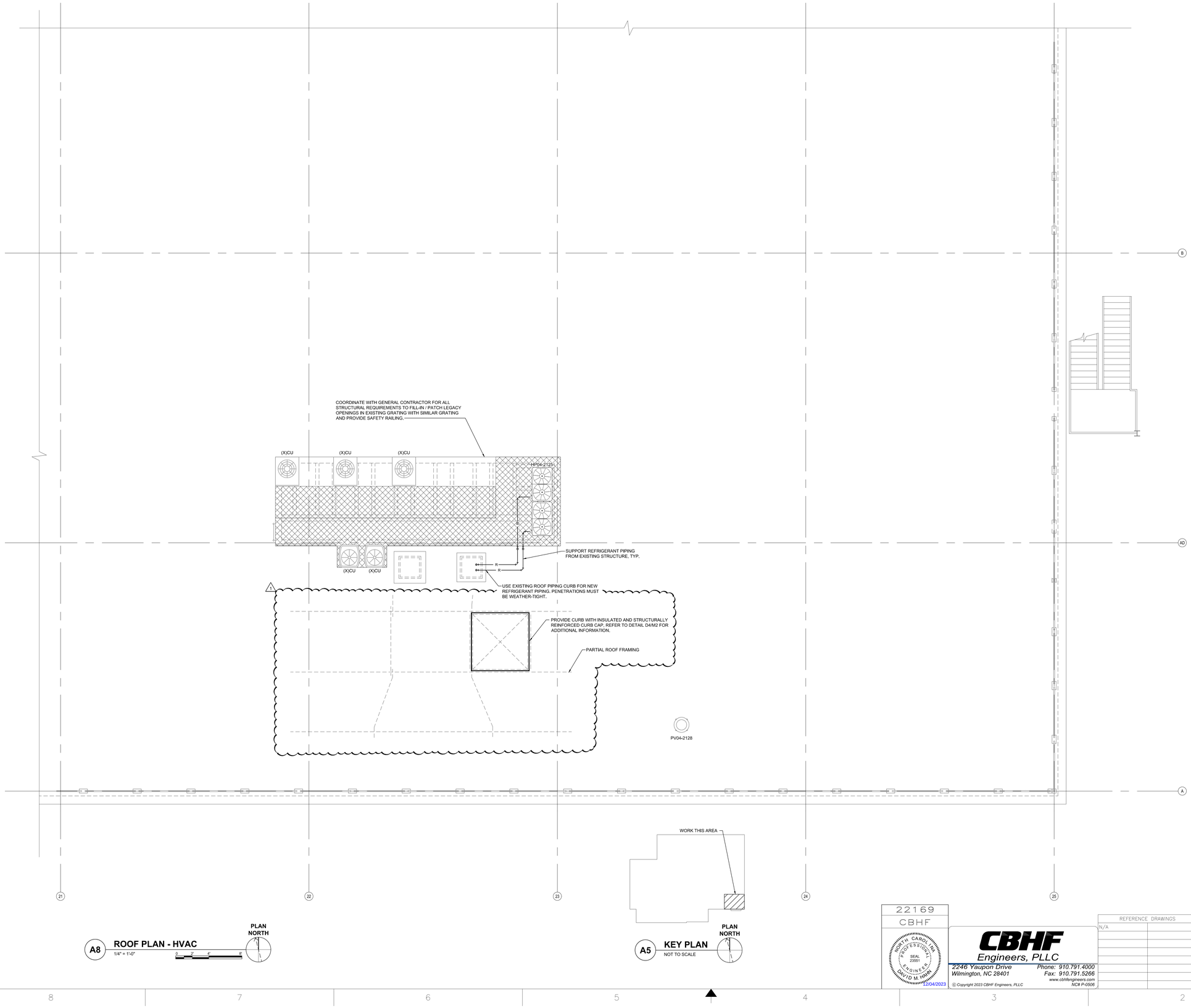
RED OFFICE HVAC MOD.'S
MECHANICAL PARTIAL
MEZZANINE PLAN – HVAC

ISSUE DATE 08/03/23 | DWG NO. 6001e23 | REV. 0
CONTROLLED BY: ---
ISSUED TO: N/A
FILE NAME: ---------.dwg
PWDL: ---
SH NO. M8
CONT ON M9



A8 **ROOF PLAN - HVAC**
1/4" = 1'-0"
0 2' 4' 8'
PLAN NORTH

A5 **KEY PLAN**
NOT TO SCALE
PLAN NORTH

REFERENCE DRAWINGS
N/A

REV	DESCRIPTION	BY	CR#	APPROVAL	DATE
1	REVISED MECHANICAL EQUIPMENT	GRM		DMH	12/04/23
0	ISSUED FOR CONSTRUCTION	GRM		DMH	08/03/23

REVISIONS

SIGNATURES		DATE
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CHECKED	DMH	08/03/23
ENGRG	DMH	08/03/23
ENGRG		

SCALE AS NOTED
UNLESS OTHERWISE SPECIFIED
ALL SURF 63
2 PLACE DECIMALS ± .__ FRACTIONS ± .__
3 PLACE DECIMALS ± .___ ANGLES ± .__

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RED OFFICE HVAC MOD.'S
MECHANICAL PARTIAL
ROOF PLAN – HVAC

ISSUE DATE 08/03/23
DWG NO. 6001e23
REV. 0
CONTROLLED BY ---
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FILE NAME --------.dwg
PIXEL ___ ___
SH NO. M9
CONT'N. –

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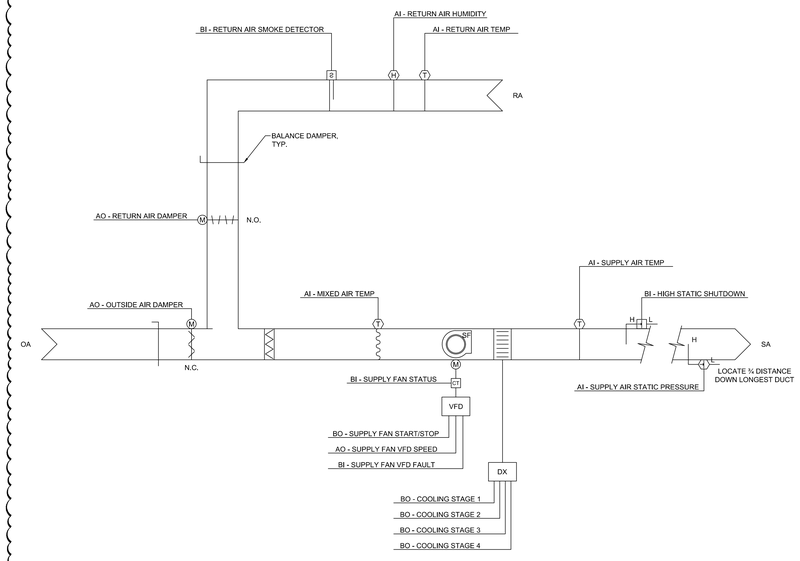

AH04-2125 SEQUENCE OF OPERATION

AHU01 (TYPICAL OF 1)

RUN CONDITIONS - REQUESTED:
THE UNIT SHALL RUN WHENEVER:

- ANY ZONE IS OCCUPIED.
- OR A DEFINABLE NUMBER OF UNOCCUPIED ZONES NEED HEATING OR COOLING.

EMERGENCY SHUTDOWN:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL.

HIGH STATIC SHUTDOWN:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN HIGH STATIC SHUTDOWN SIGNAL.

RETURN AIR SMOKE DETECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A RETURN AIR SMOKE DETECTOR STATUS.

SUPPLY FAN:
THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

SUPPLY AIR DUCT STATIC PRESSURE CONTROL:
THE CONTROLLER SHALL MEASURE DUCT STATIC PRESSURE AND MODULATE THE SUPPLY FAN VFD SPEED TO MAINTAIN A DUCT STATIC PRESSURE SETPOINT. THE SPEED SHALL NOT DROP BELOW 30% (ADJ.). THE STATIC PRESSURE SETPOINT SHALL BE RESET BASED UPON THE POSITION OF THE ZONE DAMPERS, WITH A GOAL OF REDUCING THE STATIC PRESSURE UNTIL AT LEAST ONE ZONE DAMPER IS NEARLY WIDE OPEN.

- THE INITIAL DUCT STATIC PRESSURE SETPOINT SHALL BE 1.5IN H2O (ADJ.).
- IF NO ZONE DAMPER IS NEARLY WIDE OPEN, THE SETPOINT SHALL INCREMENTALLY RESET DOWN TO A MINIMUM OF 1.3IN H2O (ADJ.) .
- AS ONE OR MORE DAMPERS NEARS THE WIDE OPEN POSITION, THE SETPOINT SHALL INCREMENTALLY RESET UP TO A MAXIMUM OF 1.8IN H2O (ADJ.).

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH SUPPLY AIR STATIC PRESSURE: IF THE SUPPLY AIR STATIC PRESSURE IS 25% (ADJ.) GREATER THAN SETPOINT.
- LOW SUPPLY AIR STATIC PRESSURE: IF THE SUPPLY AIR STATIC PRESSURE IS 25% (ADJ.) LESS THAN SETPOINT.
- SUPPLY FAN VFD FAULT.

SUPPLY AIR TEMPERATURE SETPOINT - FIXED:
THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE AND SHALL MAINTAIN A FIXED SUPPLY AIR TEMPERATURE SETPOINT OF 55°F (ADJ.).

COOLING STAGES:
THE CONTROLLER SHALL STAGE THE COOLING TO MAINTAIN ITS COOLING SETPOINT. TO PREVENT SHORT CYCLING, THERE SHALL BE A USER DEFINABLE (ADJ.) DELAY BETWEEN STAGES, AND EACH STAGE SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

THE COOLING SHALL BE ENABLED WHENEVER:

- AND THE SUPPLY FAN STATUS IS ON.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5°F (ADJ.) GREATER THAN SETPOINT.

LOW SUPPLY AIR TEMPERATURE ALARM:
THE CONTROLLER SHALL ALARM IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

THE OUTSIDE AIR DAMPER SHALL CLOSE AND THE RETURN AIR DAMPER SHALL OPEN WHEN THE UNIT IS OFF. IF OPTIMAL START UP IS AVAILABLE THE MIXED AIR DAMPER SHALL OPERATE AS DESCRIBED IN THE OCCUPIED MODE EXCEPT THAT THE OUTSIDE AIR DAMPER SHALL MODULATE TO FULLY CLOSED.

MINIMUM OUTSIDE AIR VENTILATION:
WHEN IN THE OCCUPIED MODE, THE OUTSIDE AIR DAMPER SHALL MODULATE OPEN TO A POSITION DETERMINED DURING TEST AND BALANCE FOR THE SCHEDULED VOLUME OF OUTSIDE AIR. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED DURING OCCUPIED MODE.

MIXED AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE MIXED AIR TEMPERATURE AND USE AS REQUIRED FOR ECONOMIZER CONTROL (IF PRESENT) OR PREHEATING CONTROL (IF PRESENT).

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS GREATER THAN 90°F (ADJ.).
- LOW MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

RETURN AIR HUMIDITY:
THE CONTROLLER SHALL MONITOR THE RETURN AIR HUMIDITY.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH RETURN AIR HUMIDITY: IF THE RETURN AIR HUMIDITY IS GREATER THAN 70% (ADJ.).
- LOW RETURN AIR HUMIDITY: IF THE RETURN AIR HUMIDITY IS LESS THAN 35% (ADJ.).

RETURN AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE RETURN AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS GREATER THAN 90°F (ADJ.).
- LOW RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

SUPPLY AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).
- LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

AH04-2125 POINTS LIST

	HARDWARE POINTS				SOFTWARE POINTS					
POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC
MIXED AIR TEMP	X								X		X
RETURN AIR HUMIDITY	X								X		X
RETURN AIR TEMP	X								X		X
SUPPLY AIR STATIC PRESSURE	X								X	X	X
SUPPLY AIR TEMP	X								X		X
OUTSIDE AIR DAMPER		X							X		X
RETURN AIR DAMPER		X							X		X
SUPPLY FAN VFD SPEED		X							X		X
HIGH STATIC SHUTDOWN			X						X	X	X
RETURN AIR SMOKE DETECTOR			X						X	X	X
SUPPLY FAN STATUS			X						X		X
SUPPLY FAN VFD FAULT			X							X	X
COOLING STAGE 1				X					X		X
COOLING STAGE 2				X					X		X
COOLING STAGE 3				X					X		X
COOLING STAGE 4				X					X		X
SUPPLY FAN START/STOP				X					X		X
SUPPLY AIR STATIC PRESSURE SETPOINT					X				X		X
SUPPLY AIR TEMP SETPOINT					X				X		X
EMERGENCY SHUTDOWN						X			X	X	X
COMPRESSOR RUNTIME EXCEEDED										X	
HIGH MIXED AIR TEMP										X	
HIGH RETURN AIR HUMIDITY										X	
HIGH RETURN AIR TEMP										X	
HIGH SUPPLY AIR STATIC PRESSURE										X	
HIGH SUPPLY AIR TEMP										X	
HIGH SUPPLY AIR TEMP										X	
LOW MIXED AIR TEMP										X	
LOW RETURN AIR HUMIDITY										X	
LOW RETURN AIR TEMP										X	
LOW SUPPLY AIR STATIC PRESSURE										X	

C6 AIR HANDLER CONTROLS
NOT TO SCALE

REV	DESCRIPTION	BY	CR#	APPROVAL	DATE
1	REVISED MECHANICAL EQUIPMENT	GRM		DMH	12/04/23
0	ISSUED FOR CONSTRUCTION	GRM		DMH	08/03/23

REVISIONS

SIGNATURES		DATE
DRAWN	GRM	08/03/23
CHECKED	DMH	08/03/23
ENGRG	DMH	08/03/23
ENGRG		

REFERENCE DRAWINGS: N/A

SCALE N/A — ALL SURF 63 — UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS ± .__ FRACTIONS ± .___
3 PLACE DECIMALS ± .___ ANGLES ± .__

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RED OFFICE HVAC MOD.'S
MECHANICAL CONTROLS

ISSUE DATE 08/03/23 | DWG NO. 6001e23 | REV. 0
CONTROLLED BY --- | ISSUED TO N/A | FILE NAME ---------.dwg | PANEL --_-- | SH NO. M10 | CONT ON M11

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12/04/2023

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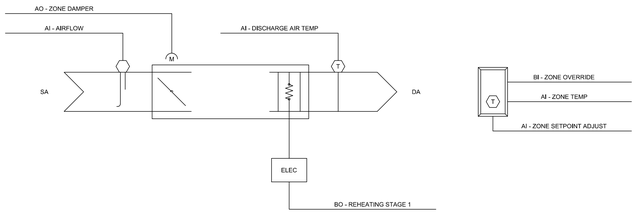
www.cbhfengineers.com
NC# P-0506



VAV TERMINAL UNIT SEQUENCE OF OPERATION

RUN CONDITIONS - SCHEDULED:
THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

- OCCUPIED MODE: THE UNIT SHALL MAINTAIN
- A 75°F (ADJ.) COOLING SETPOINT
- A 70°F (ADJ.) HEATING SETPOINT.

- UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN
- A 85°F (ADJ.) COOLING SETPOINT.
- A 55°F (ADJ.) HEATING SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.),
- LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

ZONE SETPOINT ADJUST:
THE OCCUPANT SHALL BE ABLE TO ADJUST THE ZONE TEMPERATURE HEATING AND COOLING SETPOINTS AT THE ZONE SENSOR.

ZONE OPTIMAL START:
THE UNIT SHALL USE AN OPTIMAL START ALGORITHM FOR MORNING START-UP. THIS ALGORITHM SHALL MINIMIZE THE UNOCCUPIED WARM-UP OR COOL-DOWN PERIOD WHILE STILL ACHIEVING COMFORT CONDITIONS BY THE START OF SCHEDULED OCCUPIED PERIOD.

ZONE UNOCCUPIED OVERRIDE:
A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MODE FOR AN ADJUSTABLE PERIOD OF TIME. AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN TO THE SCHEDULE.

REVERSING VARIABLE VOLUME TERMINAL UNIT - FLOW CONTROL:
THE UNIT SHALL MAINTAIN ZONE SETPOINTS BY CONTROLLING THE AIRFLOW THROUGH ONE OF THE FOLLOWING:

OCCUPIED:

- WHEN ZONE TEMPERATURE IS GREATER THAN ITS COOLING SETPOINT, THE ZONE DAMPER SHALL MODULATE BETWEEN THE MINIMUM OCCUPIED AIRFLOW (ADJ.) AND THE MAXIMUM COOLING AIRFLOW (ADJ.) UNTIL THE ZONE IS SATISFIED.
- WHEN THE ZONE TEMPERATURE IS BETWEEN THE COOLING SETPOINT AND THE HEATING SETPOINT, THE ZONE DAMPER SHALL MAINTAIN THE MINIMUM REQUIRED ZONE VENTILATION (ADJ.).
- WHEN ZONE TEMPERATURE IS LESS THAN ITS HEATING SETPOINT, THE CONTROLLER SHALL ENABLE HEATING TO MAINTAIN THE ZONE TEMPERATURE AT ITS HEATING SETPOINT. ADDITIONALLY, IF WARM AIR IS AVAILABLE FROM THE AHU, THE ZONE DAMPER SHALL MODULATE BETWEEN THE MINIMUM OCCUPIED AIRFLOW (ADJ.) AND THE MAXIMUM HEATING AIRFLOW (ADJ.) UNTIL THE ZONE IS SATISFIED.

UNOCCUPIED:

- WHEN THE ZONE IS UNOCCUPIED THE ZONE DAMPER SHALL CONTROL TO ITS MINIMUM UNOCCUPIED AIRFLOW (ADJ.).
- WHEN THE ZONE TEMPERATURE IS GREATER THAN ITS COOLING SETPOINT, THE ZONE DAMPER SHALL MODULATE BETWEEN THE MINIMUM UNOCCUPIED AIRFLOW (ADJ.) AND THE MAXIMUM COOLING AIRFLOW (ADJ.) UNTIL THE ZONE IS SATISFIED.
- WHEN ZONE TEMPERATURE IS LESS THAN ITS UNOCCUPIED HEATING SETPOINT, THE CONTROLLER SHALL ENABLE HEATING TO MAINTAIN THE ZONE TEMPERATURE AT THE SETPOINT. ADDITIONALLY, IF WARM AIR IS AVAILABLE FROM THE AHU, THE ZONE DAMPER SHALL MODULATE BETWEEN THE MINIMUM UNOCCUPIED AIRFLOW (ADJ.) AND THE AUXILIARY HEATING AIRFLOW (ADJ.) UNTIL THE ZONE IS SATISFIED.

ELECTRIC REHEATING STAGE:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND STAGE THE REHEATING TO MAINTAIN ITS SETPOINT. TO PREVENT SHORT CYCLING, THE STAGE SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

THE REHEATING SHALL BE ENABLED WHENEVER:

- OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
- AND THE ZONE TEMPERATURE IS BELOW SETPOINT.
- AND SUFFICIENT AIRFLOW IS PROVIDED.

DISCHARGE AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

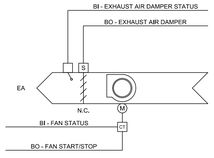
- HIGH DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).

LOW DISCHARGE AIR TEMP

VAV TERMINAL UNIT POINTS LIST

	HARDWARE POINTS				SOFTWARE POINTS					
POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC
AIRFLOW	X								X		X
DISCHARGE AIR TEMP	X								X		X
ZONE SETPOINT ADJUST	X										X
ZONE TEMP	X								X		X
ZONE DAMPER		X							X		X
ZONE OVERRIDE			X						X		X
REHEATING STAGE 1				X					X		X
AIRFLOW SETPOINT					X				X		X
COOLING SETPOINT					X				X		X
HEATING SETPOINT					X				X		X
HEATING MODE						X			X		
SCHEDULE								X			
HIGH DISCHARGE AIR TEMP										X	
HIGH ZONE TEMP										X	
LOW DISCHARGE AIR TEMP										X	
LOW ZONE TEMP										X	

E6 VAV TERMINAL UNIT CONTROLS
NOT TO SCALE



POWER VENTILATOR SEQUENCE OF OPERATION

RUN CONDITIONS - SCHEDULED:
THE FAN SHALL RUN ACCORDING TO A USER DEFINABLE SCHEDULE.

FAN:
THE FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

EXHAUST AIR DAMPER:
THE EXHAUST AIR DAMPER SHALL OPEN ANYTIME THE UNIT RUNS AND SHALL CLOSE ANYTIME THE UNIT STOPS. THE EXHAUST AIR DAMPER SHALL CLOSE 30 SEC (ADJ.) AFTER THE FAN STOPS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- DAMPER FAILURE: COMMANDED OPEN, BUT THE STATUS IS CLOSED.
- DAMPER IN HAND: COMMANDED CLOSED, BUT THE STATUS IS OPEN.

DAMPER STATUS:
THE FAN SHALL BE ENABLED AFTER THE DAMPER STATUS HAS PROVEN.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- DAMPER FAILURE: COMMANDED OPEN, BUT THE STATUS IS CLOSED.
- DAMPER IN HAND: COMMANDED CLOSED, BUT THE STATUS IS OPEN.

FAN STATUS:
THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- FAN RUNTIME EXCEEDED: FAN STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

POWER VENTILATOR POINTS LIST

	HARDWARE POINTS				SOFTWARE POINTS					
POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	SHOW ON GRAPHIC
EXHAUST AIR DAMPER STATUS			X						X		X
FAN STATUS			X						X		X
EXHAUST AIR DAMPER				X					X		X
FAN START/STOP				X					X		X
SCHEDULE								X			
EXHAUST AIR DAMPER FAILURE										X	
EXHAUST AIR DAMPER IN HAND										X	
FAN FAILURE										X	
FAN IN HAND										X	
FAN RUNTIME EXCEEDED										X	

B6 POWER VENTILATOR CONTROLS
NOT TO SCALE

REV	DESCRIPTION	BY	CR#	APPROVAL	DATE
0	ISSUED FOR CONSTRUCTION	GRM		DMH	08/03/23

REVISIONS

SIGNATURES		DATE
DRAWN	GRM	08/03/23
CHECKED	DMH	08/03/23
ENGRG	DMH	08/03/23
ENGRG		

REFERENCE DRAWINGS: N/A

SCALE N/A — UNLESS OTHERWISE SPECIFIED
2 PLACE DECIMALS ± .--
3 PLACE DECIMALS ± .---
FRACTIONS ± ---
ANGLES ± --°
ALL SURF 63

GNF Global Nuclear Fuel — A Joint Venture of GE, Toshiba, & Hitachi — Wilmington, NC

RED OFFICE HVAC MOD.'S
MECHANICAL
CONTROLS

ISSUE DATE 08/03/23 | DWG NO. 6001e23 | REV. 0
CONTROLLED BY DMH | ISSUED TO N/A | FILE NAME --------.dwg | PIXEL --- | SH. NO. M11 | CONT ON --

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