	MECHANICAL DRAWING LIST	
SHEET	DESCRIPTION	DATE
M000	HVAC SYMBOLS, ABBREVIATIONS, AND TC NOTES	8/19/20:
M001	MECHANICAL SPECIFICATIONS	8/19/20:
M101	HVAC FIRST FLOOR PLAN	8/19/20:
M102	HVAC ROOF PLAN	8/19/20:
M300	HVAC DETAILS	8/19/20:
M301	HVAC DETAILS	8/19/20
M400	HVAC SCHEDULES	8/19/20
M401	HVAC SCHEDULES	8/19/20
M600	KEC HVAC REFERENCE DRAWINGS	8/19/20:
M601	KEC HVAC REFERENCE DRAWINGS	8/19/20
M602	KEC HVAC REFERENCE DRAWINGS	8/19/20:
M603	KEC HVAC REFERENCE DRAWINGS	8/19/20:
M604	KEC HVAC REFERENCE DRAWINGS	8/19/20
M605	KEC HVAC REFERENCE DRAWINGS	8/19/20

## TEMPERATURE CONTROL NOTES

SECTION ONE - (GENERAL)

THE MECHANICAL CONTRACTOR SHALL BE THE CONTROLS CONTRACTOR FOR THIS PROJECT.

THE CONTROLS CONTRACTOR SHALL BE THE CONTROLS ENGINEER FOR THIS PROJECT: RESPONSIBLE FOR DESIGN AND ENGINEERING OF ALL CONTROL SYSTEMS TO OPERATE AS DESCRIBED IN THE SEQUENCE OF OPERATION, TO CONFORM WITH THE GOVERNING BUILDING CODES AND OPERATE IN A MANNER CONSISTENT WITH KNOWN GOOD CONTROLS ENGINEERING PRACTICE.

THE CONTROLS CONTRACTOR/ENGINEER SHALL IDENTIFY ANY POTENTIAL CONDITIONS THAT COULD BE CONSTRUED TO DEVIATE FROM GOOD CONTROLS ENGINEERING PRACTICE PRIOR TO BIDDING AND INCLUDE ALL ENGINEERING AND INSTALLATION WORK REQUIRED TO MAKE ALL HVAC SYSTEMS COMPLETE AND OPERATIONAL, IN CONFORMANCE WITH GOOD CONTROLS ENGINEERING PRACTICE PRIOR TO SUBMITTING HIS BID.

THE CONTROLS CONTRACTOR SHALL PROVIDE ALL CONTROL COMPONENTS, WIRING, INTERLOCKS, ELECTRICAL POWER AND ALL OTHER DEVICES REQUIRED TO MAKE ALL HVAC EQUIPMENT INSTALLED UNDER THIS PROJECT COMPLETE AND OPERATIONAL, PER THE SEQUENCE OF OPERATION AND AS REQUIRED FOR SAFE AND ACCURATE CONTROL.

ALL COMPONENTS, DEVICES, WIRING, PIPING AND GENERAL WORK THAT IS REQUIRED FOR THE COMPLETION OF THE WORK SHALL BE INCLUDED IN THIS CONTRACTORS SCOPE OF WORK. CONTRACTOR SHALL CONFORM TO THE BEST PRECEPTS OF THE TRADE THAT COMPLY WITH CODES AND CONTROL ENGINEERING PRACTICE. CONTRACTOR SHALL PROVIDE A SINGLE SOURCE OPERATING SYSTEM RESPONSIBILITY.

THE CONTROLS CONTRACTOR SHALL PROVIDE ALL CONTROL VALVES AND ACTUATORS TO THE MECHANICAL CONTRACTOR FOR INSTALLATION. THE CONTROLS CONTRACTOR SHALL DIRECT THE MECHANICAL CONTRACTOR AS TO THE PROPER LOCATION AND ORIENTATION OF ALL DEVICES TO ACHIEVE A PROPER AND CORRECT CONTROL

THE CONTROLS CONTRACTOR SHALL PROVIDE ENGINEERED DRAWINGS, CALIBRATION AND COMMISSIONING FOR A COMPLETE AND FULLY OPERATIONAL SYSTEM.

THE CONTROLS CONTRACTOR SHALL INCLUDE ADEQUATE TIME IN HIS BID FOR COMPLETE COMMISSIONING OF THE MECHANICAL SYSTEMS, ON SITE COORDINATION WITH THE MECHANICAL CONTRACTOR AND OTHER TRADES AS REQUIRED TO MAKE ALL EQUIPMENT COMPLETE AND FULLY OPERATIONAL.

IN THE EVENT THAT ANY PART OF THE MECHANICAL DRAWINGS, SPECIFICATIONS, OR NOTES CONFLICT WITH ANY OTHER: THE MOST STRINGENT REQUIREMENT SHALL APPLY, PROVIDING THE GREATEST SAFETY AND/OR AT THE HIGHEST COST OF THE CONFLICTING OPTIONS.

MECHANICAL EQUIPMENT, I.E. STAGES OF OPERATION.

WIPE ALL LOOSE CONTROLS AND DEVICES PROVIDED WITH HVAC FOLIDMENT AS

ALL CONTROL SYSTEMS READOUTS/DISPLAYS AND OPERATIONS SHALL MATCH INSTALLED

WIRE ALL LOOSE CONTROLS AND DEVICES PROVIDED WITH HVAC EQUIPMENT AS REQUIRED FOR A COMPLETE AND FULLY OPERATIONAL SYSTEM.

THE CONTROLS TECHNICIAN IS TO WORK WITH THE ENGINEER TO PROVIDE "PROJECT COMMISSIONING" — DEFINED AS: "THE PROCESS OF ADVANCING SYSTEMS FROM A STATE OF STATIC PHYSICAL COMPLETION TO A STATE OF FULLY DEMONSTRATED AND DOCUMENTED WORKING ORDER, ACCORDING TO DESIGN REQUIREMENTS, DURING WHICH TIME THE OWNERS OPERATING STAFF ARE INSTRUCTED IN CORRECT SYSTEMS OPERATION AND MAINTENANCE."

AT A TIME MUTUALLY AGREED UPON WITH OWNER AND ARCHITECT/ENGINEER CONTROL CONTRACTOR SHALL HOLD A TOTAL OF TWO HOURS, OR AS DEEMED NECESSARY FOR TYPE OF CONTROL SYSTEM, OF TRAINING AND SUPPORT FOR THE OWNER'S MAINTENANCE PERSONNEL.

SECTION TWO - (ELECTRICAL)

THE CONTROLS CONTRACTOR SHALL PROVIDE ALL ELECTRICAL POWER AND CONTROL WIRING, CONDUIT, JUNCTION BOXES, RACEWAY, TRANSFORMERS, RELAYS AND ALL OTHER ELECTRICAL APPURTENANCES REQUIRED FOR A COMPLETE AND FULLY OPERATIONAL CONTROL SYSTEM. THIS INCLUDES ALL POWER WIRING FROM SPARE CIRCUIT BREAKERS PROVIDED IN BUILDING EMERGENCY PANELS FOR POWERING OF CONTROLS AND CONTROL PANELS AND ALL OTHER CONTROL SYSTEM COMPONENTS.

ALL ELECTRICAL WORK SHALL BE IN CONFORMANCE WITH THE NATIONAL ELECTRICAL CODE LATEST EDITION AND APPLICABLE STATE AND LOCAL AMENDMENTS.

THE CONTROLS CONTRACTOR SHALL PROVIDE AND INSTALL ALL HARDWIRED INTERLOCKS.

THE CONTROLS CONTRACTOR SHALL PROVIDE AND INSTALL ALL HARDWIRED INTERLOCKS BETWEEN STARTERS AS REQUIRED TO ACHIEVE THE SEQUENCE OF OPERATION AND PROPER SYSTEM CONTROLS. PROVIDE RELAYS AS REQUIRED FOR AUTOMATIC START/STOP OF ALL SINGLE PHASE EXHAUST FANS AND INTERLOCK OF AUTOMATIC DAMPERS.

SECTION THREE - (THERMOSTAT)

THE CONTROLS CONTRACTOR SHALL PROVIDE THERMOSTATS FOR ALL CONTROLLED EQUIPMENT TO OPERATE AS DESCRIBED IN THE SEQUENCE OF OPERATION AND/OR PER MANUFACTURER'S REQUIREMENTS AND KNOWN STANDARDS OF GOOD CONTROL PRACTICE. INCLUDE ALL THERMOSTATS AS REQUIRED FOR EQUIPMENT TO BE COMPLETE AND FULLY OPERATIONAL WHETHER SHOWN SPECIFICALLY ON THE PLANS

PROVIDE LOCKABLE COVERS FOR ALL THERMOSTATS LOCATED IN COMMON AREAS, ETC.

THERMOSTATIC CONTROLS ARE TO HAVE 5 DEGREES F DEADBAND

ALL TEMPERATURE SENSORS IN DUCTWORK, AIR HANDLING UNITS AND PLENUMS SHALL BE OF AVERAGING TYPE. PROPERLY SUPPORT AVERAGING ELEMENT (MINIMUM TWENTY FEET LENGTH) ACROSS A REPRESENTATIVE AREA TO ACHIEVE A TRUE AVERAGE READING. SUPPORT USING HEAVY CABLE AND/OR HALF INCH CONDUIT WITH NYLON WIRE TIES.

BUILDING/SPACE STATIC PRESSURE SENSORS SHALL BE INSTALLED IN THE CEILING IN A MAIN BUILDING CORRIDOR OPEN TO THE MAIN ENTRANCE OF THE BUILDING. STATIC PRESSURE SENSING TIP SHALL HAVE COVER PLATE TO MATCH CEILING AND AN EMBOSSED LABEL STATING "PRESSURE CONTROL SENSOR — DO NOT PAINT".

THE CONTROLS CONTRACTOR/ENGINEER SHALL SELECT ALL PRESSURE AND TEMPERATURE SENSORS WITH AN APPROPRIATE SPAN AND RANGE FOR THE

ALL OUTDOOR AIR SENSORS SHALL BE INSTALLED WITH SUN SHIELD AND IN A LOCATION WHERE THEY CAN NOT BE WASHED BY EXHAUST AIR OR OTHER SOURCES OF FALSE READINGS.

ALL TEMPERATURE AND PRESSURE SENSORS SHALL BE INSTALLED IN LOCATIONS SUCH THAT THEY DO NOT MAKE FALSE READINGS. CONTROLS CONTRACTOR/ENGINEER SHALL REVIEW THE PLANS AND IDENTIFY ANY SUCH POTENTIAL CAUSES FOR FALSE READING AND NOTIFY THE ENGINEER IN WRITING THAT THESE SHOULD BE RELOCATED PRIOR TO ROUGH IN AND CONTROLS INSTALLATION. THE CONTROLS CONTRACTOR SHALL RELOCATE ANY SENSORS INSTALLED IN IMPROPER LOCATIONS AND GIVING FALSE READINGS AT HIS OWN EXPENSE. CONDITIONS TO BE AWARE OF SHALL INCLUDE BUT ARE NOT LIMITED TO LOCATIONS OF THERMOSTATS BEHIND DOORS, OUTDOOR AIR SENSORS NEAR EXHAUST OPENINGS, STATIC PRESSURE SENSORS IN TURBULENT LOCATIONS, THERMOSTATS INSTALLED ADJACENT TO HEAT SOURCES, SUCH AS COFFEE POTS, COMPUTERS, VENDING MACHINES AND OTHER APPLIANCES, ETC.

ALL REMOTE TEMPERATURE SENSORS SHALL BE EQUAL TO BUILDING AUTOMATION PRODUCTS, INC. "LOW PROFILE BUTTON SENSOR", WITH METAL BUTTON, PLASTIC BUTTON NOT ACCEPTABLE. UNLESS OTHERWISE NOTED BELOW OR ON DRAWINGS.

THERMOSTATS AND SENSORS SHALL BE MOUNTED 48 INCHES ABOVE FINISH FLOOR. REFER TO ARCHITECTURAL INTERIOR ELEVATION DRAWINGS FOR EXACT LOCATIONS SO

THE DEVICES WILL NOT INTERFER WITH EQUIPMENT LOCATIONS AND

GRAPHICS/PICTURES.

THERMOSTATS FOR HVAC EQUIPMENT TO BE LOCATED IN THE OFFICE WITH REMOTE SPACE SENSOR, UNLESS OTHERWISE INDICATED ON DRAWINGS.

TAMPERPROOF COVER IF NOT AVAILABLE WITH LOCKABLE COVER.

THERMOSTATS LOCATED IN PUBLIC AREAS TO BE PROVIDED WITH A LOCKABLE CLEAR

SECTION FOUR - (SAFETY DEVICES)

THE CONTROLS CONTRACTOR/ENGINEER SHALL FURNISH AND INSTALL MINIMUM RESET SAFETY DEVICES FOR ANY AND ALL CONDITIONS THAT COULD DAMAGE THE EQUIPMENT AND/OR REPRESENT A THREAT TO HUMAN SAFETY.

OUTDOOR AIR AND EXHAUST DAMPERS SHALL FAIL TO THE CLOSED POSITION.

OUTDOOR AIR AND EXHAUST DAMPERS ARE TO BE HIGH PREFORMANCE AIRFOIL, LOW LEAKAGE, OPPOSED BLADE — RUSKIN CD—60.

EACH UNIT WITH OUTDOOR AIR SHALL BE PROTECTED WITH A FREEZE THERMOSTAT TO SHUT DOWN SYSTEM.

SMOKE DETECTORS SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR FOR ALL SUPPLY FANS OVER 2000 CFM. THE CONTROLS CONTRACTOR SHALL WIRE SPARE CONTACT ON THE LOCAL DUCT SMOKE DETECTOR TO SHUT DOWN THE SUPPLY FAN ON SMOKE ALARM.

SECTION FIVE - (SEQUENCE OF OPERATION)

ROOFTOP UNIT <u>RTU-1</u> (<u>RTU-2</u>, <u>RTU-3</u>, <u>RTU-4</u>, <u>RTU-5</u>, <u>RTU-6</u>):

1) ROOFTOP UNIT SHALL BE CONTROLLED BY TRANE RELIATEL HVAC CONTROL SYSTEM WITH TOUCH SCREEN THERMOSTAT. PROVIDE ALL WIRING FOR A COMPLETE SYSTEM AS RECOMMENDED BY MANUFACTURER. INSTALL PER MANUFACTURER'S INSTRUCTIONS.

COOLING MODE AS SCHEDULED IN AN AUTOMATIC HEATING/COOLING CHANGEOVER PROGRAMMABLE 24/7 THERMOSTAT SUITABLE FOR SPECIFIED NUMBER OF HEATING/COOLING STAGES.

3) IN HEATING MODE, ROOFTOP UNIT SHALL OPERATE AVAILABLE STAGES OF HEATING TO MAINTAIN THERMOSTAT SETPOINT (ADJ.).

2) DURING OCCUPIED MODE, ROOFTOP UNIT SHALL OPERATE IN HEATING OR

4) IN COOLING MODE, ON CALL FOR COOLING ONLY (SPACE/AVERAGE SPACE TEMPERATURE ABOVE SETPOINT (ADJ.), SPACE HUMIDITY BELOW SETPOINT (ADJ.)), ROOFTOP UNIT SHALL OPERATE AVAILABLE STAGES OF COOLING TO SATISFY THERMOSTAT SETPOINT (ADJ.). DEHUMIDIFICATION SYSTEM SHALL BE OFF.
 5) IN COOLING MODE, ON CALL FOR COOLING AND DEHUMIDIFICATION (SPACE/

AVERAGE SPACE TEMPERATURE AND SPACE HUMIDITY ABOVE SETPOINT (ADJ.)), ROOFTOP UNIT SHALL INITIATE SUB-COOLING MODE OF OPERATION UNTIL THERMOSTAT SETPOINTS (ADJ.) ARE SATISFIED.

6) IN COOLING MODE, ON CALL FOR DEHUMIDIFICATION WITHOUT CALL FOR COOLING (SPACE/AVERAGE SPACE TEMPERATURE BELOW SETPOINT (ADJ.), SPACE HUMIDITY ABOVE SETPOINT (ADJ.)), ROOFTOP UNIT SHALL INITIATE

IS SATISFIED.

7) ECONOMIZER SHALL BE USED AS FIRST STAGE OF COOLING.

8) SUB—COOLING AND HOT GAS REHEAT MODE SHALL BE LOCKED OUT BELOW

40 DEGREES F.

HOT GAS REHEAT MODE OF OPERATION UNTIL THERMOSTAT SETPOINT (ADJ.)

9) ROOFTOP UNIT SHALL OPERATE DURING OCCUPIED MODE TO MAINTAIN BUILDING POSITIVE AIR PRESSURE.
 10) DURING UNOCCUPIED MODE HEATING/COOLING SHALL BE AVAILABLE TO MAINTAIN NIGHT SETBACK THERMOSTAT SETPOINT (ADJ.).

DURING OCCUPIED MODE OUTDOOR AIR DAMPER SHALL BE OPENED TO PROVIDE REQUIRED MINIMUM OUTDOOR AIR.
 DURING UNOCCUPIED MODE OUTDOOR AIR DAMPER SHALL BE CLOSED. IF ECONOMIZER IS USED AS FIRST STAGE OF COOLING, OUTDOOR AIR DAMPER SHALL BE OPENED.

MAKEUP AIR UNIT MAU-1 (MAU-2):

1) MAKEUP AIR UNIT SHALL BE INTERLOCKED WITH KITCHEN EXHAUST HOOD KEH-1/KEH-2 TO START/STOP WHENEVER KITCHEN EXHAUST HOOD IS

KEH-1/KEH-2 TO START/STOP WHENEVER KITCHEN EXHAUST HOOD IS TURNED ON/OFF.

2) CO SENSOR WITH VISUAL ALARM SHALL SHUT DOWN UNIT UPON SENSING OF CARBON MONOXIDE.

EXHAUST FAN KEF-1L (KEF-1M, KEF-1R, KEF-2L, KEF-2R):

1) EXHAUST FAN SHALL BE INTERLOCKED WITH RESPECTIVE KITCHEN EXHAUST HOOD KEH-1/KEH-2 SECTIONS TO START/STOP WHENEVER KITCHEN EXHAUST HOOD SECTION IS TURNED ON/OFF (MANUALLY OR BY HOOD TEMPERATURE SENSOR).

EXHAUST FAN <u>KEF-3:</u>

1) EXHAUST FAN SHALL BE INTERLOCKED WITH DISHWASHER EXHAUST HOOD KEH-3 TO START/STOP WHENEVER KITCHEN DISHWASHER EXHAUST HOOD

TOILET EXHAUST FAN <u>EF-1:</u>

AIR CURTAIN AC-1:

IS TURNED ON/OFF.

EXHAUST FAN <u>EF-1:</u>
 EXHAUST FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED MODE.
 MOTORIZED DAMPER SHALL BE CLOSED WHEN FAN IS STOPPED.

MOP SINK/TOILET EXHAUST FAN <u>EF-2:</u>

1) EXHAUST FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED MODE.

2) MOTORIZED DAMPER SHALL BE CLOSED WHEN FAN IS STOPPED.

AIR CURTAIN SHALL OPERATE UPON OPENING OF ASSOCIATED DOOR.
 AIR CURTAIN SHALL BE OFF WHEN DOOR IS CLOSED.

DUCT FREE SPLIT SYSTEM DFSS-1 (DFSS-2) (INDOOR/OUTDOOR UNIT):

DUCT FREE SPLIT SYSTEM SHALL OPERATE AS SCHEDULED BY WALL

ELECTRIC DUCT HEATER <u>EDH-1 (EDH-2, EDH-3):</u>

1) ELECTRIC DUCT HEATER SHALL BE CONTROLLED BY REMOTE WALL MOUNTED THERMOSTAT WITH LOCAL WALL MOUNTED TEMPERATURE SENSOR.

MOUNTED CONTROLLER TO MAINTAIN SPACE TEMPERATURE 60 (75) DEG F

ELECTRIC CEILING HEATER <u>ECH-1</u>, <u>ECH-2</u>:

1) ELECTRIC CEILING HEATER SHALL BE CONTROLLED BY WALL MOUNTED THERMOSTAT.

ELECTRIC UNIT HEATER <u>EUH-1:</u>

1) ELECTRIC UNIT HEATER SHALL BE CONTROLLED BY WALL MOUNTED THERMOSTAT.

ELECTRIC INFRARED RADIANT HEATER <u>ERH-1</u>:

1) ELECTRIC INFRARED RADIANT HEATER SHALL BE CONTROLLED BY WALL MOUNTED CONTROLLER. REFER TO ELECTRICAL DRAWINGS.

EMERGENCY SHUTOFF GAS SOLENOID VALVE (KEH-1/KEH-2)

1) GAS SOLENOID VALVE SHALL BE INTERLOCKED WITH KITCHEN EXHAUST HOOD FIRE SUPPRESSION SYSTEM TO SHUTOFF NATURAL GAS SUPPLY TO GAS FIRED KITCHEN EQUIPMENT WHEN FIRE SUPPRESSION SYSTEM IS

2) GAS SOLENOID VALVE SHALL BE RESET MANUALLY TO RESTORE NATURAL GAS SUPPLY TO GAS FIRED KITCHEN EQUIPMENT.

COORDINATED SHOP DRAWINGS SHALL BE PROVIDED BY EACH SUBCONTRACTOR AND SHALL CONTAIN A LAYOUT OF ALL DUCTWORK, CONDUIT, PIPING, EQUIPMENT, STRUCTURE, WALLS, CEILING, ETC. AS REQUIRED TO REFLECT FULL COORDINATION ACROSS ALL TRADES AND SHALL BE SUBMITTED FOR REVIEW. COORDINATED DRAWINGS SHALL BE SIGNED OFF BY ALL OTHER TRADES PRIOR TO BEING SUBMITTED FOR REVIEW. PLANS SHALL BE PREPARED AT A MINIMUM OF 1/8" SCALE OR THE SCALE OF THE DESIGN DRAWINGS, WHICHEVER IS LARGER. NO EQUIPMENT SHALL BE INSTALLED WITHOUT APPROVED SHOP DRAWINGS.

ENGINEERING

104 N. OA
OAK PARK,
BIRENGINE
PHONE 31

MECHANICAL | PULMBING | FIRE PROTECTION

COOPER'S HIAWK

CHIPMAN ROAD

NW 'S SI

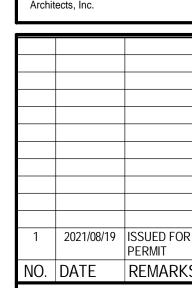
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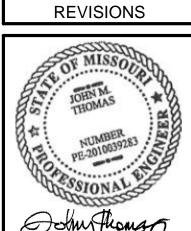
FIELD VERIFICATION
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Drawing Title
HVAC - SYMBOLS &
NOTES

Job No.
21-0064

Drawn
DNK

Job No. 21-0064 Drawn

Scale Date
08/19/2021

ALL WORK IS TO BE FULLY COORDINATED WITH ALL OTHER TRADES.

CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND INCLUDING ANY ITEMS NOT INDICATED ON THE DRAWINGS BUT NECESSARY FOR PROPER OPERATION OF MECHANICAL SYSTEM.

THE SEQUENCE FOR THE INSTALLATION OF ALL WORK SHALL BE COORDINATED BETWEEN ALL CONTRACTORS ON THE PROJECT AND IN STRICT ACCORDANCE WITH ARCHITECT/ENGINEER AND OWNER'S

THE CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES AND SHALL MAKE NECESSARY OFF-SETS AND CHANGES IN ELEVATIONS TO ACCOMMODATE OTHER TRADES AND THE EXISTING

PROVIDE TAMPER PROOF CEILING ACCESS DOORS WHERE INDICATED OR REQUIRED FOR ACCESS OR MAINTENANCE FOR REHEAT COILS, VALVES, BALANCING DAMPERS, CLEANOUTS, ETC. WHERE THERE IS EVIDENCE THAT WORK OF ONE TRADE WILL INTERFERE WITH WORK OF OTHER TRADES, THE CONTRACTOR SHALL SEND REQUEST FOR INFORMATION TO SMART SHEETS.

ALL EQUIPMENT AND MATERIALS SHALL BE U.L. LISTED.

CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND FEES REQUIRED FOR THEIR WORK.

CONTRACTOR SHALL REFER TO THE ARCHITECTURAL AND STRUCTURAL CONTRACT DRAWINGS (BEFORE SUBMITTING THEIR BIDS) TO FAMILIARIZE THEMSELVES WITH THE EXTENT OF THE GENERAL CONTRACTORS WORK, CEILING HEIGHTS AND CLEARANCE FOR INSTALLING THEIR WORK

ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS INSTALLATION INSTRUCTIONS.

PRIOR TO BID, IF THE CONTRACTOR FINDS ANY DISCREPANCIES OR OMISSIONS IN THE PROJECT DOCUMENTS, THE CONTRACTOR IS TO NOTIFY THE OWNER IN WRITING AND OBTAIN CLARIFICATION. ADDITIONAL COMPENSATION WILL NOT BE GRANTED AFTER AWARD OF CONTRACT FOR ANY ADDITIONAL WORK REQUIRED TO COMPLY WITH THESE DOCUMENTS.

ALL CHANGE PROPOSAL REQUESTS FOR WORK ADDITIONAL TO THE BASE BID CONTRACT SHALL BE BASED ON MATERIAL, LABOR, OVERHEAD AND PROFIT AS PUBLISHED IN THE LATEST EDITION OF "MEANS MECHANICAL, ELECTRICAL, PLUMBING AND BUILDING CONSTRUCTION COST DATA." ALL CHANGE REQUESTS MUST BE BROKEN DOWN IN THE FOLLOWING MANOR.

MATERIAL COST: (IE. EQUIPMENT, SHEET METAL PER POUND AND PIPING PER LINEAL FOOT/FITTING) LABOR COST: (NUMBER OF HOURS AT CURRENT LABOR RATE PER HOUR)

OVERHEAD & PROFIT: (INDICATING PERCENTAGES) TOTAL CHANGE ORDER PRICE: (MATERIAL + LABOR + 0&P)

PRICING FOR ALL ITEMS OF WORK WHICH ARE TO BE CREDITED TO THE PROJECT SHALL BE BROKEN DOWN IN A SIMILAR MANOR TO THE ADDED COSTS.

THE ASSOCIATED COST FOR DRAFTING CHANGES (INCLUDING THREE-DIMENSIONAL MODELING) SHALL NOT EXCEED 10% OF THE COST OF MATERIAL AND LABOR FOR THE CHANGE

ALL CUTTING AND PATCHING THAT IS REQUIRED TO COMPLETE THE WORK SHALL BE THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR.

THE CONTRACTOR IS TO PROVIDE ALL LINTELS, SUPPORT STEEL AND FRAMING THAT IS REQUIRED TO COMPLETE THE WORK.

CONTRACTOR SHALL PROVIDE SLEEVES IN BEAMS, FLOORS, AND COLUMNS AND WALLS AS SHOWN ON DRAWINGS, AS REQUIRED BY JOB SITE CONDITIONS, AND/OR SPECIFIED, WHEN INSTALLING THEIR WORK. ALL BEAMS AND COLUMNS WHICH ARE REQUIRED TO BE SLEEVED SHALL BE CUT AND REINFORCED AS REQUIRED BY FIELD CONDITIONS AND LOCATIONS AND SIZES SHALL BE CHECKED AND APPROVED BY ARCHITECTS BEFORE CONTRACTOR CUTS ANY STRUCTURAL BUILDING MEMBER.

PROVIDE ALL COORDINATION AND MISCELLANEOUS IRON NECESSARY FOR SUITABLE ANCHORAGE OF HVAC ITEMS AND EQUIPMENT.

INSTALL AN AUXILIARY DRAIN PAN FOR EACH COOLING OR EVAPORATOR COIL OR FUEL-FIRED APPLIANCE THAT PRODUCES CONDENSATE, WHERE DAMAGE TO ANY BUILDING COMPONENTS WILL OCCUR AS A RESULT OF OVERFLOW FROM THE EQUIPMENT DRAIN PAN OR STOPPAGE IN THE CONDENSATE DRAINAGE PIPING. THIS DRAIN PAN SHALL DISCHARGE TO A CONSPICUOUS POINT OF DISPOSAL TO ALERT OCCUPANTS IN THE EVENT OF A STOPPAGE OF THE PRIMARY DRAIN. THE PAN SHALL BE 1-1/2" DEEP AND SHALL BE 3" LARGER THAN THE UNIT DIMENSIONS. PANS TO BE CONSTRUCTED WITH A MINIMIUM OF 24

IF A SECONDARY DRAIN PAN CAN NOT BE INSTALLED, A WATER LEVEL DETECTION DEVICE CONFORMING TO UL 508 SHALL BE PROVIDED THAT WILL SHUT OFF THE EQUIPMENT SERVED IN THE EVENT THAT THE PRIMARY DRAIN IS BLOCKED. THE DEVICE SHALL BE INSTALLED IN THE PRIMARY LINE, OVERFLOW DRAIN LINE OR IN THE EQUIPMENT DRAIN PAN, LOCATED AT A POINT HIGHER THAN THE PRIMARY DRAIN LINE CONNECTED BELOW THE OVERFLOW RIM OF DRAIN PAN.

ALL CONDENSATE DRAINAGE SYSTEMS SHALL HAVE A MINIMIUM PIPE SIZE OF 1-1/4" AND BE INSTALLED WITH PROPER DRAINAGE AND CLEANOUT FITTINGS AND 1-1/2" FIBERGLASS INSULATION WITH ASJ

PROVIDE A NEUTRALIZING DEVICE FOR CORROSIVE LIQUIDS, SPENT ACIDS, OR OTHER HARMFUL CHEMICALS. ACIDIC CONDENSATE SHALL NOT BE DISCHARGED IN INTO THE BUILDING SEWER WITHOUT FIRST BEING PROPERLY DILUTED OR NEUTRALIZED.

PROVIDE FOR SAFETY AND PROTECTION OF CONTRACTOR'S OWN WORK, INCLUDING THE COVERING OF ANY HOLES, SHAFT OPENINGS, ETC., SO AS TO AVOID ANY UNNECESSARY SAFETY HAZARDS AS REQUIRED AND OUTLINED BY OSHA AND ALL APPLICABLE REGULATIONS.

PROVIDE DUST AND NOISE PROTECTION OF ADJOINING NON-CONSTRUCTION AREAS. PROPERLY PROTECT ALL FLOORS, ROOFS AND THE LIKE.

MECHANICAL EQUIPMENT AND APPLIANCES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR THE LABELED EQUIPMENT. CONNECTIONS TO THE MECHANICAL EQUIPMENT AND APPLIANCES, SUCH AS FUEL SUPPLY, AND DUCTS, SHALL CONFORM TO THE REQUIREMENTS OF THESE DOCUMENTS.

MANUFACTURER'S INSTALLATION INSTRUCTIONS SHALL BE AVAILABLE ON THE JOBSITE AT ALL TIMES FOR INSPECTION.

THE DRAWINGS, SCHEDULES, AND SPECIFICATIONS HAVE BEEN PREPARED USING ONE MANUFACTURER FOR EACH TYPES OF EQUIPMENT AS THE BASIS FOR DIMENSIONAL AND MECHANICAL DESIGN.

THE MECHANICAL EQUIPMENT HAS BEEN COORDINATED WITH THE ELECTRICAL DESIGN DRAWINGS BASED ON THE ELECTRICAL CHARACTERISTICS OF THE EQUIPMENT SPECIFIED. ALL CHANGES AND/OR MODIFICATIONS TO THE ELECTRICAL DESIGN AND INSTALLATION EXPENSE, DUE TO SUBSTITUTIONS OF EQUIPMENT (I.E. AMPERAGE INCREASE) WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.

ALL ROOFTOP AIR CONDITIONING EQUIPMENT SHALL HAVE CONVIENIENCE (GFI) OUTLETS WHICH SHALL BE WIRED INDEPENDENTLY OF THE LOAD SIDE OF THE UNIT AND SHALL REMAIN LIVE WHEN THE DISCONNECT SWITCH IS IN THE OPEN POSITION. VERIFY WITH ELECTRICAL CONTRACTOR THAT ONE OUTLET PER UNIT IS INSTALLED.

CONTRACTOR SHALL SUBMIT DETAILED DIMENSIONED SHOP DRAWINGS FOR ALL WORK WHICH MUST BE REVIEWED. COORDINATED AND SIGNED OFF BY ALL OTHER TRADES BEFORE SUBMITTAL. IN PREPARATION OF SHOP DRAWINGS, CONTRACTOR MAY, AT HIS OPTION, OBTAIN ELECTRONIC DRAWING FILES IN AUTOCAD FORMAT ON A CD-ROM DISK FROM THE ENGINEER FOR SHIPPING AND HANDLING FEE OF \$150.00 PER REQUEST. CONTRACTOR SHALL CONTACT THE ARCHITECT AND ENGINEER FOR WRITTEN AUTHORIZATION AND NECESSARY RELEASE AUTHORIZATION FORM AND TO SPECIFY SHIPPING METHOD. IN ADDITION TO PAYMENT, ARCHITECTS WRITTEN AUTHORIZATION AND ENGINEERS RELEASE AGREEMENT FORM MUST BE RECEIVED BEFORE ELECTRONIC DRAWING FILES WILL BE SENT.

CONTRACTOR AND/OR MANUFACTURER SHALL VERIFY THAT THE CHARACTERISTICS OF THE EQUIPMENT HE SUBMITS FOR REVIEW MEETS THE CAPACITY AND DUTY SPECIFIED.

WHEN EQUIPMENT IS SUBMITTED FOR REVIEW AND DOES NOT MEET THE PHYSICAL SIZE OR ARRANGEMENT OF THAT SCHEDULED AND SPECIFIED, CONTRACTOR SHALL PAY FOR ALL ALTERATIONS REQUIRED TO ACCOMMODATE SUCH EQUIPMENT AT NO ADDITIONAL COST TO OWNER. CONTRACTOR WILL ALSO PAY ALL COSTS FOR ADDITIONAL WORK REQUIRED BY OTHER CONTRACTORS, OWNER, ARCHITECT, OR ENGINEER TO MAKE CHANGE WHICH WOULD ALLOW THE EQUIPMENT TO FIT IN THE SPACE AND FUNCTION AS INTENDED.

## 2 VENTILATION SPECIFIC NOTES

ALL NEW DUCTWORK INSTALLED BY THIS CONTRACTOR SHALL BE OF SHEET METAL CONSTRUCTION AND BE FABRICATED IN ACCORDANCE WITH THE MOST RECENT REQUIREMENTS OF SMACNA.

AIR HANDLING SYSTEMS SHALL BE INSTALLED TO CONFORM TO "INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS", NFPA 90A (CURRENT EDITION).

CONTRACTOR SHALL PROVIDE AS BUILT DRAWINGS.

ALL KITCHEN EXHAUST HOODS SUPPLIED TO THE PROJECT ARE TO BE RECEIVED AND HUNG BY THIS CONTRACTOR.

WHENEVER POSSIBLE, ALL DUCT ELBOWS ON KITCHEN EXHAUST SYSTEMS SHALL BE CONSTRUCTED WITH LONG RADIS FITTINGS.

ALL DUCTWORK SERVING DISHWASHER EXHAUST SHALL BE CONSTRUCTED WITH STAINLESS STEEL WITH ALL JOINTS SEALED AND PITCHED TOWARDS THE HOOD.

TRANSFER DUCTS SHALL NOT EXCEED 5'-0" IN LENGTH.

PROVIDE FLEXIBLE CONNECTIONS AT INLET AND DISCHARGE OF ALL FAN POWERED EQUIPMENT.

FLEXIBLE DUCTWORK SHALL BE U.L. 181 TYPE AS APPROVED BY CODE AND SHALL HAVE A MAXIMUM LENGTH OF 5'-0". FLEXIBLE DUCTS ARE NOT PERMITTED ON MEDIUM PRESSURE SYSTEMS.

NO HANGERS OR SUPPORT OF ANY TRADE SHALL PENETRATE THRU ANY NEW OR EXISTING DUCTWORK EITHER FOR TEMPORARY OR PERMANENT PURPOSES.

REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR COORDINATION OF ALL SUPPLY AND RETURN AIR DEVICE LOCATIONS.

SEAL ALL DUCTWORK WITH NON-HARDENING, WATER RESISTANT, FIRE RESISTIVE DUCT SEALER, COMPATIBLE WITH MATING MATERIALS; UL 181A or 181B TAPES AND MASTICS.

PROVIDE BALANCING DAMPERS (VOLUME DAMPERS) AT POINTS ON RETURN AND EXHAUST SYSTEMS WHERE BRANCHES ARE TAKEN FROM LARGER DUCTS AS REQUIRED FOR AIR BALANCING. ALL LOW PRESSURE SUPPLY BRANCH DUCTS SHALL BE PROVIDED WITH "EXTRACTOR" DAMPERS WITH LOCKING RODS. ALL INACCESSABLE VOLUME DAMPERS INSTALLED ABOVE NON-ACCESSABLE CEILINGS (I.E. FINISHED GYP BOARD) SHALL BE INSTALLED WITH REMOTE ADJUSTABLE OPERATORS COMPLETE WITH ALL PERTAINT LINKAGES, ETC. TO LOCATIONS AS APPROVED BY THE ARCHITECT.

CONSTRUCT BENDS AND ELBOWS WITH RADIUS OF NOT LESS THAN 1-1/2 TIMES WIDTH OF DUCT ON CENTERLINE, OR USE SQUARE THROAT ELBOWS WITH TURNING VANES. INCREASE DUCT SIZES GRADUALLY NOT EXCEEDING 15 DEGREES DIVERGENCE WHEREVER POSSIBLE. DIVERGENCE UPSTREAM OF EQUIPMENT SHALL NOT EXCEED 30 DEGREES. CONVERGENCE DOWNSTREAM

SHALL NOT EXCEED 45 DEGREES. 3 PIPING SPECIFIC NOTES

ALL EXPANSION VALVES, DEVICES AND CONNECTIONS SHALL BE REMOVED FROM THE AIR STREAM OF ALL MECHANICAL EQUIPMENT AS PER LOCAL CODES.

FURNISH AND INSTALL A SAFETY RELIEF VALVE DESIGNED TO RELIEVE AND/OR PREVENT THE BUILD-UP OF EXCESSIVE REFRIGERANT PRESSURE WITHIN THE DIRECT-EXPANSION SYSTEM. THE PRESSURE RELIEF DEVICE SHALL BE SET AT 400 PSI AND SHALL BE INSTALLED ON THE HIGH TEMPERATURE SIDE AT THE DISCHARGE OF THE COMPRESSOR AND UPSTREAM OF THE COMPRESSOR SHUT-OFF (STOP) VALVE.

FURNISH AND INSTALL A REFRIGERANT RELIEF DISCHARGE PIPE OF SIZE AS SHOWN ON DRAWINGS. THE DISCHARGE PIPE OUTLET SHALL BE INSTALLED A MINIMUM OF 10'-0" FROM ANY OPENING, AND 20'-0" FROM ANY FIRE ESCAPE AND SHALL DISCHARGE THROUGH A TURNED DOWN ELBOW.

ALL REFRIGERANT PIPING SHALL BE TYPE "ACR" SOLDERED OR BRAZED RIGID COPPER PIPING

**4 PIPING SPECIFICATIONS** 

PROVIDE PIPING MATERIALS AND FACTORY FABRICATED PIPING PRODUCTS OF SIZES, TYPES, PRESSURE RATINGS, TEMPERATURE RATINGS AND CAPACITIES AS INDICATED. WHERE NOT SHOWN, PROVIDE PROPER SELECTION AS DETERMINED BY INSTALLER TO COMPLY WITH INSTALLATION REQUIREMENTS. PROVIDE MATERIALS AND PRODUCTS COMPLYING WITH ASME B31.9 CODE FOR BUILDING SERVICES POWER PIPING WHERE APPLICABLE, BASE PRESSURE RATING ON HYDRONIC PIPING SYSTEMS MAXIMUM DESIGN PRESSURES. PROVIDE SIZES AND TYPES MATCHING PIPING AND EQUIPMENT CONNECTIONS; PROVIDE FITTINGS OF MATERIALS THAT MATCH PIPE MATERIALS USED IN PIPING SYSTEMS.

INSTALLATION

CUT PIPE ACCURATELY TO MEASUREMENTS ESTABLISHED AT THE BUILDING, WORK INTO PLACE WITHOUT SPRINGING OR FORCING, AND PROPERLY CLEAR ALL WINDOWS, DOORS AND OTHER OPENINGS CUTTING OR OTHER WEAKENING OF THE BUILDING STRUCTURE TO FACILITATE PIPING INSTALLATION WILL NOT BE PERMITTED UNLESS APPROVED BY THE ENGINEER. REAM ALL PIPING TO REMOVE BURRS AND INSTALL SO AS TO PERMIT FREE EXPANSION AND CONTRACTION WITHOUT CAUSING DAMAGE. MAKE ALL CHANGES IN DIRECTION WITH FITTINGS AND CHANGES IN MAIN SIZES THROUGH ECCENTRIC REDUCING FITTINGS. PIPING AT TANKS, CONVERTERS, GENERATORS, PUMPS, ETC. SHALL BE SUPPORTED INDEPENDENTLY SO THAT THE EQUIPMENT WILL SUPPORT NO WEIGHT. (FINAL HANGER SHALL BE NO FURTHER

INSTALL PIPE, TUBE AND FITTINGS IN ACCORDANCE WITH INDUSTRY PRACTICES IN ORDER TO PERFORM EACH INDICATED SERVICE WITHOUT PIPING FAILURE.

THE FOLLOWING SHALL BE PROVIDED:

THAN 18" FROM EQUIPMENT OR COIL).

1.SWING JOINTS (MINIMUM OF FOUR ELBOWS) AT RUN-OUTS TO EQUIPMENT AS WELL AS SUFFICIENT SWING CONNECTIONS, EXPANSION LOOPS AND/OR DEVICES AT ALL OTHER POINTS FOR FLEXIBLE PIPING 2.CAPS OR PLUGS FOR ALL OPEN ENDS OF PIPE LINES AND EQUIPMENT DURING INSTALLATION TO KEEP DIRT AND OTHER FOREIGN MATTER OUT OF PIPE AND EQUIPMENT.

5 ELECTRICAL EQUIPMENT SPACES

7 INSULATION NOTES

DO NOT RUN PIPING THROUGH TRANSFORMER VAULTS AND OTHER ELECTRICAL OR ELECTRONIC EQUIPMENT SPACES AND ENCLOSURES UNLESS UNAVOIDABLE. INSTALL DRIP PAN UNDER PIPING THAT MUST BE RUN THROUGH ELECTRICAL SPACES. 6 PIPING SYSTEM JOINTS

PROVIDE JOINTS OF THE TYPE INDICATED IN EACH PIPING SYSTEM.

SOLDER COPPER TUBE-AND-FITTING JOINTS. IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICE. CUT TUBE ENDS SQUARELY, REAM TO FULL INSIDE DIAMETER. AND CLEAN OUTSIDE OF TUBE ENDS AND INSIDE OF FITTINGS. APPLY SOLDER FLUX TO JOINT AREAS OF BOTH TUBES AND FITTINGS. INSERT TUBE FULL DEPTH INTO FITTING AND SOLDER IN A MANNER WHICH WILL DRAW SOLDER THE FULL DEPTH AND CIRCUMFERENCE OF JOINT. WIPE EXCESS SOLDER FROM JOINT BEFORE IT HARDENS.

(THE INSULATION SHALL MEET ALL ENERGY REQUIREMENTS OF THE LOCAL AUTHORITIES)

PROVIDE 1" THICK ARMAFLEX INSULATION AT ALL REFRIGERATION SUCTION AND HOT GAS PIPING

PROVIDE PIPE SADDLES AS REQUIRED FOR PROTECTING PIPE AND INSULATION.

PROVIDE MINIMUM OF R-6, 2" THICK FIBERGLASS BLANKET WITH FSK (FOIL REINFORCED KRAFT) INSULATION ON ALL CONCEALED A/C SUPPLY AND 1-1/2" THICK ON....RETURN DUCTWORK. THE INSULATION SHALL PROVIDE A VAPOR BARRIER.

PROVIDE MINIMUM OF R-6, 2" THICK FIBERGLASS BOARD INSULATION WITH ASJ JACKET ON ALL EXPOSED A/C SUPPLY...RETURN DUCTWORK. THE INSULATION SHALL PROVIDE A VAPOR BARRIER. PROVIDE MINIMUM OF R-8, INSULATION ON ALL OUTDOOR A/C SUPPLY AND RETURN DUCTS. THE INSULATION SHALL PROVIDE A VAPOR BARRIER. FABRICATION AND INSTALLATION SHALL CONFORM TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND MIDWEST INSULATION CONTRACTORS ASSOCIATION NATIONAL INSULATION STANDARDS MANUAL INSULATION SHALL BE ONE OF THE FOLLOWING:

1.2" THICK STYREEN BOARD PVA MASTIC INSULATION (POLYVINYL ACETATE). 2.DUCT TO BE INSULATED WITH GLASS FIBER-REINFORCED POLYISCYANURATE FOAM CORE LAMINATED BETWEEN 1.0 MIL SMOOTH, REFLECTIVE ALUMINUM FOIL FACERS ON BOTH SIDES. INSULATION SHALL BE THERMAX SHEATHING, MANUFACTURED BY DOW.

3.DUCT TO BE INSULATED WITH LAMINATED, FLEXIBLE, SELF-ADHERING, PROTECTIVE JACKETING, VAPOR BARRIER AND WEATHER PROOFING MEMBRANE, HAVING A ACRYLIC ADHESIVE CAPABLE OF INSTALLATION WITH NO ADDITIONAL MECHANICAL ATTACHMENT. JACKETING MATERIAL IS TO HAVE A MAXIMUM FLAME SPREAD/SMOKE DEVELOPED INDEX OF 25/20, PER ASTM-E 84 TEST, A .0000 WATER VAPOR PERMEANCE RATING PER ASTM E-96, AND MOLD INHIBITORS INCORPORATED. ALL PRODUCTS ARE UV STABLE. INSULATION SHALL BE VENTURECLAD 1579CW (13PLY).

FABRICATION AND INSTALLATION SHALL CONFORM TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND MIDWEST INSULATION CONTRACTORS ASSOCIATION NATIONAL INSULATION STANDARDS

PROVIDE MINIMUM OF R-8, 2" THICK FIBERGLASS BOARD INSULATION WITH ASJ JACKET ON ALL OUTDOOR INTAKE AIR DUCTS AND MAKE-UP AIR DUCTS. THE INSULATION SHALL PROVIDE A VAPOR BARRIER. ON KITCHEN HOOD EXHAUST DUCTWORK, PROVIDE A HIGH TEMPERATURE TWO HOUR RATED FIRE RESISTIVE ENCLOSURE ASSEMBLY (ASTM E 119), ZERO CLEARANCE TO COMBUSTIBLES (UL 1978 STANDARD FOR GREASE DUCTS), CLASS 1 INTERIOR FINISH MATERIALS (ASTM E 84); THROUGH PENETRATION PROTECTION SYSTEMS FOR COMMERCIAL KITCHEN GREASE AND AIR VENTILATION DUCTS (ASTM E 814/UL 1479), ISO-6944 1985 FIRE RESISTANCE TESTS - VENTILATION DUCTS.

INSULATION ON GREASE DUCTS SERVING A TYPE 1 HOOD TO BE SINGLE (OR MULTIPLE WRAP IF REQUIRED TO COMPLY WITH LOCAL CODES) WRAP "3M FIRE BARRIER WRAP" (SOLUBLE FIBER) OR APPROVED EQUAL WHEN THE FOLLOWING CONDITIONS ARE MET:

1.DUCT DOES NOT PENETRATE A CEILING, WALL OR FLOOR ENCLOSURE. 2.CLEARANCE FROM THE DUCT TO THE INTERIOR SURFACE OF ENCLOSURES OF COMBUSTABLE CONSTRUCTION SHALL BE NOT LESS THAN 18"

3.CLEARANCE FROM THE DUCT TO THE INTERIOR SURFACE OF ENCLOSURES OF NON COMBUSTABLE CONSTRUCTION OR GYPSUM WALL BOARD ATTACHED TO NONCOMBUSTABLE STRUCTURES SHALL BE NOT

INSULATION ON GREASE DUCTS SERVING A TYPE 1 HOOD TO BE MULTIPLE WRAP "3M FIRE BARRIER WRAP" (SOLUBLE FIBER), OR APPROVED EQUAL, AND IS TO BE IN ACCORDANCE WITH ASTM E 2336 WHEN THE

1.DUCT DOES PENETRATE A CEILING, WALL OR FLOOR ENCLOSURE. 2.CLEARANCE FROM THE DUCT TO THE INTERIOR SURFACE OF ENCLOSURES OF COMBUSTABLE CONSTRUCTION SHALL IS LESS THAN 18". 3.CLEARANCE FROM THE DUCT TO THE INTERIOR SURFACE OF ENCLOSURES OF NON COMBUSTABLE CONSTRUCTION OR GYPSUM WALL BOARD ATTACHED TO NONCOMBUSTABLE STRUCTURES IS LESS THAN 6".

THERMAL CERAMICS FASTDOOR XL FOR DUCT ACCESS TO TYPE 1 COMMERCIAL KITCHEN HOOD EXHAUST DUCTWORK AND FIRE RATED HVAC DUCT: INSTALL ACCESS OPENINGS AT EACH CHANGE IN DIRECTION AND AT INTERVALS AS REQUIRED BY CODE. INSULATION COVER SYSTEM SHALL BE TESTED AND LISTED BY UL (HNKT G18) TO PROVIDE ZERO CLEARANCE TO COMBUSTIBLE CONSTRUCTION AND 2-HOUR FIRE RATING PER ASTM E 2336. DUCT ACCESS COVER PANEL SHALL BE TESTED AND LISTED BY UL (YYXS.MH47995) WITH INTEGRAL NEOPRENE GASKET TO PROVIDE LIQUID TIGHT SEAL AND SHALL HAVE A HIGH TEMPERATURE GASKET AND SIGNAGE "ACCESS DOOR - DO NOT OBSTRUCT" COMPLIANT TO CODE AND NFPA 96. INSTALLATION SHALL BE PERFORMED BY AN EXPERIENCED CONTRACTOR PER MANUFACTURER INSTRUCTIONS AND APPLICABLE ULLISTINGS. SHEET METAL AND INSULATION CONTRACTORS SHALL COORDINATE INSTALLATION OF THE FASTDOOR XL AND THE DUCT ENCLOSURE SYSTEM.

8 INSTALLATION NOTES

PROVIDE A LOW VOLTAGE SYSTEM OF TEMPERATURE CONTROLS AND TEMPERATURE CONTROL WIRING IN CONDUIT FOR TEMPERATURE CONTROL SYSTEM AS FURNISHED BY MANUFACTURE OF EQUIPMENT AS SHOWN IN EQUIPMENT SCHEDULE. INSTALL NECESSARY CONTROLS INCLUDING WIRING FROM ROOM THERMOSTAT TO UNITS.

DURING CONSTRUCTION, PROVIDE TEMPORARY METAL OR TAPED POLYETHYLENE ON OPEN DUCTWORK TO PREVENT CONSTRUCTION DUST FROM ENTERING DUCTWORK. UNTIL TURNOVER FILTER MEDIA ON ALL RETURN DUCTS SHALL BE CHANGED TWICE A WEEK.

ALL THERMOSTAT SHALL BE LOCATED IN OFFICE BEHIND THE DOOR. THERMOSTATS SHALL BE MOUNTED 4'-0" AFF.

ALL ROOF PENETRATIONS ARE TO BE MADE BY USING AN APPROVED, PREFABRICATED ROOF CURB OR PIPE PORTAL.

PROVIDE ALL FLASHING AND COUNTERFLASHING COORDINATION IN ANY AREAS WHERE PIPING PENETRATES THROUGH ROOFED AREAS. CONTRACTOR SHALL COORDINATE THE SEALING AND WATERPROOFING OF SUCH AREAS WITH THE ROOFING CONTRACTOR IN ORDER TO MAINTAIN ALL WARRANTIES.

ALL FLOOR AND WALL PENETRATIONS ARE TO BE SLEEVED AND ARE TO BE SEALED TIGHT AND ARE TO BE INSTALLED TO MAINTAIN THE INTEGRITY OF THE SMOKE, FIRE, SOUND OR WEATHER BARRIER. PROVIDE ESCUTCHEON PLATES FOR PIPE PENETRATIONS AT FLOORS AND WALLS IN EXPOSED PUBLIC AREAS. ALL PENETRATIONS ARE TO BE INSTALLED TO MEET THE REQUIREMENTS OF ALL NFPA AND LOCAL

PROVIDE A 3-1/2" CONCRETE HOUSEKEEPING PAD UNDER ALL FLOOR MOUNTED EQUIPMENT.

9 TESTING AND BALANCING

PROVIDE ALL LABOR, MATERIAL, EQUIPMENT AND SERVICES REQUIRED TO FURNISH AND INSTALL, TEST AND ADJUST, ALL HEATING, VENTILATING, AIR CONDITIONING SYSTEMS COMPLETE IN ALL DETAIL AND READY FOR SATISFACTORY OPERATION. BALANCE ALL AIR DEVICES TO ±10% OF QUANTITIES INDICATED.

ON CENTRAL FAN SYSTEMS, PROVIDE THE FOLLOWING:

1.TEST, ADJUST AND RECORD ALL SUPPLY, RETURN AND EXHAUST FAN RPM TO DESIGN REQUIREMENTS FOR ALL MECHANICAL AIR MOVING EQUIPMENT SERVING AREAS INCLUDED IN THE PROJECT AS INDICATED ON DRAWINGS. 2.TEST AND RECORD MOTOR VOLTAGE AND RUNNING AMPERES INCLUDING MOTOR NAMEPLATE DATA AND STARTER RATINGS FOR ALL EXISTING AND NEW FANS AND PUMPS SERVING AREAS INCLUDED IN THE PROJECT AS INDICATED ON DRAWINGS. 3.MAKE PITOT TUBE TRAVERSE OF ALL MAIN SUPPLY, EXHAUST AND RETURN DUCTS SERVING AREAS INCLUDED IN THE PROJECT AS INDICATED ON DRAWINGS, DETERMINE AND RECORD CFM AT THESE FANS AND ADJUST THESE FANS TO PROVIDE REQUIRED DESIGN CFM. 4.TEST AND RECORD SYSTEM STATIC PRESSURE SUCTION AND DISCHARGE.

5.MEASURE AND RECORD ALL SUPPLY AIR DUCT TEMPERATURES IMMEDIATELY UPSTREAM OF ALL REHEAT COILS.

PROVIDE TEST AND BALANCE REPORTS FROM A CERTIFIED BALANCER TO THE OWNER. REPORTS SHALL SHOW ACTUAL CFM OF SUPPLY AND RETURN CAPACITIES AT EACH AIR DEVICE INCLUDING ACTUAL OBTAINED TEMPERATURES. INCLUDE ALL BALANCING DAMPERS AND OTHER RELATED ACCESSORIES AND ALL ACCESS DOORS IN SHEET METAL DUCTS AS REQUIRED FOR THE COMPLETE TESTING AND BALANCING WORK. CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO FINISHED WALLS OR CEILINGS WHILE COMPLETING THIS TESTING AND BALANCING WORK. RETESTING IS INCLUDED BY THIS CONTRACTOR IF CONTRACTOR FAILS TO SATISFY THE DESIGN PROFESSIONALS THAT ALL INSTALLATIONS ARE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IN THE EVENT THE DESIGN PROFESSIONALS ORDER RE-TESTING TO BE DONE AND THE WORK PROVES TO BE INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, ALL COSTS ASSOCIATED WITH THIS RE-TESTING WILL BE AT THE OWNER'S

THE BALANCING TECHNICIAN IS TO WORK WITH THE MECHANICAL TRADES, TEMPERATURE CONTROL CONTRACTOR AND THE ENGINEER TO PROVIDE "PROJECT COMMISSIONING" - DEFINED AS: "THE PROCESS OF ADVANCING SYSTEMS FROM A STATE OF STATIC PHYSICAL COMPLETION TO A STATE OF FULLY DEMONSTRATED AND DOCUMENTED WORKING ORDER, ACCORDING TO DESIGN REQUIREMENTS, DURING WHICH TIME THE OWNERS OPERATING STAFF ARE INSTRUCTED IN CORRECT SYSTEMS OPERATION AND MAINTENANCE."

THE MECHANICAL AND GENERAL CONTRACTOR SHALL NOT RECEIVE FINAL PAYMENT UNTIL THE OWNER AND ARCHITECT ARE IN RECEIPT OF AN HVAC TEST AND BALANCE REPORT PERFORMED BY AN INDEPENDENT NEBB OR AABC TEST AND BALANCE AGENCY.

10 PROJECT CLOSEOUT

PROVIDE VALVE TAGS, AND EQUIPMENT TAGS FOR ALL EQUIPMENT.

AT THE COMPLETION OF CONSTRUCTION, PROVIDE THE OWNER WITH A COMPLETE SET OF REPRODUCIBLE "AS-BUILT" DRAWINGS.

UPON COMPLETION OF THE CONTRACT, THE CONTRACTOR SHALL SUBMIT A COMPLETE SET OF MANUFACTURER'S INSTALLATION, OPERATING, MAINTENANCE, AND PREVENTIVE MAINTENANCE INSTRUCTIONS, AND PARTS LIST WITH NUMBERS AND DESCRIPTION FOR EACH PIECE OF EQUIPMENT. THE CONTRACTOR SHALL ARRANGE FOR AND PAY FOR, OWNER'S INSTRUCTIONS IN THE OPERATIONAL USE OF THE

11 MINIMUM PROJECT REQUIREMENTS TO COMPLY WITH 2018 IECC

1.MINIMUM ONE TEMPERATURE CONTROL DEVICE PER SYSTEM. (C403.2.A.1)

9.OPERATION AND MAINTENANCE MANUAL PROVIDED TO BUILDING OWNER. (C408.2.5.2)

10.BALANCING DEVICES PROVIDED IN ACCORDANCE WITH IMC 403.7.

2.MINIMUM ONE HUMIDITY CONTROL DEVICE PER INSTALLED HUMIDIFICATION/DEHUMIDIFICATION SYSTEM. (C403.2.A.1) 3.AUTOMATIC CONTROLS: SETBACK TO 55 DEGREES F (HEAT) AND 85 DEGREES F (COOL); 7-DAY CLOCK, 2-HOUR OCCUPANT OVERRIDE,

10-HOUR BACKUP. (403.2.4.2.2) a.EXCEPTION: CONTINUOUSLY OPERATING ZONES. **b.EXCEPTION: 2KW DEMAND OR LESS.** 

4.AUTOMATIC SHUT-OFF DAMPERS ON EXHAUST SYSTEMS AND SUPPLY SYSTEMS WITH AIRFLOW >300 CFM. (C403.2.4.3) 5.OUTSIDE-AIR SOURCE FOR VENTILATION; SYSTEM CAPABLE OF REDUCING OSA TO REQUIRED MINIMUM. (C403.2.4.3, PARA. 2) 6.R-6 SUPPLY AND RETURN AIR DUCT INSULATION IN UNCONDITIONED SPACES R-12 SUPPLY AND RETURN AIR DUCT INSULATION OUTSIDE THE BUILDING R-12 INSULATION BETWEEN DUCTS AND THE BUILDING EXTERIOR WHEN DUCTS ARE PART OF A BUILDING ASSEMBLY. (C403.2.9 -

a.EXCEPTION: DUCTS LOCATED WITHIN EQUIPMENT. b.EXCEPTION: DUCTS WITH INTERIOR AND EXTERIOR TEMPERATURE DIFFERENCE NOT EXCEEDING 15 DEGREES F. 7.DUCTS SEALED - LONGITUDINAL SEAMS ON RIDGID DUCTS; TRANSVERSE SEAMS ON ALL DUCTS; UL 181A OR 181B TAPES AND MASTICS.

(403.2.9 & IMC 603.9): a.EXCEPTION: CONTINUOUSLY WELDED AND LOCKING-TYPE LONGITUDINAL JOINTS AND SEAMS ON DUCTS OPERATING AT STATIC PRESSURES LESS THAN 2 INCHES W.G. PRESSURE CLASSIFICATION. 8.MECHANICAL FASTENERS AND SEALANTS USED TO CONNECT DUCTS AND AIR DISTRIBUTION EQUIPMENT. (C403.2.9.1.1-.3)

12 INSULATION SCHEDULE

No	DUCTWORK	MINIMUM R-VALUE	THICKNESS ( IN )	
1	SUPPLY DUCTS (CONCEALED ABOVE CEILING)	R-6	2"	
2	TRANSFER DUCTS	-	1"	
3	GENERAL EXHAUST WITHIN 10'-0" OF FAN	-	1"	
4	RETURN DUCTWORK (CONCEALED ABOVE CEILING)	R-6	1.5"	
5	OUTSIDE AIR AND MIXED AIR DUCTWORK	R-6	2"	
6	COMBUSTION AIR DUCTWORK	R-6	2"	
7	EXPOSED SUPPLY OR RETURN DUCTWORK IN MECHANICAL OR STORAGE ROOMS	R-6	2"	
8	DISHWASHER EXHAUST WITHIN 10'-0" OF FAN	-	1"	
9	EXTERIOR / ROOF MOUNTED DUCTWORK *	_	_	
10	KITCHEN EXHAUST DUCTWORK **	_	_	

GFF - GLASS FIBER, FLEXIBLE; GFL - GLASS FIBER DUCT LINER; GFR - GLASS FIBER, RIGID

SEE INSULATION NOTES THIS SHEET / HVAC ROOF PLAN - SEE INSULATION NOTES THIS SHEET AND HVAC DETAILS

SEE INSULATION NOTES THIS SHEET FOR COMPLETE REQUIREMENTS

COORDINATED SHOP DRAWINGS SHALL BE PROVIDED BY EACH SUBCONTRACTOR AND SHALL CONTAIN A LAYOUT OF ALL DUCTWORK, CONDUIT, PIPING, EQUIPMENT STRUCTURE, WALLS, CEILING, ETC. AS REQUIRED TO REFLECT FULL COORDINATION ACROSS ALL TRADES AND SHALL BE SUBMITTED FOR REVIEW. COORDINATED DRAWINGS SHALL BE SIGNED OFF BY ALL OTHER TRADES PRIOR TO BEING SUBMITTED FOR REVIEW. PLANS SHALL BE PREPARED AT A MINIMUM OF 1/8" SCALE OR THE SCALE OF THE DESIGN DRAWINGS, WHICHEVER IS LARGER. NO EQUIPMENT SHALL BE INSTALLED WITHOUT APPROVED SHOP DRAWINGS.

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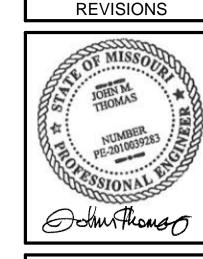
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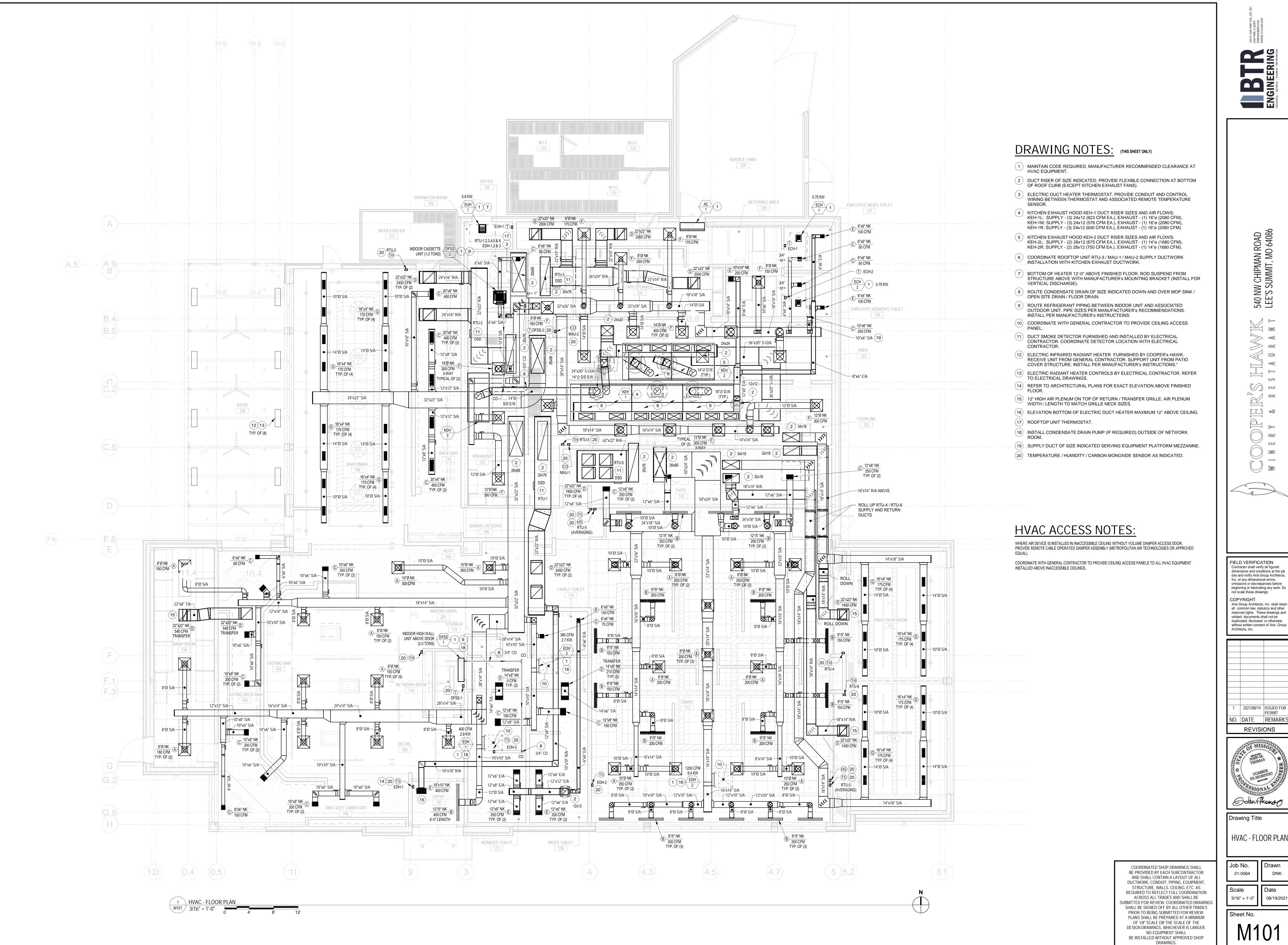
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Drawing Title HVAC - MECHANICA **SPECIFICATIONS** 

Job No. 21-0064 Scale

08/19/2021



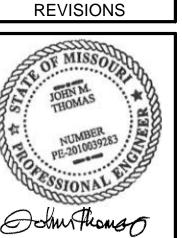


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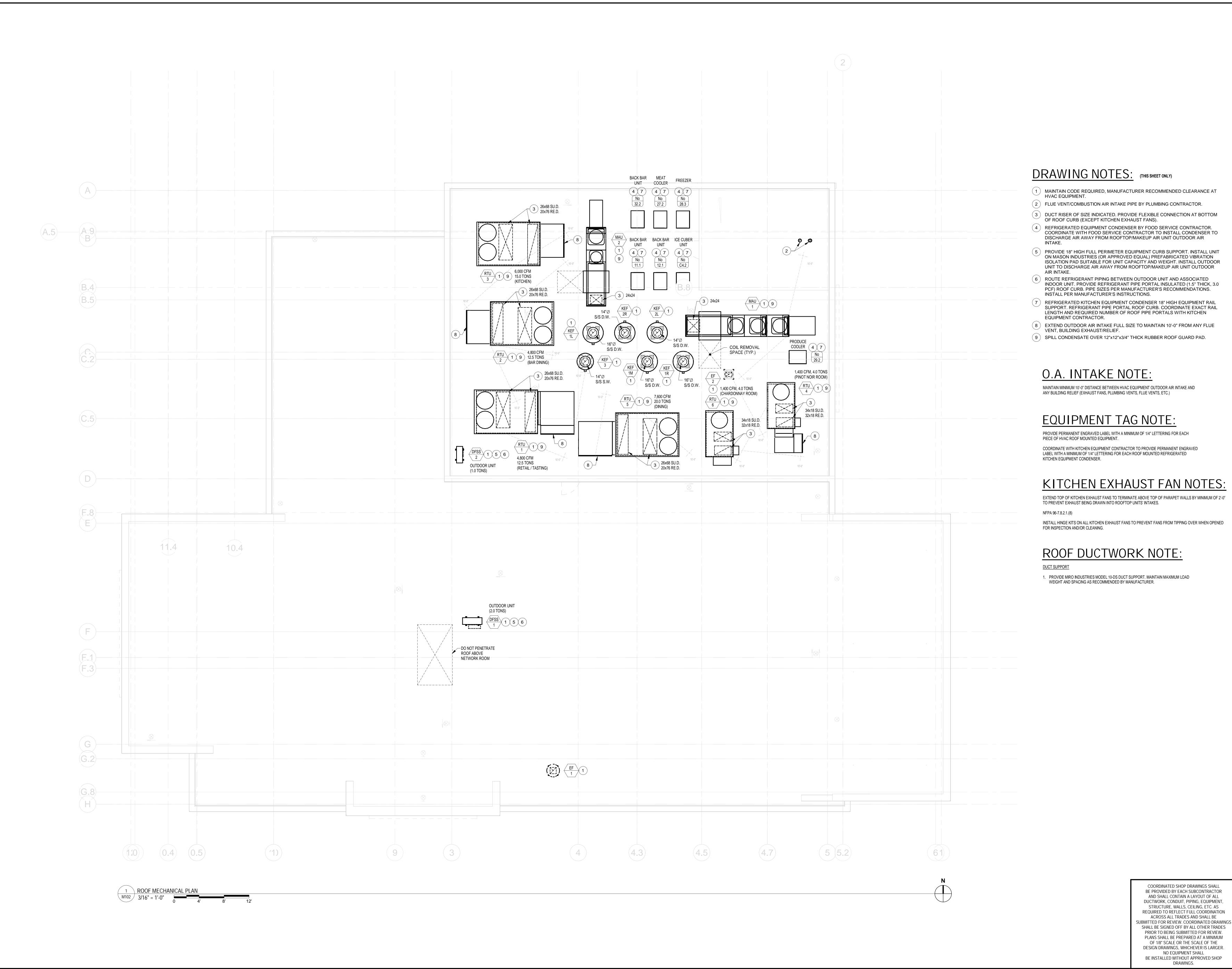


Drawing Title

HVAC - FLOOR PLAN

Job No. 21-0064

Scale 3/16" = 1'-0" 08/19/2021





540 NW CHIPMAN ROAD LEE'S SUMMIT, MO 64086

(2) FLUE VENT/COMBUSTION AIR INTAKE PIPE BY PLUMBING CONTRACTOR.

DISCHARGE AIR AWAY FROM ROOFTOP/MAKEUP AIR UNIT OUTDOOR AIR

(5) PROVIDE 18" HIGH FULL PERIMETER EQUIPMENT CURB SUPPORT. INSTALL UNIT ON MASON INDUSTRIES (OR APPROVED EQUAL) PREFABRICATED VIBRATION ISOLATION PAD SUITABLE FOR UNIT CAPACITY AND WEIGHT. INSTALL OUTDOOR UNIT TO DISCHARGE AIR AWAY FROM ROOFTOP/MAKEUP AIR UNIT OUTDOOR

6 ROUTE REFRIGERANT PIPING BETWEEN OUTDOOR UNIT AND ASSOCIATED INDOOR UNIT. PROVIDE REFRIGERANT PIPE PORTAL INSULATED (1.5" THICK, 3.0 PCF) ROOF CURB. PIPE SIZES PER MANUFACTURER'S RECOMMENDATIONS.

REFRIGERATED KITCHEN EQUIPMENT CONDENSER 18" HIGH EQUIPMENT RAIL SUPPORT. REFRIGERANT PIPE PORTAL ROOF CURB. COORDINATE EXACT RAIL LENGTH AND REQUIRED NUMBER OF ROOF PIPE PORTALS WITH KITCHEN

(8) EXTEND OUTDOOR AIR INTAKE FULL SIZE TO MAINTAIN 10'-0" FROM ANY FLUE

(9) SPILL CONDENSATE OVER 12"x12"x3/4" THICK RUBBER ROOF GUARD PAD.

MAINTAIN MINIMUM 10'-0" DISTANCE BETWEEN HVAC EQUIPMENT OUTDOOR AIR INTAKE AND

## KITCHEN EXHAUST FAN NOTES:

EXTEND TOP OF KITCHEN EXHAUST FANS TO TERMINATE ABOVE TOP OF PARAPET WALLS BY MINIMUM OF 2'-0" TO PREVENT EXHAUST BEING DRAWN INTO ROOFTOP UNITS' INTAKES.

INSTALL HINGE KITS ON ALL KITCHEN EXHAUST FANS TO PREVENT FANS FROM TIPPING OVER WHEN OPENED

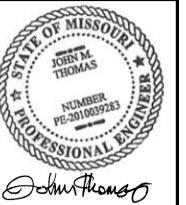
1. PROVIDE MIRO INDUSTRIES MODEL 10-DS DUCT SUPPORT. MAINTAIN MAXIMUM LOAD

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Drawing Title

HVAC - ROOF PLAN

21-0064

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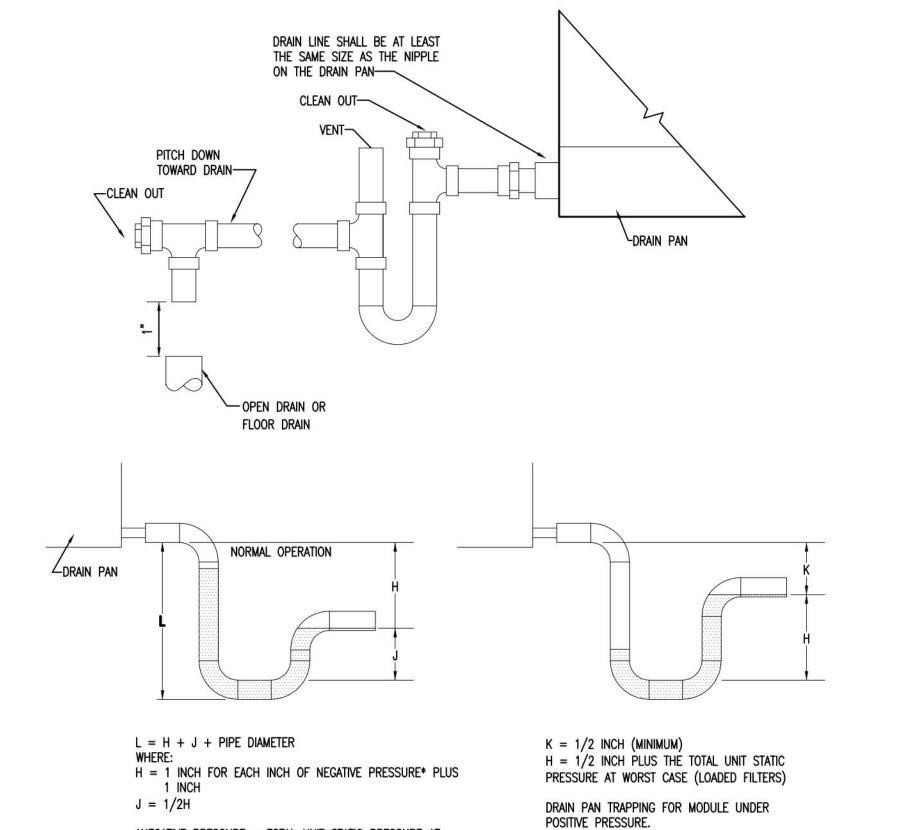
Drawing Title **HVAC - DETAILS** 

21-0064

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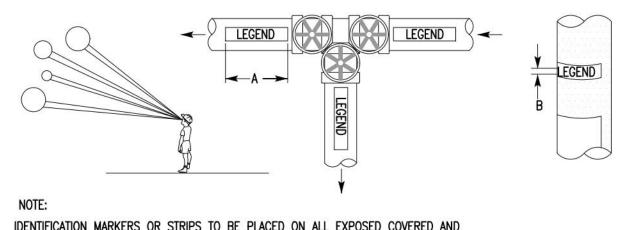


\*NEGATIVE PRESSURE = TOTAL UNIT STATIC PRESSURE AT

WORST CASE (LOADED FILTERS) MINUS EXTERNAL PRESSURE.

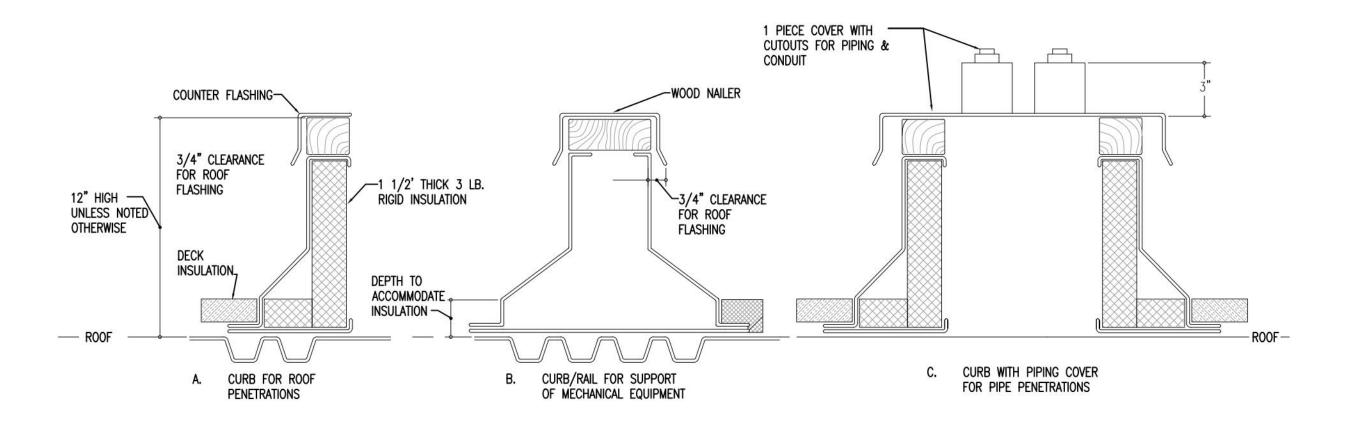
DRAIN PAN TRAPPING FOR MODULE UNDER NEGATIVE PRESSURE.

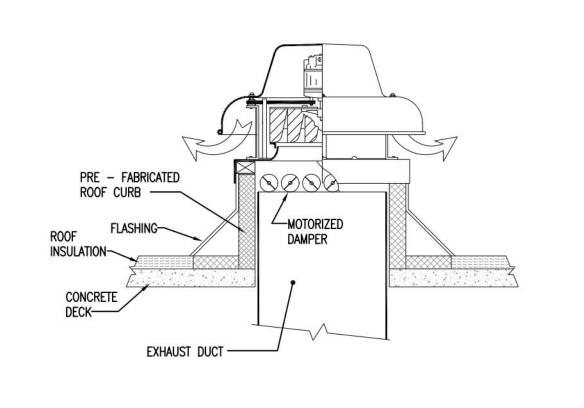
SCALE: NO SCALE



IDENTIFICATION MARKERS OR STRIPS TO BE PLACED ON ALL EXPOSED COVERED AND UNCOVERED PIPES AT 50'-0" INTERVALS AND AT ALL VALVES AND BRANCHES AND ON BOTH SIDES OF WALLS WHERE PIPES PASS THROUGH SAME. ARROWS OF SAME COLOR AS IDENTIFICATION MARKERS SHALL ALSO BE PLACED ON PIPES POINTING AWAY FROM MARKER INDICATING DIRECTION OF FLOW.

RKER INDICATING D	DIRECTION OF FLOW.		
	SIZE OF LEGEND	LETTERS	
	OUTSIDE DIAMETER OF PIPE OR COVERING	LENGTH OF COLOR FIELD A	SIZE OF LETTERS B
	3/4" TO 1-1/4" 1-1/2" TO 2" 2"-1/2" TO 6" 8" TO 10"	8" 8" 12" 24"	1/2" 3/4" 1-1/4" 2-1/2"
	OVER 10"	32"	3-1/2"
	SERVICE	BACKGROUND OR COLOR BAND	IDENTIFICATION MARKER
2.7			





AIR HANDLING UNIT TRAP

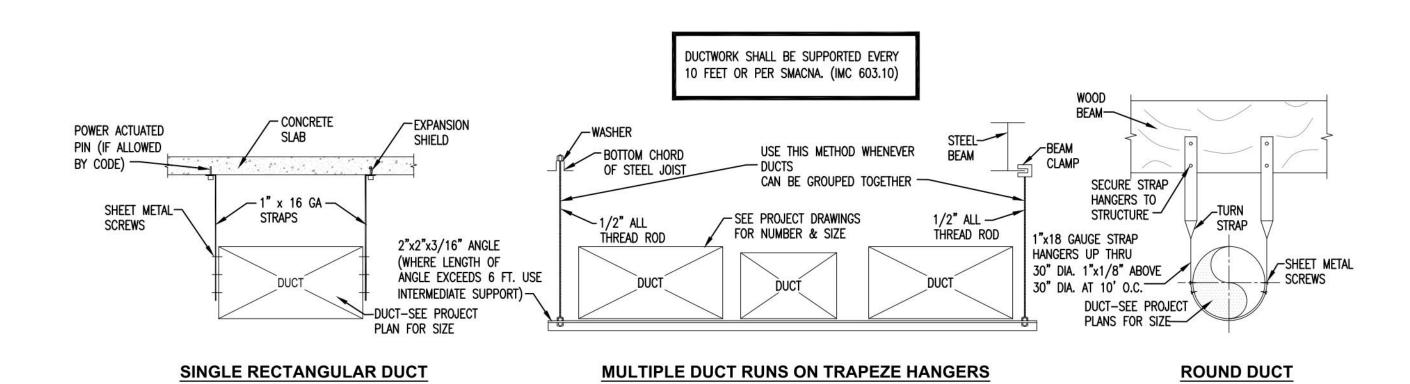
TYPICAL PIPE IDENTIFICATION MARKERS SCALE: NO SCALE

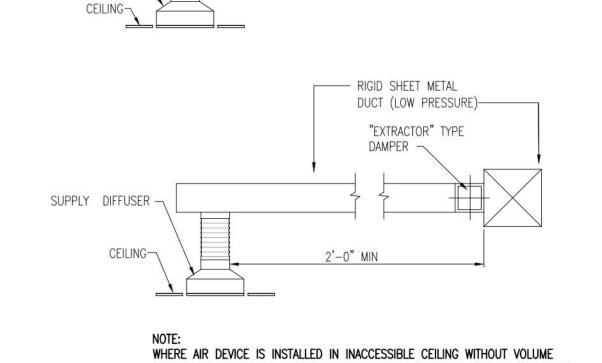
**CURBING AIR RAIL DETAIL** SCALE: NO SCALE

RIGID SHEET METAL DUCT

(LOW PRESSURE)

ROOF EXHAUST FAN DETAIL SCALE: NO SCALE





W/ LOCKING TYPE

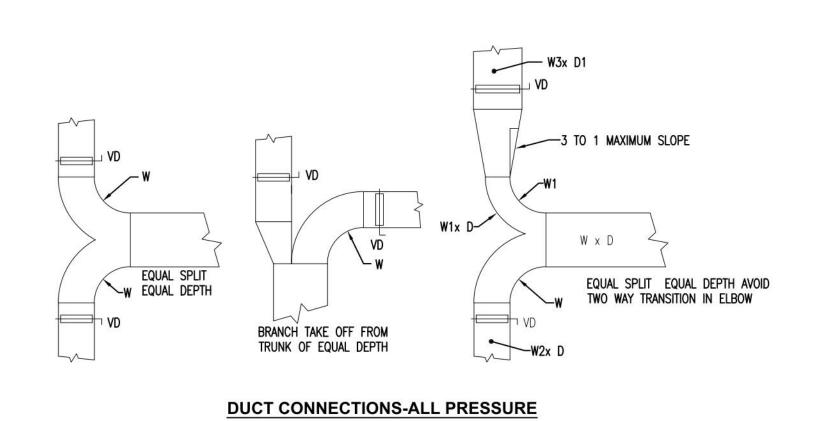
BALANCING DAMPER 7

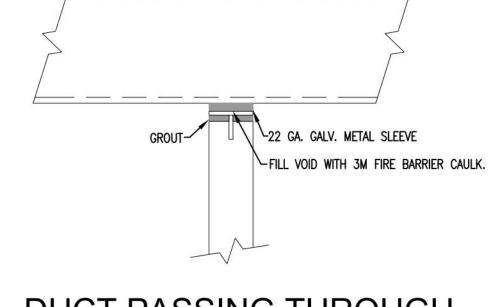
FLEX DUCT (MAX.

18" LONG) —

RIGID SHEET -METAL ELBOW

SUPPLY DIFFUSER





CONCRETE/BLOCK WALL

\_\_\_22 GA. GALV. METAL SLEEVE

PROVIDE ANCHOR AT NEW WALLS

LOW PRESSURE DUCT SUPPORT DETAIL SCALE: NO SCALE

TYPICAL SUPPLY DIFFUSER INSTALLATION SCALE: NO SCALE

(METROPOLITAN AIR TECHNOLOGIES OR APPROVED EQUAL).

DAMPER ACCESS DOOR, PROVIDE REMOTE CABLE OPERATED DAMPER ASSEMBLY

TYPICAL DUCT CONNECTIONS SCALE: NO SCALE

**DUCT PASSING THROUGH** INTERIOR WALL DETAIL SCALE: NO SCALE

> COORDINATED SHOP DRAWINGS SHALL BE PROVIDED BY EACH SUBCONTRACTOR AND SHALL CONTAIN A LAYOUT OF ALL DUCTWORK, CONDUIT, PIPING, EQUIPMENT, STRUCTURE, WALLS, CEILING, ETC. AS REQUIRED TO REFLECT FULL COORDINATION ACROSS ALL TRADES AND SHALL BE SUBMITTED FOR REVIEW. COORDINATED DRAWINGS SHALL BE SIGNED OFF BY ALL OTHER TRADES PRIOR TO BEING SUBMITTED FOR REVIEW. PLANS SHALL BE PREPARED AT A MINIMUM OF 1/8" SCALE OR THE SCALE OF THE

DESIGN DRAWINGS, WHICHEVER IS LARGER. NO EQUIPMENT SHALL BE INSTALLED WITHOUT APPROVED SHOP DRAWINGS.

reserved rights. These drawings and

related documents shall not be

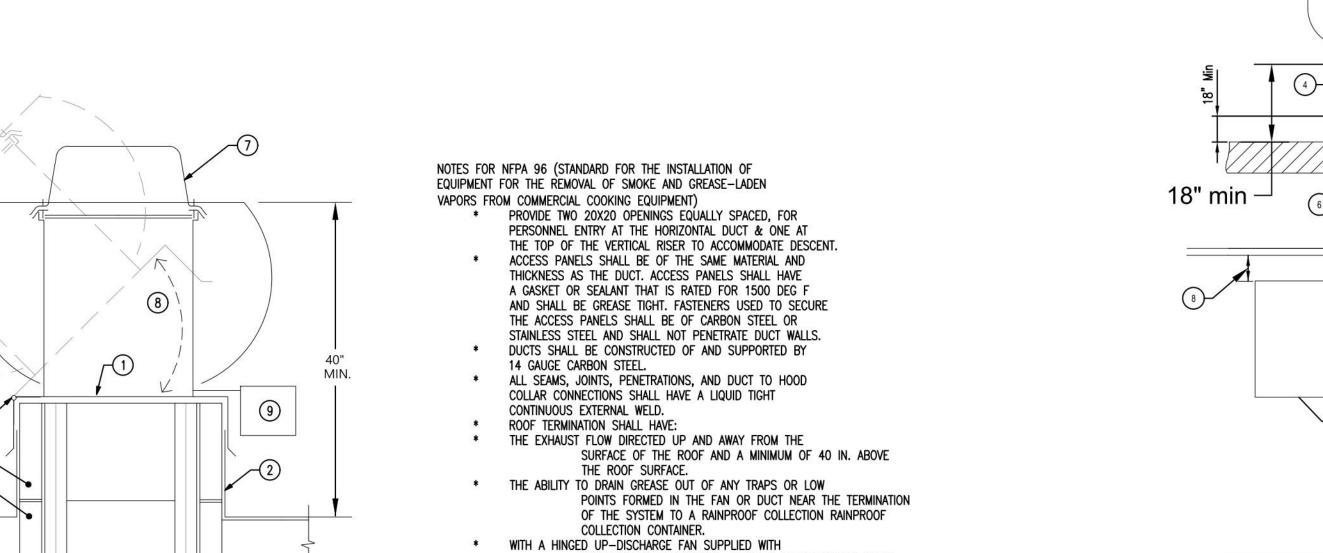
Architects, Inc.

duplicated, disclosed or otherwise

without written consent of Aria Group

N.T.S.

Sheet No.



\* THE OPERATION OF THE HOOD EXTINGUISHING SYSTEM SHALL

FEMPERATURE, INORGANIC, FOIL ENCAPSULATED CERAMIC

FIBER BLANKET DUCT WRAP, ALLOWING A ZERO INCH

HOUR FIRE RESISTIVE RATED ENCLOSURE. INSULATION

SHALL BE REMOVABLE AT CLEANOUTS. LOCATIONS TO

BE TAGGED WITH A 2" BRASS TAG.

WEATHERPROOF ELECTRICAL CABLE & SERVICE HOLD-OPEN

RETAINER TO PERMIT PROPER INSPECTION AND CLEANING.



1) NEOPRENE SEAL BETWEEN CURB & BASE. ATTACH

BASE TO CURB W/8 EVENLY SPACED BOLTS.

(3) BLACK IRON WELDED TYPE 1 HOOD EXHAUST DUCT.

6 FACTORY FABRICATED ROOF CURB W/FLASHING. NAIL TO ROOF PRIOR TO SEALANT APPLICATION.

PROVIDE FLEX CONNECTION FOR HINGE OPERATION.

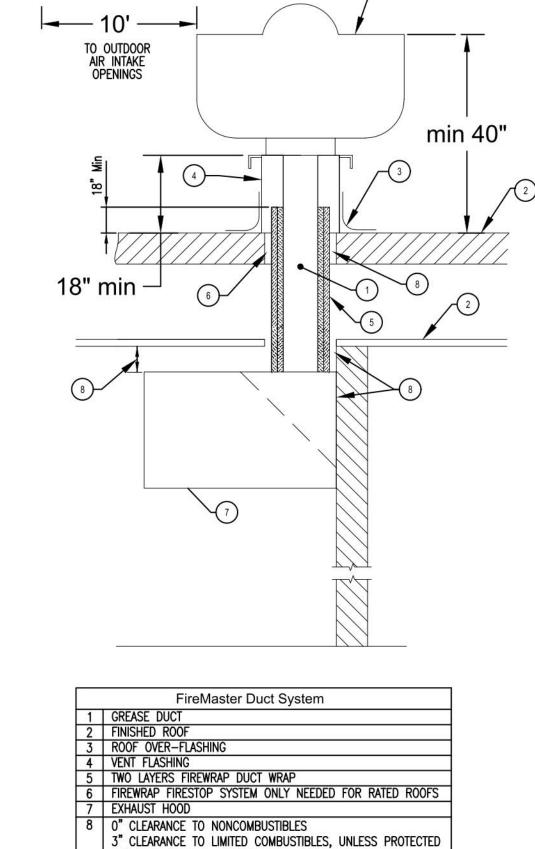
(8) COORDINATE WITH ELECTRICAL CONTRACTOR TO

10) FIRE RATED ENCLOSURE (TWO LAYERS OF FIRE

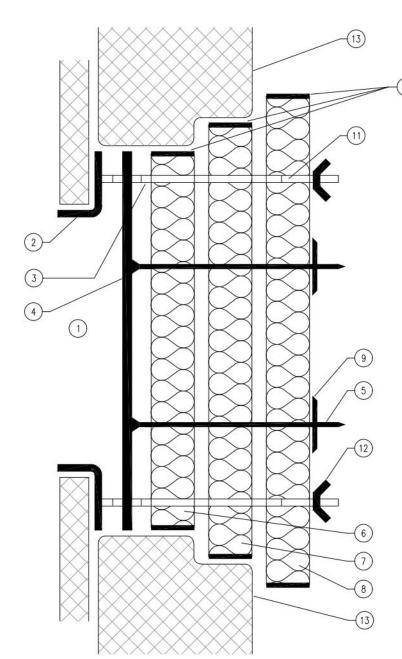
GREASE COLLECTOR.

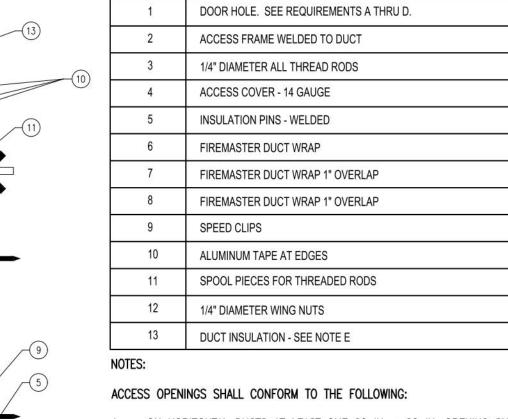
RATED INSULATION).

FACTORY SUPPLIED VENTILATED CURB EXTENSION WITH HINGE.



HINGED UPBLAST EXHAUST FAN





- ON HORIZONTAL DUCTS AT LEAST ONE 20 IN. x 20 IN. OPENING SHALL BE PROVIDED FOR PERSONNEL ENTRY. WHERE AN OPENING OF THIS SIZE IS NOT POSSIBLE, OPENINGS LARGE ENOUGH TO PERMIT THOROUGH CLEANING SHALL BE PROVIDED AT 12-FT INTERVALS
- IN HORIZONTAL SECTIONS, THE LOWER EDGE OF THE OPENING SHALL BE NOT LESS THAN 1 1/2 IN. FROM THE BOTTOM OF THE DUCT.
- ON VERTICAL DUCTWORK WHERE PERSONNEL ENTRY IS POSSIBLE, ACCESS SHALL BE PROVIDED AT THE TOP OF THE VERTICAL RISER TO ACCOMMODATE DESCENT. WHERE PERSONNEL ENTRY IS NOT POSSIBLE, ADEQUATE ACCESS FOR CLEANING SHALL BE PROVIDED ON EACH FLOOR.
- & SHALL BE GREASETIGHT. FASTENERS USED TO SECURE THE ACCESS PANELS, SUCH AS BOLTS, WELD STUDS, LATCHES, OR WING NUTS, SHALL BE CARBON STEEL OR STAINLESS STEEL & SHALL NOT PENETRATE DUCT WALLS.
- INSULATION SHALL BE A HIGH TEMPERATURE, INORGANIC FOIL ENCAPSULATED CERAMIC FIBER BLANKET DUCTWRAP, ALLOWING A ZERO INCH CLEARANCE TO COMBUSTIBLE CONSTRUCTION & A TWO HOUR FIRE RESISTIVE RATED ENCLOSURE. U.L. LISTED

## KITCHEN EXHAUST FAN (TYPE 1 HOOD) DETAIL SCALE: NO SCALE (KEF-1L, KEF-1M, KEF-1R, KEF-2L, KEF-2R)

THE INTERNAL DUCT DIAMETER. IN NO CASE SHALL THE MATERIAL

THAN 1½" WIDE

SUPPORTING FLEXIBLE DUCT THAT IS IN DIRECT CONTACT WITH IT BE LESS



18" CLEARANCE TO COMBUSTIBLES, UNLESS PROTECTED

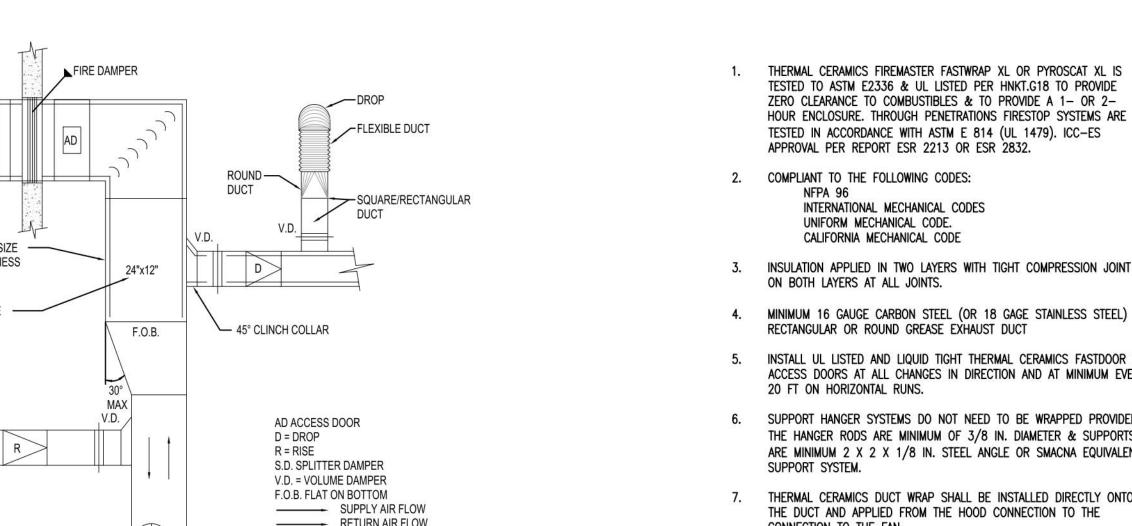


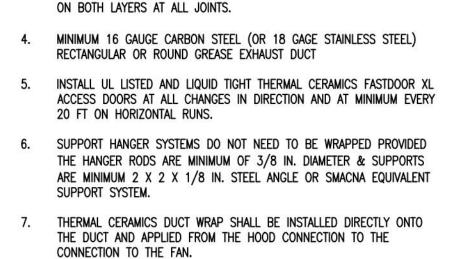
FIRE RATED ENCLOSURE - GREASE DUCT DETAIL

SCALE: NO SCALE

SCALE: NO SCALE

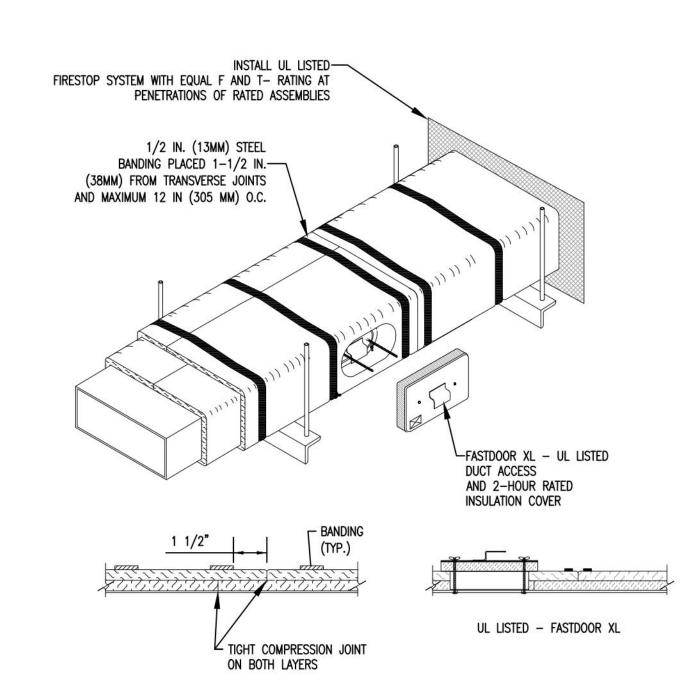






8. THERMAL CERAMICS DUCT ENCLOSURE SYSTEM SHALL BE INSTALLED IN

STRICT ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS & UL LISTINGS.





SCALE: NO SCALE

FLEXIBLE DUCT HANGER AND CONNECTION DETAIL SCALE: NO SCALE

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SHALL BE SIGNED OFF BY ALL OTHER TRADES PRIOR TO BEING SUBMITTED FOR REVIEW. PLANS SHALL BE PREPARED AT A MINIMUM OF 1/8" SCALE OR THE SCALE OF THE DESIGN DRAWINGS, WHICHEVER IS LARGER. NO EQUIPMENT SHALL BE INSTALLED WITHOUT APPROVED SHOP

DRAWINGS.

	12112211111				
EQUIPMENT TAG	SUPPLY AIR (CFM)	RETURN AIR (CFM)	OUTDOOR AIR (CFM)	RELIEF/EXH. AIR (CFM)	PRESSURE (CFM)
BUILDING AIR BALANCE				•	
RETAIL / TOILETS	4,800	(3,970)	830	(940)	(110)
BAR / BAR DINING	4,800	(4,020)	780	0	780
DINING	6,600	(5,141)	1,459	0	1,459
PRIVATE ROOM I	1,400	(1,140)	260	(260)	0
PRIVATE ROOM II	1,400	(1,140)	260	(260)	0
EXPO	1,000	(779)	221	0	221
COOKLINE (A/C)	1,800	(1,500)	300	0	300
COOKLINE (MUA/EXH)	5,400	0	5,400	(6,240)	(840)
PREP (A/C)	2,000	(1,667)	333	0	333
PREP (MUA/EXH)	2,850	0	2,850	(3,600)	(750)
STOR / TOIL / EQUIP PLAT	700	(583)	117	(400)	(283)
BREAK / OFFICE / RECEIVING	600	(500)	100	0	100
DISHWASHING (A/C)	900	(750)	150	0	150
DISHWASHING (EXH) *	0	0	0	(1,125)	(1,125)
BUILDING TOTAL =	34,250	(21,190)	13,060	(11,700)	1,360
EQUIPMENT AIR BALANCE					
RTU-1	4,800	(3,970)	830	0	830
RTU-2	4,800	(4,020)	780	0	780
RTU-3	6,000	(5,000)	1,000	0	1,000
RTU-4	1,400	(1,140)	260	(260)	0
RTU-5	7,600	(5,920)	1,680	0	1,680
RTU-6	1,400	(1,140)	260	(260)	0
MAU-1	5,400	0	5,400	0	5,400
MAU-2	2,850	0	2,850	0	2,850
KEF-1L	=			(2,080)	(2,080)
KEF-1M				(2,080)	(2,080)
KEF-1R				(2,080)	(2,080)
KEF-2L				(1,800)	(1,800)
KEF-2R				(1,800)	(1,800)
KEF-3 *				(1,125)	(1,125)
EF-1	11 00 0 11 00 0	==		(940)	(940)
EF-2	==			(400)	(400)
BUILDING TOTAL	34,250	(21,190)	13,060	(11,700)	1,360

	HVAC DESIG	ON CRITERIA	
DESIGN	DATA FROM ASHRAE - 20	017 FUNDAMENTALS HAN	IDBOOK
SUMER OUTSIDE DES	IGN TEMPERATURE *	INSIDE DESIGN	TEMPERATURE
DRY BULB [°F]	WET BULB [°F]	DRY BULB [°F]	WET BULB [°F]
96	76.5	75	62.6
WINTER OUTSIDE DES	SIGN TEMPERATURE *	INSIDE DESIGN	TEMPERATURE
DRY BULB [°F]	WET BULB [°F]	DRY BULB [°F]	WET BULB [°F]
2.4	1.1	70	53.0
* WMO No. 724460	- KANSAS CITY INTER	NATIONAL AIRPORT, I	МО

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NOTES:

2.) COORDINATED WITH TABLE 403.3.

3.) OPEN TO ADJACENT AREA.

PATIO

1.) SEE ARCHITECTURAL DRAWINGS FOR MINIMUM / ACTUAL OPERABLE AREA.

			VENTII	LATION SO	HEDULE		MIT, MO CITY	_	CAL CODE	= ( INTERNA	ATIONAL	MECHANICA	AL CODE -	- 2018 ) 					
				ROOM DATA		NATURAL VENTI	LATION (SECTION 402)					MECHANICAL	/ENTILATION (S	SECTION 403)					
ROOM	ROOM NAME	OCCUPANCY CLASSIFICATION	FOOR AREA	HEIGHT	VOLUME	MIN. OPERBL.	ACTUAL		MAX. LOAD		REQUIRE	ED OUTSIDE AIR /	EXHAUST			ACTUAL RO	OM VENTILATIO	N	NOTES
NUMBER	ROOM NAME	OCCOLANCE CEASSIFICATION	FOOR AREA	HEIGHT	VOLUME	AREA	OPERBL. AREA		MB. FIXTURES	CFM/ PERSON	O.A.	EXHAUST CFM/SQ.FT.	TOTAL O A	EVIIALIST CEM		SUPPLY CFN	И	EXHAUST CFM	NOTES
			SQ.FT.	FT.	CU.FT.	SQ.FT.	SQ.FT.	PER 1000 SQ.FT.	ACTUAL	CFM/ PERSON	CFM/SQ.FT.	CFM/WC (UR)	TOTAL O.A.	EXHAUST CFM	TOTAL	% O.A.	TOTAL O.A.	EXHAUST CFM	
ROOFTOP U	NIT RTU-1 (RETAIL / TASTING	BAR)										•				-			
101	ENTRY	CORRIDORS & UTILITIES	57	10.5	599	3	SEE NOTE 1	-	0	0	0.06	<del>=</del> 0	4		400	17.3	69	-	1,2
102	RETAIL	RETAIL STORES / SALES FLOORS	674	11.8	7,953	27	SEE NOTE 1	15	12	7.5	0.12	4-1	171		1,050	17.3	182		1,2
103	TASTING BAR	BARS / COCKTAIL LOUNGES	146	11.8	1,723	6	SEE NOTE 1	100	24	7.5	0.18	-	207		0	17.3	0		1,2,3
104	TASTING BAR BACK	BARS / COCKTAIL LOUNGES  RETAIL STORES / SALES FLOORS	502	11.5	5,773 1,518	21	SEE NOTE 1	100	10	7.5 7.5	0.18		121 91		1,360 400	17.3	235		1,2 1,2
105	TAKE-OUT / CARY-OUT HOST	LOBBIES / PREFUNCTION	132 165	11.5	1,898	7	SEE NOTE 1	15 30	10	7.5	0.12		85		300	17.3	69 52		1,2,3
107	WAITING AREA	LOBBIES / PREFUNCTION	133	12.0	1,596	6	SEE NOTE 1	30	10	7.5	0.06		83		0	17.3	0		1,2,3
108	BARREL RESERVE	LOBBIES / PREFUNCTION	132	11.5	1,518	6	SEE NOTE 1	30	0	7.5	0.06	-	8	-	300	17.3	52		1,2
-	TOILET HALL	CORRIDORS & UTILITIES	118	10.0	1,180	5	SEE NOTE 1		0	0	0.06	**	8		0	17.3	0		1,2,3
115	STORAGE	STORAGE ROOMS	16	9.0	144	1	SEE NOTE 1	1	0		0.12	4-1	2		0	17.3	0		1,2,4
117	WOMEN'S TOILET	TOILET ROOMS - PUBLIC	201	9.0	1,809	9	SEE NOTE 1	11	3		V	50		(150)	190	17.3	33	(400)	1,2
118	MEN'S TOILET	TOILET ROOMS - PUBLIC	201	9.0	1,809	9	SEE NOTE 1		4	1441	2 <b>8-6</b> 0	50		(200)	190	17.3	33	(400)	1,2
119	FAMILY TOILET	TOILET ROOMS - PUBLIC	67	9.0	603	3	SEE NOTE 1	(**)	1	,:		50		(50)	70	17.3	12	(140)	1,2
135	WRAPPING ROOM	STORAGE ROOMS	380	9.0	3,420	16	SEE NOTE 1	.=	0	\ <del></del> /	0.12		46		540	17.3	93		1,2
		TOTAL =	= 2,924						70		>		826	(400)	4,800		830	(940)	
	NIT RTU-2 (BAR DINING)	T	<del></del>		T 2000			T	· i	т т	<u> </u>	Ţ.		T T	9 9 90	<del></del>	Ť	<del></del>	
109	BAR DINING	DINING ROOMS	755	10.5	7,928	31	SEE NOTE 1	70	53	7.5	0.18		534	7 <del>5.5</del>	2,800	16.3	455		1,2,3
110	BAR	BARS / COCKTAIL LOUNGES	103	10.5	1,082	5	SEE NOTE 1	100	16	7.5	0.18	==0.	139		0	16.3	0		1,2,3
110	BAR BACK	BARS / COCKTAIL LOUNGES	437	11.5	5,026	18	SEE NOTE 1	100	3	7.5	0.18	-	102	-	2,000	16.3	325		1,2
POOLTOP II	NIT DTU 2 (KITOUEN)	TOTAL =	1,295						72				775	0	4,800		780		
	NIT RTU-3 (KITCHEN)	KITCHENS (COOKING)	T 445 T		4 005	T 20	OFF NOTE 4	Ī	1 .	1 1				(242)	4.000		1	(0.240)	40
121	COOKLINE	KITCHENS (COOKING)	445	9.0	4,005 2,376	18	SEE NOTE 1		4		·	0.7		(312)	1,800	16.7	300	(6,240)	1,2
122	DISHWASH	KITCHENS (COOKING)  KITCHENS (COOKING)	264 445	9.0	4,005	11	SEE NOTE 1	1-47	2		8 <del></del> 8	0.7		(185)	900 2,000	16.7	150 333	(1,125)	1,2 1,2
123	DRY STORAGE	STORAGE ROOMS	198	9.0	1,782	16	SEE NOTE 1	-	1 0	-	0.12	0.7	24	(312)	200	16.7	333	(3,000)	1,2
	KITCHEN HALLWAY	KITCHENS (COOKING)	233	9.0	2,097	10	SEE NOTE 1		0			0.7		(164)	180	16.7	30		1,2,3
130	RECEIVING AREA	KITCHENS (COOKING)	196	9.0	1,764	8	SEE NOTE 1	-	2			0.7	4400	(138)	340	16.7	57		1,2,3
125	EMPLOYEE BREAK AREA	KITCHENS (COOKING)	150	9.0	1,350	6	SEE NOTE 1		2		<u>.</u> ∀ <b>=</b> 4:	0.7		(105)	150	16.7	25	(200)	1,2
127	EMPLOYEE MEN'S TOILET	TOILET ROOM	56	9.0	504	3	SEE NOTE 1	0	1	0	2-4	50		(50)	50	16.7	8	(100)	1,2
128	EMPLOYEE WOMEN'S TOILET	TOILET ROOM	56	9.0	504	3	SEE NOTE 1	0	1	0	V==	50		(50)	50	16.7	8	(100)	1,2
200	EQUIPMENT PLATFORM	CORRIDORS & UTILITIES	300	10.0	3,000	12	SEE NOTE 1		0		0.06		18		250	16.7	42		1,2
		TOTAL =	2,343						16				42	(1316)	6,000		1,000	(11,365)	
ROOFTOP U	NIT RTU-4 (PINO NOIR ROOM	)				1	<u>'</u>	•											
113	PINO NOIR ROOM	DINING ROOMS	350	11.0	3,850	14	SEE NOTE 1	70	26	7.5	0.18		258		1,400	18.6	260		1,2
		TOTAL =	= 350			20			26				258	0	1,400		260		
ROOFTOP U	NIT RTU-5 (DINING)		- 1		is.	e <sup>t</sup> e	4		·	ali ali		122					•		
112	DINING	DINING ROOMS	2122	11.5	24,403	85	SEE NOTE 1	70	155	7.5	0.18	#	1,545	=	6,600	22.1	1,459		1,2,3
120	EXPO	DINING ROOMS	397	9.0	3,573	16	SEE NOTE 1	70	6	7.5	0.18		117		1,000	22.1	221		1,2
		TOTAL =	2,519						161				1,675	0	7,600		1,680		
ROOFTOP U	NIT RTU-6 (CHARDONNAY RO	OOM)	¥ 22		50°	75-1			23	2210		66					V		
114	CHARDONNAY ROOM	DINING ROOMS	361	11.0	3,971	15	SEE NOTE 1	70	26	7.5	0.18		260		1,400	18.6	260		1,2
		TOTAL =	= 361			20			26				260	0	1,400		260		ĺ
DUCT FREE	SPLIT SYSTEM DFSS-1					,													
116	NETWORK ROOM	CORRIDORS & UTILITIES	42	9.0	378	2	SEE NOTE 1	0	0	0	0.06		3	<del></del>	0	0.0	0		1,2,4
		TOTAL =	42										3	0	0		0		-
DUCT FREE	SPLIT SYSTEM DFSS-2																		
125	OFFICE	OFFICE SPACES	129	9.0	1,161	6	SEE NOTE 1	5	1	5	0.06		13		80	16.7	13		1,2,6
		TOTAL =	129						1				13	0	80		13		į
MISCELLANI	EOUS	1												1				_	
111	BEER COOLER	NOT APPLICABLE	121	0.0	0	0		0	0	0	0		0		0	0.0	0		
130	WALK-IN COOLER I	NOT APPLICABLE	180	0.0	0	0		0	0	0	0	-	0		0	0.0	0		
131	WALK-IN COOLER II	NOT APPLICABLE	134	0.0	0	0		0	0	0	0		0		0	0.0	0		
132	WALK-IN FREEZER	NOT APPLICABLE	67	0.0	0	0		0	0	0	0		0		0	0.0	0		
126	SPRINKLER ROOM	CORRIDOR & UTILITY	36	15.5	558	2	SEE NOTE 1	0	0	0	0.06		3		0	0.0	0		1,2,5
129	TRASH ENCLOSURE	NOT APPLICABLE	537	0.0	0	0	=	0	0	0	0	-	0	-	0	0.0	0	-	
122	DATIO	NOT ADDITIONALE	755	0.0			499.7	. ^			^	1 comme	^	1 Seeks	^			1	

			MECH	ANICAL / ELEC	TRICAL COORI	DINATION SCH	EDULE		
EQUIPMENT / DEVICE			UNIT MO	JNTED DEVICES		REM	OTE OR LOOSE DEV	ICES	
TAG	EQUIPMENT DESCRIPTION	STARTER	DISCONNECT	OVERCURRENT PROTECTION	SINGLE POINT CONNECTION	STARTER	DISCONNECT	OVERCURRENT PROTECTION	NOTES
AC	AIR CURTAIN (ELECTRIC)	MANUF	MANUF					E	UNITS WITH MULTIPLE CIRCUITS REQUIRE DEDICATED DISCONNECT PER CIRCUIT
DFSS (INDOOR)	DUCT FREE SPLIT SYSTEM	MANUF	MANUF		MANUF			E	
DFSS (OUTDOOR)	DUCT FREE SPLIT SYSTEM	MANUF			MANUF		E	E	
DSD	DUCT SMOKE DTECTOR								FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE LOCATION WITH MECHANICAL CONTRACTOR
EDH	ELECTRIC DUCT HEATER	MANUF	MANUF		2			E	
EF (KEF, EF)	EXHAUST FAN		MANUF			SEE NOTES		E	FOR STARTER INFORMATION, REFER TO EQUIPMENT SCHEDULE AND SEQUENCE OF OPERATIONS
EUH	ELECTRIC UNIT HEATER	MANUF					E	E	
MAU	KITCHEN MAKEUP AIR UNIT					E	E	E	INTERLOCK WITH KITCHEN EXHAUST HOOD
RTU	ROOFTOP UNIT	MANUF			MANUF		E	E	

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GENERAL NOTES:

755

**NOT APPLICABLE** 

0.0

4.) OPEN TO ADJACENT AREA WHEN IN USE.

6.) OUTDOOR AIR PROVIDED BY ROOFTOP UNIT RTU-3.

5.) OPEN TO OUTDOORS WHEN IN USE.

1.) DEVICES TO BE FURNISHED BY THE ELECTRICAL CONTRACTOR (MARKED "E"), MECHANICAL CONTRACTOR (MARKED "M"), PLUMBING CONTRACTOR (MARKED "P"), FIRE PROTECTION CONTRACTOR (MARKED "FP"), OR MANUFACTURER (MARKED "MANUF").

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2.) ALL CONDUIT AND WIRING FOR TEMPERATURE CONTROL AND EQUIPMENT INTERLOCK SHALL BE BY MECHANICAL CONTRACTOR. OTHER CONTROLS AND CONTROL CONDUIT/WIRING BY TRADE FURNISHING RESPECTIVE EQUIPMENT.

3.) IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTROL TRANSFORMER, AND CONTRACTOR TO COORDINATE AND REVIEW THE ELECTRICAL CHARACTERISTICS, AMPACITY AND OTHER REQUIREMENTS OF COMPONENTS BEFORE INSTALLATION OF WORK. ALL OTHER CONTRACTORS SHALL ADVISE ELECTRICAL CONTRACTOR OF ANY MOTOR/DEVICE 5.) SEE SPECIFICATIONS AND DR CHANGES.

4.) ALL LOOSE STARTERS SHALL INCLUDE HOA SWITCH, CONTROL TRANSFORMER, AND ONE N.O. AND ONE N.C. AUXILIARY CONTACTS. ALL SINGLE PHASE EXHAUST FAN CONTROL SWITCHES SHALL HAVE IDENTIFICATION NAMEPLATE AND PILOT LIGHT.

5.) SEE SPECIFICATIONS AND DRAWINGS FOR TYPES AND LOCATIONS OF DEVICES SCHEDULED.

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COORDINATED SHOP DRAWINGS SHALL
BE PROVIDED BY EACH SUBCONTRACTOR
AND SHALL CONTAIN A LAYOUT OF ALL
DUCTWORK, CONDUIT, PIPING, EQUIPMENT,
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COPERS HAWK 540 NW (

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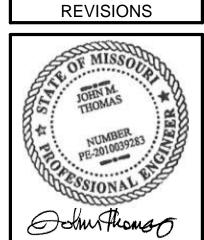
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Drawing Title

HVAC - SCHEDULES

Job No.
21-0064 Drawn
DNK

Scale Date 08/19/2021

		NOMINAL	TOTAL	MIN O.A.			COOLING (	ONDENSER FAN	EAT=95 oF)			GAS HEAT	ΓING			FAN MOT	OR	POWER			ELECT	RIC			FILT	TERS	OPERATING		MANUFACTURER	
TAG	SERVICE	TONS	CFM	CFM	% OA CFM	TOTAL MBH	SENSIBLE MBH	EAT DB / WB	LAT DB / WB	R-410A (lbs.)	INPUT/OUTPUT MBH	EAT / LAT (oF)	STAGES	MIN / MAX GAS PRESSURE (IN.)	ВНР	НР	ESP (IN. WC)		MCA	МОСР	VOLT	PH	HZ EE	ER / IEER / SEER	SIZES	TYPE	WEIGHT (LBS.)	SYSTEM	MODEL NUMBER	NOTES
RTU-1	RETAIL	12.5	4,800	830	17.3	145.1	100.5	78.3 / 65.7	58.9 / 55.8	12.7 + 6.8	250 / 200	58.3 / 96.7	2	2.5 - 14	2.69	3.0	1.0	NONE	66	80	208	3	60	12.1 EER	(4) 20x20 (4) 20x25	2" T.A.	2,790	CAV VERTICAL	TRANE YHD 150	1 THRU 7
RTU-2	BAR DINING AREA	12.5	4,800	780	16.3	140.5	103.5	76.7 / 63.4	56.7 / 53.3	12.7 + 6.8	250 / 200	59.0 / 97.4	2	2.5 - 14	2.7	3.0	1.0	NONE	66	80	208	3	60	12.1 EER	(4) 20x20 (4) 20x25	2" T.A.	2,790	CAV VERTICAL	TRANE YHD 150	1 THRU 7
RTU-3	KITCHEN	15.0	6,000	1,000	16.7	184.8	144.9	82.2 / 66.8	59.8 / 56.9	13.0 + 8.5	250 / 200	57.9 / 88.6	2	2.5 - 14	3.35	3.0	1.0	NONE	72	90	208	3	60	12.1 EER	(8) 20x20 (4) 20x16	2" T.A.	2,840	CAV VERTICAL	TRANE YHD 180	1 THRU 7
RTU-4	PINOT NOIR ROOM	4.0	1,400	260	18.6	45.9	35.2	76.4 / 63.1	53.2 / 53.2	12.5	60 / 49	57.4 / 90.1	1	4.5 - 14	0.72	1.0	1.0	NONE	30	40	208	3	60 1	17.5 SEER	(4) 16x25	2" T.A.	1,025	CAV VERTICAL	TRANE YHC 047	1 THRU 7
RTU-5	DINING AREA	20.0	7,600	1,680	22.1	244.7	167.9	78.7 / 65.4	58.2 / 54.7	15.5 + 7.5	400 / 320	55.1 / 93.9	2	2.5 - 14	5.17	5.0	1.0	NONE	115	150	208	3	60	11.0 EER	(8) 20x20 (4) 20x16	2" T.A.	3,000	CAV VERTICAL	TRANE YHD 240	1 THRU 7
RTU-6	CHARDONNAY ROOM	4.0	1,400	260	18.6	45.9	35.2	76.4 / 63.1	53.2 / 53.2	12.5	60 / 49	57.4 / 90.1	1	4.5 - 14	0.72	1.0	1.0	NONE	30	40	208	3	60 1	17.5 SEER	(4) 16x25	2" T.A.	1,025	CAV VERTICAL	TRANE YHC 047	1 THRU 7

1.) ROOF CURB: 24" HIGH, 1.5" THICK, 3.0 PCF INSULATION. 2.) CLOGGED FILTER SWITCH. 3.) 10-YEAR HEAT EXCHANGER WARRANTY, 5-YEAR COMPRESSOR WARRANTY.

4.) FACTORY INSTALLED OPTIONS: HINGED ACCESS PANELS, CONDENSER COIL HAIL GUARD, 100% SINGLE ENTHALPY ECONOMIZER, BAROMETRIC RELIEF, INDOOR FAN HIGH STATIC MOTOR AND BELT DRIVE PACKAGE, IAQ DRAIN PAN, UNPOWERED CONVENIENCE OUTLET, STAGED AIR VOLUME WITH VFD CONTROLLER, DEHUMIDIFICATION WITH HOT GAS REHEAT. FIELD INSTALLED OPTIONS: FLUE DISCHARGE DEFLECTOR.

5.) TRANE RELIATEL CONTROLS WITH REMOTE MOUNTED TEMPERATURE / HUMIDITY SENSOR. SENSOR TO BE AVERAGING TYPE FOR DINING AREA ROOFTOP UNIT RTU-5 ONLY. 6.) BI-POLAR IONIZATION UNIT PHENOMENAL AIRE COLD PLASMA GENERATOR SERIES C6.0 ( FOR AIRFLOW UP TO 6,000 CFM ) OR C10.0 (FOR AIRFLOW 6,000 TO 10,000 CFM).

2.) MOTORIZED BACKDRAFT DAMPER.

TAG

EDH-1

EDH-2

EDH-3

7.) COOPER'S HAWK HAS AN EXCLUSIVE NATIONAL ACCOUNT WITH TRANE. FOR QUESTIONS, QUOTATIONS OR GENERAL ACCOUNT NEEDS CONTACT TRANE ( CoopersHawk@Trane.com ) .

			DIFFUSER,	GRILLE, AND REGISTER SO	HEDULE		
TYPE	SERVICE	MANUFACTURER	MODEL NO.	DESCRIPTION	MATERIAL	NC LEVEL	NOTES
Α	SUPPLY	TITUS	TMSA	SQUARE CEILING DIFFUSER ADJUSTABLE	STEEL	30	1,3,4,5
В	SUPPLY	TITUS	ML-39	LINEAR SLOT DIFFUSER - TWO (2) 1" WIDE 48" LONG SLOTS	ALUMINUM	30	1,3,4,5
С	SUPPLY	TITUS	300R	DOUBLE DEFLECTION	STEEL	30	1,2,3,4,6
D	RETURN/ TRANSFER	TITUS	350ZR	0° DEFLECTION EXHAUST GRILLE	STEEL	30	1,2,3,4,6
E	RETURN/ EXHAUST	TITUS	350R	35° DEFLECTION EXHAUST GRILLE	STEEL	30	1,2,3,4,6
F	SUPPLY	TITUS	PCS-AA	PERFORATED CEILING DIFFUSER, FLUSH FACE, CURVED BLADE 4-WAY ADJUSTABLE	ALUMINUM	30	1,3,4,5,7
G	TRANSFER	TITUS	CT-700	DOOR GRILLE	ALUMINUM	30	1,4,6

1.) CUSTOM FINISH AND COLOR AS SELECTED BY ARCHITECT.
2.) PAINT INSIDE OF DUCT BLACK WHERE LINE OF SIGHT OF
4.) COORDINATE FRAME TYPE WITH REFLECTED CEILING

INSIDE OF DUCT IS VISIBLE.

PLAN / WALL TYPE AND ARCHITECT. 5.) INSULATED PLENUM / BACKPAN.

6.) BLADES PARALLEL TO FLOOR IF IN WALL, PARALLEL TO LONG DIMENSION IF IN CEILING. 7.) SEE FLOOR PLAN FOR DISCHARGE PATTERN CONTROLLER

4.) PROVIDE REFRIGERANT PIPING AND ACCESSORIES AS

PER MANUFACTURERS INSTRUCTIONS.

2.) DX COOLING AIR COOLED CONDENSERS (TOTAL OF 3) REQUIRE SEPARATE POWER.

GENERAL NOTES:

1.) WHERE AIR DEVICE IS INSTALLED IN INACCESSIBLE CEILING WITHOUT VOLUME DAMPER ACCESS DOOR, PROVIDE REMOTE CABLE OPERATED DAMPER ASSEMBLY (METROPOLITAN AIR TECHNOLOGIES OR APPROVED EQUAL).

EQUIPMENT TAG NECK SIZE
AIR FLOW (CFM)

						F	AN SCI	HEDULE	( EF, KEF	:)							
TAG	LOCATION	SERVICE	CFM	ESP (IN. W.C.)	FAN TYPE	AN DATA	SONES	DRIVE	MAX. BHP	MC HP	OTOR DATA	РН	HZ	WT. (LBS.)	MANUFACTURER (GREENHECK) MODEL NO.	CONTROLS	NOTES
KEF-1L	ROOF	KITCHEN EXHAUST HOOD KEH-1	2,080	-	CENTRIFUGAL ROOF UPBLAST		-			1.5	208	3	60	-		R	6
KEF-1M	ROOF	KITCHEN EXHAUST HOOD KEH-1	2,080		CENTRIFUGAL ROOF UPBLAST					1.5	208	3	60			R	6
KEF-1R	ROOF	KITCHEN EXHAUST HOOD KEH-1	2,080	-	CENTRIFUGAL ROOF UPBLAST	(==)				1.5	208	3	60	-		R	6
KEF-2L	ROOF	KITCHEN EXHAUST HOOD KEH-2	1,800	-	CENTRIFUGAL ROOF UPBLAST					1.5	208	3	60			R	6
KEF-2R	ROOF	KITCHEN EXHAUST HOOD KEH-2	1,800	-	CENTRIFUGAL ROOF UPBLAST					1.5	208	3	60			R	6
KEF-3	ROOF	KITCHEN EXHAUST HOOD KEH-3	1,125	-	CENTRIFUGAL ROOF UPBLAST			-	-	0.5	120	1	60			R	6
EF-1	ROOF	TOILET ROOMS 117,118,119	940	0.50	CENTRIFUGAL ROOF DOWNBLAST	1,540	8.3	BELT	0.25	1/3	120	1	60	100	GB-100-3	С	1,2,3,4,5
EF-2	ROOF	MOP SINK/TOILETS 127,128	400	0.50	CENTRIFUGAL ROOF DOWNBLAST	1,307	6.9	BELT	0.11	1/4	120	1	60	100	GB-098-4	С	1,2,3,4,5

EM = EMERGENCY POWER

10 x 10

16 x 14

10 x 10

NOTES:
1.) OTHER ACCEPTABLE MANUFACTURERS: 3.) FACTORY MOUNTED DISCONNECT SWITCH. 6.) SEE KITCHEN EQUIPMENT 4.) 18" HIGH, INSULATED (1.5" THICK, 3.0 PCF) REFERENCE DRAWINGS FOR LOREN COOK, TWIN CITY FANS, CAPTIVE-AIRE. ROOF CURB WITH CURB SEAL. ADDITIONAL INFORMATION.

LOCATION

**WOMEN'S 117** 

**DINING 112** 

**TOILET HALLWAY** 

CFM

400

1,200

22.0

22.0

22.3

5.) ALUMINUM BIRDSCREEN.

CONTROLS LEGEND:
BAS = BUILDING AUTOMATION SYSTEM FAS = FIRE ALARM SYSTEM C = TIME CLOCK OS = OCCUPANCY SENSOR

ELECTRIC DUCT HEATER SCHEDULE (EDH)

COIL VEL.

(FPM)

576

771

547

R = RELAY, INTERLOCKED WITH HVAC/ SL = INTERLOCKED WITH SPACE LIGHTS ELECTRICAL EQUIPMENT S = WALL SWITCH

CONTROL

**VOLTAGE** 

24

HZ

60

60

T = REVERSE ACTING THERMOSTAT TD = TIME DELAY OFF

MANUFACTURER & MODEL

NUMBER

**INDEECO #QUA** 

INDEECO #QUA **INDEECO #QUA** 

NOTES

1,2,3,4,5,6

1,2,3,4,5,6

1,2,3,4,5,6

		EL	ECTRI	C CEIL	.ING / L	ЈИІТ НІ	EATER SCHED	JLE ( ECI	H, EUH	)					
				HE	EATING DAT	·A	PHYSICAL DA	TA	2	ELEC.	TRICAL DAT	ΓΑ	25		
TAG	LOCATION	TYPE	CFM	втин	EAT	LAT	DIMENSIONS	WEIGHT	HEATER	AMPS	VOLT	РН	HZ	MARKEL MODEL NO.	NOTES
				БІОП	(°F)	(°F)	WxHxD	(LBS.)	KW	AIVIPS	VOLI	РП	ΠZ		
ECH-1	EMPLOYEE MEN'S TOILET 127	ELECTRIC CEILING HEATER	100	2,559	60	83.6	9.25 x 12.2 x 3.625	6	0.75	13	120	1	60	3000 SERIES	1,2
ECH-2	EMPLOYEE WOMEN'S TOILET 128	ELECTRIC CEILING HEATER	100	2,559	60	83.6	9.25 x 12.2 x 3.625	6	0.75	13	120	1	60	3000 SERIES	1,2
EUH-1	SPRINKLER ROOM 126	ELECTRIC UNIT HEATER	700	19,107	60	85.2	21.5 x 24.5 x 6.5	54	5.6	27.1	208	3	60	5100 SERIES	3,4,5

NOTES: 1.) FRONT DISCHARGE, INTAKE. 2.) WALL MOUNTED HEATING THERMOSTAT.

1.) ACCEPTABLE MANUFACTURERS: LG, CARRIER.

1.) SEE KITCHEN EQUIPMENT REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.

2.) LOW AMBIENT OPERATION (- 4.0 deg F).

3.) WALL MOUNTED HEAT STRATIFICATION THERMOSTAT. 5.) VERTICAL DISCHARGE. 4.) WALL / CEILING MOUNTING BRACKET.

3.) WIRED WALL MOUNTED CONTROLLER (7 DAY

PROGRAMMABLE) WITH LCD DISPLAY

SWITCH.

TYPE (3-WAY, 4-WAY).

NOTES:			
NOTES:			
	NOTES:		

CONTROL TO MATCH STAGES OF HEATER AND PER SEQUENCE OF OPERATION

7.) OUTDOOR UNIT HAIL GUARDS.

8.) WIND BAFFLE.

3.) DX COOLING AIR COOLED CONDENSERS (TOTAL OF 2) REQUIRE SEPARATE POWER.

SERVING

**ENTRY 101** 

**DINING 112** 

MENS WOMENS

2.) ACCEPTABLE MANUFACTURERS: MARKEL. 3.) PROVIDE FACTORY INSTALLED DISCONNECT SWITCH FOR EACH HEATER. 4.) PROVIDE AIR FLOW SWITCH - INSTALLATION OF HEATER SHALL MEET MANUFACTURER'S REQUIREMENTS FOR SWITCH

9,554

28,661

9,212

9.) CEILING CASSETTE GRILLE.

HTG. CAP. BTUH SIZE (IN) W x H

5.) PROVIDE ADEQUATE ACCESS TO PROPERLY MAINTAIN COMPONENTS. 6.) PROVIDE MAGNETIC CONTACTORS (MERCURY NOT ACCEPTABLE).

KW

8.4

2.7

**ELECTRIC** 

PH

VOLT

208

208

208

PL = PILOT LIGHT

NO. OF

STAGES

SCR

SCR

SCR

											DU	CT FREE SPLIT SYS	STEM AIR (	CONDITI	IONING U	NIT SC	HEDU	LE ( DF	SS)											
		DFSS INDOOR UNIT														DFSS OUTDOOR UNIT														
TAG	LOCATION	FAN CFM				MOTOR I	TOR DATA		SOUND					COMPRESSOR						ELECTRICAL DATA								EER	SEER	NOTES
IAG		TURBO-HI	TOTAL CLG CAP. BTUH	HEATING CAPACITY BTUH	FLA	VOLTS	PH	HZ	LEVEL dB	UNIT SIZE WxDxH (II	I) WEIGHT (LBS)	MANUFACTURER TRANE/ MITSUBISHI MODEL NO.	LOCATION	QTY	TYPE	DIA	LRA	REFRIGERANT		MCA	МОСР	VOLTS	PH	U7	UNIT SIZE WxDxH (IN)	WEIGHT (LBS)	MANUFACTURER TRANE/ MITSUBISHI MODEL NO.	LEK	SEER	NOTES
		-MED-LOW			FLA	VOLIS	FN	ΠZ	AT HIGH							KLA	LINA	TYPE	LBS.	WICA	WOCF	VOLIS	FN	П						
DFSS-1	NETWORK RM 116	775 - 705 - 635	24,000	N/A	0.36	208	1	60	45	46 x 12 x 14.5	46	TPKA0A0241KA70A	ROOF	1	INVERTER	7	11	R-410A	7.9	19	26	208	1	60	37.5 x 14 x 37	151	TRUYA0241HA70NA	12.2	21.4	1 THRU 8
DFSS-2	OFFICE 125	0 - 335 - 265 - 230	12,000	12,000	0.24	208	1	60	34	22.5 x 22.5 x 9.75	31	NTXCKS12A112AA	ROOF	1	INVERTER	6.6	8.2	R-410A	2.75	9	16	208	1	60	31.5 x 11.25 x 22	81	NTXSKS12A112AA	13.3	22	1 THRU 7, 9

											ı	KITCHE	N MAKE	UP AIR	UNIT SC	HEDUL	E(MAU)										
	GENERAL				~	)	SUPPLY FAN	N				G	AS HEATING	SECTION -	DIRECT FIR	ED		FILTERS			ELECTR	RICAL DATA					
TAG	LOCATION	SERVICE	CFM TOTAL	O.A. CFM	TYPE	ESP (IN)	RPM	ВНР	НР	PHASE	VOLT	INPUT (MBH)	OUTPUT (MBH)	STAGES	EAT (°F)	LAT (°F)	FACE AREA (SQ.FT.)	FACE VELOCITY (FPM)	TYPE	FLA	V / PH / HZ	MCA	МОСР	OPERATING WEIGHT (LBS.)	SYSTEM	MANUFACTURER MODEL NUMBER	NOTES
MAU-1	ROOF	KEH-1	5,400	5,400	<del></del>		e 1624 5200	=	10.0	3	208	399	20002			75	115.7 1875	-	7 <u>.71</u>	27	208 / 3 / 60	(3) @ 21.4	(3) @ 30	2,660		524 TO	1,2
MAU-2	ROOF	KEH-2	2,850	2,850					2.0	3	208	211		20	22			/22	122	6.1	208 / 3 / 60	11.2 + 21.4	20 + 30	1,700			1,3

6.) CONDENSATE PUMP AS REQUIRED.

5.) OPERATING RANGE COOLING: - 40 deg ~ 115 deg F DB.

									AIR CURT	AIN SCHE	DULE (AC	) - NO	HEAT									
				FAI	MOTOR				FILTERS			$\top$										
TAG	LOCATION	AREA SERVED	AIR VOLUME	AVG. OUTLET	CABINET				AIR ARRANGEMENT		НР	AMPS	VOLTS	PHASE	HZ	TYPE	SIZE	EXTRA SET	BUILT-IN DISCONNECT	WEIGHT (LBS)		NOTES
IAG	LOCATION	AREA SERVED	(CFM)	VELOCITY (FPM)	TYPE	LENGTH (IN)	WIDTH (IN)	HEIGHT (IN)	INLET AIR	DISCHARGE	ne.	AWPS	VOLIS	PHASE	П	ITPE	SIZE	EXTRA SET			) MANUFACTURER (MARS) MODEL No NH248-1U	
AC-1	RECEIVING 130	RECEIVING 130	2,447	2,447	HORIZONTAL	48	16	14	SIDE	воттом	(1) @ 1.0	11.25	120	1	60	ALUM MESH	1/4"	NO	NO	125	NH248-1U	1,2,3

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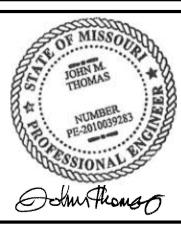
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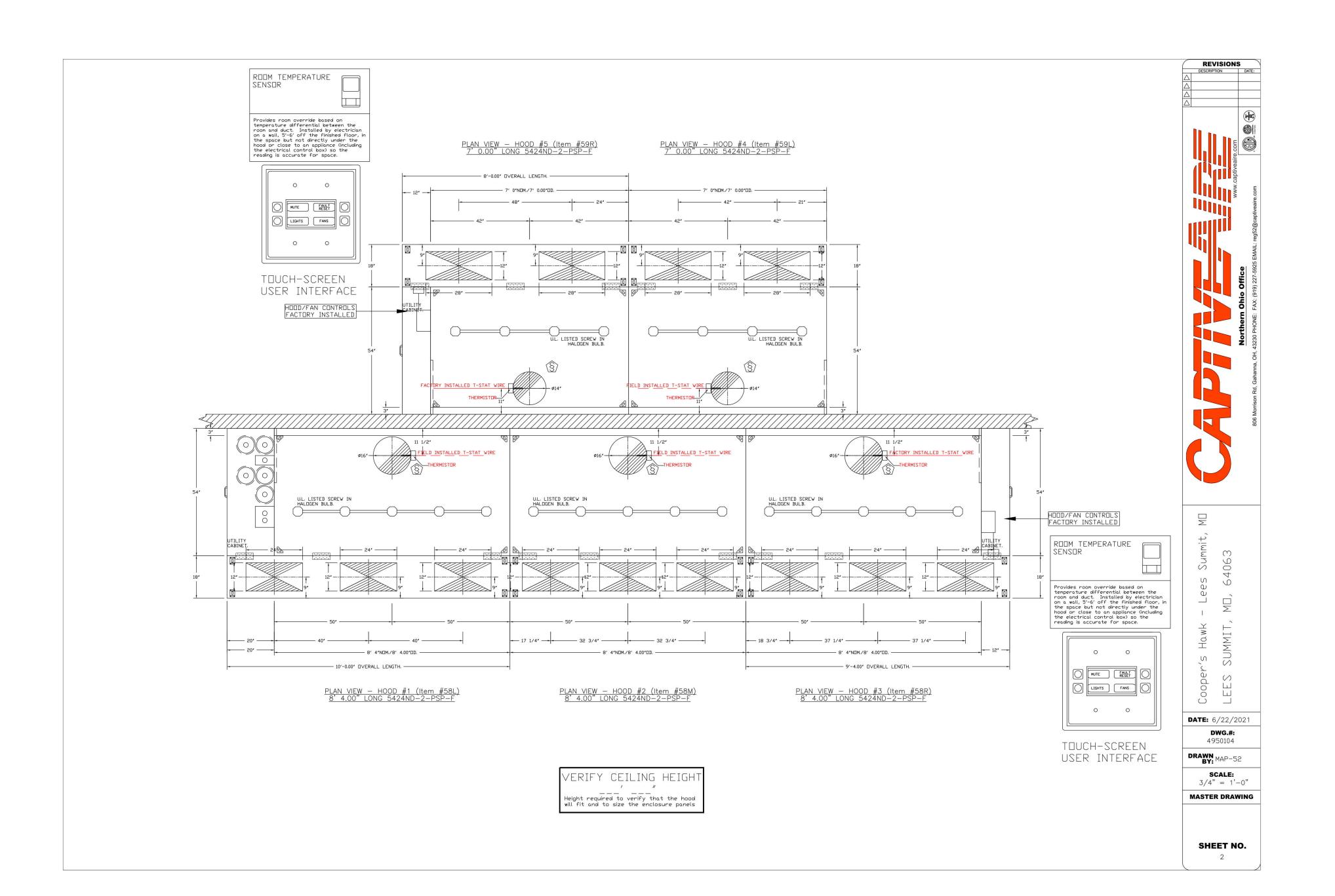
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Drawing Title HVAC - SCHEDULES

Job No. 21-0064

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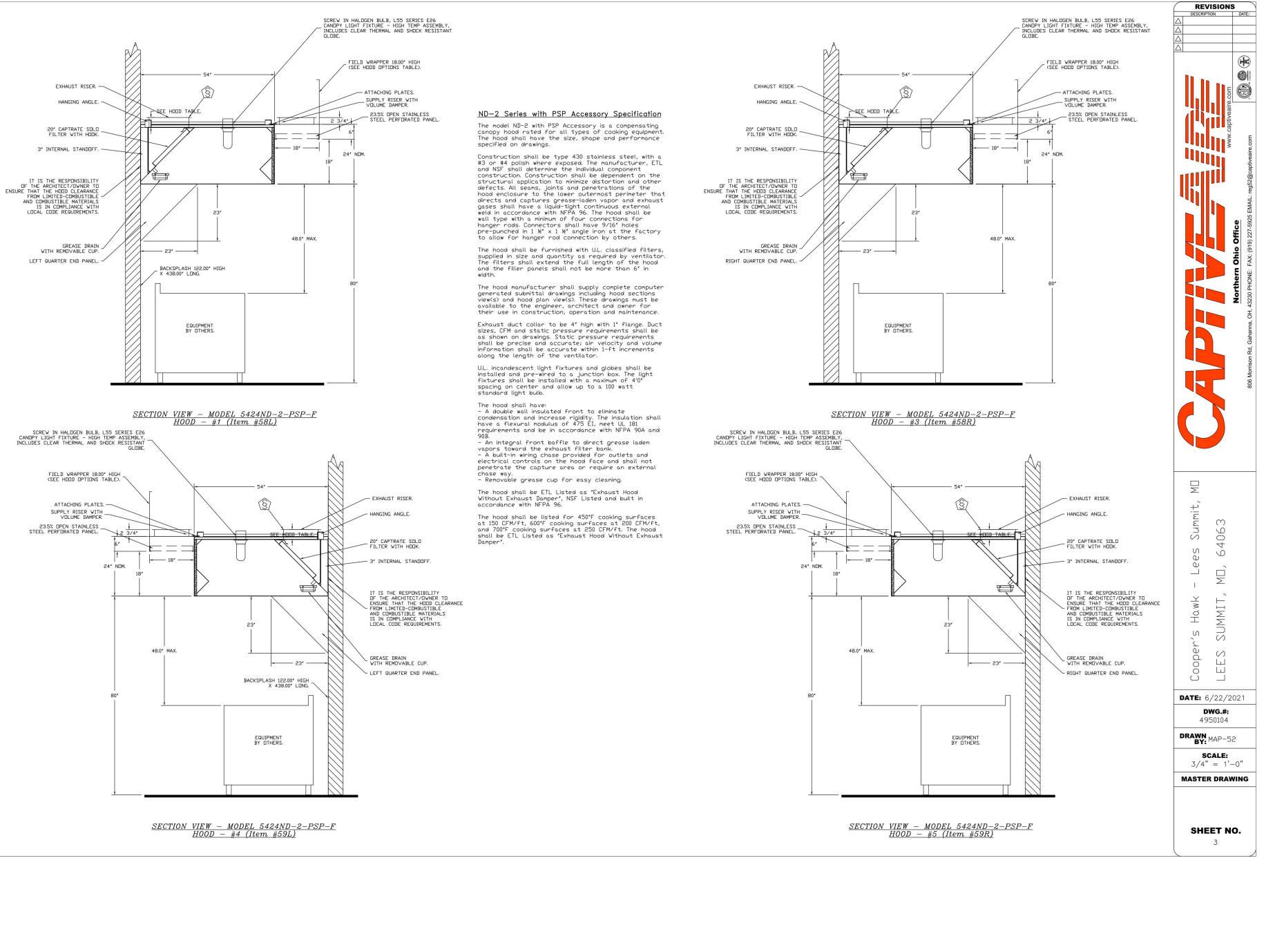
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HVAC - KEC

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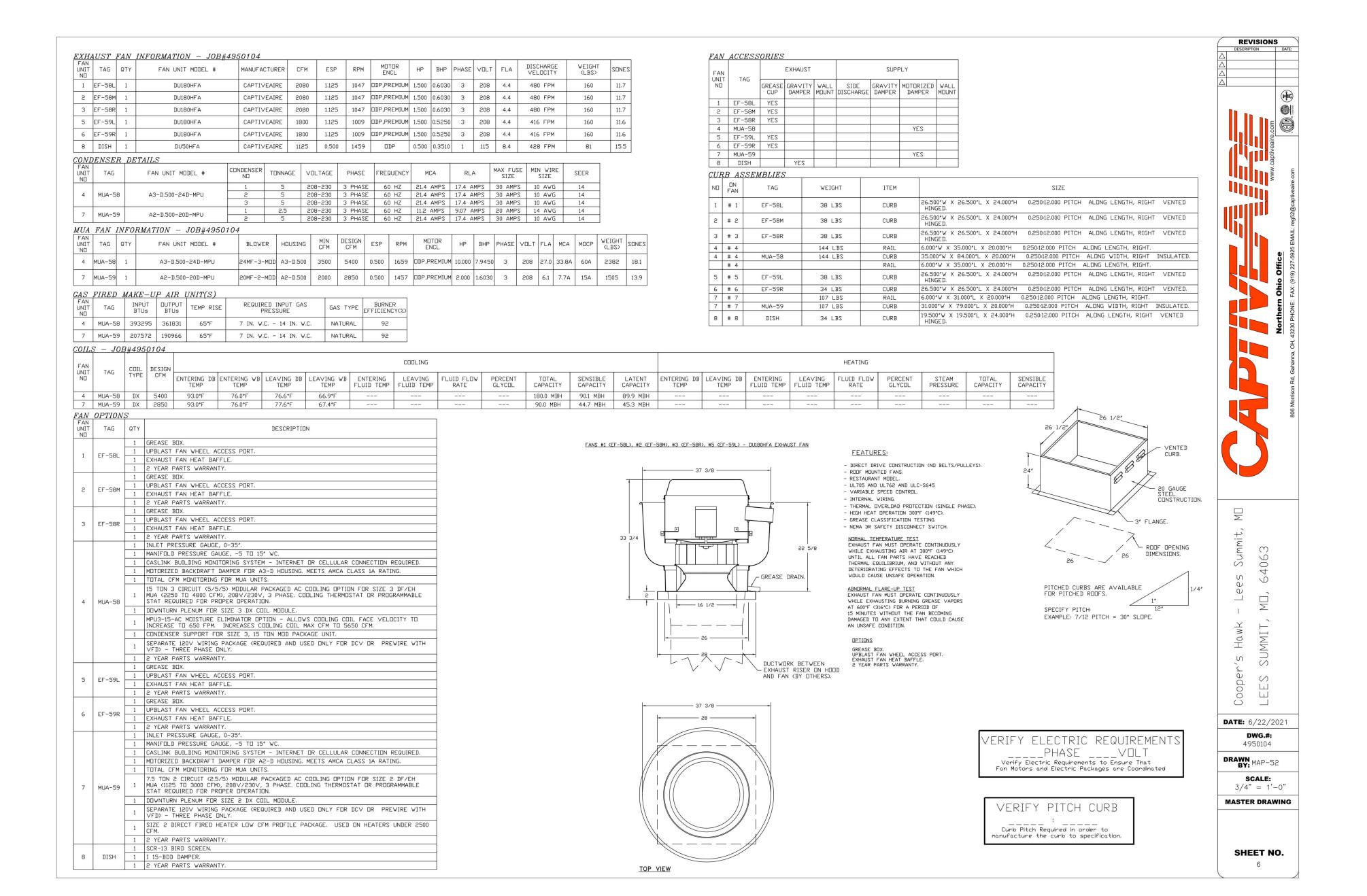
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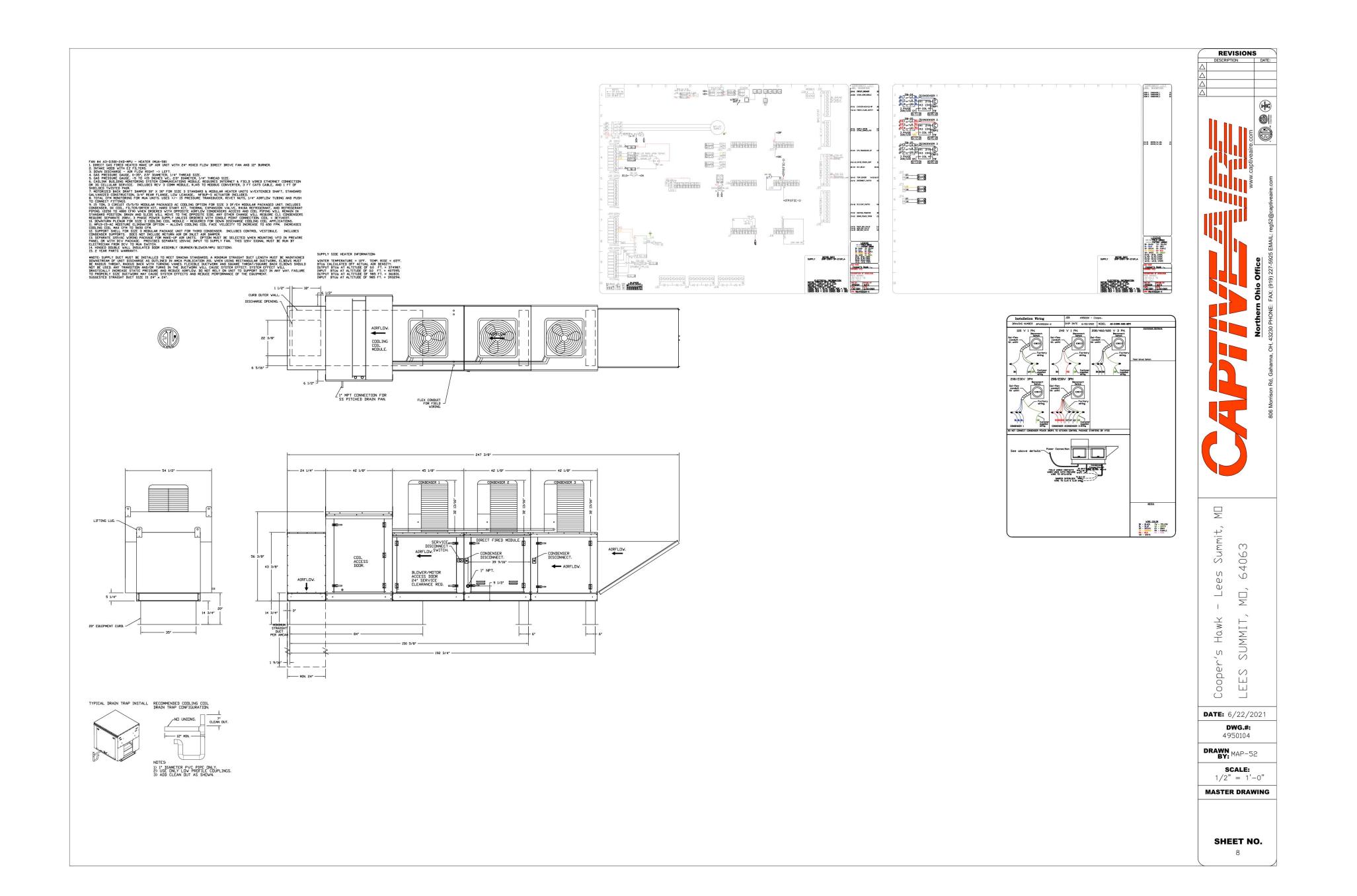
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HVAC - KEC REFERENCE DRAWINGS

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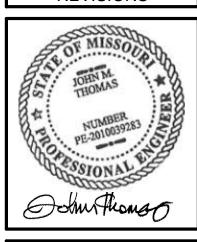
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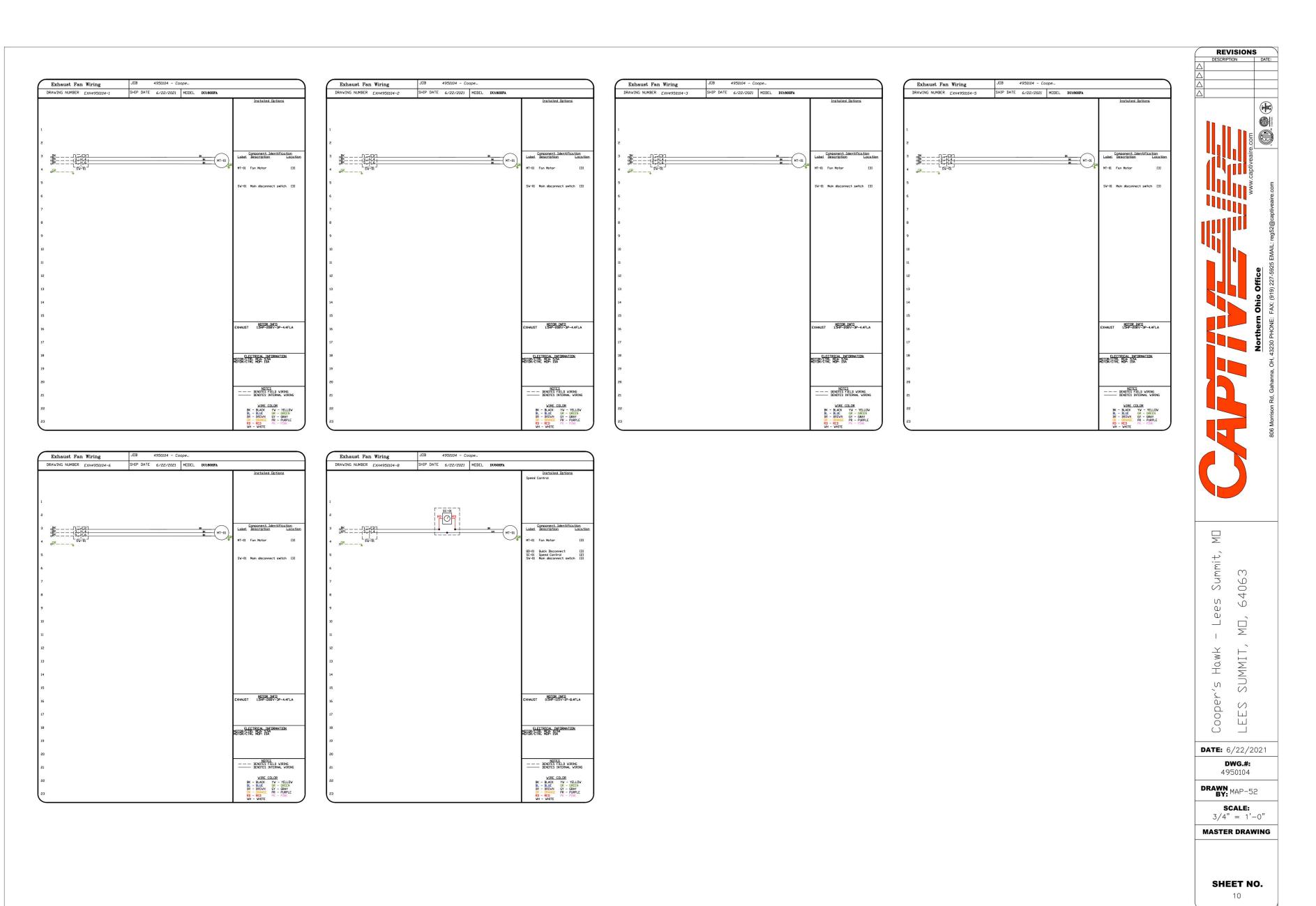
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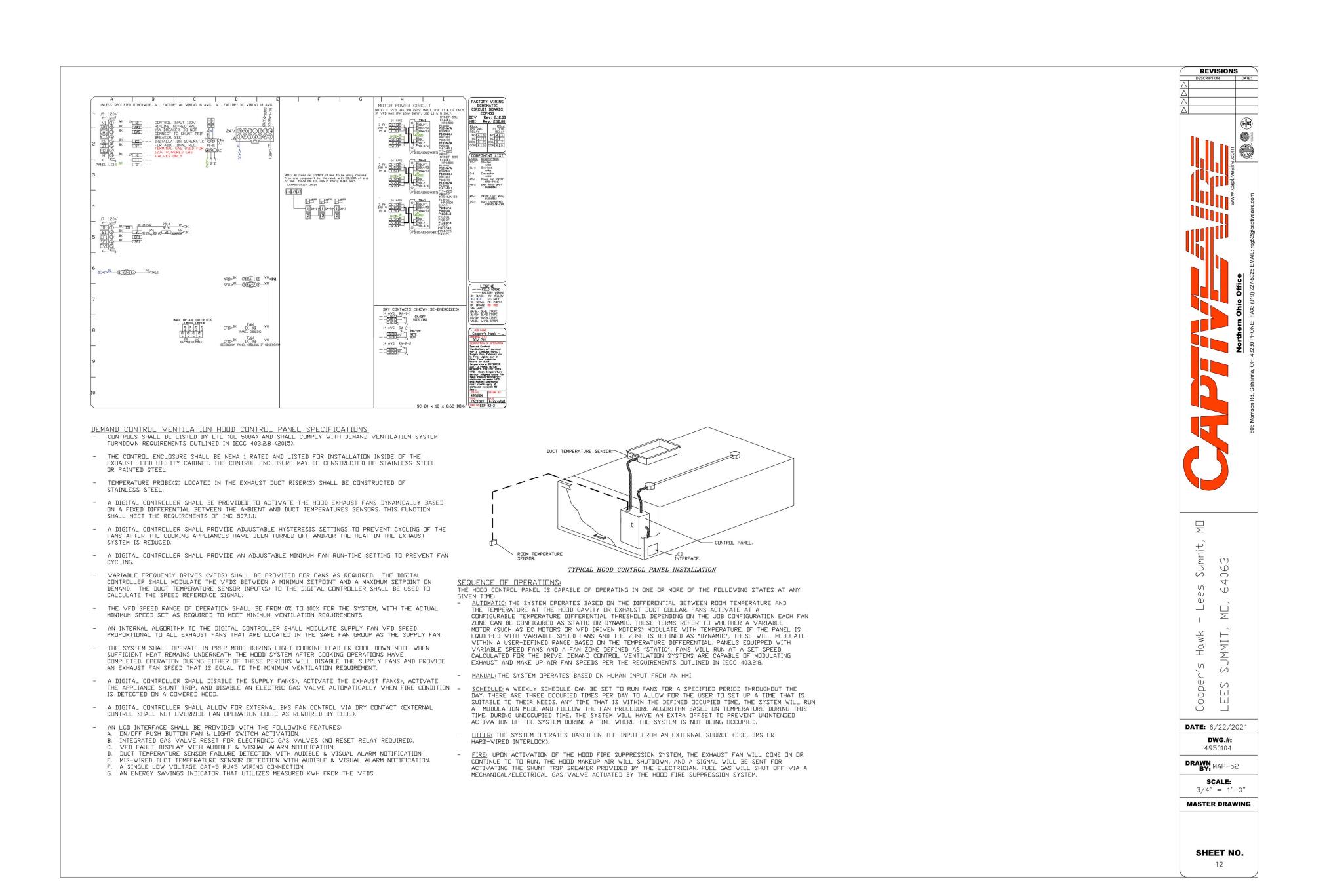
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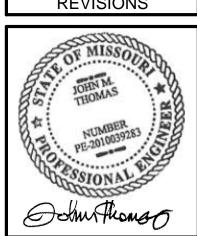
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