RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
10/04/2021

Joe Frogge

PIPING LEGEND

- DIRECTION OF PIPE PITCH (DOWN)
- DIRECTION OF FLOW
- ANCHOR
- REDUCER OR INCREASER
- ECCENTRIC REDUCER
- TOP CONNECTION, 45° OR 90°
- BOTTOM CONNECTION, 45° OR 90°
- SIDE CONNECTION
- CAPPED OUTLET
- RISE OR DROP IN PIPE
- UNION
- ORIFICE UNION
- POINT OF CONNECTION BETWEEN NEW AND EXISTING WORK
- LIMIT OF DEMOLITION
- BLAST THERMOSTATIC TRAP
- INVERTED BUCKET TRAP SET INCLUDING PIPING ACCESSORIES
- FLOAT & THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES
- THERMOSTATIC TRAP
- STRAINER
- THERMOMETER
- PRESSURE GAGE
- WATER FLOW MEASURING DEVICE
- EXISTING PIPE TO BE REMOVED
- HWS — HOT WATER SUPPLY
- HWR — HOT WATER RETURN
- HCWS — HOT CHILLED WATER SUPPLY
- HCWR — HOT CHILLED WATER RETURN
- RHWS — RADIANT HOT WATER SUPPLY
- RHWR — RADIANT HOT WATER RETURN
- GCHWS — GLYCOL CHILLED WATER RETURN
- GCHWR — GLYCOL CHILLED WATER SUPPLY
- CHWS — CHILLED WATER SUPPLY
- CHWR — CHILLED WATER RETURN
- CWS — CONDENSER WATER SUPPLY
- CWR — CONDENSER WATER RETURN
- HPS — HIGH PRESSURE STEAM
- MPS — MEDIUM PRESSURE STEAM
- LPS — LOW PRESSURE STEAM
- CPR — PUMPED CONDENSATE RETURN
- CR — CONDENSATE RETURN
- PIPE TURNING DOWN
- PIPE TURNING UP
- PIPE TEE
- PIPE TEE
- PIPE TEE
- DIRECTION OF FLOW
- SHUTOFF VALVE
- GATE VALVE
- FLOW BALANCING STATION
- 3-WAY CONTROL VALVE
- CONNECT TO EXISTING PIPE

DUCTWORK SYMBOLS

- UP / DN — SUPPLY DUCT (UP & DOWN)
- UP / DN — RETURN/EXHAUST DUCT (UP & DOWN)
- UP / DN — OUTSIDE AIR DUCT (UP & DOWN)
- CEILING DIFFUSERS
- SUPPLY TOP REGISTER OR GRILLE (WALL TYPE)
- EXHAUST OR RETURN CEILING REGISTER OR GRILLE
- EXHAUST OR RETURN BOTTOM REGISTER OR GRILLE (WALL TYPE)
- EXHAUST OR RETURN REGISTER OR TOP GRILLE (WALL TYPE)
- VANED ELBOW & AIR SPLIT TYPE DUCT TAKE-OFF
- CONNECT NEW DUCT TO EXISTING DUCT
- R — INCLINED RISE, IN DIRECTION OF AIR FLOW
- D — INCLINED DROP, IN DIRECTION OF AIR FLOW
- LIMIT OF DEMOLITION
- FC — FLEXIBLE CONNECTION
- VANED ELBOW (SHORT RADIUS)
- STANDARD RADIUS ELBOW
- 10x8 — NEW DUCT (WIDTH x DEPTH)
- EXISTING DUCT TO REMAIN
- EXISTING DUCT TO BE REMOVED
- FLEXIBLE DUCTWORK (INSULATED)
- DUCT WITH SOUND LINING
- VD — MANUAL VOLUME DAMPER
- FD — FIRE DAMPER
- BDD — BACK DRAFT DAMPER
- SD — SMOKE DAMPER
- MANUAL SPLITTER DAMPER
- 45° SUPPLY — STANDARD BRANCH SUPPLY OR RETURN, NO SPLITTER (45° TAP)
- 45° RETURN
- TERMINAL AIR BOX W/REHEAT COIL (SEE SCHEDULE)
- HUMIDIFIER
- M — MOTOR OPERATED DAMPER

ABBREVIATIONS

AD	ACCESS DOOR
AF	AFTER FILTER
AFCE	AIR FLOW CONTROL VALVE
AFM	AIR FLOW MEASURING DEVICE
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
B.I.	BLACK IRON
BG	BOTTOME GRILLE (WALL TYPE)
BR	BOTTOM REGISTER (WALL TYPE)
CC	COOLING COIL
CD	CEILING DIFFUSER
CG	CEILING GRILLE
CR	CEILING REGISTER
CW	COLD WATER
D	AUTOMATIC DAMPER
DB	DRY BULB TEMPERATURE
dB	DECIBELS
DFSS	DUCT FREE SPLIT SYSTEM
D.W.	DOUBLE WALL
EX.A.	EXHAUST AIR
EDH	ELECTRIC COIL DUCT HEATER
EER	ENERGY EXHAUST RATIO
EF	EXHAUST FAN
EX	EXISTING
EXH	EXHAUST
FC	FLEXIBLE CONNECTION
FLR.	FLOOR
FD	FIRE DAMPER
HC	HEATING COIL
HE	AIR TO AIR HEAT EXCHANGER
HF	HEPA FILTER
HP	HORSEPOWER
KEF	KITCHEN EXHAUST FAN
MER	MECHANICAL ROOM
MAU	MAKE-UP AIR UNIT
MAX.	MEDIUM
MIN.	MINIMUM
MOD	MOTOR OPERATED DAMPER
MUA	MAKE-UP AIR
NOM.	NOMINAL
O/A	OUTDOOR AIR
PD	PRESSURE DROP
PF	PRE-FILTER
PH	PREHEAT
PV	PLUMBING VENT
R/A	RETURN AIR
RD	ROOF DRAIN
RF	RETURN FAN
RH	RELATIVE HUMIDITY
S/A	SUPPLY AIR
SCD	SMOKE CONTROL DAMPER
SD.	SMOKE DAMPER
SP	STATIC PRESSURE
SPS	STATIC PRESSURE SENSOR
S/S	STAINLESS STEEL
S.W.	SINGLE WALL
TEF	TOILET EXHAUST FAN
TG	TOP GRILLE (WALL TYPE)
TR	TOP REGISTER (WALL TYPE)
TRE	TRASH ROOM EXHAUST
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER (MANUAL OPPOSED BLADE)
VFD	VARIABLE FREQUENCY DRIVE
VI	VIBRATION ISOLATOR
VIF	VERIFY IN FIELD
VSMC	VARIABLE SPEED MOTOR CONTROLLER
WB	WET BULB TEMPERATURE
WFMD	WATER FLOW MEASURING DEVICE
VRF	VARIABLE REFRIGERANT FLOW

CONTROLS SYMBOLS

- DUCT OR PIPE THERMOSTAT WITH AVERAGING ELEMENT. PROVIDE 12" [300mm] MIN. LENGTH IN DUCT WHEN SPACE PERMITS.
- DUCT THERMOSTAT WITH AVERAGING ELEMENT
- ROOM SENSOR: TEMPERATURE
- DUCT OR PIPE TEMPERATURE SENSOR. PROVIDE 12" (300 MM) MIN. LENGTH IN DUCT WHEN SPACE PERMITS.
- P — ROOM PRESSURE SENSOR
- T (G), (ISB) — THERMOSTAT (WITH GUARD), (ON INSULATED SUBBASE)
- TS (ISB) — TEMPERATURE SENSOR (ON INSULATED SUBBASE)
- TH (G), (ISB) — TEMPERATURE/HUMIDITY SENSOR (WITH GUARD), (ON INSULATED SUBBASE)
- CO_2 (G) — CARBON DIOXIDE SENSOR (WITH GUARD)
- CO (G) — CARBON MONOXIDE SENSOR (WITH GUARD)
- DSD — DUCT SMOKE DETECTOR

DRAWING SYMBOLS

- 2 — DETAIL NUMBER
- H4 — DRAWING NUMBER WHERE DRAWN
- EXH — RISER TYPE
- 1 — RISER NUMBER
- A — SECTION LETTER
- H7 — DRAWING NUMBER WHERE SHOWN

MECHANICAL DRAWING LIST

SHEET	DESCRIPTION	DATE
M000	HVAC SYMBOLS, ABBREVIATIONS, AND TC NOTES	8/19/2021
M001	MECHANICAL SPECIFICATIONS	8/19/2021
M101	HVAC FIRST FLOOR PLAN	8/19/2021
M102	HVAC ROOF PLAN	8/19/2021
M300	HVAC DETAILS	8/19/2021
M301	HVAC DETAILS	8/19/2021
M400	HVAC SCHEDULES	8/19/2021
M401	HVAC SCHEDULES	8/19/2021
M600	KEC HVAC REFERENCE DRAWINGS	8/19/2021
M601	KEC HVAC REFERENCE DRAWINGS	8/19/2021
M602	KEC HVAC REFERENCE DRAWINGS	8/19/2021
M603	KEC HVAC REFERENCE DRAWINGS	8/19/2021
M604	KEC HVAC REFERENCE DRAWINGS	8/19/2021
M605	KEC HVAC REFERENCE DRAWINGS	8/19/2021

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 SEQUENCE.

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.

ALL CONTROL SYSTEMS READOUTS/DISPLAYS AND OPERATIONS SHALL MATCH INSTALLED MECHANICAL EQUIPMENT, I.E. STAGES OF OPERATION.

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 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 OR NOT.

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 APPLICATION.

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.

THERMOSTATS LOCATED IN PUBLIC AREAS TO BE PROVIDED WITH A LOCKABLE CLEAR TAMPERPROOF COVER IF NOT AVAILABLE WITH LOCKABLE COVER.

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 RTU-1 (RTU-2, RTU-3, RTU-4, RTU-5, RTU-6):

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.
2) DURING OCCUPIED MODE, ROOFTOP UNIT SHALL OPERATE IN HEATING OR 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.).
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 HOT GAS REHEAT MODE OF OPERATION UNTIL THERMOSTAT SETPOINT (ADJ.) 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.
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.).
11) DURING OCCUPIED MODE OUTDOOR AIR DAMPER SHALL BE OPENED TO PROVIDE REQUIRED MINIMUM OUTDOOR AIR.
12) 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 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 KEF-3:

1) EXHAUST FAN SHALL BE INTERLOCKED WITH DISHWASHER EXHAUST HOOD KEH-3 TO START/STOP WHENEVER KITCHEN DISHWASHER EXHAUST HOOD IS TURNED ON/OFF.

TOILET EXHAUST FAN EF-1:

1) EXHAUST FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED MODE.
2) MOTORIZED DAMPER SHALL BE CLOSED WHEN FAN IS STOPPED.

MOP SINK/TOILET EXHAUST FAN EF-2:

1) EXHAUST FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED MODE.
2) MOTORIZED DAMPER SHALL BE CLOSED WHEN FAN IS STOPPED.

AIR CURTAIN AC-1:

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

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

1) DUCT FREE SPLIT SYSTEM SHALL OPERATE AS SCHEDULED BY WALL MOUNTED CONTROLLER TO MAINTAIN SPACE TEMPERATURE 60 (75) DEG F (ADJ.)

ELECTRIC DUCT HEATER EDH-1 (EDH-2, EDH-3):

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

ELECTRIC CEILING HEATER ECH-1, ECH-2:

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

ELECTRIC UNIT HEATER EUH-1:

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

ELECTRIC INFRARED RADIANT HEATER ERH-1:

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 ACTIVATED.
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.

BTR ENGINEERING

COOPER'S HAWK WINERY & RESTAURANT

540 NW CHIPMAN ROAD
LEE'S SUMMIT, MO 64086

FIELD VERIFICATION
Contractor shall verify all figured dimensions and conditions at the job site and notify Aria Group Architects, Inc. of any dimensional errors, omissions or discrepancies before beginning or fabricating any work. Do not scale these drawings.

NO.	DATE	REMARKS
1	2021/08/19	ISSUED FOR PERMIT

REVISIONS

STATE OF MISSOURI — JOHN A. THOMAS — NUMBER PE-2010019220 — PROFESSIONAL ENGINEER

Drawing Title: HVAC - SYMBOLS & NOTES

Job No.	Drawn
21-0064	DNK

Scale	Date
	08/19/2021

Sheet No. M000

HVAC GENERAL NOTES

1 GENERAL

ALL WORK PERFORMED SHALL CONFORM WITH ALL CITY OF LEE'S SUMMIT AND STATE OF MISSOURI CODES AND REGULATIONS. ALL WORK SHALL BE CONDUCTED, INSTALLED AND COMPLETED IN A WORKMANLIKE AND APPROVED MANNER SO AS TO SECURE THE RESULTS INTENDED BY THESE DOCUMENTS

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 STIPULATION.

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 CONDITIONS.

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 + O&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 MINIMUM OF 24 GAUGE GALVANIZED SHEET METAL.

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 JACKET.

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

GENERAL

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

GENERAL

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

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 THAN 18" FROM EQUIPMENT OR COIL).

THE FOLLOWING SHALL BE PROVIDED:

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 SYSTEMS.
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

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

GENERAL

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.

7 INSULATION NOTES

(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 MANUAL.

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 LESS THAN 6".

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 FOLLOWING CONDITIONS EXIST:

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".
FIRE-RATED DUCT ACCESS DOOR

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 UL LISTINGS. 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 CODES.

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 EXPENSE.

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 SYSTEMS AND EQUIPMENT AS REQUIRED.

11 MINIMUM PROJECT REQUIREMENTS TO COMPLY WITH 2018 IECC

1.MINIMUM ONE TEMPERATURE CONTROL DEVICE PER SYSTEM. (C403.2.A.1)
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 - ZONE 5)
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)
9.OPERATION AND MAINTENANCE MANUAL PROVIDED TO BUILDING OWNER. (C408.2.5.2)
10.BALANCING DEVICES PROVIDED IN ACCORDANCE WITH IMC 403.7.

12 INSULATION SCHEDULE

DUCTWORK INSULATION SCHEDULE

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

LEGEND:

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

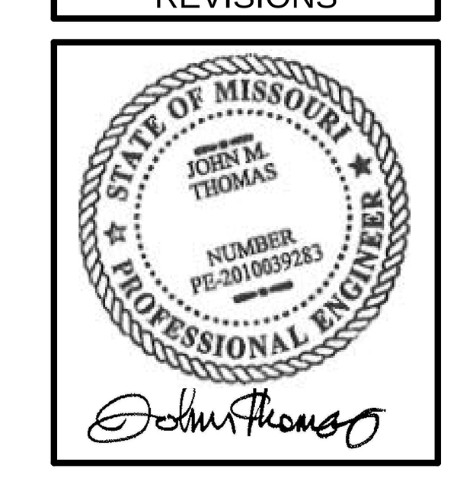
COORDINATED SHOP DRAWINGS SHALL BE PROVIDED BY EACH SUBCONTRACTOR AND SHALL CONTAIN A LAYOUT OF ALL DUCTWORK, CONDUIT, PIPING, EQUIPMENT, STRUCTURE, WALLS, CEILING, ETC. AS REQUIRED TO REFLECT FULL COORDINATION ACROSS ALL TRADES AND SHALL BE SUBMITTED FOR REVIEW. COORDINATED DRAWINGS SHALL BE SIGNED 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.

104 N. OAK PARK AVE., STE 201
OAK PARK, IL 60301
BTRENGINEERS.COM
PHONE: 312-635-6300
BTR ENGINEERING
MECHANICAL | ELECTRICAL | PLUMBING | FIRE PROTECTION

COOPER'S HAWK
WINERY & RESTAURANT
540 NW CHIPMAN ROAD
LEE'S SUMMIT, MO 64086

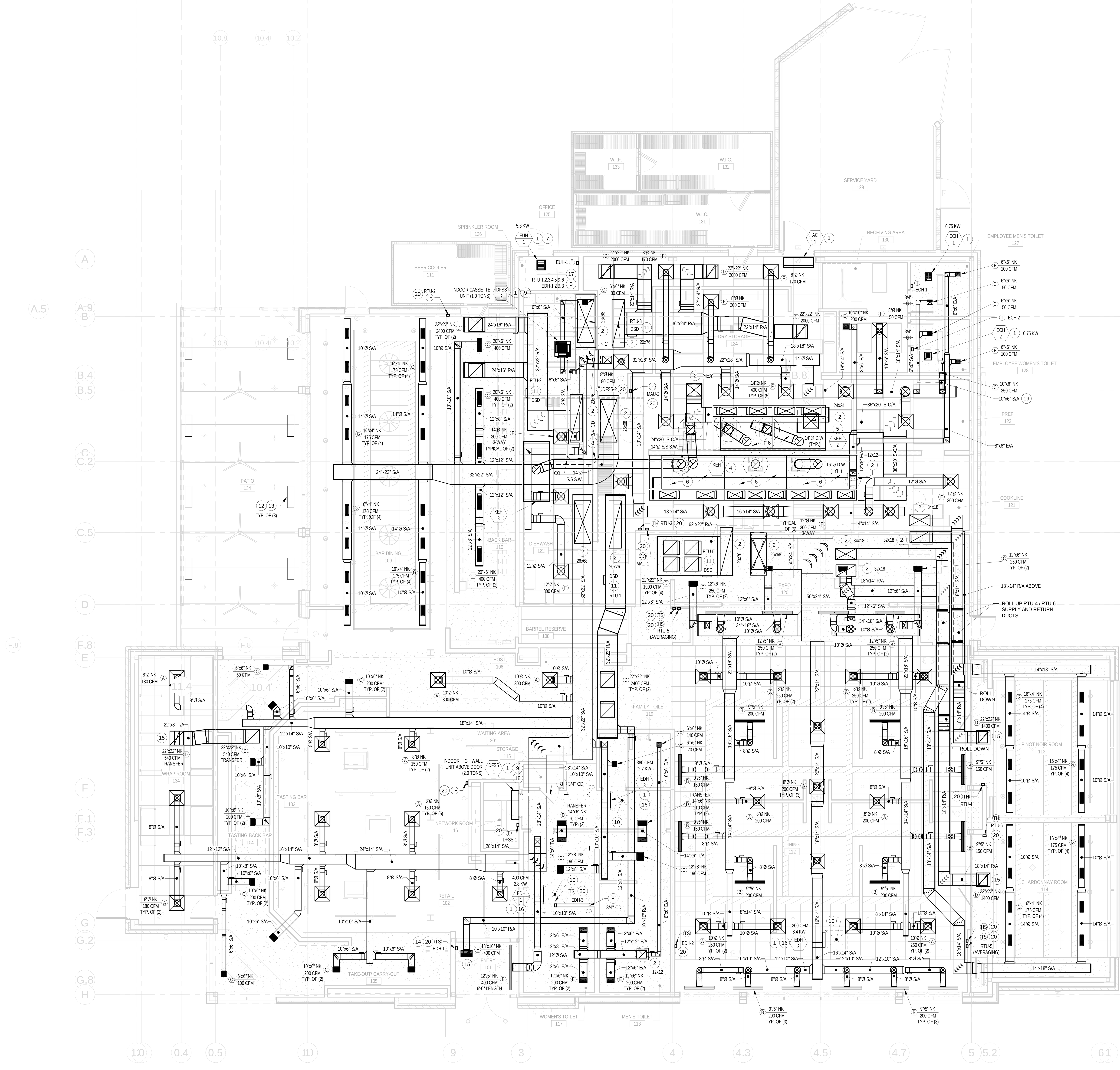
NO.	DATE	REMARKS
1	2021/08/19	ISSUED FOR PERMIT

REVISIONS



Drawing Title
HVAC - MECHANICAL SPECIFICATIONS

Job No. 21-0064
Drawn DNK
Scale
Date 08/19/2021
Sheet No.
M001



1 M101 HVAC - FLOOR PLAN
3/16" = 1'-0"

DRAWING NOTES: (THIS SHEET ONLY)

1. MAINTAIN CODE REQUIRED, MANUFACTURER RECOMMENDED CLEARANCE AT HVAC EQUIPMENT.
2. DUCT RISER OF SIZE INDICATED. PROVIDE FLEXIBLE CONNECTION AT BOTTOM OF ROOF CURB (EXCEPT KITCHEN EXHAUST FANS).
3. ELECTRIC DUCT HEATER THERMOSTAT. PROVIDE CONDUIT AND CONTROL WIRING BETWEEN THERMOSTAT AND ASSOCIATED REMOTE TEMPERATURE SENSOR.
4. KITCHEN EXHAUST HOOD KEH-1 DUCT RISER SIZES AND AIR FLOWS:
   KEH-1L: SUPPLY - (3) 24x12 (623 CFM EA.), EXHAUST - (1) 16"ø (2080 CFM),
   KEH-1M: SUPPLY - (3) 24x12 (576 CFM EA.), EXHAUST - (1) 16"ø (2080 CFM),
   KEH-1R: SUPPLY - (3) 24x12 (600 CFM EA.), EXHAUST - (1) 16"ø (2080 CFM).
5. KITCHEN EXHAUST HOOD KEH-2 DUCT RISER SIZES AND AIR FLOWS:
   KEH-2L: SUPPLY - (2) 28x12 (675 CFM EA.), EXHAUST - (1) 14"ø (1680 CFM),
   KEH-2R: SUPPLY - (2) 28x12 (750 CFM EA.), EXHAUST - (1) 14"ø (1680 CFM).
6. COORDINATE ROOFTOP UNIT RTU-3 / MAU-1 / MAU-2 SUPPLY DUCTWORK INSTALLATION WITH KITCHEN EXHAUST DUCTWORK.
7. BOTTOM OF HEATER 12'-0" ABOVE FINISHED FLOOR. ROD SUSPEND FROM STRUCTURE ABOVE WITH MANUFACTURER's MOUNTING BRACKET (INSTALL FOR VERTICAL DISCHARGE).
8. ROUTE CONDENSATE DRAIN OF SIZE INDICATED DOWN AND OVER MOP SINK / OPEN SITE DRAIN / FLOOR DRAIN.
9. ROUTE REFRIGERANT PIPING BETWEEN INDOOR UNIT AND ASSOCIATED OUTDOOR UNIT. PIPE SIZES PER MANUFACTURER's RECOMMENDATIONS. INSTALL PER MANUFACTURER's INSTRUCTIONS.
10. COORDINATE WITH GENERAL CONTRACTOR TO PROVIDE CEILING ACCESS PANEL.
11. DUCT SMOKE DETECTOR FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE DETECTOR LOCATION WITH ELECTRICAL CONTRACTOR.
12. ELECTRIC INFRARED RADIANT HEATER FURNISHED BY COOPER's HAWK. RECEIVE UNIT FROM GENERAL CONTRACTOR. SUPPORT UNIT FROM PATIO COVER STRUCTURE. INSTALL PER MANUFACTURER's INSTRUCTIONS."
13. ELECTRIC RADIANT HEATER CONTROLS BY ELECTRICAL CONTRACTOR. REFER TO ELECTRICAL DRAWINGS.
14. REFER TO ARCHITECTURAL PLANS FOR EXACT ELEVATION ABOVE FINISHED FLOOR.
15. 12" HIGH AIR PLENUM ON TOP OF RETURN / TRANSFER GRILLE. AIR PLENUM WIDTH / LENGTH TO MATCH GRILLE NECK SIZES.
16. ELEVATION BOTTOM OF ELECTRIC DUCT HEATER MAXIMUM 12" ABOVE CEILING.
17. ROOFTOP UNIT THERMOSTAT.
18. INSTALL CONDENSATE DRAIN PUMP (IF REQUIRED) OUTSIDE OF NETWORK ROOM.
19. SUPPLY DUCT OF SIZE INDICATED SERVING EQUIPMENT PLATFORM MEZZANINE.
20. TEMPERATURE / HUMIDITY / CARBON MONOXIDE SENSOR AS INDICATED.

HVAC ACCESS NOTES:

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).

COORDINATE WITH GENERAL CONTRACTOR TO PROVIDE CEILING ACCESS PANELS TO ALL HVAC EQUIPMENT INSTALLED ABOVE INACCESSIBLE CEILINGS.

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.

BTR ENGINEERING
MECHANICAL | ELECTRICAL | PLUMBING | FIRE PROTECTION
104 N. OAK PARK AVE., STE 301
OAK PARK, IL 60301
BTRENGINEERS.COM
PHONE: 312-635-63

COOPER'S HAWK
WINERY & RESTAURANT
540 NW CHIPMAN ROAD
LEE'S SUMMIT, MO 64086

FIELD VERIFICATION
Contractor shall verify all figured dimensions and conditions at the job site and notify Aria Group Architects, Inc. of any dimensional errors, omissions or discrepancies before beginning or fabricating any work. Do not scale these drawings.

NO.	DATE	REMARKS
1	2021/08/19	ISSUED FOR PERMIT

REVISIONS

STATE OF MISSOURI
JOHN M. THOMAS
NUMBER PE-2010039283
PROFESSIONAL ENGINEER

Drawing Title
HVAC - FLOOR PLAN

Job No.	Drawn
21-0064	DNK

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

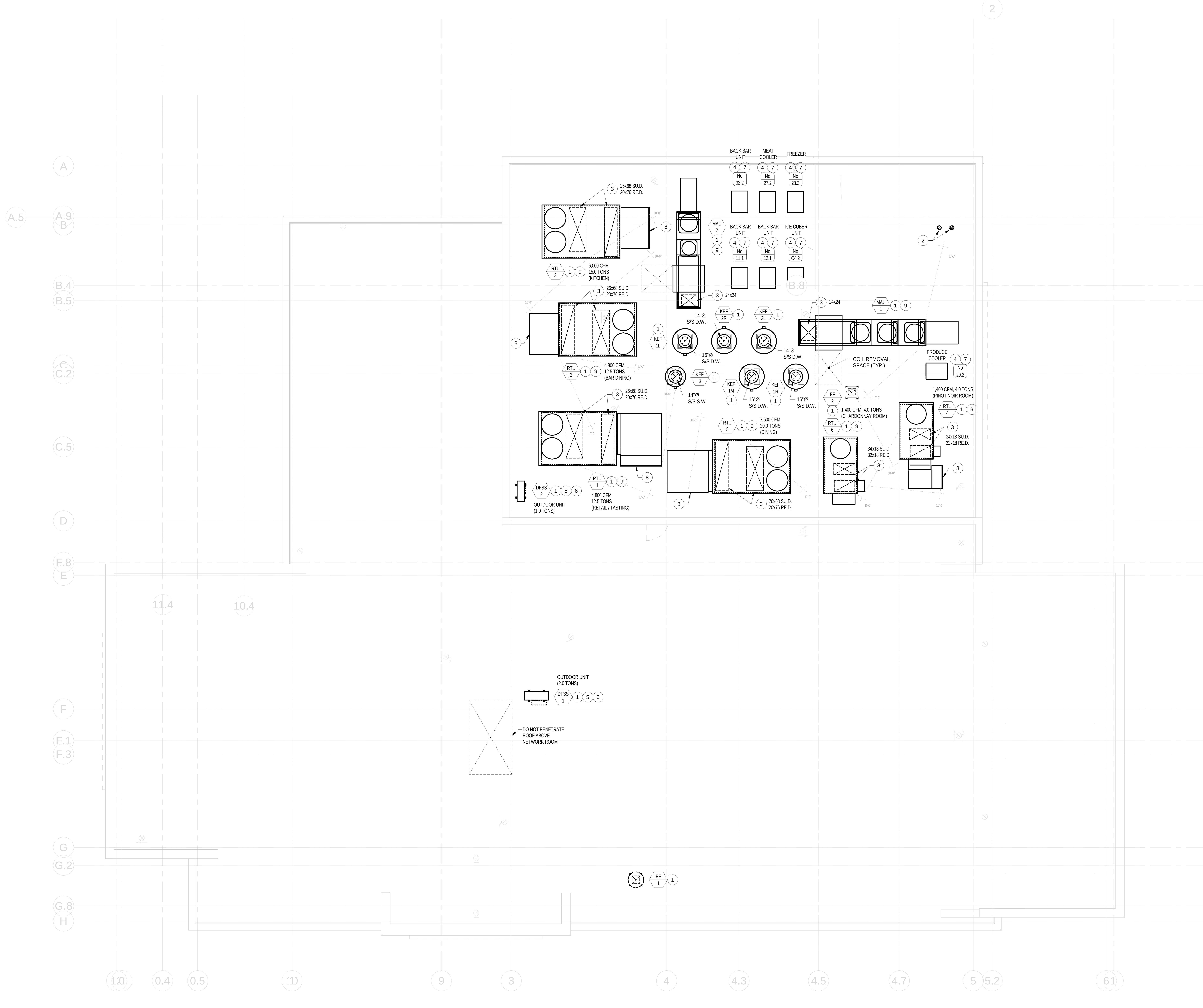
Sheet No.
M101

8/17/2021 7:11:22 PM C:\Revit Local\BTR21-0064 CH_Mech_Central_v21_Dan-S749L.rvt

BTR ENGINEERING
MECHANICAL | ELECTRICAL | PLUMBING | FIRE PROTECTION
104 N. OAK PARK AVE., STE 301
OAK PARK, IL 60301
BTRENGINEERS.COM
PHONE: 312-635-63[illegible]

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
10/14/2021

COOPER'S HAWK WINERY & RESTAURANT
540 NW CHIPMAN ROAD
LEE'S SUMMIT, MO 64086



1 M102 ROOF MECHANICAL PLAN
3/16" = 1'-0"
0 4' 8' 12'

DRAWING NOTES: (THIS SHEET ONLY)

1. MAINTAIN CODE REQUIRED, MANUFACTURER RECOMMENDED CLEARANCE AT HVAC EQUIPMENT.
2. FLUE VENT/COMBUSTION AIR INTAKE PIPE BY PLUMBING CONTRACTOR.
3. DUCT RISER OF SIZE INDICATED. PROVIDE FLEXIBLE CONNECTION AT BOTTOM OF ROOF CURB (EXCEPT KITCHEN EXHAUST FANS).
4. REFRIGERATED EQUIPMENT CONDENSER BY FOOD SERVICE CONTRACTOR. COORDINATE WITH FOOD SERVICE CONTRACTOR TO INSTALL CONDENSER TO DISCHARGE AIR AWAY FROM ROOFTOP/MAKEUP AIR UNIT OUTDOOR AIR INTAKE.
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 AIR INTAKE.
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. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
7. 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 EQUIPMENT CONTRACTOR.
8. EXTEND OUTDOOR AIR INTAKE FULL SIZE TO MAINTAIN 10'-0" FROM ANY FLUE VENT, BUILDING EXHAUST/RELIEF.
9. SPILL CONDENSATE OVER 12"x12"x3/4" THICK RUBBER ROOF GUARD PAD.

O.A. INTAKE NOTE:

MAINTAIN MINIMUM 10'-0" DISTANCE BETWEEN HVAC EQUIPMENT OUTDOOR AIR INTAKE AND ANY BUILDING RELIEF (EXHAUST FANS, PLUMBING VENTS, FLUE VENTS, ETC.)

EQUIPMENT TAG NOTE:

PROVIDE PERMANENT ENGRAVED LABEL WITH A MINIMUM OF 1/4" LETTERING FOR EACH PIECE OF HVAC ROOF MOUNTED EQUIPMENT.

COORDINATE WITH KITCHEN EQUIPMENT CONTRACTOR TO PROVIDE PERMANENT ENGRAVED LABEL WITH A MINIMUM OF 1/4" LETTERING FOR EACH ROOF MOUNTED REFRIGERATED KITCHEN EQUIPMENT CONDENSER.

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.

NFPA 96-7.8.2.1.(8)

INSTALL HINGE KITS ON ALL KITCHEN EXHAUST FANS TO PREVENT FANS FROM TIPPING OVER WHEN OPENED FOR INSPECTION AND/OR CLEANING.

ROOF DUCTWORK NOTE:

DUCT SUPPORT

1. PROVIDE MIRO INDUSTRIES MODEL 10-DS DUCT SUPPORT. MAINTAIN MAXIMUM LOAD WEIGHT AND SPACING AS RECOMMENDED BY MANUFACTURER.

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.

FIELD VERIFICATION
Contractor shall verify all figured dimensions and conditions at the job site and notify Aria Group Architects, Inc. of any dimensional errors, omissions or discrepancies before beginning or fabricating any work. Do not scale these drawings.

NO.	DATE	REMARKS
1	2021/08/19	ISSUED FOR PERMIT

REVISIONS

STATE OF MISSOURI
JOHN M. THOMAS
NUMBER PE-2010039283
PROFESSIONAL ENGINEER

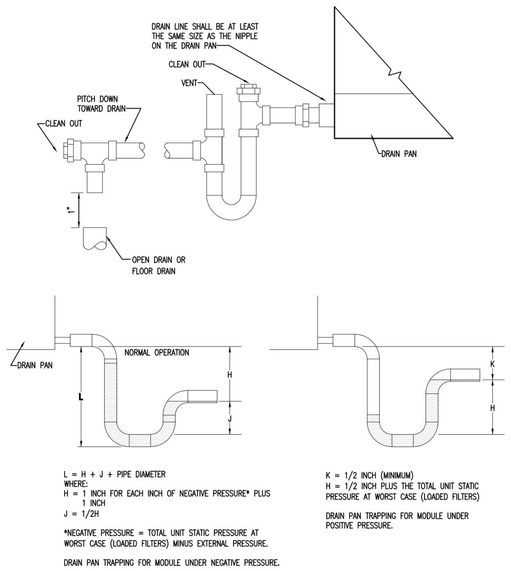
Drawing Title
HVAC - ROOF PLAN

Job No.	Drawn
21-0064	DNK

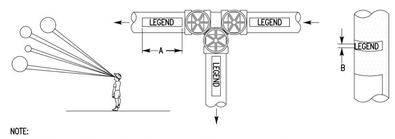
Scale	Date
3/16" = 1'-0"	08/19/2021

Sheet No.
M102

C:\Revit Local\BTR21-0064-CH_Mech_Central_v21_Dan-S749L.rvt
8/17/2021 7:11:26 PM



1 AIR HANDLING UNIT TRAP
SCALE: NO SCALE



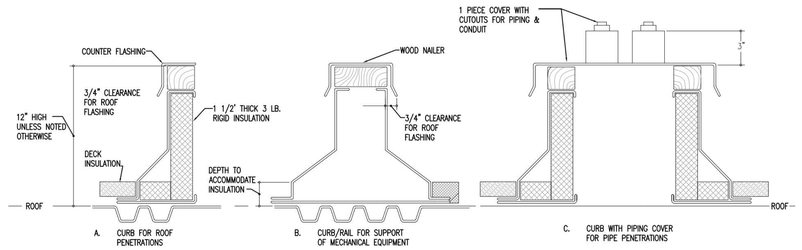
NOTE:
IDENTIFICATION MARKERS OR STRIPS TO BE PLACED ON ALL EXPOSED COVERED AND UNCOVERED PIPES AT 50'-0" INTERVALS AND AT ALL VALVES AND BRANCHES AND ON BOTH SIDES OF WALLS WHERE PIPES PASS THROUGH SAME. ARROWS OF SAME COLOR AS IDENTIFICATION MARKERS SHALL ALSO BE PLACED ON PIPES POINTING AWAY FROM MARKER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

SIZE OF LEGEND LETTERS

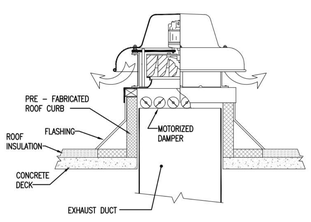
OUTSIDE DIAMETER OF PIPE OR COVERING	LENGTH OF COLOR FIELD A	SIZE OF LETTERS B
3/4" TO 1-1/4"	8"	1/2"
1-1/2" TO 2"	8"	3/4"
2"-1/2" TO 6"	12"	1-1/4"
8" TO 10"	24"	2-1/2"
OVER 10"	32"	3-1/2"

SERVICE	BACKGROUND OR COLOR BAND	IDENTIFICATION MARKER

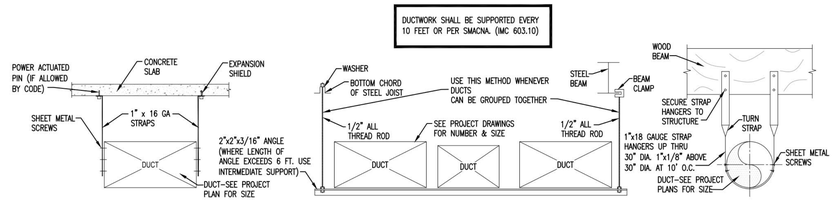
2 TYPICAL PIPE IDENTIFICATION MARKERS
SCALE: NO SCALE



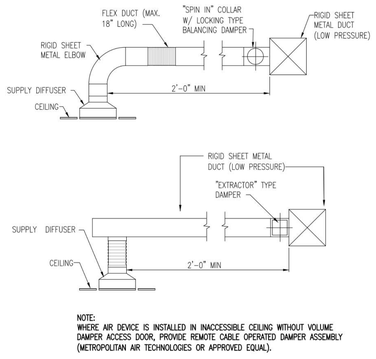
3 CURBING AIR RAIL DETAIL
SCALE: NO SCALE



4 ROOF EXHAUST FAN DETAIL
SCALE: NO SCALE

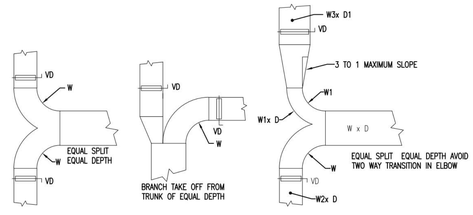


5 LOW PRESSURE DUCT SUPPORT DETAIL
SCALE: NO SCALE



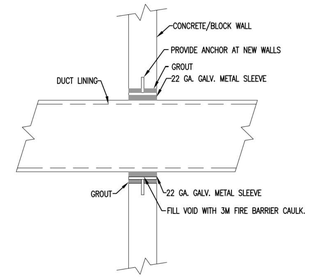
NOTE:
WHERE AIR DEVICE IS INSTALLED IN INACCESSIBLE CEILING WITHOUT VOLUME DAMPER ACCESS DOOR, PROVIDE REMOTE CABLE OPERATED DAMPER ASSEMBLY (METROPOLITAN AIR TECHNOLOGIES OR APPROVED EQUAL).

6 TYPICAL SUPPLY DIFFUSER INSTALLATION
SCALE: NO SCALE



DUCT CONNECTIONS-ALL PRESSURE

7 TYPICAL DUCT CONNECTIONS
SCALE: NO SCALE



8 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.

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
10/04/2021

BTR ENGINEERING
MECHANICAL | ELECTRICAL | PLUMBING | FIRE PROTECTION

COOPER'S HAWK WINERY & RESTAURANT
540 NW CHIPMAN ROAD
LEE'S SUMMIT, MO 64086

FIELD VERIFICATION
Contractor shall verify all figured dimensions and conditions at the job site and notify Aria Group Architects, Inc. of any dimensional errors, omissions or discrepancies before beginning or fabricating any work. Do not scale these drawings.

NO.	DATE	REMARKS
1	2021/08/19	ISSUED FOR PERMIT

REVISIONS

STATE OF MISSOURI
JOHN M. THOMAS
NUMBER PE-2010023263
PROFESSIONAL ENGINEER

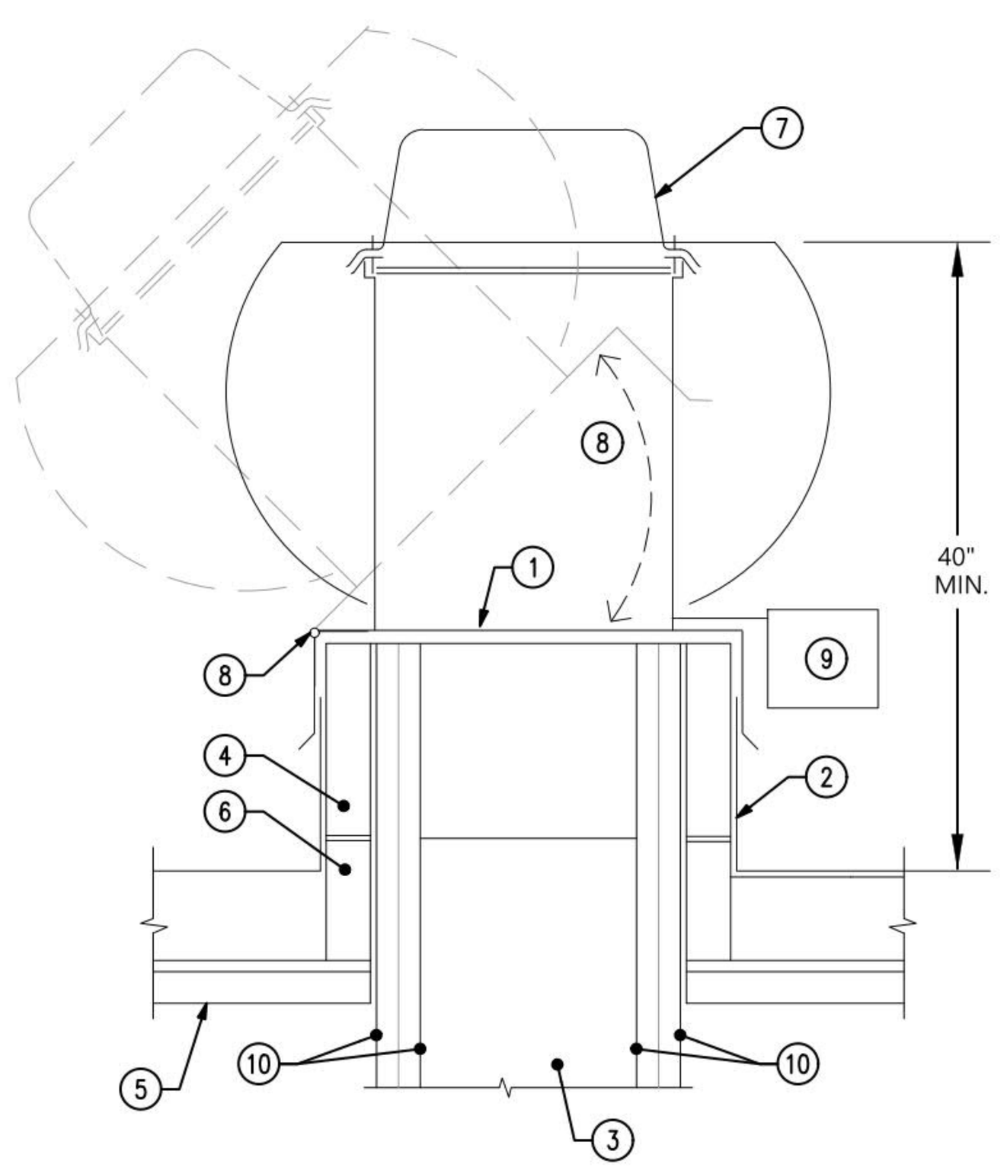
Drawing Title
HVAC - DETAILS

Job No.	Drawn
21-0064	DNK

Scale	Date
N.T.S.	08/19/2021

Sheet No.
M300

8/17/2021 7:11:29 PM C:\Revit Locals\BTR21-0064 CH_Mech_Central_v21_Dan-S749L.rvt



1. NEOPRENE SEAL BETWEEN CURB & BASE. ATTACH BASE TO CURB W/8 EVENLY SPACED BOLTS.
2. BASE FLASH
3. BLACK IRON WELDED TYPE 1 HOOD EXHAUST DUCT.
4. FACTORY SUPPLIED VENTILATED CURB EXTENSION WITH HINGE.
5. ROOF DECK.
6. FACTORY FABRICATED ROOF CURB W/FLASHING. NAIL TO ROOF PRIOR TO SEALANT APPLICATION.
7. UPBLAST EXHAUST FAN
8. COORDINATE WITH ELECTRICAL CONTRACTOR TO PROVIDE FLEX CONNECTION FOR HINGE OPERATION.
9. GREASE COLLECTOR.
10. FIRE RATED ENCLOSURE (TWO LAYERS OF FIRE RATED INSULATION).

TYPE 1 HOOD HINGED EF MOUNTING DETAIL

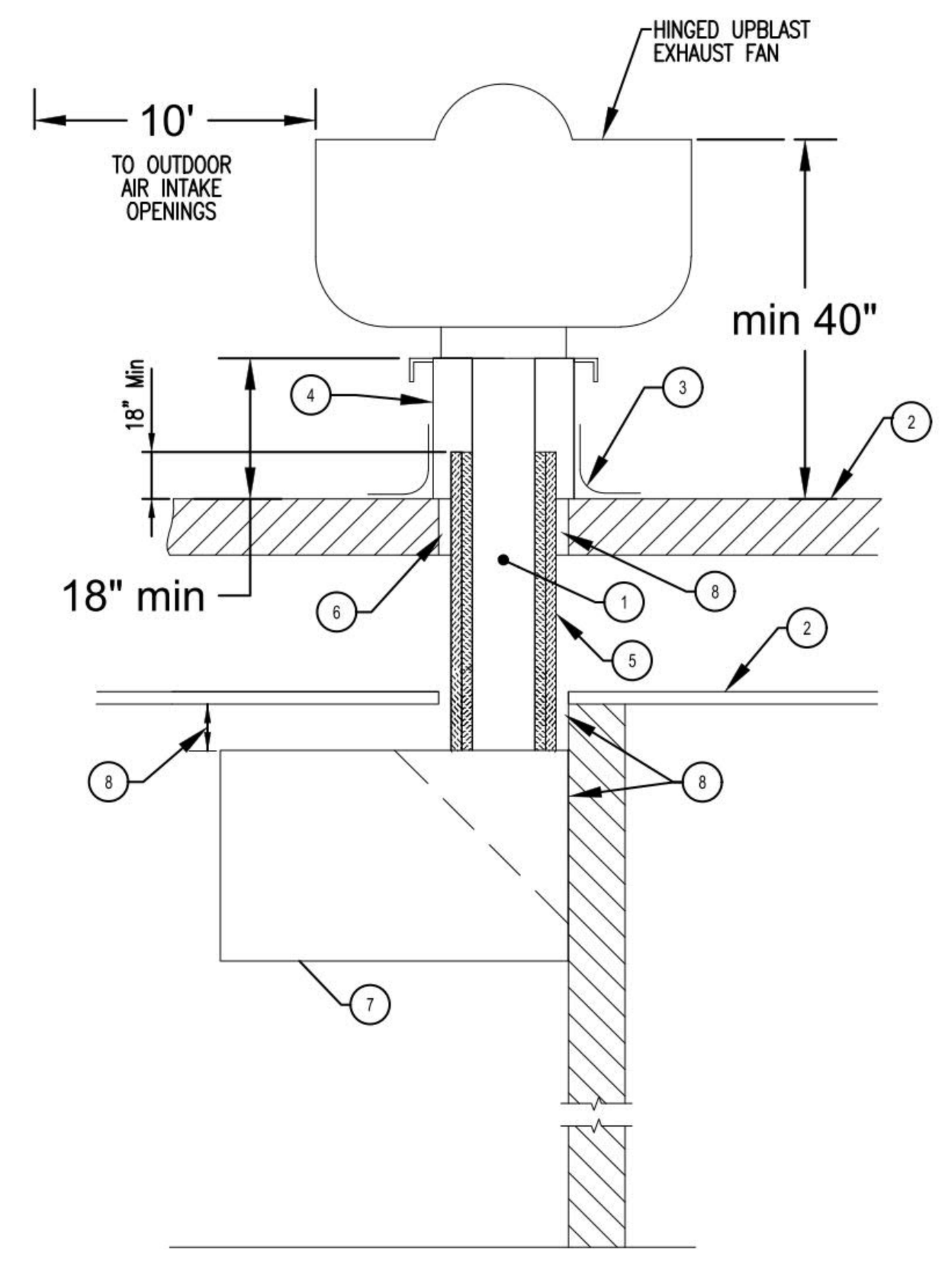
SCALE: N.T.S.

NOTES FOR NFPA 96 (STANDARD FOR THE INSTALLATION OF EQUIPMENT FOR THE REMOVAL OF SMOKE AND GREASE-LADEN VAPORS FROM COMMERCIAL COOKING EQUIPMENT)

- PROVIDE TWO 20X20 OPENINGS EQUALLY SPACED, FOR PERSONNEL ENTRY AT THE HORIZONTAL DUCT & ONE AT THE TOP OF THE VERTICAL RISER TO ACCOMMODATE DESCENT.
- ACCESS PANELS SHALL BE OF THE SAME MATERIAL AND THICKNESS AS THE DUCT. ACCESS PANELS SHALL HAVE A GASKET OR SEALANT THAT IS RATED FOR 1500 DEG F AND SHALL BE GREASE TIGHT. FASTENERS USED TO SECURE THE ACCESS PANELS SHALL BE OF CARBON STEEL OR STAINLESS STEEL AND SHALL NOT PENETRATE DUCT WALLS.
- DUCTS SHALL BE CONSTRUCTED OF AND SUPPORTED BY 14 GAUGE CARBON STEEL.
- ALL SEAMS, JOINTS, PENETRATIONS, AND DUCT TO HOOD COLLAR CONNECTIONS SHALL HAVE A LIQUID TIGHT CONTINUOUS EXTERNAL WELD.
- ROOF TERMINATION SHALL HAVE:
- THE EXHAUST FLOW DIRECTED UP AND AWAY FROM THE SURFACE OF THE ROOF AND A MINIMUM OF 40 IN. ABOVE THE ROOF SURFACE.
- THE ABILITY TO DRAIN GREASE OUT OF ANY TRAPS OR LOW POINTS FORMED IN THE FAN OR DUCT NEAR THE TERMINATION OF THE SYSTEM TO A RAINPROOF COLLECTION RAINPROOF COLLECTION CONTAINER.
- WITH A HINGED UP-DISCHARGE FAN SUPPLIED WITH WEATHERPROOF ELECTRICAL CABLE & SERVICE HOLD-OPEN RETAINER TO PERMIT PROPER INSPECTION AND CLEANING.
- AIR VELOCITY SHALL NOT BE LESS THAN 1,500 FT PER MIN.
- THE OPERATION OF THE HOOD EXTINGUISHING SYSTEM SHALL AUTOMATICALLY SHUT OFF ALL SOURCES OF FUEL
- WHERE CONCEALED, THE DUCT SHALL HAVE A HIGH TEMPERATURE, INORGANIC, FOIL ENCAPSULATED CERAMIC FIBER BLANKET DUCT WRAP, ALLOWING A ZERO INCH CLEARANCE TO COMBUSTIBLE CONSTRUCTION AND A 2 HOUR FIRE RESISTIVE RATED ENCLOSURE. INSULATION SHALL BE REMOVABLE AT CLEANOUTS. LOCATIONS TO BE TAGGED WITH A 2" BRASS TAG.

1 KITCHEN EXHAUST FAN (TYPE 1 HOOD) DETAIL

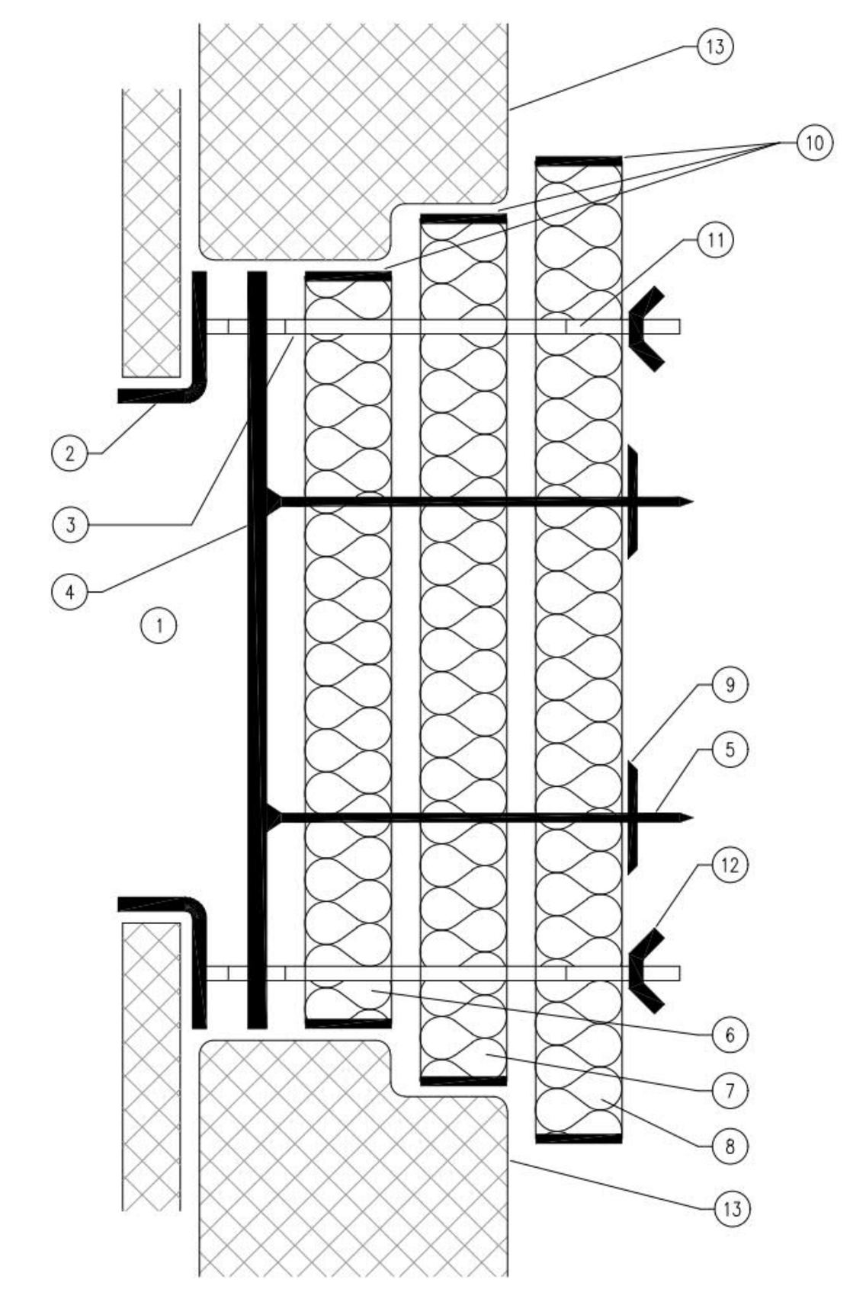
SCALE: NO SCALE (KEF-1L, KEF-1M, KEF-1R, KEF-2L, KEF-2R)



FireMaster Duct System	
1	GREASE DUCT
2	FINISHED ROOF
3	ROOF OVER-FLASHING
4	VENT FLASHING
5	TWO LAYERS FIREWRAP DUCT WRAP
6	FIREWRAP FIRESTOP SYSTEM ONLY NEEDED FOR RATED ROOFS
7	EXHAUST HOOD
8	0" CLEARANCE TO NONCOMBUSTIBLES 3" CLEARANCE TO LIMITED COMBUSTIBLES, UNLESS PROTECTED 18" CLEARANCE TO COMBUSTIBLES, UNLESS PROTECTED

2 KITCHEN EXHAUST FAN / TYPE 1 HOOD DETAIL

SCALE: NO SCALE (KEF-1L, KEF-1M, KEF-1R, KEF-2L, KEF-2R)



LEGEND	
1	DOOR HOLE. SEE REQUIREMENTS A THRU D.
2	ACCESS FRAME WELDED TO DUCT
3	1/4" DIAMETER ALL THREAD RODS
4	ACCESS COVER - 14 GAUGE
5	INSULATION PINS - WELDED
6	FIREMASTER DUCT WRAP
7	FIREMASTER DUCT WRAP 1" OVERLAP
8	FIREMASTER DUCT WRAP 1" OVERLAP
9	SPEED CLIPS
10	ALUMINUM TAPE AT EDGES
11	SPOOL PIECES FOR THREADED RODS
12	1/4" DIAMETER WING NUTS
13	DUCT INSULATION - SEE NOTE E

NOTES:

ACCESS OPENINGS SHALL CONFORM TO THE FOLLOWING:

A. 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.

B. IN HORIZONTAL SECTIONS, THE LOWER EDGE OF THE OPENING SHALL BE NOT LESS THAN 1 1/2 IN. FROM THE BOTTOM OF THE DUCT.

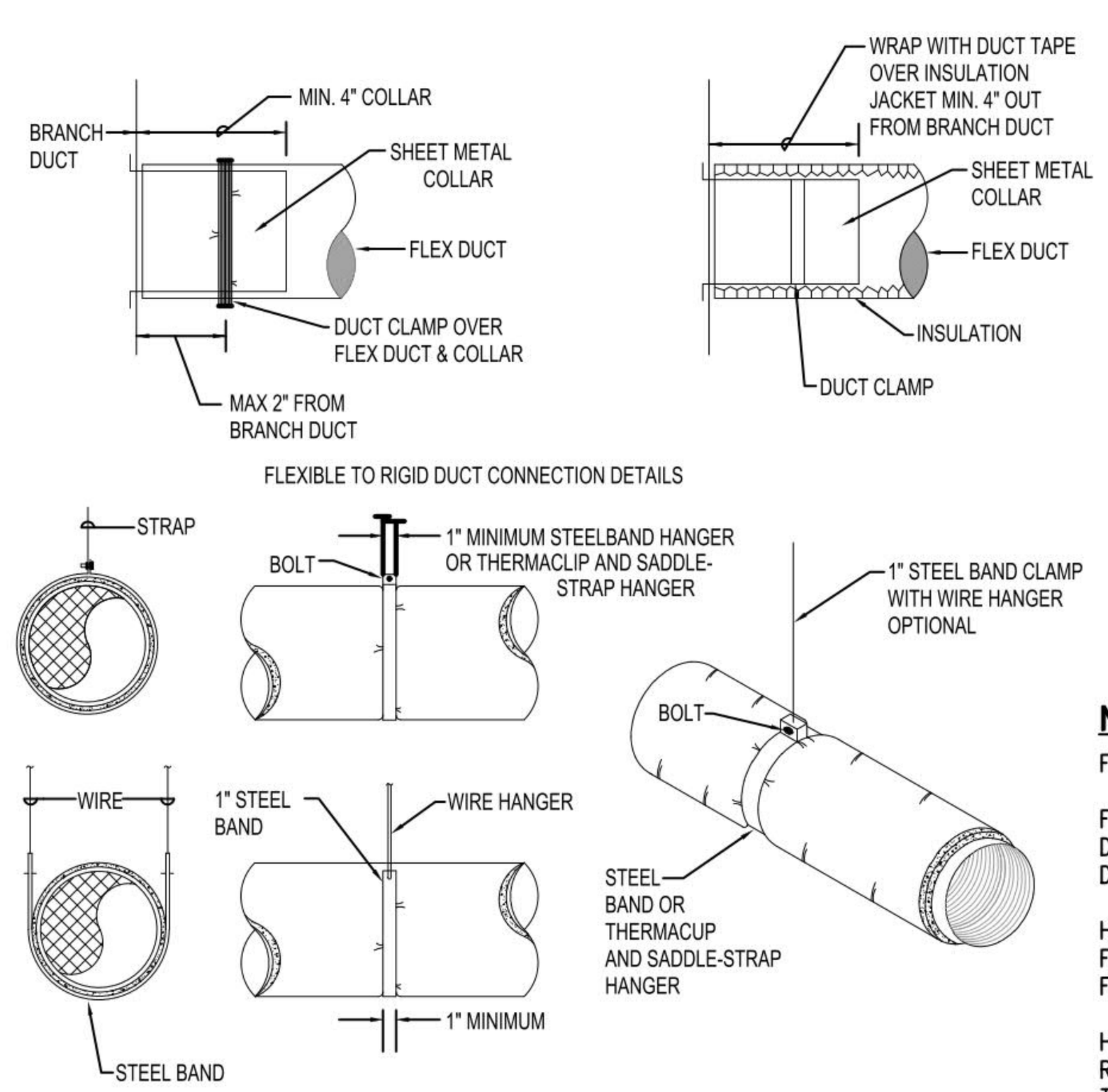
C. ON VERTICAL DUCTWORK WHERE PERSONNEL ENTRY IS POSSIBLE, ACCESS SHALL BE PROVIDED AT THE TOP OF THE VERTICAL RISER TO ACCOMMODATE DESCENT. WHERE PERSONNEL ENTRY IS NOT POSSIBLE, ADEQUATE ACCESS FOR CLEANING SHALL BE PROVIDED ON EACH FLOOR.

D. ACCESS PANELS SHALL BE OF THE SAME MATERIAL & THICKNESS AS THE DUCT. ACCESS PANELS SHALL HAVE A GASKET OR SEALANT THAT IS RATED FOR 1500°F & 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.

E. 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

3 KITCHEN EXHAUST DUCT ACCESS DOOR REQUIREMENTS AND ENCLOSURE INSTALLATION DETAIL

SCALE: NO SCALE



NOTE:
MAXIMUM PERMISSIBLE SAG PER FOOT=1/2" BETWEEN SUPPORTS.

NOTES:

FLEXIBLE DUCTWORK SHALL COMPLY TO FBCM 603.5 THROUGH 603.5.6.6)

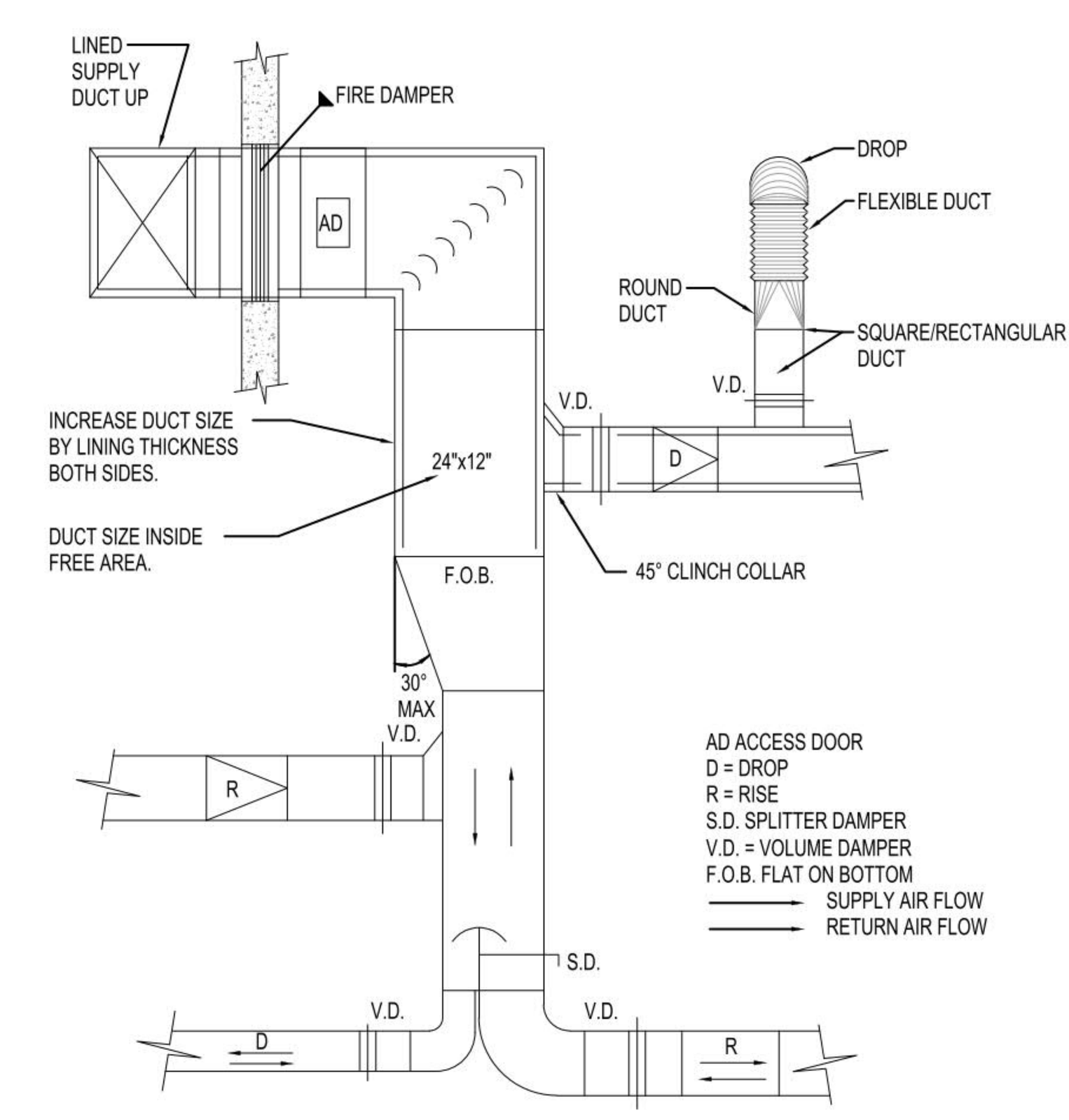
FLEXIBLE DUCTWORK SHALL BE TESTED IN ACCORDANCE WITH UL-181. DUCTS SHALL BE LISTED AND LABLED AS CLASS 0 OR CLASS 1 FLEXIBLE DUCT AND SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 304.1 FBCM.

HORIZONTAL DUCT SHALL BE SUPPORTED AT INTERVALS NOT GREATER THAN 5 FEET. SUPPORTS SHALL BE PROVIDED WITHIN 1.5 FEET OF INTERMEDIATE FITTINGS AND BENDS.

HANGERS, SADDLES AND SUPPORTS SHALL MEET THE DUCT MANUFACTURERS RECOMMENDATIONS AND SHALL BE SUFFICIENT TO PREVENT RESTRICTION OF THE INTERNAL DUCT DIAMETER. IN NO CASE SHALL THE MATERIAL SUPPORTING FLEXIBLE DUCT THAT IS IN DIRECT CONTACT WITH IT BE LESS THAN 1½" WIDE

4 FLEXIBLE DUCT HANGER AND CONNECTION DETAIL

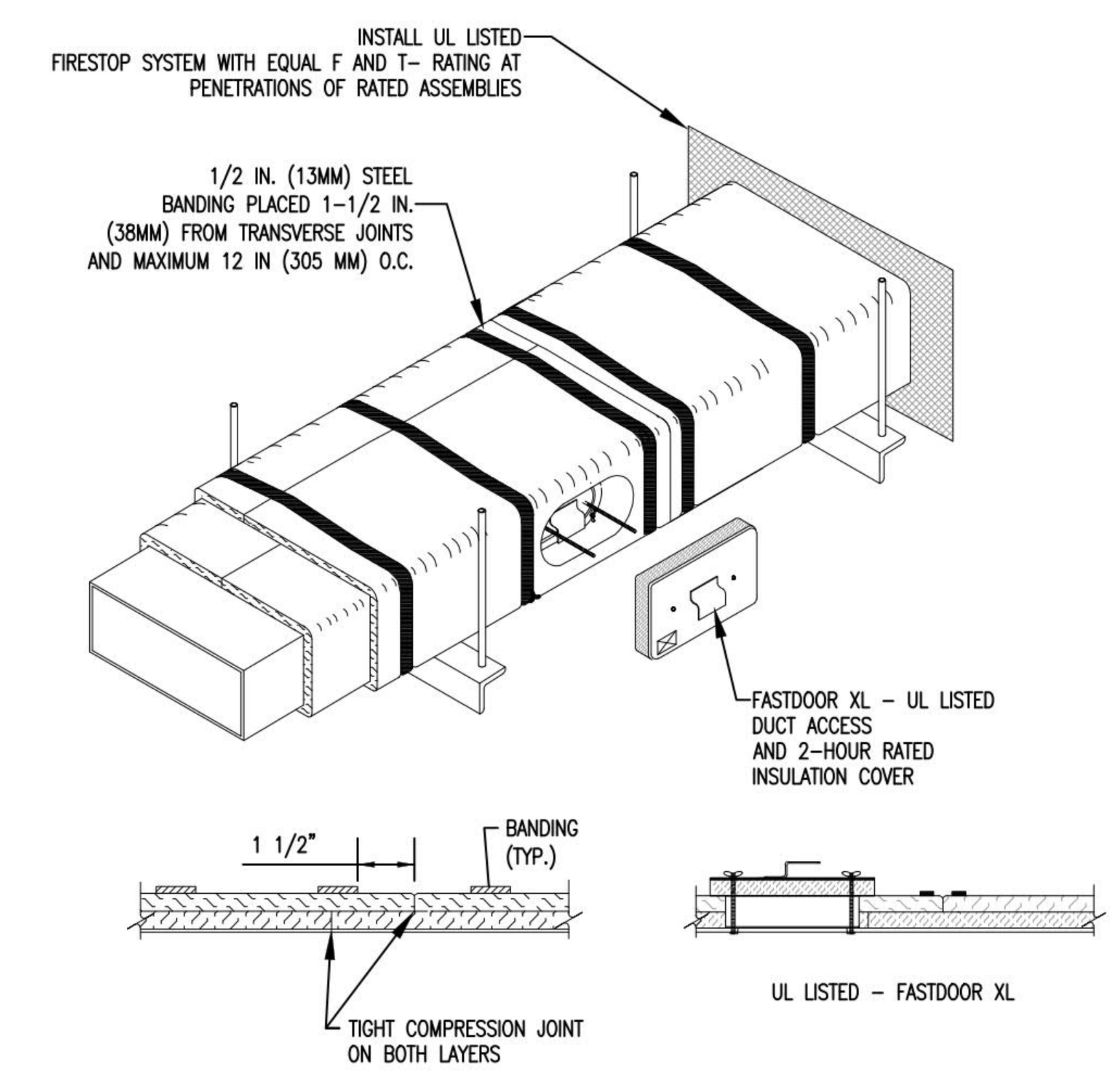
SCALE: NO SCALE



5 TYPICAL FITTINGS AND VOLUME DAMPER LOCATION IN SUPPLY OR RETURN DUCT SYSTEM

SCALE: NO SCALE

1. THERMAL CERAMICS FIREMASTER FASTWRAP XL OR PYROSCAT XL IS TESTED TO ASTM E2336 & UL LISTED PER HNKT.G18 TO PROVIDE ZERO CLEARANCE TO COMBUSTIBLES & TO PROVIDE A 1- OR 2-HOUR ENCLOSURE. THROUGH PENETRATIONS FIRESTOP SYSTEMS ARE TESTED IN ACCORDANCE WITH ASTM E 814 (UL 1479). ICC-ES APPROVAL PER REPORT ESR 2213 OR ESR 2832.
2. COMPLIANT TO THE FOLLOWING CODES:
   NFPA 96
   INTERNATIONAL MECHANICAL CODES
   UNIFORM MECHANICAL CODE.
   CALIFORNIA MECHANICAL CODE
3. INSULATION APPLIED IN TWO LAYERS WITH TIGHT COMPRESSION JOINT ON BOTH LAYERS AT ALL JOINTS.
4. MINIMUM 16 GAUGE CARBON STEEL (OR 18 GAGE STAINLESS STEEL) RECTANGULAR OR ROUND GREASE EXHAUST DUCT
5. INSTALL UL LISTED AND LIQUID TIGHT THERMAL CERAMICS FASTDOOR XL ACCESS DOORS AT ALL CHANGES IN DIRECTION AND AT MINIMUM EVERY 20 FT ON HORIZONTAL RUNS.
6. SUPPORT HANGER SYSTEMS DO NOT NEED TO BE WRAPPED PROVIDED THE HANGER RODS ARE MINIMUM OF 3/8 IN. DIAMETER & SUPPORTS ARE MINIMUM 2 X 2 X 1/8 IN. STEEL ANGLE OR SMACNA EQUIVALENT SUPPORT SYSTEM.
7. THERMAL CERAMICS DUCT WRAP SHALL BE INSTALLED DIRECTLY ONTO THE DUCT AND APPLIED FROM THE HOOD CONNECTION TO THE CONNECTION TO THE FAN.
8. THERMAL CERAMICS DUCT ENCLOSURE SYSTEM SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS & UL LISTINGS.



6 FIRE RATED ENCLOSURE - GREASE DUCT 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.

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
10/14/2021

104 N. OAK PARK AVE., STE 301
OAK PARK, IL 60301
BTRENGINEERS.COM
PHONE: 312-635-6321

BTR ENGINEERING
MECHANICAL | ELECTRICAL | PLUMBING | FIRE PROTECTION

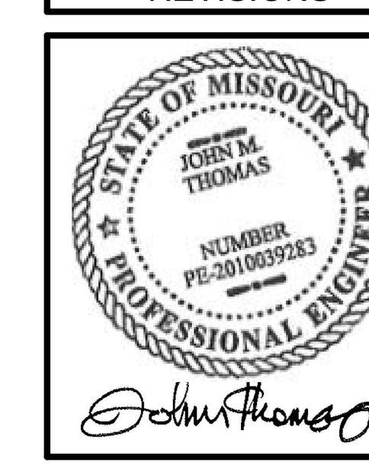
540 NW CHIPMAN ROAD
LEE'S SUMMIT, MO 64086

COOPER'S HAWK
WINERY & RESTAURANT

FIELD VERIFICATION
Contractor shall verify all figured dimensions and conditions at the job site and notify Aria Group Architects, Inc. of any dimensional errors, omissions or discrepancies before beginning or fabricating any work. Do not scale these drawings.

NO.	DATE	REMARKS
1	2021/08/19	ISSUED FOR PERMIT

REVISIONS



Drawing Title
HVAC - DETAILS

Job No. 21-0064 | Drawn DNK
Scale N.T.S. | Date 08/19/2021

Sheet No.
M301

C:\Revit Local\BTR21-0064 CH_Mech_Central_v21_Dan-S749L.rvt
8/17/2021 7:11:32 PM

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
10/14/2021

AIR BALANCE SCHEDULE

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	--	--	--	(940)	(940)
EF-2	--	--	--	(400)	(400)
BUILDING TOTAL	34,250	(21,190)	13,060	(11,700)	1,360
* - INTERMITTENT FAN OPERATION				POSITIVE PRESSURE =	4.0%

HVAC DESIGN CRITERIA

DESIGN DATA FROM ASHRAE - 2017 FUNDAMENTALS HANDBOOK			
SUMER OUTSIDE DESIGN TEMPERATURE *		INSIDE DESIGN TEMPERATURE	
DRY BULB [°F]	WET BULB [°F]	DRY BULB [°F]	WET BULB [°F]
96	76.5	75	62.6
WINTER OUTSIDE DESIGN 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 INTERNATIONAL AIRPORT, MO

VENTILATION SCHEDULE – LEE'S SUMMIT, MO CITY MECHANICAL CODE – (INTERNATIONAL MECHANICAL CODE – 2018)

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	ROOM DATA: FOOR AREA SQ.FT.	ROOM DATA: HEIGHT FT.	ROOM DATA: VOLUME CU.FT.	NATURAL VENTILATION (SECTION 402): MIN. OPERBL. AREA SQ.FT.	NATURAL VENTILATION (SECTION 402): ACTUAL OPERBL. AREA SQ.FT.	ESTIM. MAX. LOAD PERS./PLUMB. FIXTURES: PER 1000 SQ.FT.	ESTIM. MAX. LOAD PERS./PLUMB. FIXTURES: ACTUAL	REQUIRED OUTSIDE AIR / EXHAUST: CFM/ PERSON	REQUIRED OUTSIDE AIR / EXHAUST: O.A. CFM/SQ.FT.	REQUIRED OUTSIDE AIR / EXHAUST: EXHAUST CFM/SQ.FT. CFM/WC (UR)	REQUIRED OUTSIDE AIR / EXHAUST: TOTAL O.A.	REQUIRED OUTSIDE AIR / EXHAUST: EXHAUST CFM	ACTUAL ROOM VENTILATION: SUPPLY CFM: TOTAL	ACTUAL ROOM VENTILATION: SUPPLY CFM: % O.A.	ACTUAL ROOM VENTILATION: SUPPLY CFM: TOTAL O.A.	ACTUAL ROOM VENTILATION: EXHAUST CFM	NOTES
ROOFTOP UNIT RTU-1 (RETAIL / TASTING BAR)																			
101	ENTRY	CORRIDORS & UTILITIES	57	10.5	599	3	SEE NOTE 1	--	0	0	0.06	--	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	--	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	502	11.5	5,773	21	SEE NOTE 1	100	4	7.5	0.18	--	121	--	1,360	17.3	235	--	1,2
105	TAKE-OUT / CARY-OUT	RETAIL STORES / SALES FLOORS	132	11.5	1,518	6	SEE NOTE 1	15	10	7.5	0.12	--	91	--	400	17.3	69	--	1,2
106	HOST	LOBBIES / PREFUNCTION	165	11.5	1,898	7	SEE NOTE 1	30	10	7.5	0.06	--	85	--	300	17.3	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	--	0	--	0.12	--	2	--	0	17.3	0	--	1,2,4
117	WOMEN'S TOILET	TOILET ROOMS - PUBLIC	201	9.0	1,809	9	SEE NOTE 1	--	3	--	--	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	--	--	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	--	0.12	--	46	--	540	17.3	93	--	1,2
		TOTAL =	2,924						70				826	(400)	4,800		830	(940)	
ROOFTOP UNIT RTU-2 (BAR DINING)																			
109	BAR DINING	DINING ROOMS	755	10.5	7,928	31	SEE NOTE 1	70	53	7.5	0.18	--	534	--	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	--	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
		TOTAL =	1,295						72				775	0	4,800		780		
ROOFTOP UNIT RTU-3 (KITCHEN)																			
121	COOKLINE	KITCHENS (COOKING)	445	9.0	4,005	18	SEE NOTE 1	--	4	--	--	0.7	--	(312)	1,800	16.7	300	(6,240)	1,2
122	DISHWASH	KITCHENS (COOKING)	264	9.0	2,376	11	SEE NOTE 1	--	2	--	--	0.7	--	(185)	900	16.7	150	(1,125)	1,2
123	PREP	KITCHENS (COOKING)	445	9.0	4,005	18	SEE NOTE 1	--	6	--	--	0.7	--	(312)	2,000	16.7	333	(3,600)	1,2
124	DRY STORAGE	STORAGE ROOMS	198	9.0	1,782	8	SEE NOTE 1	--	0	--	0.12	--	24	--	200	16.7	33	--	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	--	(138)	340	16.7	57	--	1,2,3
125	EMPLOYEE BREAK AREA	KITCHENS (COOKING)	150	9.0	1,350	6	SEE NOTE 1	--	2	--	--	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	--	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	--	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 UNIT RTU-4 (PINO NOIR ROOM)																			
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 UNIT RTU-5 (DINING)																			
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 UNIT RTU-6 (CHARDONNAY ROOM)																			
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		
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	--	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		
MISCELLANEOUS																			
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	--	--
133	PATIO	NOT APPLICABLE	755	0.0	0	0	--	0	0	0	0	--	0	--	0	0.0	0	--	--

NOTES:

1.) SEE ARCHITECTURAL DRAWINGS FOR MINIMUM / ACTUAL OPERABLE AREA.
2.) COORDINATED WITH TABLE 403.3.
3.) OPEN TO ADJACENT AREA.
4.) OPEN TO ADJACENT AREA WHEN IN USE.
5.) OPEN TO OUTDOORS WHEN IN USE.
6.) OUTDOOR AIR PROVIDED BY ROOFTOP UNIT RTU-3.

MECHANICAL / ELECTRICAL COORDINATION SCHEDULE

EQUIPMENT / DEVICE TAG	EQUIPMENT DESCRIPTION	UNIT MOUNTED DEVICES: STARTER	UNIT MOUNTED DEVICES: DISCONNECT	UNIT MOUNTED DEVICES: OVERCURRENT PROTECTION	UNIT MOUNTED DEVICES: SINGLE POINT CONNECTION	REMOTE OR LOOSE DEVICES: STARTER	REMOTE OR LOOSE DEVICES: DISCONNECT	REMOTE OR LOOSE DEVICES: 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					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	

GENERAL NOTES:

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").

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 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 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.

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.

104 N. OAK PARK AVE., STE 200
OAK PARK, IL 60301
BTRENGINEERS.COM
PHONE 312-635-6300

BTR ENGINEERING
MECHANICAL | ELECTRICAL | PLUMBING | FIRE PROTECTION

COOPER'S HAWK WINERY & RESTAURANT
540 NW CHIPMAN ROAD
LEE'S SUMMIT, MO 64086

FIELD VERIFICATION
Contractor shall verify all figured dimensions and conditions at the job site and notify Aria Group Architects, Inc. of any dimensional errors, omissions or discrepancies before beginning or fabricating any work. Do not scale these drawings.

NO.	DATE	REMARKS
1	2021/08/19	ISSUED FOR PERMIT

REVISIONS

STATE OF MISSOURI
JOHN M. THOMAS
NUMBER PE-2010039283
PROFESSIONAL ENGINEER

Drawing Title: HVAC - SCHEDULES

Job No.: 21-0064
Drawn: DNK
Scale:
Date: 08/19/2021
Sheet No.: M400

8/17/2021 7:11:35 PM C:\Revit Local\BTR21-0064 CH_Mech_Central_v21_Dan-S749L.rvt

ROOFTOP UNIT SCHEDULE (RTU)

TAG	SERVICE	NOMINAL TONS	TOTAL CFM	MIN O.A. CFM	% OA CFM	COOLING (CONDENSER FAN EAT=95 oF)					GAS HEATING				FAN MOTOR			POWER EXHAUST (HP)	ELECTRIC						FILTERS		OPERATING WEIGHT (LBS.)	SYSTEM	MANUFACTURER MODEL NUMBER	NOTES
						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.)	BHP	HP	ESP (IN. WC)		MCA	MOCP	VOLT	PH	HZ	EER / IEER / SEER	SIZES	TYPE				
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	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	17.5 SEER	(4) 16x25	2" T.A.	1,025	CAV VERTICAL	TRANE YHC 047	1 THRU 7

NOTES:
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) .
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 SCHEDULE

TYPE	SERVICE	MANUFACTURER	MODEL NO.	DESCRIPTION	MATERIAL	NC LEVEL	NOTES
A	SUPPLY	TITUS	TMSA	SQUARE CEILING DIFFUSER ADJUSTABLE	STEEL	30	1,3,4,5
B	SUPPLY	TITUS	ML-39	LINEAR SLOT DIFFUSER - TWO (2) 1" WIDE 48" LONG SLOTS	ALUMINUM	30	1,3,4,5
C	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

NOTES:
1.) CUSTOM FINISH AND COLOR AS SELECTED BY ARCHITECT.
2.) PAINT INSIDE OF DUCT BLACK WHERE LINE OF SIGHT OF INSIDE OF DUCT IS VISIBLE.
3.) OPPOSED BLADE DAMPER IF NOT SHOWN ON PLANS.
4.) COORDINATE FRAME TYPE WITH REFLECTED CEILING 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 TYPE (3-WAY, 4-WAY).

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)

FAN SCHEDULE (EF, KEF)

TAG	LOCATION	SERVICE	CFM	ESP (IN. W.C.)	FAN DATA				MOTOR DATA					WT. (LBS.)	MANUFACTURER (GREENHECK) MODEL NO.	CONTROLS	NOTES
					FAN TYPE	RPM	SONES	DRIVE	MAX. BHP	HP	VOLT	PH	HZ				
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	C	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	C	1,2,3,4,5

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

CONTROLS LEGEND:
BAS = BUILDING AUTOMATION SYSTEM
C = TIME CLOCK
EM = EMERGENCY POWER
FAS = FIRE ALARM SYSTEM
OS = OCCUPANCY SENSOR
PL = PILOT LIGHT
R = RELAY, INTERLOCKED WITH HVAC/ ELECTRICAL EQUIPMENT
S = WALL SWITCH
SL = INTERLOCKED WITH SPACE LIGHTS
T = REVERSE ACTING THERMOSTAT
TD = TIME DELAY OFF

ELECTRIC CEILING / UNIT HEATER SCHEDULE (ECH, EUH)

TAG	LOCATION	TYPE	CFM	HEATING DATA			PHYSICAL DATA		ELECTRICAL DATA					MARKEL MODEL NO.	NOTES
				BTUH	EAT (°F)	LAT (°F)	DIMENSIONS WxHxD	WEIGHT (LBS.)	HEATER KW	AMPS	VOLT	PH	HZ		
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.
3.) WALL MOUNTED HEAT STRATIFICATION THERMOSTAT.
4.) WALL / CEILING MOUNTING BRACKET.
5.) VERTICAL DISCHARGE.

ELECTRIC DUCT HEATER SCHEDULE (EDH)

TAG	SERVING	LOCATION	CFM	TEMP RISE °F	HTG. CAP. BTUH	SIZE (IN) W x H	COIL VEL. (FPM)	NO. OF STAGES	ELECTRIC				CONTROL VOLTAGE	MANUFACTURER & MODEL NUMBER	NOTES
									KW	VOLT	PH	HZ			
EDH-1	ENTRY 101	WOMEN'S 117	400	22.0	9,554	10 x 10	576	SCR	2.8	208	3	60	24	INDEECO #QUA	1,2,3,4,5,6
EDH-2	DINING 112	DINING 112	1,200	22.0	28,661	16 x 14	771	SCR	8.4	208	3	60	24	INDEECO #QUA	1,2,3,4,5,6
EDH-3	MENS WOMENS	TOILET HALLWAY	380	22.3	9,212	10 x 10	547	SCR	2.7	208	3	60	24	INDEECO #QUA	1,2,3,4,5,6

NOTES:
1.) PROVIDE THERMOSTAT WITH REMOTE SENSOR FOR EACH HEATER - STAGES OF CONTROL TO MATCH STAGES OF HEATER AND PER SEQUENCE OF OPERATION
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
5.) PROVIDE ADEQUATE ACCESS TO PROPERLY MAINTAIN COMPONENTS.
6.) PROVIDE MAGNETIC CONTACTORS (MERCURY NOT ACCEPTABLE).

DUCT FREE SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE (DFSS)

TAG	DFSS INDOOR UNIT												DFSS OUTDOOR UNIT															EER	SEER	NOTES
	LOCATION	FAN CFM TURBO-HI -MED-LOW	TOTAL CLG CAP. BTUH	HEATING CAPACITY BTUH	MOTOR DATA				SOUND LEVEL dB AT HIGH	UNIT SIZE WxDxH (IN)	WEIGHT (LBS)	MANUFACTURER TRANE/ MITSUBISHI MODEL NO.	LOCATION	COMPRESSOR						ELECTRICAL DATA					UNIT SIZE WxDxH (IN)	WEIGHT (LBS)	MANUFACTURER TRANE/ MITSUBISHI MODEL NO.			
					FLA	VOLTS	PH	HZ						QTY	TYPE	RLA	LRA	REFRIGERANT TYPE	REFRIGERANT LBS.	MCA	MOCP	VOLTS	PH	HZ						
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

NOTES:
1.) ACCEPTABLE MANUFACTURERS: LG, CARRIER.
2.) LOW AMBIENT OPERATION (- 4.0 deg F).
3.) WIRED WALL MOUNTED CONTROLLER (7 DAY PROGRAMMABLE) WITH LCD DISPLAY
4.) PROVIDE REFRIGERANT PIPING AND ACCESSORIES AS PER MANUFACTURERS INSTRUCTIONS.
5.) OPERATING RANGE COOLING: - 40 deg ~ 115 deg F DB.
6.) CONDENSATE PUMP AS REQUIRED.
7.) OUTDOOR UNIT HAIL GUARDS.
8.) WIND BAFFLE.
9.) CEILING CASSETTE GRILLE.

KITCHEN MAKEUP AIR UNIT SCHEDULE (MAU)

GENERAL			SUPPLY FAN									GAS HEATING SECTION - DIRECT FIRED					FILTERS			ELECTRICAL DATA				OPERATING WEIGHT (LBS.)	SYSTEM	MANUFACTURER MODEL NUMBER	NOTES
TAG	LOCATION	SERVICE	CFM TOTAL	O.A. CFM	TYPE	ESP (IN)	RPM	BHP	HP	PHASE	VOLT	INPUT (MBH)	OUTPUT (MBH)	STAGES	EAT (°F)	LAT (°F)	FACE AREA (SQ.FT.)	FACE VELOCITY (FPM)	TYPE	FLA	V / PH / HZ	MCA	MOCP				
MAU-1	ROOF	KEH-1	5,400	5,400	--	--	--	--	10.0	3	208	399	--	--	--	--	--	--	--	27	208 / 3 / 60	(3) @ 21.4	(3) @ 30	2,660	--	--	1,2
MAU-2	ROOF	KEH-2	2,850	2,850	--	--	--	--	2.0	3	208	211	--	--	--	--	--	--	--	6.1	208 / 3 / 60	11.2 + 21.4	20 + 30	1,700	--	--	1,3

NOTES:
1.) SEE KITCHEN EQUIPMENT REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION.
2.) DX COOLING AIR COOLED CONDENSERS (TOTAL OF 3) REQUIRE SEPARATE POWER.
3.) DX COOLING AIR COOLED CONDENSERS (TOTAL OF 2) REQUIRE SEPARATE POWER.

AIR CURTAIN SCHEDULE (AC) - NO HEAT

GENERAL											FAN MOTOR					FILTERS			BUILT-IN DISCONNECT	WEIGHT (LBS)	MANUFACTURER (MARS) MODEL No	NOTES
TAG	LOCATION	AREA SERVED	AIR VOLUME (CFM)	AVG. OUTLET VELOCITY (FPM)	CABINET TYPE	CABINET LENGTH (IN)	CABINET WIDTH (IN)	CABINET HEIGHT (IN)	AIR ARRANGEMENT INLET AIR	AIR ARRANGEMENT DISCHARGE	HP	AMPS	VOLTS	PHASE	HZ	TYPE	SIZE	EXTRA SET				
AC-1	RECEIVING 130	RECEIVING 130	2,447	2,447	HORIZONTAL	48	16	14	SIDE	BOTTOM	(1) @ 1.0	11.25	120	1	60	ALUM MESH	1/4"	NO	NO	125	NH248-1U	1,2,3

NOTES:
1.) OTHER ACCEPTABLE MANUFACTURERS: NONE.
2.) STANDARD COMBINATION PLUNGER/ROLLER TYPE DOOR LIMIT SWITCH.
3.) COLOR AND FINISH AS SELECTED BY ARCHITECT.

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.

BTR ENGINEERING
MECHANICAL | ELECTRICAL | PLUMBING | FIRE PROTECTION
104 N. OAK PARK AVE., STE 301
OAK PARK, IL 60301
BTRENGINEERS.COM
PHONE: 312-635-6321

COOPER'S HAWK
WINERY & RESTAURANT
540 NW CHIPMAN ROAD
LEE'S SUMMIT, MO 64086

FIELD VERIFICATION
Contractor shall verify all figured dimensions and conditions at the job site and notify Aria Group Architects, Inc. of any dimensional errors, omissions or discrepancies before beginning or fabricating any work. Do not scale these drawings.

NO.	DATE	REMARKS
1	2021/08/19	ISSUED FOR PERMIT

REVISIONS

STATE OF MISSOURI
JOHN M. THOMAS
NUMBER PE-2010039283
PROFESSIONAL ENGINEER

Drawing Title
HVAC - SCHEDULES

Job No. 21-0064
Drawn DNK
Scale
Date 08/19/2021
Sheet No.
M401

FOR QUESTIONS, CALL THE:
OHIO REGIONAL OFFICE
806 MORRISON ROAD, GAHANNA, OH 43230
PHONE: (800) 948-6945
FAX: (919) 227-5925

CUSTOMER APPROVAL TO MANUFACTURE:

- Approved as Noted ☐
- Approved with NO Exception Taken ☐
- Revise and Resubmit ☐

SIGNATURE ____________

Your Title: ____________ Date: ________

HANGING ANGLE LOCATIONS

HOOD STYLE	DIM FROM REAR	DIM FROM FRONT (24"H)	DIM FROM FRONT (30"H)
CANOPY ND2	4.166"	2.246"	2.246"
ND2-PSP-F	4.166"	2.246"	2.246"
BACKSHELF BD-2	4.166"	2.246	–
VHB/VHB-G	36"X36"	42"X42"	48"X48"
FRONT/BACK DIMS BY SIZE	2.246"	2.246"	2.246"

CALCULATIONS UTILIZED

EXHAUST CFM=LENGTH OF HOOD X CFM/LIN.FT. (LOAD)

SUPPLY CFM=EXHAUST CFM X PERCENTAGE REQUIRED

$$\text{TOTAL DUCT AREA}=144 \times \frac{\text{CFM}}{\text{FPM}(*)}$$

$$\text{DUCT LENGTH}=\frac{\text{TOTAL DUCT AREA}}{\text{DUCT DEPTH}}$$

*CAPTIVE-AIRE DUCT CONNECTION SIZES ARE CALCULATED USING AN EXHAUST VELOCITY OF 1500-1800 FPM AND A SUPPLY VELOCITY OF 300-400 FPM.

BUILDING CODES

CAPTIVE-AIRE HOODS ARE BUILT IN COMPLIANCE WITH:

#3054804-001 & #3054804-002 — STANDARD 710 — Intertek — BUILT IN ACCORDANCE WITH NFPA No. 96

Listed under ETL File number 3054804-001/002

CLEARANCE TO COMBUSTIBLES

CAPTIVE-AIRE HOODS HAVE OPTIONAL CLEARANCE REDUCTION SYSTEMS AVAILABLE AS FOLLOWS:

MATERIAL	CLEARANCE REDUCTION SYSTEM
NON-COMBUSTIBLE	NONE REQUIRED
LIMITED-COMBUSTIBLE	3" UNINSULATED STANDOFF
COMBUSTIBLE	1" INSULATED STANDOFF

GENERAL NOTES

INSTALLATION

1. ALL ELECTRICAL "FIELD" CONNECTIONS AND RELATED INTERCONNECTIONS BY ELECTRICAL CONTRACTORS.
2. ALL PLUMBING "FIELD" CONNECTIONS AND RELATED INTERCONNECTIONS BY PLUMBING CONTRACTORS.
3. HANGING BRACKETS LOCATED AND WELDED AS SHOWN ON PLANS. ALL OTHER HANGER MATERIALS PROVIDED BY INSTALLING CONTRACTORS.
4. ALL CONNECTIONS FROM CAPTIVE-AIRE DUCT PER MECHANICAL CONTRACTORS'S PLANS.
5. COOKING EQUIPMENT TO SHUTOFF IN EVENT OF FIRE.
6. EXHAUST FANS TO TURN ON IN EVENT OF FIRE.
7. ALL LIGHTS FIXTURE SHOWN INSTALLED BY CAPTIVE-AIRE ARE FACTORY PREWIRED. INTERCONNECTIONS BETWEEN HOODS AND TO SWITCHES BY ELECTRICAL CONTRACTORS.
8. LAMPS FOR LIGHT FIXTURES BY INSTALLING CONTRACTORS.
9. SEISMIC RESTAINTS ARE RESPONSIBILITY OF INSTALLING CONTRACTOR.
10. INSTALLING CONTRACTORS ASSUME ALL RELATED REPONSIBILITY FOR VERIFICATION OF DIMENSIONAL DATA CONTAINED ON THESE DOCUMENTS FOR ACCURACY, INTEGRATION, AND ADMINISTRATION OF CODE REQUIREMENTS IN EFFECT PRIOR TO ANY RELEASE FOR PRODUCTION OF EQUIPMENT SHOWN.

BALANCE

11. KITCHEN HOODS MUST BE BALANCED WITH KITCHEN.
12. KITCHEN SHALL BE NEGATIVE WITH RESPECT TO DINING AREA.
13. RESTAURANT SHALL BE POSITIVE WITH RESPECT TO AMBIENT PRESSURE.

ADDITIONAL

14. WRITTEN HOOD DIMENSIONS HAVE PRECEDENCE OVER SCALE.
15. SIGNED AND "APPROVED" COPIES OF THIS DOCUMENT MUST BE RECEIVED BY THE FACTORY PRIOR TO COMMENCEMENT OF FABRICATION.

HOOD INFORMATION – JOB#4950104

HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL EXH CFM	EXHAUST PLENUM RISER(S) WIDTH	LENG	HEIGHT	DIA	CFM	VEL	SP	TOTAL SUPPLY CFM	HOOD CONSTRUCTION	HOOD CONFIG END TO END	ROW	SWITCHES QUANTITY	LOCATION
1	Item #58L	5424 ND-2-PSP-F	CAPTIVEAIRE	8' 4"	600 DEG	I	HEAVY	250	2080			4"	16"	2080	1490	-0.704"	1870	430 SS WHERE EXPOSED	LEFT	ALONE		
2	Item #58M	5424 ND-2-PSP-F	CAPTIVEAIRE	8' 4"	600 DEG	I	HEAVY	250	2080			4"	16"	2080	1490	-0.704"	1730	430 SS WHERE EXPOSED	MIDDLE	ALONE		
3	Item #58R	5424 ND-2-PSP-F	CAPTIVEAIRE	8' 4"	600 DEG	I	HEAVY	250	2080			4"	16"	2080	1490	-0.704"	1800	430 SS WHERE EXPOSED	RIGHT	ALONE		
4	Item #59L	5424 ND-2-PSP-F	CAPTIVEAIRE	7' 0"	600 DEG	I	HEAVY	240	1680			4"	14"	1680	1572	-0.675"	1350	430 SS WHERE EXPOSED	LEFT	BACK		
5	Item #59R	5424 ND-2-PSP-F	CAPTIVEAIRE	7' 0"	600 DEG	I	HEAVY	240	1680			4"	14"	1680	1572	-0.675"	1500	430 SS WHERE EXPOSED	RIGHT	BACK		
6	Item #83	4224 VHB-G-ND	CAPTIVEAIRE	7' 6"	700 DEG	II	N/A	150	1125			4"	14"	1125	1052	-0.112"	0	430 SS 100%	ALONE	ALONE	1 FAN 1 LIGHT	FRONT RIGHT FACE

PATENT NUMBERS

AC-PSP (UNITED STATES) – US PATENT 7963830 B2.
AC-PSP WALL (CANADA) – CA PATENT 2820509.
AC-PSP ISLAND (CANADA) – CA PATENT 2520330.

HOOD INFORMATION

HOOD NO	TAG	FILTER(S) TYPE	QTY	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	LIGHT(S) QTY	TYPE	WIRE GUARD	UTILITY CABINET(S) LOCATION	SIZE	FIRE SYSTEM TYPE	FIRE SYSTEM SIZE	ELECTRICAL MODEL #	SWITCHES QUANTITY	FIRE SYSTEM PIPING	HOOD HANGING WEIGHT
1	Item #58L	CAPTRATE SOLO FILTER	6	20"	16"	85% SEE FILTER SPEC	5	SCREW IN HALOGEN	NO	LEFT	20"x54"x24"	ANSUL R102	3.0/3.0/3.0/3.0/3.0			YES	685 LBS
2	Item #58M	CAPTRATE SOLO FILTER	6	20"	16"	85% SEE FILTER SPEC	5	SCREW IN HALOGEN	NO							YES	497 LBS
3	Item #58R	CAPTRATE SOLO FILTER	6	20"	16"	85% SEE FILTER SPEC	5	SCREW IN HALOGEN	NO	RIGHT	12"x54"x24"			DCV-3111	1 LIGHT 1 FAN	YES	646 LBS
4	Item #59L	CAPTRATE SOLO FILTER	5	20"	16"	85% SEE FILTER SPEC	4	SCREW IN HALOGEN	NO							YES	464 LBS
5	Item #59R	CAPTRATE SOLO FILTER	5	20"	16"	85% SEE FILTER SPEC	4	SCREW IN HALOGEN	NO	RIGHT	12"x54"x24"			DCV-2111	1 LIGHT 1 FAN	YES	590 LBS
6	Item #83						4	SCREW IN HALOGEN	NO							NO	280 LBS

HOOD OPTIONS

HOOD NO	TAG	OPTION
1	Item #58L	FIELD WRAPPER 18.00" HIGH FRONT, LEFT.
		BACKSPLASH 122.00" HIGH X 438.00" LONG 430 SS VERTICAL.
		LEFT QUARTER END PANEL 23" TOP WIDTH, 0" BOTTOM WIDTH, 23" HIGH 430 SS.
		RISER SENSOR INSTALL 3IN DBL.
2	Item #58M	FIELD WRAPPER 18.00" HIGH FRONT.
		RISER SENSOR INSTALL 3IN DBL.
3	Item #58R	FIELD WRAPPER 18.00" HIGH FRONT, RIGHT.
		RIGHT QUARTER END PANEL 23" TOP WIDTH, 0" BOTTOM WIDTH, 23" HIGH 430 SS.
		RISER SENSOR INSTALL 3IN DBL.
4	Item #59L	FIELD WRAPPER 18.00" HIGH FRONT, LEFT.
		BACKSPLASH 122.00" HIGH X 438.00" LONG 430 SS VERTICAL.
		LEFT QUARTER END PANEL 23" TOP WIDTH, 0" BOTTOM WIDTH, 23" HIGH 430 SS.
		RISER SENSOR INSTALL 3IN DBL.
5	Item #59R	FIELD WRAPPER 18.00" HIGH FRONT, RIGHT.
		RIGHT QUARTER END PANEL 23" TOP WIDTH, 0" BOTTOM WIDTH, 23" HIGH 430 SS.
		RISER SENSOR INSTALL 3IN DBL.
6	Item #83	FIELD WRAPPER 18.00" HIGH FRONT, LEFT, RIGHT.
		BACKSPLASH 120.00" HIGH X 329.00" LONG 304 SS VERTICAL.
		BACKSPLASH 120.00" HIGH X 119.00" LONG 304 SS VERTICAL.
		BACKSPLASH 120.00" HIGH X 172.00" LONG 304 SS VERTICAL.
		BACKSPLASH 120.00" HIGH X 172.00" LONG 304 SS VERTICAL.
		BACKSPLASH 120.00" HIGH X 180.00" LONG 304 SS VERTICAL.
		BACKSPLASH 120.00" HIGH X 39.00" LONG 304 SS VERTICAL.
		BACKSPLASH – INSIDE CORNER 120.00" HIGH X 2.00" LEG LENGTH 304 SS VERTICAL.
		BACKSPLASH – INSIDE CORNER 120.00" HIGH X 2.00" LEG LENGTH 304 SS VERTICAL.
		BACKSPLASH – INSIDE CORNER 120.00" HIGH X 2.00" LEG LENGTH 304 SS VERTICAL.
		BACKSPLASH – OUTSIDE CORNER 120.00" HIGH X 2.00" LEG LENGTH 304 SS VERTICAL.
		BACKSPLASH – OUTSIDE CORNER 120.00" HIGH X 2.00" LEG LENGTH 304 SS VERTICAL.
7	Mop Sink & Prep	OPTIONS ONLY: BACKSPLASH 120.00" HIGH X 45.00" LONG 304 SS VERTICAL.
		OPTIONS ONLY: BACKSPLASH 120.00" HIGH X 98.00" LONG 304 SS VERTICAL.
		OPTIONS ONLY: BACKSPLASH 122.00" HIGH X 60.00" LONG 430 SS VERTICAL.
		OPTIONS ONLY: BACKSPLASH 122.00" HIGH X 138.00" LONG 430 SS VERTICAL.
		OPTIONS ONLY: BACKSPLASH – INSIDE CORNER 120.00" HIGH X 2.00" LEG LENGTH 304 SS VERTICAL.
		OPTIONS ONLY: BACKSPLASH – INSIDE CORNER 120.00" HIGH X 2.00" LEG LENGTH 304 SS VERTICAL.
		OPTIONS ONLY: BACKSPLASH – OUTSIDE CORNER 120.00" HIGH X 2.00" LEG LENGTH 304 SS VERTICAL.
		OPTIONS ONLY: BACKSPLASH – OUTSIDE CORNER 120.00" HIGH X 2.00" LEG LENGTH 304 SS VERTICAL.

PERFORATED SUPPLY PLENUM(S)

HOOD NO	TAG	POS	LENGTH	WIDTH	HEIGHT	TYPE	RISER(S) WIDTH	LENG	DIA	CFM	SP
1	Item #58L	Front	120"	18"	6"	MUA	12"	24"		623	0.174"
						MUA	12"	24"		623	0.174"
						MUA	12"	24"		623	0.174"
2	Item #58M	Front	100"	18"	6"	MUA	12"	24"		576	0.150"
						MUA	12"	24"		576	0.150"
						MUA	12"	24"		576	0.150"
3	Item #58R	Front	112"	18"	6"	MUA	12"	24"		600	0.162"
						MUA	12"	24"		600	0.162"
						MUA	12"	24"		600	0.162"
4	Item #59L	Front	84"	18"	6"	MUA	12"	28"		675	0.173"
						MUA	12"	28"		675	0.173"
5	Item #59R	Front	96"	18"	6"	MUA	12"	28"		750	0.211"
						MUA	12"	28"		750	0.211"

SPECIFICATION: CAPTRATE® GREASE-STOP® SOLO FILTER

THE CAPTRATE GREASE-STOP SOLO FILTER IS A SINGLE-STAGE FILTER FEATURING A UNIQUE S-BAFFLE DESIGN IN CONJUNCTION WITH A SLOTTED REAR BAFFLE DESIGN, TO DELIVER EXCEPTIONAL FILTRATION EFFICIENCY.

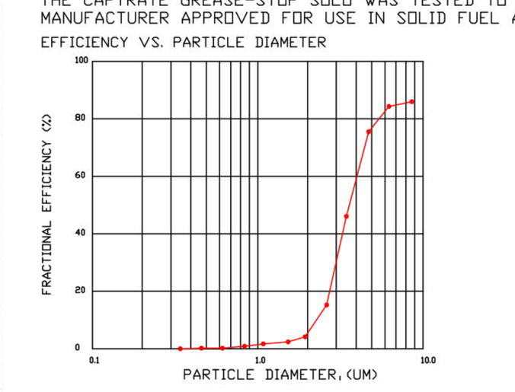
FILTER IS STAINLESS STEEL CONSTRUCTION, AND SIZED TO FIT INTO STANDARD 2-INCH DEEP HOOD CHANNEL(S).

UNITS SHALL INCLUDE STAINLESS STEEL HANDLES AND A FASTENING DEVICE TO SECURE THE TWO COMPONENTS WHEN ASSEMBLED.

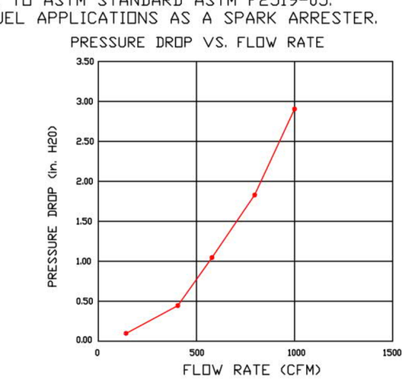
GREASE EXTRACTION EFFICIENCY PERFORMANCE SHALL REMOVE AT LEAST 75% OF GREASE PARTICLES FIVE MICRONS IN SIZE, AND 85% GREASE PARTICLES SEVEN MICRONS IN SIZE AND LARGER, WITH A CORRESPONDING PRESSURE DROP NOT TO EXCEED 1.0 INCHES OF WATER GAUGE.

THE CAPTRATE GREASE-STOP SOLO WAS TESTED TO ASTM STANDARD ASTM F2519-05. MANUFACTURER APPROVED FOR USE IN SOLID FUEL APPLICATIONS AS A SPARK ARRESTER.

EFFICIENCY VS. PARTICLE DIAMETER



PRESSURE DROP VS. FLOW RATE



CAPTRATE FILTERS ARE BUILT IN COMPLIANCE WITH:.
NFPA #96.
NSF STANDARD #2.
UL STANDARD #1046.
INT. MECH. CODE (IMC).
ULC-S649.

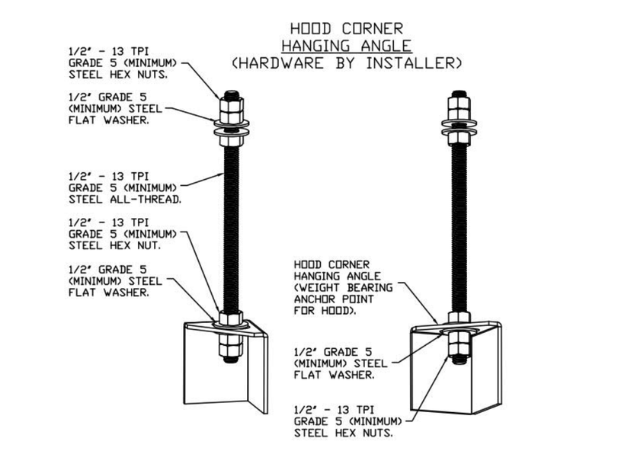
SYSTEM DESIGN VERIFICATION (SDV)

IF ORDERED, CAS SERVICE WILL PERFORM A SYSTEM DESIGN VERIFICATION (SDV) ONCE ALL EQUIPMENT HAS HAD A COMPLETE START UP PER THE OPERATION AND INSTALLATION MANUAL. TYPICALLY, THE SDV WILL BE PERFORMED AFTER ALL INSPECTIONS ARE COMPLETE.

ANY FIELD RELATED DISCREPANCIES THAT ARE DISCOVERED DURING THE SDV WILL BE BROUGHT TO THE ATTENTION OF THE GENERAL CONTRACTOR AND CORRESPONDING TRADES ON SITE. THESE ISSUES WILL BE DOCUMENTED AND FORWARDED TO THE APPROPRIATE SALES OFFICE. IF CAS SERVICE HAS TO RESOLVE A DISCREPANCY THAT IS A FIELD ISSUE, THE GENERAL CONTRACTOR WILL BE NOTIFIED AND BILLED FOR THE WORK. SHOULD A RETURN TRIP BE REQUIRED DUE TO ANY FIELD RELATED DISCREPANCY THAT CANNOT BE RESOLVED DURING THE SDV, THERE WILL BE ADDITIONAL TRIP CHARGES.

DURING THE SDV, CAS SERVICE WILL ADDRESS ANY DISCREPANCY THAT IS THE FAULT OF THE MANUFACTURER. SHOULD A RETURN TRIP BE REQUIRED, THE GENERAL CONTRACTOR AND APPROPRIATE SALES OFFICE WILL BE NOTIFIED. THERE WILL BE NO ADDITIONAL CHARGES FOR MANUFACTURER DISCREPANCIES.

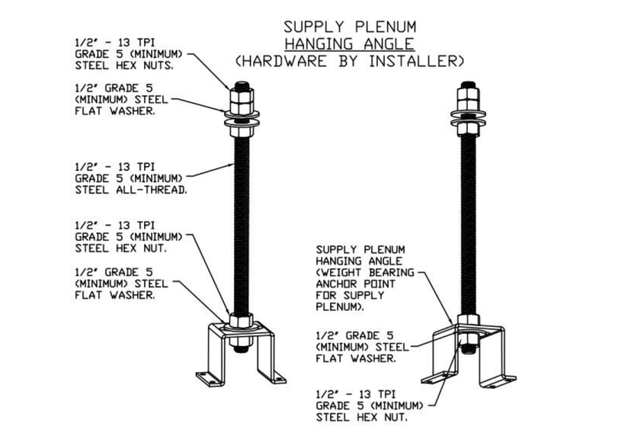
HOOD CORNER HANGING ANGLE (HARDWARE BY INSTALLER)



ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" – 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" – 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION BENEATH HOOD HANGING ANGLES AND ABOVE CEILING ANCHORS. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

SUPPLY PLENUM HANGING ANGLE (HARDWARE BY INSTALLER)



ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" – 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" – 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION ABOVE CEILING ANCHORS. SINGLE HEX NUT BENEATH HANGING ANGLE IS ACCEPTABLE FOR PSP HANGING ANGLES. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

REVISIONS — DESCRIPTION — DATE:

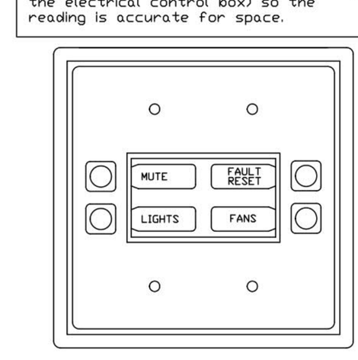
CAPTIVEAIRE www.captiveaire.com
Northern Ohio Office
806 Morrison Rd, Gahanna, OH, 43230 PHONE: FAX: (919) 227-5925 EMAIL: reg52@captiveaire.com

Cooper's Hawk – Lees Summit, MO
LEES SUMMIT, MO, 64063

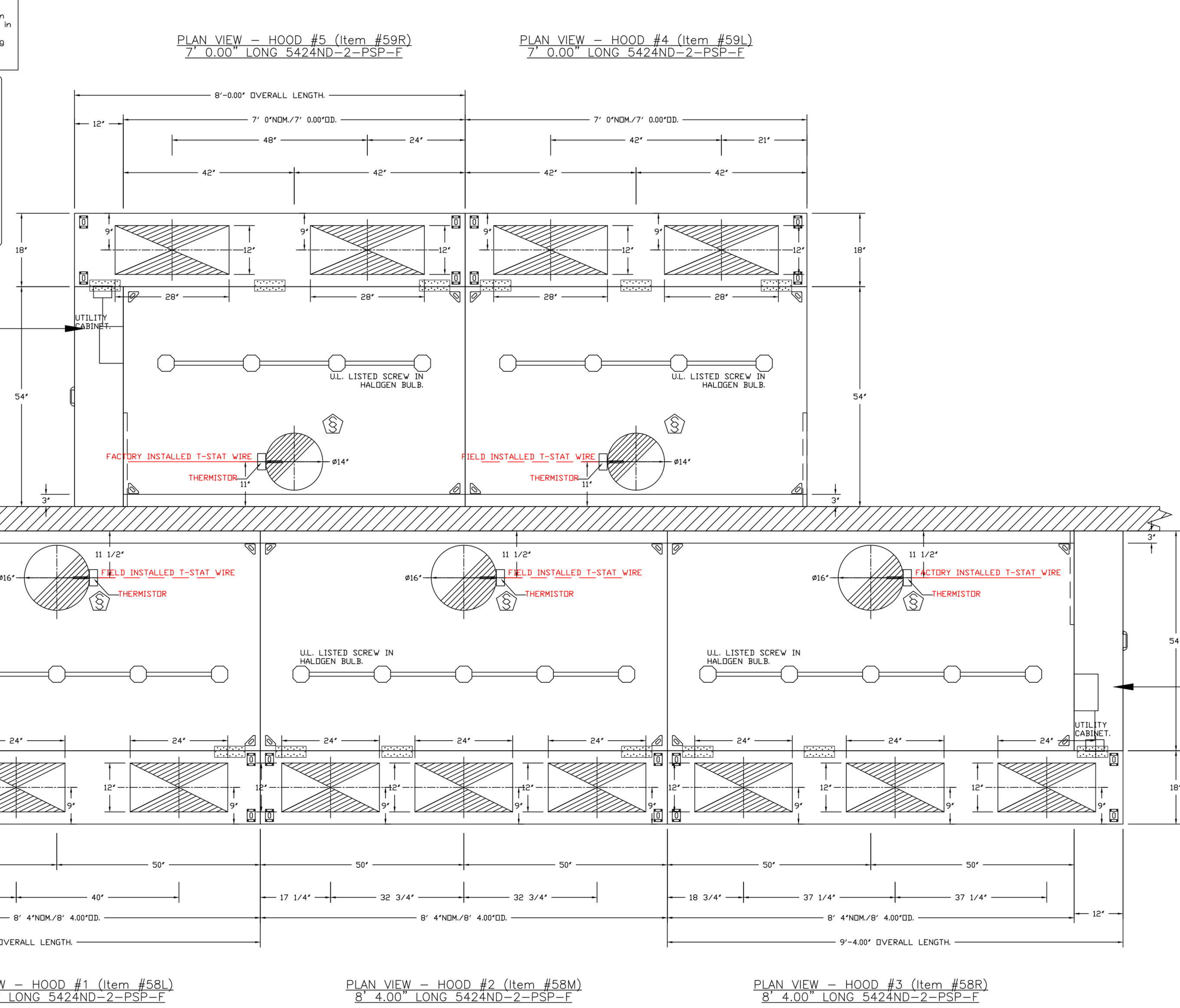
DATE: 6/22/2021
DWG.#: 4950104
DRAWN BY: MAP-52
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 1

ROOM TEMPERATURE SENSOR

Provides room override based on temperature differential between the room and duct. Installed by electrician on a wall, 5'-6' off the finished floor, in the space but not directly under the hood or close to an appliance (including the electrical control box) so the reading is accurate for space.



TOUCH-SCREEN USER INTERFACE



HOOD/FAN CONTROLS FACTORY INSTALLED

ROOM TEMPERATURE SENSOR

Provides room override based on temperature differential between the room and duct. Installed by electrician on a wall, 5'-6' off the finished floor, in the space but not directly under the hood or close to an appliance (including the electrical control box) so the reading is accurate for space.

TOUCH-SCREEN USER INTERFACE

VERIFY CEILING HEIGHT

Height required to verify that the hood will fit and to size the enclosure panels

CAPTIVEAIRE www.captiveaire.com
Northern Ohio Office

Cooper's Hawk – Lees Summit, MO
LEES SUMMIT, MO, 64063

DATE: 6/22/2021
DWG.#: 4950104
DRAWN BY: MAP-52
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 2

BTR ENGINEERING

540 NW CHIPMAN ROAD
LEE'S SUMMIT, MO 64086

COOPER'S HAWK WINERY & RESTAURANT

FIELD VERIFICATION
Contractor shall verify all figured dimensions and conditions at the job site and notify Aria Group Architects, Inc. of any dimensional errors, omissions or discrepancies before beginning or fabricating any work. Do not scale these drawings.

NO.	DATE	REMARKS
1	2021/08/19	ISSUED FOR PERMIT

REVISIONS

STATE OF MISSOURI — JOHN M. THOMAS — NUMBER PE-2010039283 — PROFESSIONAL ENGINEER

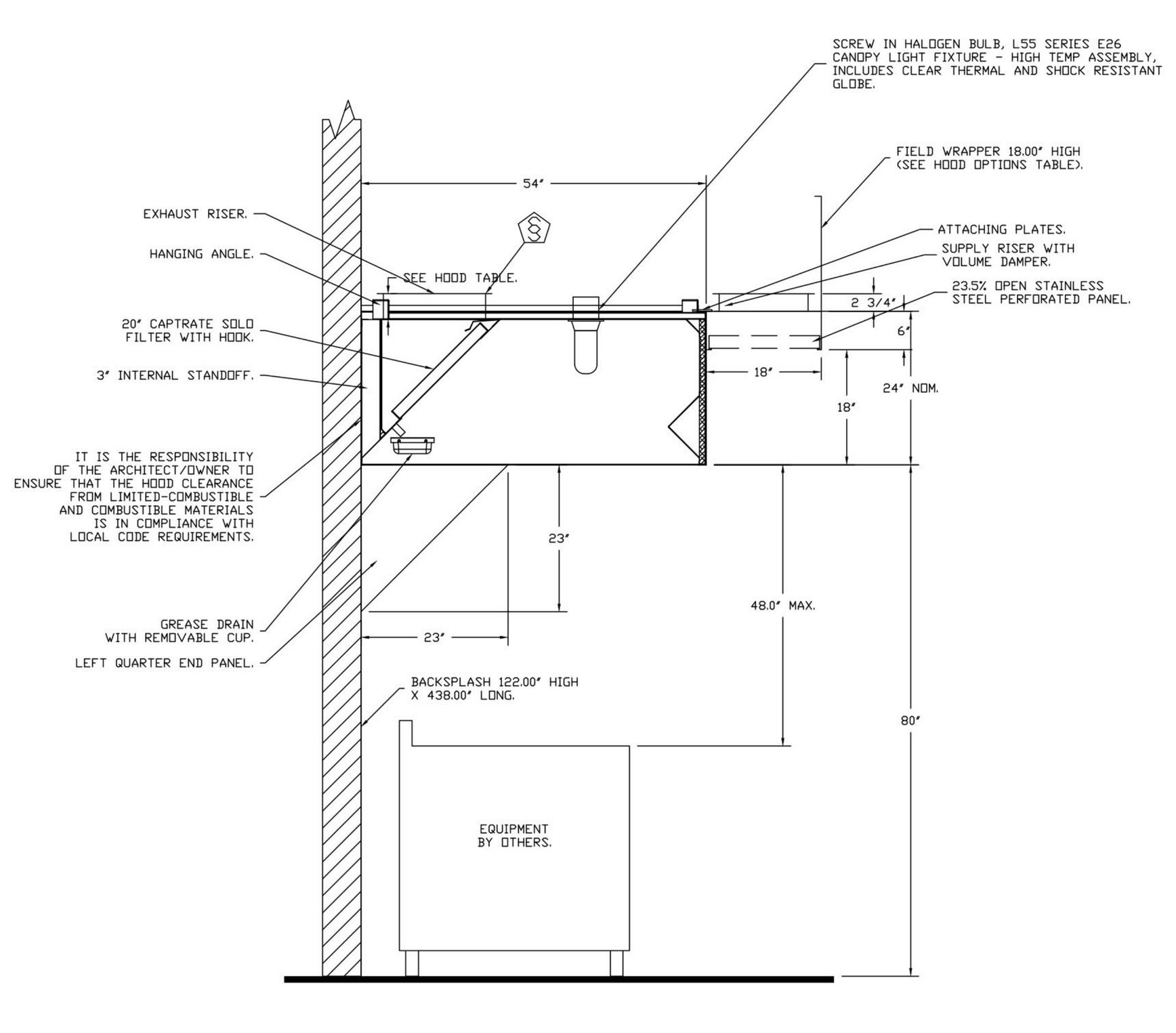
COORDINATED SHOP DRAWINGS SHALL BE PROVIDED BY EACH SUBCONTRACTOR AND SHALL CONTAIN A LAYOUT OF ALL DUCTWORK, CONDUIT, PIPING, EQUIPMENT, STRUCTURE, WALLS, CEILING, ETC. AS REQUIRED TO REFLECT FULL COORDINATION ACROSS ALL TRADES AND SHALL BE SUBMITTED FOR REVIEW. COORDINATED DRAWINGS SHALL BE SIGNED 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.

Drawing Title: HVAC - KEC REFERENCE DRAWINGS

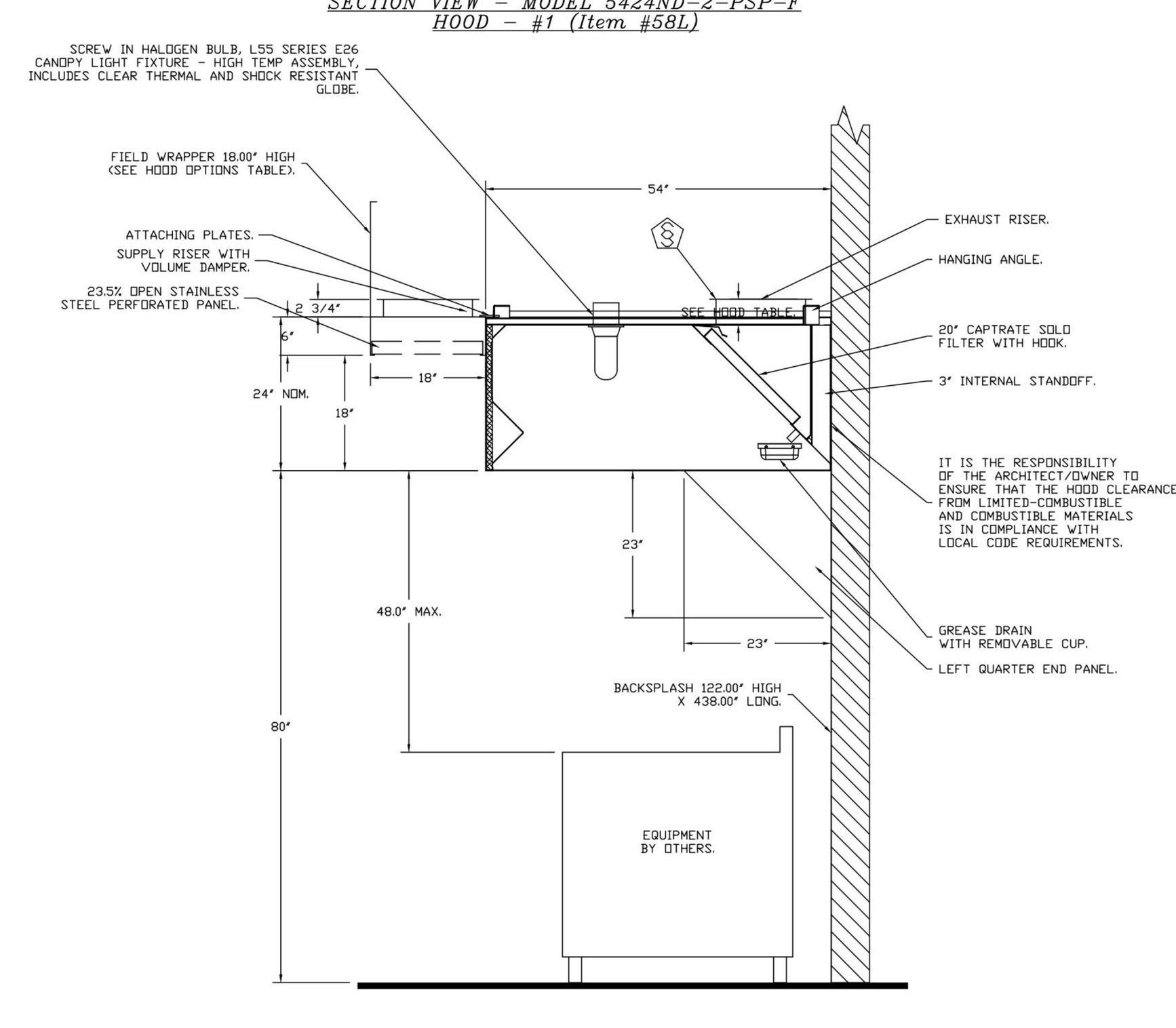
Job No.	Drawn
21-0064	DNK

Scale	Date
N.T.S.	08/19/2021

Sheet No. M600



SECTION VIEW – MODEL 5424ND-2-PSP-F
HOOD – #1 (Item #58L)



SECTION VIEW – MODEL 5424ND-2-PSP-F
HOOD – #4 (Item #59L)

ND-2 Series with PSP Accessory Specification

The model ND-2 with PSP Accessory is a compensating canopy hood rated for all types of cooking equipment. The hood shall have the size, shape and performance specified on drawings.

Construction shall be type 430 stainless steel, with a #3 or #4 polish where exposed. The manufacturer, ETL and NSF shall determine the individual component construction. Construction shall be dependent on the structural application to minimize distortion and other defects. All seams, joints and penetrations of the hood enclosure to the lower outermost perimeter that directs and captures grease-laden vapor and exhaust gases shall have a liquid-tight continuous external weld in accordance with NFPA 96. The hood shall be wall type with a minimum of four connections for hanger rods. Connectors shall have 9/16" holes pre-punched in 1 ½" x 1 ½" angle iron at the factory to allow for hanger rod connection by others.

The hood shall be furnished with U.L. classified filters, supplied in size and quantity as required by ventilator. The filters shall extend the full length of the hood and the filler panels shall not be more than 6" in width.

The hood manufacturer shall supply complete computer generated submittal drawings including hood sections view(s) and hood plan view(s). These drawings must be available to the engineer, architect and owner for their use in construction, operation and maintenance.

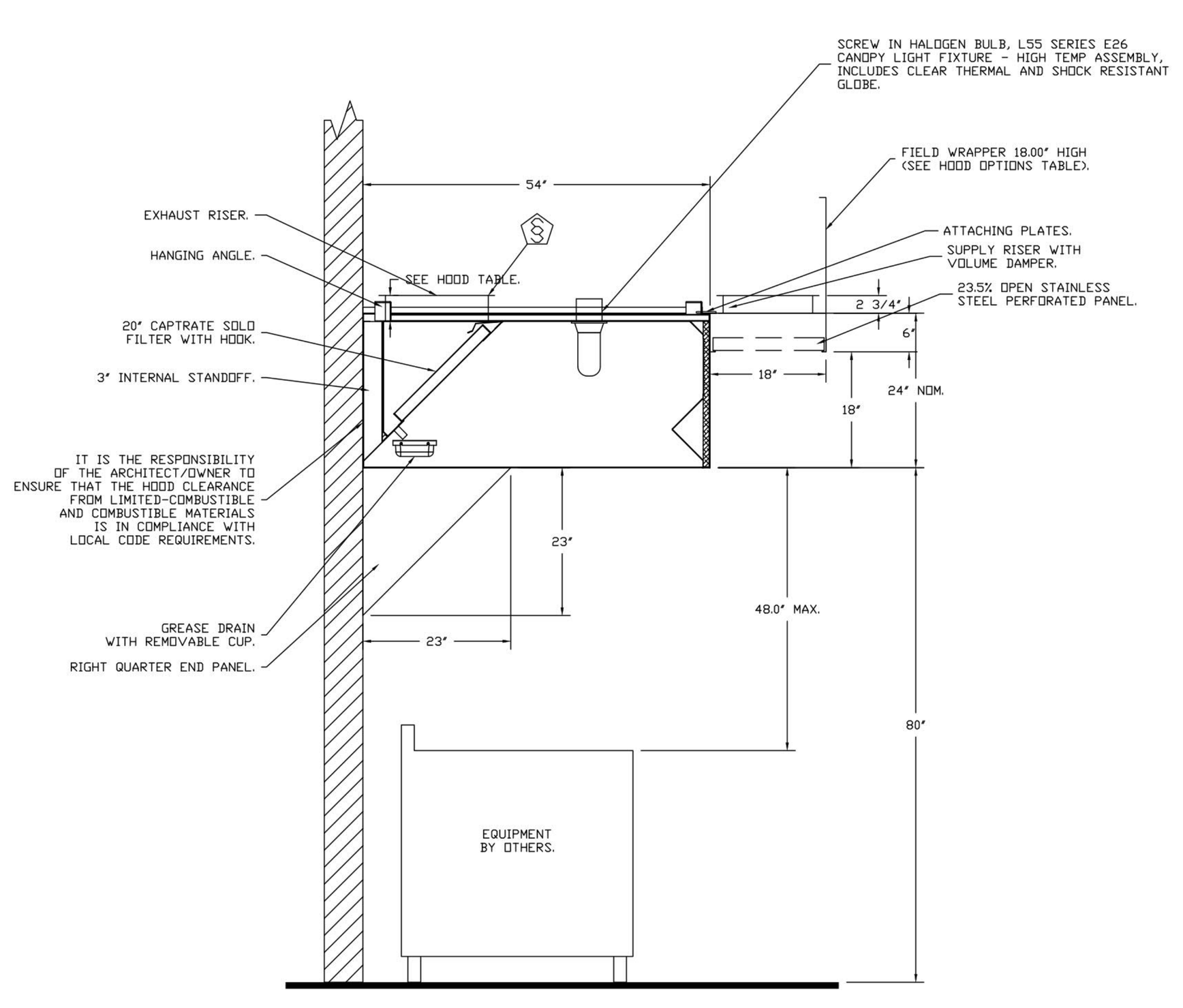
Exhaust duct collar to be 4" high with 1" flange. Duct sizes, CFM and static pressure requirements shall be as shown on drawings. Static pressure requirements shall be precise and accurate; air velocity and volume information shall be accurate within 1-ft increments along the length of the ventilator.

U.L. incandescent light fixtures and globes shall be installed and pre-wired to a junction box. The light fixtures shall be installed with a maximum of 4'0" spacing on center and allow up to a 100 watt standard light bulb.

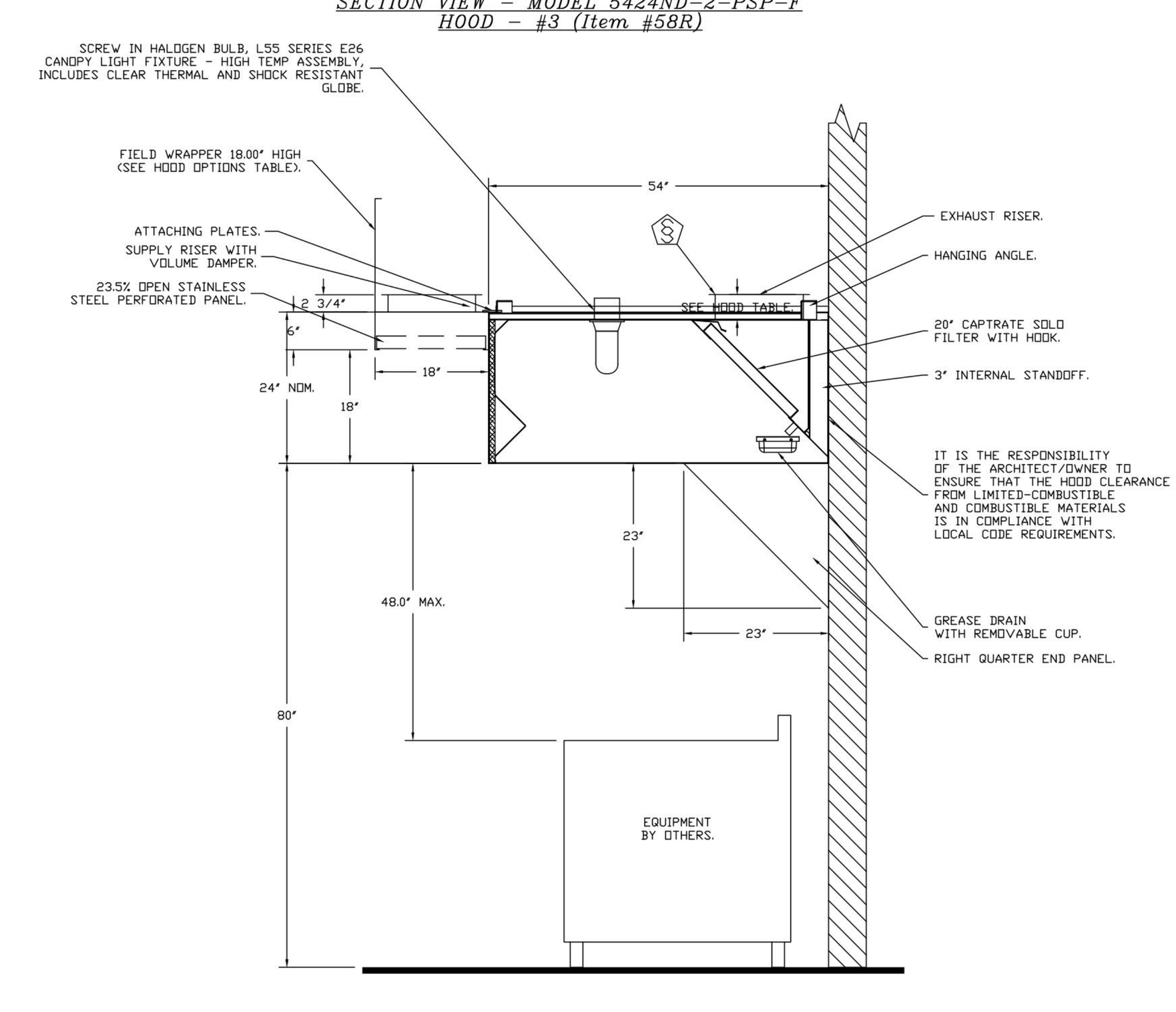
The hood shall have:
- A double wall insulated front to eliminate condensation and increase rigidity. The insulation shall have a flexural modulus of 475 EI, meet UL 181 requirements and be in accordance with NFPA 90A and 90B.
- An integral front baffle to direct grease laden vapors toward the exhaust filter bank.
- A built-in wiring chase provided for outlets and electrical controls on the hood face and shall not penetrate the capture area or require an external chase way.
- Removable grease cup for easy cleaning.

The hood shall be ETL Listed as "Exhaust Hood Without Exhaust Damper", NSF Listed and built in accordance with NFPA 96.

The hood shall be listed for 450°F cooking surfaces at 150 CFM/ft, 600°F cooking surfaces at 200 CFM/ft, and 700°F cooking surfaces at 250 CFM/ft. The hood shall be ETL Listed as "Exhaust Hood Without Exhaust Damper".



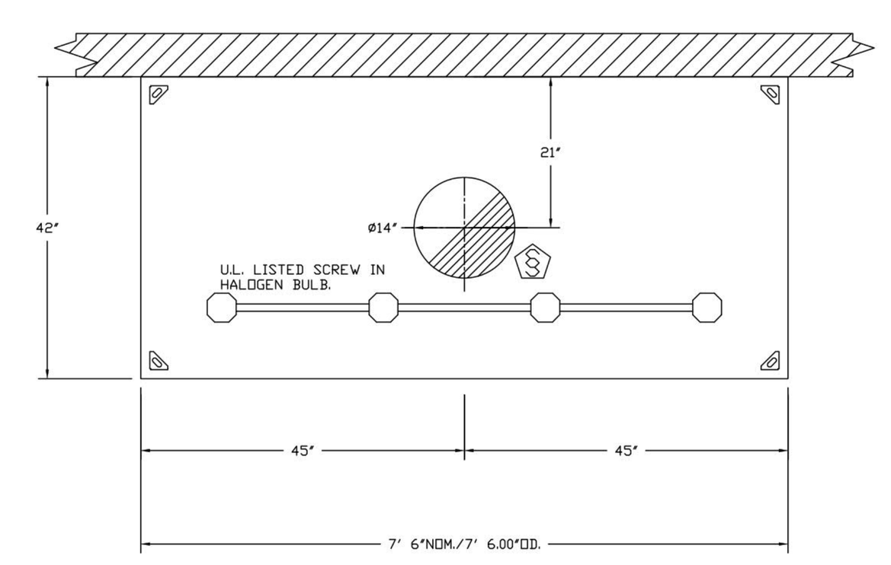
SECTION VIEW – MODEL 5424ND-2-PSP-F
HOOD – #3 (Item #58R)



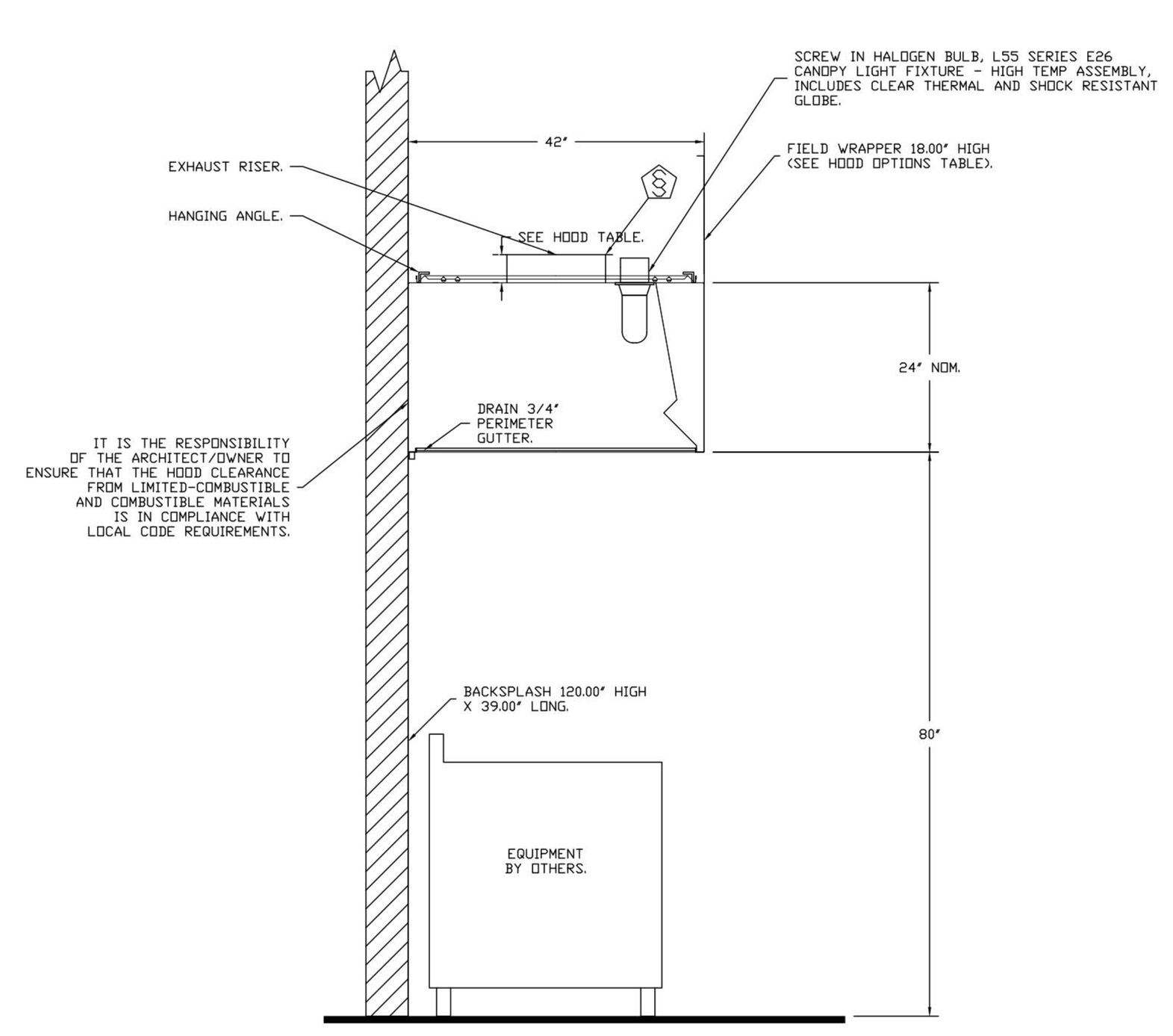
SECTION VIEW – MODEL 5424ND-2-PSP-F
HOOD – #5 (Item #59R)

Cooper's Hawk – Lees Summit, MO
LEES SUMMIT, MO, 64063

DATE: 6/22/2021
DWG.#: 4950104
DRAWN BY: MAP-52
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 3



PLAN VIEW – HOOD #6 (Item #83)
7' 6.00" LONG 4224VHB-G-ND



SECTION VIEW – MODEL 4224VHB-G-ND
HOOD – #6 (Item #83)

VERIFY CEILING HEIGHT
___' ___"
Height required to verify that the hood will fit and to size the enclosure panels

VHB-G Series Specification

The VHB-G series heat/condensate hood is a single wall vent hood used in non-grease applications for the removal of heat, vapor etc. Hood shall have the size, shape and performance specified on the drawings.

Construction shall be type 304 stainless steel with a #3 or #4 polish where exposed. Hood shall have a full perimeter gutter with a 1/2" OD Bolt thread drain connection. Hood shall be wall or island type with fully welded 10 gauge corner hanging angles. Corner hanging angles have a .625 x 1.500 slot pre-punched at the factory, allowing hanging rods to be used for quick and safe installations. Hanging rod and connection is provided by and installed by others.

The hood manufacturer shall supply complete submittal drawings including hood section views(s) and hood plan view(s). These drawings must be made available to the engineer, architect and owner for their use in construction, operation and maintenance.

Exhaust duct collar to be 4" high with 1" flanges. Duct sizes, CFM and static pressure requirements shall be as shown on the drawings. Hood shall be ETL Sanitation listed.

Cooper's Hawk – Lees Summit, MO
LEES SUMMIT, MO, 64063

DATE: 6/22/2021
DWG.#: 4950104
DRAWN BY: MAP-52
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 4

BTR ENGINEERING
PLUMBING | FIRE PROTECTION
104 N. OAK PARK AVE., STE 201
OAK PARK, IL 60301
BTRENGINEERS.COM
PHONE: 312-635-6321

COOPER'S HAWK
WINERY & RESTAURANT
540 NW CHIPMAN ROAD
LEE'S SUMMIT, MO 64086

FIELD VERIFICATION
Contractor shall verify all figured dimensions and conditions at the job site and notify Aria Group Architects, Inc. of any dimensional errors, omissions or discrepancies before beginning or fabricating any work. Do not scale these drawings.

NO.	DATE	REMARKS
1	2021/08/19	ISSUED FOR PERMIT

REVISIONS

Drawing Title
HVAC - KEC REFERENCE DRAWINGS

Job No.	Drawn
21-0064	Author
Scale	**Date**
N.T.S.	08/19/2021

Sheet No.
M601

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.

FIRE SYSTEM INFORMATION – JOB#4950104

FIRE SYSTEM NO	TAG	TYPE	SIZE	FLOW POINTS	INSTALLATION SYSTEM	INSTALLATION LOCATION ON HOOD
1	FS-1	ANSUL R102	3.0/3.0/3.0/3.0/3.0	44	FIRE CABINET LEFT	LEFT, HOOD 1

GAS VALVE(S)

FIRE SYSTEM NO	TAG	TYPE	SIZE	SUPPLIED BY
1	FS-1	MECHANICAL	2.500	CAPTIVEAIRE SYSTEMS
1	FS-1	MECHANICAL	1.500	CAPTIVEAIRE SYSTEMS

FIRE SYSTEM PARTS LIST KEY

FIRE SYSTEM NO	TAG	KEY NUMBER – PART DESCRIPTION	QTY BY FACTORY	QTY BY DIST
1	FS-1	0 – 0 – 31810 ELBOW 7/16 X 1/4 BRASS ANSUL-FOR BRAIDED STAINLESS HOSE.	1	0
		0 – 0 – 43-15733 AIR CYLINDER ASSEMBLY – AIR CYLINDER AND TUBING FOR MECHANICAL GAS VALVES (ANSUL PART #15733).	2	0
		0 – 0 – HOSE HOSE – STAINLESS STEEL ACTUATION HOSE, 42".	1	0
		0 – 0 – TANK STRAP TANK STRAP – USED FOR ANSUL TANKS.	5	0
		0 – 0 – UCTANKBRACKET TANK BRACKET FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS.	5	0
		1 – 1 – AT – 3.0 TANK(#1B) – 3.0 GALLON SS TANK (FOR USE WITH AUTOMAN RELEASE, ACTUATOR, OR SS ENCLOSURE (UL/ULC)) MACOLA # 01-429862.	5	0
		3 – 3 – ANS-OEM REGULATED RELEASE – ANSUL REGULATED MECHANICAL RELEASE/BRACKET ASSEMBLY, OEM, R-102, CARTRIDGE DETECTION INCLUDED, ANSUL PART # 79493.	1	0
		4 – 4 – ANS-OEMRA ACTUATOR – REGULATED, OEM, R-102.	1	0
		5 – 5 – LIQ-3.0 AGENT – ANSULEX LOW PH WET CHEMICAL AGENT, 3 GALLON (UL) 79372.	0	5
		9 – 9 – 101-30 CARTRIDGE – CARBON DIOXIDE, 101-30, CARTRIDGE (R-102) 19-15851.	0	1
		9 – 9 – LT-A-101-30 LT-A-101-30 CARTRIDGE.	0	1
		10 – 10 – TLINK LINK – TEST LINK (1 TEST LINK) ANSUL PART # 24916, MACOLA # 20-24916.	0	1
		11 – 11 – MICRO-SDA MICROSWITCH KIT- INCLUDES 2 SWITCHES AND MOUNTING HARDWARE. SINGLE DUAL ELECTRIC SWITCH, ONE STANDARD SWITCH, ONE ALARM DUTY SWITCH ANSUL PART # 437155, MACOLA # 08-437155.	1	0
		12 – 12 – HOSE HOSE – RUBBER HOSE.	3	0
		27 – 27 – QPSA-1/2 PULLEY SEAL – 1/2" HOOD SEAL (UL) ANSUL PART # 423253, MACOLA # 32-79768.	11	0
		34 – 34 – RPS-A REMOTE PULL STATION – RED COMPOSITE (WITHOUT WIRE ROPE) 434618 (OLD MACOLA #06-4835).	1	0
		35 – 35 – PE-LT PULLEY ELBOW – LOW TEMP. PULLEY ELBOW, SET SCREW TYPE ANSUL PART # 415670, MACOLA # 11-415671.	11	0
		36 – 36 – PE-HT PULLEY ELBOW – HIGH TEMP PULLEY ELBOW, COMPRESSION TYPE, ANSUL PART # 423251, MACOLA # 10-45771.	10	0

JOB #: 4950104.
JOB NAME: COOPER'S HAWK – LEES SUMMIT, MO.

SYSTEM SIZE: ANSUL-3.0/3.0/3.0/3.0/3.0 TOTAL FP REQUIRED: 44.
HOOD # 1 8' 4.00" LONG x 54" WIDE x 24" HIGH.
RISER # 1 SIZE: 0" x 0".
HOOD # 2 8' 4.00" LONG x 54" WIDE x 24" HIGH.
RISER # 1 SIZE: 0" x 0".
HOOD # 3 8' 4.00" LONG x 54" WIDE x 24" HIGH.
RISER # 1 SIZE: 0" x 0".
HOOD # 4 7' 0.00" LONG x 54" WIDE x 24" HIGH.
RISER # 1 SIZE: 0" x 0".
HOOD # 5 7' 0.00" LONG x 54" WIDE x 24" HIGH.
RISER # 1 SIZE: 0" x 0".

NOTES
- FIELD PIPE DROPS AS SHOWN
  SLEEVING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY CAS.
- RELOCATE NOZZLES IF FLOW PATTERN IS BLOCKED BY SHELVING, SALAMANDERS, ETC.
- MAXIMUM 9 ELBOWS IN SUPPLY LINE.
- MINIMUM 72 INCHES OF AGENT LINE FROM TANK TO FIRST NOZZLE COVERING A RANGE, FRYER, OR WOK TO REFLECT GENERAL PIPING REQUIREMENTS.
- IF APPLICABLE, PRE-PIPED CHARBROILER DROPS ARE SHIPPED LOOSE.
- FACTORY PIPING EXTENDS A MAXIMUM OF 6" ABOVE THE TOP OF THE HOOD.
- APPLIANCE DIMENSIONS LISTED REPRESENT THE COOKING SURFACE SIZE, NOT THE OVERALL APPLIANCE SIZE.

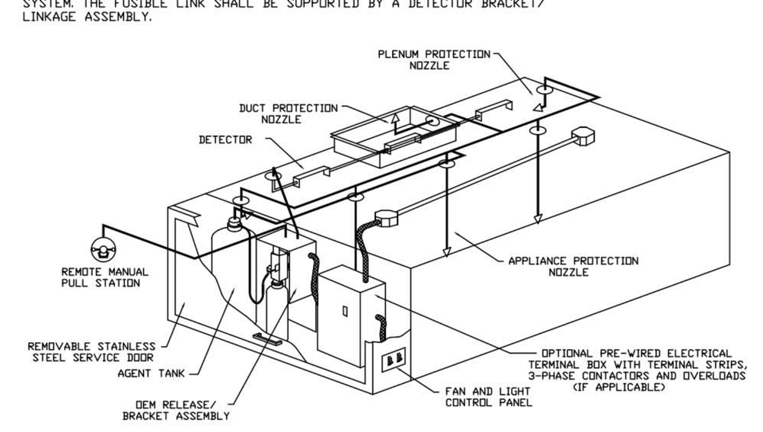
SPECIFICATIONS

THE RESTAURANT FIRE SUPPRESSION SYSTEM SHALL BE THE PRE-ENGINEERED TYPE WITH A FIXED NOZZLE AGENT DISTRIBUTION NETWORK. IT SHALL BE LISTED WITH UNDERWRITERS LABORATORIES, INC. (UL)

THE SYSTEM SHALL BE CAPABLE OF AUTOMATIC DETECTION AND ACTUATION WITH LOCAL OR REMOTE MANUAL ACTUATION. ACCESSORIES SHALL BE AVAILABLE FOR MECHANICAL OR ELECTRICAL GAS LINE SHUT-OFF APPLICATIONS.

THE EXTINGUISHING AGENT SHALL BE A POTASSIUM CARBONATE, POTASSIUM ACETATE-BASED FORMULATION DESIGNED FOR FLAME KNOCKDOWN AND SECUREMENT OF GREASE RELATED FIRES. IT SHALL BE AVAILABLE IN PLASTIC CONTAINERS WITH INSTRUCTIONS FOR LIQUID AGENT HANDLING AND USAGE.

THE REGULATED RELEASE MECHANISM SHALL BE COMPATIBLE WITH A FUSIBLE LINK DETECTION SYSTEM. THE FUSIBLE LINK SHALL BE SELECTED AND INSTALLED ACCORDING TO THE OPERATING TEMPERATURE IN THE VENTILATING SYSTEM. THE FUSIBLE LINK SHALL BE SUPPORTED BY A DETECTOR BRACKET/ LINKAGE ASSEMBLY.



TYPICAL ANSUL R-102 SYSTEM LAYOUT

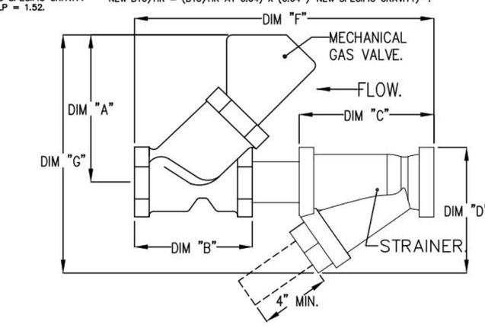
GAS VALVES AND STRAINERS

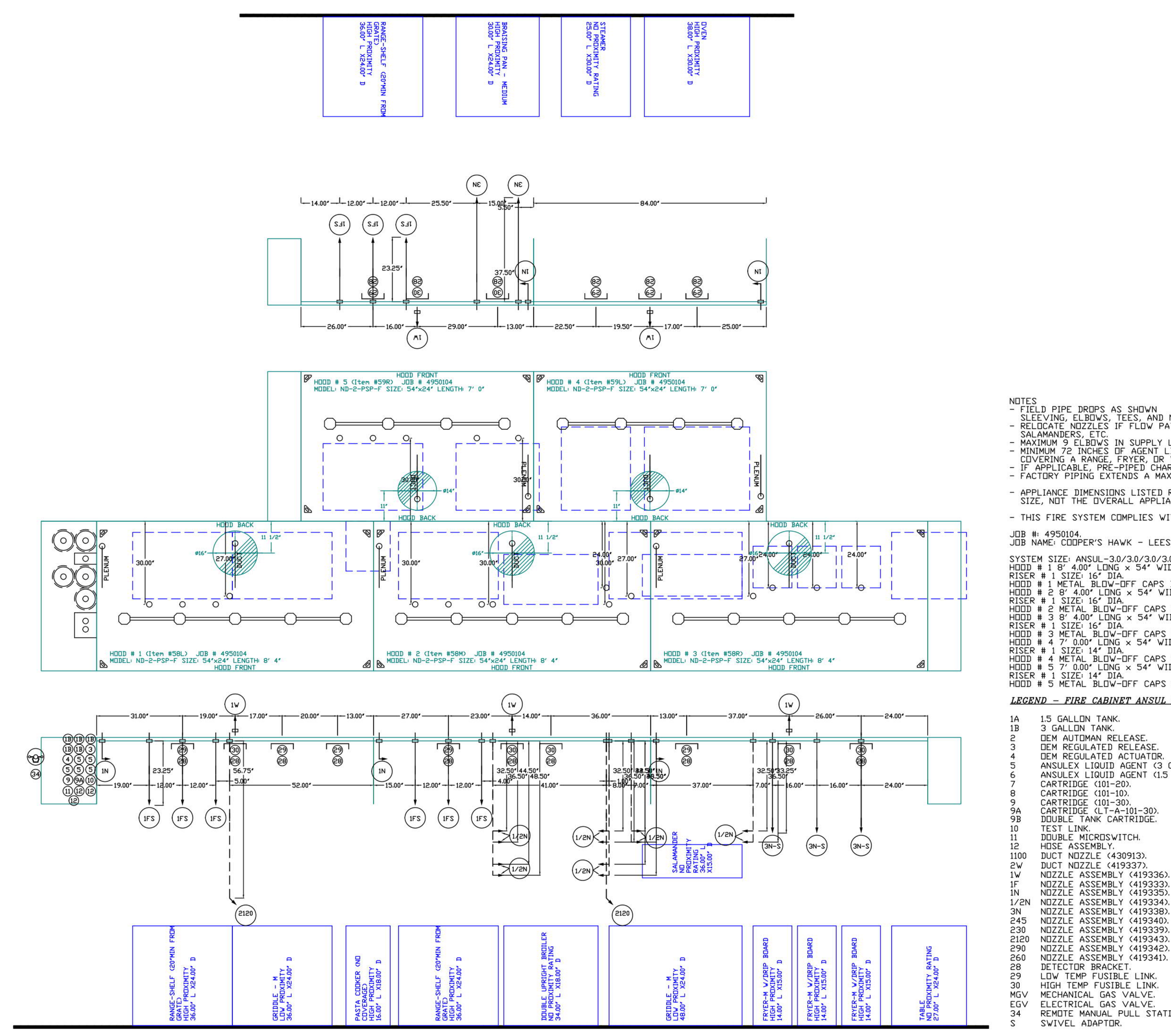
	TYPE	SIZE	VOLTAGE	MIN. INLET PRESSURE	MAX. INLET PRESSURE	FLOW AT 1 IN.W.C. DROP NATURAL GAS	FLOW AT 1 IN.W.C. DROP PROPANE	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "F"	DIM "G"	MOUNTING ORIENTATION	GAS VALVE PART NUMBER	STRAINER PART NUMBER	GAS VALVE/STRAINER KIT
GAS VALVE FOR FS#1	MECHANICAL	2-1/2"	N/A	0 PSI (0 IN.W.C.)	5 PSI (138 IN.W.C.)	5,800,000 BTU/HR	3,763,537 BTU/HR	9-1/16"	7-13/16"	8-7/8"	9-7/8"	19-15/16"	17-3/16"	HORIZONTAL	29-25937	4417K69	MGVA2-1/2
GAS VALVE FOR FS#1	MECHANICAL	1-1/2"	N/A	0 PSI (0 IN.W.C.)	10 PSI (277 IN.W.C.)	2,630,000 BTU/HR	1,706,569 BTU/HR	6-3/8"	4-7/8"	5-3/4"	6-3/16"	12-5/8"	11-3/8"	HORIZONTAL	27-55607	4417K67	MGVA1-1/2

(Column groups: GAS VALVE SIZING – TYPE through FLOW AT 1 IN.W.C. DROP PROPANE; GAS VALVE DIMENSIONS – DIM "A" through DIM "G"; INSTALLATION – MOUNTING ORIENTATION; PART NUMBERS – GAS VALVE PART NUMBER through GAS VALVE/STRAINER KIT.)

ALL GAS VALVES/STRAINERS
PROPER CLEARANCE MUST BE PROVIDED IN ORDER TO SERVICE THE STRAINERS A MINIMUM OF 4" CLEARANCE DISTANCE MUST BE PROVIDED AT THE BASE OF THE STRAINER CUSTOMER MUST VERIFY BTU CONSUMPTION AS WELL AS PRESSURE RATING SPECIFIC GRAVITY OF NATURAL GAS = 0.64, SPECIFIC GRAVITY OF LP = 1.52.

CALCULATIONS
TO CALCULATE GAS FLOW FOR OTHER THAN 1 IN.W.C. PRESSURE DROP NEW BTU/HR = (BTU/HR AT 1 IN.W.C. PRESSURE DROP) X NEW PRESSURE DROP$^{0.5}$
TO CALCULATE GAS FLOW FOR OTHER THAN 0.64 SPECIFIC GRAVITY NEW BTU/HR = (BTU/HR AT 0.64) X (0.64 / NEW SPECIFIC GRAVITY)$^{0.5}$.





NOTES
- FIELD PIPE DROPS AS SHOWN
  SLEEVING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY CAS.
- RELOCATE NOZZLES IF FLOW PATTERN IS BLOCKED BY SHELVING, SALAMANDERS, ETC.
- MAXIMUM 9 ELBOWS IN SUPPLY LINE.
- MINIMUM 72 INCHES OF AGENT LINE FROM TANK TO FIRST NOZZLE COVERING A RANGE, FRYER, OR WOK TO REFLECT GENERAL PIPING REQUIREMENTS.
- IF APPLICABLE, PRE-PIPED CHARBROILER DROPS ARE SHIPPED LOOSE.
- FACTORY PIPING EXTENDS A MAXIMUM OF 6" ABOVE THE TOP OF THE HOOD.
- APPLIANCE DIMENSIONS LISTED REPRESENT THE COOKING SURFACE SIZE, NOT THE OVERALL APPLIANCE SIZE.
- THIS FIRE SYSTEM COMPLIES WITH U.L. 300 REQUIREMENTS.

JOB #: 4950104.
JOB NAME: COOPER'S HAWK – LEES SUMMIT, MO.

SYSTEM SIZE: ANSUL-3.0/3.0/3.0/3.0/3.0 TOTAL FP REQUIRED: 44.
HOOD # 1 8' 4.00" LONG x 54" WIDE x 24" HIGH.
RISER # 1 SIZE: 16" DIA.
HOOD # 1 METAL BLOW-OFF CAPS INCLUDED.
HOOD # 2 8' 4.00" LONG x 54" WIDE x 24" HIGH.
RISER # 1 SIZE: 16" DIA.
HOOD # 2 METAL BLOW-OFF CAPS INCLUDED.
HOOD # 3 8' 4.00" LONG x 54" WIDE x 24" HIGH.
RISER # 1 SIZE: 16" DIA.
HOOD # 3 METAL BLOW-OFF CAPS INCLUDED.
HOOD # 4 7' 0.00" LONG x 54" WIDE x 24" HIGH.
RISER # 1 SIZE: 14" DIA.
HOOD # 4 METAL BLOW-OFF CAPS INCLUDED.
HOOD # 5 7' 0.00" LONG x 54" WIDE x 24" HIGH.
RISER # 1 SIZE: 14" DIA.
HOOD # 5 METAL BLOW-OFF CAPS INCLUDED.

LEGEND – FIRE CABINET ANSUL SYSTEM

1A 1.5 GALLON TANK.
1B 3 GALLON TANK.
2 OEM AUTOMAN RELEASE.
3 OEM REGULATED RELEASE.
4 OEM REGULATED ACTUATOR.
5 ANSULEX LIQUID AGENT (3 GAL.).
6 ANSULEX LIQUID AGENT (1.5 GAL.).
7 CARTRIDGE (101-20).
8 CARTRIDGE (101-10).
9 CARTRIDGE (101-30).
9A CARTRIDGE (LT-A-101-30).
9B DOUBLE TANK CARTRIDGE.
10 TEST LINK.
11 DOUBLE MICROSWITCH.
12 HOSE ASSEMBLY.
1100 DUCT NOZZLE (430913).
2W DUCT NOZZLE (419337).
1W NOZZLE ASSEMBLY (419336).
1F NOZZLE ASSEMBLY (419333).
1N NOZZLE ASSEMBLY (419335).
1/2N NOZZLE ASSEMBLY (419334).
3N NOZZLE ASSEMBLY (419338).
245 NOZZLE ASSEMBLY (419340).
230 NOZZLE ASSEMBLY (419339).
2120 NOZZLE ASSEMBLY (419343).
290 NOZZLE ASSEMBLY (419342).
260 NOZZLE ASSEMBLY (419341).
28 DETECTOR BRACKET.
29 LOW TEMP FUSIBLE LINK.
30 HIGH TEMP FUSIBLE LINK.
MGV MECHANICAL GAS VALVE.
EGV ELECTRICAL GAS VALVE.
34 REMOTE MANUAL PULL STATION.
S SWIVEL ADAPTOR.

REVISIONS
DESCRIPTION	DATE:
△	
△	
△	
△	

CAPTIVEAIRE
www.captiveaire.com
Northern Ohio Office
806 Morrison Rd, Gahanna, OH, 43230 PHONE: FAX: (919) 227-5925 EMAIL: reg52@captiveaire.com

Cooper's Hawk – Lees Summit, MO
LEES SUMMIT, MO, 64063

DATE: 6/22/2021
DWG.#: 4950104
DRAWN BY: MAP-52
SCALE: 3/8" = 1'-0"
MASTER DRAWING
SHEET NO. 5

EXHAUST FAN INFORMATION – JOB#4950104

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SONES
1	EF-58L	1	DU180HFA	CAPTIVEAIRE	2080	1.125	1047	ODP,PREMIUM	1.500	0.6030	3	208	4.4	480 FPM	160	11.7
2	EF-58M	1	DU180HFA	CAPTIVEAIRE	2080	1.125	1047	ODP,PREMIUM	1.500	0.6030	3	208	4.4	480 FPM	160	11.7
3	EF-58R	1	DU180HFA	CAPTIVEAIRE	2080	1.125	1047	ODP,PREMIUM	1.500	0.6030	3	208	4.4	480 FPM	160	11.7
5	EF-59L	1	DU180HFA	CAPTIVEAIRE	1800	1.125	1009	ODP,PREMIUM	1.500	0.5250	3	208	4.4	416 FPM	160	11.6
6	EF-59R	1	DU180HFA	CAPTIVEAIRE	1800	1.125	1009	ODP,PREMIUM	1.500	0.5250	3	208	4.4	416 FPM	160	11.6
8	DISH	1	DU50HFA	CAPTIVEAIRE	1125	0.500	1459	ODP	0.500	0.3510	1	115	8.4	428 FPM	81	15.5

CONDENSER DETAILS

FAN UNIT NO	TAG	FAN UNIT MODEL #	CONDENSER NO	TONNAGE	VOLTAGE	PHASE	FREQUENCY	MCA	RLA	MAX FUSE SIZE	MIN WIRE SIZE	SEER
4	MUA-58	A3-D.500-24D-MPU	1	5	208-230	3 PHASE	60 HZ	21.4 AMPS	17.4 AMPS	30 AMPS	10 AWG	14
			2	5	208-230	3 PHASE	60 HZ	21.4 AMPS	17.4 AMPS	30 AMPS	10 AWG	14
			3	5	208-230	3 PHASE	60 HZ	21.4 AMPS	17.4 AMPS	30 AMPS	10 AWG	14
7	MUA-59	A2-D.500-20D-MPU	1	2.5	208-230	3 PHASE	60 HZ	11.2 AMPS	9.07 AMPS	20 AMPS	14 AWG	14
			2	5	208-230	3 PHASE	60 HZ	21.4 AMPS	17.4 AMPS	30 AMPS	10 AWG	14

MUA FAN INFORMATION – JOB#4950104

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	BLOWER	HOUSING	MIN CFM	DESIGN CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	MCA	MOCP	WEIGHT (LBS)	SONES
4	MUA-58	1	A3-D.500-24D-MPU	24MF-3-MOD	A3-D.500	3500	5400	0.500	1659	ODP,PREMIUM	10.000	7.9450	3	208	27.0	33.8A	60A	2382	18.1
7	MUA-59	1	A2-D.500-20D-MPU	20MF-2-MOD	A2-D.500	2000	2850	0.500	1457	ODP,PREMIUM	2.000	1.6030	3	208	6.1	7.7A	15A	1505	13.9

GAS FIRED MAKE-UP AIR UNIT(S)

FAN UNIT NO	TAG	INPUT BTUs	OUTPUT BTUs	TEMP RISE	REQUIRED INPUT GAS PRESSURE	GAS TYPE	BURNER EFFICIENCY(%)
4	MUA-58	393295	361831	65°F	7 IN. W.C. – 14 IN. W.C.	NATURAL	92
7	MUA-59	207572	190966	65°F	7 IN. W.C. – 14 IN. W.C.	NATURAL	92

COILS – JOB#4950104

FAN UNIT NO	TAG	COIL TYPE	DESIGN CFM	COOLING ENTERING DB TEMP	COOLING ENTERING WB TEMP	COOLING LEAVING DB TEMP	COOLING LEAVING WB TEMP	COOLING ENTERING FLUID TEMP	COOLING LEAVING FLUID TEMP	COOLING FLUID FLOW RATE	COOLING PERCENT GLYCOL	COOLING TOTAL CAPACITY	COOLING SENSIBLE CAPACITY	COOLING LATENT CAPACITY	HEATING ENTERING DB TEMP	HEATING LEAVING DB TEMP	HEATING ENTERING FLUID TEMP	HEATING LEAVING FLUID TEMP	HEATING FLUID FLOW RATE	HEATING PERCENT GLYCOL	HEATING STEAM PRESSURE	HEATING TOTAL CAPACITY	HEATING SENSIBLE CAPACITY
4	MUA-58	DX	5400	93.0°F	76.0°F	76.6°F	66.9°F	---	---	---	---	180.0 MBH	90.1 MBH	89.9 MBH	---	---	---	---	---	---	---	---	---
7	MUA-59	DX	2850	93.0°F	76.0°F	77.6°F	67.4°F	---	---	---	---	90.0 MBH	44.7 MBH	45.3 MBH	---	---	---	---	---	---	---	---	---

FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION
1	EF-58L	1	GREASE BOX.
		1	UPBLAST FAN WHEEL ACCESS PORT.
		1	EXHAUST FAN HEAT BAFFLE.
		1	2 YEAR PARTS WARRANTY.
2	EF-58M	1	GREASE BOX.
		1	UPBLAST FAN WHEEL ACCESS PORT.
		1	EXHAUST FAN HEAT BAFFLE.
		1	2 YEAR PARTS WARRANTY.
3	EF-58R	1	GREASE BOX.
		1	UPBLAST FAN WHEEL ACCESS PORT.
		1	EXHAUST FAN HEAT BAFFLE.
		1	2 YEAR PARTS WARRANTY.
4	MUA-58	1	INLET PRESSURE GAUGE, 0-35".
		1	MANIFOLD PRESSURE GAUGE, -5 TO 15" WC.
		1	CASLINK BUILDING MONITORING SYSTEM – INTERNET OR CELLULAR CONNECTION REQUIRED.
		1	MOTORIZED BACKDRAFT DAMPER FOR A3-D HOUSING. MEETS AMCA CLASS 1A RATING.
		1	TOTAL CFM MONITORING FOR MUA UNITS.
		1	15 TON 3 CIRCUIT (5/5/5) MODULAR PACKAGED AC COOLING OPTION FOR SIZE 3 DF/EH MUA (2250 TO 4800 CFM), 208V/230V, 3 PHASE. COOLING THERMOSTAT OR PROGRAMMABLE STAT REQUIRED FOR PROPER OPERATION.
		1	DOWNTURN PLENUM FOR SIZE 3 DX COIL MODULE.
		1	MPU3-15-AC MOISTURE ELIMINATOR OPTION – ALLOWS COOLING COIL FACE VELOCITY TO INCREASE TO 650 FPM. INCREASES COOLING COIL MAX CFM TO 5650 CFM.
		1	CONDENSER SUPPORT FOR SIZE 3, 15 TON MOD PACKAGE UNIT.
		1	SEPARATE 120V WIRING PACKAGE (REQUIRED AND USED ONLY FOR DCV OR PREWIRE WITH VFD) – THREE PHASE ONLY.
		1	2 YEAR PARTS WARRANTY.
5	EF-59L	1	GREASE BOX.
		1	UPBLAST FAN WHEEL ACCESS PORT.
		1	EXHAUST FAN HEAT BAFFLE.
		1	2 YEAR PARTS WARRANTY.
6	EF-59R	1	GREASE BOX.
		1	UPBLAST FAN WHEEL ACCESS PORT.
		1	EXHAUST FAN HEAT BAFFLE.
		1	2 YEAR PARTS WARRANTY.
7	MUA-59	1	INLET PRESSURE GAUGE, 0-35".
		1	MANIFOLD PRESSURE GAUGE, -5 TO 15" WC.
		1	CASLINK BUILDING MONITORING SYSTEM – INTERNET OR CELLULAR CONNECTION REQUIRED.
		1	MOTORIZED BACKDRAFT DAMPER FOR A2-D HOUSING. MEETS AMCA CLASS 1A RATING.
		1	TOTAL CFM MONITORING FOR MUA UNITS.
		1	7.5 TON 2 CIRCUIT (2.5/5) MODULAR PACKAGED AC COOLING OPTION FOR SIZE 2 DF/EH MUA (1125 TO 3000 CFM), 208V/230V, 3 PHASE. COOLING THERMOSTAT OR PROGRAMMABLE STAT REQUIRED FOR PROPER OPERATION.
		1	DOWNTURN PLENUM FOR SIZE 2 DX COIL MODULE.
		1	SEPARATE 120V WIRING PACKAGE (REQUIRED AND USED ONLY FOR DCV OR PREWIRE WITH VFD) – THREE PHASE ONLY.
		1	SIZE 2 DIRECT FIRED HEATER LOW CFM PROFILE PACKAGE. USED ON HEATERS UNDER 2500 CFM.
		1	2 YEAR PARTS WARRANTY.
8	DISH	1	SCR-13 BIRD SCREEN.
		1	I 15-BDD DAMPER.
		1	2 YEAR PARTS WARRANTY.

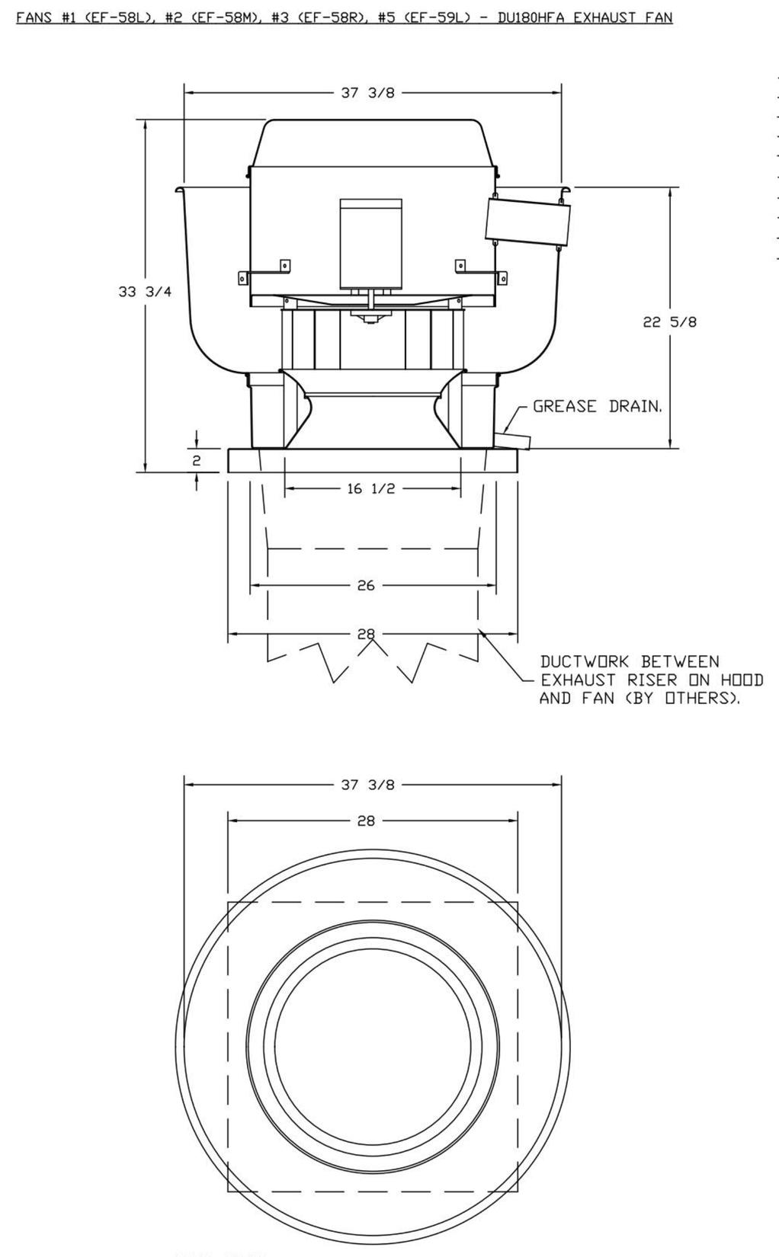
FAN ACCESSORIES

FAN UNIT NO	TAG	EXHAUST GREASE CUP	EXHAUST GRAVITY DAMPER	EXHAUST WALL MOUNT	SUPPLY SIDE DISCHARGE	SUPPLY GRAVITY DAMPER	SUPPLY MOTORIZED DAMPER	SUPPLY WALL MOUNT
1	EF-58L	YES						
2	EF-58M	YES						
3	EF-58R	YES						
4	MUA-58						YES	
5	EF-59L	YES						
6	EF-59R	YES						
7	MUA-59						YES	
8	DISH		YES					

CURB ASSEMBLIES

NO	ON FAN	TAG	WEIGHT	ITEM	SIZE
1	# 1	EF-58L	38 LBS	CURB	26.500"W X 26.500"L X 24.000"H 0.250:12.000 PITCH ALONG LENGTH, RIGHT VENTED HINGED.
2	# 2	EF-58M	38 LBS	CURB	26.500"W X 26.500"L X 24.000"H 0.250:12.000 PITCH ALONG LENGTH, RIGHT VENTED HINGED.
3	# 3	EF-58R	38 LBS	CURB	26.500"W X 26.500"L X 24.000"H 0.250:12.000 PITCH ALONG LENGTH, RIGHT VENTED HINGED.
4	# 4		144 LBS	RAIL	6.000"W X 35.000"L X 20.000"H 0.250:12.000 PITCH ALONG LENGTH, RIGHT.
4	# 4	MUA-58	144 LBS	CURB	35.000"W X 84.000"L X 20.000"H 0.250:12.000 PITCH ALONG WIDTH, RIGHT INSULATED.
	# 4			RAIL	6.000"W X 35.000"L X 20.000"H 0.250:12.000 PITCH ALONG LENGTH, RIGHT.
5	# 5	EF-59L	38 LBS	CURB	26.500"W X 26.500"L X 24.000"H 0.250:12.000 PITCH ALONG LENGTH, RIGHT VENTED HINGED.
6	# 6	EF-59R	34 LBS	CURB	26.500"W X 26.500"L X 24.000"H 0.250:12.000 PITCH ALONG LENGTH, RIGHT VENTED.
7	# 7		107 LBS	RAIL	6.000"W X 31.000"L X 20.000"H 0.250:12.000 PITCH ALONG LENGTH, RIGHT.
7	# 7	MUA-59	107 LBS	CURB	31.000"W X 79.000"L X 20.000"H 0.250:12.000 PITCH ALONG WIDTH, RIGHT INSULATED.
8	# 8	DISH	34 LBS	CURB	19.500"W X 19.500"L X 24.000"H 0.250:12.000 PITCH ALONG LENGTH, RIGHT VENTED HINGED.

FANS #1 (EF-58L), #2 (EF-58M), #3 (EF-58R), #5 (EF-59L) – DU180HFA EXHAUST FAN

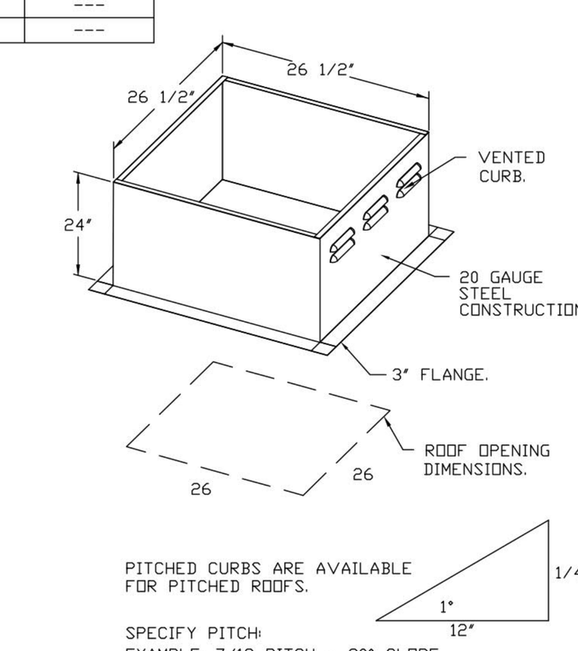


FEATURES:
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT SWITCH.

NORMAL TEMPERATURE TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

ABNORMAL FLARE-UP TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

OPTIONS
GREASE BOX.
UPBLAST FAN WHEEL ACCESS PORT.
EXHAUST FAN HEAT BAFFLE.
2 YEAR PARTS WARRANTY.



PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.

SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE.

VERIFY ELECTRIC REQUIREMENTS
_____PHASE ____VOLT
Verify Electric Requirements to Ensure That Fan Motors and Electric Packages are Coordinated

VERIFY PITCH CURB
_____ : _____
Curb Pitch Required in order to manufacture the curb to specification.

REVISIONS
DESCRIPTION	DATE:
△	
△	
△	
△	

CAPTIVEAIRE
www.captiveaire.com
Northern Ohio Office
806 Morrison Rd, Gahanna, OH, 43230 PHONE: FAX: (919) 227-5925 EMAIL: reg52@captiveaire.com

Cooper's Hawk – Lees Summit, MO
LEES SUMMIT, MO, 64063

DATE: 6/22/2021
DWG.#: 4950104
DRAWN BY: MAP-52
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 6

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.

104 N. OAK PARK AVE., STE 201
OAK PARK, IL 60301
BTRENGINEERS.COM
PHONE: 312-635-6304

BTR ENGINEERING
MECHANICAL | ELECTRICAL | PLUMBING | FIRE PROTECTION

COOPER'S HAWK
WINERY & RESTAURANT
540 NW CHIPMAN ROAD
LEE'S SUMMIT, MO 64086

NO.	DATE	REMARKS
1	2021/08/19	ISSUED FOR PERMIT

REVISIONS

STATE OF MISSOURI
JOHN M. THOMAS
NUMBER PE-2010039283
PROFESSIONAL ENGINEER

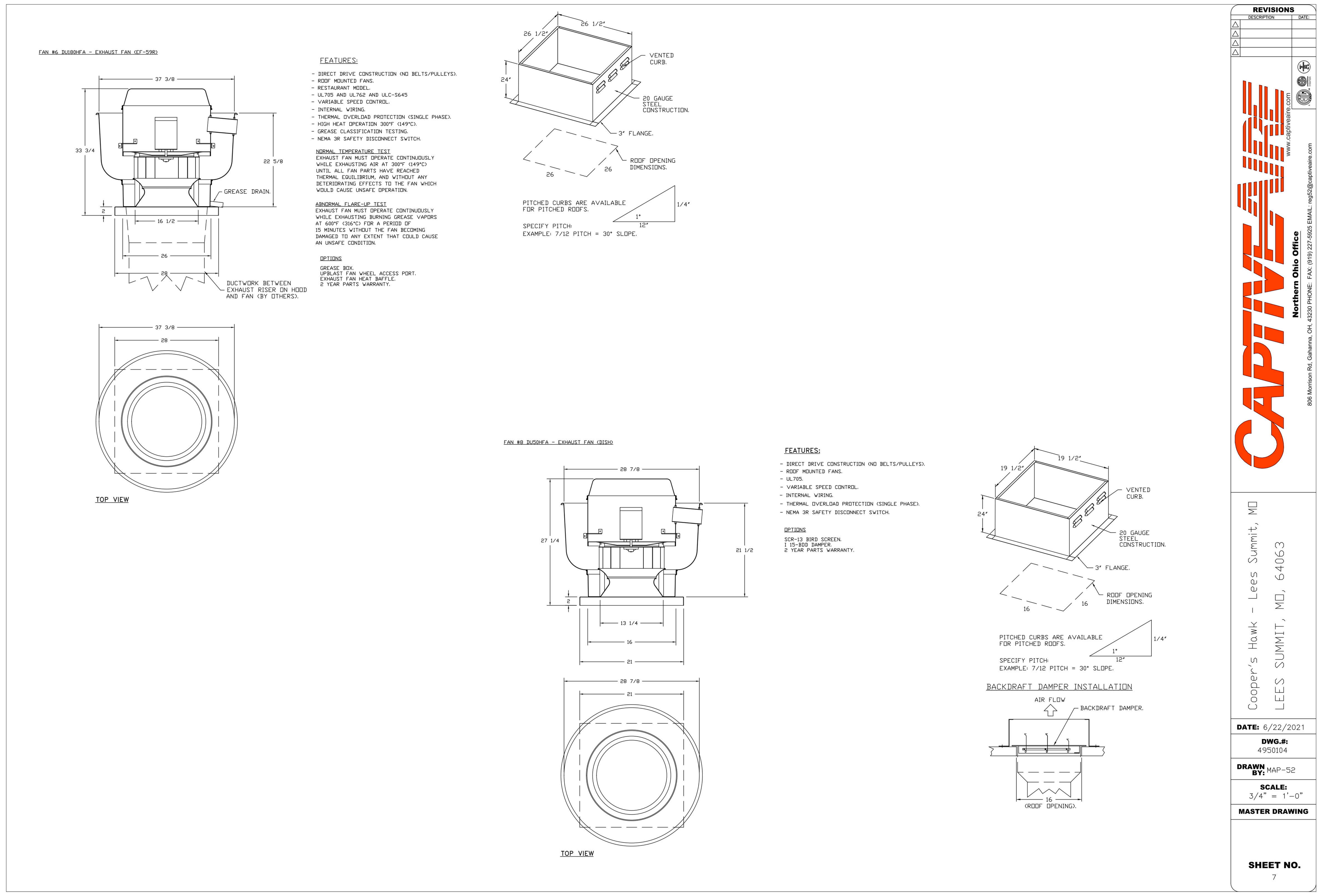
Drawing Title
HVAC - KEC REFERENCE DRAWINGS

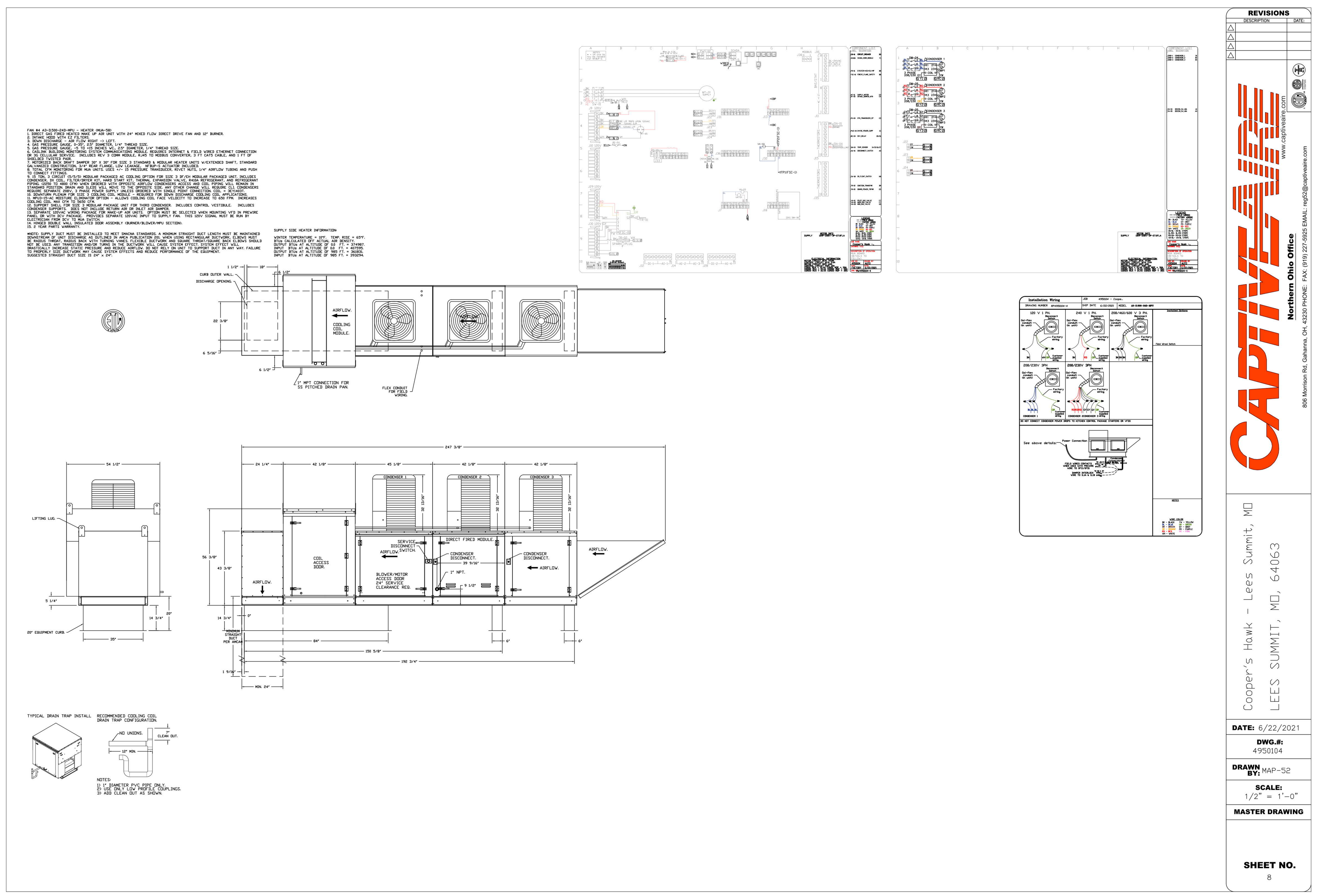
Job No. 21-0064
Drawn DNK
Scale N.T.S.
Date 08/19/2021
Sheet No. M602

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI

10/14/2021

BTR ENGINEERING
MECHANICAL | ELECTRICAL | PLUMBING | FIRE PROTECTION
104 N. OAK PARK AVE., STE 301
OAK PARK, IL 60301
BTRENGINEERS.COM
PHONE: 312-635-6321


FAN #6 DU180HFA - EXHAUST FAN (EF-59R)
37 3/8
33 3/4
22 5/8
GREASE DRAIN.
2
16 1/2
26
28
DUCTWORK BETWEEN EXHAUST RISER ON HOOD AND FAN (BY OTHERS).
TOP VIEW
FEATURES:
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT SWITCH.
NORMAL TEMPERATURE TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.
ABNORMAL FLARE-UP TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.
OPTIONS
GREASE BOX.
UPBLAST FAN WHEEL ACCESS PORT.
EXHAUST FAN HEAT BAFFLE.
2 YEAR PARTS WARRANTY.
26 1/2"
24"
VENTED CURB.
20 GAUGE STEEL CONSTRUCTION.
3" FLANGE.
ROOF OPENING DIMENSIONS.
PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.
SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE.
FAN #8 DU50HFA - EXHAUST FAN (DISH)
28 7/8
27 1/4
21 1/2
FEATURES:
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- UL705.
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- NEMA 3R SAFETY DISCONNECT SWITCH.
OPTIONS
SCR-13 BIRD SCREEN.
I 15-BDD DAMPER.
2 YEAR PARTS WARRANTY.
19 1/2"
24"
VENTED CURB.
20 GAUGE STEEL CONSTRUCTION.
3" FLANGE.
16
ROOF OPENING DIMENSIONS.
PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.
1/4"
1°
12"
SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE.
BACKDRAFT DAMPER INSTALLATION
AIR FLOW
BACKDRAFT DAMPER.
16
(ROOF OPENING).
REVISIONS
CAPTIVEAIRE
Northern Ohio Office
Cooper's Hawk - Lees Summit, MO
LEES SUMMIT, MO, 64063
DATE: 6/22/2021
DWG.#: 4950104
DRAWN BY: MAP-52
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 7



COOPER'S HAWK
WINERY & RESTAURANT

540 NW CHIPMAN ROAD
LEE'S SUMMIT, MO 64086

FIELD VERIFICATION
Contractor shall verify all figured dimensions and conditions at the job site and notify Aria Group Architects, Inc. of any dimensional errors, omissions or discrepancies before beginning or fabricating any work. Do not scale these drawings.

NO.	DATE	REMARKS
1	2021/08/19	ISSUED FOR PERMIT

REVISIONS

STATE OF MISSOURI
JOHN M. THOMAS
NUMBER PE-2018029183
PROFESSIONAL ENGINEER

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.

Drawing Title
HVAC - KEC REFERENCE DRAWINGS

Job No.	Drawn
21-0064	DNK
Scale	**Date**
N.T.S.	08/19/2021

Sheet No.
M603

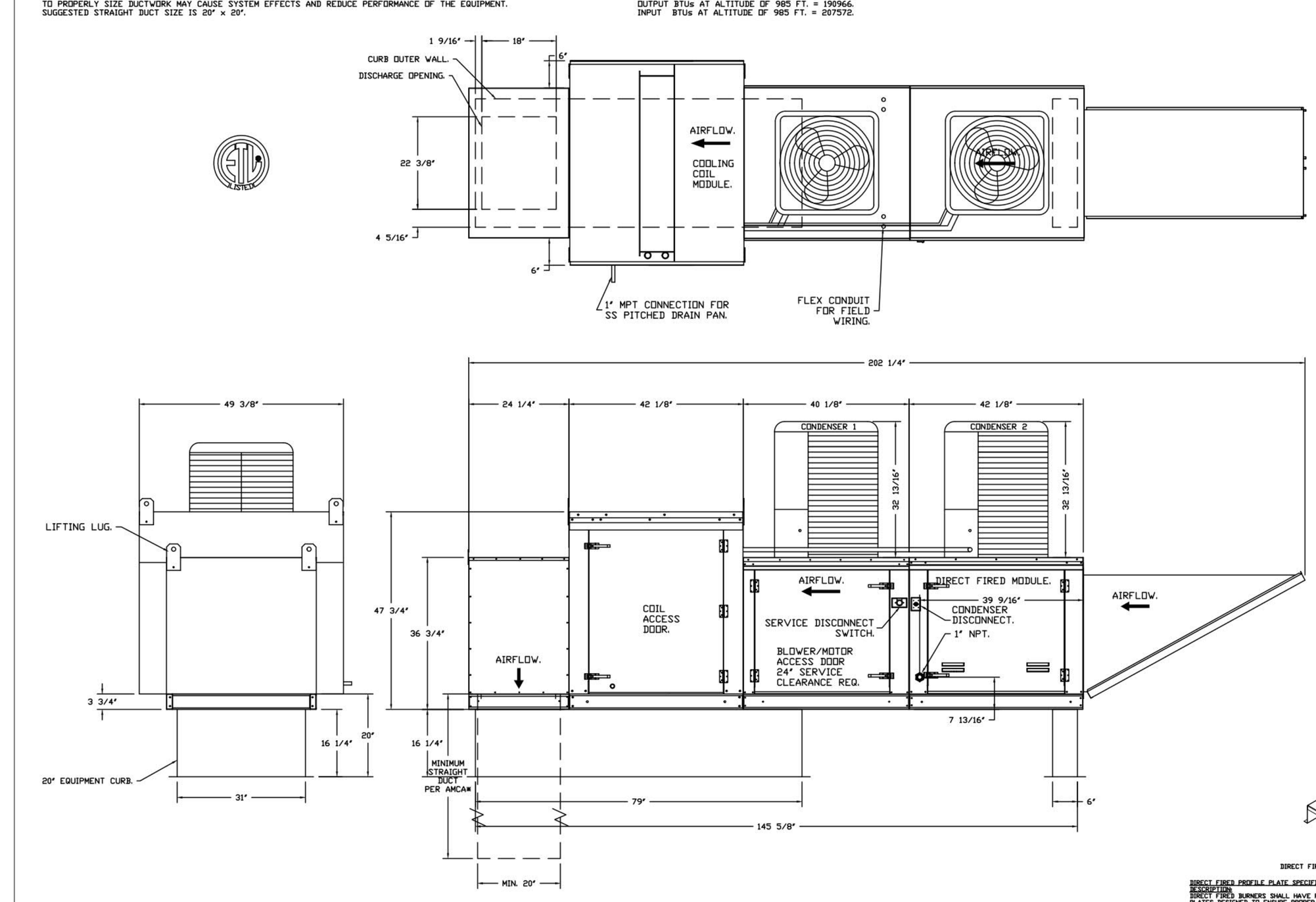
8/17/2021 7:11:50 PM C:\Revit Local\BTR21-0064 CH_Mech_Central_v21_Dan-S749L.rvt

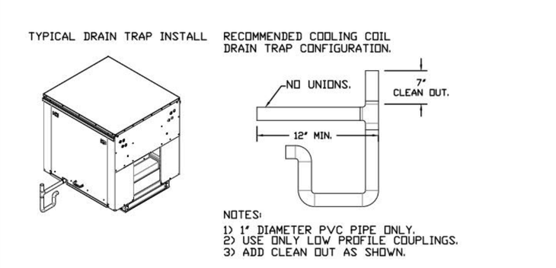
FAN #7 A2-D.500-20D-MPU - HEATER (MUA-59)
1. DIRECT GAS FIRED HEATED MAKE UP AIR UNIT WITH 20" MIXED FLOW DIRECT DRIVE FAN.
2. INTAKE HOOD WITH EZ FILTERS.
3. DOWN DISCHARGE - AIR FLOW RIGHT -> LEFT.
4. GAS PRESSURE GAUGE, 0-35", 2.5" DIAMETER, 1/4" THREAD SIZE.
5. GAS PRESSURE GAUGE, -5 TO +15 INCHES WC., 2.5" DIAMETER, 1/4" THREAD SIZE.
6. CASLINK BUILDING MONITORING SYSTEM COMMUNICATIONS MODULE. REQUIRES INTERNET & FIELD WIRED ETHERNET CONNECTION OR 3G CELLULAR SERVICE. INCLUDES REV 3 COMM MODULE, RJ45 TO MODBUS CONVERTER, 3 FT CAT5 CABLE, AND 1 FT OF SHIELDED TWISTED PAIR.
7. MOTORIZED BACK DRAFT DAMPER 22.75" X 24" FOR SIZE 2 STANDARD & MODULAR HEATER UNITS W/EXTENDED SHAFT, STANDARD GALVANIZED CONSTRUCTION, 3/4" REAR FLANGE, LOW LEAKAGE, LF120S ACTUATOR INCLUDED.
8. TOTAL CFM MONITORING FOR MUA UNITS. USES +/- 15 PRESSURE TRANSDUCER, RIVET NUTS, 1/4" AIRFLOW TUBING AND PUSH TO CONNECT FITTINGS.
9. 7.5 TON, DUAL CIRCUIT (2.5/5) MODULAR PACKAGED AC COOLING OPTION FOR SIZE 2 DF/EH MODULAR PACKAGED UNIT. INCLUDES CONDENSER, DX COIL, FILTER/DRYER KIT, THERMAL EXPANSION VALVE, R410A REFRIGERANT, AND REFRIGERANT PIPING. (1125 TO 3000 CFM) WHEN ORDERED WITH OPPOSITE AIRFLOW CONDENSERS ACCESS AND COIL PIPING WILL REMAIN IN STANDARD POSITION. DRAIN AND SLEDS WILL MOVE TO THE OPPOSITE SIDE. ANY OTHER CHANGE WILL REQUIRE CLI. CONDENSERS REQUIRE SEPARATE 208V, 3 PHASE POWER SUPPLY UNLESS ORDERED WITH SINGLE POINT CONNECTION. COIL = 3EY1402.
10. DOWNTURN PLENUM FOR SIZE 2 COOLING COIL MODULE - REQUIRED FOR DOWN DISCHARGE COOLING COIL APPLICATIONS.
11. SEPARATE 120VAC WIRING PACKAGE FOR MAKE-UP AIR UNITS. OPTION MUST BE SELECTED WHEN MOUNTING VFD IN PREWIRE PANEL OR WITH DCV PACKAGE. PROVIDES SEPARATE 120VAC INPUT TO SUPPLY FAN. THIS 120V SIGNAL MUST BE RUN BY ELECTRICIAN FROM DCV TO MUA SWITCH.
12. PROFILE PLATE CONFIGURATION FOR SIZE 2 DIRECT FIRED UNIT FOR LOW CFM APPLICATIONS.
13. HINGED DOUBLE WALL INSULATED DOOR ASSEMBLY (BURNER/BLOWER/MPU SECTION).
14. 2 YEAR PARTS WARRANTY.

*NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE AS OUTLINED IN AMCA PUBLICATION 201. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THROAT, RADIUS BACK WITH TURNING VANES. FLEXIBLE DUCTWORK AND SQUARE THROAT/SQUARE BACK ELBOWS SHOULD NOT BE USED. ANY TRANSITION AND/OR TURNS IN THE DUCTWORK WILL CAUSE SYSTEM EFFECT. SYSTEM EFFECT WILL DRASTICALLY INCREASE STATIC PRESSURE AND REDUCE AIRFLOW. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECTS AND REDUCE PERFORMANCE OF THE EQUIPMENT. SUGGESTED STRAIGHT DUCT SIZE IS 20" x 20".

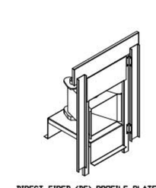
SUPPLY SIDE HEATER INFORMATION:

WINTER TEMPERATURE = 10°F. TEMP. RISE = 65°F.
BTUs CALCULATED OFF ACTUAL AIR DENSITY.
OUTPUT BTUs AT ALTITUDE OF 0.0 FT. = 197910.
INPUT BTUs AT ALTITUDE OF 0.0 FT. = 215120.
OUTPUT BTUs AT ALTITUDE OF 985 FT. = 190966.
INPUT BTUs AT ALTITUDE OF 985 FT. = 207572.





NOTES:
1) 1" DIAMETER PVC PIPE ONLY.
2) USE ONLY LOW PROFILE COUPLINGS.
3) ADD CLEAN OUT AS SHOWN.



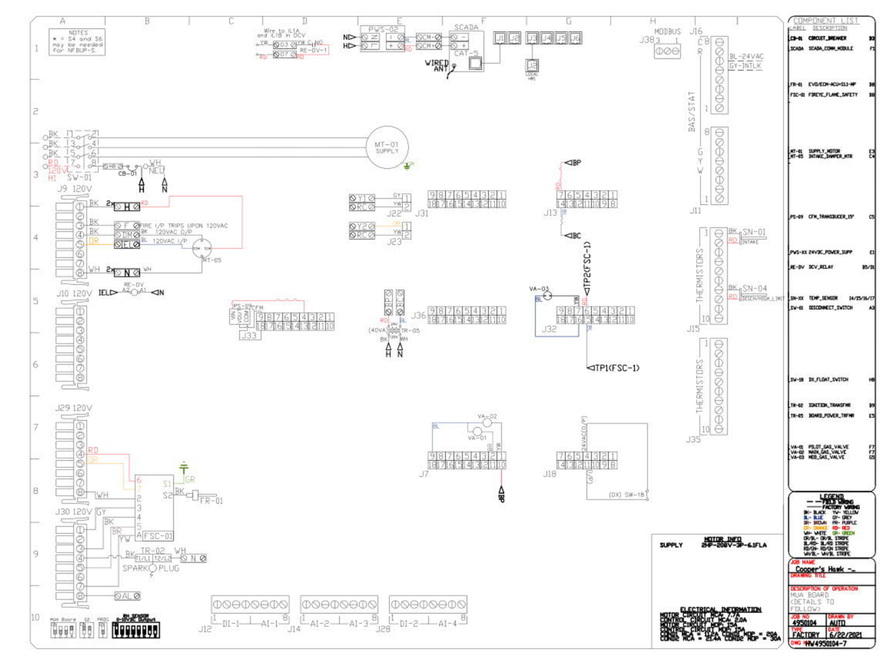
DIRECT FIRED (DF) PROFILE PLATE ASSEMBLY

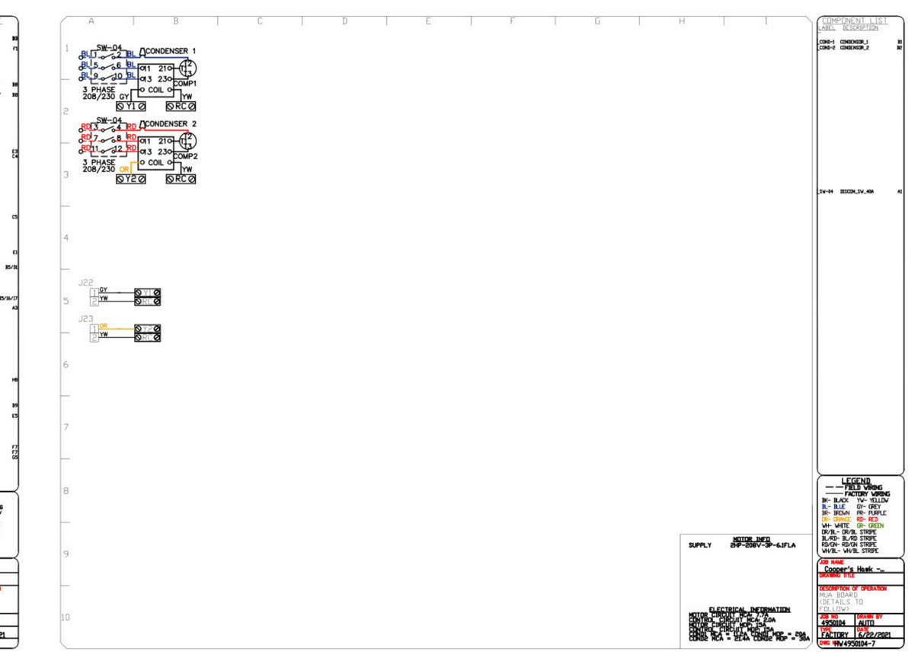
DIRECT FIRED PROFILE PLATE SPECIFICATIONS:
DESCRIPTION:
DIRECT FIRED BURNERS SHALL HAVE PATENTED (US PATENT NO.: US6629523B2), SELF-ADJUSTING PROFILE PLATES DESIGNED TO ENSURE PROPER AIR VELOCITY AND PRESSURE DROP ACROSS THE BURNER. PROFILE PLATES SHALL ALLOW BURNERS TO ACHIEVE CLEAN COMBUSTION BY LIMITING BY-PRODUCT LEVELS TO A MAXIMUM OF 5PPM OF CARBON MONOXIDE (CO), AND 0.5PPM OF NITROGEN DIOXIDE (NO2)DIRECT FIRED UNITS SHALL BE CONFIGURED WITH THE BLOWER MOUNTED DOWNSTREAM OF THE BURNER. THIS ARRANGEMENT WILL ENSURE A CONSISTENT AIRFLOW, REGARDLESS OF INLET AIR TEMPERATURE.

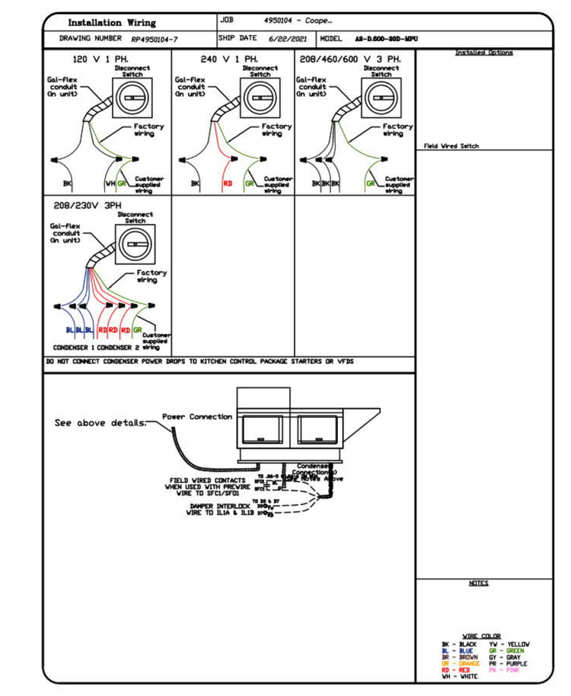
APPLICATION:
SPRING-LOADED BURNER PROFILE PLATES ARE ENGINEERED TO AUTOMATICALLY REACT TO THE MOMENTUM OF A FRESH AIR STREAM, WITHOUT THE NEED FOR ANY MOTORS OR ACTUATORS TO MECHANICALLY ADJUST THEM. WITH THIS FEATURE, ALL DF UNITS ARE DESIGNED FOR DEMAND CONTROL VENTILATION (DCV) REQUIREMENTS.

CERTIFICATIONS:
ALL PROFILE PLATE ASSEMBLIES SHALL BE INCLUDED IN THE DF UNIT'S ETL LISTING AND COMPLY WITH COMBINED SAFETY STANDARDS ANSI Z83.4 AND CSA 3.7 (NON-RECIRCULATING DF HEATERS) AND ANSI Z83.18 (RECIRCULATING DF HEATERS).

GENERAL CONSTRUCTION:
-PROFILE PLATES SHALL BE FORMED FROM G90 GALVANIZED STEEL.
-PROFILE PLATES SHALL VARY IN SIZE PER UNIT.
-PROFILE PLATES SHALL BE MOUNTED ALONG THE SAME PLANE AS THE DISCHARGE OF THE BURNER.
-DESIGN SHALL INCORPORATE PROPERLY TORQUED, PERMANENTLY MOUNTED SPRING HINGES.
-SPRING HINGES SHALL BE MADE FROM PLATED STEEL.





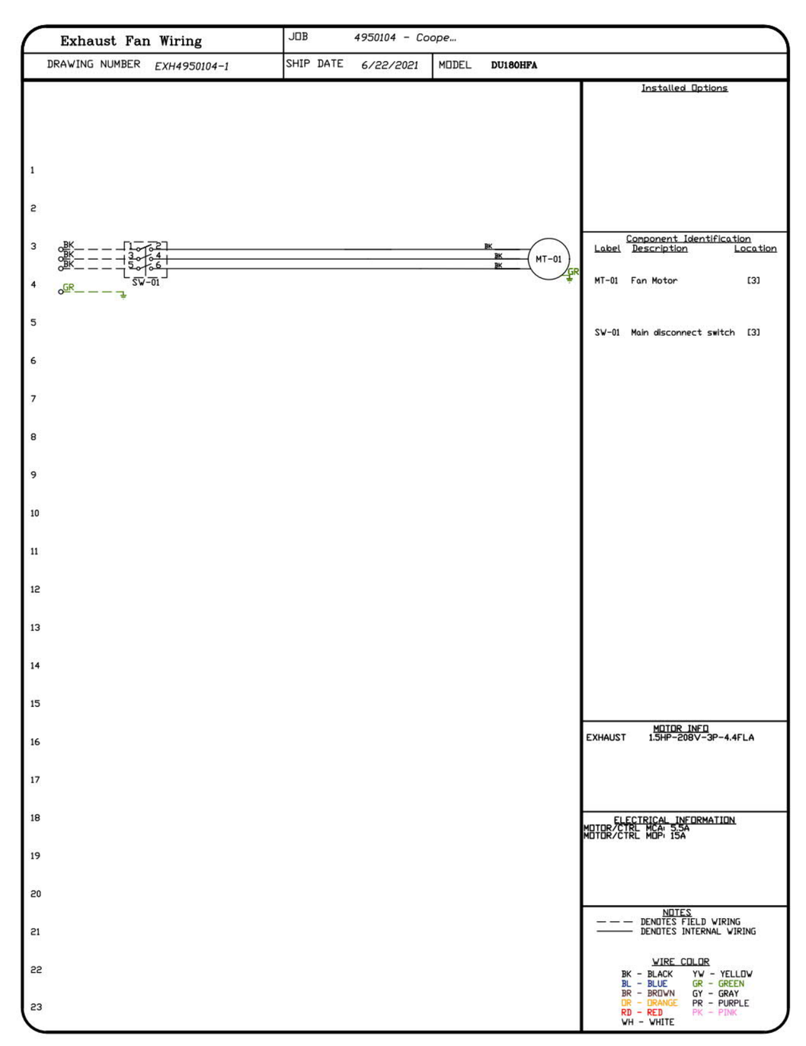


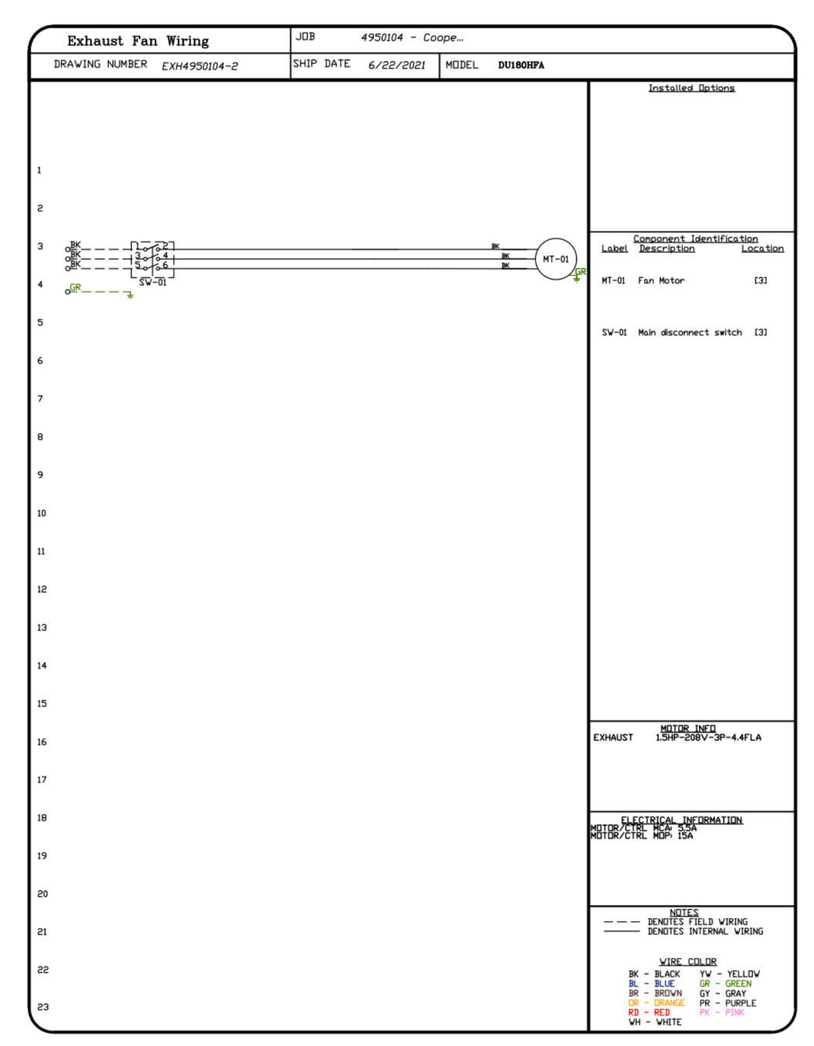
REVISIONS	
DESCRIPTION	DATE:
△	
△	
△	
△	

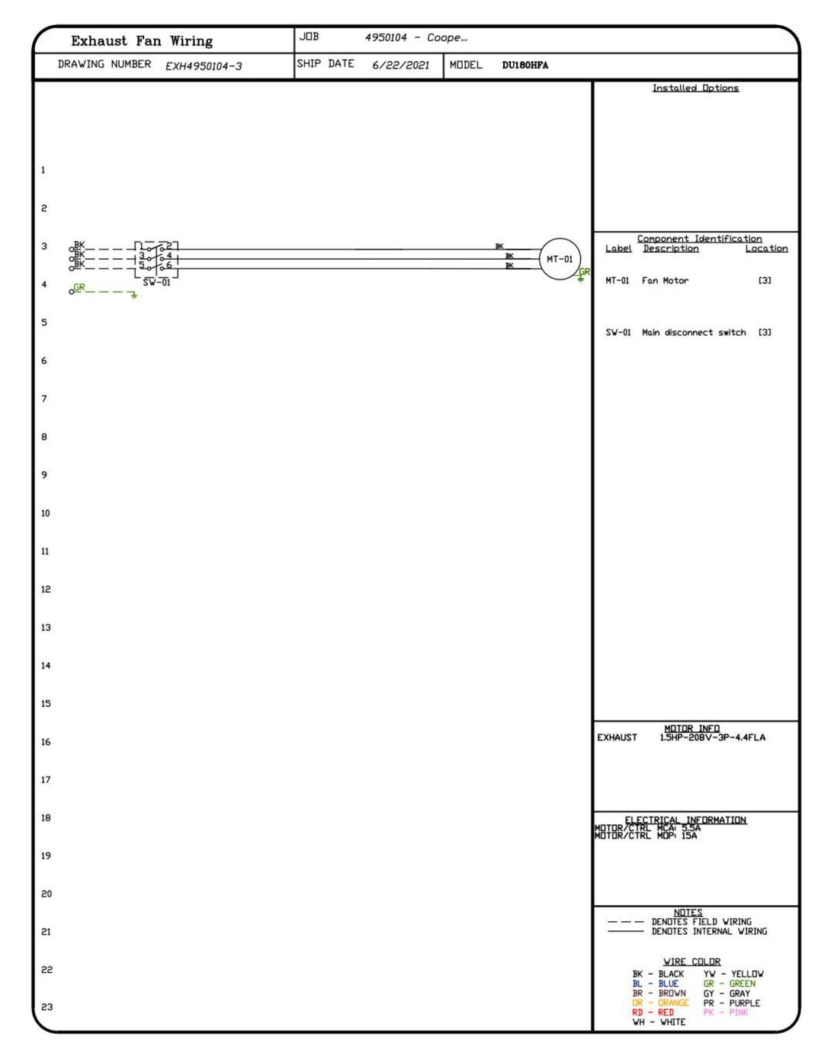
CAPTIVEAIRE
www.captiveaire.com
Northern Ohio Office
806 Morrison Rd, Gahanna, OH, 43230 PHONE: FAX: (919) 227-5925 EMAIL: reg52@captiveaire.com

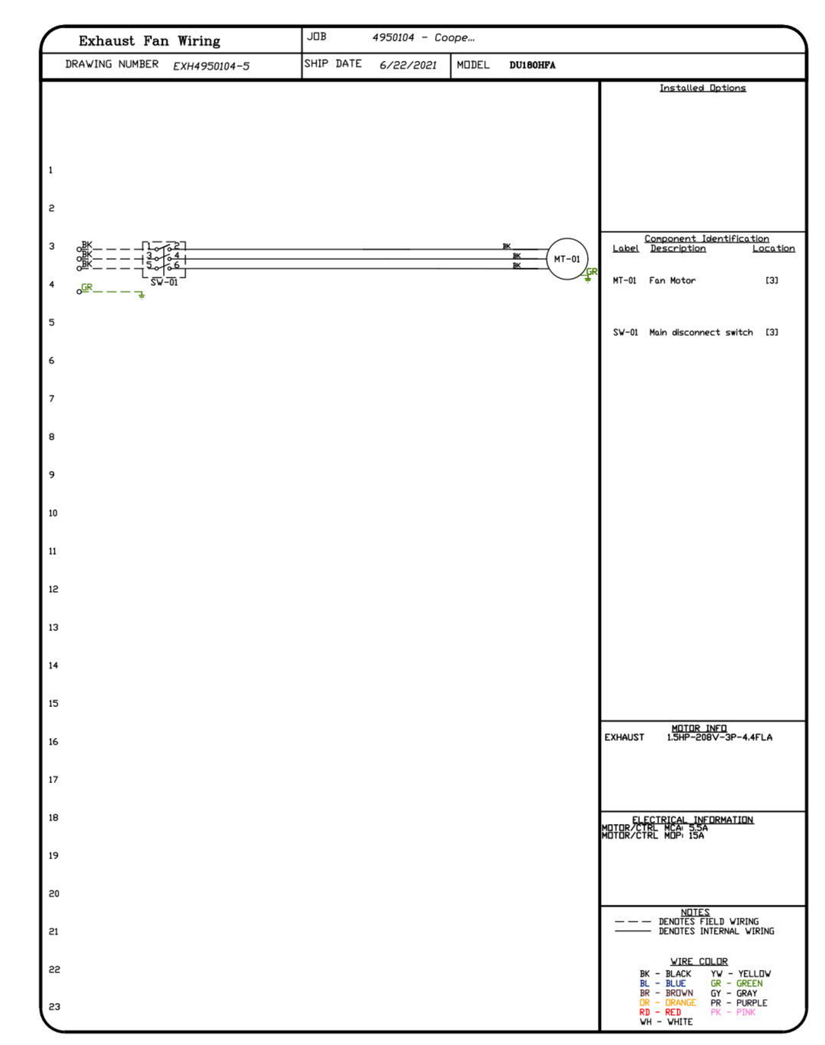
Cooper's Hawk - Lees Summit, MO
LEES SUMMIT, MO, 64063

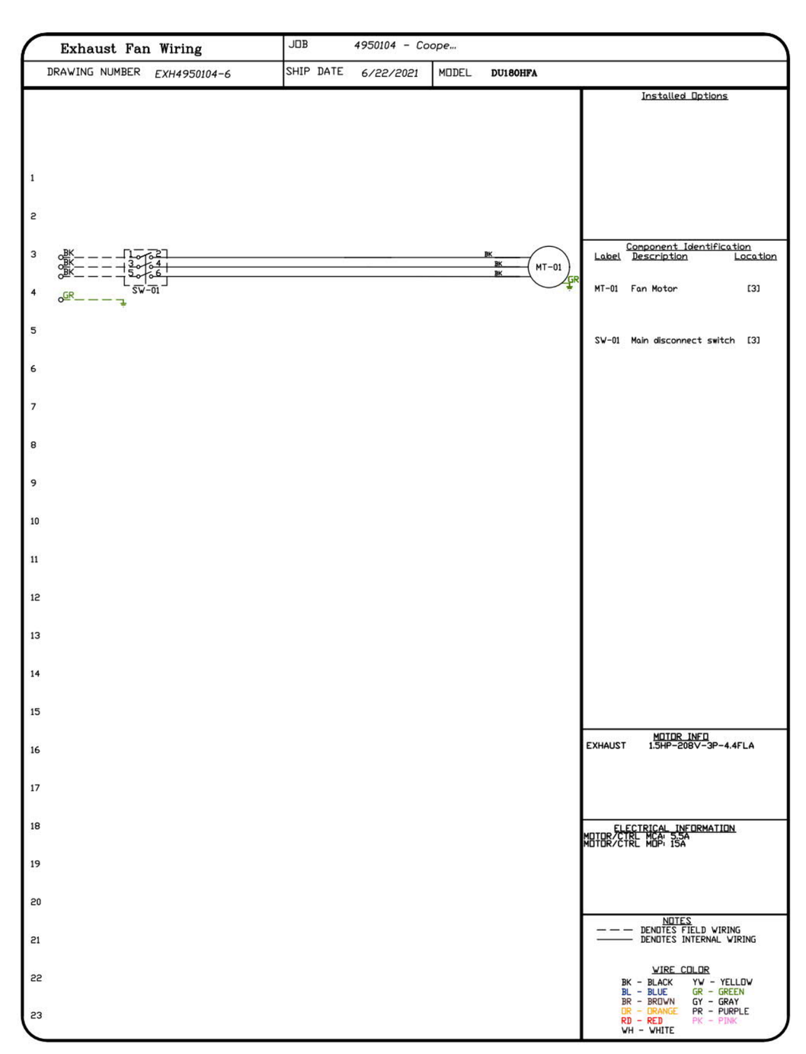
DATE: 6/22/2021
DWG.#: 4950104
DRAWN BY: MAP-52
SCALE: 1/2" = 1'-0"
MASTER DRAWING
SHEET NO. 9

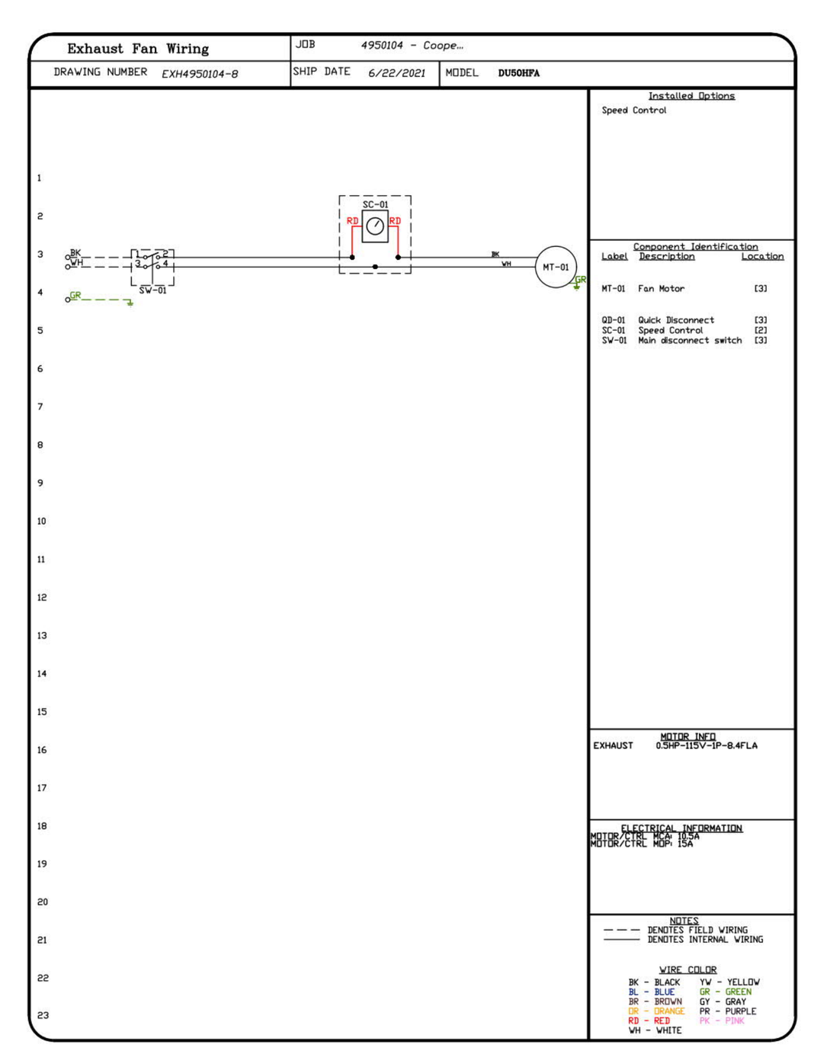












REVISIONS	
DESCRIPTION	DATE:
△	
△	
△	
△	

CAPTIVEAIRE
www.captiveaire.com
Northern Ohio Office
806 Morrison Rd, Gahanna, OH, 43230 PHONE: FAX: (919) 227-5925 EMAIL: reg52@captiveaire.com

Cooper's Hawk - Lees Summit, MO
LEES SUMMIT, MO, 64063

DATE: 6/22/2021
DWG.#: 4950104
DRAWN BY: MAP-52
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 10

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.

BTR ENGINEERING
MECHANICAL | ELECTRICAL | PLUMBING | FIRE PROTECTION
104 N. OAK PARK AVE., STE 201
OAK PARK, IL 60301
BTRENGINEERS.COM
PHONE: 312-435-6300

COOPER'S HAWK
WINERY & RESTAURANT
540 NW CHIPMAN ROAD
LEE'S SUMMIT, MO 64086

FIELD VERIFICATION
Contractor shall verify all figured dimensions and conditions at the job site and notify Aria Group Architects, Inc. of any dimensional errors, omissions or discrepancies before beginning or fabricating any work. Do not scale these drawings.

NO.	DATE	REMARKS
1	2021/08/19	ISSUED FOR PERMIT

REVISIONS

STATE OF MISSOURI
JOHN M. THOMAS
NUMBER PE-2010039283
PROFESSIONAL ENGINEER

Drawing Title
HVAC - KEC REFERENCE DRAWINGS

Job No.	Drawn
21-0064	DNK
Scale	Date
N.T.S.	08/19/2021

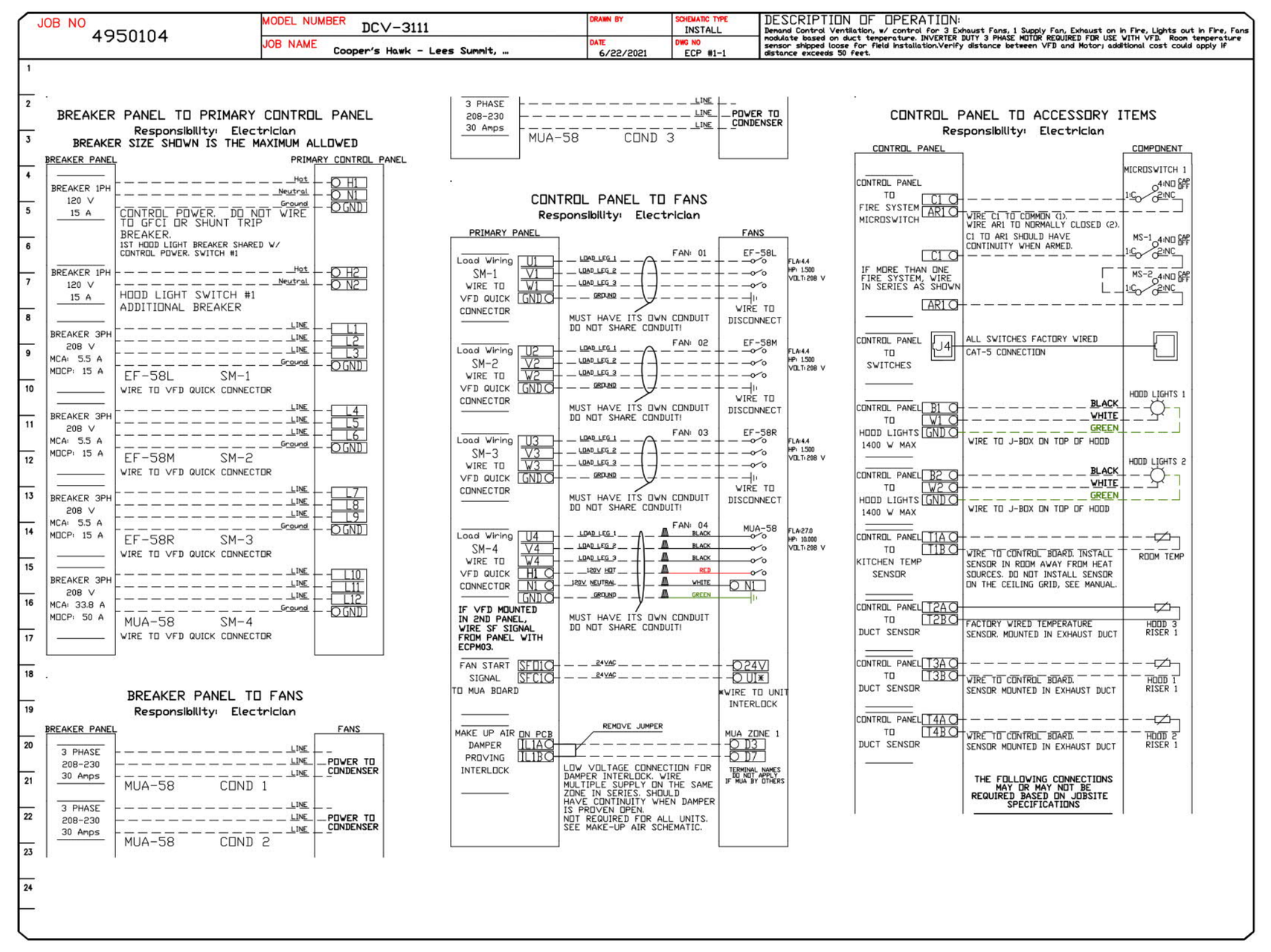
Sheet No.
M604

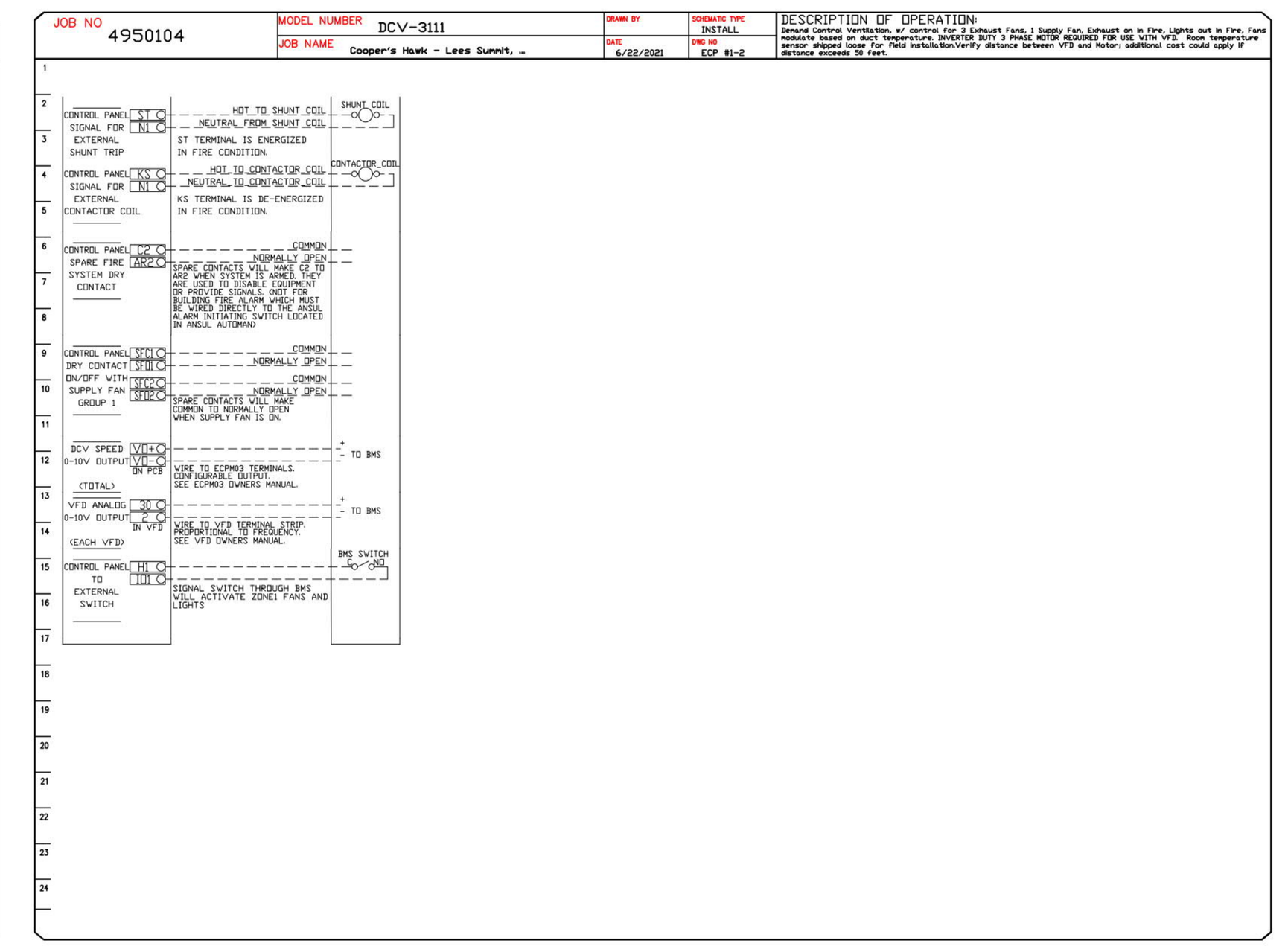
8/17/2021 7:11:52 PM C:\Revit Locals\BTR\21-0064 CH_Mech_Central_v21_Dan-S749L.rvt

ELECTRICAL PACKAGE – JOB#4950104

NO	TAG	PACKAGE #	LOCATION	SWITCHES LOCATION	SWITCHES QUANTITY	OPTION	FANS CONTROLLED FAN TAG	TYPE	φ	HP	VOLT	FLA
1	EP-1	DCV-3111	UTILITY CABINET RIGHT	04 – UTILITY CABINET RIGHT	1 LIGHT	SMART CONTROLS DCV	EF-58L	EXHAUST	3	1.500	208	4.4
							EF-58M	EXHAUST	3	1.500	208	4.4
				HOOD # 3	1 FAN		EF-58R	EXHAUST	3	1.500	208	4.4
							MUA-58	SUPPLY	3	10.000	208	27.0
2	EP-2	DCV-2111	UTILITY CABINET RIGHT	04 – UTILITY CABINET RIGHT	1 LIGHT	SMART CONTROLS DCV	EF-59L	EXHAUST	3	1.500	208	4.4
							EF-59R	EXHAUST	3	1.500	208	4.4
				HOOD # 5	1 FAN		MUA-59	SUPPLY	3	2.000	208	6.1
3	Item #83	Switches		02 – FACE MOUNT RIGHT SIDE OF HOOD	1 LIGHT							
				HOOD # 6	1 FAN							

ALL POWER FEED FROM VARIABLE FREQUENCY DRIVES IN HOOD CONTROL PANEL TO FAN MOTORS MUST BE IN SEPARATE STEEL CONDUIT – OR MOTOR/VFD FAILURE MAY OCCUR





DUCT TEMPERATURE SENSOR

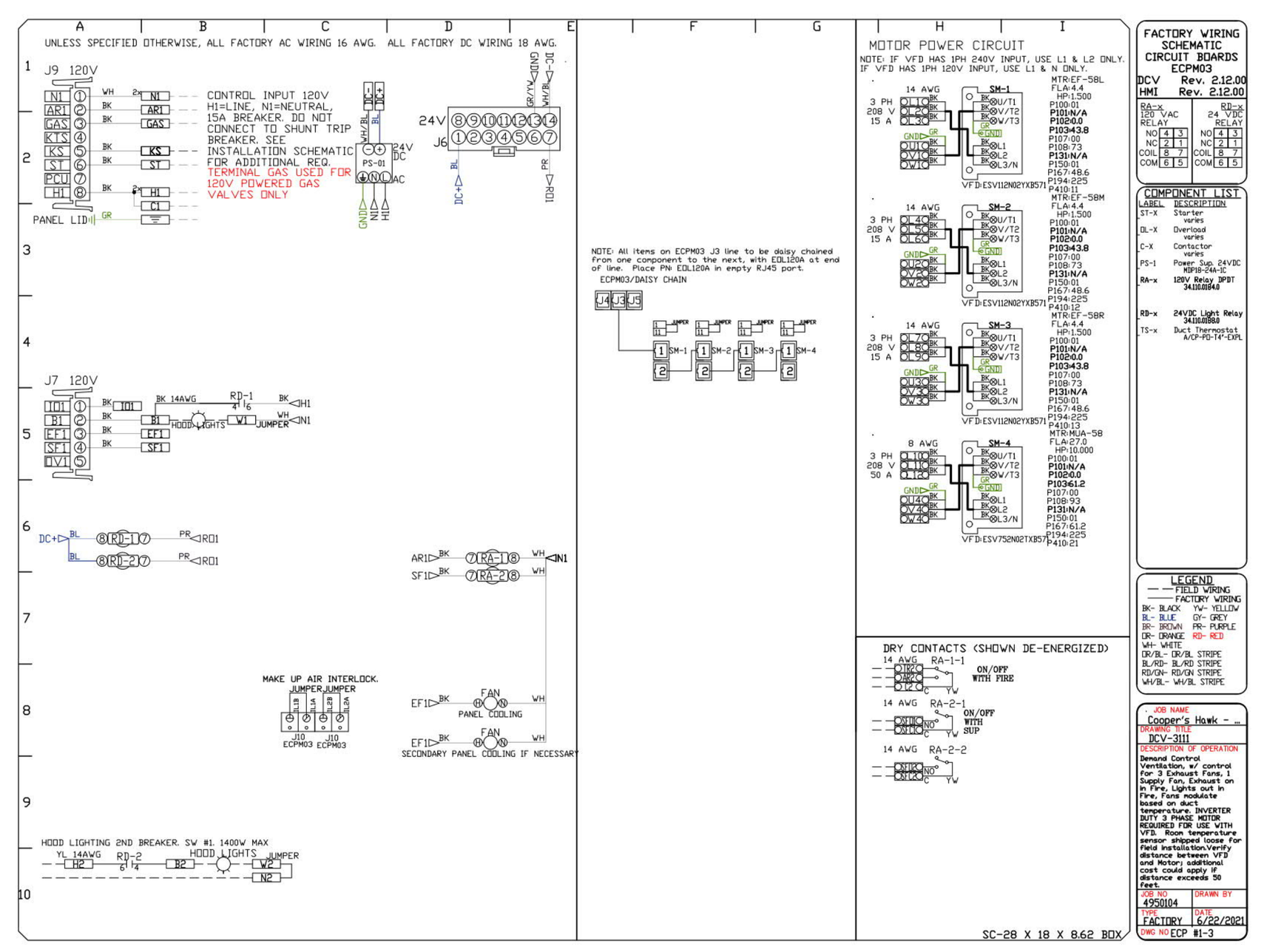
Provides exhaust air temperature for proper hood control operation. For all installations excluding a single hood with factory risers and a hood mounted panel, duct mounted temperature sensors will need to be field wired. 2-wire 18 AWG plenum rated thermistor cable must be used.

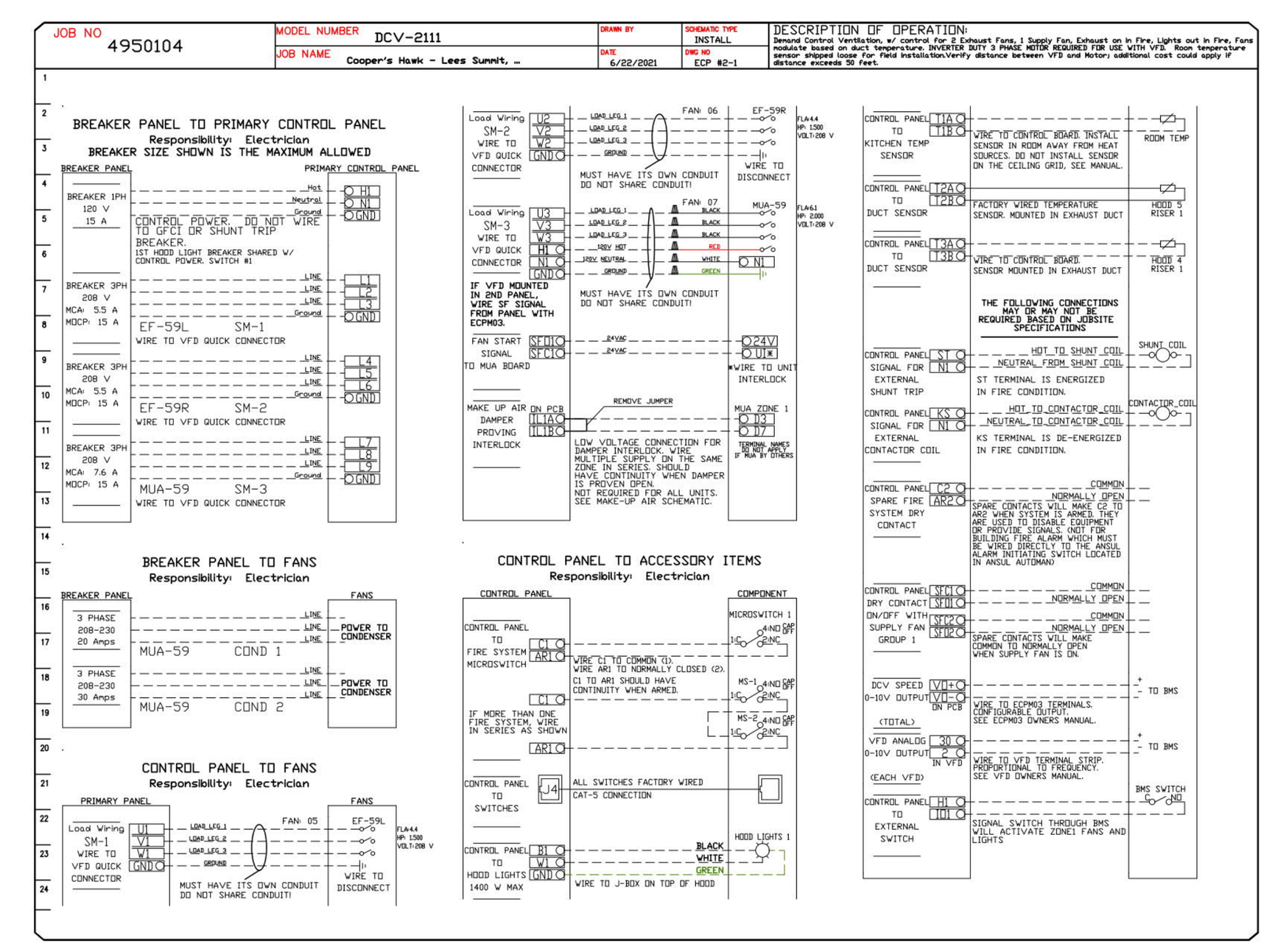
ROOM TEMPERATURE SENSOR

Provides room override based on temperature differential between the room and duct. Installed by electrician on a wall, 5'-6' off the finished floor, in the space but not directly under the hood or close to an appliance (including the electrical control box) so the reading is accurate for space.

HOOD CONTROL INTERFACE

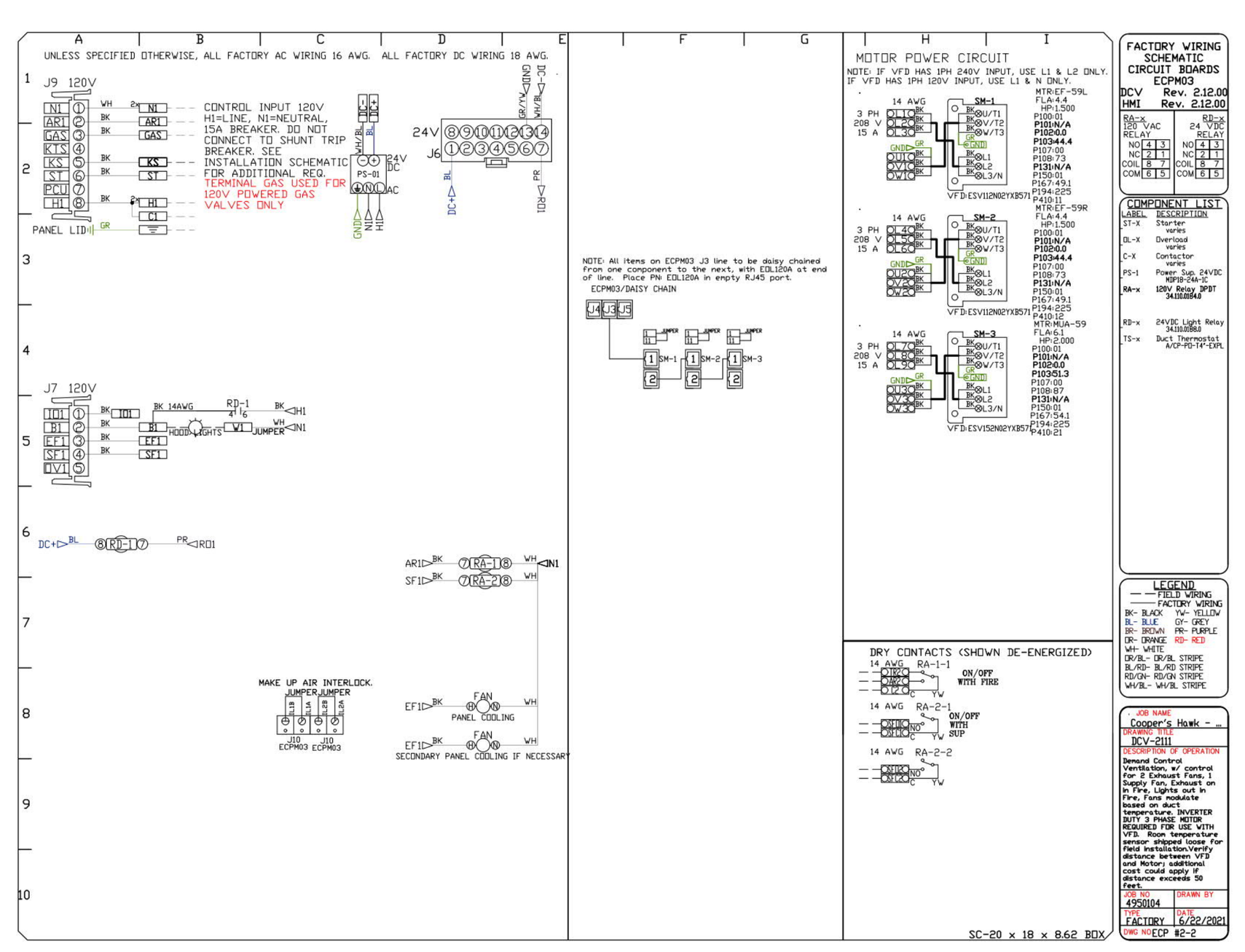
The LCD interface provides user control and hood status. The faceplate is connected to the hood control panel through CAT-5 cable. A faceplate has 2 RJ-45 connectors. One connects to port J4 or J5 in the hood control panel and the other will typically be occupied by a RJ-45 end-of-line terminator.





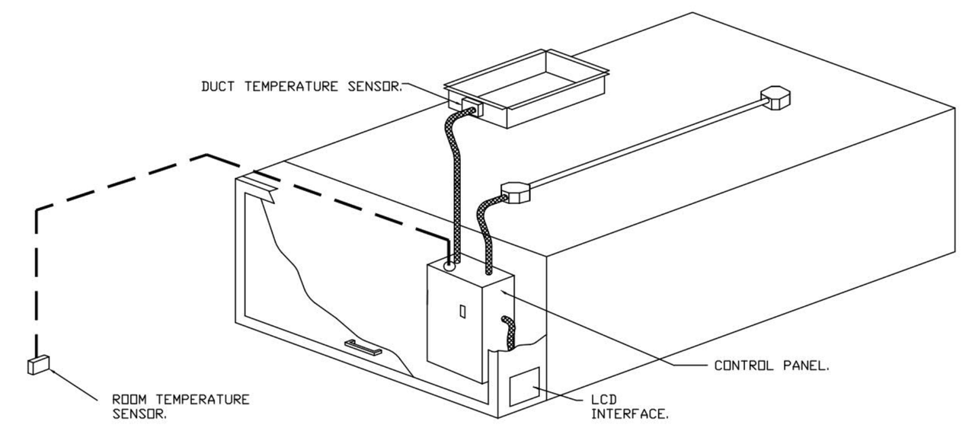
Cooper's Hawk – Lees Summit, MO
LEES SUMMIT, MO, 64063

DATE: 6/22/2021
DWG.#: 4950104
DRAWN BY: MAP-52
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 11



DEMAND CONTROL VENTILATION HOOD CONTROL PANEL SPECIFICATIONS:

- CONTROLS SHALL BE LISTED BY ETL (UL 508A) AND SHALL COMPLY WITH DEMAND VENTILATION SYSTEM TURNDOWN REQUIREMENTS OUTLINED IN IECC 403.2.8 (2015).
- THE CONTROL ENCLOSURE SHALL BE NEMA 1 RATED AND LISTED FOR INSTALLATION INSIDE OF THE EXHAUST HOOD UTILITY CABINET. THE CONTROL ENCLOSURE MAY BE CONSTRUCTED OF STAINLESS STEEL OR PAINTED STEEL.
- TEMPERATURE PROBE(S) LOCATED IN THE EXHAUST DUCT RISER(S) SHALL BE CONSTRUCTED OF STAINLESS STEEL.
- A DIGITAL CONTROLLER SHALL BE PROVIDED TO ACTIVATE THE HOOD EXHAUST FANS DYNAMICALLY BASED ON A FIXED DIFFERENTIAL BETWEEN THE AMBIENT AND DUCT TEMPERATURES SENSORS. THIS FUNCTION SHALL MEET THE REQUIREMENTS OF IMC 507.1.1.
- A DIGITAL CONTROLLER SHALL PROVIDE ADJUSTABLE HYSTERESIS SETTINGS TO PREVENT CYCLING OF THE FANS AFTER THE COOKING APPLIANCES HAVE BEEN TURNED OFF AND/OR THE HEAT IN THE EXHAUST SYSTEM IS REDUCED.
- A DIGITAL CONTROLLER SHALL PROVIDE AN ADJUSTABLE MINIMUM FAN RUN-TIME SETTING TO PREVENT FAN CYCLING.
- VARIABLE FREQUENCY DRIVES (VFDS) SHALL BE PROVIDED FOR FANS AS REQUIRED. THE DIGITAL CONTROLLER SHALL MODULATE THE VFDS BETWEEN A MINIMUM SETPOINT AND A MAXIMUM SETPOINT ON DEMAND. THE DUCT TEMPERATURE SENSOR INPUT(S) TO THE DIGITAL CONTROLLER SHALL BE USED TO CALCULATE THE SPEED REFERENCE SIGNAL.
- THE VFD SPEED RANGE OF OPERATION SHALL BE FROM 0% TO 100% FOR THE SYSTEM, WITH THE ACTUAL MINIMUM SPEED SET AS REQUIRED TO MEET MINIMUM VENTILATION REQUIREMENTS.
- AN INTERNAL ALGORITHM TO THE DIGITAL CONTROLLER SHALL MODULATE SUPPLY FAN VFD SPEED PROPORTIONAL TO ALL EXHAUST FANS THAT ARE LOCATED IN THE SAME FAN GROUP AS THE SUPPLY FAN.
- THE SYSTEM SHALL OPERATE IN PREP MODE DURING LIGHT COOKING LOAD OR COOL DOWN MODE WHEN SUFFICIENT HEAT REMAINS UNDERNEATH THE HOOD SYSTEM AFTER COOKING OPERATIONS HAVE COMPLETED. OPERATION DURING EITHER OF THESE PERIODS WILL DISABLE THE SUPPLY FANS AND PROVIDE AN EXHAUST FAN SPEED THAT IS EQUAL TO THE MINIMUM VENTILATION REQUIREMENT.
- A DIGITAL CONTROLLER SHALL DISABLE THE SUPPLY FAN(S), ACTIVATE THE EXHAUST FAN(S), ACTIVATE THE APPLIANCE SHUNT TRIP, AND DISABLE AN ELECTRIC GAS VALVE AUTOMATICALLY WHEN FIRE CONDITION IS DETECTED ON A COVERED HOOD.
- A DIGITAL CONTROLLER SHALL ALLOW FOR EXTERNAL BMS FAN CONTROL VIA DRY CONTACT (EXTERNAL CONTROL SHALL NOT OVERRIDE FAN OPERATION LOGIC AS REQUIRED BY CODE).
- AN LCD INTERFACE SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
  A. ON/OFF PUSH BUTTON FAN & LIGHT SWITCH ACTIVATION.
  B. INTEGRATED GAS VALVE RESET FOR ELECTRONIC GAS VALVES (NO RESET RELAY REQUIRED).
  C. VFD FAULT DISPLAY WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  D. DUCT TEMPERATURE SENSOR FAILURE DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  E. MIS-WIRED DUCT TEMPERATURE SENSOR DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  F. A SINGLE LOW VOLTAGE CAT-5 RJ45 WIRING CONNECTION.
  G. AN ENERGY SAVINGS INDICATOR THAT UTILIZES MEASURED KWH FROM THE VFDS.



TYPICAL HOOD CONTROL PANEL INSTALLATION

SEQUENCE OF OPERATIONS:

THE HOOD CONTROL PANEL IS CAPABLE OF OPERATING IN ONE OR MORE OF THE FOLLOWING STATES AT ANY GIVEN TIME:

- AUTOMATIC: THE SYSTEM OPERATES BASED ON THE DIFFERENTIAL BETWEEN ROOM TEMPERATURE AND THE TEMPERATURE AT THE HOOD CAVITY OR EXHAUST DUCT COLLAR. FANS ACTIVATE AT A CONFIGURABLE TEMPERATURE DIFFERENTIAL THRESHOLD. DEPENDING ON THE JOB CONFIGURATION EACH FAN ZONE CAN BE CONFIGURED AS STATIC OR DYNAMIC. THESE TERMS REFER TO WHETHER A VARIABLE MOTOR (SUCH AS EC MOTORS OR VFD DRIVEN MOTORS) MODULATE WITH TEMPERATURE. IF THE PANEL IS EQUIPPED WITH VARIABLE SPEED FANS AND THE ZONE IS DEFINED AS "DYNAMIC", THESE WILL MODULATE WITHIN A USER-DEFINED RANGE BASED ON THE TEMPERATURE DIFFERENTIAL. PANELS EQUIPPED WITH VARIABLE SPEED FANS AND A FAN ZONE DEFINED AS "STATIC", FANS WILL RUN AT A SET SPEED CALCULATED FOR THE DRIVE. DEMAND CONTROL VENTILATION SYSTEMS ARE CAPABLE OF MODULATING EXHAUST AND MAKE UP AIR FAN SPEEDS PER THE REQUIREMENTS OUTLINED IN IECC 403.2.8.
- MANUAL: THE SYSTEM OPERATES BASED ON HUMAN INPUT FROM AN HMI.
- SCHEDULE: A WEEKLY SCHEDULE CAN BE SET TO RUN FANS FOR A SPECIFIED PERIOD THROUGHOUT THE DAY. THERE ARE THREE OCCUPIED TIMES PER DAY TO ALLOW FOR THE USER TO SET UP A TIME THAT IS SUITABLE TO THEIR NEEDS. ANY TIME THAT IS WITHIN THE DEFINED OCCUPIED TIME, THE SYSTEM WILL RUN AT MODULATION MODE AND FOLLOW THE FAN PROCEDURE ALGORITHM BASED ON TEMPERATURE DURING THIS TIME. DURING UNOCCUPIED TIME, THE SYSTEM WILL HAVE AN EXTRA OFFSET TO PREVENT UNINTENDED ACTIVATION OF THE SYSTEM DURING A TIME WHERE THE SYSTEM IS NOT BEING OCCUPIED.
- OTHER: THE SYSTEM OPERATES BASED ON THE INPUT FROM AN EXTERNAL SOURCE (DDC, BMS OR HARD-WIRED INTERLOCK).
- FIRE: UPON ACTIVATION OF THE HOOD FIRE SUPPRESSION SYSTEM, THE EXHAUST FAN WILL COME ON OR CONTINUE TO TO RUN, THE HOOD MAKEUP AIR WILL SHUTDOWN, AND A SIGNAL WILL BE SENT FOR ACTIVATING THE SHUNT TRIP BREAKER PROVIDED BY THE ELECTRICIAN. FUEL GAS WILL SHUT OFF VIA A MECHANICAL/ELECTRICAL GAS VALVE ACTUATED BY THE HOOD FIRE SUPPRESSION SYSTEM.

Cooper's Hawk – Lees Summit, MO
LEES SUMMIT, MO, 64063

DATE: 6/22/2021
DWG.#: 4950104
DRAWN BY: MAP-52
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 12

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
10/14/2021

BTR ENGINEERING
MECHANICAL | ELECTRICAL | PLUMBING | FIRE PROTECTION
104 N. OAK PARK AVE., STE 301
OAK PARK, IL 60301
BTRENGINEERS.COM
PHONE: 312-635-6381

540 NW CHIPMAN ROAD
LEE'S SUMMIT, MO 64086

COOPER'S HAWK
WINERY & RESTAURANT

FIELD VERIFICATION
Contractor shall verify all figured dimensions and conditions at the job site and notify Aria Group Architects, Inc. of any dimensional errors, omissions or discrepancies before beginning or fabricating any work. Do not scale these drawings.

NO.	DATE	REMARKS
1	2021/08/19	ISSUED FOR PERMIT

REVISIONS

STATE OF MISSOURI
JOHN M. THOMAS
NUMBER PE-2019037653
PROFESSIONAL ENGINEER

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.

Drawing Title
HVAC - KEC REFERENCE DRAWINGS

Job No. 21-0064
Drawn DNK
Scale N.T.S.
Date 08/19/2021
Sheet No. M605

8/17/2021 7:11:55 PM C:\Revit Local\BTR21-0064-CH_Mech_Central_v21_Dan-S749L.rvt