FIELD VERIFY ALL CONDITIONS

DESIGN DRAWINGS ARE SCHEMATIC. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING OR AWARD OF CONTRACT TO INSPECT EXISTING FIELD CONDITIONS. THIS CONTRACT SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS DUE TO EXISTING CONDITIONS.

THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN HIS BID ALL COSTS TO MEET THE DESIGN INTENT. CLARIFICATIONS MADE BY THE ARCHITECT, ENGINEER OR OWNER AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT CONTRACTORS COST.

BIDDING CONTRACTORS SHALL HAVE A WORKING KNOWLEDGE OF LOCAL CODES AND ORDINANCES AND SHALL INCLUDE IN THEIR BIDS THE COSTS FOR ALL WORK INSTALLED IN STRICT ACCORDANCE WITH GOVERNING CODES, THE PLANS AND SPECIFICATIONS NOT WITHSTANDING. THE CONTRACTOR SHALL ALERT ARCHITECT, ENGINEER OR OWNER OF ANY APPARENT DISCREPANCIES BETWEEN GOVERNING CODES AND DESIGN INTENT.

HVAC GENERAL NOTES

A. COORDINATE ROOF TOP EQUIPMENT PLACEMENT WITH ARCHITECTURAL DRAWINGS. COORDINATE EXACT LOCATION WITH EXISTING STRUCTURE AND LANDLORD'S ROOFING CONTRACTOR.

B. REFER TO FOOD SERVICE DRAWINGS FOR ADDITIONAL SCOPE OF WORK.

C. INSTALL ALL DUCT, PIPE ECT. AS HIGH AS POSSIBLE. COORDINATE INSTALLATION OF WORK WITH OTHER CONTRACTORS.

D. PROVIDE FLEXIBLE CONNECTION BETWEEN DUCT WORK AND ALL EQUIPMENT WITH RATING PARTS.

E. ALL DUCTWORK SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA STANDARDS. ALL JOINTS SEALED PRIOR TO INSULATION. ALL DUCTWORK TO BE CONCEALED UNLESS NOTED OTHERWISE. DUCTWORK SIZES INDICATED ARE ACTUAL DUCT SIZES. ADDITIONAL CLEARANCE SHALL BE CONSIDERED FOR INSULATION.

F. ALL ROOFING WORK SHALL BE PERFORMED BY LANDLORDS ROOFING CONTRACTOR AT THIS CONTRACTORS EXPENSE TO MAINTAIN ROOF WARRANTY. COORDINATE ROOF PENETRATIONS WITH THIS CONTRACTOR. VERIFY CONTRACTOR WITH LANDLORD.

MECHANICAL LEGEND

SYMBOL	DESCRIPTION
PLAN-VIEW LINE TYPES	
	WORK SHOWN FADED INDICATES EXISTING WORK TO REMAIN OR NEW WORK BY OTHERS AS APPLICABLE
	WORK SHOWN BOLD-CONTINUOUS INDICATES NEW WORK
MECHANICAL MISCELLANOUS	
	CONNECT TO EXISTING (FIELD VERIFY EXISTING UTILITY SERVICE TYPE, PRIOR TO MAKING CONNECTION)
MECHANICAL STATS & SENSORS	
TS	TEMPERATURE SENSOR
T	LOW VOLTAGE THERMOSTAT
MECHANICAL DUCTWORK ACCESSORIES	
	DUCT WITH MANUAL VOLUME DAMPER
M	MOTOR OPERATED DAMPER - LOW VOLTAGE
S	DUCT MOUNTED SMOKE DETECTOR (HARD WIRE INTERLOCK TO FAN MOTOR BY E.C.) FURNISHED BY E.C., INSTALLED BY M.C.
MECHANICAL AIR DEVICES	
SR	SUPPLY REGISTER
RR	RETURN REGISTER
ER	EXHAUST REGISTER
RG	RETURN GRILLE
CD	CEILING DIFFUSER
MECHANICAL DUCTWORK	
UP	SUPPLY DUCT WITH ELBOW TURNED UP
DN	SUPPLY DUCT WITH ELBOW TURNED DOWN
UP	RETURN DUCT WITH ELBOW TURNED UP
DN	RETURN DUCT WITH ELBOW TURNED DOWN
UP	EXHAUST DUCT WITH ELBOW TURNED UP
DN	EXHAUST DUCT WITH ELBOW TURNED DOWN
24X12 SA	SUPPLY DUCT
24X12 RA	RETURN DUCT
24X12 EA	EXHAUST DUCT
	1" LINED DUCTWORK
	FLEXIBLE DUCTWORK CONNECTION
	BRANCH TAKEOFF
	REDUCER, CONCENTRIC
	REDUCER, NONCONCENTRIC

STANDARD HVAC ABBREVIATIONS

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

BUILDING PRESSURIZATION CALCULATION

EQUIPMENT	OUTSIDE AIR	EXHAUST AIR	TOTALS
EX RTU-1	540	0	540
EX RTU-2	684	0	684
EX RTU-3	972	0	972
RTU-4	620	0	620
RTU-5	324	0	324
EF-1	0	-150	-150
EF-2	0	-150	-150
EF-3	0	-200	-200
DISHFAN K50A	0	-600	-600
EX KEF1	0	-1950	-1950
EX KEF2	0	-1950	-1950
EX KEF3	0	-2250	-2250
EX MUA-1	4920	0	4920
Building Totals	8060	-7250	810
EQUIPMENT	**OUTSIDE AIR**	**EXHAUST AIR**	**TOTALS**
EX RTU-3	972	0	972
EF-3	0	-200	-200
DISHFAN K50A	0	-600	-600
EX KEF1	0	-1950	-1950
EX KEF2	0	-1950	-1950
EX KEF3	0	-2250	-2250
EX MUA-1	4920	0	4920
Kitchen Totals	5892	-6950	-1058

HOOD BALANCING COMPANY CONTACT:
MELINK
ALEX FALCK
(513) 965 - 7301

OCCUPANCY/TEMPERATURE SCHEDULE

SEASON	OCCUPIED		UNOCCUPIED	
	TIME	TEMP.	TIME	TEMP.
SUMMER	6AM-4PM	74	4PM-6AM	80
WINTER	6AM-4PM	72	4PM-6AM	60

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Revisions:

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NO.	DATE	BY	DESCRIPTION

FIRST WATCH
THE DAYTIME CAFE

BRANNON CROSSING

NICHOLASVILLE, KY

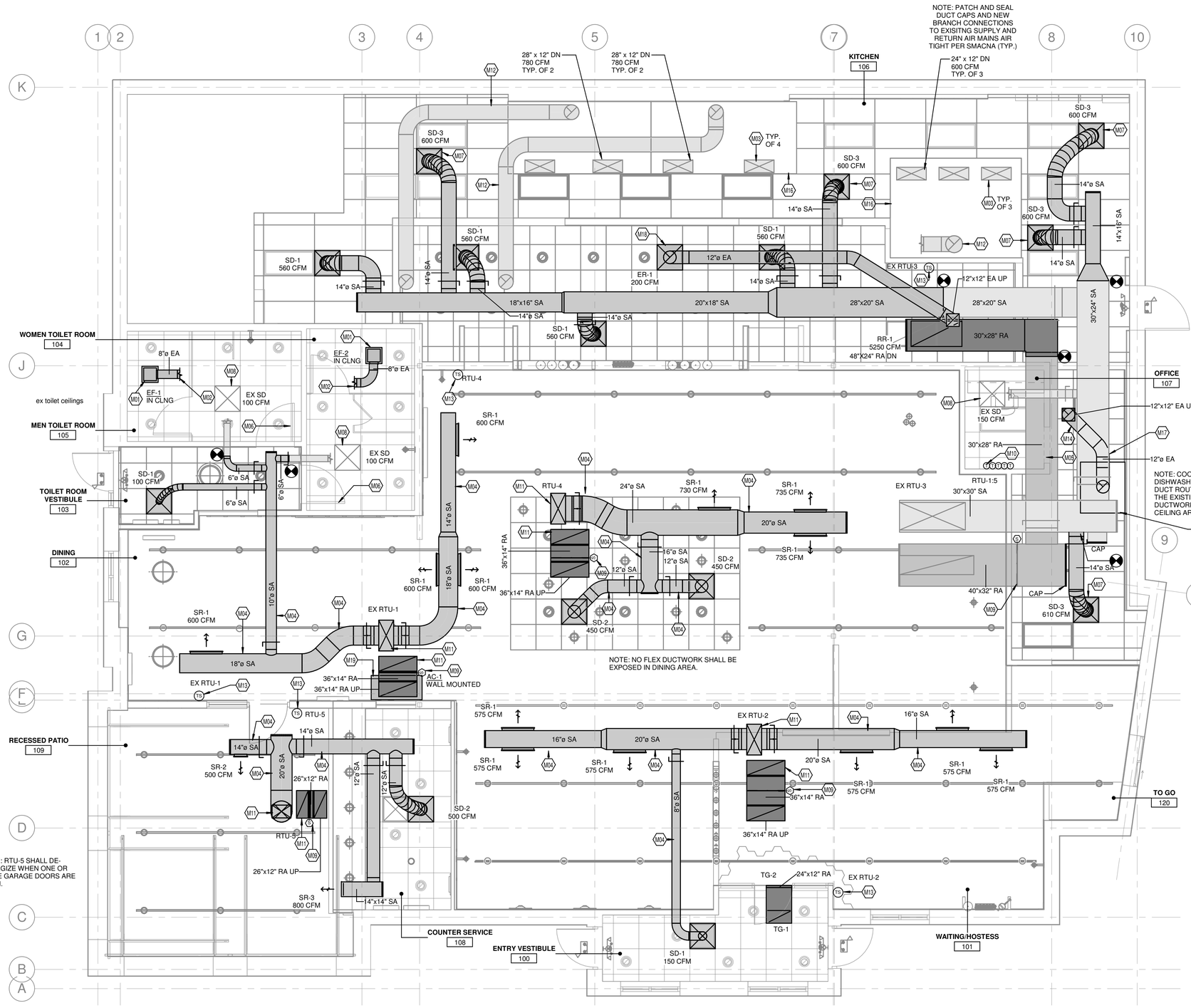
Project No.	220410
KLH Project No.	2434
Issue Date	05/23/2022

Title

MECHANICAL LEGEND AND ABBREVIATIONS

Sheet

M000



KEYED NOTES

M01	PROVIDE IN CEILING EXHAUST FAN AS SCHEDULED. BALANCE TO THE SCHEDULED AIRFLOW. INSTALL IN SAME LOCATION AS EXISTING.
M02	EXTEND AND CONNECT NEW EXHAUST DUCTWORK TO EXISTING EXHAUST DUCTWORK SERVING RESTROOMS. PATCH AND SEAL AIR TIGHT PER SMACNA. FIELD VERIFY EXACT LOCATION.
M03	EXISTING MUA DUCTWORK TO REMAIN. FIELD VERIFY EXACT ROUTING IN FIELD.
M04	PROVIDE DOUBLE WALL DUCTWORK WITH 1" INSULATION FOR ALL EXPOSED DUCTWORK.
M05	IF NOT EXISTING, PROVIDE 1.5" AIRSPACE BETWEEN BOTTOM OF DOOR AND FINISHED FLOOR FOR AIRFLOW.
M06	IF NOT EXISTING, PROVIDE 1" AIRSPACE BETWEEN BOTTOM OF DOOR AND FINISHED FLOOR FOR AIRFLOW.
M07	PERFORATED SUPPLY DIFFUSER PROVIDED WITHOUT PATTERN CONTROLLER.
M08	EXISTING SUPPLY DIFFUSER TO REMAIN. CLEAN AND BALANCE TO THE SCHEDULED AIRFLOW.
M09	IF NOT EXISTING, MECHANICAL CONTRACTOR SHALL FURNISH A NEW ADDRESSABLE SMOKE DETECTOR. MECHANICAL CONTRACTOR SHALL INSTALL SMOKE DETECTOR IN NEW AIR DUCT MAIN. MECHANICAL CONTRACTOR SHALL INTERLOCK SMOKE DETECTOR TO FAN MOTOR. ELECTRICAL CONTRACTOR SHALL WIRE SMOKE DETECTOR TO REMOTE ANNUNCIATOR. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION INCLUDING ANNUNCIATOR LOCATION.
M10	PROVIDE THERMOSTAT AND EXTEND CONTROL WIRING FROM RTU AND SPACE SENSOR TO THIS LOCATION.
M11	EXTEND DUCTWORK UP TO UNIT THROUGH OPENING IN ROOF AND CONNECT TO ROOFTOP UNIT. VERTICAL DUCTWORK SAME SIZE AS EQUIPMENT. PROVIDE FLEXIBLE CONNECTION IN VERTICAL DUCT.
M12	EXISTING KITCHEN EXHAUST DUCTWORK TO REMAIN. CLEAN AND PROVIDE RECONDITIONING REPORT TO OWNER.
M13	PROVIDE SPACE SENSOR AT THIS LOCATION. EXTEND CONTROL WIRING TO THERMOSTATS LOCATED IN OFFICE.
M14	EXHAUST DUCT DOWN TO DISHWASHER HOOD FLANGED CONNECTION AND CONNECT. REFERENCE FOOD SERVICE (FS) DRAWINGS FOR ADDITIONAL REQUIREMENTS. EXTEND ALUMINUM DUCT UP THRU ROOF TO EXHAUST FAN.
M15	TYPE II DISHWASHER EXHAUST HOOD. REFERENCE FOOD SERVICE (FS) DRAWINGS FOR ADDITIONAL REQUIREMENTS.
M16	EXISTING KITCHEN HOOD TO REMAIN. CLEAN TO LIKE NEW CONDITION.
M17	EXTEND EXHAUST DUCT UP THRU ROOF TO EXHAUST FAN. PROVIDE DUCT TRANSITION AT FAN.
M18	LOCATE EXHAUST GRILLE OVER TOASTER. LOCATE AS CLOSE AS CEILING TILE WILL PERMIT. EXTEND ALUMINUM DUCT FROM GRILLE TO 10"X10" VERTICAL ALUMINUM DUCT UP TO EXHAUST FAN AND CONNECT. SLOPE FROM GRILLE TO VERTICAL DUCT.
M19	PROVIDE AIR CURTAIN AS SCHEDULED. INSTALL PER MANUFACTURER'S PRINTED INSTRUCTIONS. AIR CURTAIN SHALL ENERGIZE WHEN ONE OR MORE GARAGE DOORS OPEN.

1 MECHANICAL FLOOR PLAN
1/4" = 1'-0"

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Revisions:

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THE DAYTIME CAFE

BRANNON CROSSING

NICHOLASVILLE, KY

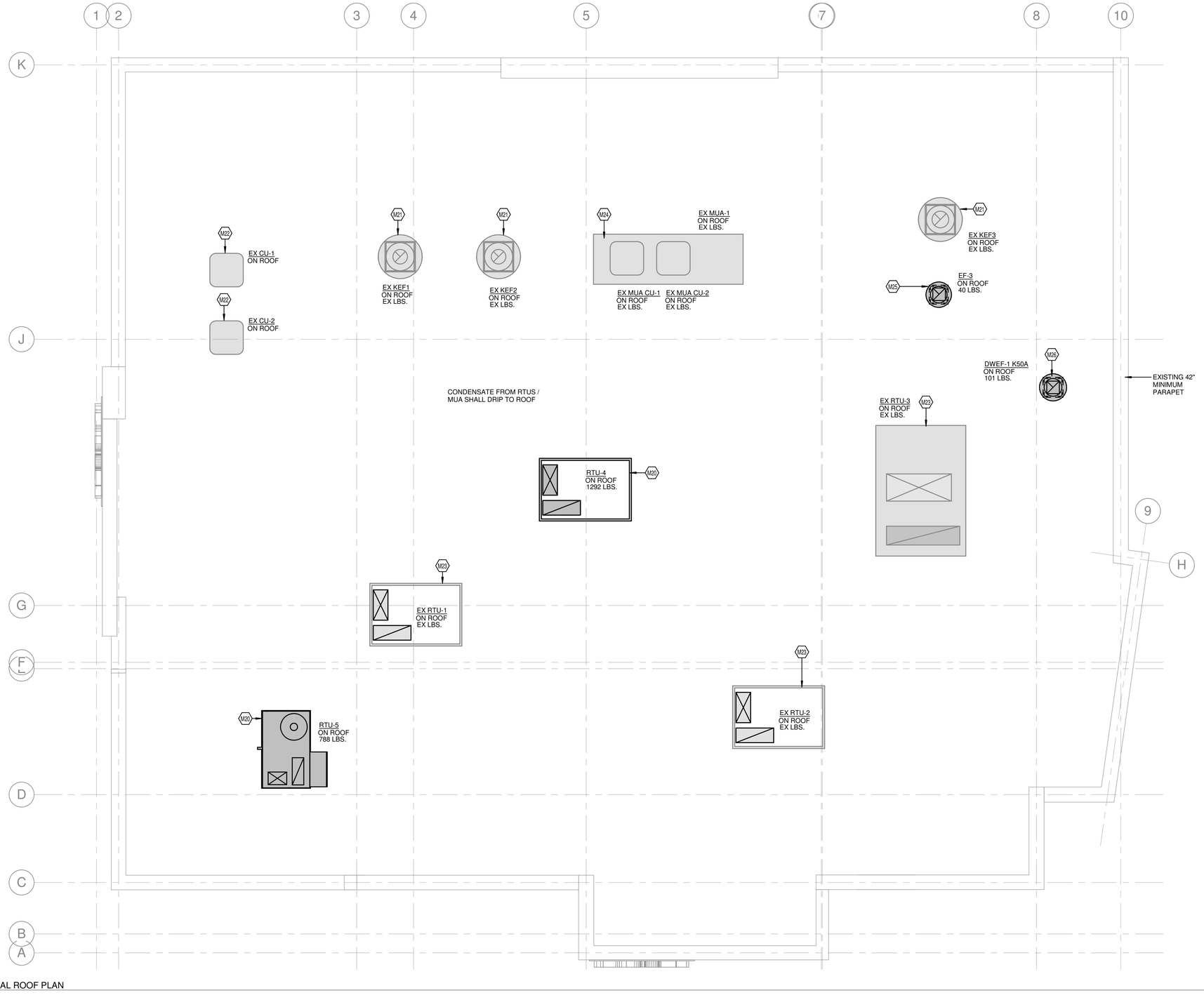
Project No.	220410
KLH Project No.	24340
Issue Date	05/23/2022

Title

MECHANICAL FLOOR PLAN

Sheet

M100



KEYED NOTES

M20	PROVIDE RTU AS SCHEDULED WITH MANUFACTURER'S ROOF CURB. BALANCE TO THE SCHEDULED AIRFLOW. MAINTAIN ALL CODE AND MANUFACTURER REQUIRED CLEARANCES.
M21	EXISTING KITCHEN EXHAUST FAN TO REMAIN. BALANCE TO THE SCHEDULED AIRFLOW. CLEAN AND PROVIDE OWNER WITH RECONDITIONING REPORT.
M22	EXISTING REMOTE CONDENSING UNIT TO REMAIN.
M23	EXISTING ROOFTOP UNIT TO REMAIN. BALANCE TO THE SCHEDULED AIRFLOW. CLEAN AND VERIFY PROPER OPERATION; CLEAN COOLING, HEATING COILS, RECHARGE REFRIGERANT, REPLACE BELT, DRIVE, AND MOTOR AS REQUIRED, REPLACE FILTERS. CHECK COMPRESSOR AND FANS, REPLACE/REPAIR AS REQUIRED. PROVIDE OWNER WITH RECONDITIONING REPORT PRIOR TO TURNOVER. FIELD VERIFY EXACT LOCATION AND ORIENTATION PRIOR TO BID.
M24	EXISTING MAKEUP AIR UNIT TO REMAIN. BALANCE TO THE SCHEDULED AIRFLOW. CLEAN AND VERIFY PROPER OPERATION; CLEAN COOLING, HEATING COILS, RECHARGE REFRIGERANT, REPLACE BELT, DRIVE, AND MOTOR AS REQUIRED, REPLACE FILTERS. CHECK COMPRESSOR AND FANS, REPLACE/REPAIR AS REQUIRED. PROVIDE OWNER WITH RECONDITIONING REPORT PRIOR TO TURNOVER. FIELD VERIFY EXACT LOCATION AND ORIENTATION PRIOR TO BID.
M25	PROVIDE EXHAUST FAN ON ROOF. BALANCE TO THE SCHEDULED AIRFLOW. PROVIDE DUCT TRANSITION AT FAN.
M26	DISHWASHER EXHAUST FAN ON ROOF. BALANCE TO THE SCHEDULED AIRFLOW, REFERENCE FOOD SERVICE DRAWINGS FOR ADDITIONAL REQUIREMENTS.

1 MECHANICAL ROOF PLAN
1/4" = 1'-0"

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NICHOLASVILLE, KY

Project No.	220410
KLH Project No.	24340
Issue Date	05/23/2022

Title

MECHANICAL ROOF PLAN

Sheet

M101

HVAC ACCESSORIES

ACCESSORIES:

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

HVAC DIFFUSERS AND REGISTERS SCHEDULE - FIRST WATCH

TAG	MANUFACTURER	MODEL	FACE	MOUNTING	MATERIAL	FINISH	DAMPER TYPE	BORDER STYLE	REMARKS
ER-1	TITUS	350FL	24"x24"	CEILING	ALUMINUM	STANDARD WHITE	PARALLEL BLADE	LAY IN MOUNTING	
RR-1	TITUS	350ZFL	48"x24"	CEILING	ALUMINUM	STANDARD WHITE	PARALLEL BLADE	LAY IN MOUNTING	
SD-1	TITUS	OMNI-AA	24"x24"	CEILING	ALUMINUM	STANDARD WHITE	OPPOSED BLADE	LAY IN MOUNTING	REFER TO DRAWINGS FOR DUCT CONNECTION SIZES.
SD-2	TITUS	OMNI-AA	24"x24"	CEILING	ALUMINUM	STANDARD WHITE	OPPOSED BLADE	LAY IN MOUNTING	REFER TO DRAWINGS FOR DUCT CONNECTION SIZES. DIFFUSER TO RECIEVE FINISH TO MATCH SURROUNDING CEILING. COORDINATE WITH FIRST WATCH REPRESENTATIVE.
SD-3	TITUS	PAS-AA	24"x24"	CEILING	ALUMINUM	STANDARD WHITE	(none)	LAY IN MOUNTING	REFER TO DRAWINGS FOR DUCT CONNECTION SIZES.
SR-1	TITUS	S300FL	30"x6"	DUCT	ALUMINUM	METALESCENT ALUM. BAKED ENAMEL	SCOOP DAMPER	SURFACE MOUNT	
SR-2	TITUS	S300FL	12"x10"	DUCT	ALUMINUM	METALESCENT ALUM. BAKED ENAMEL	SCOOP DAMPER	SURFACE MOUNT	
SR-3	TITUS	300FL	12"x12"	SIDEWALL	ALUMINUM	METALESCENT ALUM. BAKED ENAMEL	OPPOSED BLADE	SURFACE MOUNT	PAINT TO MATCH SURROUNDING WALL. COORDINATE WITH FIRST WATCH REPRESENTATIVE.
TG-1	TITUS	350FL	24"x12"	CEILING	ALUMINUM	STANDARD WHITE	(none)	LAY IN MOUNTING	
TG-2	TITUS	350FL	24"x12"	SIDEWALL	ALUMINUM	STANDARD WHITE	(none)	SURFACE MOUNT	PAINT TO MATCH SURROUNDING WALL. COORDINATE WITH FIRST WATCH REPRESENTATIVE.

HVAC LOAD SCHEDULE - FIRST WATCH

THE HEATING AND COOLING LOAD CALCULATIONS ARE BASED ON THE CLTD/CLF (COOLING LOAD TEMPERATURE DIFFERENCE/COOLING LOAD FACTOR) METHOD. ASSUMPTIONS AND EXECUTION OF THESE METHODS ARE PER ASHRAE 183-2007...

HVAC LOADS	COOLING LOAD BREAKDOWN				HEATING LOAD BREAKDOWN	
	CROOF	SENSIBLE HEAT GAIN FROM ROOF	CSSENS	TOTAL SENSIBLE HEAT GAIN TO SPACE	HROOF	HEAT LOSS FROM ROOF
	CWALL	SENSIBLE HEAT GAIN FROM EXTERIOR WALLS	CFAN	SENSIBLE HEAT GAIN FROM AIR HANDLER FAN	HWALL	HEAT LOSS FROM EXTERIOR WALLS
	CPART	SENSIBLE HEAT GAIN FROM PARTITIONS	COAS	SENSIBLE HEAT GAIN FROM OUTDOOR VENTILATION AIR	HPART	HEAT LOSS FROM PARTITIONS
	CGLASS	SENSIBLE HEAT GAIN FROM GLAZING	CTSENS	TOTAL SENSIBLE HEAT GAIN	HGLASS	HEAT LOSS FROM GLAZING
	CSOLAR	SENSIBLE HEAT GAIN FROM SOLAR GAIN THROGH GLAZING	CPLAT	LATENT HEAT GAIN FROM PEOPLE	HSLAB	HEAT LOSS FROM SLAB
	CLIGHTS	SENSIBLE HEAT GAIN FROM INTERIOR LIGHTING	COAL	LATENT HEAT GAIN FROM OUTDOOR VENTILATION AIR	HSPACE	TOTAL HEAT LOSS FROM SPACE
	CEQUIP	SENSIBLE HEAT GAIN FROM PLUG LOADS, COMPUTERS,	CTLAT	TOTAL LATENT HEAT GAIN	HOA	HEAT LOSS FROM OUTDOOR VENTILATION AIR
	CPSENS	ETC.	CTOT	TOTAL HEAT GAIN (SENSIBLE + LATENT)	HTOT	TOTAL HEAT LOSS
		SENSIBLE HEAT GAIN FROM PEOPLE				

EQUIPMENT MARK	CROOF	CWALL	CPART	CGLASS	CSOLAR	CLIGHTS	CEQUIP	CPSENS	CSSENS	CFAN	COAS	CTSENS	CPLAT	COAL	CTLAT	CTOT	HROOF	HWALL	HPART	HGLASS	HSLAB	HSPACE	HOA	HTOT
EX RTU-1	1.1	0.7	0	0.3	0.7	4	0	10.5	17.6	2.5	10.2	66.4	8.8	13.9	22.7	89.1	2.5	2.6	0	1.8	2.9	10	39.3	49.3
EX RTU-2	1.8	1.1	0	1.2	7.2	6.2	0.6	13.4	31.9	3.4	12.9	88.6	11.2	17.6	28.9	117.5	3.9	3.8	0	5.9	4.4	18.2	49.7	68
EX RTU-3	2.3	2.8	0	0.1	1.1	7.8	63.1	7.5	85.1	5.1	18.4	132	6.3	25.1	31.4	163.4	4.9	9.7	0	0.7	8.7	24.2	70.7	95
RTU-4	1.1	0	0	0	0	3.7	0	11.7	16.6	2.9	11.7	76.9	9.8	16	25.8	102.7	2.3	0	0	0	0.7	3.1	45.1	48.2
RTU-5	0.7	0.8	0	1.1	4.7	2.4	3.4	5.8	19.3	1.4	6.1	43.8	4.9	8.3	13.2	57	1.5	3	0	5.6	3.1	13.3	23.5	36.9

HVAC MAKEUP AIR UNIT SCHEDULE - FIRST WATCH

EQUIPMENT MARK	DESCRIPTION	STATUS	WEIGHT (lbs)	MANUFACTURER	MODEL	VOLTS	PHASE	OACFM (cfm)	GAS HTG IN (mbh)	GAS HTG OUT (mbh)	MIN GAS PRESSURE (in WC)	MAX GAS PRESSURE (in WC)	FLA (amps)	Access
EX MUA-1	PACKAGED MAKEUP AIR UNIT	EXISTING	EX	CAPTIVEAIRE	EX	208	3	4920	342	314	5	14	15	EX

HVAC ELECTRICAL COORDINATION SCHEDULE - FIRST WATCH

ABBREVIATIONS		CONTRACTOR TYPE		MOTOR CONTROL TYPE		CONTROL TYPE	
DC	LOCAL DISCONNECT	EC	ELECTRICAL CONTRACTOR	CS	COMBINATION STARTER	TC	TIMECLOCK
MC	MOTOR CONTROL (POWER)	EX	EXISTING	MCC	MOTOR CONTROL STARTER	CPT	CONTROL POWER TRANSFORMER
SD	DUCT SMOKE DETECTOR	FC	FIRE PROTECTION CONTRACTOR	MG	MAGNETIC STARTER OR CONTACT	BAS	BUILDING AUTOMATION SYSTEM
CN	CONTROLS	GC	GENERAL CONTRACTOR	MS	MANUAL STARTER	LOW	LOW VOLTAGE CONTROLS
TS	TOGGLE SWITCH	HC	HVAC CONTRACTOR	VFD	VARIABLE FREQUENCY DRIVE	LINE	LINE VOLTAGE CONTROLS
CB	H.A.C.R. CIRCUIT BREAKER AT SOURCE PANELBOARD	MFR	MANUFACTURER	MSR	MANUAL STARTER W/ CONTROL RELAY	RLINE	REVERSE ACTING LINE VOLTAGE THERMOSTAT
FUSE	FUSE AT LOCAL DISCONNECT (VERIFY FIELD RATING)	PC	PLUMBING CONTRACTOR	OV	OVERCURRENT PROTECTION	MAN	MANUAL
FLA	OPERATING FULL LOAD AMPS	OR	OWNER OR OTHERS			FA	FIRE ALARM
MCA	MINIMUM CIRCUIT AMPACITY					CO	CARBON MONOXIDE SENSOR
CP	CORD AND PLUG CONNECTION					INT	INTEGRAL TO EQUIPMENT

EQUIPMENT MARK	DESCRIPTION	VOLTS (V)	PHASE	EMERGENCY	BHP (HP)	HP (HP)	HTG (kW)	WATTS	FLA (A)	MCA (A)	OCP (A)	DC TYPE	DC FURN	DC INST	DC WIRE	MC TYPE	MC FURN	MC INST	MC WIRE	CN TYPE	CN FURN	CN INST	CN WIRE	SD TYPE	AVAILABLE FAULT CURRENT (A)
AC-1	AIR CURTAIN	120	1			1/5			4.4	15			EC	EC	EC	MG	MFR	MFR	MFR	INT	MFR	MFR	MFR		684
DWEF-1 K50A	CENTRIFUGAL ROOF VENTILATOR	120	1			.333			4.3				EC	EC	EC	MG	MFR	MFR	MFR	TC	EC	EC	EC		1591
EF-1	CEILING MOUNTED VENTILATOR	120	1					23					EC	EC	EC	MS	MFR	MFR	MFR	MAN	EC	EC	EC		733
EF-2	CEILING MOUNTED VENTILATOR	120	1					23					EC	EC	EC	MS	MFR	MFR	MFR	MAN	EC	EC	EC		905
EF-3	CENTRIFUGAL ROOF VENTILATOR	120	1		0.03				1.5				EC	EC	EC	MG	MFR	MFR	MFR	TC	EC	EC	EC		1788
EX CU-1	AIR COOLED CONDENSING UNIT	208	1										EC	EC	EC	MG	MFR	MFR	MFR	INT	EC	EC	EC		
EX CU-2	AIR COOLED CONDENSING UNIT	208	1										EC	EC	EC	MG	MFR	MFR	MFR	INT	EC	EC	EC		
EX KEF1	CENTRIFUGAL ROOF VENTILATOR	208	3		0.502	1			3.8			EX	---	---	---	EX	---	---	---	EX	---	---	---		0
EX KEF2	CENTRIFUGAL ROOF VENTILATOR	208	3		0.502	1			3.8			EX	---	---	---	EX	---	---	---	EX	---	---	---		0
EX KEF3	CENTRIFUGAL ROOF VENTILATOR	208	3		0.588	1			3.8			EX	---	---	---	EX	---	---	---	EX	---	---	---		0
EX MUA CU-1	AIR COOLED CONDENSING UNIT	208	3							21.4	30	EX	---	---	---	EX	---	---	---	EX	---	---	---		0
EX MUA CU-2	AIR COOLED CONDENSING UNIT	208	3							21.4	30	EX	---	---	---	EX	---	---	---	EX	---	---	---		0
EX MUA-1	PACKAGED MAKEUP AIR UNIT	208	3			5			15	18.8	30	EX	---	---	---	EX	---	---	---	EX	---	---	---		0
EX RTU-1	PACKAGED OUTDOOR ROOFTOP UNIT	208	3									EX	---	---	---	EX	---	---	---	LOW	HC	HC	HC	DUCT SMOKE	0
EX RTU-2	PACKAGED OUTDOOR ROOFTOP UNIT	208	3									EX	---	---	---	EX	---	---	---	LOW	HC	HC	HC	DUCT SMOKE	0
EX RTU-3	PACKAGED OUTDOOR ROOFTOP UNIT	208	3									EX	---	---	---	EX	---	---	---	LOW	HC	HC	HC	DUCT SMOKE	0
RTU-4	PACKAGED OUTDOOR ROOFTOP UNIT	208	3							46	60		EC	EC	EC	MG	MFR	MFR	MFR	LOW	HC	HC	HC	DUCT SMOKE	3871
RTU-5	PACKAGED OUTDOOR ROOFTOP UNIT	208	3							31	45		EC	EC	EC	MG	MFR	MFR	MFR	LOW	HC	HC	HC	DUCT SMOKE	1937

HVAC AIR COOLED CONDENSING UNIT SCHEDULE - FIRST WATCH

Equipment Mark	DESCRIPTION	STATUS	WEIGHT (lbs)	MANUFACTURER	MODEL	VOLTS	PHASE	NOMINAL TONS	MCA (amps)	OCP (amps)	Access
EX MUA CU-1	AIR COOLED CONDENSING UNIT	EXISTING	EX	EX	EX	208	3	5	21.4	30	EX
EX MUA CU-2	AIR COOLED CONDENSING UNIT	EXISTING	EX	EX	EX	208	3	5	21.4	30	EX

HVAC FANS SCHEDULE - FIRST WATCH

Equipment shall be braced and labeled by the equipment manufacturer to withstand the minimum scheduled available fault current value for listed equipment.

EQUIPMENT MARK	DESCRIPTION	STATUS	WEIGHT (lbs)	MANUFACTURER	MODEL	VOLTS	PHASE	CFM (cfm)	ESP (in WC)	HP (hp)	FLA (amps)	Access	AVAILABLE FAULT CURRENT
DWEF-1 K50A	CENTRIFUGAL ROOF VENTILATOR	BY OTHERS	101	AQUAMATIC	DU33H	120	1	600	0.5	.333	4.3	BY OTHERS	1591
EF-1	CEILING MOUNTED VENTILATOR			GREENHECK	CSP-A390-VG	120	1	150	0.35				733
EF-2	CEILING MOUNTED VENTILATOR			GREENHECK	CSP-A390-VG	120	1	150	0.35				905
EF-3	CENTRIFUGAL ROOF VENTILATOR		40	GREENHECK	G-080-VG	120	1	200	0.35		1.5	1,3	1788
EX KEF1	CENTRIFUGAL ROOF VENTILATOR	EXISTING	EX	CAPTIVEAIRE	DU180HFA	208	3	1950	1	1	3.8	EX	0
EX KEF2	CENTRIFUGAL ROOF VENTILATOR	EXISTING	EX	CAPTIVEAIRE	DU180HFA	208	3	1950	1	1	3.8	EX	0
EX KEF3	CENTRIFUGAL ROOF VENTILATOR	EXISTING	EX	CAPTIVEAIRE	DU180HFA	208	3	2250	1	1	3.8	EX	0

HVAC AIR CURTAINS SCHEDULE - FIRST WATCH

Equipment shall be braced and labeled by the equipment manufacturer to withstand the minimum scheduled available fault current value for listed equipment.

EQUIPMENT MARK	DESCRIPTION	WEIGHT (lbs.)	MANUFACTURER	MODEL	VOLTS	PHASE	CFM (cfm)	HP (hp)	MCA (amps)	OCP (amps)	AVAILABLE FAULT CURRENT
AC-1	AIR CURTAIN	66	BERNER	AE08-E-1048A	120	1	1467	1/5	4.4	15	684

HVAC VENTILATION SCHEDULE - FIRST WATCH

NUMBER	NAME	AREA	PEOPLE RED	OA PER PERSON	OA PER SQ FT.	REQ SUP	ACT SUP	REQ OA	ACT OA	ACT RET	ACT EXH	CRIT OA	PRESSURE	PCT OPERABLE	NATURAL VENTILATION
100	ENTRY VESTIBULE	112 SF	0	0	0	147	150	28	28	150	0	0	E	0	
101	WAITING/HOSTESS	413 SF	10	5	0.06	647	650	123	124	650	0	0.1446	E	0	
102	DINING	464 SF	43	7.5	0.18	2335	2400	467	480	2400	0	0.2116	E	0	
103	TOILET ROOM VESTIBULE	79 SF	0	0	0.06	95	100	19	20	100	0	0.06	E	0	
104	WOMEN TOILET ROOM	121 SF	0	0	0	95	100	19	20	0	160	0	N	0	
105	MEN TOILET ROOM	118 SF	0	0	0	95	100	19	20	0	160	0	N	0	
106	KITCHEN	1483 SF	30	7.5	0.12	2778	5250	500	945	5250	0	0.096	E	0	
107	OFFICE	48 SF	1	5	0.06	78	150	14	27	150	0	0.0666	E	0	
108	COUNTER SERVICE	125 SF	2	0	0	472	500	85	90	500	8	0	N	0	
109	RECESSED PATIO	363 SF	22	7.5	0.18	1233	1300	222	234	1300	0	0.2215	E	0	
110	DINING	677 SF	43	7.5	0.18	2779	2800	528	532	2800	0	0.1982	E	0	
111	DINING	737 SF	48	7.5	0.18	3080	3100	616	620	3100	0	0.1987	E	0	
120	TO GO	17 SF	2	7.5	0.18	0	0	0	0	0	0	0	E	0	
TOTAL		4757 SF													

HVAC ROOFTOP UNITS SCHEDULE - FIRST WATCH

Equipment shall be braced and labeled by the equipment manufacturer to withstand the minimum scheduled available fault current value for listed equipment.

EQUIPMENT MARK	DESCRIPTION	STATUS	WEIGHT (lbs)	MANUFACTURER	MODEL	VOLTS	PHASE	CFM (cfm)	ESP (in WC)	OACFM (cfm)	NOMINAL TONS	MAT CLG DB (Deg F)	MAT CLG WB (Deg F)	CLG MBH (mbh)	CLG SENS (mbh)	LAT DB (Deg F)	LAT CLG WB (Deg F)	HTG MBH (mbh)	LAT HTG (Deg F)	GAS HTG IN (mbh)	GAS HTG OUT (mbh)	MIN GAS PRESSURE (in WC)	MAX GAS PRESSURE (in WC)	MCA (amps)	OCP (amps)	Access	AVAILABLE FAULT CURRENT
EX RTU-1	PACKAGED OUTDOOR ROOFTOP UNIT	EXISTING	EX	CARRIER	48HCDD08	208	3	2700	0.7	540	7.5	79	67	89	66	55	54	70	64	125	103	4.5	13.5			EX	0
EX RTU-2	PACKAGED OUTDOOR ROOFTOP UNIT	EXISTING	EX	CARRIER	48HCDD12	208	3	3600	0.7	684	10	79	67	118	89	55	54	91	84	180	148	4.5	13.5			EX	0
EX RTU-3	PACKAGED OUTDOOR ROOFTOP UNIT	EXISTING	EX	CARRIER	48HCDD17	208	3	5400	0.7	972	15	79	67	163	132	55	54	102	79	220	178	4.5	13.5			EX	0
RTU-4	PACKAGED OUTDOOR ROOFTOP UNIT		1292	CARRIER	48TCDD09	208	3	3100	0.7	620	8.5	79	67	103	77	55	54	57	77	125	103	4.5	13.5	46	60	2,3,4,10,21	3871
RTU-5	PACKAGED OUTDOOR ROOFTOP UNIT		788	CARRIER	48GCEN06	208	3	1800	0.6	324	5	79	67	57	44	55	54	49	87	110	88	4.5	13.5	31	45	2,3,4,10,21,22	1937

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Revisions:

Mark	Date	By	Description
Issued			

NO.	DATE	BY	DESCRIPTION

FIRST WATCH
THE DAYTIME CAFE

BRANNON CROSSING

NICHOLASVILLE, KY

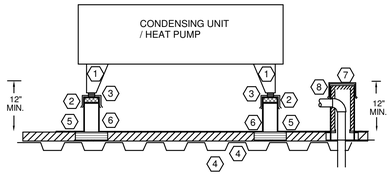
Project No. 220410
KLH Project No. 24340
Issue Date 05/23/2022

Title

MECHANICAL SCHEDULES

Sheet

M102

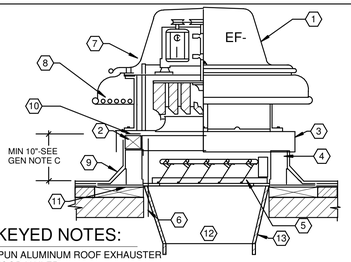


KEYED NOTES:

1. ANCHOR UNIT TO CURB
2. PRESSURE TREATED WOOD NAILER
3. VIBRATION ISOLATORS
4. ROOF DECK
5. PREFABRICATED EQUIPMENT SUPPORT
6. SINGLE MEMBREANE ROOFING, FLASH PER MFG'R RECOMMENDATIONS. FLASH UP AND OVER WOOD NAILER.
7. PREFABRICATED DOG HOUSE
8. SEAL AND FLASH OPENING

GENERAL NOTES:

A. ON PROJECTS WITH BUILT-UP ROOFS, ADD CANT ON EQUIPMENT SUPPORTS AND PREFABRICATE PIPING CHASE
B. PLACE EQUIPMENT ACROSS BAR JOIST OR ADD ADDITIONAL STRUCTURAL STRUCTURAL STEEL AS NECESSARY TO CARRY EQUIPMENT WEIGHT
C. LOCATE A MINIMUM OF 10'-0" FROM EDGE OF ROOF AND ROOF HATCH.



KEYED NOTES:

1. SPUN ALUMINUM ROOF EXHAUSTER
2. WOOD NAILER
3. ANCHOR ALL FOUR SIDES OF CURB CAP INTO NAILER SCREWS AT 12" O.C.
4. PREFABRICATED, INSULATED ALUMINUM CURB
5. MOTOR OPERATED DAMPER WIRED TO INTERFACE WITH EXHAUST FAN START/STOP
6. CONDUIT THROUGH HOLE IN DAMPER SHELF
7. POWER DISCONNECT
8. ALUMINUM BIRD SCREEN
9. CURB TYPE AND FLASHING PER ROOFING MANUFACTURER'S REQUIREMENTS
10. RUBBER GASKET APPLIED TO TOP OF CURB
11. ANCHOR TO ROOF DECK AS REQUIRED
12. CENTER TRANSITION TO DUCTWORK FROM DAMPER OR CURB. PROVIDE 3x DIAMETER STRAIGHT RUN MINIMUM.
13. INSULATED DUCTWORK

GENERAL NOTES:

A. DELETE CANT FOR SINGLE MEMBRANE ROOFS.
B. TOP OF CURB MUST BE LEVEL. FABRICATE PITCH IN CURB OR SHIM AS NECESSARY.
C. TOP OF CURB SHALL BE A MINIMUM OF 10" ABOVE FINISHED ROOF SURFACE. CONTRACTOR HAS THE OPTION TO EITHER FURNISH A CURB WITH SUFFICIENT HEIGHT TO ACCOMMODATE ROOF INSULATION THICKNESS OR TO ADD PRESSURE TREATED WOOD BLOCKING, SECURED TO THE ROOF DECK, BELOW THE CURB
D. LOCATE FAN A MINIMUM OF 10'-0" FROM EDGE OF ROOF, INTAKES, AND ROOF HATCH.
E. INSTALL ROOF MEMBRANE UP UNDER FLASHING, FLASH PER ROOFING MFGR. RQMTS.

233423.00-10 - ROOF EXHAUSTER A

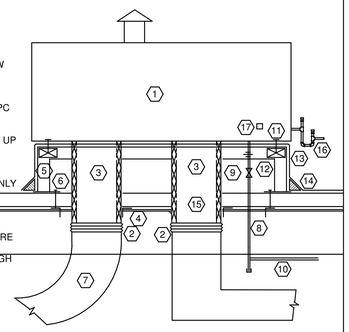
SCALE: NONE

KEYED NOTES:

1. GAS FIRED ROOFTOP UNIT LOCATE A MINIMUM OF 10'-0" FROM EDGE OF ROOF AND ROOF HATCH
2. CANVAS FLEXIBLE CONNECTION
3. 1" ACOUSTICALLY LINED DUCTS
4. 4X4 ANGLE FASTENED TO ROOF DECK AND STRUCURAL SYSTEM. PROVIDE SUPPORTS AS REQUIRED
5. FACTORY FABRICATED, INSULATED ROOF CURB (BY SAME MFG'R AS UNIT)
6. FASTEN TO CURB DECK
7. INSULATED RADIUSED ELBOW
8. UNION BY PUMBING CONTRACTOR (PC)
9. GAS SHUT-OFF VALVE BY PC
10. GAS LINE (BLACK STEEL) BY PC
11. SECURE TO CURB
12. WOOD NAILER
13. ROOFING MEMBRANE, FALSH UP TO BELOW WOOD NAILER
14. CANT STRIP
15. ROOF DECK - CUT OPENINGS FOR DUCT PENETRATIONS ONLY
16. CONDENSATE TRAP - SEE CONDENSATE DRAIN TRAP DETAIL
17. HIGH WATER ALARM IN CONDENSATE DRAIN PAN. WIRE TO BREAK 24 VOLT CONTROL POWER IN THE CASE OF A HIGH WATER EVENT.

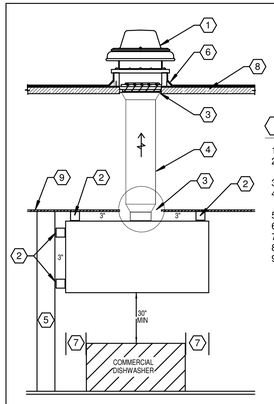
GENERAL NOTES:

A. CONTRACTOR SHALL PROVIDE CURB TO MAINTAIN 14" MINIMUM ABOVE FINISHED ROOFING SYSTEM. PROVIDE ADDITIONAL BLOCKING AS REQUIRED TO ACCOMMODATE ROOF INSULATION THICKNESS.
B. FINAL LOCATION AND STRUCTURAL VERIFICATION BY OTHERS.



237433.00-04 - ROOF CURB & MOUNTING C

SCALE: NONE

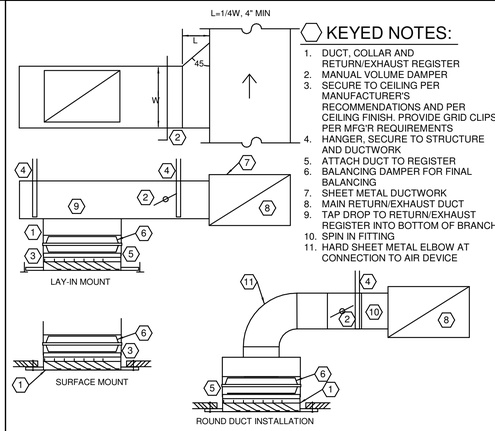


KEYED NOTES:

1. ROOF EXHAUSTER, SEE DETAIL.
2. HOOD TO BE SUPPORTED BY NON-COMBUSTIBLE SUPPORTS.
3. 6" CLEARANCE.
4. INSULATED EXHAUST DUCT MIN. 24 GA. STAINLESS STEEL.
5. INTERIOR WALL.
6. FLASH & COUNTER FLASH AT CURB.
7. 6" MINIMUM OVERHANG.
8. ROOF SYSTEM.
9. CEILING.

233813.00-01 - DISHWASHER HOOD TYPE 2

SCALE: NONE

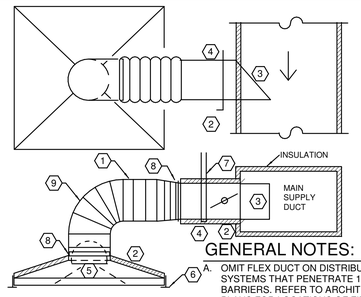


KEYED NOTES:

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

233713.00-21 - RETURN/EXHAUST REGISTER INSTALLATION

SCALE: NONE



GENERAL NOTES:

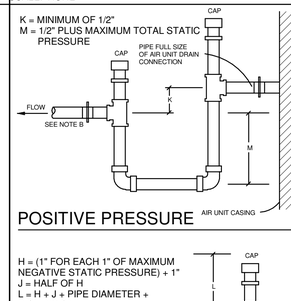
A. OMIT FLEX DUCT ON DISTRIBUTION SYSTEMS THAT PENETRATE 1-HR FIRE BARRIERS. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS OF FIRE BARRIERS.

KEYED NOTES:

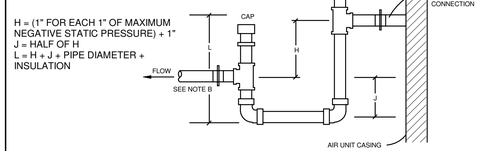
1. MAXIMUM LENGTH OF INSUL. FLEX DUCT EQUALS 5 FEET. FLEX NOT PERMITTED IN INACCESSIBLE CEILINGS
2. INSULATED DUCT, COLLAR AND DIFFUSER BY HVAC CONTRACTOR
3. SCOOP
4. SPIN IN FITTING WITH MANUAL VOLUME DAMPER
5. INTERNAL BUTTERFLY DAMPER FOR DRYWALL APPLICATIONS ONLY. (PROVIDE KEY FOR ADJUSTMENT)
6. SECURE TO CEILING PER MANUFACTURER'S RECOMMENDATIONS AND PER CEILING FINISH. PROVIDE GRID CLIPS PER MFG'R REQUIREMENTS. PROVIDE FRAMING FOR DRYWALL INSTALLATION.
7. HANGER, SECURE TO STRUCTURE AND DUCTWORK
8. PEEL BACK INSULATION AND PROVIDE STRAPPING AND SHEET METAL SCREWS AT FLEX CONNECTION TO DUCT. THEN PROVIDE STRAPPING AROUND INSULATION
9. SUPPORT FLEX TO PREVENT COLLAPSING

233713.00-04 - DIFFUSER INSTALLATION TYPICAL

SCALE: NONE



POSITIVE PRESSURE



NEGATIVE PRESSURE

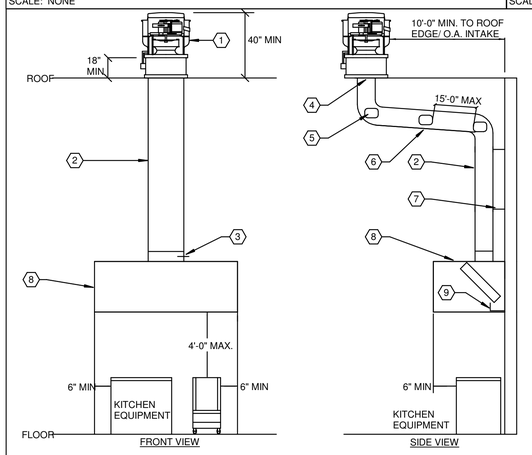
GENERAL NOTES:

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

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

232113.23-05 - CONDENSATE DRAIN TRAP POSITIVE & NEGATIVE

SCALE: NONE



KEYED NOTES:

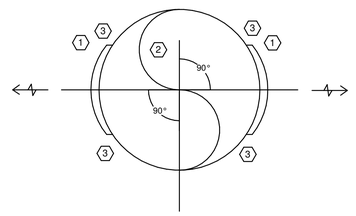
1. KITCHEN EXHAUST FAN U.L. LISTED FOR GREASE (SEE KITCHEN EXHAUSTER DETAIL). FAN MOTOR SHALL BE OUT OF AIRSTREAM. PROVIDE GREASE CUP AND DRAIN.
2. 16 GAUGE INSULATED WELDED BLACK IRON OR 18 GAUGE INSULATED WELDED STAINLESS STEEL. DUCTWORK WRAPPED WITH 2 LAYERS OF ZERO CLEARANCE DUCT WRAP (TYPICAL).
3. HEAT SENSOR IN EACH COLLAR INTERLOCKED TO VENTILATION SYSTEM.
4. FLANGED & GASKETED DUCT TO EXHAUST FAN CONNECTION.
5. CLEANOUT DOOR/LATCH (12"X12" MIN.) MADE OF 16 GAUGE WELDED BLACK IRON OR 18 GAUGE WELDED STAINLESS STEEL (TYPICAL).
6. MINIMUM 2% SLOPE TOWARD HOOD WITH CLEANOUTS A MINIMUM OF EVERY 15 FEET AND CHANGE IN DIRECTION.
7. GREASE DUCT SUPPORT IS TO BE SIZED, SPACED, AND INSTALLED BY CODE.
8. HOOD WITH ANSUL SYSTEM.
9. MAINTAIN 18" CLEARANCE TO COMBUSTIBLES.
10. GREASE DRIP TRAY.

GENERAL NOTES:

A. TYPE I HOOD SHALL BE STAINLESS STEEL, 18 GAUGE, WITH WELDED SEAMS AND UL 710 LISTED.
B. EXHAUST DUCT SHALL BE 16 GA. BLACK IRON OR 18 GA. STAINLESS STEEL, FINISH # 3, WITH CONTINUOUS LIQUID TIGHT WELDED JOINTS AND SEAMS.
C. AIR VELOCITY SHALL BE PER CODE AND AHJ.
D. PROVIDE INSULATION WRAP EQUAL TO 3M "FIRE MASTER DUCT WRAP" WITH UL LISTINGS OF 723, 1978, AND 1479.
E. INSULATION SHALL BE A LIGHTWEIGHT, NON-ASBESTOS, HIGH TEMPERATURE, INORGANIC, CERAMIC FIBER BLANKET TOTALLY ENCAPSULATED IN FOIL/SCRIM HAVING A SERVICE TEMPERATURE RANGE UP TO 2300 DEGREE F.
F. INSULATION SHALL BE A 2-HOUR FIRE RESISTIVE RATED GREASE AIR DUCT ENCLOSURE AS A SHAFT ALTERNATIVE AND A METHOD FOR PROVIDING ZERO INCH CLEARANCE AROUND COMMERCIAL KITCHEN GREASE DUCT EXHAUST SYSTEMS TO COMBUSTIBLE MATERIALS.
G. ALUMINUM GREASE FILTER WITH TROUGH, SHALL BE INSTALLED IN THE HOOD IN COMPLIANCE WITH CODE. FILTERS SHALL BE MOUNTED AT AN ANGLE OF 45 DEGREES MINIMUM.
H. PROVIDE STAINLESS STEEL ENCLOSURE PANEL BETWEEN TOP OF KITCHEN HOOD AND CEILING, PER LOCAL CODE REQUIREMENTS.

233813.00-04 - KITCHEN HOOD DETAIL UP BLAST

SCALE: NONE

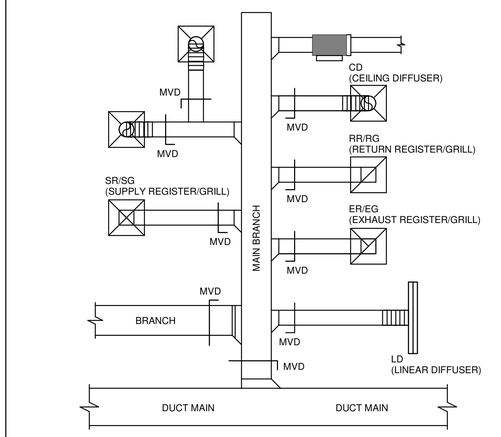


KEYED NOTES:

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

233713.00-24 - ANGLED REGISTER INSTALLATION 0 DEGREES

SCALE: NONE



233713.00-20 - DAMPER LOCATIONS

SCALE: NONE

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Revisions:

Mark	Date	By	Description
Issued			

NO.	DATE	BY	DESCRIPTION

FIRST WATCH
THE DAYTIME CAFE

BRANNON CROSSING

NICHOLASVILLE, KY

Project No.	220410
KLH Project No.	24340
Issue Date	05/23/2022

Title

MECHANICAL DETAILS

Sheet

M103

SECTION 23 05 01.00 – COMMON REQUIREMENTS FOR HVAC

General
General Provisions of the Contract including General and Supplementary Conditions and General Requirements apply to work of this section.
Scope
The base bid includes furnishing all materials, labor, tools, and equipment and the performance of all work required to install a complete heating and air conditioning system as outlined herein.
Guarantee
The contractor shall provide a guarantee in written form stating that all work under this section shall be free of defective work, materials, or parts for a period of one year from the date of owner's final acceptance and shall repair, revise or replace at no cost to the owner any such defects occurring within the guarantee period. Contractor shall also state in written form that any items or occurrences arising during the guarantee period will be attended to in a timely manner and will in no case exceed four (4) working days from date of notification by owner.
Quality Assurance
Provide a complete installation in conformance with the following standards.
ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers
NFPA: National Fire Protection Association
SMACNA: Sheet Metal and Air Conditioning Contractors National Association.
Statewide Building Code
Permits, Fees, Inspections, Laws and Regulations
Permits and fees of every nature required in connection with this work shall be obtained and paid for by this contractor who shall also pay for all the installation fees and similar charges. Laws and regulations, which bear upon or affect the various branches of this work shall be complied with by this contractor and are hereby made a part of this contract. All work, which such laws require to be inspected, shall be submitted to the proper public official for inspection and a certificate of final approval must be furnished.
Demolition
Any Equipment to be demolished shall also include the demolition of any and all ductwork, piping etc serving or served by the equipment, all accessories, air devices, wiring, gas piping, venting, control wiring and power wiring associated with the equipment.
Demolition shall be coordinated with all trades. All materials shall be turned over to the owner or disposed at the owner's direction.
Contractor is responsible for reclaiming any refrigerant in association with the demolition in accordance with all local, state and federal regulations.
Any roof or wall penetration shall be patched watertight to the satisfaction of the architect.
Tests and Adjustments
No ducts, piping, fixtures or equipment shall be concealed or covered until they have been inspected and approved by the Architect and the inspector who shall be notified by the contractor when the work is ready for inspection.
Work shall be completely installed, tested and leak tight before inspection is required. All tests shall be repeated to the satisfaction of those making the inspection.
Architectural coordination items
Cutting and Patching: Cut and drill all openings in walls and floors required for the installation. Secure approval of Engineer before cutting and drilling. Neatly patch all openings cut.
Fire Caulking: Patching through fire rated walls and enclosures shall not diminish the rating of that wall or enclosure. Patch shall be equal to rockwool, firestop, caulk or approved "rated" patch.
Access Panels and Pathways: Furnish all access panels required for proper servicing of equipment. Provide access panels for all concealed valves, vents, controls, cleanout doors, and sprinkler devices required by NFPA. Provide access panels for all fire and/or fire & smoke dampers. Provide frame as required for finish. Furnish panels to General Contractor. Exact locations to be approved by the Architect. Minimum size to be 12" x 12", units to be 16 gauge steel, locking device shall be screwdriver cam locks.
project conditions
Where new HVAC systems are required to be connected to existing HVAC systems, it is the contractor's responsibility to verify the location, size, pressure, condition, and they shall verify that the existing HVAC system is indeed the correct and appropriate HVAC system before any work is done. Provide all necessary camera scoping and dye testing as necessary. If there is any need for concern, if it is determined that the existing HVAC system is not a correct or appropriate HVAC system or not connected to a correct or appropriate HVAC system, if the condition of the existing HVAC system is not viable for re-use, or any other condition that would not allow the proper functioning of the new HVAC system, the contractor shall notify the engineer in writing immediately via RFI and wait for direction before proceeding.
MECHANICAL EQUIPMENT COMMON REQUIREMENTS
INSPECTION
Examine areas and conditions under which mechanical equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
Uncrate equipment and inspect for damage. Verify that nameplate data corresponds with unit designation.
INSTALLATION
General: Install mechanical equipment as indicated, and in accordance with manufacturer's installation instructions.
Location: Install each unit level/plum and accurately in position indicated in relation to other work; and maintain sufficient clearance for normal service and maintenance, but in no case less than that recommended by manufacturer.
Coordinate with other trades to assure correct recess size for recessed units.
Protect interior mechanical equipment with protective covers during balance of construction.
For ducted equipment, connect ductwork to units with flexible duct connections. Provide transitions to exactly match unit duct connection size. Provide 1" acoustic duct lining on return air side a minimum of 10' from fan.
Provide trap at drain piping connection to unit sized per manufacturer's recommendations.
Access: Provide access space around and over mechanical equipment for service as indicated, but in no case less than that recommended by manufacturer or required by code in effect.
Access Panels: Furnish all access panels required for proper servicing of equipment. Provide access panels for all concealed valves, vents, controls and cleanout doors, and sprinkler devices required by NFPA. Provide frame as required for finish. Furnish panels to General Contractor. Exact locations to be approved by the Architect. Minimum size to be 12" x 12", units to be 16 gauge steel, locking device shall be screwdriver cam locks.
Rooftop mechanical equipment shall be installed a minimum of 10'-0" from any roof edge regardless of location indicated on plans, unless a screen wall or railing is installed per the local building code. See the architectural plans for coordination.
Roof Curbs: Furnish roof curbs to roofing Installer for installation. Install and secure roof curb to roof structure, in accordance with National Roofing Contractor's Association (NRCA) installation recommendations and shop drawings. Install and secure units on curbs and coordinate roof penetrations and flashing. Install according to roofing manufacturer's recommendation and specifications.
ELECTRICAL COORDINATION ITEMS
Electrical Wiring: Install electrical devices furnished by manufacturer but not specified to be factory-mounted.
Furnish copy of manufacturer's wiring diagram submittal to Electrical Installer.
Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division 26 sections. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.
Install electric heating terminal units including components in accordance with equipment manufacturer's written instructions, and with recognized industry practices; complying with applicable installation requirements of NEC and NECA's "Standard of Installation".
Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Std 486A.
Grounding: Provide equipment grounding connections for electric heating terminals as indicated. Tighten connections to comply with tightening torque values specified in UL Std 486A to assure permanent and effective grounding.
FIELD QUALITY CONTROL
Testing: After installation has been completed, test to demonstrate proper operation of mechanical equipment at performance requirements specified. When possible, field correct malfunctioning units, then retest to demonstrate compliance. Replace units, which cannot be satisfactorily corrected. Test controls and demonstrate compliance with requirements.
Cleaning: After construction is completed, including painting, clean unit exposed surfaces, vacuum clean coils and inside of cabinets. Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.
START-UP
Provide the services of a factory-authorized service representative to start-up rooftop units, in accordance with manufacturer's written start-up instructions. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
TRAINING OF OWNER'S PERSONNEL
Provide services of manufacturer's technical representative for 1-half day to instruct Owner's personnel in operation and maintenance of units. Schedule training with Owner, provide at least 7-day notice to Contractor and Engineer of training date.

SECTION 23 05 03.00 – SUBMITTALS FOR HVAC

General
Where submittals are required by the Contract Documents, they shall be prepared and supplied in accordance with the Contract Documents. In addition to Division 01, the Contractor is advised to review and comply with the requirements articulated within each Division and within each section of that Division.
Some Divisions may include a division-specific "Submittal Requirements for …." section. Where this section exists, it articulates additional requirements for submittals that apply to the work of that Division.
The following requirements help to identify, track and keep the project organized for all parties involved. They are necessary to ensure a timely turnaround and an appropriate technical review. Submittals that do not conform to the administrative requirements are rejected and returned, without technical review.
Requirements
Supply submittals for each section: Submittals shall be supplied on a section-by-section and type-by-type basis. For example, independent product data submittals shall be furnished for each section that requires product data submittals. Independent shop drawing submittals shall be furnished for each section that requires shop drawings. Refer to the specifications for identification of which submittals are required for the project. Separate PDF file packages shall be supplied for each section, for each submittal type, where electronic submittals are required. Each PDF shall represent a single standalone submittal. Separately bound and identified submittals shall be provided where hardcopies are required.
Include a transmittal: Transmittals shall enumerate each submittal for each section of each type and iteration.
Include cover sheet / title page: The cover sheet shall include the information identified in the contract documents. It shall be included as the first page of each electronic and/or hardcopy document-based submittal. An editable and printable PDF form created with editable fields and specification compliant appearance is available from KLH upon request. It is also downloadable from the KLH website at www.klhengrs.com.
Include an index: The index shall enumerate the contents of the submittal.
Include checklists: Where checklists are included with the specifications, complete and include them within the appropriate submittal. Supply complete submittals: Complete submittals of each type are required. Partial submittals will be rejected. Where a section requires a product data submittal, all product data for that section shall be supplied together, at one time, as one complete submittal. Do not send half the product data as one submittal and the other half as a separate one. When resubmittal is required (e.g. Revise and Resubmit) the revised submittal shall be more complete, more accurate and more contract-compliant than its rejected predecessor. The submittal number (for each section and type) shall increment for each subsequent submittal (00 – Original submission, 01 – First Resubmission, 02 – Second Resubmission, etc…). Resubmittals shall include a copy of the reviewer's comments supplied with the prior submittal rejection and shall be amended with a description of the specific action taken to comply with the reviewer's comments. The absence of this on resubmittal is cause for rejection.
Name electronic files to match the submittal ID and cover sheet: The electronic file name of submittals shall match the submittal ID included on the submittals cover page. For example: The original/first product data submittal for Section 234116 would be labeled as "234116.00-PD-00"; the first resubmittal of same shall be labeled "234116.00-PD-01". The original/first shop drawings submittal file for the same section would be labeled "234116.00-SD-00"; the first resubmittal of same shall be labeled "234116.00-SD-01".
Use of Electronic Drawings from the Owner's Design Team Plan drawings for the Project were created with AutoCAD and Revit.
If expressly permitted by the Owner and the terms of the Contract, editable electronic versions of standard-scale, AutoCAD-based plan drawings may be made available for the creation of shop and as-built drawings.
Due to the proprietary nature of internal design systems, editable native-software versions of some drawings, including but not limited to system diagrams and details will not be made available in an editable form. In these cases, electronic versions of the drawings may be made available only in PDF, JPG or similar non-editable electronic form, at the sole discretion of the Design Professional.
The Request Drawings form can be accessed, filled out and submitted at the following internet address (scroll down to bottom of home page): http://www.klhengrs.com.

SECTION 23 05 29.00 – HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

Submittal Requirements
Product Data: For each type of product indicated.
Shop Drawings: Fabrication and installation details.

General
Support all ductwork and equipment by hangers or brackets properly from the building structure. Support from decking above is prohibited. Furnish structural steel members where required to support piping and equipment. No portion of piping or valves shall be supported by equipment.
Ductwork - Support by means of hangers as follows:

Duct Width	Hanger Size and Type	Max. Spacing
30 or less	(#16 gage)	8
31 to 60	(#14 gage)	8

A pair of hangers shall be located at every transverse joint and elsewhere according to the table.

SECTION 23 05 93.00 – TESTING, ADJUSTING AND BALANCING FOR HVAC

Submittal Requirements
Shop Drawings: Certified Reports: Submit testing, adjusting, and balancing reports bearing the seal and signature of the Test and Balance Engineer. The reports shall be certified proof that the systems have been tested, adjusted, and balanced in accordance with the referenced standards; are an accurate representation of how the systems have been installed; are a true representation of how the systems are operating at the completion of the testing, adjusting, and balancing procedures; and are an accurate record of all final quantities measured, to establish normal operating values of the systems. Final Report: Upon verification and approval prepare final reports, type written, and organized and formatted as specified below. Submit 2 complete sets of final report to the owner.

General
Test, adjust, and balance the following mechanical systems:
Supply air systems, all pressure ranges
Return air systems.
Exhaust air systems.
Verify temperature control system operation.
Test systems for proper sound and vibration levels.
Quality Assurance
Codes and Standards:
AABC: "National Standards for Total System Balance".
ASHRAE: ASHRAE Handbook, 2011 Applications, Chapter 38, Testing, Adjusting, and Balancing.
Qualifications
The contractor shall procure the services of an independent Balance and Testing Agency, approved by the Engineer, and a member of Associated Air Balance Council (AABC) or NEBB, which specializes in the balancing and testing of heating, ventilating and air conditioning systems, to balance, adjust and test all air and water systems and equipment as herein specified. All work by this agency shall be done under direct supervision of a qualified heating and ventilating Engineer employed by this agency. All instruments used by this agency shall be accurately calibrated and maintained in good working order.
Sequencing and Scheduling
Test, adjust and balance air conditioning systems during summer season and heating systems during winter season, including at least a period of operation at outside conditions within 5 deg F wet bulb temperature of maximum summer design condition, and within 10 deg F dry bulb temperature of minimum winter design condition. Take final temperature readings during seasonal operation.
Check all filters for cleanliness, provide new as required.
Check dampers (volume and fire) for correct and locked position, and temperature control for completeness of installation before starting fans. Place outlet dampers in full open position. Lubricate all motors and bearings.
Check fan belt tension. Check fan rotation.
Air balance and testing shall not begin until the system has been completed and is in full working order. The Contractor shall put all heating, ventilating and air conditioning systems and equipment into full operation and shall continue the operation of same during each working day of testing and balancing. The contractor shall submit within 30 days after receipt of contract, 8 copies of submittal data for the testing and balancing of the air conditioning, heating, and ventilating systems. The Air Balance and Testing Agency shall provide proof of having successfully completed at least five projects of similar size and scope.
The air balancing contractor shall include the additional cost to change every fan factory installed sheave, pulley and/or belt of in order to obtain the design air flows.
Performing Testing, Adjusing and Balancing
Perform testing and balancing procedures on each system identified, in accordance with the detailed procedures outlined in the referenced standards.
Cut insulation, ductwork, and piping for installation of test probes to the minimum extent necessary to allow adequate performance of procedures.
Patch insulation, ductwork, and housings, using materials identical to those removed.
Seal ducts and piping, and test for and repair leaks.
Seal insulation to re-establish integrity of the vapor barrier.
Mark equipment settings, including damper control positions; valve indicators, fan speed control levers, and similar controls and devices, to show final settings. Mark with paint or other suitable, permanent identification materials.
Retest, adjust, and balance systems subsequent to significant system modifications, and resubmit test results.

SECTION 23 07 13.00 – DUCT INSULATION

Submittal Requirements
Product Data: For each product indicated.
Shop Drawings: Include plans, elevations, sections, details and attachments to other work.

All liners, insulation and adhesives shall have a flame spread index not more than 25 and a smoke developed index of not more than 50. Insulation shall have a minimum installed thermal resistance value of R6 or code minimum, whichever higher.
Rigid Fiberglass Ductwork Insulation: Glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IB, without facing and with vapor barrier all-service jacket manufactured from kraft paper, reinforcing scrim, aluminum foil, and vinyl film.
Flexible Fiberglass Ductwork Insulation: Glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II, without facing and with vapor barrier all-service jacket manufactured from kraft paper, reinforcing scrim, aluminum foil, and vinyl film.
Vapor Barrier Material for Ductwork: Paper-backed aluminum-foil, except as otherwise indicated; strength and permeability rating equivalent to factory-applied vapor barriers on adjoining ductwork insulation, where available; with following additional construction characteristics:
High Puncture Resistance: Low vapor transmission (for ducts in exposed areas: Mech. Rooms, etc.)
Moderate Puncture Resistance: Medium vapor transmission (for ducts in concealed areas).
All ductwork shall be insulated except:
Double wall ductwork
Fabric ductwork
Metal ducts with duct liner of sufficient thickness to comply with energy code.
Factory insulated flexible ductwork
Factory insulated plenums and casings
Flexible connectors
Vibration control devices
Factory insulated access panels and doors
Supply ductwork exposed in conditioned spaces excluding mechanical rooms, server rooms and electric equipment rooms
Toilet exhaust, general exhaust and return ductwork in an insulated joist or attic space.

SECTION 23 09 93.00 – SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

Submittal Requirements
Product Data: Provide written sequences of operation for each controlled system and piece of equipment.

Packaged Rooftop Unit
1. Startup

The unit shall operate on a 7 day/night programmable thermostat.
During startup, the fan shall run with the dampers in the full recirculation position. Provide occupied changeover sequence with optimum start function. When the return air temperature reaches occupied setpoint (adjustable), the minimum outside air damper shall open to the controlled minimum outdoor air position.

2. Supply Fan Control

The supply fan speed shall be constant, run continuously during occupied mode and set to the required CFM. (RTU-5)

The supply fan shall be two staged and modulate up and down based on a call for heating or cooling. (all other RTUs)

3. Space Temperature Control

Provide 7-day programmable thermostat with digital display of space temperature and setpoint (+/- deg. F. adjustable), with override feature and remote space temperature sensor.

4. Minimum Outside Air Control

During occupied mode the minimum outside air damper shall be open. Provide motorized outdoor air damper (RTU-5)

During occupied mode, the minimum outside air damper shall be open to the scheduled minimum outdoor air flow and modulate proportionally with the supply fan speed to maintain the scheduled minimum outside airflow. When the supply fan speed is set to high, outside air damper shall be partially closed allowing minimum outside air flow as scheduled. As supply fan speed is set to low, damper shall fully open allowing minimum outside air flow as scheduled. Provide motor operated dampers. (all other RTUs)

5. Economizer Control

Provide dual enthalpy economizer control. Economizer control shall be enabled whenever the outside air enthalpy is lower than the return air enthalpy. Enthalpy shall be calculated from sensors which are tied to the same controller for accuracy. During economizer mode, the outside air damper shall modulate to 100% open. The economizer damper shall modulate open on a call for cooling and modulate closed on a call for heating. The return damper shall modulate inversely with the economizer damper. (RTU-4,5)

Economizer shall have powered relief (RTU-4).

6. Cooling Control

Cooling shall be controlled to maintain space temperature setpoint. On a call for cooling, the heating shall be off. On a further call for cooling, enable the economizer mode. On a further call for cooling, disable the economizer mode and the mechanical cooling shall be staged on. (RTU-5)

Cooling shall be controlled to maintain space temperature setpoint. On a call for cooling, the heating shall be off and supply fan speed shall be low. On a further call for cooling, the economizer shall be enabled. On a further call for cooling, disable the economizer and energize first stage cooling on. On a further call for cooling, the supply fan speed shall be high and energized second stage of cooling. (all other RTUs)

7. Heating Control

Heating shall be controlled to maintain space temperature setpoint. On a call for heating, the mechanical cooling shall be off. On a further call for heating, the economizer mode shall be disabled. On a further call for heating the gas heating shall be staged on. (RTU-5)

Heating shall be controlled to maintain space temperature setpoint. On a call for heating, the mechanical cooling shall be off. On a further call for heating, the economizer mode shall be disabled. On a further call for heating, the supply fan shall be set to low speed and the gas heating shall be disabled. On a further call for heating, the supply fan shall be set to high speed and the gas heating shall be staged on. (all other RTUs)

8. Smoke Detector

When the smoke detector is alarmed, the system shall be alarmed and the air handler shall fail safe with manual reset.

9. Unoccupied Mode

During the unoccupied mode of operation, the RTU shall go into night setback mode.
Night Setback/Shutdown
At night setback/shutdown the RTU shall go to fail safe position. Fail safe position is defined by the following: The supply fan is off, the outdoor air intake damper is closed, the heating is off and the mechanical cooling is off. The supply fan shall cycle in conjunction with either the heating or cooling system to maintain a minimum/maximum space temperature depending on the season.

Exhaust Fans (Manual)
Exhaust fans shall be controlled by local manual switch furnished, installed and wired by electrical contractor.
When activated, exhaust fan motor damper shall open and fan shall start.
(Indicated by EC on HECS schedule)

Exhaust Fans (Timeclock)
Exhaust fans shall be tied to timeclock, which shall be furnished, installed and wired by electrical contractor.
When activated, exhaust fan motor damper shall open and fan shall start.
(Indicated by EC on HECS schedule)

Kitchen Hood Exhaust Fan (Type II)
Provide heat detector in hood collar interlocked to fan operation.
The Kitchen Hood exhaust system shall be initiated by the heat detector. Provide indicator light on face of hood. At startup, energize exhaust fan motor. Interlock to makeup air system (whether dedicated makeup air or makeup air from HVAC system), so that makeup air is provided whenever exhaust fan is running.
The exhaust fan shall run continuously at constant speed.
Provide a current transducer to prove fan operation. At shutdown, the exhaust fan shall stop.
Provide all controls and wiring for complete interlock and operation of Kitchen Hood, exhaust fan, and all associated motor dampers.

Controls
Electrical contractor will provide power wiring. HVAC contractor shall provide all the low voltage wiring of HVAC units and controls, thermostats and controllers.
Thermostat shall be by the manufacturer of the HVAC unit (heat/cool/auto/off) with night setback. Provide plastic protective cover for all thermostats. Replace controls on existing unit, adjust and calibrate controls.

Low Voltage Thermostats
Low voltage thermostats shall be furnished, installed and wired by the HVAC contractor. The electrical contractor shall provide 4" square x 1- 1/2" deep wall outlet boxes (with single-gang rings) for all thermostats/sensors. The electrical contractor shall provide one 3/4" empty conduit from each thermostat/sensor location, turned out above accessible ceilings (in joist space or against overhead slab/deck). The HVAC/Temperature Control Contractor shall provide all other necessary conduit, raceway and wiring related work. Conduit shall be identified in ceiling cavity and shall be provided with sweep bends, bushings and dragline.
The HVAC/TemperatureControl Contractor shall coordinate with the General Contractor to ensure thermal envelope is maintained at these locations.

General Control Wiring Requirements and Installation Methods
Except where specifically indicated otherwise above, the HVAC/Temperature Control Contractor shall provide all electrical work as required for all temperature control related wiring (i.e. conduit, raceway, outlet boxes, junction boxes, wiring, etc.) in accordance with Electrical Specifications requirements. All conduit shall be 3/4" minimum.
Coordinate all thermostat/sensor locations in field (case by case) with Architect, Owner and Electrical Contractor to ensure that they are placed in locations that will not interfere with furniture, equipment, artwork, wall-hung specialties, room finishes, etc. All thermostat/sensor wall locations indicated on HVAC drawings are schematic only and must be verified case-by-case prior to rough-in.
All electrical work as described in this specification shall be per the latest edition of the National Electrical Code (NEC) and per applicable state and local codes.
Where "free-air" installation methods (either exposed above the ceilings, in bridle rings or in cable trays) are permitted under Electrical Specifications above ceilings, provide plenum-rated cables wherever plenum ceilings (if any) exist and install as defined under Electrical Specifications. Install low voltage circuits, located in concrete slabs and masonry walls, in inaccessible locations, or exposed in occupied areas, in electrical conduit regardless of what wiring methods are permitted under Electrical Specifications.
Where cable trays or bridle rings are provided by the electrical contractor for low voltage cables, these raceways may be utilized for control wiring by this contractor (provide special color coded jackets, label cable jackets per Electrical Specifications and group control wiring cables together). Provide conduit drops from cable tray/bridle ring paths to wall outlet boxes and equipment unless directed otherwise under Electrical Specifications. Regardless of permitted methods in Electrical Specifications, all cables/wiring installed concealed by

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Revisions:

Mark	Date	By	Description
Issued			

NO.	DATE	BY	DESCRIPTION

BRANNON CROSSING

NICHOLASVILLE, KY

Project No.	220410
KLH Project No.	24340
Issue Date	05/23/2022

Title

MECHANICAL SPECIFICATIONS

Sheet

M601

gypsum board, masonry or other inaccessible materials in walls or above ceilings shall be installed in conduit, 3/4" minimum.
All conduit, bridle rings, raceway, outlet boxes, etc. necessary for complete operational installation of control wiring shall be provided (furnished and installed) by the temperature control contractor in strict compliance with Electrical Specifications documents. Coordinate all work with all other applicable trades including the electrical contractor.
Provide all required conduit work to and between equipment in a manner compliant with that described above (i.e. between VAV boxes, to boilers, starters, condensing units, etc. as applicable).
Install control wiring without splices between terminal points, color-coded. Install in neat workmanlike manner, securely fastened. Install in accordance with National Electrical Code and per Electrical Specifications.
Install circuits over 25 volt with color-coded No. 12 wire in electrical metallic tubing, per Electrical Specifications.
Install circuits under 25 volt with color-coded No. 18 wire with 0.031" high temperature (105 degs. F) plastic insulation on each conductor and plastic sheath over all.
Install electronic circuits with color-coded No. 22 wire with 0.023" polyethylene insulation on each conductor with plastic-jacketed copper shield over all.

Smoke Detector
All duct smoke detectors will be furnished by electrical contractor, installed by the HVAC contractor, and wired by the electrical contractor per local codes. HVAC contractor will interlock fan with smoke detector.

Motor Operated Dampers
All fresh air intakes and exhaust louvers shall have motor operated dampers. Dampers shall be low leak with blade and edge seals. All motor operated dampers shall be provided and wired by the mechanical contractor unless otherwise noted. Provide all necessary transformers, contactors, controls and wiring for interlocking equipment to motor operated dampers.

SECTION 23 21 13.23 – ABOVEGROUND HYDRONIC PIPING AND SPECIALTIES

Submittal Requirements
Product Data: For each type listed.
Shop Drawings: Detail the piping layout, fabrication of pipe anchors, hangers, supports, alignment guides, expansion joints and loops and attachments of the same to the building structure. Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate the general location and arrangement of piping systems. Locations and arrangements of piping take into consideration pipe sizing and friction loss, expansion, pump sizing, and other design considerations. So far as practical, install piping as indicated. Locate groups of pipes parallel to each other, spaced to permit full insulation and servicing of valves.

Gas Piping
All gas piping and connections by the plumbing contractor unless otherwise noted.
Hydronic Piping
Condensate drain piping shall be schedule 40 PVC piping with PVC cement joints.
Installation
Install all condensate piping at a uniform grade of 1/8 inch per 1 foot downward in the direction of flow to the nearest drain location.

SECTION 23 31 13.00 – METAL DUCTS

Submittal Requirements
Product Data: For liners, adhesives, sealants and gaskets.
Shop Drawings: Sheet metal thickness, reinforcing details, duct layouts indicating sizes, configuration, liner material, elevation and static pressure class.

Ductwork Materials
Exposed Ductwork Materials: Where ductwork is indicated to be exposed to view in occupied spaces, provide materials which are free from visual imperfections including pitting, seam marks, roller marks, stains and discolorations, and other imperfections, including those which would impair painting. Mechanical contractor shall confirm ductwork paint scope and color with architect.
Exposed ductwork which is to be painted shall have paint grip applied and be oil free.
Sheet Metal: Except as otherwise indicated, fabricate ductwork from galvanized sheet steel, lock forming quality; with G 90 zinc coating and mill phosphatized for exposed locations. Minimum gauge shall be 24.
Miscellaneous Ductwork Materials
Volume Dampers: Provide volume dampers in all branch ducts or as required for balancing to required air flows.
Fittings: Provide radius type fittings fabricated of multiple sections with maximum 15 deg. change of direction per section. Unless specifically detailed otherwise, use 45 deg. laterals and 45 deg. elbows for branch takeoff connections. Where 90 deg. branches are indicated, provide conical type tees.
Duct Sealant: Non-hardening, non-migrating mastic or liquid elastic sealant, type applicable for fabrication/installation detail, as compounded and recommended by manufacturer specifically for sealing joints and seams in ductwork.
Duct Cement: Non-hardening migrating mastic or liquid neoprene based cement, type applicable for fabrication/installation detail, as compounded and recommended by manufacturer specifically for cementing fitting components, or longitudinal seams in ductwork.
Ductwork Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim and angles for support of ductwork.
Flexible Ducts
Either spiral-wound spring steel with flameproof vinyl sheathing, or corrugated aluminum. Unless specifically mentioned, the maximum length of flex duct on the supply equals 5 feet. Flex is not allowed for return, relief or exhaust applications. The flexible ducts indicated for use in the H.V.A.C. system shall conform to the requirements of UL 181 for Class 0 or Class 1 flexible air ducts and shall be so identified.
Where installed in unconditioned spaces other than return air plenums, provide 1" thick 1-1/2 lb. continuous flexible fiberglass sheath with vinyl vapor barrier jacket.
Installation is not permitted above drywall ceilings and inaccessible ceilings.
Fabrication
Shop fabricate ductwork in 4, 8, 10 or 12-ft lengths, unless otherwise indicated or required to complete runs. All ductwork shall be Pittsburgh Construction with a minimum of thickness of 24 gauge. In addition, ductwork used in systems over 3" W.G. shall have cold sealant applied.
Shop fabricate ductwork of gauges and reinforcement complying with SMACNA "HVAC Duct Construction Standards".
Lined Duct
Fabricate ductwork with duct liner in each section of duct where indicated. Laminate liner to internal surfaces of duct in accordance with instructions by manufacturers of lining and adhesive, and fasten with mechanical fasteners. Duct liner to be 3-lb density for acoustic requirements 1" thick or as noted. Size of ductwork shown on the drawings is free net area, outside dimension of ducts will need to be increased if lined duct is used.
Size of ductwork shown on the drawings is free net area, outside dimension of ducts will need to be increased if lined duct is used.
Duct Liner: Fibrous glass of thickness indicated. 3-lb density. All liners, insulation and adhesives shall have a flame spread index not more than 25 and a smoke developed index of not more than 50.
Duct Liner Adhesive: As recommended by insulation manufacturer and complying with NFPA 90A or NFPA 90B.
Duct Liner Fasteners: Comply with SMACNA HVAC Duct Construction Standards.
Double Wall Ducts
Exposed round and rectangular ductwork and fittings shall be manufactured or shop-fabricated double wall a minimum G-90 galvanized steel ductwork with 1" fiberglass insulation between the solid outer shell and perforated inner liner. All ducts and fittings shall be construction for SMACNA's latest standards. All gaskets shall be UL listed to conform to ASTM E84-91a and NFPA 90A.
Manufacturers: Subject to compliance with requirements, provide ductwork of one of the following: United-McGills K-27, Lindab Safe, Semco or approved equal.
Installation of Metal Ductwork
General: Assemble and install ductwork in accordance with recognized industry practices which will achieve air-tight (5% leakage for systems rated 3" and under; 1% for systems rated over 3") and noiseless (no objectionable noise) systems, capable of performing each indicated service. Install each run with minimum number of joints. Align ductwork accurately at connections, within 1/8" misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers and anchors of type which will hold ducts true-to-shape and to prevent buckling. Support vertical ducts at every floor.
Sealing: Seal all longitudinal seams, S's and drives and all joints with mastic or cement. Install according to SMACNA standards.
Balancing Dampers: The sheet metal contractor shall be fully responsible for installing balancing dampers in the ductwork, (whether shown on the drawing or not) in order to arrive at the intended air flow. The balancing sub-contractor shall provide direction and assistance in determining locations where dampers are required. Additional dampers, if required shall be installed at no additional cost to the owner.
Wall Penetrations: Seal and pack around all ducts and piping sleeves which pass through walls that extend to bottom side of structure and rated walls.
Field Fabrication: Complete fabrication of work at project as necessary to match shop-fabricated work and accommodate installation requirements.
Routing: Locate ductwork runs, except as otherwise indicated, vertically and horizontally and avoid diagonal runs wherever possible. Run ductwork in shortest route which does not obstruct useable space or block access for servicing building and its equipment. Hold ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building. Limit clearance to 1/2" where furring is shown for enclosure or concealment of ducts, but allow for insulation thickness, if any. Where possible, locate insulated ductwork for 1" clearance outside of insulation. Wherever possible in finished and occupied spaces, conceal ductwork from view, by locating in mechanical shafts, hollow wall construction or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as specifically shown.
Coordinate layout with suspended ceiling and lighting layouts and similar finished work.
Electrical Equipment Spaces: Do not route ductwork through transformer vaults and their electrical equipment spaces and enclosures.
Penetrations: Where ducts pass through interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same gage as duct. Overlap opening on 4 sides by at least 1-1/2". Fasten to duct and substrate.
All dampers shall be low leakage with edge and blade seals. Damper manufacturers are subject to specification compliance. Provide products by one of the following:
Greenheck Fan Corporation
Nailor Industries
Ruskin Company
Young Regulator Company
Coordination: Coordinate duct installations with installation of accessories, dampers, coil frames, equipment, controls and other associated work of ductwork system.
Installation of Duct Liner
General: Install duct liner in accordance with SMACNA HVAC Duct Construction Standards. Size of ductwork shown on the drawings is free net area, outside dimension of ducts will need to be increased if lined duct is used. Store internally lined ductwork up off of the floor. Protect internally lined ductwork from water and dust.
The following ductwork shall be lined in addition to that shown per plans:
Return from open ceiling plenum return to HVAC unit.
Supply and return ductwork 10 feet downstream of HVAC unit.
Transfer air ducts.
Butter the leading edge of all internal duct lining with the manufacturer's recommended adhesive.
Inspect and repair all damaged lining prior to installation of ductwork.
Installation of Flexible Ducts
Maximum Length: For any duct run using flexible ductwork, do not exceed 5' - 0" extended length.
Installation shall have smooth full radius turns down to diffuser.
Installation not permitted above inaccessible ceilings.

23 34 23.00 – HVAC POWER VENTILATORS

Submittal Requirements
Product Data: For each type of product indicated.
Centrifugal Roof Ventilators
Provide centrifugal roof type, curb mounted, power ventilators of type, size, and capacity as scheduled, and as specified herein.
Type: Centrifugal fan, direct or belt driven as scheduled. Provide aluminum, galvanized steel, or fiberglass weatherproof housings as scheduled. Provide square base to suit roof curb. Provide permanent split-capacitor type motor for direct driven fans; capacitor-start, induction-run type motor for belt driven fans.
Provide the Following Types of Housing Design:
Hooded dome type.
Electrical: Provide factory-wired non-fusible type disconnect switch at motor in fan housing. Provide thermal overload protection in fan motor. Provide conduit chase within unit for electrical connection.
Provide NEMA 1 disconnect factory mounted. For single phase fractional HP fans use a toggle type disconnect switch. On three phase integral HP fans use a NEMA 1 safety switch.
Bird Screens: Provide removable bird screens, 1/2" mesh, 16-ga aluminum or brass wire.
Roof Curb: Provide factory fabricated roof curb by the same manufacturer as the equipment. Roof curb to be insulated.
Manufacturer: Subject to compliance with requirements, provide centrifugal roof ventilators of one of the following:
Acme
CaptiveAire
Cook (Loren) Co.
Greenheck.
Twin City Fan & Blower
Ceiling Ventilators
Centrifugal Ceiling Exhausters: Provide centrifugal ceiling exhausters, designed for ceiling or wall mounting, of type, size and capacity as scheduled.
Provide AMCA Certified Ratings Seal.
Type: Provide galvanized steel housing lined with acoustical insulation, adaptable for ceiling or wall installation. Provide centrifugal fan wheels mounted on motor shaft with fan shrouds, all removable for service.
Provide integral backdraft damper fan discharge.
Grille: Provide steel louvered grille with flange on intake with thumbscrew attachment to fan housing.
Motor: Provide permanent split-capacitor motor, permanently lubricated.
Accessories: Provide manufacturer's standard roof jack, wall cap, and transition fittings as indicated on drawings or schedules.
Duct Lining: Provide 1" thick, 3-lb density duct liner a minimum of 5' (five feet) up and down stream of fan.
Manufacturer: Subject to compliance with requirements, provide centrifugal ceiling exhausters of one of the following:
Acme
Cook (Loren) Co.
Greenheck.
Twin City Fan & Blower
Prefabricated Roof Curbs
General: Provide manufacturer's standard shop-fabricated units, modified if necessary to comply with requirements.
Fabricate structural framing for units of structural quality sheet steel, formed to manufacturer's standard profiles for coordination with roofing, insulation and deck construction. Include 45 deg. cant strips and deck flanges with offsets to accommodate roof insulation. Weld corners and seams to form watertight units.
Clean and paint units with manufacturer's standard rust-inhibitive metal primer paint.
Reinforce continuous runs of over 3'-0" length, by inserting welded stiffeners of heavy gage with flanges as required to provide sufficient rigidity and strength to withstand maximum lateral forces in addition to superimposed vertical loads.
Sloping Roof Decks: For deck slopes of 1/4" per foot and more, fabricate support units to form level top edge.
Gage and Height: Fabricate units of metal gage and to height above roof surface as indicated.
Where gage or height are not indicated, fabricate units of 14-ga metal, and nominal height of 14".
Provide pressure treated wood nailer, not less than 1-5/8" thick and of width indicated, but not less than width of support wall assembly. Anchor nailer securely to top of metal frame unit.
Provide lumber pressure treated with water-borne preservatives for "above ground" use.
Insulate units inside structural support wall with rigid glass fiber insulation board of approximately 3-lb. density and 1-1/2" minimum thickness, except as otherwise indicated.
Manufacturer: Subject to compliance with requirements, provide prefabricated roof curbs of one of the following:
Custom Curb, Inc.
Equipment Manufacturer.
MicroMetl
Pate Co.
Shipman.
Thycurb.
INSTALLATION
Coordinate ventilator work with work of roofing, walls, and ceilings, as necessary for proper interfacing.
Provide access door in duct below ventilator to service damper.
Solder bottom joints and up 2" of side joints of duct under roof ventilator to retain any moisture entering ventilator.

23 37 13.00 – DIFFUSERS, REGISTERS AND LOUVERS

Submittal Requirements
Product Data: For each type of product indicated.

DIFFUSERS, GRILLES AND REGISTERS
Manufacturer: Subject to compliance with requirements, provide diffusers of one of the following:
Anemostat Products Div., Dynamics Corp. of America.
Metal-Aire
Titus Products Div., Philips Industries, Inc.
Tuttle and Bailey.
Price
Dampers
Provide louvers and dampers of size as noted.
Manufacturer: Subject to compliance with requirements, provide diffusers of one of the following:
Aerolite
Prefco
Greenheck
Ruskin

23 38 13.00 – COMMERCIAL KITCHEN HOODS AND DUCTWORK

Submittal Requirements
Product Data: For each type of product indicated.
Type 2 Dishwasher Exhaust Ducts
General: Fabricate dishwasher exhaust ducts and supports, used for vapor removal, of 22-ga minimum stainless steel. For duct construction, comply with SMACNA "HVAC Duct Construction Standards", Ducts shall be welded, and pitched back to dishwasher.
Type 2 Commercial Dishwasher Hood
Refer to food service drawings for equipment furnished by food service vendor.
Dishwasher Exhaust Fan
Refer to food service drawings for equipment furnished by food service vendor.
Inspection
Installation of Type 2 Dishwasher Exhaust Ducts
General: Fabricate joints and seams with continuous welds for watertight construction. Install without dips or traps, which may collect residues, pitch towards dishwasher.
Field Quality Control
Testing: After installaton of Hood exhaust system has been completed, test each system to demonstrate proper operation of units at performance requirements specified. When possible, field correct malfunctioning units, then retest to demonstrate compliance. Replace units which cannot be satisfactorily corrected.
Provide testing, permits and approvals as required by state and local authorities.
Adjusting and Cleaning
Clean factory-finished surfaces.
Repair any marred or scratched surfaces.
Inspection
Installation
Coordinate work with work of roofing, walls, and ceilings, as necessary for proper interfacing.
Duct connections to be provided by the HVAC contractor.
The termination of kitchen exhaust outlets shall not be less than 10 feet horizontally from parts of the same or contiguous buildings, adjacent property lines and air intakes.
Outlet shall not be less than 10 feet vertically above adjoining grade level.
Ensure that rotation is in direction indicated and intended for proper performance.
Do not proceed with centrifugal fan start-up until wiring installation is acceptable to fan Installer.

23 74 33.00 – PACKAGED OUTDOOR ROOFTOP UNITS

Submittal Requirements
Product Data: For each type of product indicated.

Warranty
Warranty on Compressor and Heat Exchanger: Provide written warranty, signed by manufacturer, agreeing to replace/repair, within warranty period, compressors and heat exchangers with inadequate and defective materials and workmanship, including leakage, breakage, improper assembly, or failure to perform as required; provided manufacturer's instructions for handling, installing, protecting, and maintaining units have been adhered to during warranty period. Replacement is limited to component replacement only, and does not include labor for removal and reinstallation.
Warranty Period: 5 years from date of owner acceptance.

CONSTANT VOLUME (RTU-5); STAGED VOLUME (RTU-4)
General: Rooftop unit shall be factory-assembled and tested, designed for roof or slab installation and, consisting of compressors, condensers, evaporator coils, condenser and evaporator fans, refrigeration and temperature controls, filters, and dampers. Capacities and electrical characteristics are scheduled. Casing manufacturer's standard casing construction, having corrosion protection coating, and exterior finish. Casings shall have removable panels or access doors for inspection and access to internal parts, a minimum of 1" thick thermal insulation, knockouts for electrical and piping connections, and an exterior condensate drain connection, and lifting lugs.
Unit casing shall be single wall construction.
Roof Curbs: Manufacturer's standard construction, insulated and having corrosive protective coating, complete with factory-installed wood nailer and drain nipple. Construction shall be in accordance with NRCA Standards.
Evaporator Fans: Forward-curved, centrifugal, belt-driven fans with adjustable sheaves; and permanently lubricated motor bearings.
Condenser fans: Propeller-type, direct-driven fans with permanently lubricated bearings.
Coils: Aluminum plate fin and seamless copper tube type. Fins shall have collars drawn, belled and firmly bonded to the tubes by means of mechanical expansion of the tubes. No soldering or tinning shall be used in the bonding process. Coils shall have a galvanized steel casing. Coils shall be mounted in the coil casing with same end connections accessible for service. Coils shall be removable from the unit through the roof or through the piping enclosure. Coil section shall be completely insulated.
Refrigerant cooling coils: have an equalizing type vertical distributor to ensure each coil circuit receives the same amount of refrigerant. Coils shall be proof (450 psig) and leak (300 psig) tested with air pressure under water, then cleaned, dehydrated, and sealed with a holding charge of nitrogen.
Condensate Pan: Provide IAQ steel, double sloping drain pain. Provide high condensate in primary condensate pan to de-energize unit upon detection of high condensate levels.
Compressors: Serviceable, semi-hermetic, or hermetic compressors with integral vibration isolators, and crankcase heaters, which de-energize during compressor operation.

Safety Controls:
low pressure cutout, manual reset;
high pressure cutout, manual reset;
compressor motor overload protection, manual reset;
anti-recycling timing device;
adjustable low-ambient lockout;
oil pressure switch.
Controls:
redundant gas valves;
intermittent pilot ignition;
electronic spark ignition system;
high limit cutout;
forced draft proving switch;
flame roll-out switch.
Enthalpy Economizer Control:
Provide dual enthalpy economizer control. Provide return and outside air dampers, outside air filter, fully modulating electric control system with dry control, and adjustable mixed-air thermostat. System shall be capable of driving 100% closed for unoccupied mode, minimum outside air position and modulation to 100 percent open outside air capability. Provide automatic changeover through adjustable control device.
Heating Types:
Heat exchangers: Provide manufacturer's construction of aluminized steel gas-fired heat exchangers and burners, designed for minimum of 2-stage operation. Provide single gas connection.
Temperature Control:
Temperature control: factory-installed, demand-oriented solid-state control system above 5 tons shall have minimum of 2 cooling steps and 2 heating steps. Controls shall include solid-state thermostats with dead-band, and sub-base with system and fan switches. Other control features include:
Relief:
Barometric Relief (RTU-5) - Shall include relief damper section with mist eliminator. Dampers open to relieve positive pressure within the building. Available only with economizer.
Power Exhaust Fan (RTU-4)– Shall be factory installed for units larger than 5 tons. Shall include relief damper section with mist eliminator. Dampers open to relieve positive pressure within the building. Available only with economizer.
Filters:
Provide air filters to fit in filter box, with a Maximum filter face velocity of 500 fpm, of the following type:
Disposable Type: Provide 30% efficient disposable type air filters 2" thick, consisting of viscous coated fibers with filtering media encased in fiberboard cell sides having perforated metal grids on each side to provide media support.
Options:
Hail guards protecting the condenser fins.
Controls:
Self Contained: Programmable Electronic Night Setback Thermostat - Shall provide heating setback and cooling setup with 7-day, programming capability. Optional remote sensor available.
Manufacturers: Subject to compliance with requirements, provide rooftop units of one of the following:
Aaon
Carrier Air Conditioning, Div of Carrier Corp.
Lennox Industries Inc.
Trane; a division of Ingersoll Rand.
Daikin

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Revisions:

Mark	Date	By	Description
Issued			

NO.	DATE	BY	DESCRIPTION

FIRST WATCH
THE DAYTIME CAFE

BRANNON CROSSING

NICHOLASVILLE, KY

Project No.	220410
KLH Project No.	24360
Issue Date	05/23/2022

Title

MECHANICAL SPECIFICATIONS

Sheet

M602

COMcheck Software Version 4.1.5.0

Mechanical Compliance Certificate

Project Information

Energy Code: 90.1 (2010) Standard
Project Title:
Location: Nicholasville, Kentucky
Climate Zone: 4a
Project Type: Alteration

Construction Site:

Owner/Agent:

Designer/Contractor:
KLH Engineers
1538 Alexandria Pike
Fort Thomas, KY 41075

Mechanical Systems List

Quantity **System Type & Description**

1 RTU-4
Heating: 1 each - Central Furnace, Gas, Capacity = 125 kBtu/h
Proposed Efficiency = 80.00% Et, Required Efficiency: 80.00 % Et (or 78% AFUE)
Cooling: 1 each - Single Package DX Unit, Capacity = 102 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 11.00 EER, Required Efficiency: 11.00 EER
Fan System: FAN SYSTEM 3 -- Compliance (Motor nameplate HP method) : Passes

Fans:
FAN 3 Supply, Single-Zone VAV, 3000 CFM, 3.0 motor nameplate hp

SYSTEM VERIFICATION REQUIRED.

1 RTU-5
Heating: 1 each - Central Furnace, Gas, Capacity = 67 kBtu/h
Proposed Efficiency = 82.00% Et, Required Efficiency: 80.00 % Et (or 78% AFUE)
Cooling: 1 each - Single Package DX Unit, Capacity = 60 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 16.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FAN SYSTEM 4 -- Compliance (Motor nameplate HP method) : Passes

Fans:
FAN 4 Supply, Single-Zone VAV, 2000 CFM, 1.0 motor nameplate hp

SYSTEM VERIFICATION REQUIRED.

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 90.1 (2010) Standard requirements in COM*check* Version 4.1.5.0 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title _____ Signature _____ Date _____

COMcheck Software Version 4.1.5.0

Inspection Checklist

Energy Code: 90.1 (2010) Standard

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

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

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

Additional Comments/Assumptions:

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

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

Additional Comments/Assumptions:

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

Section # & Req.ID	Mechanical Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
6.4.1.4,6.4.1.5 [ME1][2]	HVAC equipment efficiency verified. Non-NAECA HVAC equipment labeled as meeting 90.1.	Efficiency:____	Efficiency:____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Mechanical Systems list for values.*
6.4.3.4.1 [ME3][3]	Stair and elevator shaft vents have motorized dampers that automatically close.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.4.3.4.2,6.4.3.4.3 [ME4][3]	Outdoor air and exhaust systems have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Check gravity dampers where allowed.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.4.5 [ME39][3]	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.4.3.4.4 [ME5][3]	Ventilation fans >0.75 hp have automatic controls to shut off fan when not required.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.9 [ME6][1]	Demand control ventilation provided for spaces >500 ft2 and >40 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1200 cfm.
6.4.3.10 [ME40][2]	Single zone HVAC systems with fan motors >=5 hp have variable airflow controls. Air conditioning equipment with a cooling capacity >=110,000 Btu/h has variable airflow controls.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values.*
6.4.3.10 [ME40][2]	Single zone HVAC systems with fan motors >=5 hp have variable airflow controls. Air conditioning equipment with a cooling capacity >=110,000 Btu/h has variable airflow controls.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values.*
6.4.4.1.1 [ME7][3]	Insulation exposed to weather protected from damage. Insulation outside of the conditioned space and associated with cooling systems is vapor retardant.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.4.1.2 [ME8][2]	HVAC ducts and plenums insulated. Where ducts or plenums are installed in or under a slab, verification may need to occur during Foundation Inspection.	R-____	R-____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.4.1.3 [ME9][2]	HVAC piping insulation thickness. Where piping is installed in or under a slab, verification may need to occur during Foundation Inspection.	____ in.	____ in.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

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

Section # & Req.ID	Mechanical Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
6.4.4.1.4 [ME41][3]	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.4.4.2.1 [ME10][2]	Ducts and plenums sealed based on static pressure and location.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.4.2.2 [ME11][3]	Ductwork operating >3 in. water column requires air leakage testing.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.4.4.2.2 [ME11][3]	Ductwork operating >3 in. water column requires air leakage testing.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.1,6.5.1.1,6.5.1.3 [ME12][1]	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
6.5.1,6.5.1.1,6.5.1.3 [ME12][1]	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
6.5.2.3 [ME19][3]	Dehumidification controls provided to prevent reheating, recooling, mixing of hot and cold airstreams or concurrent heating and cooling of the same airstream.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.5.3.3 [ME42][3]	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values.*
6.5.3.3 [ME42][3]	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values.*
6.5.4.1 [ME25][3]	HVAC pumping systems >10 hp designed for variable fluid flow.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Systems with three or fewer control valves.
6.5.6.1 [ME56][1]	Exhaust air energy recovery on systems meeting Table 6.5.6.1.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

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

Section # & Req.ID	Mechanical Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
6.5.7.1.1 [ME32][2]	Kitchen hoods >5,000 cfm have make up air >=50% of exhaust air volume.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.7.1.2 [ME46][3]	Conditioned supply air to space with a kitchen hood shall not exceed the greater of a) supply flow required to meet space heating or cooling, or b) hood exhaust flow minus the available air transfer from available spaces.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.5.7.1.2 [ME46][3]	Conditioned supply air to space with a kitchen hood shall not exceed the greater of a) supply flow required to meet space heating or cooling, or b) hood exhaust flow minus the available air transfer from available spaces.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.5.7.1.5 [ME49][3]	Approved field test used to evaluate design air flow rates and demonstrate proper capture and containment of kitchen exhaust systems.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.5.7.2 [ME33][1]	Fume hoods exhaust systems >=15,000 cfm have VAV hood exhaust and supply systems, direct make-up air or heat recovery.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.8.1 [ME34][2]	Unenclosed spaces that are heated use only radiant heat.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.5.9 [ME35][1]	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.5.9 [ME35][1]	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

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

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FIRST WATCH
THE DAYTIME CAFE

BRANNON CROSSING

NICHOLASVILLE, KY

Project No. 220410
KLH Project No. 24340
Issue Date 05/23/2022

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MECHANICAL ENERGY COMPLIANCE

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

Additional Comments/Assumptions:

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

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

Additional Comments/Assumptions:

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

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