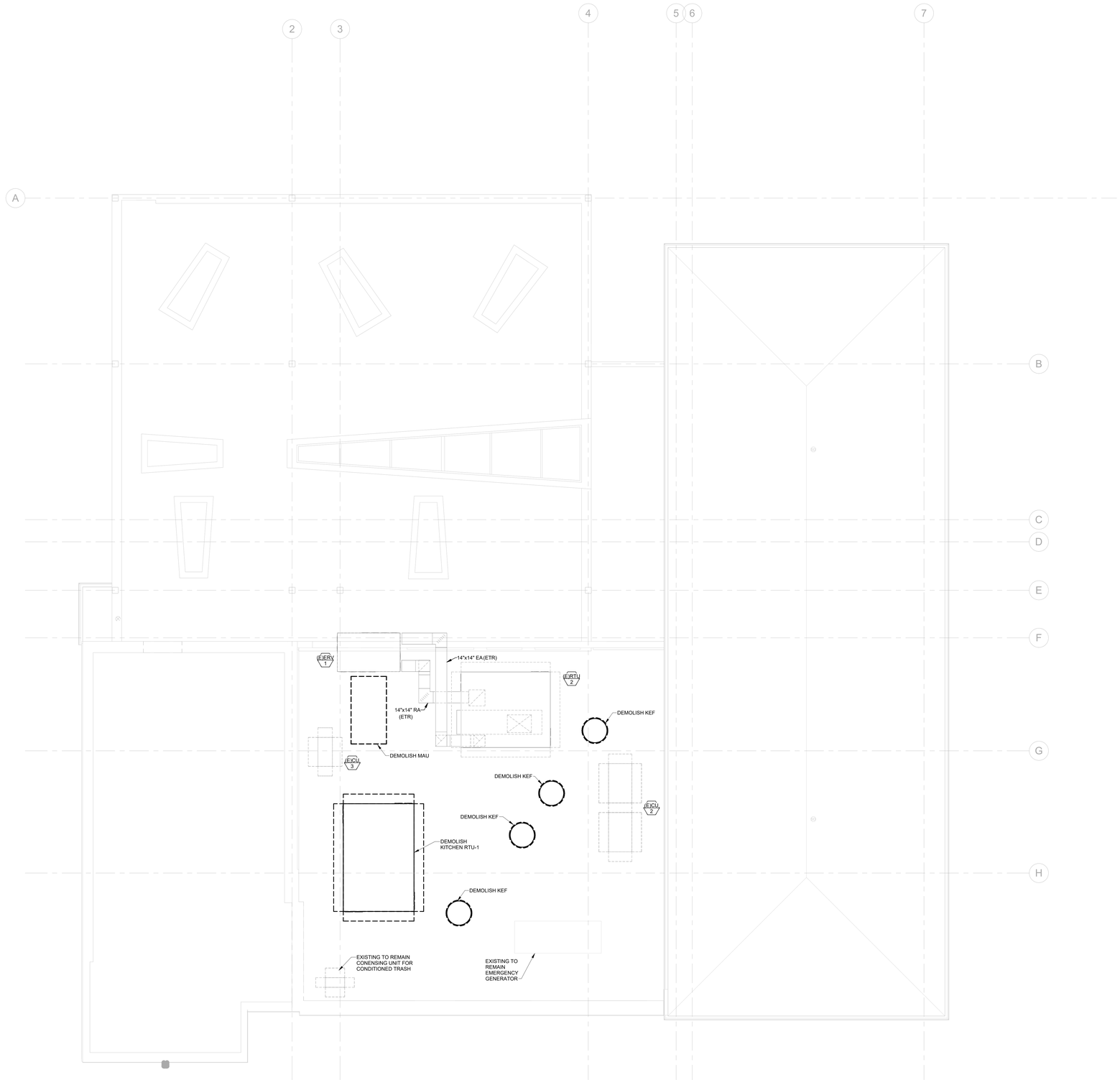

1 MECHANICAL ROOF DEMO PLAN
1/4" = 1'-0"

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MECHANICAL ROOF DEMO PLAN

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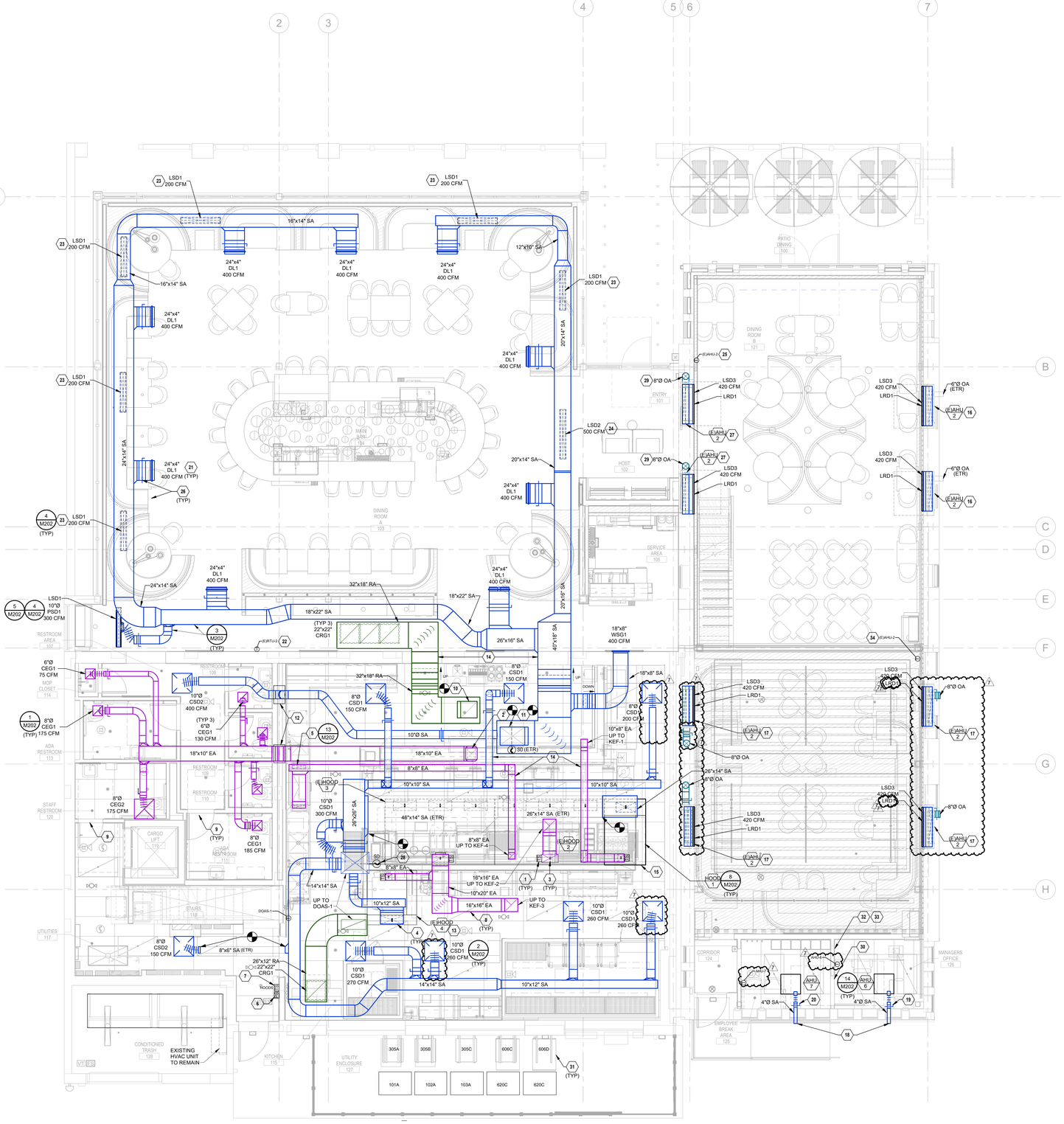

1 MECHANICAL FIRST FLOOR PLAN
1/4" = 1'-0"

MECHANICAL PLAN NOTES:

1. DUCT MOUNTED HEAT DETECTOR MOUNTED IN EXHAUST HOOD DUCT RISER, FURNISHED WITH HOOD, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.
2. CONNECT NEW 18" X 10" EXHAUST AIR DUCTWORK TO EXISTING 14" X 14" EXHAUST DUCT THROUGH ROOF TO (E)ERV-1. SIZE DUCT CONNECTION TO MATCH.
3. PROVIDE GREASE EXHAUST CONNECTION TO HOOD. TRANSITION AS NECESSARY. BALANCE EXHAUST TO MATCH KITCHEN EXHAUST HOOD SCHEDULE.
4. PROVIDE MAKEUP AIR CONNECTIONS TO HOOD. DUCT SIZE TO MATCH HOOD CONNECTION SIZE. BALANCE MAKEUP AIR TO KITCHEN EXHAUST HOOD SCHEDULE.
5. COORDINATE DISHWASHER EXHAUST DUCT WITH FSEC. SLOPE EXHAUST DUCT 1/4" PER FOOT TOWARD DISHWASHER HOOD. PROVIDE TRANSITIONS AS REQUIRED TO RIGIDLY CONNECT TO EXHAUST FAN.
6. INSTALL MANUAL PULL STATION FOR HOOD FIRE SUPPRESSION SYSTEM PER NFPA 96 REQUIREMENTS. PRIOR TO INSTALLATION, VERIFY LOCATION AND QUANTITY OF PULL STATIONS WITH AHJ.
7. INSTALL WALL TEMPERATURE SENSOR. TEMPERATURE SENSOR IS PART OF ADVANCED HOOD SYSTEM. MOUNT HIGH ON WALL. COORDINATE WITH FOOD SERVICE EQUIPMENT CONTRACTOR.
8. KITCHEN HOOD EXHAUST GREASE DUCT. DUCT SHALL BE UL LISTED SINGLE WALL STAINLESS STEEL GREASE DUCT AND WRAPPED WITH A UL LISTED GREASE DUCT WRAP AS REQUIRED BY NFPA 96 AND LOCAL CODES. SLOPE DUCTWORK AS REQUIRED TO MEET UL LISTING OF DUCTWORK.
9. PROVIDE 1" DOOR UNDERCUT FOR TRANSFER AIR ON RESTROOM DOORS. MECHANICAL CONTRACTOR TO COORDINATE EXECUTION OF THIS WORK WITH GENERAL CONTRACTOR.
10. CONNECT NEW 32" X 18" RETURN DUCT TO EXISTING 20" X 20" DUCT UP THROUGH ROOF TO (E)RTU-2. SIZE DUCT CONNECTION TO MATCH.
11. CONNECT NEW 40" X 18" SUPPLY DUCT TO EXISTING 30" X 22" DUCT UP THROUGH ROOF TO (E)RTU-2. SIZE DUCT CONNECTION TO MATCH.
12. ROUTE NEW DUCTS THROUGH EXISTING SUPPLY AND EXHAUST DUCT WALL OPENINGS.
13. RELOCATE EXISTING PREP HOOD TO LOCATION SHOWN.
14. ROUTE DUCT IN BEAM POCKET.
15. EXHAUST HOOD FIRE EXTINGUISHING SUITEM AND CONTROLS SHALL BE PROVIDED BY MECHANICAL CONTRACTOR IN COMPLETE CONFORMANCE WITH NFPA 96, LOCAL CODES, AND SIZED TO SERVE ASSOCIATED HOODS. SEE ADVANCED HOOD PLANS AND FOOD SERVICE PLANS FOR MORE INFORMATION. SYSTEM SHALL BE MOUNTED TO END OF HOOD.
16. EXISTING (E)AHU-2 TO REMAIN. BALANCE OUTSIDE AIR TO 120 CFM. TYP.
17. LOWER EXISTING (E)AHU-2 UNDER NEW MEZZANINE TO 5'-0" AFF. PROVIDE ACCESS PANEL IN WALL PER MANUFACTURES RECOMMENDATIONS. COORDINATE INSTALLATION HEIGHT AND ACCESS PANEL WITH ARCHITECTURAL DRAWINGS. INTENT IS FOR UNIT ACCESS DOOR TO BE LOCATED ON AISLE SIDE OF UNIT. ~~PROVIDE ACCESS PANEL ON AISLE SIDE OF UNIT.~~
18. PROVIDE OA DUCT WITH WALL CAP AND GRAVITY DAMPER.
19. BALANCE AHU-6 OUTSIDE AIR DAMPER TO 20 CFM.
20. BALANCE AHU-7 OUTSIDE AIR DAMPER TO 25 CFM.
21. INSTALL DL1 IN SIDE WALL OVER BAFFLE CEILING. TYP.
22. RELOCATE EXISTING THERMOSTAT FOR (E)RTU-2 TO LOCATION SHOWN. CONTRACTOR TO CONFIRM THERMOSTAT HAS ABILITY TO BE LOCALLY ADJUSTABLE ONLY WITHIN THE RANGE OF 66F TO 74F AND IS IN GOOD WORKING CONDITION. PROVIDE ALTERNATE BID TO REPLACE IF NECESSARY.
23. PROVIDE DAMPER AND FIELD FABRICATED DAMPER BOX FOR LSD1.
24. PROVIDE DAMPER AND FIELD FABRICATED DAMPER BOX FOR LSD2.
25. ALL (E)AHU-2 UNITS SERVING DINING ROOM B SHALL BE CONTROLLED BY SINGLE EXISTING THERMOSTAT. CONTRACTOR TO CONFIRM THERMOSTAT HAS ABILITY TO BE LOCALLY ADJUSTABLE ONLY WITHIN THE RANGE OF 66F TO 74F AND IS IN GOOD WORKING CONDITION. PROVIDE ~~ALTERNATE BID TO REPLACE IF NECESSARY.~~
26. DRUM LOUVER INSTALLED IN INACCESSIBLE CEILING SHALL HAVE A BALANCING STATION WITH CABLE OPERATED DAMPER FOR AIR BALANCING. PROVIDE CABLE OPERATED VOLUME DAMPER BY YOUNG REGULATOR 5020CC WITH 270-301 BOWDEN REMOTE CABLE CONTROL. PROVIDE WITH PRIMER COATED COVER PLATE AND FIELD PAINT TO MATCH WALL. INSTALL CONTROLLER CUP IN FACE OF SOFFIT WALL IN ACCESSIBLE LOCATION BELOW THE BAFFLE CEILING AND AVOID CONFLICTS WITH LIGHT TROUGH.
27. RAISE (E)AHU-2 TO 10'8" AFF TO ALLOW UNIT AND ~~DISCHARGE DUCTWORK TO CLEAR HOOD PIPING.~~
28. PROVIDE ACCESS PANEL IN WALL PER MANUFACTURERS RECOMMENDATIONS. COORDINATE INSTALLATION HEIGHT AND ACCESS PANEL WITH ARCHITECTURAL DRAWINGS.
29. DUCT SMOKE DETECTOR PROVIDED BY DIVISION 28.
30. CONNECT NEW OUTSIDE AIR DUCT TO RETURN DUCT OF (E)AHU-2. BALANCE TO 120 CFM.
31. PROVIDE DOOR LOUVER WITH 15 SQ IN FREE AREA. INSTALL BOTTOM OF LOUVER AT 12" AFF MAX. REFER TO ARCHITECTURAL PLANS.
32. INSTALL FSEC CONDENSERS ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. MOUNT CONDENSERS ON EXTERIOR WALL. SHOWN OFFSET FOR CLARITY. COORDINATE LOCATION WITH FSEC AND ARCHITECTURAL DRAWINGS. ENSURE CONDENSING UNIT SUPPORTS MEET FLORIDA NOA LISTING AND REQUIREMENTS.
33. MOUNT VRF CONTROLLER ON WALL IN MANAGER'S OFFICE. COORDINATE ELECTRICAL REQUIREMENTS OF DEVICE WITH ELECTRICAL CONTRACTOR.
34. PROVIDE SIZE AND QUANTITY OF REFRIGERANT PIPES AS REQUIRED BY MANUFACTURER. INSTALL ALL REFRIGERANT PIPING PER MANUFACTURER RECOMMENDATIONS. REFRIGERANT PIPING SHALL BE ROUTED TIGHT TO DECK ~~UNDER SOFFIT.~~
35. ALL (E)AHU-2 UNITS SERVING DINING ROOM C SHALL BE CONTROLLED BY SINGLE EXISTING THERMOSTAT. CONTRACTOR TO CONFIRM THERMOSTAT HAS ABILITY TO BE LOCALLY ADJUSTABLE ONLY WITHIN THE RANGE OF 66F TO 74F AND IS IN GOOD WORKING CONDITION. PROVIDE ~~ALTERNATE BID TO REPLACE IF NECESSARY.~~

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MECHANICAL FIRST FLOOR PLAN

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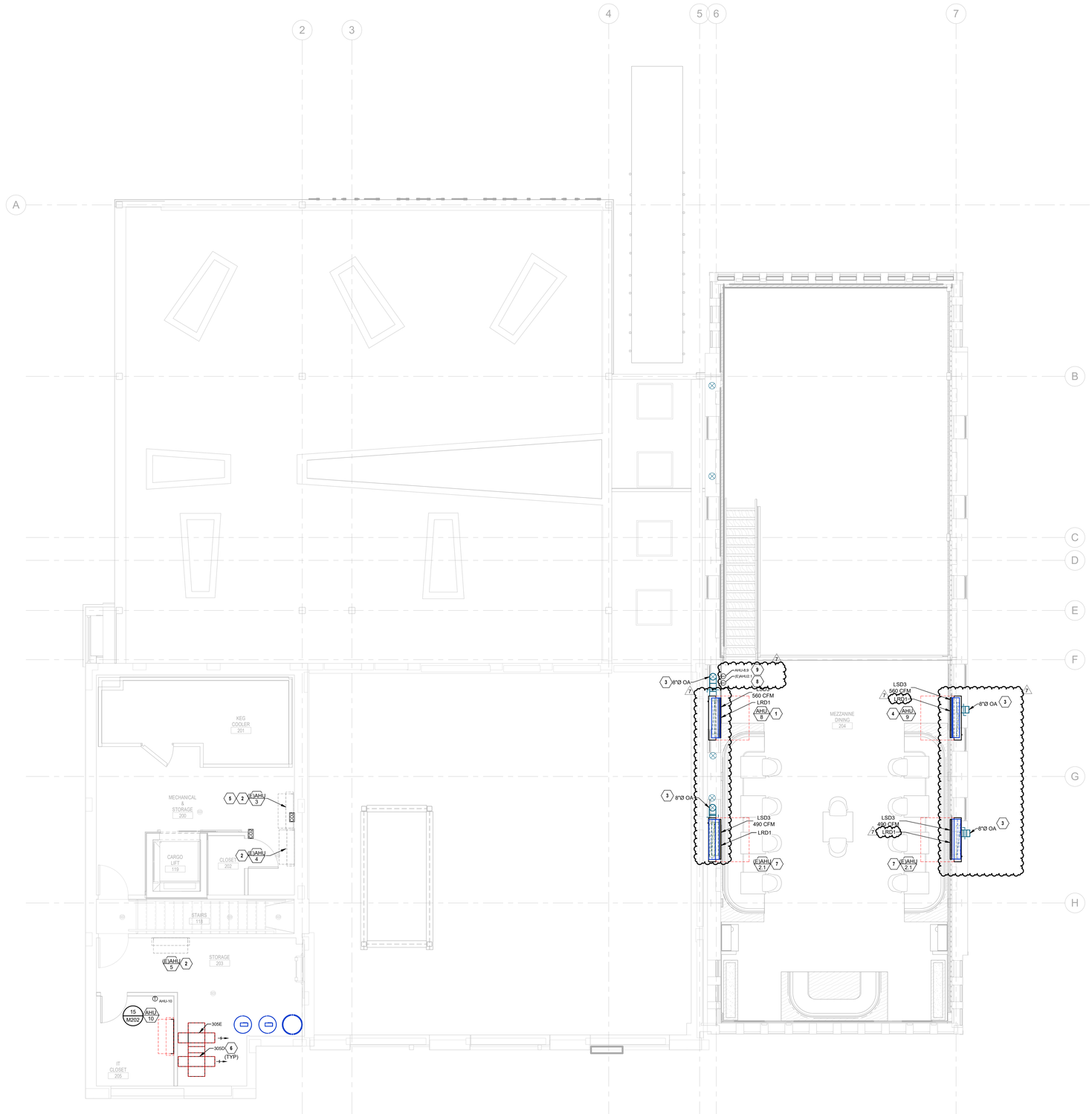

MECHANICAL PLAN NOTES:

1. INSTALL AHU-8 IN WALL AT 4'-0" AFF ACCORDING TO MANUFACTURES RECOMMENDATIONS. PROVIDE ACCESS PANEL IN WALL PER MANUFACTURERS RECOMMENDATIONS. COORDINATE INSTALLATION HEIGHT AND ACCESS PANEL WITH ARCHITECTURAL DRAWINGS. INTENT IS FOR UNIT ACCESS PANEL TO BE CONCEALED BY WALL ART.
2. REUSE EXISTING THERMOSTAT. CONTRACTOR TO CONFIRM THERMOSTAT HAS ABILITY TO BE LOCALLY ADJUSTABLE ONLY WITHIN THE RANGE OF 66F - 74F AND IS IN GOOD WORKING CONDITION. PROVIDE ALTERNATE BID TO REPLACE IF NECESSARY.
3. CONNECT OUTSIDE AIR DUCT TO RETURN DUCT OF AHU. OUTSIDE AIR DUCT UP TO ROOF. BALANCE TO 150 CFM.
4. INSTALL AHU-9 IN WALL AT 4'-0" AFF ACCORDING TO MANUFACTURES RECOMMENDATIONS. PROVIDE ACCESS PANEL IN WALL PER MANUFACTURERS RECOMMENDATIONS. COORDINATE INSTALLATION HEIGHT AND ACCESS PANEL WITH ARCHITECTURAL DRAWINGS. INTENT IS FOR UNIT ACCESS PANEL TO BE CONCEALED BY WALL ART.
5. RELOCATE (E)AHU-3 AND ASSOCIATED PIPING AND ACCESSORIES TO WALL SHOWN.
6. INSTALL FSEC CONDENSERS ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. RELOCATE EXISTING (E)AHU-2.1 IN DINING MEZZANINE AT 4'-0" AFF. PROVIDE ACCESS PANEL IN WALL PER MANUFACTURERS RECOMMENDATIONS. COORDINATE INSTALLATION HEIGHT AND ACCESS PANEL WITH ARCHITECTURAL DRAWINGS. INTENT IS FOR UNIT ACCESS PANEL TO BE CONCEALED BY WALL ART.
8. RELOCATE (E)AHU-2.1 THERMOSTAT TO LOCATION SHOWN. CONTRACTOR TO CONFIRM THERMOSTAT HAS ABILITY TO BE LOCALLY ADJUSTABLE ONLY WITHIN THE RANGE OF 66F - 74F AND IS IN GOOD WORKING CONDITION. PROVIDE ALTERNATE BID TO REPLACE IF NECESSARY.
9. IF SYSTEM CONFIGURATION ALLOWS, COMBINE AHU-8, AHU-9, AND AHU-(E)2.1 ON NEW THERMOSTAT. IF NOT FEASIBLE, REUSE EXISTING AHU-(E)2.1 THERMOSTAT AND INSTALL NEXT TO NEW THERMOSTAT.

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

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MECHANICAL MEZZANINE PLAN

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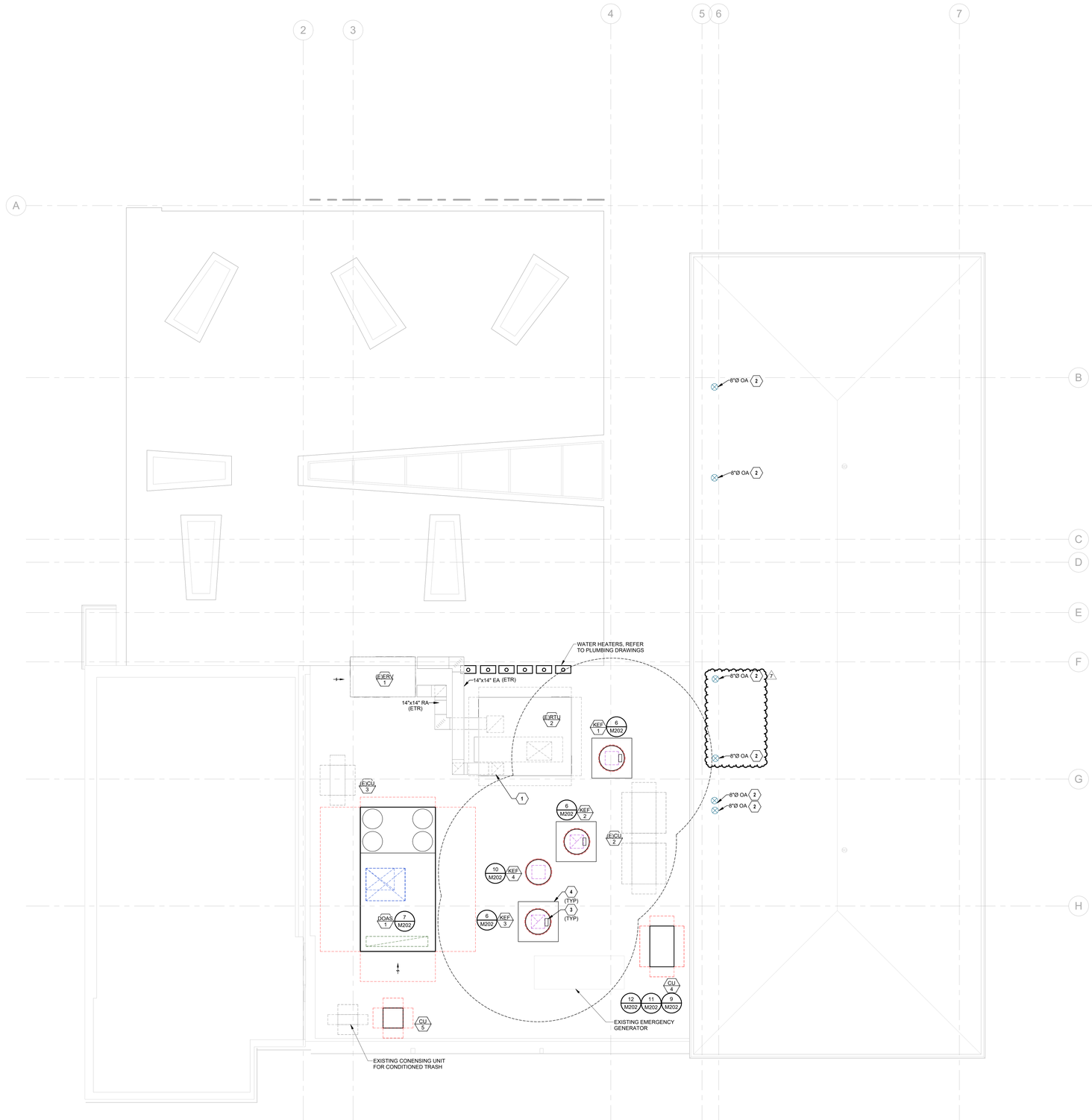

1 MECHANICAL ROOF PLAN
1/4" = 1'-0"

MECHANICAL PLAN NOTES:

1. CONNECT NEW 18" X 10" EXHAUST AIR DUCTWORK TO EXISTING 14" X 14" EXHAUST DUCT THROUGH ROOF TO (E)ERV-1. SIZE DUCT CONNECTION TO MATCH.
2. PROVIDE OUTSIDE AIR ALPACA WATERPROOF CAP AND GRAVITY DAMPER. REUSE EXISTING ROOF PENETRATION WHERE POSSIBLE.
3. INSTALL GREASE COLLECTION BOX ON FACE OF DURS ON OPPOSITE SIDE OF HINGE. ORIENT DRAIN OUTLET ACCORDINGLY.
4. PROVIDE GREASE GUARD MAT AROUND KITCHEN EXHAUST FAN.

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MECHANICAL ROOF PLAN

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PACKAGED DOAS UNIT CONTROL MATRIX

CONTROL FEATURE	UNITS	DOAS-1 SETPOINT OR Y/N	POINT TYPE INTERFACE WITH DDC (READ/WRITE)	NOTES
CONTROL STRATEGY				
DOAS SUPPLY AIR TEMPERATURE CONTROL		Y		
HEATING AND COOLING SET POINTS				
COOLING MODE ENABLE - OUTSIDE AIR TEMPERATURE	°F DB	55 < X	READ/WRITE	X
COOLING - SUPPLY AIR TEMPERATURE SETPOINT	°F DB	55	READ/WRITE	X
HEATING MODE ENABLE - OUTSIDE AIR TEMPERATURE	°F DB	X < 50	READ/WRITE	X
HEATING - SUPPLY AIR TEMPERATURE SETPOINT	°F DB	50	READ/WRITE	X
DEHUMIDIFICATION - REHEAT CONTROL - SUPPLY AIR TEMPERATURE SETPOINT	°F DB	70	READ/WRITE	F
PROGRAMMED CONTROL FEATURES				
HVAC SYSTEM OCCUPIED/UNOCCUPIED MODE - SCHEDULED THROUGH BAS		Y	READ	B
OPTIMUM START SEQUENCE		Y	READ STATUS	
EQUIPMENT COMPONENTS, ACCESSORIES AND CONTROL FEATURES				
COOLING COIL (DX - MODULATING CAPACITY)		Y	READ STATUS	K
DEHUMIDIFICATION - MODULATING HOT GAS REHEAT		Y	READ STATUS	
HEATING - ELECTRIC - MODULATING		Y	READ STATUS	K
OUTSIDE AIR DAMPER - MOTOR OPERATED		Y	READ STATUS	J
SUPPLY FAN CONTROL METHODS				
ON DURING OCCUPIED MODE		Y		
VARIABLE VOLUME SUPPLY FAN OPERATION - DCV TURNDOWN		Y	READ	B, K
SAFETIES, INTERLOCKS, AND ALARMS				
SUPPLY AIR SMOKE DETECTOR - SAFETY SHUTDOWN		Y	READ	E
LOW LIMIT FREEZESTAT - FREEZE PROTECTION SAFETY SHUTDOWN		Y	READ	F
FIRE ALARM CONTROL PANEL - SAFETY SHUTDOWN INTERLOCK		Y	READ	
HIGH SUPPLY AIR STATIC PRESSURE SENSOR - SAFETY SHUTDOWN		Y	READ	F
KITCHEN EXHAUST SYSTEM INTERLOCK		Y	READ	L

DIV. 23 CONTRACTOR SHALL PROVIDE CONTROL PANEL(S), WIRING, THERMOSTAT(S), TEMPERATURE SENSOR(S), HUMIDISTAT(S), AND/OR CO2 SENSOR(S) WHERE SHOWN ON THE DRAWINGS AND AS REQUIRED TO FACILITATE THE SCHEDULED CONTROL MODULES AND SEQUENCES OF OPERATION. EACH UNIT SHALL CONTROL BASED ON ITS OWN INTERNAL SAFETIES, TIME DELAYS, AND SEQUENCES UNLESS NOTED OTHERWISE. COORDINATE WITH OWNER FINAL BUILDING AND EQUIPMENT SCHEDULES DURING STARTUP. REFERENCE DIVISION SPECIFICATIONS FOR INDIVIDUAL DEVICE REQUIREMENTS.

NOTES:
B. DIVISION 23 CONTRACTOR SHALL PROVIDE DEVICE.
E. DIVISION 28 CONTRACTOR SHALL PROVIDE DEVICE.
F. DEVICE SHALL BE FACTORY MOUNTED AND PRE-WIRED FOR OPERATION SUBJECT TO THE ONBOARD CONTROLLER.
J. DAMPER SHALL BE CLOSED DURING UNOCCUPIED MODE.
K. UNITARY CONTROLLER SHALL MODULATE AND/OR CYCLE SUPPLY FAN SPEED AND COIL CAPACITY SUBJECT TO THE INTERNAL SAFETIES AND SEQUENCES TO MAINTAIN SCHEDULED SETPOINTS.
L. INTERLOCK RTU WITH KITCHEN EXHAUST HOOD SYSTEM(S) TO SHUT DOWN UPON SIGNAL FROM HOOD FIRE EXTINGUISHING SYSTEM. INTERLOCK RTU WITH KITCHEN EXHAUST FAN TO ENERGIZE WHEN HOOD SYSTEM IS ENERGIZED FOR PRESSURIZATION.
W. HOOD CONTROL PANEL SHALL CONTROL THE DOAS UNIT. DOAS UNIT SHALL MODULATE THE OUTSIDE AIR WITH THE EXHAUST FANS FOR KITCHEN EXHAUST TURNDOWN. HOOD TO DELIVER 0-10V SIGNAL TO BMS, FAN SPEED TO BE SET DURING TEST AND BALANCING.
X. UNIT SHALL BE ON WHEN EITHER OCCUPIED OR HOODS ARE ENERGIZED, OFF IF BOTH UNOCCUPIED AND HOODS ARE OFF.

ROOFTOP UNIT CONTROL MATRIX

CONTROL FEATURE	UNITS	(E)RTU-2 SETPOINT OR Y/N	NOTES
SETPOINTS			
COOLING - OCCUPIED SETPOINT	°F	72	
COOLING - UNOCCUPIED SETPOINT	°F	80	
DEAD BAND - MINIMUM HEATING AND COOLING TEMPERATURE SETPOINT DIFFERENCE	°F	5	
HEATING - OCCUPIED SETPOINT	°F	70	
HEATING - UNOCCUPIED SETPOINT	°F	60	
DEHUMIDIFICATION SETPOINT - HUMIDITY SENSOR FEEDBACK	% RH	N/A	B
PROGRAMMED CONTROL FEATURES			
HVAC SYSTEM OCCUPIED/UNOCCUPIED MODE - PROGRAMMABLE THERMOSTAT		Y	B
EQUIPMENT ACCESSORIES AND CONTROL MODULES			
OUTSIDE AIR DAMPER - MOTOR OPERATED (MODULATING)		Y	L
COOLING COIL (DX - STAGED)		Y	M
HEATING COIL (ELECTRIC)			M
SUPPLY FAN CONTROL METHODS			
ON DURING OCCUPIED HOURS		Y	
CYCLE WITH LOADS DURING UNOCCUPIED HOURS		Y	
VARIABLE VOLUME - STAGED FAN CONTROL IN RESPONSE TO ACTIVE COOLING COIL STAGES		Y	M, Q
SAFETIES, INTERLOCKS, AND ALARMS			
RETURN AIR SMOKE DETECTOR - SAFETY SHUTDOWN		Y	B
KITCHEN EXHAUST SYSTEM INTERLOCK		Y	S

DIV. 23 CONTRACTOR SHALL PROVIDE CONTROL PANEL(S), WIRING, THERMOSTAT(S), TEMPERATURE SENSOR(S), HUMIDISTAT(S), AND/OR CO2 SENSOR(S) WHERE SHOWN ON THE DRAWINGS AND AS REQUIRED TO FACILITATE THE SCHEDULED CONTROL MODULES AND SEQUENCES OF OPERATION. EACH UNIT SHALL CONTROL BASED ON ITS OWN INTERNAL SAFETIES, TIME DELAYS, AND SEQUENCES UNLESS NOTED OTHERWISE. COORDINATE WITH OWNER FINAL BUILDING AND EQUIPMENT SCHEDULES DURING STARTUP. REFERENCE DIVISION SPECIFICATIONS FOR INDIVIDUAL DEVICE REQUIREMENTS.

NOTES:
B. DIVISION 23 CONTRACTOR SHALL PROVIDE DEVICE.
L. EQUIPMENT MANUFACTURER SHALL PROVIDE MODULATING DAMPER AND CONTROLS CAPABLE OF ADJUSTING THE DAMPER POSITION TO MAINTAIN THE SCHEDULED OUTSIDE AIR ON THE DRAWINGS ACROSS ALL FAN SPEEDS. DIV. 23 CONTRACTOR SHALL PROGRAM MULTIPLE DAMPER POSITION SETPOINTS IN THE FIELD DURING TESTING AND BALANCING TO MAINTAIN MINIMUM VENTILATION WHEN NOT IN ECONOMIZER. DAMPER SHALL BE CLOSED DURING UNOCCUPIED HOURS.
M. UNITARY CONTROLLER SHALL MODULATE AND/OR CYCLE SUPPLY FAN SPEED SETTING AND COIL CAPACITY STAGES SUBJECT TO THE INTERNAL SAFETIES AND SEQUENCES TO MAINTAIN SCHEDULED SETPOINTS.
Q. PROVIDE STAGED FAN CONTROL WITH MINIMUM 2 FAN SPEEDS. LOW SPEED SHALL NOT EXCEED 66% OF FULL SPEED AND SHALL DRAW NO MORE THAN 40% OF FAN POWER AT FULL SPEED.
S. INTERLOCK RTU WITH KITCHEN EXHAUST HOOD SYSTEM TO PUT RTUS IN OCCUPIED MODE DURING OPERATION. INTERLOCK RTU WITH KITCHEN EXHAUST FAN TO ENERGIZE WHEN HOOD SYSTEM IS ENERGIZED FOR...

VRF CONDENSING UNIT SCHEDULE

MARK	SERVICE	MANUFACTURER	MODEL	CONFIGURATION	REFR TYPE	COOLING CAPACITY TOTAL (MBH)	COOLING CAPACITY MIN EFF EER	COOLING CAPACITY MIN EFF SEER	COOLING CAPACITY MIN EFF IEER	HEATING CAPACITY HEAT PUMP (MBH)	HEATING CAPACITY AMBIENT (°F DB)	HEATING CAPACITY MIN EFF COP 47°F	ELECTRICAL MCA	ELECTRICAL MOCP	ELECTRICAL V/PH	DISC TYPE	WEIGHT (LBS)	NOTES
CU 4	AHU 6,7,8,9	DAIKIN	RXYQ72AATJB	HEAT PUMP	R410A	66.2	10.8	4.5	14.4	54.0	48	3.3	27	30	208 V / 3PH	NF	500	A - L

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:
A. PROVIDE LOW AMBIENT CONTROL TO 40° F.
B. EQUIPMENT SIZED FOR 97°F AMBIENT TEMPERATURE.
C. APPROXIMATE LOCATION OF REFRIGERANT COMPONENTS AND CONTROL DEVICES AND GENERAL PIPE ROUTING ARE SHOWN ON THE DRAWINGS ONLY TO CONVEY GENERAL DESIGN INTENT. COORDINATE WITH THE MANUFACTURER THE FINAL HORIZONTAL AND VERTICAL REFRIGERANT PIPE ROUTING TO DETERMINE PIPE SIZES FOR THE REFRIGERANT PIPING. MANUFACTURER SHALL PROVIDE DETAILED REFRIGERANT PIPING DIAGRAMS INCLUDING DIMENSIONAL DATA FOR ALL REFRIGERANT PIPING DEVICES. THE MANUFACTURER SHALL SIZE AND LOCATE THE ASSOCIATED REFRIGERANT TRAPS BASED ON THE ACTUAL ROUTING AND PROVIDE OTHER APPURTENANCES TO PROVIDE A FULLY FUNCTIONAL AND OPERATIONAL SYSTEM. COORDINATE WITH THE MANUFACTURER LOCATIONS FOR ALL REFRIGERANT PIPING AND CONTROL DEVICES TO MAINTAIN SERVICEABILITY AND ACCESSIBILITY.
D. PROVIDE CONDENSER HAIL GUARDS.
E. PROVIDE FLORIDA APPROVED NOA PRE-ENGINEERED ROOF EQUIPMENT SUPPORTS WITH MINIMUM HEIGHT REQUIRED TO MAINTAIN BOTTOM OF EQUIPMENT A MINIMUM OF 8 INCHESABOVE FINISHED ROOF SURFACE. COORDINATE WITH ROOF INSULATION THICKNESS AND ROOF TAPER AT INSTALLED LOCATION.
F. DISCONNECT SWITCH PROVIDED BY DIVISION 26 CONTRACTOR.
G. STARTERS FOR ALL MOTORS SHALL BE PROVIDED INTEGRAL WITH UNIT.
H. COORDINATE SIZE OF CONDUCTOR TERMINATION LUGS WITH CONDUCTOR SIZES SHOWN ON ELECTRICAL DRAWINGS.
I. PROVIDE MANUFACTURER'S VRF SYSTEM CONTROLLER FOR CONTROL OF VRF SYSTEMS AND INTERFACE TO BUILDING CONTROL SYSTEM. GATEWAY SHALL BE PROVIDED BY CONTROLS CONTRACTOR (IF REQURIED).
J. EQUIPMENT SHALL BE SIZED FOR WORST CASE OF HEATING OR COOLING CAPACITY NEEDS FOR ALL ASSOCIATED VRF SYSTEMS WITHOUT DIVERSITY FACTORS APPLIED.
K. HEATING CAPACITY SHALL INCLUDE ALL APPLICABLE DERATES FOR PIPING, AMBIENT TEMPERATURE, CONNECTED LOAD AND DEFROST.
L. PROVIDE A FACTORY APPLIED COIL CORROSION COATING TO CONDENSER COIL WHICH IS CAPABLE OF WITHSTANDING GREATER THAN 6,000 HOURS OF THE ASTM B117 SALT SPRAY TEST.

FAN SCHEDULE

MARK	SERVICE DESCRIPTION	MANUFACTURER	MOUNTING	MODEL	CFM	ESP (IN)	BHP	NOM HP	FAN RPM	DRIVE (BELT/DIRECT)	VFD (Y/N)	ELECTRICAL V/PH	ELECTRICAL DISC TYPE	ELECTRICAL STARTER TYPE	WEIGHT (LBS)	NOTES
KEF 1	HOOD 1	ADVANCED HOOD	ROOF	AH-DU50HFA	633	1.3	0.38	0.50	1551	DIRECT	Yes	208 V / 3PH	NF		90	A-L
KEF 2	(EXISTING) HOOD 2	ADVANCED HOOD	ROOF	AH-DU180HFA	2771	1.7	1.58	2.00	1308	DIRECT	Yes	208 V / 3PH	NF		250	A-L
KEF 3	(EXISTING) HOOD 3 & 4	ADVANCED HOOD	ROOF	AH-DU180HFA	3427	1.7	2.05	3.00	1418	DIRECT	Yes	208 V / 3PH	NF		200	A-L
KEF 4	DISH	ADVANCED HOOD	ROOF	AH-DU50HFA	600	0.4	0.09	0.50	943	DIRECT	No	120 V / 1PH	NF		100	A-L

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:
A. REFER TO M1.1 FOR CLARIFICATION OF RESPONSIBILITES. UNITS ARE OWNER FURNISHED, CONTRACTOR INSTALLED.
B. INSTALL ROOF CURB FURNISHED WITH CAPTIVEAIRE PACKAGE WITH MINIMUM HEIGHT REQUIRED TO MAINTAIN BOTTOM OF EQUIPMENT A MINIMUM OF 8 INCHES ABOVE FINISHED ROOF SURFACE. PROVIDE SLOPED CURB IF NEEDED TO MATCH ROOF SLOPE. VERIFY ROOF INSULATION THICKNESS AND ROOF TAPER AT INSTALLED LOCATION AND COORDAINTE HEIGHT WITH CAPTIVEAIRE. CURB TO BE FLORIDA APPROVED NOA CURB DESIGNED TO WITHSTAND HURRICANE WIND FORCES.
C. INSTALL GREASE EXHAUST FAN WITH ROOF CURB EXTENSION FOR 40 INCH MINIMUM DISCHARGE HEIGHT ABOVE ROOF SURFACE OR AT ELEVATION HIGHER THAN ADJACENT BUILDING STRUCTURE WITHIN 10 FEET WHICHEVER IS GREATER, GREASE TRAP WITH ASSORBANT MATERIAL AND DRAIN CONNECTION, HINGE KIT, ACCESS PORT FOR CLEANING FAN BLADES AND INTEGRAL MOTOR OVERLOAD PROTECTION. TO BE FLORIDA APPROVED NOA CURB DESIGNED TO WITHSTAND HURRICANE WIND FORCES.
D. INSTALL BIRDSCREEN AND GRAVITY BACKDRAFT DAMPER.
E. PROVIDED WITH FACTORY DISCONNECT SWITCH.
F. PROVIDED WITH VFD.
G. PROVIDED WITH ELECTRONICALLY COMMUTATED (EC) MOTOR MANUFACTURER'S FAN SPEED CONTROLLER FOR BALANCING PURPOSES.
H. NOMINAL MOTOR HP SHALL BE NO LARGER THAN THE FIRST AVAILABLE NOMINAL MOTOR SIZE GREATER THAN THE BHP.
I. INTERLOCK FAN WITH CPI CABINET. ENERGIZE FAN DURING TIMES OF NORMAL BUSINESS OPERATION AND DE-ENGERGIZE FAN DURING TIMES BUSINESS IS CLOSED.
J. INTERLOCK FAN OPERATION WITH DISHWASHER.
K. REFER TO CAPTIVEAIRE DRAWINGS FOR ADDITIONAL INFORMATION.
L. INTERLOCK FAN WITH CPI CABINET. ENERGIZE FAN WHENEVER IT ROOM THERMOSTAT IS OVER 85F (ADJUSTABLE).

SEQUENCE OF OPERATIONS
VARIABLE REFRIGERANT FLOW SYSTEM (VRF)

The sequence of operations is organized into the following main categories: operating modes; control setpoint resets; safeties, overrides and interlocks; and component control loops. The operating modes describe the criteria that either enable or disable the various modes of operation. If a mode of operation is not listed within a component control loop section then that mode of operation has no direct influence on the operation of the component. The control setpoint reset section describes the logic and reference variables that will be used to reset control setpoints to a new value within its reset range. The safeties, overrides, and interlocks section outlines the hardwired interlocks that are required to meet life safety requirements. Safeties and interlocks take precedence over all other control strategies outlined in this document. The control responses of each component for the various modes of operation are described in the component control loop sections. Setpoints shall be adjustable (ad.) as noted.

The sequence of operations, the points list and control diagrams shall be used to provide a complete description of the control philosophy for the controlled equipment. Individual setpoint values, reset ranges, and alarm action levels are listed in the points list. Components and control sensor locations are graphically depicted on the control diagram. The controls contractor shall be responsible for coordinating any necessary time delay setpoints to establish stable system operation.

GENERAL DESCRIPTION: CU-4

The VRF system described by this sequence of operations consists of condensing unit(s), fan coil unit(s), and a central controller that operate together to provide space conditioning as shown on the drawings. The VRF system shall be furnished with factory digital controls (DDC).

Ventilation air is provided via VRF indoor units as shown on the drawings. The ventilation air is distributed directly to the space.

Heat Pump System Control
Each condensing unit shall be capable of serving multiple fan coil units. All fan coil units associated with the heat pump condensing unit shall be in heating or cooling mode at the same time.

Manufacturer Central Controller:
The VRF manufacturer shall furnish a central controller that shall provide centralized management of system scheduling, temperature setpoints, mode, alarms, fan speed, unoccupied space temperature limits, remote controller restrictions, and mode changeover.

OPERATING MODES
The unit shall go into cool or heating modes based on setpoints in project design conditions. Unit shall be in occupied or unoccupied modes based on building schedule.

GENERAL DESCRIPTION: (E)CU-2, (E)CU-3

The VRF system described by this sequence of operations consists of existing to remain condensing unit(s), fan coil unit(s), and a central controller that operate together to provide space conditioning as shown on the drawings.

Ventilation air is provided via existing to remain VRF indoor units as shown on the drawings. The ventilation air is distributed directly to the space.

OPERATING MODES
The unit shall go into cool or heating modes based on setpoints in project design conditions. Unit shall be in occupied or unoccupied modes based on building schedule.

KITCHEN EXHAUST HOOD SCHEDULE

MARK	EQUIPMENT SERVED	MANUFACTURER	MODEL	HOOD DIMENSIONS (IN)	EXHAUST AIR (CFM)	MAKEUP AIR (CFM)	WEIGHT (LBS)	NOTES
(E)HOOD 2	COOKLINE MIDDLE	CAPTIVE AIRE	6024 ND-2-PSP-F	11' - 1"	2771	2378	700	I
(E)HOOD 3	COOKLINE RIGHT	CAPTIVE AIRE	6024 ND-2-PSP-F	11' - 1"	2771	2378	700	I
(E)HOOD 4	PREP	CAPTIVE AIRE	5424 ND-2-PSP-F	3' - 9"	656	564	450	I, J
HOOD 1	COOKLINE LEFT	ADVANCED HOOD	6024 AH-ND-2-PSP-F	3' - 2"	792	680	450	A - H

NOTES:
A. HOOD SUPPLIER SHALL PROVIDE HOOD PRE-PIPED FOR WET-TYPE FIRE EXTINGUISHING SYSTEM MEETING REQUIREMENTS OF NFPA-96 AND LOCAL CODES.
B. HOOD SUPPLIER SHALL FURNISH HOOD WITH UL LISTED BAFFLE-TYPE GREASE FILTERS, GREASE DRAIN WITH REMOVABLE CUP, AND UL LISTED VAPORPROOF INCANDESCENT LIGHT FIXTURES.
C. HOOD SUPPLIER SHALL FURNISH STAINLESS STEEL ENCLOSURE PANELS FROM TOP OF HOOD TO FINISH CEILING AND 3 INCH STANDOFF FROM WALL AS REQUIRED.
D. PROVIDE HOOD FIRE SUPPRESSION SYSTEM MEETING NFPA-96 AND LOCAL CODES.
E. PROVIDE INTERLOCK KIT WITH ONE TEMPERATURE SENSOR PER GREASE EXHAUST COLLAR TO MEET IMC REQUIREMENTS.
F. HOOD FIRE SUPPRESSION SYSTEM SUPPLIER SHALL FURNISH AUTOMATIC SOLENOID GAS SHUT-OFF VALVE TO BE INSTALLED BY PLUMBING CONTRACTOR.
G. HOOD SHALL BE FURNISHED AND INSTALLED BY DIVISION 23.
H. MOUNT BOTTOM OF HOOD AT 6'-8" ABOVE FINISHED FLOOR.
I. HOOD IS EXISTING, SHOWN FOR REFERENCE ONLY. BALANCE AIR FLOW TO CFMS SHOWN.
J. RELOCATE EXISTING PREP HOOD TO LOCATION SHOWN ON PLANS. COORDINATE WITH FSEC DRAWINGS.

DOAS UNIT (DX COOLING, ELECTRIC HEATING)

MARK	MANUFACTURER	MODEL	SERVICE	SUPPLY FAN DESIGN CFM	SUPPLY FAN ESP (IN)	SUPPLY FAN NOM HP	SUPPLY FAN VFD (Y/N)	COOLING COIL REFR TYPE	COOLING COIL TH (MBH)	COOLING COIL SH (MBH)	COOLING COIL EAT (°F DB)	COOLING COIL EAT (°F WB)	COOLING COIL LAT (°F DB)	COOLING COIL LAT (°F WB)	COOLING COIL MIN EFF (ISMRE)	COOLING COIL MIN NO STAGES	HEATING COIL MIN OUT (MBH)	HEATING COIL NOM (KW)	HEATING COIL EAT (°F DB)	HEATING COIL LAT (°F DB)	HEATING COIL MIN NO STAGES	ELECTRICAL V/PH	ELECTRICAL MCA	ELECTRICAL MOCP	ELECTRICAL DISC TYPE	OUTSIDE AIR CFM	WEIGHT (LBS)	NOTES
DOAS 1	ADVANCED HOOD	AHRTU4-E.902-30-50T-2	KITCHEN	8000	0.75	7.50	Yes	R454B	603.2	233.2	80.9	75.6	54.7	53.8	5.9	4	279.7	90	52.6	85.0	4	208 V / 3PH	246	250	FUSED	6000	6000	A - V

MODEL NUMBERS AND NOMINAL TONS LISTED SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER, MODEL NUMBERS, OR NOMINAL TONS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:
A. REFER TO ROOFTOP UNIT CONTROL MATRIX FOR ADDITIONAL UNIT FEATURES, COMPONENTS, MODULES, ACCESSORIES, AND CONTROLS THAT SHALL BE PROVIDED WITH THE EQUIPMENT.
B. EQUIPMENT SIZED FOR 97 °F AMBIENT TEMPERATURE.
C. PROVIDE 2" MERV 8, EFFICIENT PLEATED THROWAWAY AIR FILTERS.
D. DISCONNECT SWITCH PROVIDED BY DIVISION 26 CONTRACTOR.
E. STARTERS FOR ALL MOTORS SHALL BE FURNISHED INTEGRAL WITH UNIT.
F. PROVIDE FACTORY MOUNTED VARIABLE FREQUENCY DRIVE TO FACILITATE MODULATING FAN SPEED CONTROL.
G. PROVIDE SHAFT GROUNDING SYSTEM ON FAN MOTOR. REFER TO MOTOR SPECIFICATION FOR ADDITIONAL INFORMATION.
H. PROVIDE SINGLE POINT POWER CONNECTION.
J. COORDINATE SIZE OF CONDUCTOR TERMINATION LUGS WITH CONDUCTOR SIZES SHOWN ON ELECTRICAL DRAWINGS.
K. PROVIDE 125 VAC, 20 AMP DUPLEX CONVENIENCE RECEPTACLE MOUNTED TO UNIT READY FOR FIELD WIRING WITH A COVER UL LISTED FOR WET AND DAMP LOCATIONS WHEN IN USE.
L. SPECIFIED FAN ESP ACCOUNTS FOR DUCT LOSSES EXTERNAL TO UNIT.
M. PROVIDE MOTOR HORSEPOWER TO OVERCOME INTERNAL UNIT STATIC PRESSURE DROP PLUS SPECIFIED EXTERNAL STATIC PRESSURE DROP. NOMINAL MOTOR HP SHALL BE NO LARGER THAN THE FIRST AVAILABLE NOMINAL MOTOR SIZE GREATER THAN THE REQUIRED BHP.
N. PROVIDE INSULATED ROOF CURB WITH MINIMUM HEIGHT REQUIRED TO MAINTAIN BOTTOM OF EQUIPMENT A MINIMUM OF 8 INCHES ABOVE FINISHED ROOF SURFACE. PROVIDE SLOPED CURB IF NEEDED TO MATCH ROOF SLOPE. COORDINATE WITH ROOF INSULATION THICKNESS AND ROOF TAPER AT INSTALLED LOCATION. COORDINATE CURB TYPE WITH DRAWINGS.
O. PROVIDE FLORIDA APPROVED NOA CURB DESIGNED TO WITHSTAND HURRICANE WIND FORCES IN COMPLIANCE WITH MIAMI-DADE PRODUCT CONTROL SECTION.
P. SCHEDULED WEIGHT IS THE MAXIMUM ALLOWABLE OPERATING WEIGHT OF THE EQUIPMENT.
Q. COOLING COIL LAT IS LEAVING AIR TEMPERATURE OF COIL.
R. COOLING COIL SHALL BE CAPABLE OF MODULATING CAPACITY WITHOUT THE USE OF HOT GAS BYPASS. PROVIDE VARIABLE SPEED OR DIGITAL SCROLL LEAD COMPRESSOR FOR CAPACITY CONTROL.
S. PROVIDE HEATER TO MEET OR EXCEED SCHEDULED MINIMUM MBH OUTPUT. NOMINAL INPUT IS BASED ON LISTED MANUFACTURERS STANDARD PRODUCT. COORDINATE EQUIPMENT GAS LOAD WITH PLUMBING CONTRACTOR IF DIFFERENT FROM THAT SCHEDULED. MEET MINIMUM EFFICIENCY SCHEDULED.
T. PROVIDE GUARDS TO PROTECT CONDENSER COIL FROM HAIL OR OTHER DAMAGE.
U. PROVIDE A FACTORY APPLIED COIL CORROSION COATING TO EVAPORATOR AND CONDENSER COILS WHICH IS CAPABLE OF WITHSTANDING GREATER THAN 6,000 HOURS OF THE ASTM B117 SALT SPRAY TEST.
V. PROVIDE HOT GAS REHEAT COIL AND DEHUMIDIFICATION CONTROLS.

(FOR REFERENCE ONLY) EXISTING VRF FAN COIL UNIT SCHEDULE

MARK	SERVICE	LOCATION	MANUFACTURER	MODEL	TYPE	MOUNTING	SUPPLY FAN NOMINAL (CFM)	SUPPLY FAN DESIGN (CFM)	COOLING COIL TH (MBH)	COOLING COIL SH (MBH)	COOLING COIL EAT (°F DB)	COOLING COIL EAT (°F WB)	COOLING COIL LAT (°F DB)	COOLING COIL LAT (°F WB)	COOLING COIL REFR TYPE	TOTAL HTG CAP (MBH)	HEAT PUMP HEATING COIL MIN OUT (MBH)	HEAT PUMP HEATING COIL EAT (°F DB)	HEAT PUMP HEATING COIL LAT (°F DB)	MIN OA (CFM)	ELECTRICAL V/PH	ELECTRICAL MCA	ELECTRICAL MOCP	ELECTRICAL DISC TYPE	WEIGHT (LBS)
(E)AHU 2	(E)CU 2	DINING B & C	DAIKIN	FXNQ24	STANDING	CONCEALED WALL	560	420	19.1	9.2	75	68	55	54	R410A	28.0	12.9	63	85	120	208 V / 1PH	0.6	15	NF	80
(E)AHU 2.1	(E)CU 2	MEZZ DINING	DAIKIN	FXNQ18	STANDING	CONCEALED WALL	490	380	17.7	8.3	76	69	57	55	R410A	21.0	9.9	61	85	130	208 V / 1PH	0.6	15	NF	80
(E)AHU 3	(E)CU 3	MECHANICAL & STORAGE	DAIKIN	FXAQ18	WALL	WALL MOUNTED	500	500	10.6	10.6	72	60	73	52	R410A	20.0	6.5	70	85	0	208 V / 1PH	0.5	15	NF	25
(E)AHU 4	(E)CU 3	MECHANICAL & STORAGE	DAIKIN	FXAQ12	WALL	WALL MOUNTED	300	300	10.6	10.6	72	60	73	52	R410A	20.0	6.5	70	85	0	208 V / 1PH	0.4	15	NF	25
(E)AHU 5	(E)CU 3	MEZZ STORAGE	DAIKIN	FXAQ18	WALL	WALL MOUNTED	400	400	5.0	5.0	72	62	60	58	R410A	20.0	8.1	70	85	0	280 V / 1PH	0.5	15	NF	30

MODEL NUMBERS AND NOMINAL TONS LISTED SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER, MODEL NUMBERS, OR NOMINAL TONS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:
A. EQUIPMENT IS EXISTING TO REMAIN AND SHOWN FOR REFERENCE ONLY. BALANCE EQUIPMENT TO SCHEDULED AIRFLOWS AS REQUIRED.
B. REFER TO ROOFTOP UNIT CONTROL MATRIX FOR ADDITIONAL UNIT FEATURES, COMPONENTS, MODULES, ACCESSORIES, AND CONTROLS THAT SHALL BE PROVIDED WITH THE EQUIPMENT.
C. PROVIDE NEW FILTERS FOR EXISTING AIR HANDLING EQUIPMENT PRIOR TO STARTUP OF EQUIPMENT. NEW FILTERS SHALL BE COMPATIBLE WITH THE EXISTING EQUIPMENT. PROVIDE 2" MERV 8 FILTERS.
D. CONTRACTOR SHALL FIELD VERIFY THAT THE EXISTING UNIT INCLUDING ITS ACCESSORIES BEING RESUSED IS NOT DAMAGED AND IS IN GOOD WORKING ORDER. REPORT ANY DEFICIENCIES TO THE OWNER OR ARCHITECT. CONTRACTOR SHALL SUBMIT TO THE OWNER AND ARCHITECT A WRITTEN REPORT DESCRIBING TESTS PERFORMED TO VERIFY OPERATION AND RESULTS OF THE TESTS.

(FOR REFERENCE ONLY) EXISTING VRF CONDENSING UNIT SCHEDULE

MARK	SERVICE	MANUFACTURER	MODEL	CONFIGURATION	REFR TYPE	COOLING CAPACITY TOTAL (MBH)	COOLING CAPACITY MIN EFF EER	HEATING CAPACITY HEAT PUMP (MBH)	HEATING CAPACITY AMBIENT (°F DB)	HEATING CAPACITY MIN EFF COP 47°F	OUTDOOR MODULE 1 MCA	OUTDOOR MODULE 1 MOCP	OUTDOOR MODULE 1 V/PH	OUTDOOR MODULE 2 MCA	OUTDOOR MODULE 2 MOCP	OUTDOOR MODULE 2 V/PH	DISC TYPE	WEIGHT (LBS)	NOTES
(E)CU 2	(E)AHU 2, 2.1	DAIKIN	RXYQ216	VRV-III HEAT PUMP	R410A	188.2	11.6	123.0	48	3.5	43	50	208 V / 3PH	43	50	208 V / 3PH	NF	1240	A - D
(E)CU 3	(E)AHU 3, 4, 5	DAIKIN	RXMQ48	VRV-III HEAT PUMP	R410A	15.6	10	40.0	48	3.5	27	30	208 V / 1PH				NF	310	A - D

MODEL NUMBERS AND NOMINAL TONS LISTED SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER, MODEL NUMBERS, OR NOMINAL TONS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:
A. EQUIPMENT IS EXISTING TO REMAIN AND SHOWN FOR REFERENCE ONLY. BALANCE EQUIPMENT TO SCHEDULED AIRFLOWS AS REQUIRED.
B. PROVIDE NEW FILTERS FOR EXISTING AIR HANDLING EQUIPMENT PRIOR TO STARTUP OF EQUIPMENT. NEW FILTERS SHALL BE COMPATIBLE WITH THE EXISTING EQUIPMENT. PROVIDE 2" MERV 8 FILTERS.
C. CONTRACTOR SHALL FIELD VERIFY THAT THE EXISTING UNIT INCLUDING ITS ACCESSORIES BEING RESUSED IS NOT DAMAGED AND IS IN GOOD WORKING ORDER. REPORT ANY DEFICIENCIES TO THE OWNER OR ARCHITECT. CONTRACTOR SHALL SUBMIT TO THE OWNER AND ARCHITECT A WRITTEN REPORT D

GRILLE, REGISTER AND DIFFUSER SCHEDULE

MARK	MANUFACTURER	MODEL	FACE TYPE	MOUNTING LOCATION	FACE SIZE (IN)	MAX NC	MAX PRESS DROP (IN W.C.)	NOTES
CEG1	TITUS	OMNI	PLAQUE	CEILING	12"x12"	25	0.08	A, B, E, H, L
CEG2	TITUS	OMNI	PLAQUE	CEILING	24"x24"	25	0.08	A, B, E, H, L
CRG1	TITUS	PAR	PERFORATED	CEILING	24"x24"	25	0.05	A, B, E, H, L
CSD1	TITUS	PAR-A	PERFORATED	CEILING	24"x24"	25	0.08	A, B, E, H, L
CSD2	TITUS	OMNI	PLAQUE	CEILING	24"x24"	25	0.08	A, B, E, H, L
DL1	TITUS	DL	DRUM LOUVER W DAMPER	WALL	REFER TO PLANS	25	0.08	A, B, E, H, P
LRD1	TITUS	CT-580	BAR GRILLE	CEILING	4" NOMINAL DUCT WIDTH, 4'-0" LONG (NOMINAL)	25	0.08	E, G, H, J, M, P
LSD1	TITUS	ML-39	LINEAR SLOT	CEILING	2 SLOT, 4'-0" (NOMINAL)	25	0.08	E, G, H, J, P
LSD2	TITUS	ML-39	LIENAR SLOT	CEILING	4 SLOT, 4'-0" (NOMINAL)	25	0.08	E, G, H, J, P
LSD3	TITUS	CT-580	BAR GRILLE	CEILING	4" NOMINAL DUCT WIDTH, 4'-0" LONG (NOMINAL)	25	0.08	E, G, H, J, P
PSD1	TITUS	MPI-39	INSULATED PLENUM	CEILING	4'-0" (NOMINAL)	25	0.08	A, J, K
WSG1	TITUS	300RL	FIXED BLADE	WALL	REFER TO PLANS	25	0.08	A, B, C, D, F, H

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.
NOTES:

A. NECK SIZE SHOWN ON DRAWINGS. PROVIDE BRANCH DUCT TO MATCH NECK SIZE UNLESS OTHERWISE SHOWN ON DRAWINGS.
B. BAKED ENAMEL FINISH, COLOR TO MATCH CEILING COLOR. REFER TO ARCHITECTURAL PLANS.
C. FRONT BLADES PARALLEL TO LONG DIMENSION.
D. DOUBLE DEFLECTION BARS SHALL BE ADJUSTABLE.
E. FRAME TYPE TO MATCH CEILING/WALL CONSTRUCTION, COORDINATE WITH ARCHITECTURAL REFLECTED CEILING/WALL PLAN.
F. PROVIDE OPPOSED BLADE DAMPER ADJUSTABLE FROM FACE OF DEVICE.
G. PROVIDE EXPOSED FLANGE BORDER. PROVIDE INSULATED PLENUM BOX WITH NECK.
H. PROVIDE DIFFUSERS, LINEAR SLOTS, AND GRILLES WITH NO EXPOSED MOUNTING SCREWS.
J. PAINT ALL INTERIOR SURFACES SLOTS, GRILLES AND PLENUMS FLAT BLACK.
K. SUPPLY PLENUM MAY BE FIELD FABRICATED BASED ON PROVIDED DETAILS TO ACCOMODATE CEILING CONDITIONS, OR PURCHASED FROM THE SLOT DIFFUSER MANUFACTURER. PROVIDE 1/4" CLOSED CELL INSULATION ON THE INTERIOR OF THE SUPPLY PLENUM.
L. PROVIDE WITH RAPID MOUNT FRAMING OPTION FOR LAY-IN TYPE DIFFUSERS INSTALLED IN A HARD CEILING.
P. FIELD PAINT TO MATCH WALL OR CEILING. REFER TO ARCHITECTURAL PLANS.

RESTAURANT AIR BALANCE SCHEDULE

KITCHEN

OUTDOOR AIR SOURCE EQUIPMENT	AREA/EQUIPMENT SERVED	SUPPLY AIR (CFM)	DESIGN OA (CFM)	PERCENT OA/SA
DOAS-1	KITCHEN VENTILATION/COOLING	8000	6000	75.0%
TOTAL AIRFLOW		8,000	6,000	75.0%
EXHAUST EQUIPMENT	AREA/EQUIPMENT SERVED	AREA DESCRIPTION		EXHAUST (CFM)
KEF-1	HOOD 1	COOKLINE		792
KEF-2	EXISTING HOOD 2	COOKLINE		2771
KEF-3	EXISITING HOOD 3 & 4	COOKLINE & PREP		3427
KEF-4	DISH	DISH		600
TOTAL EXHAUST				7,590
TOTAL KITCHEN POSITIVE/NEGATIVE AIR FLOW				-1590
PERCENT POSITIVE/NEGATIVE AIR FLOW				-26.5%
TOTAL BUILDING POSITIVE AIR FLOW				415
PERCENT BUILDING POSITIVE AIR FLOW				4.6%

DINING

OUTDOOR AIR EQUIPMENT	AREA/EQUIPMENT SERVED	SUPPLY AIR (CFM)	DESIGN OA (CFM)	PERCENT OA/SA
(E)RTU 2	DINING/BAR	6400	1400	21.9%
(E)AHU 2.1	MEZZ DINING	980	300	30.6%
(E)AHU 2	DINING B	3360	960	28.6%
AHU-6	OFFICE	260	20	7.7%
AHU-7	STAFF	230	25	10.9%
AHU-8	MEZZ DINING	560	150	26.8%
AHU-9	MEZZ DINING	590	150	25.4%
TOTAL AIRFLOW		12,380	3,005	24.3%
EXHAUST EQUIPMENT	AREA/EQUIPMENT SERVED	AREA...		EXHAUST (CFM)
ERV-1	RR			1000
TOTAL EXHAUST				1,000
TOTAL DINING POSITIVE/NEGATIVE AIR FLOW				2005
PERCENT POSITIVE/NEGATIVE AIR FLOW				66.7%

NOTES:
1. OUTSIDE AIRFLOW VALUES TAKEN FROM APPLICABLE CODE STANDARDS.
* UNIT SHUTS DOWN WHEN PATIO WINDOWS ARE OPEN.

OUTSIDE AIR REQUIREMENTS, 2023 FBC - MECHANICAL 8TH EDITION

SYSTEM DESIGNATION	SYSTEM TAB NAME OR LIST 'SINGLE'	SINGLE-ZONE SYSTEMS ONLY: SINGLE-ZONE SYSTEM ASSOCIATED VENTILATION ZONE	SINGLE-ZONE SYSTEMS ONLY: SINGLE ZONE WORST CASE ZONE AIR DISTRIBUTION EFFECTIVENESS [Ez]	MULTI-ZONE SYSTEMS ONLY: SYSTEM VENTILATION EFFICIENCY [Ev]	FLOOR AREA SERVED BY SYSTEM [Aa] (SF)	SYSTEM AVERAGED AREA-BASED OUTDOOR AIR RATE (CFM/SF)	SYSTEM POPULATION [Ps] (PEOPLE)	SYSTEM AVERAGED PEOPLE-BASED OUTDOOR AIR RATE (CFM/P)	REQUIRED OA INTAKE FLOW [Vot] (CFM)	REQUIRED DCV OA INTAKE FLOW [Vot] (CFM)	DESIGN OA INTAKE FLOW [Vot] (CFM)	NOTES
DOAS-1	100%OA (DOAS-1)	-	-		1,523	0.150	26.26	9.38	475	N/A	6,000	C
(E)RTU-2	MULTIZONE (ERTU-2)	-	-	0.92	2,932	0.135	118	7.50	1,389	N/A	1,400	-
(E)AHU-2	MULTIZONE (EAHU-2)	-	-	0.93	1,471	0.177	84	7.50	957	N/A	960	-
(E)AHU-2.1/AHU-8/AHU-9	SINGLE ZONE	MEZZ DINING	0.80	-	824	0.180	44	7.50	598	N/A	600	-
AHU-6	SINGLE ZONE	MANAGERS OFFICE	0.80	-	62	0.060	2	5.00	17	N/A	20	-
AHU-7	SINGLE ZONE	EMPLOYEE AREA	0.80	-	62	0.060	3.1	5.00	24	N/A	25	-
								TOTALS	3,460	0	9,005	

GENERAL NOTES:
1. VENTILATION CALCULATIONS BASED ON IMC-2021.
2. SYSTEM POPULATIONS BASED ON MAX SEATING AND/OR CODE MAXIMUM VALUES.
3. SINGLE ZONE SYSTEMS (Vot = Voz): SYSTEM VENTILATION EFFICIENCY CALCULATION IS NOT REQUIRED FOR SINGLE ZONE SYSTEMS. WORST CASE AIR DISTRIBUTION EFFECTIVENESS BETWEEN HEATING AND COOLING MODES OF OPERATION IS SHOWN IN TABLE.
4. 100% OA SYSTEMS (Vot = ΣAll zones Voz): WHEN ONE AIR HANDLER SUPPLIES ONLY OUTDOOR AIR TO ONE OR MORE ZONES. EACH ZONE IS INDIVIDUALLY CALCULATED WITH ITS WORST CASE ZONE AIR DISTRIBUTION EFFECTIVENESS (HEATING/COOLING).
5. MULTI-ZONE RECIRCULATING SYSTEMS: CALCULATOR USED TO DETERMINE VENTILATION AIRFLOW IN COMPLIANCE WITH 2023 FBC-M VRP AND ASHRAE 62.1-2019 APPENDIX A. VENTILATION RATE SHOWN IS ACTUAL CALCULATED WITH CORRECTION FACTORS INCLUDED. EACH ZONE IS CALCULATED WITH ITS WORST CASE ZONE AIR DISTRIBUTION EFFECTIVENESS (HEATING/COOLING) AS PART OF CALCULATIONS TO FIND Ev.

NOTES:
C. AIRFLOW IS FOR EXHAUST MAKEUP AS REQUIRED BY THE VENTILATION STANDARD.

MINI SPLIT INDOOR UNIT SCHEDULE (DUCTLESS)

MARK	MANUFACTURER	MODEL	UNIT TYPE	ASSOCIATED OUTDOOR UNIT	FLOW (CFM)	COOLING EAT (°F DB)	COOLING EAT (°F WB)	ELECTRICAL V/PH	ELECTRICAL MCA	ELECTRICAL MOCP	WEIGHT (LBS)	NOTES
AHU 10	MITSUBISHI	MSY-GS36	WAL MOUNT	CU 5	500	53	52	208 V / 1PH	1	15	50.00	A-I

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:

A. UNITS ARE OWNER FURNISHED, CONTRACTOR INSTALLED.
B. ASSOCIATED CONDENSING UNIT SHALL BE BY THE SAME MANUFACTURER.
C. PROVIDE UNIT WITH CLEANABLE AIR FILTERS.
D. PROVIDE WITH 7-DAY PROGRAMMABLE THERMOSTAT WITH STAGED HEATING AND COOLING CAPABILITY AS REQUIRED FOR OPERATION OF HEATING AND COOLING CONTROLS.
E. DISCONNECT SWITCH FURNISHED BY DIVISION 26 CONTRACTOR.
F. FCU POWERED BY OUTDOOR UNIT CU-1. COORDINATE CIRCUITING REQUIREMENTS WITH ELECTRICAL CONTRACTOR.
G. PROVIDE WITH SPRING VIBRATION ISOLATION AND ALL-THREAD HANGING RODS.
H. INSTALL PER MANUFACTURERS INSTALLATION REQUIREMENTS.
I. REFERENCE PLUMBING PLANS FOR CONDENSATE DRAIN PIPING FROM UNIT.

MINI SPLIT OUTDOOR UNIT SCHEDULE

MARK	MANUFACTURER	MODEL	ASSOCIATED INDOOR UNIT	REFR TYPE	COOLING AMBIENT (°F DB)	COOLING TH (MBH)	COOLING SH (MBH)	MIN EFFICIENCY (EER)	MIN EFFICIENCY (SEER)	ELECTRICAL V/PH	ELECTRICAL MCA	ELECTRICAL MOCP	WEIGHT (LBS)	NOTES
CU 5	MITSUBISHI	MUY-G36	AHU 10	R410A	97	33.2	22.9	8.8	16.2	208 V / 1PH	19	20	130.00	A-J

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:

A. UNITS ARE OWNER FURNISHED, CONTRACTOR INSTALLED.
B. EQUIPMENT CAPACITY SCHEDULED IS MINIMUM CAPACITY THAT MUST BE PROVIDED AT AMBIENT TEMPERATURE INDICATED.
C. CONTRACTOR SHALL VERIFY WITH EQUIPMENT SUPPLIER EXACT QUANTITY AND SIZE OF REFRIGERANT PIPING.
D. PROVIDE LIQUID LINE FILTER DRYER AND SIGHT GLASS.
E. PROVIDE FLORIDA APPROVED NOA PREFABRICATED EQUIPMENT SUPPORT RAILS WITH MINIMUM HEIGHT REQUIRED TO MAINTAIN BOTTOM OF EQUIPMENT A MINIMUM OF 8 INCHES ABOVE FINISHED ROOF SURFACE. COORDINATE WITH ROOF INSULATION THICKNESS AND ROOF TAPER AT INSTALLED LOCATION.
F. DISCONNECT SWITCH FURNISHED BY DIVISION 26 CONTRACTOR.
G. STARTERS FOR ALL MOTORS SHALL BE FURNISHED INTEGRAL WITH UNIT.
H. COORDINATE SIZE OF CONDUCTOR TERMINATION LUGS WITH CONDUCTOR SIZES SHOWN ON ELECTRICAL DRAWINGS.
I. PROVIDE CONDENSER COIL HAIL GUARDS.
J. PROVIDE A FACTORY APPLIED COIL CORROSION COATING TO CONDENSER COIL WHICH IS CAPABLE OF WITHSTANDING GREATER THAN 6,000 HOURS OF THE ASTM B117 SALT SPRAY TEST.

ASHRAE 15-2022 COMPLIANCE CALCULATOR

WORST CASE ROOM NAME x	OUTDOOR UNIT MARK	OCCUPANCY CLASSIFICATION	REFRIGERATING SYSTEM CLASSIFICATION	REFRIGERATING SYSTEM LEAK PROBABILITY	OCCUPANCY ADJUSTMENT FACTOR	REFRIGERANT TYPE	REFRIGERANT GROUP	RCL: REFRIGERANT CONCENTRATION LIMIT (LB/1,000 CU FT)	RCL ADJUSTED FOR ALTITUDE (LB/1,000 CU FT)	LFL: LOWER FLAMMABILITY LIMIT (LB/1,000 CU FT)	RELATIVE MOLAR MASS (M) (UNITLESS)	ROOM AREA (SQ FT)	ROOM HEIGHT (FT)	PLENUM HEIGHT (FT)	ROOM VOLUME (CU FT)	CONNECTED TO CRITICAL ROOM?	CONNECTED CRITICAL ROOM NAME	ADDITIONAL ROOM AREA (SQ FT)	ADDITIONAL ROOM VOLUME (CU FT)	EFFECTIVE DISPERSAL VOLUME (Veff) (CU FT)	MIN. VENT AREA (Avent) (SQ FT)	EFFECTIVE DISPERSAL CHARGE INDIV. ROOM (EDVC) (LBS)	TOTAL EFFECTIVE DISPERSAL VOLUME CHARGE (EDVC) (LBS)	ACTUAL SYSTEM REFRIGERANT CHARGE (mnel) (LBS)	ACTUAL REF. CHARGE COMPLIES?
MANAGERS OFFICE	CU-4	COMMERCIAL	DIRECT	HIGH	1.0	410A	A1	26.0	26.0	-	72.6	63	7.5		473			86	647	1,119	0.1	12.3	29.1	15.2	YES
EMPLOYEE AREA/CORRIDOR	CU-4	COMMERCIAL	DIRECT	HIGH	1.0	410A	A1	26.0	26.0	-	72.6	86	7.5		647	YES	MANAGERS OFFICE	--	--	--	--	--	--	--	--

NOTES:
A. PLENUMS: SPACE ABOVE SUSPENDED CEILING SHALL NOT BE INCLUDED IN CALCULATING THE REFRIGERANT QUANTITY LIMIT IN THE SYSTEM UNLESS SUCH SPACE IS PART OF THE AIR SUPPLY OR RETURN SYSTEM. (SECTION 7.2.3.3.2)

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MECHANICAL SCHEDULES

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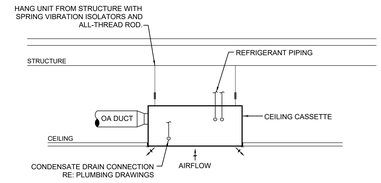
NOTES:

1. ARRANGEMENT SHOWN IS SCHEMATIC, ADJUST TO SUIT FIELD CONDITIONS AND MEET LOCAL CODE REQUIREMENTS.
2. PROVIDE MINIMUM 3.5" OF CLEARANCE AT THE TOP OF THE UNIT.
3. ATTACH FAN COIL UNIT TO MANUFACTURER'S PROVIDED INSTALLATION PLATE. MOUNT INSTALLATION PLATE TO WALL PER MANUFACTURER'S RECOMMENDATIONS.

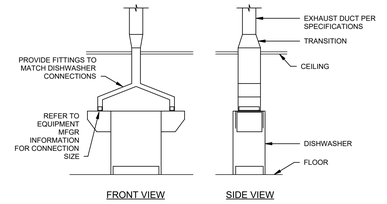
15 VRF WALL-MOUNTED UNIT DETAIL
12" = 1'-0"



NOTES:

1. ARRANGEMENT SHOWN IS SCHEMATIC, ADJUST TO SUIT FIELD CONDITIONS AND MEET LOCAL CODE REQUIREMENTS.

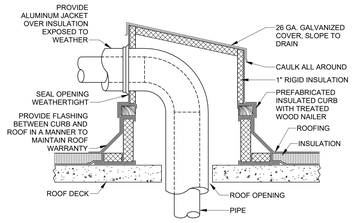
14 VRF CEILING CASSETTE DETAIL
12" = 1'-0"



NOTES:

1. COORDINATE EXACT LOCATION OF MECHANICAL CONNECTIONS WITH KITCHEN EQUIPMENT.

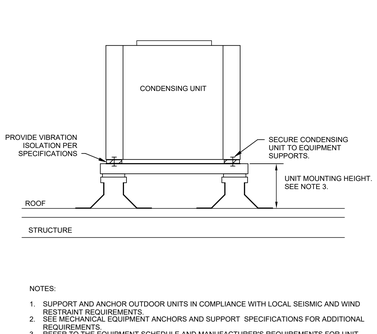
13 DISHWASHER EXHAUST DUCT DETAIL
NTS



NOTES:

1. FOR MULTIPLE PIPES, PROVIDE ONE ENCLOSURE, WHERE FEASIBLE.

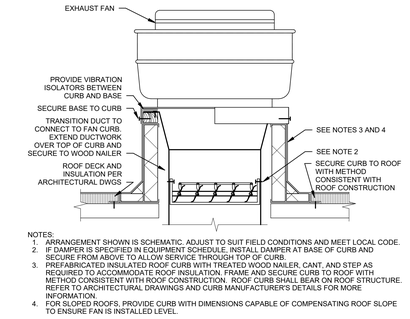
12 PIPE ROOF PENETRATION ENCLOSURE DETAIL
NTS



NOTES:

1. SUPPORT AND ANCHOR OUTDOOR UNITS IN COMPLIANCE WITH LOCAL SEISMIC AND WIND RESTRAINT REQUIREMENTS.
2. SEE MECHANICAL EQUIPMENT ANCHORS AND SUPPORT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. REFER TO THE EQUIPMENT SCHEDULE AND MANUFACTURER'S REQUIREMENTS FOR UNIT MOUNTING HEIGHT.

11 CONDENSING UNIT SUPPORT DETAIL
NTS

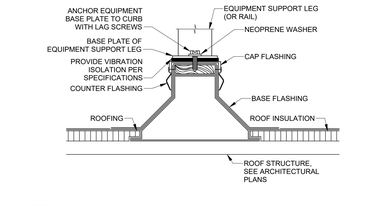


NOTES:

1. ARRANGEMENT SHOWN IS SCHEMATIC, ADJUST TO SUIT FIELD CONDITIONS AND MEET LOCAL CODE.
2. IF DAMPER IS SPECIFIED IN EQUIPMENT SCHEDULE, INSTALL DAMPER AT BASE OF CURB AND SECURE FROM ABOVE TO ALLOW SERVICE THROUGH TOP OF CURB.
3. PREFABRICATED INSULATED ROOF CURB WITH TREATED WOOD NAILER, CANT, AND STEP AS REQUIRED TO ACCOMMODATE ROOF INSULATION. FRAME AND SECURE CURB TO ROOF WITH METHOD CONSISTENT WITH ROOF CONSTRUCTION. ROOF CURB SHALL BEAR ON ROOF STRUCTURE. REFER TO ARCHITECTURAL DRAWINGS AND CURB MANUFACTURER'S DETAILS FOR MORE INFORMATION.
4. FOR SLOPED ROOFS, PROVIDE CURB WITH DIMENSIONS CAPABLE OF COMPENSATING ROOF SLOPE TO ENSURE FAN IS INSTALLED LEVEL.

HIGH WIND STRAPPING: PROVIDE STAINLESS STEEL STRAPS OF LENGTH, WIDTH, THICKNESS, AND SPACING SUFFICIENT TO SECURE FAN TO CURB TO WITHSTAND WIND SPEED REQUIREMENTS PER LOCAL CODE. WRAP STRAPS OVER FAN AND SECURELY ATTACH TO OPPOSITE SIDE OF THE CURB.

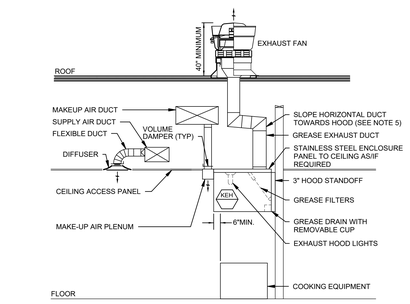
10 ROOF MOUNTED UPBLAST FAN DETAIL
NTS



NOTES

1. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR EQUIPMENT SUPPORTS, ANCHORING AND SEISMIC/WIND RESISTANCE.

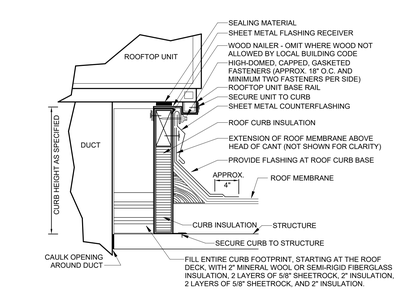
9 ROOF EQUIPMENT SUPPORT RAIL DETAIL
NTS



NOTES:

1. SUBMIT SHOP DRAWINGS OF ALL HOOD SYSTEMS TO CITY FOR APPROVAL PRIOR TO INSTALLATION.
2. TOTAL HOOD SYSTEM TO BE IN COMPLETE CONFORMANCE WITH NFPA, AND ALL LOCAL CODES AND REGULATIONS.
3. COORDINATE ALL FIRE PROTECTION SYSTEMS WITH FIRE PROTECTION CONTRACTOR WHO SHALL ALSO BE RESPONSIBLE FOR ALL PERMITS AND TESTING REQUIRED.
4. PROVIDE WRAP SYSTEM WHERE APPROVED BY LOCAL CODES IN LIEU OF RATED ENCLOSURE
5. PROVIDE ACCESS PANELS AS REQUIRED BY LOCAL CODE AND PER PLAN.
6. HOODS SHALL EXTEND MINIMUM 6" BEYOND ALL OPEN SIDES AND FRONT EDGE OF FOOD COOKING EQUIPMENT BEING SERVED.

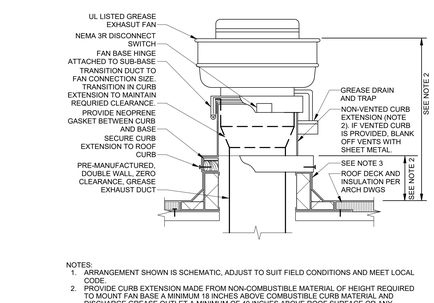
8 KITCHEN EXHAUST HOOD ELEVATION DETAIL
NTS



NOTES:

1. CUT METAL DECKING TO ALLOW CURB INSTALLATION ON STEEL FRAMING. AFTER CURB IS SET IN PLACE, TRIM REMAINING METAL DECKING AND INSTALL WITHIN CURB. TACK WELD DECKING TO SUPPORT STEEL. DO NOT WELD INTERIOR DECKING TO ROOF CURB. PROVIDE ADDITIONAL CROSS FRAMING TO SUPPORT INTERIOR DECKING AND FILL MATERIAL AS REQUIRED.
2. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR ROOF CURBS, ANCHORING AND SEISMIC/WIND RESISTANCE.

7 ROOF CURB DETAIL
NTS

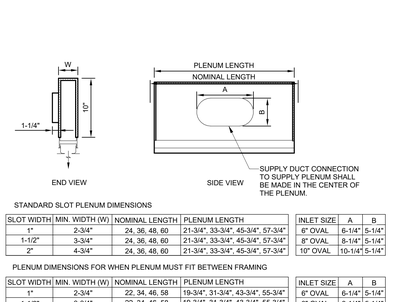


NOTES:

1. ARRANGEMENT SHOWN IS SCHEMATIC, ADJUST TO SUIT FIELD CONDITIONS AND MEET LOCAL CODE.
2. PROVIDE CURB EXTENSION MADE FROM NON-COMBUSTIBLE MATERIAL OF HEIGHT REQUIRED TO MOUNT FAN BASE A MINIMUM 18 INCHES ABOVE COMBUSTIBLE CURB MATERIAL AND DISCHARGE GREASE OUTLET A MINIMUM OF 40 INCHES ABOVE ROOF SURFACE OR ANY ADJACENT BUILDING STRUCTURE WITHIN 10 FEET OF OUTLET, WHICHEVER IS HIGHER.
3. PREFABRICATED INSULATED ROOF CURB WITH TREATED WOOD NAILER, CANT, AND STEP AS REQUIRED TO ACCOMMODATE ROOF INSULATION. FRAME AND SECURE CURB TO ROOF WITH METHOD CONSISTENT WITH ROOF CONSTRUCTION. ROOF CURB SHALL BEAR ON ROOF STRUCTURE. FOR SLOPED ROOFS, PROVIDE CURB WITH DIMENSIONS CAPABLE OF COMPENSATING ROOF SLOPE TO ENSURE FAN IS INSTALLED LEVEL. REFER TO ARCHITECTURAL DRAWINGS AND CURB MANUFACTURER'S DETAILS FOR MORE INFORMATION.

HIGH WIND STRAPPING: PROVIDE STAINLESS STEEL STRAPS OF LENGTH, WIDTH, THICKNESS, AND SPACING SUFFICIENT TO SECURE FAN TO CURB TO WITHSTAND WIND SPEED REQUIREMENTS PER LOCAL CODE. WRAP STRAPS OVER FAN AND SECURELY ATTACH TO OPPOSITE SIDE OF THE CURB.

6 UPBLAST GREASE EXHAUST FAN DETAIL
NTS



STANDARD SLOT PLENUM DIMENSIONS

SLOT WIDTH	MIN. WIDTH (W)	NOMINAL LENGTH	PLENUM LENGTH
1"	2-3/4"	24, 36, 48, 60	21-3/4", 33-3/4", 45-3/4", 57-3/4"
1-1/2"	3-3/4"	24, 36, 48, 60	21-3/4", 33-3/4", 45-3/4", 57-3/4"
2"	4-3/4"	24, 36, 48, 60	21-3/4", 33-3/4", 45-3/4", 57-3/4"

INLET SIZE	A	B
6" OVAL	6-1/4"	5-1/4"
8" OVAL	8-1/4"	5-1/4"
10" OVAL	10-1/4"	5-1/4"

PLENUM DIMENSIONS FOR WHEN PLENUM MUST FIT BETWEEN FRAMING

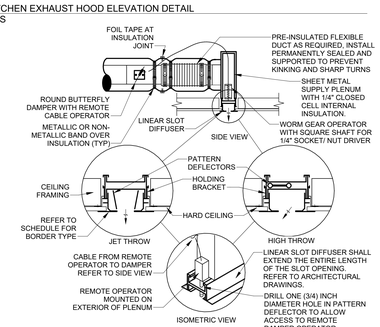
SLOT WIDTH	MIN. WIDTH (W)	NOMINAL LENGTH	PLENUM LENGTH
1"	2-3/4"	22, 34, 46, 58	19-3/4", 31-3/4", 43-3/4", 55-3/4"
1-1/2"	3-3/4"	22, 34, 46, 58	19-3/4", 31-3/4", 43-3/4", 55-3/4"
2"	4-3/4"	22, 34, 46, 58	19-3/4", 31-3/4", 43-3/4", 55-3/4"

INLET SIZE	A	B
6" OVAL	6-1/4"	5-1/4"
8" OVAL	8-1/4"	5-1/4"
10" OVAL	10-1/4"	5-1/4"

NOTES:

1. PLENUM MAY BE MOUNTED ON LINEAR SLOT DIFFUSER OR ARCHITECTURAL SLOT.
2. PROVIDE 1/4" THICK, INTERNAL, CLOSED CELL INSULATION ON ALL PLENUMS.
3. MINIMUM WIDTH INCLUDES 1/4" CLOSED CELL INTERNAL INSULATION.
4. COVE SLOT PLENUM CONSTRUCTION DIMENSIONS TO BE USED FOR PLENUMS SUPPLYING OUT OF LIGHT COVES ONLY.
5. COVE SLOT PLENUMS SHALL BE CONSTRUCTED TO FIT BETWEEN SLOT FRAMING AT 24", 36", 48" OR 60" ON CENTER.

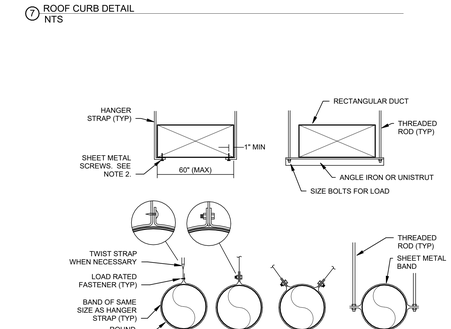
5 SUPPLY PLENUM CONSTRUCTION DETAIL
NTS



NOTES:

1. EXTEND HARD METAL DUCT SO THAT MAXIMUM FLEXIBLE DUCT LENGTH DOES NOT EXCEED 5'-0". PROVIDE RIGID 90° ELBOW WHERE REQUIRED TO KEEP FLEXIBLE DUCT WITHIN 5'-0" LENGTH LIMITATION.
2. COORDINATE EXACT LENGTH AND LOCATION OF SLOT DIFFUSER WITH ARCHITECT'S REFLECTED CEILING PLAN.
3. REFER TO DIFFUSER MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR EACH SCHEDULED BORDER TYPE.
4. REFER TO SPECIFICATIONS FOR FLEXIBLE DUCTWORK INSTALLATION REQUIREMENTS.

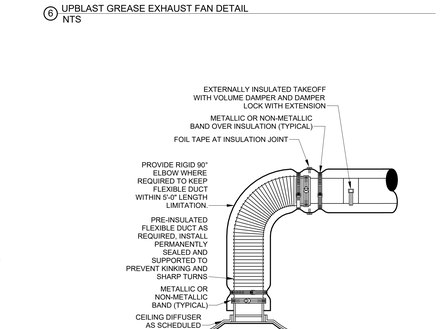
4 LINEAR SLOT DIFFUSER IN GYP CEILING DETAIL
NTS



NOTES:

1. USE THREADED ROD FOR RECTANGULAR DUCTS LARGER THAN 60" WIDE.
2. OMIT SHEET METAL SCREWS IF HANGER STRAP IS CONTINUOUS AND LOOPS UNDER ENTIRE RECTANGULAR DUCT.
3. FOR ROUND DUCTS LARGER THAN 36"Ø, USE TWO HANGER RODS TO SUPPORT DUCT FROM EACH SIDE.
4. HANGERS MUST NOT DEFORM DUCT SHAPE.

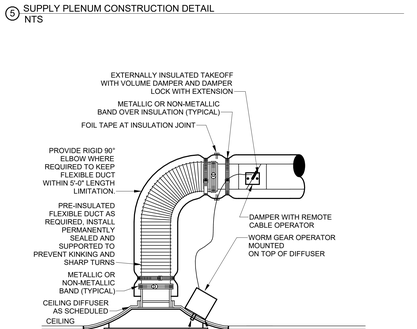
3 DUCT HANGER LOWER ATTACHMENT DETAILS
NTS



NOTES:

1. FLEXIBLE DUCT LENGTH MAY NOT EXCEED 5'-0". EXTEND RIGID DUCT AS REQUIRED.
2. REFER TO SPECIFICATIONS FOR FLEXIBLE DUCTWORK INSTALLATION REQUIREMENTS.

2 CEILING DIFFUSER DETAIL
NTS



NOTES:

1. FLEXIBLE DUCT LENGTH MAY NOT EXCEED 5'-0". EXTEND RIGID DUCT AS REQUIRED.
2. PROVIDE WORM GEAR OPERATOR AND DAMPER WITH REMOTE CABLE FOR DAMPERS ABOVE HARD CEILINGS.
3. REFER TO SPECIFICATIONS FOR FLEXIBLE DUCTWORK INSTALLATION REQUIREMENTS.

1 CEILING DIFFUSER DETAIL
NTS

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TEL 913.742.5000 FAX 913.742.5001
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FL REGISTRY NO. EB 7606
EXPIRES 2/28/2026

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LICENSE # 86060

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NO.	BY	DATE	DESCRIPTION
1		01.10.2025	PERMIT TI

CACTUS CLUB CAFE

MIAMI BEACH

850 COMMERCE ST
MIAMI BEACH, FL 33139

MECHANICAL DETAILS

DRAWN BY:	HEI
REVIEWED BY:	HEI
JOB NO:	20240136

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COMcheck Software Version COMcheckWeb

Mechanical Compliance Certificate

Project Information

Energy Code:	90.1 (2019) Standard
Project Title:	Cactus Club Cafe Miami Beach
Location:	Miami Beach, Florida
Climate Zone:	1a
Project Type:	New Construction

Construction Site:
850 Commerce Street
Miami Beach, Florida 33139

Owner/Agent:
Cactus Club Cafe

Designer/Contractor:
Henderson Engineers
8345 Lenexa Dr
Lenexa, Kansas 66214
9137425453

Mechanical Systems List

Quantity **System Type & Description**

1 DOAS-1 (Single Zone):
Heating: 1 each - Other, Electric, Capacity = 243 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Single Package DX Unit, Capacity = 485 kBtu/h, Air-Cooled Condenser
Proposed Efficiency = 10.00 EER, Required Efficiency = 10.00 EER
Proposed Part Load Efficiency = 17.10 IEER, Required Part Load Efficiency = 13.20 IEER
Fan System: DOAS FAN SYSTEM 1 -- compliance (Brake HP and fan efficiency method) : Passes

Fans:
FAN 1 Supply, Single-Zone VAV, 6000 CFM, 7.5 motor nameplate hp, 3.2 design brake hp (5.0 max. BHP), 0.95 fan energy index

1 CU-4 (Unknown):
VRF Condensing Unit, Air Cooled Heat Pump
Heating Mode: Capacity = 23 kBtu/h,
Proposed Efficiency = 7.70 HSPF, Required Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 34 kBtu/h,
Proposed Efficiency = 14.50 SEER, Required Efficiency = 13.00 SEER
Proposed Part Load Efficiency = 0.00 , Required Part Load Efficiency = 0.00
Fan System: None

1 AHU-6 (Single Zone):
Cooling: 1 each - VRF Zone Fan Unit, Capacity = 6 kBtu/h
No minimum efficiency requirement applies
Fan System: FAN SYSTEM 6 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
FAN 6 Supply, Single-Zone VAV, 260 CFM, 0.1 motor nameplate hp, 0.00 fan energy index , fan exception: Single fan < 1 HP or < 0.89 kW

1 AHU-7 (Single Zone):
Cooling: 1 each - VRF Zone Fan Unit, Capacity = 4 kBtu/h
No minimum efficiency requirement applies
Fan System: FAN SYSTEM 7 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
FAN 7 Supply, Single-Zone VAV, 230 CFM, 0.1 motor nameplate hp, 0.00 fan energy index , fan exception: Single fan < 1 HP or < 0.89 kW

1 AHU-8 (Single Zone):
Cooling: 1 each - VRF Zone Fan Unit, Capacity = 23 kBtu/h
No minimum efficiency requirement applies

Quantity **System Type & Description**

Fan System: FAN SYSTEM 8 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
FAN 8 Supply, Single-Zone VAV, 570 CFM, 0.1 motor nameplate hp, 0.00 fan energy index , fan exception: Single fan < 1 HP or < 0.89 kW

1 AHU-9 (Single Zone):
Cooling: 1 each - VRF Zone Fan Unit, Capacity = 23 kBtu/h
No minimum efficiency requirement applies
Fan System: FAN SYSTEM 9 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
FAN 9 Supply, Single-Zone VAV, 570 CFM, 0.1 motor nameplate hp, 0.00 fan energy index , fan exception: Single fan < 1 HP or < 0.89 kW

1 CU-5 (Single Zone):
Cooling: 1 each - Split System, Capacity = 33 kBtu/h, Air-Cooled Condenser
Proposed Efficiency = 16.20 SEER2, Required Efficiency = 13.40 SEER2
Proposed Part Load Efficiency = 0.00 , Required Part Load Efficiency = 0.00
Fan System: FAN SYSTEM 10 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
FAN 6 Supply, Single-Zone VAV, 500 CFM, 0.3 motor nameplate hp, 0.00 fan energy index , fan exception: Single fan < 1 HP or < 0.89 kW

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design 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 (2019) Standard requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Cesar Giron — Name - Title
Cesar Giron — Signature
01/06/2025 — Date

COMcheck Software Version COMcheckWeb

Inspection Checklist

Energy Code: 90.1 (2019) Standard

Requirements: 100.0% were addressed directly in the COMcheck 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][1]	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.
4.2.5.2 [PR5][1]	Commissioning shall be performed as stated in Sections 5.9.2, 6.9.2, 7.9.2, 8.9.2, 9.9.2, 10.9.2, 11.2(d), and G1.2.1(c). Commissioning must utilize ASHRAE/IES Standard 202 or other generally accepted engineering standards acceptable to the building official. FPT and verification requirements for commissioning are as stated in Section 4.2.5.1. Commissioning shall document compliance of the building systems, controls, and building envelope with required provisions of this standard. Commissioning requirements shall be incorporated into the construction documents.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Buildings, additions, or alterations with less than 10,000 ft2 of conditioned space and combined heating, cooling, and service water heating equipment totaling less than 960,000 Btuh in capacity.

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
6.4.3.7 [FO3][1]	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][1]	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][1]	Stair and elevator shaft vents have motorized dampers that automatically close.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.4.3.4.5 [ME39][1]	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][1]	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.
6.4.3.8 [ME6][1]	Demand control ventilation provided for spaces >500 ft2 and >25 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	Requirement will be met.
6.5.3.2.1 [ME40][1]	DX cooling systems >= 75 kBtu/h (>= 65 kBtu/h effective 1/2016) and chilled-water and evaporative cooling fan motor hp >= ½ designed to vary supply fan airflow as a function of load and comply with operational requirements.			☐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][1]	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][1]	HVAC ducts and plenums insulated per Table 6.8.2. 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][1]	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.
6.4.4.1.4 [ME41][1]	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][1]	Ducts and plenums having pressure class ratings are Seal Class A construction.			☐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
6.8.1-15, 6.8.1-16 [ME110][1]	Electrically operated DX-DOAS units meet requirements per Tables 6.8.1-15 or 6.8.1-16.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.4.2.2 [ME11][1]	Ductwork operating >3 in. water column requires air leakage testing.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.2.3 [ME19][1]	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.
6.5.2.4.1 [ME68][1]	Humidifiers with airstream mounted preheating jackets have preheat auto-shutoff value set to activate when humidification is not required.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.2.4.2 [ME69][1]	Humidification system dispersion tube hot surfaces in the airstreams of ducts or air-handling units insulated >= R-0.5.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.2.5 [ME70][1]	Preheat coils controlled to stop heat output whenever mechanical cooling, including economizer operation, is active.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.5.2.6 [ME106][1]	Units that provide ventilation air to multiple zones and operate in conjunction with zone heating and cooling systems are prevented from using heating or heat recovery to warm supply air above 60°F when representative building loads or outdoor air temperature indicate that most zones demand cooling.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.4.7 [ME107][1]	Chilled-water cooling coils provide a 15°F or higher temperature difference between leaving and entering water temperatures and a minimum of 57°F leaving water temperature at design conditions			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.3.1.3 [ME74][1]	Fans have efficiency grade (FEG) >= 67. The total efficiency of the fan at the design point of operation <= 15% of maximum total efficiency of the fan.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.5.3.6 [ME72][1]	Motors for fans >= 1/12 hp and < 1 hp are electronically-commutated motors or have a minimum motor efficiency of 70%. These motors are also speed adjustable for either balancing or remote control.			☐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
6.5.3.4 [ME108][1]	Parallel-flow fan-powered VAV air terminals have automatic controls to a) turn off the terminal fan except when space heating is required or if required for ventilation; b) turn on the terminal fan as the first stage of heating before the heating coil is activated; and c) during heating for warmup or setback temperature control, either operate the terminal fan and heating coil without primary air or reverse the terminal damper logic and provide heating from the central air handler through primary air.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.3.7 [ME109][1]	Required minimum outdoor air rate is the larger of minimum outdoor air rate or minimum exhaust air rate required by Standard 62.1, Standard 170, or applicable codes or accreditation standards. Outdoor air ventilation systems shall comply with one of the following: a) design minimum system outdoor air provided < 135% of the required minimum outdoor air rate, b) dampers, ductwork, and controls allow the system to supply <= the required minimum outdoor air rate with a single set-point adjustment., or c) system includes exhaust air energy recovery complying with Section 6.5.6.1.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.5.3.3 [ME42][1]	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.*
6.5.4.2 [ME25][1]	HVAC pumping systems with >= 3 control valves designed for variable fluid flow (see section details).			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.7.1 [ME100][1]	Conditioned supply air to space with mechanical exhaust <= the greater of criteria of supply flow, required ventilation rate, exhaust flow minu the available transfer air (see section details).			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.5.7.2.1 [ME32][1]	Kitchen hoods >5,000 cfm have make up air >=50% of exhaust air volume.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.5.7.2.4 [ME49][1]	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.

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
6.5.8.1 [ME34][1]	Unenclosed spaces that are heated use only radiant heat.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.9 [ME35][1]	Hot gas bypass limited to: <=240 kBtu/h - 15% >240 kBtu/h - 10%			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.9 [ME63][1]	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperatures > 45F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint <= 60F and cooling setpoint >= 80F.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
6.5.10 [ME73][1]	Doors separating conditioned space from the outdoors have controls that disable/reset heating and cooling system when open.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Building entrances have automatic closing devices.

Additional Comments/Assumptions:

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

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
8.4.2 [EL10][1]	At least 50% of all 125 volt 15- and 20-Amp receptacles are controlled by an automatic control device.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
8.4.3 [EL11][1]	New buildings have electrical energy use measurement devices installed. Where tenant spaces exist, each tenant is monitored separately. In buildings with a digital control system the energy use is transmitted to to control system and displayed graphically.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Individual tenant spaces less than 10,000 ft2.
10.4.1 [EL9][1]	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][1]	Thermostatic controls have a 5 °F deadband.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.2 [FI20][1]	Temperature controls have setpoint overlap restrictions.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.3.1 [FI21][1]	HVAC systems equipped with at least one automatic shutdown control.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Systems designed for continuous operation.
6.4.3.3.2 [FI22][1]	Setback controls allow automatic restart and temporary operation as required for maintenance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.5 [FI5][1]	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.4.3.6 [FI6][1]	When humidification and dehumidification are provided to a zone, simultaneous operation is prohibited. Humidity control prohibits the use of fossil fuel or electricity to produce RH > 30% in the warmest zone humidified and RH < 60% in the coldest zone dehumidified.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.7.2.1 [FI7][1]	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.7.2.2 [FI8][1]	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
6.7.2.3 [FI9][1]	An air and/or hydronic system balancing report is provided for HVAC systems serving zones >5,000 ft2 of conditioned area.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
10.4.3 [FI24][1]	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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CACTUS CLUB CAFE

MIAMI BEACH

850 COMMERCE ST
MIAMI BEACH, FL 33139

MECHANICAL ENERGY COMPLIANCE

DRAWN BY: HEI
REVIEWED BY: HEI
JOB NO: 20240136

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Division 23: HEATING, VENTILATING, AND AIR CONDITIONING

1. GENERAL INSTRUCTIONS

A. GENERAL REQUIREMENTS

All requirements under Division 01 and the general and supplementary conditions of these specifications apply to this section and division. Where the requirements of this section and division exceed those of Division 01, this section and division take precedence. Become thoroughly familiar with all its contents as to requirements that affect this division, section, or both. Work required under this division includes all material, equipment, appliances, transportation, services, and labor required to complete the entire system as required by the drawings and specifications, or reasonably inferred to be necessary to facilitate the function of each system as implied by the design and the equipment specified.

The specifications and drawings for the project are complementary, and any portion of work described in one shall be provided as if described in both. In the event of discrepancies, notify the Engineer and request clarification prior to proceeding with the work involved.

Drawings are graphic representations of the work upon which the contract is based. They show the materials and their relationship to one another, including sizes, shapes, locations, and connections. They convey the scope of work, indicating the intended general arrangement of the systems without showing all of the exact details as to elevations, offsets, control lines, and other installation requirements. Use the drawings as a guide when laying out the work and to verify that materials and equipment will fit into the designated spaces, and which when installed per manufacturers' requirements, will ensure a complete, coordinated, satisfactory, and properly operating system.

B. DEFINITIONS

Division: References contained in this specification follow the numbering system defined in the Construction Specifications Institute (CSI) MasterFormat 2004 Edition. Specification Divisions 01 through 13 provided with this project may reference the CSI MasterFormat 1995 Edition. The corresponding division references between the 2004 Edition and 1995 Edition are as follows:

2004 Edition		1995 Edition
1.	Division 21 – Fire Suppression	Division 15
2.	Division 22 – Plumbing	Division 15
3.	Division 23 – HVAC	Division 15
4.	Division 26 – Electrical	Division 16
5.	Division 27 – Communications	Division 16
6.	Division 28 – Electronic Safety and Security	Division 16

Furnish: "to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations."

Install: "to perform all operations at the project site including, but not limited to, the actual unloading, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, testing, commissioning, starting up and similar operations, complete, and ready for the intended use."

Provide: "to furnish and install."

Furnished by Owner (or Owner-Furnished) or Furnished by Others: "an item furnished by the Owner or under other divisions or contracts, and installed under the requirements of this division, complete and ready for intended use, including all items and services incidental to the work necessary for proper installation and operation. Include the installation under the warranty required by this division."

Engineer: Where referenced in this division, "Engineer" is the Engineer of Record and the Design Professional for the work under this division, and is a consultant to, and an authorized representative of the Architect, as defined in the General and/or Supplementary Conditions. When used in this division, Engineer means increased involvement by and obligations to the Engineer, in addition to involvement by and obligations to the Architect.

AHJ: The local code and/or inspection agency (Authority) Having Jurisdiction over the work.

NRTL: Nationally recognized testing laboratory, as defined and listed by OSHA in 29 CFR 1910.7 (e.g., UL, ETL, CSA), and acceptable to the AHJ over this project. Nationally recognized testing laboratories and standards listed are used only to represent the characteristics required and are not intended to restrict the use of other NRTLs that are acceptable to the AHJ and standards that meet the specified criteria.

Substitution: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor. Substitutions include Value Engineering proposals.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

The terms "approved equal", "equivalent", or "equal" are used synonymously and shall mean "accepted by or acceptable to the Engineer as equivalent to the item or manufacturer specified". The term "approved" shall mean labeled, listed, or both, by an NRTL, and acceptable to the AHJ over this project.

C. MATERIAL AND WORKMANSHIP

Provide new material, equipment, and apparatus under this contract unless otherwise stated herein, of best quality normally used for the purpose in good commercial practice, and free from defects. Install material and equipment in accordance with the manufacturer's installation instructions. Model numbers listed in the specifications or shown on the drawings are not necessarily intended to designate the required trim, written descriptions of the trim govern model numbers.

Pipe, pipe fittings, pipe specialties and valves shall be manufactured in plants located in the United States or certified to meet the specified ASTM and ANSI standards.

Work performed under this contract shall provide a neat and "workmanlike" appearance when completed, to the satisfaction of the Architect and Engineer. Workmanship shall be the finest by experienced mechanics. Installations shall comply with applicable codes and laws.

The complete installation shall function as designed and intended with respect to efficiency, capacity, noise level, etc. Abnormal noise caused by rattling equipment, piping, ducts, air devices, and squeaks in rotating components shall not be acceptable. Materials and equipment shall be of commercial specification grade in quality. Light duty and residential grade equipment shall not be accepted unless otherwise indicated.

Remove from the premises waste material present as a result of work, including cartons, crating, paper, stickers, and/or excavation material not used in backfilling, etc. Clean equipment installed under this contract to present a neat and clean installation at the termination of the work.

Repair or replace public and private property damaged as a result of work performed under this contract to the satisfaction of authorities and regulations having jurisdiction. Provide all safety lights, guards, and warning signs required for the performance of the work and for the safety of the public.

D. MANUFACTURERS

In other articles where lists of manufacturers are introduced, subject to compliance with requirements, provide products by one of the manufacturers specified.

Where a list is provided, manufacturers are listed alphabetically and not in accordance with any ranking or preference.

Where manufacturers are not listed, provide products subject to compliance with requirements from manufacturers that have been actively involved in manufacturing the specified product for no less than 5 years.

E. COORDINATION

Coordinate work with that of other trades so that the various components of the systems are installed at the proper time, will fit the available space, and will allow proper service access to those items requiring maintenance. Components which are installed without regard to the above shall be relocated at no additional cost to the Owner.

Unless otherwise indicated, the General Contractor shall provide chases and openings in building construction required for installation of the systems specified herein. Contractor shall furnish the General Contractor with information where chases and openings are required. Contractor shall keep informed as to the work of other trades engaged in the construction of the project and shall execute work in a manner as to not interfere with or delay the work of other trades.

Figured dimensions shall be taken in preference to scale dimensions. Contractor shall take his own measurements at the building, as variations may occur. Contractor shall be held responsible for errors that could have been avoided by proper checking and inspection.

Provide materials with trim that will properly fit the types of ceiling, wall, or floor finishes actually installed. Model numbers listed in the specifications or shown on the drawings are not intended to designate the required trim.

F. ORDINANCES AND CODES

Work performed under this contract shall, at a minimum, be in conformance with applicable national, state and local codes having jurisdiction. Equipment furnished and associated installation work performed under this contract shall be in strict compliance with current applicable codes adopted by the local AHJ, including any amendments and standards as set forth by the following:

1. National Electrical Code (NEC)
2. National Fire Protection Association (NFPA)
3. Underwriters Laboratories (UL)
4. Occupational Safety and Health Administration (OSHA)
5. American Society of Mechanical Engineers (ASME)
6. American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE)
7. American National Standards Institute (ANSI)
8. American Society of Testing and Materials (ASTM)
9. Other national standards and codes where applicable.

Where the contract documents exceed the requirements of the referenced codes, standards, etc., the contract documents shall take precedence. Where conflicts between various codes, ordinances, rules, and regulations exist, comply with the most stringent.

Promptly bring all conflicts observed between codes, ordinances, rules, regulations, referenced standards, and these documents to the attention of the Architect and Engineer for final resolution. Contractor will be held responsible for any violation of the law.

Procure and pay for permits and licenses required for the accomplishment of the work herein described. Where required, obtain, pay for, and furnish certificates of inspection to Owner.

G. PROTECTION OF EQUIPMENT AND MATERIALS

Store and protect from damage equipment and materials delivered to job site. For materials and equipment susceptible to changing weather conditions, dampness, or temperature variations, store inside in conditioned spaces. For materials and equipment not susceptible to these conditions, cover with waterproof, tear-resistant, heavy tarp or polyethylene plastic as required to protect from plaster, dust, dirt, paint, water, or physical damage. Replace insulation that has become wet at any time during construction. Provide any additional protection that is necessary to keep equipment and material of a like kind at his own expense.

Keep premises broom clean of foreign material created during work performed under this contract. Piping, equipment, etc. shall have a neat and clean appearance at the termination of the work. Remove debris from ceiling/return air plenum, including duct.

Plug, seal, or cap open ends of ductwork and piping systems while stored and installed during construction when not in use to prevent the entrance of debris into the systems. Remove temporary protection prior to starting equipment and turning the system over to the owner.

H. SUBSTITUTIONS

Materials, products, equipment, and systems described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by the proposed substitution. The base bid shall include only the products from manufacturers specifically named in the drawings and specifications. To request a substitution, request the Substitution Request Form from the Architect or Engineer. Complete and send the Substitution Request Form for each material, product, equipment, or system that is proposed to be substituted. The burden of proof of the merit of the proposed substitution is upon the proposer.

Unless stated otherwise in writing to the Engineer by the Contractor, Contractor warrants to the Engineer, Architect, and Owner the following:

1. Proposed substitution has been fully investigated and determined to meet or exceed the specified Work in all respects unless stated otherwise in the substitution request.
2. Proposed substitution is consistent with the Contract Documents and will produce indicated results, including functional clearances, maintenance service, and sourcing of replacement parts.
3. Proposed substitution has received necessary approvals of authorities having jurisdiction.
4. Same warranty will be furnished for proposed substitution as for specified Work.
5. If accepted substitution fails to perform as required, Contractor shall replace substitute material or system with that originally specified and bear costs incurred thereby.
6. Coordination, installation and changes in the Work as necessary for accepted substitution will be complete in all respects.

No substitutions will be considered unless the Substitution Request Form is completed and attached with the appropriate substitution documentation. No substitution will be considered prior to receipt of bids unless written request for approval to bid has been received by the Engineer at least ten (10) calendar days prior to the date for receipt of bids.

If the proposed substitution is approved prior to receipt of bids, such approval will be stated in an addendum. Bidders shall not rely upon approvals made in any other way. Verbal approval will not be given. No substitutions will be considered after the contract is awarded unless specifically provided in the contract documents.

I. SUBMITTALS

Assemble and submit for review shop drawings, material lists, manufacturer product literature for equipment to be furnished, and items requiring coordination between contractors under this contract. Provide submittals in sufficient detail so as to demonstrate compliance with these contract documents and the design concept. Prior to transmitting submittals, verify that the equipment submitted is mutually compatible and suitable for the intended use, will fit the available space, and maintain manufacturer recommended service clearances. If the size of equipment furnished makes necessary any change in location or configuration, submit a shop drawing showing the proposed layout.

Transmit submittals as early as required to support the project schedule. Allow for two weeks Engineer review time, plus to/from mailing time via the Architect, plus a duplication of this time for resubmittal, if required. Only resubmit those sections requested for resubmittal.

Submittals shall contain the project name, applicable specification section, submittal date, equipment identification acronym as used on the drawings, and the Contractor's stamp. The stamp shall certify that the submittal has been checked by the Contractor, complies with the drawings and specifications, and is coordinated with other trades. Manufacturer product literature shall include shop drawings, product data, performance sheets, samples and other submittals required by this division. Highlight, mark, list, or indicate the materials, performance criteria, and accessories that are being proposed. General product catalog data not specifically noted to be part of the specified product will be rejected and returned without review.

Submittals and shop drawings shall not contain the firm name, logo, seal, or signature of the Engineer. They shall not be copies of the work product of the Engineer. If the Contractor desires to use elements of such product, refer to paragraph "Electronic Drawing Files" for procedures to be used.

Separate submittals according to individual specification sections. Illegible submittals will be rejected and returned without review. Catalog data shall be properly bound, identified, indexed and tabbed. Each item or model number shall be clearly marked and accessories indicated. Label the catalog data with the equipment identification acronym or number as used on the drawings and include performance curves, capacities, sizes, weights, materials, finishes, wiring diagrams, electrical requirements and deviations from specified equipment or materials. For equipment with motor starters or VFDs, include short circuit current ratings. Mark out inapplicable items. Shop drawings will be returned without review if the above mentioned requirements are not met.

For electronic submittals, Contractor shall submit the documents in accordance with the procedures specified in Division 01. Contractor shall notify the Architect and Engineer that the submittals have been posted. If electronic submittal procedures are not defined in Division 01, Contractor shall include the website, user name, and password information needed to access the submittals. For submittals sent by e-mail, Contractor shall copy the designated representatives of the Architect and Engineer. Contractor shall allow for the Engineer review time as specified above in the construction schedule. Contractor shall submit only the documents required to purchase the materials and/or equipment in the electronic submittal.

The checking and subsequent acceptance of submittals by the Engineer and/or Architect shall not relieve the Contractor from responsibility for deviations from the drawings and specifications, errors in dimensions, details, size of members, or quantities, omissions of components or fittings; coordination of electrical requirements; and not coordinating items with actual building conditions and adjacent work. Proceed with the procurement and installation of equipment only after receiving approved shop drawings relative to each item.

J. ELECTRONIC DRAWING FILES

In preparation of shop drawings or record drawings, Contractor may, at his option, obtain electronic drawing files in AutoCAD or DXF format on CD-ROM disk, DVD disk, flash drive or direct download, as desired, from the Engineer for a shipping and handling fee of $200 for a drawing set up to 12 sheets and $15 per sheet for each additional sheet. Contact the Architect for written authorization and Engineer for the necessary release agreement form and to specify shipping method and drawing format. In addition to payment, the written authorization from the Architect and release agreement form from the Engineer must be received before electronic drawing files will be sent.

K. RECORD DRAWINGS (AS-BUILT DRAWINGS)

During progress of the work in this division, Contractor shall maintain an accurate record of all changes made during the installation of the system. Upon completion of the work, accurately transfer all record information to three identical sets of the approved shop drawings. Insert one set into each copy of the manual described below.

See Division 01 and General Conditions for additional information.

L. OPERATION AND MAINTENANCE INSTRUCTIONS

During the course of construction, collect and compile a complete brochure of equipment furnished and installed on this project. Include operational and maintenance instructions, manufacturer's catalog sheets, wiring diagrams, parts lists, approved submittals and shop drawings, warranties, and descriptive literature as furnished by the equipment manufacturer. Include an inside cover sheet that lists the project name, date, Owner, Architect, Engineer, General Contractor, Sub-Contractor, and an index of contents.

Submit three copies of literature bound in approved binders with index and tabs separating equipment types to the Architect, for Engineer's review, at the termination of the work. Paper clips, staples, rubber bands, loose-leaf binding, and mailing envelopes are not considered approved binders. Final approval of systems installed under this contract shall be withheld until this equipment brochure is received and deemed complete by the Architect and Engineer. Instruct workmen to save required literature shipped with the equipment itself for inclusion in this brochure.

Include Record Drawings as described above.

Refer to Division 01 for acceptance of electronic manuals for this project. For electronic manuals, refer to paragraph "Submittals" for requirements.

M. SPARE PARTS

Furnish to Owner, with receipt, the following spare parts for the equipment furnished for this project:

1. One set of spare filters or belts, type required for each unit. In addition to the spare set of filters, install new filters prior to testing, adjusting, and balancing work and before turning system over to Owner.
2. Furnish one complete set of belts for each fan.
3. Furnish three operating keys for each type of air outlet and inlet that require them.

N. TRAINING

At a time mutually agreed upon between the Owner and Contractor, provide the services of a factory trained and authorized representative to train Owner's designated personnel on the operation and maintenance of the equipment provided for this project.

Provide training to include, but not be limited to, an overview of the system and/or equipment as it relates to the facility as a whole; operation and maintenance procedures and schedules related to startup and shutdown, troubleshooting, servicing, preventive maintenance and appropriate operator intervention; and review of data included in the operation and maintenance manuals.

Submit a certification letter to the Architect stating that the Owner's designated representative has been trained as specified herein. Letter shall include date, time, attendance and subject of training. The Contractor and the Owner's representative shall sign the certification letter indicating agreement that the training has been provided.

Schedule training with Owner with at least 7 days advance notice.

O. WARRANTIES

Warrant each system and each element thereof against all defects due to faulty workmanship, design, or material for a period of 12 months from date of Substantial Completion, unless specific items are noted to carry a longer warranty in the construction documents or manufacturer's standard warranty exceeds 12 months. Remedy all defects, occurring within the warranty period(s), as stated in the General Conditions and Division 01.

Warranties shall include labor and material, including travel expenses. Make repairs or replacements without any additional costs to the Owner, and to the satisfaction of the Owner, Architect, and Engineer.

Perform the remedial work promptly, upon written notice from the Engineer or Owner.

At the time of Substantial Completion, deliver to the Owner all warranties, in writing and properly executed, including term limits for warranties extending beyond the one year period and any actions the Owner must take in order to maintain warranty status. Each warranty instrument shall be addressed to the Owner and state the commencement date and term.

2. GENERAL MATERIALS AND INSTALLATION

A. BUILDING OPERATION

Comply with the schedule of operations as outlined in the architectural portions of this specification. Accomplish work requiring interruption of building operation at a time when the building is not in operation and only with written approval of building Owner and/or tenant. Coordinate interruption of building operation with the Owner and/or tenant a minimum of seven (7) days in advance of work.

B. COINCIDENTAL DAMAGE

Repair streets, sidewalks, drives, paving, walls, finishes, and other facilities damaged in the course of the work. Repair materials shall match existing construction. Repair work shall meet all requirements of the Owner, local authorities having jurisdiction, and meet the satisfaction of the Architect.

C. CUTTING AND PATCHING

Conform to the requirements in Division 01. Cut walls, floors, ceilings, and other portions of the facility as required to install work under this division. Obtain permission from the Architect prior to cutting. Do not cut or disturb structural members without prior approval from the Architect and Structural Engineer. For post-tension slabs, x-ray slab and closely coordinate all core drill locations with Architect and Structural Engineer prior to performing any work. Obtain approval from Architect and Structural Engineer for all core drill locations at least four days prior to performing work. Penetrations shall be made as small as possible while maintaining required clearances between the building element penetrated and the system component. Patch around openings to match the adjacent construction including fire ratings, if applicable. Repair and refinish areas disturbed by work to the condition of adjoining surfaces in a manner satisfactory to the Architect.

D. ROUGH-IN

Coordinate without delay all roughing-in with other divisions. Conceal piping, conduit, and rough-in except in unfinished areas and where otherwise shown.

E. STRUCTURAL SUPPORT SYSTEMS

Structural steel used for support of equipment, ductwork and piping shall be new, clean, and conform to ASTM Designation A-36.

Support mechanical components from the building structure. Do not support mechanical components from ceilings, other mechanical or electrical components, and other non-structural elements.

F. PRE-ENGINEERED ROOF EQUIPMENT SUPPORTS AND CURBS

Provide prefabricated equipment support rails and roof curbs manufactured by AES Industries, Custom Curb, Inc., Pate Company, Thybar or approved equal. Provide with fully mitered raised cant and step to match roof insulation thickness, welded, minimum 18 gauge galvanized steel shell, internally reinforced to load bearing factors of equipment being supported, minimum 1-1/2 inch thick, 3 pound rigid insulation internal to shell to maintain continuous roof insulation where required, factory installed wood nailer, and minimum 18 gauge jacket with counterflashing where equipment does not fully cover the equipment support. Provide sloped roof equipment supports to enable level installation. Provide rigid backing material behind cant to maintain cant slope. Provide multiple support rails to uniformly support the equipment. Attach to roof structure according to manufacturer's installation instructions.

Attach equipment directly to pre-engineered roof equipment support using one of the following methods:

1. Rail Equipment Supports: Secure each equipment support leg to the rail with a minimum of 4 points of connection per leg.
2. Roof Curbs: Secure each corner of the equipment to the curb nailer using a minimum of 4 lag screws, located along the length of the equipment. Alternatively, Secure equipment to the curb using hold-down brackets. Provide minimum 6 inch long, 14 gauge galvanized steel brackets sized to wrap around top of curb and under equipment base rail with sufficient horizontal offset to cover overlap gap between the equipment rail and curb. Secure bracket to equipment and curb nailer using a minimum of 8 points of connection per bracket. Provide one bracket at each corner along the length of the unit.
3. Submit signed and sealed drawings that indicate the design and installation requirements of pre-engineered roof supports can withstand the design criteria listed. Include installation requirements for anchoring to the roof structure. The Engineer is not responsible and will not provide the seal and signature. Deliver submittal to the local AHJ for approval prior to installation of the contractor provided, pre-engineered roof supports.
4. Provide seismic restraints in accordance with Article "Seismic Controls for MEPF Systems."

G. ACCESS PANELS AND DOORS

Refer to Architectural documents for specification of access panels and doors.

H. PENETRATIONS

Provide sleeves for pipes passing through above grade concrete or masonry walls, concrete floor or roof slabs. Sleeves are not required for core drilled holes in existing masonry walls, concrete floors or roofs. Provide 10 gage galvanized steel sleeves for sleeves 6 inches and smaller. Provide galvanized sheet metal sleeves for larger than 6 inches. Schedule 40 PVC sleeves are acceptable for installation in areas without return air plenums.

Seal elevated floor, exterior wall and roof penetrations watertight and weathertight with non-shrink, non-hardening commercial sealant. Pack with mineral wool and seal both ends with minimum of 1/2 inch of sealant.

Seal around penetrations of fire rated assemblies. Coordinate fire ratings and locations with the architectural drawings. Refer to architectural specifications for fire stoppings. Provide a product schedule for UL listing, location, wall or floor rating and installation drawing for each penetration fire stop system.

Extend pipe insulation for insulated pipe through floor, wall and roof penetrations, including fire rated walls and floors. The vapor barrier shall be maintained. Size sleeve for a minimum annular clear space between inside of sleeve and insulation.

Provide prefabricated roof curbs where pipes and or ductwork penetrate elevated slabs or the roof to the exterior. Provide cover over curb of weather-resistant material and seal duct or pipe penetrations through the cover. Provide pipe collar of weather-resistant material with stainless steel pipe clamps for piping penetrations.

I. FIRESTOPPING

Sealants and accessories shall have fire-resistance ratings indicated, as established by testing identical assemblies in accordance with UL 2079 or ASTM E 814, or other NRTL acceptable to AHJ.

Manufacturers: Hilti, RectorSeal, Specified Technologies Inc., United States Gypsum Company, or 3M corp.

Through and Membrane Penetration Firestopping Systems Product Schedule: Provide UL listing, location, wall or floor rating, and installation drawing for each penetration fire stop system.

Where project conditions require modification to qualified testing and inspecting agency's illustrations for a particular firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Include qualifications data for testing agency.

J. MOTORS AND STARTERS

Provide motors and starting equipment where not furnished with the equipment package. Motors shall have copper windings, Class B insulation, and standard squirrel cage with starting torque characteristics suitable for the equipment served. Motors controlled by variable frequency drives shall be rated for voltage peaks and minimum rise times in accordance with NEMA MG1, Part 31. Motors 5 horsepower and larger controlled by variable frequency drives shall be provided with a shaft grounding system equal to Aegis SGR Bearing Protection Ring, Inpro/Seal Current Diverter Ring (CDR) or approved equal. Motors for air handling equipment shall be selected for quiet operation. Each motor shall be checked for proper rotation after electrical connection has been completed. Provide drip-proof enclosure for locations protected from weather and not in air stream of fan; and totally enclosed fan cooled enclosure for motors exposed to weather. Motors shall be manufactured by Century, General Electric, Louis Allis, Westinghouse, or approved equal.

Provide every motor, except fractional horsepower single phase motors with an approved type of "built-in" thermal overload protection, with a motor starter. Each starter shall be provided with overload heaters sized to the motor rating, and every three phase motor starter shall have overload heaters in each phase. Ambient compensated heaters shall be installed wherever necessary. Unless noted otherwise, motor starters shall be furnished by the Division 23 Contractor for installation and connection by the Division 26 Contractor. Starters shall be Allen-Bradley, Clark, Furnas, Square D, or approved equal.

K. ELECTRICAL WIRING

High voltage wiring is defined as 50 Volts or higher. Low voltage wiring is defined as less than 50 Volts. Line voltage wiring shall be provided by Division 26. Line voltage control and interlock wiring for mechanical systems shall also be provided by Division 26. Low voltage control wiring shall be provided by Division 23. Furnish wiring diagrams to Division 26 as required for proper equipment hookup. Coordinate with Division 26 the actual wire sizing amps for mechanical equipment (from the equipment nameplate) to ensure proper installation.

Provide power and communication wiring with transient protection in accordance with IEEE C62.41.2. All control and interlock wiring shall comply with the NEC. Control wiring shall be sized to accommodate the voltage drop associated with the distance between the control device and the controller. Control wiring not installed in conduit shall be UL rated for plenum installation. All NEC Class 1 (line voltage) wiring shall be UL listed in approved raceway according to the NEC and Division 26 allowable wiring methods. Minimum wire gauge shall be No. 14 AWG. All low-voltage wiring shall meet NEC Class 2 requirements. Low-voltage power circuits shall be sub-fused when required to meet Class 2 current limit.

Conduit for Control Wiring: EMT with compression fittings, cold rolled steel, zinc coated or zinc-coated rigid steel with threaded connections.

Pull and Junction Boxes: Size according to number, size, and position of entering raceway as required by National Electrical Codes. Enclosure type shall be suited to location.

Install wiring parallel to building lines wherever possible. Conceal all control wiring in finished rooms. Do not install Class 2 wiring in raceway containing Class 1 wiring. Boxes and panels containing high voltage wiring and equipment may not be used for low-voltage wiring except for the purpose of interfacing the two wires (e.g., relays and transformers). All wire-to-device and wire-to-wire connections shall be made at a terminal block or terminal strip. All runs of communication wiring shall be unspliced length when that length is commercially available. Verify the integrity of the entire network following the cable installation. Use appropriate test measures for each particular cable. Label all wiring and cables at each end with identification of termination with the controller termination number. Label control devices used in the system with permanent labels using the identifiers that match the record documents.

Install BACnet MS/TP communication wiring in accordance with ASHRAE/ANSI Standard 135. Maximum length of MS/TP communication wiring shall be 4000 ft with AWG 22 or 24 cable. Splices in shielded cables shall consist of terminations and the use of shielded cable couplers that maintain the integrity of the shielding.

L. EQUIPMENT FURNISHED BY OTHERS

Provide necessary equipment and accessories that are not provided by the equipment supplier or Owner to complete installation of equipment furnished by others in locations as indicated on the drawings, specified herein, or both. Equipment and accessories not provided by the equipment supplier may include, but not be limited to flues, vents, intakes, associated roof jacks and caps to outdoors, dampers, in-line fans, roof fans, and control interlocks, etc. as required for proper operation of the complete system in accordance with the manufacturer's instructions.

Contractor shall be responsible for correct rough-in dimensions and shall verify them with Architect and/or equipment supplier prior to service installations.

M. SYSTEM TESTING, ADJUSTING, AND BALANCING

Upon completion of each phase of the installation, test each system in conformance with local code requirements and as noted below. Furnish labor and equipment required to test each system installed under this contract. Assume all costs involved in making the tests and repairing and/or replacing any damages resulting therefrom.

Final system testing, balancing and adjustments (TAB) shall be performed by a Contractor certified by the National Environmental Balancing Bureau (NEBB), Associated Air Balance Council (AABC), or Testing, Adjusting and Balancing Bureau (TABB). TAB shall be performed in accordance with the most current edition of the certified agencies procedural standard for testing, adjusting and balancing and shall comply with the strictest interpretation of that standard for execution and reporting of all TAB work.

Test, adjust, and balance equipment and systems included in the scope of work. Prepare testing and balancing report log using forms equivalent with the standard forms available from the TAB certification standard being followed. Adjust equipment to deliver specified flow amounts on the drawings. For air systems, include airflow supply quantities, entering and leaving temperatures, and pressures at design flow. Include fan and unit test readings, motor voltage and amp draws, etc., and submit six copies of the final compilation of data to the Architect for evaluation and approval before final inspection of the project.

Balance air systems to within plus or minus 10 percent for terminal devices and branch lines and plus or minus 5 percent for main ducts and air handling equipment of the amount of air shown on the drawings. TAB Contractor shall record space temperatures and make adjustments in airflow to each diffuser to obtain uniform temperature (no greater than +/- 3 F) in spaces. Document temperatures and adjustments in tab report. Adjust equipment to operate as intended by the specification. TAB report shall include a 'report summary/remarks' section in accordance with the procedural standard that provides both system set up and a summary of deficiencies as defined by the procedural standard.

TAB Contractor shall be responsible to calibrate, set, and adjust automatic temperature control sensors, actuators and control devices. Check proper sequencing of interlock systems, and operation of safety controls, adjust thermostats, and control setpoints, limits and time based adjustment to operate in accordance with the performance requirements of the Construction Documents. Adjust pumps, fans, etc. for proper and efficient operation. Certify to Architect that adjustments have been made and that system is operating satisfactorily. Calibrate, set, and adjust automatic temperature controls. Check proper sequencing of interlock systems, and operation of safety controls.

Division 23 contractor shall align bearings and replace bearings that have dirt or foreign material in them with new bearings without additional cost to the Owner.

N. VIBRATION ISOLATION

Provide vibration isolation equipment and materials by a single manufacturer. If type and deflection for specific equipment is not specified within the contract documents, reference ASHRAE Handbook "HVAC Applications" or provide per manufacturer's recommendations. Approved manufacturers include Caldyn, Kinetics Noise Control, Mason Industries, Inc., Vibration Eliminator Co., Inc., Vibration Mounting and Controls, or Vibro-Acoustics, provided their systems are in compliance with the specified design and performance requirements.

General Requirements: Select vibration isolators by the weight distribution to produce uniform deflection. Vibration isolators shall have either known un-deflected heights or calibration markings so that, after adjustment, the static deflection can be verified, thus determining that the load is within the proper range of the isolator. Isolators shall operate in the linear portion of their load versus deflection curves. Spring isolators shall have 50 percent excess capacity without becoming coil bound. Coat vibration isolators with factory-applied paint. Coat vibration isolators exposed to weather and other corrosive environments with factory-applied corrosion resistance protection. Install and adjust vibration isolators in accordance with manufacturers written instructions.

Pipe connections. Provide flexible connectors for piping system connections on equipment side of shutoff valves for all pumps, mechanical equipment supported or suspended by spring isolators, and where indicated on drawings. Fabricate flexible piping connectors from stainless steel or rubber materials as suitable for system fluid. Flexible piping connectors shall be bellows, spherical or braided hose type as recommended by the manufacturer for the application.

Isolator Types:

1. Type SPNH (Spring and Neoprene Hangers): Provide a steel hanger box containing a laterally stable, double-deflecting neoprene isolator in series with a steel spring. Design springs so the ratio of the horizontal to vertical spring constant is between one and two. The spring diameter shall be not less than 80 percent of the compressed height of the spring at rated load. Loaded springs shall operate within the linear portion of their load versus deflection curve over a deflection range of not less than 50 percent above design deflection. Spring diameter and hanger box hole size shall be large enough to permit the hanger rod to swing through a 30 degree arc. Include a neoprene bushing to prevent contact between the lower hanger rod and hanger box and short-circuiting the isolating function. The neoprene element shall have a maximum durometer of 50 and designed for 15 percent strain, with a static deflection of not less than 0.4 inches. Unless otherwise specified, the static deflection of SPNH hangers shall be 2 inches. Provide SPNH hangers with 1 inch static deflection for water source heat pumps and fan-powered VAV terminal units. When installed, do not cock the spring element and do not allow the hanger box to rotate through a full 360 degree arc without encountering obstructions. Provide Mason Industries Type 30N or equal.

2. Type NR (Neoprene Bushing): Provide neoprene, rubber-in-shear bushings for lightweight (less than 100 pounds), suspended equipment supported from structure with all thread rod and angle iron or Unistrut. Select for a maximum durometer of 50 and designed for 15 percent strain, with a static deflection of 0.15 inches. Provide Mason Industries Type HMIB or equal.

O. AIR FILTERS

Provide AAF/Flanders PrePleat 13, Camfil AP-Thirteen, pleated, throwaway type filters, minimum MERV 13, or similar as manufactured by Air Filter, Inc., Bioclimatic, Columbus, Koch, or approved equal, unless otherwise indicated.

Temporary filters used to protect openings in ductwork and inside equipment when permanent HVAC equipment is used during the construction period shall be pleated, throwaway type filters, minimum MERV 6.

P. REFRIGERANT AND OIL

Provide full refrigerant and oil charge in new air conditioning refrigeration systems, and maintain it for full term of the guarantee.

Q. IDENTIFICATION

Provide manufacturer's standard pre-printed, semi-rigid snap-on or permanent adhesive, pressure-sensitive vinyl pipe markers. Color code pipe markers to comply with ANSI A13.1.

Install pipe markers on each HVAC piping system and include arrows to show normal direction of flow.

Locate pipe markers and color bands wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior non-concealed locations.

Provide plastic laminate or brass valve tag on every valve, cock and control device in each HVAC piping system; exclude check valves, valves within factory-fabricated equipment units, and shut-off valves at HVAC terminal devices and similar rough-in connections of end-use fixtures and units.

Provide manufacturer's standard laminated plastic, color coded equipment markers. Conform to the following color code: Green for Cooling; Yellow for Heating; Yellow/Green for combination Cooling and Heating; Brown for Energy Recovery Reclamation; Blue for other equipment types. Conform to ANSI A13.1 for Hazardous Equipment.

Provide stenciled signs for equipment identification at Contractor's option or where distance of required identification requires lettering larger than 1 inch height. Stencil paint shall be exterior type, oil-based, alkyd enamel, minimum 1-1/4 inch height or greater as required for long distance identification, white or black color for best contrast.

Provide duct markers or provide stenciled signs and arrows indicating ductwork service and flow direction in black or white lettering for best contrast with duct or insulation color. Locate markers maximum 50 feet along each duct side and within 5 feet of all control and balancing dampers or branch ducts more than 25 feet long. Locate within 5 feet on each side of wall, floor, and ceiling penetrations. Provide additional markers in congested areas or at multiple duct runs as required for clarity.

3. DUCT INSULATION, DUCTWORK, ACCESSORIES, FLUES AND FANS

A. DUCT INSULATION

Provide fiberglass duct liner with fibers firmly bonded together with a thermosetting resin. Liner surface shall serve as a barrier against infiltration of dust and dirt, shall meet ASTM C1338 for fungi resistance, and shall be cleanable using duct cleaning methods and equipment outlined by North American Insulation Manufacturers Association (NAIMA) duct cleaning guide. Install with liner adhesive and mechanical fasteners in accordance with manufacturer's instructions and recommendations. Ductwork sizes shown on drawings are inside clear dimensions. Increase sheet metal by liner thickness in both directions where liner is installed.

Provide rectangular liner conforming to ASTM C1071, Type I or II that is 1-1/2 pound density, minimum R-6.3 Celaintеed Corp. "Toughgard" or equivalent, Johns Manville, Owens-Corning, or Knauf.

Provide liner on the following interior air ducts and where specified on the drawings:

1. All return ductwork in front of house first floor that opens into sound attenuation.

Cover rigid ductwork visible from dining space with insulation consisting of 1.5 inch thickness Armaflex flexible elastomeric insulation or equivalent meeting ASTM C534. Cover all seams with Armatuff seal tape.

Cover concealed, rigid ductwork not visible from dining space with ASTM C553, Type II flexible fiberglass insulation. Installed insulation shall be minimum R-6.0 duct wrap, Certainteed or equivalent Johns Manville, Owens-Corning, or Knauf with heavy-duty foil-scrim-kraft facing, and with joints taped with 3 inch wide foil tape as follows:

1. Concealed Round and rectangular supply and return air ductwork.
2. Round and rectangular outside air ductwork.
3. Round and rectangular exhaust and relief air ductwork within 10 feet of exterior discharge.

Insulating materials, adhesives, coatings, etc., shall not exceed flame spread rating of 25 and smoke developed rating of 50 per ASTM E84. Containers for mastics and adhesives shall have U.L. Label.

For supply and return ductwork located exterior to the building, insulation shall be minimum R-8.0. Provide Insulation and jacket in accordance with one of the following three options:

1. Exterior insulation and jacket consisting of 2 inch thickness of Armatuff flexible elastomeric insulation or equivalent meeting ASTM C534 with integral 12 mils thick UV resistant cladding laminated at factory. Cover all seams with Armatuff seal tape.
2. Exterior insulation consisting of 2 inch thickness of flexible elastomeric insulation meeting ASTM C534 or 3 lb density rigid fiberglass meeting ASTM C612, and jacket consisting of 20 gauge corrugated aluminum jacket with aluminum fitting covers and minimum three aluminum attachment bands per section.
3. Exterior insulation consisting of 2 inch thickness of flexible elastomeric insulation meeting ASTM C534 or 3 lb density rigid fiberglass meeting ASTM C612, and jacket consisting of 15.5 mils thick Ventureclad Plus UV resistant cladding.

Install exterior ductwork with sufficient slope to ensure that watter cannot pond anywhere on the duct. Drainage must be achieved by sloping ductwork – not by varying the insulation thickness. Locate longitudinal seams of outer shell (aluminum, flexible elastomeric, or cladding as applicable) at bottom of duct. Install cladding in strict conformance with cladding manufacturer's instructions.

B. DUCTWORK

Provide galvanized steel ductwork and housings as shown on drawings. Construct ductwork including fittings and transitions in conformance with current SMACNA standards relative to gauge, bracing, joints, etc. Minimum thickness of duct shall be 26-gauge sheet metal. Reinforce housings and ductwork over 30 inches with 1-1/4 inch angles not less than 5'-6" on centers, and closer if required for sufficient rigidity to prevent vibration. Support horizontal runs of duct from the building structure or ceiling grid, conduits, pipes, equipment, etc. from ductwork. Coordinate routing of ductwork with other contractors such that piping, electrical conduit, and associated supports are not routed through the ductwork.

Fiberglass ductw

B. SPLIT DUCTLESS AIR-CONDITIONING SYSTEMS

Install owner furnished split ductless system consisting of evaporator section for wall or ceiling mounting as indicated and remote condensing section similar to Mitsubishi. Evaporator cabinet shall be factory assembled pre-wired consisting of furniture-grade steel with baked-enamel finish, front access, with direct-drive centrifugal fans, 2-speed motor, and cleanable foam filter. Evaporator coil shall be direct-expansion cooling coil of seamless copper tubes expanded into aluminum fins, with thermal-expansion valve with external equalizer. Air-cooled condenser shall be of corrosion-resistant cabinet containing compressor, copper-tube aluminum-fin coils, direct-drive propeller fans with motors with internal overload protection; capacity control to 0 degrees Fahrenheit.

Provide pre-engineered roof equipment support rails for units located on roof. Securely attach units to rail.

Provide refrigerant piping sized as recommended by equipment manufacturer with foamed plastic insulation on the suction line as specified in this section.

5. VARIABLE REFRIGERANT FLOW (VRF) SYSTEMS

A. SUBMITTALS

Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.

Refrigerant: Provide data indicating type and quantity for each specified equipment type. Provide analysis report indicating refrigerant volumes for proper charging based on installed layout and statement of code compliance for maximum allowable system volume for the smallest room in the event of an accidental refrigerant release for review by the Engineer.

Performance data for any sound mitigating devices required to meet space or environmental acoustical characteristics.

Heating Capacity Performance: Provide a submittal verifying that the submitted system meets the performance requirements without supplemental electric heat at the design heating ambient temperature. Where supplemental heat is allowed the supplemental electric heat shall be included in the system efficiency rating.

VRF installer current training certificates signed by manufacturer's designated training agent in compliance with requirements specified under "Quality Assurance" below.

Training certificates of VRF system startup representative indicating successful completion of training within two (2) years of system installation.

Test Reports: Submit test reports required for field quality control, startup, and training.

Operation and Maintenance Data: Include start-up instructions, maintenance data, parts lists, controls, accessories, and trouble-shooting guides in the Operation and Maintenance manuals.

B. SHOP DRAWINGS

Provide drawings that indicate size, profile, and dimensional requirements of equipment. Drawings shall be based on the specific system indicated. Provide floor plans that indicate quantity and location of indoor and outdoor units that satisfy the basis of design system capacity and zone temperature control; location of refrigerant control boxes; and refrigerant pipe quantity, sizing and routing.

Clearly indicate exceptions to basis of design where appropriate. Exceptions requiring additional construction related costs (materials and labor) shall be coordinated and shall be included at no additional cost to the owner.

Provide diagrams for power, signal, and control wiring. Provide refrigerant piping installation drawings and details. Provide refrigerant piping diagrams.

Indicate condensate piping and power connection locations to be connected by others and identify any additional connections required due to changes in system configuration due to differences in product offerings from basis of design manufacturer.

C. WARRANTY

Parts Warranty: Provide written manufacturer parts warranty for a period of 10 years from the date of startup. Warranty shall cover replacement and/or repair of parts with inadequate or 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 Labor Service: Provide written full parts and labor warranty for a period of 1 year from date of startup, unless specific items are noted to carry a longer warranty in the Construction Documents or manufacturer's standard warranty. Warranty shall cover replacement and/or repair of parts with inadequate or defective materials and workmanship. Warranty labor service shall be provided by a factory authorized and trained service technician.

D. MANUFACTURERS

Subject to compliance with requirements, provide products from Carrier, Daikin, Lennox, Hitachi, LG, Mitsubishi, Samsung, Trane, or York.

E. VRF CONDENSING UNITS

Provide VRF condensing units (outdoor units) for use with variable refrigerant flow (VRF) heat recovery and heat-pump fan coil air conditioning units to accomplish the basis of design zone temperature control and capacity requirements shown on the drawings.

Condensing units shall be air-cooled or water cooled cooling only or heat pump as defined on the equipment schedules.

The condensing unit shall be a direct expansion (DX), multi-zone air-conditioning system with variable speed inverter driven compressors using refrigerant. All zones shall be capable of operating separately with individual temperature control.

The outdoor unit shall be interconnected to indoor unit types specified under VRF fan coil units section. The indoor units shall be connected to the condensing unit utilizing manufacturer specified piping joints and headers to ensure correct refrigerant flow and balancing. Field fabricated tees, Y-fittings, headers, or other branch fittings shall not be allowed. See VRF refrigerant piping for interconnecting piping specifications.

Provide the condensing unit with high pressure sensor and switch, low pressure sensor, control circuit fuses, crankcase heaters, fusible plug, overload relay, inverter overload protector, thermal protectors for compressor and fan motors, over current protection for the inverter and anti-recycling timers.

The refrigerant circuit shall be provided with a sub-cooling feature to ensure liquid refrigerant does not flash when supplying to the various indoor units.

Unit shall employ an oil management system that ensures equipment is properly protected for the life of the equipment. Any oil recovery cycles shall not cause occupant discomfort or erratic system operation.

The condensing unit shall be capable of heating operation at 0 F dry bulb and cooling operation at 23 F dry bulb ambient temperature without additional low ambient controls or an auxiliary heat source.

The electrical requirements shall be as scheduled on the drawings.

The air cooled condenser coil shall be manufactured from copper tubes expanded into aluminum fins to form a mechanical bond. The coil and fins shall be factory treated with anti-corrosion coating.

F. VRF FAN COIL UNITS

Provide fan coil units (indoor units) for use with variable refrigerant flow (VRF) heat recovery and heat-pump condensing units and VRF refrigerant piping system to accomplish the basis of design zone temperature control and capacity requirements shown on the drawings.

Unit shall be completely factory assembled, wired and tested. Unit shall include factory wiring, piping, electronic proportional expansion valve, control circuit board, fan motor thermal protector, flare connections, condensate drain pan, condensate safety shut off and alarm, self-diagnostics, auto-restart function, 3-minute fused time delay, and test run switch. Unit shall be equipped with a return air thermistor. Unit cabinet: cabinet shall be constructed with sound absorbing foamed polystyrene and polyethylene insulation. Airflow rate shall be adjustable. Motor shall be brushless digitally controlled type with permanently lubricated bearings. Motor shall be thermally protected.

Coils shall be of the direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond. The coil shall be of a waffle louver or smooth plate fin and rifled bore tube design. The refrigerant connections shall be flare connections. A condensate pan shall be located under the coil. A thermistor shall be located on the liquid and gas line. Electrical characteristics shall be as scheduled on the drawings.

G. VRF CENTRAL CONTROLLER

Provide factory furnished central controller capable of operating and monitoring the VRF system. Central controller shall have the following capabilities:
1. Capability of operating independently or in conjunction with a building automation system (BAS).
2. Capability to manage multiple VRF indoor units or groups of indoor units without requiring memory expansion kits.
3. Capability to manage multiple outdoor units from a single interface point with options for remote internet monitoring interface and malfunction reporting.
4. Capability to receive expansion kits to increase the management capacity of the controller.
5. Capability to receive additional inputs and outputs to control third party equipment, such as exhaust fans.
6. Capability to be installed in a daisy chain configuration from the outdoor unit, to the system controller, to the power supply.
7. Capability to group, name, and display a collection of indoor units together for control and monitoring purposes.
8. Capability to lock out central controller display and individual zone display.

Central controller shall have touch screen display and capability to display the following parameters for each VRF indoor unit: On/off, operating mode, temperature setpoint, space temperature, airflow direction, fan speed, malfunction/error, forced stop, schedule, individual auto-changeover, filter, screen lock, time, date, and day of week. Each editable parameter shall be adjustable through the central controller. Scheduling function shall allow independent schedules with multiple events settable for each day. Central controller shall have battery backup and settings stored in non-volatile memory.

6. PIPING AND PIPING SPECIALTIES

A. REFRIGERANT PIPING AND INSULATION

Copper tubing: ASTM B 280, alloy C12200, Type ACR, hard-drawn straight lengths, and soft-annealed coils, seamless copper tubing. Tubing shall be factory cleaned, ready for installation, and have ends capped to protect cleanliness of pipe interiors prior to shipping.

Fittings: wrought-copper fittings: ANSI B16.22, streamlined pattern.

Brazing filler metals: BCUP - 5: copper (CU), phosphorus (P) 4.8 - 5.2 percent, and silver (AG) 14.5 - 15.5 for joining wrought copper fittings and copper tubing. Braze joints with a slow stream of dry nitrogen passing through the piping.

Insulate suction lines with 1 inch and liquid lines with 1/2 inch foamed plastic insulation, Armaflex or equal. Piping insulation shall have a flame spread of 25 or less, and a smoke developed rating of 50 or less when tested in accordance with ASTM E84. Coat insulation that is exposed to the elements with a protective sealer. Install and support piping to keep noise and vibration to a minimum. Support and secure piping to Unistrut type supports so that no vibration passes to the building structure. Pipe attachments shall be copper-plated or have nonmetallic coating for electrolytic protection where attachments are in direct contact with copper tubing. Install a support within one foot of each change of direction. Mount pipe hangers around the outside of the insulation with saddles to prevent hangers from rupturing the insulation. Replace insulation that is cut or broken by the hangers.

Run refrigerant lines parallel and perpendicular to wall and floor lines and to appear straight and in good order. Pitch suction lines down slightly (1 inch in 20 feet) towards the compressor. Provide oil traps at the base of vertical suction risers over 6 feet high.

Install liquid line sight glasses in liquid lines nearest the expansion valve. Factory mount expansion valves with the sensing bulbs shipped loose. Field mount expansion valve bulb after refrigerant piping is complete (damage may occur if bulbs come in contact with heat).

For systems of 5 ton capacity and smaller, the contractor shall have the option to provide copper refrigerant tubing line set sized as recommended by equipment manufacturer and of length as required for the installation. Provide minimum 1 inch thick foamed plastic insulation, Armaflex or equal, on the suction and liquid lines. Provide quick-connect flare tubing compression fittings or solder connections as required to match the connections of the condensing unit and evaporator coil.

B. SYSTEM EVACUATION AND CHARGING

Blow out refrigeration lines with dry nitrogen at a suitable pressure before making final connection at the condensing unit or coil to ensure against dirt, scale, or other foreign material being in the lines. Draw a vacuum to 29 inches of mercury. Break this vacuum by charging dry refrigerant gas into the system, raising the pressure to 0 PSIG. Repeat the latter two steps for a triple evacuation before the final evacuation is started. Make final evacuation by reducing the system absolute pressure to a maximum of 0.5 millimeters (500 microns) and allowing the pump to run at this pressure for a minimum of two hours.

Repeat the proper amount of refrigerant charge per the manufacturer's recommendations. Record the amount of refrigerant by weight charged into the system for each circuit recorded to the nearest 1/4 pound on tags and attach tags to the liquid line near the condensing unit. Refrigerant shall be supplied by the HVAC Contractor.

7. TEMPERATURE CONTROLS

A. GENERAL REQUIREMENTS

Provide a complete temperature control system including control panels, controllers, control power transformers, thermostats, sensors, time switches, override timers, actuators, relays, and wiring as required to control the systems as specified on the drawings.

Submit shop drawings of equipment provided for temperature control. Submit operation and maintenance data, including trouble-shooting maintenance guide, step-by-step procedures indexed for each controller and thermostat function, inspection period, cleaning methods and materials, and calibration tolerances.

Provide integrated wiring diagrams showing interconnections between field-installed equipment and package wiring furnished with the HVAC equipment. Control wiring shall be sized to accommodate the voltage drop associated with the distance between the control device and the controller.

Provide supervision and on-job checkout service as required to ensure that installation and operation of the temperature control system meets requirements of the drawings, specifications, and sequences of operation. The system shall be guaranteed for a period of one year following the acceptance of the system by the Architect/Engineer. Correct defects occurring during this period at no additional cost to the Owner.

Install control devices with top of device at 48 inches AFF to meet ADA requirements unless otherwise noted on the plans.

B. THERMOSTAT CONTROL EQUIPMENT

Provide thermostat control equipment with sufficient communication, programming, input and output connections, and modulating or staging capability to meet the sequence of operations. Provide thermostats with the features as indicated:
1. LCD or LED display screen.
2. Button or touchscreen interface.
3. Display temperature.
4. Display temperature setpoint.
5. Adjust temperature setpoint.
6. Limit temperature setpoint adjustment within plus or minus 3 degrees F.
7. Display operating mode.
8. Adjust operating mode.
9. Adjust schedule, minimum seven day occupied/unoccupied.
10. Adjust fan switch setting.
11. Security lockout.
12. Security cover.
13. Insulated backing for exterior wall mounting.
14. Recessed mounting with aspirating box.
15. Color: Coordinate with architectural drawings.
16. At contractor's option where multiple sensors are shown, the sensors may be provided with the thermostat in a single device.

Provide programmable thermostats or controllers with wall module interfaces that shall control non-packaged equipment requiring customized controls per the sequence of operations by Automated Logic, Delta Controls, Honeywell, Johnson Controls, Schneider Electric, Siemens, or Trane with quality and features as indicated. Include additional controllers and sensors as required for economizer operation. Thermostat shall be locally adjustable only within the range of 66F - 74F.

Provide non-programmable thermostats for on/off operation by the equipment manufacturer or Honeywell, Johnson Controls, Trane, or equal. Provide wall or duct-mounted humidistat as indicated on the drawings that is compatible with the thermostat.

C. SENSORS AND RELAYS

Manufacturers and model numbers are listed for reference as to quality and features required for the sensors and relays. Provide general-purpose type sensing elements for use in input and output sensors. Provide transmitters or transducers with sensor as required, compatible with the controllers used, with range suitable for the systems encountered. Transmitters and transducers shall have offset and span adjustments, temperature compensation, shock and vibration immunity, and zeroing capability. Accuracy requirements shall include the combined effects of linearity, hysteresis, repeatability, and the transmitter.

Provide sensors that meet the following minimum performance:
1. Dry-bulb temperature sensors at a minimum shall be accurate to +/- 2 degrees Fahrenheit over the range of 40 to 80 degrees Fahrenheit.
2. Humidity sensors at a minimum shall be accurate within +/- 3 percent full range between 20 and 95 percent, with drift less than 1 percent full scale per year.

D. WIRING

Provide electrical and control wiring as specified under the section "Electrical Wiring."

8. SEQUENCE OF OPERATION

A. ROOFTOP UNIT CONTROL

Reference the Rooftop Unit Control Matrix for unit setpoints, options, and accessories.

B. VRF FAN COIL CONTROL

Refer to sequence of operation on sheet M200.

C. EXHAUST FAN CONTROL

KEF-1, 2, 3: Kitchen exhaust fans shall be energized through on-off switches at their associated exhaust hoods or cooking equipment or through a control panel as indicated on the drawings. Kitchen exhaust shall modulate based on manufacturers controls sequence.

Kitchen fans shall be interlocked to operate with make-up air and other air-handling equipment providing fresh air to the kitchen area as noted or scheduled on the drawings. Refer to kitchen equipment supplier's drawings or equipment data for fan control and interlock information.

KEF-4 Dishwasher: Dishwasher exhaust fan shall be interlocked with associated dishwasher.

ERV-1 Restrooms: Electrical contractor to interlock fan with 7 day time clock. Fan to operate during occupied hours and shut down during unoccupied hours.

D. DOAS UNIT CONTROL

Reference the DOAS Unit Control Matrix for unit setpoints, options, and accessories.

E. IT SPLIT SYSTEM CONTROL (CU-5, AHU-10)

Control interior fan coil unit with zone controller thermostat interlocked with condensing unit. Cycle cooling to maintain room thermostat set point during occupied hours (85 F cooling).

9. COMMISSIONING

Provide commissioning that verifies and documents the commissioned building systems have been designed, installed, and function according to the owner's project requirements, construction documents, and to minimum code requirements. Retain the services of a third-party registered design professional or approved agency that is regularly engaged in conducting commissioning to develop a commissioning plan, supporting documentation, and reports. Refer to the latest adopted edition of the applicable energy code for more information. Complete all related commissioning requirements prior to final inspections. Submit final TAB report and final commissioning report to the Engineer and Owner within 90 days of the date of receipt of the certificate of occupancy.

ASHRAE 90.1 Commissioning Requirements: Test control systems to ensure the control elements are calibrated, adjusted, and in proper working condition. Commission systems according to ASHRAE Guideline 1.1 "HVAC&R Technical Requirements for the Commissioning Process", most current edition.

Commissioning plan shall include the following:

1. Narrative description of activities and personnel required during commissioning.
2. List of equipment and systems to be tested with description of tests to be performed.
3. List of functions to be tested, including calibration and economizer controls.
4. List of conditions under which the tests shall be performed.
5. List of measurable criteria for performance.

Submit a copy of the preliminary commissioning report to the AHJ. Preliminary commissioning report shall include the following:

1. Results of preliminary functional performance tests. Organize equipment and components specified by other Divisions in separate sections for independent review.
2. List of functional performance testing procedures used during commissioning, including measurable criteria for test acceptance.
3. Completed Commissioning Compliance Checklist. Refer to energy code for the form.
4. Itemization of deficiencies found during testing that have not been corrected at the time of preliminary commissioning report preparation.
5. List of deferred tests that cannot be performed at the time of preliminary commissioning report preparation because of climatic conditions.
6. List of climatic conditions required for the performance of the deferred tests.

Final commissioning report shall include the following:

1. Results of final functional performance tests. Organize equipment and components specified by other Divisions in separate sections for independent review.
2. List of functional performance testing procedures used during commissioning, including measurable criteria for test acceptance.
3. Itemization of resolved deficiencies found during preliminary commissioning.
4. List of deferred tests that cannot be performed at the time of final commissioning report preparation because of climatic conditions.

Conduct functional performance tests on equipment, controls, and economizers. Functional performance tests shall demonstrate the following:

1. The operation, function, and maintenance serviceability for each commissioned equipment, component, and system is confirmed according to the approved plans and specifications.
2. The sequence of operations, including modes, backup modes (if applicable), alarms, and mode of operation upon a loss of power and restoration of power for each control device, equipment, component, and system.
3. Control devices, components, equipment, and systems are calibrated, adjusted, and operate in accordance with the approved plans and specifications.
4. Air economizers operated in accordance with manufacturer's specifications and specified sequence of operation

9. ALTERNATES

A. DESCRIPTION

Refer to the architectural portion of the specification for list of alternates. Applicable sections of the base specifications shall apply to all work required by the alternate unless otherwise specified. Determine whether or not and how each alternate affects work. Include labor, materials, equipment, and transportation services necessary for and incidental to the completion of work under each particular alternate. Furnish separate bid for each alternate applicable to work, stating the amount to be added or deducted from the base bid.

END OF SECTION 23

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EXPIRES 2/28/2026

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IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES

NO.	BY	DATE	DESCRIPTION
7		11.07.2025	CLASS A BUDGET
5		10.07.2025	PERMIT AMENDMENT 2
1		01.10.2025	PERMIT TI

CACTUS CLUB CAFE

MIAMI BEACH

850 COMMERCE ST
MIAMI BEACH, FL 33139

MECHANICAL SPECIFICATIONS

DRAWN BY:	HEI
REVIEWED BY:	HEI
JOB NO:	20240136

M401

1/16/2025 8:40:48 PM Autodesk Docs://20240136.00 - Cactus Club Cafe South Beach, FL/24500032?7 Cactus Club Cafe Miami Beach FL MEP R24.rvt
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HOOD INFORMATION - JOB#7225768

HOOD NO	TAG	MODEL:	MANUFACTURER	LENGTH	MAX FIXTURE WEIGHT	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL CFM	EXHAUST PLENUM					TOTAL EXH CFM	HOOD CONSTRUCTION	HOOD SUPPLY AIR TO ROOM	
										WIDTH	LENG	HEIGHT	SIDE	BACK			FIRE SUP	ROV
1	3563	60FP-8610-D-PSP-F	ADVANCED HOOD	3' 0"	600 LBS	1	HEAVY	250	750	9"	8"	4"		750	1584	16 GA SS WHERE EXPOSED	6"	ALONE	ALONE

HOOD INFORMATION

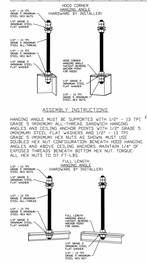
HOOD NO	TAG	CAL/RATED				LIGHTING			UTILITY CARRIER(S)						FIRE SYSTEM	HOOD WASHING	
		TYPE	QTY	HEIGHT	LENGTH	TYPE	QTY	TYPE	WIRE GUARD	LOCATION	SIZE	TYPE	SIZE	MECHANICAL	SWITCHES	SYSTEM	SYSTEM	
														MODEL #	QUANTITY			
1	3563	CAPTRATE SOLO FILTER	2	20"	76"	8955 SEE FILTER SPEC.	2	RECESSED ROUND	NO	LEFT	12"x40"x4"			DCV-3651	1 / LIGHT 1 / FAN	NO	405 L/M	

HOOD OPTIONS

HOOD NO	TAG	OPTION	
1	3563	FIELD WRAPPER 28.00" HIGH - FRONT, LEFT BACKSPLASH - 120.00" HIGH X 28.00" LONG - 430 SS, VERTICAL BACK SPLASH DIVIDER - 28.00" HIGH - 430 SS, VERTICAL	

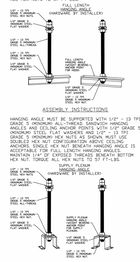
PERFORATED SUPPLY PLENUM(S)

HOOD NO	TAG	POS	BOARD(S)						
			LENGTH	WIDTH	HEIGHT	TYPE	WIDTH	LENG	SSA	DPW	SP
1	3563	Front	76"	20"	6"	Work	18"	24"		688	0.600"



ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 MINIMUM ALL-THREAD SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM STEEL) FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 DOUBLED HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION BENEATH HOOD HANGING ANGLE AND ABOVE CEILING ANCHOR POINTS. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 37 FT-LBS.



ASSEMBLY INSTRUCTIONS

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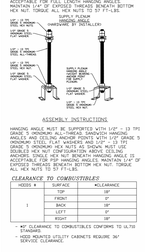

ASSEMBLY INSTRUCTIONS

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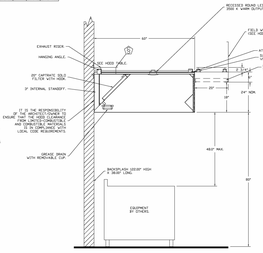
CLEARANCE TO COMBUSTIBLES

HOOD'S #	SURFACE	■CLEARANCE
1	TOP	18"
	FRONT	0"
	BACK	0"
	LEFT	0"
	RIGHT	0"

- #47 CLEARANCE TO COMBUSTIBLES CONFORMS TO UL710 #47 CLEARANCE.
- HOOD MOUNTED UTILITY CABINETS REQUIRE 36" SERVICE CLEARANCE.



SECTION VIEW - MODEL #60FAHI-ND-2-PSP-F
HOOD - BY OTHERS

IT IS THE RESPONSIBILITY OF THE INSPECTED OWNER TO ENSURE THAT ALL EQUIPMENT AND FINAL LOCATIONS/ARRANGEMENTS OF EQUIPMENT AND APPLIANCES IS IN COMPLIANCE WITH LOCAL CODE REQUIREMENTS.

SPECIFICATION: CAPTRATE GREASE-STOP SOLO FILTER

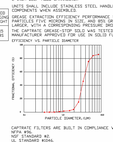
THE CAPTRATE GREASE-STOP SOLO FILTER IS A SINGLE-STAGE FILTER FEATURING A UNIQUE 5-BAFFLE DESIGN IN CONJUNCTION WITH A SLOTTED REAR BAFFLE DESIGN, TO DELIVER EXCEPTIONAL FILTRATION EFFICIENCY.

THE FILTER IS MADE OF 430 STAINLESS STEEL CONSTRUCTION, AND SIZED TO FIT INTO STANDARD 20 INCH DEEP HOOD CHANNELS.

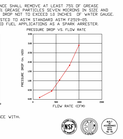
UNITS SHALL INCLUDE STAINLESS STEEL HANDLES AND A FASTENING DEVICE TO SECURE THE TWO COMPONENTS WHEN ASSEMBLED.

GREASE EXTRACTION EFFICIENCY PERFORMANCE SHALL REMOVE AT LEAST 75% OF GREASE PARTICLES 5 MICRONS AND LARGER. THE CAPTRATE GREASE-STOP SOLO FILTER SHALL BE RATED AT OR LARGER WITH A CORRESPONDING PRESSURE DROP NOT TO EXCEED 0.6 INCHES OF WATER GAUGE. THE CAPTRATE GREASE-STOP SOLO WAS TESTED TO ASTM STANDARD ASTM F1919-05. THE CAPTRATE GREASE-STOP SOLO FILTER SHALL BE RATED BY FUEL TECHNOLOGY.

EFFICIENCY VS. PARTICLE DIAMETER



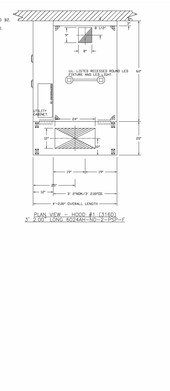
PRESSURE DROP VS. FLOW RATE

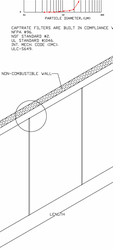


CAPTRATE FILTERS ARE BUILT IN COMPLIANCE WITH:
NFPA 96
NOT STANDARD #2
IMC 2009 CODE
2ND MECH. CODE CIRC.
UL-1046

PATENT NUMBERS

AC-PSP UNITED STATES® - US PATENT 7963839 B2
AC-PSP WALL (CANADA)® - CA PATENT 2605506
AC-PSP ISLAND (CANADA)® - CA PATENT 2505336





- BACKSPLASH IS NOT INSULATED AND IS UNSUITABLE FOR ATTACHMENT TO COMBUSTIBLE WALLS

ADVANCED HOOD SYSTEMS
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FL PHONE: 772.905.9663 FAX: 772.905.9664 INFO@advancedhoodsystems.com

Cactus Club Cafe - Miami Beach
1901 Convention Center Drive,
Miami Beach, FL, 33139

REVISIONS		
NO.	DESCRIPTION	DATE
1		
2		
3		
4		

DATE: 1/3/2025
DWG.#: 7225768
DRAWN BY: SAC-140
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 1

EXHAUST FAN INFORMATION - JOB#7225768

FAN UNIT NO.	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL.	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT LBS.	SONES
1	NEW EX	1	AH-3UDSWF-A	ADVANCED HOOD	750	1.250	1578	ODP	0.500	0.4060	3	208	2.2	351 FPM	84	17.3
2	MIDDLE EX	1	AH-3UDSWF-A	ADVANCED HOOD	2775	1.650	1308	ODP/PREMIUM	2.000	1.5840	3	208	7.2	640 FPM	215	18.8
3	RIGHT & PREP EX	1	AH-3UDSWF-A	ADVANCED HOOD	3427	1.650	1418	ODP/PREMIUM	3.000	2.0520	3	208	9.5	791 FPM	185	23.3
4	SUSH	1	AH-3UDSWF-A	ADVANCED HOOD	688	0.430	943	TEAO-4CH	0.500	0.0870	1	115	6.3	208 FPM	71	6.1

FAN OPTIONS

FAN UNIT NO.	TAG	QTY	DESCRIPTION
1	NEW EX	1	GREASE BOX
		1	FAN BASE CERAMIC SEAL - SU-SM1836P-A - INSTALLED AT PLANT - FOR GREASE DUCTS
		1	ROAMI BASE CERTIFICATION - NOM-1 ALUMINUM UPBLAST
		2	2 YEAR PARTS WARRANTY
2	MIDDLE EX	1	GREASE BOX
		1	FAN BASE CERAMIC SEAL - SU-SM1836P-A - INSTALLED AT PLANT - FOR GREASE DUCTS
		1	ROAMI BASE CERTIFICATION - NOM-1 ALUMINUM UPBLAST
		2	2 YEAR PARTS WARRANTY
3	RIGHT & PREP EX	1	GREASE BOX
		1	FAN BASE CERAMIC SEAL - SU-SM1836P-A - INSTALLED AT PLANT - FOR GREASE DUCTS
		1	ROAMI BASE CERTIFICATION - NOM-1 ALUMINUM UPBLAST
		2	2 YEAR PARTS WARRANTY
4	SUSH	1	ROAMI BASE CERTIFICATION - NOM-1 ALUMINUM UPBLAST
		1	FCM WIRING PACKAGE - EXHAUST - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL, MISC-TITLE24, CEW ROTATION
		2	2 YEAR PARTS WARRANTY

FAN ACCESSORIES

FAN UNIT NO.	TAG	EXHAUST			SUPPLY			
		GREASE CUP	GRAVITY DAMPER	WALL MOUNT	SIZE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1	NEW EX	YES						
2	MIDDLE EX	YES						
3	RIGHT & PREP EX	YES						
4	SUSH							

CURB ASSEMBLIES

NO.	QTY	TAG	WEIGHT	ITEM	SIZE
1	1	NEW EX	60 LBS	CURB	31.500"W X 19.500"L X 20.000"H - VENTED - HINGED - 16 GAGE
2	1	MIDDLE EX	55 LBS	CURB	28.500"W X 25.500"L X 26.000"H - VENTED - HINGED - 16 GAGE
3	1	RIGHT & PREP EX	34 LBS	CURB	28.500"W X 25.500"L X 20.000"H - VENTED - HINGED
4	1	SUSH	60 LBS	CURB	19.500"W X 19.500"L X 20.000"H - VENTED - HINGED - 16 GAGE

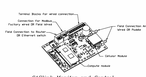
HOOD SIZE VEN. ALARUM (P-ELAT) TAB
WIRING NOTES:
ALL WIRING SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC) AND ALL LOCAL CODES AND REGULATIONS.
1. FIELD WIRING SHALL BE #14 AWG MIN. COPPER CONDUCTORS RATED FOR 75°C MIN.
2. FIELD WIRING SHALL BE ELECTRICALLY ISOLATED FROM LOW VOLTAGE CONTROL WIRING.
3. FIELD WIRING MUST BE KEPT SEPARATE FROM LOW VOLTAGE WIRING.
4. FIELD WIRING MUST BE SECURED AND STRAIN RELIEVED.
FAN WIRING
(REFER TO WIRING DIAGRAM FOR ADDITIONAL INFORMATION)
FIELD WIRING
FACTORY WIRING
FACTORY WIRING (OPTIONAL)
FIELD WIRING (OPTIONAL)
FIELD WIRING (OPTIONAL)
FACTORY WIRING (OPTIONAL)
FACTORY WIRING (OPTIONAL)
FACTORY

NOTE:
THE DOCUMENTATION CONTAINED ON THIS SHEET WAS NOT PREPARED BY HENDERSON ENGINEERS AND IS INCLUDED IN THIS SET FOR REFERENCE ONLY. HENDERSON ENGINEERS REVIEWED THE DOCUMENTATION ON THIS SHEET FOR GENERAL COMPLIANCE WITH DESIGN INTENT. SUPPLIER IS RESPONSIBLE THAT ALL FURNISHED EQUIPMENT ON THIS SHEET COMPLIES WITH APPLICABLE LOCAL, STATE AND FEDERAL LAWS, CODES AND REGULATIONS.

ELECTRICAL PACKAGE - 2084722568

NO	TAG	PACKAGE #	LOCATION
1	3063	3CV-3011	UTILITY CABINET LOFT

SWITCHES		OPTION	FANS CONTROLLED					
LOCATION	QUANTITY		FAN TAG	TYPE	#	HP	VOLTS	FLA
UTILITY CABINET	1 Lot/set	SMART CONTROLS DCV	New Ex	EXHAUST	3	3.000	208	23
HOOD # 1	1 FAN		Middle Ex	EXHAUST	3	3.000	208	7.2
			Right & Prep Ex	EXHAUST	3	3.000	208	9.3

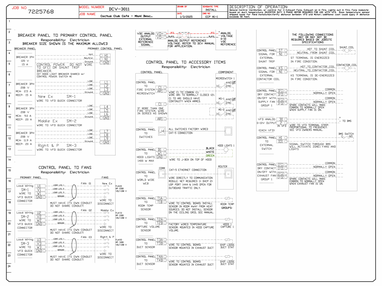


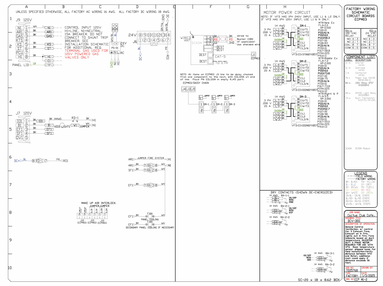
CATlink Monitor and Control

Stack control panel to support communications to cloud-based Building Management System.
Stack Control Panel to allow cloud-based Building Management System to monitor key fans parameters outlined on 3CV07705 in the plenum list.
Stack Control Panel to allow cloud-based Building Management System to control performance outlined on 3CV07705 in the plenum list.
Stack Control Panel to allow cloud-based Building Management System to augmentor 3107706 3107708 3107709 control strategies for fully integrated Building Management.

MONITORING AND CONTROL POINTS LIST

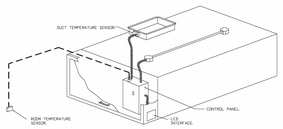
3CV Package	Function	3V Package	Function
Hood Temperature	3107708	Hood Temperature(s)	3107708
Duct Temperature(s)	3107708	Duct Temperature(s)	3107708
3CV Discharge Temperature	3107708	3V1 Discharge Temperature	3107708
Kitchen 3CV1 Discharge Temperature	3107708	Kitchen 3V1 Discharge Temperature	3107708
Fire Signal	3107708	Controller Faults	3107708
Fan stoppage	3107708	Fan Faults	3107708
Fan Faults	3107708	Fan Status	3107708
VFD Faults	3107708	VFD Faults	3107708
Controller Faults	3107708	VFD Feed Hrs Percentage	3107708
Fan Faults	3107708	Fire Condition	3107708
Fan Status	3107708	HOOD Fire System	3107708
VFD Faults	3107708	Building Pressure	3107708
VFD Feed Hrs Percentage	3107708	Room Temp(s)	3107708 & 3107706
Fire Condition	3107708	Make Up Temp(s)	3107708 & 3107706
HOOD Fire System	3107708	Fault Alarms	3107708 & 3107706
Building Pressure	3107708		
Prep Temp Alarms	3107708 & 3107706		
Fans Alarms	3107708 & 3107706		
Make Up Alarms	3107708 & 3107706		
Fault Alarms	3107708 & 3107706		





DEMAND CONTROL VENTILATION HOOD CONTROL PANEL SPECIFICATIONS:

- CONTROLS SHALL BE LISTED BY ETL (UL 508A) AND SHALL COMPLY WITH DEMAND VENTILATION SYSTEM TURNDOWN REQUIREMENTS OUTLINED IN ICCC 403.7.5 (2021).
- THE CONTROL ENCLOSURE SHALL BE NEMA 1-RATED AND LISTED FOR INSTALLATION INSIDE OF THE EXHAUST HOOD UTILITY CABINET. THE CONTROL ENCLOSURE MAY BE CONSTRUCTED OF STAINLESS STEEL OR PAINTED STEEL.
- TEMPERATURE PROBE(S) LOCATED IN THE EXHAUST DUCT RISER(S) SHALL BE CONSTRUCTED OF STAINLESS STEEL.
- A DIGITAL CONTROLLER SHALL BE PROVIDED TO ACTIVATE THE HOOD EXHAUST FANS DYNAMICALLY BASED ON A FIXED DIFFERENTIAL BETWEEN THE AMBIENT AND DUCT TEMPERATURES SENSORS. THIS FUNCTION SHALL MEET THE REQUIREMENTS OF IMC 507.1.1.
- A DIGITAL CONTROLLER SHALL PROVIDE ADJUSTABLE HYSTERESIS SETTINGS TO PREVENT CYCLING OF THE FANS AFTER THE COOKING APPLIANCES HAVE BEEN TURNED OFF AND/OR THE HEAT IN THE EXHAUST SYSTEM IS REDUCED.
- A DIGITAL CONTROLLER SHALL PROVIDE AN ADJUSTABLE MINIMUM FAN RUN-TIME SETTING TO PREVENT FAN CYCLING.
- VARIABLE FREQUENCY DRIVES (VFDS) SHALL BE PROVIDED FOR FANS AS REQUIRED. THE DIGITAL CONTROLLER SHALL MODULATE THE VFDS BETWEEN A MINIMUM SETPOINT AND A MAXIMUM SETPOINT ON DEMAND. THE DUCT TEMPERATURE SENSOR INPUT(S) TO THE DIGITAL CONTROLLER SHALL BE USED TO CALCULATE THE SPEED REFERENCE SIGNAL.
- THE VFD SPEED RANGE OF OPERATION SHALL BE FROM 0% TO 100% FOR THE SYSTEM, WITH THE ACTUAL MINIMUM SPEED SET AS REQUIRED TO MEET MINIMUM VENTILATION REQUIREMENTS.
- AN INTERNAL ALGORITHM TO THE DIGITAL CONTROLLER SHALL MODULATE SUPPLY FAN VFD SPEED PROPORTIONAL TO ALL EXHAUST FANS THAT ARE LOCATED IN THE SAME FAN GROUP AS THE SUPPLY FAN.
- THE SYSTEM SHALL OPERATE IN PREP MODE DURING LIGHT COOKING LOAD OR COOL DOWN MODE WHEN SUFFICIENT HEAT REMAINS UNDERNEATH THE HOOD SYSTEM AFTER COOKING OPERATIONS HAVE COMPLETED. OPERATION SHALL BE EITHER AT THE MINIMUM VFD SPEED FOR EXHAUST FANS AND PROVIDE AN EXHAUST FAN SPEED THAT IS EQUAL TO THE MINIMUM VENTILATION REQUIREMENT.
- A DIGITAL CONTROLLER SHALL DISABLE THE SUPPLY FAN(S), ACTIVATE THE EXHAUST FAN(S), ACTIVATE THE APPLIANCE SHUNT TRIP, AND DISABLE AN ELECTRIC GAS VALVE AUTOMATICALLY WHEN FIRE CONDITION IS DETECTED ON A COVERED HOOD.
- A DIGITAL CONTROLLER SHALL ALLOW FOR EXTERNAL BMS FAN CONTROL VIA DRY CONTACT (EXTERNAL CONTROL SHALL NOT OVERRIDE FAN OPERATION LOGIC AS REQUIRED BY CODE).
- AN LCD INTERFACE SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
  A. ON/OFF PUSH BUTTON FAN & LIGHT SWITCH ACTIVATION.
  B. INTEGRATED GAS VALVE RESET FOR ELECTRONIC GAS VALVES (NO RESET RELAY REQUIRED).
  C. VFD FAULT DISPLAY WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  D. DUCT TEMPERATURE SENSOR FAILURE DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  E. MIS-WIRED DUCT TEMPERATURE SENSOR DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  F. A SINGLE LOW VOLTAGE CAT-5 RJ45 WIRING CONNECTION.
  G. AN ENERGY SAVINGS INDICATOR THAT UTILIZES MEASURED KWH FROM THE VFDS.



TYPICAL HOOD CONTROL PANEL INSTALLATION

SEQUENCE OF OPERATIONS:

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

- AUTOMATIC: THE SYSTEM OPERATES BASED ON THE DIFFERENTIAL BETWEEN ROOM TEMPERATURE AND THE TEMPERATURE AT THE HOOD CAVITY OR EXHAUST DUCT COLLAR. FANS ACTIVATE AT A CONFIGURABLE TEMPERATURE DIFFERENTIAL THRESHOLD. DEPENDING ON THE JOB CONFIGURATION EACH FAN ZONE CAN BE CONFIGURED AS STATIC OR DYNAMIC. THESE TERMS REFER TO WHETHER A VARIABLE SPEED FAN IS USED IN THE ZONE OR NOT. IF THE ZONE IS DEFINED AS "STATIC", THE ZONE WILL BE EQUIPPED WITH VARIABLE SPEED FANS AND THE ZONE IS DEFINED AS "DYNAMIC", THESE WILL MODULATE WITHIN A USER-DEFINED RANGE BASED ON THE TEMPERATURE DIFFERENTIAL. PANELS EQUIPPED WITH VARIABLE SPEED FANS AND A FAN ZONE DEFINED AS "STATIC" FANS WILL RUN AT A SET SPEED CALCULATED FOR THE DRIVE. DEMAND CONTROL VENTILATION SYSTEMS ARE CAPABLE OF MODULATING EXHAUST AND MAKE UP AIR FAN SPEEDS PER THE REQUIREMENTS OUTLINED IN ICCC 403.7.5 (2021).
- MANUAL: THE SYSTEM OPERATES BASED ON HUMAN INPUT FROM AN HMI.
- SCHEDULE: A WEEKLY SCHEDULE CAN BE SET TO RUN FANS FOR A SPECIFIED PERIOD THROUGHOUT THE DAY. THERE ARE THREE OCCUPIED TIMES PER DAY TO ALLOW FOR THE USER TO SET UP A TIME THAT IS SUITABLE TO THEIR NEEDS ANY TIME THAT IS WITHIN THE DEFINED OCCUPIED TIME, THE SYSTEM WILL RUN IN OCCUPIED MODE AND FOLLOW THE FAN PROGRAMMING AND TEMPERATURE DURING THIS TIME. DURING UNOCCUPIED TIME, THE SYSTEM WILL HAVE AN EXTRA OFFSET TO PREVENT UNINTENDED ACTIVATION OF THE SYSTEM DURING A TIME WHERE THE SYSTEM IS NOT BEING OCCUPIED.
- OTHER: THE SYSTEM OPERATES BASED ON THE INPUT FROM AN EXTERNAL SOURCE (ODC, BMS OR HARD-WIRED INTERLOCK).
- FIRE: UPON ACTIVATION OF THE HOOD FIRE SUPPRESSION SYSTEM, THE EXHAUST FAN WILL COME ON OR CONTINUE TO TO RUN. THE HOOD MAKEUP AIR WILL SHUTDOWN, AND A SIGNAL WILL BE SENT FOR ACTIVATING THE SHUNT TRIP BREAKER PROVIDED BY THE ELECTRICIAN. FUEL GAS WILL SHUT OFF VIA A MECHANICAL/ELECTRICAL GAS VALVE ACTUATED BY THE HOOD FIRE SUPPRESSION SYSTEM.

REVISIONS

NO.	BY	DATE	DESCRIPTION
5		10.07.2025	PERMIT AMENDMENT 2
1		01.10.2025	PERMIT TI

Advanced Hoods Systems LLC
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MIAMI BEACH

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ADVANCED HOOD DRAWINGS

DRAWN BY:	HEI
REVIEWED BY:	HEI
JOB NO:	20240136

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