ABBREVIATIONS

(A)	EXISTING TO BE ABANDONED	FPI	FINS PER INCH
(D)	EXISTING TO BE DEMOLISHED	GC	GENERAL TRADES CONTRACTOR
(E)	EXISTING TO REMAIN	ID	INNER DIAMETER
(F)	FUTURE	LAT	LEAVING AIR TEMPERATURE
(R)	EXISTING TO BE RELOCATED	LWT	LEAVING WATER TEMPERATURE
AAV	AUTOMATIC AIR VENT	MAU	MAKEUP AIR UNIT
AFF	ABOVE FINISHED FLOOR	MC	MECHANICAL CONTRACTOR
AHJ	AUTHORITY HAVING JURISDICTION	MFR	MANUFACTURER
AMB	AMBIENT	N/A	NOT APPLICABLE
APD	AIR PRESSURE DROP	NC	NORMALLY CLOSED
BAS	BUILDING AUTOMATIC SYSTEM	NO	NORMALLY OPEN
BFP	BACKFLOW PREVENTER	NTS	NOT TO SCALE
BLDG	BUILDING	OA	OUTSIDE AIR
BOB	BOTTOM OF BEAM	OD	OUTSIDE DIAMETER
BOD	BOTTOM OF DUCT	PD	PRESSURE DROP
BOP	BOTTOM OF PIPE	PRV	PRESSURE REDUCING VALVE
BOS	BOTTOM OF STRUCTURE	RA	RETURN AIR
CL	CENTER LINE	REL	RELIEF AIR
DB	DRY BULB	RTU	ROOFTOP UNIT
DIA	DIAMETER	SA	SUPPLY AIR
DN	DOWN	SCC	SENSIBLE COOLING CAPACITY
EA	EXHAUST AIR	SP	STATIC PRESSURE
EAT	ENTERING AIR TEMPERATURE	TCP	TEMPERATURE CONTROL PANEL
EC	ELECTRICAL CONTRACTOR	TSP	TOTAL STATIC PRESSURE
EF	EXHAUST FAN	TYP	TYPICAL
EFF	EFFICIENCY	UNO	UNLESS NOTED OTHERWISE
EG	ETHYLENE GLYCOL	VFD	VARIABLE FREQUENCY DRIVE
ESP	EXTERNAL STATIC PRESSURE	WB	WET BULB
EWT	ENTERING WATER TEMPERATURE	WG	WATER GAUGE
EXH	EXHAUST	WPD	WATER PRESSURE DROP

MECHANICAL LEGEND

	SUPPLY DUCT UP		PIPING DOWN
	SUPPLY DUCT DOWN		PIPING UP
	RETURN DUCT UP		TURNING VANES
	RETURN DUCT DOWN		VOLUME DAMPER
FD	FIRE DAMPER	C	CONDENSATE DRAIN
SD	SMOKE DAMPER	M	MOTORIZED DAMPER
C/S	COMB. FIRE/SMOKE DAMPER	A	REMOTE ANNUNCIATOR
BD	BACKDRAFT DAMPER	S	REMOTE TEMP. SENSOR
SD	SMOKE DETECTOR	T	THERMOSTAT
	SPIN-IN WITH VOLUME DAMPER	H	HUMIDISTAT
	45° RETURN DUCT TAP WITH VOL. DAMPER		FLEX DUCT
	DIFFUSER		LINEAR DIFFUSER WITH FLEX CONNECTION
	DIFFUSER WITH FLEX CONNECTION		ROUND DUCT UP
	GRILLE/REGISTER		ROUND DUCT DOWN
	SIDEWALL GRILLE/ REGISTER/ DIFFUSER		REDUCER

GENERAL NOTES:

A. ALL WORK TO BE PERFORMED TO MEET ALL STATE, CITY & LOCAL CODE REQUIREMENTS.

B. ALL WALL PATCHING TO BE BY GC.

C. MC IS TO COORDINATE WITH OTHER TRADES BEFORE INSTALLING DUCTWORK. IF THE MC FAILS TO COORDINATE WITH OTHER TRADES AND THE WORK MUST BE ALTERED THE MC WILL CHANGE IT AT HIS OWN EXPENSE.

D. COORDINATE THE EXACT LOCATION OF ALL GRILLES, REGISTERS & DIFFUSER WITH ARCHITECTURAL REFLECTED CEILING PLAN.

E. MECHANICAL CONTRACTOR IS TO VISIT THE SITE PRIOR TO SUBMITTING A BID & INCLUDE IN THE BID ANY ITEMS NECESSARY FOR A COMPLETE & OPERATIONAL SYSTEM.

F. DRAWINGS ARE SCHEMATIC IN NATURE & MC IS TO INCLUDE ANY ITEMS REQUIRED FOR A COMPLETE & OPERATIONAL SYSTEM WHETHER SHOWN OR NOT SHOWN ON THE DRAWINGS.

G. MC TO FURNISH ALL PERMITS REQUIRED FOR HIS PORTION OF THE WORK.

H. MC TO COORDINATE WITH ELECTRICAL CONTRACTOR CONCERNING ELECTRICAL REQUIREMENTS BEFORE ORDERING ANY EQUIPMENT.

I. CONTRACTOR IS RESPONSIBLE FOR ADHERING TO THE ENTIRETY OF THIS DRAWING SET, INCLUDING BUT NOT LIMITED TO; PLANS, ELEVATIONS, DETAILS, SCHEDULES, AND SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ALL DRAWINGS OF OTHER TRADES, INCLUDING BUT NOT LIMITED TO, ARCHITECTURAL, PLUMBING, ELECTRICAL, CIVIL, AND STRUCTURAL.

J. ALL CUTTING AND PATCHING OF ROOF IS TO BE BY GC.

SEQUENCE OF OPERATION

A. PROVIDE STAND ALONE OR APPLICATION SPECIFIC CONTROLLERS AS REQUIRED TO PERFORM THE FOLLOWING SEQUENCES OF OPERATIONS.

B. PACKAGED ROOFTOP UNITS

1. UNIT SHALL CONSIST OF SUPPLY AIR FAN, FILTERS, DX COOLING COIL, GAS-FIRED HEAT SECTION, AND A 7-DAY PROGRAMMABLE THERMOSTAT.
2. PROVIDE AN OVERRIDE SWITCH TO OPERATE THE UNIT DURING UNOCCUPIED HOURS. THIS SWITCH SHALL BE PART OF THE PROGRAMMABLE THERMOSTAT. OVERRIDE SWITCH ALLOWS THE UNIT TO OPERATE FOR TWO HOURS (ADJUSTABLE).
3. OCCUPIED MODE: BASED ON THE ROOFTOP UNIT'S HOURS OF OCCUPANCY, START THE UNIT AT THE BEGINNING OF OCCUPANCY AND SHUT DOWN THE UNIT AT THE END OF OCCUPANCY (NOTE: OUTSIDE AIR DAMPER WITHIN THE RTU SHALL OPEN AND THEN THE RTU SHALL START). THE UNIT SHALL START EARLIER AS DETERMINED BY THE PROGRAM FOR EARLY WARM-UP OR COOL DOWN. ON A SYSTEM STARTUP, THE RTU FAN SHALL START AND RUN CONTINUOUSLY AND THE INTERNAL FACTORY CONTROLS SHALL BE ENABLED. BASED ON THE SPACE TEMPERATURE SENSOR, THE UNIT SHALL CYCLE THE HEATING/COOLING TO MAINTAIN THE SPACE TEMPERATURE SETPOINT.
   - 3.1. ECONOMIZER MODE: WHEN ENTHALPY OF OA IS BELOW 28 BTU/LB, ECONOMIZER MODE SHALL BE ENABLED. ECONOMIZER MODE SHALL LINEARLY MODULATE OUTDOOR AIR CFM FROM MINIMUM OA CFM TO 100% BASED ON ENTHALPY READINGS.
   - 3.2. HUMIDITY CONTROL (WHEN NEEDED BASED ON CLIMATE): UPON DETECTION OF RELATIVE HUMIDITY ABOVE 55%, THE UNIT SHALL CYCLE INTO DEHUMIDIFICATION MODE IF NOT ALREADY IN COOLING.
4. UNOCCUPIED MODE: THE RTU INTERNAL OA DAMPERS SHALL REMAINED CLOSED WHEN THE BUILDING IS NOT OCCUPIED. THE RTU SHALL STOP HEATING/COOLING AND THE FAN SHALL STOP. IF THE SPACE TEMPERATURE FALLS BELOW 60 DEGREE F (ADJUSTABLE), THE UNIT SHALL START AND HEAT UNTIL THE SPACE TEMPERATURE IS 64 DEGREE F (ADJUSTABLE) AND THEN SHUTDOWN. IF THE SPACE TEMPERATURE RISES ABOVE 85 DEGREE F (ADJUSTABLE), THE UNIT SHALL START AND COOL UNTIL THE SPACE TEMPERATURE IS 80 DEGREE F (ADJUSTABLE) AND THEN SHUTDOWN.
5. UPON DETECTION OF SMOKE BY UNIT SMOKE DETECTOR BOTH RTUS SHALL SHUT DOWN AND AN ALARM SHALL BE SENT TO THE FIRE ALARM CONTROL PANEL (WHERE APPLICABLE). LOCAL REMOTE ANNUNCIATORS SHALL ALSO BE ACTIVATED.

C. KITCHEN HOOD EXHAUST FAN (KEF-1)

1. THE KITCHEN HOOD EXHAUST FAN SHALL BE ENABLED WHEN ANY COOKING APPLIANCE LOCATED UNDER ITS RESPECTIVE HOOD, IS IN USE.

D. MAKE UP AIR UNIT

1. THE MAKE UP AIR UNIT SHALL BE ENABLED WHEN THE KITCHEN HOOD EXHUAST FAN (KEF-1) IS ENERGIZED. THE INTERNAL MOTORIZED DAMPER WITHIN WITH MAU-1 SHALL OPEN AND THE FAN SHALL RUN. IF OA IS LESS THAN 65° (ADJ.), THE MAU-1 HEAT PUMP HEAT SECTION SHALL BE ENABLED TO MAINTAIN A MINIMUM OF 65°.
2. WHEN KEF-1 IS OFF, MAU-1 SHALL BE DE-ENERGIZED AND THE INTERNAL MOTORIZED DAMPED SHALL CLOSE.

E. ANSUL SYSTEM ACTIVATION

1. UPON ACTIVATION OF ANSUL SYSTEM, SHUT DOWN MAU-1, RTU-1 AND RTU-2. PROVIDE RELAYS CONTACTS, INTERLOCKS, TRANSFORMERS AND ALL ASSOCIATED WIRING TO ACCOMPLISH SEQUENCE. MAU-1 IS ALREADY PREWIRED TO SHUT DOWN IN HOOD CONTROL PANEL. MECHANICAL CONTRACTOR SHALL INTERLOCK RTU-1 AND RTU-2 TO ALSO SHUT DOWN.

annex
ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

CAVA

CAVA #148 - E DELRAY BEACH, FL
1831 S. FEDERAL HWY. SUITE 300
DELRAY BEACH, FL 33483
FOR
CAVA
14 Ridge Square NW #500, WASHINGTON, DC 20016

PROJECT NUMBER:
CAV148

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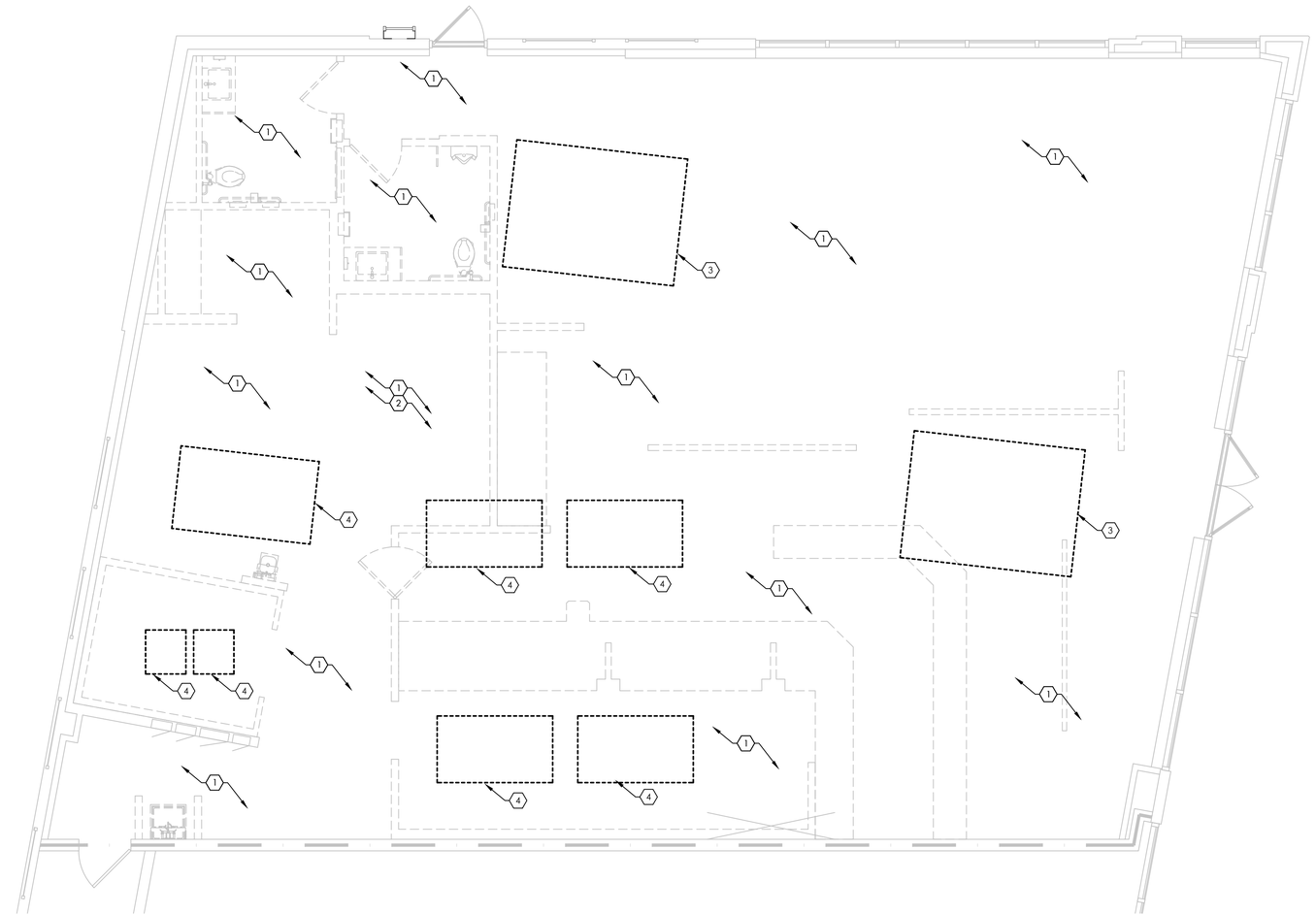
REVISION 1	3.14.2025
REVISION 2	1.10.2025
CONSTRUCTION SET 1	7.18.2025

GENERAL INFORMATION
MECHANICAL

SHEET:
M000



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

GENERAL NOTES:

A. 'E' DENOTES EXISTING TO REMAIN, 'D' DENOTES TO DEMOLISH, 'R' DENOTES TO RELOCATE.

B. DESIGN DRAWINGS ARE DIAGRAMMATIC. THE CONTRACTOR SHALL INSPECT EXISTING FIELD CONDITIONS. THIS CONTRACT SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS DUE TO EXISTING CONDITIONS.

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

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

E. CONTRACTOR SHALL VERIFY ALL EXISTING DUCTWORK PRIOR TO START TO ANY WORK. IF EXISTING DUCTWORK IS ABLE TO BE REUSED, CONTACT EOR IMMEDIATELY FOR FURTHER INSTRUCTION.

CODED NOTES: (#)

1. DEMOLISH EXISTING AIR TERMINALS, DUCTWORK, HANGER AND SUPPORTS, AND ALL ASSOCIATED COMPONENTS BACK TO THE EXISTING AIR HANDLING UNITS.
2. DEMOLISH EXISTING KITCHEN EXHASUT SYSTEMS AND ASSOCIATED COMPONENTS BACK TO SOURCE.
3. DEMOLISH EXISTING ROOFTOP UNIT AND ASSOCIATED CURB, PATCH ROOF TO MATCH EXISTING.
4. EXISTING ROOFTOP EQUIPMENT AND ASSOCIATED SUPPROTS. PATCH ROOF TO MATCH EXISTING.

annex
ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

CAVA

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CONSTRUCTION SET 3	7.18.2025

MECHANICAL
DEMOLITION PLAN

SHEET:
MD10

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

GENERAL NOTES:

A. DO NOT PENETRATE KITCHEN EXHAUST HOODS OR DUCTWORK WITH ANY TYPE OF FASTENING ASSEMBLY (I.E. SCREWS, RIVETS).

B. IF NOT PAINTED, ALL DUCTWORK SHALL HAVE A GASKET SEAL.

C. EXPOSED DUCTWORK IN THE DINING AREA SHALL BE MADE OF ELECTRO-GALVANIZED STEEL (PAINTLOCK). SEE MECHANICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.

CODED NOTES: (#)

1. MOUNT REGISTER AT 15° ANGLE ON SIDE OF DUCT. ADJUST DIFFUSER BLADES TO 45° PATTERN. BALANCE AIR SCOOP TO CFM INDICATED.
2. EXTEND FULL SIZE RETURN DUCT TIGHT TO STRUCTURE ABOVE A MINIMUM OF 5' AND PROVIDE ELBOW UP COMPELTE WITH FULL METAL ANGLE AND BIRD SCREEN.
3. ROUTE 10"x10" EXHASUT DUCT UP THROUGH ROOF ABOVE AND CONNECT TO EXHAUST FAN, REFER TO SHEET M201 FOR CONTINUATION. SEAL WEATHER TIGHT.
4. INSTALL LED TOUCHSCREEN 24/7 PROGRAMMABLE THERMOSTAT (WITH CONTROLS LOCKED BY CODE) MOUNTED AT 48" AFF. COORDINATE EXACT LOCATION WITH OWNER.
5. ROUTE 16" Ø CUSTOM FABRICATED TYPE 1 KITCHEN EXHAUST DUCT FROM EXHAUST HOOD, UP THROUGH ROOF ABOVE AND CONNECT TO KITCHEN EXHAUST FAN, REFER TO SHEET M201 FOR CONTINUATION. COORDINATE WITH KES AND CAPTIVE AIRE DRAWINGS. SEAL WEATHER TIGHT. CONTRACTOR SHALL PROVIDE CLEANOUT EVERY 20' AND AT EVERY CHANGE OF DIRECTION IN TYPE 1 EXHAUST DUCT.
6. REMOTE TEMPERATURE AVERAGING SENSOR MOUNTED AT 48" AFF FOR RTU-2. WIRE BACK TO THERMOSTAT AT MANAGERS DESK.
7. REMOTE TEMPERATURE SENSOR MOUNTED WITHIN RETURN DUCT FOR RTU-1. WIRE BACK TO THERMOSTAT AT MANAGERS DESK.
8. PROVIDE AUDIO/VISUAL REMOTE SMOKE DETECTOR ANNUNCIATOR WITH REMOTE KEY OPERATED RESET FOR SMOKE DETECTOR MOUNTED AT 48" AFF. ALIGN ANNUNCIATOR WITH THERMOSTAT SENSOR WHERE APPLICABLE.
9. TYPE 1 GREASE EXHAUST HOOD. REFER TO KES AND CAPTIVE AIRE DRAWINGS FOR ADDITIONAL INFORMATION.
10. ROUTE 18"x18" MAKE UP AIR DUCT UP THROUGH ROOF ABOVE AND CONNECT TO MAKE UP AIR UNIT, REFER TO SHEET M201 FOR CONTINUATION. COORDINATE WITH KES AND CAPTIVE AIRE DRAWINGS. SEAL WEATHER TIGHT.
11. ROUTE 28"x14" SUPPLY AND RETURN AIR DUCT UP THROUGH ROOF ABOVE AND CONNECT TO ROOF TOP UNIT, REFER TO SHEET M201 FOR CONTINUATION. SEAL WEATHER TIGHT.
12. MOUNT SPIRAL DUCT TIGHT TO BOTTOM OF STRUCTURE..
13. PROVIDE DUCT MOUNTED SMOKE DETECTOR IN SUPPLY AIR DUCT. UPON DETECTION OF SMOKE UNIT SHALL DE-ENERGIZE.

3

14. ROUTE 26"x8" SUPPLY AIR DUCT DOWN FROM CEILING SPACE AND CONNECT TO SUPPLY AIR PLENUM ON HOOD. PROVIDE BALANCING DAMPER AND BALANCE TO 422 CFM. REFER TO KES AND CAPTIVE AIRE DRAWINGS FOR ADDITIONAL INFORMATION.
15. ROUTE 28"x10" MAKEUP AIR DUCT DOWN FROM CEILING SPACE AND CONNECT TO MAKE UP AIR PLENUM ON HOOD. PROVIDE BALANCING DAMPER AND BALANCE TO 563CFM. REFER TO KES AND CAPTIVE AIRE DRAWINGS FOR ADDITIONAL INFORMATION.
16. PROVIDE AIR CURTAIN ABOVE ENTRANCE DOOR. INSTALL PER MANUFACTURES RECOMMENDATIONS.
17. ROUTE 3" COMBUSTION AIR AND FLUE DOWN FROM CEILING SPACE AND CONNECT TO WATER HEATER, INSTALLATION SHALL BE PER MANUFACTURERS RECOMMENDATIONS.
18. EXTEND 3" COMBUSTION AIR AND FLUE IN CEILING SPACE. FIELD VERIFY EXACT ROUTING.
19. EXTEND 3" COMBUSTION AIR AND FLUE UP TO CONCENTRIC VENT THROUGH ROOF ABOVE, REFER TO SHEET M201 FOR ADDITIONAL INFORMATION.
20. REMOTE BALANCING DAMPER, TYPICAL FOR BALANCING DAMPERS IN HARD CEILING APPLICATIONS.

annex
ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

CAVA

CAVA #148 - E DELRAY BEACH, FL
1831 S. FEDERAL HWY. SUITE 300
DELRAY BEACH, FL 33483
FOR
CAVA
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REVISION 2	1.10.2025
CONSTRUCTION SET 3	7.18.2025

MECHANICAL PLAN

SHEET:
M101

GENERAL NOTES:

A. DO NOT PENETRATE KITCHEN EXHAUST HOODS OR DUCTWORK WITH ANY TYPE OF FASTENING ASSEMBLY (I.E. SCREWS, RIVETS).

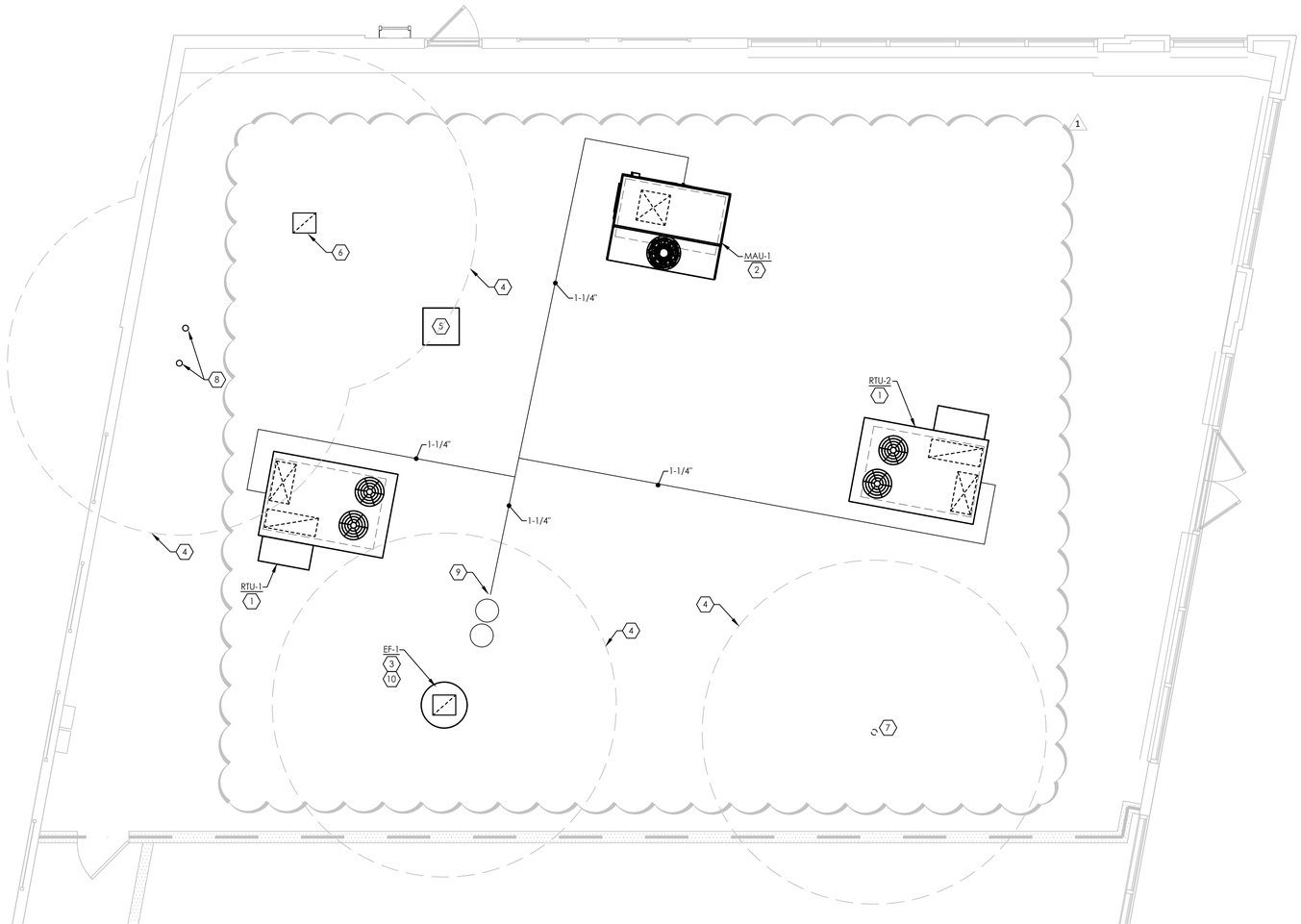
B. IF NOT PAINTED, ALL DUCTWORK SHALL HAVE A GASKET SEAL.

C. EXPOSED DUCTWORK IN THE DINING AREA SHALL BE MADE OF ELECTRO-GALVANIZED STEEL (PAINTLOCK). SEE MECHANICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.

CODED NOTES: ⟨#⟩

1. INSTALL NEW ROOFTOP AIR UNIT ON MANUFACTURERS ROOF CURB. CONTRACTOR SHALL CUT, PATCH, FLASH, AND AND COUNTER FLASH AROUND ROOF CURB TO MAINTAIN ANY APPLICABLE ROOF WARRANTY.
2. INSTALL NEW MAKE-UP AIR UNIT ON MANUFACTURERS ROOF CURB. CONTRACTOR SHALL CUT, PATCH, FLASH, AND AND COUNTER FLASH AROUND ROOF CURB TO MAINTAIN ANY APPLICABLE ROOF WARRANTY.
3. INSTALL NEW HOOD EXHAUST FAN ON MANUFACTURERS ROOF CURB. ENSURE LOCATION IS A MINIMUM OF 10'-0" FROM ANY OUTSIDE AIR INTAKES. CONTRACTOR SHALL CUT, PATCH, FLASH, AND AND COUNTER FLASH AROUND ROOF CURB TO MAINTAIN ANY APPLICABLE ROOF WARRANTY.
4. ENSURE TO MAINTAIN 10'-0" CLEARANCE TO OUTSIDE AIR INTAKES.
5. EXISTING WALK IN COOLER CONDENSING UNIT TO REMAIN.!
6. INSTALL 10"x10" EXHAUST DUCT WITH GOOSENECK AND BIRDSCREEN. ENSURE LOCATION IS A MINIMUM OF 10' - 0" FROM ANY OUTSIDE AIR INTAKES. CONTRACTOR SHALL CUT, PATCH, FLASH, AND AND COUNTER FLASH AROUND ROOF PENETRATION TO MAINTAIN ANY APPLICABLE ROOF WARRANTY.
7. 4" VENT THROUGH ROOF. CONTRACTOR SHALL ENSURE LOCATION IS A MINIMUM OF 10' - 0" FROM ANY OUTSIDE AIR INTAKES.
8. COMBINATION AIR INTAKE AND FLUE EXHAUST FOR WATER HEATER, INSTALL PER MANUFACTURERS RECOMMENDATIONS. CONTRACTOR SHALL ENSURE LOCATION IS A MINIMUM OF 10' - 0" FROM ANY OUTSIDE AIR INTAKES.
9. CONDENSATE LINE SHALL BE DIRECTED DIRECTLY INTO THE EXISTING ROOF DRAINS. CONDENSATE WATER SHALL NOT FLOW ONTO ROOF. CONDENSATE LINES SHALL NOT COME IN DIRECT CONTACT WITH THE ROOF AND SHALL BE PLACED INTO CONDENSATE LINE SUPPORTS.
10. INSTALL AND MAINTAIN A ROOFTOP GREASE CONTAINMENT SYSTEM BY GREASE GUARD COMPANY TO COLLECT GREASE DISCHARGED FROM THE KITCHEN EXHAUST FAN. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

1



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

annex ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

CAVA

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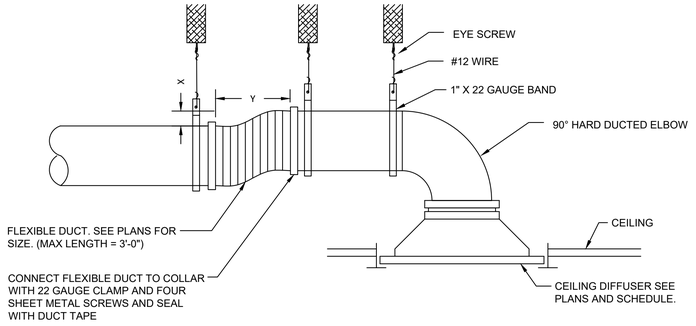
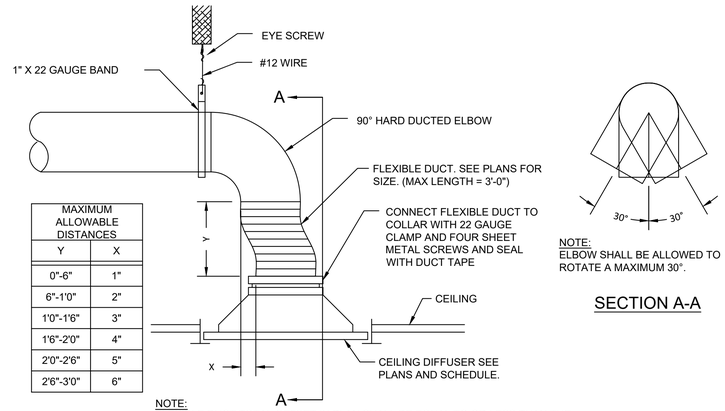
MECHANICAL ROOF PLAN

SHEET: M201



LIMITED CEILING SPACE



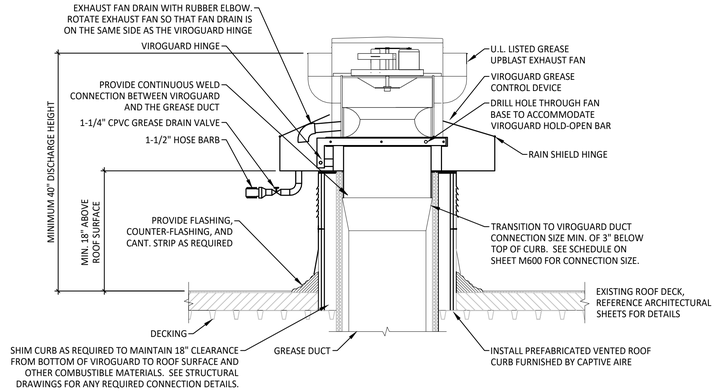
MAXIMUM ALLOWABLE DISTANCES	
Y	X
0"-6"	1"
6"-1'0"	2"
1'0"-1'6"	3"
1'6"-2'0"	4"
2'0"-2'6"	5"
2'6"-3'0"	6"

NOTE:
FLEXIBLE DUCT TOTAL OFFSET IN PLAN SHALL BE EQUAL TO OR LESS THAN THE VALUE SHOWN IN THIS DETAIL (IN ANY DIRECTION).

NOTE:
ELBOW SHALL BE ALLOWED TO ROTATE A MAXIMUM 30°.

SECTION A-A

3

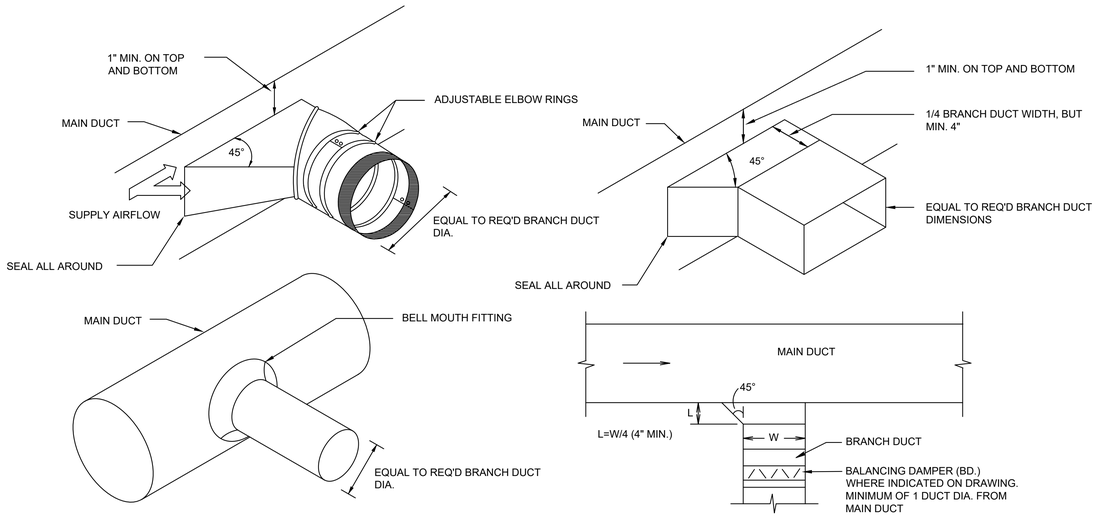


NOTES:

1. INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA 96 REQUIREMENTS.
2. CUT AND PATCH EXISTING ROOFING AS REQUIRED FOR NEW CURB INSTALLATION (CONFIRM IF BY LL BASED ON WORK LETTER).
3. CURB SHALL BE TAPERED TYPE AND MATCH THE PITCH OF THE ROOF.
4. CONTRACTOR TO PROVIDE TREATED WOOD BLOCKINGS AND SHIM FLAT ROOF CURB TILL LEVEL FOR ALL EXHAUST FANS AND TO ACHIEVE ROOF CURB HEIGHTS. PROVIDE ROOF CURB EXTENSION IF REQUIRED.
5. HINGE FAN SO IT TIPS BACK TOWARD FAN DRAIN AND TOWARD VIROGUARD DRAIN.
6. CURB SHALL BE MIAMI DADE RATED, INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

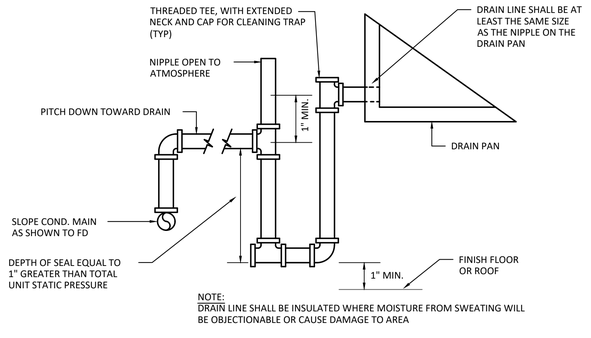
4 GREASE EXHAUST FAN DETAIL

N.T.S.



3 DUCT BRANCH DETAIL

N.T.S.



NOTE:
DRAIN LINE SHALL BE INSULATED WHERE MOISTURE FROM SWEATING WILL BE OBJECTIONABLE OR CAUSE DAMAGE TO AREA

1 CONDENSATE DRAIN DETAIL

N.T.S

2 CEILING DIFFUSER DETAIL

N.T.S.

annex ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
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MECHANICAL DETAILS

SHEET:
M401

ROOFTOP AIR HANDLING UNIT SCHEDULE (PROVIDED BY LANDLORD)

3 OUTSIDE AIR CONDITIONS - SUMMER DB/WB: 91/78°F, WINTER DB: 43°F.

UNIT TAG	MANUF.	MODEL	TONS	AIR FLOW				HEATING (MBH)				COOLING (MBH)			COOLING DESIGN AMBIENT (95°F)	ELECTRIC		WEIGHT (LBS)	NOTES
				CFM	OA MIN	ESP.	MOTOR HP	INPUT	OUTPUT	STAGES	AFUE %	TOTAL	SENS.	EER/SEER		MCA/MOCP	VOLT		
RTU-1	CARRIER	48HCD09	8.5	3,400	350	1.0	3	180/120	148/98	2	82	103.6	81.0	12.0	80db/67wb	45/50	208/3/60	1,300	1,2,3
RTU-2	CARRIER	48HCD12	10	4,000	800	1.0	3	224/180	184/147	2	82	119.8	92.5	11.5	80db/67wb	58/70	208/3/60	1,350	1,2,3

NOTES:
1. PROVIDE WITH 14" CURB. FIELD VERIFY EXACT REQUIREMENTS.
2. INCLUDE WITH ENTHAPLY CONTROLLED 100% MODULATING ECONOMIZER, HOT GAS REHEAT, POWERED EXHAUST, SMOKE DETECTOR IN RETURN AIR DUCT.
3. PROVIDE WITH HONEYWELL VISIONPRO 8000 TOUCHSCREEN PROGRAMMABLE THERMOSTAT, MODEL TH8320. INTERLOCK WITH REMOTE TEMPERATURE SENSOR.

3 THIS EQUIPMENT HAS BEEN SELECTED AND APPROVED BY CATIVEAIRE. ALL INFORAIOTN PERTINENT TO THIS UNIT SHALL BE THE SOLE RESPONSIBILITY OF CAPTIVE AIRE.

MAKEUP AIR UNIT SCHEDULE

UNIT TAG	MODEL	TONS	AIR FLOW				HEAT PUMP DATA			COOLING (MBH)			COOLING DESIGN AMBIENT (95°F)	ELECTRICAL DATA		WEIGHT (LBS)	NOTES
			CFM	OA MIN	ESP.	MOTOR HP	INPUT TEMP.	DISCHARGE TEMP.	COP	TOTAL	SENS.	IEER		MCA/MOCP	VOLT		
MAU-1	EARTU1-15-5T-MPU	5	1,691	1,691	0.75	2	51	77	3.5	64.0	25.0	17.9	80db/67wb	25.7/30	208/3/60	1,114	1

NOTES: 1. REFER TO KES AND CAPTIVE AIRE DRAWINGS FOR ADDITIONAL INFORMATION.

3 THIS EQUIPMENT HAS BEEN SELECTED AND APPROVED BY CAPTIVEARE. ALL INFORMATION PERTINENT TO THESE UNITS SHALL BE THE SOLE RESPONSIBILITY OF CAPTIVEAIRE.

KITCHEN HOOD SCHEDULE

BASED ON CAPTIVEAIRE U.N.O

UNIT DATA					LIGHTS		MISC.		
TAG	**MODEL**	**HOOD LENGTH**	**MAX. COOKING TEMP.**	**TOTAL EXHAUST CFM**	**QTY.**	**TYPE**	**FIRE SUPP. SYSTEM**	**HANGING WEIGHT (LBS.)**	**COMMENTS**
H-1	6030 ND-2-ACPSP-F	11' - 7"	600°	2317	6	RECESSED ROUND	YES	1213	1

NOTES: 1. REFER TO KES AND CAPTIVEAIRE DRAWINGS FOR ACCESSORY INFORMATION.

EXHAUST FAN SCHEDULE

UNIT DATA				PERFORMANCE DATA				MOTOR DATA				
TAG	**MODEL**	**FUNCTION**	**FAN TYPE**	**CFM**	**ESP**	**DAMPER**	**BELT OR DIRECT**	**SONES RATING**	**HP**	**VOLT**	**PH**	**COMMENTS**
KEF-1	DU85HFA	HOOD EXHAUST	UPBLAST	2317	1	--	BELT	14.1	1.00	115	1	1,2,3
EF-2	SP-A290	RESTROOM EXHAUST	CEILING	125	0.3	BDD	DIRECT	5.3	0.03	120	1	1,2,3
EF-3	SP-A290	RESTROOM EXHAUST	CEILING	125	0.3	BDD	DIRECT	5.3	0.03	120	1	1,2,3

NOTES:
1. FAN SHALL BE INTERLOCKED WITH HOOD CONTROLS, REFER TO KES AND CAPTIVEAIRE DRAWINGS FOR ADDITIONAL INFORMATION.
2. FAN SHALL OPERATE DURING OCCUPIED HOURS
3. PROVIDE FAN WITH MIAMI DADE RATED ROOF CURB. INSTALL PER MIAMI DADE REQUIREMENTS.

TAG-NECK SIZE
CFM

GRILLES, REGISTERS, AND DIFFUSERS SCHEDULE

D = DIFFUSER G=GRILLE R=REGISTER

BASED ON TITUS U.N.O.

UNIT DATA				PERFORMANCE DATA					
TAG	**FUNCTION**	**MODEL**	**FACE SIZE**	**FRAME TYPE**	**MATERIAL**	**FINISH**	**BALANCE DAMPER**	**MAX N.C.**	**COMMENTS**
D1	SUPPLY	PAS	24" X 24"	LAY-IN	STEEL	WHITE	-	25	1,2
D2	SUPPLY	OMNI	12" x 12"	SURFACE	STEEL	WHITE	-	25	1
R1	SUPPLY	4004P-1	20" x 6"	DUCT	ALUMINUM	WHITE	AIR SCOOP	25	DUCT SIZE 20" x 6"
L1	SUPPLY	FL-20-22	48" x 4.75"	SURFACE	ALUMINUM	WHITE	-	25	1 SLOT, 2" SLOT WIDTH
G1	RETURN	350RL	24" x 24"	LAY-IN	STEEL	WHITE	-	25	

NOTES: 1. SUPPY DIFFUSERS TO BE INSULATED VIA FACTORY SYSTEM.
2. WITH NO INTERNAL DEFLECTOR.

VENTILATION SCHEDULE

BASED ON FLMC 2017 AND ASHRAE 62.1 - 2013

SPACE DATA				PEOPLE VENTILATION			AREA VENTILATION			TOTAL
DINING	**100-105**	DINING	**RTU-1**	52	7.5	390	1280	0.18	230	620
HALL	**106**	CORRIDOR	**RTU-1**	0	0	0	74	0.06	4	4
RESTROOM	**107-108**	RESTROOM	**RTU-2**	0	0	0	106	0	0	0
										625

SPACE NAME	ROOM NUMBER	CATEGORY	RTU SERVED BY	OCC.	CFM PER PERSON	CFM TOTAL (PEOPLE)	AREA (SF)	CFM REQUIRED PER SF	CFM TOTAL (AREA)	TOTAL VENTILATION
BACK OF HOUSE	**104**	KITCHEN	**RTU-1**	3	7.5	22.5	554	0.12	66	89
KITCHEN	**102-103**	KITCHEN	**RTU-2**	9	7.5	67.5	508	0.12	61	128
OFFICE	**109**	OFFICE	**RTU-2**	1	5	5	56	0.06	3	8
										226

RTU-2			
0.8	781	**800**	

3

RTU-1		
SYSTEM EFFICIENCY	**CORRECTED OA**	**OA PROVIDED**
0.8	282	**350**

3

COMPONENT	SUPPLY CFM	RETURN CFM	OUTDOOR AIR CFM	EXHAUST CFM	
RTU-1	3400	3050	350	-	
RTU-2	4000	3200	800	-	
MAU-1	1694	-	1694		**BUILDING PRESSURE**
KEF-1	-	-	-	2317	
EF-2	-	-	-	125	
EF-3	-	-	-	125	
TOTAL	**9094**	**6250**	**2844**	**2567**	**277 CFM**

3

AIR CURTAIN SCHEDULE

UNIT TAG	MANUF.	MODEL	NOZZLE WIDTH	SERVICE	CFM	MOTOR HP	VOLT	WEIGHT (LBS)	NOTES
AC-1	BERNER	AE08-F-1036A	36"	ENTRANCE	989	(1) 1/5	120/1/60	52	1,2

NOTES:
1. PROVIDE WITH INTEGRAL DISCONNECT SWITCH AND WALL MOUNTING BRACKET.
2. COORDINATE COLOR WITH ARCHITECT.

annex ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

CAVA

CAVA #148 - E DELRAY BEACH, FL
1831 S. FEDERAL HWY. SUITE 300
DELRAY BEACH, FL 33483
FOR
CAVA
14 Ridge Square NW #500, WASHINGTON, DC 20016

PROJECT NUMBER:
CAV148

ISSUE	DATE
PERMIT SET	1.17.2025
REVISION 1	3.14.2025
REVISION 2	1.10.2025
CONSTRUCTION SET, 3	7.18.2025

MECHANICAL SCHEDULES

SHEET:
M501

SPECIFICATIONS - DIVISION 23 - HVAC

SECTION 230500 - GENERAL MECHANICAL REQUIREMENTS:

HVAC SUBCONTRACTOR SHALL PROVIDE AT BID TIME A BID TO PROVIDE PREVENTATIVE MAINTENANCE SERVICES FOR ONE YEAR.

FURNISH TO THE OWNER ALL OPERATING & MAINTENANCE MANUALS, RECORD DRAWINGS, TEST & BALANCE REPORT. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER REPRESENTATIVES FOR EMPLOYEE TRAINING REQUIREMENTS FOR ALL EQUIPMENT.

MECHANICAL CONTRACTOR SHALL SUBMIT COMPLIANCE CHECKLIST TO BUILDING OFFICIAL UPON SUBSTANTIAL COMPLETION OF PROJECT.
PROVIDE EQUIPMENT INDICATED ON THE DRAWINGS, AND AS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM.

DEFINITIONS:
FURNISH MEANS TO SUPPLY AND DELIVER TO PROJECT SITE, READY FOR INSTALLATION.
INSTALL MEANS TO PLACE IN POSITION AND MAKE CONNECTIONS FOR SERVICE OR USE.
PROVIDE MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE.

WARRANTY:
PROVIDE LABOR AND MATERIALS TO REPAIR OR REPLACE DEFECTIVE PARTS AND MATERIALS AS REQUIRED FOR ONE YEAR AFTER SUBSTANTIAL COMPLETION OR OWNER ACCEPTANCE OF THE COMPLETED PROJECT. PROVIDE A SEPARATE LINE ITEM DEDUCT AMOUNT ON THE PROPOSAL FORM TO DELETE WARRANTY SERVICE, AT THE OWNER'S OPTION. CONTRACTOR SHALL INCLUDE ONE YEAR WARRANTY ON OWNER FURNISHED EQUIPMENT. CONTRACTOR SHALL INCLUDE COSTS FOR RECEIVING, HANDLING, STORAGE, AND HOISTING OF OWNER FURNISHED EQUIPMENT.

COORDINATION:
COORDINATE WITH THE WORK OF OTHER SECTIONS, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE.

DUCT DIMENSIONS:
UNLESS OTHERWISE NOTED, DUCT DIMENSIONS ON THE DRAWINGS ARE INSIDE CLEAR DIMENSIONS.

TESTING AND BALANCING:
THE OWNER SHALL CONTRACT DIRECTLY WITH SUPERIOR INC. TO PROVIDE A THIRD PARTY TEST AND BALANCE OF THE HVAC SYSTEM. THE GC IS RESPONSIBLE FOR SCHEDULING THE TEST AND BALANCE. CONTACT SUPERIOR INC. (ERIC HOLCOMB) @ (800) 222-1819 AND (615) 479-1578 FOR COORDINATION AND SCHEDULING. IF THE SITE IS NOT READY WHEN SUPERIOR INC. ARRIVES AT THE SCHEDULED TIME, ALL COSTS REQUIRED FOR SUPERIOR TO RETURN TO THE SITE SHALL BE THE GC'S RESPONSIBILITY. TEST AND ADJUST ALL MECHANICAL SYSTEMS AND EQUIPMENT TO ASSURE PROPER BALANCE AND OPERATION. PERFORM TESTS IN ACCORDANCE WITH NBC AND ASHRAE STANDARDS. ELIMINATE NOISE AND VIBRATION, AND ASSURE PROPER FUNCTION OF CONTROLS. SUBMIT COMPLETED TEST AND BALANCE REPORT TO OWNER'S REPRESENTATIVE. BALANCING CONTRACTOR SHALL BE AN INDEPENDENT CERTIFIED TEST AND BALANCE CONTRACTOR, WITH NBC CERTIFICATION. BALANCE ALL SYSTEMS TO WITHIN 5% OF AIR FLOWS INDICATED ON THE DRAWINGS, AND REPORT ALL DISCREPANCIES TO HVAC INSTALLER FOR CORRECTION. MARK FINAL BALANCE POSITIONS ON DAMPERS WITH PERMANENT MARKER.

MAKE-UP AIR UNIT:
UNIT SHALL HAVE AN INTEGRAL DISCHARGE THERMOSTAT LINKED TO THE INTERNAL CONTROLS. THE HEATER SHALL BE SET TO MAINTAIN DUCT SUPPLY TEMPERATURE AT NO LESS THAN 65 DEG. F. (ADJ.).
HIGH LIMIT SWITCH SET TO 180 DEG. F.
INTAKE AIR SENSOR SET TO 10 DEG. F. (ADJ.) LOWER THAN DISCHARGE AIR SENSOR.

TEMPERATURE CONTROLS:
PROVIDE PROGRAMMABLE THERMOSTATS WITH REMOTE TEMPERATURE SENSORS AND REMOTE HUMIDISTATS COMPATIBLE WITH ROOFTOP UNIT. CONTROL WIRING SHALL BE INSTALLED IN CONDUIT. THERMOSTAT SHALL MEET SETPOINT ADJUSTMENT FOR UNOCCUPIED MODE: HEATING DOWN TO 55 DEGREES AND COOLING UP TO 85 DEGREES. PROVIDE INTERLOCK CONTROL WIRING BETWEEN HOOD EXHAUST FANS AND ROOFTOP UNITS.

END OF SECTION

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL
1.1 SECTION REQUIREMENTS
A. SUBMITTALS:
1. CERTIFIED TAB REPORTS.
B. TAB FIRM QUALIFICATIONS: NBC CERTIFIED.
C. TAB REPORT FORMS: STANDARD TAB CONTRACTOR'S FORMS APPROVED BY ARCHITECT.
PART 2 - PRODUCTS (NOT USED)
PART 3 - EXECUTION
3.1 EXAMINATION
A. EXAMINE THE CONTRACT DOCUMENTS TO BECOME FAMILIAR WITH PROJECT REQUIREMENTS AND TO DISCOVER CONDITIONS IN SYSTEMS' DESIGNS THAT MAY PRECLUDE PROPER TAB OF SYSTEMS AND EQUIPMENT.
B. EXAMINE THE APPROVED SUBMITTALS FOR HVAC SYSTEMS AND EQUIPMENT.
C. EXAMINE SYSTEMS FOR INSTALLED BALANCING DEVICES, SUCH AS TEST PORTS, GAGE COCKS, THERMOMETER WELLS, FLOW-CONTROL DEVICES, BALANCING VALVES AND FITTINGS, AND MANUAL VOLUME DAMPERS. VERIFY THAT LOCATIONS OF THESE BALANCING DEVICES ARE ACCESSIBLE.
D. EXAMINE SYSTEM AND EQUIPMENT INSTALLATIONS AND VERIFY THAT FIELD QUALITY-CONTROL TESTING, CLEANING, AND ADJUSTING SPECIFIED IN INDIVIDUAL SECTIONS HAVE BEEN PERFORMED.
E. EXAMINE HVAC EQUIPMENT AND FILTERS AND VERIFY THAT BEARINGS ARE GREASED, BELTS ARE ALIGNED AND TIGHT, AND EQUIPMENT WITH FUNCTIONING CONTROLS IS READY FOR OPERATION.
F. EXAMINE TERMINAL UNITS, SUCH AS VARIABLE-AIR-VOLUME BOXES, AND VERIFY THAT THEY ARE ACCESSIBLE AND THEIR CONTROLS ARE CONNECTED AND FUNCTIONING.
G. EXAMINE AUTOMATIC TEMPERATURE SYSTEM COMPONENTS TO VERIFY THE FOLLOWING:
1. DAMPERS, VALVES, AND OTHER CONTROLLED DEVICES ARE OPERATED BY THE INTENDED CONTROLLER.
2. DAMPERS AND VALVES ARE IN THE POSITION INDICATED BY THE CONTROLLER.
3. INTEGRITY OF DAMPERS AND VALVES FOR FREE AND FULL OPERATION AND FOR TIGHTNESS OF FULLY CLOSED AND FULLY OPEN POSITIONS. THIS INCLUDES DAMPERS IN MULTIZONE UNITS, MIXING BOXES, AND VARIABLE-AIR-VOLUME TERMINALS.
4. AUTOMATIC MODULATING AND SHUTOFF VALVES, INCLUDING TWO-WAY VALVES AND THREE-WAY MIXING AND DIVERTING VALVES, ARE PROPERLY CONNECTED.
5. THERMOSTATS AND HUMIDISTATS ARE LOCATED TO AVOID ADVERSE EFFECTS OF SUNLIGHT, DRAFTS, AND COLD WALLS.
6. SENSORS ARE LOCATED TO SENSE ONLY THE INTENDED CONDITIONS.
7. SEQUENCE OF OPERATION FOR CONTROL MODES IS ACCORDING TO THE CONTRACT DOCUMENTS.
8. CONTROLLER SET POINTS ARE SET AT INDICATED VALUES.
9. INTERLOCKED SYSTEMS ARE OPERATING.
10. CHANGEOVER FROM HEATING TO COOLING MODE OCCURS ACCORDING TO INDICATED VALUES.
H. REPORT DEFICIENCIES DISCOVERED BEFORE AND DURING PERFORMANCE OF TEST AND BALANCE PROCEDURES.
3.2 GENERAL PROCEDURES FOR TESTING AND BALANCING
A. PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO THE PROCEDURES CONTAINED IN AABC'S "NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE", NBC, ASHRAE 111, NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS" OR SMACNA'S "HVAC SYSTEMS - TESTING, ADJUSTING, AND BALANCING" AND IN THIS SECTION.
B. CUT INSULATION, DUCTS, PIPES, AND EQUIPMENT CABINETS FOR INSTALLATION OF TEST PROBES TO THE MINIMUM EXTENT NECESSARY FOR TAB PROCEDURES. AFTER TESTING AND BALANCING, PATCH PROBE HOLES IN DUCTS WITH SAME MATERIAL AND THICKNESS AS USED TO CONSTRUCT DUCTS. INSTALL AND JOIN NEW INSULATION THAT MATCHES REMOVED MATERIALS. RESTORE INSULATION, COVERINGS, VAPOR BARRIER, AND FINISH.
C. MARK EQUIPMENT AND BALANCING DEVICES, INCLUDING DAMPER-CONTROL POSITIONS, VALVE POSITION INDICATORS, FAN-SPEED-CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, WITH PAINT OR OTHER SUITABLE, PERMANENT IDENTIFICATION MATERIAL TO SHOW FINAL SETTINGS.
3.3 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS
A. PREPARE SCHEMATIC DIAGRAMS OF SYSTEMS' "AS-BUILT" DUCT LAYOUTS.
B. FOR VARIABLE-AIR-VOLUME SYSTEMS, DEVELOP A PLAN TO SIMULATE DIVERSITY.
C. DETERMINE THE BEST LOCATIONS IN MAIN AND BRANCH DUCTS FOR ACCURATE DUCT AIRFLOW MEASUREMENTS.
D. VERIFY THAT MOTOR STARTERS ARE EQUIPPED WITH PROPERLY SIZED THERMAL PROTECTION.
E. CHECK FOR AIRFLOW BLOCKAGES.
F. CHECK CONDENSATE DRAINS FOR PROPER CONNECTIONS AND FUNCTIONING.
G. CHECK FOR PROPER SEALING OF AIR-HANDLING UNIT COMPONENTS.
H. CHECK FOR PROPER SEALING OF AIR DUCT SYSTEM.
3.4 TOLERANCES
A. SET HVAC SYSTEM AIRFLOW AND WATER FLOW RATES WITHIN THE FOLLOWING TOLERANCES:
1. SUPPLY, RETURN, AND EXHAUST FANS AND EQUIPMENT WITH FANS: PLUS OR MINUS 5 PERCENT.
2. AIR OUTLETS AND INLETS: PLUS OR MINUS 10 PERCENT.

END OF SECTION

SECTION 230700 - HVAC INSULATION

PART 1 - GENERAL
1.1 SECTION REQUIREMENTS
A. QUALITY ASSURANCE: LABELED WITH MAXIMUM FLAME-SPREAD INDEX OF 25 AND MAXIMUM SMOKE-DEVELOPED INDEX OF 50 ACCORDING TO ASTM E 84.
PART 2 - PRODUCTS
2.1 PERFORMANCE REQUIREMENTS
A. SURFACE-BURNING CHARACTERISTICS:
1. INDOOR INSULATION AND RELATED MATERIALS: TO BE FACTORY LABELED DESIGNATING MAXIMUM FLAME-SPREAD INDEX OF 25 OR LESS, AND SMOKE-DEVELOPED INDEX OF 50 OR LESS ACCORDING TO ASTM E 84.
2.2 INSULATION MATERIALS
A. FLEXIBLE ELASTOMERIC: CLOSED-CELL, SPONGE- OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C 534, TYPE I FOR TUBULAR MATERIALS AND TYPE II FOR SHEET MATERIALS.
B. MINERAL-FIBER BLANKET INSULATION: COMPLY WITH ASTM C 553, TYPE II AND ASTM C 1290, TYPE I.
1. FSK JACKET: ALUMINUM-FOIL, FIBERGLASS-REINFORCED SCRIM WITH KRAFT-PAPER BACKING; COMPLYING WITH ASTM C 1136, TYPE II.
2. FSK TAPE: FOIL-FACE, VAPOR-RETARDER TAPE MATCHING FACTORY-APPLIED JACKET WITH ACRYLIC ADHESIVE; COMPLYING WITH ASTM C 1136.
C. MINERAL-FIBER, PIPE AND TANK INSULATION: COMPLYING WITH ASTM C 1393, TYPE II OR TYPE IIIA CATEGORY 2, OR WITH PROPERTIES SIMILAR TO ASTM C 612, TYPE IB: AND HAVING FACTORY-APPLIED ASJ JACKET. NOMINAL DENSITY IS 2.5 LB/CU. FT. OR MORE. THERMAL CONDUCTIVITY (K-VALUE) AT 100 DEG F IS 0.29 BTU X IN./H X SQ. FT. X DEG F OR LESS.
1. ASJ: WHITE, KRAFT-PAPER, FIBERGLASS-REINFORCED SCRIM WITH ALUMINUM-FOIL BACKING; COMPLYING WITH ASTM C 1136, TYPE I.
2. ASJ TAPE: WHITE VAPOR-RETARDER TAPE MATCHING FACTORY-APPLIED JACKET WITH ACRYLIC ADHESIVE, COMPLYING WITH ASTM C 1136.
D. FLEXIBLE ELASTOMERIC ADHESIVE: COMPLY WITH MIL-A-24179A, TYPE II, CLASS I.
E. MINERAL-FIBER ADHESIVE: COMPLY WITH MIL-A-3316C, CLASS 2, GRADE A.
F. VAPOR-BARRIER MASTIC: WATER BASED; SUITABLE FOR INDOOR AND OUTDOOR USE ON BELOW AMBIENT SERVICES; COMPLY WITH MIL-PRF-19565C, TYPE II.
PART 3 - EXECUTION
3.1 INSULATION INSTALLATION
A. COMPLY WITH REQUIREMENTS OF THE MIDWEST INSULATION CONTRACTORS ASSOCIATION'S "NATIONAL COMMERCIAL & INDUSTRIAL INSULATION STANDARDS" FOR INSULATION INSTALLATION ON PIPES AND EQUIPMENT.
B. INSULATION INSTALLATION AT INTERIOR WALL AND PARTITION PENETRATIONS (THAT ARE NOT FIRE RATED): INSTALL INSULATION CONTINUOUSLY THROUGH WALLS AND PARTITIONS.
C. INSULATION INSTALLATION AT FIRE-RATED WALL, PARTITION, AND FLOOR PENETRATIONS: INSTALL INSULATION CONTINUOUSLY THROUGH PENETRATIONS. SEAL PENETRATIONS. COMPLY WITH REQUIREMENTS IN SECTION 078400.
D. FLEXIBLE ELASTOMERIC INSULATION INSTALLATION:
1. SEAL LONGITUDINAL SEAMS AND END JOINTS WITH ADHESIVE TO ELIMINATE OPENINGS IN INSULATION THAT ALLOW PASSAGE OF AIR TO SURFACE BEING INSULATED.
2. INSULATION INSTALLATION ON PIPE FITTINGS AND ELBOWS: INSTALL MITERED SECTIONS OF PIPE INSULATION. SECURE INSULATION MATERIALS AND SEAL SEAMS WITH ADHESIVE TO ELIMINATE OPENINGS IN INSULATION THAT ALLOW PASSAGE OF AIR TO SURFACE BEING INSULATED.
E. MINERAL-FIBER INSULATION INSTALLATION:
1. INSULATION INSTALLATION ON STRAIGHT PIPES AND TUBES: WHERE VAPOR BARRIERS ARE INDICATED, SEAL LONGITUDINAL SEAMS, END JOINTS, AND PROTRUSIONS WITH VAPOR-BARRIER MASTIC AND JOINT SEALANT.
2. FOR INSULATION WITH FACTORY-APPLIED JACKETS ON ABOVE AMBIENT SURFACES, SECURE LAPS WITH OUTWARD CLINCHED STAPLES AT 6 INCHES O.C.
3. FOR INSULATION WITH FACTORY-APPLIED JACKETS ON BELOW AMBIENT SURFACES, DO NOT STAPLE LONGITUDINAL TABS BUT SECURE TABS WITH ADDITIONAL ADHESIVE AS RECOMMENDED BY INSULATION MATERIAL MANUFACTURER AND SEAL WITH VAPOR-BARRIER MASTIC AND FLASHING SEALANT.
4. BLANKET INSULATION INSTALLATION ON DUCTS AND PLENUMS: SECURE WITH ADHESIVE AND INSULATION PINS.
5. FOR DUCTS AND PLENUMS WITH SURFACE TEMPERATURES BELOW AMBIENT, INSTALL A CONTINUOUS UNBROKEN VAPOR BARRIER.
F. PLENUMS AND DUCTS REQUIRING INSULATION:
1. CONCEALED SUPPLY AIR.
2. CONCEALED AND EXPOSED OUTDOOR AIR.
3. CONCEALED AND EXPOSED RETURN AIR LOCATED IN NONCONDITIONED SPACE.
3.2 DUCT AND PLENUM INSULATION SCHEDULE

RETAIN " ONE OF" OPTION IN PARAGRAPHS IN THIS ARTICLE TO ALLOW CONTRACTOR TO SELECT PIPING MATERIALS FROM THOSE RETAINED.

A. CONCEALED DUCT INSULATION SHALL BE 1-1/2" THICK MINERAL-FIBER BLANKET WITH A 1.5-LB/CU. FT. NOMINAL DENSITY.
3.3 HVAC PIPING INSULATION SCHEDULE
A. CONDENSATE PIPING: INSULATION SHALL BE 1" THICK FLEXIBLE ELASTOMERIC.
B. REFRIGERANT PIPING: INSULATION SHALL BE 1" THICK FLEXIBLE ELASTOMERIC.

END OF SECTION

SECTION 232300 - REFRIGERANT PIPING

PART 2 - PRODUCTS
2.1 TUBES AND FITTINGS
A. COPPER TUBE: ASTM B 88, TYPE K OR TYPE L, ANNEALED OR DRAWN-TEMPER TUBING AND WROUGHT-COPPER FITTINGS WITH BRAZED OR SOLDERED JOINTS.
B. WROUGHT-COPPER FITTINGS AND UNIONS: ASME B16.22.
C. SOLDER FILLER METALS: ASTM B 32. USE 95-5 TIN ANTIMONY OR ALLOY HB SOLDER TO JOIN COPPER SOCKET FITTINGS ON COPPER PIPE.
D. BRAZING FILLER METALS: AWS A5.8.
2.2 VALVES AND SPECIALTIES
A. AS REQUIRED BY THE KITCHEN EQUIPMENT MANUFACTURER.
PART 3 - EXECUTION
3.1 INSTALLATION
A. INSTALL REFRIGERANT PIPING AND CHARGE WITH REFRIGERANT ACCORDING TO ASHRAE 15.
B. INSTALL REFRIGERANT PIPING AS REQUIRED BY THE KITCHEN EQUIPMENT MANUFACTURER.

END OF SECTION

SECTION 233100 - HVAC DUCTS AND CASINGS

PART 2 - PRODUCTS
2.1 PERFORMANCE REQUIREMENTS
A. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
B. STRUCTURAL PERFORMANCE: DUCT HANGERS AND SUPPORTS SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS DESCRIBED IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE".
C. COMPLY WITH NFPA 96 FOR DUCTS CONNECTED TO COMMERCIAL KITCHEN HOODS.
2.2 DUCTS
A. ELECTROGALVANIZED-STEEL SHEET: ASTM A 879
1. PAINTLOK/PAINTLOCK OR EQUAL.
B. GENERAL DUCTWORK SHALL BE GALVANIZED STEEL, ASTM A653/A635M, CONSTRUCTED TO THE GAUGE AND CORRESPONDING REINFORCING SCHEDULE AS INDICATED IN THE LATEST EDITION OF SMACNA.
C. TYPE 1 KITCHEN EXHAUST DUCTWORK
1. FACTORY-BUILT COMMERCIAL KITCHEN GREASE DUCT:
a. INSTALL REDUCED CLEARANCE, ROUND, DOUBLE-WALL GREASE DUCT AS SPECIFIED MEETING UL 1978 REQUIREMENTS. REFER TO KITCHEN EQUIPMENT SUPPLIER DRAWINGS FOR REQUIREMENTS.
b. DUCTWORK AND FITTINGS FURNISHED BY OWNER FOR INSTALLATION BY THIS CONTRACTOR.
c. NO FIRE WRAP SHALL BE REQUIRED FOR THIS INSTALLATION.
D. TYPE 2 KITCHEN EXHAUST DUCTWORK: 18 GAUGE ALUMINUM OR STAINLESS STEEL. SEAMS SHALL BE CONTINUOUSLY WELDED LIQUID TIGHT.
E. JOINT AND SEAM TAPE, AND SEALANT: COMPLY WITH UL 181A. PROVIDE POLYMERIC RUBBER TYPE SEALANT FOR USE ON BOTH INTERIOR LOCATED DUCTWORK AND DUCTWORK EXPOSED TO OUTDOOR CONDITIONS. SEALER SHALL HAVE HIGH BONDING STRENGTH FOR SURE, FIRST TIME SEALING OF JOINTS IN LOW, MEDIUM, AND HIGH PRESSURE DUCT SYSTEMS. SEALER SHALL BE HIGH IN SOLID CONTENT. PROVIDE A TWO PART TAPE SEALING SYSTEM, CONSISTING OF WOVEN FIBER TAPE IMPREGNATED WITH A GYPSUM MINERAL COMPOUND, AND A MODIFIED ACRYLIC/SILICONE ACTIVATOR THAT REACTS EXOTHERMICALLY WITH THE TAPE. TWO PART TAPE SEALING SYSTEM MUST BE RATED FOR BOTH INDOOR AND OUTDOOR APPLICATION. TAPE SHALL NOT CONTAIN ASBESTOS.
F. METAL DUCT FABRICATION: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
2.3 ACCESSORIES
A. VOLUME DAMPERS AND CONTROL DAMPERS: SINGLE-BLADE AND MULTIPLE OPPOSED-BLADE DAMPERS, STANDARD LEAKAGE RATING, HEAVY DUTY, AND SUITABLE FOR HORIZONTAL OR VERTICAL APPLICATIONS; FACTORY FABRICATED AND COMPLETE WITH REQUIRED HARDWARE AND ACCESSORIES.
2. ROUND VOLUME DAMPERS: PROVIDE MINIMUM 20 GAUGE GALVANIZED STEEL FRAME AND BLADES, MINIMUM 3/8" SQUARE STEEL AXLE, MOLDED SYNTHETIC BEARINGS, WITH LOCKING POSITION REGULATOR. REGULATOR SHALL BE POSITIONED WITH SHEET METAL BRACKET BEYOND DUCT COVERING, WHERE POSITIONING REGULATOR IS NOT ACCESSIBLE. PROVIDE COUPLING AND EXTENSION ROD WITH REGULATOR FOR CEILING OR WALL INSTALLATION, AS REQUIRED.
3. RECTANGULAR VOLUME DAMPERS: PROVIDE MINIMUM 16 GAUGE GALVANIZED STEEL CHANNEL FRAME, 16 GAUGE GALVANIZED STEEL BLADES, MINIMUM ½" HEXAGONAL AXLE. BOLDED SYNTHETIC BEARINGS, WITH 3/8" SQUARE PLATED STEEL CONTROL SHAFT. LINKAGES SHALL BE CONCEALED IN THE FRAME. OPERATING SHAFT SHALL EXTEND BEYOND FRAME AND DUCT TO A LOCKING QUADRANT WITH ADJUSTABLE LEVER. MAXIMUM BLADE WIDTH SHALL NOT EXCEED 6".
B. FLEXIBLE DUCT CONNECTORS: FLAME-RETARDED OR NONCOMBUSTIBLE FABRICS, COATINGS, AND ADHESIVES COMPLYING WITH UL 181, CLASS 1. CONNECTOR TO BE 30 OUNCE, NEOPRENE COATED, FIBERGLASS FABRIC.
C. FLEXIBLE DUCTS: FACTORY ASSEMBLED, UL 181, CLASS 1, WITH 1-1/2-INCH THICK (R-5 MIN.), 1 PCF FIBERGLASS INSULATION AND REINFORCED OUTER PROTECTIVE COVER/VAPOR BARRIER. FLEXIBLE DUCT SHALL MEET NFPA 90A WITH FLAME SPREAD UNDER 25, SMOKE DEVELOPED UNDER 50, AND SHALL BE RATED FOR MINIMUM 2-INCH WG PRESSURE AND 0 TO 250ºF TEMPERATURE. PROVIDE SCREW-OPERATED METAL ADJUSTABLE CLAMPING DEVICES. USE TWIST-LOCK CONICAL TAP COLLARS AT CONNECTIONS INTO SHEET METAL DUCTWORK. MAXIMUM EXTENDED LENGTH OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FEET.
D. TURNING VANES: PROVIDE FABRICATED TURNING VANES AND VANE RUNNERS, CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS". PROVIDE TURNING VANES CONSTRUCTED OF CURVED BLADES, SUPPORTED WITH BARS PERPENDICULAR TO BLADES, AND SET INTO SIDE STRIPS SUITABLE FOR MOUNTING IN DUCTWORK. FOLLOW SMACNA GUIDELINES FOR SPACING SUPPORT, AND CONSTRUCTION. ALL BLADES SHALL BE DOUBLE THICKNESS AIRFOIL TYPE.
E. BIRD SCREENS AND FRAMES: PROVIDE BIRD SCREENS THAT CONFORM TO ASTM E 2016, NO. 2 MESH, ALUMINUM OR STAINLESS STEEL. PROVIDE "MEDIUM-LIGHT" RATED ALUMINUM SCREENS. PROVIDE "LIGHT" RATES STAINLESS STEEL SCREENS.
F. DUCT-MOUNTED ACCESS DOORS: FABRICATE ACCESS PANELS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE"; FIGURES 2-10, "DUCT ACCESS DOORS AND PANELS," AND 2-11, "ACCESS PANELS - ROUND DUCT."
PART 3 - EXECUTION
3.1 INSTALLATION
A. INSTALL DUCTWORK, ACCESSORIES, AND SUPPORTS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" UNLESS OTHERWISE INDICATED.
B. SEAL DUCTS TO THE FOLLOWING SEAL CLASSES ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE": 1-INCH WG, SEAL CLASS A.
C. AVOID PASSING THROUGH OR ABOVE ELECTRICAL EQUIPMENT SPACES AND ENCLOSURES.
D. CLEAN DUCT SYSTEMS BEFORE TESTING, ADJUSTING, AND BALANCING.
3.2 DUCTWORK SCHEDULE
A. EXPOSED DUCTWORK IN ARCHITECTURALLY FINISHED SPACES- ELECTRO-GALVANIZED STEEL SHEET.
B. CONCEALED DUCTWORK AND DUCTWORK IN UNFINISHED ARCHITECTURAL SPACES- GALVANIZED STEEL.

END OF SECTION

SECTION 233423 - HVAC EXHAUST FANS

PART 2 - PRODUCTS
2.1 PERFORMANCE REQUIREMENTS
A. PRODUCTS SHALL BE LICENSED TO USE THE AMCA-CERTIFIED RATINGS SEAL.
B. EXHAUST FANS SHALL COMPLY WITH UL 705. TYPE 1 FANS SHALL ALSO COMPLY WITH UL 762.
C. TYPE 1 FANS TO BE DESIGNED FOR HIGH HEAT OPERATION AT 300ºF.
D. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
2.2 CENTRIFUGAL VENTILATORS
A. HOUSING: REMOVABLE, SPUN-ALUMINUM, DOME TOP AND OUTLET BAFFLE; SQUARE, ONE-PIECE, ALUMINUM BASE WITH VENTURI INLET CONE.
1. UPBLAST UNITS: ALUMINUM DISCHARGE BAFFLE TO DIRECT DISCHARGE AIR UPWARD, WITH RAIN AND SNOW DRAINS.
B. FAN WHEELS: ALUMINUM HUB AND WHEEL WITH BACKWARD-INCLINED BLADES.
C. BELT-DRIVEN DRIVE ASSEMBLY: RESILIENTLY MOUNTED TO HOUSING.
1. FAN SHAFT: TURNED, GROUND, AND POLISHED STEEL; KEYED TO WHEEL HUB.
2. SHAFT BEARINGS: PERMANENTLY LUBRICATED, PERMANENTLY SEALED, SELF-ALIGNING BALL BEARINGS.
3. PULLEYS: CAST-IRON, ADJUSTABLE-PITCH MOTOR PULLEY.
4. FAN AND MOTOR ISOLATED FROM EXHAUST AIRSTREAM.
D. ACCESSORIES:
1. DISCONNECT SWITCH: NON-FUSIBLE TYPE, WITH THERMAL-OVERLOAD PROTECTION, FACTORY WIRED THROUGH AN INTERNAL ALUMINUM CONDUIT.
2. BIRD SCREENS: REMOVABLE, 1/2-INCH MESH, ALUMINUM OR BRASS WIRE.
3. DAMPERS: COUNTERBALANCED, PARALLEL-BLADE, BACKDRAFT DAMPERS MOUNTED IN CURB BASE; FACTORY SET TO CLOSE WHEN FAN STOPS.
4. MOTORIZED DAMPERS: PARALLEL-BLADE DAMPERS MOUNTED IN CURB BASE WITH ELECTRIC ACTUATOR; WIRED TO CLOSE WHEN FAN STOPS.
E. ROOF CURBS: 20 GAUGE GALVANIZED STEEL; MITERED AND WELDED CORNERS; 1-1/2-INCH THICK, RIGID, FIBERGLASS INSULATION ADHERED TO INSIDE WALLS; AND 1-1/2-INCH WOOD NAILER. SIZE AS REQUIRED TO SUIT ROOF OPENING AND FAN BASE.
1. CONFIGURATION: SELF-FLASHING WITHOUT A CANT STRIP, WITH MOUNTING FLANGE.
2. OVERALL HEIGHT: 12 INCHES FOR GENERAL EXHAUST FANS; 20 INCHES FOR KITCHEN EXHAUST FANS.
3. PITCH MOUNTING: MANUFACTURE CURB FOR ROOF SLOPE.
4. MOUNTING PEDESTAL: GALVANIZED STEEL WITH REMOVABLE ACCESS PANEL.
5. TYPE 1 ROOF CURBS TO BE VENTED TYPE.
6. TYPE 1 AND TYPE 2 ROOF CURBS TO BE HINGED TYPE.
F. CAPACITIES AND CHARACTERISTICS:
1. SEE SCHEDULE.
G. MOTORS
A.A. COMPLY WITH NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, ENCLOSURE TYPE, AND EFFICIENCY REQUIREMENTS FOR MOTORS.
1.1. MOTOR SIZES: MINIMUM SIZE AS INDICATED. IF NOT INDICATED, LARGE ENOUGH SO DRIVEN LOAD WILL NOT REQUIRE MOTOR TO OPERATE IN SERVICE FACTOR RANGE ABOVE 1.0.
A.B. ENCLOSURE TYPE: TOTALLY ENCLOSED, FAN COOLED.
PART 3 - EXECUTION
3.1 INSTALLATION
A. INSTALL UNITS WITH CLEARANCES FOR SERVICE AND MAINTENANCE.
B. ROOF-MOUNTED UNITS: INSTALL ROOF CURB ON ROOF STRUCTURE, ACCORDING TO ARI GUIDELINE B. INSTALL AND SECURE ROOF-MOUNTED FANS ON CURBS, AND COORDINATE ROOF PENETRATIONS AND FLASHING WITH ROOF CONSTRUCTION.

END OF SECTION

SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL
PART 2 - PRODUCTS
2.1 DIFFUSERS, REGISTERS, AND GRILLES:
A. REFER TO SCHEDULES FOR FINISH TYPE, COLOR, MATERIAL, AND MOUNTING.
PART 3 - EXECUTION
3.1 INSTALLATION
A. INSTALL DIFFUSERS, REGISTERS, AND GRILLES LEVEL AND PLUMB.
B. CEILING-MOUNTED OUTLETS AND INLETS: DRAWINGS INDICATE GENERAL ARRANGEMENT OF DUCTS, FITTINGS, AND ACCESSORIES. MAKE FINAL LOCATIONS WHERE INDICATED, AS MUCH AS PRACTICAL. FOR UNITS INSTALLED IN LAY-IN CEILING PANELS, LOCATE UNITS IN THE CENTER OF PANEL UNLESS OTHERWISE INDICATED. WHERE ARCHITECTURAL FEATURES OR OTHER ITEMS CONFLICT WITH INSTALLATION, NOTIFY ARCHITECT FOR A DETERMINATION OF FINAL LOCATION.
C. AFTER INSTALLATION, ADJUST DIFFUSERS, REGISTERS, AND GRILLES TO AIR PATTERNS INDICATED, OR AS DIRECTED, BEFORE STARTING AIR BALANCING.

2. END OF SECTION

annex ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

CAVA

CAVA #148 - E DELRAY BEACH, FL
1831 S. FEDERAL HWY. SUITE 300
DELRAY BEACH, FL 33483
FOR
CAVA
14 Ridge Square NW #500, WASHINGTON, DC 20016

PROJECT NUMBER:
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ISSUE	DATE
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MECHANICAL SPECIFICATIONS

SHEET:
M701

SPECIFICATIONS - DIVISION 23 - HVAC (CONTINUED)

SECTION 237339 - DIRECT-FIRED MAKE-UP AIR UNIT

PART 2 - PRODUCTS

2.1 PACKAGED UNITS

A. FACTORY-ASSEMBLED, PREWIRED, SELF-CONTAINED UNIT CONSISTING OF CABINET, SUPPLY FAN, CONTROLS, FILTERS, AND DIRECT-FIRED GAS FURNACE TO BE INSTALLED OUTSIDE THE BUILDING.

2.2 CABINET

A. CABINET: GALVANIZED-STEEL PANELS WITH LIFTING LUGS. CABINET SHALL BE FULLY WEATHERIZED FOR OUTDOOR INSTALLATION.. HEAT-RESISTANT, BAKED-ENAMEL FINISH. VERTICAL-PATTERN, GALVANIZED-STEEL DISCHARGE PLENUM WITH DIFFUSERS INCORPORATING INDIVIDUALLY ADJUSTABLE VANES.

B. ROOF CURB: FULL-PERIMETER CURB OF SHEET METAL, MINIMUM 20 INCHES HIGH, WITH WOOD NAILER, NEOPRENE SEALING STRIP, AND WELDED Z-BAR FLASHING.

C. OUTDOOR-AIR INTAKE: GALVANIZED-STEEL HOOD WITH RAIN BAFFLES, BIRD SCREEN, AND FINISH TO MATCH CABINET; AND SIZED TO SUPPLY 100 PERCENT OUTDOOR AIR. GALVANIZED-STEEL, OPPOSED-BLADE MOTORIZED DAMPERS WITH VINYL BLADE SEALS AND STAINLESS-STEEL JAMB SEAL.

D. FILTERS: COMPLY WITH NFPA 90A; 1 INCH THICK.

2.3 SUPPLY-AIR FAN

A. FAN: CENTRIFUGAL, RATED ACCORDING TO AMCA 210; STATICALLY AND DYNAMICALLY BALANCED, GALVANIZED STEEL; MOUNTED ON SOLID-STEEL SHAFT.

B. MOTOR: TOTALLY ENCLOSED, SINGLE SPEED MOTOR.

C. DRIVE: V-BELT DRIVE WITH MATCHING FAN PULLEY AND ADJUSTABLE MOTOR SHEAVES AND BELT ASSEMBLY.

D. GAS PRESSURE GAUGE: 2-1/2 INCH DIAMETER AND 1/4 INCH THREAD SIZE.

2.4 DIRECT-FIRED GAS FURNACE

A. DESCRIPTION: FACTORY ASSEMBLED, PIPED, AND WIRED; AND COMPLYING WITH ANSI Z83.4, ANSI Z83.18, AND NFPA 54. CAST-IRON BURNER WITH STAINLESS-STEEL MIXING PLATES. SINGLE-STAGE CONTROL VALVE. FUEL: NATURAL GAS.

B. SAFETY CONTROLS: AIRFLOW PROVING SWITCH; HIGH-TEMPERATURE LIMIT; SAFETY LOCKOUT; REDUNDANT, AUTOMATIC, MAIN GAS VALVES; ELECTRIC PILOT VALVE; MODULATING TEMPERATURE CONTROL VALVE; MAIN AND PILOT GAS REGULATORS; MAIN AND PILOT MANUAL SHUTOFF VALVES; MAIN AND PILOT PRESSURE TAPS; AND HIGH-LOW GAS PRESSURE SWITCHES TO COMPLY WITH ANSI STANDARDS.

2.5 CONTROLS

A. FACTORY-WIRED, FUSE-PROTECTED CONTROL TRANSFORMER, CONNECTION FOR POWER SUPPLY AND FIELD-WIRED UNIT TO REMOTE CONTROL PANEL.

1. FAN CONTROL: INTERLOCK FAN TO START WITH EXHAUST FAN(S) AND WITH RTU COOLING CYCLE.
2. OUTDOOR-AIR DAMPER CONTROL: OUTDOOR-AIR DAMPER OPENS WHEN SUPPLY FAN STARTS, AND CLOSES WHEN FAN STOPS.
3. TEMPERATURE CONTROL: OPERATES GAS VALVE TO MAINTAIN SUPPLY-AIR TEMPERATURE.

2.6 INSTALLATION

A. INSTALL GAS-FIRED UNITS ACCORDING TO NFPA 54.

B. INSTALL ROOF CURB ON ROOF STRUCTURE, ACCORDING TO ARI GUIDELINE B OR NRCA'S "LOW-SLOPE MEMBRANE ROOFING CONSTRUCTION DETAILS MANUAL."

C. CONNECT GAS PIPING WITH SHUTOFF VALVE AND UNION AND WITH SUFFICIENT CLEARANCE FOR BURNER REMOVAL AND SERVICE.

D. DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF DUCTS. CONNECT SUPPLY DUCTS TO DIRECT-FIRED MAU WITH FLEXIBLE DUCT CONNECTORS; FLEXIBLE DUCT CONNECTORS ARE SPECIFIED IN SECTION 233100 "HVAC DUCTS AND CASINGS."

END OF SECTION

SECTION 237413 - PACKAGED ROOFTOP UNITS

1.1 SUMMARY

A. THIS SECTION INCLUDES PACKAGED, ROOFTOP UNITS WITH THE FOLLOWING COMPONENTS AND ACCESSORIES:

1. DIRECT-EXPANSION COOLING.
2. HUMIDITY CONTROL WITH HOT-GAS REHEAT (OPTIONAL)
3. GAS FURNACE.
4. ECONOMIZER OUTDOOR-AND RETURN-AIR DAMPER SECTION.
5. INTEGRAL, SPACE TEMPERATURE CONTROLS.
6. ROOF CURBS.

1.2 SECTION REQUIREMENTS

A. SUBMITTALS:

1. PRODUCT DATA: INCLUDE MANUFACTURER'S TECHNICAL DATA FOR EACH RTU, INCLUDING RATED CAPACITIES, DIMENSIONS, REQUIRED CLEARANCES, CHARACTERISTICS, FURNISHED SPECIALTIES, AND ACCESSORIES.

PART 2 - PRODUCTS

2.1 CASING

A. GENERAL FABRICATION REQUIREMENTS FOR CASINGS: FORMED AND REINFORCED INSULATED PANELS, FABRICATED TO ALLOW REMOVAL FOR ACCESS TO INTERNAL PARTS AND COMPONENTS, WITH JOINTS BETWEEN SECTIONS SEALED.

B. EXTERIOR CASING MATERIAL: GALVANIZED STEEL WITH FACTORY-PAINTED FINISH, WITH PITCHED ROOF PANELS AND KNOCKOUTS WITH GROMMET SEALS FOR ELECTRICAL AND PIPING CONNECTIONS AND LIFTING LUGS.

1. CASING THICKNESS: 16 GAUGE THICK.

C. CASING INSULATION AND ADHESIVE: COMPLY WITH NFPA 90A.

1. MATERIALS: ASTM C 1071, TYPE I.
2. THICKNESS: 1/2 INCH
3. LINER MATERIALS SHALL HAVE AIR-STREAM SURFACE INSULATED WITH A MINIMUM 1/2-IN. THICK, MINIMUM 1 1/2 LB DENSITY, FLEXIBLE FIBERGLASS INSULATION BONDED WITH A PHENOLIC BINDER, NEOPRENE COATED ON THE AIR SIDE.
4. LINER ADHESIVE: COMPLY WITH ASTM C 916, TYPE I.

D. UNIT SHALL HAVE A THRU-THE-BASE GAS AND ELECTRICAL CONNECTIONS.

2.2 FANS

OPTION A OR B:

A. DIRECT-DRIVEN SUPPLY-AIR FANS: DOUBLE WIDTH, BACKWARD INCLINED, CENTRIFUGAL; WITH PERMANENTLY LUBRICATED, MOTOR RESILIENTLY MOUNTED IN THE FAN INLET. ALUMINUM OR PAINTED-STEEL WHEELS, AND GALVANIZED- OR PAINTED-STEEL FAN SCROLLS.

B. BELT-DRIVEN SUPPLY-AIR FANS: DOUBLE WIDTH, FORWARD CURVED, CENTRIFUGAL; WITH PERMANENTLY LUBRICATED, SINGLE-SPEED MOTOR INSTALLED ON AN ADJUSTABLE FAN BASE RESILIENTLY MOUNTED IN THE CASING. ALUMINUM OR PAINTED-STEEL WHEELS, AND GALVANIZED- OR PAINTED-STEEL FAN SCROLLS.

C. CONDENSER-COIL FAN: DIRECT DRIVE, PROPELLER, MOUNTED ON SHAFT OF PERMANENTLY LUBRICATED MOTOR WITH THERMAL OVERLOAD PROTECTION.

D. POWER EXHAUST: FORWARD CURVED, SHAFT MOUNTED ON PERMANENTLY LUBRICATED MOTOR.

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2.3 COILS

A. SUPPLY-AIR REFRIGERANT COIL:

1. ALUMINUM-PLATE FIN AND SEAMLESS INTERNALLY GROOVED COPPER TUBE IN STEEL CASING WITH EQUALIZING-TYPE VERTICAL DISTRIBUTOR.
2. POLYMER STRIP SHALL PREVENT ALL COPPER COIL FROM CONTACTING STEEL COIL FRAME OR CONDENSATE PAN.
3. CATHODIC EPOXY COATING.
4. CONDENSATE DRAIN PAN: GALVANIZED STEEL WITH CORROSION-RESISTANT COATING FORMED WITH PITCH AND DRAIN CONNECTIONS.

B. OUTDOOR-AIR REFRIGERANT COIL:

1. ALUMINUM-PLATE FIN AND SEAMLESS INTERNALLY GROOVED COPPER TUBE IN STEEL CASING WITH EQUALIZING-TYPE VERTICAL DISTRIBUTOR.
2. POLYMER STRIP SHALL PREVENT ALL COPPER COIL FROM CONTACTING STEEL COIL FRAME OR CONDENSATE PAN.
3. CATHODIC EPOXY COATING.

C. HOT-GAS REHEAT REFRIGERANT COIL (OPTIONAL):

1. ALUMINUM-PLATE FIN AND SEAMLESS INTERNALLY GROOVED COPPER TUBE IN STEEL CASING WITH EQUALIZING-TYPE VERTICAL DISTRIBUTOR.
2. POLYMER STRIP SHALL PREVENT ALL COPPER COIL FROM CONTACTING STEEL COIL FRAME OR CONDENSATE PAN.
3. CATHODIC EPOXY COATING.

2.4 REFRIGERANT CIRCUIT COMPONENTS

A. NUMBER OF REFRIGERANT CIRCUITS: TWO

B. COMPRESSOR: HERMETIC, SCROLL, MOUNTED ON VIBRATION ISOLATORS; WITH INTERNAL OVERCURRENT AND HIGH-TEMPERATURE PROTECTION, INTERNAL PRESSURE RELIEF AND CRANKCASE HEATER.

C. REFRIGERATION SPECIALTIES:

1. REFRIGERANT: R-410A
2. EXPANSION VALVE WITH REPLACEABLE THERMOSTATIC ELEMENT.
3. REFRIGERANT FILTER/DRYER.
4. MANUAL-RESET HIGH-PRESSURE SAFETY SWITCH.
5. AUTOMATIC-RESET LOW-PRESSURE SAFETY SWITCH.
6. MINIMUM OFF-TIME RELAY.
7. AUTOMATIC-RESET COMPRESSOR MOTOR THERMAL OVERLOAD.
8. BRASS SERVICE VALVES INSTALLED IN COMPRESSOR SUCTION AND LIQUID LINES.
9. LOW-AMBIENT KIT HIGH-PRESSURE SENSOR.
10. HOT-GAS REHEAT SOLENOID VALVE WITH A REPLACEABLE MAGNETIC COIL.

2.5 AIR FILTRATION

A. PROVIDE 2" THROW-AWAY FIBERGLASS FILTERS.

2.6 GAS FURNACE

A. BURNERS: IN-SHOT TYPE CONSTRUCTED OF ALUMINUM-COATED STEEL.

1. FUEL: NATURAL GAS.
2. IGNITION: DIRECT SPARK IGNITION (DSI).

VERIFY AVAILABILITY OF HIGH-ALTITUDE FEATURE WITH MANUFACTURERS.

3. HIGH-ALTITUDE KIT: FOR PROJECT ELEVATIONS MORE THAN 2,000 FEET ABOVE SEA LEVEL.

B. HEAT-EXCHANGER AND DRAIN PAN: STAINLESS STEEL.

C. INDUCED DRAFT COMBUSTION BLOWER.

D. SAFETY CONTROLS:

1. GAS CONTROL VALVE: TWO STAGE.
2. GAS TRAIN: SINGLE-BODY, REGULATED, REDUNDANT, 24-V AC GAS VALVE ASSEMBLY CONTAINING PILOT SOLENOID VALVE, PILOT FILTER, PRESSURE REGULATOR, PILOT SHUTOFF, AND MANUAL SHUTOFF.

2.7 DAMPERS

A. OUTDOOR AND RETURN AIR MIXING DAMPERS: PARALLEL OR OPPOSED-BLADE GALVANIZED-STEEL DAMPERS MECHANICALLY FASTENED TO CADMIUM PLATED FOR GALVANIZED-STEEL OPERATING ROD IN REINFORCED CABINET. CONNECT OPERATING RODS WITH COMMON LINKAGE AND INTERCONNECT LINKAGES SO DAMPERS OPERATE SIMULTANEOUSLY.

1. DAMPER MOTOR: MODULATING WITH ADJUSTABLE MINIMUM POSITION.
2. RELIEF AIR DAMPER: GRAVITY ACTUATED, WITH BIRD SCREEN AND HOOD.

2.8 ELECTRICAL POWER CONNECTION

A. PROVIDE FOR SINGLE CONNECTION OF POWER TO UNIT WITH UNIT-MOUNTED DISCONNECT SWITCH ACCESSIBLE FROM OUTSIDE UNIT AND CONTROL-CIRCUIT TRANSFORMER WITH BUILT-IN OVERCURRENT PROTECTION.

2.9 CONTROLS

A. BASIC UNIT CONTROLS:

1. CONTROL-VOLTAGE TRANSFORMER.
2. WALL-MOUNTED THERMOSTAT OR SENSOR WITH THE FOLLOWING FEATURES:
   a. HEAT-COOL-OFF SWITCH.
   b. FAN ON-AUTO SWITCH.
   c. FAN-SPEED SWITCH.
   d. AUTOMATIC CHANGEOVER.
   e. ADJUSTABLE DEADBAND.
   f. EXPOSED SET POINT.
   g. EXPOSED INDICATION.
   h. DEGREE F INDICATION.
   i. UNOCCUPIED-PERIOD-OVERRIDE PUSH BUTTON.
   j. DATA ENTRY AND ACCESS PORT TO INPUT TEMPERATURE AND HUMIDITY SET POINTS, OCCUPIED AND UNOCCUPIED PERIODS, AND OUTPUT ROOM TEMPERATURE AND HUMIDITY, SUPPLY-AIR TEMPERATURE, OPERATING MODE, AND STATUS.
3. WALL-MOUNTED HUMIDISTAT OR SENSOR WITH THE FOLLOWING FEATURES:
   a. EXPOSED SET POINT.
   b. EXPOSED INDICATION.
4. REMOTE WALL-MOUNTED ANNUNCIATOR PANEL WITH KEYED ACCESS FOR EACH UNIT:
   a. LIGHTS TO INDICATE POWER ON, UNIT ALARM OR FAILURE, SMOKE DETECTION.

B. DDC CONTROLLER:

1. CONTROLLER SHALL HAVE VOLATILE-MEMORY BACKUP.
2. SAFETY CONTROL OPERATION:
   a. SMOKE DETECTORS: STOP FAN AND CLOSE OUTDOOR-AIR DAMPER IF SMOKE IS DETECTED. PROVIDE ADDITIONAL CONTACTS FOR ALARM INTERFACE TO FIRE ALARM CONTROL PANEL.
   b. FIRE ALARM CONTROL PANEL INTERFACE WHERE APPLICABLE.
   c. LOW-DISCHARGE TEMPERATURE: STOP FAN AND CLOSE OUTDOOR-AIR DAMPER IF SUPPLY AIR TEMPERATURE IS LESS THAN 40°F.
   RETAIN FIRST SUBPARAGRAPH BELOW FOR AIR-TO-AIR HEAT-PUMP FEATURE.
   d. DEFROST CONTROL FOR CONDENSER COIL: PRESSURE DIFFERENTIAL SWITCH TO INITIATE DEFROST SEQUENCE.
3. UNIT SHALL BE CAPABLE OF DIRECT COMMUNICATION WITH GENERIC OPEN PROTOCOL SUCH AS BACNET MS/TP, LONTALK, OR MODUS. THIS WILL ALLOW THE UNIT TO INTEGRATE WITH A FACILITY ENERGY MANAGEMENT SYSTEM.
4. SCHEDULED OPERATION: OCCUPIED AND UNOCCUPIED PERIODS ON SEVEN-DAY CLOCK WITH A MINIMUM OF FOUR PROGRAMMABLE PERIODS PER DAY.
5. UNOCCUPIED PERIOD:
   a. HEATING SETBACK: 10ºF.
   b. COOLING SETBACK: SYSTEM OFF.
   c. OVERRIDE OPERATION: TWO HOURS.
6. SUPPLY FAN OPERATION:
   a. OCCUPIED PERIODS: RUN FAN CONTINUOUSLY.
   b. UNOCCUPIED PERIODS: CYCLE FAN TO MAINTAIN SETBACK TEMPERATURE.
7. REFRIGERANT CIRCUIT OPERATION:
   a. OCCUPIED PERIODS: CYCLE OR STAGE COMPRESSORS, AND OPERATE HOT-GAS BYPASS TO MATCH COMPRESSOR OUTPUT TO COOLING LOAD TO MAINTAIN ROOM TEMPERATURE AND HUMIDITY. CYCLE CONDENSER FANS TO MAINTAIN MAXIMUM HOT-GAS PRESSURE. OPERATE LOW-AMBIENT CONTROL KIT TO MAINTAIN MINIMUM HOT-GAS PRESSURE.
   b. UNOCCUPIED PERIODS: CYCLE COMPRESSORS AND CONDENSER FANS FOR HEATING TO MAINTAIN SETBACK TEMPERATURE.
8. HOT-GAS REHEAT-COIL OPERATION (OPTIONAL):
   a. OCCUPIED PERIODS: HUMIDISTAT OPENS HOT-GAS VALVE TO PROVIDE HOT-GAS REHEAT, AND CYCLES COMPRESSOR.
   b. UNOCCUPIED PERIODS: REHEAT NOT REQUIRED.
9. GAS FURNACE OPERATION:
   a. OCCUPIED PERIODS: STAGE BURNER TO MAINTAIN ROOM TEMPERATURE.
   b. UNOCCUPIED PERIODS: CYCLE BURNER TO MAINTAIN SETBACK TEMPERATURE.
10. FIXED MINIMUM OUTDOOR-AIR DAMPER OPERATION:
    a. OCCUPIED PERIODS: OPEN TO 25 PERCENT.
    b. UNOCCUPIED PERIODS: CLOSE THE OUTDOOR-AIR DAMPER.
11. ECONOMIZER OUTDOOR-AIR DAMPER OPERATION:
    a. OCCUPIED PERIODS: OPEN TO 25 PERCENT FIXED MINIMUM INTAKE, AND MAXIMUM 100 PERCENT OF THE FAN CAPACITY TO COMPLY WITH ASHRAE CYCLE II. CONTROLLER SHALL PERMIT AIR-SIDE ECONOMIZER OPERATION WHEN OUTDOOR AIR IS LESS THAN 60 ° F. USE MIXED-AIR TEMPERATURE AND SELECT BETWEEN OUTDOOR-AIR AND RETURN-AIR ENTHALPY TO ADJUST MIXING DAMPERS DURING ECONOMIZER CYCLE OPERATION. LOCK OUT COOLING.
    b. UNOCCUPIED PERIODS: CLOSE OUTDOOR-AIR DAMPER AND OPEN RETURN-AIR DAMPER.

2.10 ACCESSORIES

A. DUPLEX, 115-V, GROUND-FAULT-INTERRUPTER OUTLET WITH 15-A OVERCURRENT PROTECTION. INCLUDE TRANSFORMER IF REQUIRED.

B. LOW-AMBIENT KIT STAGED DOWN TO 0ºF.

C. FILTER DIFFERENTIAL PRESSURE SWITCH WITH SENSOR TUBING ON EITHER SIDE OF FILTER. SET FOR FINAL FILTER PRESSURE LOSS.

D. HAIL GUARDS OF GALVANIZED STEEL, PAINTED TO MATCH CASING.

E. DUCT MOUNTED SMOKE DETECTOR IN RETURN AIR STREAM CAPABLE OF SHUTTING DOWN THE UNIT IN THE PRESENCE OF SMOKE DETECTION.

2.11 ROOF CURBS

A. MATERIALS: GALVANIZED STEEL WITH CORROSION-PROTECTION COATING, WATERTIGHT GASKETS, AND FACTORY-INSTALLED WOOD NAILER; COMPLYING WITH NRCA STANDARDS.

1. CURB INSULATION AND ADHESIVE: COMPLY WITH NFPA 90A OR NFPA 90B.
   a. MATERIALS: ASTM C 1071, TYPE I OR II.
   b. THICKNESS: 1-1/2 INCHES.
2. APPLICATION: FACTORY APPLIED WITH ADHESIVE AND MECHANICAL FASTENERS TO THE INTERNAL SURFACE OF CURB.
   a. LINER ADHESIVE: COMPLY WITH ASTM C 916, TYPE I.
   b. MECHANICAL FASTENERS: GALVANIZED STEEL, SUITABLE FOR ADHESIVE ATTACHMENT, MECHANICAL ATTACHMENT, OR WELDING ATTACHMENT TO DUCT WITHOUT DAMAGING LINER WHEN APPLIED AS RECOMMENDED BY MANUFACTURER AND WITHOUT CAUSING LEAKAGE IN CABINET.
   c. LINER MATERIALS SHALL HAVE AIR-STREAM SURFACE INSULATED WITH A MINIMUM 1/2-IN. THICK, MINIMUM 1 1/2 LB DENSITY, FLEXIBLE FIBERGLASS INSULATION BONDED WITH A PHENOLIC BINDER, NEOPRENE COATED ON THE AIR SIDE.
   d. LINER ADHESIVE: COMPLY WITH ASTM C 916, TYPE I.

B. CURB HEIGHT: 14 INCHES TYPICAL UNO. PROVIDE 24 INCH CURB IN AREAS WITH EXPECTED HEAVY SNOWFALL.

PART 3 - EXECUTION

3.1 EXAMINATION

A. EXAMINE SUBSTRATES, AREAS, AND CONDITIONS, WITH INSTALLER PRESENT, FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING PERFORMANCE OF RTUS.

B. EXAMINE ROUGHING-IN FOR RTUS TO VERIFY ACTUAL LOCATIONS OF PIPING AND DUCT CONNECTIONS BEFORE EQUIPMENT INSTALLATION.

C. EXAMINE ROOFS FOR SUITABLE CONDITIONS WHERE RTUS WILL BE INSTALLED.

D. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.2 INSTALLATION

A. ROOF CURB: INSTALL ON ROOF STRUCTURE, LEVEL AND SECURE. INSTALL RTUS ON CURBS AND COORDINATE ROOF PENETRATIONS AND FLASHING WITH ROOF CONSTRUCTION. RTUS TO UPPER CURB RAIL, AND SECURE CURB BASE TO ROOF FRAMING OR CONCRETE BASE WITH ANCHOR BOLTS.

3.3 CONNECTIONS

A. . THE FOLLOWING ARE SPECIFIC CONNECTION REQUIREMENTS:

1. INSTALL DUCTS TO TERMINATION AT TOP OF ROOF CURB.
2. REMOVE ROOF DECKING ONLY AS REQUIRED FOR PASSAGE OF DUCTS. DO NOT CUT OUT DECKING UNDER ENTIRE ROOF CURB.

3.4 COORDINATION

A. CONTRACTOR TO COORDINATE WITH KITCHEN EQUIPMENT SUPPLIER TO ENSURE THAT THE RTUS ARE COORDINATED WITH THE KITCHEN EQUIPMENT, PARTICULARLY THE EXHAUST HOODS AND THE MAKE-UP AIR UNIT, TO PROPERLY PRESSURIZE THE BUILDING/SPACE.

B. CONTRACTOR TO ENSURE THAT ALL THERMOSTATS AND SENSORS ARE COMPATIBLE WITH THE RTU CONTROLS.

3.5 FIELD QUALITY CONTROL

A. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT, TEST, AND ADJUST COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS. REPORT RESULTS IN WRITING.

B. PERFORM TESTS AND INSPECTIONS AND PREPARE TEST REPORTS.

1. MANUFACTURER'S FIELD SERVICE: ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS, AND TO ASSIST IN TESTING, REPORT RESULTS IN WRITING.

C. TESTS AND INSPECTIONS:

1. AFTER INSTALLING RTUS AND AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, TEST UNITS FOR COMPLIANCE WITH REQUIREMENTS.
2. OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER MOTOR ROTATION AND UNIT OPERATION.
3. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.

D. REMOVE AND REPLACE MALFUNCTIONING UNITS AND RETEST AS SPECIFIED ABOVE.

3.6 STARTUP SERVICE

A. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO PERFORM STARTUP SERVICE.

B. COMPLETE INSTALLATION AND STARTUP CHECKS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AND DO THE FOLLOWING:

1. INSPECT FOR VISIBLE DAMAGE TO UNIT CASING, FURNACE COMBUSTION CHAMBER, COMPRESSOR, COILS, AND FANS.
2. VERIFY THAT LABELS ARE CLEARLY VISIBLE. CLEARANCES HAVE BEEN PROVIDED FOR SERVICING, CONTROLS ARE CONNECTED AND OPERABLE, AND FILTERS ARE INSTALLED.
3. CLEAN CONDENSER COIL AND FURNACE AND INSPECT FOR CONSTRUCTION DEBRIS.
4. REMOVE PACKING FROM VIBRATION ISOLATORS.
5. VERIFY LUBRICATION ON FAN AND MOTOR BEARINGS.
6. INSPECT FAN-WHEEL ROTATION FOR MOVEMENT IN CORRECT DIRECTION WITHOUT VIBRATION AND BINDING.
7. ADJUST FAN BELTS TO PROPER ALIGNMENT AND TENSION.
8. START UNIT ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.
   a. INSPECT AND RECORD PERFORMANCE OF INTERLOCKS AND PROTECTIVE DEVICES; VERIFY SEQUENCES.
10. OPERATE UNIT FOR AN INITIAL PERIOD AS RECOMMENDED OR REQUIRED BY MANUFACTURER.
11. PERFORM THE FOLLOWING OPERATIONS FOR BOTH MINIMUM AND MAXIMUM FIRING. ADJUST BURNER FOR PEAK EFFICIENCY.
    a. MEASURE GAS PRESSURE ON MANIFOLD.
    b. INSPECT OPERATION OF POWER VENTS.
    c. MEASURE SUPPLY-AIR TEMPERATURE AND VOLUME WHEN BURNER IS AT MAXIMUM FIRING RATE AND WHEN BURNER IS OFF. CALCULATE USEFUL HEAT TO SUPPLY AIR.
20. ADJUST AND INSPECT HIGH-TEMPERATURE LIMITS.
21. INSPECT OUTDOOR-AIR DAMPERS FOR PROPER STROKE AND INTERLOCK WITH RETURN-AIR DAMPERS.
22. INSPECT CONTROLS FOR CORRECT SEQUENCING OF HEATING, MIXING DAMPERS, REFRIGERATION, AND NORMAL AND EMERGENCY SHUTDOWN.
23. SIMULATE MAXIMUM COOLING DEMAND AND INSPECT THE FOLLOWING:
    a. COMPRESSOR REFRIGERANT SUCTION AND HOT-GAS PRESSURES.
    b. SHORT CIRCUITING OF AIR THROUGH CONDENSER COIL OR FROM CONDENSER FANS TO OUTDOOR-AIR INTAKE.
27. VERIFY OPERATION OF REMOTE PANEL INCLUDING PILOT-LIGHT OPERATION AND FAILURE MODES. INSPECT THE FOLLOWING:
    a. HIGH-TEMPERATURE LIMIT ON GAS-FIRED HEAT EXCHANGER.
    b. LOW-TEMPERATURE SAFETY OPERATION.
    c. FILTER HIGH-PRESSURE DIFFERENTIAL ALARM.
    d. ECONOMIZER TO MINIMUM OUTDOOR-AIR CHANGEOVER.
    e. RELIEF-AIR FAN OPERATION.
    f. SMOKE ALARMS.
28. AFTER STARTUP AND PERFORMANCE TESTING AND PRIOR TO SUBSTANTIAL COMPLETION, REPLACE EXISTING FILTERS WITH NEW FILTERS.

3.7 CLEANING AND ADJUSTING

A. OCCUPANCY ADJUSTMENTS: WHEN REQUESTED WITHIN 12 MONTHS OF DATE OF SUBSTANTIAL COMPLETION, PROVIDE ON-SITE ASSISTANCE IN ADJUSTING SYSTEM TO SUIT ACTUAL OCCUPIED CONDITIONS. PROVIDE UP TO TWO VISITS TO SITE DURING OTHER-THAN-NORMAL OCCUPANCY HOURS FOR THIS PURPOSE.

B. AFTER COMPLETING SYSTEM INSTALLATION AND TESTING, ADJUSTING, AND BALANCING RTU AND AIR-DISTRIBUTION SYSTEMS, CLEAN FILTER HOUSINGS AND INSTALL NEW FILTERS.

annex ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

CAVA

CAVA #148 - E DELRAY BEACH, FL
1831 S. FEDERAL HWY. SUITE 300
DELRAY BEACH, FL 33483
FOR
CAVA
14 Ridge Square NW #500, WASHINGTON, DC 20016

PROJECT NUMBER:
CAV148

ISSUE	DATE
PERMIT SET	1.17.2025
REVISION 1	3.14.2025
REVISION 2	1.10.2025
CONSTRUCTION SET 1	7.18.2025

MECHANICAL SPECIFICATIONS

SHEET:
M702

FOR QUESTIONS, CALL THE
Maryland Mechanical
REGION 76
PHONE: (800) 988 - 0881
EMAIL: reg76@captiveaire.com

PATENT NUMBERS

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

HOOD INFORMATION – JOB#7564802

HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL EXH CFM	EXHAUST PLENUM RISER(S) WIDTH	LENG	HEIGHT	DIA	CFM	VEL	SP	MUA CFM	AC CFM	HOOD CONSTRUCTION	HOOD CONFIG END TO END	ROW
1		6030 ND-2-ACPSP-F	CAPTIVEAIRE	11' 7"	600 DEG	I	HEAVY	200	2317			4"	16"	2317	1659	-0.765"	1691	844	430 SS WHERE EXPOSED	ALONE	ALONE

HOOD INFORMATION

HOOD NO	TAG	FILTER(S) TYPE	QTY	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	LIGHT(S) QTY	TYPE	WIRE GUARD	UTILITY CABINET(S) LOCATION	SIZE	FIRE SYSTEM TYPE	FIRE SYSTEM SIZE	ELECTRICAL MODEL #	SWITCHES QUANTITY	FIRE SYSTEM PIPING	HOOD HANGING WEIGHT
1		CAPTRATE SOLO FILTER	8	20"	16"	85% SEE FILTER SPEC	4	L55 SERIES E26	NO	LEFT	12"x60"x30"	TANK FS	4.0/4.0	DCV-1111	1 LIGHT 1 FAN	YES	1213 LBS

HOOD OPTIONS

HOOD NO	TAG	OPTION
1		FIELD WRAPPER 10.00" HIGH FRONT, LEFT, RIGHT.
		INSULATION FOR BACK OF HOOD.
		RIGHT VERTICAL END PANEL 27" TOP WIDTH, 21" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS.
		LEFT VERTICAL END PANEL 27" TOP WIDTH, 21" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS.

PERFORATED SUPPLY PLENUM(S)

HOOD NO	TAG	POS	LENGTH	WIDTH	HEIGHT	TYPE	RISER(S) WIDTH	LENG	DIA	CFM	SP
1		Front	151"	22"	6"	MUA	10"	28"		563	0.148"
						MUA	10"	28"		563	0.148"
						MUA	10"	28"		563	0.148"
						AC	8"	26"		422	0.095"
						AC	8"	26"		422	0.095"

GREASE DUCT & CHIMNEY SPECIFICATIONS:
PROVIDE GREASE DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW" ROUND 20 GAUGE 430 STAINLESS STEEL DUCTWORK. MODEL "DW" IS LISTED TO UL-1978 AND IS INSTALLED USING "V" CLAMP LOCKING CONNECTIONS SEALED WITH 3M FIRE BARRIER 2000 PLUS. MODEL "DW" DOES NOT REQUIRE WELDING PROVIDING IT HAS BEEN INSTALLED PER THE MANUFACTURES INSTALLATION GUIDE.
PROVIDE RATED ACCESS DOORS AT EVERY CHANGE IN DIRECTION AND EVERY 12' ON CENTER. PER MANUFACTURES LISTING MODEL "DW" HORIZONTAL RUNS LESS THAN 75 FT. CAN BE SLOPED 1/16" PER 12", HORIZONTAL RUNS MORE THAN 75 FT. CAN BE SLOPED 3/16" PER 12".
DUCT SHOULD BE SLOPED AS MUCH AS POSSIBLE TO REDUCE THE CHANCE OF GREASE ACCUMULATION IN HORIZONTAL RUNS.

IF THE DUCT OR CHIMNEY IS WITHIN 18 INCHES OF COMBUSTIBLE MATERIAL, PROVIDE UL-2221 OR UL-103 HT LISTED DOUBLE WALL GREASE DUCT OR DOUBLE WALL CHIMNEY EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW- 2R, 2R TYPE HT, 3R, OR 3Z" ROUND 20 GAUGE 430 STAINLESS INNER DUCT INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.

CAPTIVEAIRE SYSTEMS RECOMMENDS THE USE OF LISTED, PRE-FABRICATED ROUND GREASE EXHAUST DUCT TO REDUCE STATIC PRESSURE IN THE SYSTEM, MINIMIZE INSTALLATION AND INSPECTION TIMES, AND ENSURE DUCT IS LIQUID TIGHT

HVAC DISTRIBUTION NOTE

HIGH VELOCITY DIFFUSERS OR HVAC RETURNS SHOULD NOT BE PLACED WITHIN TEN (10) FEET OF THE EXHAUST HOOD. PERFORATED DIFFUSERS ARE RECOMMENDED.

VERIFY CEILING HEIGHT

___' - ___"

HEIGHT REQUIRED TO VERIFY THAT HOOD FITS SPACE AND TO SIZE THE ENCLOSURE PANELS

CUSTOMER APPROVAL TO MANUFACTURE:

APPROVED AS NOTED ☐
APPROVED WITH NO EXCEPTION TAKEN ☐
REVISE AND RESUBMIT ☐
SIGNATURE _____
YOUR TITLE _____ DATE _____ _____

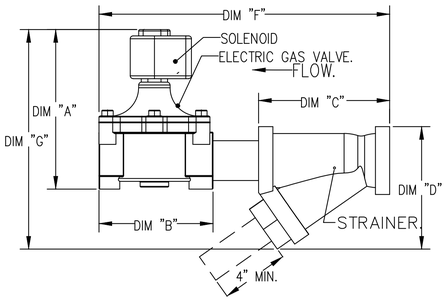
GAS VALVES AND STRAINERS

	GAS VALVE SIZING TYPE	SIZE	VOLTAGE	MIN. INLET PRESSURE	MAX. INLET PRESSURE	FLOW AT 1 IN.W.C. DROP NATURAL GAS	FLOW AT 1 IN.W.C. DROP PROPANE	GAS VALVE DIMENSIONS DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "F"	DIM "G"	INSTALLATION PIPE ORIENTATION	PART NUMBERS GAS VALVE PART NUMBER	STRAINER PART NUMBER	GAS VALVE/STRAINER KIT
GAS VALVE FOR FS#1 →	ELECTRICAL	2"	120 VAC	0 PSI (0 IN.W.C.)	5 PSI (138 IN.W.C.)	2,940,500 BTU/HR	1,908,048 BTU/HR	7-5/8"	6-3/8"	7-1/4"	7-13-16"	15-5/8"	13-15/16"	HORIZONTAL/VERTICAL	8214280	4417K68	(SC)EGVA2

ELECTRIC GAS VALVES ONLY:SOLENOID ORIENTATION
3/4"-2" 120VAC GAS VALVES CAN BE MOUNTED WITH THE SOLENOID IN ANY POSITION AT OR ABOVE HORIZONTAL.
2 1/2"-3" 120VAC GAS VALVES MUST BE MOUNTED WITH THE SOLENOID VERTICAL AND UPRIGHT.
24VDC GAS VALVES MUST BE MOUNTED WITH THE SOLENOID VERTICAL AND UPRIGHT.

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

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



SPECIFICATION: CAPTRATE GREASE-STOP SOLO FILTER

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

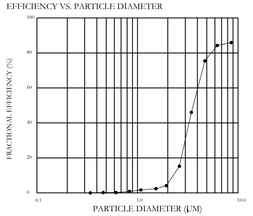
FILTER IS STAINLESS STEEL CONSTRUCTION, AND SIZED TO FIT INTO STANDARD 2-INCH DEEP HOOD CHANNEL(S).

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

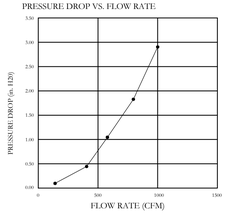
GREASE EXTRACTION EFFICIENCY PERFORMANCE SHALL REMOVE AT LEAST 75% OF GREASE PARTICLES FIVE MICRONS IN SIZE, AND 85% GREASE PARTICLES SEVEN MICRONS IN SIZE AND LARGER, WITH A CORRESPONDING PRESSURE DROP NOT TO EXCEED 1.0 INCHES OF WATER GAUGE.

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

EFFICIENCY VS. PARTICLE DIAMETER



PRESSURE DROP VS. FLOW RATE



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

annex ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

HOOD DRAWINGS FOR REFERENCE ONLY

CAVA

CAVA #148 - E DELRAY BEACH, FL
1831 S. FEDERAL HWY. SUITE 300
DELRAY BEACH, FL 33483
FOR
CAVA
14 Ridge Square NW #500, WASHINGTON, DC 20016

PROJECT NUMBER: CAV148

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REVISION 2	1.10.2025
CONSTRUCTION SET 1	7.18.2025

HOOD DRAWINGS FOR REFERENCE ONLY

SHEET: 1
H1.1

REVISIONS

	DESCRIPTION	DATE:
1		
2		
3		
4		

CAPTIVEAIRE
Maryland Mechanical
5523 Research Park Drive, Suite 250, Catonsville, MD, 21228 PHONE: (800) 988 - 0881 FAX: 9192275931 EMAIL: reg76@captiveaire.com
www.captiveaire.com

Cava - Delray Beach, FL_R1
1831 South Federal Highway,
Delray Beach, FL, 33483

DATE: 6/4/2025

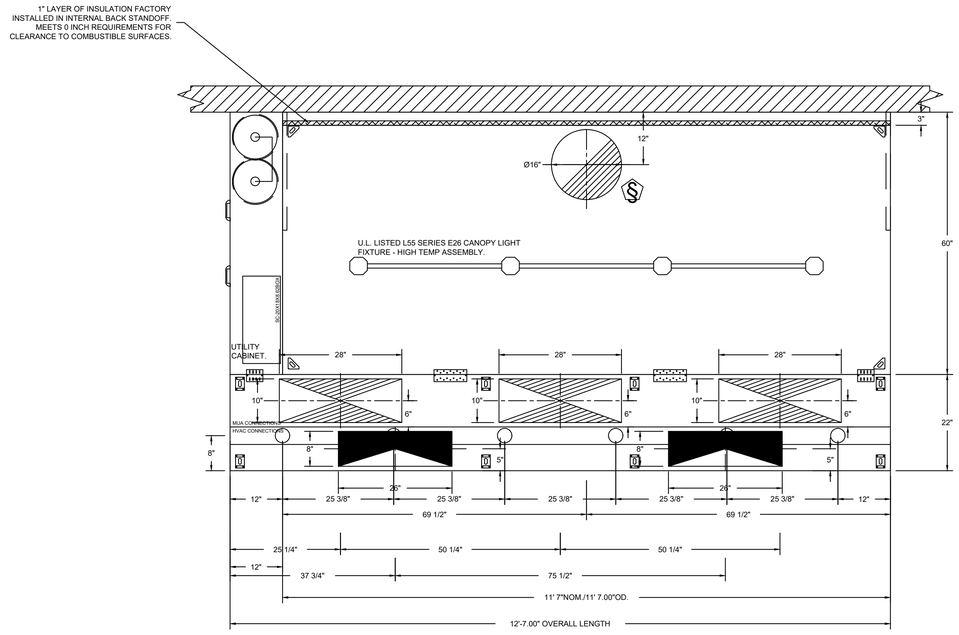
DWG.#: 7564802

DRAWN BY: ABS-76

SCALE: NTS

MASTER DRAWING

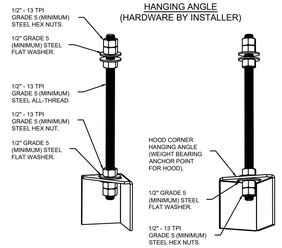
SHEET NO. 1



PLAN VIEW – HOOD #1
11' 7.00" LONG 6030ND-2-ACPSP-F

LIGHTING FOR ACPSP JOB # 7564802 - HOOD #1
INPUT: 120V AC, 1 PHASE, 50/60HZ, 3.5 WATTS PER LIGHT.
TO CONTROL LIGHTS WITH HOOD LIGHT SWITCH, WIRE PER HOOD ELECTRICAL CONTROL PANEL SCHEMATIC.
TO CONTROL LIGHTS WITH BUILDING LIGHT SWITCH, WIRE BLACK AND WHITE WIRE TO A 120VAC SERVICE.
END TO END ACPSPS REQUIRE 120VAC FIELD WIRING FROM J-BOX TO J-BOX. REPLACE LIGHTS WITH LED LIGHTS ONLY.

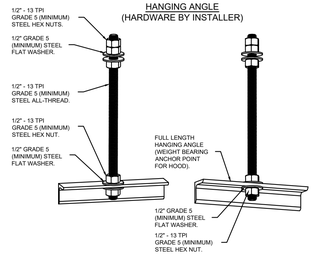
HOOD CORNER
HANGING ANGLE
(HARDWARE BY INSTALLER)



ASSEMBLY INSTRUCTIONS

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

FULL LENGTH
HANGING ANGLE
(HARDWARE BY INSTALLER)



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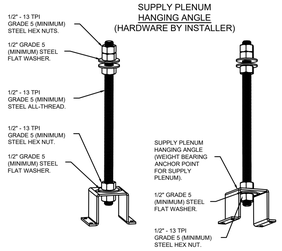
SUPPLY PLENUM
HANGING ANGLE
(HARDWARE BY INSTALLER)



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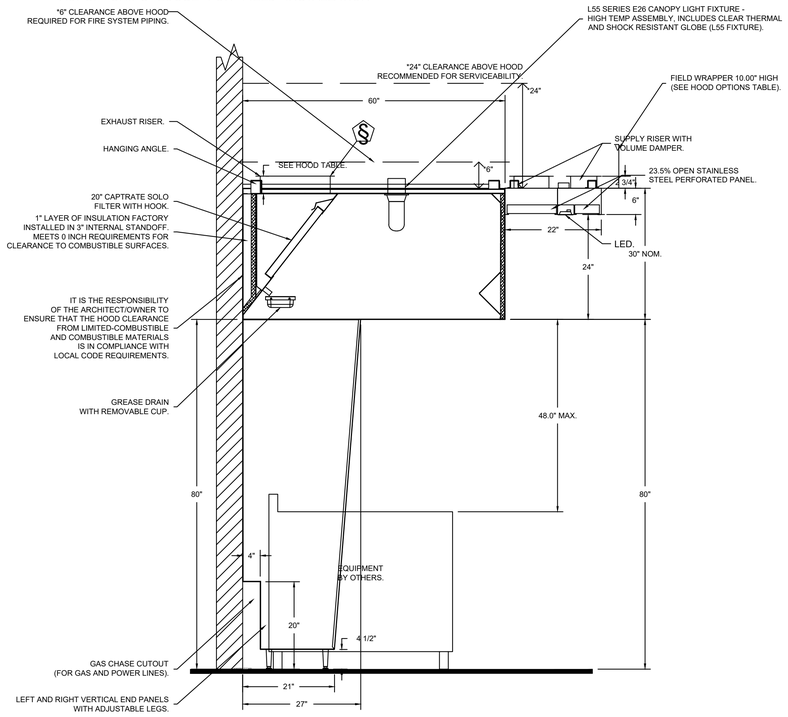
CLEARANCE TO COMBUSTIBLES

HOODS #	SURFACE	*CLEARANCE
1	TOP	18"
	FRONT	0"
	BACK	0"
	LEFT	0"
	RIGHT	18"

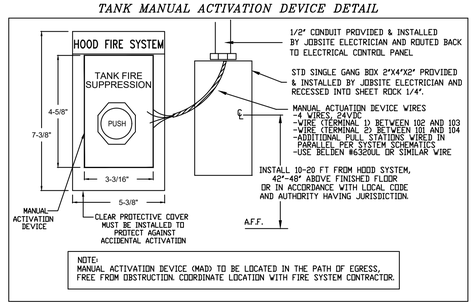
- *0" CLEARANCE TO COMBUSTIBLES CONFORMS TO UL710 STANDARD.
- HOOD MOUNTED UTILITY CABINETS REQUIRE 36" SERVICE CLEARANCE.

ACPSP SHIPS LOOSE FOR FIELD INSTALLATION



SECTION VIEW – MODEL 6030ND-2-ACPSP-F HOOD – #1

TANK MANUAL ACTIVATION DEVICE DETAIL



REVISIONS

	DESCRIPTION	DATE:
1		
2		
3		
4		

CAPTIVEAIRE
Maryland Mechanical
5523 Research Park Drive, Suite 250, Catonsville, MD, 21228 PHONE: (800) 988 - 0881 FAX: 9192275931 EMAIL: reg76@captiveairenc.com
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Cava - Delray Beach, FL_R1
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DATE: 6/4/2025

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SCALE: NTS

MASTER DRAWING

SHEET NO. 2

annex
ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

CAVA

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HOOD DRAWINGS FOR REFERENCE ONLY

SHEET: H1.2

HOOD DRAWINGS FOR REFERENCE ONLY

FIRE SYSTEM INFORMATION – JOB#7564802

FIRE SYSTEM NO	TAG	TYPE	SIZE	MAX FP	DESIGN FP	INSTALLATION	
						SYSTEM	LOCATION ON HOOD
1		TANK FS	4.0/4.0	40	37	FIRE CABINET LEFT	LEFT, HOOD 1

GAS VALVE(S)

FIRE SYSTEM NO	TAG	TYPE	SIZE	SUPPLIED BY
1		SC ELECTRICAL	2.000	CAPTIVEAIRE SYSTEMS

FIRE SYSTEM PARTS LIST KEY

FIRE SYSTEM NO	TAG	KEY NUMBER - PART DESCRIPTION	QTY BY FACTORY	QTY BY DIST
1		0 - 0 - TANK FIRE SUPPRESSION POST-DISCHARGE PROCEDURE UTILITY CABINET LABEL SHEET.	1	0
		0 - 0 - TANK FIRE SUPPRESSION MAINTENANCE GUIDE UTILITY CABINET LABEL SHEET.	1	0
		0 - 0 - 12-F28021-32144-OT-360 DUCT FIRE THERMOSTAT WITH 12 FOOT WIRE LEADS. NO, CLOSE ON TEMP RISE AT 360°F. (A0034310).	1	0
		0 - 0 - 32-00002 QUIK SEAL - 1/2" (UL).	1	0
		0 - 0 - 4429K153 1/2" MALE NPT TO 1/2" FEMALE NPT ELBOW, BRASS.	2	0
		0 - 0 - 4429K422 1/2" X 1/4" BRASS REDUCING BUSHING.	1	0
		0 - 0 - 79525 1/2" 90 PRO-PRESS ELBOW WITH 1/2" NPT FEMALE CONNECTION, VIEGA.	1	0
		0 - 0 - 79580 1/2" X 1/2" PRO-PRESS TEE X 1/2" NPT FEMALE CONNECTION, VIEGA.	2	0
		0 - 0 - 87-120042-001 SECONDARY ACTUATOR VALVE (SVA) - SINGLE ACTUATOR, REQUIRES PRIMARY RELEASE ACTUATOR, TANK FIRE SUPPRESSION.	1	0
		0 - 0 - 87-120045-001 HOSE, SECONDARY ACTUATOR HOSE, 7.5" BRAIDED STAINLESS STEEL, TANK FIRE SUPPRESSION.	1	0
		0 - 0 - 87-300001-001 TANK - PRESSURIZED TANK USED FOR TANK FIRE SUPPRESSION.	2	0
		0 - 0 - 87-300030-001 PRIMARY ACTUATOR KIT (PAK) - ACTUATOR AND RELEASE SOLENOID ASSEMBLY, ONE NEEDED PER FIRE SYSTEM, SUPERVISED, TANK FIRE SUPPRESSION.	1	0
		0 - 0 - 87-300033-001 DIN CONNECTOR, CANFIELD PART #5J560-201-EU0A, TANK FIRE SUPPRESSION, SUBMINATURE SOLENOID CONNECTION (CED VENDOR 30377).	1	0
		0 - 0 - 87-300152-001 HARDWARE, SVA BOLTS, TANK FIRE SUPPRESSION.	8	0
		0 - 0 - 9055455PC PRO PRESS 1/2 PRESS X PRESS 90 ELBOW LD.	6	0
		0 - 0 - 9097200PC PRO PRESS PC611 1/2 PRESS TEE LD.	7	0
		0 - 0 - 98694A115 HARDWARE, DATANKLOCK LOCKING BRACKET SQUARE NUTS 5/16" ZINC, TANK FIRE SUPPRESSION.	4	0
		0 - 0 - A0034332 JUNCTION BOX FOR MANUAL PULL STATION. 1.5" DEEP BACK BOX, RED COLOR.	1	0
		0 - 0 - A31484 1/4" NPT SCHRADER VALVE AND CAP, JB INDUSTRIES. 1/4" FLARE X 1/4" MPT HALF UNION. USED ON TANK SERVICE PORT.	1	0
		0 - 0 - BI145 3/8" BLACK IRON 90 ELL.	3	0
		0 - 0 - DATANKLOCK DISCHARGE ADAPTER TANK LOCKING PLATE FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.	2	0
		0 - 0 - TANK STRAP TANK STRAP - USED FOR TANK FIRE SUPPRESSION.	6	0
		0 - 0 - TFS-UCTANKBRACKET TANK BRACKET FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.	2	0
		0 - 0 - WK-283952-000 DISCHARGE ADAPTER, TANK FIRE SUPPRESSION.	2	0
		16 - 16 - 79210 1/2" X 3/8" NPT MALE ADAPTER, VIEGA.	8	0
		16 - 16 - OL-F NOZZLE - TANK PROTECTION APPLIANCE COVERAGE NOZZLE (INCLUDES METAL BLOW OFF CAP, LANYARD, USED WITH CHROME-PLATED PIPE).	8	0
		26 - 26 - QSA-3/8 QUIK SEAL - 3/8" (UL).	8	0
		34 - 34 - A0034331 24VDC SINGLE ACTION MANUAL ACTUATION DEVICE (PUSH/PULL STATION) WITH PROTECTIVE COVER, ONE (1) NORMALLY OPEN CONTACT. RED COLOR.	1	0

NOTES
- FIELD PIPE DROPS AS SHOWN
  PIPING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY CAS.
- FIELD INSTALLED DROP: FACTORY WILL PROVIDE QTY 2 60IN LONG PIECES OF CHROME PLATED PIPING SHIPPED LOOSE TO BE FIELD-INSTALLED.
- SHIP LOOSE DROP: FACTORY WILL PROVIDE THE EXACT CHROME PIPE LENGTH NEEDED SHIPPED LOOSE TO BE FIELD-INSTALLED.
- RELOCATE NOZZLES IF FLOW PATTERN IS BLOCKED BY SHELVING, SALAMANDERS, ETC.
- OVERLAPPING COVERAGE SHALL NOT BE USED ON ANY APPLIANCE WITH AN OBSTRUCTION.
- IF APPLICABLE, EXTENDED PRE-PIPED DROPS ARE SHIPPED LOOSE.
- FACTORY PIPING EXTENDS A MAXIMUM OF 6" ABOVE THE TOP OF THE HOOD.

- APPLIANCE DIMENSIONS LISTED REPRESENT THE COOKING SURFACE SIZE, NOT THE OVERALL APPLIANCE SIZE.

- THIS PRE-ENGINEERED FIRE SYSTEM COMPLIES WITH U.L. 300 REQUIREMENTS.

- OL-F NOZZLE PART NUMBER REPLACES 3070-3/8H-10-SS

JOB #: 7564802.
JOB NAME: CAVA - DELRAY BEACH, FL_R1.

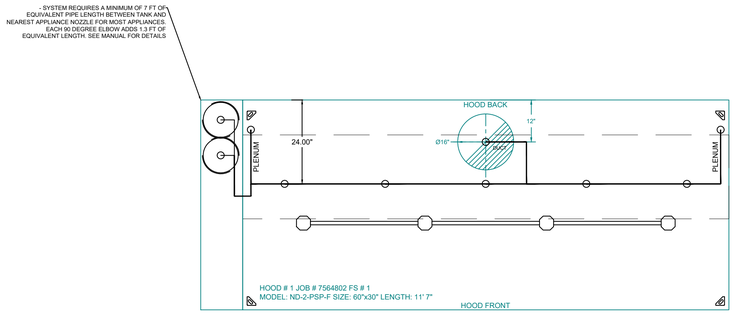
SYSTEM SIZE: TANK-SP-2 DESIGN FP: 37. MAXIMUM FP: 40.
HOOD # 1 11' 7.00" LONG x 60" WIDE x 30" HIGH.
RISER # 1 SIZE: 16" DIA.
HOOD # 1 METAL BLOW-OFF CAPS INCLUDED.

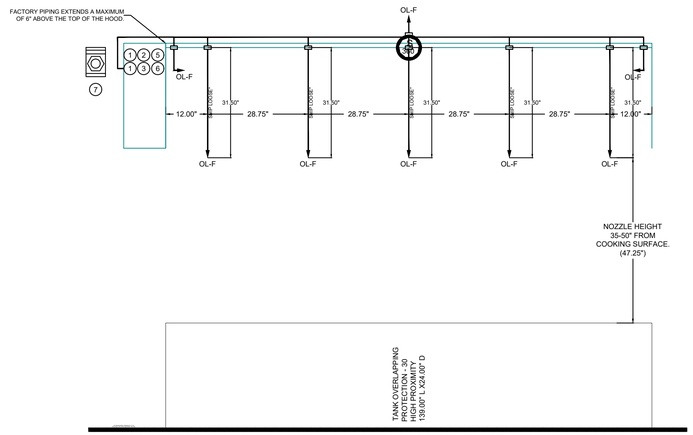
- HEAVY-DUTY APPLIANCES (RATED 600°F) WILL REQUIRE AN ADDITIONAL DOWNSTREAM FIRESTAT IN THE EVENT THAT THE DUCTWORK CONTAINS ANY HORIZONTAL RUNS OVER 25 FT IN LENGTH.
- MEDIUM TO LIGHT-DUTY APPLIANCES (RATED 450°F) WILL NOT REQUIRE ANY ADDITIONAL DOWNSTREAM DETECTION.

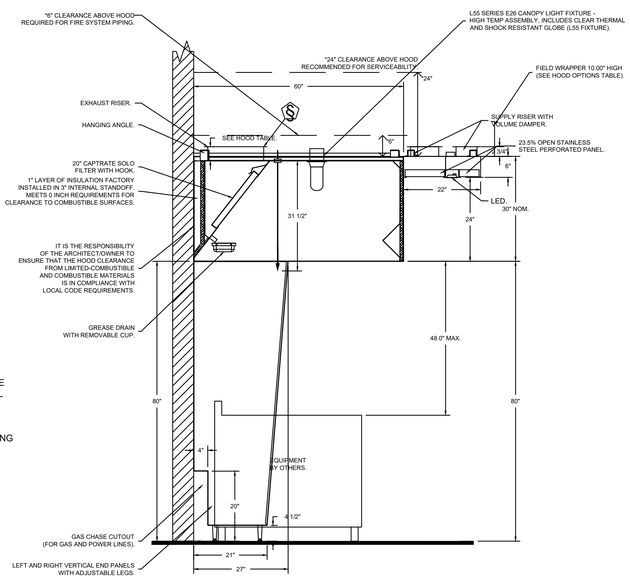
AGENT DISTRIBUTION PIPING LIMITATIONS	
PIPE SECTION	MAX PIPE LENGTH (FT)
MAX SUPPLY LINE TO FIRST OVERLAPPING NOZZLE	42
OVERLAPPING NOZZLE APPLIANCE BRANCH	10
DEDICATED NOZZLE APPLIANCE BRANCH	10

LEGEND – FIRE CABINET TANK SYSTEM

1 4 GALLON TANK.
2 PRIMARY ACTUATOR RELEASE.
3 SECONDARY ACTUATOR RELEASE.
4 PRESSURE SUPERVISION SWITCH.
5 PRIMARY HOSE ASSEMBLY.
6 SECONDARY HOSE ASSEMBLY.
7 REMOTE MANUAL ACTUATION DEVICE.







SECTION VIEW – MODEL 6030ND-2-ACPSP-F HOOD – #1

INCLUDES: FIELD INSTALLATION AND HOOKUP DURING NORMAL BUSINESS HOURS BY CERTIFIED INSTALLERS ONLY IN THE LOCATION NOTED ABOVE, TWO SITE VISITS ONLY (ONE VISIT TO SET PULL STATION & SYSTEM HOOKUP AND ONE VISIT FOR ONE TEST; ADDITIONAL VISITS WILL RESULT IN ADDITIONAL CHARGES), ONE MECHANICAL OR ELECTRICAL GAS VALVE PER SYSTEM AT A MAXIMUM SIZE OF 2", PERMIT, AND SYSTEM TEST.
EXCLUDES: UNION LABOR & PREVAILING WAGE (LABOR & WAGES WILL BE ADDED IF APPLICABLE), GAS VALVE INSTALLATION, ELECTRICAL HOOKUP AND CONNECTIONS, HANGING OF FIRE CABINET, SHUNT TRIP, HANDHELD EXTINGUISHER(S), ON-SITE RE-PIPING DUE TO EQUIPMENT LAYOUT CHANGES.

REVISIONS

	DESCRIPTION	DATE:
1		
2		
3		
4		

CAPTIVEAIRE
www.captiveaire.com
Maryland Mechanical
5523 Research Park Drive, Suite 250, Catonsville, MD, 21228 PHONE: (800) 988 - 0881 FAX: 9192275931 EMAIL: reg76@captiveaire.com

Cava - Delray Beach, FL_R1
1831 South Federal Highway,
Delray Beach, FL, 33483

DATE: 6/4/2025

DWG.#: 7564802

DRAWN BY: ABS-76

SCALE: NTS

MASTER DRAWING

SHEET NO. 3

annex
ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

HOOD DRAWINGS FOR REFERENCE ONLY

CAVA

CAVA #148 - E DELRAY BEACH, FL
1831 S. FEDERAL HWY. SUITE 300
DELRAY BEACH, FL 33483
FOR
CAVA
14 Ridge Square NW #500, WASHINGTON, DC 20016

PROJECT NUMBER: CAV148

ISSUE	DATE
PERMIT SET	1.17.2025
REVISION 1	3.14.2025
REVISION 2	1.10.2025
CONSTRUCTION SET 1	7.18.2025

HOOD DRAWINGS FOR REFERENCE ONLY

SHEET: H1.3

EXHAUST FAN INFORMATION – JOB#7564802

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	KEF	1	DU85HFA	CAPTIVEAIRE	2317	1.000	1551	TEAO-ECM	1.000	0.6650	1	115	11.6	733 FPM	94	16.7

DOAS/RTU FAN SCHEDULE – JOB#7564802

FAN INFORMATION										ELECTRICAL INFORMATION					COOLING INFORMATION										HEAT PUMP INFORMATION				A2L MINIMUM ROOM VOLUME			
FAN UNIT NO	TAG	QTY	DOAS/RTU MODEL #	MANUFACTURER	BLOWER	RETURN AIR CFM	MAX OUTSIDE AIR CFM	TOTAL CFM	WEIGHT (LBS)	ESP	HP	PHASE	VOLT	MCA	MOCP	OUTSIDE AIR		MIXED AIR		LEAVING AIR			CAPACITY		IEER	ISMRE2	ENTERING TEMP	MAX TEMP RISE	DISCHARGE TEMP	COP	ROOM AREA (FT2)	AIRFLOW (CFM)	HEIGHT (FT)	NOTES
																DB	WB	DB	WB	DB	WB	DP	TOTAL	SENS.									
2	MAU	1	EARTU1-15-5T-MPU	ECON-AIR	15P-1	0	1691	1691	1114	0.750	1.50	3	208	25.7A	30A	87.5°F	80.5°F	87.5°F	80.5°F	73.7°F	71.4°F	70.5°F	64.0 MBH	25.0 MBH	17.9	6.4	51.0°F	26.0°F	77.0°F	3.5	198.2	357	7.2	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18

NOTES:

1. INVERTER SCROLL COMPRESSOR WITH INTEGRATED OIL SENSOR. DIGITAL OR STAGED SCROLL NOT AN APPROVED EQUAL
2. DIRECT DRIVE PLENUM BLOWER. BELT DRIVEN BLOWERS ARE NOT ACCEPTABLE
3. INTEGRATED MONITORING VIA CELLULAR CONNECTION BY MANUFACTURER
4. REFRIGERATION PRESSURE MONITORING ON HIGH AND LOW PRESSURE SIDE OF SYSTEM INCLUDED THROUGH DIGITAL INTERFACE
5. EC MOTOR CONDENSING FANS
6. ELECTRONIC EXPANSION VALVE. TXV NOT ACCEPTABLE
7. SUCTION LINE ACCUMULATOR
8. FACTORY COMMISSIONING WITH 5 YEAR PARTS WARRANTY
9. AVERAGING INTAKE, EVAP AND DISCHARGE TEMPERATURE SENSORS (DISCHARGE SENSOR TO BE FACTORY MOUNTED WITHIN UNIT)
10. SUPPLY CFM MONITORING INTEGRAL TO UNIT WITH CFM MEASUREMENT INCLUDED THROUGH DIGITAL INTERFACE
11. 15 DEGREE LOW AMBIENT OPERATION
12. MIAMI DADE RATED
13. E-COATED CONDENSING COIL
14. E-COATED EVAPORATIVE COIL
15. E-COATED REHEAT COIL
16. 1" EXTERIOR DUAL-WALL CONSTRUCTION W/ R-4.3 INSULATION-MINIMUM 24GA EXTERIOR W/ 18GA BASE
17. DOWN DISCHARGE/NO RETURN
18. MINIMUM ROOM AREA ASSUMED 7.2' SUPPLY DIFFUSER HEIGHT AND IS CALCULATED PER UL60335-2-40 4TH ED. VALUES BASED ON FACTORY CHARGE. ACTUAL SITE CHARGE MAY DIFFER.

FAN ACCESSORIES

FAN UNIT NO	TAG	EXHAUST			SUPPLY			
		GREASE CUP	GRAVITY DAMPER	WALL MOUNT	SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1	KEF	YES						

CURB ASSEMBLIES

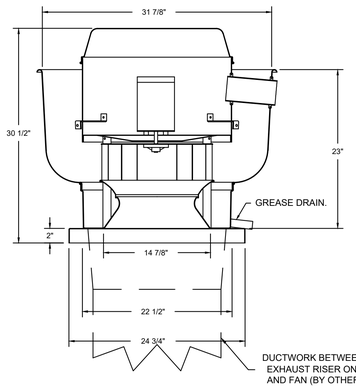
NO	ON FAN	TAG	WEIGHT	ITEM	SIZE
1	# 1	KEF	66 LBS	CURB	23.000"W X 23.000"L X 26.000"H VENTED 16 GAUGE.
2	# 2	MAU	103 LBS	CURB	41.000"W X 71.000"L X 20.000"H INSULATED.

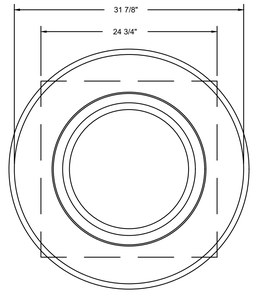
FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION	IMPORTANT NOTE
1	KEF	1	GREASE BOX	
		1	MIAMI DADE CERTIFICATION - NOA-1 ALUMINUM UPBLAST	
		1	ECM WIRING PACKAGE - PWM SIGNAL FROM ECPMO3 PREWIRE (TELCO MOTOR), CCW ROTATION	
		1	2 YEAR PARTS WARRANTY	
2	MAU	1	CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED	THIS UNIT IS CONFIGURED WITH A HEAT PUMP WHICH MAY BE AT RISK OF FREEZING THE OUTDOOR COIL AT TIMES WHEN OUTDOOR TEMPS REACH APPROXIMATELY 45F OR LOWER AND OUTDOOR HUMIDITY LEVELS ARE HIGH. DURING THESE CONDITIONS, THE UNIT HAS POTENTIAL TO RUN A DEFROST CYCLE WHICH WILL DELIVER VERY COLD AIR INTO THE SPACE UNTIL THE DEFROST CYCLE COMPLETES, AND MAY REPEAT THIS PROCESS UNTIL WEATHER CONDITIONS PASS. IT IS HIGHLY RECOMMENDED THAT BACKUP HEAT BE ADDED TO AVOID RISK OF COLD AIR DELIVERY TO THE SPACE.
		1	2" MERV 13 FILTERS FOR RTU1 (QTY. 4)	
		1	2" MERV 8 FILTERS FOR RTU1 (QTY. 4)	
		1	TOTAL CFM MONITORING	
		1	RTU1 DOWN DISCHARGE	
		1	RTU FIXED 100% OA INTAKE CONTROL	
		1	FREEZESTAT	
		1	INTAKE FIRESTAT SET TO 135°F	
		1	RTU1 NO RETURN - 100% OA - MPU	
		1	RTU1 CURB DUCT HANGER	
		1	RTU1 MIAMI DADE CERTIFICATION	
		1	RTU BLOWER DOOR SWITCH	
		1	2" METAL MESH FILTERS FOR RTU1 OUTDOOR INTAKE	
		1	VAV PACKAGE W/ 0-10VDC INPUT CONTROL (571 VFD INCLUDED)	
		1	LOW AMBIENT COOLING OPERATION - DOWN TO 0F AMBIENT	
		1	R454B LEAK DETECTOR OPTION FOR RTUS	
		1	ECOATING FOR RTU1 3/4/5T CONDENSER COIL	
		1	ECOATING FOR RTU1 3/4/5T EVAP COIL	
		1	ECOATING FOR RTU1 3/4/5T REHEAT COIL	
		1	SIZE 1 MOISTURE ELIMINATOR FOR SIZE 1, 5 TON RTU. NO REHEAT	
		1	5 TON MODULATING COOLING OPTION WITH HEAT PUMP, 208/230V. R454B REFRIGERANT, VARIABLE SPEED COMPRESSOR, ECM CONDENSING FAN	
		1	VFD FACTORY MOUNTED AND WIRED IN RTU COMMERCIAL CONTROL VESTIBULE	
		1	SINGLE POINT ELECTRICAL CONNECTION FOR RTU. 750VA TRANSFORMER USED. IF A NON-DCV PREWIRE CONTROLS THIS UNIT, THE #28, #47, "MA", OR "E2" PREWIRE OPTION MUST BE SELECTED. DOES NOT PROVIDE SUPPLY STARTER IN PREWIRE	
		1	5 YEAR ENTIRE UNIT PARTS WARRANTY, 10 YEAR ENTIRE UNIT PARTS WARRANTY WITH REMOTE MONITORING AND CAPTIVEAIRE SERVICE CONTRACT	

HMI SCHEDULE				
UNIT NUMBER	HMI #	HMI LOCATION	TEMP AVERAGING	MODBUS ADDRESS
FAN #2	HMI #1 - UNIT	IN UNIT	NOT AVERAGED	55

FAN #1 DU85HFA - EXHAUST FAN (KEF)





TOP VIEW

FEATURES:

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

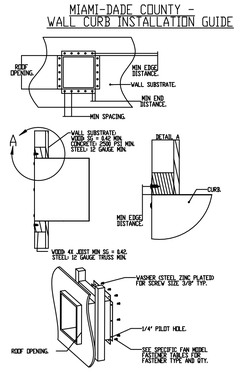
NORMAL TEMPERATURE TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

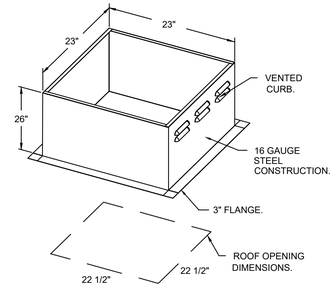
ABNORMAL FLARE-UP TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

OPTIONS

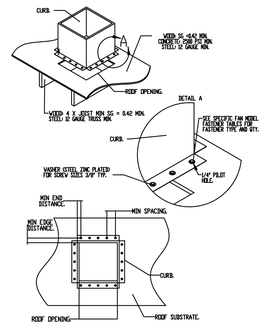
- GREASE BOX.
- MIAMI DADE CERTIFICATION - NOA-1 ALUMINUM UPBLAST.
- ECM WIRING PACKAGE - PWM SIGNAL FROM ECPMO3 PREWIRE (TELCO MOTOR), CCW ROTATION.
- 2 YEAR PARTS WARRANTY.

MIAMI-DADE COUNTY – WALL CURB INSTALLATION GUIDE





MIAMI-DADE COUNTY – CURB ROOF INSTALLATION GUIDE



annex ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

REVISIONS

	DESCRIPTION	DATE:
1		
2		
3		
4		

CAPTIVEAIRE
www.captiveaire.com
Maryland Mechanical
5523 Research Park Drive, Suite 250, Catonsville, MD, 21228 PHONE: (800) 968 - 0861 FAX: 9192275931 EMAIL: reg76@captiveaire.com

Cava - Delray Beach, FL_R1
1831 South Federal Highway,
Delray Beach, FL, 33483

DATE: 6/4/2025

DWG.#: 7564802

DRAWN BY: ABS-76

SCALE: NTS

MASTER DRAWING

SHEET NO. 4

HOOD DRAWINGS FOR REFERENCE ONLY

CAVA

CAVA #148 - E DELRAY BEACH, FL
1831 S. FEDERAL HWY. SUITE 300
DELRAY BEACH, FL 33483
FOR
CAVA
14 Ridge Square NW #500, WASHINGTON, DC 20016

PROJECT NUMBER: CAV148

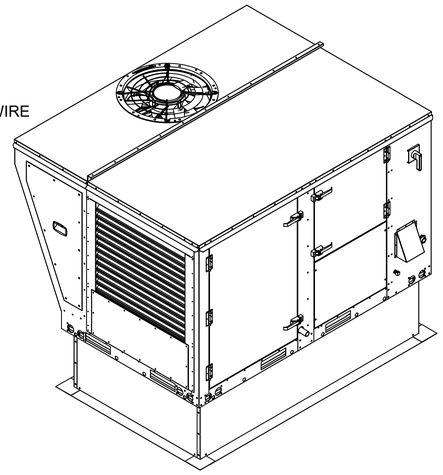
ISSUE	DATE
PERMIT SET	1.17.2025
REVISION 1	3.14.2025
REVISION 2	1.10.2025
CONSTRUCTION SET 1	7.18.2025

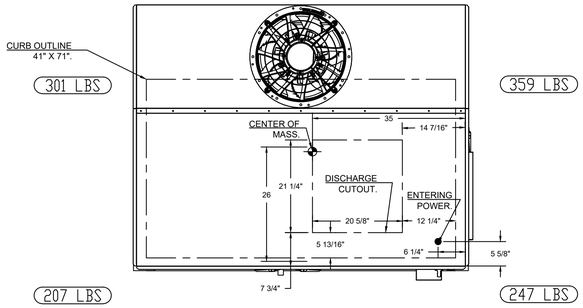
HOOD DRAWINGS FOR REFERENCE ONLY

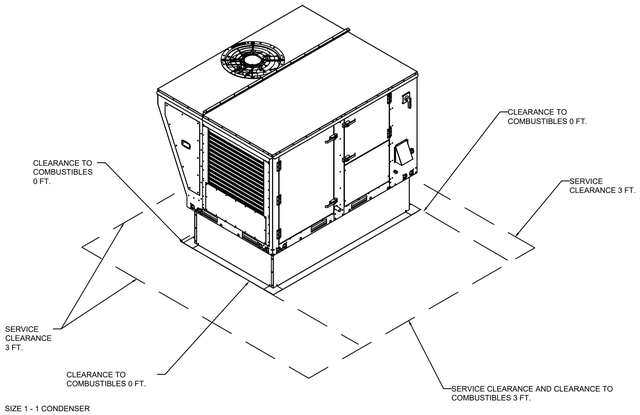
SHEET: H1.4

FAN #2 EARTU1-15-5T-MPU - SUPPLY FAN (MAU)

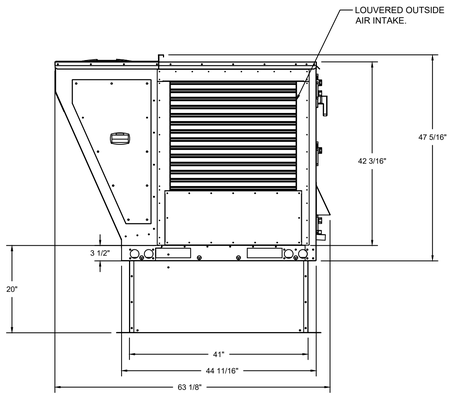
NOTES:
1. DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
2. (⌀) DENOTES CORNER WEIGHT.
3. ROOF OPENING MUST BE 2" SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.
4. CONNECTION FROM BREAKER TO UNITS SAFETY DISCONNECT SWITCH TO BE COPPER WIRE ONLY.

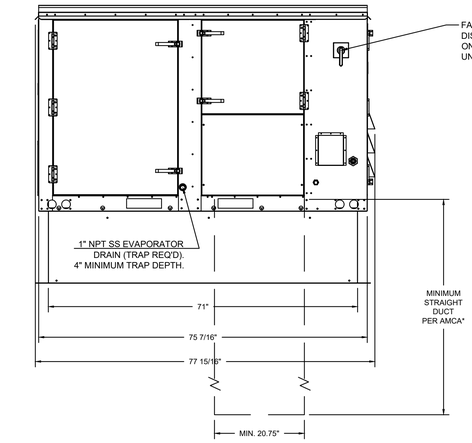






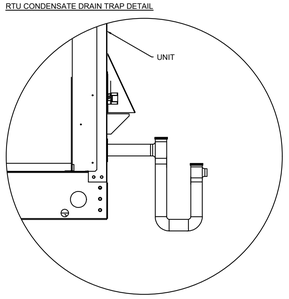
SIZE 1 - 1 CONDENSER

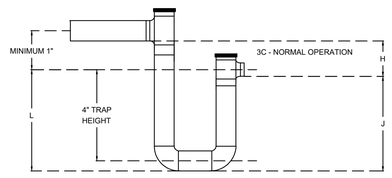




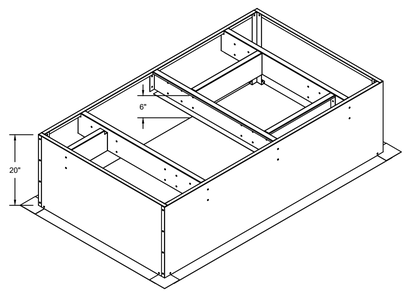
*NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE AS OUTLINED IN AMCA PUBLICATION 201. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THROAT, RADIUS BACK WITH TURNING VANES. FLEXIBLE DUCTWORK AND SQUARE THROAT/SQUARE BACK ELBOWS SHOULD NOT BE USED. ANY TRANSITION AND/OR TURNS IN THE DUCTWORK WILL CAUSE SYSTEM EFFECT. SYSTEM EFFECT WILL DRASTICALLY INCREASE STATIC PRESSURE AND REDUCE AIRFLOW. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECTS AND REDUCE PERFORMANCE OF THE EQUIPMENT.
SUGGESTED STRAIGHT DUCT SIZE IS 20.75" x 21.5".

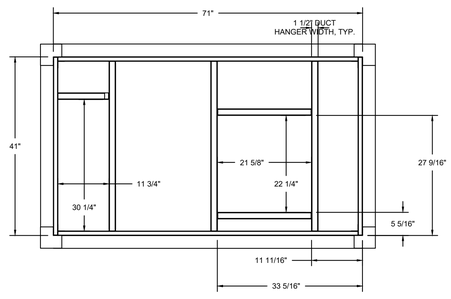
RTU CONDENSATE DRAIN TRAP DETAIL





H = (1" FOR EACH 1" OF MAXIMUM NEGATIVE STATIC PRESSURE) + 1"
J = HALF OF H
L = H + J + PIPE DIAMETER + INSULATION





REVISIONS

	DESCRIPTION	DATE:
△		
△		
△		
△		

CAPTIVEAIRE
Maryland Mechanical
5523 Research Park Drive, Suite 250, Catonsville, MD. 21228 PHONE: (800) 988 - 0881 FAX: 9192275931 EMAIL: reg76@captiveaire.com
www.captiveaire.com

Cava - Delray Beach, FL_R1
1831 South Federal Highway,
Delray Beach, FL, 33483

DATE: 6/4/2025

DWG.#: 7564802

DRAWN BY: ABS-76

SCALE: NTS

MASTER DRAWING

SHEET NO. 5

annex ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

HOOD DRAWINGS FOR REFERENCE ONLY

CAVA

CAVA #148 - E DELRAY BEACH, FL
1831 S. FEDERAL HWY. SUITE 300
DELRAY BEACH, FL 33483
FOR
CAVA
14 Ridge Square NW #500, WASHINGTON, DC 20016

PROJECT NUMBER: CAV148

ISSUE	DATE
PERMIT SET	1.17.2025
REVISION 1	3.14.2025
REVISION 2	1.10.2025
CONSTRUCTION SET 3	7.18.2025

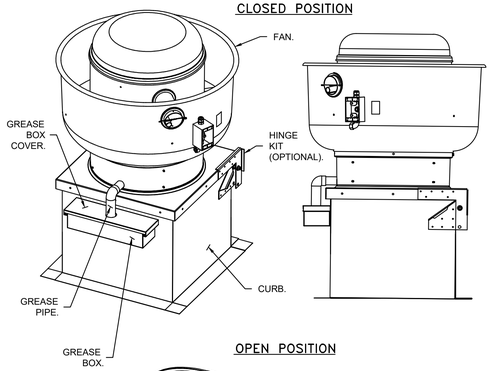
HOOD DRAWINGS FOR REFERENCE ONLY

SHEET: 3
H1.5

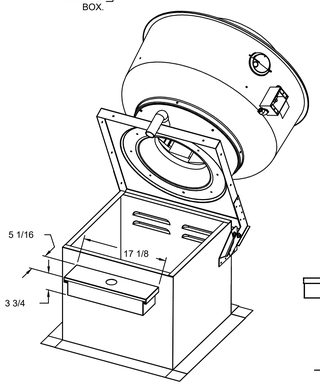
GREASEBOX
REV.#2 08/19/02

GREASE BOX INSTALLATION

CLOSED POSITION



OPEN POSITION



PARTS INCLUDED

GREASE BOX.
GREASE BOX COVER.
GREASE PIPE.

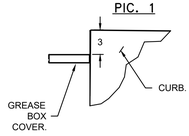
SHEET METAL SCREWS
3 - LONG (3/4" LG.).

GREASE BOX FIELD INSTALLATION

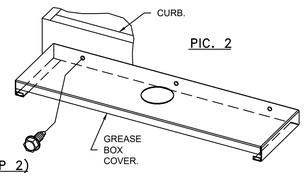
STEP 1)

ATTACH GREASE BOX COVER TO THE CURB,
HOLD 3" DIMENSION AS SHOWN ON PIC. 1.
SCREW GREASE BOX COVER TO CURB USING (3) LONG (3/4" LG.)
SCREWS AS SHOWN ON PIC. 2.

PIC. 1



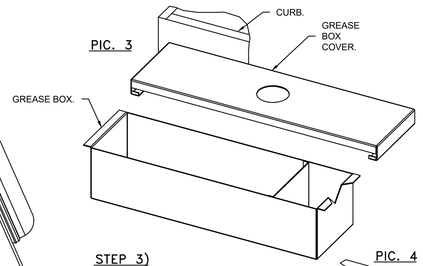
PIC. 2

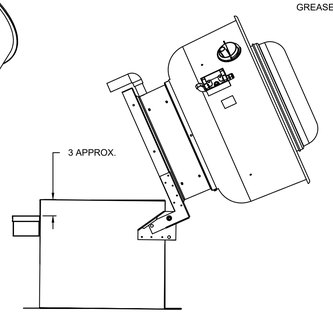


STEP 2)

ATTACH GREASE BOX TO GREASE BOX COVER, SLIDE AND DROP.
AS SHOWN ON PIC. 3.

PIC. 3

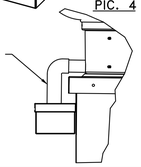




STEP 3)

INSTALL GREASE PIPE AS SHOWN ON PIC. 4.

PIC. 4



*NOTE: UL 705 INSTALL.

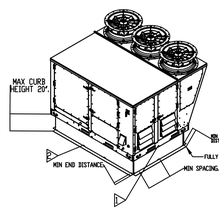
GREASE DUCT & CHIMNEY SPECIFICATIONS:
PROVIDE GREASE DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW"
ROUND 20 GAUGE 430 STAINLESS STEEL DUCTWORK. MODEL "DW"
IS LISTED TO UL-1978 AND IS INSTALLED USING "V" CLAMP LOCKING
CONNECTIONS SEALED WITH 3M FIRE BARRIER 2000 PLUS. MODEL "DW"
DOES NOT REQUIRE WELDING PROVIDING IT HAS BEEN INSTALLED PER
THE MANUFACTURES INSTALLATION GUIDE.
PROVIDE RATED ACCESS DOORS AT EVERY CHANGE IN DIRECTION AND EVERY 12' ON CENTER. PER MANUFACTURES LISTING MODEL "DW" HORIZONTAL RUNS LESS THAN 75 FT. CAN BE SLOPED 1/16" PER 12", HORIZONTAL RUNS MORE THAN 75 FT. CAN BE SLOPED 3/16" PER 12".
DUCT SHOULD BE SLOPED AS MUCH AS POSSIBLE TO REDUCE THE CHANCE OF GREASE ACCUMULATION IN HORIZONTAL RUNS.

IF THE DUCT OR CHIMNEY IS WITHIN 18 INCHES OF COMBUSTIBLE MATERIAL, PROVIDE UL-2221 OR UL-103 HT LISTED DOUBLE WALL GREASE DUCT OR DOUBLE WALL CHIMNEY EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW- 2R, 2R TYPE HT, 3R, OR 3Z" ROUND 20 GAUGE 430 STAINLESS INNER DUCT INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.

CUSTOMER APPROVAL TO MANUFACTURE:

APPROVED AS NOTED ☐
APPROVED WITH NO EXCEPTION TAKEN ☐
REVISE AND RESUBMIT ☐
SIGNATURE _____
YOUR TITLE _____ DATE _____ _____

MIAMI-DADE NOA6 RTU



GENERAL NOTES:
1. THIS APPROVAL IS FOR THE STRUCTURAL CAPACITY AND IMPACT RATING OF THE EXTERIOR HOUSING ONLY. IT DOES NOT INCLUDE ANY INTERIOR MECHANICAL OR ELECTRICAL PART.
2. THESE FANS HAVE NOT BEEN WIND TESTED FOR WIND DRIVEN RAIN TEST PER FLORIDA BUILDING CODE, TAS200 VO=55.
3. TESTED IN ACCORDANCE TO FLORIDA BUILDING CODE TEST PROTOCOL TAS201, TAS202, TAS203.
4. TESTED FOR AREAS INCLUDING HIGH VELOCITY HURRICANE ZONES.
5. TESTED UNDER MIAMI-DADE COUNTY NOTIFICATION NUMBER ATI-15071.

INSTALLATION INSTRUCTIONS:
1. SECURE CAPTIVEAIRE TO CURB USING 5/16"-18 X 2" ZINC PLATED STEEL SELF DRILLING SCREW (ELCO DRIL-FLEX OR BETTER) THROUGH PRE-PUNCHED HOLES IN THE SUPPORT RAILS. SEE TABLE BELOW FOR FASTENER QTY.
2. SECURE CURB TO ROOF BY DRILLING 1/4" DIA PILOT HOLES IN THE CURB FLANGE AT LOCATIONS SHOWN IN THE DIAGRAM. SEE TABLE BELOW FOR FASTENER TYPE AND TABLE BELOW FOR FASTENER QTY.

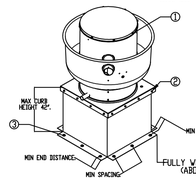
CURB MATERIAL:
20" HIGH & LESS = 18 GA. STEEL.

DESIGN PRESSURE: +30.0 / -30.0 PSF.
LARGE MISSILE IMPACT RESISTANT.

INSTALLATION FASTENER TYPES				
	FAN TO CURB	WOOD (SG = 0.42 MIN.)	STEEL (12 GAUGE MIN.)	CONCRETE (2500 PSI MIN. CRACKED CONCRETE)
FASTENER	5/16"-18 X 2" SELF DRILLING SCREW (ELCO DRIL-FLEX OR BETTER)	3/8" DIA. ZINC PLATED LAG BOLT	1/4"-14 DRIL-FLEX SELF DRILLING SCREW	3/8" DIA. SS HILTI KWIK BOLT TZ EXPANSION ANCHOR
MINIMUM THREAD PENETRATION	N/A	2-1/2"	12 GAUGE	2"
MINIMUM EDGE DISTANCE	N/A	1-1/2"	3/8"	3"
MINIMUM END DISTANCE	N/A	4-1/2"	4-1/2"	4-1/2"
MINIMUM SPACING	N/A	1-1/2"	6"	6"

INSTALLATION FASTENER QTY												
	CURB TO FAN			WOOD			STEEL			CONCRETE		
FAN MODEL	LONG SIDE	SHORT SIDE	TOTAL	LONG SIDE	SHORT SIDE	TOTAL	LONG SIDE	SHORT SIDE	TOTAL	LONG SIDE	SHORT SIDE	TOTAL
HVAC1	7	4	22	12	6	36	15	7	44	12	6	36

MIAMI-DADE NOA1 ALUMINUM UP-BLAST FANS



GENERAL NOTES:
1. THIS APPROVAL IS FOR THE STRUCTURAL CAPACITY AND IMPACT RATING OF THE EXTERIOR HOUSING ONLY. IT DOES NOT INCLUDE ANY INTERIOR MECHANICAL OR ELECTRICAL PART.
2. THESE FANS HAVE NOT BEEN WIND TESTED FOR WIND DRIVEN RAIN TEST PER FLORIDA BUILDING CODE, TAS200 VO=55.
3. TESTED IN ACCORDANCE TO FLORIDA BUILDING CODE TEST PROTOCOL TAS201, TAS202, TAS203.
4. TESTED FOR AREAS INCLUDING HIGH VELOCITY HURRICANE ZONES.
5. TESTED UNDER MIAMI-DADE COUNTY NOTIFICATION NUMBER ATI-08033.

INSTALLATION INSTRUCTIONS:
1. SECURE LID TO FAN USING 40 1/4"-14 X 2" ZINC PLATED STEEL SELF DRILLING SCREW HEXHEAD WITH RUBBER WASHER SPACED EVENLY AROUND LID.
2. SECURE FAN BASE TO CURB USING 1/4"-14 X 2" GALVANIZED SELF DRILLING SCREWS (#287 OR BETTER) THROUGH PRE-PUNCHED HOLES IN THE FAN BASE. SEE TABLE BELOW FOR QTY.
3. SECURE CURB TO ROOF OR WALL BY DRILLING 1/4" DIA PILOT HOLES IN THE CURB FLANGE AT LOCATIONS SHOWN IN THE DIAGRAM. SEE TABLE BELOW FOR FASTENER TYPE. USE TABLE BELOW FOR FASTENER QTY.

CURB MATERIAL:
20" HIGH & LESS = 20 GA. STEEL.
ABOVE 20" THRU 42" = 16 GA. STEEL.

DESIGN PRESSURE: +30.0 / -30.0 PSF.
LARGE MISSILE IMPACT RESISTANT.

INSTALLATION FASTENER TYPES				
	FAN TO CURB	WOOD (SG = 0.42 MIN.)	STEEL (12 GAUGE MIN.)	CONCRETE (2500 PSI MIN. CRACKED CONCRETE)
FASTENER	5/16"-18 X 2" SELF DRILLING SCREW (ELCO DRIL-FLEX OR BETTER)	3/8" DIA. ZINC PLATED LAG BOLT	1/4"-14 DRIL-FLEX SELF DRILLING SCREW	3/8" DIA. SS HILTI KWIK BOLT TZ EXPANSION ANCHOR
MINIMUM THREAD PENETRATION	N/A	2-1/2"	12 GAUGE	2"
MINIMUM EDGE DISTANCE	N/A	1-1/2"	3/8"	3"
MINIMUM END DISTANCE	N/A	2-5/8"	3/8"	3"
MINIMUM SPACING	N/A	1-1/2"	3/4"	5-1/2"

INSTALLATION FASTENER QTY																			
	CURB TO FAN (ROOF)		CURB TO FAN (WALL)		WOOD (ROOF)		WOOD (WALL)		STEEL (ROOF)		STEEL (WALL)		CONCRETE (ROOF)		CONCRETE (WALL)				
FAN MODEL	PER SIDE	TOTAL	PER SIDE	TOTAL	PER SIDE	TOTAL	PER SIDE	TOTAL	PER SIDE	TOTAL	PER SIDE	TOTAL	PER SIDE	TOTAL	PER SIDE	TOTAL			
DUBS	3	12	3	12	4	16	4	16	5	20	5	20	4	16	4	16			

annex ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

REVISIONS

	DESCRIPTION	DATE:
1		
2		
3		
4		

CAPTIVEAIRE
www.captiveaire.com
Maryland Mechanical
5523 Research Park Drive, Suite 250, Catonsville, MD. 21228 PHONE: (800) 988 - 0881 FAX: 9192275931 EMAIL: reg7@captiveaire.com

Cava - Delray Beach, FL_R1
1831 South Federal Highway,
Delray Beach, FL, 33483

DATE: 6/4/2025

DWG.#: 7564802

DRAWN BY: ABS-76

SCALE: NTS

MASTER DRAWING

SHEET NO. 6

HOOD DRAWINGS FOR REFERENCE ONLY

CAVA

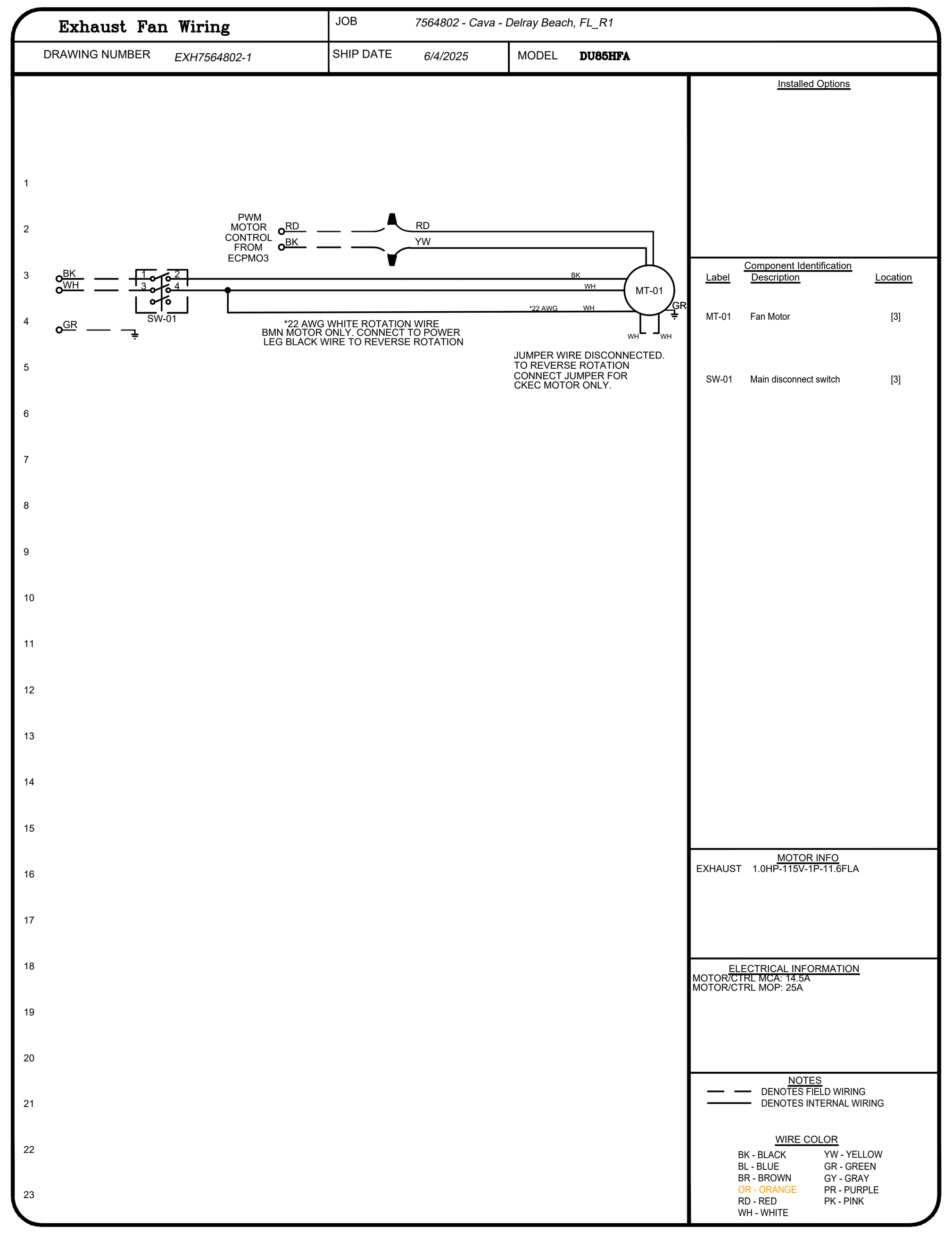
CAVA #148 - E DELRAY BEACH, FL
1831 S. FEDERAL HWY. SUITE 300
DELRAY BEACH, FL 33483
FOR
CAVA
14 Ridge Square NW #500, WASHINGTON, DC 20016

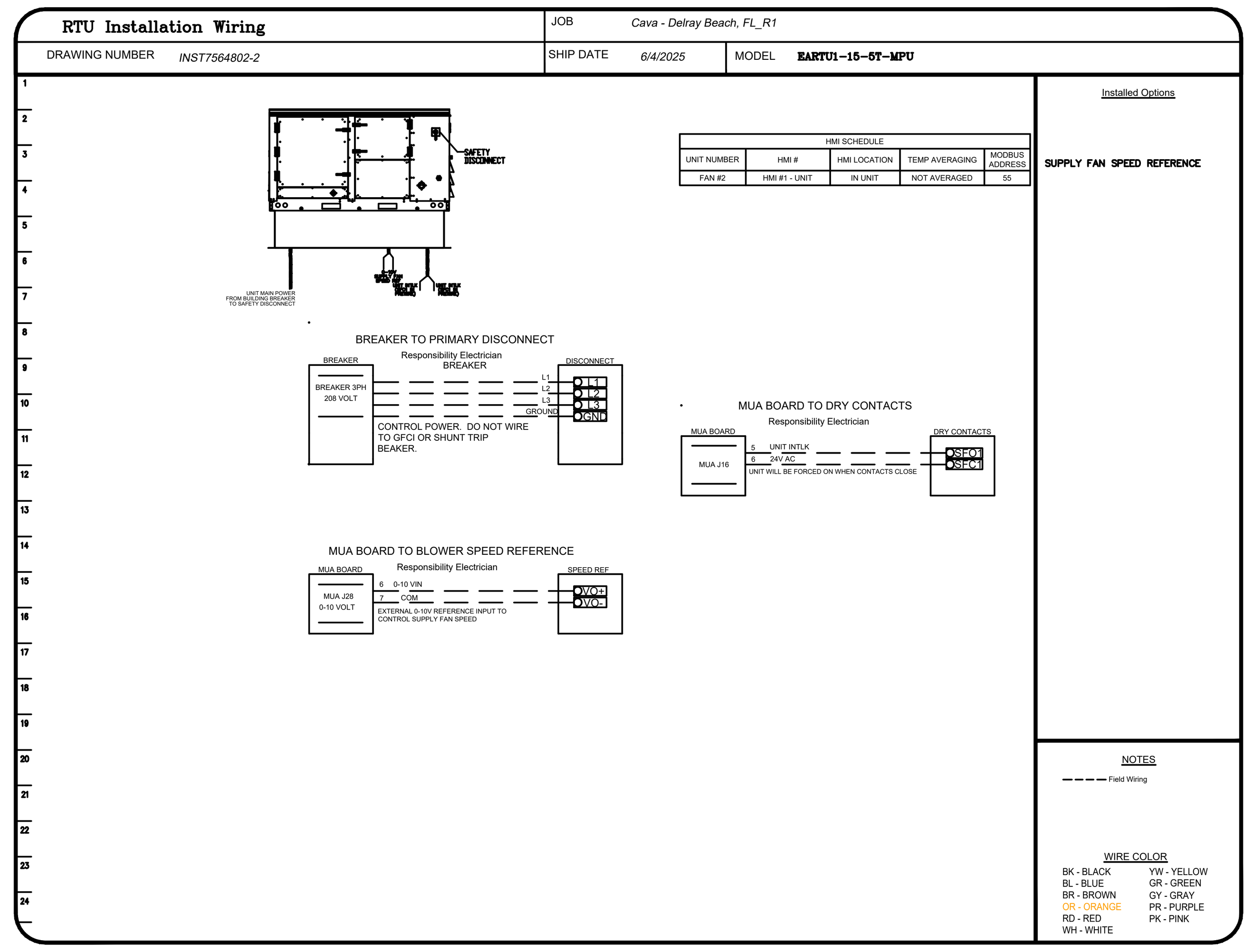
PROJECT NUMBER: CAV148

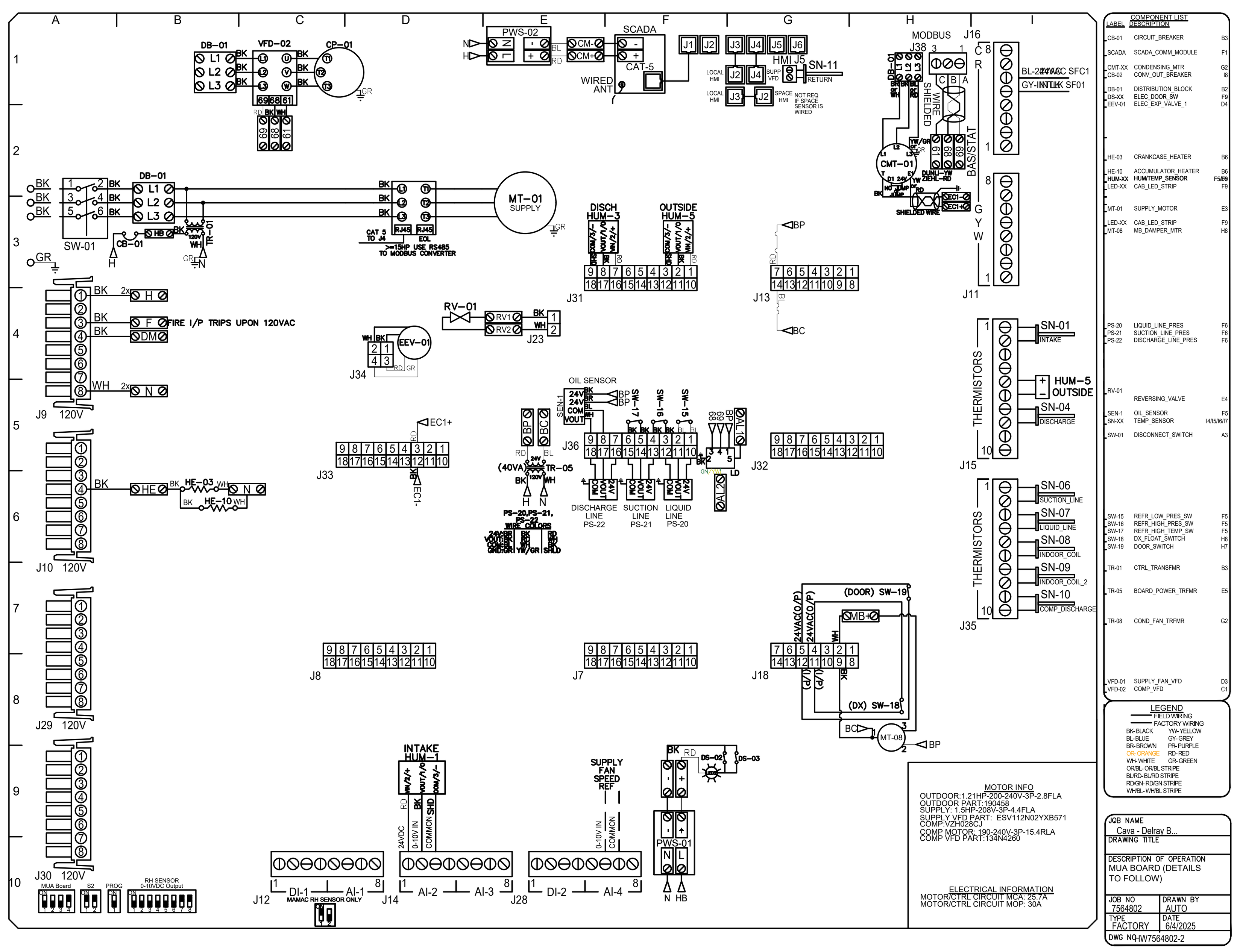
ISSUE	DATE
PERMIT SET	1.17.2025
REVISION 1	3.14.2025
REVISION 2	1.10.2025
CONSTRUCTION SET 1	7.18.2025

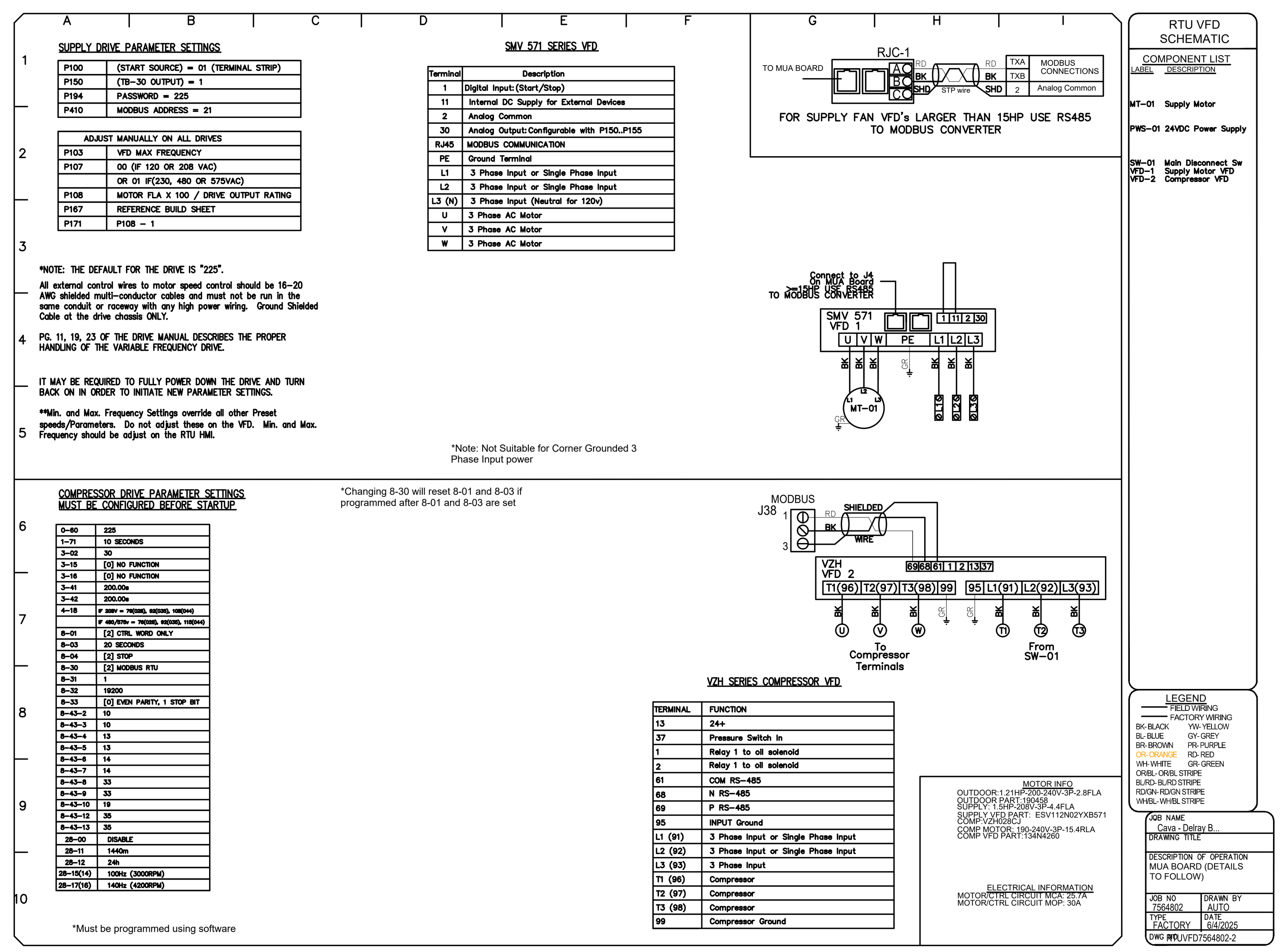
HOOD DRAWINGS FOR REFERENCE ONLY

SHEET: 3
H1.6









REVISIONS	
DESCRIPTION	DATE:
△	
△	
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CAPTIVEAIRE

Maryland Mechanical

5523 Research Park Drive, Suite 250, Catonsville, MD, 21228 PHONE: (800) 988 - 0881 FAX: 9192275931 EMAIL: reg76@captiveaire.com

www.captiveaire.com

Cava - Delray Beach, FL_R1
1831 South Federal Highway,
Delray Beach, FL, 33483

DATE: 6/4/2025

DWG.#: 7564802

DRAWN BY: ABS-76

SCALE: NTS

MASTER DRAWING

SHEET NO. 7

HOOD DRAWINGS FOR REFERENCE ONLY

annex ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

CAVA

CAVA #148 - E DELRAY BEACH, FL
1831 S. FEDERAL HWY. SUITE 300
DELRAY BEACH, FL 33483
FOR
CAVA
14 Ridge Square NW #500, WASHINGTON, DC 20016

PROJECT NUMBER: CAV148

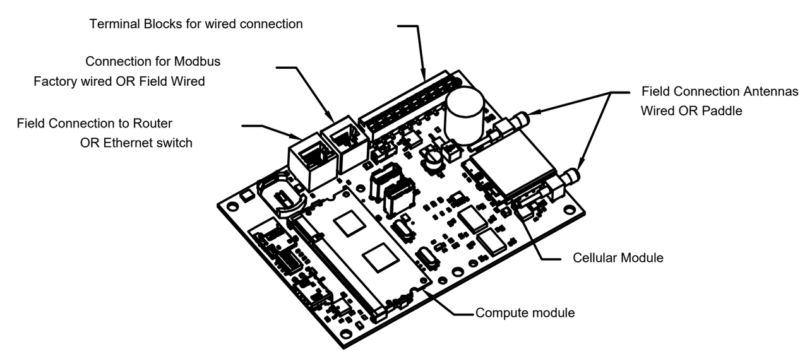
ISSUE	DATE
PERMIT SET	1.17.2025
REVISION 1	3.14.2025
REVISION 2	1.10.2025
CONSTRUCTION SET 3	7.18.2025

HOOD DRAWINGS FOR REFERENCE ONLY

SHEET: H1.7

ELECTRICAL PACKAGE – JOB#7564802

NO	TAG	PACKAGE #	LOCATION	SWITCHES		OPTION	FANS CONTROLLED					
				LOCATION	QUANTITY		FAN TAG	TYPE	ϕ	HP	VOLT	FLA
1		DCV-1111	UTILITY CABINET LEFT	UTILITY CABINET LEFT	1 LIGHT	SMART CONTROLS DCV	KEF	EXHAUST	1	1.000	115	11.6
				HOOD # 1	1 FAN		MAU	SUPPLY	3	1.500	208	4.4



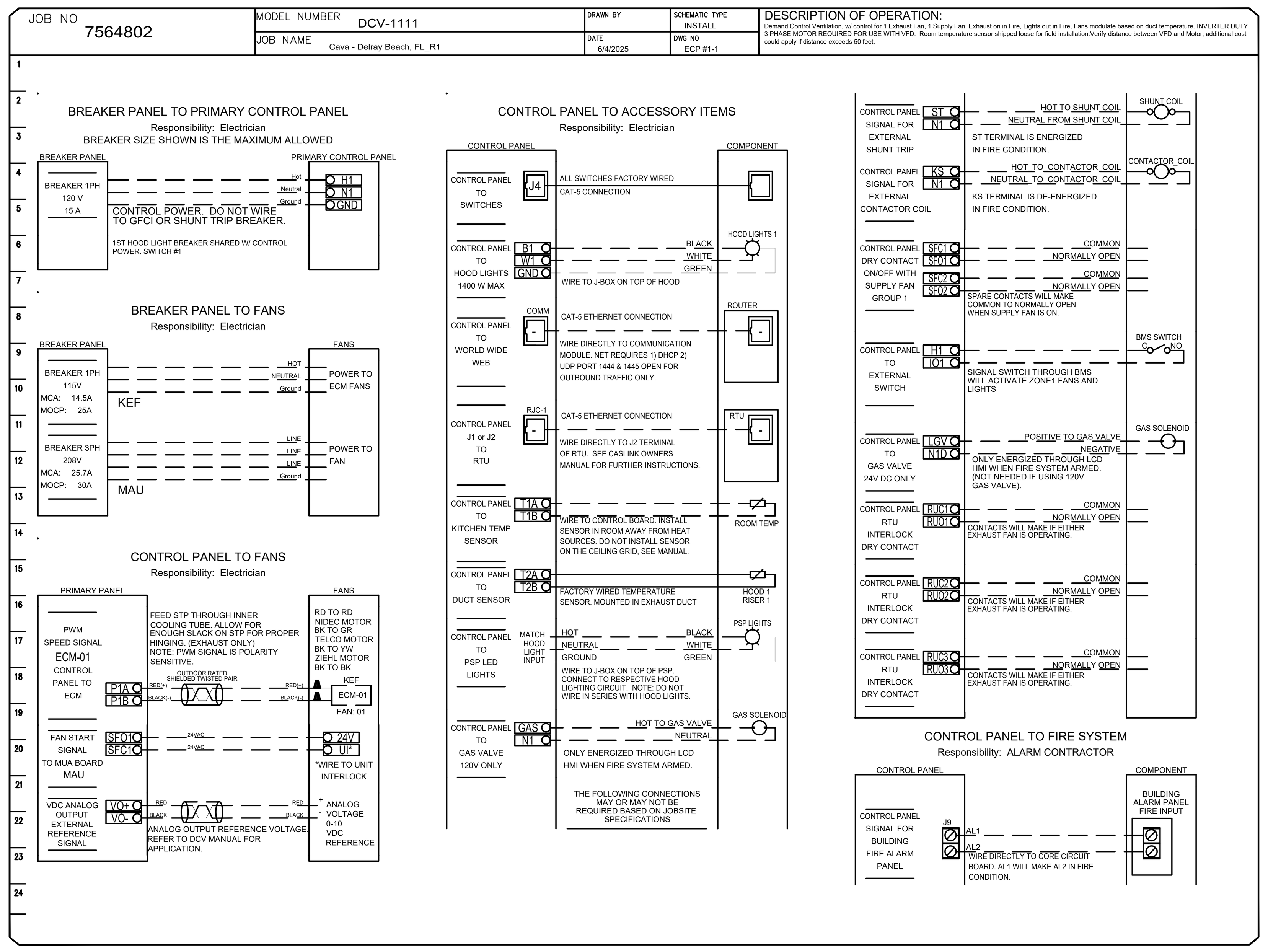
CASlink Monitor and Control

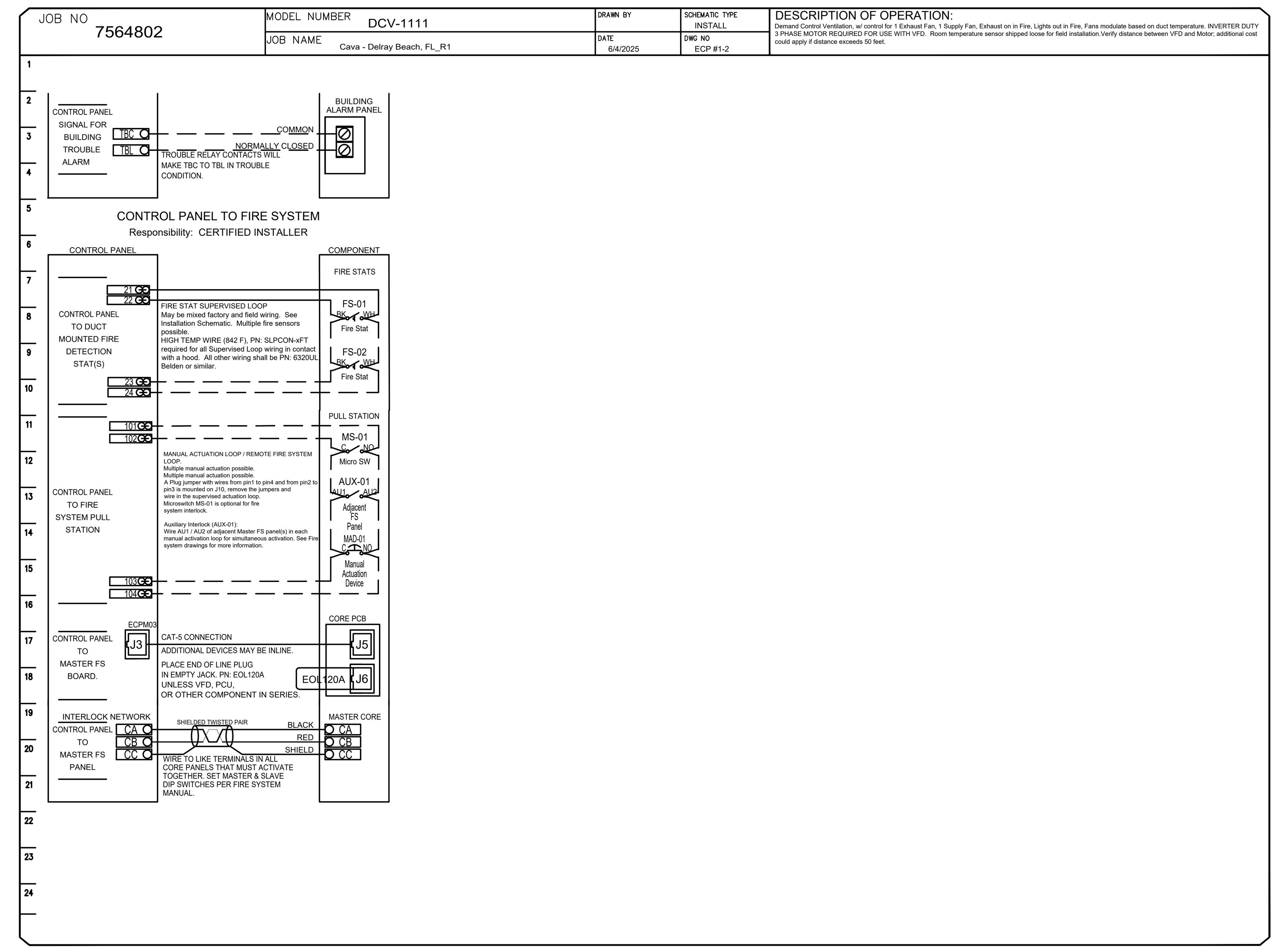
– Hood control panel to support communications to cloud-based Building Management System.
– Hood Control Panel to allow cloud-based Building Management System to monitor real time parameters outlined as MONITOR in the points list.
– Hood Control Panel to allow cloud-based Building Management System to control parameters outlined as CONTROL in the points list.
– Hood Control Panel to allow cloud-based Building Management System to implement SYSTEM ECONOMIZER control strategies for fully integrated Building Management.

MONITORING AND CONTROL POINTS LIST

DCV Packages	Function
Room Temperature	MONITOR
Duct Temperature(s)	MONITOR
MUA Discharge Temperature	MONITOR
Kitchen RTU Discharge Temperature	MONITOR
Fan Speed	MONITOR
Fan Amperage	MONITOR
Fan Power	MONITOR
VFD Faults	MONITOR
Controller Faults	MONITOR
Fan Faults	MONITOR
Fan Status	MONITOR
PCU Faults	MONITOR
PCU Filter Clog Percentages	MONITOR
Fire Condition	MONITOR
CORE Fire System	MONITOR
Building Pressures	MONITOR
Prep Time Button	MONITOR & CONTROL
Fans Button	MONITOR & CONTROL
Lights Button	MONITOR & CONTROL
Wash Button	MONITOR & CONTROL

SC Packages	Function
Room Temperature(s)	MONITOR
Duct Temperature(s)	MONITOR
MUA DIscharge Temperature	MONITOR
Kitchen RTU Discharge Temperature	MONITOR
Controller Faults	MONITOR
Fan Faults	MONITOR
Fan Status	MONITOR
PCU Faults	MONITOR
PCU Filter Clog Percentages	MONITOR
Fire Condition	MONITOR
CORE Fire System	MONITOR
Building Pressures	MONITOR
Fans Button(s)	MONITOR & CONTROL
Lights Button(s)	MONITOR & CONTROL
Wash Button	MONITOR & CONTROL





JOB NO 7564802 | MODEL NUMBER DCV-1111 | JOB NAME Cava - Delray Beach, FL_R1 | DRAWN BY | DATE 6/4/2025 | SCHEMATIC TYPE INSTALL | DWG NO ECP #1-3 | DESCRIPTION OF OPERATION: Fire System #1 TANK FS - 4.0/4.0.

TANK PROTECTION ELECTRICAL DETAIL

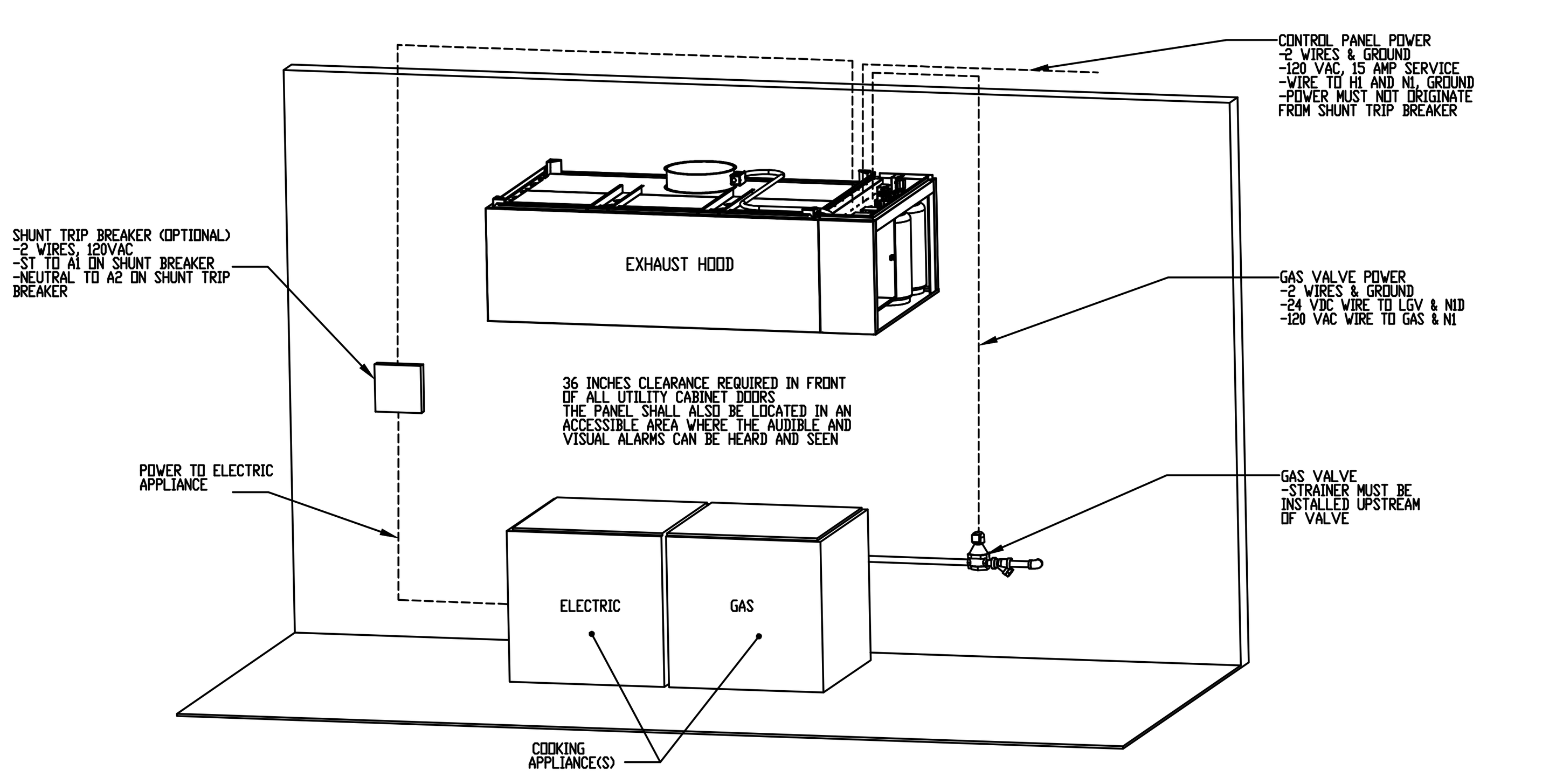
02/10/2021 Rev. 2

FS-1: MASTER

ELECTRICIAN:
1. WIRE MAIN CONTROL PANEL PER INCLUDED SCHEMATIC
2. WIRE ALL FANS PER INCLUDED SCHEMATIC
3. WIRE SHUNT TRIP BREAKER (OPTIONAL)
4. WIRE UDS APPLIANCE KILL SWITCH, IF EQUIPPED (OPTIONAL)
5. WIRE GAS VALVE

ELECTRICAL CONTRACTOR REQUIREMENT

ITEM	CONNECTION IN PANEL	CONNECTION IN DEVICE	VOLTAGE	AMPERAGE	COMMENTS
SHUNT TRIP BREAKER (OPTIONAL)	ST & N1	BREAKER COIL (A1 & A2)	120 VAC	< 4 AMPS	ST TO A1 ON SHUNT BREAKER COIL, AND NEUTRAL TO A2 ON SHUNT TRIP BREAKER COIL
CONTROL PANEL POWER	H1 & N1 + GROUND	CIRCUIT BREAKER	120 VAC	15 AMPS	CONTROL PANEL POWER MUST NOT BE RUN THROUGH SHUNT TRIP BREAKER
UDS APPLIANCE KILL SWITCH (OPTIONAL)	KTS & N1	KTS & N1	120 VAC	< 4 AMPS	KILL SWITCH TERMINALS MUST BE IN SERIES WITH OTHER KILL SWITCHES
REMOTE 120VAC ANSUL AUTOMAN (OPTIONAL)	AU1, AU2	SOLENOID	120 VAC	< 6 AMPS	120V TO AU1, AU2 TO ANSUL ELECTRIC AUTOMAN, ANSUL SOLENOID TO NEUTRAL
GAS VALVE	LGV & N1D (IF 24 VDC) GAS & N1 (IF 120 VAC)	RED/RED/GREEN	24 VDC OR 120 VAC	< 1.0 AMPS	IF 24 VDC - 2 WIRES & GROUND, N1D TO RED, LGV TO RED, AND GREEN TO GROUND IF 120 VAC - 2 WIRES & GROUND GAS TO RED, N1 TO RED, AND GREEN TO GROUND



NOTE: SEE INSTALLATION, OPERATION, AND MAINTENANCE MANUAL FOR FURTHER INSTRUCTIONS

JOB NO 7564802 | MODEL NUMBER DCV-1111 | JOB NAME Cava - Delray Beach, FL_R1 | DRAWN BY | DATE 6/4/2025 | SCHEMATIC TYPE INSTALL | DWG NO ECP #1-4 | DESCRIPTION OF OPERATION: Fire System #1 TANK FS - 4.0/4.0.

TANK PROTECTION LOW-VOLTAGE DETAIL

10/01/2023 Rev. 3

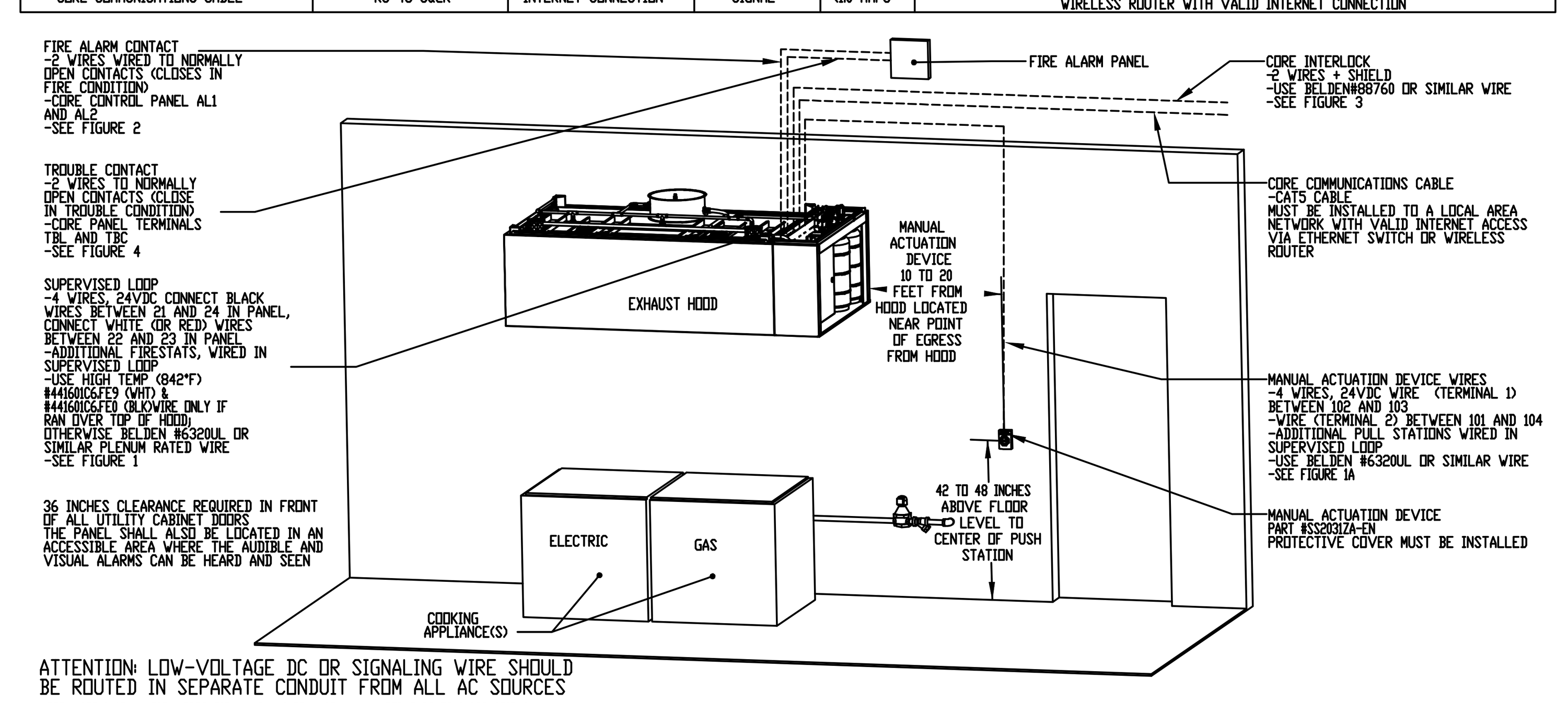
FS-1: MASTER

ALARM CONTRACTOR:
1. WIRE MANUAL ACTUATION DEVICE(S), *REMOTE FIRESTAT(S), CORE INTERLOCK(S), FIRE SENSOR(S) AND FIRE ALARM CONTACTS
2. COMPLETE FINAL HOOKUP OF SYSTEM
3. VERIFY FINAL FIRE SYSTEM TEST

*REMOTE FIRESTAT(S) MAYBE BE REQUIRED DEPENDING ON THE DUCT LAYOUT AND HOOD TEMPERATURE RATING. REFERENCE MANUAL FOR LOCATION AND GUIDELINES.

ALARM CONTRACTOR REQUIREMENT

ITEM	CONNECTION IN PANEL	CONNECTION ON DEVICE	VOLTAGE	AMPERAGE	COMMENTS
MANUAL ACTUATION DEVICE(S)	101 AND 104 102 AND 103	1 & 2	24 VDC	< 1.0 AMPS	WIRE MANUAL ACTUATION DEVICE TERMINAL 1 BETWEEN CORE PANEL TERMINALS 102 AND 103 WIRE MANUAL ACTUATION DEVICE TERMINAL 2 BETWEEN CORE PANEL TERMINALS 101 AND 104 JUMPER 101 TO 104 AND 102 TO 103 IF NO MANUAL ACTUATION DEVICE IS INSTALLED
MANUAL ACTUATION DEVICE COVER	N/A	N/A	N/A	N/A	MANUAL ACTUATION DEVICE COVER MUST BE INSTALLED IF SURFACE MOUNTED, USE COVER EXTENSION STI-6531B
REMOTE FIRESTAT SENSOR(S)	21 AND 24 22 AND 23	BLACK AND WHITE	24 VDC	< 1.0 AMPS	WIRE FIRE SENSOR WHITE WIRES BETWEEN HOOD CORE PANEL TERMINALS 22 AND 23 WIRE FIRE SENSOR BLACK WIRE BETWEEN HOOD CORE PANEL TERMINALS 21 AND 24 HIGH TEMP (842°F) #441601C6.FE9 (WHT) & #441601C6.FE0 (BLK)WIRE OR SIMILAR ONLY IF RAN OF HOOD; OTHERWISE BELDEN #6320UL OR SIMILAR PLENUM RATED WIRE; SEE FIGURE 1
FIRE ALARM CONTACT	AL1, AL2	VARIES	50V MAX (AC/DC)	UP TO 1 AMP	FIRE ALARM RELAY CONTACTS FOR BUILDING FIRE ALARM LOCATED IN THE CORE ELECTRICAL CONTROL PANEL
CORE INTERLOCK(S)	CA, CB, CC	CA, CB, CC	RS-485 COMMUNICATIONS SIGNAL		CORE SYSTEM (1) CA, TO CORE SYSTEM (2) CA. CORE SYSTEM (1) CB, TO CORE SYSTEM (2) CB. CORE SYSTEM (1) CC, TO CORE SYSTEM (2) CC. USE BELDEN# 88760 OR SIMILAR WIRE
TROUBLE CONTACT	TBC, TBL, TOK	VARIES	MAX 120 VAC	UP TO 6 AMPS	WIRE TO TBL & TBC NORMALLY OPEN CONTACT, CLOSES IN TROUBLE CONDITION
CORE COMMUNICATIONS CABLE	RJ-45 Jack	INTERNET CONNECTION	SIGNAL	<1.0 AMPS	TYPICAL CONNECTION CAT5 CABLE TO LOCAL AREA NETWORK VIA ETHERNET SWITCH OR WIRELESS ROUTER WITH VALID INTERNET CONNECTION



ATTENTION: LOW-VOLTAGE DC OR SIGNALING WIRE SHOULD BE ROUTED IN SEPARATE CONDUIT FROM ALL AC SOURCES

NOTE: SEE INSTALLATION, OPERATION, AND MAINTENANCE MANUAL FOR FURTHER INSTRUCTIONS

REVISIONS

DESCRIPTION	DATE:

www.captiveaire.com
Maryland Mechanical
5523 Research Park Drive, Suite 250, Catonsville, MD, 21228 PHONE: (800) 988 - 0881 FAX: 9192275931 EMAIL: reg76@captiveaire.com

Cava - Delray Beach, FL_R1
1831 South Federal Highway,
Delray Beach, FL, 33483

DATE: 6/4/2025

DWG.#: 7564802

DRAWN BY: ABS-76

SCALE: NTS

MASTER DRAWING

SHEET NO. 8

annex ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
fax: 614.487.8777

CAVA

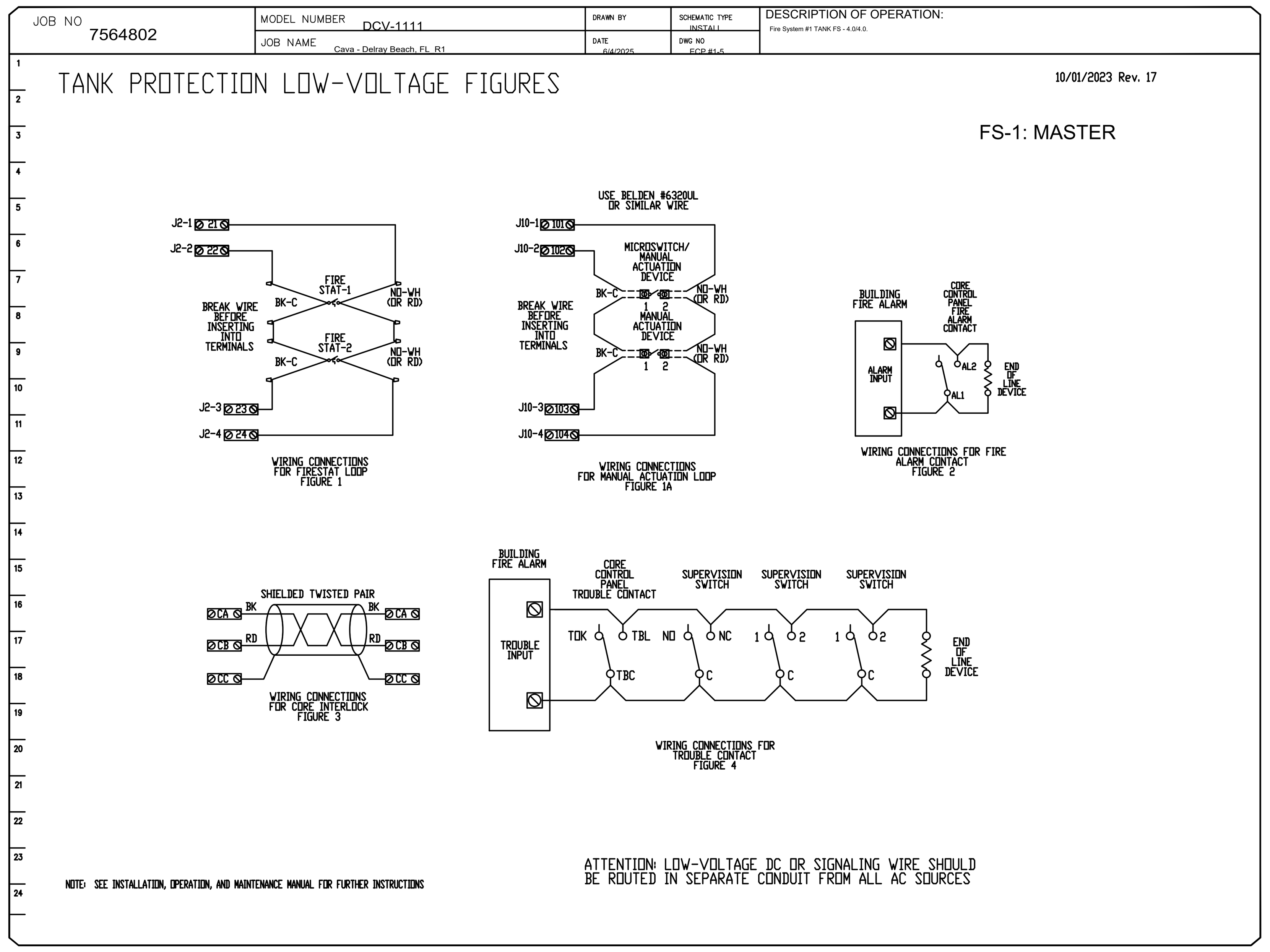
CAVA #148 - E DELRAY BEACH, FL
1831 S. FEDERAL HWY. SUITE 300
DELRAY BEACH, FL 33483
FOR
CAVA
14 Ridge Square NW #500, WASHINGTON, DC 20016

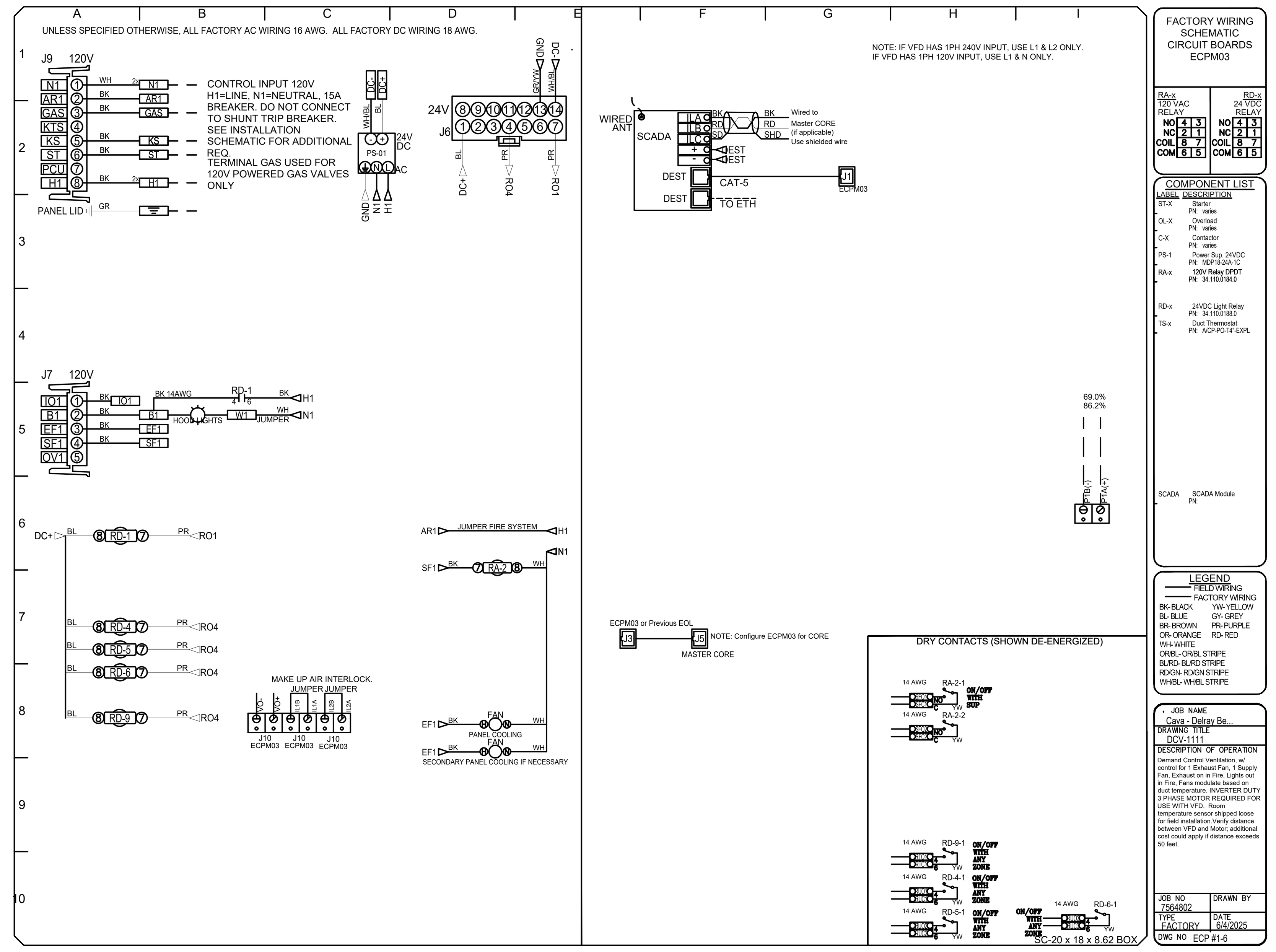
PROJECT NUMBER: CAV148

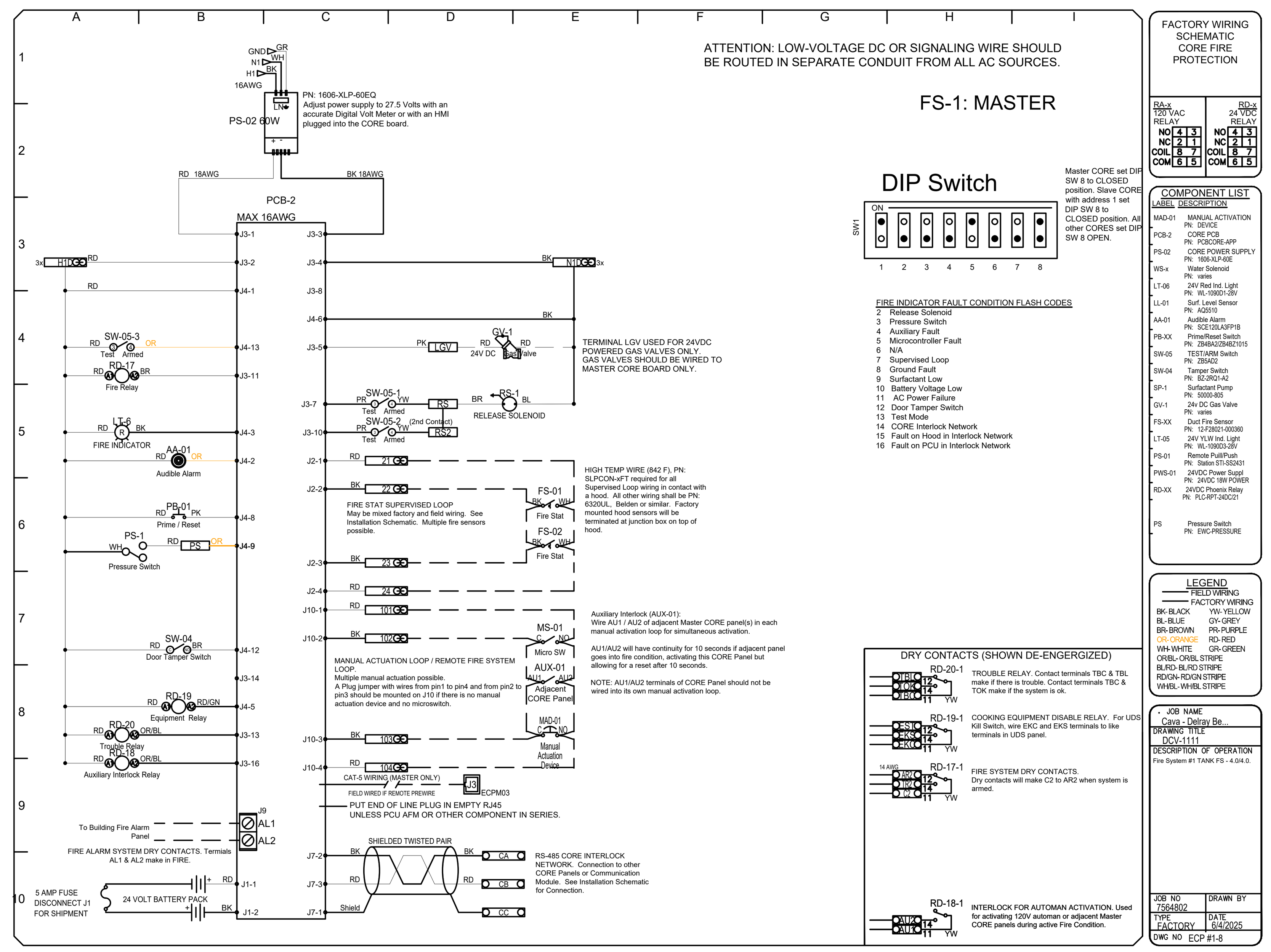
ISSUE	DATE
PERMIT SET	1.17.2025
REVISION 1	3.14.2025
REVISION 2	1.10.2025
CONSTRUCTION SET 3	7.18.2025

HOOD DRAWINGS FOR REFERENCE ONLY

SHEET: H1.8







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columbus, ohio 43215
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fax: 614.487.8777

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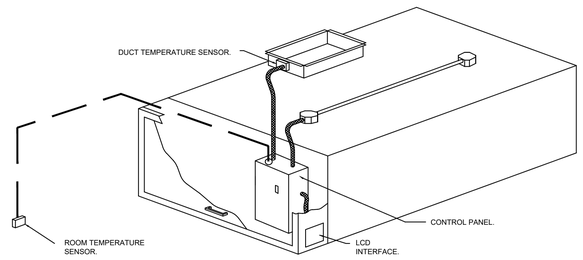
DEMAND CONTROL VENTILATION HOOD CONTROL PANEL SPECIFICATIONS:

- CONTROLS SHALL BE LISTED BY ETL (UL 508A) AND SHALL COMPLY WITH DEMAND VENTILATION SYSTEM TURNDOWN REQUIREMENTS OUTLINED IN IECC 403.7.5 (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 DURING EITHER OF THESE PERIODS WILL DISABLE THE SUPPLY FANS AND PROVIDE AN EXHAUST FAN SPEED THAT IS EQUAL TO THE MINIMUM VENTILATION REQUIREMENT.
- A DIGITAL CONTROLLER SHALL DISABLE THE SUPPLY FAN(S), ACTIVATE THE EXHAUST FAN(S), ACTIVATE THE APPLIANCE SHUNT TRIP, AND DISABLE AN ELECTRIC GAS VALVE AUTOMATICALLY WHEN FIRE CONDITION IS DETECTED ON A COVERED HOOD.
- A DIGITAL CONTROLLER SHALL ALLOW FOR EXTERNAL BMS FAN CONTROL VIA DRY CONTACT (EXTERNAL CONTROL SHALL NOT OVERRIDE FAN OPERATION LOGIC AS REQUIRED BY CODE).
- AN LCD INTERFACE SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
  A. ON/OFF PUSH BUTTON FAN & LIGHT SWITCH ACTIVATION.
  B. INTEGRATED GAS VALVE RESET FOR ELECTRONIC GAS VALVES (NO RESET RELAY REQUIRED).
  C. VFD FAULT DISPLAY WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  D. DUCT TEMPERATURE SENSOR FAILURE DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  E. MIS-WIRED DUCT TEMPERATURE SENSOR DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  F. A SINGLE LOW VOLTAGE CAT-5 RJ45 WIRING CONNECTION.
  G. AN ENERGY SAVINGS INDICATOR THAT UTILIZES MEASURED KWH FROM THE VFDS.



TYPICAL HOOD CONTROL PANEL INSTALLATION

SEQUENCE OF OPERATIONS:

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

- AUTOMATIC: THE SYSTEM OPERATES BASED ON THE DIFFERENTIAL BETWEEN ROOM TEMPERATURE AND THE TEMPERATURE AT THE HOOD CAVITY OR EXHAUST DUCT COLLAR. FANS ACTIVATE AT A CONFIGURABLE TEMPERATURE DIFFERENTIAL THRESHOLD. DEPENDING ON THE JOB CONFIGURATION EACH FAN ZONE CAN BE CONFIGURED AS STATIC OR DYNAMIC. THESE TERMS REFER TO WHETHER A VARIABLE MOTOR (SUCH AS EC MOTORS OR VFD DRIVEN MOTORS) MODULATE WITH TEMPERATURE. IF THE PANEL IS EQUIPPED WITH VARIABLE SPEED FANS AND THE ZONE IS DEFINED AS "DYNAMIC", THESE WILL MODULATE WITHIN A USER-DEFINED RANGE BASED ON THE TEMPERATURE DIFFERENTIAL. PANELS EQUIPPED WITH VARIABLE SPEED FANS AND A FAN ZONE DEFINED AS "STATIC", FANS WILL RUN AT A SET SPEED CALCULATED FOR THE DRIVE. DEMAND CONTROL VENTILATION SYSTEMS ARE CAPABLE OF MODULATING EXHAUST AND MAKE UP AIR FAN SPEEDS PER THE REQUIREMENTS OUTLINED IN IECC 403.7.5 (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 AT MODULATION MODE AND FOLLOW THE FAN PROCEDURE ALGORITHM BASED ON TEMPERATURE DURING THIS TIME. DURING UNOCCUPIED TIME, THE SYSTEM WILL HAVE AN EXTRA OFFSET TO PREVENT UNINTENDED ACTIVATION OF THE SYSTEM DURING A TIME WHERE THE SYSTEM IS NOT BEING OCCUPIED.
- OTHER: THE SYSTEM OPERATES BASED ON THE INPUT FROM AN EXTERNAL SOURCE (DDC, BMS OR HARD-WIRED INTERLOCK).
- FIRE: UPON ACTIVATION OF THE HOOD FIRE SUPPRESSION SYSTEM, THE EXHAUST FAN WILL COME ON OR CONTINUE TO TO RUN, THE HOOD MAKEUP AIR WILL SHUTDOWN, AND A SIGNAL WILL BE SENT FOR ACTIVATING THE SHUNT TRIP BREAKER PROVIDED BY THE ELECTRICIAN. FUEL GAS WILL SHUT OFF VIA A MECHANICAL/ELECTRICAL GAS VALVE ACTUATED BY THE HOOD FIRE SUPPRESSION SYSTEM.

SYSTEM DESIGN VERIFICATION (SDV)

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

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

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

REVISIONS

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1		
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3		
4		

CAPTIVEAIRE
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SHEET NO. 10

annex ENGINEERING GROUP
589 w nationwide blvd ste b
columbus, ohio 43215
tel: 614.481.2292
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