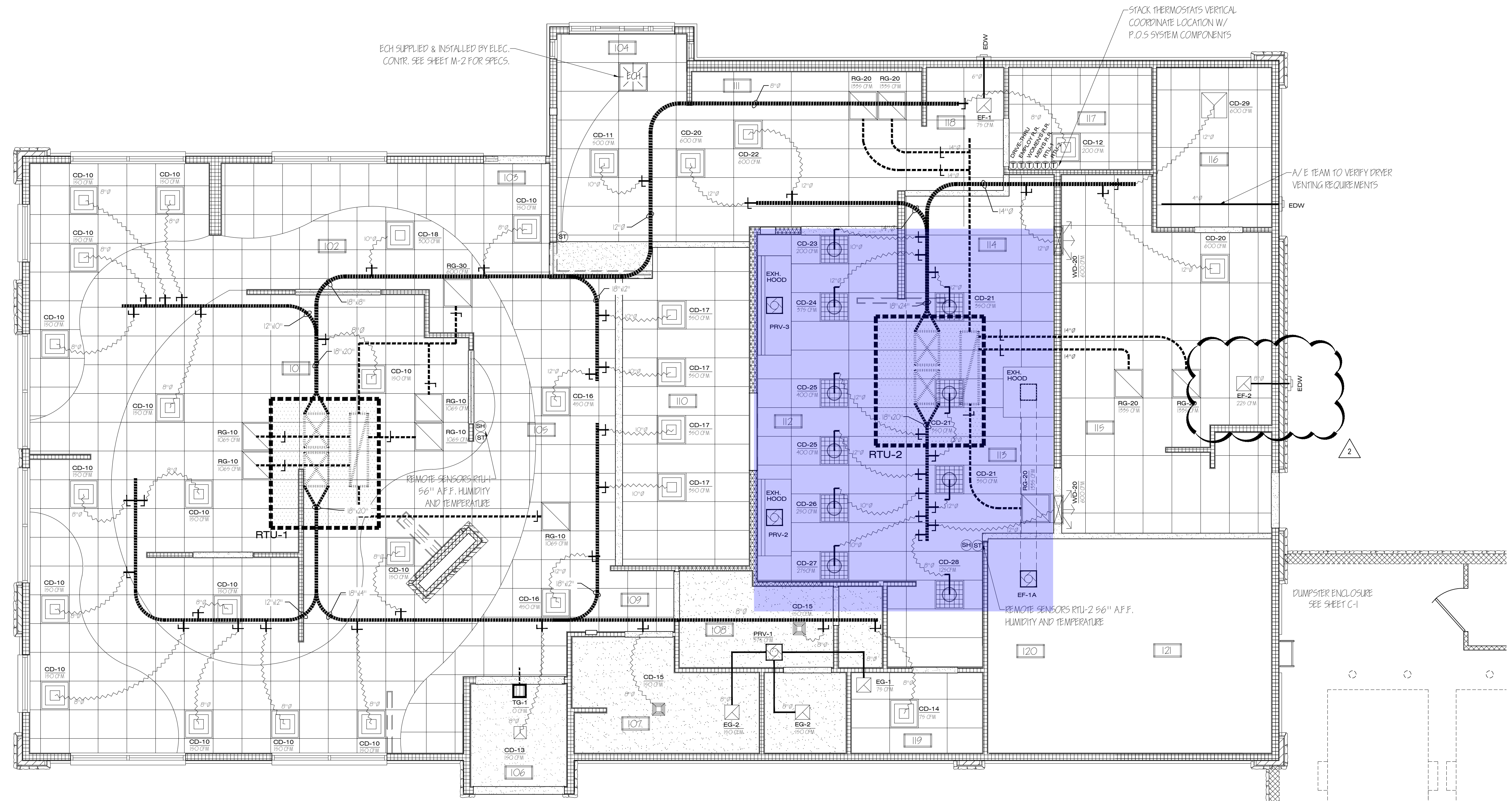


**H.V.A.C. LEGEND:**

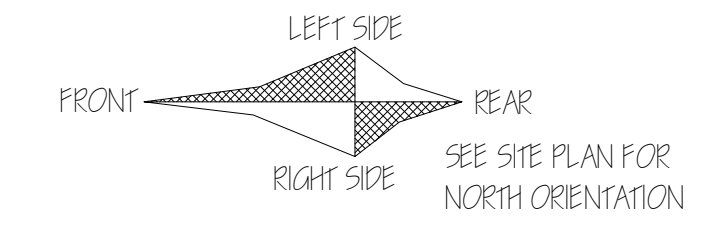
WD-20	←	DIFFUSER DESIGNATION
600 CFM	←	DIFFUSER C.F.M.
	CD	CEILING DIFFUSER W/ C.F.M. - 4 WAY
	CD	PERFORATED CEILING DIFFUSER
	CD	CEILING DIFFUSER W/ C.F.M. - 3 WAY
	CD	CEILING DIFFUSER W/ C.F.M. - 2 WAY
	RG	RETURN DIFFUSER - SUSP. CEILING
	EG	EXHAUST GRILLE
	PRV	POWER ROOF VENT
	ECH	ELECTRIC CEILING HEATER
	WD	WALL OR BULKHEAD SUPPLY GRILLE - LINEAR
	TG	TRANSFER GRILL
	SH	SENSOR HUMIDITY
	ST	SENSOR TEMPERATURE

- GENERAL NOTES:**
1. VERIFY ALLOWABLE FLEX DUCT LENGTHS WITH LOCAL CODES AND MODIFY ACCORDINGLY. ATTACH FLEXIBLE AIR CONNECTOR TO RIGID DUCT W/ STEEL DRAW BANDS N-ONLY. CLASS 1 FLEXIBLE AIR CONNECTOR PER UL-181 - MAX LENGTH 8'-0" - PROVIDE SUPPORT AT 4'-0" O.C.
  2. VENTING OF ANY COMBUSTIBLE BY-PRODUCTS IS PROHIBITED WITHIN 10 FEET OF ROOF TOP UNITS. VERIFY WITH LOCAL BUILDING INSPECTOR.
  3. ALL SUPPLY AND RETURN DUCTWORK TO BE LOCATED IN TRUSS SPACE. COORDINATE WITH TRUSS SUPPLIER.
  4. DIFFUSERS AND RETURN GRILLES IN BLACK ACT TO BE BLACK, ALL OTHERS TO BE WHITE.

- RECOMMENDED HVAC SET POINTS:**
1. DINING HEATING 70°, COOLING 72°
  2. KITCHEN HEATING 68°, COOLING 74°



**HVAC PLAN - METRO M - 2023 PROTOTYPE**  
 SCALE: 1/4" = 1'-0"



PERMIT	• 02.03.25
ADDENDUM 2	• 03.13.25
DRAWN BY:	• JMV
CHECKED:	• DSH
<b>HVAC PLAN</b>	

P:\2023\20230325 Culvers North\Working Drawings\20230325 M-1.dwg, 3/13/2025 11:06:34 AM, mdelora

FOR QUESTIONS, CALL THE  
 Florida National Accounts  
 REGION 60  
 PHONE: (407) 682 - 3100  
 EMAIL: reg60@captiveaire.com

**HOOD INFORMATION - JOB#7150660**

HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL EXH CFM	EXHAUST PLENUM RISER(S)				HOOD CONSTRUCTION	HOOD CONFIG			
										WIDTH	LENG	HEIGHT	DIA		CFM	VEL	SP	END TO END
1	FRYER HOOD	3347 BD-2	CAPTIVEAIRE	7' 0"	600 DEG	I	HEAVY	214	1500	12'	12'	4'	1500	1500	-0.874"	430 SS WHERE EXPOSED	ALONE	ALONE
2	GRIDDLE HOOD	3347 BD-2	CAPTIVEAIRE	5' 6"	600 DEG	I	HEAVY	273	1500	12'	12'	4'	1500	1500	-1.124"	430 SS WHERE EXPOSED	ALONE	ALONE
3	DISH HOOD	4224 VHB-G-ND-REM1	CAPTIVEAIRE	3' 6"	700 DEG	II	N/A	100	350	7'	7'	4'	350	1029	-0.048"	304 SS 100%	ALONE	ALONE

**HOOD INFORMATION**

HOOD NO	TAG	TYPE	FILTER(S)			EFFICIENCY @ 7 MICRONS	QTY	LIGHT(S)			UTILITY CABINET(S)			FIRE SYSTEM PIPING	HOOD HANGING WEIGHT
			QTY	HEIGHT	LENGTH			TYPE	SIZE	WIRE GUARD	LOCATION	SIZE	FIRE SYSTEM		
1	FRYER HOOD	CAPTRATE SOLO FILTER	5	16"	16"	85% SEE FILTER SPEC	3	L55 SERIES E26	ND					ND	286 LBS
2	GRIDDLE HOOD	CAPTRATE SOLO FILTER	4	16"	16"	85% SEE FILTER SPEC	3	L55 SERIES E26	ND					ND	239 LBS
3	DISH HOOD						0							ND	166 LBS

**HOOD OPTIONS**

HOOD NO	TAG	OPTION
1	FRYER HOOD	FIELD WRAPPER 14.00' HIGH FRONT, LEFT, RIGHT.
		RIGHT QUARTER END PANEL 23' TOP WIDTH, 0' BOTTOM WIDTH, 23' HIGH 430 SS.
		LEFT QUARTER END PANEL 23' TOP WIDTH, 0' BOTTOM WIDTH, 23' HIGH 430 SS. SENSOR-CV.
2	GRIDDLE HOOD	FIELD WRAPPER 14.00' HIGH FRONT, LEFT, RIGHT.
		RIGHT QUARTER END PANEL 23' TOP WIDTH, 0' BOTTOM WIDTH, 23' HIGH 430 SS.
		LEFT QUARTER END PANEL 23' TOP WIDTH, 0' BOTTOM WIDTH, 23' HIGH 430 SS. SENSOR-CV.

**SPECIFICATION: CAPTRATE GREASE-STOP SOLO FILTER**

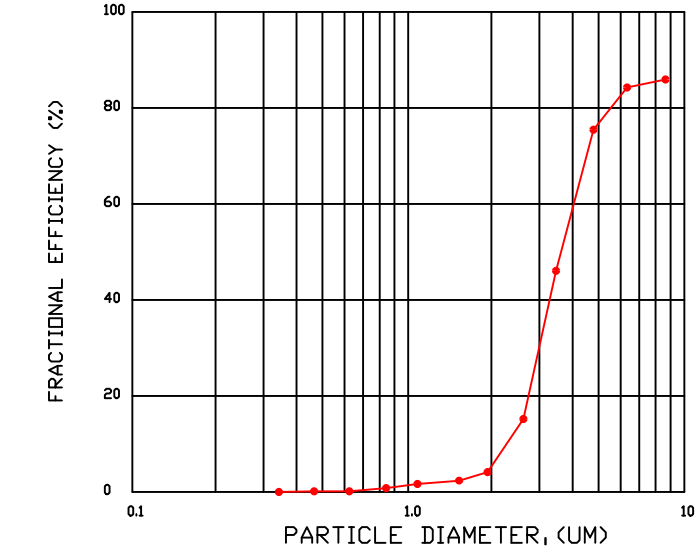
THE CAPTRATE GREASE-STOP SOLO FILTER IS A SINGLE-STAGE FILTER FEATURING A UNIQUE S-BAFFLE DESIGN IN CONJUNCTION WITH A SLOTTED REAR BAFFLE DESIGN, TO DELIVER EXCEPTIONAL FILTRATION EFFICIENCY.

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

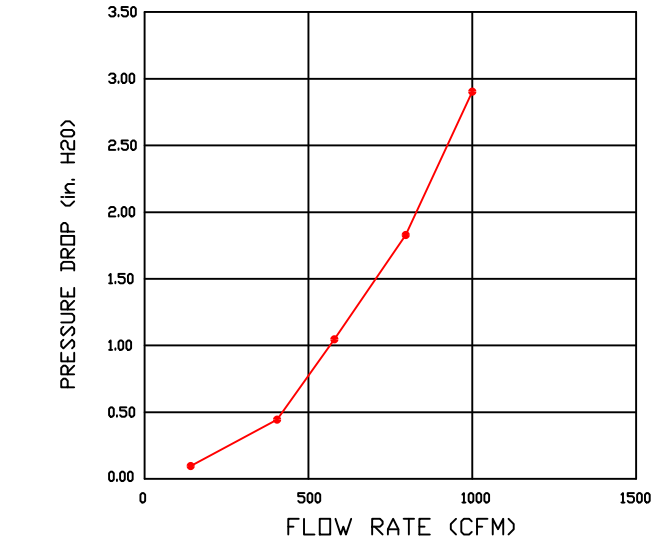
UNITS SHALL INCLUDE STAINLESS STEEL HANDLES AND A FASTENING DEVICE TO SECURE THE TWO COMPONENTS WHEN ASSEMBLED.

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.

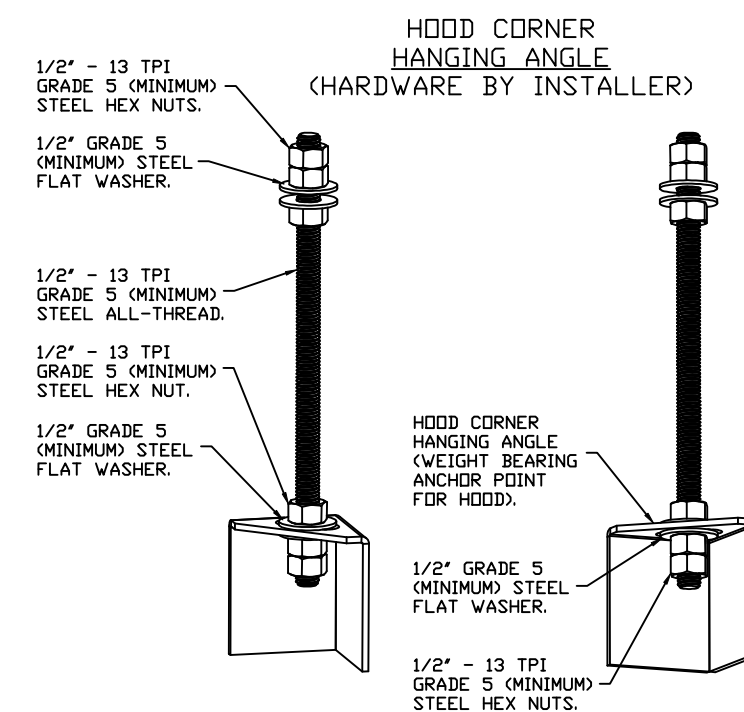
EFFICIENCY VS. PARTICLE DIAMETER



PRESSURE DROP VS. FLOW RATE

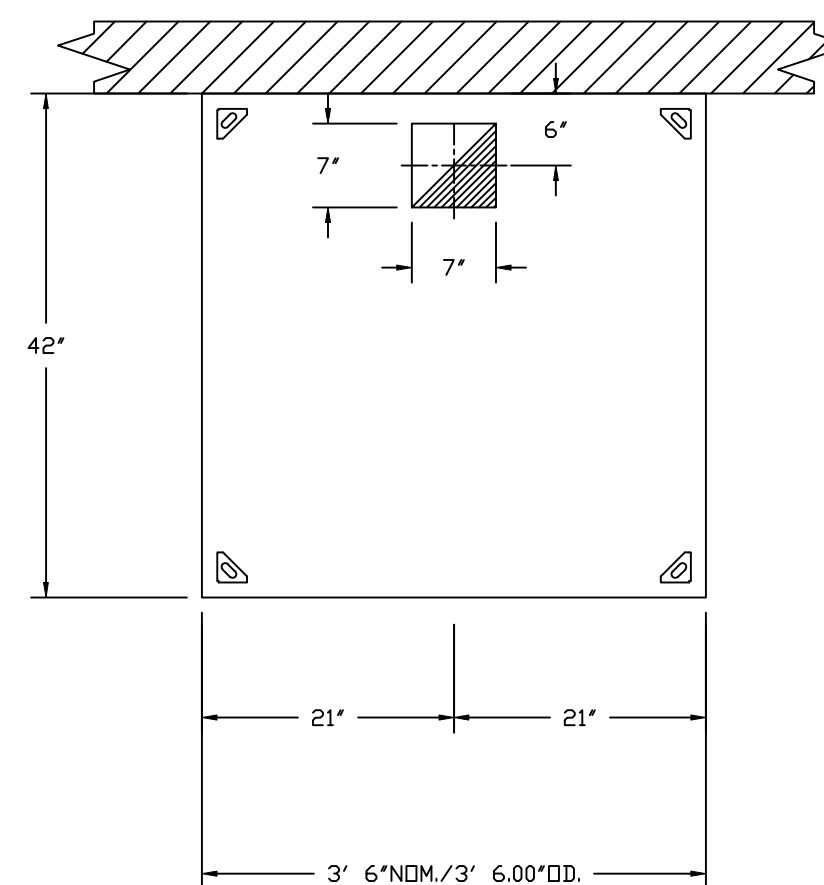


CAPTRATE FILTERS ARE BUILT IN COMPLIANCE WITH:  
 NFPA #96.  
 NSF STANDARD #2.  
 UL STANDARD #1046.  
 INT. MECH. CODE (IMC).  
 ULC-S649.

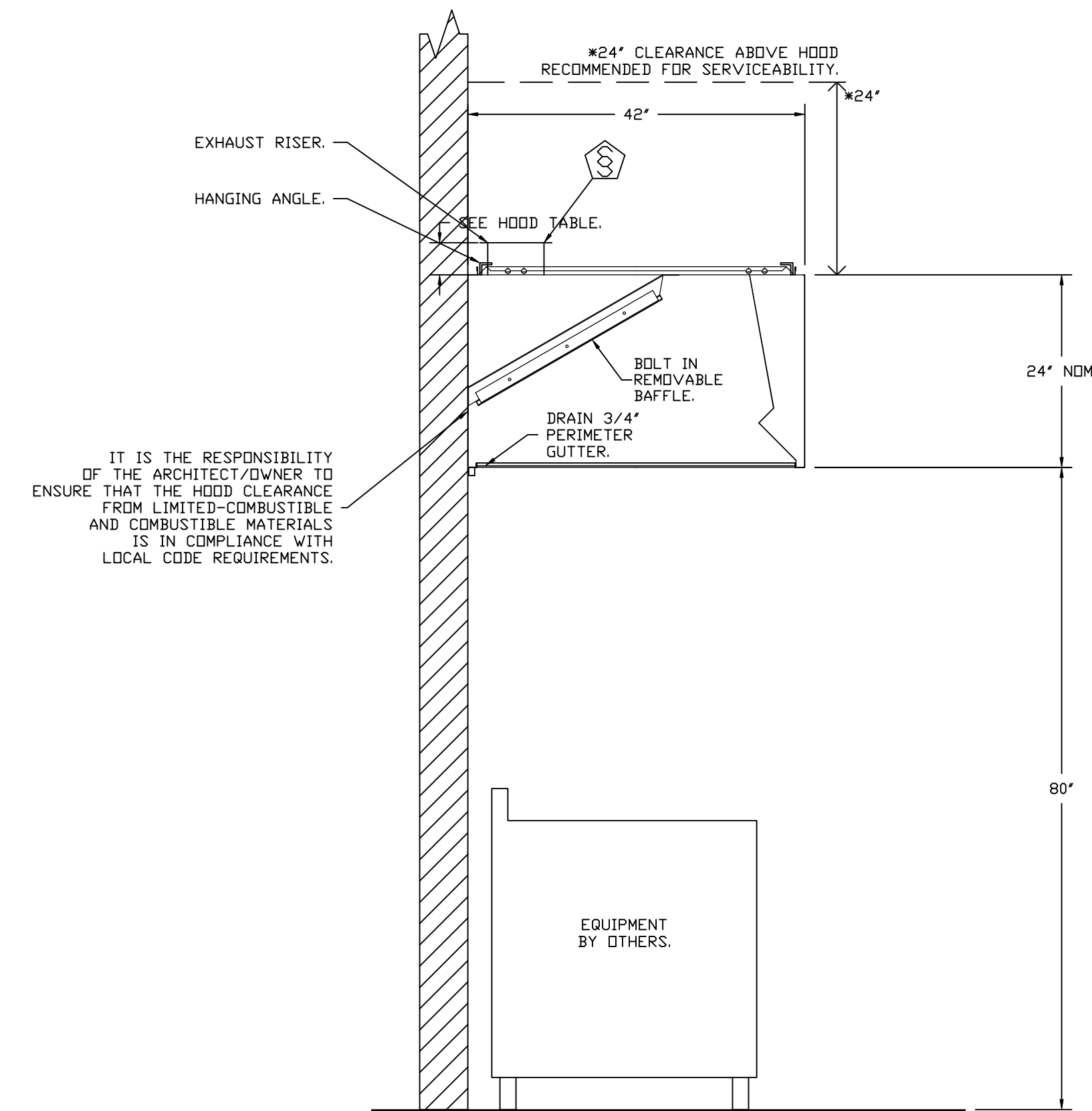


**ASSEMBLY INSTRUCTIONS**

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.



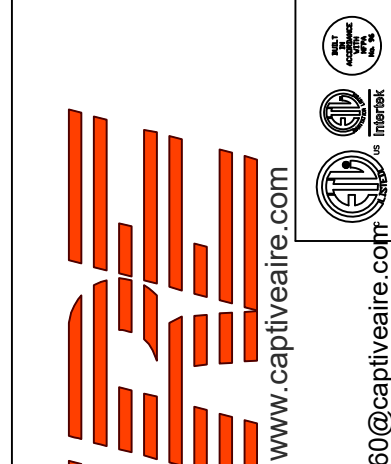
PLAN VIEW - HOOD #3 (DISH HOOD)  
 3' 6.00" LONG 4224VHB-G-ND-REM1



SECTION VIEW - MODEL 4224VHB-G-ND-REM1  
 HOOD - #3 (DISH HOOD)

**REVISIONS**

DESCRIPTION	DATE

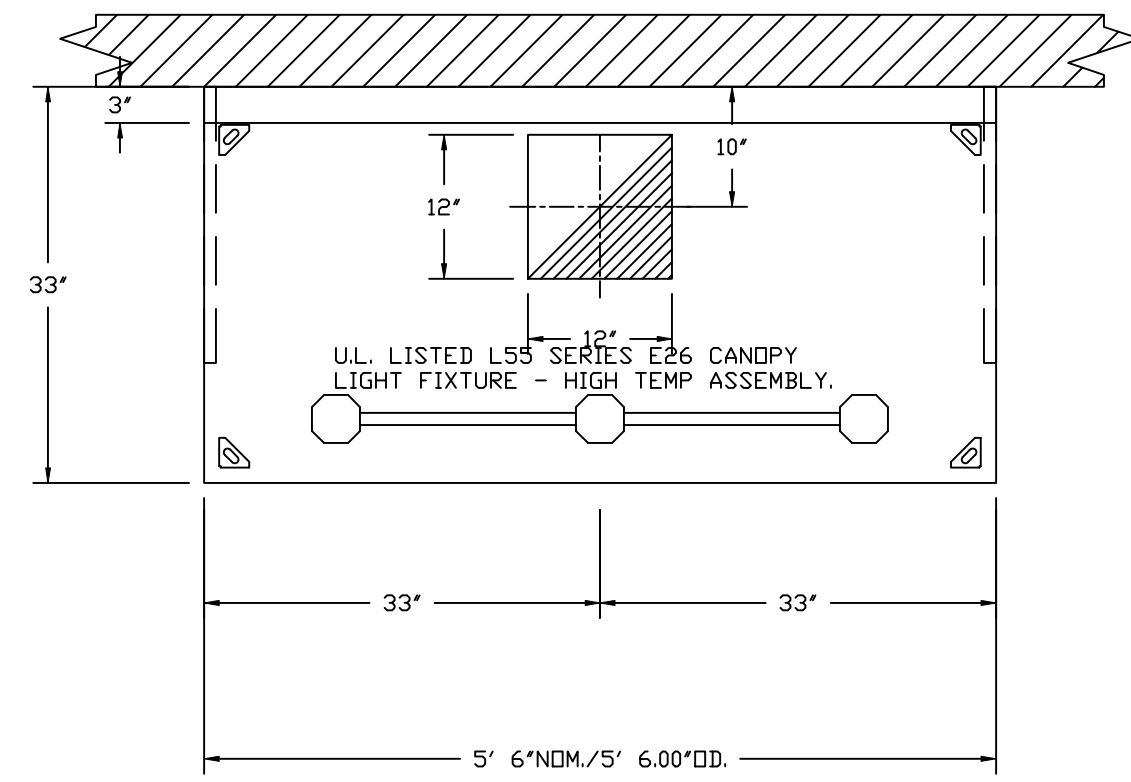


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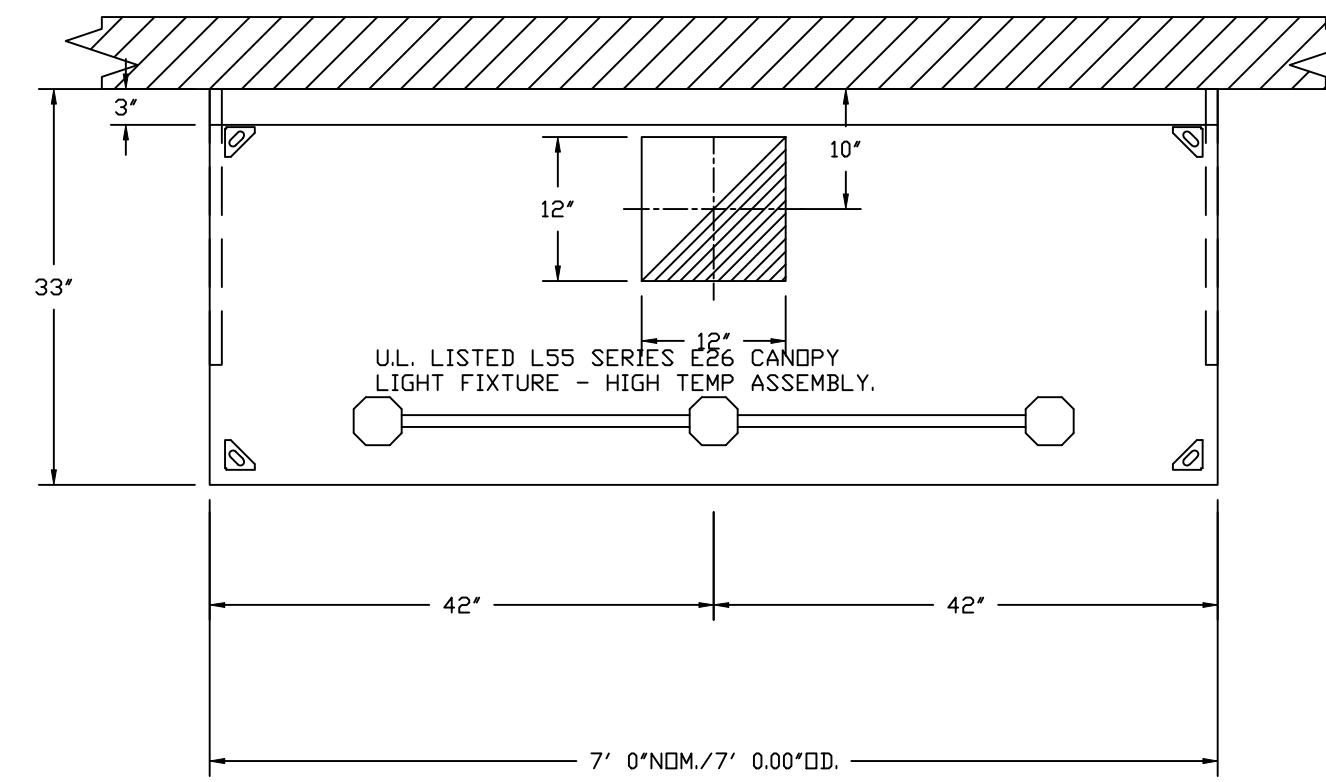
CULVERS NOVI MI  
 43530 W OAKS DRIVE,  
 Novi, MI, 48377

DATE: 4/30/2025  
 DWG.#: 7150660  
 DRAWN BY: sluddy jr  
 SCALE: 3/4" = 1'-0"  
 MASTER DRAWING

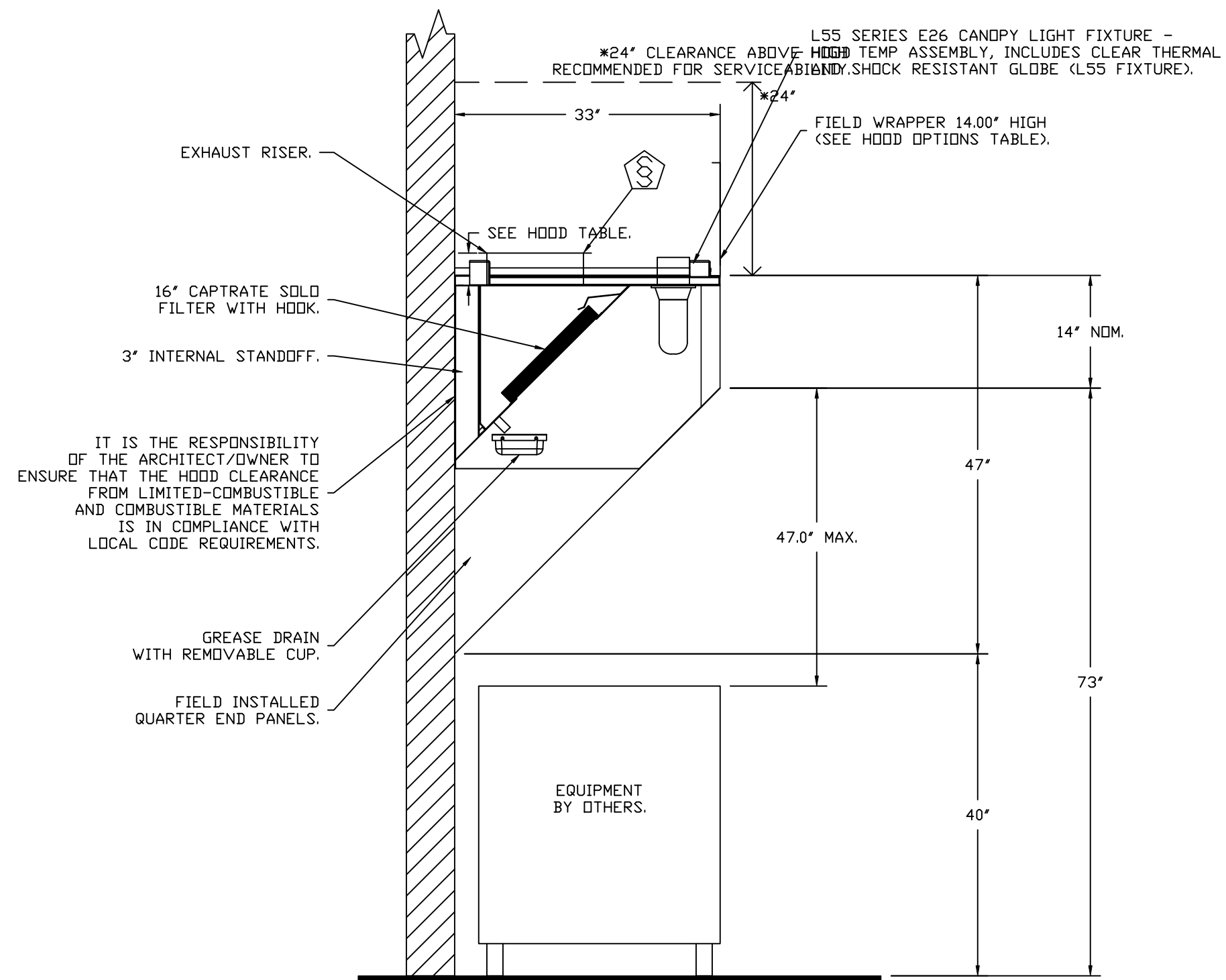
**SHEET NO.**  
 1



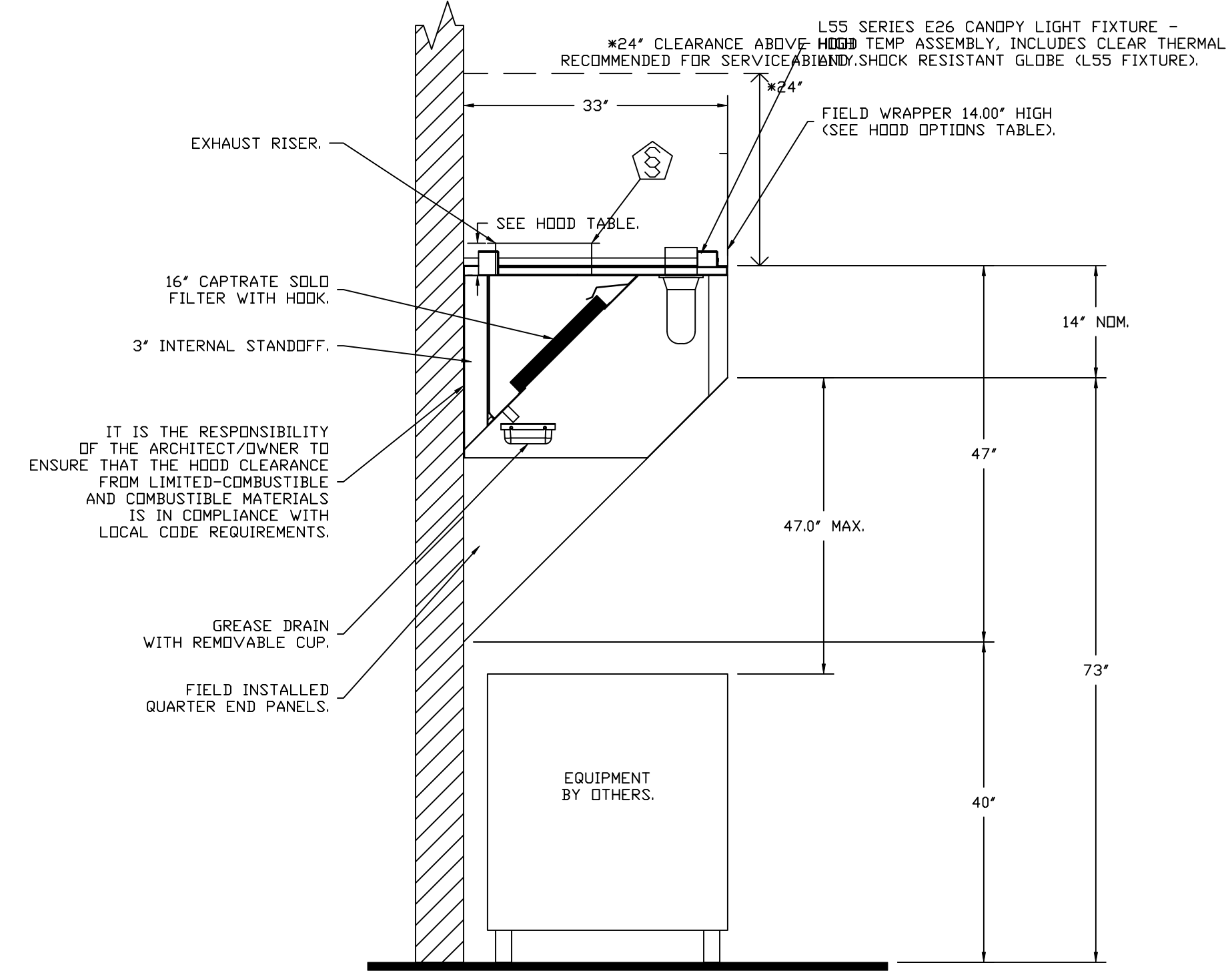
PLAN VIEW - HOOD #2 (GRIDDLE HOOD)  
5' 6.00" LONG 3347BD-2



PLAN VIEW - HOOD #1 (FRYER HOOD)  
7' 0.00" LONG 3347BD-2

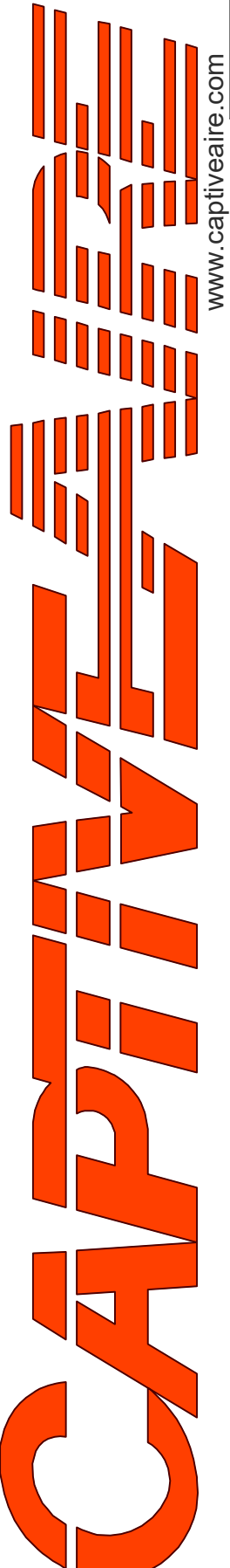


SECTION VIEW - MODEL 3347BD-2  
HOOD - #2 (GRIDDLE HOOD)



SECTION VIEW - MODEL 3347BD-2  
HOOD - #1 (FRYER HOOD)

REVISIONS	
DESCRIPTION	DATE


  
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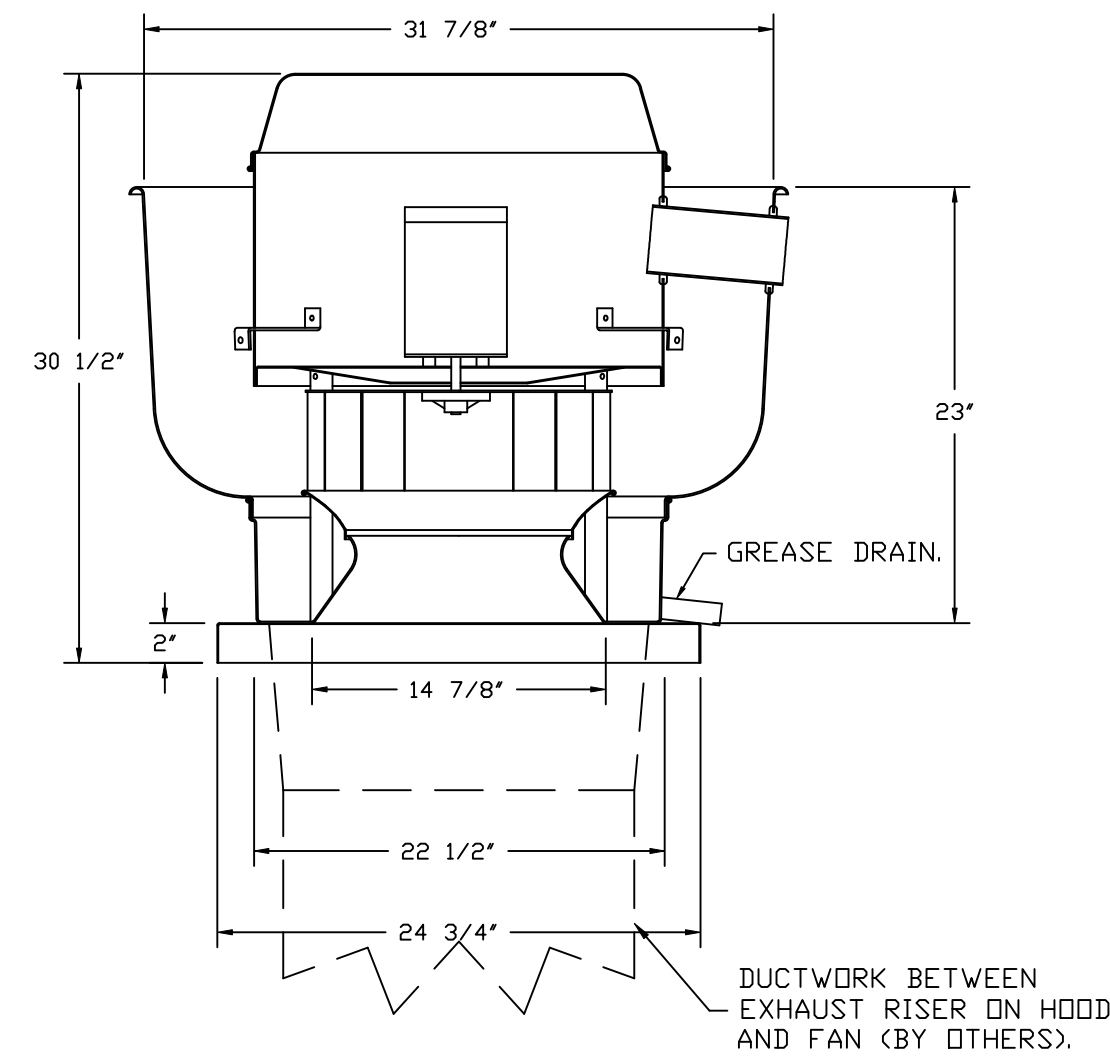
**DATE:** 4/30/2025  
**DWG.#:** 7150660  
**DRAWN BY:** sluddy jr  
**SCALE:** 3/4" = 1'-0"  
**MASTER DRAWING**

**SHEET NO.**  
 2

**EXHAUST FAN INFORMATION - JOB#7150660**

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SDNES
1	PRV-1 RESTROOM	1	DR12HFA	CAPTIVEAIRE	375	0.500	1369	TEAD-ECM	0.250	0.1110	1	115	2.9		85	7
2	PRV-2	1	DU85HFA	CAPTIVEAIRE	1500	1.412	1406	TEAD-ECM	1.000	0.5330	1	115	11.6	475 FPM	129	12.3
3	PRV-3	1	DU85HFA	CAPTIVEAIRE	1500	1.250	1348	TEAD-ECM	1.000	0.4700	1	115	11.6	475 FPM	129	11.3
4	PRV-4 DISH	1	DUI2HFA	CAPTIVEAIRE	350	0.375	1434	TEAD-ECM	0.250	0.0760	1	115	2.9	248 FPM	87	7.7
5	EF-1	1	CFA 100CA	CAPTIVEAIRE	75	0.125	493	GENERALPURPOSE	0.116	0.0510	1	115	1.1		25	N/A

FANS #2 (PRV-2), #3 (PRV-3) - DU85HFA EXHAUST FAN



**FEATURES:**

- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTRL.
- 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**

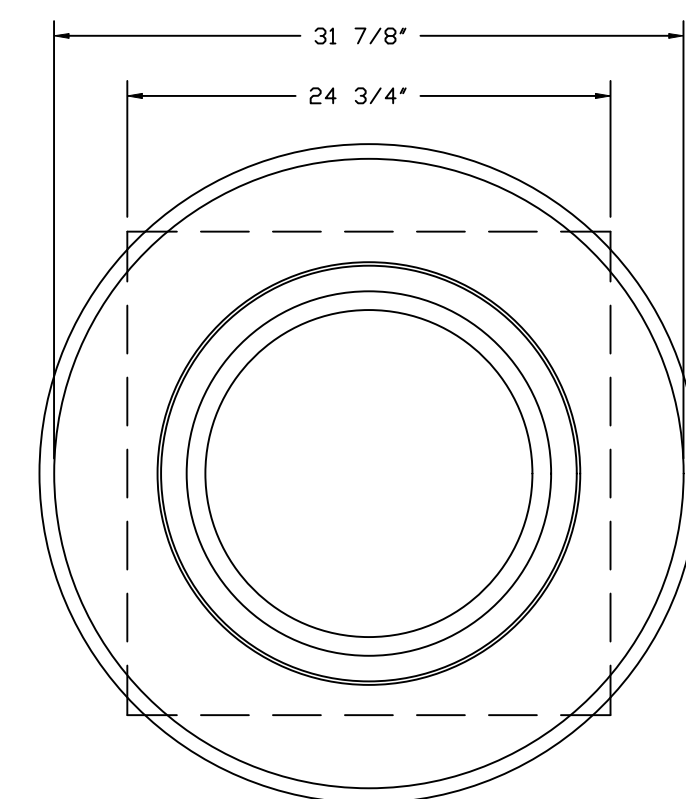
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

**ABNORMAL FLARE-UP TEST**

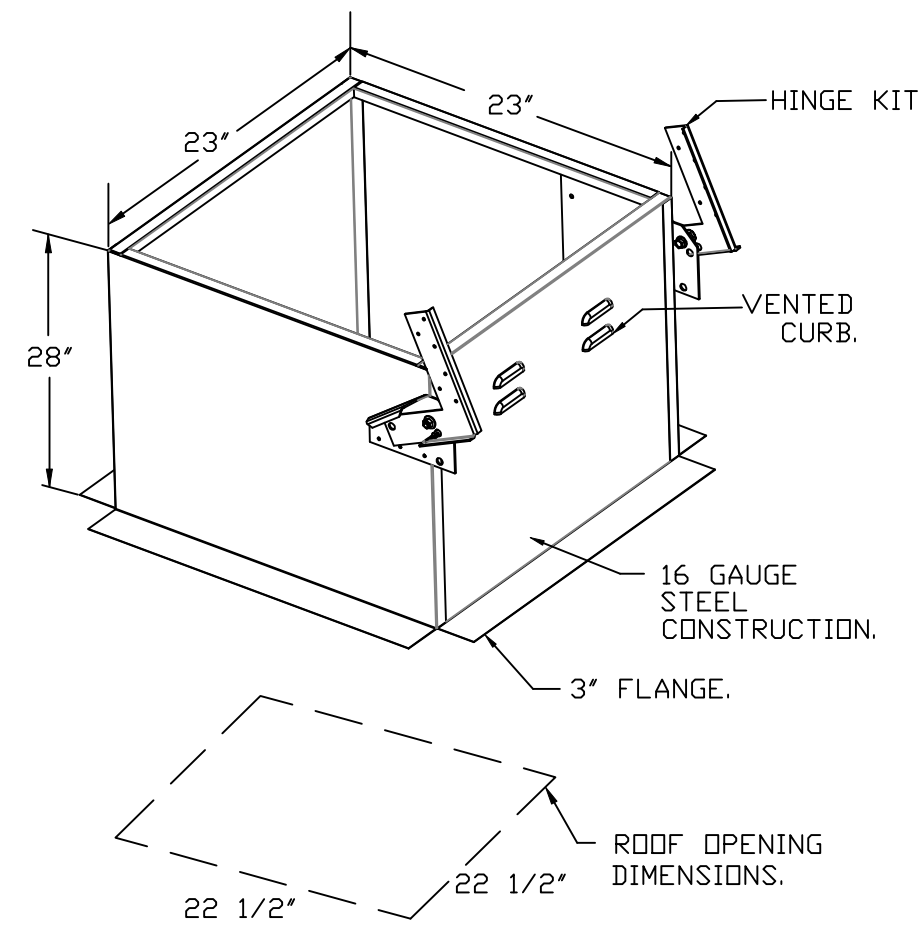
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

**OPTIONS**

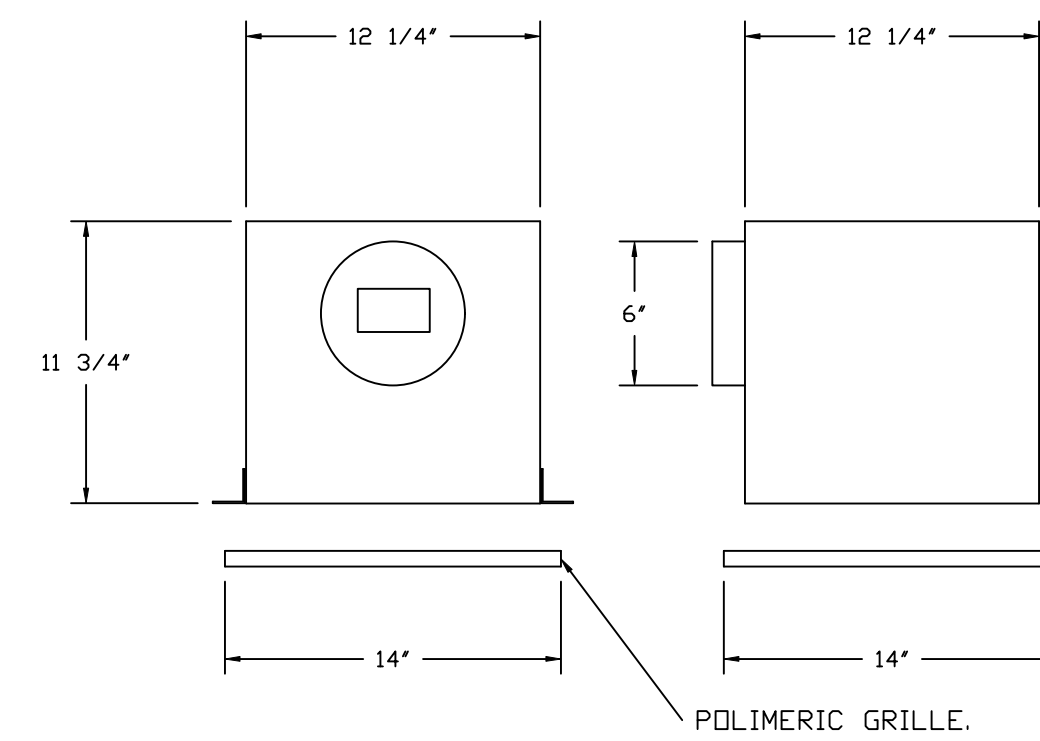
- GREASE BDX.
- ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL.
- RTC- (TELOD MOTOR), CCW ROTATION.
- FAN BASE CERAMIC SEAL - DU/DR85HFA
- SHIP LOOSE - FOR GREASE DUCTS.
- FULL CRATING FOR EXHAUST FANS.
- 2 YEAR PARTS WARRANTY.



TOP VIEW



FAN #5 CFA 100CA - EXHAUST FAN (EF-1)



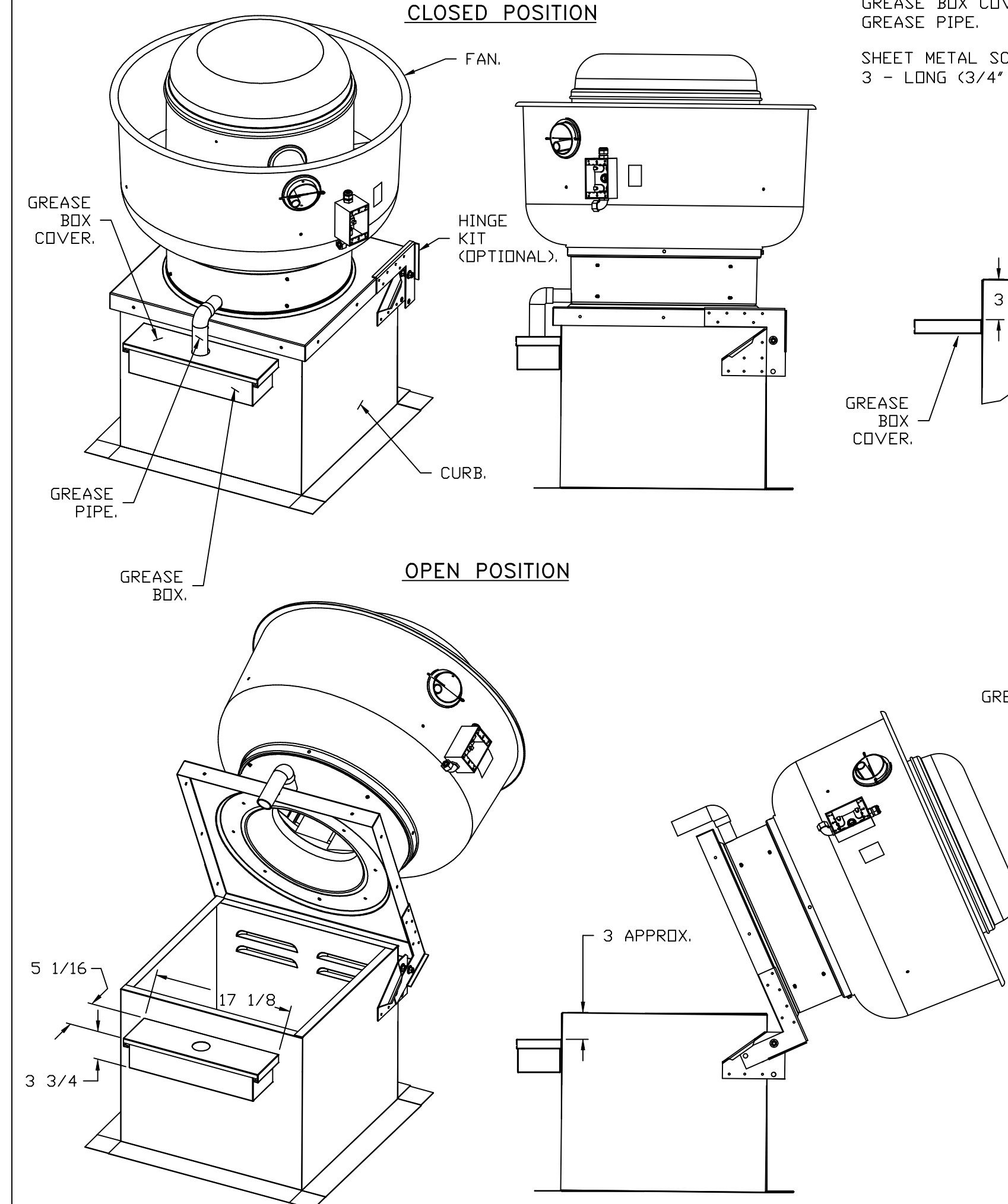
**FEATURES:**

- 1/2" ACOUSTIC HOUSING INSULATION.
- 20 GA. GALVANIZED STEEL HOUSING.
- PLUG TYPE DISCONNECT.
- BUILT IN AUTOMATIC BACKDRAFT DAMPER.
- AMCA SOUND & AIR CERTIFIED.
- UL LISTED.
- CAN BE INSTALLED IN CEILING OR WALL.
- 8 POSITION MOUNTING BRACKETS.

**OPTIONS**

- MG1 - METAL GRILLE KIT.
- 2 YEAR PARTS WARRANTY.

**GREASE BOX INSTALLATION**



**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.

**STEP 2)**

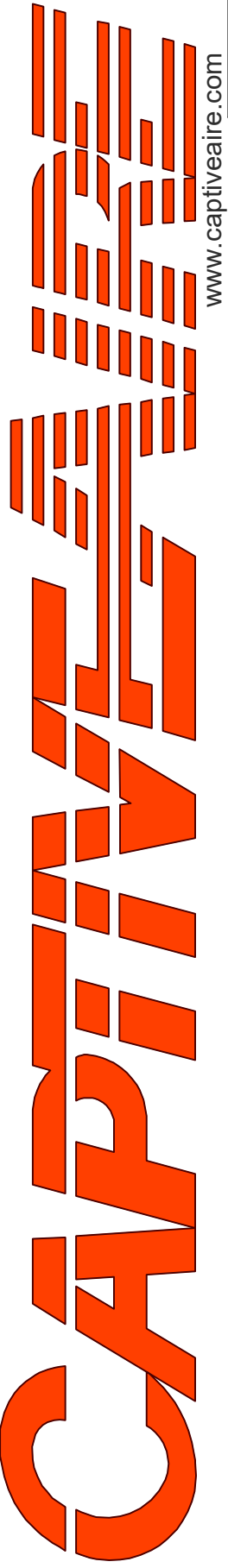
ATTACH GREASE BOX TO GREASE BOX COVER, SLIDE AND DROP. AS SHOWN ON PIC. 3.

**STEP 3)**

INSTALL GREASE PIPE AS SHOWN ON PIC. 4.

\*NOTE: UL 705 INSTALL.

REVISIONS	
DESCRIPTION	DATE

  
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 MASTER DRAWING

**SHEET NO.**  
 3

DOAS/RTU FAN SCHEDULE - JOB#7150660

FAN INFORMATION										ELECTRICAL INFORMATION										COOLING INFORMATION										REHEAT INFORMATION										GAS HEAT INFORMATION										AQL MINIMUM ROOM VOLUME			NOTES
FAN UNIT NO	TAG	QTY	DOAS/RTU MODEL #	MANUFACTURER	BLOWER	RETURN AIR CFM	MAX OUTSIDE AIR CFM	TOTAL CFM	WEIGHT (LBS)	ESP	HP	PHASE	VOLTS	MCA	MDCP	OUTSIDE AIR DB	OUTSIDE AIR WB	MIXED AIR DB	MIXED AIR WB	LEAVING AIR DB	LEAVING AIR WB	DP	CAPACITY TOTAL	SENS.	IEER	ISMRE	DISCHARGE DB	DISCHARGE WB	CAPACITY DESIRED	CAPACITY MAX	MOISTURE REMOVAL RATE	GAS TYPE	INPUT BTU/H	OUTPUT BTU/H	TEMP RISE	REQUIRED INPUT GAS PRESSURE	ROOM AREA (FT <sup>2</sup> )	AIRFLOW (CFM)	HEIGHT (FT)														
6	RTU-1 DINING	1	CAS-HVAC3-1400-24-20T	CAPTIVEAIRE	24MF-3-RTU	4250	1900	6150	2820	0.750	10.00	3	208	1031A	125A	85.2°F	75.3°F	78.2°F	66.6°F	53.1°F	53.1°F	53.2°F	242.6 MBH	160.9 MBH	18.2	6.0	70.0°F	59.7°F	113.3 MBH	129.6 MBH	74.9 LBS/HR	NATURAL	288637	233796	35°F	7 IN. W.C. - 14 IN. W.C.	572.7	1031	7.2	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19													
7	RTU-2 KITCHEN	1	CAS-HVAC3-1400-24-20T	CAPTIVEAIRE	24MF-3-RTU	4250	1900	6150	2820	0.750	10.00	3	208	1031A	125A	85.2°F	75.3°F	78.2°F	66.6°F	53.1°F	53.1°F	53.2°F	242.6 MBH	160.9 MBH	18.2	6.0	70.0°F	59.7°F	113.3 MBH	129.6 MBH	74.9 LBS/HR	NATURAL	247404	200397	30°F	7 IN. W.C. - 14 IN. W.C.	572.7	1031	7.2	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19													

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. ECM MOTOR CONDENSING FANS  
 6. ELECTRONIC EXPANSION VALVE. TXV NOT ACCEPTABLE  
 7. SUCTION LINE ACCUMULATOR  
 8. FACTORY COMMISSIONING WITH 5 YEAR PARTS WARRANTY, 25 YEAR WARRANTY ON STAINLESS STEEL HEAT EXCHANGER  
 9. AVERAGING INTAKE, EVAP AND DISCHARGE TEMPERATURE SENSORS (DISCHARGE SENSOR TO BE FACTORY MOUNTED WITHIN UNIT)  
 10. 2" EXTERIOR DUAL-WALL CONSTRUCTION W/ R-13 INSULATION-MINIMUM 20GA EXTERIOR W/ 14GA BASE  
 11. 81% EFFICIENT FURNACE, WITH MODULATING INDUCER TO MAINTAIN CONSTANT COMBUSTION EFFICIENCY ACROSS FIRING RANGE. 6:1 TURNDOWN WITH NG AND 5:1 TURNDOWN WITH LP  
 12. SUPPLY CFM MONITORING INTEGRAL TO UNIT WITH CFM MEASUREMENT INCLUDED THROUGH DIGITAL INTERFACE  
 13. FULLY MODULATING HOT GAS REHEAT  
 14. 15 DEGREE LDW AMBIENT OPERATION  
 15. HAIL GUARD FOR CONDENSING COIL  
 16. RTU ECONOMIZER WITH FIXED ENTHALPY CONTROL  
 17. BAROMETRIC RELIEF DAMPER  
 18. DOWN DISCHARGE/DOWN RETURN  
 19. 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 OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION	FAN UNIT NO	TAG	QTY	DESCRIPTION
1	PRV-1 RESTROOM	1	1 12-BDD DAMPER	7	RTU-2 KITCHEN	1	20 TON MODULATING REHEAT OPTION - SPACE DEWPOINT CONTROL - R454B
		1	ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL -RTC- (TELCO MOTOR), CCW ROTATION			1	REMOTE TEMPERATURE AND HUMIDITY SPACE SENSOR
		1	FULL CRATING FOR EXHAUST FANS			1	RTU BLOWER DOOR SWITCH
		1	2 YEAR PARTS WARRANTY			1	2" METAL MESH FILTERS FOR RTU3 OUTDOOR INTAKE
		1	GREASE BOX			1	RTU SMOKE DETECTOR KEYED TEST SWITCH
2	PRV-2	1	ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL -RTC- (TELCO MOTOR), CCW ROTATION	1	24VAC FIRE INPUT		
		1	FAN BASE CERAMIC SEAL - DU/DRBSHFA - SHIP LOOSE - FOR GREASE DUCTS	1	COOLING OVERRIDE		
		1	FULL CRATING FOR EXHAUST FANS	1	5 YEAR ENTIRE UNIT PARTS WARRANTY, 10 YEAR ENTIRE UNIT PARTS WARRANTY WITH REMOTE MONITORING AND CAPTIVEAIRE SERVICE CONTRACT, 25 YEAR STAINLESS STEEL FURNACE PARTS WARRANTY (SEE ADDITIONAL DETAILS)		
		1	2 YEAR PARTS WARRANTY	1	EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET		
		1	GREASE BOX	1	INLET PRESSURE GAUGE, 0-35"		
3	PRV-3	1	ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL -RTC- (TELCO MOTOR), CCW ROTATION	1	MANIFOLD PRESSURE GAUGE, 0 TO 10" WC, 1 FURNACE		
		1	FAN BASE CERAMIC SEAL - DU/DRBSHFA - SHIP LOOSE - FOR GREASE DUCTS	1	TOTAL CFM MONITORING		
		1	FULL CRATING FOR EXHAUST FANS	1	INTAKE FIRESTAT SET TO 135°F		
		1	2 YEAR PARTS WARRANTY	1	FREEZE STAT		
		1	GREASE BOX	1	DISCHARGE FIRESTAT SET TO 240°F		
4	PRV-4 DISH	1	ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL -RTC- (TELCO MOTOR), CCW ROTATION	1	SHIP LOOSE GAS STRAINER 1"		
		1	FULL CRATING FOR EXHAUST FANS	1	CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED		
		1	2 YEAR PARTS WARRANTY	1	RTU3 DOWN DISCHARGE, 400, 500 MBH		
		1	GREASE BOX	1	2" MERV 13 FILTERS FOR RTU3 (QTY. 4)		
		1	ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL -RTC- (TELCO MOTOR), CCW ROTATION	1	2" MERV 8 FILTERS FOR RTU3 (QTY. 4)		
5	EF-1	1	INLET PRESSURE GAUGE, 0-35"	1	OVERHEAT STAT		
		1	MANIFOLD PRESSURE GAUGE, 0 TO 10" WC, 1 FURNACE	1	OCCUPIED SCHEDULING		
		1	TOTAL CFM MONITORING	1	RTU3 CURB DUCT HANGER		
		1	INTAKE FIRESTAT SET TO 135°F	1	RTU RETURN MOUNTED SMOKE DETECTOR AND SAMPLING TUBE - FACTORY INSTALLED		
		1	FREEZE STAT	1	LDW AMBIENT COOLING OPERATION - DOWN TO 0° AMBIENT		
6	RTU-1 DINING	1	DISCHARGE FIRESTAT SET TO 240°F	1	RTU3 CONVENIENCE OUTLET (GFCI), 15 AMP - REQUIRES SEPARATE 120V CONNECTION. INCLUDES RECEPTACLE, COVER AND J-BOX		
		1	SHIP LOOSE GAS STRAINER 1"	1	RTU ECONOMIZER - FIXED ENTHALPY CONTROL		
		1	SINGLE POINT ELECTRICAL CONNECTION FOR RTU. 750VA TRANSFORMER USED. IF A NON-DCV PREWIRE CONTROLS THIS UNIT, THE #8B, #47, "MA", OR #2" PREWIRE OPTION MUST BE SELECTED. DOES NOT PROVIDE SUPPLY STARTER IN PREWIRE	1	RTU3 ECONOMIZER BAROMETRIC RELIEF		
		1	CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED	1	RTU INTAKE/RETURN DAMPER - MANUAL CONTROL VIA HMI		
		1	RTU3 DOWN DISCHARGE, 400, 500 MBH	1	RTU3 HAIL GUARD		
		1	2" MERV 13 FILTERS FOR RTU3 (QTY. 4)	1	RTU3 DOWN RETURN		
		1	2" MERV 8 FILTERS FOR RTU3 (QTY. 4)	1	20 TON MODULATING COOLING OPTION, 208/230V. R454B REFRIGERANT, VARIABLE SPEED COMPRESSOR, ECM CONDENSING FANS		
		1	OVERHEAT STAT	1	R454B LEAK DETECTOR OPTION FOR RTU3		
		1	VFD FACTORY MOUNTED AND WIRED IN RTU COMMERCIAL CONTROL VESTIBULE	1	20 TON MODULATING REHEAT OPTION - SPACE DEWPOINT CONTROL - R454B		
		1	RTU3 CURB DUCT HANGER	1	REMOTE TEMPERATURE AND HUMIDITY SPACE SENSOR		
		1	RTU RETURN MOUNTED SMOKE DETECTOR AND SAMPLING TUBE - FACTORY INSTALLED	1	RTU BLOWER DOOR SWITCH		
		1	LDW AMBIENT COOLING OPERATION - DOWN TO 0° AMBIENT	1	2" METAL MESH FILTERS FOR RTU3 OUTDOOR INTAKE		
		1	OCCUPIED SCHEDULING	1	RTU SMOKE DETECTOR KEYED TEST SWITCH		
		1	RTU3 CONVENIENCE OUTLET (GFCI), 15 AMP - REQUIRES SEPARATE 120V CONNECTION. INCLUDES RECEPTACLE, COVER AND J-BOX	1	24VAC FIRE INPUT		
		1	RTU ECONOMIZER - FIXED ENTHALPY CONTROL	1	VFD FACTORY MOUNTED AND WIRED IN RTU COMMERCIAL CONTROL VESTIBULE		
1	RTU3 ECONOMIZER BAROMETRIC RELIEF	1	SINGLE POINT ELECTRICAL CONNECTION FOR RTU. 750VA TRANSFORMER USED. IF A NON-DCV PREWIRE CONTROLS THIS UNIT, THE #8B, #47, "MA", OR #2" PREWIRE OPTION MUST BE SELECTED. DOES NOT PROVIDE SUPPLY STARTER IN PREWIRE				
1	RTU INTAKE/RETURN DAMPER - MANUAL CONTROL VIA HMI	1	VAV PACKAGE W/ 0-10VDC INPUT CONTROL (571 VFD INCLUDED)				
1	RTU3 HAIL GUARD	1	COOLING OVERRIDE				
1	RTU3 DOWN RETURN	1	5 YEAR ENTIRE UNIT PARTS WARRANTY, 10 YEAR ENTIRE UNIT PARTS WARRANTY WITH REMOTE MONITORING AND CAPTIVEAIRE SERVICE CONTRACT, 25 YEAR STAINLESS STEEL FURNACE PARTS WARRANTY (SEE ADDITIONAL DETAILS)				
1	VAV PACKAGE W/ MANUAL/DCV CONTROL (571 VFD INCLUDED)	1	EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET				
1	20 TON MODULATING COOLING OPTION, 208/230V. R454B REFRIGERANT, VARIABLE SPEED COMPRESSOR, ECM CONDENSING FANS						
1	R454B LEAK DETECTOR OPTION FOR RTU3						

FAN ACCESSORIES

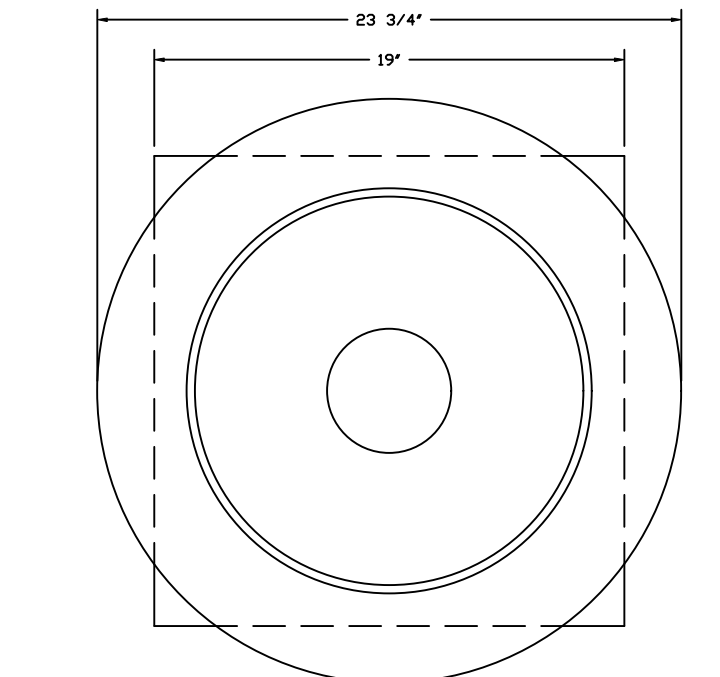
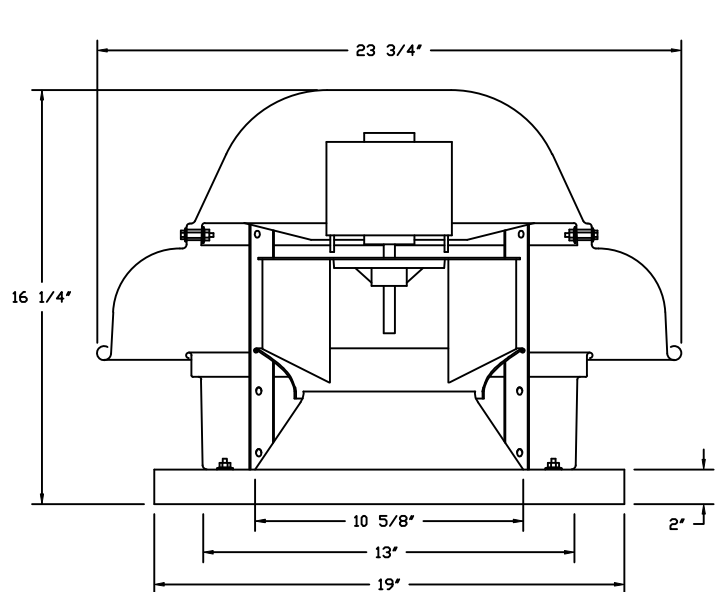
FAN UNIT NO	TAG	EXHAUST			SUPPLY		
		GRAVITY CLIP	GRAVITY DAMPER	WALL MOUNT DISCHARGE	SIDE DAMPER	GRAVITY DAMPER	MOTORIZED WALL MOUNT
1	PRV-1 RESTROOM		YES				
2	PRV-2	YES					
3	PRV-3	YES					
4	PRV-4 DISH						
5	EF-1						

CURB ASSEMBLIES

NO	DN FAN	TAG	WEIGHT	ITEM	SIZE
1	# 1	PRV-1 RESTROOM	22 LBS	CURB	17.500"W X 17.500"L X 20.000"H
2	# 2	PRV-2	78 LBS	CURB	23.000"W X 23.000"L X 28.000"H VENTED HINGED 16 GAUGE.
3	# 3	PRV-3	78 LBS	CURB	23.000"W X 23.000"L X 28.000"H VENTED HINGED 16 GAUGE.
4	# 4	PRV-4 DISH	22 LBS	CURB	17.500"W X 17.500"L X 20.000"H VENTED.
6	# 6	RTU-1 DINING	130 LBS	CURB	59.500"W X 91.000"L X 20.000"H 0.250/12.000 PITCH ALONG WIDTH, LEFT INSULATED.
7	# 7	RTU-2 KITCHEN	130 LBS	CURB	59.500"W X 91.000"L X 20.000"H 0.250/12.000 PITCH ALONG WIDTH, LEFT INSULATED.

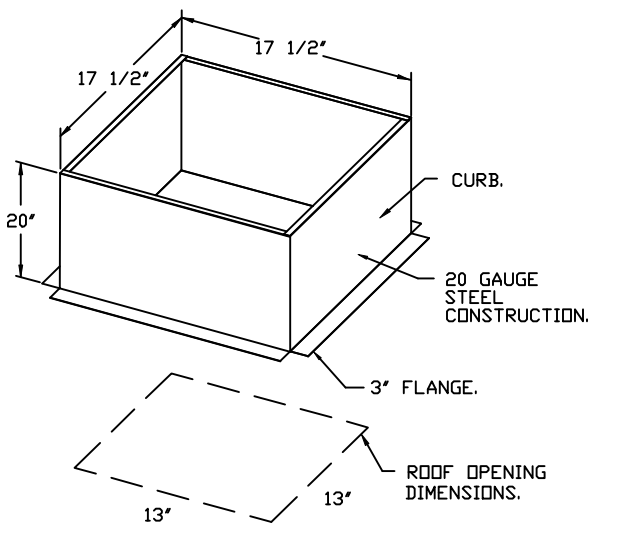
HMI SCHEDULE				
UNIT NUMBER	HMI #	HMI LOCATION	TEMP AVERAGING	MODBUS ADDRESS
FAN #6	HMI #1 - UNIT	IN UNIT	NOT AVERAGED	55
FAN #6	HMI #2 - SPACE	MANAGER OFFICE	AVERAGED	56
FAN #7	HMI #1 - UNIT	IN UNIT	NOT AVERAGED	55
FAN #7	HMI #2 - SPACE	MANAGER OFFICE	AVERAGED	56

FAN #1 DRIFEA - EXHAUST FAN (PRV-1 RESTROOM)

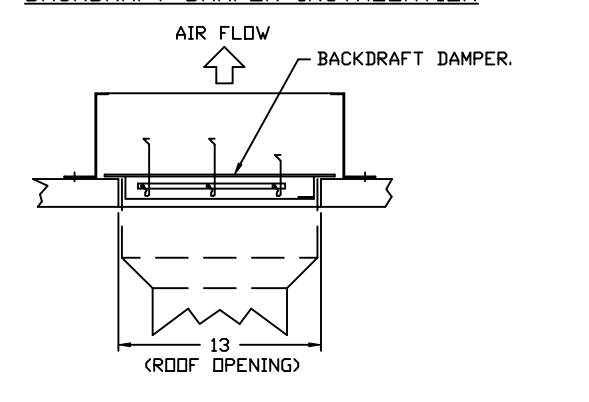


TOP VIEW

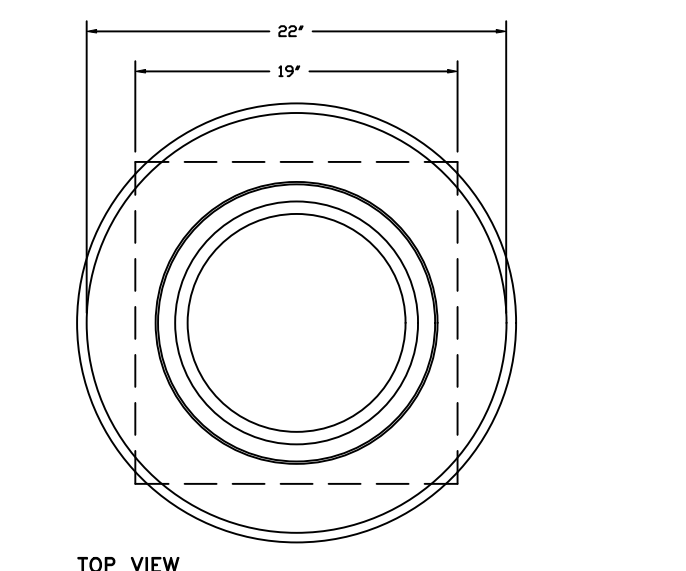
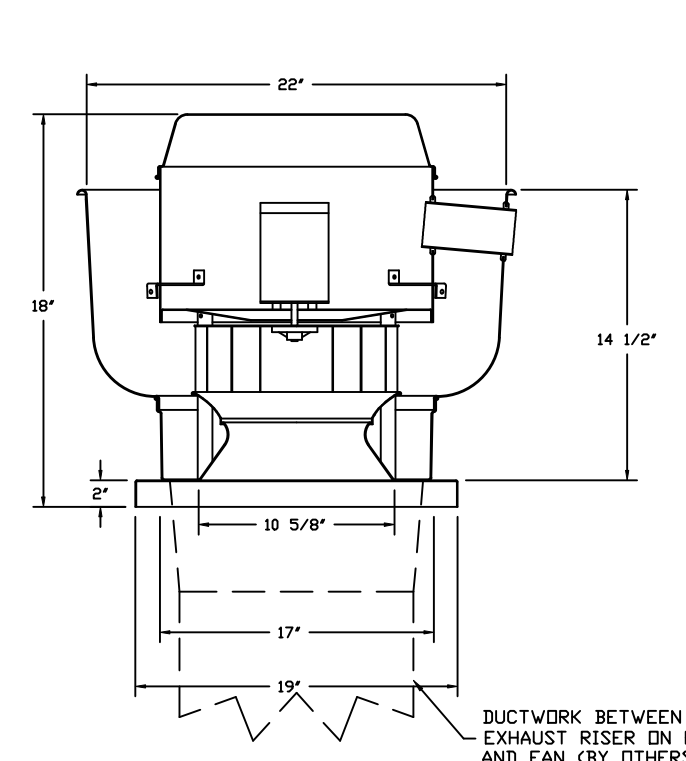
- FEATURES:
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
  - ROOF MOUNTED FANS.
  - UL705.
  - SAFETY DISCONNECT.
  - STANDARD BIRD SCREEN.
  - SPEED CONTROL.
  - THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- OPTIONS:
- 1 12-BDD DAMPER.
  - ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL.
  - RTC- (TELCO MOTOR), CCW ROTATION.
  - FULL CRATING FOR EXHAUST FANS.
  - 2 YEAR PARTS WARRANTY.



BACKDRAFT DAMPER INSTALLATION

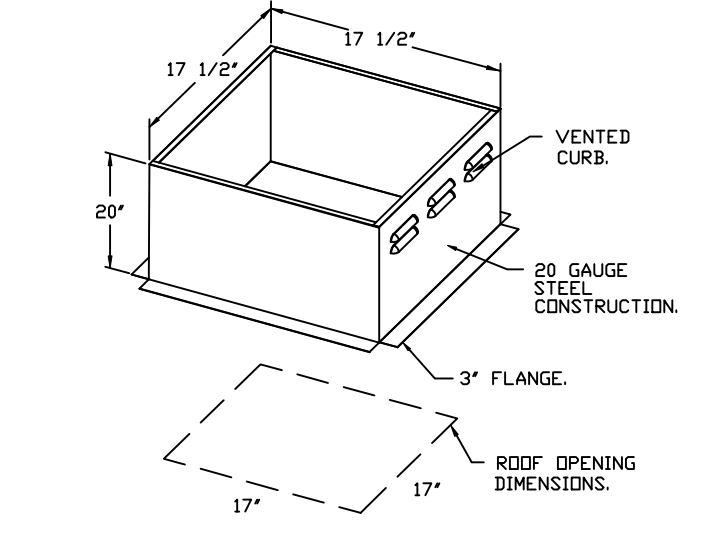


FAN #4 DRIFEA - EXHAUST FAN (PRV-4 DISH)



TOP VIEW

- FEATURES:
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
  - ROOF MOUNTED FANS.
  - RESTAURANT MODEL.
  - UL705.
  - VARIABLE SPEED CONTROL.
  - INTERNAL WIRING.
  - THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
  - HIGH HEAT OPERATION 300°F (149°C).
  - NEMA 3R SAFETY DISCONNECT SWITCH.
- NORMAL OPERATING 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 DETRIMENTAL EFFECTS TO THE FAN WHICH WOULD CAUSE UNSURE OPERATION.
- OPTIONS:
- ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL.
  - RTC- (TELCO MOTOR), CCW ROTATION.
  - FULL CRATING FOR EXHAUST FANS.
  - 2 YEAR PARTS WARRANTY.



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DESCRIPTION	DATE:

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CULVERS NOVI MI  
 43530 W OAKS DRIVE,  
 Novi, MI, 48377

DATE: 4/30/2025

DWG.#:  
 7150660

DRAWN BY: sluddy jr

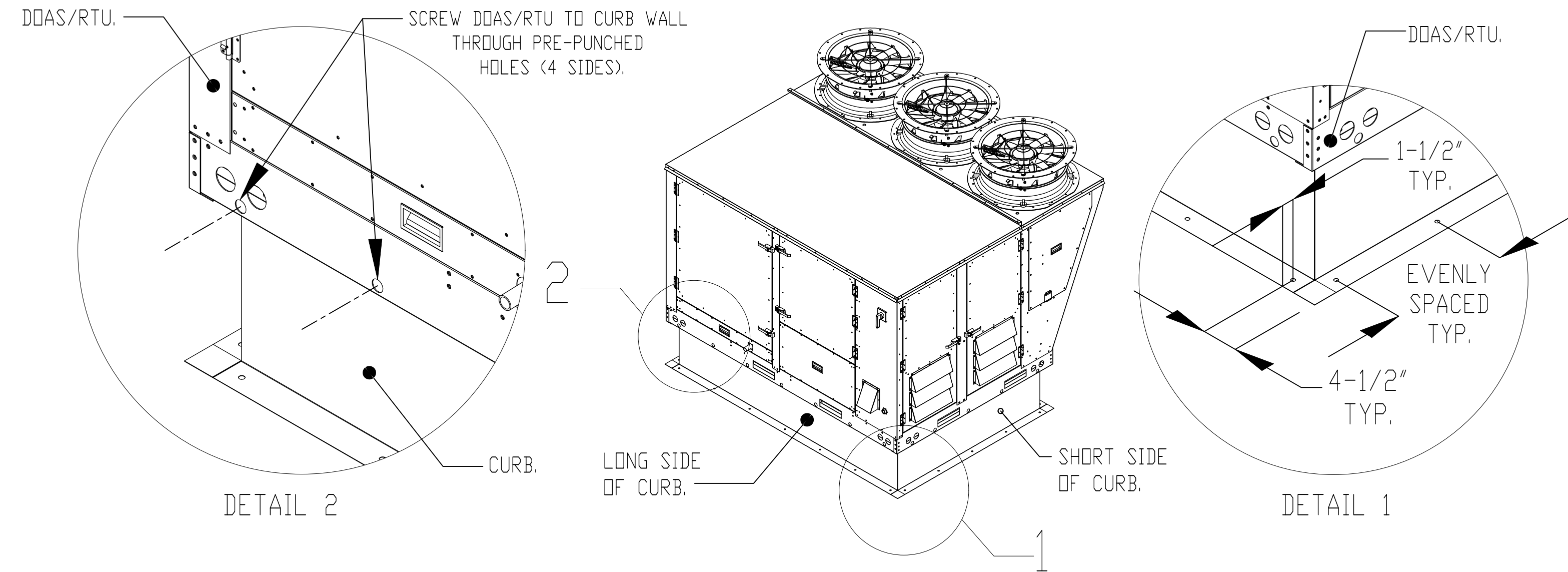
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MASTER DRAWING

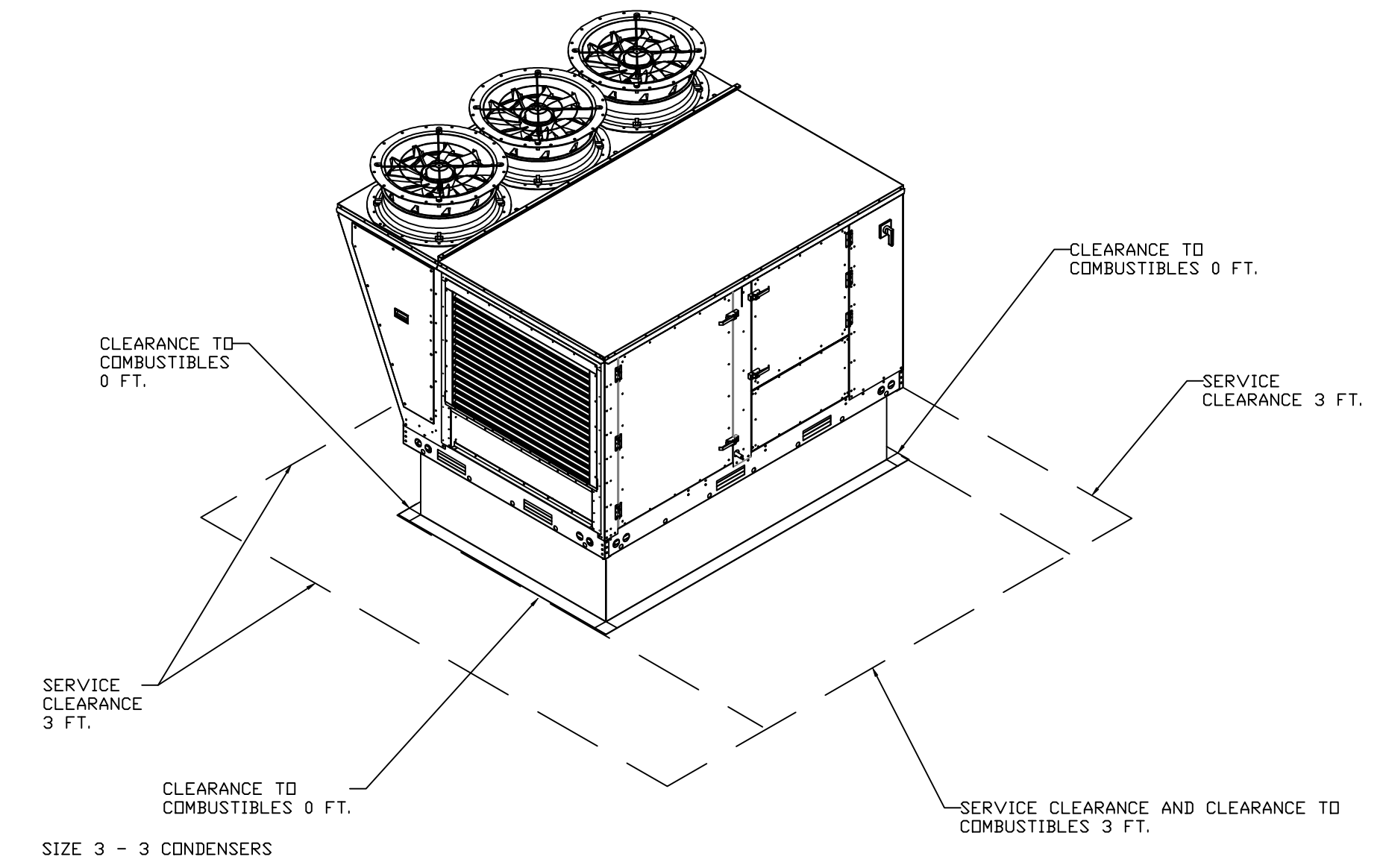
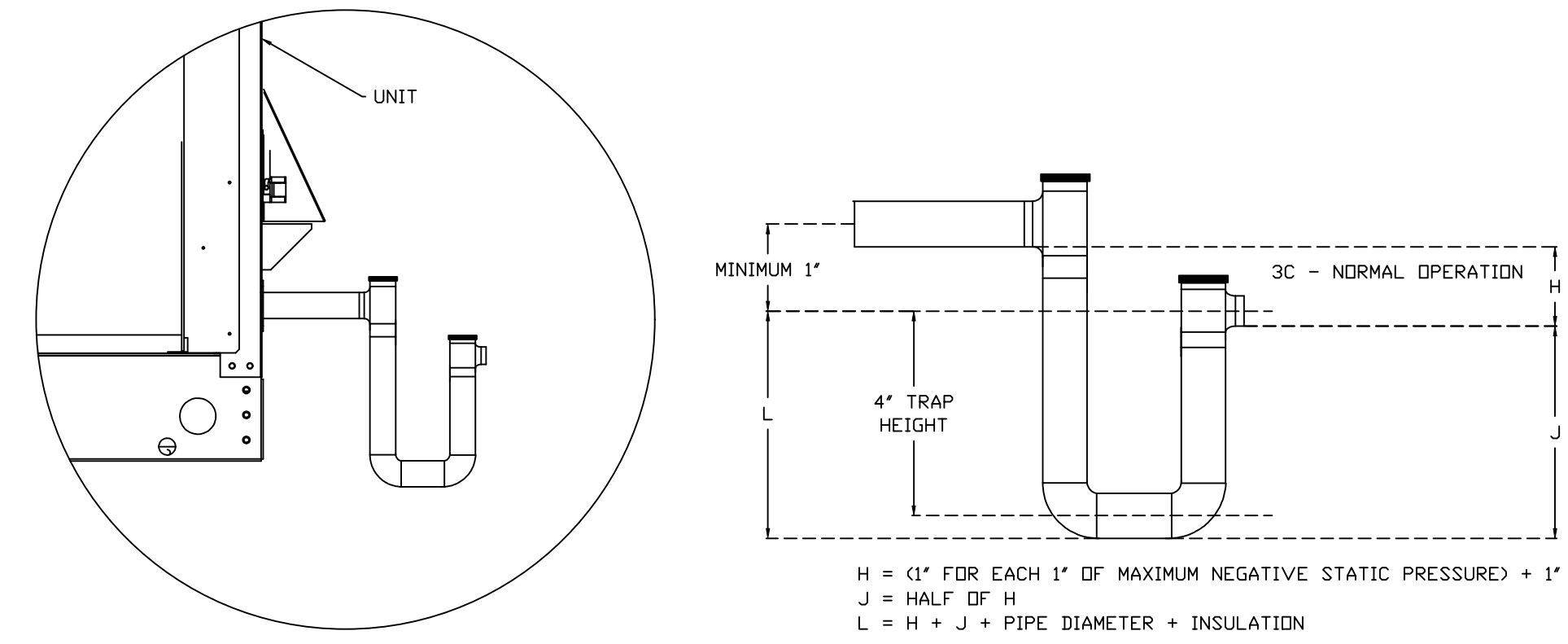
SHEET NO.  
 4

# TYPICAL DOAS/RTU ROOF MOUNTING INSTALLATION INSTRUCTIONS

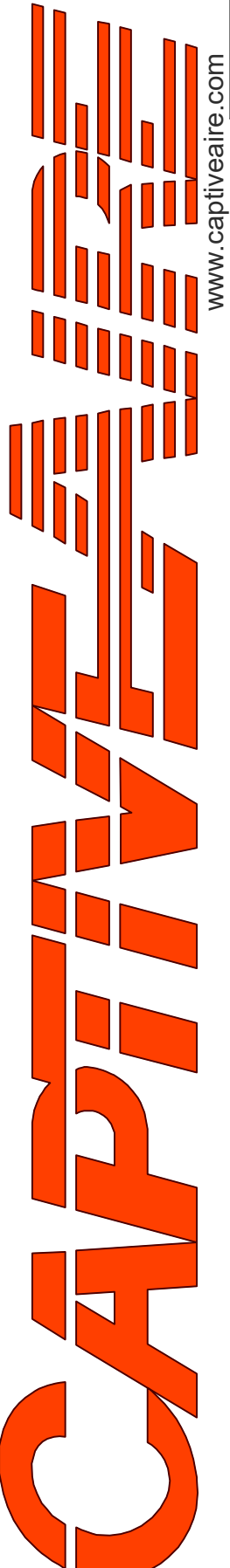
1. SECURE THE CURB TO THE ROOF FRAMING MEMBERS BY DRILLING 1/4" PILOT HOLES IN THE CURB FLANGES AT LOCATIONS SHOWN IN THE DIAGRAM BELOW. USING 3/8" X 2" ZINC PLATED STEEL LAG BOLTS, AND ZINC PLATED WASHERS, SCREW THROUGH THE CURB FLANGES AND INTO THE ROOF FRAMING MEMBERS. A MINIMUM OF (5) LAG BOLTS ON EACH SHORT SIDE, AND (7) LAG BOLTS ON EACH LONG SIDE IS REQUIRED.
2. SECURE THE UNIT BASE TO THE SIDE WALLS OF THE CURB USING (24) 1/4"-14 X 2" SELF-DRILLING, STEEL ZINC PLATED SCREWS. PRE-PUNCHED HOLES HAVE BEEN PROVIDED FOR EACH SCREW LOCATION.



RTU CONDENSATE DRAIN TRAP DETAIL



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
CULVERS NOVI MI  
 43530 W OAKS DRIVE,  
 Novi, MI, 48377

**DATE:** 4/30/2025  
**DWG.#:** 7150660  
**DRAWN BY:** sluddy jr  
**SCALE:** 3/4" = 1'-0"  
**MASTER DRAWING**

**SHEET NO.**  
 5

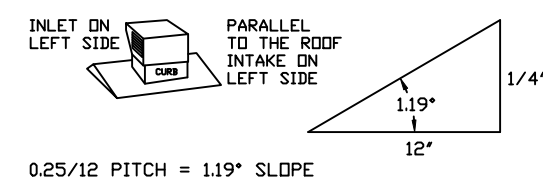
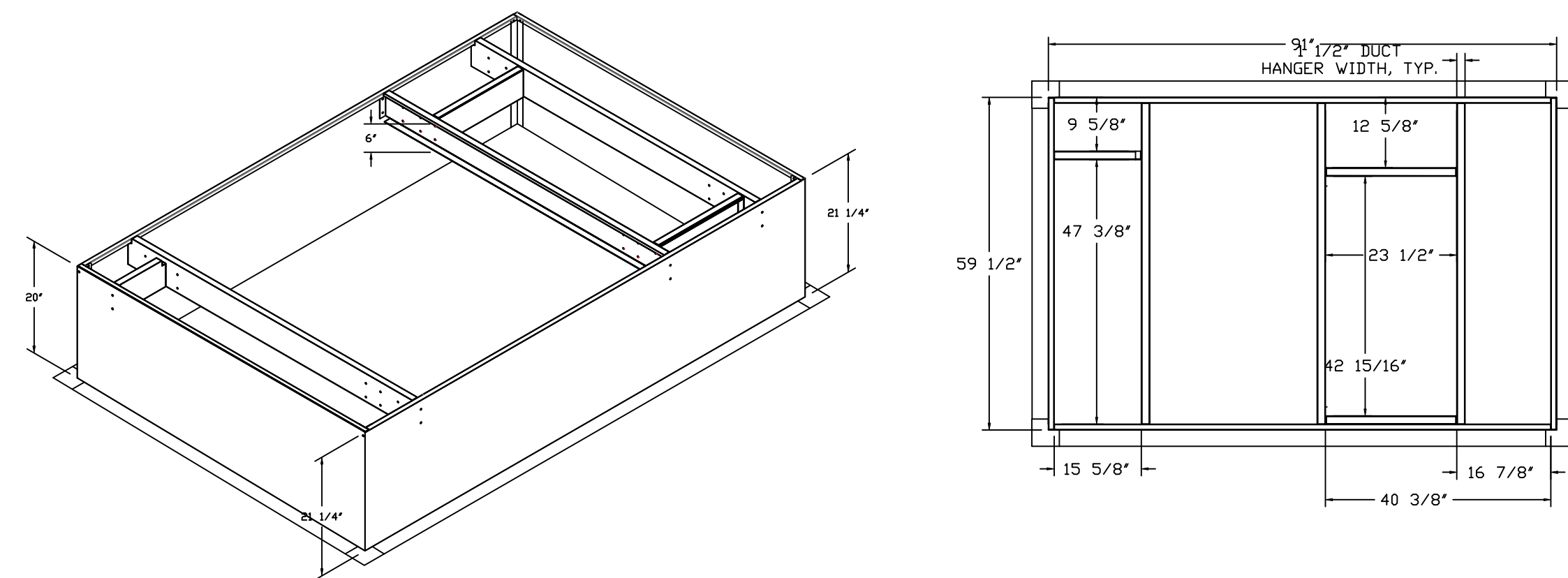
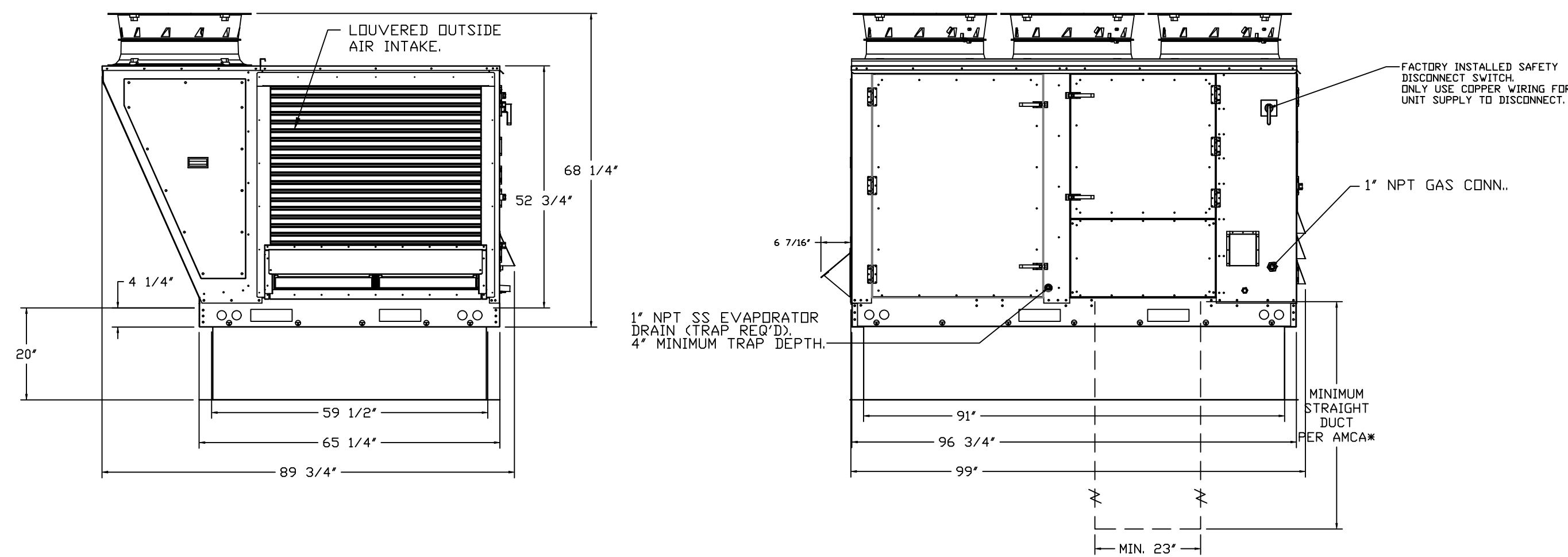
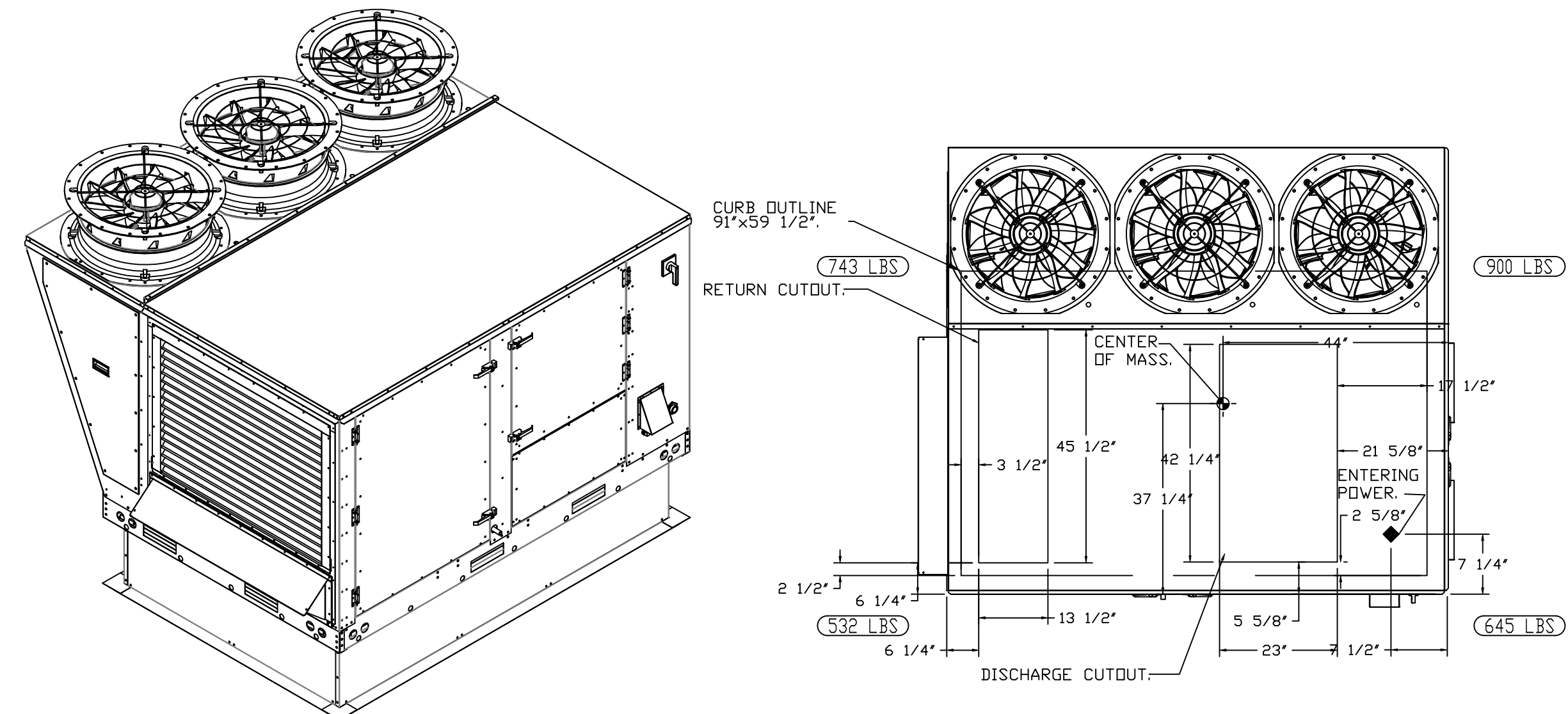
FAN #6 CAS-HVAC3-I.400-24MF-20T - HEATER (RTU-1 DINING)

NOTES:

- DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
-  DENOTES CORNER WEIGHT.
- ROOF OPENING MUST BE 2" SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.
- CONNECTION FROM BREAKER TO UNITS SAFETY DISCONNECT SWITCH TO BE COPPER WIRE ONLY.
- EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET.


\*NOTE: INTEGRAL CO2 MONITORING AND CONTROL CAPABILITIES FOR ALL SPACE MOUNTED THERMOSTATS.

\*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 23" x 39".



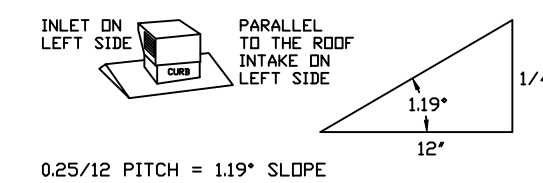
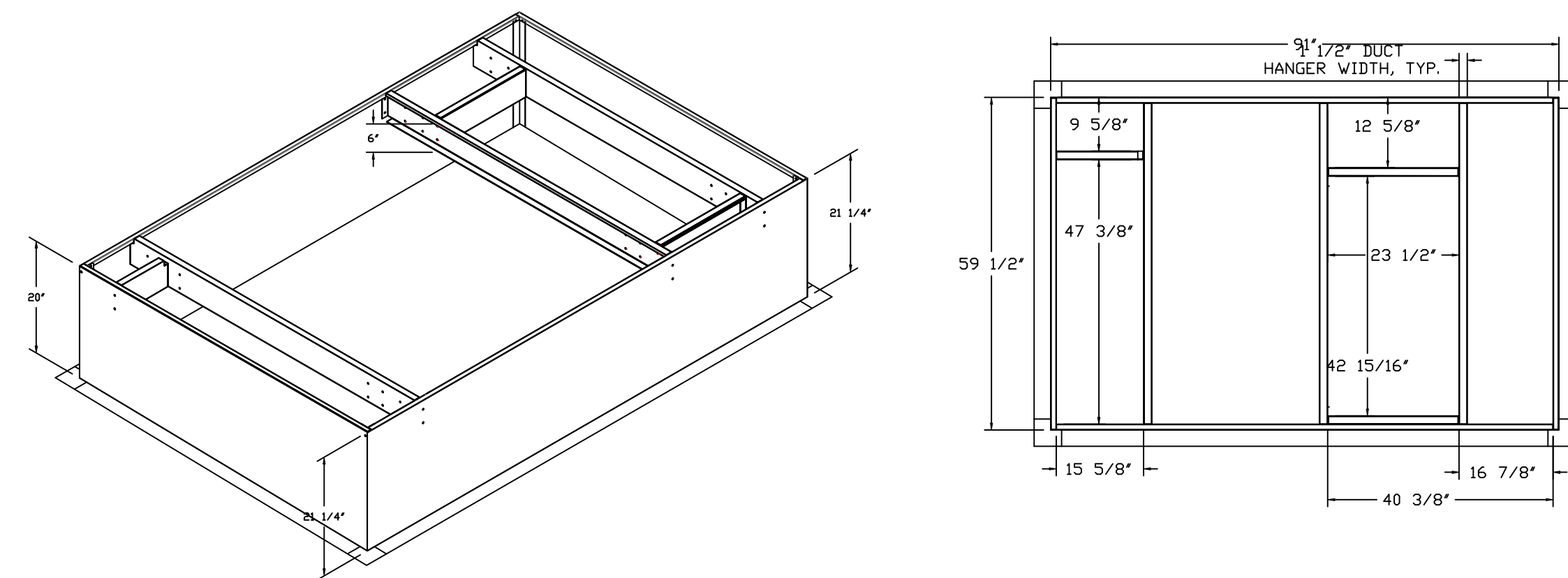
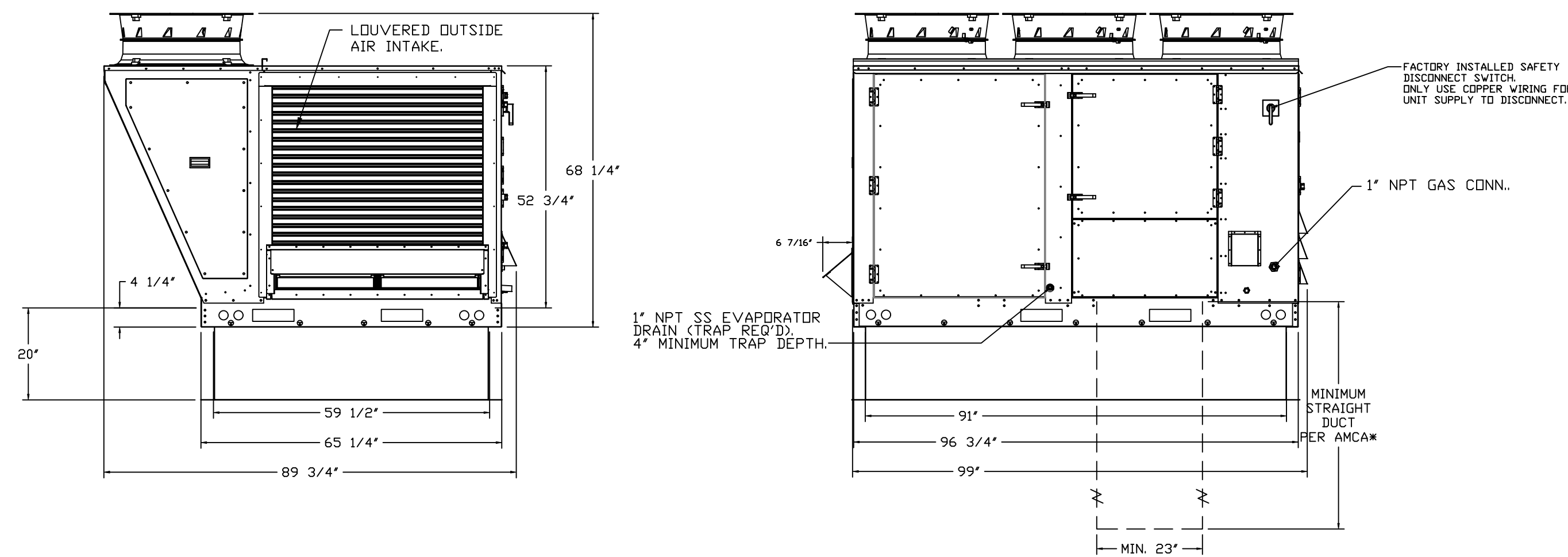
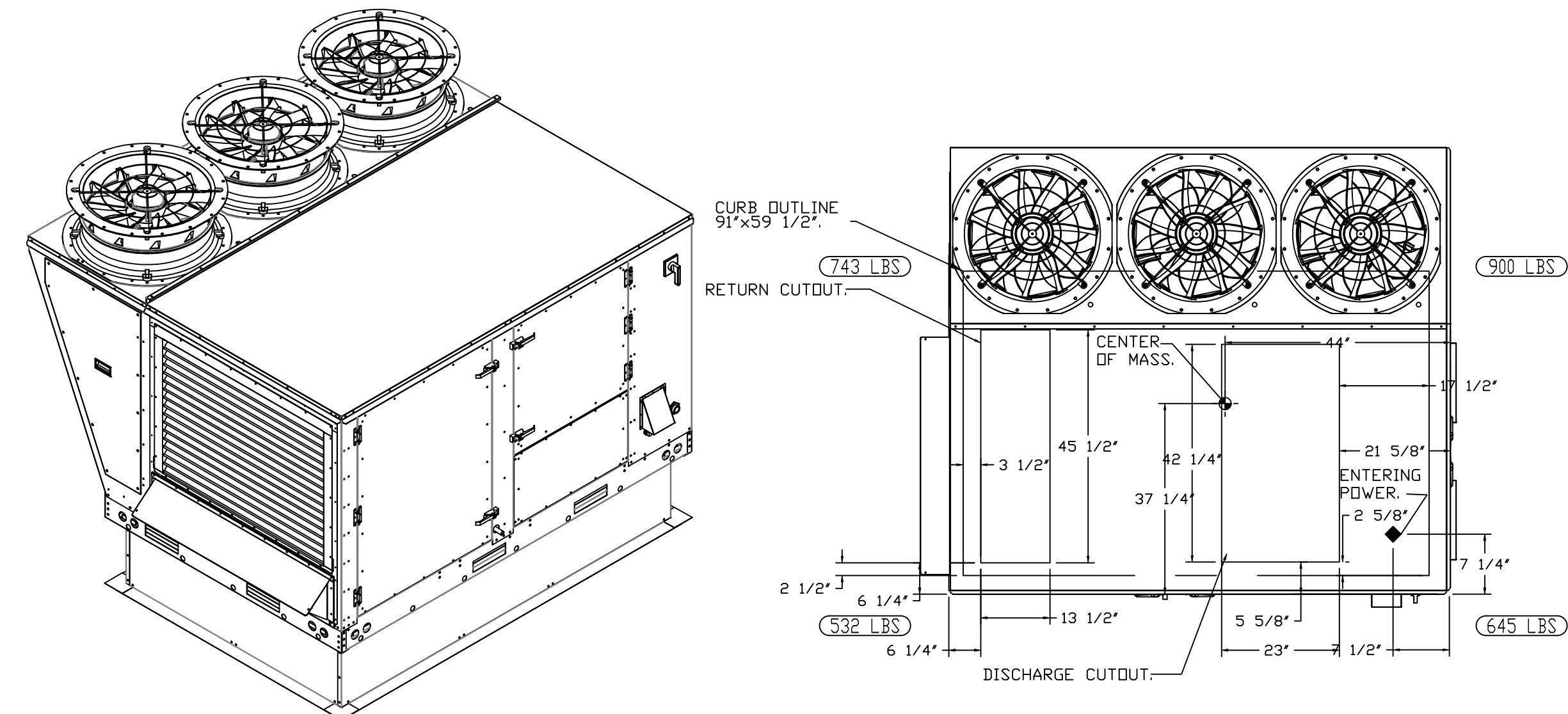
FAN #7 CAS-HVAC3-I.400-24MF-20T - HEATER (RTU-2 KITCHEN)

NOTES:

- DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
-  DENOTES CORNER WEIGHT.
- ROOF OPENING MUST BE 2" SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.
- CONNECTION FROM BREAKER TO UNITS SAFETY DISCONNECT SWITCH TO BE COPPER WIRE ONLY.
- EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET.

\*NOTE: INTEGRAL CO2 MONITORING AND CONTROL CAPABILITIES FOR ALL SPACE MOUNTED THERMOSTATS.

\*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 23" x 39".



**REVISIONS**

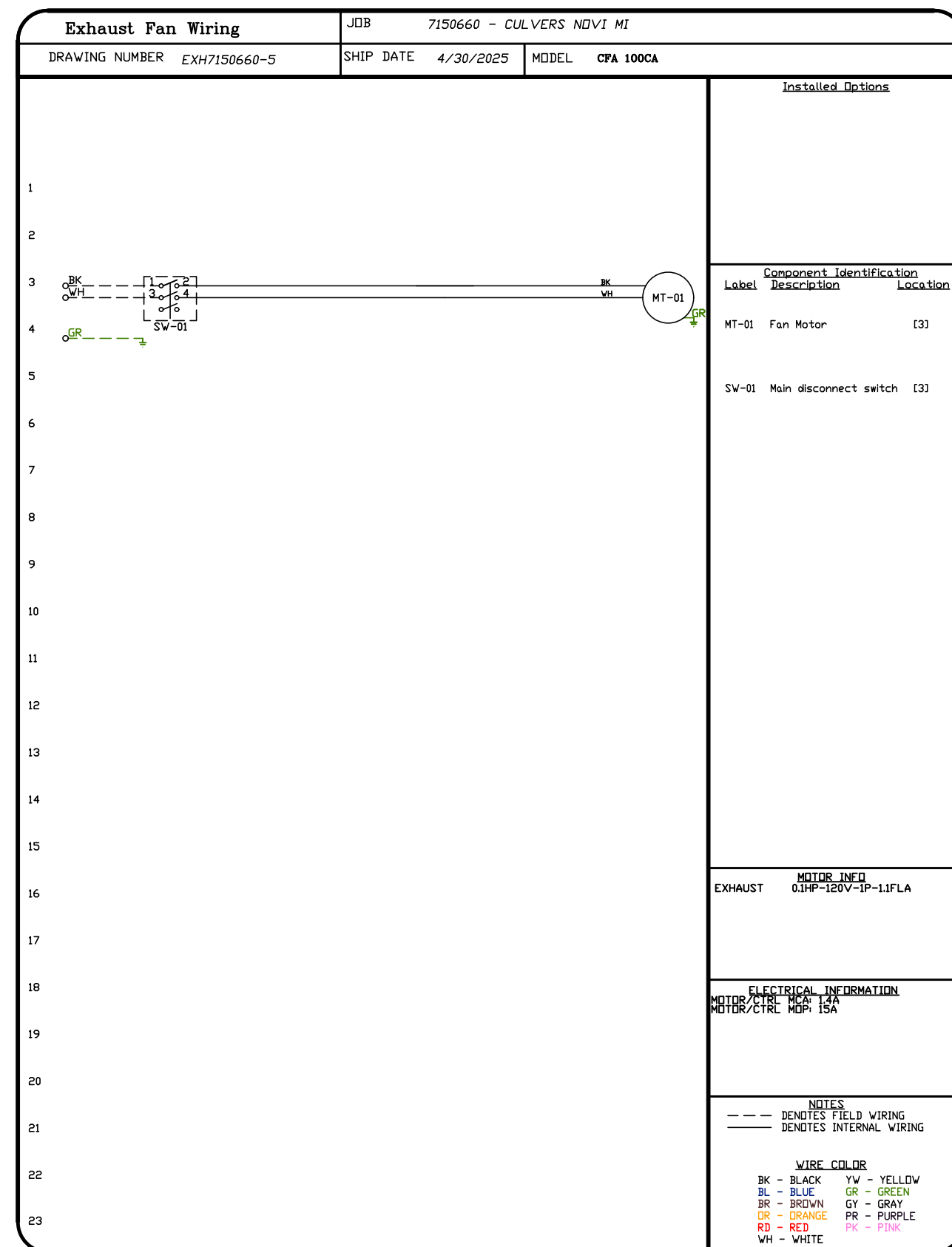
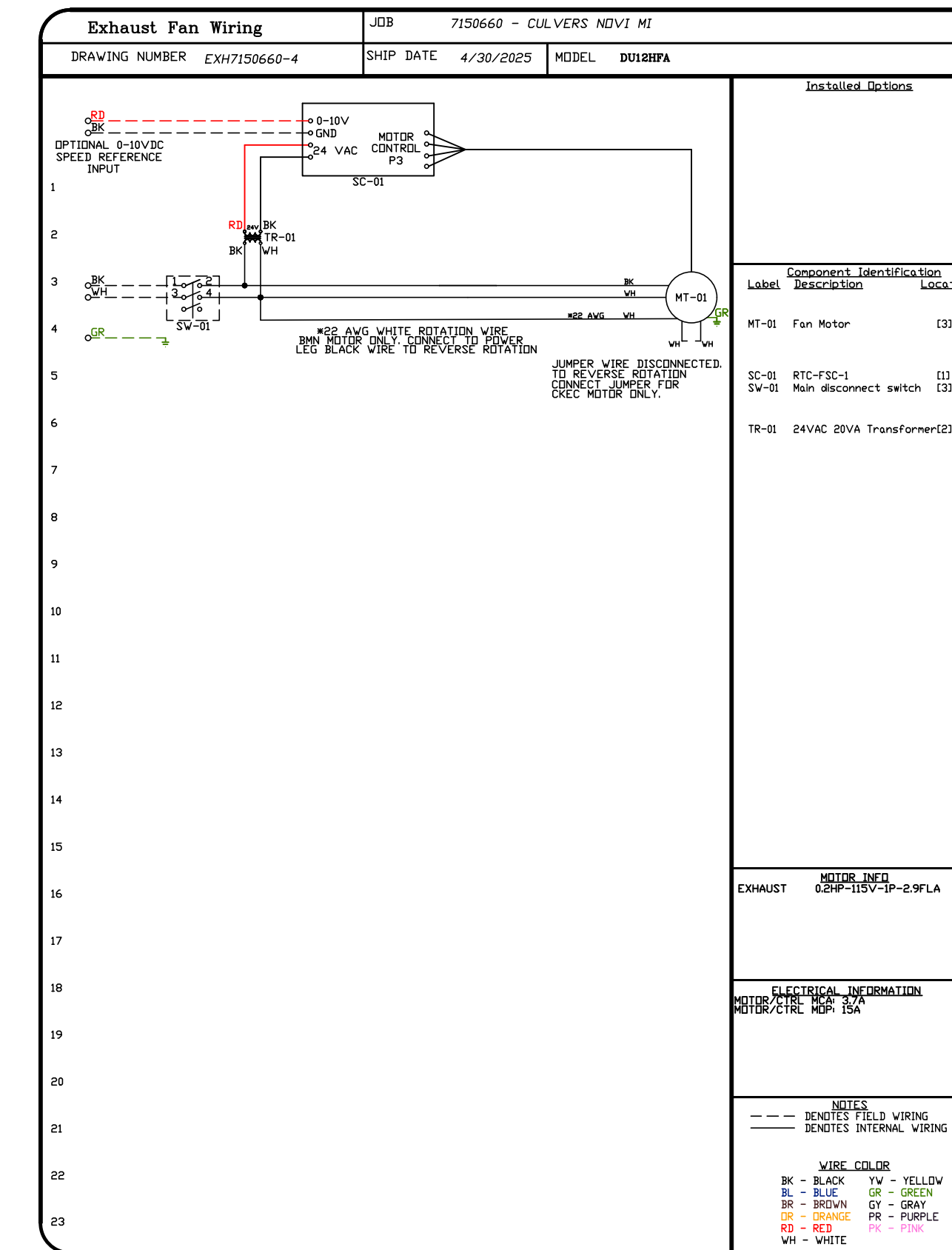
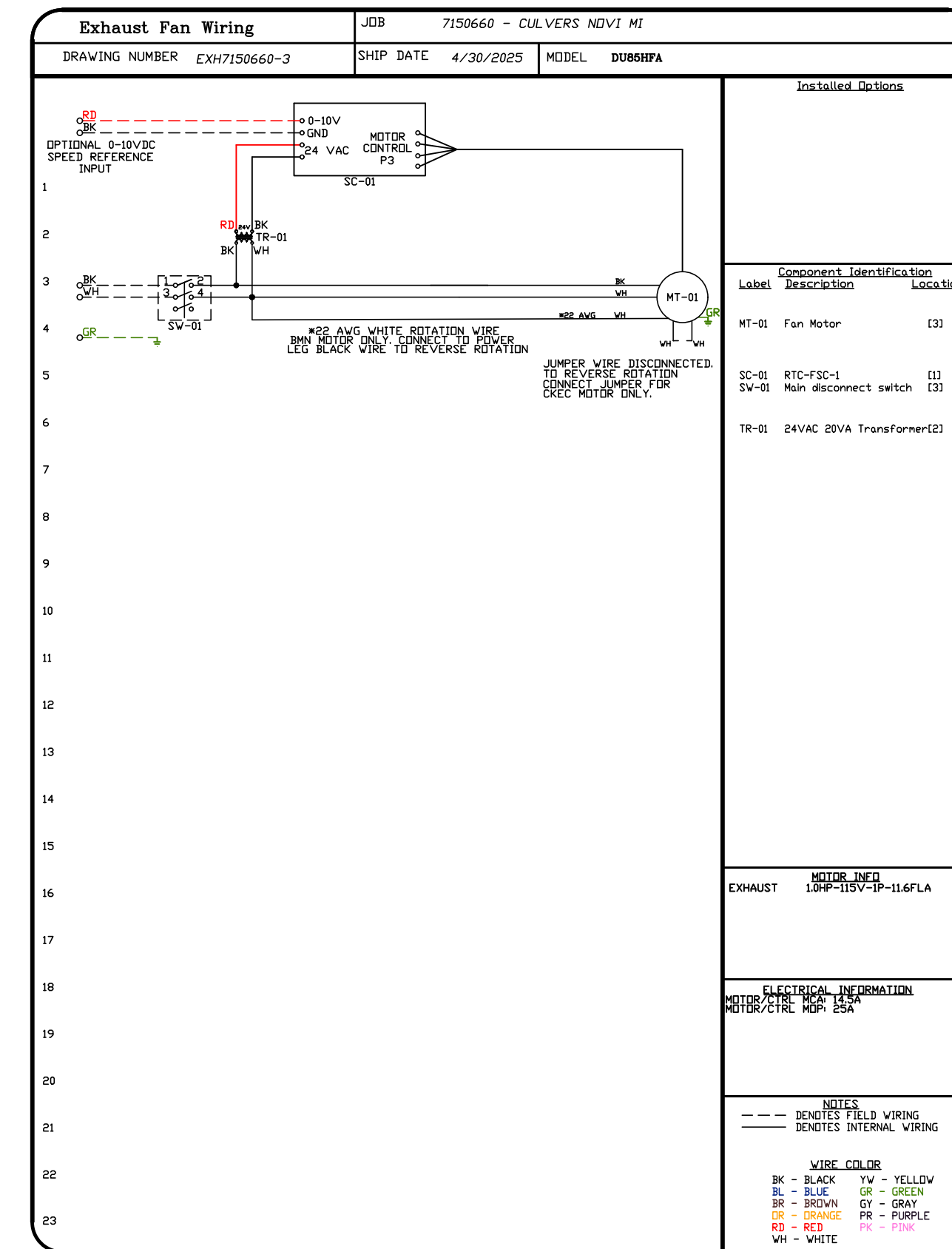
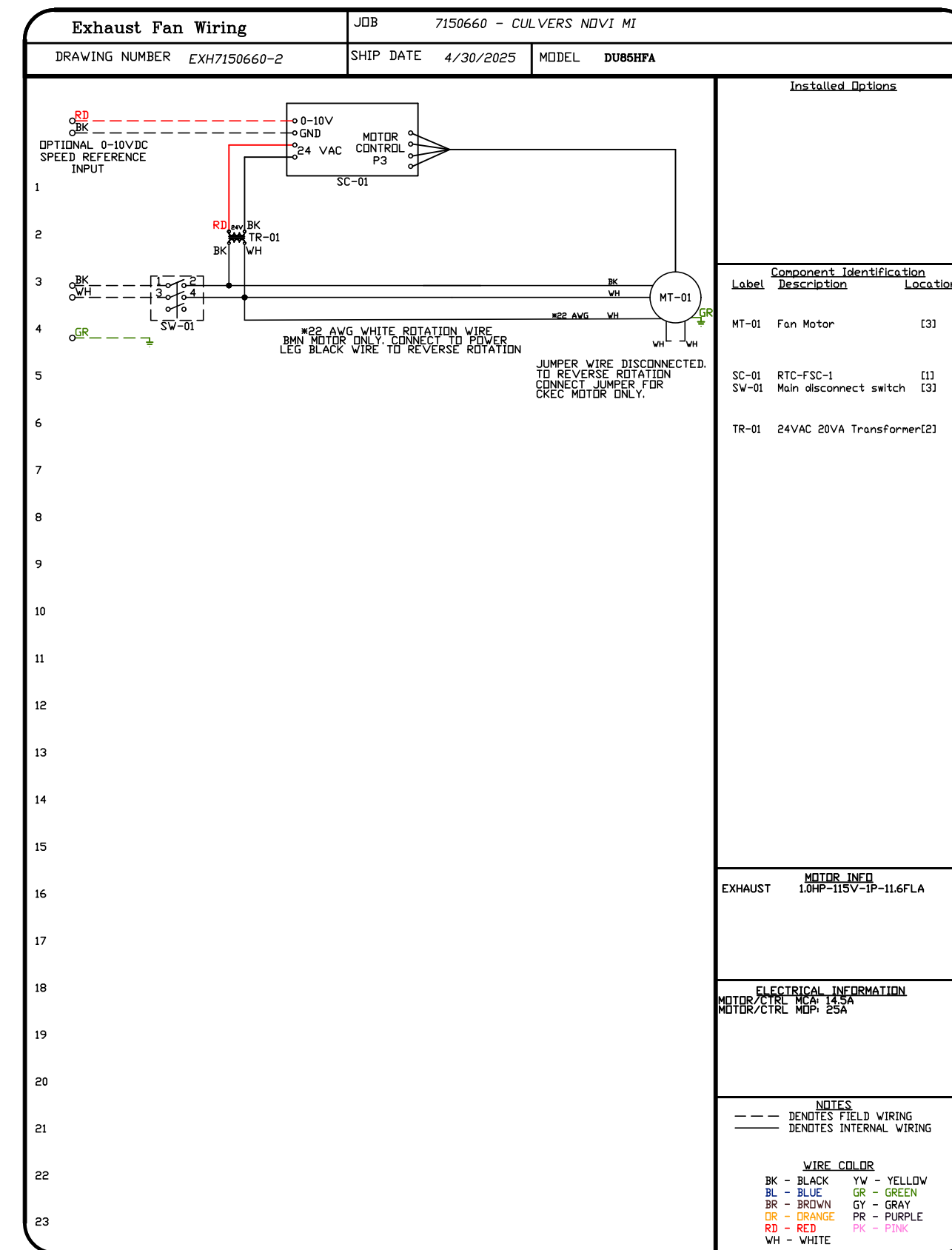
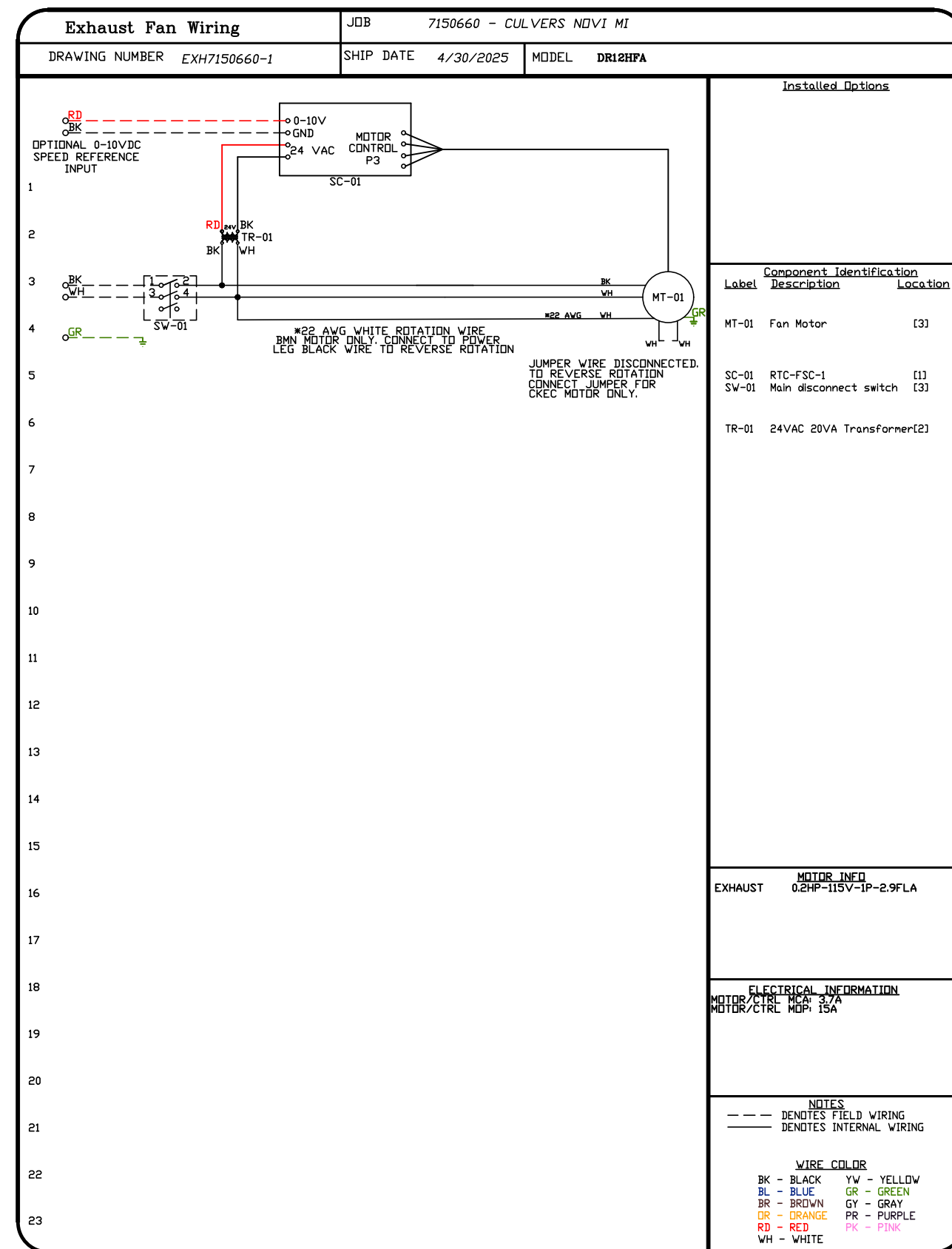
DESCRIPTION	DATE

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43530 W OAKS DRIVE,  
Novi, MI, 48377

DATE: 4/30/2025  
DWG.#: 7150660  
DRAWN BY: sluddy jr  
SCALE: 1/2" = 1'-0"  
MASTER DRAWING

SHEET NO. 6



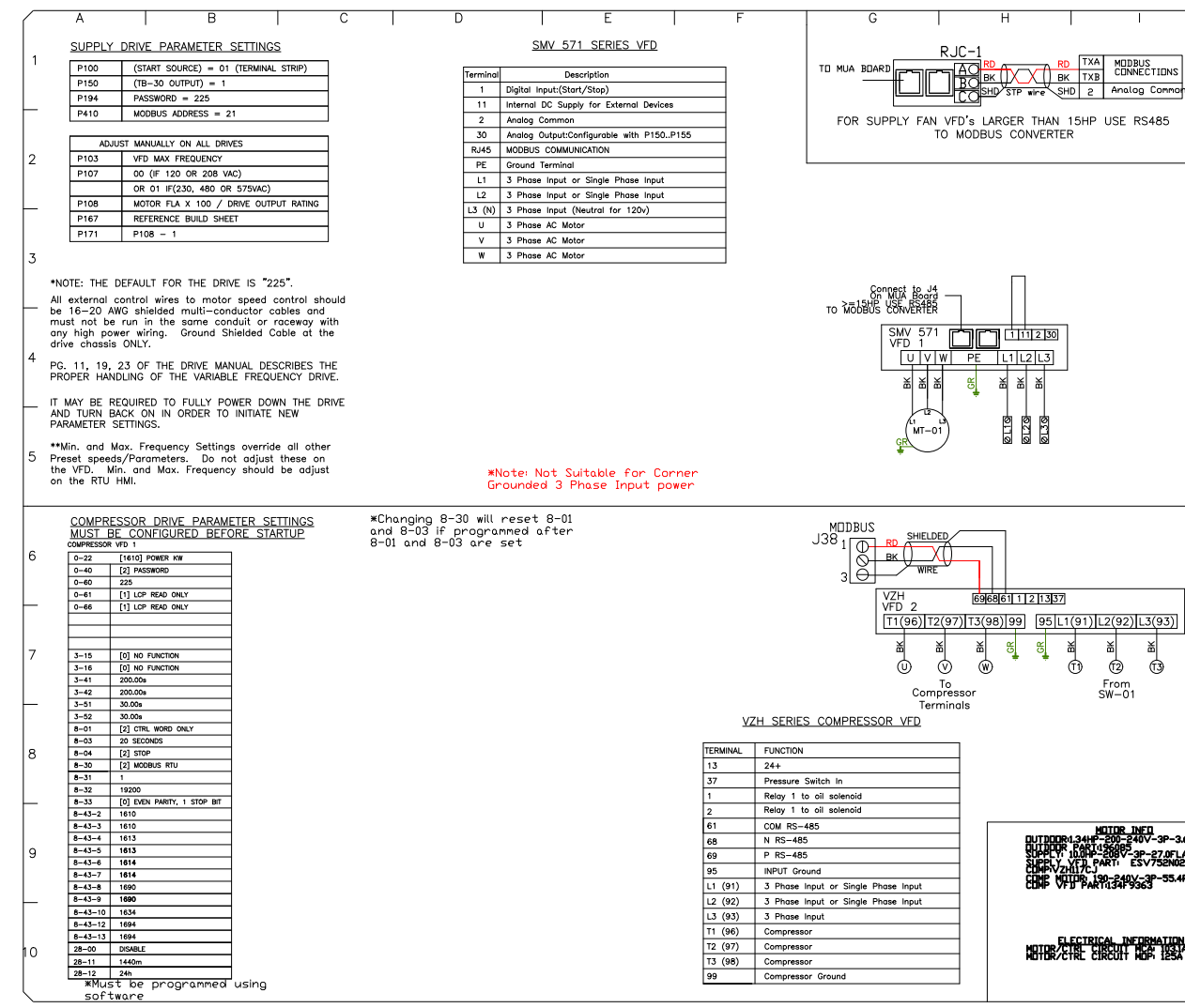
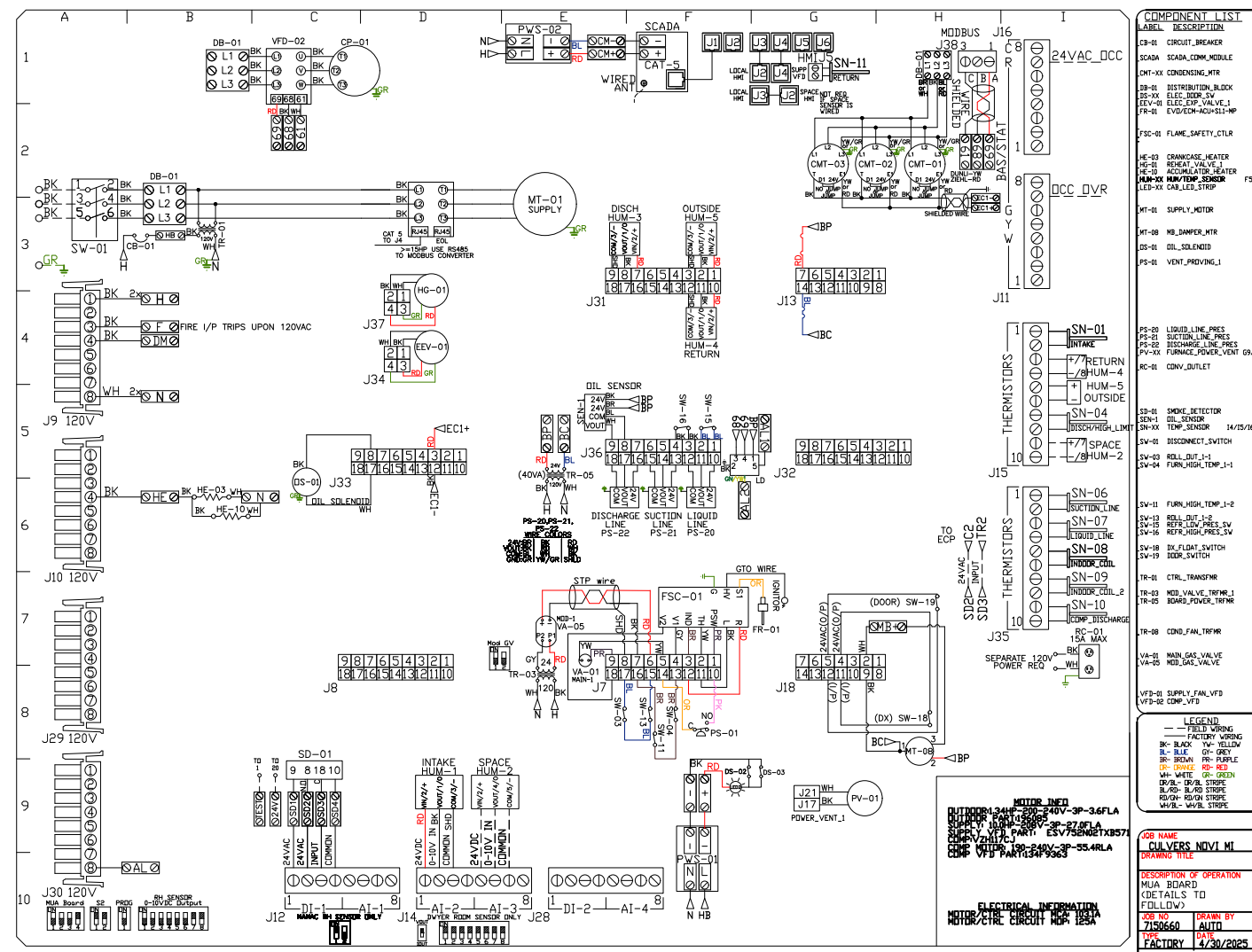
REVISIONS	
DESCRIPTION	DATE:

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 43530 W OAKS DRIVE,  
 Novi, MI, 48377

**DATE:** 4/30/2025  
**DWG.#:** 7150660  
**DRAWN BY:** sluddy jr  
**SCALE:** 3/4" = 1'-0"  
**MASTER DRAWING**

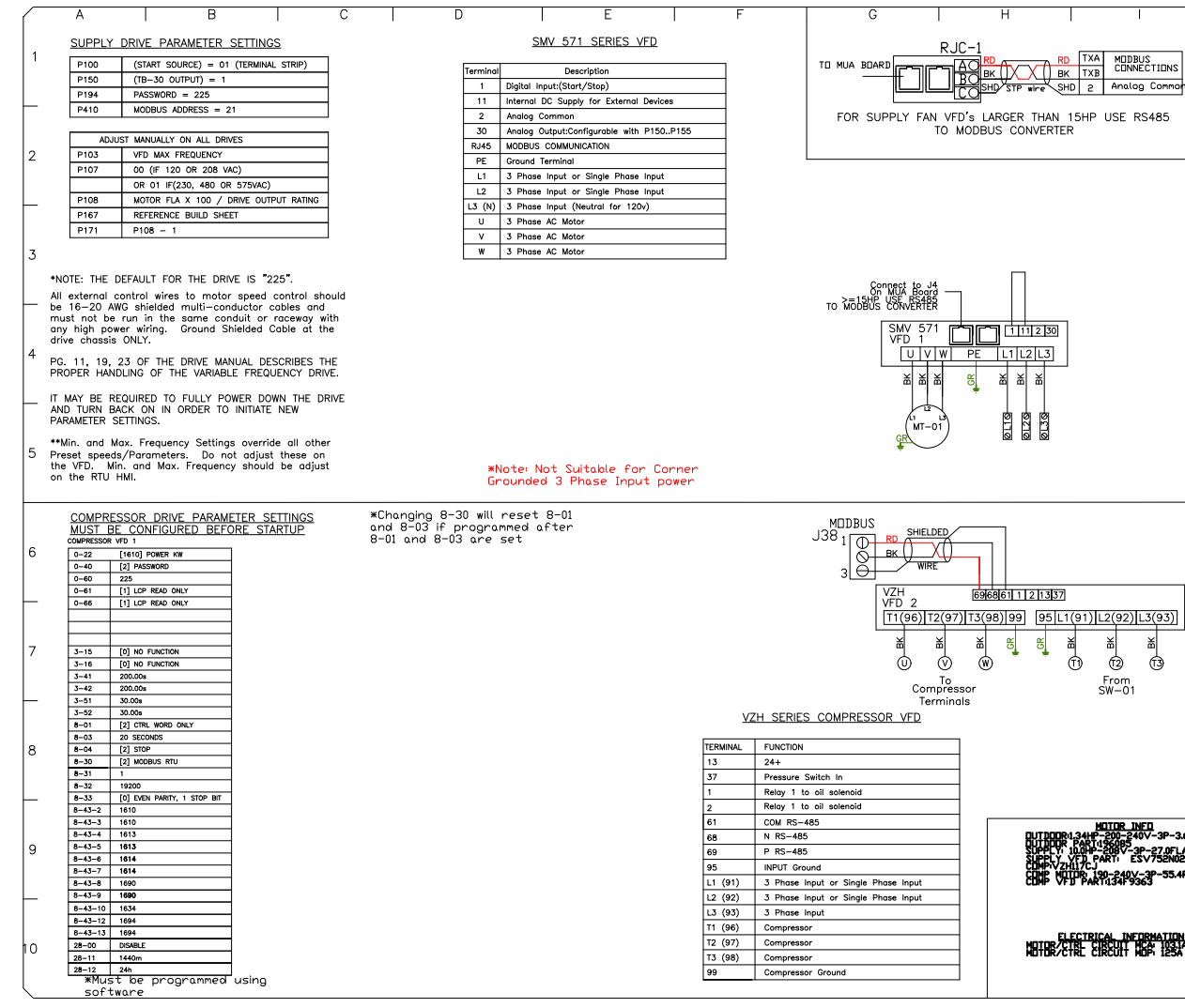
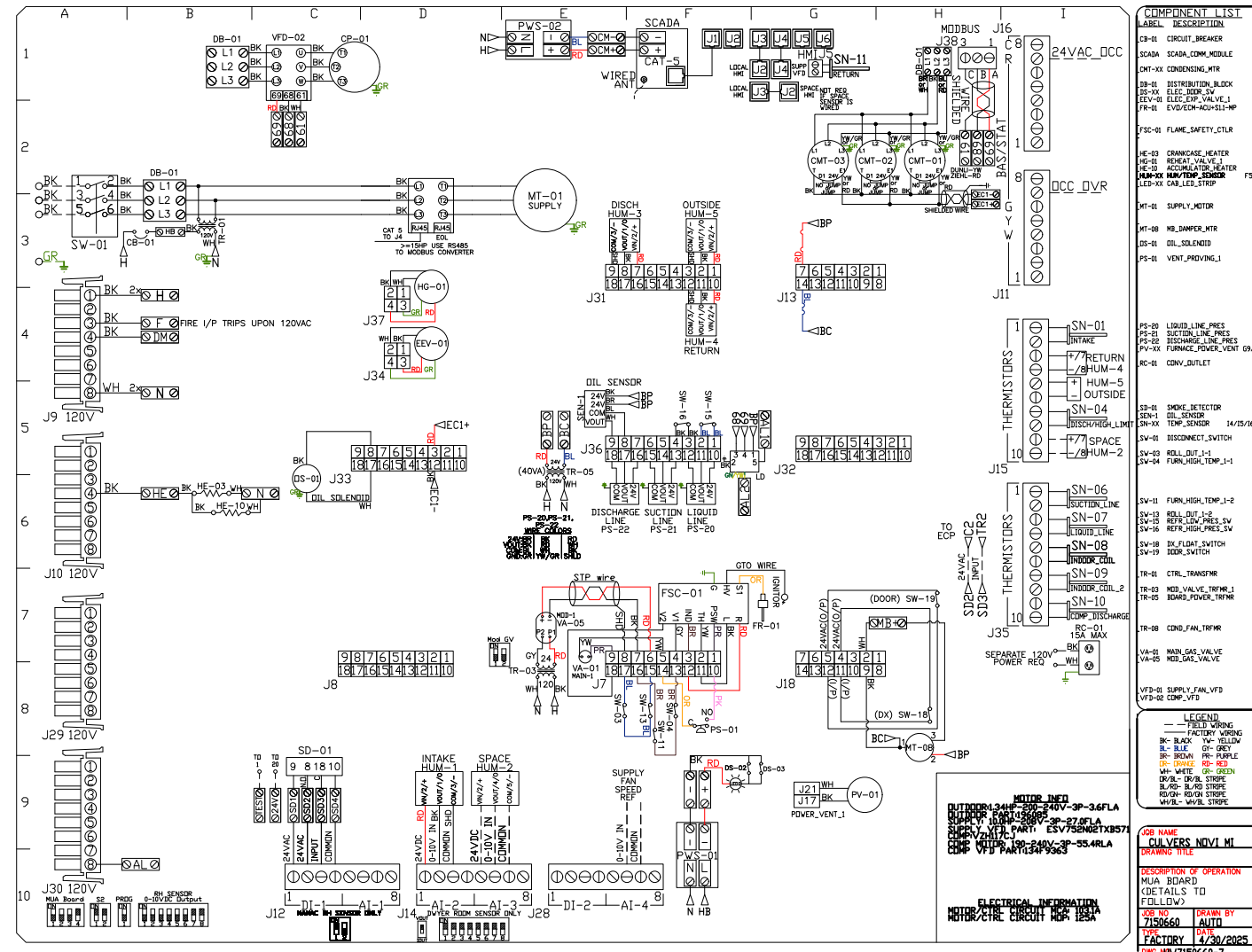
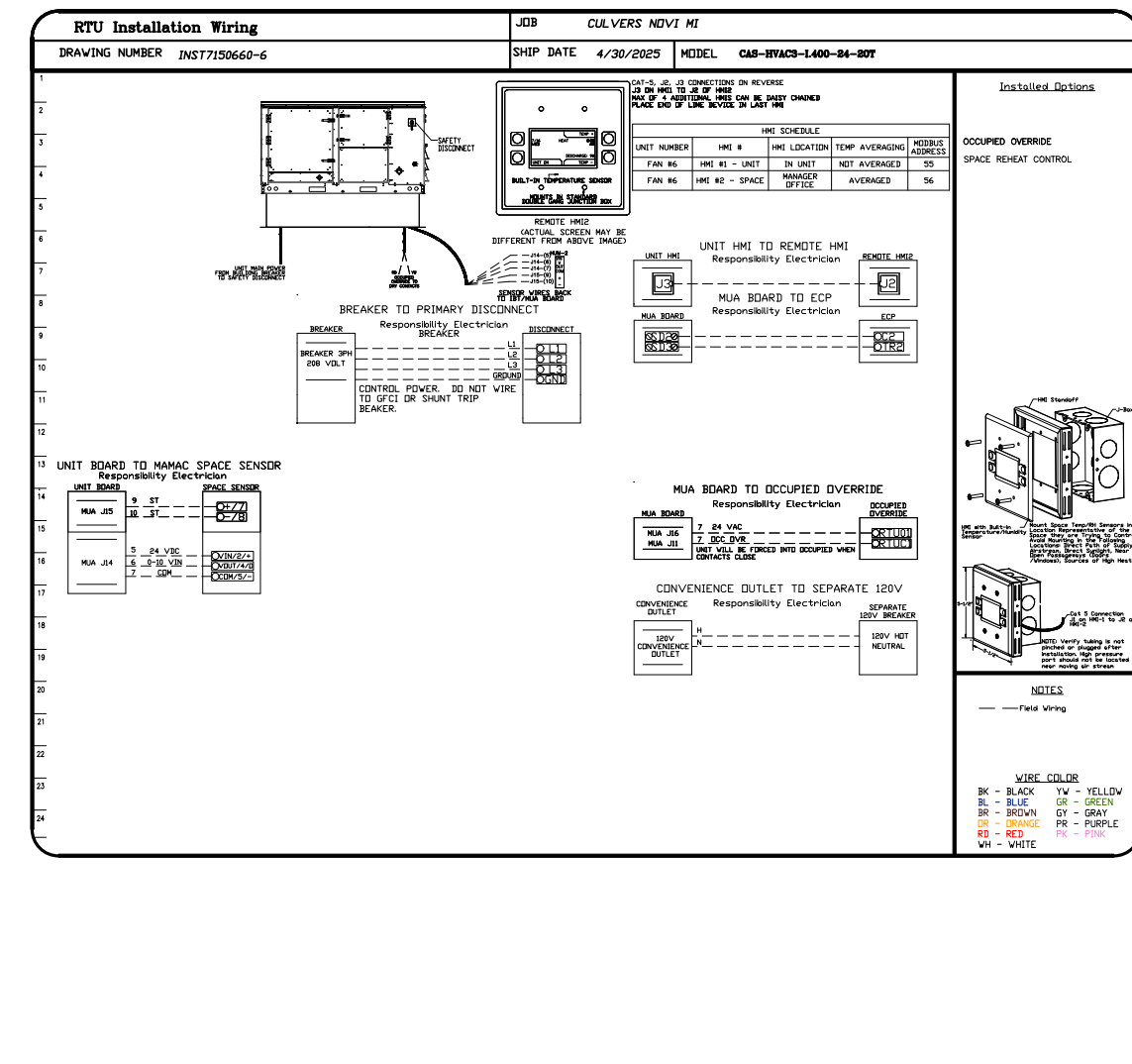
**SHEET NO.**  
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RTU VFD SCHEMATIC

COMPONENT LIST

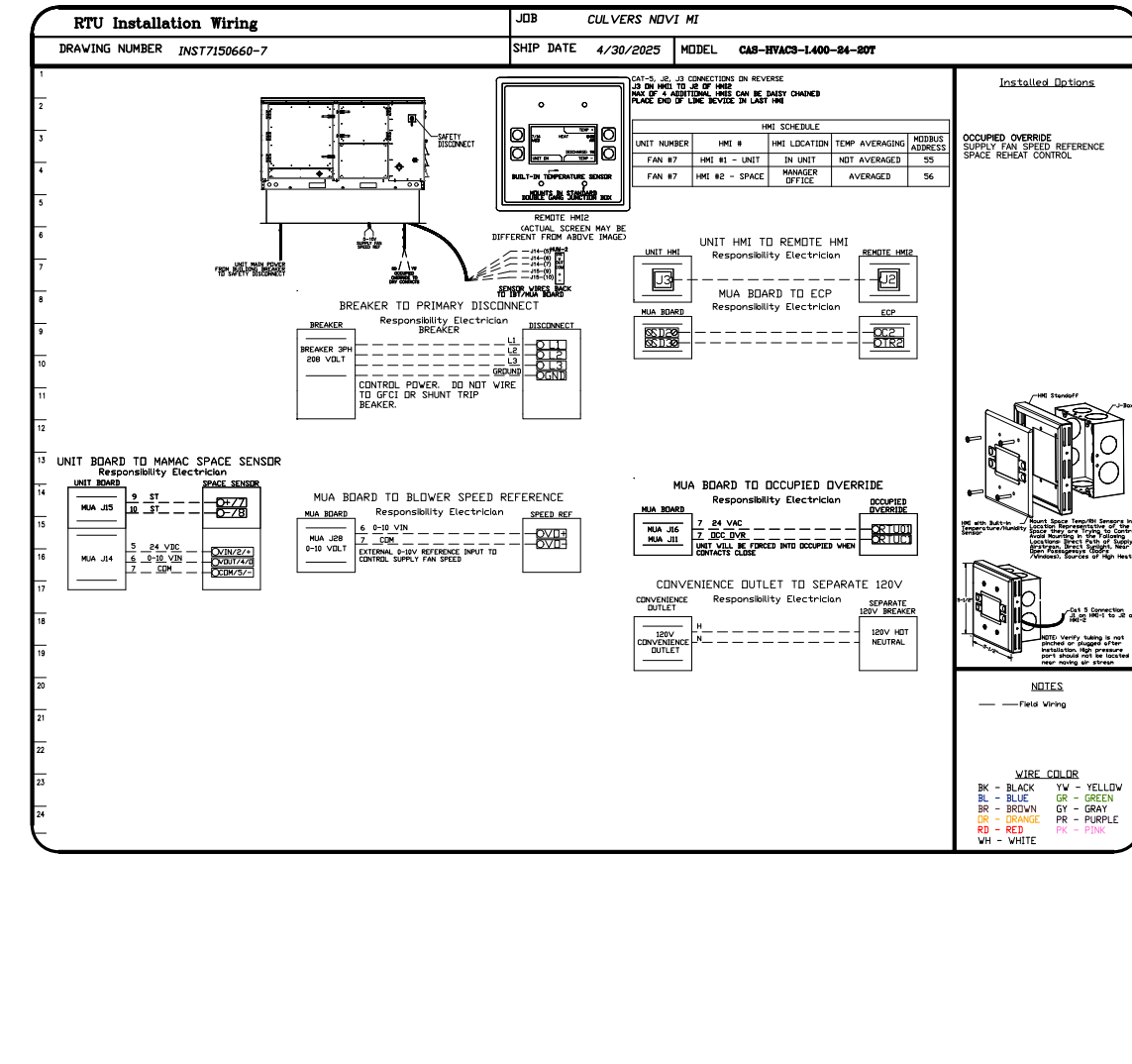
Part No.	Description
1	Supply Motor
2	3 Phase AC Power Supply
3	3 Phase AC Motor
4	3 Phase AC Motor
5	3 Phase AC Motor
6	3 Phase AC Motor
7	3 Phase AC Motor
8	3 Phase AC Motor
9	3 Phase AC Motor
10	3 Phase AC Motor
11	3 Phase AC Motor
12	3 Phase AC Motor
13	3 Phase AC Motor
14	3 Phase AC Motor
15	3 Phase AC Motor
16	3 Phase AC Motor
17	3 Phase AC Motor
18	3 Phase AC Motor
19	3 Phase AC Motor
20	3 Phase AC Motor



RTU VFD SCHEMATIC

COMPONENT LIST

Part No.	Description
1	Supply Motor
2	3 Phase AC Power Supply
3	3 Phase AC Motor
4	3 Phase AC Motor
5	3 Phase AC Motor
6	3 Phase AC Motor
7	3 Phase AC Motor
8	3 Phase AC Motor
9	3 Phase AC Motor
10	3 Phase AC Motor
11	3 Phase AC Motor
12	3 Phase AC Motor
13	3 Phase AC Motor
14	3 Phase AC Motor
15	3 Phase AC Motor
16	3 Phase AC Motor
17	3 Phase AC Motor
18	3 Phase AC Motor
19	3 Phase AC Motor
20	3 Phase AC Motor



**REVISIONS**

NO.	DESCRIPTION	DATE

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43530 W OAKS DRIVE,

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DATE: 4/30/2025

DWG.#: 7150660

DRAWN BY: studdy jr

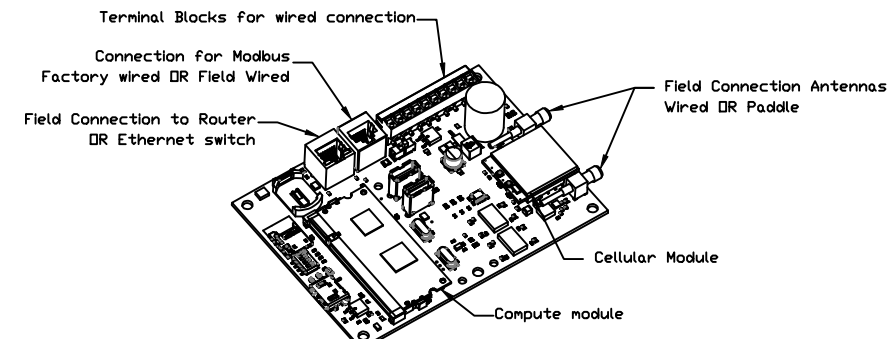
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MASTER DRAWING

SHEET NO. 8

**ELECTRICAL PACKAGE - JOB#7150660**

NO	TAG	PACKAGE #	LOCATION	SWITCHES		OPTION	FANS CONTROLLED					
				LOCATION	QUANTITY		FAN TAG	TYPE	#	HP	VOLT	FLA
1		SC-E012011MA	WALL MOUNT IN SS BDX	SHIP LOOSE W/ PREWIRE	1 LIGHT	SMART CONTROLS THERMSTATIC CONTROL W/ RELAY DN/OFF WITH SUPPLY	PRV-2	EXHAUST	1	1.000	115	11.6
					1 FAN		RTU-2 Kitchen	SUPPLY	3	10.000	208	27.0

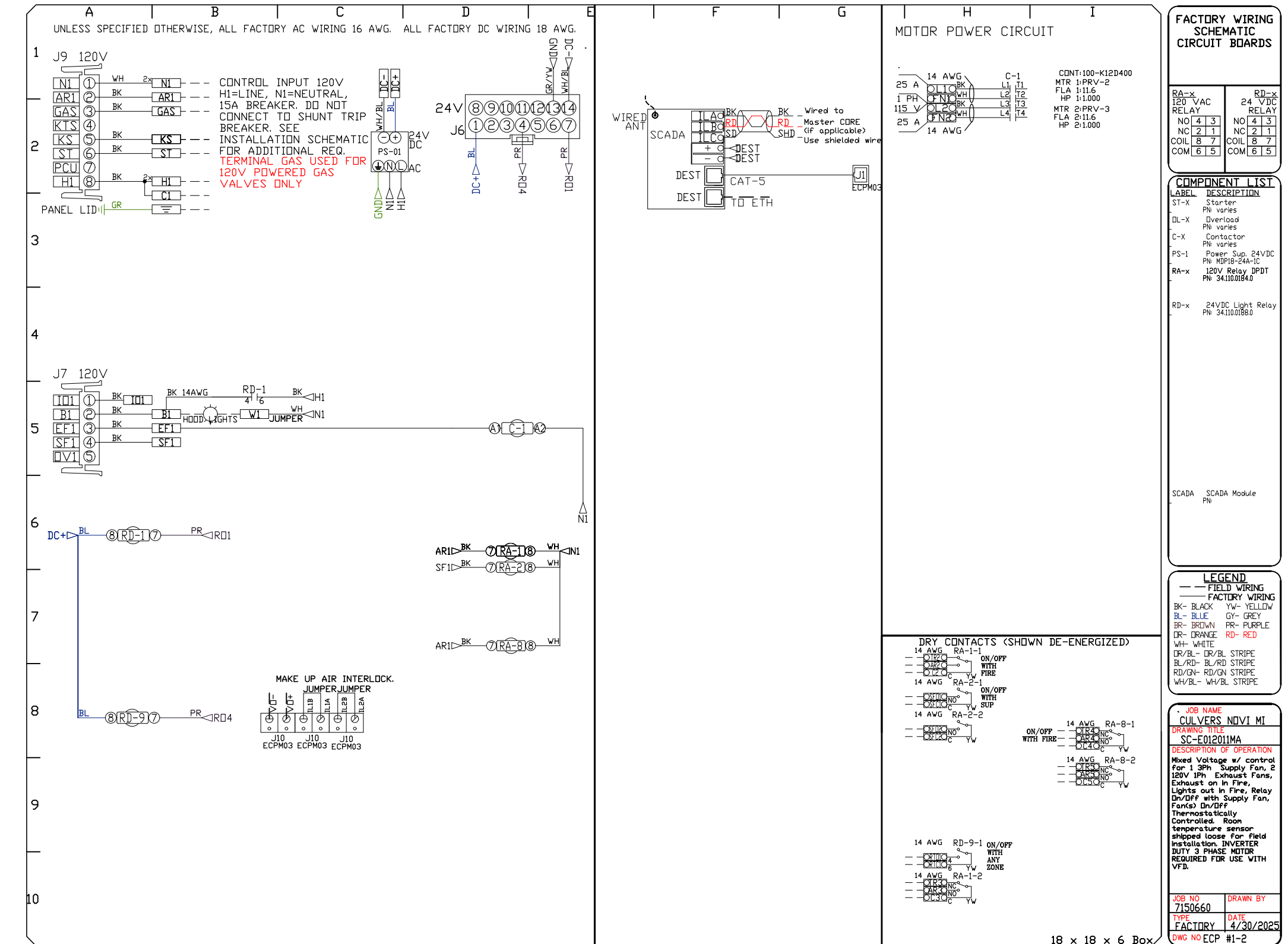
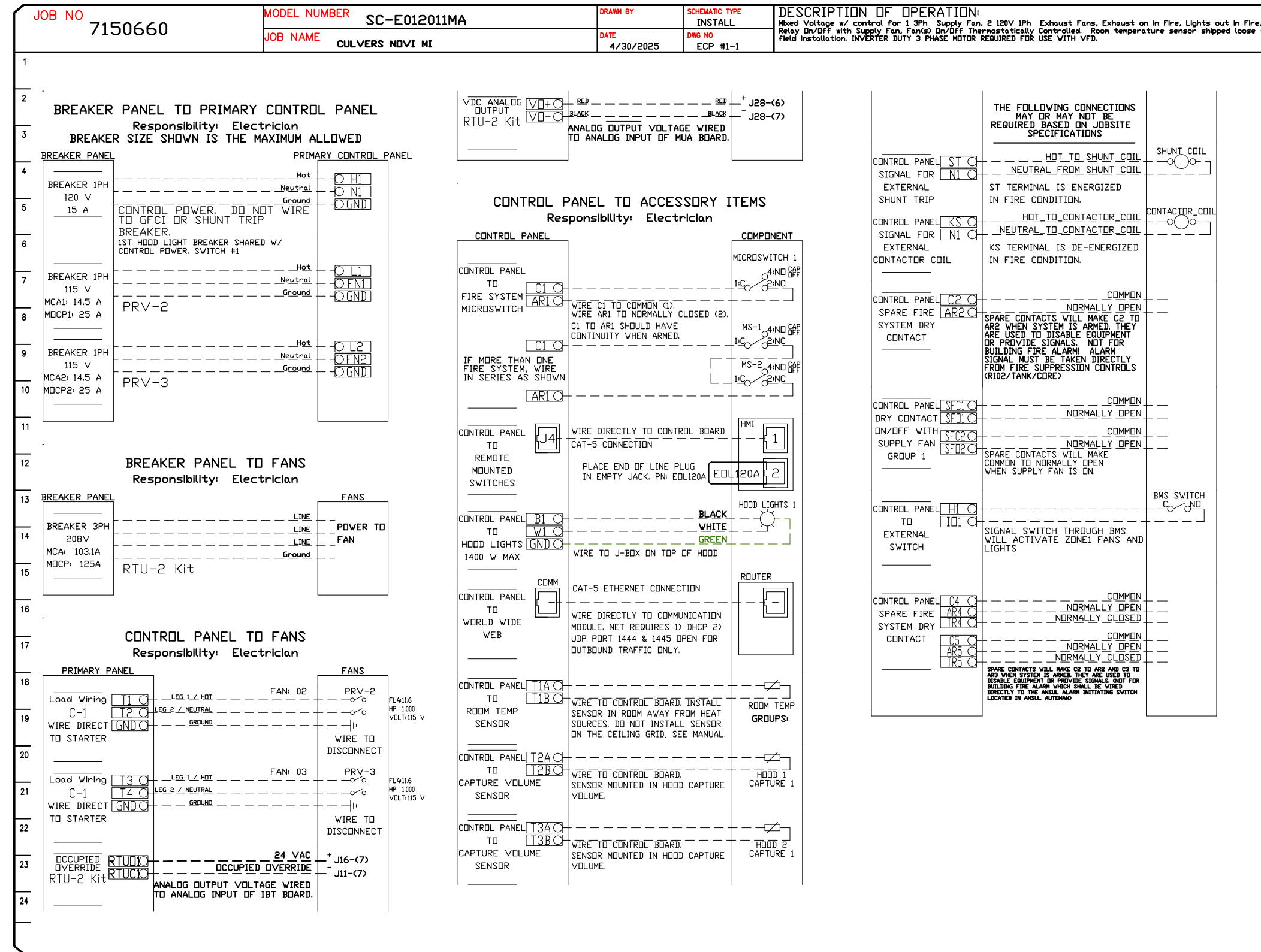


**CASlink Monitor and Control**

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



REVISIONS	
DESCRIPTION	DATE

**CAPTIVE**

Florida National Accounts

239 N Hunt Club Blvd., STE 201, Longwood, FL 32779 PHONE: (407) 682-3100 FAX: 9192275913 EMAIL: reg60@captiveware.com

www.captiveware.com

CULVERS NOVI MI  
43530 W OAKS DRIVE,  
Novi, MI, 48377

DATE: 4/30/2025

DWG.#:  
7150660

DRAWN BY: studdy jr

SCALE:  
3/4" = 1'-0"

MASTER DRAWING

SHEET NO.  
9

SYSTEM DESIGN VERIFICATION (SDV)

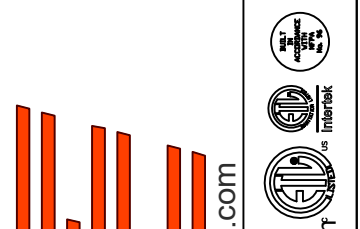
IF ORDERED, CAS SERVICE WILL PERFORM A SYSTEM DESIGN VERIFICATION (SDV) ONCE ALL EQUIPMENT HAS HAD A COMPLETE START UP PER THE OPERATION AND INSTALLATION MANUAL. TYPICALLY, THE SDV WILL BE PERFORMED AFTER ALL INSPECTIONS ARE COMPLETE.

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**

DESCRIPTION	DATE:
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Δ	
Δ	



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CULVERS NOVI MI  
43530 W OAKS DRIVE,  
Novi, MI, 48377

**DATE:** 4/30/2025

**DWG.#:**  
7150660

**DRAWN BY:** sluddy jr

**SCALE:**  
3/4" = 1'-0"

**MASTER DRAWING**

**SHEET NO.**  
10

# GENERAL NOTES

- DEVIATIONS FROM THE HVAC PLANS ARE THE RESPONSIBILITY OF THE HVAC CONTRACTOR & WILL NOT RESULT IN ADDITIONAL COSTS TO THE OWNER UNLESS WRITTEN CHANGE ORDERS ARE APPROVED BY THE OWNER.
- ALL WORK TO BE PERFORMED TO STATE AND LOCAL CODES & SMACNA GUIDELINES.
- INSTALL UNITS ACCORDING TO MANUFACTURERS GUIDELINES.
- PROVIDE OWNER w/OPERATION & MAINTENANCE MANUALS & SYSTEM SCHEMATICS.
- CONTRACTOR TO CONFIRM VOLTAGES & PHASES OF EQUIPMENT PRIOR TO INSTALLATION.
- EXHAUST FANS AND FURNACE FANS TO RUN CONTINUOUSLY DURING OCCUPIED MODE.
- VERIFY w/ OWNER EXACT HEATER LOCATION TO AVOID BUILDING FUNCTION INTERFERENCE.
- NIGHT SET BACK THERMOSTATS TO BE INSTALLED ON ALL HVAC EQUIPMENT.
- INSULATE DUCT WORK TO SMACNA GUIDELINES AND STATE CODES.
- INSTALL VOLUME CONTROL DAMPERS AS INDICATED ON PLANS.
- MAINTAIN AT LEAST 10 FEET CLEARANCE FROM INTAKES OR WINDOWS ON ALL EXHAUST VENTS.
- RETURN AIR DUCT WORK TO BE LINED FOR SOUND ATTENUATION.
- FLEXIBLE ROUND DUCT WORK NOT TO EXCEED 8 FEET IN LENGTH. AVOID UNNECESSARY TURNS & SLACK.
- DUCT WORK TO BE STANDARD GAUGE SHEET METAL (FIBROUS DUCT NOT ALLOWED).
- COORDINATE WORK & GENERAL CONTRACTOR & OWNER TO MAXIMIZE CEILING HEIGHT & AVOID CONFLICTS.
- TEST, ADJUST & CALIBRATE CONTROL SYSTEMS AS REQUIRED. PROVIDE SCHEMATICS & DESCRIPTION TO THE OWNER PRIOR TO INSTALLATION.
- INSULATE EXHAUST DUCT FOR EXHAUST FAN TO EXTERIOR TERMINATION. comply with note 31 below.
- CONTRACTOR TO VERIFY GAS METER CAPACITY WITH LOCAL GAS SUPPLIER.
- VERIFY ALL EXISTING CONDITIONS PRIOR TO INSTALLATION (DRAWINGS ARE DIAGRAMMATIC IN NATURE AND DO NOT REFLECT EXACT LOCATIONS OF EQUIPMENT OR OTHER APPARATUSES.)
- PROVIDE SHOP DRAWINGS TO THE ARCHITECT/DESIGNER FOR EQUIPMENT, FANS, REGISTERS ETC. PRIOR TO PROCUREMENT.
- PROVIDE OWNER WITH COLOR CHOICES FOR SWITCHES AND OTHER APPARATUSES WHERE APPLICABLE.
- WATER HEATER IS EXISTING TO REMAIN.
- VENT DRYER TO EXTERIOR AS REQUIRED. MAINTAIN CLEARANCES FROM INTAKES AS NOTED ABOVE.
- HANG AND SUPPORT MATERIALS SHALL BE INSTALLED THE LATEST EDITION OF THE ASHRAE HANDBOOK OF FUNDAMENTALS.
- HVAC CONTRACTOR RESPONSIBLE FOR A COMPLETE AND FULLY WORKING SYSTEM.
- REPLACE ALL AIR FILTERS PRIOR TO TURNING SYSTEM OPERATIONS OVER TO OWNER.
- INSTALLER IS RESPONSIBLE FOR FINAL TEST & BALANCING DURING TRAINING WEEK & PROVIDE A WRITTEN REPORT TO OWNER.
- HVAC CONTRACTOR TO INSTALL #2 GAS w/ 1/4" WATER COLUMN MAX. PER STATE CODE & AGA GUIDELINES (LABEL AS REQUIRED).
- VERIFY DUCT LOCATIONS PRIOR TO FABRICATION. VERIFY LIMITED AREA FOR DUCTWORK & OTHER APPARATUSES.
- S/S WALL PANELS FOR THE KITCHEN AREA ARE TO BE FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.** PANELS ARE TO BE 18 GA. TYPE 304 S/S. SEE DETAILS AND LOCATIONS ON THE A-6 AND A-8.1 DRAWINGS.
- COMMERCIAL KITCHEN HOOD VENTILATION DUCTS AND EXHAUST EQUIPMENT SHALL BE IN COMPLIANCE WITH NFPA-96-2014, WHICH IS THE STANDARD OF THE NATIONAL FIRE PROTECTION ASSOCIATION LISTED IN CHAPTER 15 OF THE CODE.

# MECHANICAL EQUIPMENT SPECIFICATIONS

**RTU - 1 REFER TO CAPTIVEAIRE SCHEDULES FOR INFORMATION**

**RTU - 2 REFER TO CAPTIVEAIRE SCHEDULES FOR INFORMATION**

**PRV - 1 REFER TO CAPTIVEAIRE SCHEDULES FOR INFORMATION**

**PRV - 2 REFER TO CAPTIVEAIRE SCHEDULES FOR INFORMATION**  
(ITEM #49)

**PRV - 3 REFER TO CAPTIVEAIRE SCHEDULES FOR INFORMATION**  
(ITEM #59)

**EF1-A REFER TO CAPTIVEAIRE SCHEDULES FOR INFORMATION**  
(ITEM #25)

**EF - 1 REFER TO CAPTIVEAIRE SCHEDULES FOR INFORMATION**

**ITEM #49 REFER TO CAPTIVEAIRE SCHEDULES FOR INFORMATION**

**ITEM #59 REFER TO CAPTIVEAIRE SCHEDULES FOR INFORMATION**

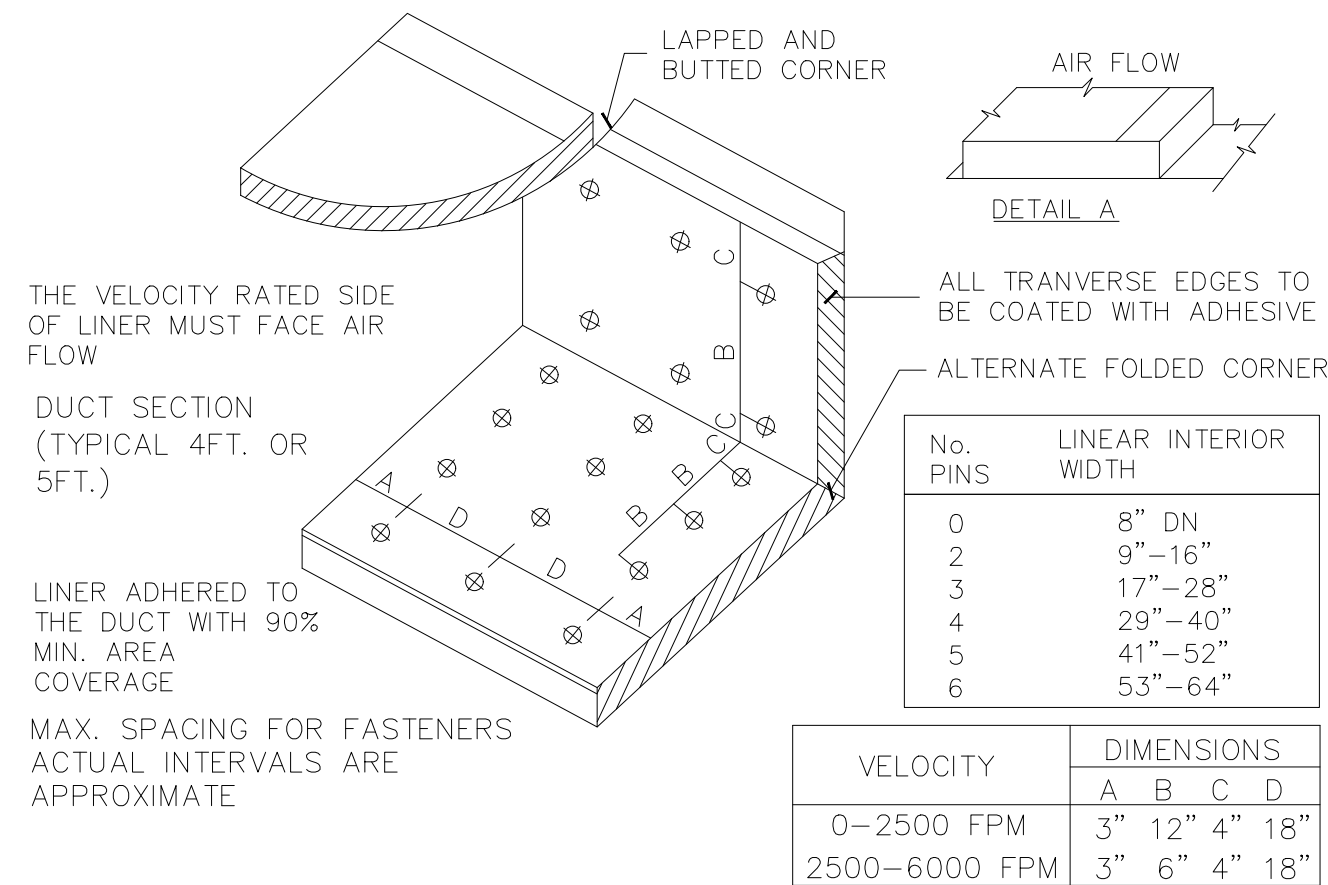
**ITEM #25A REFER TO CAPTIVEAIRE SCHEDULES FOR INFORMATION**

**ECH ELECTRIC CEILING HEATER** - 0-MARK OR EQUAL CDF-548 ELECTRIC CEILING HEATER & CDF RECESSED MOUNTING FRAME, CDF-TR4 TRANSFORMER & THERMOSTAT. 208/240 VOLT SINGLE PHASE. 19.2 AMPS. **(SUPPLIED AND INSTALLED BY ELECTRICAL CONTRACTOR)**

**EF-2 CO2 EXHAUST FAN** GREENHECK SP-A200 CEILING EXHAUST FAN OR EQUAL. 225 CFM AT 0.15" SP, 900 RPM, 54 WATTS 115 VOLT 0.6 MCA. WITH WALL CAP. CONTINUOUS OPERATION.

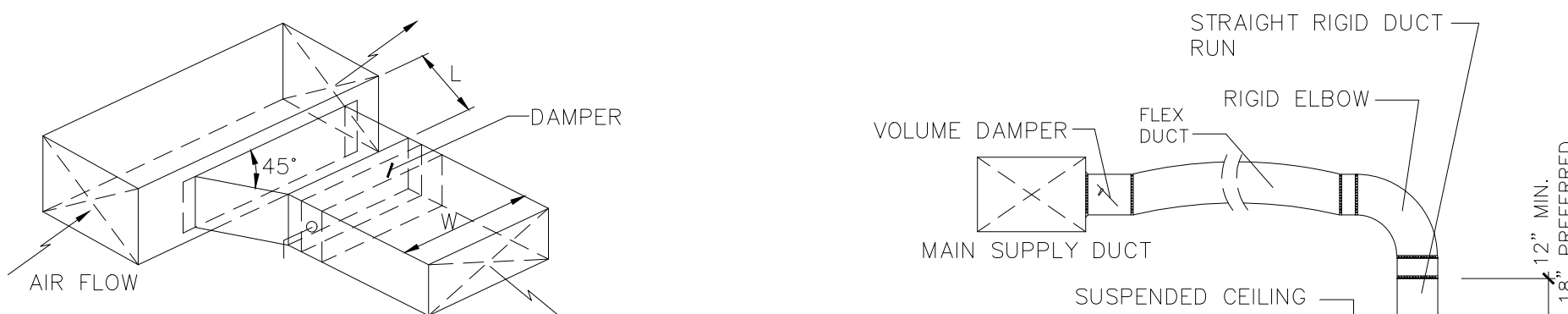
### AIR BALANCE TABLE

Mark	Vent. Air CFM	Exh. Air CFM	Net Balance
RTU-1	+1900	--	+1900
RTU-2	+1900	--	+3800
PRV-1	--	-300	+3500
PRV-2	--	-1500	+2000
EF1-A	--	-1500	+500
PRV-4	--	-350	+150
EF-1	--	-75	+75



### DUCT LINER INSTALLATION DETAIL

**N.T.S.** NOTE: USE ONLY ON VERTICAL DROP FROM RTU TO WITHIN 9'-10" A.F.F., DUCT LINER WILL NOT BE PERMITTED ON ANY HORIZ. RUNS.



### BRANCH DUCT TAKEOFF DETAILS

**N.T.S.**

# DIFFUSER/GRILLE SCHEDULE

QNTY	Mark	Manuf.	Model	Type	Mounting	Diffuser	Neck	CFM	Zone	Notes
16	CD-10	RAYMON	PRO2	SUPPLY	GRID	4-WAY	8"	150	RTU-1	2
1	CD-11	RAYMON	PRO2	SUPPLY	GRID	4-WAY	10"	500	RTU-1	
1	CD-12	RAYMON	PRO2	SUPPLY	GRID	4-WAY	8"	200	RTU-1	
1	CD-13	RAYMON	PRO2/DMF/DAG	SUPPLY	CEILING	3-WAY	8"	150	RTU-1	3
1	CD-14	RAYMON	PRO2	SUPPLY	GRID	4-WAY	8"	75	RTU-1	
2	CD-15	RAYMON	PRO2/DMF	SUPPLY	CEILING	4-WAY	8"	150	RTU-1	3
2	CD-16	RAYMON	PRO2	SUPPLY	GRID	4-WAY	12"	450	RTU-1	
4	CD-17	RAYMON	PRO2	SUPPLY	GRID	4-WAY	10"	350	RTU-1	
1	CD-18	RAYMON	PRO2	SUPPLY	GRID	4-WAY	10"	300	RTU-1	6
1	CD-20	RAYMON	PRO2	SUPPLY	GRID	4-WAY	12"	600	RTU-2	
3	CD-21	RAYMON	RPR	SUPPLY	GRID	PERFORATED	12"	350	RTU-2	7,9
2	CD-22	RAYMON	PRO2	SUPPLY	GRID	4-WAY	12"	600	RTU-2	
1	CD-23	RAYMON	RPR	SUPPLY	GRID	PERFORATED	10"	200	RTU-2	7,9
1	CD-24	RAYMON	RPR	SUPPLY	GRID	PERFORATED	12"	375	RTU-2	7,9
2	CD-25	RAYMON	RPR	SUPPLY	GRID	PERFORATED	12"	400	RTU-2	7,9
1	CD-26	RAYMON	RPR	SUPPLY	GRID	PERFORATED	10"	250	RTU-2	7,9
1	CD-27	RAYMON	RPR	SUPPLY	GRID	PERFORATED	10"	275	RTU-2	7,9
1	CD-28	RAYMON	RPR	SUPPLY	GRID	PERFORATED	8"	125	RTU-2	7,9
1	CD-29	RAYMON	PRO2/DAG	SUPPLY	GRID	3-WAY	12"	600	RTU-2	
2	EG-1	RAYMON	FGECR-TB	EXHAUST	GRID	24" x 24"	8"	75	RTU-1	
2	EG-2	RAYMON	RA-HVD	EXHAUST	CEILING	12" x 12"	8"	150	RTU-1	4
5	RG-10	RAYMON	FGEC-TB1	RETURN	GRID	RETURN	14"	1245	RTU-1	8
5	RG-20	RAYMON	FGEC-TB1	RETURN	GRID	RETURN	14"	1335	RTU-2	8
1	TG-1	RAYMON	RA-RH	TRANSFER	WALL	12" x 4"	12" x 4"	0	RTU-1	5
2	WD-20	RAYMON	RA-HVD	SUPPLY	WALL	24 x 6"		600	RTU-2	

- DIFFUSER NOTES:**
- REMOVED NOTE
  - 4 OF THE CD-10 DIFFUSERS ARE TO BE FLAT BLACK. ALL OTHERS TO BE WHITE. SEE REFLECTED CEILING PLAN FOR LOCATIONS.
  - 12X12 NOMINAL PANEL SIZE.
  - PROVIDE WITH ADJUSTABLE OPPOSED BLADE DAMPER
  - MOUNT SO THE OCCUPANT CAN NOT SEE INTO THE DUCT
  - FLAT BLACK FINISH
  - DESIGN CFM MUST BE MAINTAINED FOR PROPER HOOD OPERATION
  - REMOVABLE CORE DIFFUSERS
  - WITHOUT PATTERN CONTROLLERS

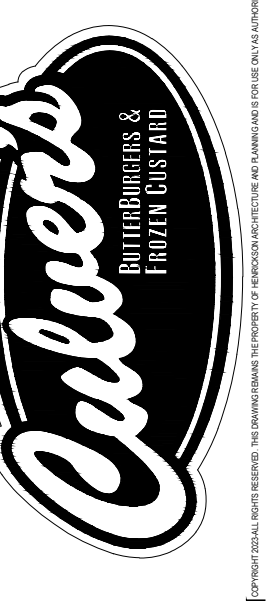
# CONTROL NOTES

- WIRE RTU-1, RTU-2 TO SHUT-DOWN & EXHAUST HOOD FANS TO CONTINUE TO RUN UPON ACTIVATION OF THE ANSUL SYSTEM.
- WIRE RTU-1 & RTU-2 TO SHUT-DOWN UPON ACTIVATION OF ANY IN-DUCT SMOKE DETECTOR.
- OCCUPIED MODE: FANS IN RTU-1 & RTU-2, EXHAUST FANS PRV-1, 2 & 3 AND EF-1 TO RUN CONTINUOUSLY.
- UNOCCUPIED MODE: FANS IN RTU-1 & RTU-2 TO RUN ONLY WHEN COOLING OR HEATING IS CALLED FOR.



415 Leonard St. NW, Suite 201  
Grand Rapids, MI 49504  
616.458.5554

**Metro M - 2023**  
4850 W. OAKS DRIVE  
NOVI, MICHIGAN 48377



PERMIT	• 02.03.26
ADDENDUM 2	• 03.13.25
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	•
DRAWN BY:	• JMV
CHECKED:	• DSH

### HVAC NOTES

PROJECT No. • 230509

**M-2**