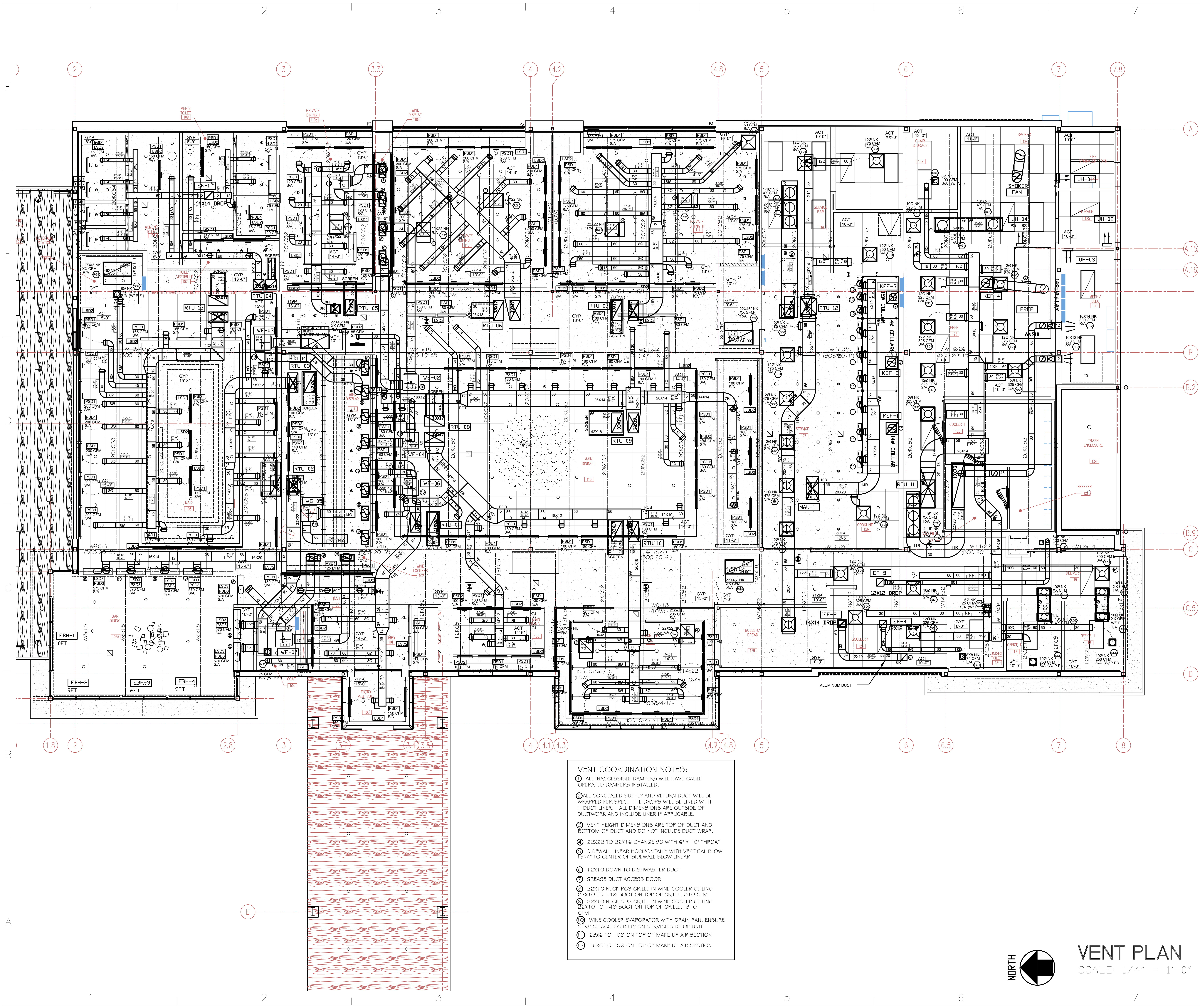

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7
F
E
D
C
B
A
MEN'S TOILET
PRIVATE DINING I
WINE DISPLAY
WOMEN'S TOILET
TOILET VESTIBULE
RTU 13
RTU 04
RTU 05
RTU 06
RTU 07
RTU 03
RTU 02
RTU 01
RTU 08
RTU 09
RTU 10
RTU 11
RTU 12
WE-03
WE-02
WE-04
WE-05
WE-06
WE-07
EF-1
EF-2
EF-3
EF-4
KEF-1
KEF-2
KEF-3
KEF-4
MAU-1
UH-01
UH-02
UH-03
UH-04
EBH-1
EBH-2
EBH-3
EBH-4
10FT
9FT
6FT
14X14 DROP
12X12 DROP
SMOKER FAN
ANSUL
PREP
BAR
BAR DINING
MAIN DINING I
WINE LOCKERS
HOST
ENTRY VESTIBULE
COAT
BUSSER/ BREAD
SERVICE BAR
SERVICE
COOLER
TRASH ENCLOSURE
FREEZER
STORAGE
DELIVERY
OFFICE
UNISEX TOILET
SCULLERY
COOKLINE
ALUMINUM DUCT
12Ø COLLAR
14Ø COLLAR
HSS10x4x1/4
VENT PLAN
SCALE: 1/4" = 1'-0"
NORTH

VENT COORDINATION NOTES:

① ALL INACCESSIBLE DAMPERS WILL HAVE CABLE OPERATED DAMPERS INSTALLED.

② ALL CONCEALED SUPPLY AND RETURN DUCT WILL BE WRAPPED PER SPEC. THE DROPS WILL BE LINED WITH 1" DUCT LINER. ALL DIMENSIONS ARE OUTSIDE OF DUCTWORK AND INCLUDE LINER IF APPLICABLE.

③ VENT HEIGHT DIMENSIONS ARE TOP OF DUCT AND BOTTOM OF DUCT AND DO NOT INCLUDE DUCT WRAP.

④ 22X22 TO 22X16 CHANGE 90 WITH 6" X 10" THROAT

⑤ SIDEWALL LINEAR HORIZONTALLY WITH VERTICAL BLOW 15'-4" TO CENTER OF SIDEWALL BLOW LINEAR

⑥ 12X10 DOWN TO DISHWASHER DUCT

⑦ GREASE DUCT ACCESS DOOR

⑧ 22X10 NECK RG3 GRILLE IN WINE COOLER CEILING 22X10 TO 14Ø BOOT ON TOP OF GRILLE. 810 CFM

⑨ 22X10 NECK SD2 GRILLE IN WINE COOLER CEILING 22X10 TO 14Ø BOOT ON TOP OF GRILLE. 810 CFM

⑩ WINE COOLER EVAPORATOR WITH DRAIN PAN. ENSURE SERVICE ACCESSIBILTY ON SERVICE SIDE OF UNIT

⑪ 28X6 TO 10Ø ON TOP OF MAKE UP AIR SECTION

⑫ 16X6 TO 10Ø ON TOP OF MAKE UP AIR SECTION

VENT PLAN

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

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WOLF MECHANICAL DRAFTING SERVICES

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MARK	DATE	DESCRIPTION
2	6.06.23	FOR CONSTRUCTION
1	3.24.23	FOR COORDINATION

PROJECT NO: ----
CAD DWG FILE: M1.0 FOR CONSTRUCTION 6.06.23.DWG
DRAWN BY: JAKE
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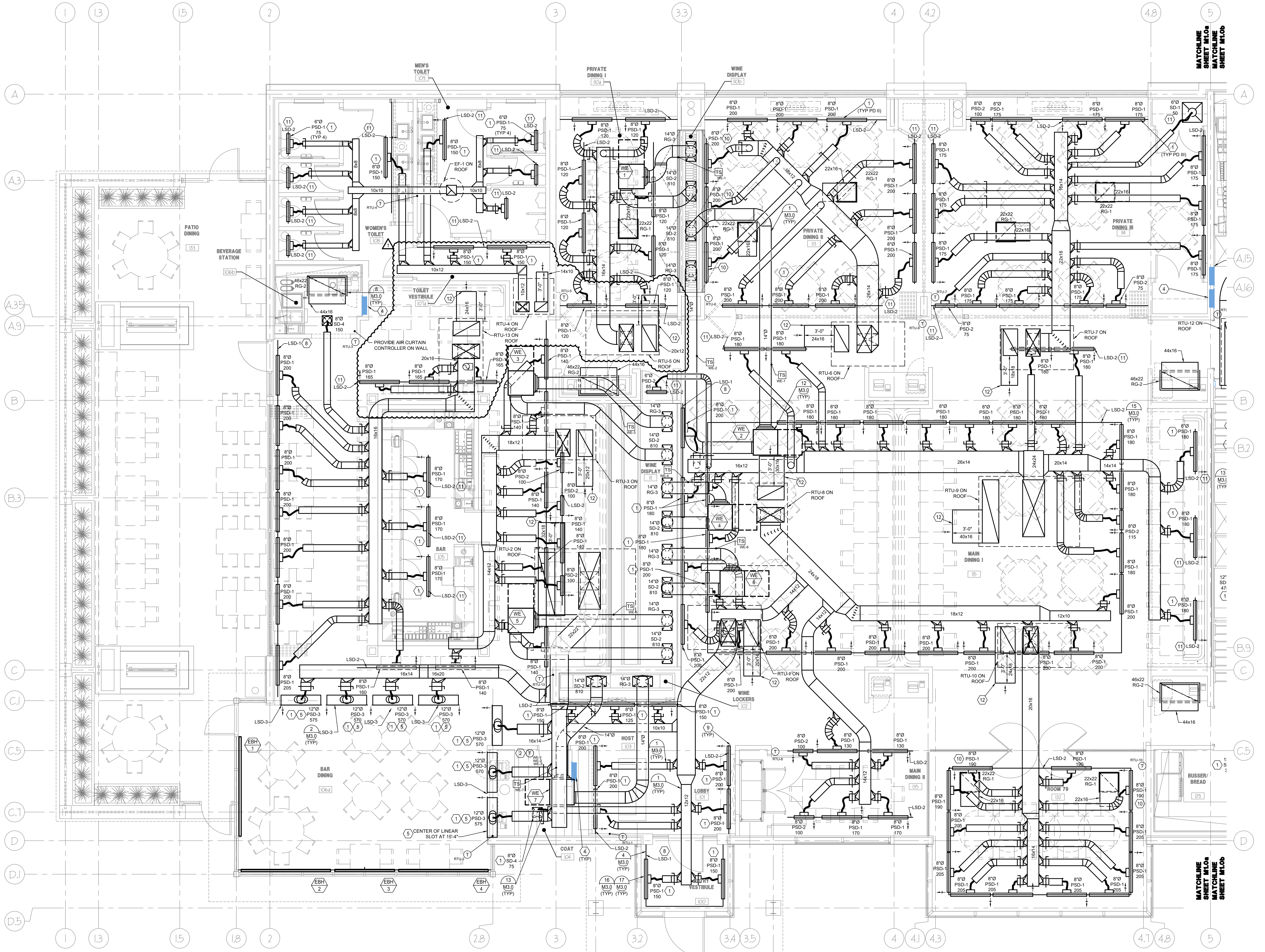
SHEET TITLE

VENT COORDINATION

M1.0

SHEET SHEET INDEX OF TOTAL SHEETS


MEN'S TOILET
WOMEN'S TOILET
TOILET VESTIBULE
PRIVATE DINING I
WINE DISPLAY
PRIVATE DINING II
PRIVATE DINING III
PATIO DINING
BEVERAGE STATION
BAR
BAR DINING
WINE LOCKERS
HOST
LOBBY
COAT
VESTIBULE
MAIN DINING I
MAIN DINING II
ROOM 79
BUSSER/ BREAD
PROVIDE AIR CURTAIN CONTROLLER ON WALL
EF-1 ON ROOF
RTU-2 ON ROOF
RTU-3 ON ROOF
RTU-4 ON ROOF
RTU-5 ON ROOF
RTU-6 ON ROOF
RTU-7 ON ROOF
RTU-8 ON ROOF
RTU-9 ON ROOF
RTU-10 ON ROOF
RTU-11 ON ROOF
RTU-12 ON ROOF
RTU-13 ON ROOF
CENTER OF LINEAR SLOT AT 15'-4"
MATCHLINE SHEET M1.0a MATCHLINE SHEET M1.0b

① MECHANICAL FLOOR PLAN - SEGMENT A
SCALE: 1/4"=1'-0"

MECHANICAL PLAN NOTES:

1. CEILING DIFFUSER INSTALLED IN INACCESSIBLE CEILING SHALL HAVE CABLE OPERATED DAMPER FOR AIR BALANCING. PROVIDE CABLE OPERATED VOLUME DAMPER BY METROPLOLITAN AIR TECHNOLOGIES MODEL RT-250 WITH EXTERNAL WORM GEAR OR YOUNG REGULATOR EQUIVALENT BUTTERFLY DAMPER WITH 270-275 CONTROLLER. DAMPER CABLE ACTUATOR SHALL BE ACCESSIBLE FOR BALANCING FROM THE FLANGE OF A SLOT DIFFUSER OR THE TOP OF A SQUARE OR ROUND FACE DIFFUSER AS DETAILED. INSTALL VOLUME DAMPER AT LOCATION INDICATED ON PLAN.
2. PROVIDE WINE ROOM THERMOSTATS ON WALL, MINIMUM 48" AFF. POWER FROM EVAPORATOR TO THERMOSTAT IS 120/1. WIRING TO TEMPERATURE SENSOR IS LOW VOLTAGE. INSTALL PER MANUFACTURERS INSTALLATION GUIDELINES.
3. MOUNT TEMPERATURE SENSOR IN RETURN AIR DUCTWORK. CONNECT SENSOR TO ASSOCIATED THERMOSTAT.
4. DO NOT INSTALL DUCTWORK OR PIPING ABOVE ELECTRICAL PANELS OR MAINTAIN NEC HEIGHT REQUIREMENTS.
5. CENTER OF LINEAR SLOT SHALL BE AT 15'-4" AFF. ANGLE AIRFLOW 15 DEGREES DOWNWARD. SLOT SHALL BE 4'-2" LONG ALLOWING SPACE FOR CABLE OPERATED DAMPER ACTUATOR ACCESS..
6. ACCESS PANEL, SEE ARCHITECTURAL SHEETS FOR MORE INFORMATION. COORDINATE LOCATION WITH EQUIPMENT AND FILTER ACCESS REQUIREMENTS. COORDINATE TYPE AND COLOR WITH ARCHITECT.
7. NOT USED.
8. ALL JET THROW SLOT DIFFUSERS ALONG WALLS SHALL HAVE ADJUSTABLE CONTROLLERS ADJUSTED TO THROW AIR 15 DEGREES TOWARDS WALL.
9. FIELD ADJUST LINEAR SLOT AIR DEFLECTION TO MATCH THROW DIRECTION SHOWN BY ARROWS.
10. PROVIDE FIELD FABRICATED PLENUM BOX EXTENDED AS NECESSARY TO ACCOMMODATE DIFFERING CEILING HEIGHTS OR OBSTRUCTIONS. COORDINATE WITH DETAIL AND ARCHITECTURAL RCP.
11. LINEAR SLOT SHALL BE LONG ENOUGH TO ACCOMMODATE REMOTE OPERATOR ACCESS PER DETAIL.
12. INSTALL DUCT WITHIN BEAM POCKET, TIGHT TO DECK.
13. INSTALL BOTTOM OF UNIT 1'-6" ABOVE CEILING.

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EXPIRES ON: 11/30/2023
COY M. MACY
062.068038
04/20/2023

Drawing Title
MECHANICAL
FLOOR PLAN
SEGMENT A

Job No.

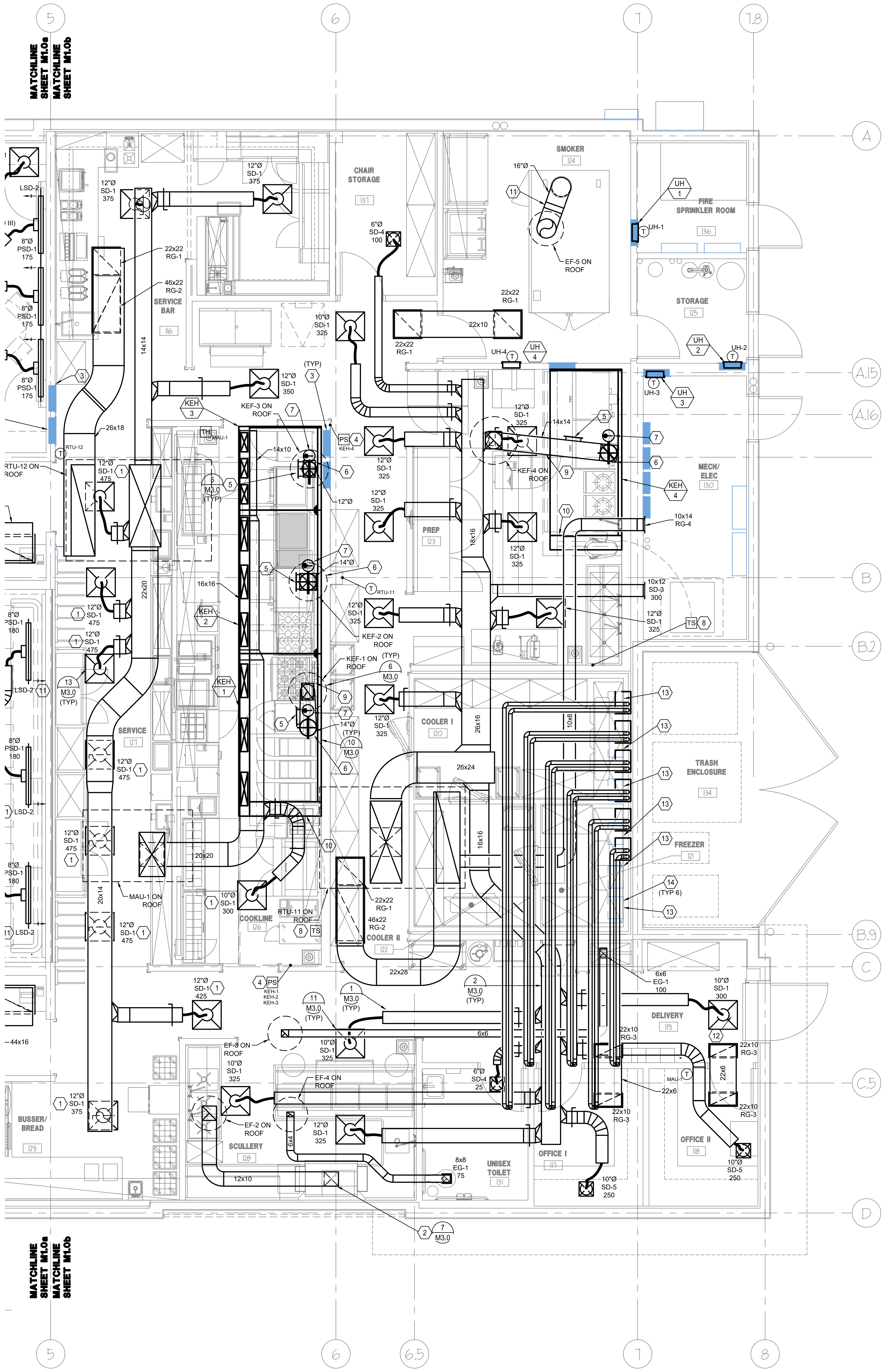
Drawn
DLJ

Scale
AS NOTED

Date

Sheet No.
M1.0a

COY M. MACY


MATCHLINE SHEET M1.0a
MATCHLINE SHEET M1.0b
5
6
6.5
7
7.8
8
A
A1.5
A1.6
B
B.2
B.9
C
C.5
D
CHAIR STORAGE
SMOKER
FIRE SPRINKLER ROOM
STORAGE
SERVICE BAR
MECH/ELEC
PREP
COOLER I
TRASH ENCLOSURE
FREEZER
SERVICE
COOKLINE
COOLER II
DELIVERY
BUSSER/BREAD
SCULLERY
UNISEX TOILET
OFFICE I
OFFICE II
RTU-12 ON ROOF
MAU-1 ON ROOF
RTU-11 ON ROOF
KEF-3 ON ROOF
KEF-2 ON ROOF
KEF-1 ON ROOF
KEF4 ON ROOF
EF-5 ON ROOF
EF-3 ON ROOF
EF-4 ON ROOF
EF-2 ON ROOF
UH-1
UH-2
UH-3
UH-4
22x22 RG-1
46x22 RG-2
10x14 RG-4
22x10 RG-3
10x12 SD-3 300
10"Ø SD-5 250
8x8 EG-1 75
6x6 EG-1 100
12"Ø SD-1 325
M3.0 (TYP)

1 MECHANICAL FLOOR PLAN - SEGMENT B
SCALE: 1/4"=1'-0"

MECHANICAL PLAN NOTES:

1. CEILING DIFFUSER INSTALLED IN INACCESSIBLE CEILING SHALL HAVE CABLE OPERATED DAMPER FOR AIR BALANCING. PROVIDE CABLE OPERATED VOLUME DAMPER BY METROPLOLITAN AIR TECHNOLOGIES MODEL RT-250 WITH EXTERNAL WORM GEAR OR YOUNG REGULATOR EQUIVALENT BUTTERFLY DAMPER WITH 270-275 CONTROLLER. DAMPER CABLE ACTUATOR SHALL BE ACCESSIBLE FOR BALANCING FROM THE FLANGE OF A SLOT DIFFUSER OR THE TOP OF A SQUARE OR ROUND FACE DIFFUSER AS DETAILED. INSTALL VOLUME DAMPER AT LOCATION INDICATED ON PLAN.
2. COORDINATE DISHWASHER EXHAUST DUCT WITH FSEC. PROVIDE ALUMINUM EXHAUST DUCT FROM DISHWASHER PANTLEG CONNECTION AT CEILING TO EXHAUST FAN. SLOPE EXHAUST DUCT MINIMUM 1/4" PER FOOT TOWARD DISHWASHER HOOD. PROVIDE TRANSITIONS AS REQUIRED TO RIGIDLY CONNECT TO EXHAUST FAN.
3. DO NOT INSTALL DUCTWORK OR PIPING ABOVE ELECTRICAL PANELS OR MAINTAIN NEC HEIGHT REQUIREMENTS.
4. INSTALL MANUAL PULL STATION FOR HOOD FIRE SUPPRESSION SYSTEM PER NFPA 96 REQUIREMENTS. PRIOR TO INSTALLATION, VERIFY LOCATION WITH AHJ.
5. PROVIDE GREASE DUCT CLEANOUT ACCESS DOOR AT LOCATIONS INDICATED AND AS REQUIRED TO MEET AHJ REQUIREMENTS. PROVIDE PROPER CLEARANCE IN FRONT OF CLEANOUT FOR ACCESS.
6. PROVIDE GREASE EXHAUST CONNECTION TO HOOD. DUCT SIZE TO MATCH HOOD CONNECTION SIZE, TRANSITION AS NECESSARY. BALANCE EXHAUST TO MATCH CAPTIVEAIRE PLANS.
7. DUCT MOUNTED HEAT DETECTOR MOUNTED IN EXHAUST HOOD DUCT RISER, FURNISHED WITH HOOD, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.
8. INSTALL WALL TEMPERATURE SENSOR. TEMPERATURE SENSOR IS PART OF CAPTIVEAIRE HOOD SYSTEM. MOUNT HIGH ON WALL. COORDINATE WITH FOOD SERVICE EQUIPMENT CONTRACTOR.
9. PROVIDE RADIUS ELBOWS WITHOUT TURNING VANES AS NECESSARY FOR TYPE 1 GREASE HOOD EXHAUST DUCTWORK. SLOPE GREASE DUCT TOWARDS HOODS AT MINIMUM OF 1/4" PER LINEAL FOOT. PROVIDE TRANSITIONS AS REQUIRED TO CONNECT TO HOOD AND EXHAUST FAN.
10. EXHAUST HOOD FIRE EXTINGUISHING SYSTEM AND CONTROLS SHALL BE FURNISHED AND INSTALLED BY FOOD SERVICE EQUIPMENT CONTRACTOR (MECHANICAL CONTRACTOR TO COORDINATE) IN COMPLETE CONFORMANCE WITH NFPA 96, LOCAL CODES, AND SIZED TO SERVE ASSOCIATED HOODS. SEE CAPTIVEAIRE PLANS AND FOOD SERVICE PLANS FOR MORE INFORMATION. SYSTEM SHALL BE HOOD MOUNTED.
11. SMOKER SHALL BE DIRECT VENTED PER MANUFACTURERS INSTALLATION GUIDELINES. SMOKER HAS LISTINGS U.L. 737 (FIREPLACE STOVES) AND U.L. 391 (SOLID-FUEL AND COMBINATION-FUEL CENTRAL AND SUPPLEMENTARY FURNACES) PERMITTING DIRECT VENTING. VENT DUCTWORK SHALL BE DURAVENT DURATECH OR EQUIVALENT CAPTIVEAIRE DUCT. OFFSET AS SHOWN WITH 45 DEGREE ELBOWS.
12. AIR CURTAIN PROVIDED BY KITCHEN EQUIPMENT CONSULTANT.
13. WALL MOUNTED GAS-FIRED WATER HEATER. REFER TO PLUMBING DRAWINGS.
14. PROVIDE 3" FLUE AND 3" VENT PIPE TO EACH WATER HEATER. TERMINATE AT ROOF WITH CONCENTRIC VENT. INSTALL PER MANUFACTURERS REQUIREMENTS.
15. COORDINATE UNIT HEATER MOUNTING LOCATION WITH WATER HEATER PIPING AND WATER HEATER CLEARANCES.

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062.068038
04/20/2023

Drawing Title
MECHANICAL FLOOR PLAN SEGMENT B

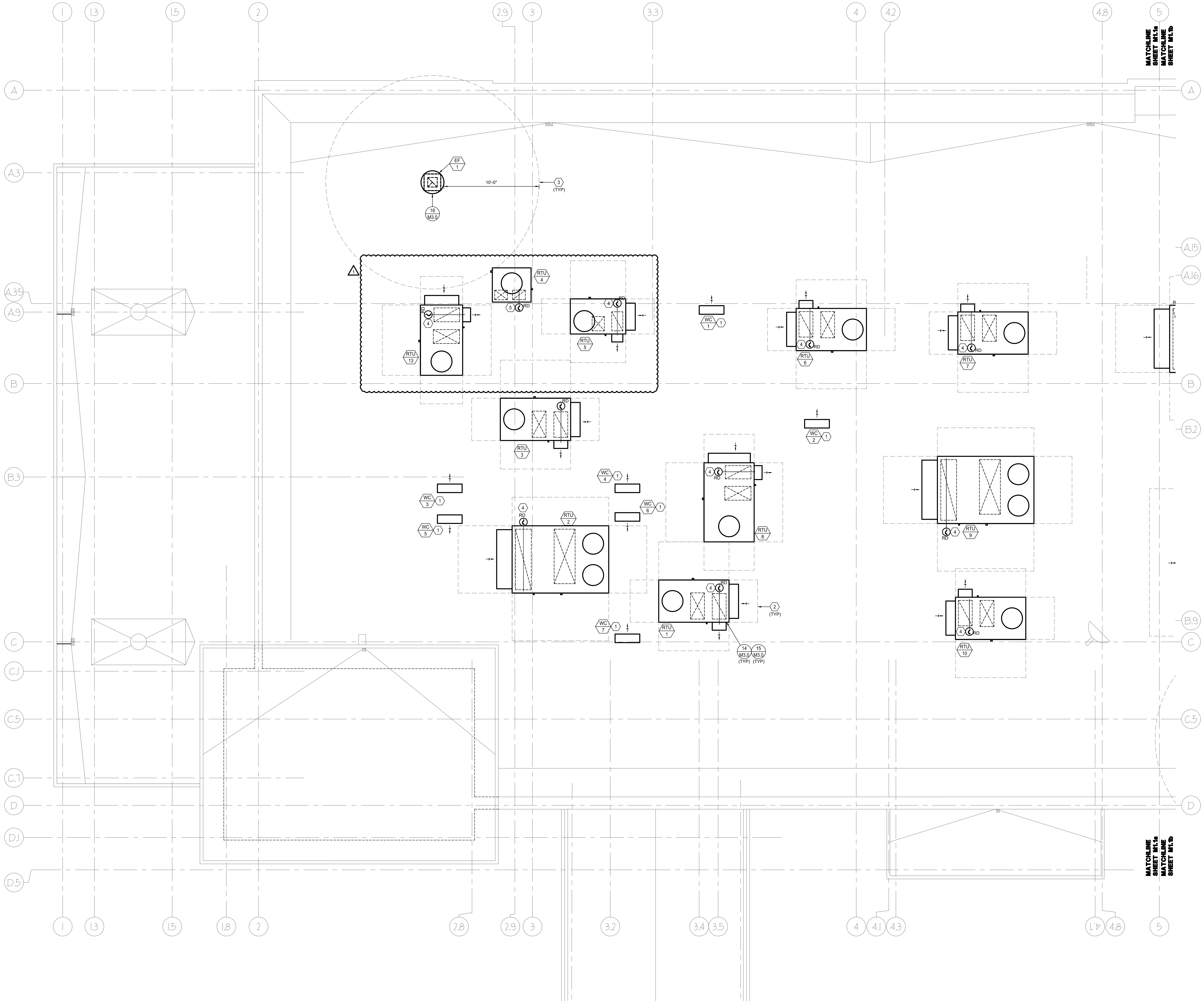
Job No.	Drawn
	DLJ
Scale	Date
AS NOTED	

Sheet No.
M1.0b

COY M. MACY

MECHANICAL PLAN NOTES:

1. CONDENSING UNIT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS WITH THE UNIT LOCATION COORDINATED WITH ALL DISCIPLINES. PROVIDE REFRIGERANT PIPING TO EVAPORATOR SIZED AND INSTALLED PER MANUFACTURERS REQUIREMENTS.
2. DASHED LINE INDICATES MANUFACTURERS REQUIRED SERVICE CLEARANCE.
3. DO NOT INSTALL OUTSIDE AIR INTAKES WITHIN 10' OF EXHAUST.
4. RETURN SMOKE DETECTOR TO BE PROVIDED IN UNIT BY RTU MANUFACTURER.
5. RETURN SMOKE DETECTOR TO BE PROVIDED BY FIRE ALARM CONTRACTOR.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A
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A.9
A.15
A.16
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B.2
B.3
B.9
C
C.1
C.5
C.7
D
D.1
D.5
1.8
2.8
3.2
3.4
3.5
4.1
4.3
4.7
MATCHLINE SHEET M1.1a
MATCHLINE SHEET M1.1b
EF 1
18 M3.0
10'-0"
3 (TYP)
RTU 1
RTU 2
RTU 3
RTU 4
RTU 5
RTU 6
RTU 7
RTU 8
RTU 9
RTU 10
RTU 13
WC 1
WC 2
WC 3
WC 4
WC 5
WC 6
WC 7
RD
4
5
1
2 (TYP)
14 M3.0 (TYP)
15 M3.0 (TYP)

1 MECHANICAL ROOF PLAN - SEGMENT A
SCALE: 1/4"=1'-0"

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Drawing Title
MECHANICAL ROOF PLAN SEGMENT A

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DLJ

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Date

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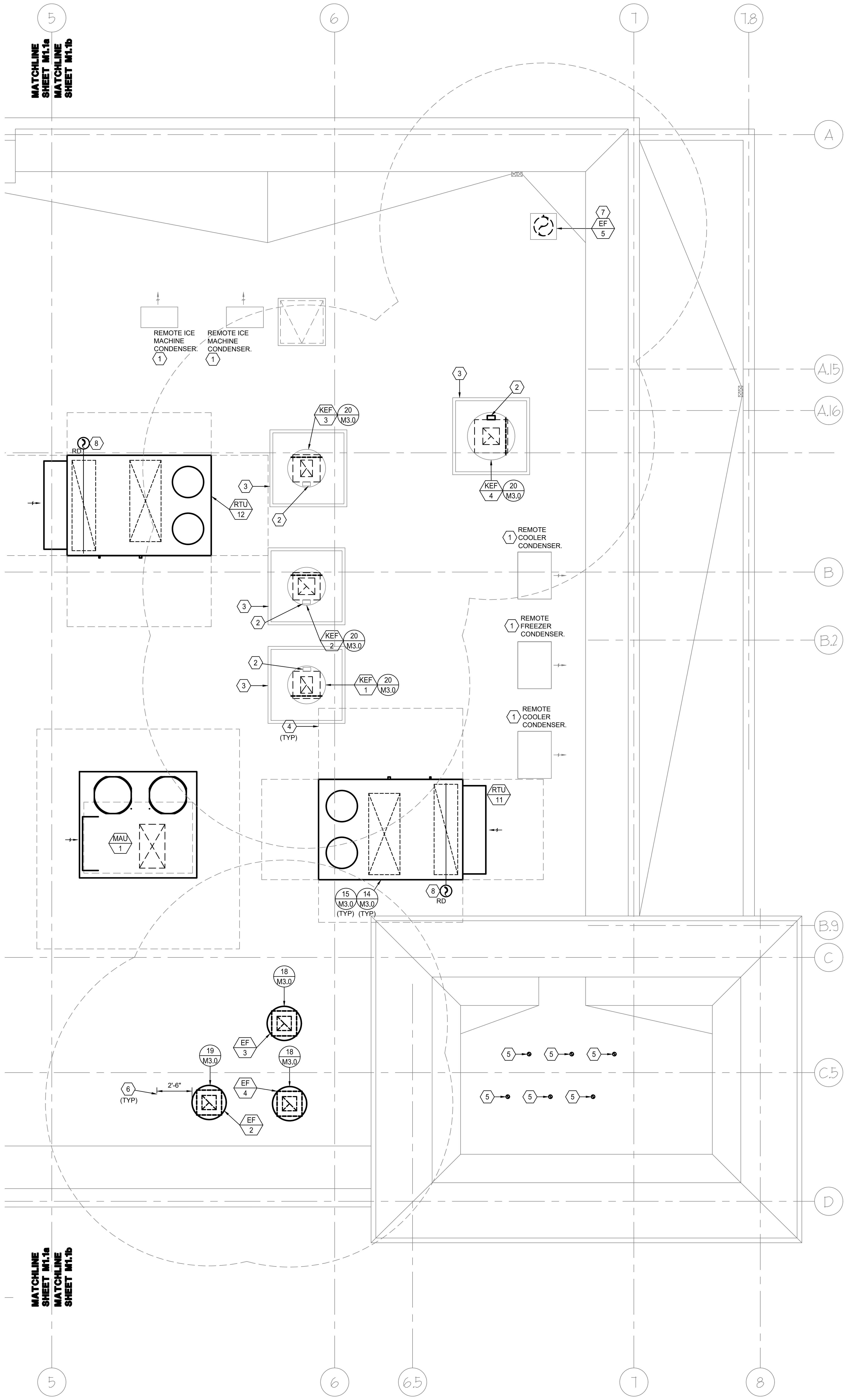
M1.1a

COY M. MACY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7.8
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B
B.2
B.9
C
C.5
D
6.5
8
MATCHLINE SHEET M1.1a
MATCHLINE SHEET M1.1b
7
EF 5
REMOTE ICE MACHINE CONDENSER.
1
REMOTE ICE MACHINE CONDENSER.
1
KEF 3
20 M3.0
3
2
KEF 4
20 M3.0
8
RD
3
RTU 12
2
REMOTE COOLER CONDENSER.
1
3
2
KEF 2
20 M3.0
REMOTE FREEZER CONDENSER.
1
2
3
KEF 1
20 M3.0
4 (TYP)
REMOTE COOLER CONDENSER.
1
MAU 1
RTU 11
15 M3.0 (TYP)
14 M3.0 (TYP)
8
RD
18 M3.0
EF 3
19 M3.0
18 M3.0
6 (TYP)
2'-6"
EF 4
EF 2
5

1 MECHANICAL ROOF PLAN - SEGMENT B

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

N

MECHANICAL PLAN NOTES:

1. CONDENSING UNIT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS WITH THE UNIT LOCATION COORDINATED WITH ALL DISCIPLINES. PROVIDE REFRIGERANT PIPING TO EVAPORATOR SIZED AND INSTALLED PER MANUFACTURERS REQUIREMENTS.
2. INSTALL GREASE COLLECTION BOX ON FACE OF CURB ON OPPOSITE SIDE OF HINGE. ORIENT DRAIN OUTLET ACCORDINGLY.
3. PROVIDE GREASE GUARD MAT AROUND EXHAUST FAN.
4. DASHED LINE INDICATES MANUFACTURERS REQUIRED SERVICE CLEARANCE.
5. TERMINATE WATER HEATER FLUES WITH MANUFACTURERS CONCENTRIC VENT KIT. TERMINATIONS SHALL BE MINIMUM 24" FROM EACH OTHER. VENT TERMINATION SHALL BE 24" ABOVE ROOF.
6. DO NOT INSTALL OUTSIDE AIR INTAKES WITHIN 10' OF EXHAUST.
7. INSTALL EXHAUST FAN ON TOP OF SMOKER EXHAUST DUCT. TERMINATION OF FAN SHALL BE EVEN WITH TOP OF ADJACENT PARAPET.
8. RETURN SMOKE DETECTOR TO BE PROVIDED IN UNIT BY RTU MANUFACTURER.

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OF ILLINOIS
04/20/2023

Drawing Title
MECHANICAL ROOF PLAN SEGMENT B

Job No.

Drawn
DLJ

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AS NOTED

Date

Sheet No.
M1.1b

COY M. MACY

MAKEUP AIR UNIT SCHEDULE (DX COOLING, NATURAL GAS HEAT)

MARK	MANU.	MODEL	UNIT TYPE	SUPPLY FAN CFM	SUPPLY FAN MIN. CFM	SUPPLY FAN ESP (IN)	SUPPLY FAN BHP	SUPPLY FAN NOM HP	COOLING COIL TH (MBH)	COOLING COIL SH (MBH)	EAT-UNIT (°F DB)	EAT-UNIT (°F WB)	LAT-COIL (°F DB)	LAT-COIL (°F WB)	REFR TYPE	MIN EFF (EER)	MIN NO STAGES	HEAT EXCHANGER MIN OUT (MBH)	NOM INPUT (MBH)	MIN EFF (%)	EAT (°F DB)	LAT (°F DB)	MIN NO STAGES	O/A CFM	ELECTRICAL V/PH	MCA	MOCP	DISC TYPE	WEIGHT (LBS)	NOTES
MAU-1	CAPTIVEAIRE	CASRTU3-I.400-18-20T	SZVAV	3,000	2,000	0.75	1.98	3.0	225.0	130.8	91.4	74.0	52	51.1	R410A	12.7	VARIABLE	320.0	400	80	-1.0	68	VARIABLE	3000	480/3	43.7	45	NON-FUSED	2624	A-P

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

NOTES:

A. REFER TO ROOFTOP UNIT CONTROL MATRIX FOR CONTROL FEATURES, MODULES, AND ACCESSORIES THAT SHALL BE PROVIDED WITH THE EQUIPMENT.
B. EQUIPMENT SIZED FOR 95°F AMBIENT TEMPERATURE.
C. PROVIDE 2 INCH MERV 8, EFFICIENT PLEATED THROWAWAY AIR FILTERS.
D. PROVIDE FACTORY MOUNTED DISCONNECT INSTALLED ON SERVICE SIDE OF UNIT.
E. STARTERS FOR ALL MOTORS SHALL BE FURNISHED INTEGRAL WITH UNIT.
F. PROVIDE SINGLE POINT POWER CONNECTION.
G. COORDINATE SIZE OF CONDUCTOR TERMINATION LUGS WITH CONDUCTOR SIZES SHOWN ON ELECTRICAL DRAWINGS.
H. SPECIFIED FAN ESP ACCOUNTS FOR DUCT LOSSES EXTERNAL TO UNIT.
J. PROVIDE MOTOR HORSEPOWER TO OVERCOME INTERNAL UNIT STATIC PRESSURE DROP PLUS SPECIFIED EXTERNAL STATIC PRESSURE DROP. NOMINAL MOTOR HP SHALL BE NO LARGER THAN THE FIRST AVAILABLE NOMINAL MOTOR SIZE GREATER THAN THE REQUIRED BHP.
K. PROVIDE STANDARD INSULATED ROOF CURB WITH MINIMUM HEIGHT OF 24 INCHES.
L. SCHEDULED WEIGHT IS THE MAXIMUM ALLOWABLE OPERATING WEIGHT OF THE EQUIPMENT AND CURB.
M. PROVIDE GUARDS TO PROTECT CONDENSER COIL FROM HAIL OR OTHER DAMAGE.
N. PROVIDE HEATER TO MEET OR EXCEED SCHEDULED MINIMUM MBH OUTPUT. NOMINAL INPUT IS BASED ON LISTED MANUFACTURER'S STANDARD PRODUCT. COORDINATE EQUIPMENT GAS LOAD WITH PLUMBING CONTRACTOR IF DIFFERENT FROM THAT SCHEDULED. MEET MINIMUM EFFICIENCY SCHEDULED.
P. MIN. CFM IS THE MINIMUM SUPPLY CFM TURNDOWN BASED OFF OF HOOD EXHAUST RATE.

OUTSIDE AIR REQUIREMENTS, IMC-2018 (IP)

SYSTEM DESIGNATION	SYSTEM TAB NAME OR LIST 'SINGLE'	SINGLE-ZONE SYSTEMS ONLY: SINGLE-ZONE SYSTEM ASSOCIATED VENTILATION ZONE	SINGLE-ZONE SYSTEMS ONLY: SINGLE ZONE WORST CASE ZONE AIR DISTRIBUTION EFFECTIVENESS [Ez]	FLOOR AREA SERVED BY SYSTEM [As] (SF)	SYSTEM AVERAGED AREA-BASED OUTDOOR AIR RATE (CFM/SF)	SYSTEM POPULATION [Ps] (PEOPLE)	SYSTEM AVERAGED PEOPLE-BASED OUTDOOR AIR RATE (CFM/P)	REQUIRED OA INTAKE FLOW [Vot] (CFM)	DESIGN OA INTAKE FLOW [Vot] (CFM)	NOTES
RTU-1	SINGLE ZONE	ENTRY	0.80	394	0.060	8	7.50	105	200	
RTU-2	SINGLE ZONE	BAR DINING	0.80	279	0.180	33	7.50	372	760	
RTU-3	SINGLE ZONE	BAR DINING	0.80	1,287	0.180	25	7.50	524	200	A
RTU-4	SINGLE ZONE	RESTROOM	0.80	504	0.000	7	0.00	0	150	B
RTU-5	SINGLE ZONE	PD I	0.80	279	0.180	14	7.50	194	200	
RTU-6	SINGLE ZONE	PD II	0.80	485	0.180	32	7.50	409	410	
RTU-7	SINGLE ZONE	PD III	0.80	638	0.180	40	7.50	519	520	
RTU-8	SINGLE ZONE	MAIN DINING I	0.80	1,146	0.180	67	7.50	886	1,040	
RTU-9	SINGLE ZONE	MAIN DINING II	0.80	1,387	0.180	72	7.50	987	840	A
RTU-10	SINGLE ZONE	RM 79	0.80	360	0.180	14	7.50	212	215	
RTU-11	SINGLE ZONE	BOH	0.80	1,383	0.120	13	7.50	329	875	B
RTU-12	SINGLE ZONE	BOH	0.80	822	0.120	11	7.50	226	875	B
RTU-13	SINGLE ZONE	BAR DINING	0.80	279	0.180	51	7.50	541	480	A
MAU-1	SINGLE ZONE	BOH	0.80	504	0.120	6	7.50	132	3,000	B
							TOTALS	5,436	9,765	

GENERAL NOTES:
1. VENTILATION CALCULATIONS BASED ON IMC-2018.
2. SYSTEM POPULATIONS BASED ON MAX SEATING AND/OR CODE MAXIMUM VALUES.
3. SINGLE ZONE SYSTEMS (Vot = Voz): SYSTEM VENTILATION EFFICIENCY CALCULATION IS NOT REQUIRED FOR SINGLE ZONE SYSTEMS. WORST CASE AIR DISTRIBUTION EFFECTIVENESS BETWEEN HEATING AND COOLING MODES OF OPERATION IS SHOWN IN TABLE.

NOTES:
A. VENTILATION AIR PROVIDED VIA TRANSFER FROM ADJACET OPEN SPACES.
B. AIRFLOW IS FOR EXHAUST MAKEUP AS REQUIRED BY THE VENTILATION STANDARD.

RESTAURANT AIR BALANCE SCHEDULE

KITCHEN

OUTDOOR AIR SOURCE EQUIPMENT	AREA/EQUIPMENT SERVED	SUPPLY AIR (CFM)	DESIGN OA (CFM)	PERCENT OA/SA
RTU-11	SCULLERY/OFFICE	4800	875	18.2%
RTU-12	PREP	4800	875	18.2%
MAU-1	COOKLINE	3000	3000	100.0%
TOTAL AIRFLOW		12,600	4,750	37.7%

EXHAUST EQUIPMENT	AREA/EQUIPMENT SERVED	AREA DESCRIPTION	EXHAUST (CFM)
KEF-1	ROOF	KEH-1	1311
KEF-2	ROOF	KEH-2	2250
KEF-3	ROOF	KEH-3	1808
KEF-4	ROOF	KEH-4	1800
EF-2	ROOF	DISH	600
EF-3	ROOF	MOP SINK	100
EF-4	ROOF	TOILET	75
EF-5	ROOF	SMOKER	500
TOTAL EXHAUST			8,444

TOTAL KITCHEN POSITIVE/NEGATIVE AIR FLOW -3694
PERCENT POSITIVE/NEGATIVE AIR FLOW -77.8%

DINING

OUTDOOR AIR EQUIPMENT	AREA/EQUIPMENT SERVED	SUPPLY AIR (CFM)	DESIGN OA (CFM)	PERCENT OA/SA
RTU-1	ENTRY	1600	200	12.5%
RTU-2	BAR DINING	4000	760	19.0%
RTU-3	BAR	1280	200	15.6%
RTU-4	RESTROOMS	600	150	25.0%
RTU-5	PDR I	960	200	20.8%
RTU-6	PDR II	1920	410	21.4%
RTU-7	PDR III	2400	520	21.7%
RTU-8	MAIN DINING	3200	1040	32.5%
RTU-9	MAIN DINING	4000	840	21.0%
RTU-10	ROOM 79	2400	215	9.0%
RTU-13	BAR	2400	480	20.0%
TOTAL AIRFLOW		24,760	5,015	20.3%

EXHAUST EQUIPMENT	AREA/EQUIPMENT SERVED	AREA DESCRIPTION	EXHAUST (CFM)
EF-1	ROOF	RESTROOM	600
TOTAL EXHAUST			600

TOTAL DINING POSITIVE/NEGATIVE AIR FLOW 4415
PERCENT POSITIVE/NEGATIVE AIR FLOW 88.0%

TOTAL BUILDING POSITIVE AIR FLOW 721
PERCENT BUILDING POSITIVE AIR FLOW 7.4%

NOTES:
1. OUTSIDE AIRFLOW VALUES TAKEN FROM APPLICABLE CODE STANDARDS.

UNIT SHUTS DOWN WHEN PATIO WINDOWS ARE OPEN.

GRILLE, REGISTER AND DIFFUSER SCHEDULE

MARK	MANUFACTURER	MODEL	FACE TYPE	MOUNTING LOCATION	FACE SIZE (IN)	MAX. NC	MAX. PRESS. DROP (IN. W.C.)	NOTES
LSD-1	TITUS	FLOWBAR FL-10-JT	LINEAR SLOT	CEILING	1" LINEAR SLOT	25	0.1	E,M,R,S
LSD-2	TITUS	FLOWBAR FL-10-HT	LINEAR SLOT	CEILING	1" LINEAR SLOT	25	0.1	E,M,R,S
LSD-3	TITUS	FLOWBAR FL-15-JT	LINEAR SLOTS	WALL	1.5" LINEAR SLOT	25	0.1	M,R,S
PSD-1	TITUS	FBPI-10	1" SLOT PLENUM	CEILING	4'-0" (NOMINAL)	25	0.1	A,C,F
PSD-2	TITUS	FBPI-10	1" SLOT PLENUM	CEILING	2'-0" (NOMINAL)	25	0.1	A,C,F
PSD-3	TITUS	FBPI-15	1.5" SLOT PLENUM	CEILING	4'-0" (NOMINAL)	25	0.1	A,C,F
SD-1	TITUS	PAR-AA	PERFORATED	CEILING	24x24	30	0.1	A,C,D,F,G,J,K,L,N
SD-2	TITUS	PAR-AA	PERFORATED	CEILING	12x24	30	0.1	A,C,D,F,G,J,K,L,N
SD-3	TITUS	301RL	ADJUSTABLE BLADE	WALL	12x14	30	0.1	A,C,F,G,H,P
SD-4	TITUS	OMNI	PLAQUE	CEILING	12x12	30	0.1	A,B,C,D,F,G,N
SD-5	TITUS	250-AA L4	ADJUSTABLE	CEILING	12x12	30	0.1	A,C,D,F,G,Q
RG-1	TITUS	PAR	PERFORATED	CEILING	24x24	30	0.1	A,C,D,F,G
RG-2	TITUS	PAR	PERFORATED	CEILING	48x24	30	0.1	A,C,D,F,G
RG-3	TITUS	PAR	PERFORATED	CEILING	24x12	30	0.1	A,C,D,F,G
RG-4	TITUS	350FL	FIXED BLADE	CEILING	12x16	30	0.1	A,D,F,G,H,P
EG-1	TITUS	350FL	FIXED BLADE	CEILING	12x12	30	0.1	A,D,F,G,H,P

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

NOTES:

A. NECK SIZE SHOWN ON DRAWINGS.
B. 4-WAY THROW PATTERN UNLESS OTHERWISE SHOWN ON DRAWINGS.
C. BRANCH DUCT SIZE SHALL BE SAME AS NECK SIZE UNLESS OTHERWISE SHOWN ON DRAWINGS.
D. BAKED ENAMEL FINISH, WHITE.
E. ON 90 DEGREE CORNERS PROVIDE TITUS FBMC MITERED CORNER OR EQUAL TO PROVIDE A CONTINUOUS DIFFUSER AESTHETIC.
F. PROVIDE NECK FOR DUCT CONNECTION.
G. FRAME TYPE TO MATCH CEILING CONSTRUCTION, COORDINATE WITH ARCHITECTURAL REFLECTED CEILING PLAN.
H. PROVIDE OPPOSED BLADE DAMPER.
J. PROVIDE WITH NECK FLANGE FOR DUCT CONNECTION AND 1/4 TURN FASTENERS FOR REMOVAL AND CLEANING, FILTER NOT REQUIRED.
K. PROVIDE WITHOUT DIRECTIONAL PATTERN CONTROLLERS.
L. PROVIDE TITUS "TRM" RAPID MOUNT FRAME TO CREATE LAY-IN APPLICATION WHEN INSTALLED IN A HARD CEILING.
M. PROVIDE WITH MANUFACTURER'S INSULATED NARROW PLENUM FOR DUCT CONNECTION.
N. PROVIDE FACTORY INSULATION BLANKET ON PLENUM SIDE OF SUPPLY AIR DEVICE. ATTACH TO AIR DEVICE IN APPROVED MANNER.
P. FRONT BLADES PARALLEL TO LONG DIMENSION.
Q. PROVIDE WITH GANG OPERATED MULTI-LOUVER DAMPER ADJUSTABLE FROM THE FACE OF THE DEVICE BY A SINGLE LEVER.
R. PROVIDE BORDER TYPE 22 IN HARD CEILING/WALL APPLICATIONS, BORDER TYPE 14 FOR GYP TO VERTICAL FRAMING, AND BORDER TYPE 66 FOR LAY-IN AND LAY-IN TO VERTICAL FRAMING. COORDINATE WITH ARCHITECTURAL PLANS.
S. PROVIDE LINEAR SLOT WITH CUSTOM FACTORY FINISH TO MATCH CEILING COLOR. REFER TO ARCHITECTURAL SHEETS FOR COLOR. PAINT ALL INTERIOR SURFACES OF PLENUMS FLAT BLACK.

ROOFTOP UNIT SCHEDULE (DX COOLING, NATURAL GAS HEAT)

MARK	MANU.	MODEL	UNIT TYPE	SUPPLY FAN CFM	ESP (IN)	BHP	NOM HP	COOLING COIL TH (MBH)	SH (MBH)	EAT (°F DB)	EAT (°F WB)	LAT (°F DB)	LAT (°F WB)	REFR TYPE	MIN EFF (EER)	MIN EFF (SEER)	MIN NO STAGES	HEAT EXCHANGER MIN OUT (MBH)	NOM INPUT (MBH)	MIN EFF (%)	EAT (°F DB)	LAT (°F DB)	MIN NO STAGES	O/A CFM	ELECTRICAL V/PH	MCA	MOCP	DISC TYPE	WEIGHT (LBS)	NOTES
RTU-1	TRANE	YHC060	CV	1,600	0.75	0.87	1.00	49.4	35.7	74.4	63.2	54.1	52.6	R410	11.9	14.2	1	64	80	80	59.4	85	1	200	480/3	12	15	NON-FUSED	1095	A-P
RTU-2	TRANE	YHD150	MULTI-SPEED	4,000	0.75	1.66	3.00	136.4	103.8	74.1	61.8	50.4	49.6	R410	12.1	15.0	2	200	250	80	54.9	85	2	760	480/3	30	40	NON-FUSED	2325	A-G,J-P
RTU-3	TRANE	YHC048	MULTI-SPEED	1,280	0.75	0.46	1.00	40.8	27.2	73.4	63.3	54.0	52.3	R410	12.0	14.0	1	64.8	80	81	57.2	85	2	200	480/3	11	15	NON-FUSED	767	A-G,J-P
RTU-4	TRANE	4YCC4030	CV	600	0.75	-	0.33	20.1	14.4	76.9	64.7	55.0	53.5	R410	11.5	-	1	25	55	80	50.8	85	1	150	208/1	19	30	NON-FUSED	475	A-P
RTU-5	TRANE	YHC037	MULTI-SPEED	960	0.75	0.43	0.75	30.4	21.7	76.1	64.3	55.5	53.7	R410	13	17.5	1	64	80	80	53.6	85	1	200	480/3	12	15	NON-FUSED	767	A-G,J-P
RTU-6	TRANE	YHC092	MULTI-SPEED	2,400	0.75	0.97	1.00	65.1	47.8	75.3	64.6	57.2	55.8	R410	11.2	12.7	2	97.2	120	81	53.3	85	1	410	480/3	18	20	NON-FUSED	1182	A-P
RTU-7	TRANE	YHC092	MULTI-SPEED	2,400	0.75	0.83	2.75	75.1	52.9	76.2	65.0	56.2	54.7	R410	12.6	15	2	121.5	150	81	53.1	85	1	520	480/3	20	25	NON-FUSED	1220	A-G,J-P
RTU-8	TRANE	YHC120	MULTI-SPEED	3,200	0.75	0.84	2.75	117.2	77.2	78.3	66.5	56.4	54.7	R410	12.4	15.2	2	162	200	81	45.6	85	2	1040	480/3	22	25	NON-FUSED	1500	A-G,J-P
RTU-9	TRANE	YHD150	MULTI-SPEED	4,000	0.75	2.46	3.00	118.7	82.2	76.1	65.3	57.4	55.7	R410	12.1	15.0	2	200	250	80	53.5	85	2	840	480/3	29	40	NON-FUSED	2325	A-P
RTU-10	TRANE	YHC092	MULTI-SPEED	2,400	0.75	1.11	1.00	63.3	53.4	73.8	61.5	53.5	52.2	R410	11.2	12.7	2	64.8	80	81	60.6	85	1	215	480/3	18	20	NON-FUSED	1182	A-G,J-P
RTU-11	TRANE	YHD180	MULTI-SPEED	4,800	1.00	2.49	3.00	143.8	113.9	77.2	64.2	55.6	54.2	R410	12.1	15.0	2	200	250	80	55.4	85	2	875	480/3	35	45	NON-FUSED	2530	A-P
RTU-12	TRANE	YHD150	MULTI-SPEED	4,800	1.00	2.77	3.00	125.8	100.5	77.2	65.1	58.2	56.6	R410	12.1	15.0	2	200	250	80	55.4	85	2	875	480/3	32	40	NON-FUSED	2455	A-P
RTU-13	TRANE	YHC102	MULTI-SPEED	2,720	0.75	0.90	2.00	87.9	58.9	73.8	63.5	54.1	52.5	R410	11.2	12.7	2	121.5	150	81	54.2	85	2	480	480/3	21	25	NON-FUSED	1150	A-G,J-P

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

NOTES:

A. REFER TO ROOFTOP UNIT CONTROL MATRIX FOR CONTROL FEATURES, MODULES, AND ACCESSORIES THAT SHALL BE PROVIDED WITH THE EQUIPMENT.
B. EQUIPMENT SIZED FOR 95°F AMBIENT TEMPERATURE.
C. PROVIDE 2 INCH MERV 8, EFFICIENT PLEATED THROWAWAY AIR FILTERS.
D. PROVIDE FACTORY MOUNTED DISCONNECT INSTALLED ON SERVICE SIDE OF UNIT.
E. STARTERS FOR ALL MOTORS SHALL BE FURNISHED INTEGRAL WITH UNIT.
F. PROVIDE SINGLE POINT POWER CONNECTION.
G. COORDINATE SIZE OF CONDUCTOR TERMINATION LUGS WITH CONDUCTOR SIZES SHOWN ON ELECTRICAL DRAWINGS.
H. PROVIDE DUPLEX RECEPTACLE MOUNTED ON UNIT FOR FIELD WIRING.
J. SPECIFIED FAN ESP ACCOUNTS FOR DUCT LOSSES EXTERNAL TO UNIT.
K. PROVIDE MOTOR HORSEPOWER TO OVERCOME INTERNAL UNIT STATIC PRESSURE DROP PLUS SPECIFIED EXTERNAL STATIC PRESSURE DROP. NOMINAL MOTOR HP SHALL BE NO LARGER THAN THE FIRST AVAILABLE NOMINAL MOTOR SIZE GREATER THAN THE REQUIRED BHP.
L. PROVIDE STANDARD INSULATED ROOF CURB WITH HEIGHT OF 24 INCHES.
M. SCHEDULED WEIGHT IS THE MAXIMUM ALLOWABLE OPERATING WEIGHT OF THE EQUIPMENT AND CURB.
N. PROVIDE GUARDS TO PROTECT CONDENSER COIL FROM HAIL OR OTHER DAMAGE.
P. PROVIDE HEATER TO MEET OR EXCEED SCHEDULED MINIMUM MBH OUTPUT. NOMINAL INPUT IS BASED ON LISTED MANUFACTURER'S STANDARD PRODUCT. COORDINATE EQUIPMENT GAS LOAD WITH PLUMBING CONTRACTOR IF DIFFERENT FROM THAT SCHEDULED. MEET MINIMUM EFFICIENCY SCHEDULED.

UNIT HEATER SCHEDULE (ELECTRIC)

MARK	SERVICE LOCATION	MANUFACTURER	MODEL	MIN OUT (MBH)	NOM (KW)	MIN NO OF STAGES	V/PH	DISC TYPE	NOTES
UH-1	FIRE RISER	QMARK	LFK408F	13.64	4	1	208/1	NON-FUSED	A-C
UH-2	STORAGE	QMARK	LFK408F	13.64	4	1	208/1	NON-FUSED	A-C
UH-3	MECHANICAL	QMARK	LFK408F	13.64	4	1	208/1	NON-FUSED	A-C
UH-4	MECHANICAL	QMARK	LFK408F	13.64	4	1	208/1	NON-FUSED	A-C

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NOTES:
A. PROVIDE WITH FACTORY INTEGRAL THERMOSTAT.
B. PROVIDE NECESSARY MOUNTING BRACKET AND ACCESSORIES FOR WALL MOUNTING.
C. PROVIDE FACTORY MOUNTED DISCONNECT INSTALLED ON SERVICE SIDE OF UNIT.

ELECTRIC BASEBOARD HEATER SCHEDULE

MARK	MANUFACTURER	MODEL	LENGTH (IN)	SIZE (IN) WxH	W/FT	OUTPUT (MBH)	OUTPUT (KW)	INTAKE	OUTLET	MOUNTING TYPE	DISC. TYPE	AMPS	V/PH	NOTES
EBH-1	QMARK	SLQDB10	120	2-5/8"x4"	188	6.42	1.88	BOTTOM	TOP	PEDESTALS	NON-FUSED	6.8	277/1	A-C
EBH-2	QMARK	SLQDB9	108	2-5/8"x4"	188	5.77	1.69	BOTTOM	TOP	PEDESTALS	NON-FUSED	6.1	277/1	A-C
EBH-3	QMARK	SLQDB6	72	2-5/8"x4"	188	3.86	1.13	BOTTOM	TOP	PEDESTALS	NON-FUSED	4.1	277/1	A-C
EBH-4	QMARK	SLQDB9	108	2-5/8"x4"	188	5.77	1.69	BOTTOM	TOP	PEDESTALS	NON-FUSED	6.1	277/1	A-C

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

NOTES:

A. PROVIDE NECESSARY MOUNTING BRACKETS AND ACCESSORIES (UNIT SHALL BE APPROVED FOR ZERO CLEARANCE). PROVIDE MANUFACTURERS 3" PEDESTALS.
B. PROVIDE WITH INTEGRAL TAMPER PROOF THERMOSTAT AND DISCONNECT SWITCH.
C. UNIT SHALL BE STEEL WITH BAKED ENAMEL FINISH (COORDIANTE COLOR WITH ARCHITECT).

FAN SCHEDULE

MARK	SERVICE DESCRIPTION	MANUFACTURER	MOUNTING	MODEL	CFM	ESP (IN)	NOM HP	FAN RPM	DRIVE (BELT/DIRECT)	ELECTRICAL V/PH	DISC TYPE	STARTER TYPE	WEIGHT (LBS)	NOTES
KEF-1	EXH-L	CAPTIVEAIRE	ROOF	DU85HFA	1444	1.5	0.75	1421	DIRECT	208/1	NON-FUSED	VSD	133	C,D,H,K,L
KEF-2	EXH-M	CAPTIVEAIRE	ROOF	DU85HFA	2306	1.2	1	1585	DIRECT	208/1	NON-FUSED	VSD	133	C,D,H,K,L
KEF-3	EXH-R	CAPTIVEAIRE	ROOF	DU85HFA	1662	1.3	0.75	1410	DIRECT	208/1	NON-FUSED	VSD	133	C,D,H,K,L
KEF-4	PREP	CAPTIVEAIRE	ROOF	DU180HFA	1800	1.9	1.5	1255	DIRECT	208/3	NON-FUSED	VSD	220	C,D,H,K,L
EF-1	RESTROOMS	CAPTIVEAIRE	ROOF	DR33HFA	600	0.4	0.33	1227	DIRECT	120/1	NON-FUSED	-	97	A-C,E,G,L
EF-2	DISHWASHER	CAPTIVEAIRE	ROOF	DU33HFA	600	0.4	0.33	1227	DIRECT	120/1	NON-FUSED	-	97	A-C,E,F,L
EF-3	MOP	CAPTIVEAIRE	ROOF	DR10HFA	100	0.3	0.17	1124	DIRECT	120/1	NON-FUSED	-	79	A-C,E,G,L
EF-4	TOILET	CAPTIVEAIRE	ROOF	DR10HFA	75	0.3	0.17	1087	DIRECT	120/1	NON-FUSED	-	79	A-C,E,G,L
EF-5	SMOKER	ENERVEX	ROOF	GSV014	1000	0.5	0.25	-	DIRECT	120/1	NON-FUSED	VSD	100	J, M

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NOTES:

A. PROVIDE BIRDSCREEN AND GRAVITY BACKDRAFT DAMPER.
B. PROVIDE STANDARD INSULATED ROOF CURB WITH MINIMUM HEIGHT OF24 INCHES. PROVIDE SLOPED CURB IF NEEDED TO MATCH ROOF SLOPE.
C. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH.
D. PROVIDE WITH ROOF CURB EXTENSION FOR 40" MINIMUM DISCHARGE HEIGHT ABOVE ROOF SURFACE OR AT ELEVATION HIGHER THAN ADJACENT BUILDING STRUCTURE WITHIN 5 FEET WHICHEVER IS GREATER, GREASE TRAP WITH ABSORBANT MATERIAL AND DRAIN CONNECTION, HINGE KIT, BIRDSCREEN, ACCESS PORT FOR CLEANING FAN BLADES AND INTEGRAL MOTOR OVERLOAD PROTECTION.
E. PROVIDE WITH EC MOTOR AND MANUFACTURER'S FAN SPEED CONTROLLER FOR BALANCING PURPOSES.
F. INTERLOCK FAN OPERATION WITH DISHWASHER.
G. INTERLOCK FAN OPERATION WITH TIME CLOCK.
H. INTERLOCK FAN OPERATION WITH ASSOICATED MAKEUP AIR UNIT OR RTU.
J. INTERLOCK FAN OPERATION WITH SMOKER.
K. STARTER TO BE FACTORY MOUNTED IN KITCHEN HOOD, LOCATE IN HOOD CONTROL PANEL.
L. REFER TO CAPTIVEAIRE DRAWINGS FOR ADDITIONAL INFORMATION.
M. EQUIPMENT SHALL BE FURNISHED BY SMOKER MANUFACTURER, INSTALLED BY DIVISION 23 CONTRACTOR.

ROOFTOP UNIT CONTROL MATRIX

CONTROL FEATURE	UNITS	RTU-1 SETPOINT OR Y/N	RTU-5,6,10 SETPOINT OR Y/N	RTU-2,3,7-9,13 SETPOINT OR Y/N	RTU-4 SETPOINT OR Y/N	RTU-11,12 SETPOINT OR Y/N	MAU-1 SETPOINT OR Y/N	NOTES
SETPOINTS								
COOLING - OCCUPIED SETPOINT	°F	70	70	70	70	70	70	
COOLING - UNOCCUPIED SETPOINT	°F	73	73	73	73	73	-	
HEATING - OCCUPIED SETPOINT	°F	68	68	68	68	68	68	
HEATING - UNOCCUPIED SETPOINT	°F	67	67	67	67	67	-	
DEHUMIDIFICATION SETPOINT - HUMIDITY SENSOR FEEDBACK	% RH	50%	50%	50%	NA	50%	50%	B
PROGRAMMED CONTROL FEATURES								
HVAC SYSTEM OCCUPIED/UNOCCUPIED MODE - PROGRAMMABLE THERMOSTAT		Y	Y	Y	Y	Y	Y	B
EQUIPMENT ACCESSORIES AND CONTROL MODULES								
OUTSIDE AIR DAMPER - MOTOR OPERATED (2-POSITION)		N	N	N	Y	N	N	K
OUTSIDE AIR DAMPER - MOTOR OPERATED (MODULATING)		Y	Y	Y	N	Y	Y	K
INTEGRATED ECONOMIZER - ENTHALPY ENABLE	BTU/LB	26	26	26	N	26	N	E
ECONOMIZER FAULT DETECTION AND DIAGNOSTICS (FDD) SYSTEM		Y	Y	Y	N	Y	N	F, G
RELIEF - BAROMETRIC DAMPER		Y	Y	Y	Y	Y	Y	
COOLING COIL (DX)		Y	Y	N	Y	N		
COOLING COIL (DX - VARIABLE SPEED or STAGED)		N	N	Y	N	Y	Y	M
DEHUMIDIFICATION - HOT GAS REHEAT		Y	Y	Y	N	Y	Y	O
HEATING COIL (NATURAL GAS)		Y	Y	Y	Y	Y	Y	
SUPPLY FAN CONTROL METHODS								
ON DURING OCCUPIED HOURS		Y	Y	Y	Y	Y	Y	
CYCLE WITH LOADS DURING UNOCCUPIED HOURS		Y	Y	Y	Y	Y	N	
CONSTANT VOLUME FAN CONTROL		Y	N	N	Y	N	N	
VARIABLE VOLUME - MODULATE FAN SPEED IN RESPONSE TO ACTIVE COOLING COIL STAGES		N	Y	Y	N	Y	N	M
VARIABLE VOLUME - MODULATE FAN SPEED IN RESPONSE TO KITCHEN EXHAUST		N	N	N	N	N	Y	M, R
SAFETIES, INTERLOCKS, AND ALARMS								
RETURN AIR SMOKE DETECTOR - SAFETY SHUTDOWN		Y	Y	Y	Y	Y	Y	F
FIRE ALARM CONTROL PANEL - SAFETY SHUTDOWN INTERLOCK		Y	Y	Y	Y	Y	Y	
KITCHEN EXHAUST SYSTEM INTERLOCK		Y	Y	Y	Y	Y	Y	S

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

NOTES:
B. DIVISION 23 CONTRACTOR SHALL PROVIDE DEVICE.
E. IF SETPOINT VALUE IS LISTED, IT INDICATES ECONOMIZER HIGH-LIMIT SHUTOFF. UNIT SHALL BE IN ECONOMIZER IF CONDITIONS ARE LESS THAN SETPOINT. THE FOLLOWING SENSORS SHALL DETERMINE ECONOMIZER ON POINT.
   OUTSIDE AIR TEMPERATURE; DIVISION 23 PROVIDED AS PART OF ECONOMIZER CONTROL MODULE.
   OUTSIDE AIR HUMIDITY; DIVISION 23 PROVIDED AS PART OF ECONOMIZER CONTROL MODULE.
F. DEVICE SHALL BE FACTORY MOUNTED (EXCEPT RTU-4) AND PRE-WIRED FOR OPERATION SUBJECT TO THE ONBOARD CONTROLLER.
G. PROVIDE UNIT WITH AN FDD SYSTEM CONSISTING OF PERMANENTLY INSTALLED OUTSIDE AIR, SUPPLY AIR, AND RETURN AIR TEMPERATURE SENSORS. THE UNIT CONTROLLER SHALL AT A MINIMUM BE CAPABLE OF PROVIDING SYSTEM STATUS OF ECONOMIZER, COMPRESSOR, HEATING, MIXED AIR LOW LIMIT ALARM, AND SENSOR VALUES. EACH OPERATING MODE SHALL BE CAPABLE OF INDEPENDENTLY OPERATING FOR TESTING. THE SYSTEM SHALL REPORT FAULTS TO AN APPLICATION ACCESSIBLE BY SERVICE PERSONNEL. THE FOLLOWING FAULTS SHALL BE DETECTED: AIR TEMPERATURE SENSOR FAILURE, ECONOMIZER ENABLED/DISABLED WHEN ECONOMIZER SHOULD BE OFF/ON, RESPECTIVELY, DAMPER NOT MODULATING, AND EXCESS OUTSIDE AIR.
K. DETERMINE MINIMUM DAMPER POSITION IN FIELD DURING BALANCING TO PROVIDE SCHEDULED OUTDOOR AIRFLOW DURING OCCUPIED HOURS. DAMPER SHALL BE CLOSED DURING UNOCCUPIED HOURS.
M. UNITARY CONTROLLER SHALL MODULATE SUPPLY FAN SPEED SETTING AND COIL CAPACITY STAGES SUBJECT TO THE INTERNAL SAFETIES AND SEQUENCES TO MAINTAIN SCHEDULED SETPOINTS.
O. PROGRAM DEHUMIDIFICATION SEQUENCE BASED ON ZONE AIR HUMIDITY.
R. UNIT SHALL CONTROL SUPPLY FAN BETWEEN MAX AND MINIMUM CFM TO TRACK KITCHEN EXHAUST RATE PER HOOD CONTROLS. UNIT SHALL VARY SUPPLY AIR TEMPERATURE TO MEET SPACE TEMPERATURE REQUIREMENTS.
S. INTERLOCK RTU WITH KITCHEN EXHAUST HOOD SYSTEM(S) TO SHUT DOWN UPON SIGNAL FROM HOOD FIRE EXTINGUISHING SYSTEM OR FIRE ALARM SYSTEM. INTERLOCK THE FOLLOWING RTU WITH KITCHEN CONTROLS TO ENERGIZE WHEN HOOD SYSTEM IS ENERGIZED FOR PRESSURIZATION. RTU-8,9,12 AND MAU-1 SHALL BE INTERLOCKED WITH KEH-1/2/3. RTU-2,3,11 SHALL BE INTERLOCKED WITH KEH-4. BUILDING SHALL BE POSITIVELY PRESSURIZED WHEN ANY HOOD IS ON.

WINE COOLER SCHEDULE

MARK	MANUFACTURER'S REP	SYSTEM	EVAPORATOR CFM	EVAPORATOR MCA (AMPS)	EVAPORATOR MOCP (AMPS)	EVAPORATOR V/PH	EVAPORATOR WEIGHT LBS	CONDENSER HP	CONDENSER MCA (AMPS)	CONDENSER MOCP (AMPS)	CONDENSER V/PH	CONDENSER WEIGHT LBS	NOTES
WE 1 / WC 1	WHISPER KOOL	QUANTUM 12000	810	9.2	15	115/1	96	1.50	6.6	15	230/1	84	A-F
WE 2 / WC 2	WHISPER KOOL	QUANTUM 12000	810	9.2	15	115/1	96	1.50	6.6	15	230/1	84	A-F
WE 3 / WC 3	WHISPER KOOL	QUANTUM 9000	810	9.2	15	115/1	96	1.00	4.9	15	230/1	64	A-F
WE 4 / WC 4	WHISPER KOOL	QUANTUM 9000	810	9.2	15	115/1	96	1.00	4.9	15	230/1	64	A-F
WE 5 / WC 5	WHISPER KOOL	QUANTUM 9000	810	9.2	15	115/1	96	1.00	4.9	15	230/1	64	A-F
WE 6 / WC 6	WHISPER KOOL	QUANTUM 9000	810	9.2	15	115/1	96	1.00	4.9	15	230/1	64	A-F
WE 7 / WC 7	WHISPER KOOL	QUANTUM 9000	810	9.2	15	115/1	96	1.00	4.9	15	230/1	64	A-F

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

NOTES:

A. CONTACT CINDI BENT, WHISPER KOOL, (800)343-9463. CBENT@VINOTHEQUE.COM
B. PROVIDE CONDENSER WITH EXTERIOR SHROUD.
C. MAINTAIN ALL REQUIRED CLEARANCES.
D. PROVIDE WITH MANUFACTURERS DIGITAL CONTROLLER, MOUNTING PLATE, AND REMOTE SENSOR. SET THERMOSTAT TO 62F.
E. DIVISION 26 CONTRACTOR SHALL PROVIDE DISCONNECT SWITCHES.
F. PROVIDE AUXILIARY DRAIN PAN WITH FLOOD DETECTOR TO SHUT OFF UNIT WHEN WATER IS PRESENT IN DRAIN PAN.

PROJECT DESIGN CONDITIONS

CLIMATE CONDITONS		WEATHER STATION						REFERENCE
WEATHER STATION:		CHICAGO EXECUTIVE, IL						2021 ASHRAE
CLIMATE ZONE:		5A						
ASHRAE HEATING:	99.6%	-1.0	°F DB					
DESIGN HEATING CONDITIONS:		-1.0	°F DB					
HUMIDIFICATION:	99.6%	-6	°F DP	4.1	gr/lb	8.2	°F DB	
ASHRAE COOLING:	0.4%	91.4	°F DB	74.0	°F WB			
DESIGN COOLING CONDITIONS:		91.4	°F DB	74.0	°F WB			
DEHUMIDIFICATION:	0.4%	73.3	°F DP	126.9	gr/lb	82.8	°F DB	

BUILDING OPERATING HOURS:	
MONDAY - FRIDAY	7AM - 2AM
SATURDAY	7AM - 2AM
SUNDAY	7AM - 2AM
HOLIDAY	7AM - 2AM

SPACE / UNIT DESCRIPTION	SET POINTS: COOLING / DE-HUMIDIFICATION OCC °F	UNOCC °F	MAX RH %	MIN RH %	HEATING OCC °F	HEATING UNOCC °F	SPACE OPERATING HOURS OCCUPIED / UNOCCUPIED DAYS OF THE WEEK M-F	SAT	SUN	NOTES
DINING	70	73	50%	NA	68	67	TBD	TBD	TBD	A-C
BACK OF HOUSE	70	73	50%	NA	68	67	TBD	TBD	TBD	A-C

NOTES:
A. ZONE LEVEL SET POINT CONDITIONS SHALL BE AS SCHEDULED.
B. ZONE LEVEL OCCUPANCY HOUR SCHEDULE SHALL BE PER BUILDING OPERATING HOURS UNLESS OTHERWISE SCHEDULED.
C. ZONE LEVEL CONTROLS SHALL BE CAPABLE OF OPERATING WITH INDEPENDENT OCCUPANCY SCHEDULES.

KITCHEN EXHAUST HOOD SCHEDULE

MARK	HOOD TYPE	MANUFACTURER	MODEL	MAX COOKING TEMP (F)	HOOD DIMENSIONS (IN.) (L)	EXHAUST AIR CFM	WEIGHT (LBS)	NOTES
KEH-1	TYPE I	CAPTIVEAIRE	6030 ND-2	600	6'-4"	1,444	429	A-J
KEH-2	TYPE I	CAPTIVEAIRE	6030 ND-2	600	10'-3"	2,306	542	A-J
KEH-3	TYPE I	CAPTIVEAIRE	6030 ND-2	600	9'-6"	1,662	1,077	A-J
KEH-4	TYPE I	CAPTIVEAIRE	6030 ND-2	600	11'-6"	1,800	847	A-J

NOTES:
A. HOOD SUPPLIER SHALL PROVIDE HOOD PRE-PIPED FOR FIRE EXTINGUISHING SYSTEM MEETING REQUIREMENTS OF NFPA-96 AND LOCAL CODES.
B. HOOD SUPPLIER SHALL FURNISH HOOD WITH UL LISTED BAFFLE-TYPE GREASE FILTERS, GREASE DRAIN WITH REMOVABLE CUP, AND UL LISTED VAPORPROOF INCANDESCENT LIGHT FIXTURES.
C. HOOD SUPPLIER SHALL FURNISH 3 INCH STANDOFF FROM WALL AS REQUIRED.
D. PROVIDE HOOD FIRE SUPPRESSION SYSTEM MEETING NFPA-96 AND LOCAL CODES.
E. PROVIDE INTERLOCK KIT WITH ONE TEMPERATURE SENSOR PER GREASE EXHAUST COLLAR TO MEET IMC REQUIREMENTS.
F. HOOD FIRE SUPPRESSION SYSTEM SUPPLIER SHALL FURNISH AUTOMATIC SOLENOID GAS SHUT-OFF VALVE TO BE INSTALLED BY PLUMBING CONTRACTOR. SEE PLUMBING DRAWINGS FOR MORE INFORMATION.
G. REFER TO REFERENCE DRAWINGS OF KITCHEN HOOD MANUFACTURER FOR KITCHEN EXHAUST HOOD DETAILS.
H. HOOD SHALL HAVE VARIABLE EXHAUST RATE DOWN TO 50% OF CODE MINIMUM EXHAUST BASED ON TEMPERATURE UNDER HOOD.
J. HOOD UTILITY CABINET FOR FIRE SUPRESSION SYSTEM AND CONTROLS SHALL BE MOUNTED ON END OF HOOD.

CAPTIVEAIRE EQUIPMENT SHALL BE FURNISHED BY KITCHEN EQUIPMENT CONSULTANT AND INSTALLED BY MECHANICAL CONTRACTOR. OWNER'S CAPTIVEAIRE NATIONAL ACCOUNT CONTACT IS MIKE LITTLE, MIKE.LITTLE@CAPTIVEAIRE.COM, (913) 579-0504.

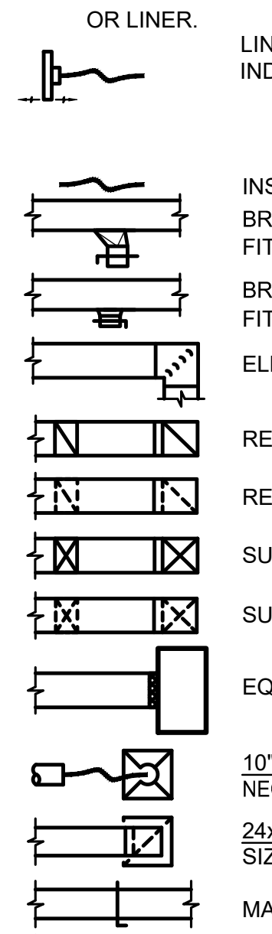
TEST AND BALANCE SHALL BE PROVIDED BY OWNER'S VENDOR. COORDINATE WITH OWNER FOR SCHEDULING. MECHANICAL CONTRACTOR SHALL BE ON SITE DURING ENTIRE TESTING AND BALANCING PERIOD FOR ASSISTANCE.

ALL OTHER ITEMS ON THE MECHANICAL DRAWINGS SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR UNLESS NOTED OTHERWISE.

MECHANICAL SYMBOLS

HVAC EQUIPMENT & DUCTWORK

NOTE: ALL DUCT DIMENSIONS SHOWN ON DRAWINGS ARE INSIDE DIMENSIONS. SEE SPECIFICATION FOR DUCTWORK TO RECEIVE INSULATION OR LINER.



- LINEAR SLOT DIFFUSER WITH INDICATED THROW. ARROWS INDICATE DIRECTION OF THROW.
- INSULATED FLEXIBLE DUCT (MAX. 5'-0" LONG)
- BRANCH DUCT WITH 45° RECTANGLE-ROUND BRANCH FITTING AND MANUAL VOLUME DAMPER
- BRANCH DUCT WITH CONICAL SPIN-IN ROUND BRANCH FITTING AND MANUAL VOLUME DAMPER
- ELBOW WITH TURNING VANES
- RETURN, EXHAUST, OR OUTSIDE AIR DUCT UP
- RETURN, EXHAUST, OR OUTSIDE AIR DUCT DOWN
- SUPPLY AIR DUCT UP
- SUPPLY AIR DUCT DOWN
- EQUIPMENT WITH FLEXIBLE DUCT CONNECTION
- 10" CSD-1 300 CFM — NECK SIZE, TYPE, CFM OF SUPPLY DIFFUSER OR REGISTER
- 24x24 CEG-1 800 CFM — SIZE, TYPE, CFM OF EXHAUST GRILLE
- MANUAL VOLUME DAMPER
- SQUARE TO ROUND TRANSITION
- SD — DUCT MOUNTED SMOKE DETECTOR (SD=SUPPLY/RD=RETURN)

#	RISER DESIGNATION	CO	CARBON MONOXIDE SENSOR
FD	FIRE DAMPER	CO2	CARBON DIOXIDE SENSOR
FSD	FIRE SMOKE DAMPER	DP	DIFFERENTIAL PRESSURE SENSOR
SD	SMOKE DAMPER	FS	FLOW SWITCH
VD	VOLUME DAMPER	HS	HUMIDITY SENSOR
MD	MOTORIZED DAMPER	PS	PULL STATION
BD	BACKDRAFT DAMPER	SP	STATIC PRESSURE PORT
H	HUMIDISTAT	TS	TEMPERATURE SENSOR
TH	COMBINATION TEMPERATURE AND HUMIDITY THERMOSTAT	TH	COMBINATION TEMPERATURE AND HUMIDITY SENSOR

——CWS——	CONDENSER WATER SUPPLY (CWS)
——CWR——	CONDENSER WATER RETURN (CWR)
——RL——	REFRIGERANT LIQUID (RL)
——RD——	REFRIGERANT DISCHARGE (HOT GAS) (RD)
——RS——	REFRIGERANT SUCTION (RS)

STANDARD MOUNTING HEIGHTS

MECHANICAL (AFF, UNLESS NOTED OTHERWISE)

THERMOSTATS (USER ADJUSTABLE)(TOP OF DEVICE)	48"
CONTROLS (TOP OF DEVICE)	48"

ANNOTATION

1	MECHANICAL OR FIRE PROTECTION PLAN CALLOUT
CU 1	MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
◑	CONNECTION POINT OF NEW WORK TO EXISTING
1 / M1	DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER

ABBREVIATION

AFF	ABOVE FINISHED FLOOR
AHJ	AUTHORITY HAVING JURISDICTION
ETR	EXISTING TO REMAIN
FSEC	FOOD SERVICE EQUIPMENT CONTRACTOR
TYP	TYPICAL

UNLESS NOTED OTHERWISE, THERE SHALL BE NO PIPING, DUCTWORK, CONDUITS, ETC, ROUTED EXPOSED ON THE EXTERIOR OF THE BUILDING. WHERE EXTERIOR ROUTING IS SPECIFICALLY REQUIRED BY THE AHJ OR LANDLORD, CONTACT ENGINEER FOR EXACT ROUTING LOCATIONS PRIOR TO ROUGH-IN.

GENERAL NEW NOTES:

1. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS WHICH MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER AND/OR OWNER OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
2. EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
3. COORDINATE THE INSTALLATION OF THE MECHANICAL SYSTEMS WITH OTHER TRADES TO ENSURE A NEAT AND ORDERLY INSTALLATION. INSTALL DUCTWORK AND PIPING AS TIGHT TO STRUCTURE AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS. COORDINATE INSTALLATION OF DUCTWORK AND PIPING TO AVOID CONFLICTS WITH ELECTRICAL PANELS, LIGHTING FIXTURES, ETC. ANY MODIFICATIONS REQUIRED DUE TO LACK OF COORDINATION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO EXTRA COST TO THE OWNER.
4. DURING INSTALLATION OF NEW WORK, AVOID DAMAGING EXISTING SURFACES AND EQUIPMENT TO REMAIN. REPAIR DAMAGE CAUSED DURING CONSTRUCTION AT NO EXTRA COST TO THE OWNER.
5. NEW MECHANICAL EQUIPMENT, DUCTWORK AND PIPING ARE SHOWN AT APPROXIMATE LOCATIONS. FIELD MEASURE FINAL DUCTWORK AND PIPING LOCATIONS PRIOR TO FABRICATION AND MAKE ADJUSTMENTS AS REQUIRED TO FIT THE DUCTWORK AND PIPING WITHIN THE AVAILABLE SPACE. VERIFY THAT FINAL EQUIPMENT LOCATIONS MEET MANUFACTURER'S RECOMMENDATIONS REGARDING SERVICE CLEARANCE AND PROPER AIRFLOW CLEARANCE AROUND EQUIPMENT.
6. REFER TO ARCHITECTURAL DRAWINGS FOR RELATED CONSTRUCTION DETAILS AS APPLICABLE TO THE HVAC SYSTEM. VERIFY CHASES AND PENETRATIONS SHOWN ON ARCHITECTURAL DRAWINGS THAT ARE INTENDED FOR DUCTWORK AND PIPING MEET REQUIREMENTS.
7. COORDINATE LOCATION OF ROOF MOUNTED HVAC EQUIPMENT AND ROOF PENETRATIONS WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS.
8. INDOOR AIR QUALITY MEASURES: PROTECT INSIDE OF (INSTALLED AND DELIVERED) DUCTWORK AND HVAC UNITS FROM EXPOSURE TO DUST, DIRT, PAINT AND MOISTURE. REPLACE INSULATION THAT HAS BECOME WET AT ANY TIME DURING CONSTRUCTION, DRYING THE INSULATION IS NOT ACCEPTABLE. SEAL ANY TEARS OR JOINTS OF INTERNAL FIBERGLASS INSULATION. REMOVE DEBRIS FROM CEILING/RETURN AIR PLENUM INCLUDING DUST. AN INDEPENDENT, PROFESSIONAL DUCT CLEANING COMPANY SHALL VACUUM CLEAN ANY DUCTWORK CONNECTED TO HVAC UNITS THAT WERE OPERATED DURING THE CONSTRUCTION PERIOD AFTER NEW FILTERS ARE INSTALLED AND PRIOR TO TURNING SYSTEM OVER TO THE OWNER. THE INTERNAL SURFACES AND ASSOCIATED COILS OF ANY HVAC UNITS THAT WERE OPERATED SHALL ALSO BE CLEANED.
9. INSTALL DUCTWORK AND PIPING PARALLEL TO BUILDING COLUMN LINES UNLESS OTHERWISE SHOWN OR NOTED.
10. OVERHEAD HANGERS AND SUPPORTS FOR EQUIPMENT, DUCTWORK AND PIPING SHALL BE FASTENED TO BUILDING JOISTS OR BEAMS. DO NOT ATTACH HANGERS AND SUPPORTS TO THE ABOVE FLOOR SLAB OR ROOF EXCEPT WHERE CONCRETE INSERTS IN CONCRETE SLABS ARE ALLOWED BY THE SPECIFICATIONS.
11. COORDINATE LOCATION OF EQUIPMENT SUPPORTS WITH LOCATION OF EQUIPMENT ACCESS PANELS/DOORS TO ENABLE SERVICE OF EQUIPMENT AND/OR FILTER REPLACEMENT.
12. SEAL PENETRATIONS THROUGH THE BUILDING COMPONENTS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. FIREPROOF PENETRATIONS THROUGH FIRE RATED COMPONENTS IN ACCORDANCE WITH U.L. REQUIREMENTS.
13. COORDINATE THE EXACT MOUNTING SIZE AND FRAME TYPE OF DIFFUSERS, REGISTERS AND GRILLES WITH THE SUPPLIER TO MEET THE CEILING, WALL AND DUCT INSTALLATION REQUIREMENTS.
14. ADJUST LOCATION OF CEILING DIFFUSERS, REGISTERS AND GRILLES AS REQUIRED TO ACCOMMODATE FINAL CEILING GRID AND LIGHTING LOCATIONS.
15. DUCTWORK CROSSING FIRE RATED WALLS OR OTHER FIRE RATED ASSEMBLIES SHALL BE MINIMUM 26 GAUGE SHEET METAL.
16. LOCATE AND SET THERMOSTATS AT LOCATIONS SHOWN ON PLANS. VERIFY EXACT LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION. INSTALL DEVICES WITH TOP OF DEVICE AT MAXIMUM 48" AFF TO MEET ADA REQUIREMENTS UNLESS NOTED OTHERWISE ON PLANS. PROVIDE INSULATED BACKING FOR THERMOSTATS MOUNTED ON EXTERIOR BUILDING WALLS. INSTALL WIRING IN CONDUIT PROVIDED BY DIVISION 26. AT A MINIMUM, PROVIDE CONDUIT IN THE WALL FROM THE JUNCTION BOX TO 6" ABOVE THE CEILING. COORDINATE THE LOCATION AND ELEVATION OF WALL-MOUNTED DEVICES WITH COMPONENTS SHOWN ON THE ARCHITECTURAL DRAWINGS THAT ARE TO BE INSTALLED UNDER OTHER DIVISIONS. CONTRACTOR WILL NOT BE REIMBURSED FOR RELOCATION OF WALL-MOUNTED DEVICES CAUSED BY A LACK OF COORDINATION.
17. PROVIDE A MANUAL BALANCING DAMPER IN EACH DUCT TAKEOFF FROM SUPPLY, RETURN, OUTDOOR AND EXHAUST AIR DUCTS.
18. BRANCH DUCTWORK TO AIR OUTLETS SHALL BE SAME SIZE AS OUTLET NECK SIZE UNLESS OTHERWISE NOTED.
19. FLEXIBLE DUCTWORK SHALL NOT EXCEED 5'-0" IN LENGTH AND SHALL BE INSTALLED AND SUPPORTED TO AVOID SHARP BENDS AND SAGGING. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
20. PROVIDE A NEW SET OF AIR FILTERS IN UNITS PRIOR TO TESTING, ADJUSTING AND BALANCING AND BEFORE TURNING SYSTEM(S) OVER TO OWNER.

HENDERSON ENGINEERS
8345 LENEXA DRIVE, SUITE 300
LENEXA, KS 66214
TEL 913.742.5000 FAX 913.742.5001
WWW.HENDERSONENGINEERS.COM
2150004520
IL. CORPORATE NUMBER: 184-002965
04/30/23

VERNON HILLS, IL 60061

Perry's STEAKHOUSE & GRILLE ®

1050 N MILWAUKEE AVE

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

No	Date	Remarks
	04/19/23	PERMIT UPDATES
	04/04/23	PERMIT UPDATES
△1	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERMIT/BID
	06/17/22	STEEL PACKAGE

REVISIONS

EXPIRES ON: 11/30/2023
COY M. MACY
062.068038
04/20/2023

Drawing Title
MECHANICAL SCHEDULES

Job No.

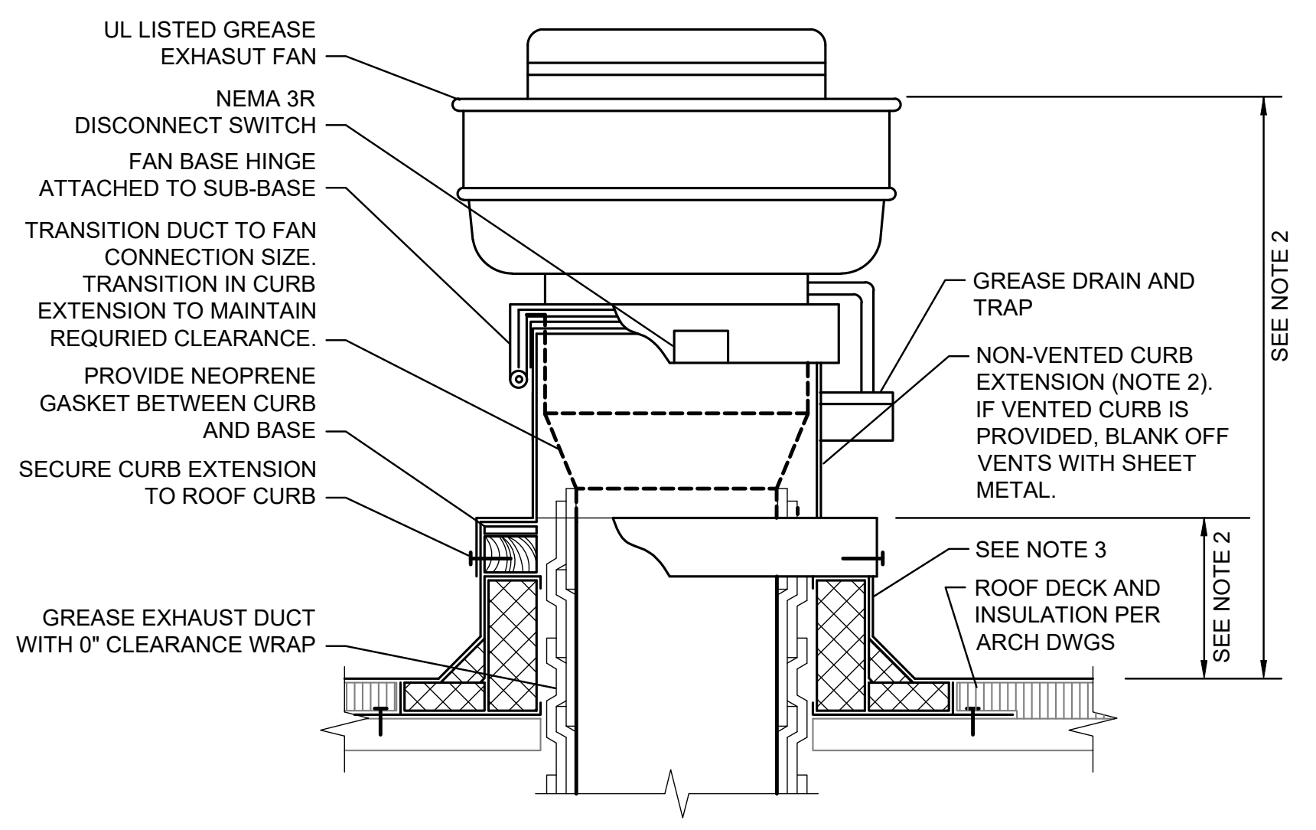
Drawn
CMM

Scale
AS NOTED

Date

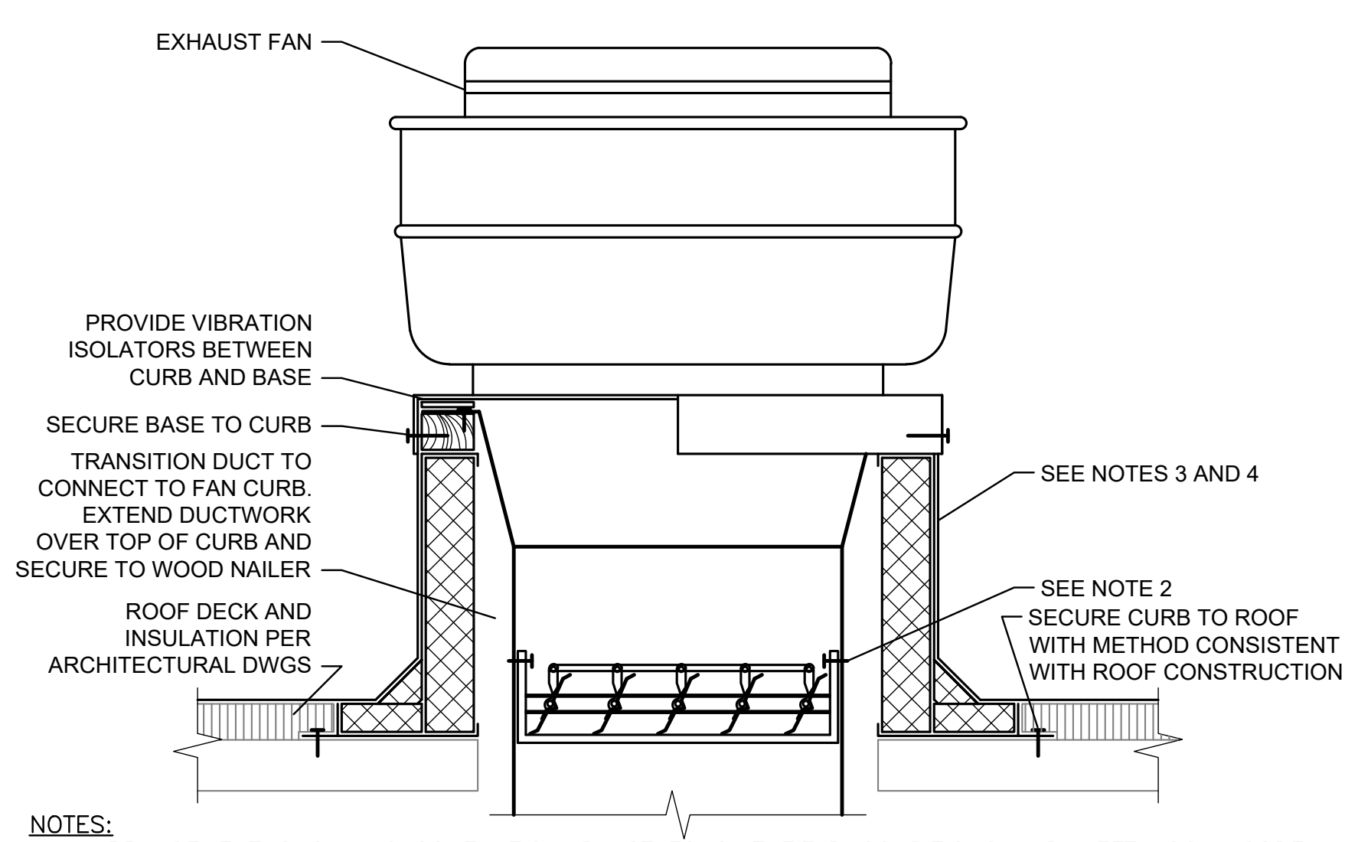
Sheet No.
M2.0

COY M. MACY


UL LISTED GREASE EXHASUT FAN
NEMA 3R DISCONNECT SWITCH
FAN BASE HINGE ATTACHED TO SUB-BASE
TRANSITION DUCT TO FAN CONNECTION SIZE. TRANSITION IN CURB EXTENSION TO MAINTAIN REQURIED CLEARANCE.
PROVIDE NEOPRENE GASKET BETWEEN CURB AND BASE
SECURE CURB EXTENSION TO ROOF CURB
GREASE EXHAUST DUCT WITH 0" CLEARANCE WRAP
GREASE DRAIN AND TRAP
NON-VENTED CURB EXTENSION (NOTE 2). IF VENTED CURB IS PROVIDED, BLANK OFF VENTS WITH SHEET METAL.
SEE NOTE 3
ROOF DECK AND INSULATION PER ARCH DWGS
SEE NOTE 2
SEE NOTE 2

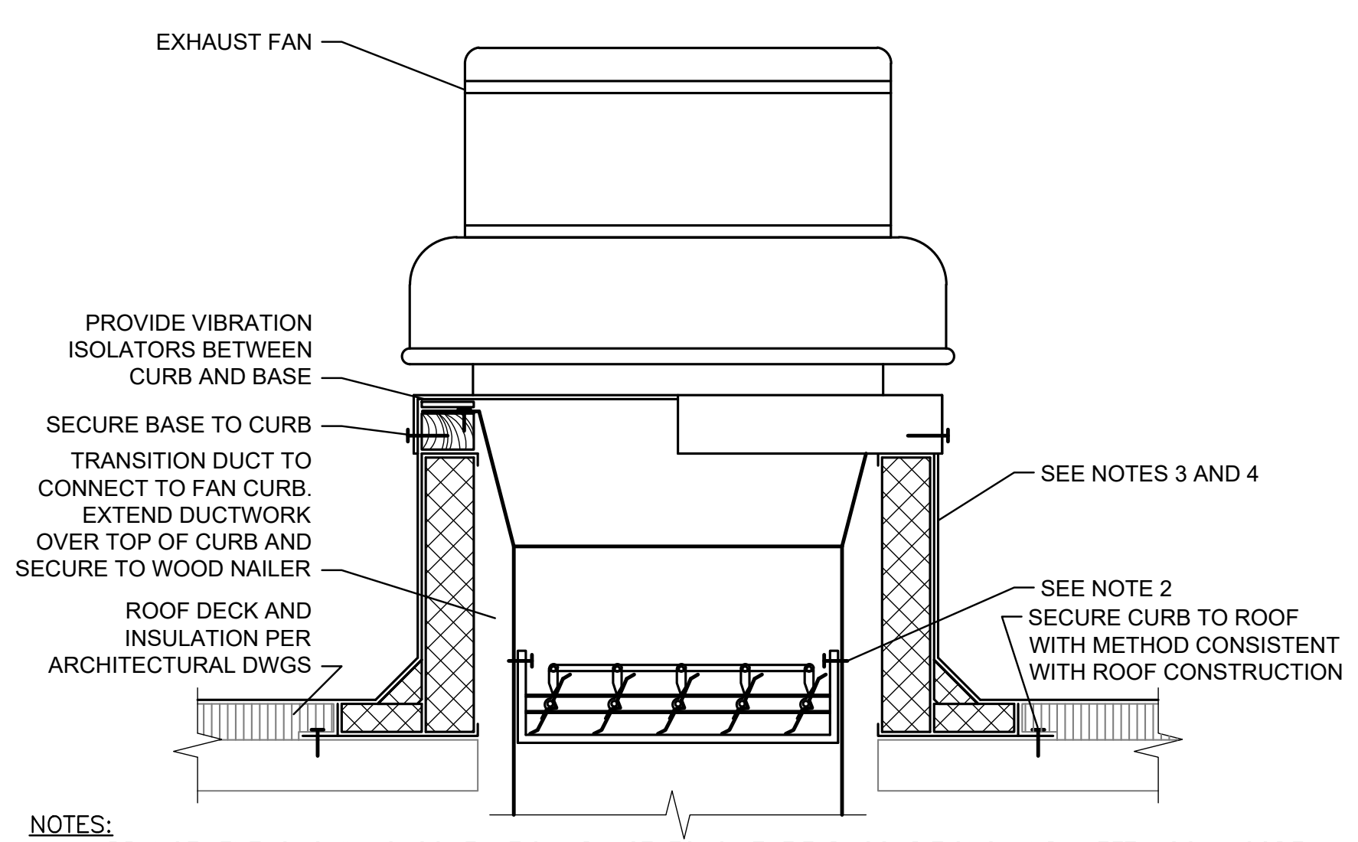
NOTES:
1. ARRANGEMENT SHOWN IS SCHEMATIC, ADJUST TO SUIT FIELD CONDITIONS AND MEET LOCAL CODE.
2. PROVIDE CURB EXTENSION MADE FROM NON–COMBUSTIBLE MATERIAL OF HEIGHT REQUIRED TO MOUNT FAN BASE A MINIMUM 18 INCHES ABOVE COMBUSTIBLE CURB MATERIAL AND DISCHARGE GREASE OUTLET A MINIMUM OF 40 INCHES ABOVE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

20 UPBLAST GREASE EXHAUST FAN DETAIL
NO SCALE


EXHAUST FAN
PROVIDE VIBRATION ISOLATORS BETWEEN CURB AND BASE
SECURE BASE TO CURB
TRANSITION DUCT TO CONNECT TO FAN CURB. EXTEND DUCTWORK OVER TOP OF CURB AND SECURE TO WOOD NAILER
ROOF DECK AND INSULATION PER ARCHITECTURAL DWGS
SEE NOTES 3 AND 4
SEE NOTE 2
SECURE CURB TO ROOF WITH METHOD CONSISTENT WITH ROOF CONSTRUCTION

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

19 ROOF MOUNTED UPBLAST FAN DETAIL
NO SCALE


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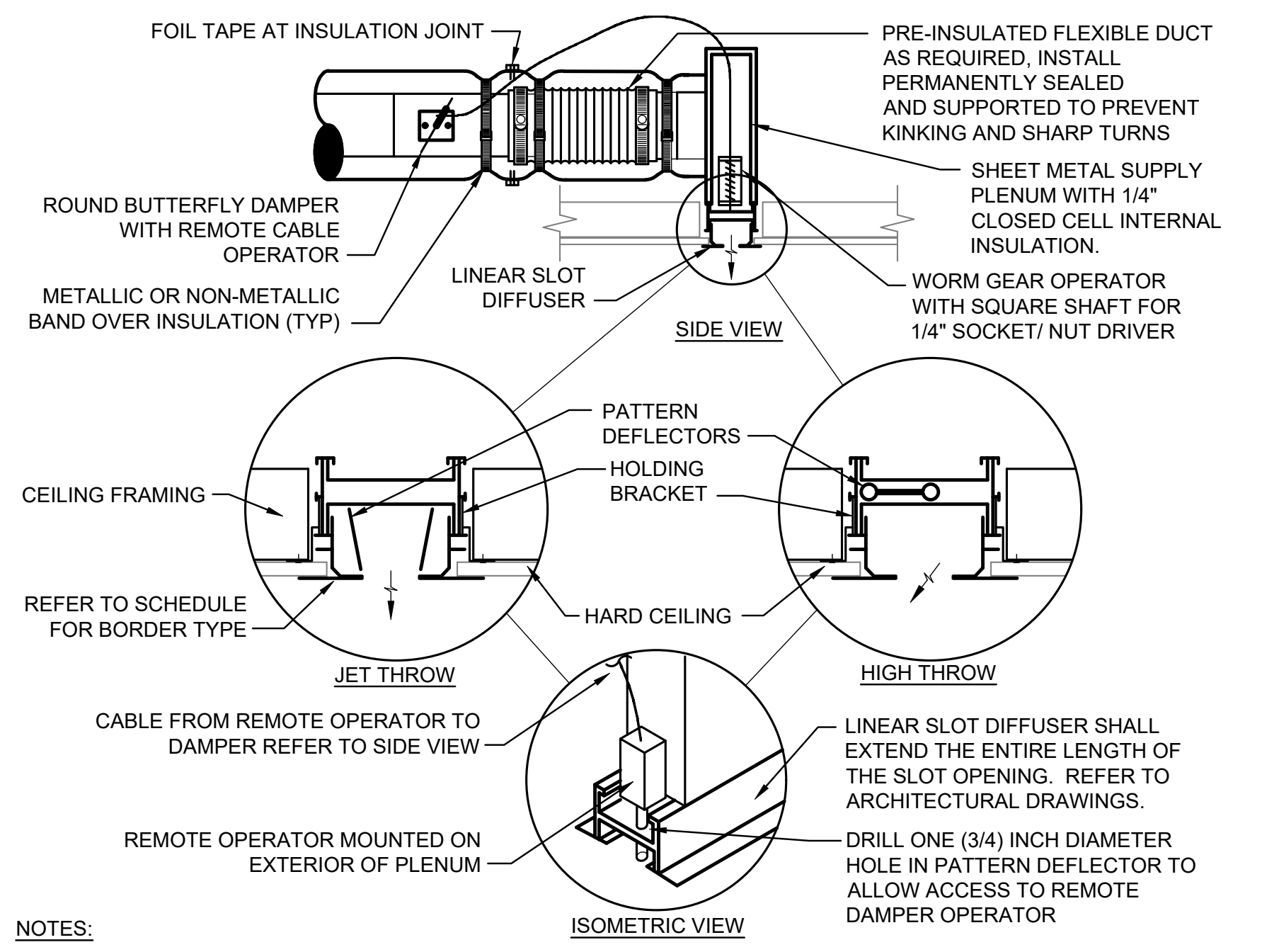
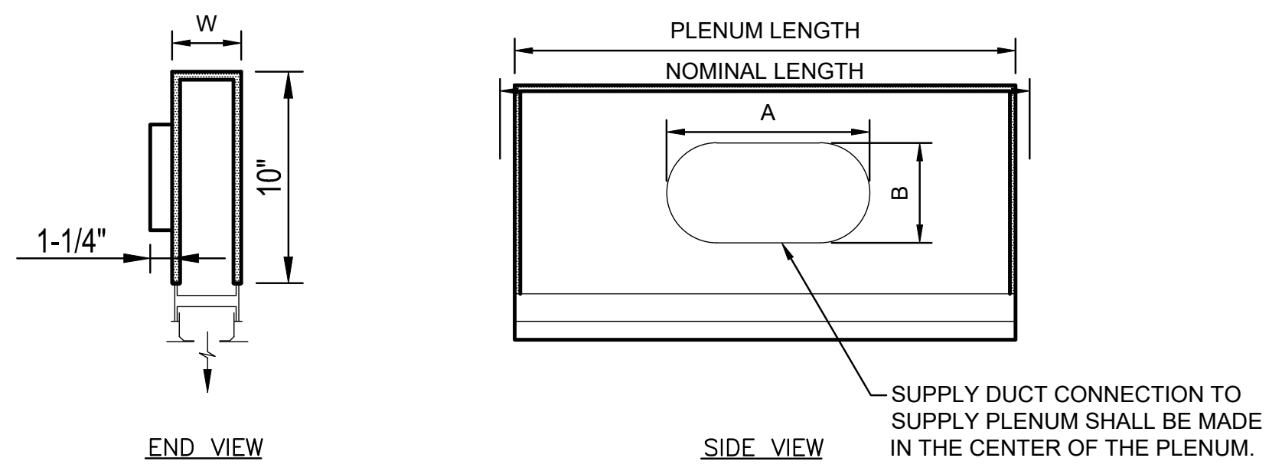
NOTES:
1. ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS AND MEET LOCAL CODE.
2. IF DAMPER IS SPECIFIED IN EQUIPMENT SCHEDULE, INSTALL DAMPER AT BASE OF CURB AND SECURE FROM ABOVE TO ALLOW SERVICE THROUGH TOP OF CURB.
3. PREFABRICATED INSULATED ROOF CURB WITH TREATED WOOD NAILER, CANT,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

18 ROOF MOUNTED DOWNBLAST FAN DETAIL
NO SCALE


FOIL TAPE AT INSULATION JOINT
PRE-INSULATED FLEXIBLE DUCT AS REQUIRED, INSTALL PERMANENTLY SEALED AND SUPPORTED TO PREVENT KINKING AND SHARP TURNS
ROUND BUTTERFLY DAMPER WITH REMOTE CABLE OPERATOR
SHEET METAL SUPPLY PLENUM WITH 1/4" CLOSED CELL INTERNAL INSULATION.
METALLIC OR NON-METALLIC BAND OVER INSULATION (TYP)
LINEAR SLOT DIFFUSER
SIDE VIEW
WORM GEAR OPERATOR WITH SQUARE SHAFT FOR 1/4" SOCKET/ NUT DRIVER
PATTERN DEFLECTORS
HOLDING BRACKET
CEILING FRAMING
REFER TO SCHEDULE FOR BORDER TYPE
HARD CEILING
JET THROW
HIGH THROW
CABLE FROM REMOTE OPERATOR TO DAMPER REFER TO SIDE VIEW
REMOTE OPERATOR MOUNTED ON EXTERIOR OF PLENUM
LINEAR SLOT DIFFUSER SHALL EXTEND THE ENTIRE LENGTH OF THE SLOT OPENING. REFER TO ARCHITECTURAL DRAWINGS.
DRILL ONE (3/4) INCH DIAMETER HOLE IN PATTERN DEFLECTOR TO ALLOW ACCESS TO REMOTE DAMPER OPERATOR
ISOMETRIC VIEW

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

17 LINEAR SLOT DIFFUSER IN GYP CEILING DETAIL
NO SCALE


W
10"
1-1/4"
END VIEW
PLENUM LENGTH
NOMINAL LENGTH
A
B
SIDE VIEW
SUPPLY DUCT CONNECTION TO SUPPLY PLENUM SHALL BE MADE IN THE CENTER OF THE PLENUM.

STANDARD SLOT PLENUM DIMENSIONS

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

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

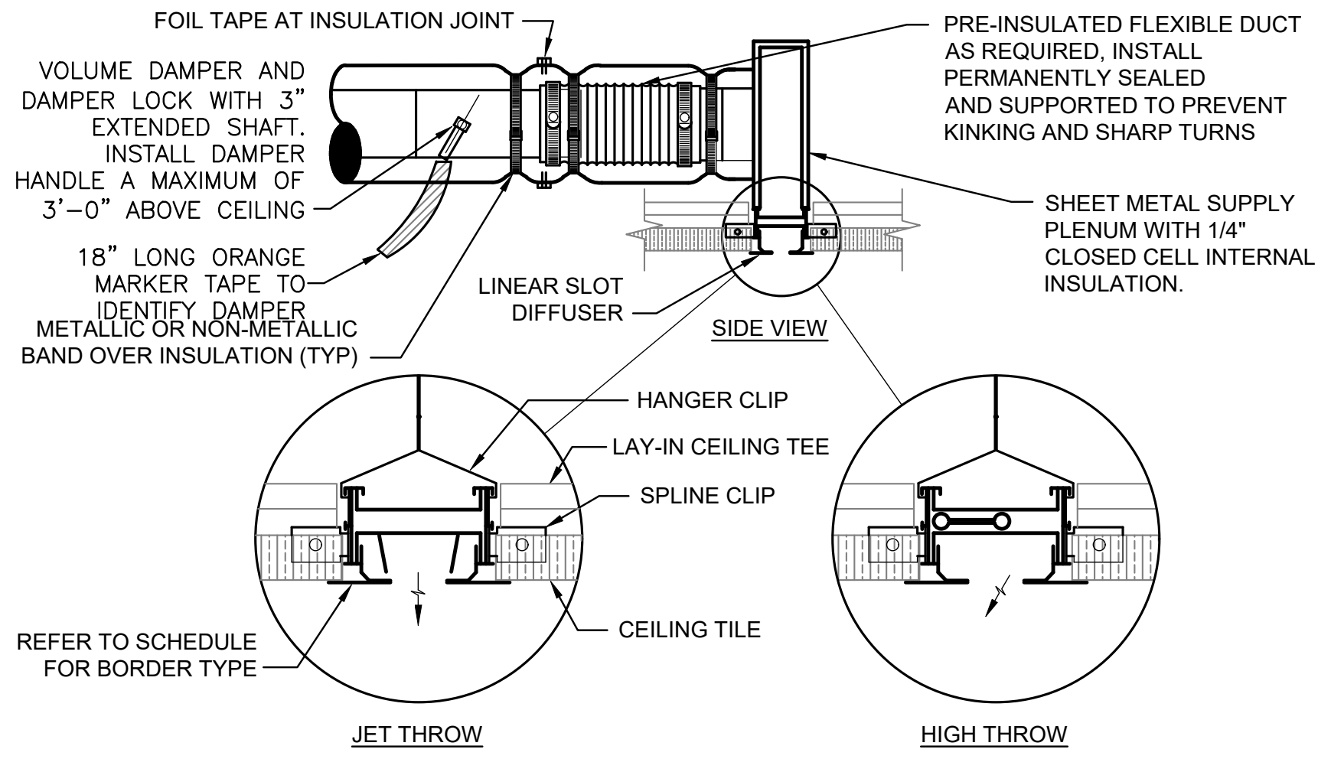
PLENUM DIMENSIONS FOR WHEN PLENUM MUST FIT BETWEEN FRAMING

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

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

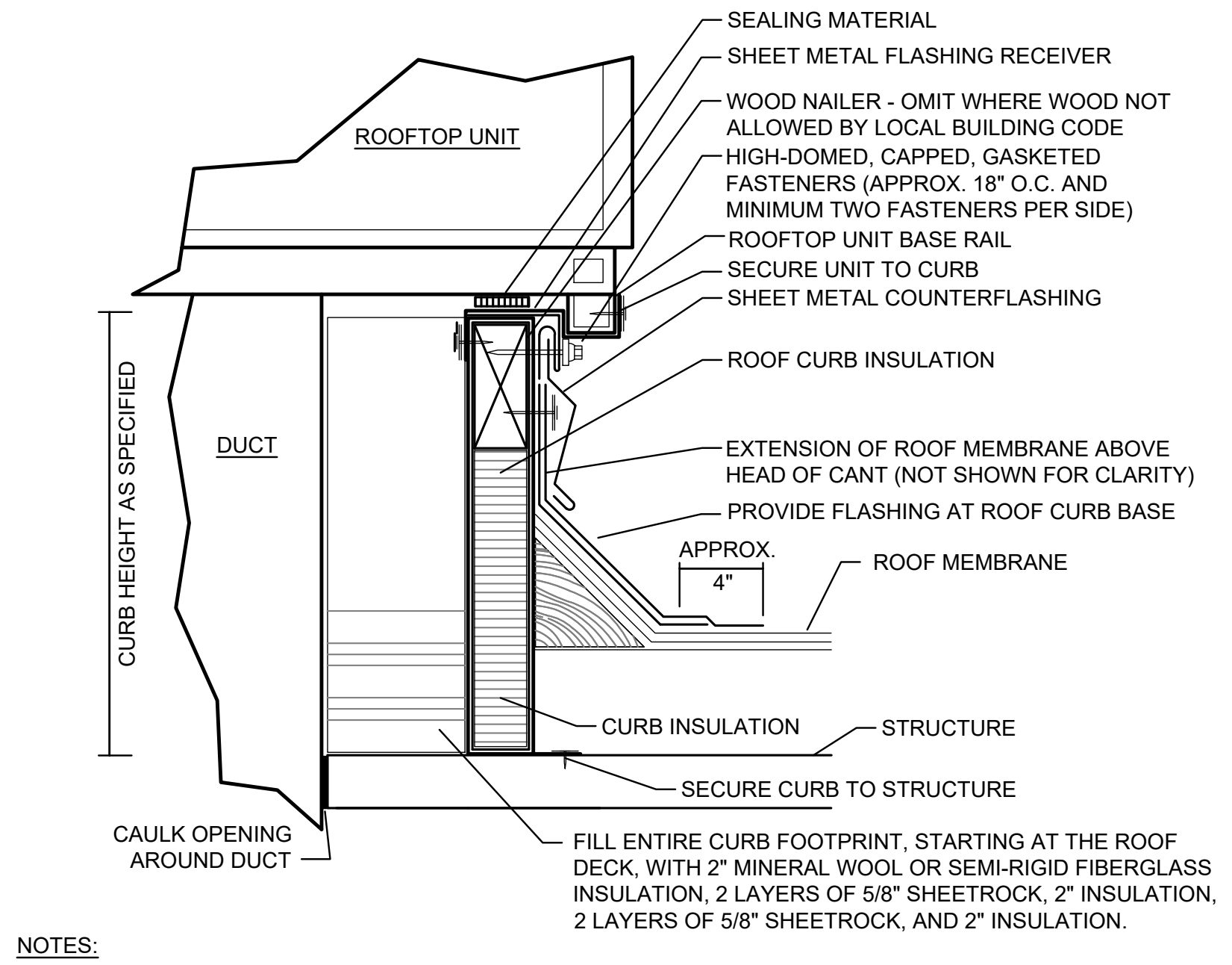
NOTES:
1. PLENUM MAY BE MOUNTED ON LINEAR SLOT DIFFUSER OR ARCHITECTURAL SLOT.
2. PROVIDE 1/4" THICK, INTERNAL, CLOSED CELL INSULATION ON ALL PLENUMS.
3. MINIMUM WIDTH INCLUDES 1/4" CLOSED CELL INTERNAL INSULATION.
4. COVE SLOT PLENUM CONSTRUCTION DIMENSIONS TO BE USED FOR PLENUMS SUPPLYING OUT OF LIGHT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

16 SUPPLY PLENUM CONSTRUCTION DETAIL
NO SCALE


FOIL TAPE AT INSULATION JOINT
VOLUME DAMPER AND DAMPER LOCK WITH 3" EXTENDED SHAFT. INSTALL DAMPER HANDLE A MAXIMUM OF 3'–0" ABOVE CEILING
18" LONG ORANGE MARKER TAPE TO IDENTIFY DAMPER
METALLIC OR NON-METALLIC BAND OVER INSULATION (TYP)
PRE-INSULATED FLEXIBLE DUCT AS REQUIRED, INSTALL PERMANENTLY SEALED AND SUPPORTED TO PREVENT KINKING AND SHARP TURNS
SHEET METAL SUPPLY PLENUM WITH 1/4" CLOSED CELL INTERNAL INSULATION.
LINEAR SLOT DIFFUSER
SIDE VIEW
HANGER CLIP
LAY-IN CEILING TEE
SPLINE CLIP
CEILING TILE
REFER TO SCHEDULE FOR BORDER TYPE
JET THROW
HIGH THROW

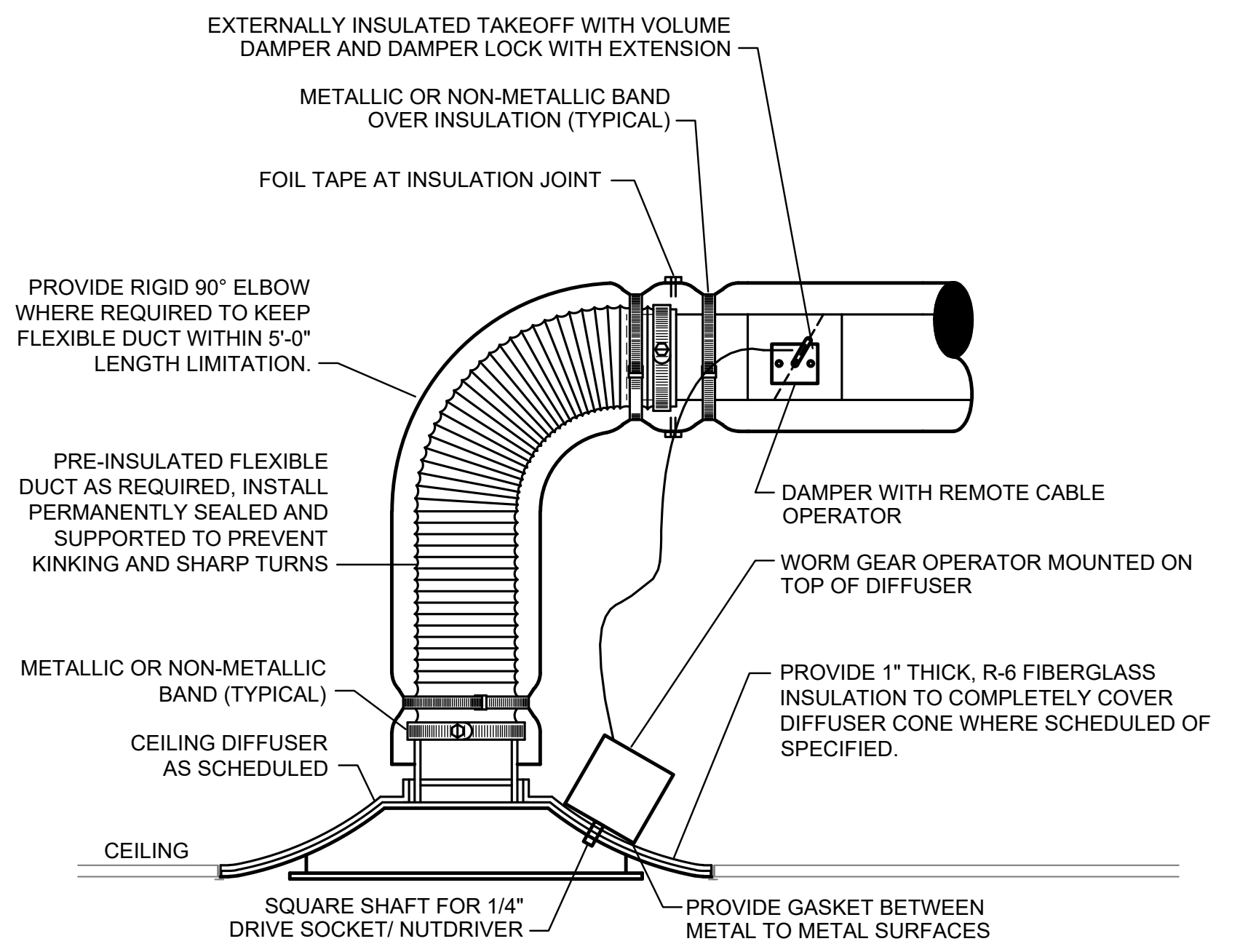
NOTES:
1. EXTEND HARD METAL DUCT SO THAT MAXIMUM FLEXIBLE DUCT LENGTH DOES NOT EXCEED 5'-0". PROVIDE RIGID 90° ELBOW WHERE REQUIRED TO KEEP FLEXIBLE DUCT WITHIN 5'-0" LENGTH LIMITATION.
2. COORDINATE EXACT LENGTH AND LOCATION OF SLOT DIFFUSER WITH ARCHITECT'S REFLECTED CEILING PLAN.
3. REFER TO DIFFUSER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

15 LINEAR SLOT DIFFUSER IN LAY–IN CEILING DETAIL
NO SCALE


SEALING MATERIAL
SHEET METAL FLASHING RECEIVER
ROOFTOP UNIT
WOOD NAILER - OMIT WHERE WOOD NOT ALLOWED BY LOCAL BUILDING CODE
HIGH-DOMED, CAPPED, GASKETED FASTENERS (APPROX. 18" O.C. AND MINIMUM TWO FASTENERS PER SIDE)
ROOFTOP UNIT BASE RAIL
SECURE UNIT TO CURB
SHEET METAL COUNTERFLASHING
ROOF CURB INSULATION
CURB HEIGHT AS SPECIFIED
DUCT
EXTENSION OF ROOF MEMBRANE ABOVE HEAD OF CANT (NOT SHOWN FOR CLARITY)
PROVIDE FLASHING AT ROOF CURB BASE
APPROX. 4"
ROOF MEMBRANE
CURB INSULATION
STRUCTURE
SECURE CURB TO STRUCTURE
CAULK OPENING AROUND DUCT
FILL ENTIRE CURB FOOTPRINT, STARTING AT THE ROOF DECK, WITH 2" MINERAL WOOL OR SEMI-RIGID FIBERGLASS INSULATION, 2 LAYERS OF 5/8" SHEETROCK, 2" INSULATION, 2 LAYERS OF 5/8" SHEETROCK, AND 2" INSULATION.

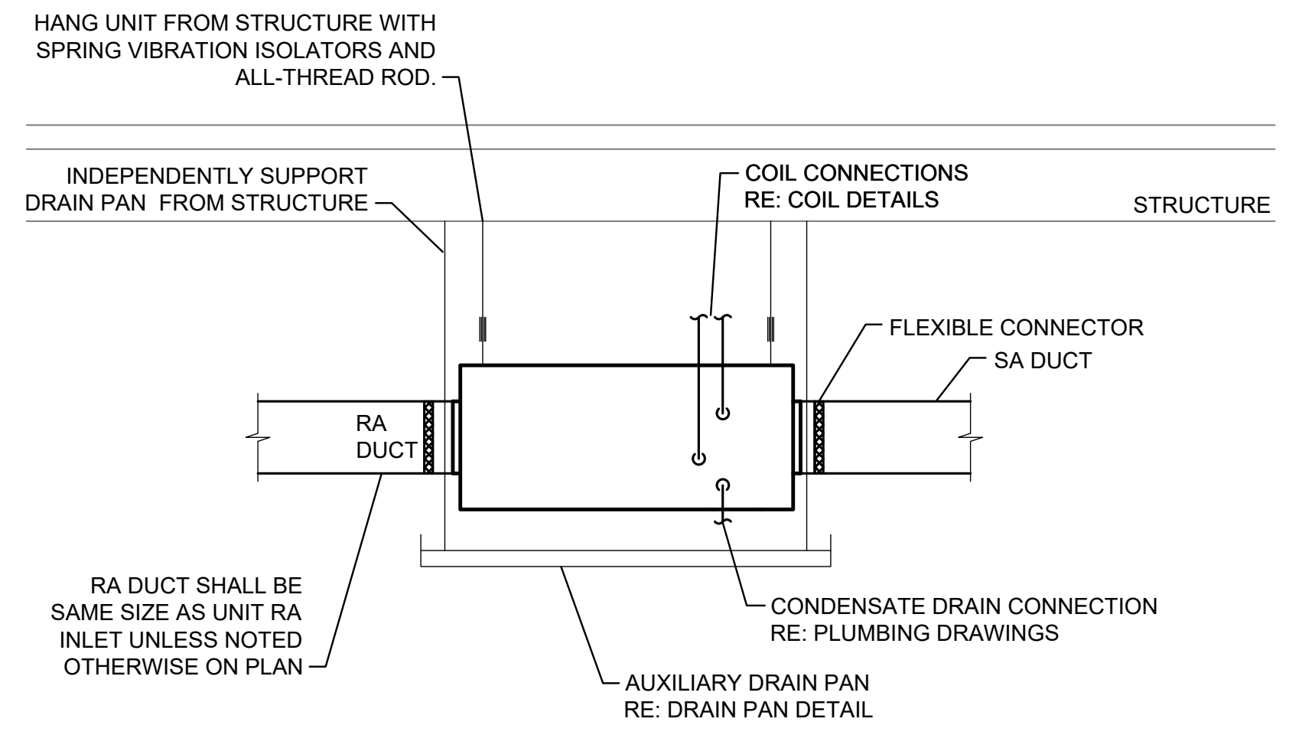
NOTES:
1. CUT METAL DECKING TO ALLOW CURB INSTALLATION ON STEEL FRAMING. AFTER CURB IS SET IN PLACE, TRIM REMAINING METAL DECKING AND INSTALL WITHIN CURB. TACK WELD DECKING TO SUPPORT STEEL. DO NOT WELD INTERIOR DECKING TO ROOF CURB. PROVIDE ADDITIONAL CROSS FRAMING TO SUPPORT INTERIOR DECKING AND FILL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

14 ROOF CURB DETAIL
NO SCALE


EXTERNALLY INSULATED TAKEOFF WITH VOLUME DAMPER AND DAMPER LOCK WITH EXTENSION
METALLIC OR NON-METALLIC BAND OVER INSULATION (TYPICAL)
FOIL TAPE AT INSULATION JOINT
PROVIDE RIGID 90° ELBOW WHERE REQUIRED TO KEEP FLEXIBLE DUCT WITHIN 5'-0" LENGTH LIMITATION.
PRE-INSULATED FLEXIBLE DUCT AS REQUIRED, INSTALL PERMANENTLY SEALED AND SUPPORTED TO PREVENT KINKING AND SHARP TURNS
DAMPER WITH REMOTE CABLE OPERATOR
WORM GEAR OPERATOR MOUNTED ON TOP OF DIFFUSER
METALLIC OR NON-METALLIC BAND (TYPICAL)
CEILING DIFFUSER AS SCHEDULED
PROVIDE 1" THICK, R-6 FIBERGLASS INSULATION TO COMPLETELY COVER DIFFUSER CONE WHERE SCHEDULED OF SPECIFIED.
CEILING
SQUARE SHAFT FOR 1/4" DRIVE SOCKET/ NUTDRIVER
PROVIDE GASKET BETWEEN METAL TO METAL SURFACES

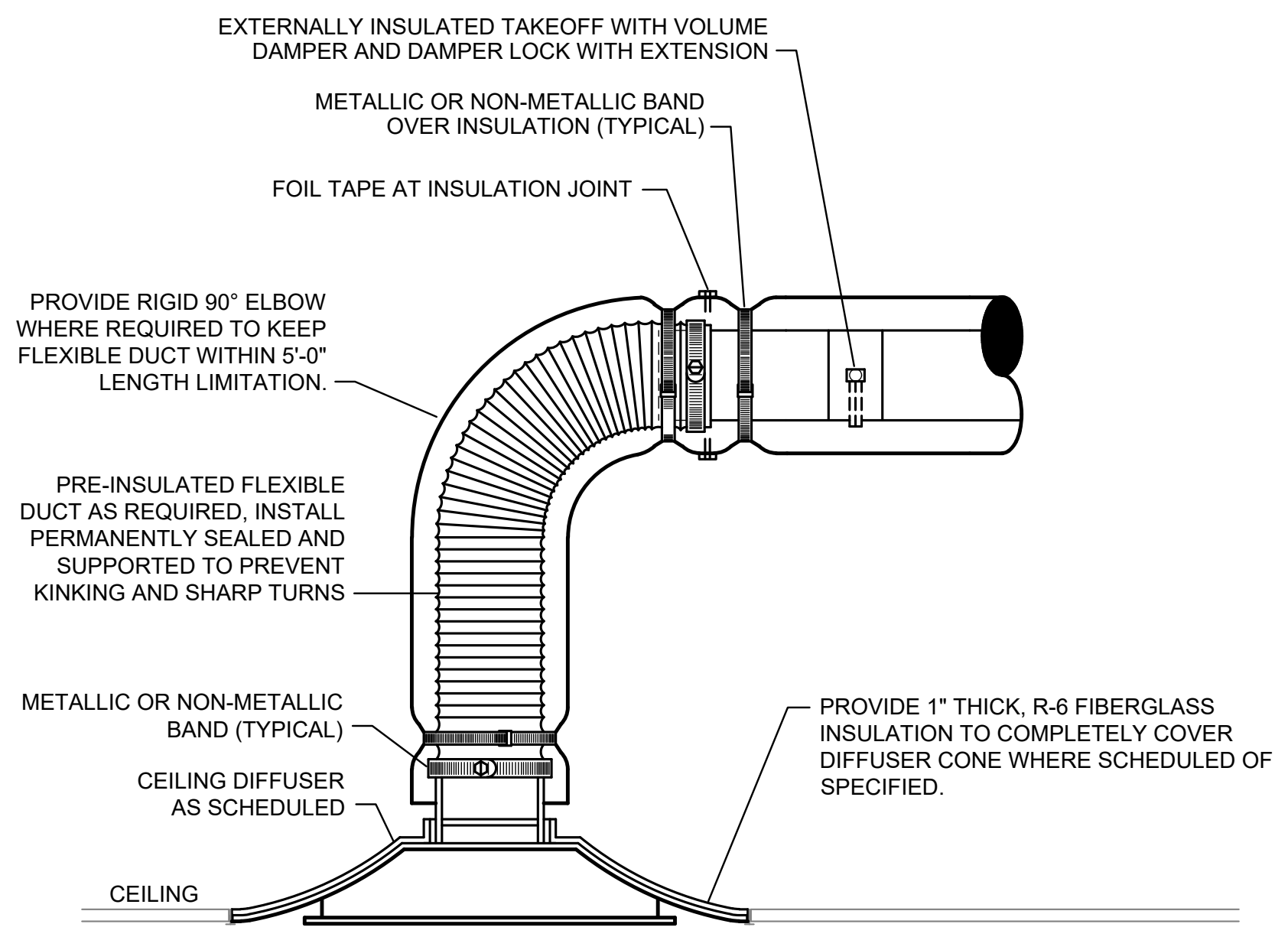
NOTES:
1. FLEXIBLE DUCT LENGTH MAY NOT EXCEED 5'-0". EXTEND RIGID DUCT AS REQUIRED.
2. REFER TO SPECIFICATIONS FOR FLEXIBLE DUCTWORK INSTALLATION REQUIREMENTS.

13 HARD CEILING DIFFUSER DETAIL
NO SCALE


HANG UNIT FROM STRUCTURE WITH SPRING VIBRATION ISOLATORS AND ALL-THREAD ROD.
INDEPENDENTLY SUPPORT DRAIN PAN FROM STRUCTURE
COIL CONNECTIONS RE: COIL DETAILS
STRUCTURE
FLEXIBLE CONNECTOR
SA DUCT
RA DUCT
RA DUCT SHALL BE SAME SIZE AS UNIT RA INLET UNLESS NOTED OTHERWISE ON PLAN
CONDENSATE DRAIN CONNECTION RE: PLUMBING DRAWINGS
AUXILIARY DRAIN PAN RE: DRAIN PAN DETAIL

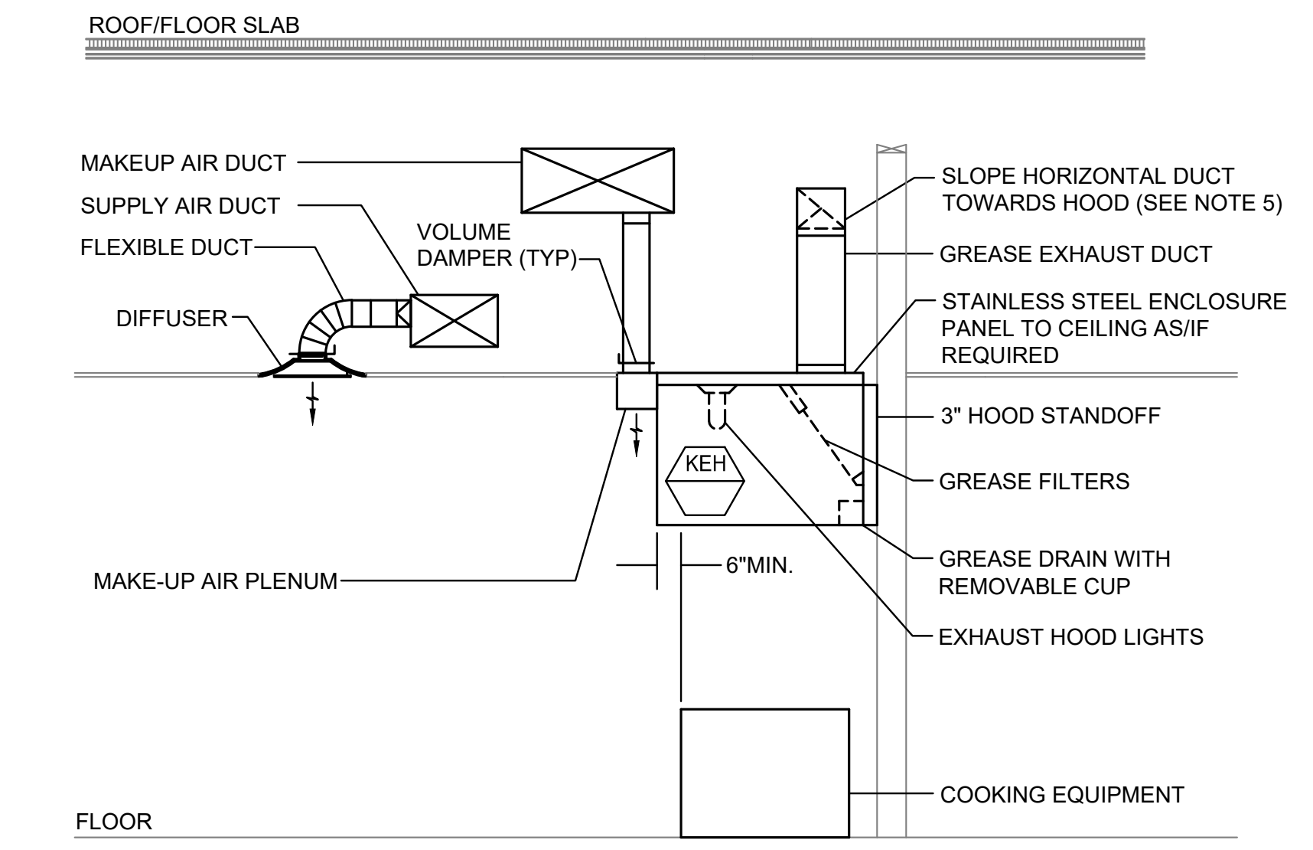
NOTES:
1. ARRANGEMENT SHOWN IS SCHEMATIC, ADJUST TO SUIT FIELD CONDITIONS AND MEET LOCAL CODE REQUIREMENTS.

12 HORIZONTAL HVAC UNIT DETAIL
NO SCALE


EXTERNALLY INSULATED TAKEOFF WITH VOLUME DAMPER AND DAMPER LOCK WITH EXTENSION
METALLIC OR NON-METALLIC BAND OVER INSULATION (TYPICAL)
FOIL TAPE AT INSULATION JOINT
PROVIDE RIGID 90° ELBOW WHERE REQUIRED TO KEEP FLEXIBLE DUCT WITHIN 5'-0" LENGTH LIMITATION.
PRE-INSULATED FLEXIBLE DUCT AS REQUIRED, INSTALL PERMANENTLY SEALED AND SUPPORTED TO PREVENT KINKING AND SHARP TURNS
METALLIC OR NON-METALLIC BAND (TYPICAL)
CEILING DIFFUSER AS SCHEDULED
PROVIDE 1" THICK, R-6 FIBERGLASS INSULATION TO COMPLETELY COVER DIFFUSER CONE WHERE SCHEDULED OF SPECIFIED.
CEILING

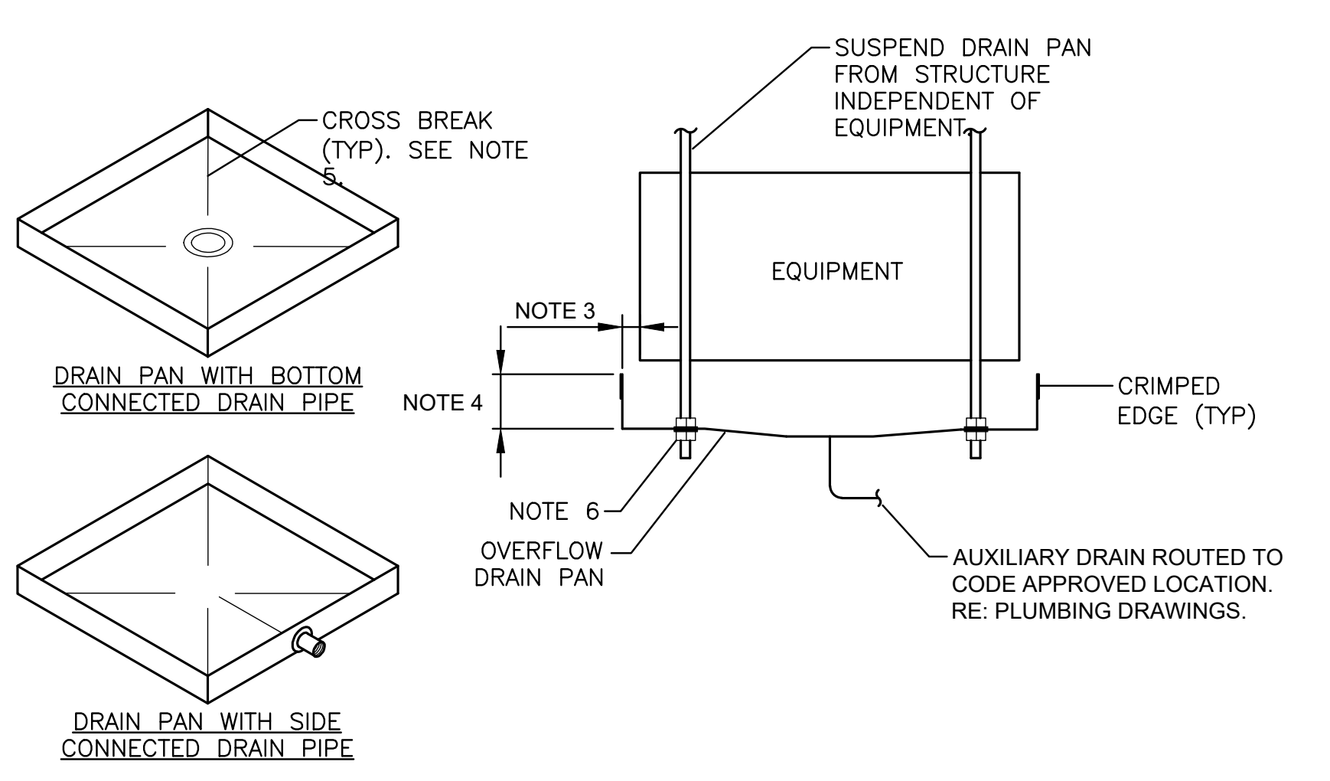
NOTES:
1. FLEXIBLE DUCT LENGTH MAY NOT EXCEED 5'-0". EXTEND RIGID DUCT AS REQUIRED.
2. REFER TO SPECIFICATIONS FOR FLEXIBLE DUCTWORK INSTALLATION REQUIREMENTS.

11 LAY–IN CEILING DIFFUSER DETAIL
NO SCALE


ROOF/FLOOR SLAB
MAKEUP AIR DUCT
SUPPLY AIR DUCT
FLEXIBLE DUCT
VOLUME DAMPER (TYP)
DIFFUSER
SLOPE HORIZONTAL DUCT TOWARDS HOOD (SEE NOTE 5)
GREASE EXHAUST DUCT
STAINLESS STEEL ENCLOSURE PANEL TO CEILING AS/IF REQUIRED
3" HOOD STANDOFF
KEH
GREASE FILTERS
MAKE-UP AIR PLENUM
6"MIN.
GREASE DRAIN WITH REMOVABLE CUP
EXHAUST HOOD LIGHTS
COOKING EQUIPMENT
FLOOR

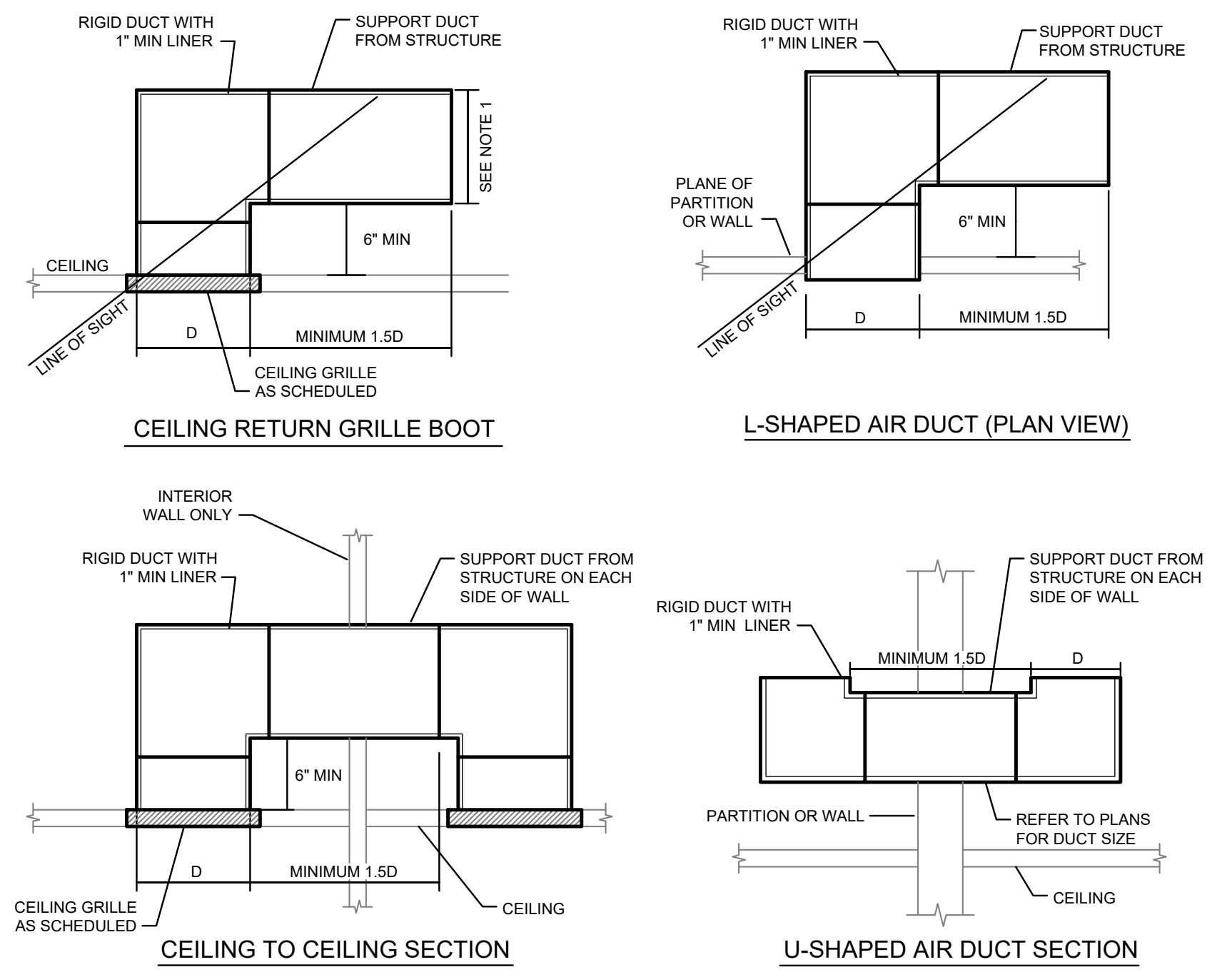
NOTES:
1. SUBMIT SHOP DRAWINGS OF ALL HOOD SYSTEMS TO CITY FOR APPROVAL PRIOR TO INSTALLATION.
2. TOTAL HOOD SYSTEM TO BE IN COMPLETE CONFORMANCE WITH NFPA, AND ALL LOCAL CODES AND REGULATIONS.
3. COORDINATE ALL FIRE PROTECTION SYSTEMS WITH FIRE PROTECTION CONTRACTOR WHO SHALL ALSO BE RESPONSIBLE FOR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

10 KITCHEN EXHAUST HOOD ELEVATION DETAIL
NO SCALE


CROSS BREAK (TYP). SEE NOTE 5.
DRAIN PAN WITH BOTTOM CONNECTED DRAIN PIPE
DRAIN PAN WITH SIDE CONNECTED DRAIN PIPE
SUSPEND DRAIN PAN FROM STRUCTURE INDEPENDENT OF EQUIPMENT
NOTE 3
EQUIPMENT
NOTE 4
NOTE 6
OVERFLOW DRAIN PAN
CRIMPED EDGE (TYP)
AUXILIARY DRAIN ROUTED TO CODE APPROVED LOCATION. RE: PLUMBING DRAWINGS.

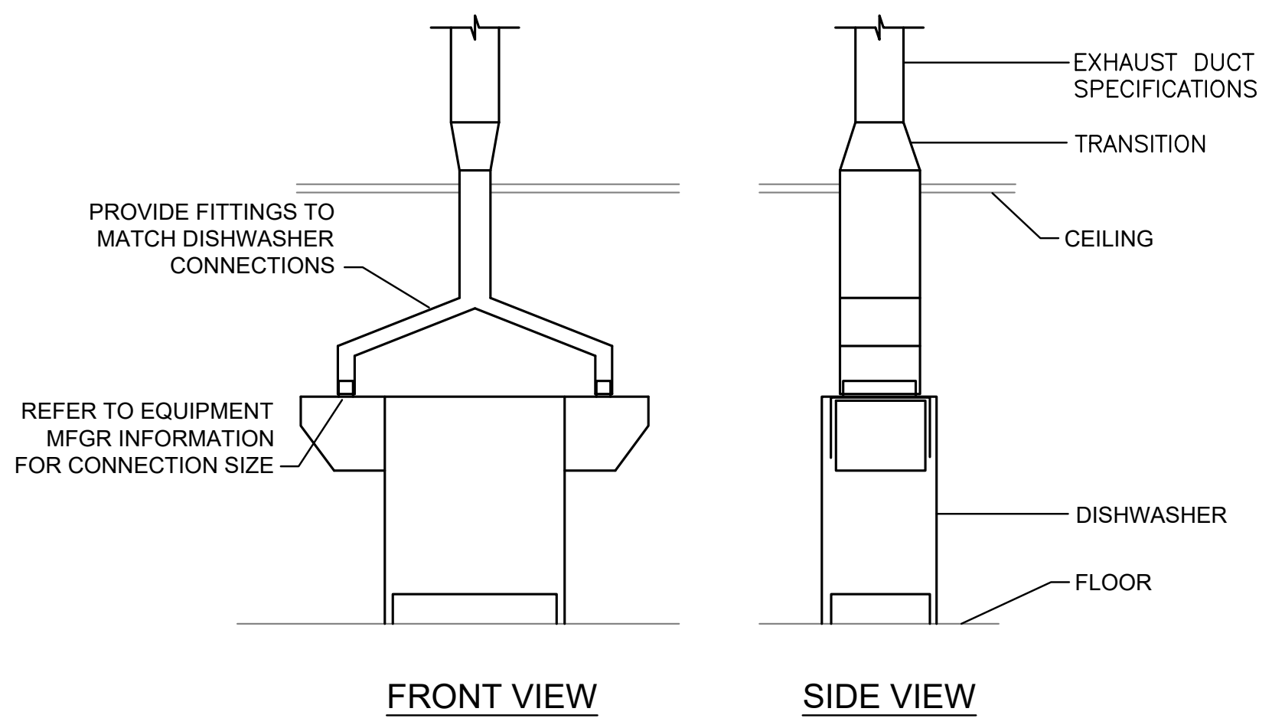
NOTES:
1. SOLDER ALL JOINTS TO MAKE DRAIN PAN LEAK TIGHT.
2. FABRICATE DRAIN PAN FROM 20 GAUGE GALVANIZED SHEET METAL.
3. DRAIN PAN SHALL EXTEND MINIMUM 3" BEYOND EQUIPMENT ON ALL SIDES.
4. HEIGHT OF DRAIN PAN TO BE MINIMUM 1/2" GREATER THAN DIAMETER OF SIDE–CONNECTED DRAIN PIPE FLANGE OR 1–1/2", WHICHEVER IS GREATER.
5. CROSS BREAK BOTTOM OF SHEET METAL DRAIN PAN TO PROVIDE SLOPED DRAINAGE TO OUTLET.
6. SEAL DRAIN PAN WITH NEOPRENE WASHERS AT SUPPORT RODS.

9 CONDENSATE OVERFLOW DRAIN PAN DETAIL
NO SCALE


RIGID DUCT WITH 1" MIN LINER
SUPPORT DUCT FROM STRUCTURE
SEE NOTE 1
6" MIN
CEILING
LINE OF SIGHT
D
MINIMUM 1.5D
CEILING GRILLE AS SCHEDULED
CEILING RETURN GRILLE BOOT
RIGID DUCT WITH 1" MIN LINER
SUPPORT DUCT FROM STRUCTURE
PLANE OF PARTITION OR WALL
6" MIN
LINE OF SIGHT
D
MINIMUM 1.5D
L-SHAPED AIR DUCT (PLAN VIEW)
INTERIOR WALL ONLY
RIGID DUCT WITH 1" MIN LINER
SUPPORT DUCT FROM STRUCTURE ON EACH SIDE OF WALL
6" MIN
D
MINIMUM 1.5D
CEILING GRILLE AS SCHEDULED
CEILING
CEILING TO CEILING SECTION
RIGID DUCT WITH 1" MIN LINER
SUPPORT DUCT FROM STRUCTURE ON EACH SIDE OF WALL
MINIMUM 1.5D
D
PARTITION OR WALL
REFER TO PLANS FOR DUCT SIZE
CEILING
U-SHAPED AIR DUCT SECTION

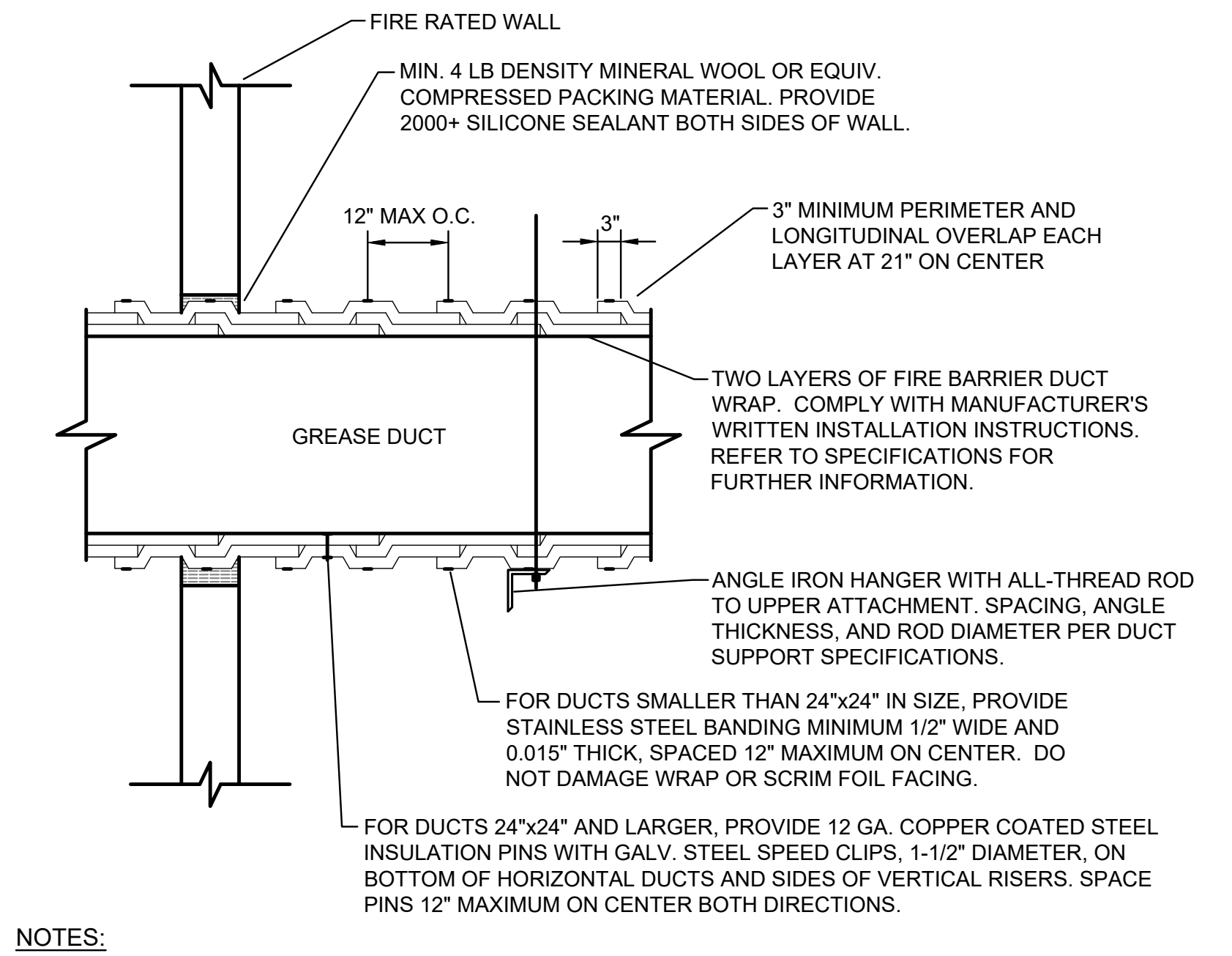
NOTES:
1. REFER TO FLOOR PLAN FOR OUTLET DEPTH. WHEN NO DEPTH IS SHOWN, MINIMUM DEPTH SHALL BE AS REQUIRED TO LIMIT AIR VELOCITY TO 500 FPM WITH A MINIMUM SIZE OF 0.5D.

8 RETURN/TRANSFER AIR DUCT DETAILS
NO SCALE


PROVIDE FITTINGS TO MATCH DISHWASHER CONNECTIONS
REFER TO EQUIPMENT MFGR INFORMATION FOR CONNECTION SIZE
EXHAUST DUCT PER SPECIFICATIONS
TRANSITION
CEILING
DISHWASHER
FLOOR
FRONT VIEW
SIDE VIEW

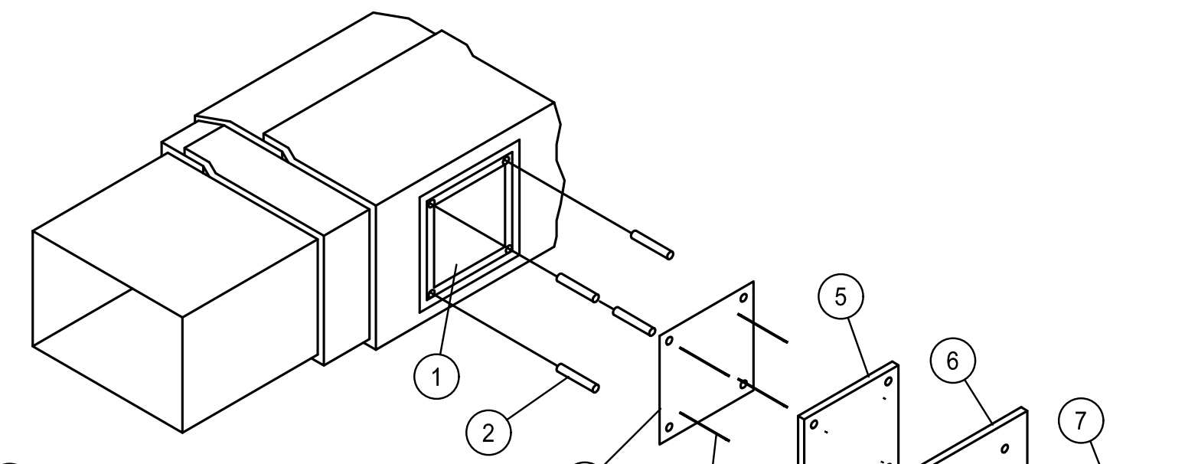
NOTES:
1. COORDINATE EXACT LOCATION OF MECHANICAL CONNECTIONS WITH KITCHEN EQUIPMENT.

7 DISHWASHER EXHAUST DUCT DETAIL
NO SCALE


FIRE RATED WALL
MIN. 4 LB DENSITY MINERAL WOOL OR EQUIV. COMPRESSED PACKING MATERIAL. PROVIDE 2000+ SILICONE SEALANT BOTH SIDES OF WALL.
12" MAX O.C.
3"
3" MINIMUM PERIMETER AND LONGITUDINAL OVERLAP EACH LAYER AT 21" ON CENTER
GREASE DUCT
TWO LAYERS OF FIRE BARRIER DUCT WRAP. COMPLY WITH MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.
ANGLE IRON HANGER WITH ALL-THREAD ROD TO UPPER ATTACHMENT. SPACING, ANGLE THICKNESS, AND ROD DIAMETER PER DUCT SUPPORT SPECIFICATIONS.
FOR DUCTS SMALLER THAN 24"x24" IN SIZE, PROVIDE STAINLESS STEEL BANDING MINIMUM 1/2" WIDE AND 0.015" THICK, SPACED 12" MAXIMUM ON CENTER. DO NOT DAMAGE WRAP OR SCRIM FOIL FACING.
FOR DUCTS 24"x24" AND LARGER, PROVIDE 12 GA. COPPER COATED STEEL INSULATION PINS WITH GALV. STEEL SPEED CLIPS, 1-1/2" DIAMETER, ON BOTTOM OF HORIZONTAL DUCTS AND SIDES OF VERTICAL RISERS. SPACE PINS 12" MAXIMUM ON CENTER BOTH DIRECTIONS.

NOTES:
1. INSTALL GREASE EXHAUST AND FIRE RATED DUCT WRAP IN ACCORDANCE WITH THE MANUFACTURER'S APPROVED INSTRUCTIONS AND UL LISTED INSTALLATION DETAILS. TECHNIQUES THAT DIFFER FROM THE ABOVE METHOD ARE ACCEPTABLE IF THEY ARE UL TESTED AND APPROVED.

6 GREASE DUCT FIRE WRAP INSULATION INSTALLATION DETAIL
NO SCALE


1
2
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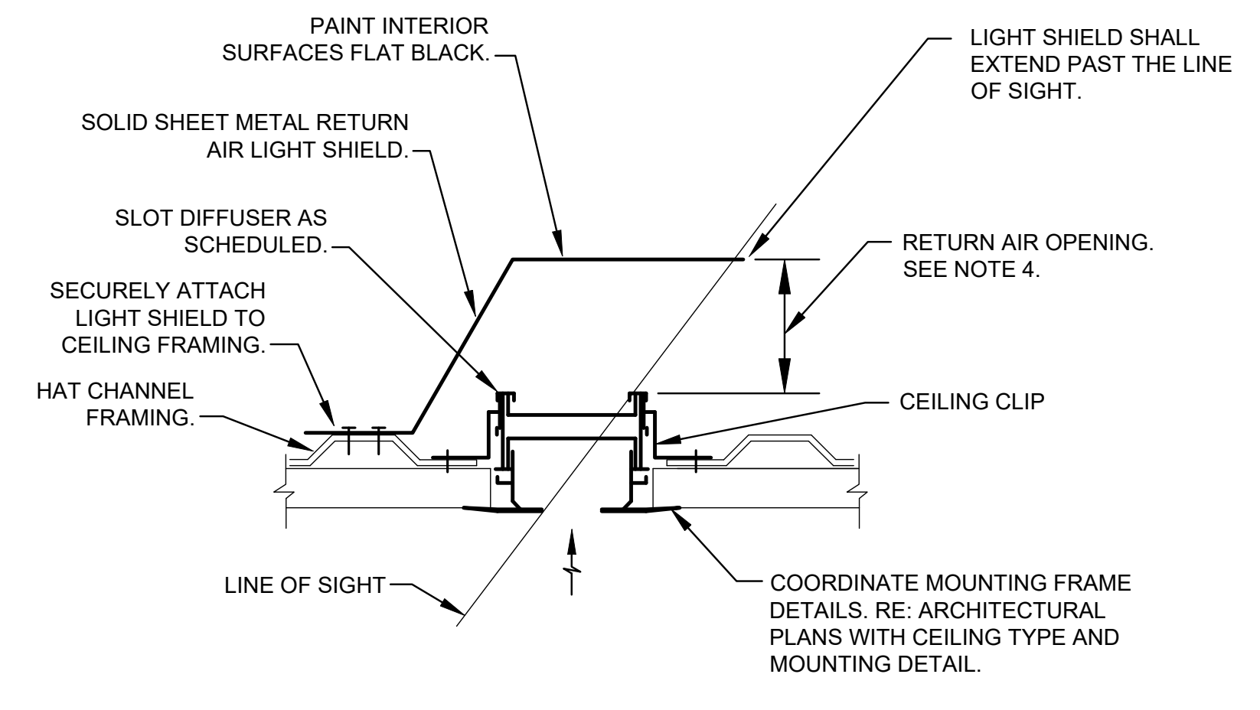
KEYED NOTES
1. ACCESS HOLE
2. 1/4 IN. (6mm) DIAMETER ALL THREADED RODS
3. ACCESS COVER - 16 GAUGE
4. INSULATED PINS - WELDED
5. FIRST LAYER FIRE BARRIER DUCT WRAP CUT SAME SIZE AS COVER
6. SECOND LAYER FIRE BARRIER DUCT WRAP WITH 1 IN. (25mm) OVERLAP ON ALL SIDES
7. THIRD LAYER FIRE BARRIER DUCT WRAP WITH 1 IN. (25mm) OVERLAP ON ALL SIDES OF PREVIOUS LAYER
8. SPEED CLIPS
9. ALUMINUM TAPE COVERING ALL EXPOSED EDGES
10. SPOOL PIECES FOR THREADED RODS
11. 1/4 IN. (6mm) DIAMETER WING NUTS

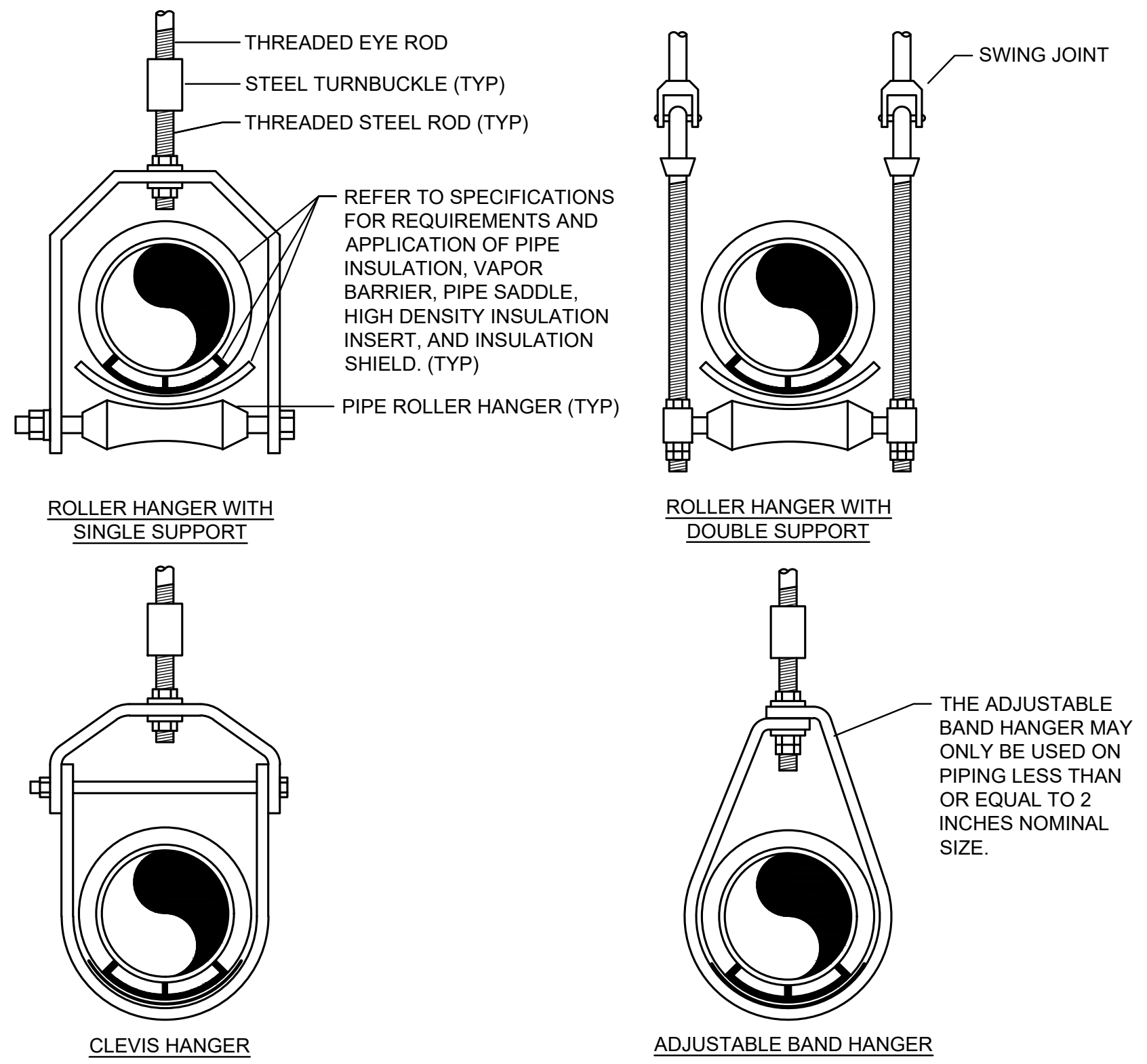
NOTES:
1. FOR REFERENCE ONLY. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
2. AT CONTRACTOR'S OPTION, A LISTED UL 1978 GREASE ACCESS DOOR PRODUCT MAY BE SUBSTITUTED FOR THE ACCESS DOOR PICTURED IN THIS DETAIL. DOOR SHALL BE RATED FOR UP TO 2,300F AND MEET NFPA96 STANDARDS. BOLTS SHALL BE LONG ENOUGH FOR DUCT WRAP SYSTEM (WHEN USED). INSTALL IN ACCORDANCE WITH MANUFACTURER'S LITERATURE.

5 GREASE DUCT CLEANOUT ACCESS DOOR DETAIL
NO SCALE

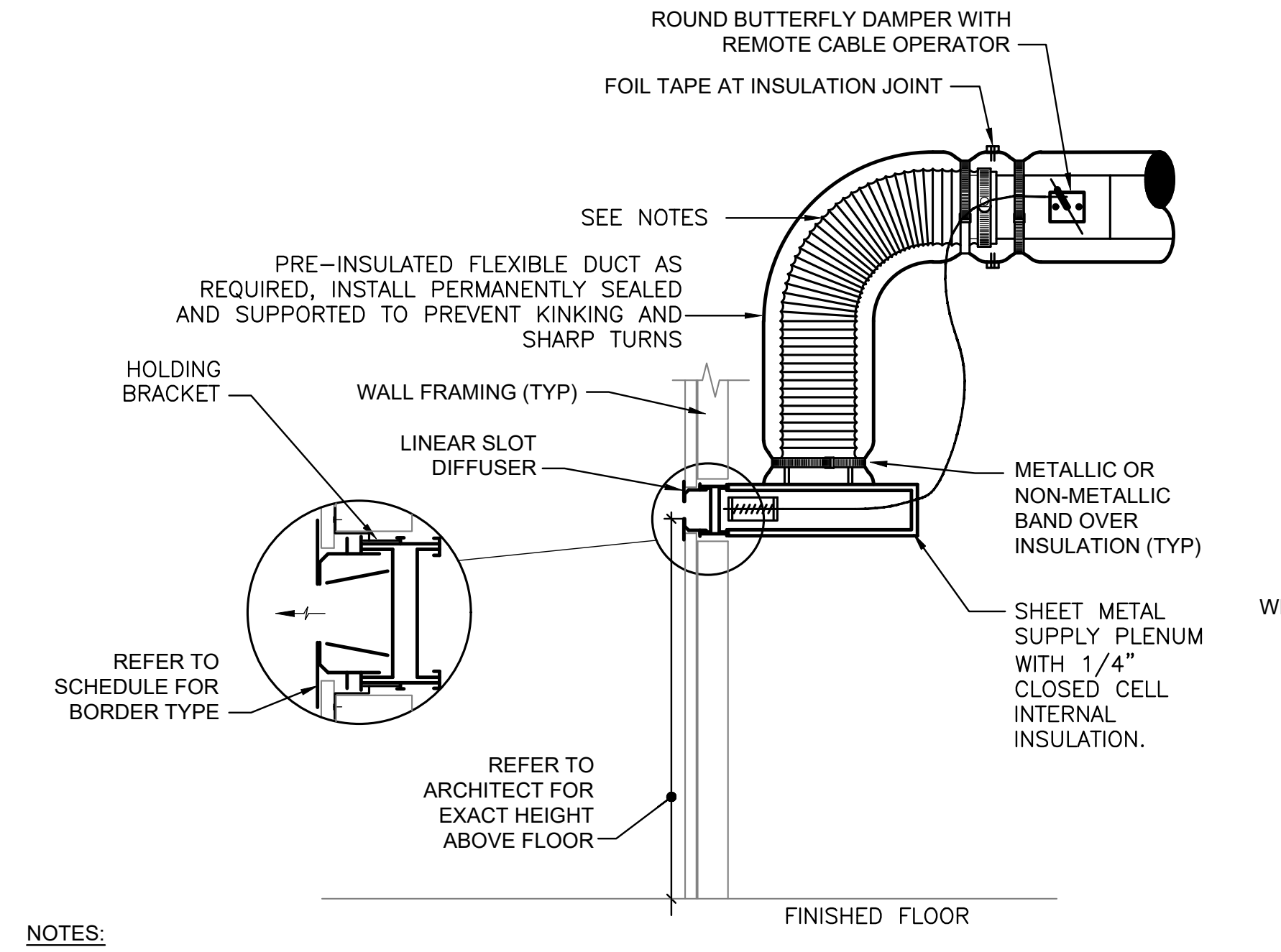

PAINT INTERIOR SURFACES FLAT BLACK.
SOLID SHEET METAL RETURN AIR LIGHT SHIELD.
SLOT DIFFUSER AS SCHEDULED.
SECURELY ATTACH LIGHT SHIELD TO CEILING FRAMING.
HAT CHANNEL FRAMING.
LIGHT SHIELD SHALL EXTEND PAST THE LINE OF SIGHT.
RETURN AIR OPENING. SEE NOTE 4.
CEILING CLIP
LINE OF SIGHT
COORDINATE MOUNTING FRAME DETAILS. RE: ARCHITECTURAL PLANS WITH CEILING TYPE AND MOUNTING DETAIL.

NOTES:
1. DETAIL REFERS TO LIGHT SHIELD OVER LINEAR SLOT DIFFUSERS IN THE CEILING OR REVEAL.
2. COORDINATE INSTALLATION POINT OF RETURN AIR LIGHT SHIELD WITH ACTUAL INSTALLED CEILING FRAMING. SECURELY ATTACH LIGHT SHIELD TO THE SAME CEILING FRAMING DIFFUSER IS ATTACHED TO.
3. POSITION PATTERN DEFLECTOR SUCH THAT IT DISALLOWS DIRECT LINE OF SIGHT INTO THE PLENUM.
4. LIGHT SHIELD RETURN AIR OPENING SHALL BE A MINIMUM OF 3" FOR SLOT WIDTHS UP TO 2" AND 6" FOR SLOT WIDTHS LARGER THAN 2".

4 FIELD–FABRICATED RETURN AIR LIGHT SHIELD DETAIL
NO SCALE

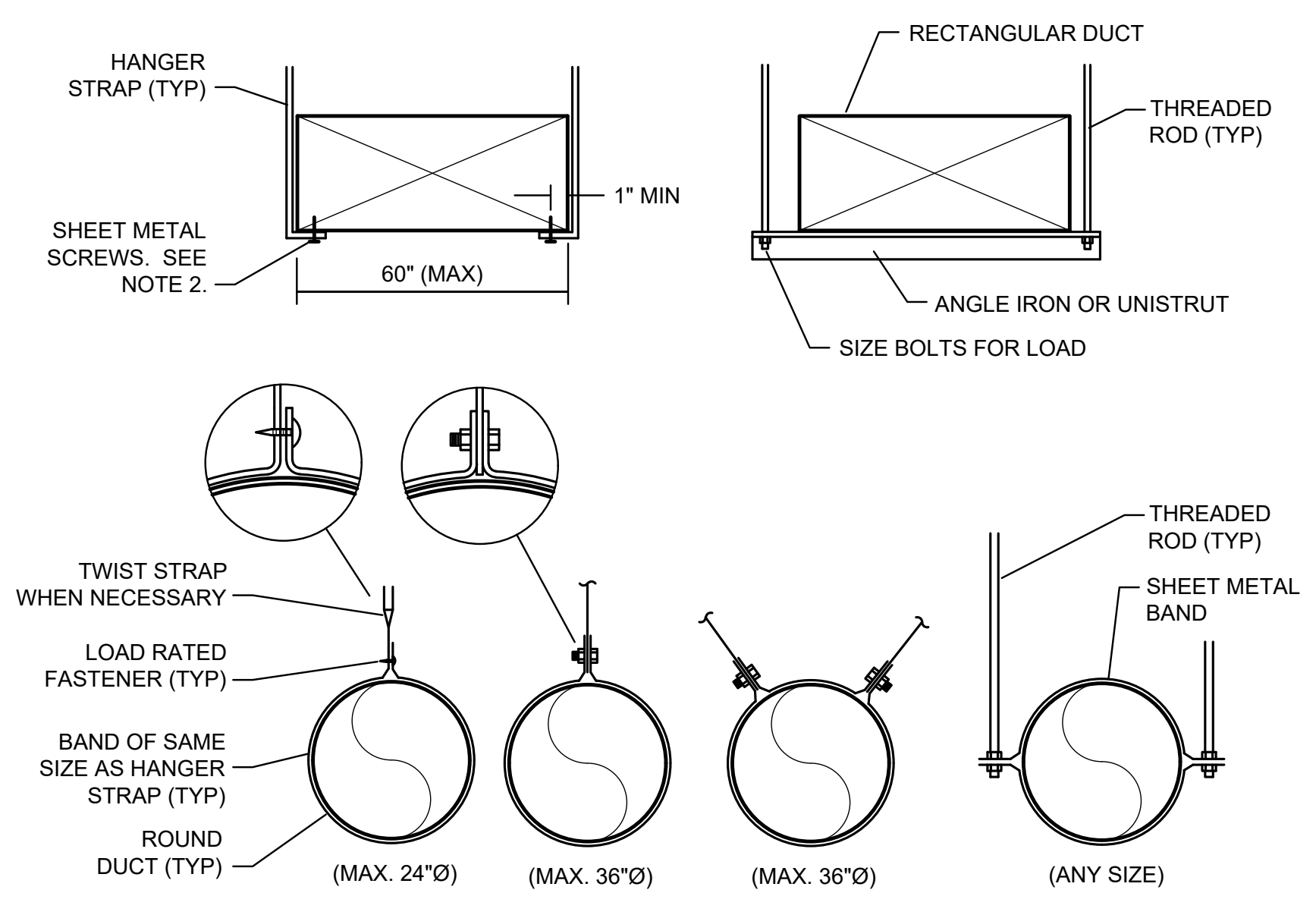

THREADED EYE ROD
STEEL TURNBUCKLE (TYP)
THREADED STEEL ROD (TYP)
REFER TO SPECIFICATIONS FOR REQUIREMENTS AND APPLICATION OF PIPE INSULATION, VAPOR BARRIER, PIPE SADDLE, HIGH DENSITY INSULATION INSERT, AND INSULATION SHIELD. (TYP)
PIPE ROLLER HANGER (TYP)
SWING JOINT
ROLLER HANGER WITH SINGLE SUPPORT
ROLLER HANGER WITH DOUBLE SUPPORT
THE ADJUSTABLE BAND HANGER MAY ONLY BE USED ON PIPING LESS THAN OR EQUAL TO 2 INCHES NOMINAL SIZE.
CLEVIS HANGER
ADJUSTABLE BAND HANGER

3 PIPE HANGER DETAILS
NO SCALE


ROUND BUTTERFLY DAMPER WITH REMOTE CABLE OPERATOR
FOIL TAPE AT INSULATION JOINT
SEE NOTES
PRE–INSULATED FLEXIBLE DUCT AS REQUIRED, INSTALL PERMANENTLY SEALED AND SUPPORTED TO PREVENT KINKING AND SHARP TURNS
HOLDING BRACKET
WALL FRAMING (TYP)
LINEAR SLOT DIFFUSER
METALLIC OR NON-METALLIC BAND OVER INSULATION (TYP)
SHEET METAL SUPPLY PLENUM WITH 1/4" CLOSED CELL INTERNAL INSULATION.
REFER TO SCHEDULE FOR BORDER TYPE
REFER TO ARCHITECT FOR EXACT HEIGHT ABOVE FLOOR
FINISHED FLOOR

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

2 SIDEWALL LINEAR SLOT DIFFUSER DETAIL
NO SCALE


HANGER STRAP (TYP)
SHEET METAL SCREWS. SEE NOTE 2.
1" MIN
60" (MAX)
RECTANGULAR DUCT
THREADED ROD (TYP)
ANGLE IRON OR UNISTRUT
SIZE BOLTS FOR LOAD
TWIST STRAP WHEN NECESSARY
LOAD RATED FASTENER (TYP)
BAND OF SAME SIZE AS HANGER STRAP (TYP)
ROUND DUCT (TYP)
(MAX. 24"Ø)
(MAX. 36"Ø)
(MAX. 36"Ø)
THREADED ROD (TYP)
SHEET METAL BAND
(ANY SIZE)

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

1 DUCT HANGER LOWER ATTACHMENT DETAILS
NO SCALE

HENDERSON ENGINEERS
8345 LENEXA DRIVE, SUITE 300
LENEXA, KS 66214
TEL 913.742.5000 FAX 913.742.5001
WWW.HENDERSONENGINEERS.COM
2150004520
IL. CORPORATE NUMBER: 184-002965
04/30/23

VERNON HILLS, IL 60061

Perry's
STEAKHOUSE & GRILLE®

1050 N MILWAUKEE AVE

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

No	Date	Remarks
	04/19/23	PERMIT UPDATES
	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

REVISIONS

EXPIRES ON: 11/30/2023
COY M. MACY
062.068038
04/20/2023

Drawing Title
MECHANICAL DETAILS

Job No.

Drawn
CMM

Scale
AS NOTED

Date

Sheet No.
M3.0

COY M. MACY

Division 23: HEATING, VENTILATING, AND AIR CONDITIONING

1. GENERAL INSTRUCTIONS

A. GENERAL REQUIREMENTS

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

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

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

B. DEFINITIONS

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

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

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

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

Provide: "to furnish and install."

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

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

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

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

Substitution: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor. Substitutions include Value Engineering proposals.
1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

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

C. PREBID SITE VISIT

Prior to submitting bid, visit the site of the proposed work and become fully informed as to the conditions under which the work is to be done. Failure to comply with this requirement shall not be considered sufficient justification to request or obtain extra compensation over and above the contract price.

D. MATERIAL AND WORKMANSHIP

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

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

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

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

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

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

E. MANUFACTURERS

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

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

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

F. COORDINATION

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

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

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

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

G. ORDINANCES AND CODES

Work performed under this contract shall, at a minimum, be in conformance with applicable national, state and local codes having jurisdiction. Equipment furnished and associated installation work performed under this contract shall be in strict compliance with current applicable codes adopted by the local AHJ, including any amendments and standards as set forth by the following:
1. National Electrical Code (NEC)
2. National Fire Protection Association (NFPA)
3. Underwriters Laboratories (UL)
4. Occupational Safety and Health Administration (OSHA)
5. American Society of Mechanical Engineers (ASME)
6. American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE)
7. American National Standards Institute (ANSI)
8. American Society of Testing and Materials (ASTM)
9. Other national standards and codes where applicable.

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

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

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

H. PROTECTION OF EQUIPMENT AND MATERIALS

Store and protect from damage equipment and materials delivered to job site. For materials and equipment susceptible to changing weather conditions, dampness, or temperature variations, store inside in conditioned spaces. For materials and equipment not susceptible to these conditions, cover with waterproof, tear-resistant, heavy tarp or polyethylene plastic as required to protect from plaster, dust, dirt, paint, water, or physical damage. Replace insulation that has become wet at any time during construction. Drying the insulation is not acceptable. Seal any tears or joints of internal fiberglass insulation. Equipment and material damaged by construction activities shall be rejected and Contractor shall furnish new equipment and material of a like kind at his own expense.

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

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

I. SUBSTITUTIONS

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

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

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

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

J. SUBMITTALS

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

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

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

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

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

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

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

K. RECORD DRAWINGS (AS-BUILT DRAWINGS)

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

See Division 01 and General Conditions for additional information.

L. OPERATION AND MAINTENANCE INSTRUCTIONS

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

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

Include Record Drawings as described above.

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

M. SPARE PARTS

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

N. TRAINING

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

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

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

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

O. WARRANTIES

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

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

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

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

2. GENERAL MATERIALS AND INSTALLATION

A. BUILDING OPERATION

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

B. COINCIDENTAL DAMAGE

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

C. CUTTING AND PATCHING

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

D. ROUGH-IN

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

E. STRUCTURALSUPPORT SYSTEMS

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

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

F. PRE-ENGINEERED ROOF EQUIPMENT SUPPORTS AND CURBS

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

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

G. ACCESS PANELS AND DOORS

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

H. PENETRATIONS

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

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

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

Extend pipe insulation for insulated pipe through floor, wall and roof penetrations, including fire rated walls and floors. The vapor barrier shall be maintained. Size sleeve for a minimum of 1 inch annular clear space between inside of sleeve and outside of insulation.

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

Provide box frames for rectangular openings welded 12 gauge galvanized steel attached to forms and of a maximum dimension established by the Architect. Notify the General Contractor or Architect before installing any box openings not shown on the Architectural or Structural drawings.

I. FIRESTOPPING

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

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

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

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

J. ELECTRICAL WIRING

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

Provide power and communication wiring with transient protection in accordance with IEEE C62.41.2. All control and interlock wiring shall comply with the NEC. Control wiring shall be sized to accommodate the voltage drop associated with the distance between the control device and the controller. Control wiring not installed in conduit shall be UL rated for plenum installation. All NEC Class 1 (line voltage) wiring shall be UL listed in approved raceway according to the NEC and Division 26 requirements. Maximum allowable voltage for control wiring shall be 120 V. All low-voltage wiring shall meet NEC Class 2 requirements. Low-voltage power circuits shall be sub-fused when required to meet Class 2 current limit.

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

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

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

K. EQUIPMENT FURNISHED BY OTHERS

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

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

L. SYSTEM TESTING, ADJUSTING, AND BALANCING

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

Final system testing, balancing and adjustments (TAB) shall be performed by Owner Vendor at contractor's cost. Coordinate with Owner Vendor on timing of test and balance and provide on site support for accessing equipment and accessories, and picking up any punch items.

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

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

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

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

M. VIBRATION ISOLATION

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

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

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

Isolator Types:

1. Type WP (Waffle Pads): Provide 5/16 inch thick neoprene pads ribbed or waffled on both sides. Manufacture pads with bridge bearing quality neoprene and select for a maximum durometer of 50 and designed for 15 percent strain, with a static deflection of 0.05 inches. Incorporate steel load_spreading plates where required between the equipment and the neoprene pad to provide selected deflection. If the isolator is bolted to the structure, install a neoprene mounting sleeve under the bolt head between the steel washer and the base plate to prevent metal to metal contact. Provide Mason Industries Type W or equal.

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

N. AIR FILTERS

Provide AAF/Flanders Perfect Pleat HC M8, Camfil Farr 30/30, pleated, throwaway type filters, minimum MERV 8, or similar as manufactured by Air Filter, Inc., Bioclimatic, Columbus, Koch, or approved equal, unless otherwise indicated.

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

O. REFRIGERANT AND OIL

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

P. IDENTIFICATION

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

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

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

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

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

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

A. DUCT INSULATION

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

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

Provide round liner that is 1 inch thick, 4 pound density, minimum R-4.3 Johns Manville "Spiracoustic Plus" or equivalent, Certainteed or Owens-Corning.

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

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

Cover concealed, rigid ductwork with ASTM C553, Type II flexible fiberglass insulation. Installed insulation shall be 3/4 pound density, minimum R-6.0 duct wrap, Certainteed or equivalent Johns Manville, Owens-Corning, or Knauf with heavy-duty foil-scrim-kraft facing, and with joints taped with 3 inch wide foil tape as follows:

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

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

B. PLENUM INSULATION

Provide Fyrewrap 0.5 plenum insulation or ETS Schaefer Plenumshield blanket to encapsulate combustible materials located within a fire-rated return air plenum where permitted by AHJ. Plenum insulation shall be 1/2 inch thick, 6 to 8 PCF density, consisting of a high temperature bio-soluble material with aluminum foil encapsulating material and fiberglass reinforcing scrim covering. Plenum insulation shall be rated and certified per UL 1887 (modified), ASTM E136 for non-combustibility and ASTM E84/UL 723 for surface burning characteristics. Provide minimum 1 inch overlap at all seams and joints and secure insulation with stainless steel banding at locations and intervals per manufacturer's instructions.

C. DUCTWORK

Provide galvanized steel ductwork and housings as shown on drawings. Construct ductwork including fittings and transitions in conformance with current SMACNA standards relative to gauge, bracing, joints, etc. Minimum thickness of duct shall be 26-gauge sheet metal. Reinforce housings and ductwork over 30 inches with 1-1/4 inch angles not less than 5'-6" on centers, and closer if required for sufficient rigidity to prevent vibration. Support horizontal runs of duct from strap iron hangers on centers not to exceed 8'-0". Do not support ceiling grid, conduits, pipes, equipment, etc. from ductwork. Coordinate routing of ductwork with other contractors such that piping, electrical conduit, and associated supports are not routed through the ductwork.

Construct non-VAV supply ducts to meet SMACNA positive pressure of 2 inches w.g. Construct Return, Outdoor and Exhaust ductwork upstream of fans to meet SMACNA negative pressure of 1 inch w.g. Construct exhaust ductwork downstream of fans to meet SMACNA positive pressure of 1 inch w.g.

Provide mill phosphatized or galvanealed finish for exposed ductwork to be field painted. Shop treated sheet metal shall have galvanized metal primer applied in the shop after fabrication and prior to shipping.

Seal ductwork with heavy liquid sealant, Hardcast Irongrip 601, Design Polymer DP 1010 , United Mcgill duct sealer or approved equal, applied according to sealant manufacturer's instructions. Seal all longitudinal and transverse ductwork joints airtight to meet SMACNA Seal Class A. Tapes and mastics shall be listed and labeled in accordance with UL 181A.

Provide radius elbows, turns, and offsets with a minimum centerline radius of 1-1/2 times the duct width. Where space does not permit full radius elbows, provide short radius elbows with a minimum of two continuous splitter vanes. Vanes shall be the entire length of the bend. Provide mitered elbows where space does not permit radius elbows, where shown on the drawings, or at the option of the contractor with the engineer's approval. Mitered elbows less than 45 degrees shall not require turning vanes. Mitered elbows 45 degrees and greater shall have single thickness turning vanes of same gauge as ductwork, rigidly fastened with guide strips in ductwork. Vanes for mitered elbows shall be provided in all supply and exhaust ductwork and in return and outside air ductwork that has an air velocity exceeding 1000 fpm. Do not install vanes in grease ductwork. The use of square throat, radius heel elbows is prohibited. Remove and replace all installed elbows of this type with an approved elbow at no additional cost to the owner.

Connect ducts to vibrating equipment and when transitioning between two different metallic duct materials (e.g., aluminum to galvanized steel) by means of flexible connectors. Flexible connectors shall be neoprene coated glass cloth canvas connections, Duro-Dyne, Elgen, Ventfabric or equal. Flexible connectors shall have a flame spread of 25 or less and smoke developed rating not higher than 50. Make airtight joints and install with minimum 1-1/2 inches slack.

Provide balancing dampers type where shown on drawings and wherever necessary for complete control of air flow. Dampers shall be constructed in accordance with SMACNA "HVAC Duct Construction Standards." Dampers shall be manufactured by Cesco, Greenheck, Louvers & Dampers, Nailor Industries, Pottorff, Ruskin, Tamco, or approved equal. Rectangular volume dampers shall be opposed blade interlocking type. Round volume dampers shall be single-blade type consisting of circular blade mounted to a shaft. Balancing dampers shall be provided with locking hand quadrant.

Dampers shall be galvanized steel for standard air systems, aluminum for wet or natatorium environments and stainless steel for corrosive environments. Bearings shall be corrosion resistant, molded synthetic. Axles shall positively lock into the damper blade. Provide extended shafts and stand-off bracket for dampers installed in ductwork that is wrapped with insulation.

Provide balancing dampers at branch takeoffs from main ducts. For round branch ductwork takeoffs from rectangular mains, provide prefabricated 45 degree, high efficiency, rectangular/round branch takeoff fittings with integral manual balancing damper and locking hand quadrant; Flexmaster model STO with BO3 option or equal. At contractors option, in Kitchen areas "spin-in" collar fitting with integral balancing damper and locking hand quadrant may be used. Omit damper at takeoff fitting when damper is located further downstream on branch.

Where access to dampers through a hard ceiling is required, provide a concealed, remote cable-operated, butterfly-type volume damper assembly with external worm gear operator. Damper assembly shall include duct casing with rolled bead stiffeners, reinforced blade, self-lubricating bearing, and remote operator mounting plate. External operator shall attach to damper as a single piece with no linkage adjustment required. Damper shall be adjustable through the diffuser frame with standard 1/4 inch nutdriver or flat screwdriver. Provide positive, direct, two-way damper control with no sleeves, springs or screw adjustments to come loose after installation. Provide cable length to span the distance from the damper to the remote operator location. Install damper in branch duct. Do not install in diffuser neck. Install remote operator on the back of the diffuser frame or side of a slot diffuser plenum. Support cable assembly to avoid bends and kinks in cable at manufacturer recommended intervals. Where approved by architect, a ceiling cup with cover plate may be used for access to cable operator. Provide round dampers by Metropolitan Air Technology model RT-250, Young's Regulator model 5020-1200, or approved equal. Provide rectangular dampers by Metropolitan Air Technology model RT-200, Young's Regulator model 820-1200, or approved equal. Provide remote cable control by Metropolitan Air Technology model RT-WGA, Young's Regulator model 270-275, or approved equal.

Round or oval ductwork shall be FlaktGroup Semco, United, Hercules Industries or equal, sheetmetal, with smooth interior surface, with low pressure (duct pressure class up to and including 2 inches w.g.) Round ductwork gauges per the following table (reference SMACNA HVAC duct construction standards for gauges when pressures exceed 2 inches w.g.):

Size	Duct Gauge	Fitting Gauge
14" & under	26	24
15" thru 26"	24	22
28" thru 36"	22	20

Lewis & Lambert, Linx Industries Lindab Safe, or approved equal factory-manufactured round ductwork and fittings may be substituted for specified round branch ductwork, at Contractors option. Heavy liquid joint sealant may be omitted on factory-manufactured round ductwork.

Low pressure (duct pressure class up to and including 2 inches w.g.) Fittings 24 inches in diameter and less shall be prefabricated, spot-welded and internally sealed. Continuously weld fittings larger than 24 inches in diameter. Fitting gauge shall be 22 gauge for 36 inch fittings and under, 20 gauge for larger sizes. 90 degree tees shall be conical type. Seal longitudinal and transverse ductwork joints airtight with heavy liquid sealant applied according to manufacturer's instructions. Provide gauge thickness in medium pressure (duct pressure class 3 inches to 6 inches w.g.) ductwork as recommended by SMACNA.

At Contractors option, provide Ductmate, Gripple, or approved equal wire rope duct hanging system. Provide Ductmate WR10 through WR40 or Gripple No. 1 through No. 5 wire rope using 7x7 or 7x19 aircraft quality zinc coated cable or galvanized steel wire rope. Secure wire rope to duct using Ductmate Clutcher or Gripple hang fast adjustable rope attachment. For seismic applications, wire rope systems shall be seismic tested, conforming to GR 63, Level 4 Seismic. Where applicable for upper attachment, provide Ductmate EZ-Lock wire rope beam clamp with locking nut adjustment or Gripple ceiling, beam, or purlin clips. Wire rope, adjustable duct attachment, and upper attachment to structure shall each have minimum 5 to 1 load safety factor.

If permanent HVAC equipment is used during the construction period, provide temporary filters at all openings in the ductwork and inside equipment to protect the system from dust, dirt, paint, and moisture. Replace and maintain filters when needed, but not less than every month. On the day of Substantial Completion, clean the unit and ductwork and provide a new set of filters in the unit. Refer to section "Air Filters" for filter requirements.

An independent, professional duct cleaning company shall vacuum clean all internal surfaces of equipment, coils, and ductwork connected to permanent HVAC units that are operated during the construction period. Conduct cleaning after new air filters are installed and prior to turning the system over to the owner.

D. FLEXIBLE DUCT

Low pressure (duct pressure class up to and including 2 inches w.g.) and medium pressure (duct pressure class 2.1 inch to 6 inches w.g.) flexible duct shall be Flexmaster type 5B, Thermaflex type G-KM, M-KE, JPL type Silver Jacket, or equal (fire retardant polyethylene) protective vapor barrier, U.L.181 Class 1, acoustical insulated duct, R-6.0 fiberglass insulation. Provide CPE liner with steel wire helix mechanically locked or permanently bonded to the liner.

Flexible duct runs shall not exceed 5 feet in length, and shall be installed fully extended and straight as possible avoiding tight turns. Install flexible duct in accordance with manufacturer's instructions. Support flexible duct at maximum 5 feet on center and within 6 inches of bends. Bends shall not exceed a centerline radius of one duct diameter. Duct sag shall not exceed 1/2 inch. Supporting material in direct contact with the duct shall not be less than 1-1/2 inches in width.

Connect flexible duct to rigid metal duct or air devices as recommended by the manufacturer. At a minimum, install two wraps of duct tape around the inner core connection and a metallic or non-metallic clamp over the tape and two wraps of duct tape or a clamp over the outer jacket. Duct clamps shall be labeled in accordance with UL-181B and marked 181B-C. Duct tape shall be labeled in accordance with UL 181B and marked 181B-FX.

E. PLASTIC FLUE GAS VENTS

Provide UL 1738 listed plastic flue gas vents, with positive or negative flue pressures complying with NFPA 211 and suitable for condensing gas appliances. Provide PVC system by IPEX "System 1738", or Polypropylene system by Centrotherm "Innoflue" or equal by Nova Flex Group "Z-DENS."

Where plastic gas vents are installed in a return air plenum, wrap the vent with fire rated plenum insulation. Reference Article "Plenum Insulation" for plenum-rated fire wrap. Coordinate vent material compatibility with the appliance manufacturer's installation instructions prior to purchasing and installation.

F. AIR DEVICES

Provide air devices as scheduled on drawings, manufactured by Carnes, Krueger, Metalaire, Nailor Industries, Price, Titus, or Tuttle & Bailey. Select air devices to limit room noise level to no higher than NC-30 unless otherwise shown. Provide devices with a soft plastic gasket to make an airtight seal against the mounting surface. Coordinate final location, frame, and mounting type of air devices with Architectural reflected ceiling plans.

Submit complete shop drawings including information on noise level, pressure drop, throw, CFM for each air device, styles, borders, etc. Clearly marked with specified equipment number. Submit samples of each air device as requested by the Engineer.

Provide wall return air grilles and exhaust air registers with horizontal 35 or 45 degree angle vision-proof bars. Provide concealed fasteners for wall mounted registers and grilles. Provide floor supply air registers of aluminum heavy duty type with 0 degree deflection. Provide opposed blade dampers for supply air registers and exhaust air registers unless indicated otherwise.

Provide ceiling mounted air devices of lay-in or surface mounted type as required to be compatible with ceiling construction. Provide ceiling diffusers and grilles with white enamel finish unless noted otherwise.

Provide linear slot diffusers of standard one-piece lengths up to 6-feet and furnish in multiple sections greater than 6-feet. Join multiple sections together end-to-end with alignment pins to form a continuous slot appearance. For installations in a hard ceiling, install diffuser per manufacturers installation instructions prior to installation of drywall. Contractor shall use manufacturer's hard ceiling clips for mounting to ceiling framing. Screws through face of linear slot diffuser are not acceptable. Provide alignment components by the manufacturer. Provide plenums by the slot diffuser manufacturer. Plenums shall be internally insulated by the manufacturer with minimum 1/4 inch thick, closed-cell insulation or externally wrapped by the contractor. Comply with insulation requirements specified under duct insulation section.

G. EXHAUST AIR SYSTEMS

Exhaust as scheduled on the drawings furnished by KEC, installed by Mecahncial Contractor.

H. KITCHEN EXHAUST AIR SYSTEMS

Provide ducts connecting Type 1 exhaust hoods to exhaust fans made of #16 gauge black iron with continuously welded joints and clean-out doors. Provide at least one opening that is minimum size of 20 inches by 20 inches for personnel entry. Where an opening of this size is not possible, provide access openings at each change in direction and at 12 foot intervals. Locate openings on sides of duct 1-1/2 inches minimum from bottom and fit with grease-tight covers of same material as duct. Support systems for ducts 24 inch and larger in any dimension shall be designed for the weight of the duct plus 800 pounds at any point in the duct system. Provide transition at connection to fan with opening size equal to or greater than the venturi opening of the fan inlet. Provide gasket at flanged connection to fan rated for 1500 degrees Fahrenheit and grease applications.

Enclose duct in fireproof enclosure per locally adopted mechanical code or, if approved by local code official, in fire rated wrap insulation. Insulation shall be minimum two-hour rated duct wrap insulation for Type I hood grease exhaust duct applications and shall conform to ASTM E2336 where required to comply with IMC. Insulation shall be flexible wrap enclosure rated for minimum 2000 degrees Fahrenheit and for zero clearance to combustibles. Insulation shall be non-mineral wool, passive, low bio-persistent fiber totally encapsulated on all sides with aluminum foil. Insulation shall be as manufactured by Certainteed, Thermal Ceramics, Unifrax or 3M. Slope duct back towards hood at minimum of 1/4 inch per lineal foot. Horizontal ducts that exceed 75 feet in length shall be sloped not less than 1 inch per foot. At Contractor's option, a UL listed concentric ductwork package that complies with UL 1978 standard for grease ducts may be used in lieu of the welded black iron duct for connecting hood to exhaust fan. Ductwork package shall be as manufactured by CaptiveAire, DuraVent, Enervex, Metal-FabSchebler, Selkirk, or approved equal. Provide manufacturers UL listing number and verification certificate as a part of the shop drawing submittal. Install duct package in strict conformance with manufacturer's instructions and recommendations.

All portions of grease duct systems shall be tested for leakage in accordance with the "Grease Duct Test" paragraph of the IMC. Leakage tests shall be by light or other equivalent test methods as approved by the local code official to determine that all joints are liquid tight. Tests shall be performed in the presence of the local code official. Any joints found defective shall be repaired and retested until satisfactory results are obtained. The contractor shall submit a copy of the grease duct leakage test report to the architect/engineer complete with the approval signature of the local code official.

Grease exhaust fans by CaptiveAire furnished by KEC, installed by Mechanical contractor. Exhaust fans serving Type I kitchen exhaust hoods shall discharge a minimum of 40 inches above the roof surface, shall have hinged access including access for blade inspection and cleaning per NFPA 96, grease drain trough filled with replaceable, absorbent material or replaceable cup and cap with absorbent material which absorbs grease and rejects water, and insulated curb, and shall be installed in accordance with NFPA 96 and local codes.

Exhaust hoods by CaptiveAire furnished by KEC, installed by Mechanical Contractor, shall be single shell exhaust only stainless steel hood. Hoods shall be ICBO approved and UL certified for air quantities shown on drawings and in conformance with manufacturer's data. Provide manufacturer UL listing number and verification certificate as a part of the shop drawing submittal. Conform with NFPA Bulletin 96 and UL Standard 710. Construct hood of 18 gauge stainless steel with welds polished. Hood shall contain full length stainless steel filter holder welded to hood with integral drip trap and UL classified, X-Air stainless steel filters installed at 45 degrees from horizontal. Provide vapor proof incandescent lights, and control panel with pilot lights and switches for fan and lights. Hood package shall include 3 inch filler panel at wall, and stainless steel closure panels from top of hood to finished ceiling.

Makeup air unit by CaptiveAire furnished by KEC, installed by Mechanical contractor. Interlock with exhibition cookline exhaust system to vary supply CFM based on hood exhaust rate. Unit shall be at maximum supply CFM when hood is at maximum exhaust CFM. Unit shall be at minimum supply CFM when hood is at minimum exhaust CFM.

Provide dishwasher exhaust duct systems in accordance with SMACNA "HVAC Duct Construction Standards", 2005 Edition, Figure 10-2. Slope horizontal ductwork back towards the dishwasher hood a minimum of 1/4 inch per foot. Flanged joints should have watertight EPDM gaskets. Locate longitudinal seams on top or side of duct. Coordinate with plumbing contractor to provide minimum ¾" drain piping from inline fan drain connection to nearest floor sink.

Hoods shall have Ansul or approved equal wet chemical type fire extinguishing system for each hood as scheduled on drawings complete with hood nozzles, wet chemical cylinders, piping, etc. and accessories to provide an approved, operating system. Provide manual pull station(s) at locations shown on the drawings. System shall be in full conformance with NFPA-96.

Mechanical or electrical gas shutoff valve furnished by KEC, installed by Plumbing Contractor to shutoff fuel or power source to cooking equipment upon detection of fire. Valve shall have a clearly marked open/closed indicator.

Wall mounted thermostat and remote sensing element at the exhaust hood duct collar wired in parallel furnished by KEC, installed by Mechanical Contractor, wired to hood controller to ensure that the hood's associated exhaust fan is energized when the cooking appliances served by the hood are activated. The installation shall be in compliance with the International Mechanical Code.

4. HVAC EQUIPMENT

A. ROOFTOP UNITS (GAS FIRED HEAT) 3-25 TONS

Provide electric cooling, gas heating rooftop units as scheduled on the drawings, manufactured by Aaon, Carrier, Daikin, Lennox, Johnson Controls, Trane, or York, with features as noted in the RTU schedule and in the RTU Control Matrix, and complete with factory installed direct-drive hermetic compressors with internal spring vibration isolation, built-in motor thermal overload protection, crankcase heater, and low pressure switches; direct expansion cooling and condensing coils with1 inch factory installed flexible elastomeric insulation around the suction and liquid lines not directly located above a condensate drain pan and protective UV coating on any insulation exposed to sunlight, minimum SEER or EER rating (cooling) as required by the applicable energy code or greater if scheduled on the drawings, centrifugal evaporator blower; air filter rack, propeller type condenser fan; aluminized steel heat exchanger, minimum AFUE rating (heating) as required by the applicable energy code or greater if scheduled on the drawings, forced combustion air blower; complete factory installed micro-processor controls including anti-short cycle timers, time delay relays and minimum "on" time controls, 100 percent safety gas shutoff, direct spark ignition system; built-in thermal overload protection on motors and compressors; outdoor air damper; relief; weathertight housing constructed of zinc coated, heavy gauge, galvanized steel with weather-resistant baked enamel finish; pre-engineered roof curb with minimum height as scheduled on the drawings if unit is equipped with internal vibration isolators; Type CMB if unit is not equipped with internal vibration isolators; single point electrical power connection. Provide guards or louvered panels to protect the condenser coil from hail or other damage. Provide a 125 VAC, 20 amp duplex convenience receptacle mounted to unit ready for field wiring with a cover UL listed for wet and damp locations when in use. Provide unit complete with manufacturer's one year guarantee on components plus an additional four year guarantee on the compressors and heat exchangers. For units equipped with an economizer assembly, the assembly shall be covered with minimum 5 year manufacturer warranty, certified to operate through 60,000 damper opening and closing cycles, and certified to meet leakage requirements specified under the section, "Control Dampers."

B. WINE ROOM CONDENSING UNITS

Provide air cooled wine cooler condensing units as scheduled. Units shall have factory installed hermetic or semi-hermetic motor/compressor assembly with internal spring vibration isolation and built-in thermal overload protection. Provide refrigerant piping sized as recommended by equipment manufacturer with foamed plastic insulation on the suction line as specified in this section.

C. WINE ROOM FAN COIL UNITS

Provide wine room fan coil units as scheduled on the drawings, horizontal configuration complete with zinc coated, heavy gauge, galvanized steel cabinet; internally insulated; access doors; direct expansion cooling coil section of aluminum/copper construction; condensate drain pan; statically and dynamically balanced centrifugal fan section with built-in motor thermal overload protection; factory installed and wired controls and single point electrical power connection; magnetic motor starters and contactors as required;; Provide electronic programmable type thermostat from fan coil manufacturer; Provide spring vibration isolators and all-thread hanging rods for horizontal installations. Provide an auxiliary drain pan for suspended units with flood detector switch to shut off unit when water is detected in auxiliary drain pan. Flood detector switch shall be Diversitech wet switch or equivalent. Detector shall shut system down when water comes in contact with the hydrophilic pad of the detector. Place detector in the lowest location in the auxiliary drain pan.

D. ELECTRIC UNIT HEATERS

Provide electric unit heaters as scheduled on the drawings, manufactured by Berko, Brasch, Indeeco, Markel, QMark, or Raywall, standard type propeller unit heaters with sidewall mounting brackets and hardware for horizontal airflow. Furnish heater fan motors complete with a manual motor starter with automatic thermal cutouts sized to the motor load, disconnect switch, and other code required safety devices. Provide unit mounted thermostat and manual summer/winter changeover switch.

E. ELECTRIC BASEBOARD HEATERS

Provide electric baseboard heaters as scheduled on the drawings, manufactured by Berko, Erincraft, Markel, Q-Mark, or Raywall. Enclosures shall be extruded aluminum,. They shall have an 18 gauge rear panel, A 16 gauge front panel and A 14 gauge grille with anodized finish, color as selected by the Architect. Provide tamper proof hardware for all removable covers. Air inlet shall be through the bottom or side and the air discharge shall be through the top. Provide blank sections, corner and end caps as required. All sections shall be factory fabricated, no section shall be field fabricated.

Baseboard heaters shall be provided with a continuous raceway, equivalent to a 3/4 inch conduit, the entire length of the enclosure. Conductors shall be suitable for the temperatures encountered.

5. PIPING AND PIPING SPECIALTIES

A. REFRIGERANT PIPING AND INSULATION

Copper Tubing: ASTM B280, Type ACR, hard-drawn straight lengths, and soft-annealed coils, seamless copper tubing. Tubing shall be factory cleaned, ready for installation, and have ends capped to protect cleanliness of pipe interiors prior to shipping.

Refrigerant Line Kits: Soft-annealed copper tubing with pipe diameters as recommended by the manufacturer and of length as required for the installation. Tubing shall be factory or field insulated with flexible unicellular insulation with thickness as specified below.

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

Press fit fittings as manufactured by Rapid Locking System (Zoomlock) are an acceptable option to solder or brazed fittings as long as it is acceptable by equipment manufacturer. Fittings shall be approved for use with the copper tubing in the system and be compatible with the refrigerant and oils used in the system. Fittings shall be rated for continuous operating temperature from -40 F to 250 F and maximum operating pressure of 700 psi. Installers shall be trained using manufacturers training tools prior to installing any joints. Prepare the tubing, install fittings to minimum depth and crimp the fitting in accordance with manufacturers instructions. Verify the joint is properly made using crimp gauges or manufacturer's approved verification methods.

Solder filler metals: ASTM B32, 95-5 Tin-Antimony.

Brazing filler metals:
1. AWS A5.8, Classification BAg-5: Silver (Ag) 44.0-46.0 percent, Zinc (Z) 23.0-27.0 percent, and Copper (Cu) 29.0-31.0 percent.
2. AWS A5.8, Classification BCuP-5: Phosphorus (P) 4.8-5.2 percent, Silver (Ag) 14.5-15.5 percent, and Copper (Cu) remainder.

Braze mechanical joints. Solder joints connecting to refrigerant valves and specialties. Continuously purge the pipe and fittings during brazing with an inert gas per manufacturer's recommendation (e.g., dry nitrogen) to prevent formation of scale. Maintain purge until the joint is cool to the touch. Provide temporary cap or cover on completed joints with open ends to prevent entry of contaminating materials.

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

Run refrigerant lines parallel and perpendicular to wall and floor lines and to appear straight and in good order. Pitch suction lines down slightly (1 inch in 20 feet) towards the compressor. Provide oil traps at the base of vertical suction risers over 6 feet high. Install liquid line sight glasses in liquid lines nearest the expansion valve. Factory mount expansion valves with the sensing bulbs shipped loose. Field mount expansion valve bulb after refrigerant piping is complete (damage may occur if bulbs come in contact with heat).

For systems of 5 ton capacity and smaller, the contractor shall have the option to provide copper refrigerant tubing line set sized as recommended by equipment manufacturer and of length as required for the installation. Provide quick-connect flare tubing compression fittings, solder connections, or brazed connections as recommended by the manufacturer to match the connections of the condensing unit and evaporator coil.

B. SYSTEM EVACUATION AND CHARGING

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

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

6. TEMPERATURE CONTROLS

A. GENERAL REQUIREMENTS

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

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

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

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

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

B. THERMOSTAT CONTROL EQUIPMENT

Provide thermostat control equipment with sufficient communication, programming, input and output connections, and modulating or staging capability to meet the sequence of operations. Provide thermostats with the features as indicated:
1. LCD or LED display screen.
2. Button or touchscreen interface.
3. Display temperature.
4. Display temperature setpoint.
5. Adjust temperature setpoint.
6. Limit temperature setpoint adjustment within plus or minus 3 degrees F.
7. Display operating mode.
8. Adjust operating mode.
9. Adjust schedule, minimum seven day occupied/unoccupied.
10. Adjust fan switch setting.
11. Security lockout.
12. Insulated backing for exterior wall mounting.
13. Color: <Coordinate with Architect>.

Provide programmable thermostats that shall control packaged equipment by Honeywell.

Thermostats for wine cooling units shall be purchased with unit, or compatible with equipment from Honeywell, Johnson Controls, Trane, or equal.

Provide thermostat for makeup air unit from makeup air unit manufacturer.

C. SENSORS AND RELAYS

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

Provide sensors that meet the following minimum performance:
1. Dry-bulb temperature sensors at a minimum shall be accurate to +/- 2 degrees Fahrenheit over the range of 40 to 80 degrees Fahrenheit.
2. Wet-bulb temperature shall be calculated using dry-bulb temperature and humidity and shall be accurate to +/- 2 degrees Fahrenheit.
3. Humidity sensors at a minimum shall be accurate within +/- 3 percent full range between 20 and 95 percent, with drift less than 1 percent full scale per year.
4. every 5 years.

Provide relays with contact rating, configuration, and coil voltage that is suitable for the application. Relay shall be general purpose, enclosed plug-in type and protected by a heat and shock resistant duct cover. Number of contacts and operational function shall be as required. Transient suppression shall be provided as an integral part of the relay. Contactors shall be single coil, electrically operated, mechanically held, double-break, silver-to-silver type protected by arcing contacts. Positive locking shall be obtained without the use of hooks, latches, or semi-permanent magnets. Operating and release times shall be 100 milliseconds or less.

D. WIRING

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

7. SEQUENCE OF OPERATION

A. FAN COIL UNIT CONTROL

Fan coil unit serving wine room and lockers shall maintain setpoint temperature 24/7.

B. RESTROOM EXHAUST FAN CONTROL

Restroom exhaust fan shall operate continuously during occupied hours and shut down during unoccupied hours. Provide a 7-day timeswitch to switch between occupied and unoccupied operation.

C. KITCHEN EXHAUST FAN CONTROL

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

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

D. DISHWASHER EXHAUST FAN CONTROL

Dishwasher exhaust fan shall be interlocked with associated dishwasher.

E. MOP SINK EXHAUST FAN CONTROL

Mop sink exhaust fan shall run 24/7.

8. COMMISSIONING

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

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

IECC Commissioning Requirements: Provide commissioning of all mechanical systems included in the scope of work, except for packaged equipment not equipped with an economizer. Packaged equipment includes unitary air conditioners and condensing units, unitary air-cooled and water-cooled heat pumps, and packaged terminal air conditioning units. Contract the third-party registered design professional or approved agency to develop a commissioning plan, preliminary commissioning report, and final commissioning report.

Commissioning plan shall include the following:

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

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

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

Final commissioning report shall include the following:

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

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

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

9. ALTERNATES

A. DESCRIPTION

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

END OF SECTION 23

HENDERSON ENGINEERS
8345 LENEXA DRIVE, SUITE 300
LENEXA, KS 66214
TEL 913.742.5000 FAX 913.742.5001
WWW.HENDERSONENGINEERS.COM
2150004520
IL. CORPORATE NUMBER: 184-002965
04/30/23

Perry's
STEAKHOUSE & GRILLE
1050 N MILWAUKEE AVE
VERNON HILLS, IL 60061

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

No	Date	Remarks
	04/19/23	PERMIT UPDATES
	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

REVISIONS

EXPIRES ON: 11/30/2023
COY M. MACY
062.068038
Coy M. Macy
04/20/2023

Drawing Title
MECHANICAL SPECIFICATIONS

Job No.

Drawn
CMM

Scale
AS NOTED

Date

Sheet No.
M4.0

COY M. MACY

FOR QUESTIONS, CALL THE
St. Louis Mechanical
REGION 109
PHONE: (636) 229-9777
EMAIL: reg109@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.
EXHAUST HOODS ND-2/BD-2/SND-2 (CANADA) - CA PATENT 2520435 C.

HOOD INFORMATION - JOB#5539822

HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL EXH CFM	EXHAUST PLENUM RISER(S) WIDTH	LENG	HEIGHT	DIA	CFM	VEL	SP	TOTAL SUPPLY CFM	HOOD CONSTRUCTION	HOOD CONFIG END TO END	ROW
1	EXH-L	6030 ND-2-PSP-F	CAPTIVEAIRE	5' 9"	600 DEG	I	HEAVY	228	1311			4"	12"	1311	1669	-0.704"	564	430 SS WHERE EXPOSED	LEFT	ALONE
2	EXH-M	6030 ND-2-PSP-F	CAPTIVEAIRE	10' 0"	600 DEG	I	HEAVY	225	2250			4"	14"	2250	2105	-1.013"	990	430 SS WHERE EXPOSED	MIDDLE	ALONE
3	EXH-R	6030 ND-2-PSP-F	CAPTIVEAIRE	10' 4"	600 DEG	I	HEAVY	175	1808			4"	14"	1808	1691	-0.654"	1139	430 SS WHERE EXPOSED	RIGHT	ALONE
4	Prep	6030 ND-2	CAPTIVEAIRE	11' 6"	600 DEG	I	HEAVY	157	1800			4"	14"	1800	1684	-0.626"	0	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	EXH-L	CAPTRATE SOLO FILTER	4	20"	16"	85% SEE FILTER SPEC	2	RECESSED ROUND	NO							YES	415 LBS
2	EXH-M	CAPTRATE SOLO FILTER	7	20"	16"	85% SEE FILTER SPEC	3	RECESSED ROUND	NO							YES	533 LBS
3	EXH-R	CAPTRATE SOLO FILTER	7	20"	16"	85% SEE FILTER SPEC	3	RECESSED ROUND	NO	RIGHT	12"x60"x30"	TANK FS	4.0/4.0/4.0/4.0			YES	1108 LBS
4	Prep	CAPTRATE SOLO FILTER	8	20"	16"	85% SEE FILTER SPEC	3	RECESSED ROUND	NO	RIGHT	12"x60"x30"	TANK FS	4.0	DCV-4011_MA4	1 LIGHT 1 FAN	YES	847 LBS

HOOD OPTIONS

HOOD NO	TAG	OPTION
1	EXH-L	LEFT END STANDOFF (FINISHED) 1" WIDE 60" LONG INSULATED.
		RISER SENSOR INSTALL 6IN PLEN.
		LEFT VERTICAL END PANEL 27" TOP WIDTH, 21" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS.
3	EXH-R	STRUCTURAL FRONT PANEL.
		RISER SENSOR INSTALL 6IN PLEN.
		RIGHT VERTICAL END PANEL 27" TOP WIDTH, 21" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS.
4	Prep	FIELD WRAPPER 18.00" HIGH FRONT, RIGHT.
		LEFT END STANDOFF (FINISHED) 1" WIDE 60" LONG INSULATED.
		RIGHT VERTICAL END PANEL 27" TOP WIDTH, 21" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS.
		LEFT WALL AS END PANEL.

PERFORATED SUPPLY PLENUM(S)

HOOD NO	TAG	POS	LENGTH	WIDTH	HEIGHT	TYPE	RISER(S) WIDTH	LENG	DIA	CFM	SP
1	EXH-L	Front	70"	9"	6"	MUA	6"	16"		188	0.055"
						MUA	6"	16"		188	0.055"
						MUA	6"	16"		188	0.055"
2	EXH-M	Front	120"	9"	6"	MUA	6"	28"		330	0.091"
						MUA	6"	28"		330	0.091"
						MUA	6"	28"		330	0.091"
3	EXH-R	Front	136"	9"	6"	MUA	6"	28"		379	0.117"
						MUA	6"	28"		379	0.117"
						MUA	6"	28"		379	0.117"

SPECIFICATION: CAPTRATE GREASE-STOP SOLO FILTER

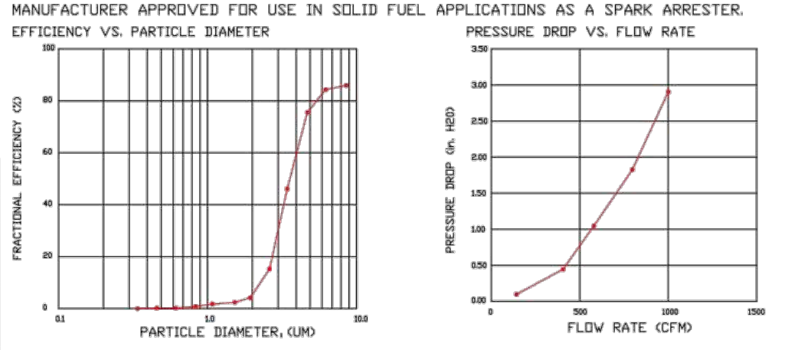
THE CAPTRATE GREASE-STOP SOLO FILTER IS A SINGLE-STAGE FILTER FEATURING A UNIQUE S-BAFFLE DESIGN IN CONJUNCTION WITH A SLOTTED REAR BAFFLE DESIGN, TO DELIVER EXCEPTIONAL FILTRATION EFFICIENCY.

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.



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

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

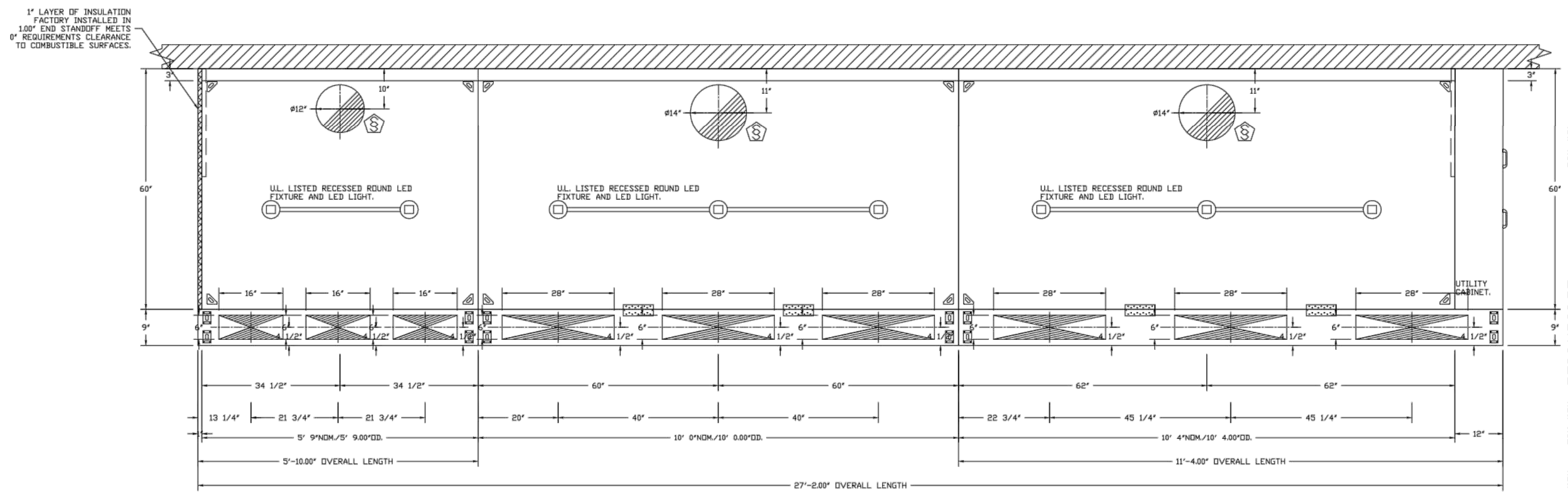
___' - ___"

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 ____________

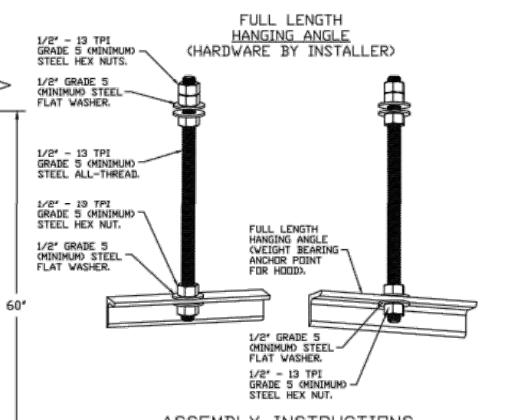
REVISIONS
St. Louis Mechanical
2 City Place Drive, Suite #200, St. Louis, MO, 63141 PHONE: (636) 229-9777 EMAIL: reg109@captiveaire.com
www.captiveaire.com
Perry's-Vernon Hills, IL_R1
VERNON HILLS, IL, 60061
DATE: 7/6/2022
DWG.#: 5539822
DRAWN BY: ML
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 1


1" LAYER OF INSULATION FACTORY INSTALLED IN LIEU OF 3" STANDOFF MEETS 3" REQUIREMENTS CLEARANCE TO COMBUSTIBLE SURFACES.
U.L. LISTED RECESSED ROUND LED FIXTURE AND LED LIGHT.
UTILITY CABINET.
5'-10.00" OVERALL LENGTH
5' 9"NOM./5' 9.00"OD.
10' 0"NOM./10' 4.00"OD.
10' 4"NOM./10' 4.00"OD.
37'-0.00" OVERALL LENGTH
10'-4.00" OVERALL LENGTH

PLAN VIEW - HOOD #1 (EXH-L)
5' 9.00" LONG 6030ND-2-PSP-F

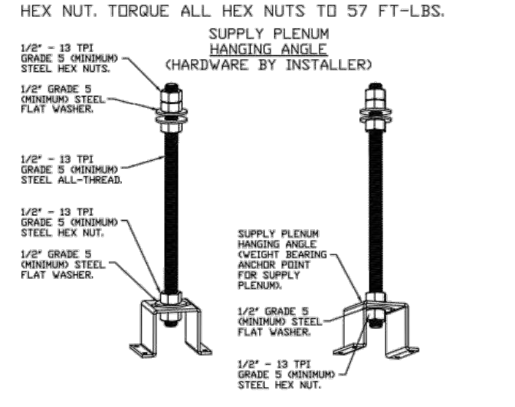
PLAN VIEW - HOOD #2 (EXH-M)
10' 0.00" LONG 6030ND-2-PSP-F

PLAN VIEW - HOOD #3 (EXH-R)
10' 4.00" LONG 6030ND-2-PSP-F


FULL LENGTH HANGING ANGLE (HARDWARE BY INSTALLER)
1/2" - 13 TPI GRADE 5 (MINIMUM) STEEL HEX NUTS.
1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHER.
1/2" - 13 TPI GRADE 5 (MINIMUM) STEEL ALL-THREAD.
1/2" - 13 TPI GRADE 5 (MINIMUM) STEEL HEX NUT.
FULL LENGTH HANGING ANGLE (WEIGHT BEARING ANCHOR POINT FOR HOOD).

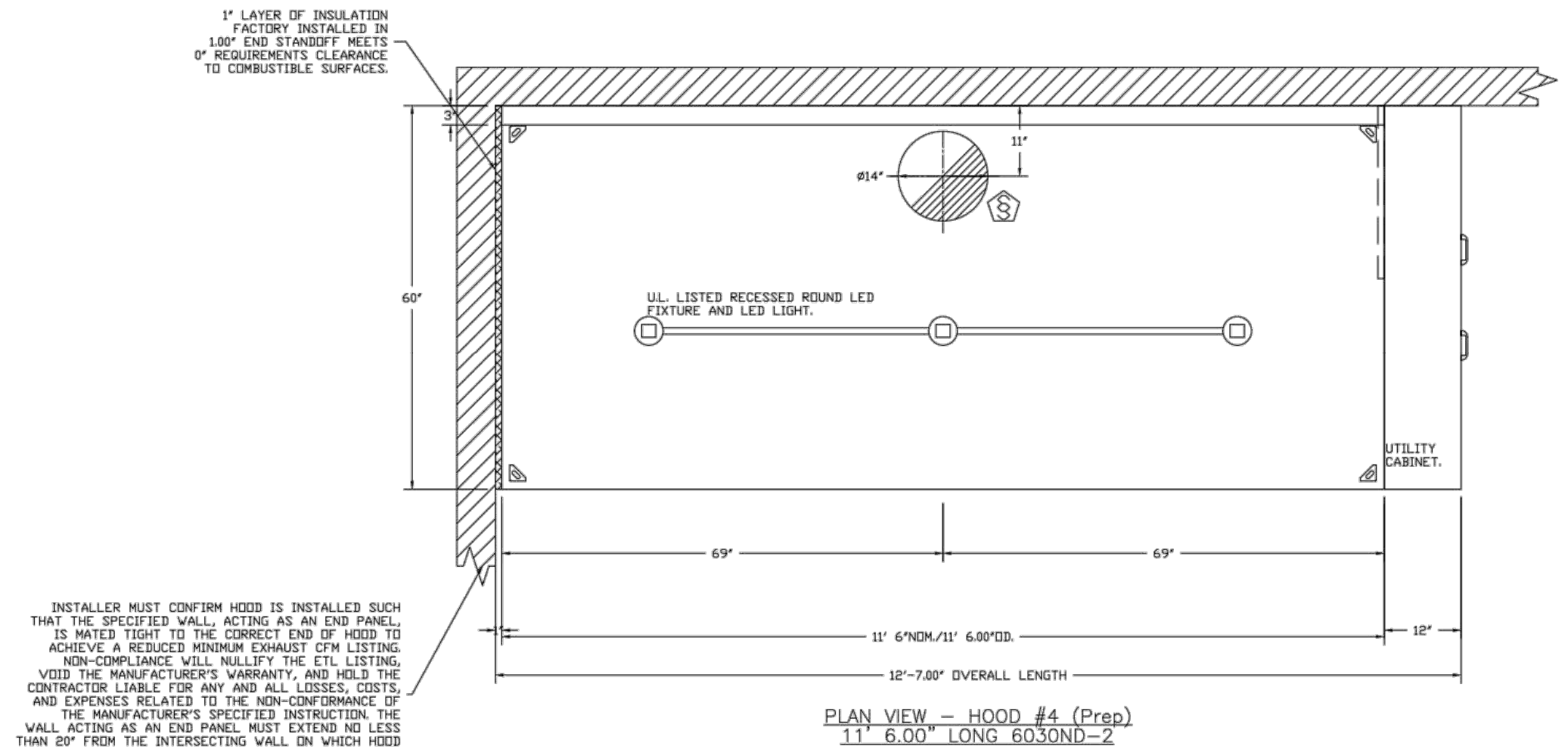
ASSEMBLY INSTRUCTIONS

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

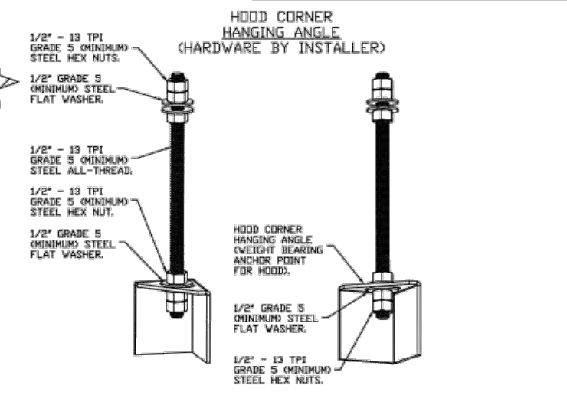

SUPPLY PLENUM HANGING ANGLE (HARDWARE BY INSTALLER)
1/2" - 13 TPI GRADE 5 (MINIMUM) STEEL HEX NUTS.
1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHER.
1/2" - 13 TPI GRADE 5 (MINIMUM) STEEL ALL-THREAD.
1/2" - 13 TPI GRADE 5 (MINIMUM) STEEL HEX NUT.
SUPPLY PLENUM HANGING ANGLE (WEIGHT BEARING ANCHOR POINT FOR SUPPLY PLENUM).

ASSEMBLY INSTRUCTIONS

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


1" LAYER OF INSULATION FACTORY INSTALLED IN LIEU OF 3" STANDOFF MEETS 3" REQUIREMENTS CLEARANCE TO COMBUSTIBLE SURFACES.
Ø14"
11"
60"
U.L. LISTED RECESSED ROUND LED FIXTURE AND LED LIGHT.
UTILITY CABINET.
69"
69"
11' 6"NOM./11' 6.00"OD.
12"
12'-7.00" OVERALL LENGTH
INSTALLER MUST CONFIRM HOOD IS INSTALLED SUCH THAT THE SPECIFIED WALL, ACTING AS AN END PANEL, IS MATED TIGHT TO THE CORRECT END OF HOOD TO ACHIEVE A REDUCED MINIMUM EXHAUST CFM LISTING. NON-COMPLIANCE WILL NULLIFY THE ETL LISTING, VOID THE MANUFACTURER'S WARRANTY, AND HOLD THE CONTRACTOR LIABLE FOR ANY AND ALL LOSSES, COSTS, AND EXPENSES RELATED TO THE NON-CONFORMANCE OF THE MANUFACTURER'S SPECIFIED INSTRUCTION. THE WALL ACTING AS AN END PANEL MUST EXTEND NO LESS THAN 20" FROM THE INTERSECTING WALL ON WHICH HOOD IS MOUNTED AND MUST EXTEND NO LESS THAN 20" UNDER BOTTOM OF HOOD TO BE ELIGIBLE FOR REDUCED MINIMUM EXHAUST CFM LISTING.

PLAN VIEW - HOOD #4 (Prep)
11' 6.00" LONG 6030ND-2


HOOD CORNER HANGING ANGLE (HARDWARE BY INSTALLER)
1/2" - 13 TPI GRADE 5 (MINIMUM) STEEL ALL-THREAD.
1/2" - 13 TPI GRADE 5 (MINIMUM) STEEL HEX NUT.
1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHER.
HOOD CORNER HANGING ANGLE (WEIGHT BEARING ANCHOR POINT FOR HOOD).
1/2" - 13 TPI GRADE 5 (MINIMUM) STEEL HEX NUTS.

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.

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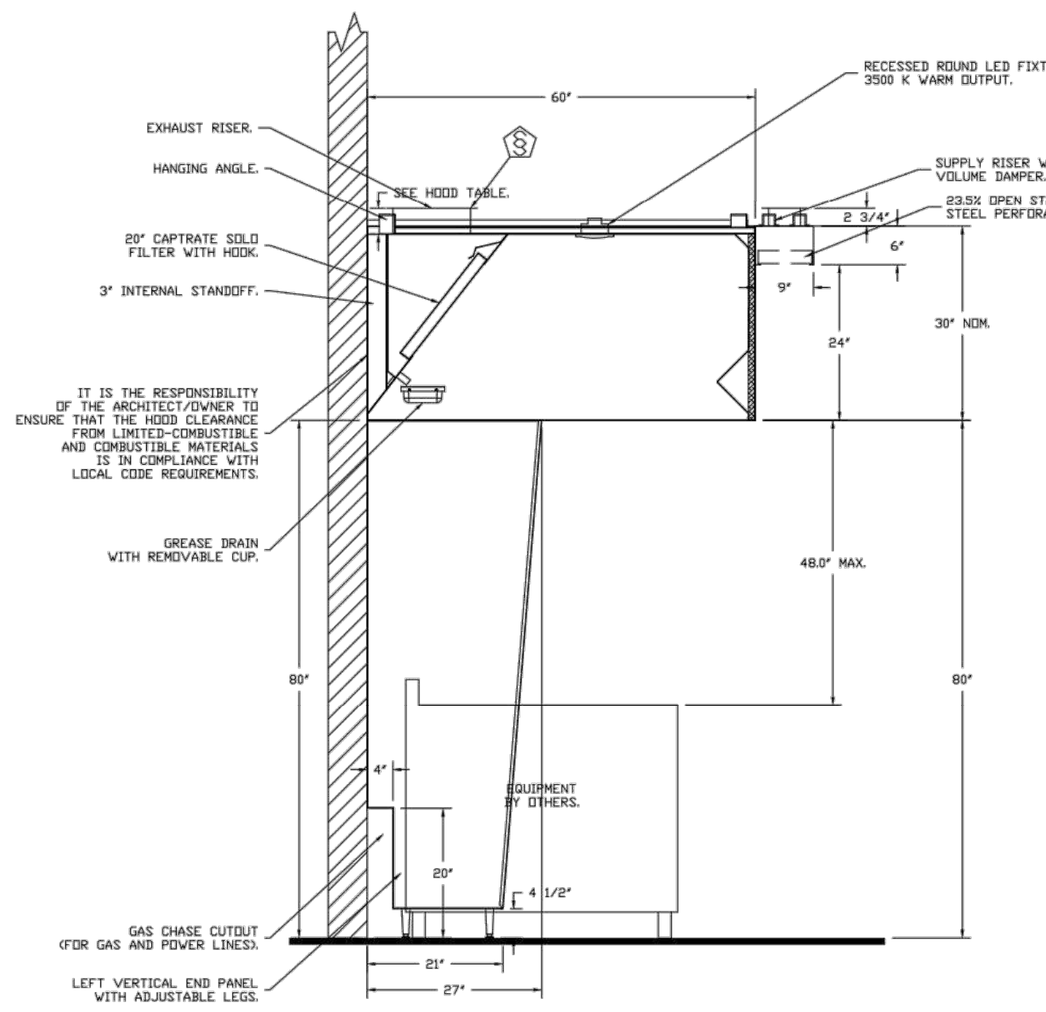
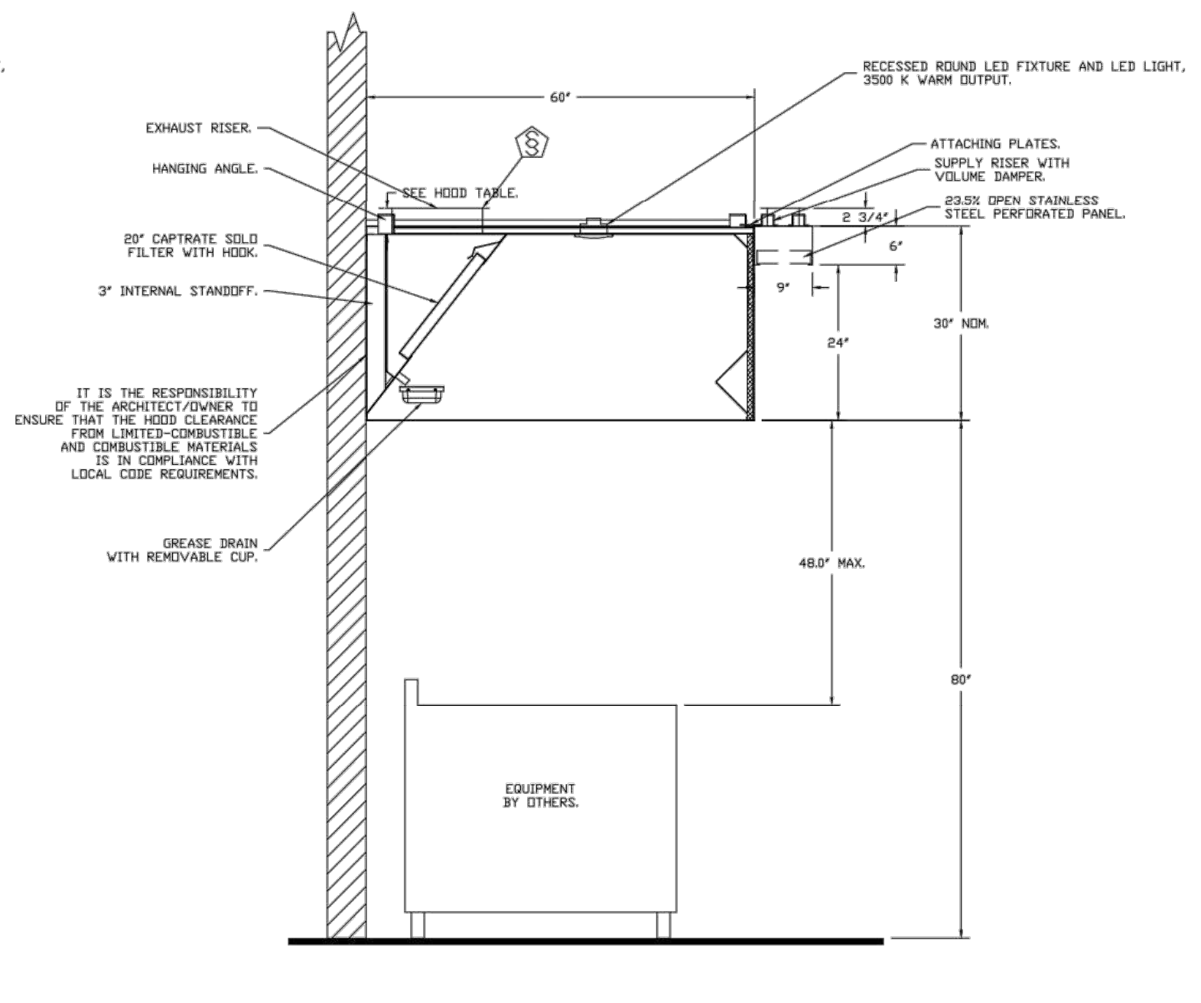
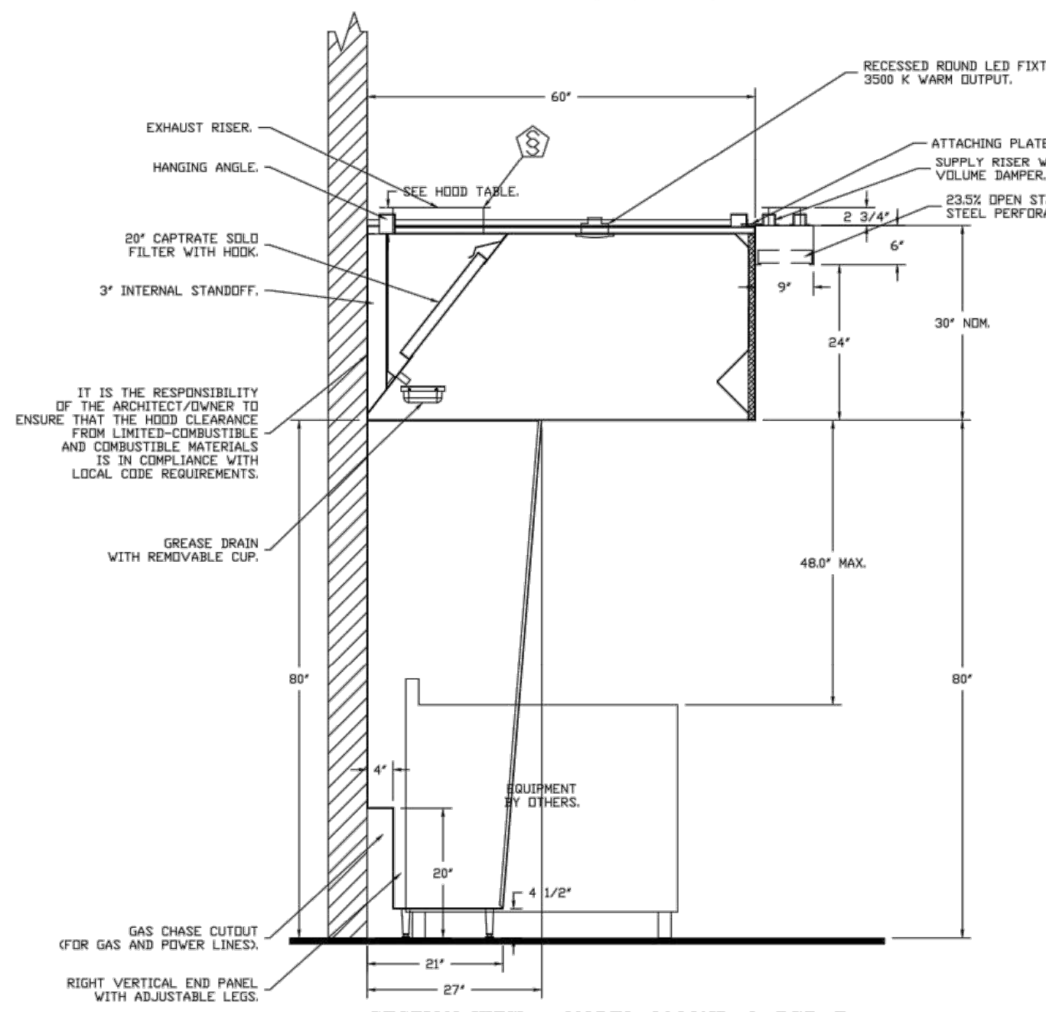

EXHAUST RISER.
HANGING ANGLE.
20" CAPTRATE SOLO FILTER WITH HOOK.
3" INTERNAL STANDOFF.
IT IS THE RESPONSIBILITY OF THE ARCHITECT/OWNER TO ENSURE THAT THE HOOD CLEARANCE FROM LIMITED-COMBUSTIBLE AND COMBUSTIBLE MATERIALS IS IN COMPLIANCE WITH LOCAL CODE REQUIREMENTS.
GREASE DRAIN WITH REMOVABLE CUP.
GAS CHASE CUTOUT (FOR GAS AND POWER LINES).
LEFT VERTICAL END PANEL WITH ADJUSTABLE LEGS.
RECESSED ROUND LED FIXTURE AND LED LIGHT, 3500 K WARM OUTPUT.
SUPPLY RISER WITH VOLUME DAMPER.
ECCO OPEN STAINLESS STEEL PERFORATED PANEL.
EQUIPMENT BY OTHERS.
ROD TABLE.
60"
24"
30" NOM.
48.0" MAX.
80"

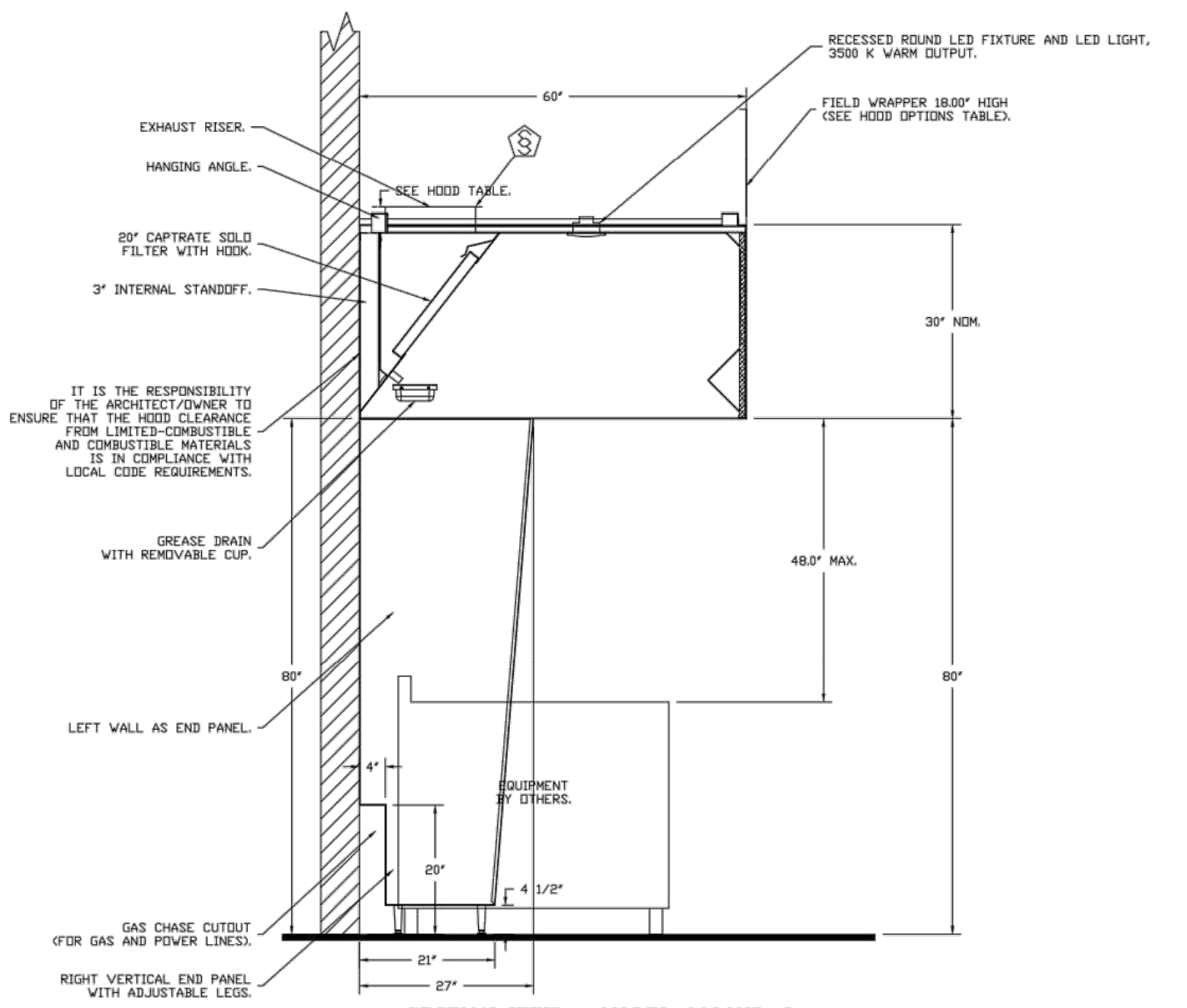
SECTION VIEW - MODEL 6030ND-2-PSP-F
HOOD - #1 (EXH-L)


EXHAUST RISER.
HANGING ANGLE.
20" CAPTRATE SOLO FILTER WITH HOOK.
3" INTERNAL STANDOFF.
IT IS THE RESPONSIBILITY OF THE ARCHITECT/OWNER TO ENSURE THAT THE HOOD CLEARANCE FROM LIMITED-COMBUSTIBLE AND COMBUSTIBLE MATERIALS IS IN COMPLIANCE WITH LOCAL CODE REQUIREMENTS.
GREASE DRAIN WITH REMOVABLE CUP.
GAS CHASE CUTOUT (FOR GAS AND POWER LINES).
RECESSED ROUND LED FIXTURE AND LED LIGHT, 3500 K WARM OUTPUT.
ATTACHING PLATES.
SUPPLY RISER WITH VOLUME DAMPER.
ECCO OPEN STAINLESS STEEL PERFORATED PANEL.
EQUIPMENT BY OTHERS.
60"
24"
30" NOM.
48.0" MAX.
80"

SECTION VIEW - MODEL 6030ND-2-PSP-F
HOOD - #2 (EXH-M)


EXHAUST RISER.
HANGING ANGLE.
20" CAPTRATE SOLO FILTER WITH HOOK.
3" INTERNAL STANDOFF.
IT IS THE RESPONSIBILITY OF THE ARCHITECT/OWNER TO ENSURE THAT THE HOOD CLEARANCE FROM LIMITED-COMBUSTIBLE AND COMBUSTIBLE MATERIALS IS IN COMPLIANCE WITH LOCAL CODE REQUIREMENTS.
GREASE DRAIN WITH REMOVABLE CUP.
GAS CHASE CUTOUT (FOR GAS AND POWER LINES).
RIGHT VERTICAL END PANEL WITH ADJUSTABLE LEGS.
RECESSED ROUND LED FIXTURE AND LED LIGHT, 3500 K WARM OUTPUT.
ATTACHING PLATES.
SUPPLY RISER WITH VOLUME DAMPER.
ECCO OPEN STAINLESS STEEL PERFORATED PANEL.
EQUIPMENT BY OTHERS.
60"
30" NOM.
48.0" MAX.
80"

SECTION VIEW - MODEL 6030ND-2-PSP-F
HOOD - #3 (EXH-R)


EXHAUST RISER.
HANGING ANGLE.
20" CAPTRATE SOLO FILTER WITH HOOK.
3" INTERNAL STANDOFF.
IT IS THE RESPONSIBILITY OF THE ARCHITECT/OWNER TO ENSURE THAT THE HOOD CLEARANCE FROM LIMITED-COMBUSTIBLE AND COMBUSTIBLE MATERIALS IS IN COMPLIANCE WITH LOCAL CODE REQUIREMENTS.
GREASE DRAIN WITH REMOVABLE CUP.
LEFT WALL AS END PANEL.
GAS CHASE CUTOUT (FOR GAS AND POWER LINES).
RIGHT VERTICAL END PANEL WITH ADJUSTABLE LEGS.
RECESSED ROUND LED FIXTURE AND LED LIGHT, 3500 K WARM OUTPUT.
FIELD WRAPPER 18.00" HIGH (SEE HOOD OPTIONS TABLE).
EQUIPMENT BY OTHERS.
60"
30" NOM.
48.0" MAX.
80"

SECTION VIEW - MODEL 6030ND-2
HOOD - #4 (Prep)

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SECTION 23 38 13 13

SPECIFICATIONS
TAG: Commercial Kitchen Ventilation Hoods, Listed Commercial Kitchen Hoods

PART 1 - GENERAL

1.1 SUMMARY

A. The ND2 series is a Type I, wall canopy hood for use over 600°F cooking surface temperatures. The aerodynamic design includes a mechanical baffle and performance enhancing lip for exceptional capture and containment.

B. The hood shall have the size, shape, and performance specified on drawings.

1.2 SUBMITTALS

A. The manufacturer assumes no liability for the use or results of use from this document. Specifications are to be reviewed by the engineer to confirm the project's requirements and meet Federal, State, and Local codes and regulations.

B. As the manufacturer continues product development, it reserves the right to change design and specifications without notice.

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

1.3 QUALITY ASSURANCE

A. This hood is ETL-listed to standard UL710, ULC710, and ULC-S646 when installed in accordance with these installation instructions and National Fire Protection Association Standard "NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations."

B. Built-in compliance with NSF/ANSI Standard 2.

C. The hood shall be ETL Listed as:

1. "Exhaust Hood Without Exhaust Damper."
2. ETL Sanitation Listed and built in accordance with NFPA 96.
3. The ETL label shall list temperature rating(s) and minimum CFM/ft rating(s).

1.4 WARRANTY

A. All units shall be provided with the following standard warranty:

1. This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 2-years from date of shipment.

B. The manufacturer shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 2-year warranty period, upon examination by the manufacturer, such part will be repaired or replaced by manufacturer at no charge. The buyer shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without manufacturer's prior authorization, and all returned equipment shall be shipped by the buyer, freight prepaid to a destination determined by the manufacturer.

C. Refer to Manufacturer's Operation, Installation, and Maintenance (OIM) Manual for detailed descriptions of what is/is not covered and contact information for warranty claims.

PART 2 - PRODUCTS

2.1 GENERAL

A. Construction shall be dependent on the structural application to minimize distortion and other defects. All seams, joints, and penetrations of the hood enclosure to the lower outermost perimeter, which directs and captures grease-laden vapor and exhaust gases, shall have a liquid-tight continuous external weld in accordance with NFPA 96.

B. Duct sizes, CFM, and static pressure requirements shall be as shown on drawings. Static pressure requirements shall be precise and accurate; air velocity and volume information shall be accurate within 1-ft increments along the length of the ventilator.

2.2 CONSTRUCTION

A. Construction shall be type 430 stainless steel.

B. Double wall insulated front to eliminate condensation and increase rigidity on wide sizes. The insulation shall have a flexural modulus of 475 EI, meet UL 181 requirements and be in accordance with NFPA 90A and 90B.

C. Hood shall be equipped with a minimum of four connections for hanger rods. Hood lengths greater than 12' will have added hangers.

D. Exhaust duct collar to be 4"high with flange.

E. The grease drain system shall be an enclosed integral part of the hood back and have slopes with an exposed, removable 1/2 grease cup to facilitate cleaning.

F. An integral baffle to direct grease laden vapors toward the exhaust filter bank.

G. Hood shall be furnished with UL classified filters, supplied in size and quantity as required by ventilator.

H. All seams shall be welded and have stainless steel on exposed surfaces.

2.3 LIGHTING

A. Recessed round LED fixture and LED light, 3500K Warm output.

2.4 FILTERS

A. Stainless Steel Captrate Solo filter with hook, ETL Listed. Particulate capture efficiency: 85% efficient at 9 microns, 76% efficient at 5 microns.

2.5 OPTIONS

A. Fire Suppression System: UL 300 fire suppression system.

B. Optional perforated supply plenum shall provide make-up air discharged below the cooking equipment.

1. Perforated diffuser plates shall be included in the design to provide even air distribution.
2. Unexposed surfaces shall be constructed of aluminized steel. Plenum shall be insulated to prevent condensation.
3. Perforated Supply Plenum (PSP)

C. Hood Mounted Utility Cabinet - Cabinet can store listed fire suppression system, listed components, pre-wired electrical controls.

2.6 ACCESSORIES

A. End Panel(s) maximize hood performance and eliminate the effects of cross drafts in the kitchen. Units constructed of stainless steel and sized according to hood width and cooking equipment. Exposed edges hemmed for safety and rigidity. Selected panels:

1. Vertical End Panel
2. Wall as End Panel

B. Standoff(s) selected:

1. Left End Standoff

C. Wrapper(s) may be installed from the factory or field installed. Wrapper(s) selected:

1. Wrapper

D. Miscellaneous option(s) selected:

1. Riser Sensor Install -Sensor set-up for 6"plenum.
2. Structural Front Panel -Front panel made with 18 gauge material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions under which the system is installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions, drawings, written specifications, manufacturer's installation manual, and all applicable building codes.

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NOTE:

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

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No	Date	Remarks
	04/19/23	PERMIT UPDATES
	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

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CAPTIVEAIRE DRAWINGS

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Drawn
- - -
Scale
AS NOTED
Date

Sheet No.
M6.0

SECTION 904.12

COMMERCIAL COOKING SYSTEMS
TAG: CORE Fire Protection

PART 1 – GENERAL

1.1 SUMMARY

A. The CORE Fire Protection system is a pre-engineered wet chemical water based (surfactant) fire suppression system for use in commercial kitchens.

1.2 SUBMITTALS

A. The manufacturer assumes no liability for the use or results of use of this document. This specification is to be reviewed by the engineer to confirm requirements of the project and building codes are met.

B. As the manufacturer continues product development, it reserves the right to change design and specifications without notice.

1.3 QUALITY ASSURANCE

A. CORE Fire Protection System shall be UL & ULC listed in accordance with UL300, and ULC/ORD-C1254.6.

B. Microprocessor-based control board shall be ETL Listed to UL Standard 864 and CAN/ ULC-S527-11.

C. CORE Fire Protection System is intended for installation and for use in accordance with the National Fire Protection Association Standards:

1. Wet Chemical Extinguishing Systems, NFPA 17A
2. National Electrical Code, NFPA 70
3. National Fire Alarm & Signaling Code, NFPA 72
4. Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment, NFPA 96

D. The CORE Fire Protection System is approved for use in New York City per FDNY COA #5877.

1.4 WARRANTY

A. All units are provided with the following 5-year standard warranty from date of shipment. Warranty does not cover consumable products such as batteries, surfactant, and nozzle caps.

B. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the manufacturer's installation instructions shipped with the product.
2. The equipment is not installed in accordance with Federal, State, and Local codes and regulations.
3. The equipment is misused, neglected, or not maintained per the manufacturer's maintenance instructions.
4. The equipment is not operated within its published capacity.
5. The invoice is not paid within the terms of the sales agreement.

C. The manufacturer shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 5-year warranty period, upon examination by the manufacturer, such part will be repaired or replaced by the manufacturer at no charge. The buyer shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without manufacturer's prior authorization. All returned equipment shall be shipped by the buyer, freight prepaid to a destination determined by the manufacturer.

PART 2 – PRODUCTS

2.1 GENERAL ASSEMBLY

A. A pre-engineered, fixed pipe, automatic wet chemical (surfactant) fire suppression system for protection of all hazard areas associated with cooking operations, including exhaust hoods, plenums, ductwork, and cooking appliances.

B. The fire system shall be factory assembled, tested, and shipped as a complete unit.

C. The following specifications, delivering all capacities scheduled and conforming to the design indicated herein. Alternate layouts or dimensional changes will not be accepted.

2.2 COMPONENTS

A. Exhaust hood fire system components to be factory installed.

B. Distribution Nozzles

1. Nozzles shall be located to protect the exhaust ducts, plenums, and all cooking appliances requiring protection.
2. All nozzles shall be equipped with a metal blow off cap. The cap prevents contamination from entering the pipe network and is designed to pop-off upon system discharge, allowing agent to flow to the protected hazard area.
3. All nozzles shall incorporate a stamped part number to quickly identify nozzle type.

C. Distribution System

1. The distribution system shall consist of Copper, Schedule 40 black iron, chrome-plated or stainless-steel pipe and fittings. All exposed piping and fittings must be chrome-plated or stainless-steel.
2. Fittings shall be minimum class 150. Galvanized fittings shall not be used.
3. Flow rate for the hood, when in a fire condition, would be 1.5 gallons per minute per foot of hood.
4. Operating pressure for water lines, both hot water and dedicated line, is 30 to 70 psi, depending on the system configuration.
5. The maximum static pressure cannot exceed 125 psi; pressure reducing valves can be utilized to meet the correct operating water pressure

D. Suppression System

1. The system control equipment shall be capable of all functions associated with automatically and manually discharging surfactant from surfactant tank, including automatic shutdown of the heat source or fuel and electrical power to all protected areas upon system discharge.
2. For automatic activation, the system will be activated by a Firestat (heat) detector.
3. For manual activation, an electrically operated manual release shall be used to actuate the system manually.

E. Firestat

1. Hoods #1, 2, 3, 4: Normally Open, Close on Rise 360°F.
2. Additional firestats may be required based on hood temperature rating and length of ductwork. Refer to Installation, Operation, and Maintenance Manual for information.

F. Electrical

1. Electrical Division to provide shunt trip breakers at main power panel, or disconnects, as designated by the Electrical Engineer; interconnection provided at hood control panel for the signal to shut down all electricity in and under the exhaust hood. Shunt trips/disconnects to accomplish shut off of electricity in the event of fire system activation by others.
2. Printed circuit board with microprocessor-based controller that provides all the necessary monitoring, timing, and supervision functions required for the reliable operation of the fire system.
3. Independent supervised loops incorporate redundancy and fault detection.
4. Real-time cloud-based monitoring connection provided with system by ownership.
5. All wiring must be in accordance to NFPA 70 and the Authority Having Jurisdiction (AHJ).
6. Electric gas valve provided for equipment below exhaust hood. Coordinate size and installation with Plumbing Division.
7. All wiring is to be in accordance with the applicable manufacturer's instructions for the fire alarm control panel, gas shut-off valve, manual reset relay, and contractor supplied shut-off devices.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine all areas and conditions under which package(s) are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 INSTALLATION

A. Install the package in accordance with manufacturer's instructions, drawings, written specifications, manufacturer's installation manual, and all applicable building codes.

3.3 CONNECTIONS

A. Electrical connections conform to applicable requirements in Division 26 Sections.

3.4 SYSTEM START-UP

A. System start-up is performed by a factory-trained Service Technician.

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△ DESCRIPTION	DATE:
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FIRE SYSTEM INFORMATION – JOB#5539822

FIRE SYSTEM NO	TAG	TYPE	SIZE	FLOW POINTS	INSTALLATION	
					SYSTEM	LOCATION ON HOOD
1		TANK FS	4.0/4.0/4.0/4.0	79	FIRE CABINET RIGHT	RIGHT, HOOD 3
2		TANK FS	4.0	20	FIRE CABINET RIGHT	RIGHT, HOOD 4

GAS VALVE(S)

FIRE SYSTEM NO	TAG	TYPE	SIZE	SUPPLIED BY
1		SC ELECTRICAL	2.500	CAPTIVEAIRE SYSTEMS
2		SC ELECTRICAL	1.500	CAPTIVEAIRE SYSTEMS

FIRE SYSTEM PARTS LIST KEY

FIRE SYSTEM NO	TAG	KEY NUMBER – PART DESCRIPTION	QTY BY FACTORY	QTY BY DIST
1		0 – 0 – 12-F28021-32144-DT-360 DUCT FIRE THERMOSTAT WITH 12 FOOT WIRE LEADS. NO, CLOSE ON TEMP RISE AT 360°F.	3	0
		0 – 0 – 361091 3/8" BRASS PLUG.	7	0
		0 – 0 – 79425 3/8" NPT FEMALE TO 1/2" MALE PROPRESS ADAPTER.	7	0
		0 – 0 – 87-120042-001 SECONDARY ACTUATOR VALVE (SVA) – SINGLE ACTUATOR, REQUIRES PRIMARY RELEASE ACTUATOR, TANK FIRE SUPPRESSION.	3	0
		0 – 0 – 87-120045-001 HOSE, SECONDARY ACTUATOR HOSE, 7.5" BRAIDED STAINLESS STEEL, TANK FIRE SUPPRESSION.	3	0
		0 – 0 – 87-300001-001 TANK – PRESSURIZED TANK USED FOR TANK FIRE SUPPRESSION.	4	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 – 87-300152-001 HARDWARE, SVA BOLTS, TANK FIRE SUPPRESSION.	16	0
		0 – 0 – 9055455PC PRO PRESS 1/2 PRESS X PRESS 90 ELBOW LD.	15	0
		0 – 0 – 9097200PC PRO PRESS PC611 1/2 PRESS TEE LD.	14	0
		0 – 0 – 98694A115 HARDWARE, DATANKLOCK LOCKING BRACKET SQUARE NUTS 5/16" ZINC, TANK FIRE SUPPRESSION.	8	0
		0 – 0 – A0034332 JUNCTION BOX FOR MANUAL PULL STATION. 1.5" DEEP BACK BOX, RED COLOR.	1	0
		0 – 0 – BI145 3/8" BLACK IRON 90 ELL.	7	0
		0 – 0 – CBI-102 CHROME PLATED PIPE FITTING 3/8" NPT 45 DEGREE ELBOW.	1	0
		0 – 0 – CBI-104 CHROME PLATED PIPE FITTING 3/8" NPT TEE.	3	0
		0 – 0 – CBI-106 CHROME PLATED PIPE FITTING 3/8" NPT 90 DEGREE ELBOW.	4	0
		0 – 0 – CBI-107 CHROME PLATED PIPE FITTING 3/8" NPT UNION.	3	0
		0 – 0 – DATANKLOCK DISCHARGE ADAPTER TANK LOCKING PLATE FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.	4	0
		0 – 0 – SLPCON-03FT SUPERVISED LOOP CONNECTION KIT. CONTAINS THE PARTS NEEDED TO CONNECT THE SUPERVISED LOOP BETWEEN END TO END HOODS WITH LESS THAN A 2' GAP. KIT CONTAINS 5 FEET OF BLACK MG WIRE, 5 FEET OF TAN MG WIRE, 3 FEET OF FLEXIBLE CONDUIT, AND TWO 7/8" CONNECTORS.	3	0
		0 – 0 – SLPCON-30FT SUPERVISED LOOP CONNECTION KIT. CONTAINS THE PARTS NEEDED TO CONNECT THE SUPERVISED LOOP BETWEEN HOODS WITH UPTO 29' GAP. KIT CONTAINS 32 FEET OF BLACK MG WIRE, 32 FEET OF TAN MG WIRE, 30 FEET OF FLEXIBLE CONDUIT, AND TWO 7/8" CONNECTORS.	1	0
		0 – 0 – TANK STRAP TANK STRAP – USED FOR TANK FIRE SUPPRESSION.	12	0
		0 – 0 – TFS-UCTANKBRACKET TANK BRACKET FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.	4	0
		0 – 0 – WK-283952-000 DISCHARGE ADAPTER, TANK FIRE SUPPRESSION.	4	0
		16 – 16 – 79210 1/2" X 3/8" NPT MALE ADAPTER, VIEGA.	15	0
		16 – 16 – OL-F NOZZLE – TANK PROTECTION APPLIANCE COVERAGE NOZZLE (INCLUDES METAL BLOW OFF CAP, LANYARD, USED WITH CHROME-PLATED PIPE)– 4 FLOW POINTS.	18	0
		26 – 26 – QSA-3/8 QUIK SEAL – 3/8" (UL).	15	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
2		0 – 0 – 12-F28021-32144-DT-360 DUCT FIRE THERMOSTAT WITH 12 FOOT WIRE LEADS. NO, CLOSE ON TEMP RISE AT 360°F.	1	0
		0 – 0 – 87-300001-001 TANK – PRESSURIZED TANK USED FOR TANK FIRE SUPPRESSION.	1	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 – 87-300152-001 HARDWARE, SVA BOLTS, TANK FIRE SUPPRESSION.	4	0
		0 – 0 – 9055455PC PRO PRESS 1/2 PRESS X PRESS 90 ELBOW LD.	5	0
		0 – 0 – 9097200PC PRO PRESS PC611 1/2 PRESS TEE LD.	4	0
		0 – 0 – 98694A115 HARDWARE, DATANKLOCK LOCKING BRACKET SQUARE NUTS 5/16" ZINC, TANK FIRE SUPPRESSION.	2	0
		0 – 0 – A0034332 JUNCTION BOX FOR MANUAL PULL STATION. 1.5" DEEP BACK BOX, RED COLOR.	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.	1	0
		0 – 0 – TANK STRAP TANK STRAP – USED FOR TANK FIRE SUPPRESSION.	3	0
		0 – 0 – TFS-UCTANKBRACKET TANK BRACKET FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.	1	0
		0 – 0 – WK-283952-000 DISCHARGE ADAPTER, TANK FIRE SUPPRESSION.	1	0
		16 – 16 – 79210 1/2" X 3/8" NPT MALE ADAPTER, VIEGA.	5	0
		16 – 16 – OL-F NOZZLE – TANK PROTECTION APPLIANCE COVERAGE NOZZLE (INCLUDES METAL BLOW OFF CAP, LANYARD, USED WITH CHROME-PLATED PIPE)– 4 FLOW POINTS.	5	0
		26 – 26 – QSA-3/8 QUIK SEAL – 3/8" (UL).	5	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

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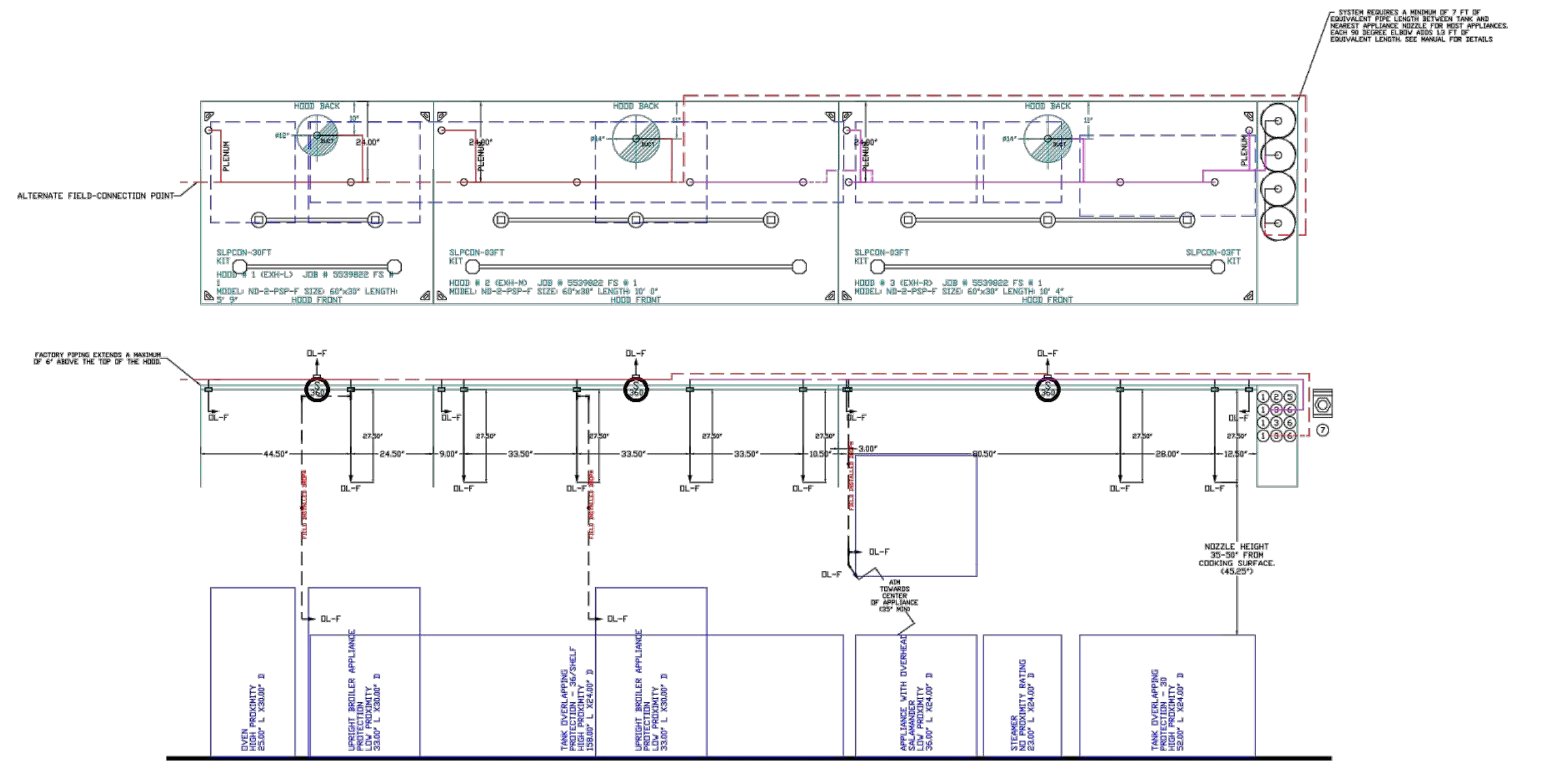
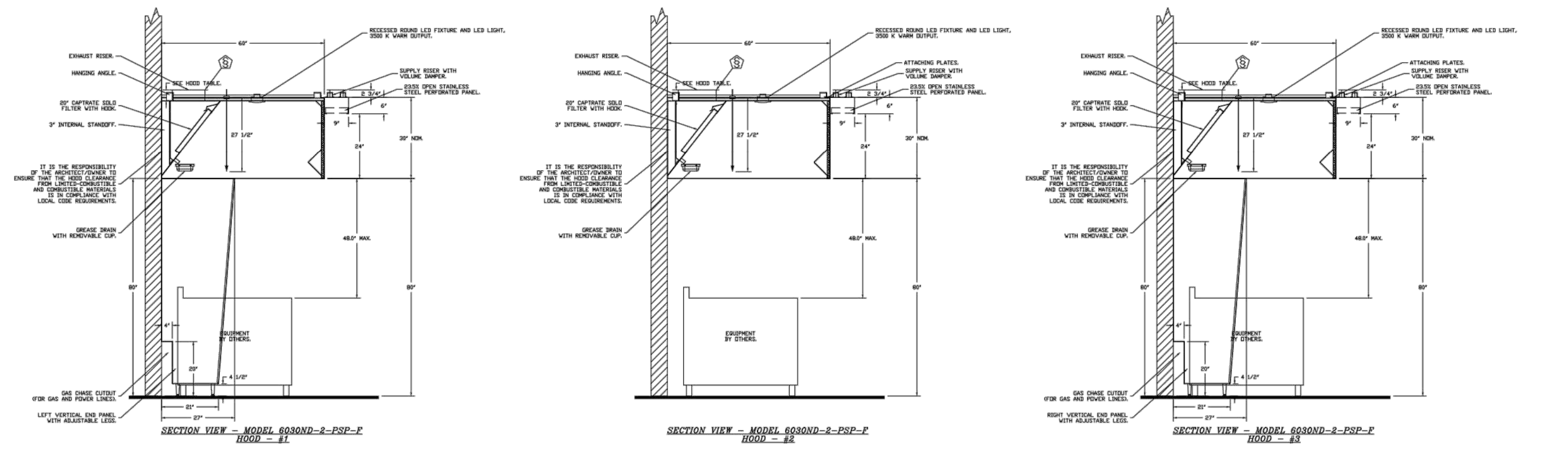



RECESSED ROUND LED FIXTURE AND LED LIGHT, 3500 K WARM OUTPUT.
SECTION VIEW – MODEL 6030ND-2-PSP-F HOOD – #1
SECTION VIEW – MODEL 6030ND-2-PSP-F HOOD – #2
SECTION VIEW – MODEL 6030ND-2-PSP-F HOOD – #3

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 FIRE SYSTEM COMPLIES WITH U.L. 300 REQUIREMENTS.

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

JOB #: 5539822.
JOB NAME: PERRY'S-VERNON HILLS, IL_R1.

SYSTEM SIZE: TANK-SP-4 TOTAL FP REQUIRED: 79.
HOOD # 1 5' 9.00" LONG x 60" WIDE x 30" HIGH.
RISER # 1 SIZE: 12" DIA.
HOOD # 1 METAL BLOW-OFF CAPS INCLUDED.
HOOD # 2 10' 0.00" LONG x 60" WIDE x 30" HIGH.
RISER # 1 SIZE: 14" DIA.
HOOD # 2 METAL BLOW-OFF CAPS INCLUDED.
HOOD # 3 10' 4.00" LONG x 60" WIDE x 30" HIGH.
RISER # 1 SIZE: 14" DIA.
HOOD # 3 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.

LEGEND – FIRE CABINET TANK SYSTEM

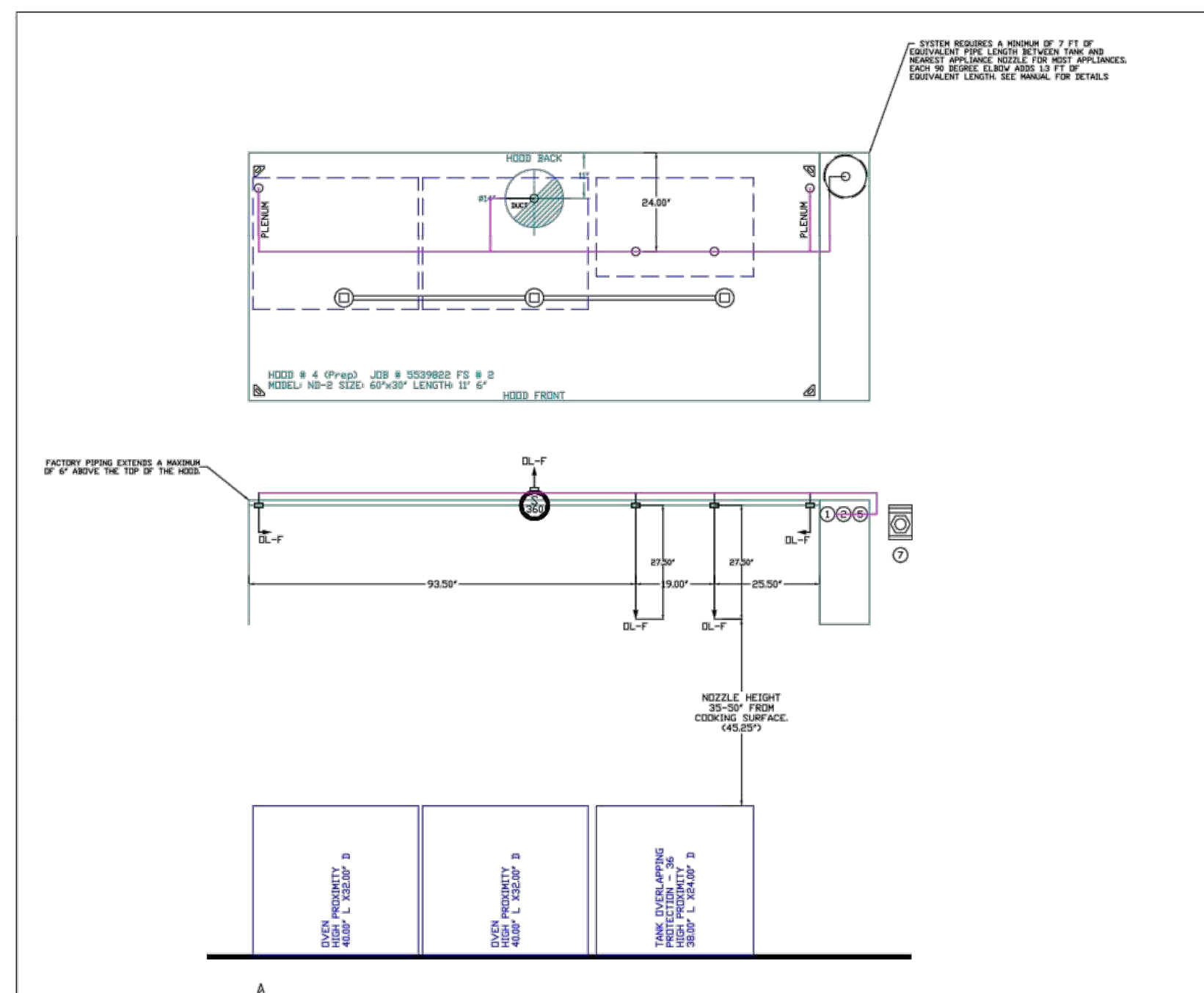
1	4 GALLON TANK.
2	PRIMARY ACTUATOR RELEASE.
3	SECONDARY ACTUATOR RELEASE.
4	PRESSURE SUPERVISION SWITCH.
5	PRIMARY HOSE ASSEMBLY.
6	SECONDARY HOSE ASSEMBLY.
7	REMOTE MANUAL ACTUATION DEVICE.

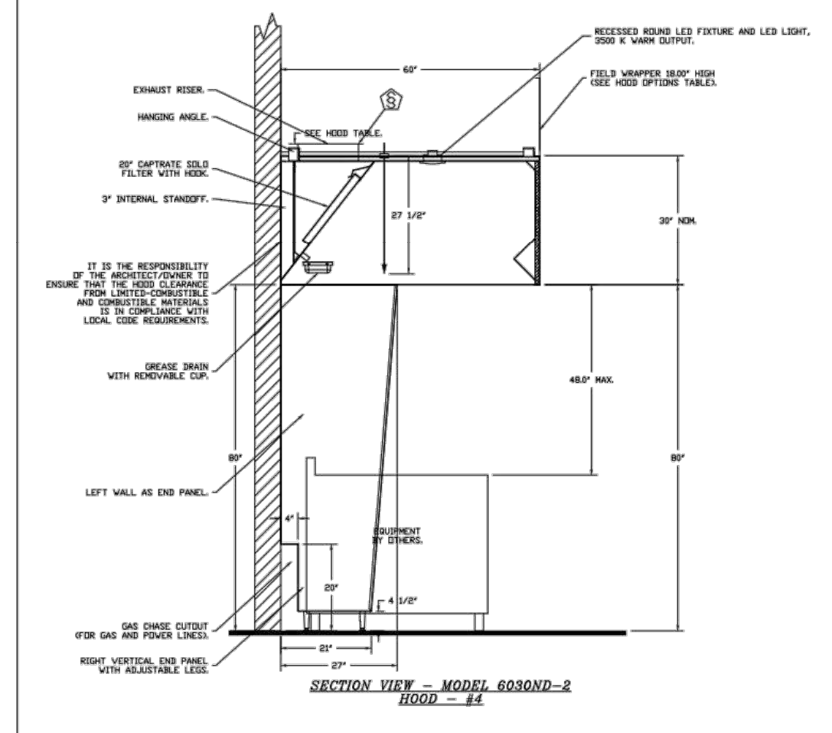
REVISIONS

St. Louis Mechanical

Perry's-Vernon Hills, IL_R1
VERNON HILLS, IL, 60061

DATE: 7/6/2022
DWG.#: 5539822
DRAWN BY: ML
SCALE: 1/2" = 1'-0"
MASTER DRAWING
SHEET NO. 7





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 FIRE SYSTEM COMPLIES WITH U.L. 300 REQUIREMENTS.

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

JOB #: 5539822.
JOB NAME: PERRY'S-VERNON HILLS, IL_R1.

SYSTEM SIZE: TANK-SP-1 TOTAL FP REQUIRED: 20.
HOOD # 4 11' 6.00" LONG x 60" WIDE x 30" HIGH.
RISER # 1 SIZE: 14" DIA.
HOOD # 4 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.

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.

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 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.

NOTES
- FIELD PIPE DROPS AS SHOWN
  SLEEVING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY CAS.
- FIELD INSTALLED DROP: FACTORY WILL PROVIDE QTY 1 60IN LONG PIECE 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.
- MAXIMUM 9 ELBOWS IN SUPPLY LINE.
- MINIMUM 72 INCHES OF AGENT LINE FROM TANK TO FIRST NOZZLE COVERING A RANGE, FRYER, OR WOK TO REFLECT GENERAL PIPING REQUIREMENTS.
- IF APPLICABLE, PRE-PIPED CHARBROILER DROPS ARE SHIPPED LOOSE.
- FACTORY PIPING EXTENDS A MAXIMUM OF 6" ABOVE THE TOP OF THE HOOD.

JOB #: 5539822.
JOB NAME: PERRY'S-VERNON HILLS, IL_R1.

SYSTEM SIZE: TANK-SP-4 TOTAL FP REQUIRED: 79.
HOOD # 1 5' 9.00" LONG x 60" WIDE x 30" HIGH.
RISER # 1 SIZE: 0" x 0".
HOOD # 2 10' 0.00" LONG x 60" WIDE x 30" HIGH.
RISER # 1 SIZE: 0" x 0".
HOOD # 3 10' 4.00" LONG x 60" WIDE x 30" HIGH.
RISER # 1 SIZE: 0" x 0".

SYSTEM SIZE: TANK-SP-1 TOTAL FP REQUIRED: 20.
HOOD # 4 11' 6.00" LONG x 60" WIDE x 30" HIGH.
RISER # 1 SIZE: 0" x 0".

REVISIONS

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VERNON HILLS, IL, 60061

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NOTE:

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VERNON HILLS, IL 60061

STEAKHOUSE & GRILLE

1050 N MILWAUKEE AVE

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	04/19/23	PERMIT UPDATES
	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

REVISIONS

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Job No.

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Date

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M6.1

SECTION 21 23 00
WET- CHEMICAL FIRE-EXTINGUISHING SYSTEMS
TAG: TANK Fire Suppression

PART 1 - GENERAL

1.1 SUMMARY

A. TANK Fire Suppression is a pre-engineered, stored-pressure wet chemical solution extinguishing system.

1.2 SUBMITTALS

A. The manufacturer assumes no liability for the use or results of use from this document. Specifications are to be reviewed by the engineer to confirm the requirements of the project and meet Federal, State, and Local codes.

B. As the manufacturer continues product development, it reserves the right to change design and specifications without notice.

1.3 QUALITY ASSURANCE

A. TANK Fire Suppression System shall be UL & ULC listed in accordance with UL300, UL1254, ULCORD-C1254.6.

B. Microprocessor-based control board shall be ETL Listed to UL Standard 864 and CAN/ ULC-S527-11.

C. TANK Fire Suppression System intended for installation and for use in accordance with the National Fire Protection Association Standards:

1. Wet Chemical Extinguishing Systems, NFPA 17A
2. National Electrical Code, NFPA 70
3. National Fire Alarm & Signaling Code, NFPA 72

D. New York City and FDNY approved under COA# 5870.

E. California State Fire Marshal (CFSM), Listing No. 7085-2199:0502.

1.4 WARRANTY

A. All units shall be provided with the following standard warranties:

1. TANK Fire Suppression System is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 60-months from date of shipment.

B. Warranty does not cover consumable products such as batteries and nitrogen.

C. The manufacturer shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 60-month warranty period, upon examination by the manufacturer, such part will be repaired or replaced by manufacturer at no charge. The buyer shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without manufacturer's prior authorization, and all returned equipment shall be shipped by the buyer, freight prepaid to a destination determined by the manufacturer.

D. Refer to Manufacturer's Operation, Installation, and Maintenance (OIM) Manual for detailed descriptions of what is/is not covered and contact information for warranty claims.

PART 2 - PRODUCTS

2.1 GENERAL

A. A pre-engineered, fixed pipe, automatic wet chemical agent fire suppression system for protection of all hazard areas associated with cooking operations, including exhaust hoods, plenums, ductwork, and cooking appliances.

2.2 COMPONENTS

A. Exhaust hood fire system components to be factory installed.

B. Cylinder and Valve Assembly

1. The cylinders shall have a tin-nickel alloy plated brass valve with pressure gauge.
2. Wet chemical agent shall be contained in one or more stored pressure DOT/TC rated steel cylinder and valve assemblies.
3. Each cylinder is factory-filled with liquid fire suppressant and pressurized to 200 PSIG at 70°F.

C. Distribution Nozzles

1. Nozzles shall be located to protect the exhaust ducts, plenums, and all cooking appliances requiring protection.
2. All nozzles shall be equipped with a metal blow off cap. The cap prevents contamination from entering the pipe network and is designed to pop-off upon system discharge, allowing agent to flow to the protected hazard area.
3. All nozzles shall incorporate a stamped part number to easily identify nozzle type.

D. Distribution System

1. The distribution system shall consist of Copper, Schedule 40 black iron, chrome-plated or stainless-steel pipe and fittings. All exposed piping and fittings must be chrome-plated or stainless steel.
2. Fittings shall be minimum class 150. Galvanized fittings shall not be used.

E. Suppression System

1. The system control equipment shall be capable of all functions associated with automatically and manually discharging the wet chemical agent from all cylinder and valve assemblies, including automatic shutdown of the heat source or fuel and electrical power to all protected areas upon system discharge.
2. Liquid Fire Suppressant shall be Aqueous Potassium Carbonate (APC).
3. All mechanical components of the actuator kit shall be enclosed.
4. The actuator kit shall be capable of automatic or manual activation means.
5. Supervisory Pressure Switch added to monitor operating system pressure.
6. For manual activation, an electrically operated manual release shall be used to actuate the system manually.
7. For automatic activation, the system will be activated by a Firestat (heat) detector.

F. Electrical

1. Electrical Division to provide shunt trip breakers at main power panel, or disconnects, as designated by the Electrical Engineer; interconnection provided at hood control panel for the signal to shut down all electricity in and under the exhaust hood. Shunt trips/disconnects to accomplish shut off of electricity in the event of fire system activation by others.
2. Printed circuit board with microprocessor-based controller that provides all the necessary monitoring, timing, and supervision functions required for the reliable operation of the fire system.
3. Independent supervised loops incorporate redundancy and fault detection.
4. Real-time cloud-based monitoring connection provided with system by ownership.
5. Primary power supply, with battery backup for power loss.
6. All wiring must be in accordance to NFPA 70 and the Authority Having Jurisdiction (AHJ).
7. Electric gas valve provided for equipment below exhaust hood. Coordinate size and installation with Plumbing Division.
8. All wiring is to be in accordance with the applicable manufacturer's instructions for the fire alarm control panel, gas shut-off valve, manual reset relay, and contractor supplied shut-off devices.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions under which the system is installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 APPLICATION

A. Wet chemical-based fire suppression system for use in commercial kitchens. It can be mounted in the integral cabinet located at the end of the hood or offered as a wall mount package.

3.3 INSTALLATION

A. As part of this item, provide wall mounted type K handheld portable fire extinguisher, placard, and mounting bracket as required in the immediate vicinity of each cooking area, per NFPA-96 and NFPA-10. Additional fire extinguishers as required in the kitchen area are to be specified by the Architect and provided by the General Contractor.

B. Install in accordance with manufacturer's instructions, drawings, written specifications, manufacturer's installation manual, and all applicable building codes.

C. Six-month and twelve-month inspections, servicing, and replacement of components as per NFPA 96 to be provided by the General Contractor or Owner.

REVISIONS

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St. Louis Mechanical
2 City Place Drive, Suite #200, St. Louis, MO, 63141 PHONE: (636) 229-9777 EMAIL: reg109@captiveaire.com

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VERNON HILLS, IL, 60061

DATE: 7/6/2022
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GAS VALVES AND STRAINERS

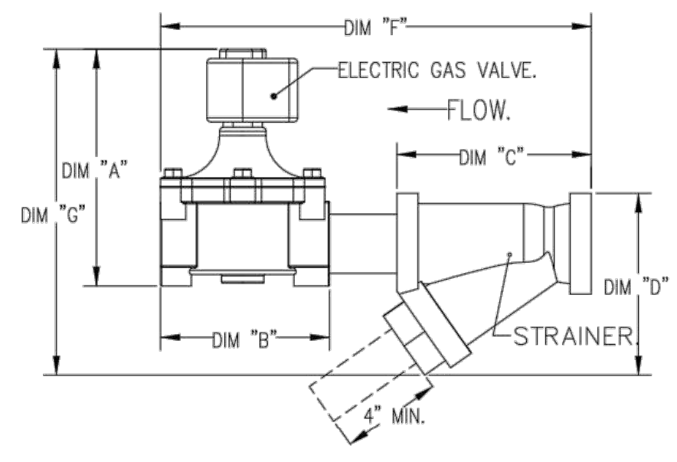
	GAS VALVE SIZING							GAS VALVE DIMENSIONS						INSTALLATION	PART NUMBERS		
	TYPE	SIZE	VOLTAGE	MIN. INLET PRESSURE	MAX. INLET PRESSURE	FLOW AT 1 IN.W.C. DROP NATURAL GAS	FLOW AT 1 IN.W.C. DROP PROPANE	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "F"	DIM "G"	MOUNTING ORIENTATION	GAS VALVE PART NUMBER	STRAINER PART NUMBER	GAS VALVE/STRAINER KIT
GAS VALVE FOR FS#1→	ELECTRICAL	2-1/2"	120 VAC	0 PSI (0 IN.W.C.)	5 PSI (138 IN.W.C.)	5,607,800 BTU/HR	3,638,821 BTU/HR	10-5/16"	8-1/16"	8-7/8"	9-7/8"	18-15/16"	18-5/8"	HORIZONTAL	8214290	4417K69	(SC)EGVA2-1/2
GAS VALVE FOR FS#2→	ELECTRICAL	1-1/2"	120 VAC	0 PSI (0 IN.W.C.)	5 PSI (138 IN.W.C.)	2,406,000 BTU/HR	1,561,219 BTU/HR	7-5/8"	6-3/8"	5-3/4"	6-3/16"	14-1/8"	12-5/16"	HORIZONTAL/ VERTICAL	8214275	4417K67	(SC)EGVA1-1/2

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)$^{0.5}$.



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EXHAUST FAN INFORMATION - JOB#5539822

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	1	DU85HFA	CAPTIVEAIRE	1311	1.500	1389	TEAO-ECM	0.750	0.5160	1	208	5.2	415 FPM	88	13.1
2	KEF-2	1	DU85HFA	CAPTIVEAIRE	2288	1.200	1579	TEAO-ECM	1.000	0.7590	1	208	6.9	724 FPM	92	17.6
3	KEF-3	1	DU85HFA	CAPTIVEAIRE	1779	1.300	1445	TEAO-ECM	0.750	0.5820	1	208	5.2	563 FPM	88	14.1
4	KEF-4	1	DU180HFA	CAPTIVEAIRE	1800	1.900	1255	ODP,PREMIUM	2.000	1.2960	3	208	8.3	416 FPM	182	16.3
6	EF-1	1	DR33HFA	CAPTIVEAIRE	600	0.400	1227	TEAO-ECM	0.333	0.1270	1	115	4.3		57	8.6
7	EF-2	1	DU33HFA	CAPTIVEAIRE	600	0.400	1227	TEAO-ECM	0.333	0.1220	1	115	4.3	297 FPM	67	10.5
8	EF-3	1	DR10HFA	CAPTIVEAIRE	100	0.300	1124	TEAO-ECM	0.166	0.0270	1	115	1.9		48	2.7
9	EF-4	1	DR10HFA	CAPTIVEAIRE	75	0.300	1087	TEAO-ECM	0.166	0.0250	1	115	1.9		48	2.3

DOAS/RTU FAN SCHEDULE - JOB#5539822

FAN INFORMATION											ELECTRICAL INFORMATION					COOLING INFORMATION									REHEAT INFORMATION					GAS HEAT INFORMATION				NOTES
																OUTSIDE AIR		LEAVING AIR			CAPACITY				DISCHARGE		CAPACITY							
FAN UNIT NO	TAG	QTY	DOAS/RTU MODEL #	MANUFACTURER	BLOWER	RETURN AIR CFM	MAX OUTSIDE AIR CFM	TOTAL CFM	WEIGHT (LBS)	ESP	HP	ø	VOLT	MCA	MOCP	DB	WB	DB	WB	DP	TOTAL	SENS.	IEER	ISMRE	DB	WB	DESIRED	MAX	MOISTURE REMOVAL RATE	GAS TYPE	INPUT BTUs	OUTPUT BTUs	TEMP RISE	
5	MAU-1	1	CASRTU3-I.400-18-20T-DOAS	CAPTIVEAIRE	18P-3	0	3000	3000	2624	0.750	2.00	3	460	43.5A	45A	84.9°F	76.8°F	51.4°F	49.0°F	47.1°F	264.0 MBH	105.2 MBH	18.2	6.0	70.0°F	56.8°F	61.3 MBH	129.6 MBH	143.3 LBS/HR	NATURAL	400000	320000	88°F	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15

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, 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. 80% 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. HAIL GUARD FOR CONDENSING COIL
15. DOWN DISCHARGE/NO RETURN

FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION
1	KEF-1	1	GREASE BOX
		1	ECM WIRING PACKAGE - PWM SIGNAL FROM ECPM03 PREWIRE (TELCO MOTOR), CCW ROTATION
		1	2 YEAR PARTS WARRANTY
2	KEF-2	1	GREASE BOX
		1	ECM WIRING PACKAGE - PWM SIGNAL FROM ECPM03 PREWIRE (TELCO MOTOR), CCW ROTATION
		1	2 YEAR PARTS WARRANTY
3	KEF-3	1	GREASE BOX
		1	ECM WIRING PACKAGE - PWM SIGNAL FROM ECPM03 PREWIRE (TELCO MOTOR), CCW ROTATION
		1	2 YEAR PARTS WARRANTY
4	KEF-4	1	GREASE BOX
		1	2 YEAR PARTS WARRANTY
5	MAU-1	1	RTU HEATED FURNACE CONDENSATE DRAIN KIT. REQUIRED FOR WINTER DESIGN TEMP OF 0 DEGREES F AND LOWER
		1	INLET PRESSURE GAUGE, 0-35"
		1	MANIFOLD PRESSURE GAUGE, 0 TO 10" WC, 1 FURNACE
		1	RTU TOTAL CFM MONITORING
		1	SHIP LOOSE GAS STRAINER 3/4"
		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	CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED
		1	RTU3 DOWN DISCHARGE
		1	2" MERV 13 FILTERS FOR RTU3 (QTY. 4)
		1	2" MERV 8 FILTERS FOR RTU3 (QTY. 4)
		1	OVERHEAT STAT
		1	VFD FACTORY MOUNTED AND WIRED IN RTU COMMERCIAL CONTROL VESTIBULE
		1	RTU FIXED 100% OA INTAKE CONTROL
		1	RTU3 NO RETURN - 100% OA
		1	REMOTE TEMPERATURE AND HUMIDITY SPACE SENSOR
		1	RTU3 CURB DUCT HANGER
		1	COMMERCIAL SMOKE DETECTOR/ALARM INTERLOCK - ALARM SUPPLIED BY OTHERS
		1	CLOGGED FILTER SWITCH - NOTIFICATION ON HMI
		1	RTU3 POWERED CONVENIENCE OUTLET (GFCI), 15 AMP
		1	RTU3 HAIL GUARD
		1	20 TON MODULATING COOLING OPTION, 460/480V. R410A REFRIGERANT, VARIABLE SPEED COMPRESSOR, ECM CONDENSING FANS
		1	20 TON MODULATING REHEAT OPTION - DISCHARGE DEWPOINT CONTROL
		1	VAV PACKAGE W/ MANUAL/DDC CONTROL (571 VFD INCLUDED)
		1	LOAD REACTOR MOUNTED IN FAN
		1	CONTROL PANEL ENCLOSURE HEATER - RECOMMENDED FOR WINTER DESIGN TEMPERATURES LESS THAN 0°F
		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)
6	EF-1	1	ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL -RTC- (TELCO MOTOR), CCW ROTATION
		1	I 15-BDD DAMPER
		1	2 YEAR PARTS WARRANTY
7	EF-2	1	SCR-11 BIRD SCREEN
		1	I 15-BDD DAMPER
		1	ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL -RTC- (TELCO MOTOR), CCW ROTATION
		1	2 YEAR PARTS WARRANTY
8	EF-3	1	ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL -RTC- (TELCO MOTOR), CCW ROTATION
		1	I 12-BDD DAMPER
		1	2 YEAR PARTS WARRANTY
9	EF-4	1	ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL -RTC- (TELCO MOTOR), CCW ROTATION
		1	I 12-BDD DAMPER
		1	2 YEAR PARTS WARRANTY

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DATE: 7/6/2022
DWG.#: 5539822
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SCALE: 3/4" = 1'-0"
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SHEET NO. 11

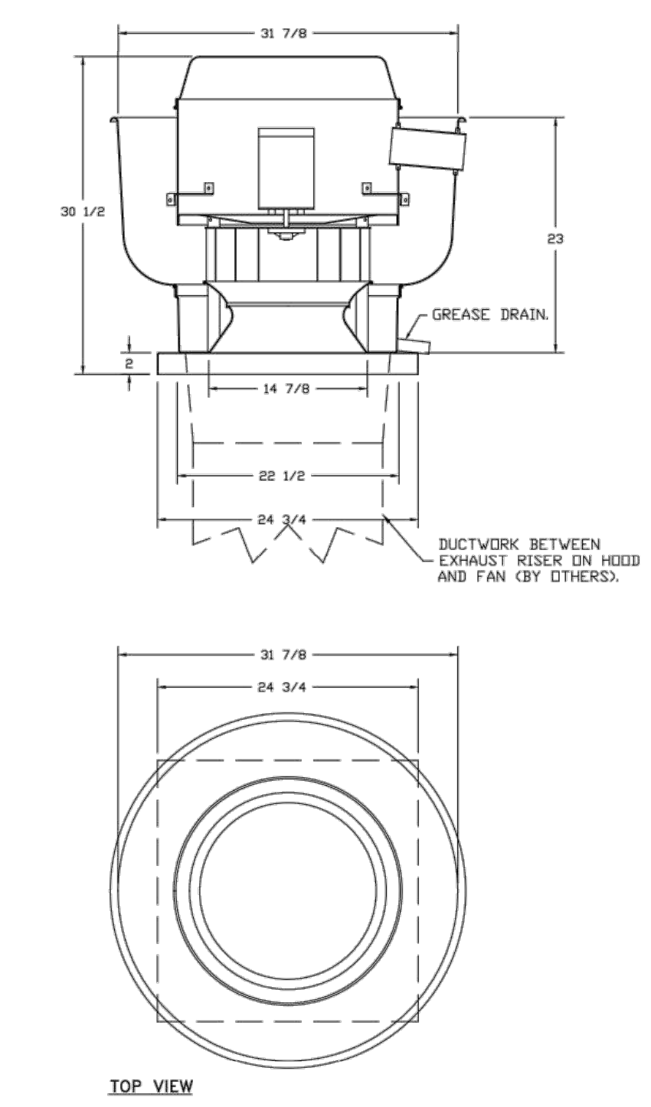
FAN ACCESSORIES

FAN UNIT NO	TAG	EXHAUST			SUPPLY			
		GREASE CUP	GRAVITY DAMPER	WALL MOUNT	SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1	KEF-1	YES						
2	KEF-2	YES						
3	KEF-3	YES						
4	KEF-4	YES						
6	EF-1		YES					
7	EF-2		YES					
8	EF-3		YES					
9	EF-4		YES					

CURB ASSEMBLIES

NO	ON FAN	TAG	WEIGHT	ITEM	SIZE
1	# 1	KEF-1	41 LBS	CURB	23.000"W X 23.000"L X 24.000"H ALONG LENGTH, RIGHT VENTED HINGED.
2	# 2	KEF-2	41 LBS	CURB	23.000"W X 23.000"L X 24.000"H ALONG LENGTH, RIGHT VENTED HINGED.
3	# 3	KEF-3	41 LBS	CURB	23.000"W X 23.000"L X 24.000"H ALONG LENGTH, RIGHT VENTED HINGED.
4	# 4	KEF-4	38 LBS	CURB	26.500"W X 26.500"L X 24.000"H ALONG LENGTH, RIGHT VENTED HINGED.
5	# 5	MAU-1	102 LBS	CURB	59.500"W X 91.000"L X 18.000"H ALONG WIDTH, RIGHT INSULATED.
6	# 6	EF-1	30 LBS	CURB	19.500"W X 19.500"L X 24.000"H ALONG LENGTH, RIGHT.
7	# 7	EF-2	30 LBS	CURB	19.500"W X 19.500"L X 24.000"H ALONG LENGTH, RIGHT.
8	# 8	EF-3	31 LBS	CURB	17.500"W X 17.500"L X 24.000"H ALONG LENGTH, RIGHT.
9	# 9	EF-4	31 LBS	CURB	17.500"W X 17.500"L X 24.000"H ALONG LENGTH, RIGHT.

FANS #1 (KEF-1), #2 (KEF-2), #3 (KEF-3) - DU85HFA EXHAUST FAN



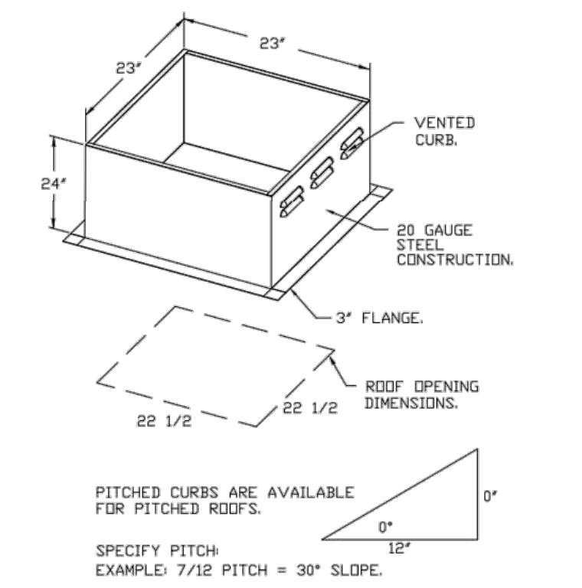
TOP VIEW

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.
ECM WIRING PACKAGE - PWM SIGNAL FROM ECPM03 PREWIRE (TELCO MOTOR), CCW ROTATION.
2 YEAR PARTS WARRANTY.



PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.

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

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	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

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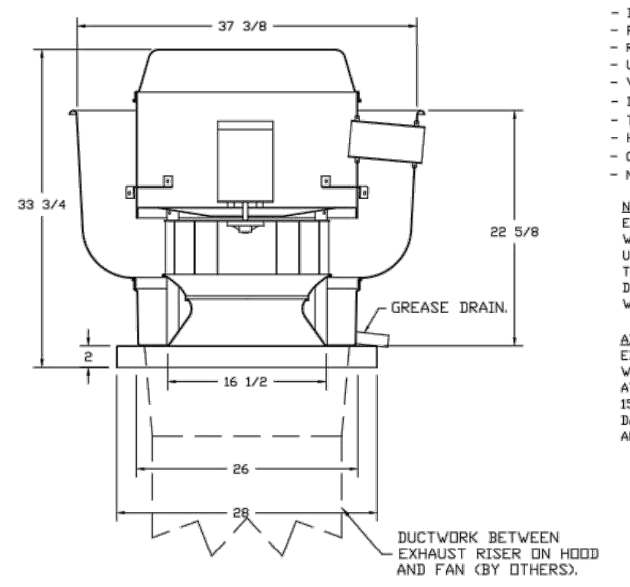
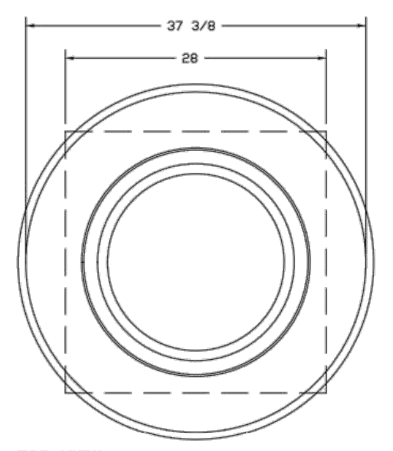
FAN #4 DU180HFA - EXHAUST FAN (KEF-4)





TOP VIEW

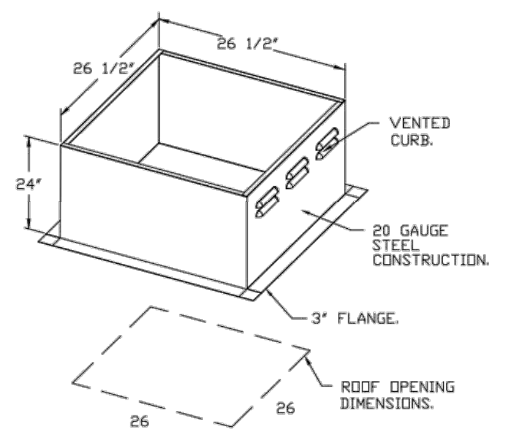
FEATURES:

- 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.

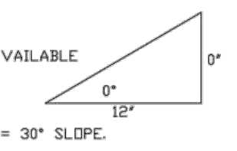
ABNORMAL FLARE-UP TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

OPTIONS
GREASE BOX.
2 YEAR PARTS WARRANTY.



PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.

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



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	06/17/22	STEEL PACKAGE
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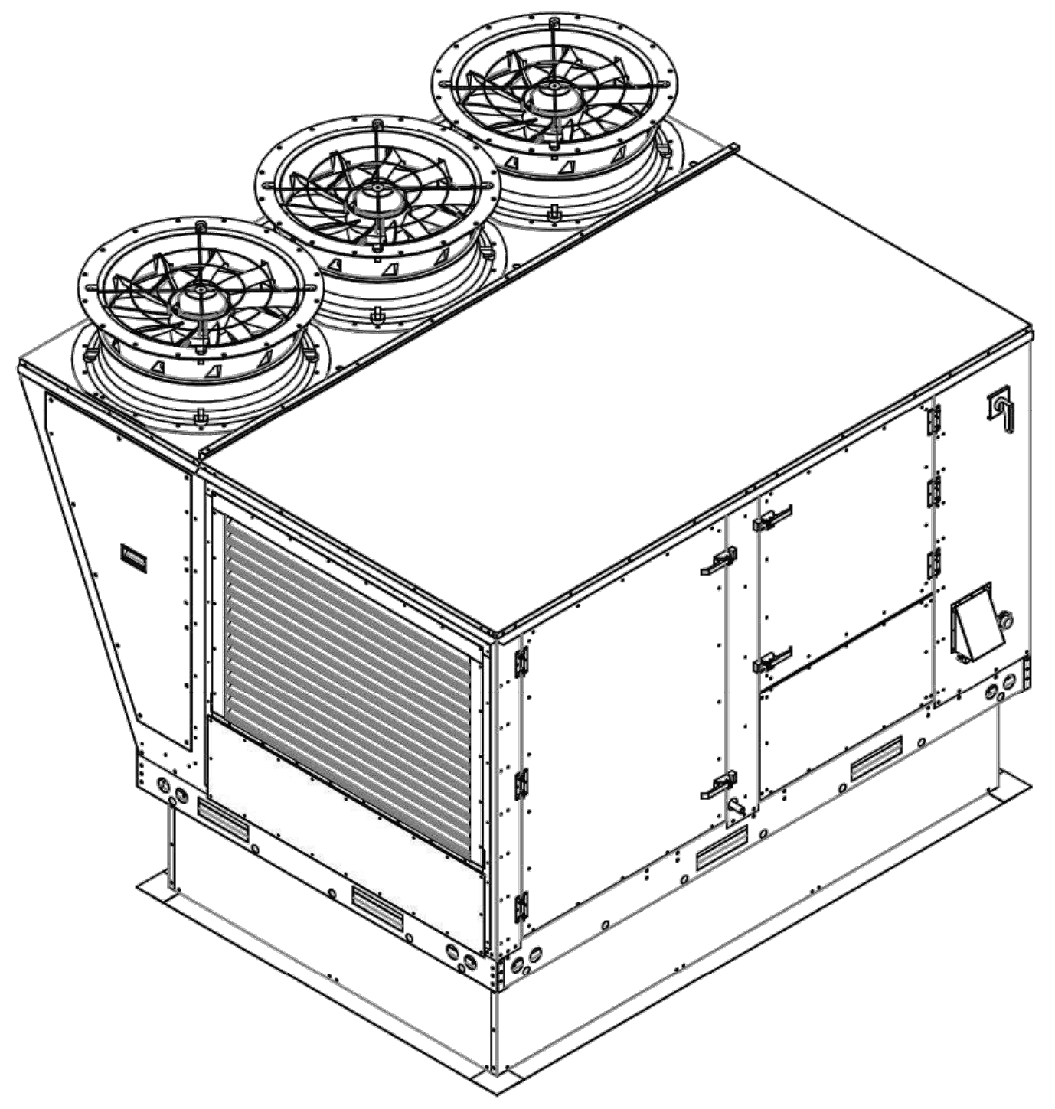
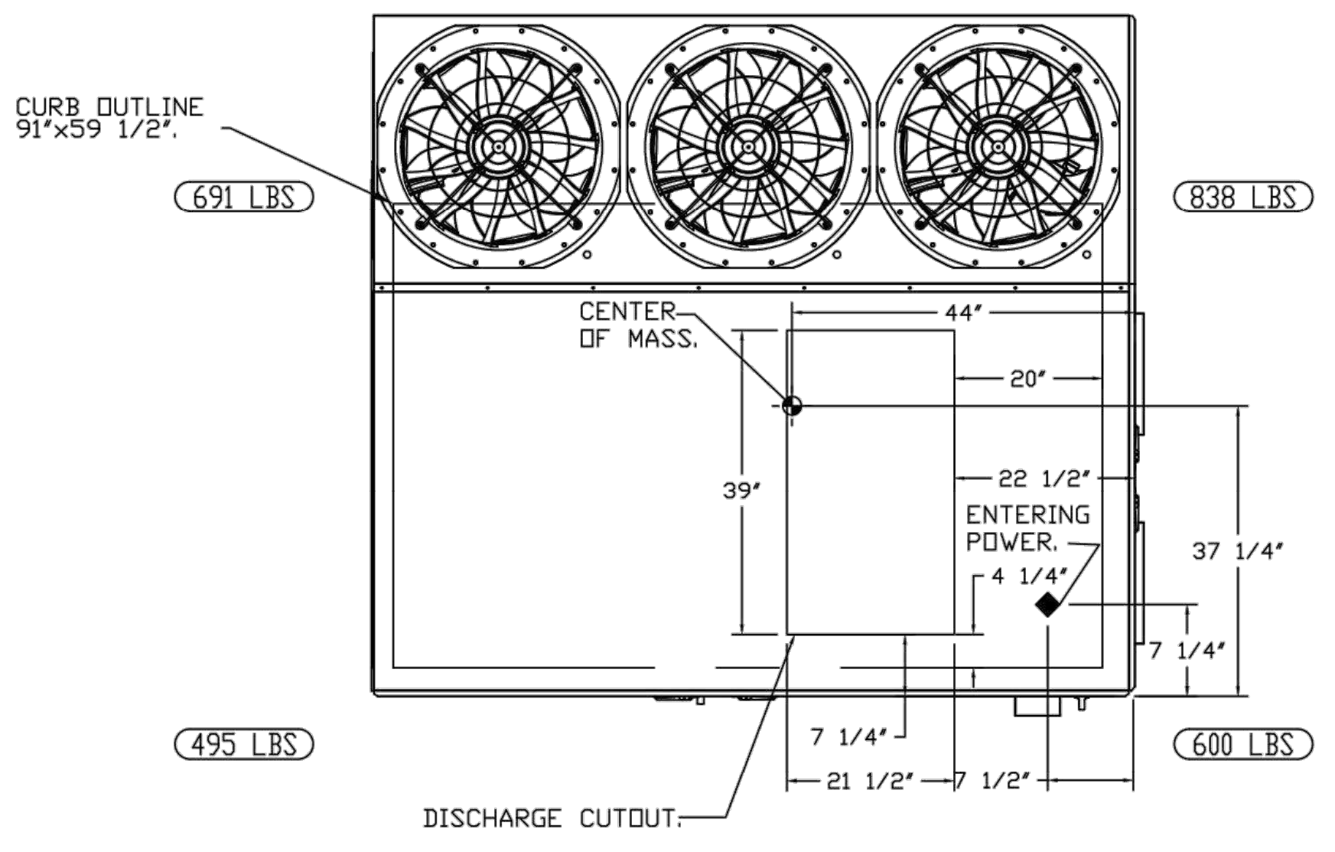
FAN #5 CASRTU3-I.400-18-20T-DOAS - HEATER (MAU-1)

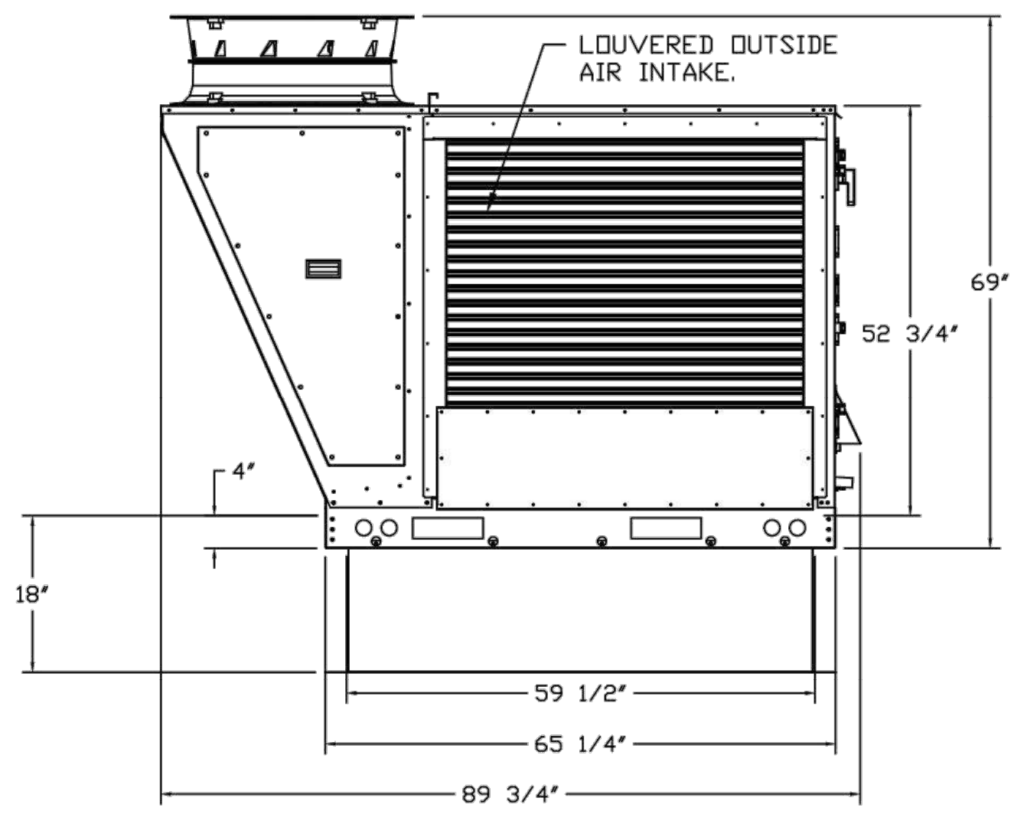
NOTES:

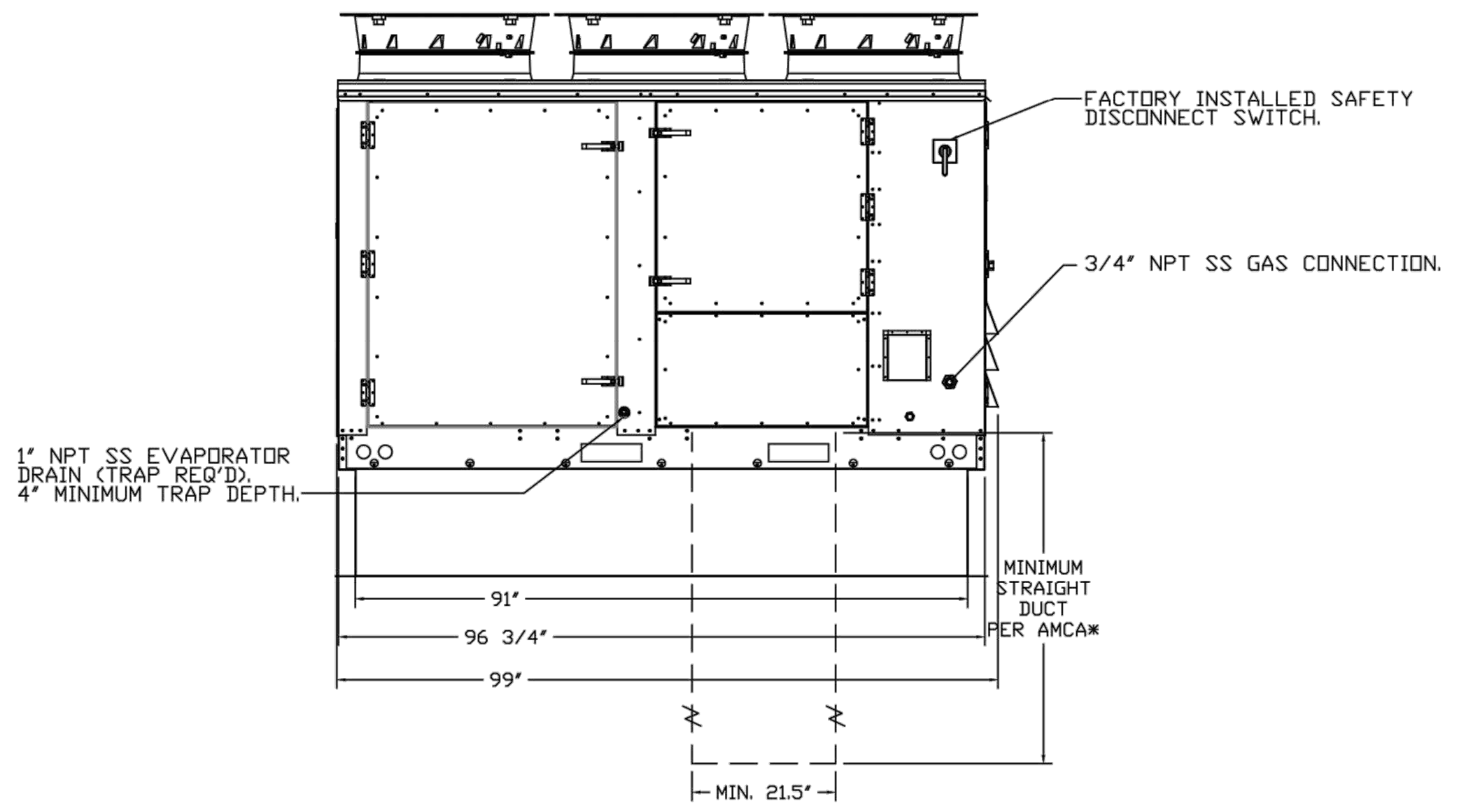
1. DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
2. ( ) DENOTES CORNER WEIGHT.
3. ROOF OPENING MUST BE 2" SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.

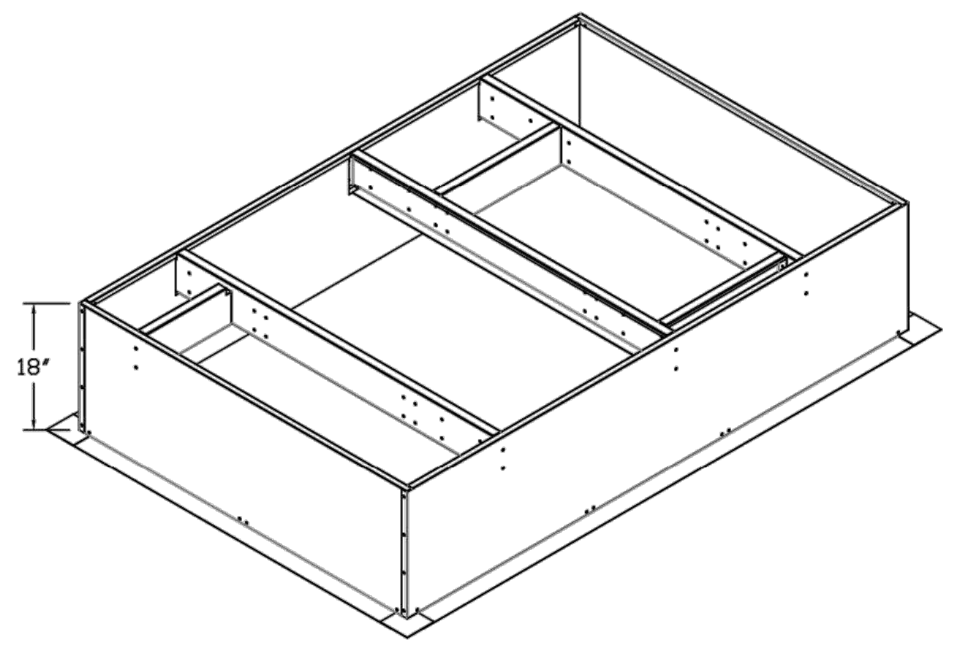
*NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE AS OUTLINED IN AMCA PUBLICATION 201. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THROAT, RADIUS BACK WITH TURNING VANES. FLEXIBLE DUCTWORK AND SQUARE 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 21.5" x 39".

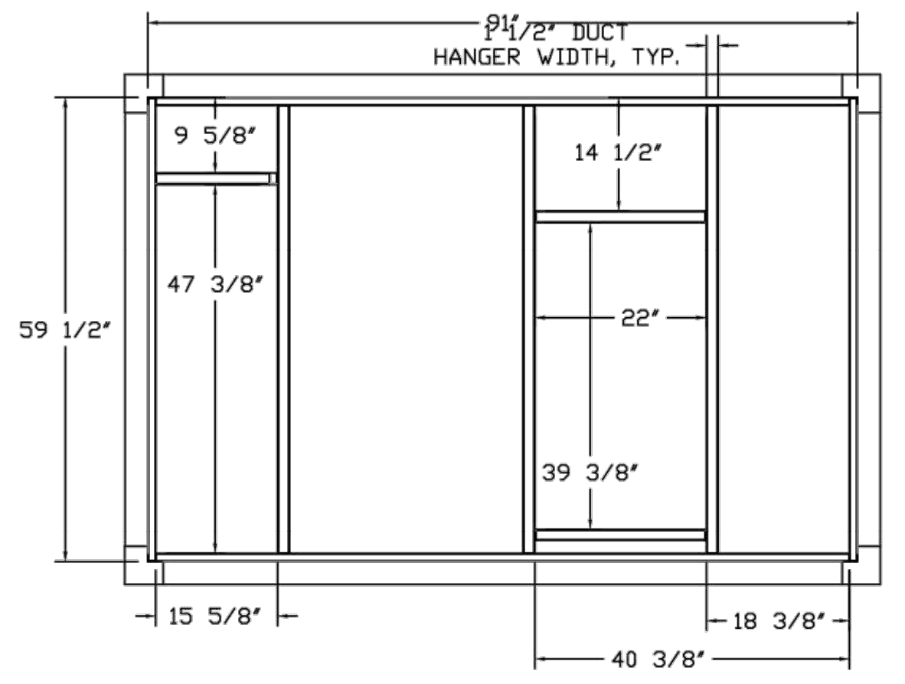



CURB OUTLINE 91"x59 1/2".
691 LBS
838 LBS
495 LBS
600 LBS
CENTER OF MASS.
44"
20"
39"
22 1/2"
ENTERING POWER.
4 1/4"
37 1/4"
7 1/4"
7 1/4"
21 1/2"
7 1/2"
DISCHARGE CUTOUT.

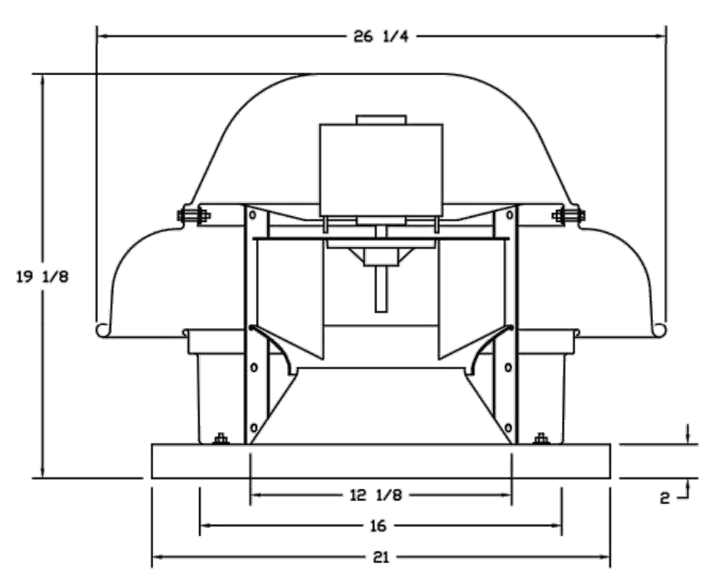

LOUVERED OUTSIDE AIR INTAKE.
69"
52 3/4"
4"
18"
59 1/2"
65 1/4"
89 3/4"

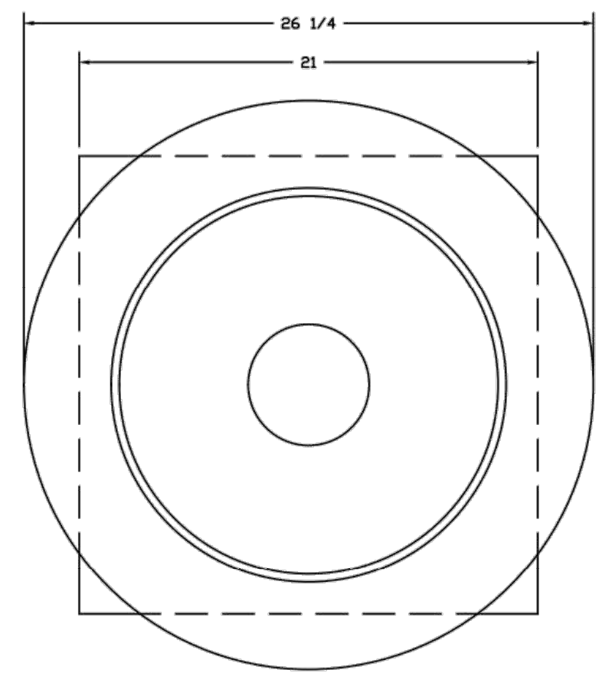

FACTORY INSTALLED SAFETY DISCONNECT SWITCH.
3/4" NPT SS GAS CONNECTION.
1" NPT SS EVAPORATOR DRAIN (TRAP REQ'D). 4" MINIMUM TRAP DEPTH.
MINIMUM STRAIGHT DUCT PER AMCA*
91"
96 3/4"
99"
MIN. 21.5"




91"
1 1/2" DUCT HANGER WIDTH, TYP.
9 5/8"
47 3/8"
59 1/2"
14 1/2"
22"
39 3/8"
15 5/8"
18 3/8"
40 3/8"

FAN #6 DR33HFA - EXHAUST FAN (EF-1)


26 1/4
19 1/8
12 1/8
16
21
2



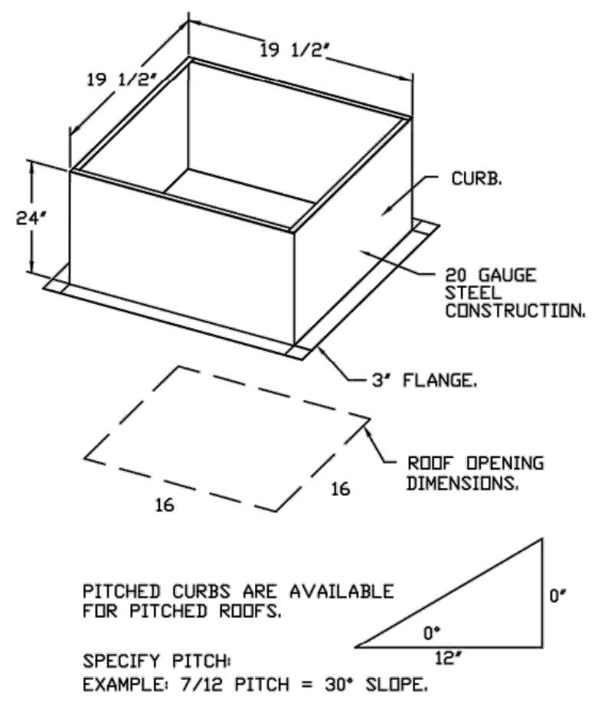
TOP VIEW

FEATURES:

- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- UL705.
- SAFETY DISCONNECT.
- STANDARD BIRD SCREEN.
- SPEED CONTROL.

OPTIONS

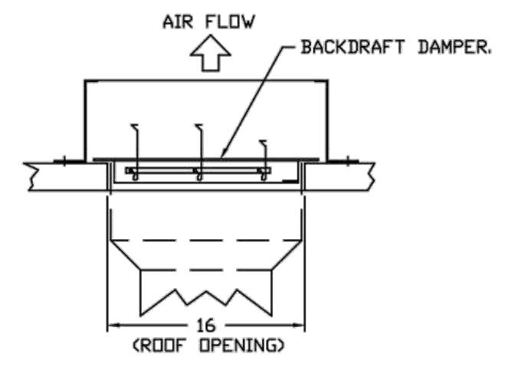
ECM WIRING PACKAGE - MANUAL OR
0-10VDC REFERENCE SPEED CONTROL
-RTC- (TELCO MOTOR), CCW ROTATION.
I 15-BDD DAMPER.
2 YEAR PARTS WARRANTY.


19 1/2"
19 1/2"
24"
CURB.
20 GAUGE STEEL CONSTRUCTION.
3" FLANGE.
ROOF OPENING DIMENSIONS.
16
16
0"
0°
12"

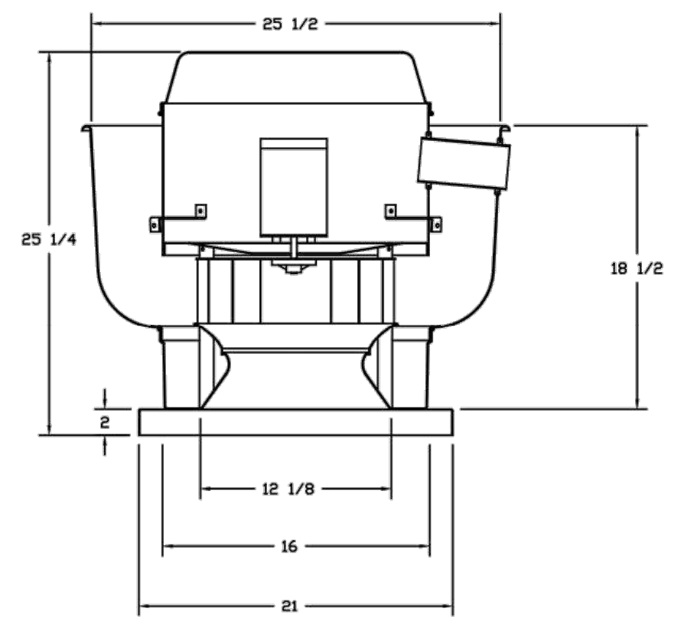
PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.

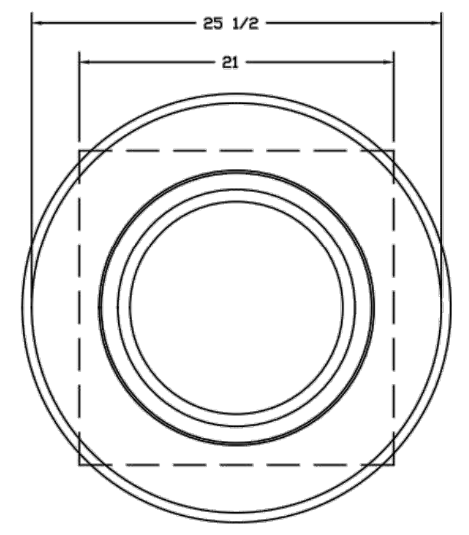
SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE.

BACKDRAFT DAMPER INSTALLATION


AIR FLOW
BACKDRAFT DAMPER.
16
(ROOF OPENING)

FAN #7 DU33HFA - EXHAUST FAN (EF-2)


25 1/2
25 1/4
18 1/2
2
12 1/8
16
21



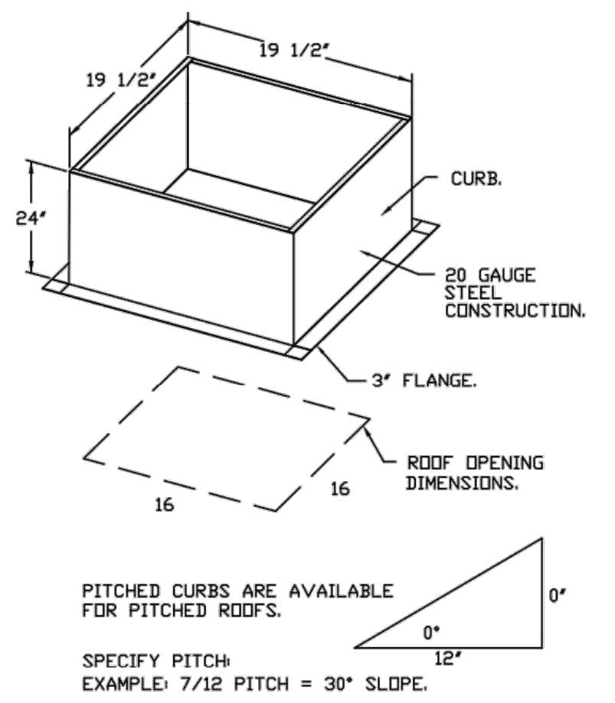
TOP VIEW

FEATURES:

- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- UL705.
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- NEMA 3R SAFETY DISCONNECT SWITCH.

OPTIONS

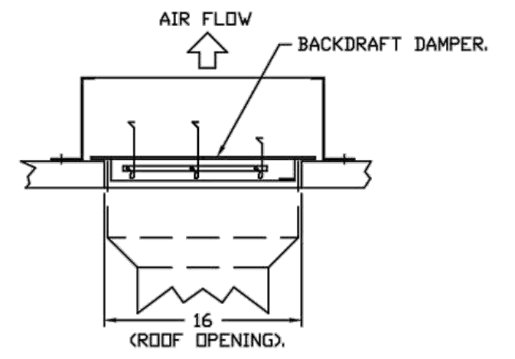
SCR-11 BIRD SCREEN.
I 15-BDD DAMPER.
ECM WIRING PACKAGE - MANUAL OR
0-10VDC REFERENCE SPEED CONTROL
-RTC- (TELCO MOTOR), CCW ROTATION.
2 YEAR PARTS WARRANTY.


19 1/2"
19 1/2"
24"
CURB.
20 GAUGE STEEL CONSTRUCTION.
3" FLANGE.
ROOF OPENING DIMENSIONS.
16
16
0"
0°
12"

PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.

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

BACKDRAFT DAMPER INSTALLATION


AIR FLOW
BACKDRAFT DAMPER.
16
(ROOF OPENING).

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	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

REVISIONS

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Drawn

Scale
AS NOTED

Date

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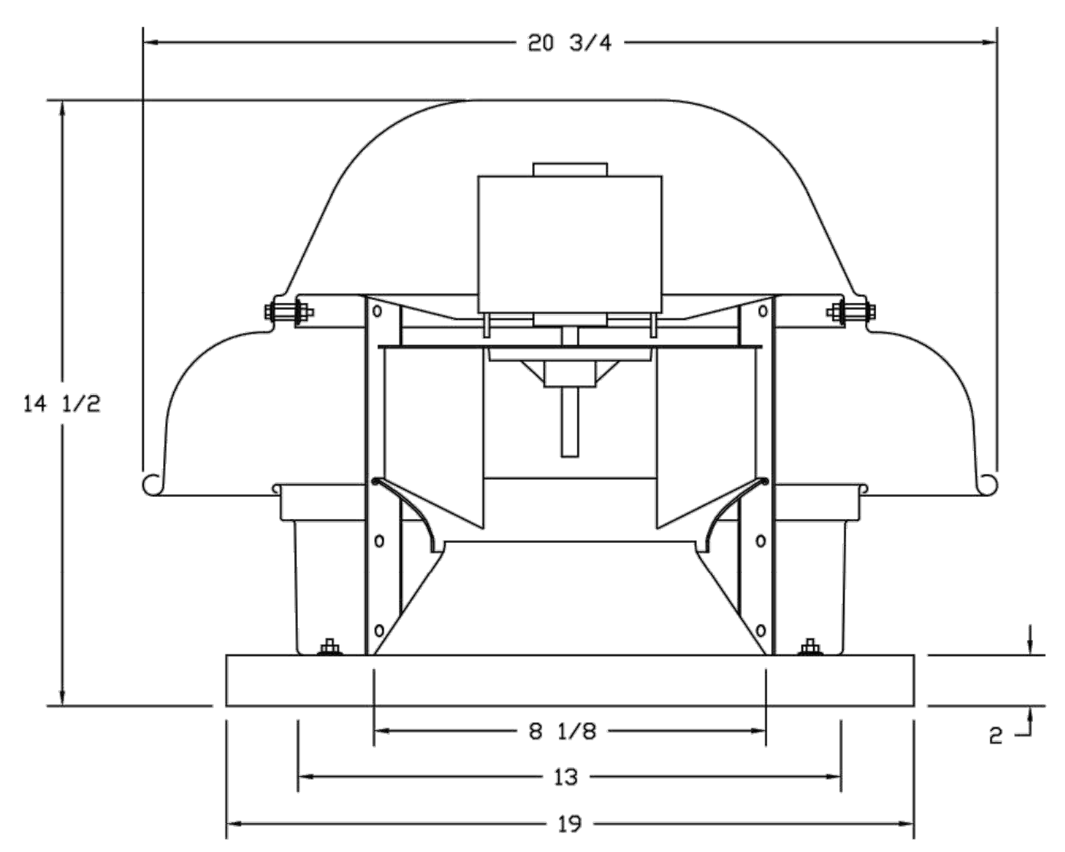
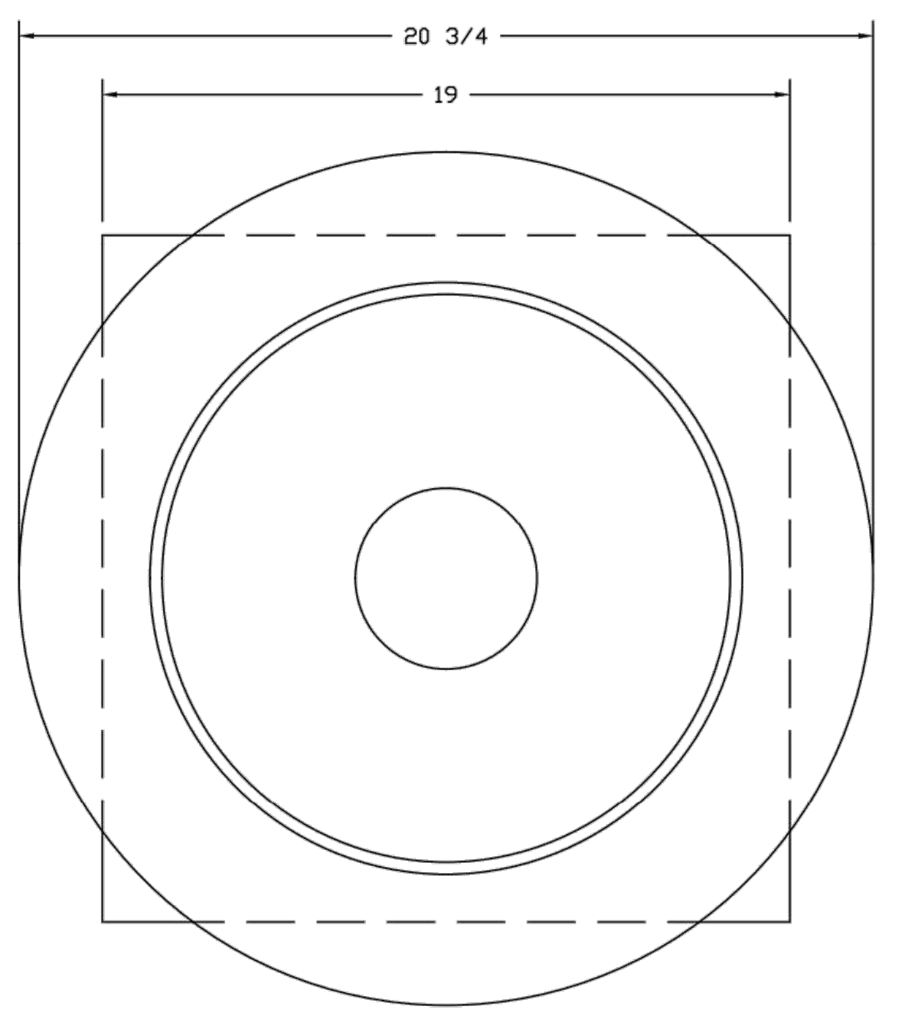
FANS #8 (EF-3), #9 (EF-4) - DR10HFA EXHAUST FAN


20 3/4
14 1/2
2
8 1/8
13
19



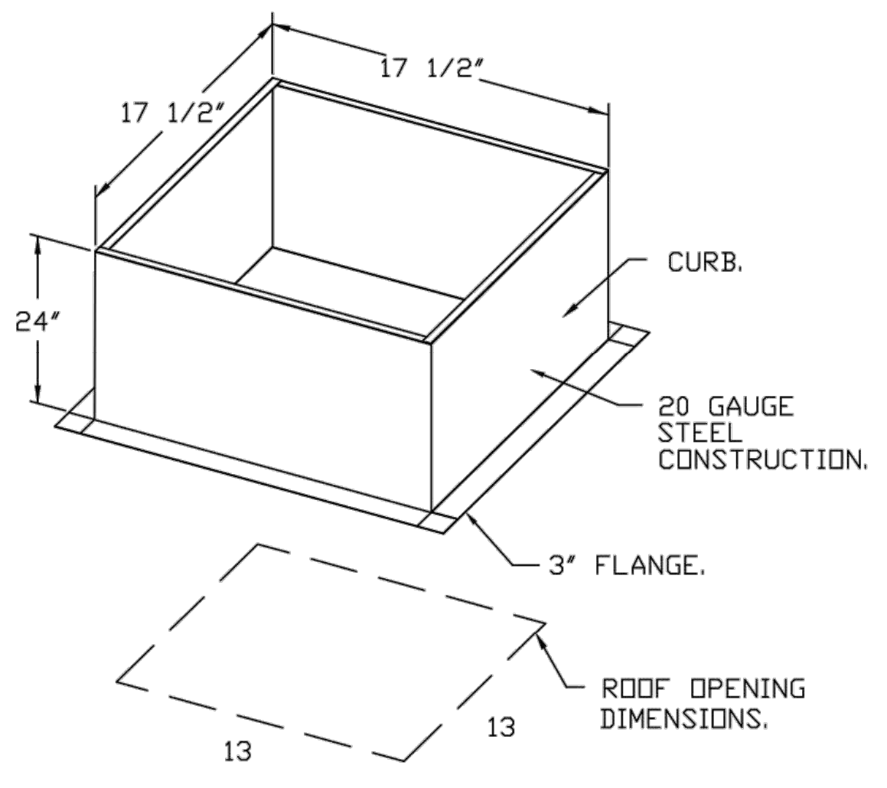
TOP VIEW

FEATURES:

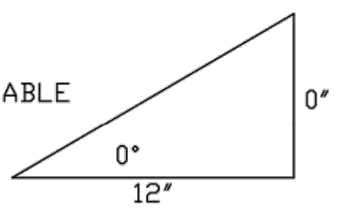
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- UL705.
- SAFETY DISCONNECT.
- STANDARD BIRD SCREEN.
- SPEED CONTROL.

OPTIONS

ECM WIRING PACKAGE - MANUAL OR
0-10VDC REFERENCE SPEED CONTROL
-RTC- (TELCO MOTOR), CCW ROTATION.
I 12-BDD DAMPER.
2 YEAR PARTS WARRANTY.

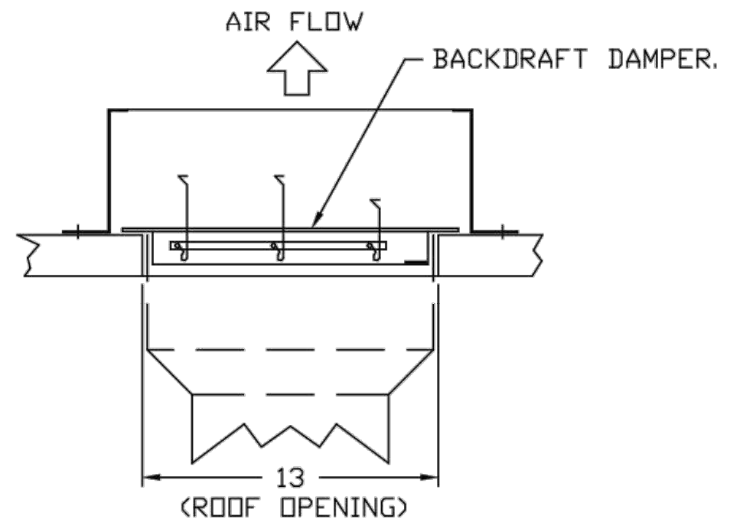

17 1/2"
17 1/2"
24"
CURB.
20 GAUGE STEEL CONSTRUCTION.
3" FLANGE.
ROOF OPENING DIMENSIONS.
13
13

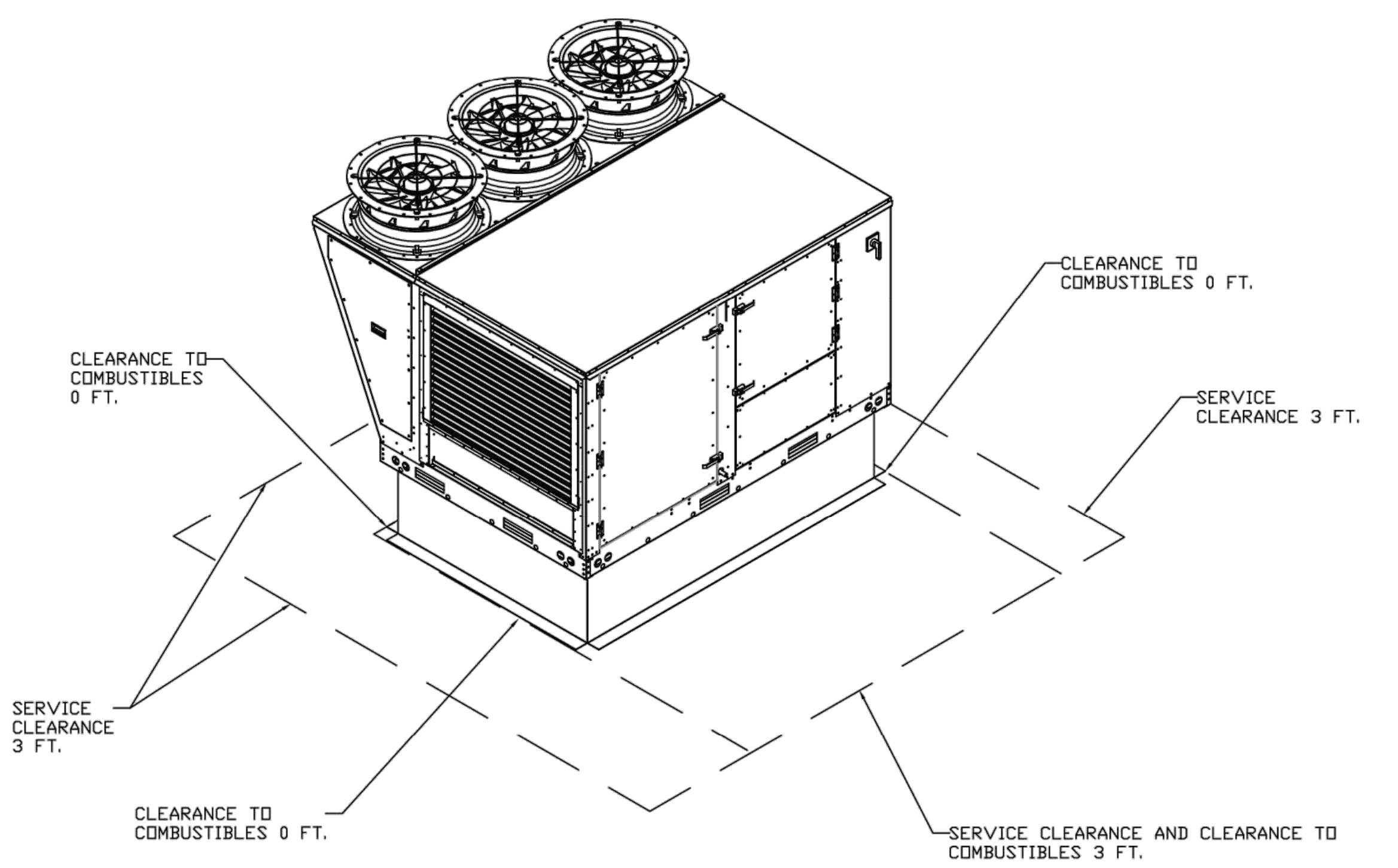
PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.

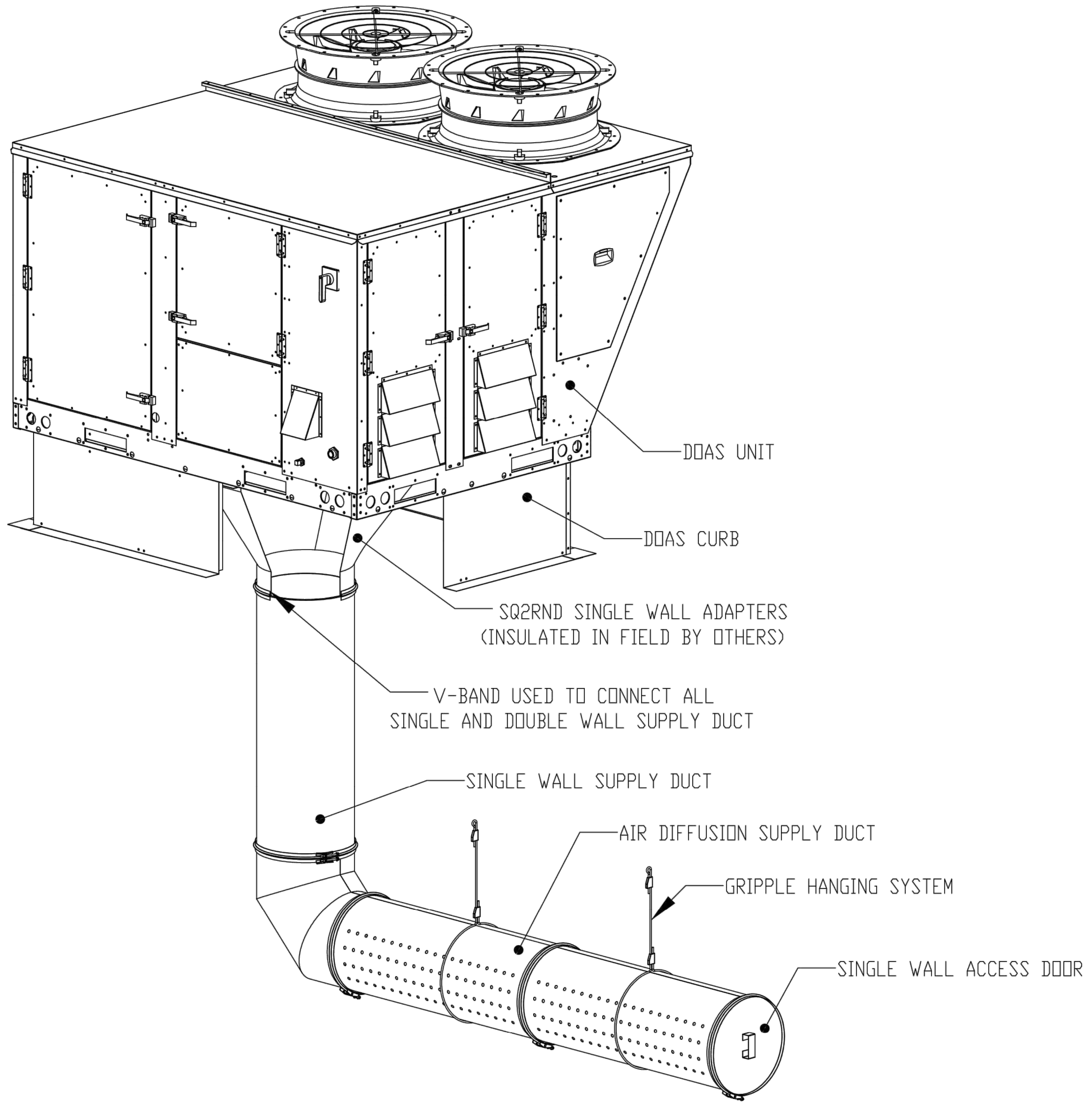


SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE.

BACKDRAFT DAMPER INSTALLATION


AIR FLOW
BACKDRAFT DAMPER.
13
(ROOF OPENING)


CLEARANCE TO COMBUSTIBLES 0 FT.
SERVICE CLEARANCE 3 FT.
CLEARANCE TO COMBUSTIBLES 0 FT.
SERVICE CLEARANCE 3 FT.
CLEARANCE TO COMBUSTIBLES 0 FT.
SERVICE CLEARANCE AND CLEARANCE TO COMBUSTIBLES 3 FT.


DOAS UNIT
DOAS CURB
SQ2RND SINGLE WALL ADAPTERS (INSULATED IN FIELD BY OTHERS)
V-BAND USED TO CONNECT ALL SINGLE AND DOUBLE WALL SUPPLY DUCT
SINGLE WALL SUPPLY DUCT
AIR DIFFUSION SUPPLY DUCT
GRIPPLE HANGING SYSTEM
SINGLE WALL ACCESS DOOR

REVISIONS

	DESCRIPTION	DATE:
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VERNON HILLS, IL, 60061

DATE: 7/6/2022

DWG.#: 5539822

DRAWN BY: ML

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

MASTER DRAWING

SHEET NO. 15

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	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

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CAPTIVEAIRE DRAWINGS

Job No.

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AS NOTED

Date

Sheet No.
M6.5

AIR DIFFUSION SUPPLY DUCT SPECIFICATIONS:
PROVIDE AIR DIFFUSION SUPPLY DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL DW-S0(HC), DW-S90(HC), & DW-S180(HC).
THREE DISTINCT HOLE PATTERN OPTIONS TO COVER A VARIETY OF CEILING HEIGHTS.
NO ADDITIONAL DIFFUSERS REQUIRED, AS THE DUCT ITSELF PROVIDES AIR DIFFUSION.
MADE OF HIGH QUALITY STAINLESS STEEL DESIGNED TO LAST 20+ YEARS.
HIGH INDUCTION SUPPLY DUCT IS CONSTRUCTED USING 24 GAUGE, 430 SS - 5" THRU 24".
HIGH INDUCTION SUPPLY DUCT IS CONSTRUCTED USING 20 GAUGE, 430 SS - 26" THRU 36".
QUICK ONSITE ASSEMBLY USING EPDM GASKETS & UNIVERSAL V-BANDS.
DOUBLE WALL SUPPLY DUCT AVAILABLE FOR INTERIOR AND EXTERIOR SPACES, EITHER CONDITIONED OR UNCONDITIONED.
DOUBLE WALL SUPPLY DUCT AVAILABLE IN DW-1S, DW-2S, & DW-3S TO MEET SPECIFIC REGIONAL "R" VALUE REQUIREMENTS.

Insulation R-Value Recommendations

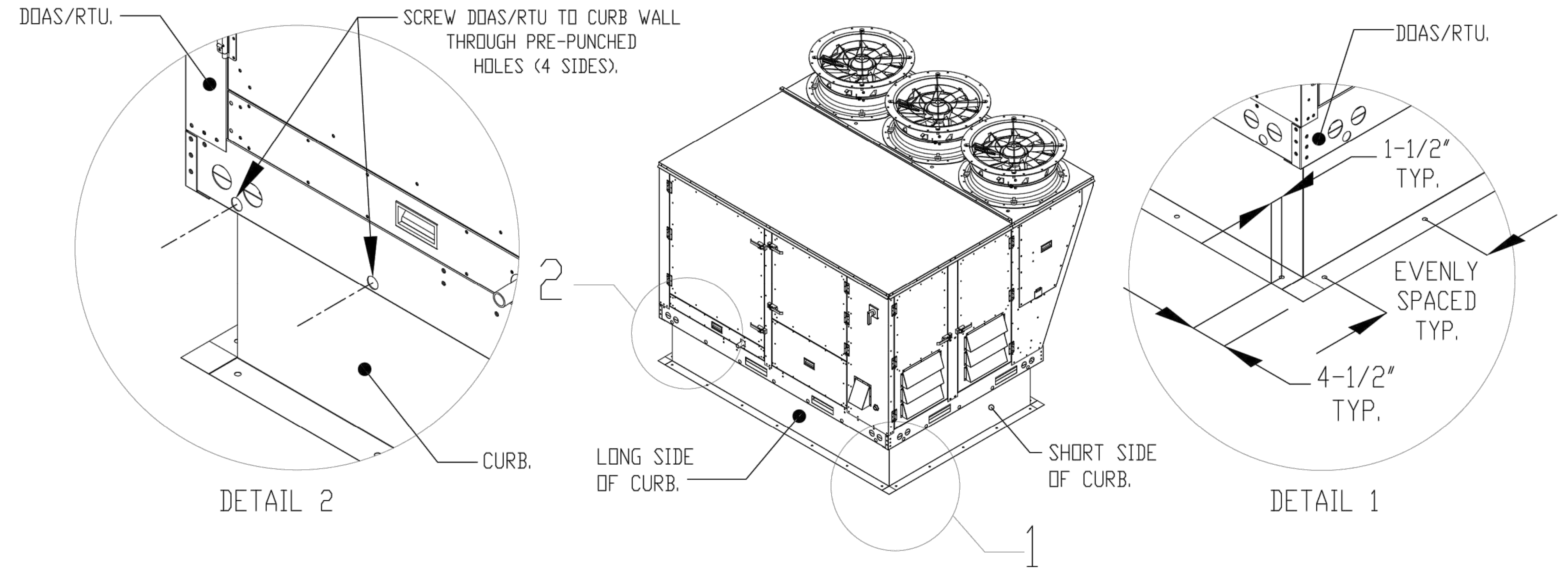
Supply Duct Type	Minimum R-value	Space Type
Single Wall - S & -HC	N/A	Conditioned Space Only
Double Wall - 1S	R-4	Unconditioned Interior Space Only
Double Wall - 2S	R-8	Unconditioned Space Climate Zones 1-4
Double Wall - 3S	R-12	Unconditioned Space Climate Zones 5-8

DOUBLE WALL SUPPLY DUCT IS INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.
AIR DIFFUSION SUPPLY DUCT COMPLIES WITH SMACNA (SHEET METAL AND AIR CONDITIONING CONTRACTORS) BEST PRACTICES.
POSITIONING OF SPRINKLERS TO AVOID OBSTRUCTION TO DISCHARGE, SEE NFPA 13, TABLE 8.12.5.1.1.

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.



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	06/17/22	STEEL PACKAGE
No	Date	Remarks

REVISIONS

Drawing Title
CAPTIVEAIRE DRAWINGS

Job No.

Drawn

Scale
AS NOTED

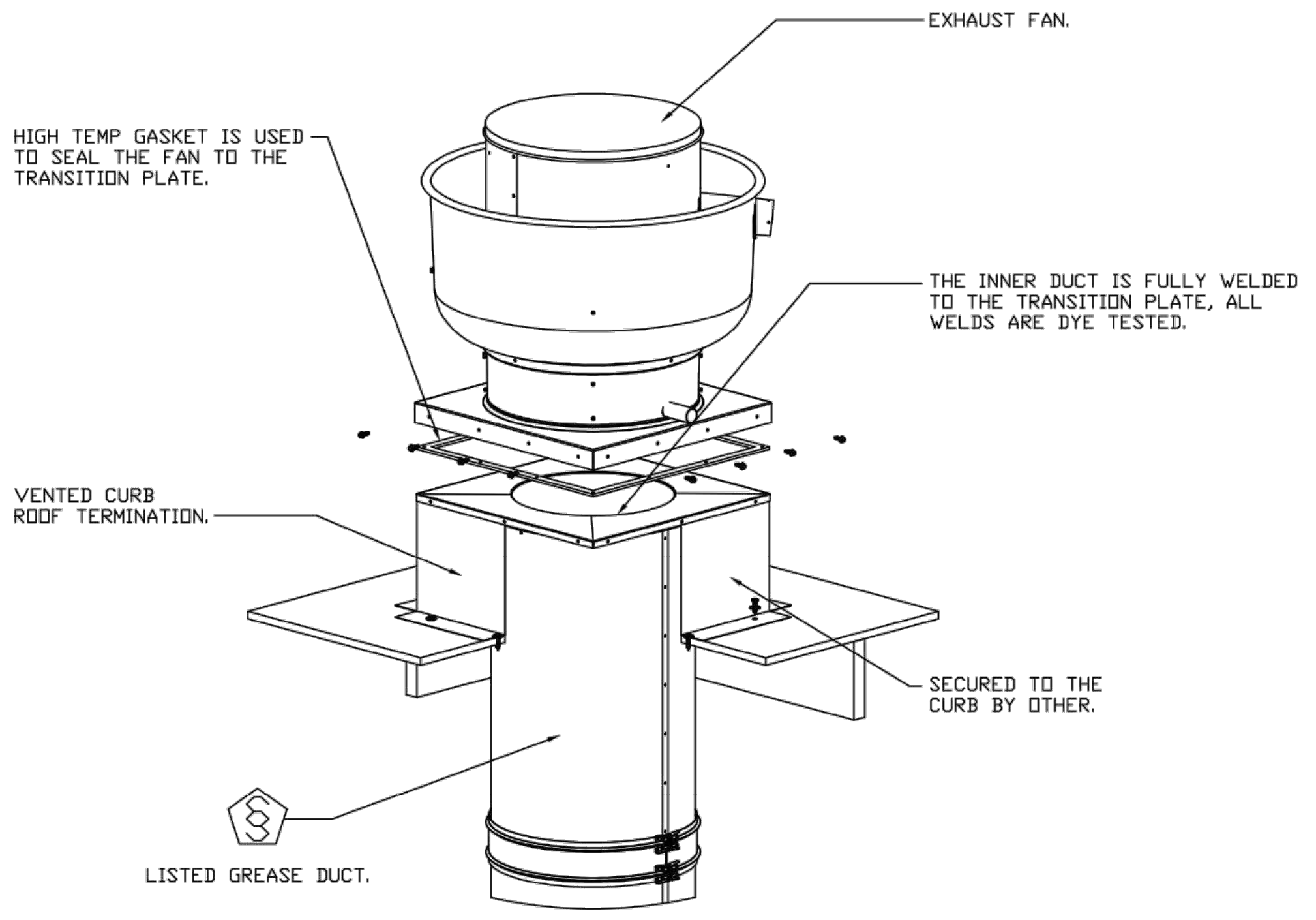
Date

Sheet No.
M6.6

S 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.


EXHAUST FAN.
HIGH TEMP GASKET IS USED TO SEAL THE FAN TO THE TRANSITION PLATE.
THE INNER DUCT IS FULLY WELDED TO THE TRANSITION PLATE, ALL WELDS ARE DYE TESTED.
VENTED CURB ROOF TERMINATION.
SECURED TO THE CURB BY OTHER.
S
LISTED GREASE DUCT.

CUSTOMER APPROVAL TO MANUFACTURE:

APPROVED AS NOTED ☐
APPROVED WITH NO EXCEPTION TAKEN ☐
REVISE AND RESUBMIT ☐
SIGNATURE ______________________________
YOUR TITLE ____________________ DATE ____________________ ____________

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	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
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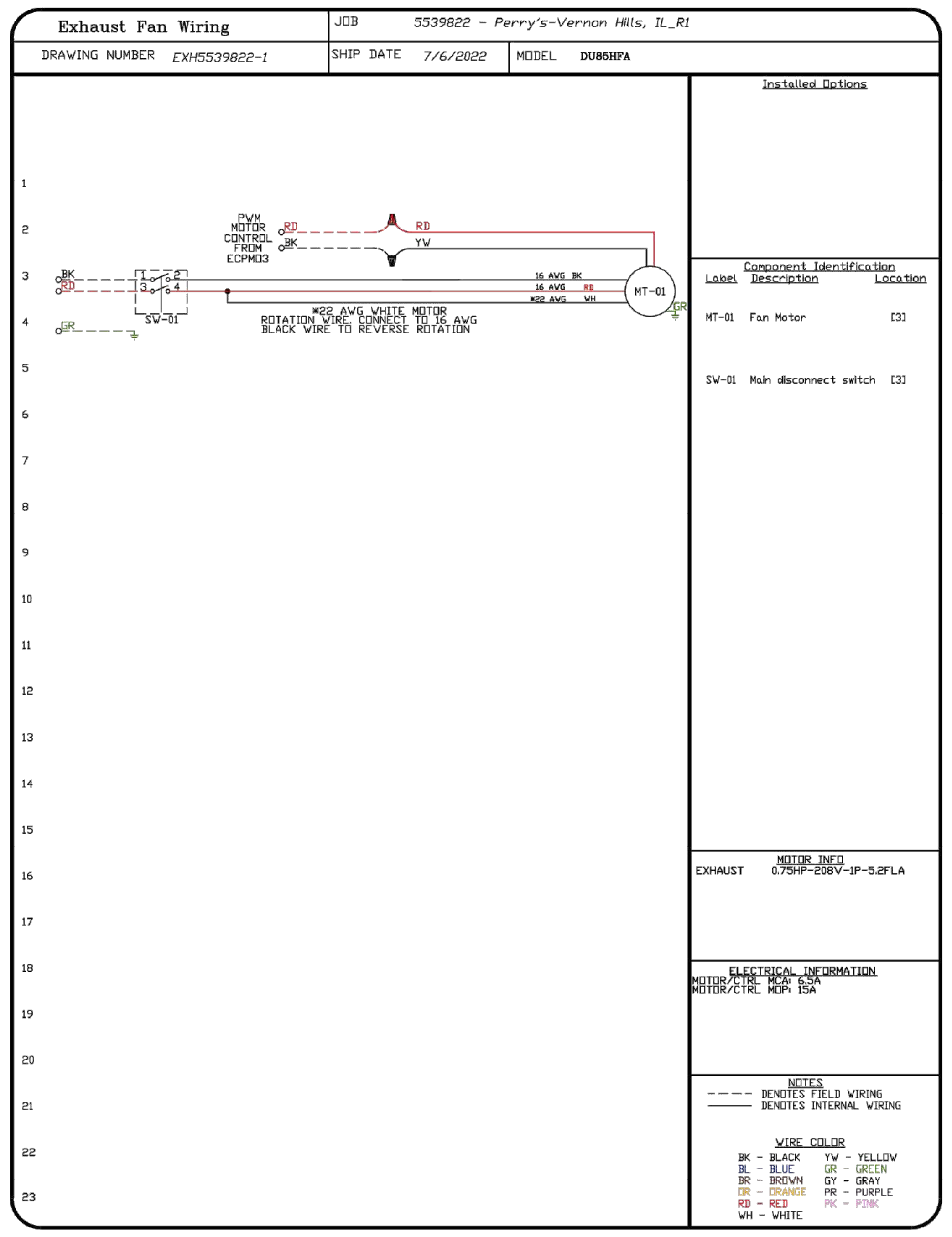
Drawing Title
CAPTIVEAIRE DRAWINGS

Job No.
Drawn ---
Scale AS NOTED
Date
Sheet No.
M6.7

Exhaust Fan Wiring

JOB	5539822 - Perry's-Vernon Hills, IL_R1	
DRAWING NUMBER EXH5539822-1	SHIP DATE 7/6/2022	MODEL **DU85HFA**


PWM
MOTOR
CONTROL
FROM
ECPM03
RD
BK
RD
YW
BK
RD
1
2
3
4
SW-01
GR
16 AWG BK
16 AWG RD
*22 AWG WH
MT-01
GR
*22 AWG WHITE MOTOR
ROTATION WIRE. CONNECT TO 16 AWG
BLACK WIRE TO REVERSE ROTATION

Installed Options

Component Identification

Label	Description	Location
MT-01	Fan Motor	[3]
SW-01	Main disconnect switch	[3]

MOTOR INFO

EXHAUST 0.75HP-208V-1P-5.2FLA

ELECTRICAL INFORMATION

MOTOR/CTRL MCA: 6.5A
MOTOR/CTRL MOP: 15A

NOTES

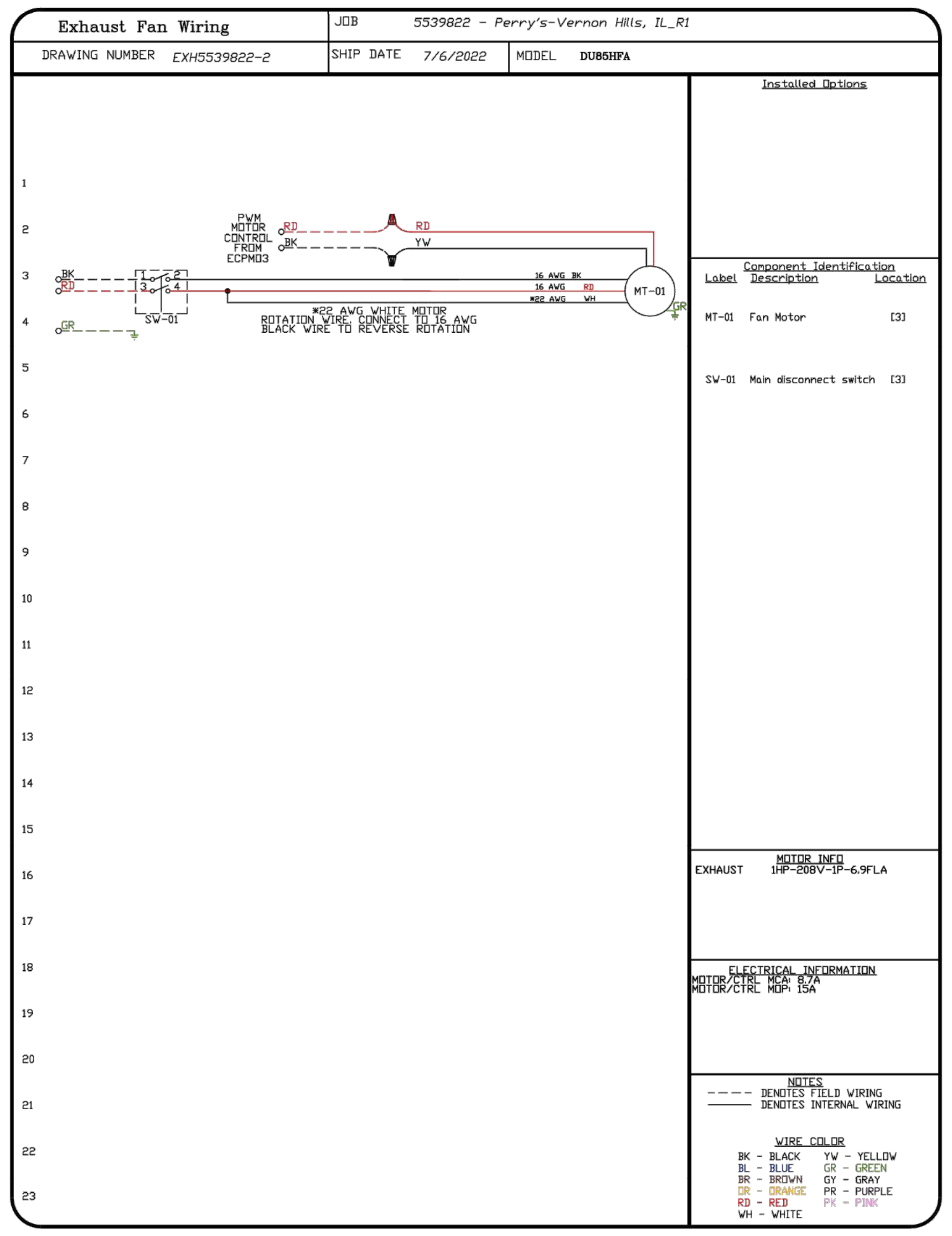
- - - - DENOTES FIELD WIRING
———— DENOTES INTERNAL WIRING

WIRE COLOR

BK - BLACK	YW - YELLOW
BL - BLUE	GR - GREEN
BR - BROWN	GY - GRAY
OR - ORANGE	PR - PURPLE
RD - RED	PK - PINK
WH - WHITE	

Exhaust Fan Wiring

JOB	5539822 - Perry's-Vernon Hills, IL_R1	
DRAWING NUMBER EXH5539822-2	SHIP DATE 7/6/2022	MODEL **DU85HFA**


PWM
MOTOR
CONTROL
FROM
ECPM03
RD
BK
RD
YW
BK
RD
1
2
3
4
SW-01
GR
16 AWG BK
16 AWG RD
*22 AWG WH
MT-01
GR
*22 AWG WHITE MOTOR
ROTATION WIRE. CONNECT TO 16 AWG
BLACK WIRE TO REVERSE ROTATION

Installed Options

Component Identification

Label	Description	Location
MT-01	Fan Motor	[3]
SW-01	Main disconnect switch	[3]

MOTOR INFO

EXHAUST 1HP-208V-1P-6.9FLA

ELECTRICAL INFORMATION

MOTOR/CTRL MCA: 8.7A
MOTOR/CTRL MOP: 15A

NOTES

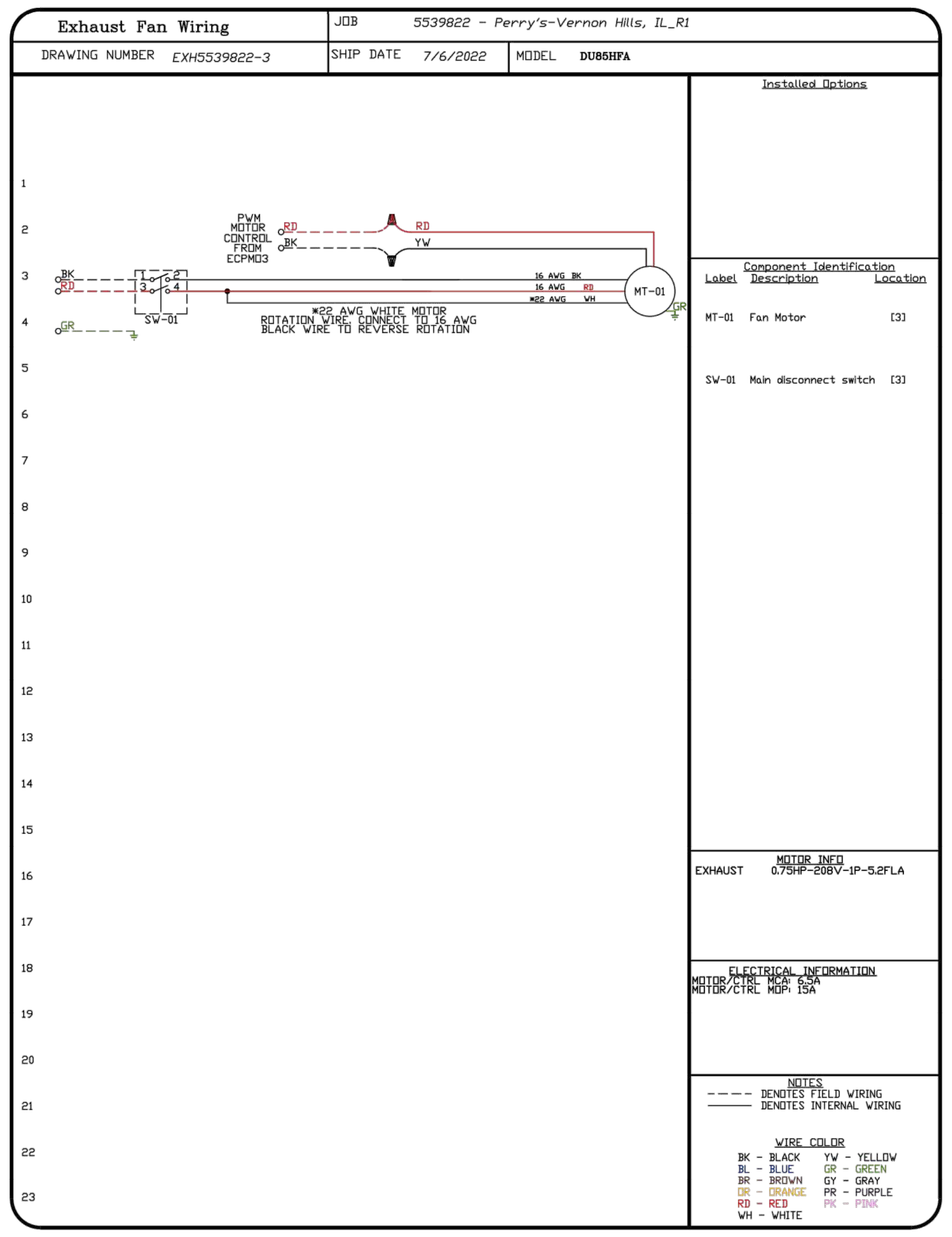
- - - - DENOTES FIELD WIRING
———— DENOTES INTERNAL WIRING

WIRE COLOR

BK - BLACK	YW - YELLOW
BL - BLUE	GR - GREEN
BR - BROWN	GY - GRAY
OR - ORANGE	PR - PURPLE
RD - RED	PK - PINK
WH - WHITE	

Exhaust Fan Wiring

JOB	5539822 - Perry's-Vernon Hills, IL_R1	
DRAWING NUMBER EXH5539822-3	SHIP DATE 7/6/2022	MODEL **DU85HFA**


PWM
MOTOR
CONTROL
FROM
ECPM03
RD
BK
RD
YW
BK
RD
1
2
3
4
SW-01
GR
16 AWG BK
16 AWG RD
*22 AWG WH
MT-01
GR
*22 AWG WHITE MOTOR
ROTATION WIRE. CONNECT TO 16 AWG
BLACK WIRE TO REVERSE ROTATION

Installed Options

Component Identification

Label	Description	Location
MT-01	Fan Motor	[3]
SW-01	Main disconnect switch	[3]

MOTOR INFO

EXHAUST 0.75HP-208V-1P-5.2FLA

ELECTRICAL INFORMATION

MOTOR/CTRL MCA: 6.5A
MOTOR/CTRL MOP: 15A

NOTES

- - - - DENOTES FIELD WIRING
———— DENOTES INTERNAL WIRING

WIRE COLOR

BK - BLACK	YW - YELLOW
BL - BLUE	GR - GREEN
BR - BROWN	GY - GRAY
OR - ORANGE	PR - PURPLE
RD - RED	PK - PINK
WH - WHITE	

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SHEET NO.
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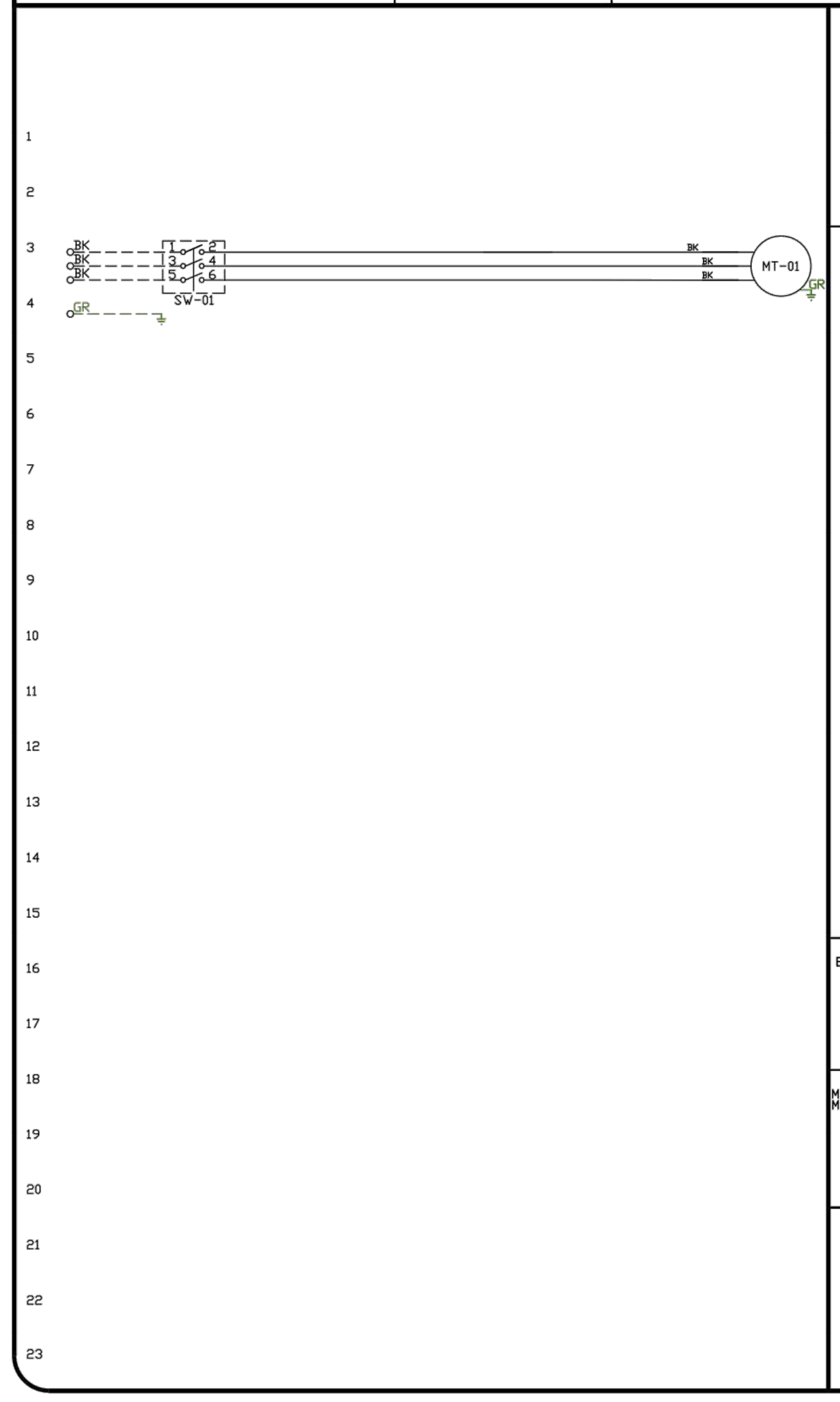
Sheet No.
M6.8

Exhaust Fan Wiring

JOB 5539822 - Perry's-Vernon Hills, IL_R1
DRAWING NUMBER EXH5539822-4
SHIP DATE 7/6/2022
MODEL **DU180HFA**


BK
BK
BK
1 2
3 4
5 6
SW-01
GR
BK
BK
BK
MT-01
GR

Installed Options

Component Identification

Label	Description	Location
MT-01	Fan Motor	[3]
SW-01	Main disconnect switch	[3]

MOTOR INFO
EXHAUST 2HP-208V-3P-8.3FLA

ELECTRICAL INFORMATION
MOTOR/CTRL MCA: 10.4A
MOTOR/CTRL MOP: 15A

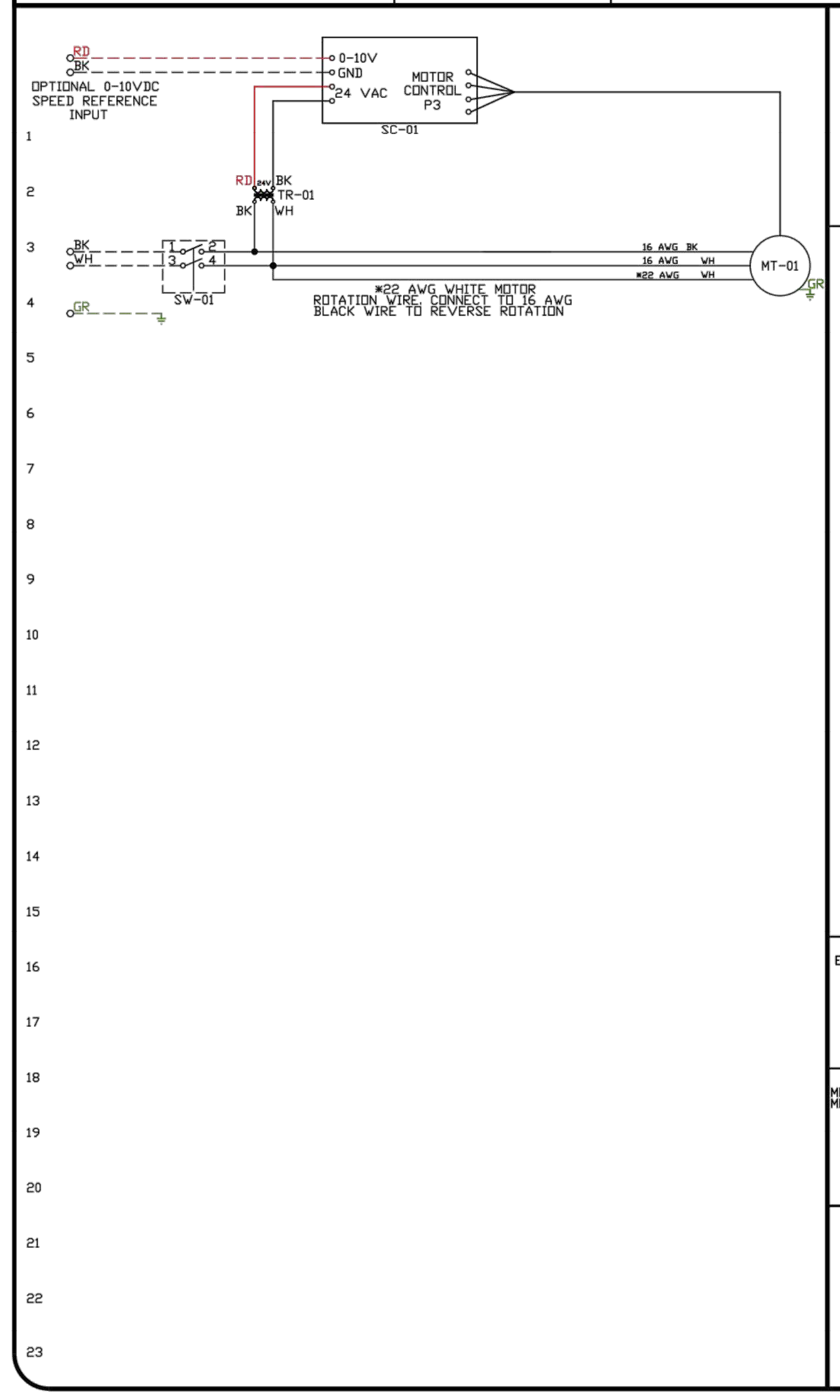
NOTES
- - - - - DENOTES FIELD WIRING
——— DENOTES INTERNAL WIRING

WIRE COLOR

BK - BLACK	YW - YELLOW
BL - BLUE	GR - GREEN
BR - BROWN	GY - GRAY
OR - ORANGE	PR - PURPLE
RD - RED	PK - PINK
WH - WHITE	

Exhaust Fan Wiring

JOB 5539822 - Perry's-Vernon Hills, IL_R1
DRAWING NUMBER EXH5539822-6
SHIP DATE 7/6/2022
MODEL **DR33HFA**


RD
BK
OPTIONAL 0-10VDC
SPEED REFERENCE
INPUT
0-10V
GND
24 VAC
MOTOR
CONTROL
P3
SC-01
RD
24V
BK
TR-01
BK
WH
BK
WH
1 2
3 4
SW-01
GR
16 AWG BK
16 AWG WH
*22 AWG WH
MT-01
GR
*22 AWG WHITE MOTOR
ROTATION WIRE. CONNECT TO 16 AWG
BLACK WIRE TO REVERSE ROTATION

Installed Options

Component Identification

Label	Description	Location
MT-01	Fan Motor	[3]
SC-01	RTC-FSC-1	[1]
SW-01	Main disconnect switch	[3]
TR-01	24VAC 20VA Transformer	[2]

MOTOR INFO
EXHAUST 0.333HP-115V-1P-4.3FLA

ELECTRICAL INFORMATION
MOTOR/CTRL MCA: 5.4A
MOTOR/CTRL MOP: 15A

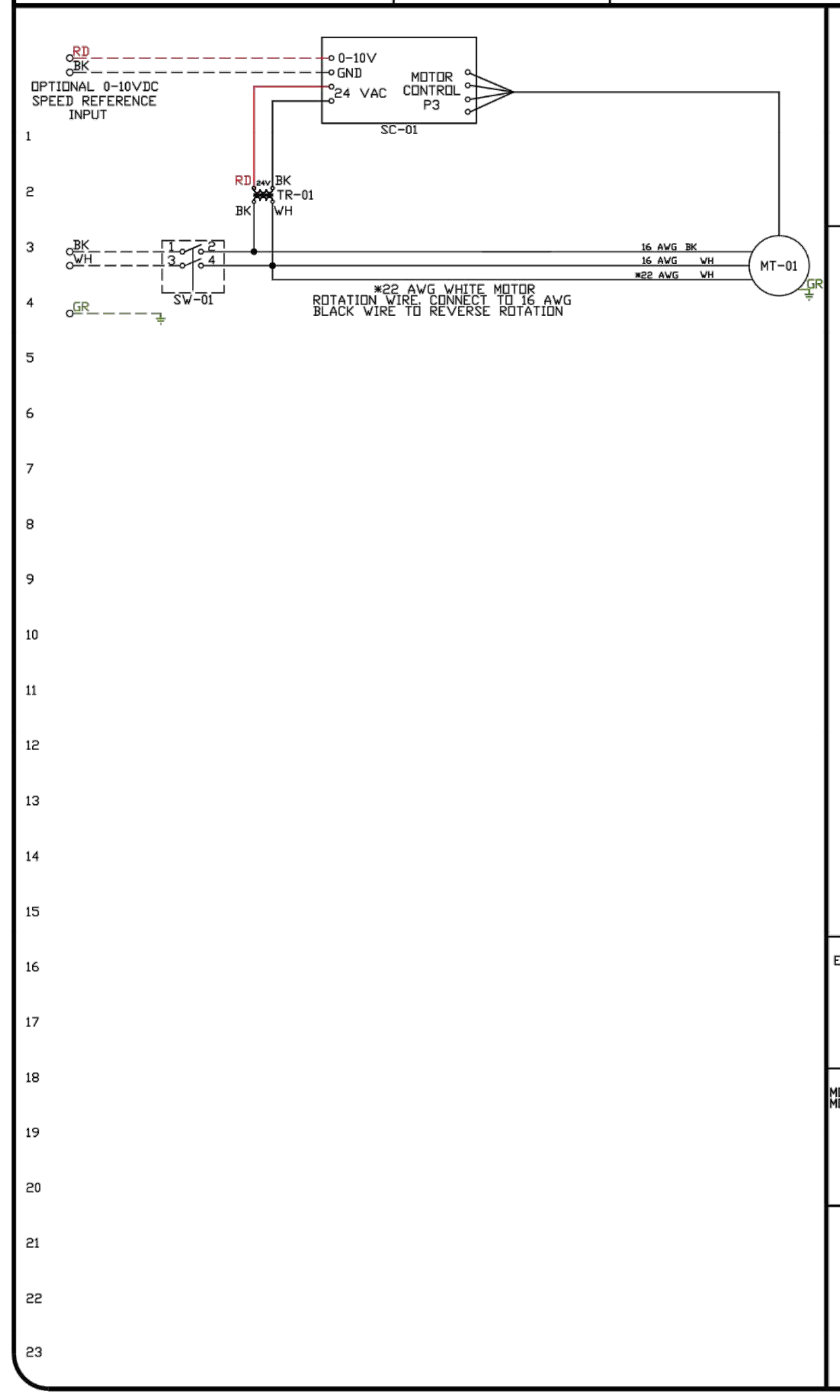
NOTES
- - - - - DENOTES FIELD WIRING
——— DENOTES INTERNAL WIRING

WIRE COLOR

BK - BLACK	YW - YELLOW
BL - BLUE	GR - GREEN
BR - BROWN	GY - GRAY
OR - ORANGE	PR - PURPLE
RD - RED	PK - PINK
WH - WHITE	

Exhaust Fan Wiring

JOB 5539822 - Perry's-Vernon Hills, IL_R1
DRAWING NUMBER EXH5539822-7
SHIP DATE 7/6/2022
MODEL **DU33HFA**


RD
BK
OPTIONAL 0-10VDC
SPEED REFERENCE
INPUT
0-10V
GND
24 VAC
MOTOR
CONTROL
P3
SC-01
RD
24V
BK
TR-01
BK
WH
BK
WH
1 2
3 4
SW-01
GR
16 AWG BK
16 AWG WH
*22 AWG WH
MT-01
GR
*22 AWG WHITE MOTOR
ROTATION WIRE. CONNECT TO 16 AWG
BLACK WIRE TO REVERSE ROTATION

Installed Options

Component Identification

Label	Description	Location
MT-01	Fan Motor	[3]
SC-01	RTC-FSC-1	[1]
SW-01	Main disconnect switch	[3]
TR-01	24VAC 20VA Transformer	[2]

MOTOR INFO
EXHAUST 0.333HP-115V-1P-4.3FLA

ELECTRICAL INFORMATION
MOTOR/CTRL MCA: 5.4A
MOTOR/CTRL MOP: 15A

NOTES
- - - - - DENOTES FIELD WIRING
——— DENOTES INTERNAL WIRING

WIRE COLOR

BK - BLACK	YW - YELLOW
BL - BLUE	GR - GREEN
BR - BROWN	GY - GRAY
OR - ORANGE	PR - PURPLE
RD - RED	PK - PINK
WH - WHITE	

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DRAWN BY: ML

SCALE:
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REVISIONS

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Job No.

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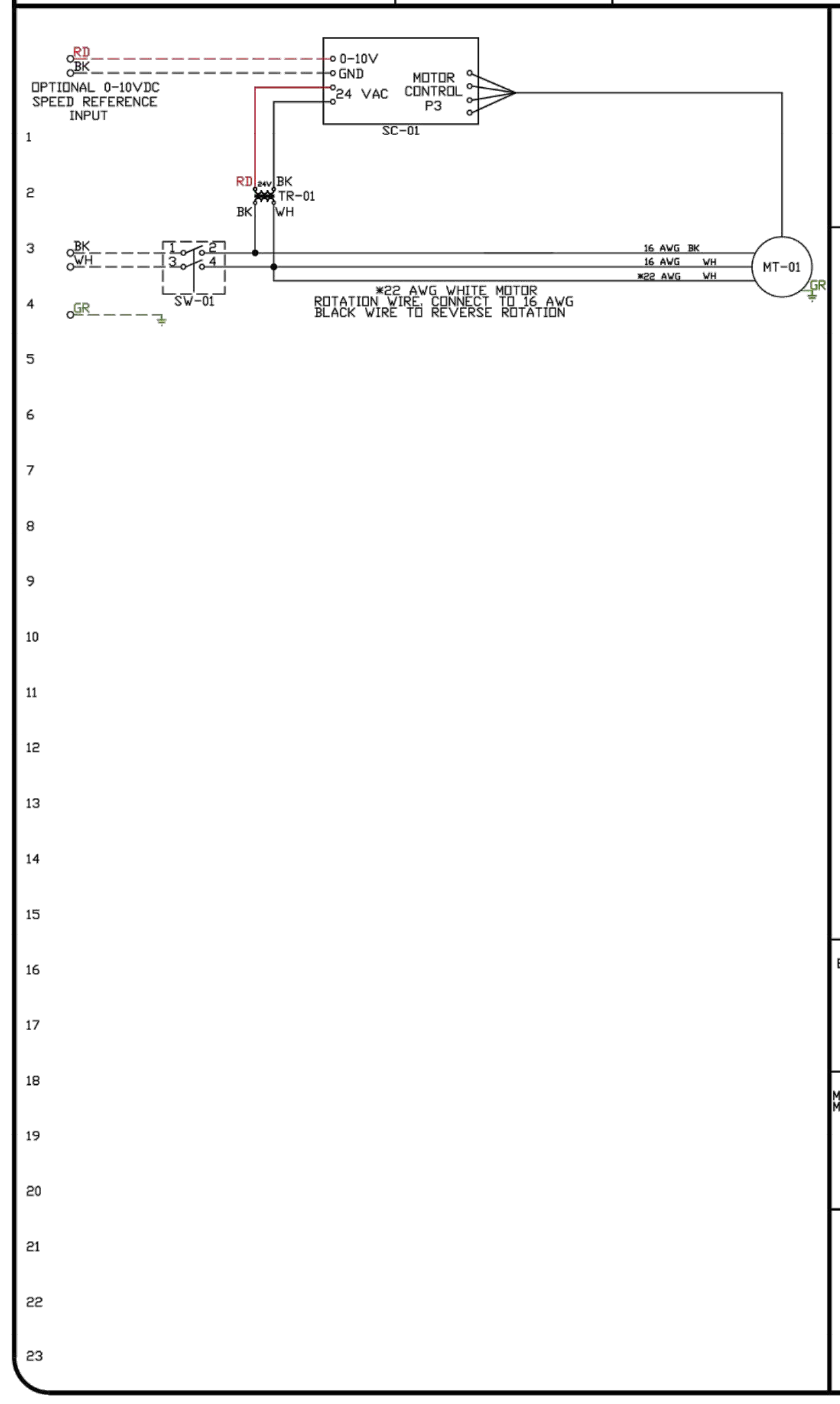
Date

Sheet No.
M6.9

Exhaust Fan Wiring

JOB	5539822 - Perry's-Vernon Hills, IL_R1
DRAWING NUMBER	EXH5539822-8
SHIP DATE	7/6/2022
MODEL	DR10HFA


RD
BK
OPTIONAL 0-10VDC SPEED REFERENCE INPUT
0-10V
GND
24 VAC
MOTOR CONTROL P3
SC-01
RD
24V
BK
TR-01
BK
WH
BK
WH
1 2
3 4
SW-01
GR
16 AWG BK
16 AWG WH
*22 AWG WH
MT-01
GR
*22 AWG WHITE MOTOR ROTATION WIRE. CONNECT TO 16 AWG BLACK WIRE TO REVERSE ROTATION
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
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23

Installed Options

Component Identification

Label	Description	Location
MT-01	Fan Motor	[3]
SC-01	RTC-FSC-1	[1]
SW-01	Main disconnect switch	[3]
TR-01	24VAC 20VA Transformer	[2]

MOTOR INFO

EXHAUST 0.166HP-115V-1P-1.9FLA

ELECTRICAL INFORMATION

MOTOR/CTRL MCA: 2.4A
MOTOR/CTRL MOP: 15A

NOTES

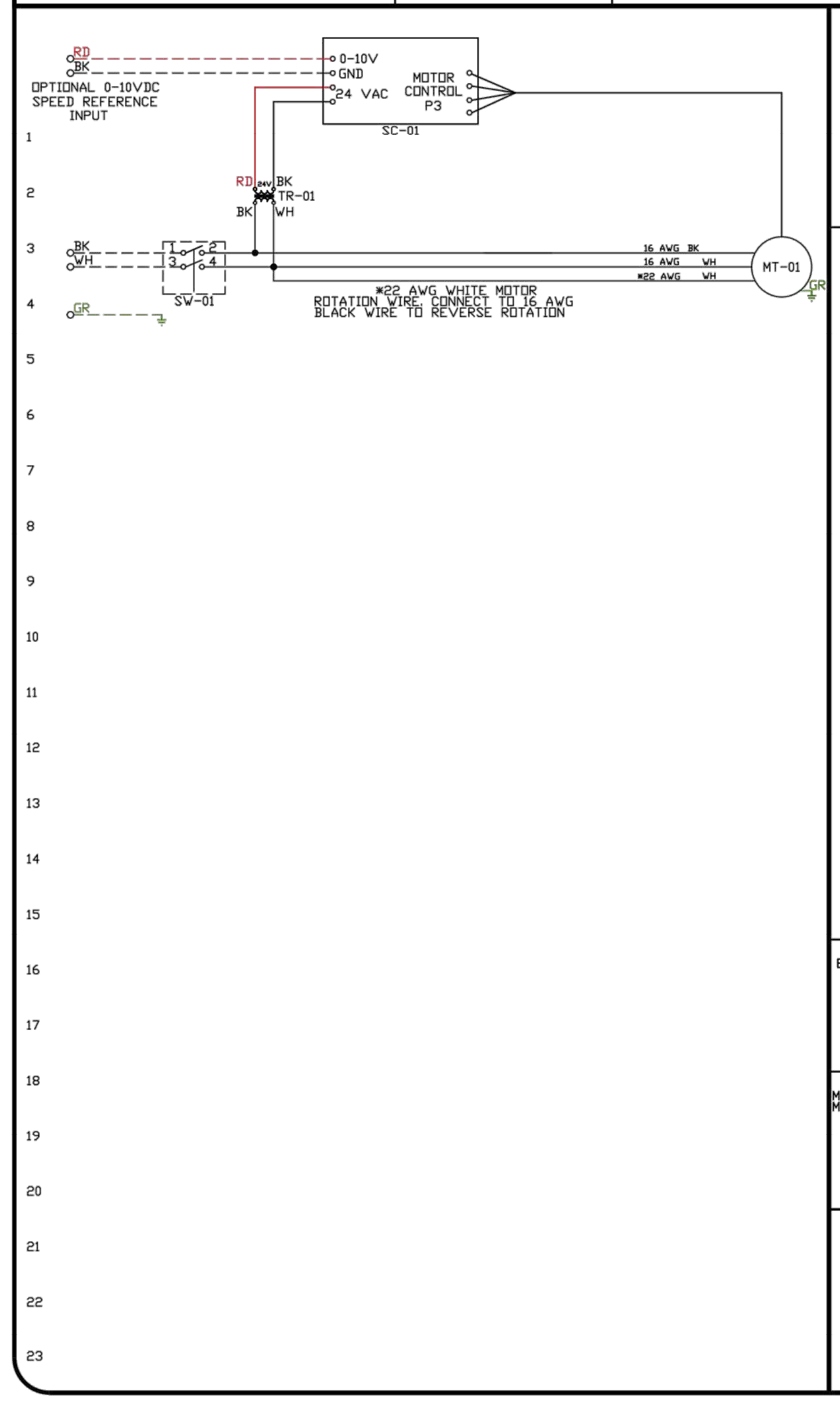
- - - - DENOTES FIELD WIRING
——— DENOTES INTERNAL WIRING

WIRE COLOR

BK - BLACK	YW - YELLOW
BL - BLUE	GR - GREEN
BR - BROWN	GY - GRAY
OR - ORANGE	PR - PURPLE
RD - RED	PK - PINK
WH - WHITE	

Exhaust Fan Wiring

JOB	5539822 - Perry's-Vernon Hills, IL_R1
DRAWING NUMBER	EXH5539822-9
SHIP DATE	7/6/2022
MODEL	DR10HFA


RD
BK
OPTIONAL 0-10VDC SPEED REFERENCE INPUT
0-10V
GND
24 VAC
MOTOR CONTROL P3
SC-01
RD
24V
BK
TR-01
BK
WH
BK
WH
1 2
3 4
SW-01
GR
16 AWG BK
16 AWG WH
*22 AWG WH
MT-01
GR
*22 AWG WHITE MOTOR ROTATION WIRE. CONNECT TO 16 AWG BLACK WIRE TO REVERSE ROTATION
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

Installed Options

Component Identification

Label	Description	Location
MT-01	Fan Motor	[3]
SC-01	RTC-FSC-1	[1]
SW-01	Main disconnect switch	[3]
TR-01	24VAC 20VA Transformer	[2]

MOTOR INFO

EXHAUST 0.166HP-115V-1P-1.9FLA

ELECTRICAL INFORMATION

MOTOR/CTRL MCA: 2.4A
MOTOR/CTRL MOP: 15A

NOTES

- - - - DENOTES FIELD WIRING
——— DENOTES INTERNAL WIRING

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BR - BROWN	GY - GRAY
OR - ORANGE	PR - PURPLE
RD - RED	PK - PINK
WH - WHITE	

REVISIONS

	DESCRIPTION	DATE:
△		
△		
△		
△		

www.captiveaire.com

St. Louis Mechanical

2 City Place Drive, Suite #200, St. Louis, MO, 63141 PHONE: (636) 229-9777 EMAIL: reg109@captiveaire.com

Perry's-Vernon Hills, IL_R1
VERNON HILLS, IL, 60061

DATE: 7/6/2022

DWG.#: 5539822

DRAWN BY: ML

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

MASTER DRAWING

SHEET NO. 20

VERNON HILLS, IL 60061

1050 N MILWAUKEE AVE

Perry's
STEAKHOUSE & GRILLE®

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

No	Date	Remarks
	04/19/23	PERMIT UPDATES
	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

REVISIONS

Drawing Title
CAPTIVEAIRE DRAWINGS

Job No.

Drawn

Scale
AS NOTED

Date

Sheet No.
M6.10

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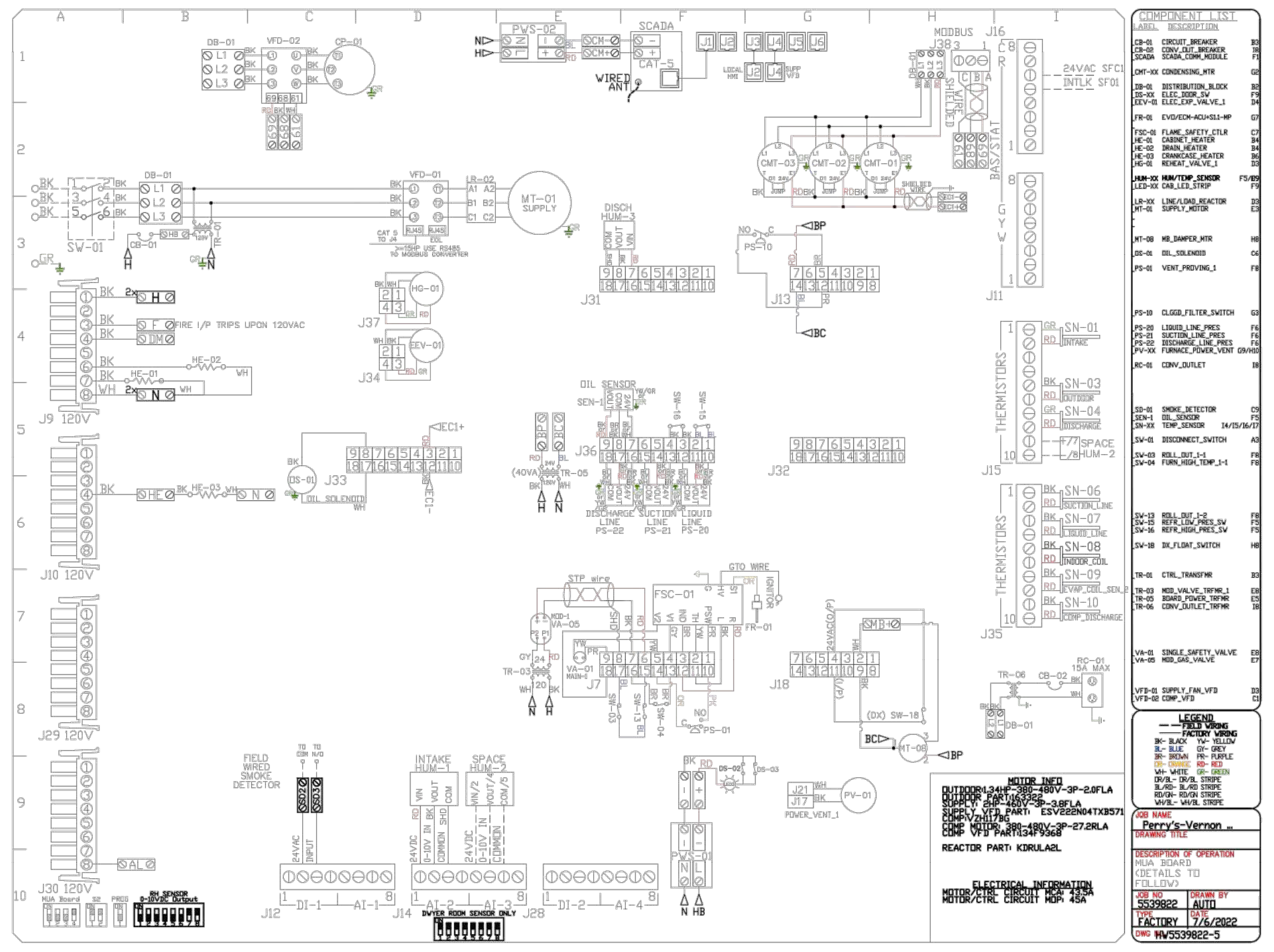


COMPONENT LIST

LABEL	DESCRIPTION	
CB-01	CIRCUIT_BREAKER	B3
CB-02	CONV_OUT_BREAKER	I8
SCADA	SCADA_COMM_MODULE	F1
CMT-XX	CONDENSING_MTR	G2
DB-01	DISTRIBUTION_BLOCK	B2
DS-XX	ELEC_DOOR_SW	F9
EEV-01	ELEC_EXP_VALVE_1	D4
FR-01	EVO/ECM-ACU+S1.1-MP	G7
FSC-01	FLAME_SAFETY_CTLR	C7
HE-01	CABINET_HEATER	B4
HE-02	DRAIN_HEATER	B4
HE-03	CRANKCASE_HEATER	B6
HG-01	REHEAT_VALVE_1	D3
HUM-XX	HUM/TEMP_SENSOR	F5/B9
LED-XX	CAB_LED_STRIP	F9
LR-XX	LINE/LOAD_REACTOR	D3
MT-01	SUPPLY_MOTOR	E3
MT-08	MB_DAMPER_MTR	H8
OS-01	OIL_SOLENOID	C6
PS-01	VENT_PROVING_1	F8
PS-10	CLGGD_FILTER_SWITCH	G3
PS-20	LIQUID_LINE_PRES	F6
PS-21	SUCTION_LINE_PRES	F6
PS-22	DISCHARGE_LINE_PRES	F6
PV-XX	FURNACE_POWER_VENT	G9/H10
RC-01	CONV_OUTLET	I8
SD-01	SMOKE_DETECTOR	C9
SEN-1	OIL_SENSOR	F5
SN-XX	TEMP_SENSOR	I4/I5/I6/I7
SW-01	DISCONNECT_SWITCH	A3
SW-03	ROLL_OUT_1-1	F8
SW-04	FURN_HIGH_TEMP_1-1	F8
SW-13	ROLL_OUT_1-2	F8
SW-15	REFR_LOW_PRES_SW	F5
SW-16	REFR_HIGH_PRES_SW	F5
SW-18	DX_FLOAT_SWITCH	H8
TR-01	CTRL_TRANSFMR	B3
TR-03	MOD_VALVE_TRFMR_1	E8
TR-05	BOARD_POWER_TRFMR	E5
TR-06	CONV_OUTLET_TRFMR	I8
VA-01	SINGLE_SAFETY_VALVE	E8
VA-05	MOD_GAS_VALVE	E7
VFD-01	SUPPLY_FAN_VFD	D3
VFD-02	COMP_VFD	C1

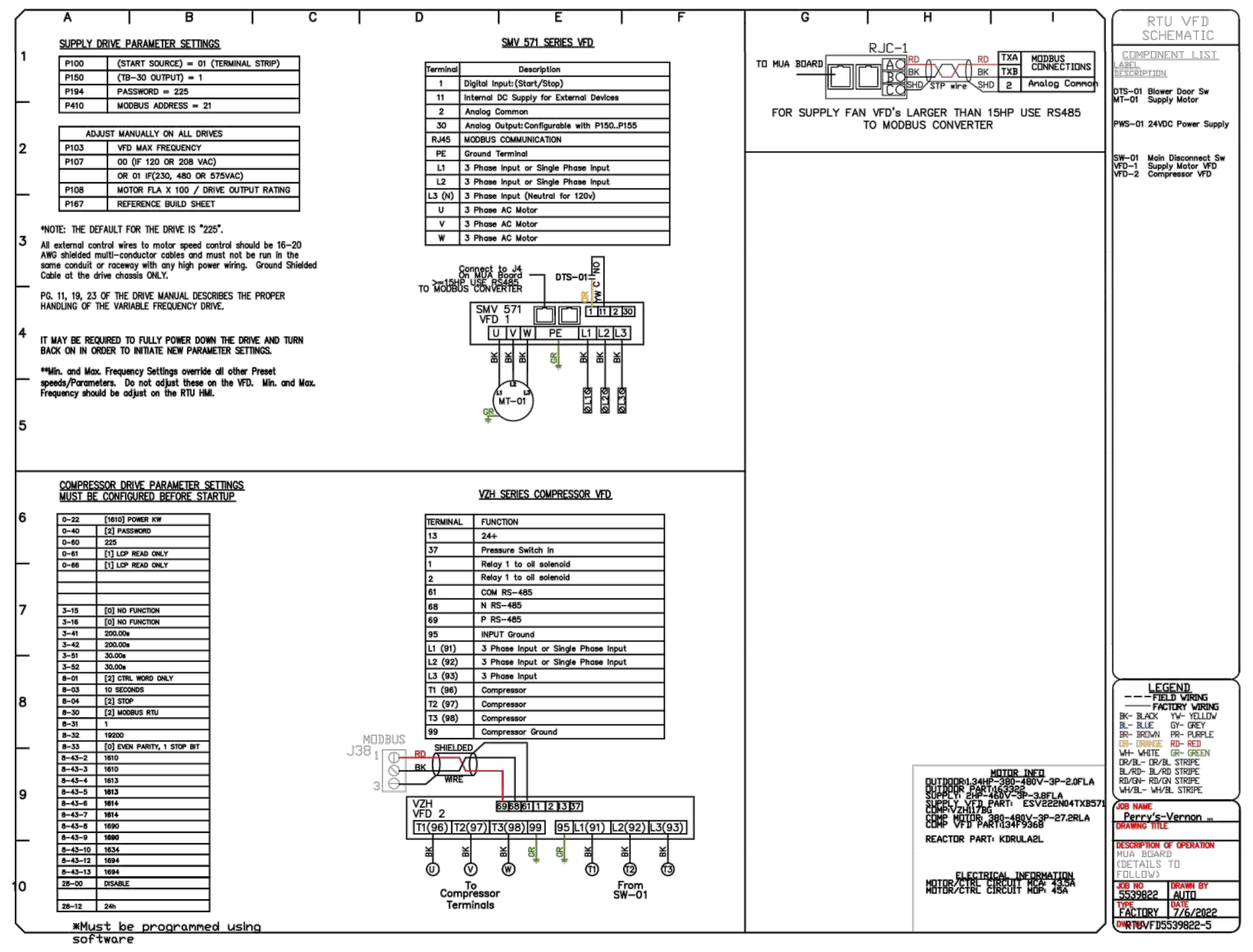
LEGEND
--- FIELD WIRING
— FACTORY WIRING
BK- BLACK YW- YELLOW
BL- BLUE GY- GREY
BR- BROWN PR- PURPLE
OR- ORANGE RD- RED
WH- WHITE GR- GREEN
OR/BL- OR/BL STRIPE
BL/RD- BL/RD STRIPE
RD/GN- RD/GN STRIPE
WH/BL- WH/BL STRIPE

MOTOR INFO
OUTDOOR:1.34HP-380-480V-3P-2.0FLA
OUTDOOR PART:163322
SUPPLY: 2HP-460V-3P-3.8FLA
SUPPLY VFD PART: ESV222N04TXB571
COMP:VZH117BG
COMP MOTOR: 380-480V-3P-27.2RLA
COMP VFD PART:134F9368
REACTOR PART: KDRULA2L

ELECTRICAL INFORMATION
MOTOR/CTRL CIRCUIT MCA: 43.5A
MOTOR/CTRL CIRCUIT MOP: 45A

JOB NAME
Perry's-Vernon ...
DRAWING TITLE
DESCRIPTION OF OPERATION
MUA BOARD
(DETAILS TO FOLLOW)
JOB NO 5539822
DRAWN BY AUTO
TYPE FACTORY
DATE 7/6/2022
DWG HW5539822-5

MODBUS
J16
J38
24VAC SFC1
INTLK SF01
BAS/STAT
J11
THERMISTORS
J15
SN-01 INTAKE
SN-03 OUTDOOR
SN-04 DISCHARGE
SPACE
HUM-2
J35
SN-06 SUCTION_LINE
SN-07 LIQUID_LINE
SN-08 INDOOR_COIL
SN-09 EVAP_COIL_SEN_2
SN-10 COMP_DISCHARGE
CMT-02
CMT-01
RC-01 15A MAX
TR-08
CB-02
DB-01
(DX) SW-18
MT-08
PV-01
BP
BC



SUPPLY DRIVE PARAMETER SETTINGS

P100	(START SOURCE) = 01 (TERMINAL STRIP)
P150	(TB-30 OUTPUT) = 1
P194	PASSWORD = 225
P410	MODBUS ADDRESS = 21

ADJUST MANUALLY ON ALL DRIVES	
P103	VFD MAX FREQUENCY
P107	00 (IF 120 OR 208 VAC)
	OR 01 IF(230, 480 OR 575VAC)
P108	MOTOR FLA X 100 / DRIVE OUTPUT RATING
P167	REFERENCE BUILD SHEET

*NOTE: THE DEFAULT FOR THE DRIVE IS "225".

All external control wires to motor speed control should be 16-20 AWG shielded multi-conductor cables and must not be run in the same conduit or raceway with any high power wiring. Ground Shielded Cable at the drive chassis ONLY.

PG. 11, 19, 23 OF THE DRIVE MANUAL DESCRIBES THE PROPER HANDLING OF THE VARIABLE FREQUENCY DRIVE.

IT MAY BE REQUIRED TO FULLY POWER DOWN THE DRIVE AND TURN BACK ON IN ORDER TO INITIATE NEW PARAMETER SETTINGS.

**Min. and Max. Frequency Settings override all other Preset speeds/Parameters. Do not adjust these on the VFD. Min. and Max. Frequency should be adjust on the RTU HMI.

SMV 571 SERIES VFD

Terminal	Description
1	Digital Input:(Start/Stop)
11	Internal DC Supply for External Devices
2	Analog Common
30	Analog Output:Configurable with P150..P155
RJ45	MODBUS COMMUNICATION
PE	Ground Terminal
L1	3 Phase Input or Single Phase Input
L2	3 Phase Input or Single Phase Input
L3 (N)	3 Phase Input (Neutral for 120v)
U	3 Phase AC Motor
V	3 Phase AC Motor
W	3 Phase AC Motor

COMPRESSOR DRIVE PARAMETER SETTINGS
MUST BE CONFIGURED BEFORE STARTUP

0-22	[1610] POWER KW
0-40	[2] PASSWORD
0-60	225
0-61	[1] LCP READ ONLY
0-66	[1] LCP READ ONLY
3-15	[0] NO FUNCTION
3-16	[0] NO FUNCTION
3-41	200.00s
3-42	200.00s
3-51	30.00s
3-52	30.00s
8-01	[2] CTRL WORD ONLY
8-03	10 SECONDS
8-04	[2] STOP
8-30	[2] MODBUS RTU
8-31	1
8-32	19200
8-33	[0] EVEN PARITY, 1 STOP BIT
8-43-2	1610
8-43-3	1610
8-43-4	1613
8-43-5	1613
8-43-6	1614
8-43-7	1614
8-43-8	1690
8-43-9	1690
8-43-10	1634
8-43-12	1694
8-43-13	1694
28-00	DISABLE
28-12	24h

*Must be programmed using software

VZH SERIES COMPRESSOR VFD

TERMINAL	FUNCTION
13	24+
37	Pressure Switch In
1	Relay 1 to oil solenoid
2	Relay 1 to oil solenoid
61	COM RS-485
68	N RS-485
69	P RS-485
95	INPUT Ground
L1 (91)	3 Phase Input or Single Phase Input
L2 (92)	3 Phase Input or Single Phase Input
L3 (93)	3 Phase Input
T1 (96)	Compressor
T2 (97)	Compressor
T3 (98)	Compressor
99	Compressor Ground

FOR SUPPLY FAN VFD's LARGER THAN 15HP USE RS485 TO MODBUS CONVERTER

COMPONENT LIST

LABEL	DESCRIPTION
DTS-01	Blower Door Sw
MT-01	Supply Motor
PWS-01	24VDC Power Supply
SW-01	Main Disconnect Sw
VFD-1	Supply Motor VFD
VFD-2	Compressor VFD

LEGEND
--- FIELD WIRING
— FACTORY WIRING
BK- BLACK YW- YELLOW
BL- BLUE GY- GREY
BR- BROWN PR- PURPLE
OR- ORANGE RD- RED
WH- WHITE GR- GREEN
OR/BL- OR/BL STRIPE
BL/RD- BL/RD STRIPE
RD/GN- RD/GN STRIPE
WH/BL- WH/BL STRIPE

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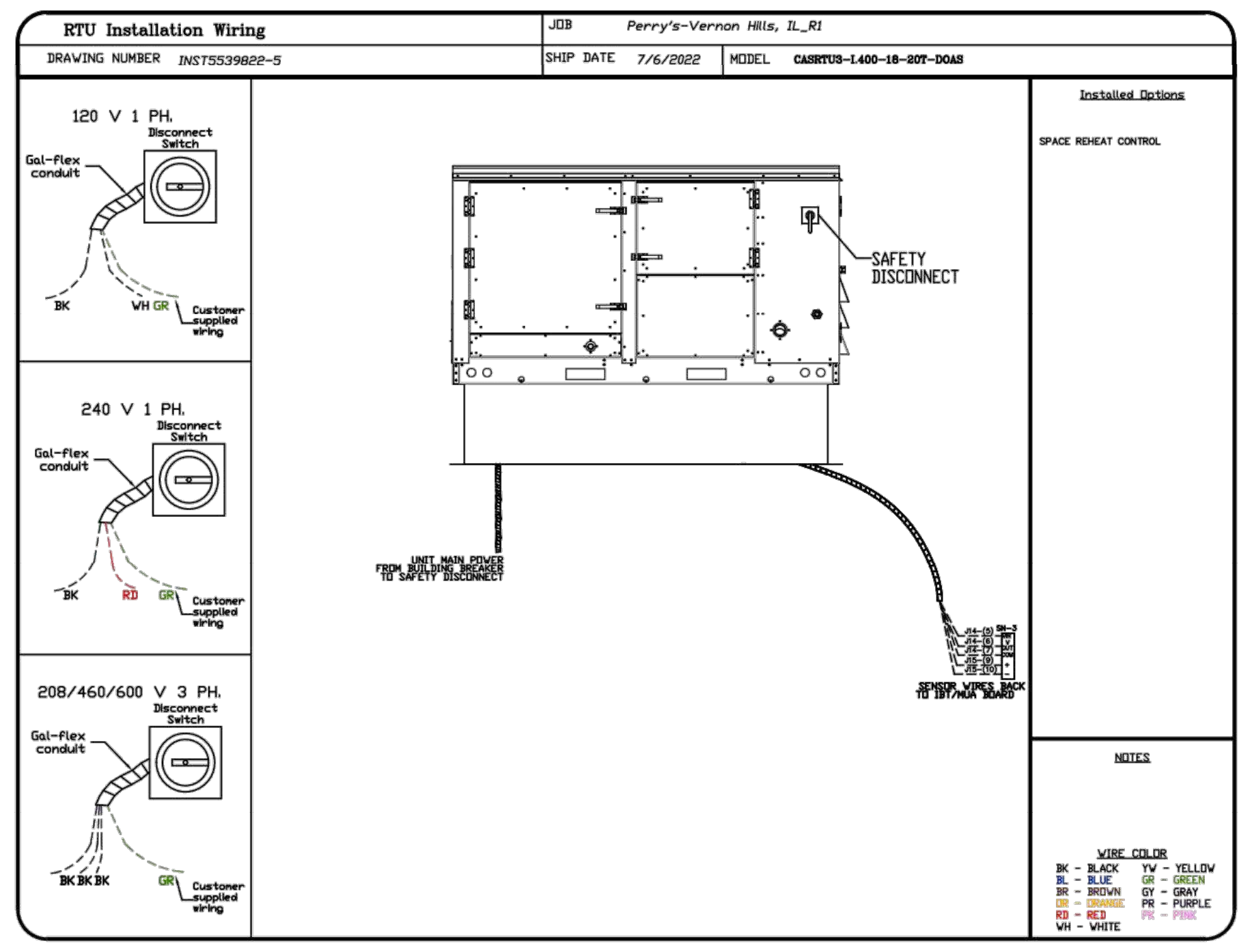
COMP VFD PART:134F9368
REACTOR PART: KDRULA2L

ELECTRICAL INFORMATION
MOTOR/CTRL CIRCUIT MCA: 43.5A
MOTOR/CTRL CIRCUIT MOP: 45A

RTU VFD SCHEMATIC
JOB NAME
Perry's-Vernon ...
DRAWING TITLE
DESCRIPTION OF OPERATION
MUA BOARD
(DETAILS TO FOLLOW)
JOB NO 5539822
DRAWN BY AUTO
TYPE FACTORY
DATE 7/6/2022
DWG RTUVFD5539822-5

Connect to J4 On MUA Board
>=15HP USE RS485 TO MODBUS CONVERTER
DTS-01
SMV 571 VFD 1
MT-01
MODBUS J38
SHIELDED WIRE
VZH VFD 2
To Compressor Terminals
From SW-01
TO MUA BOARD
RJC-1
STP wire
TXA
TXB
MODBUS CONNECTIONS
Analog Common



RTU Installation Wiring
JOB Perry's-Vernon Hills, IL_R1
DRAWING NUMBER INST5539822-5
SHIP DATE 7/6/2022
MODEL CASRTU3-I.400-18-20T-DOAS

Installed Options
SPACE REHEAT CONTROL

NOTES

WIRE COLOR
BK - BLACK YW - YELLOW
BL - BLUE GR - GREEN
BR - BROWN GY - GRAY
OR - ORANGE PR - PURPLE
RD - RED PK - PINK
WH - WHITE

120 V 1 PH.
240 V 1 PH.
208/460/600 V 3 PH.
Disconnect Switch
Gal-flex conduit
BK
WH
RD
GR
Customer supplied wiring
SAFETY DISCONNECT
UNIT MAIN POWER FROM BUILDING BREAKER TO SAFETY DISCONNECT
SENSOR WIRES BACK TO IBT/MUA BOARD

REVISIONS	
DESCRIPTION	DATE:
△	
△	
△	
△	
△	

CAPTIVEAIRE
St. Louis Mechanical
2 City Place Drive, Suite #200, St. Louis, MO, 63141 PHONE: (636) 229-9777 EMAIL: reg109@captiveaire.com
www.captiveaire.com

Perry's-Vernon Hills, IL_R1
VERNON HILLS, IL, 60061

DATE: 7/6/2022

DWG.#:
5539822

DRAWN BY: ML

SCALE:
1/2" = 1'-0"

MASTER DRAWING

SHEET NO.
21

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	04/19/23	PERMIT UPDATES
	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

REVISIONS

Drawing Title
CAPTIVEAIRE DRAWINGS

Job No.

Drawn

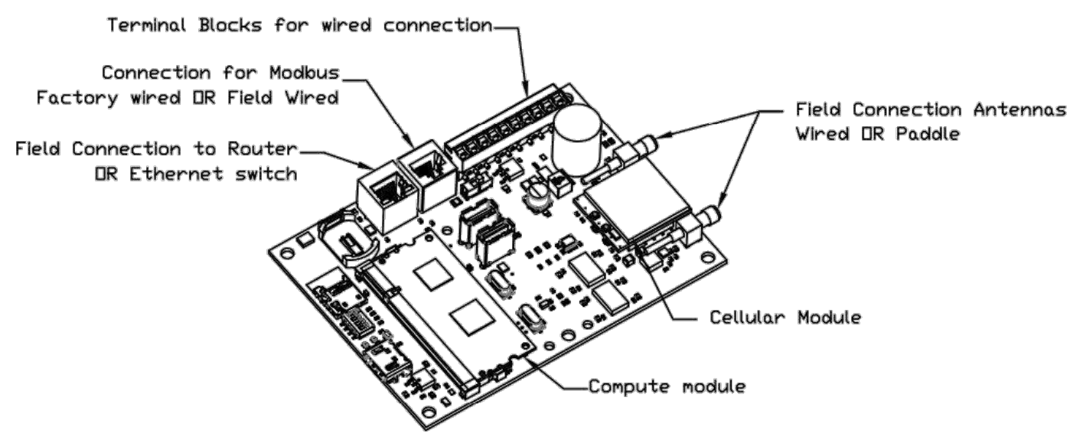
Scale
AS NOTED

Date

Sheet No.
M6.11

ELECTRICAL PACKAGE – JOB#5539822

NO	TAG	PACKAGE #	LOCATION	SWITCHES		OPTION	FANS CONTROLLED					
				LOCATION	QUANTITY		FAN TAG	TYPE	ϕ	HP	VOLT	FLA
1		DCV-4011_MA4	UTILITY CABINET RIGHT	04 - UTILITY CABINET RIGHT	1 LIGHT	SMART CONTROLS DCV	KEF-1	EXHAUST	1	0.750	208	5.2
							KEF-2	EXHAUST	1	1.000	208	6.9
				HOOD # 4	1 FAN		KEF-3	EXHAUST	1	0.750	208	5.2
							KEF-4	EXHAUST	3	2.000	208	8.3


Terminal Blocks for wired connection
Connection for Modbus
Factory wired OR Field Wired
Field Connection to Router
OR Ethernet switch
Field Connection Antennas
Wired OR Paddle
Cellular Module
Compute module

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.*

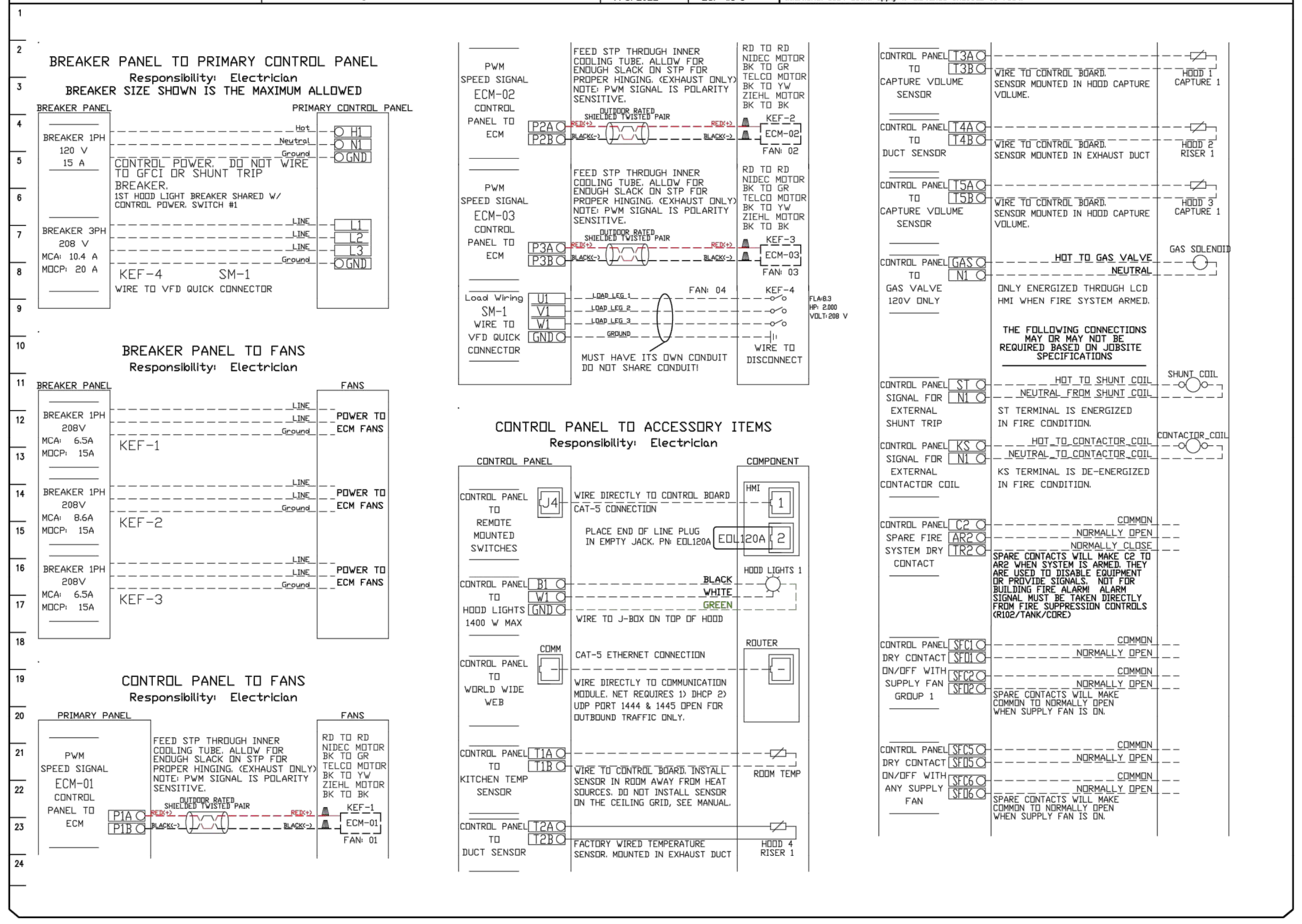
MONITORING AND CONTROL POINTS LIST

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 5539822
MODEL NUMBER DCV-4011_MA4
JOB NAME Perry's-Vernon Hills, IL_R1
DRAWN BY
DATE 7/6/2022
SCHEMATIC TYPE INSTALL
DWG NO ECP #1-1

DESCRIPTION OF OPERATION: Demand Control Ventilation, w/ control for 4 Exhaust Fan, Exhaust on in Fire, Lights out in Fire, Fans modulate based on duct temperature. 4 Dry Contacts On/Off with Supply. INVERTER DUTY 3 PHASE MOTOR REQUIRED FOR USE WITH VFD. Room temperature sensor shipped loose for field installation.Verify distance between VFD and Motor; additional cost could apply if distance exceeds 50 feet.


BREAKER PANEL TO PRIMARY CONTROL PANEL
Responsibility: Electrician
BREAKER SIZE SHOWN IS THE MAXIMUM ALLOWED
BREAKER PANEL
PRIMARY CONTROL PANEL
BREAKER 1PH 120 V 15 A
Hot
Neutral
Ground
H1
N1
GND
CONTROL POWER. DO NOT WIRE TO GFCI OR SHUNT TRIP BREAKER.
1ST HOOD LIGHT BREAKER SHARED W/ CONTROL POWER. SWITCH #1
BREAKER 3PH 208 V MCA: 10.4 A MOCP: 20 A
LINE
L1
L2
L3
KEF-4
SM-1
WIRE TO VFD QUICK CONNECTOR
BREAKER PANEL TO FANS
Responsibility: Electrician
FANS
BREAKER 1PH 208V MCA: 6.5A MOCP: 15A
KEF-1
BREAKER 1PH 208V MCA: 8.6A MOCP: 15A
KEF-2
BREAKER 1PH 208V MCA: 6.5A MOCP: 15A
KEF-3
POWER TO ECM FANS
CONTROL PANEL TO FANS
Responsibility: Electrician
PRIMARY PANEL
PWM SPEED SIGNAL ECM-01 CONTROL PANEL TO ECM
P1A
P1B
FEED STP THROUGH INNER COOLING TUBE. ALLOW FOR ENOUGH SLACK ON STP FOR PROPER HINGING. (EXHAUST ONLY) NOTE: PWM SIGNAL IS POLARITY SENSITIVE.
OUTDOOR RATED SHIELDED TWISTED PAIR
RED(+)
BLACK(-)
RD TO RD NIDEC MOTOR BK TO GR TELCO MOTOR BK TO YW ZIEHL MOTOR BK TO BK
ECM-01
FAN: 01
PWM SPEED SIGNAL ECM-02 CONTROL PANEL TO ECM
P2A
P2B
ECM-02
FAN: 02
PWM SPEED SIGNAL ECM-03 CONTROL PANEL TO ECM
P3A
P3B
ECM-03
FAN: 03
Load Wiring SM-1 WIRE TO VFD QUICK CONNECTOR
U1
V1
W1
GND
LOAD LEG 1
LOAD LEG 2
LOAD LEG 3
GROUND
FAN: 04
FLA:8.3
HP: 2.000
VOLT: 208 V
MUST HAVE ITS OWN CONDUIT DO NOT SHARE CONDUIT!
WIRE TO DISCONNECT
CONTROL PANEL TO ACCESSORY ITEMS
Responsibility: Electrician
CONTROL PANEL
COMPONENT
CONTROL PANEL TO REMOTE MOUNTED SWITCHES
J4
WIRE DIRECTLY TO CONTROL BOARD CAT-5 CONNECTION
HMI
PLACE END OF LINE PLUG IN EMPTY JACK. PN: EOL120A
EOL120A
CONTROL PANEL TO HOOD LIGHTS 1400 W MAX
B1
HOOD LIGHTS 1
BLACK
WHITE
GREEN
WIRE TO J-BOX ON TOP OF HOOD
CONTROL PANEL TO WORLD WIDE WEB
COMM
CAT-5 ETHERNET CONNECTION
ROUTER
WIRE DIRECTLY TO COMMUNICATION MODULE. NET REQUIRES 1) DHCP 2) UDP PORT 1444 & 1445 OPEN FOR OUTBOUND TRAFFIC ONLY.
CONTROL PANEL TO KITCHEN TEMP SENSOR
T1A
T1B
WIRE TO CONTROL BOARD. INSTALL SENSOR IN ROOM AWAY FROM HEAT SOURCES. DO NOT INSTALL SENSOR ON THE CEILING GRID, SEE MANUAL.
ROOM TEMP
CONTROL PANEL TO DUCT SENSOR
T2A
T2B
FACTORY WIRED TEMPERATURE SENSOR. MOUNTED IN EXHAUST DUCT
HOOD 4 RISER 1
CONTROL PANEL TO CAPTURE VOLUME SENSOR
T3A
T3B
WIRE TO CONTROL BOARD. SENSOR MOUNTED IN HOOD CAPTURE VOLUME.
HOOD 1 CAPTURE 1
CONTROL PANEL TO DUCT SENSOR
T4A
T4B
WIRE TO CONTROL BOARD. SENSOR MOUNTED IN EXHAUST DUCT
HOOD 2 RISER 1
CONTROL PANEL TO CAPTURE VOLUME SENSOR
T5A
T5B
WIRE TO CONTROL BOARD. SENSOR MOUNTED IN HOOD CAPTURE VOLUME.
HOOD 3 CAPTURE 1
CONTROL PANEL TO GAS VALVE 120V ONLY
GAS
HOT TO GAS VALVE
NEUTRAL
GAS SOLENOID
ONLY ENERGIZED THROUGH LCD HMI WHEN FIRE SYSTEM ARMED.
THE FOLLOWING CONNECTIONS MAY OR MAY NOT BE REQUIRED BASED ON JOBSITE SPECIFICATIONS
CONTROL PANEL SIGNAL FOR EXTERNAL SHUNT TRIP
ST
HOT TO SHUNT COIL
NEUTRAL FROM SHUNT COIL
SHUNT COIL
ST TERMINAL IS ENERGIZED IN FIRE CONDITION.
CONTROL PANEL SIGNAL FOR EXTERNAL CONTACTOR COIL
KS
HOT_TO_CONTACTOR_COIL
NEUTRAL_TO_CONTACTOR_COIL
CONTACTOR_COIL
KS TERMINAL IS DE-ENERGIZED IN FIRE CONDITION.
CONTROL PANEL SPARE FIRE SYSTEM DRY CONTACT
C2
AR2
TR2
COMMON
NORMALLY OPEN
NORMALLY CLOSE
SPARE CONTACTS WILL MAKE C2 TO AR2 WHEN SYSTEM IS ARMED. THEY ARE USED TO DISABLE EQUIPMENT OR PROVIDE SIGNALS. NOT FOR BUILDING FIRE ALARM! ALARM SIGNAL MUST BE TAKEN DIRECTLY FROM FIRE SUPPRESSION CONTROLS (R102/TANK/CORE)
CONTROL PANEL DRY CONTACT ON/OFF WITH SUPPLY FAN GROUP 1
SFC1
SFO1
SFC2
SFO2
SPARE CONTACTS WILL MAKE COMMON TO NORMALLY OPEN WHEN SUPPLY FAN IS ON.
CONTROL PANEL DRY CONTACT ON/OFF WITH ANY SUPPLY FAN
SFC5
SFO5
SFC6
SFO6
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
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DESCRIPTION	DATE:
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Perry's-Vernon Hills, IL_R1
VERNON HILLS, IL, 60061

DATE: 7/6/2022
DWG.#: 5539822
DRAWN BY: ML
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 22

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

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	04/19/23	PERMIT UPDATES
	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

REVISIONS

Drawing Title
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Job No.
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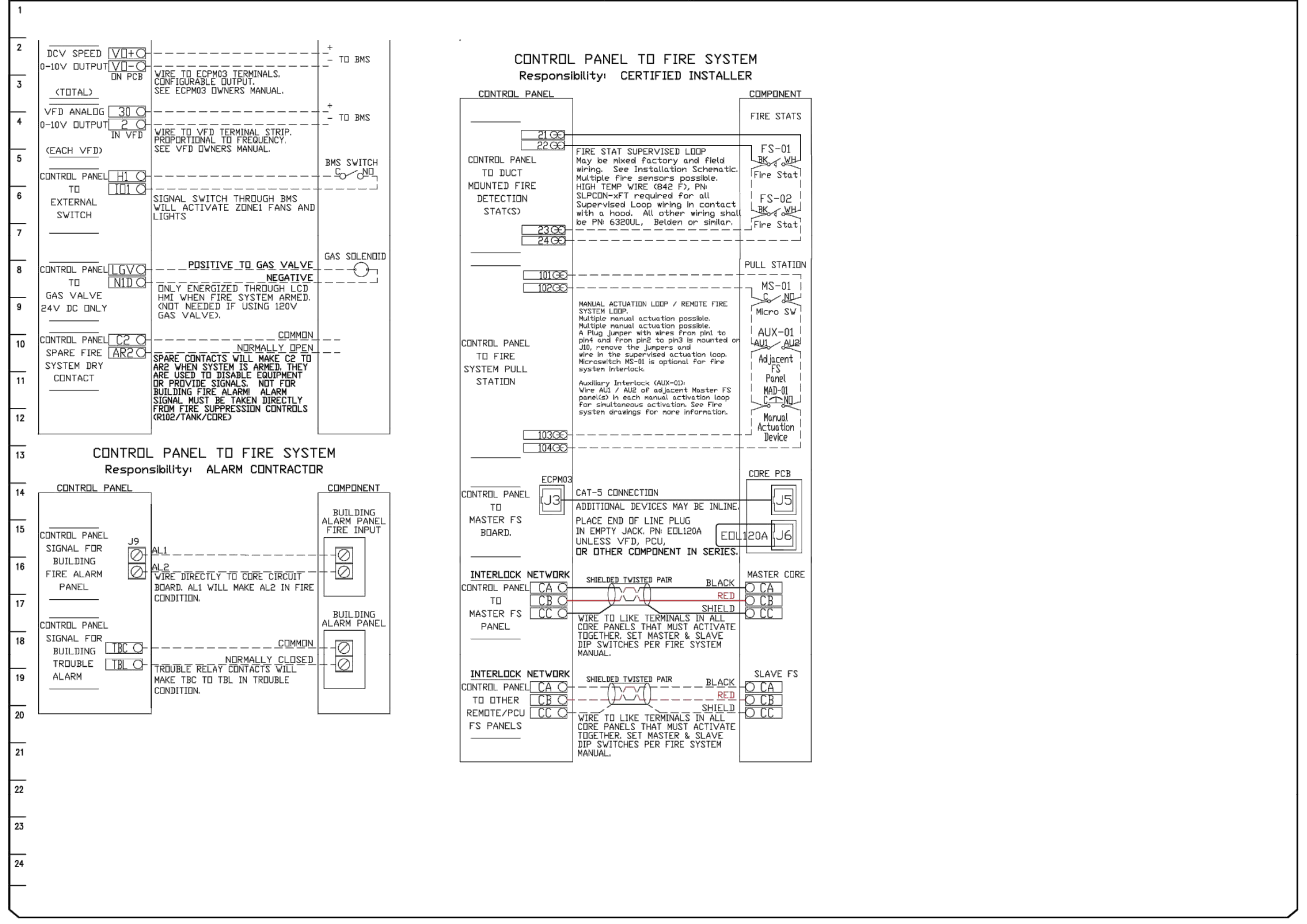
JOB NO	MODEL NUMBER	DRAWN BY	SCHEMATIC TYPE	DESCRIPTION OF OPERATION:
5539822	DCV-4011_MA4		INSTALL	Demand Control Ventilation, w/ control for 4 Exhaust Fan, Exhaust on in Fire, Lights out in Fire, Fans modulate based on duct temperature. 4 Dry Contacts On/Off with Supply. INVERTER DUTY 3 PHASE MOTOR REQUIRED FOR USE WITH VFD. Room temperature sensor shipped loose for field installation.Verify distance between VFD and Motor; additional cost could apply if distance exceeds 50 feet.
	JOB NAME Perry's-Vernon Hills, IL_R1	DATE 7/6/2022	DWG NO ECP #1-2	


DCV SPEED
0-10V OUTPUT
V0+
V0-
ON PCB
(TOTAL)
+ - TO BMS
VFD ANALOG
0-10V OUTPUT
30
2
IN VFD
(EACH VFD)
+ - TO BMS
CONTROL PANEL TO EXTERNAL SWITCH
H1
I01
BMS SWITCH
C NO
CONTROL PANEL TO GAS VALVE 24V DC ONLY
LGV
N1D
POSITIVE TO GAS VALVE
NEGATIVE
GAS SOLENOID
CONTROL PANEL SPARE FIRE SYSTEM DRY CONTACT
C2
AR2
COMMON
NORMALLY OPEN
CONTROL PANEL
COMPONENT
CONTROL PANEL SIGNAL FOR BUILDING FIRE ALARM PANEL
J9
AL1
AL2
BUILDING ALARM PANEL FIRE INPUT
CONTROL PANEL SIGNAL FOR BUILDING TROUBLE ALARM
TBC
TBL
COMMON
NORMALLY CLOSED
BUILDING ALARM PANEL
CONTROL PANEL TO DUCT MOUNTED FIRE DETECTION STAT(S)
21
22
23
24
FIRE STATS
FS-01
BK WH
Fire Stat
FS-02
BK WH
Fire Stat
CONTROL PANEL TO FIRE SYSTEM PULL STATION
101
102
103
104
PULL STATION
MS-01
C NO
Micro SW
AUX-01
AU1 AU2
Adjacent FS Panel
MAD-01
C NO
Manual Actuation Device
ECPM03
CONTROL PANEL TO MASTER FS BOARD.
J3
CORE PCB
J5
J6
EOL120A
INTERLOCK NETWORK
CONTROL PANEL TO MASTER FS PANEL
CA
CB
CC
SHIELDED TWISTED PAIR
BLACK
RED
SHIELD
MASTER CORE
INTERLOCK NETWORK
CONTROL PANEL TO OTHER REMOTE/PCU FS PANELS
SLAVE FS
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

WIRE TO ECPM03 TERMINALS. CONFIGURABLE OUTPUT. SEE ECPM03 OWNERS MANUAL.

WIRE TO VFD TERMINAL STRIP. PROPORTIONAL TO FREQUENCY. SEE VFD OWNERS MANUAL.

SIGNAL SWITCH THROUGH BMS WILL ACTIVATE ZONE1 FANS AND LIGHTS

ONLY ENERGIZED THROUGH LCD HMI WHEN FIRE SYSTEM ARMED. (NOT NEEDED IF USING 120V GAS VALVE).

SPARE CONTACTS WILL MAKE C2 TO AR2 WHEN SYSTEM IS ARMED. THEY ARE USED TO DISABLE EQUIPMENT OR PROVIDE SIGNALS. NOT FOR BUILDING FIRE ALARM! ALARM SIGNAL MUST BE TAKEN DIRECTLY FROM FIRE SUPPRESSION CONTROLS (R102/TANK/CORE)

CONTROL PANEL TO FIRE SYSTEM

Responsibility: ALARM CONTRACTOR

WIRE DIRECTLY TO CORE CIRCUIT BOARD. AL1 WILL MAKE AL2 IN FIRE CONDITION.

TROUBLE RELAY CONTACTS WILL MAKE TBC TO TBL IN TROUBLE CONDITION.

CONTROL PANEL TO FIRE SYSTEM

Responsibility: CERTIFIED INSTALLER

FIRE STAT SUPERVISED LOOP
May be mixed factory and field wiring. See Installation Schematic. Multiple fire sensors possible. HIGH TEMP WIRE (842 F), PN: SLPCON-xFT required for all Supervised Loop wiring in contact with a hood. All other wiring shall be PN: 6320UL, Belden or similar.

MANUAL ACTUATION LOOP / REMOTE FIRE SYSTEM LOOP.
Multiple manual actuation possible.
Multiple manual actuation possible.
A Plug jumper with wires from pin1 to pin4 and from pin2 to pin3 is mounted on J10, remove the jumpers and wire in the supervised actuation loop. Microswitch MS-01 is optional for fire system interlock.

Auxiliary Interlock (AUX-01):
Wire AU1 / AU2 of adjacent Master FS panel(s) in each manual activation loop for simultaneous activation. See Fire system drawings for more information.

CAT-5 CONNECTION
ADDITIONAL DEVICES MAY BE INLINE.
PLACE END OF LINE PLUG IN EMPTY JACK. PN: EOL120A UNLESS VFD, PCU, **OR OTHER COMPONENT IN SERIES.**

WIRE TO LIKE TERMINALS IN ALL CORE PANELS THAT MUST ACTIVATE TOGETHER. SET MASTER & SLAVE DIP SWITCHES PER FIRE SYSTEM MANUAL.

WIRE TO LIKE TERMINALS IN ALL CORE PANELS THAT MUST ACTIVATE TOGETHER. SET MASTER & SLAVE DIP SWITCHES PER FIRE SYSTEM MANUAL.

JOB NO	MODEL NUMBER	DRAWN BY	SCHEMATIC TYPE	DESCRIPTION OF OPERATION:
5539822	DCV-4011_MA4		INSTALL	Fire System #2 TANK FS - 4.0. Tank-based Fire Protection System equipped with Electronic Detection utilizing CORE board as a Listed Release Mechanism. Installed in Hood Utility Cabinet with integral hood prewire panel.
	JOB NAME Perry's-Vernon Hills, IL_R1	DATE 7/6/2022	DWG NO ECP #1-3	

TANK PROTECTION ELECTRICAL DETAIL

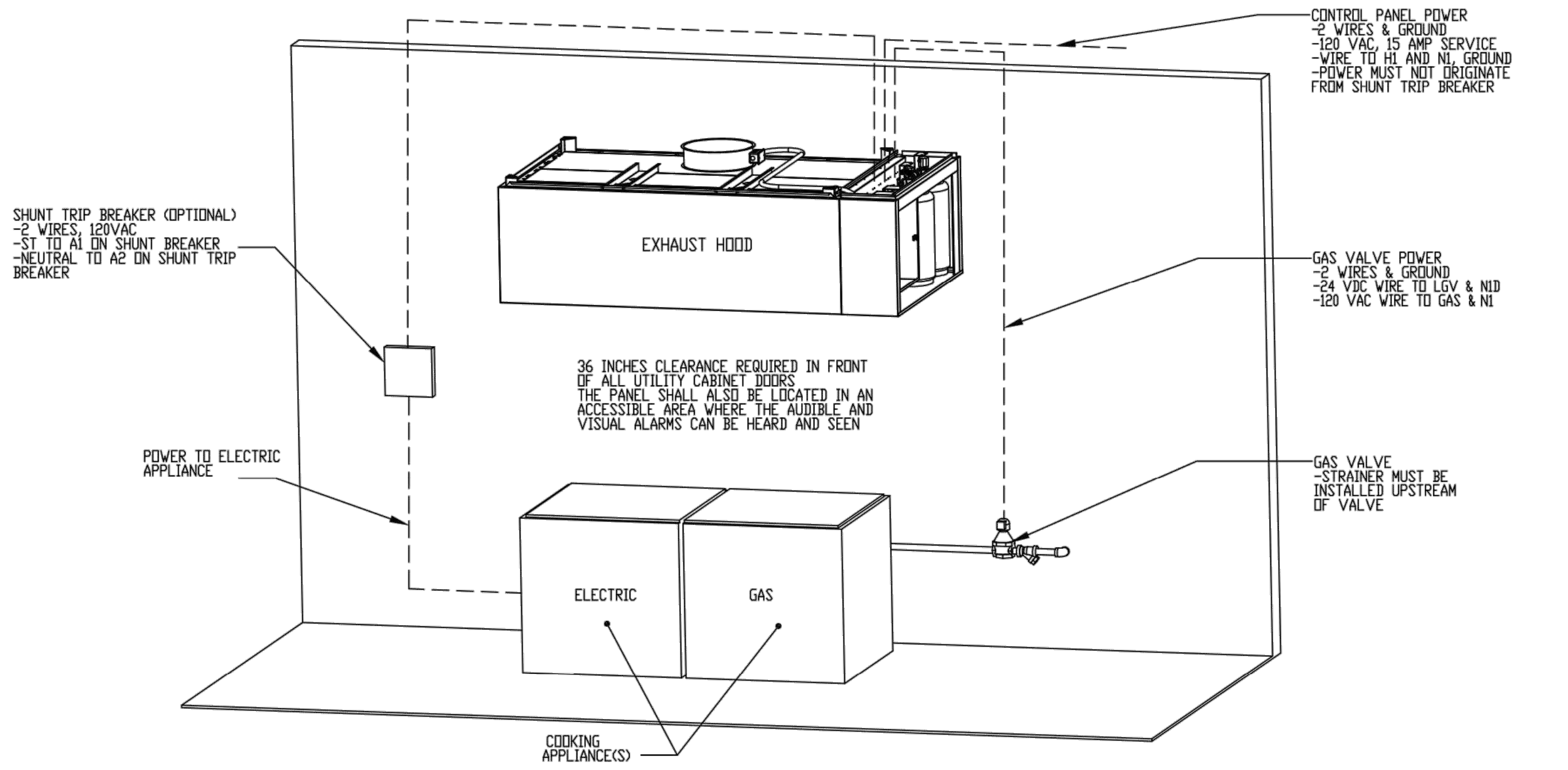
02/10/2021 Rev. 2

FS-2: 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


EXHAUST HOOD
ELECTRIC
GAS

CONTROL PANEL POWER
-2 WIRES & GROUND
-120 VAC, 15 AMP SERVICE
-WIRE TO H1 AND N1, GROUND
-POWER MUST NOT ORIGINATE FROM SHUNT TRIP BREAKER

SHUNT TRIP BREAKER (OPTIONAL)
-2 WIRES, 120VAC
-ST TO A1 ON SHUNT BREAKER
-NEUTRAL TO A2 ON SHUNT TRIP BREAKER

GAS VALVE POWER
-2 WIRES & GROUND
-24 VDC WIRE TO LGV & N1D
-120 VAC WIRE TO GAS & N1

36 INCHES CLEARANCE REQUIRED IN FRONT OF ALL UTILITY CABINET DOORS
THE PANEL SHALL ALSO BE LOCATED IN AN ACCESSIBLE AREA WHERE THE AUDIBLE AND VISUAL ALARMS CAN BE HEARD AND SEEN

POWER TO ELECTRIC APPLIANCE

GAS VALVE
-STRAINER MUST BE INSTALLED UPSTREAM OF VALVE

COOKING APPLIANCE(S)

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

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Perry's-Vernon Hills, IL_R1
VERNON HILLS, IL, 60061

DATE: 7/6/2022

DWG.#: 5539822

DRAWN BY: ML

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

MASTER DRAWING

SHEET NO. 23

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1050 N MILWAUKEE AVE

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	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

REVISIONS

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Drawing Title
CAPTIVEAIRE DRAWINGS

Job No.

Drawn ---

Scale AS NOTED

Date

Sheet No.
M6.13

JOB NO 5539822
MODEL NUMBER DCV-4011_MA4
JOB NAME Perry's-Vernon Hills, IL_R1
DRAWN BY
DATE 7/6/2022
SCHEMATIC TYPE INSTALL
DWG NO ECP #1-4
DESCRIPTION OF OPERATION: Fire System #2 TANK FS - 4.0. Tank-based Fire Protection System equipped with Electronic Detection utilizing CORE board as a Listed Release Mechanism. Installed in Hood Utility Cabinet with integral hood prewire panel.

TANK PROTECTION LOW-VOLTAGE DETAIL

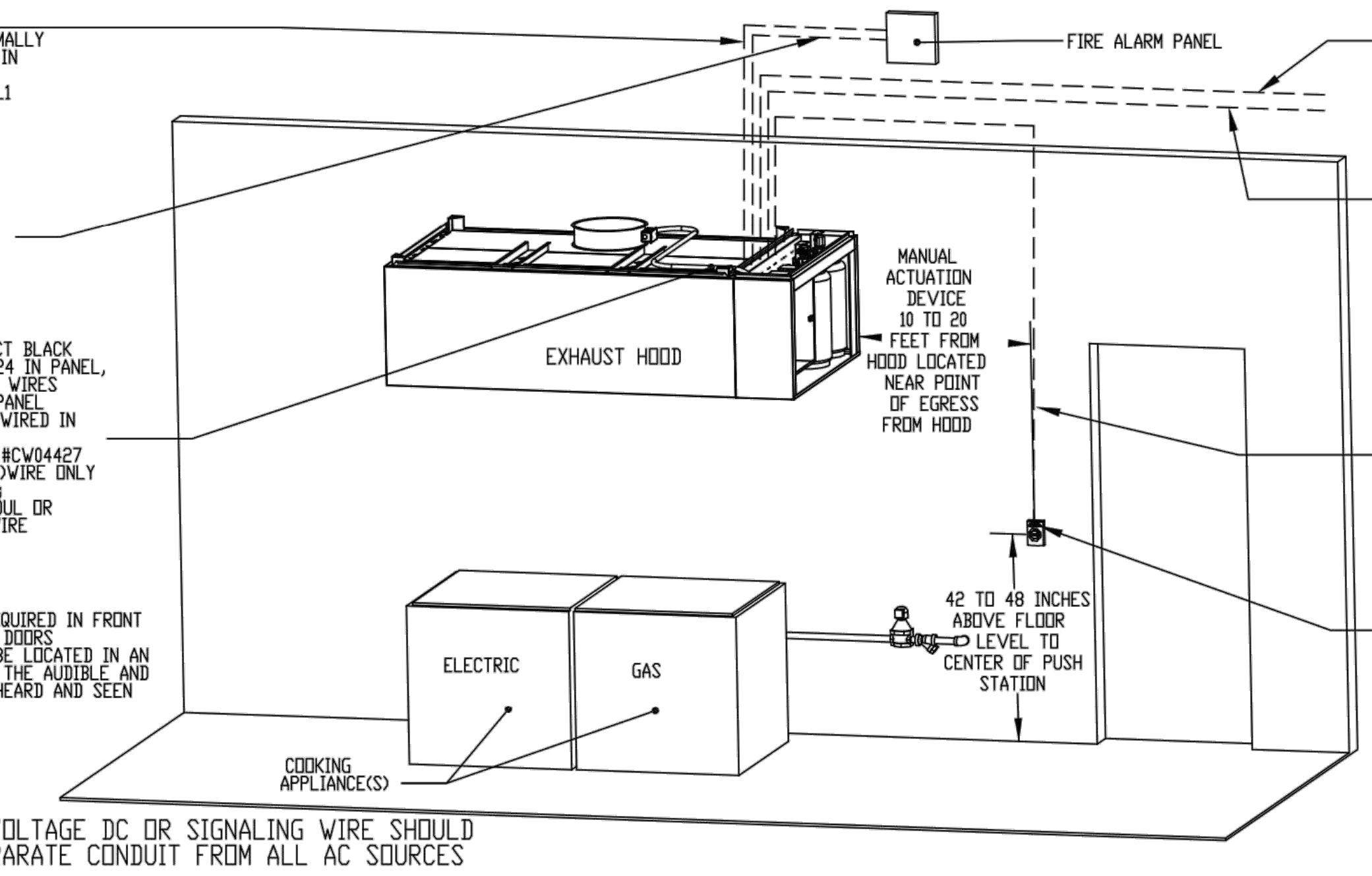
02/10/2021 Rev. 2

FS-2: 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

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) #CW04427 (WHT) & #CW04427B (BLK)WIRE OR SIMILAR ONLY IF RAN OVER TOP 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)	ILA, ILB, ILC	ILA, ILB, ILC	RS-485 COMMUNICATIONS SIGNAL		CORE SYSTEM (1) ILA, TO CORE SYSTEM (2) ILA. CORE SYSTEM (1) ILB, TO CORE SYSTEM (2) ILB. CORE SYSTEM (1) ILC, TO CORE SYSTEM (2) ILC. 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


FIRE ALARM PANEL
EXHAUST HOOD
ELECTRIC
GAS

FIRE ALARM CONTACT
-2 WIRES WIRED TO NORMALLY OPEN CONTACTS (CLOSES IN FIRE CONDITION)
-CORE CONTROL PANEL AL1 AND AL2
-SEE FIGURE 2

TROUBLE CONTACT
-2 WIRES TO NORMALLY OPEN CONTACTS (CLOSE IN TROUBLE CONDITION)
-CORE PANEL TERMINALS TBL AND TBC
-SEE FIGURE 4

SUPERVISED LOOP
-4 WIRES, 24VDC CONNECT BLACK WIRES BETWEEN 21 AND 24 IN PANEL, CONNECT WHITE (OR RED) WIRES BETWEEN 22 AND 23 IN PANEL
-ADDITIONAL FIRESTATS, WIRED IN SUPERVISED LOOP
-USE HIGH TEMP (842°F) #CW04427 (WHT) & #CW04227B (BLK)WIRE ONLY IF RAN OVER TOP OF HOOD; OTHERWISE BELDEN #6320UL OR SIMILAR PLENUM RATED WIRE
-SEE FIGURE 1

36 INCHES CLEARANCE REQUIRED IN FRONT OF ALL UTILITY CABINET DOORS
THE PANEL SHALL ALSO BE LOCATED IN AN ACCESSIBLE AREA WHERE THE AUDIBLE AND VISUAL ALARMS CAN BE HEARD AND SEEN

COOKING APPLIANCE(S)

MANUAL ACTUATION DEVICE 10 TO 20 FEET FROM HOOD LOCATED NEAR POINT OF EGRESS FROM HOOD

42 TO 48 INCHES ABOVE FLOOR LEVEL TO CENTER OF PUSH STATION

CORE INTERLOCK
-2 WIRES + SHIELD
-USE BELDEN#88760 OR SIMILAR WIRE
-SEE FIGURE 3

CORE COMMUNICATIONS CABLE
-CAT5 CABLE
MUST BE INSTALLED TO A LOCAL AREA NETWORK WITH VALID INTERNET ACCESS VIA ETHERNET SWITCH OR WIRELESS ROUTER

MANUAL ACTUATION DEVICE WIRES
-4 WIRES, 24VDC WIRE (TERMINAL 1) BETWEEN 102 AND 103
-WIRE (TERMINAL 2) BETWEEN 101 AND 104
-ADDITIONAL PULL STATIONS WIRED IN SUPERVISED LOOP
-USE BELDEN #6320UL OR SIMILAR WIRE
-SEE FIGURE 2

MANUAL ACTUATION DEVICE
PART #STI-SS2431
PROTECTIVE COVER MUST BE INSTALLED

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

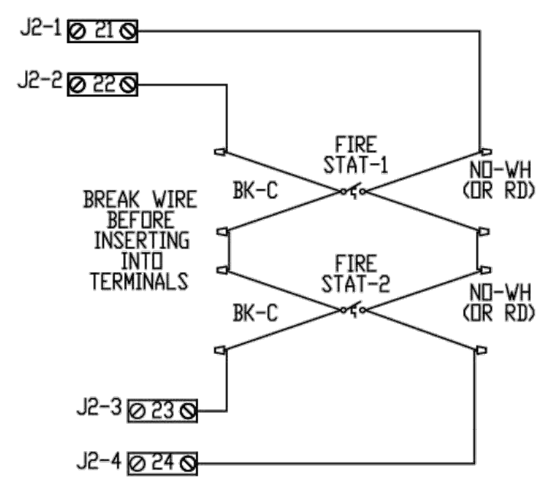
NOTE: SEE INSTALLATION, OPERATION, AND MAINTENANCE MANUAL FOR FURTHER INSTRUCTIONS

JOB NO 5539822
MODEL NUMBER DCV-4011_MA4
JOB NAME Perry's-Vernon Hills, IL_R1
DRAWN BY
DATE 7/6/2022
SCHEMATIC TYPE INSTALL
DWG NO ECP #1-5
DESCRIPTION OF OPERATION: Fire System #2 TANK FS - 4.0. Tank-based Fire Protection System equipped with Electronic Detection utilizing CORE board as a Listed Release Mechanism. Installed in Hood Utility Cabinet with integral hood prewire panel.

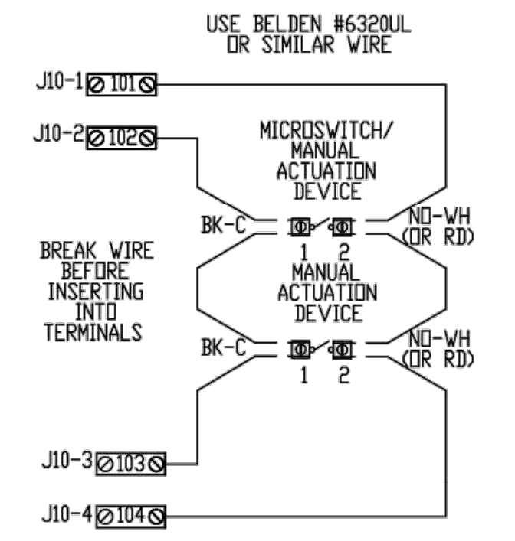
TANK PROTECTION LOW-VOLTAGE FIGURES

02/10/2021 Rev. 17

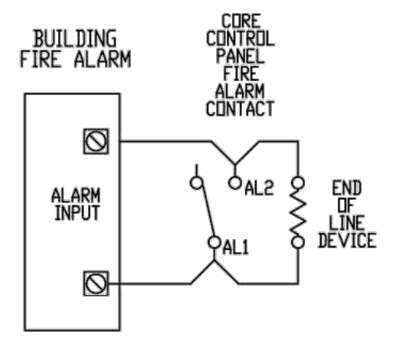
FS-2: MASTER


J2-1
21
J2-2
22
FIRE STAT-1
BK-C
NO-WH (OR RD)
BREAK WIRE BEFORE INSERTING INTO TERMINALS
FIRE STAT-2
BK-C
NO-WH (OR RD)
J2-3
23
J2-4
24

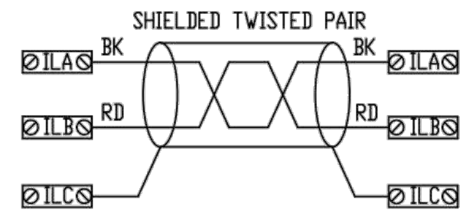
WIRING CONNECTIONS FOR FIRESTAT LOOP
FIGURE 1


USE BELDEN #6320UL OR SIMILAR WIRE
J10-1
101
J10-2
102
MICROSWITCH/ MANUAL ACTUATION DEVICE
BK-C
1
2
NO-WH (OR RD)
BREAK WIRE BEFORE INSERTING INTO TERMINALS
MANUAL ACTUATION DEVICE
BK-C
1
2
NO-WH (OR RD)
J10-3
103
J10-4
104

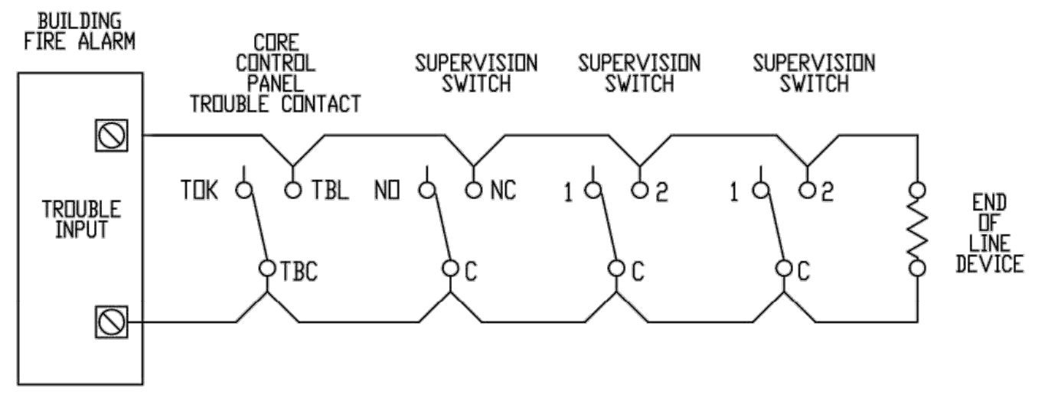
WIRING CONNECTIONS FOR MANUAL ACTUATION LOOP
FIGURE 1A


BUILDING FIRE ALARM
CORE CONTROL PANEL FIRE ALARM CONTACT
ALARM INPUT
AL2
AL1
END OF LINE DEVICE

WIRING CONNECTIONS FOR FIRE ALARM CONTACT
FIGURE 2


SHIELDED TWISTED PAIR
ILA
BK
ILB
RD
ILC
BK
ILA
RD
ILB
ILC

WIRING CONNECTIONS FOR CORE INTERLOCK
FIGURE 3


BUILDING FIRE ALARM
CORE CONTROL PANEL TROUBLE CONTACT
SUPERVISION SWITCH
SUPERVISION SWITCH
SUPERVISION SWITCH
TROUBLE INPUT
TOK
TBL
TBC
NO
NC
C
1
2
C
1
2
C
END OF LINE DEVICE

WIRING CONNECTIONS FOR TROUBLE CONTACT
FIGURE 4

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

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

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Perry's-Vernon Hills, IL_R1
VERNON HILLS, IL, 60061

DATE: 7/6/2022
DWG.#: 5539822
DRAWN BY: ML
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 24

NOTE:
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No	Date	Remarks
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	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

REVISIONS

Drawing Title
CAPTIVEAIRE DRAWINGS

Job No.
Drawn ---
Scale AS NOTED
Date
Sheet No.
M6.14

JOB NO	MODEL NUMBER	DRAWN BY	SCHEMATIC TYPE	DESCRIPTION OF OPERATION:
5539822	DCV-4011_MA4		INSTALL	Fire System #1 TANK FS - 4.0/4.0/4.0/4.0. Tank-based Fire Protection System equipped with Electronic Detection utilizing CORE board as a Listed Release Mechanism. Installed in Hood Utility Cabinet separate from prewire. Includes 12" box housing circuit board, batteries, and terminals for connection to main control panel.
	JOB NAME Perry's-Vernon Hills, IL_R1	DATE 7/6/2022	DWG NO ECP #1-6	

TANK PROTECTION ELECTRICAL DETAIL

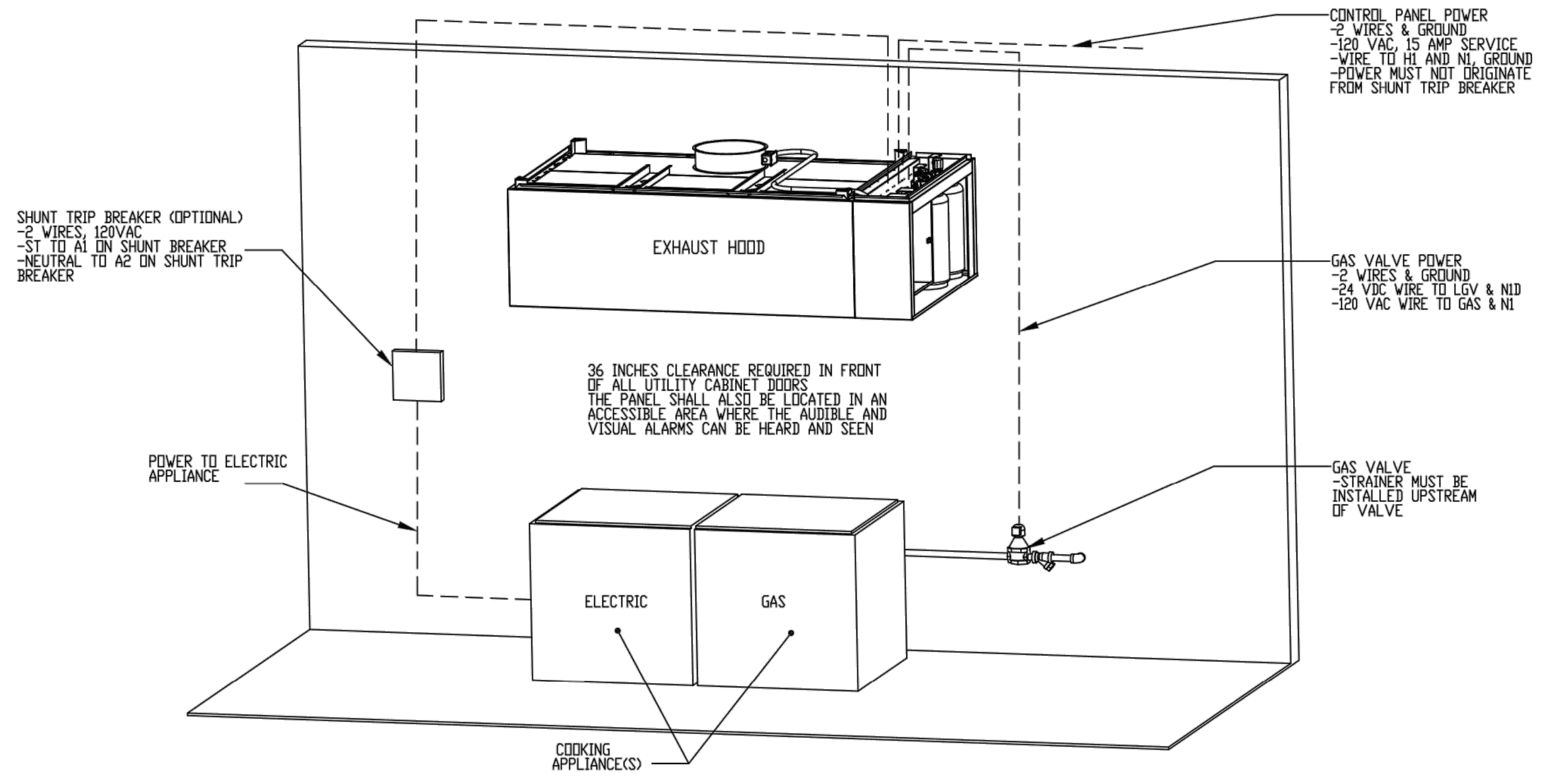
02/10/2021 Rev. 2

FS-1: SLAVE

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


CONTROL PANEL POWER
-2 WIRES & GROUND
-120 VAC, 15 AMP SERVICE
-WIRE TO H1 AND N1, GROUND
-POWER MUST NOT ORIGINATE FROM SHUNT TRIP BREAKER
SHUNT TRIP BREAKER (OPTIONAL)
-2 WIRES, 120VAC
-ST TO A1 ON SHUNT BREAKER
-NEUTRAL TO A2 ON SHUNT TRIP BREAKER
EXHAUST HOOD
GAS VALVE POWER
-2 WIRES & GROUND
-24 VDC WIRE TO LGV & N1D
-120 VAC WIRE TO GAS & N1
36 INCHES CLEARANCE REQUIRED IN FRONT OF ALL UTILITY CABINET DOORS
THE PANEL SHALL ALSO BE LOCATED IN AN ACCESSIBLE AREA WHERE THE AUDIBLE AND VISUAL ALARMS CAN BE HEARD AND SEEN
POWER TO ELECTRIC APPLIANCE
GAS VALVE
-STRAINER MUST BE INSTALLED UPSTREAM OF VALVE
ELECTRIC
GAS
COOKING APPLIANCE(S)

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

JOB NO	MODEL NUMBER	DRAWN BY	SCHEMATIC TYPE	DESCRIPTION OF OPERATION:
5539822	DCV-4011_MA4		INSTALL	Fire System #1 TANK FS - 4.0/4.0/4.0/4.0. Tank-based Fire Protection System equipped with Electronic Detection utilizing CORE board as a Listed Release Mechanism. Installed in Hood Utility Cabinet separate from prewire. Includes 12" box housing circuit board, batteries, and terminals for connection to main control panel.
	JOB NAME Perry's-Vernon Hills, IL_R1	DATE 7/6/2022	DWG NO ECP #1-7	

TANK PROTECTION LOW-VOLTAGE DETAIL

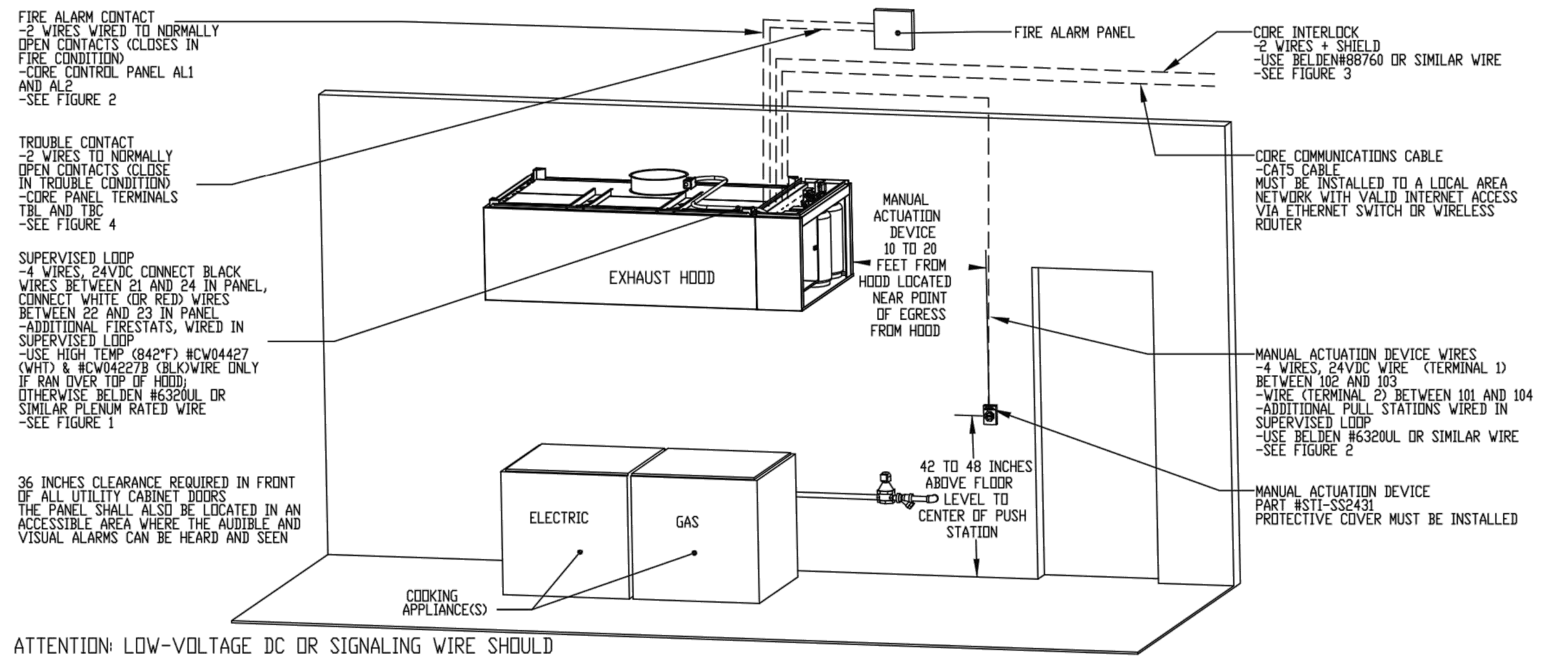
02/10/2021 Rev. 2

FS-1: SLAVE

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

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) #CW04427 (WHT) & #CW04427B (BLK)WIRE OR SIMILAR ONLY IF RAN OVER TOP 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)	ILA, ILB, ILC	ILA, ILB, ILC	RS-485 COMMUNICATIONS SIGNAL		CORE SYSTEM (1) ILA, TO CORE SYSTEM (2) ILA. CORE SYSTEM (1) ILB, TO CORE SYSTEM (2) ILB. CORE SYSTEM (1) ILC, TO CORE SYSTEM (2) ILC. 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


FIRE ALARM CONTACT
-2 WIRES WIRED TO NORMALLY OPEN CONTACTS (CLOSES IN FIRE CONDITION)
-CORE CONTROL PANEL AL1 AND AL2
-SEE FIGURE 2
FIRE ALARM PANEL
CORE INTERLOCK
-2 WIRES + SHIELD
-USE BELDEN#88760 OR SIMILAR WIRE
-SEE FIGURE 3
TROUBLE CONTACT
-2 WIRES TO NORMALLY OPEN CONTACTS (CLOSE IN TROUBLE CONDITION)
-CORE PANEL TERMINALS TBL AND TBC
-SEE FIGURE 4
CORE COMMUNICATIONS CABLE
-CAT5 CABLE
MUST BE INSTALLED TO A LOCAL AREA NETWORK WITH VALID INTERNET ACCESS VIA ETHERNET SWITCH OR WIRELESS ROUTER
SUPERVISED LOOP
-4 WIRES, 24VDC CONNECT BLACK WIRES BETWEEN 21 AND 24 IN PANEL, CONNECT WHITE (OR RED) WIRES BETWEEN 22 AND 23 IN PANEL
-ADDITIONAL FIRESTATS, WIRED IN SUPERVISED LOOP
-USE HIGH TEMP (842°F) #CW04427 (WHT) & #CW04227B (BLK)WIRE ONLY IF RAN OVER TOP OF HOOD; OTHERWISE BELDEN #6320UL OR SIMILAR PLENUM RATED WIRE
-SEE FIGURE 1
EXHAUST HOOD
MANUAL ACTUATION DEVICE 10 TO 20 FEET FROM HOOD LOCATED NEAR POINT OF EGRESS FROM HOOD
MANUAL ACTUATION DEVICE WIRES
-4 WIRES, 24VDC WIRE (TERMINAL 1) BETWEEN 102 AND 103
-WIRE (TERMINAL 2) BETWEEN 101 AND 104
-ADDITIONAL PULL STATIONS WIRED IN SUPERVISED LOOP
-USE BELDEN #6320UL OR SIMILAR WIRE
-SEE FIGURE 2
36 INCHES CLEARANCE REQUIRED IN FRONT OF ALL UTILITY CABINET DOORS
THE PANEL SHALL ALSO BE LOCATED IN AN ACCESSIBLE AREA WHERE THE AUDIBLE AND VISUAL ALARMS CAN BE HEARD AND SEEN
ELECTRIC
GAS
42 TO 48 INCHES ABOVE FLOOR LEVEL TO CENTER OF PUSH STATION
MANUAL ACTUATION DEVICE
PART #STI-SS2431
PROTECTIVE COVER MUST BE INSTALLED
COOKING APPLIANCE(S)

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

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St. Louis Mechanical
2 City Place Drive, Suite #200, St. Louis, MO, 63141 PHONE: (636) 229-9777 EMAIL: reg109@captiveaire.com

Perry's-Vernon Hills, IL_R1
VERNON HILLS, IL, 60061

DATE: 7/6/2022

DWG.#: 5539822

DRAWN BY: ML

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

MASTER DRAWING

SHEET NO. 25

Perry's
STEAKHOUSE & GRILLE®

VERNON HILLS, IL 60061

1050 N MILWAUKEE AVE

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No	Date	Remarks
	04/19/23	PERMIT UPDATES
	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

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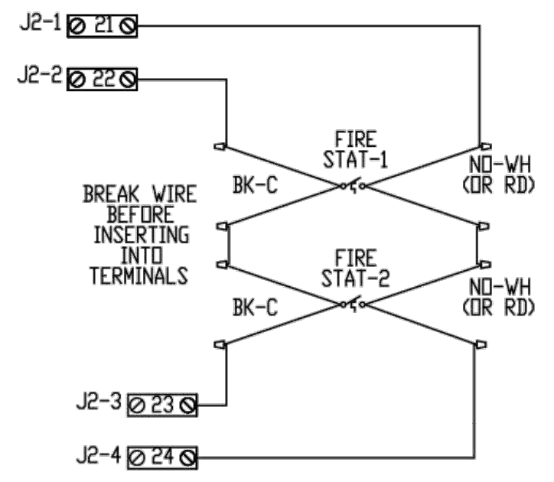
JOB NO	MODEL NUMBER	DRAWN BY	SCHEMATIC TYPE	DESCRIPTION OF OPERATION:
5539822	DCV-4011_MA4		INSTALL	Fire System #1 TANK FS - 4.0/4.0/4.0/4.0. Tank-based Fire Protection System equipped with Electronic Detection utilizing CORE board as a Listed Release Mechanism. Installed in Hood Utility Cabinet separate from prewire. Includes 12" box housing circuit board, batteries, and terminals for connection to main control panel.
	JOB NAME Perry's-Vernon Hills, IL_R1	DATE 7/6/2022	DWG NO ECP #1-8	

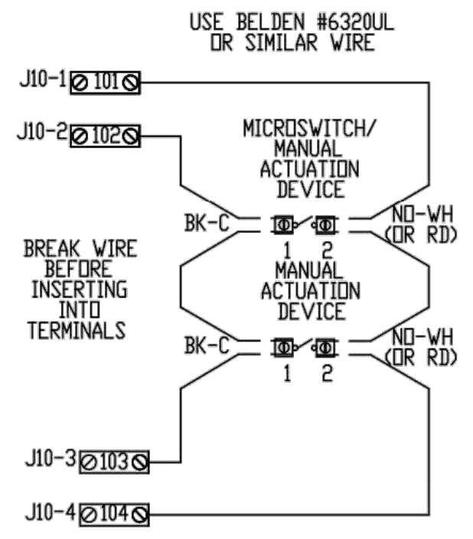
TANK PROTECTION LOW-VOLTAGE FIGURES

02/10/2021 Rev. 17

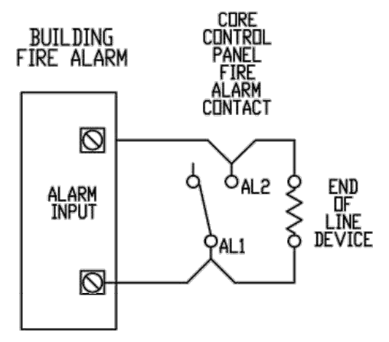
FS-1: SLAVE


J2-1 21
J2-2 22
J2-3 23
J2-4 24
FIRE STAT-1
FIRE STAT-2
BK-C
BK-C
NO-WH (OR RD)
NO-WH (OR RD)
BREAK WIRE BEFORE INSERTING INTO TERMINALS

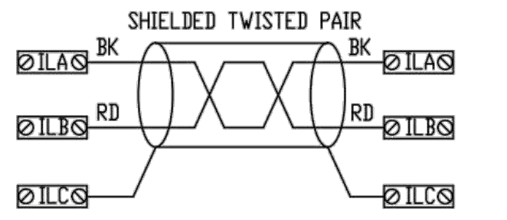
WIRING CONNECTIONS FOR FIRESTAT LOOP FIGURE 1


USE BELDEN #6320UL OR SIMILAR WIRE
J10-1 101
J10-2 102
J10-3 103
J10-4 104
MICROSWITCH/ MANUAL ACTUATION DEVICE
MANUAL ACTUATION DEVICE
BREAK WIRE BEFORE INSERTING INTO TERMINALS
BK-C
BK-C
1 2
1 2
NO-WH (OR RD)
NO-WH (OR RD)

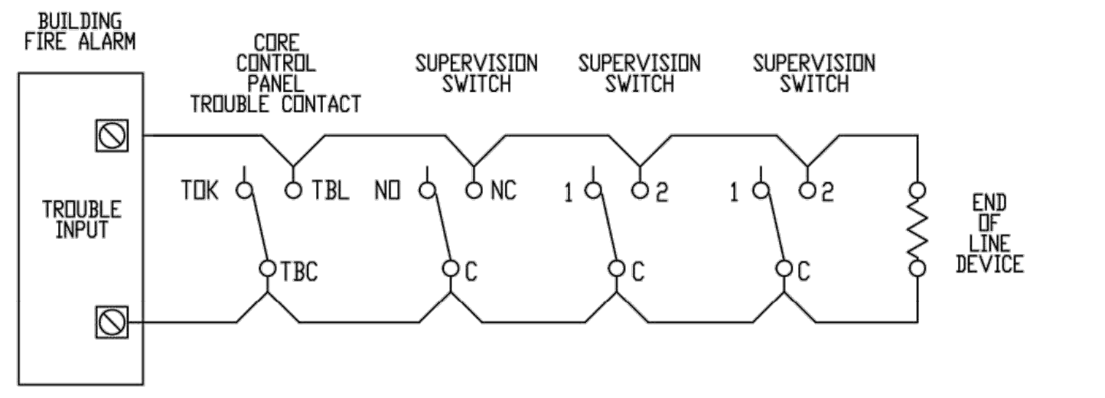
WIRING CONNECTIONS FOR MANUAL ACTUATION LOOP FIGURE 1A


BUILDING FIRE ALARM
CORE CONTROL PANEL FIRE ALARM CONTACT
ALARM INPUT
AL2
AL1
END OF LINE DEVICE

WIRING CONNECTIONS FOR FIRE ALARM CONTACT FIGURE 2


SHIELDED TWISTED PAIR
BK
BK
RD
RD
ILA
ILB
ILC
ILA
ILB
ILC

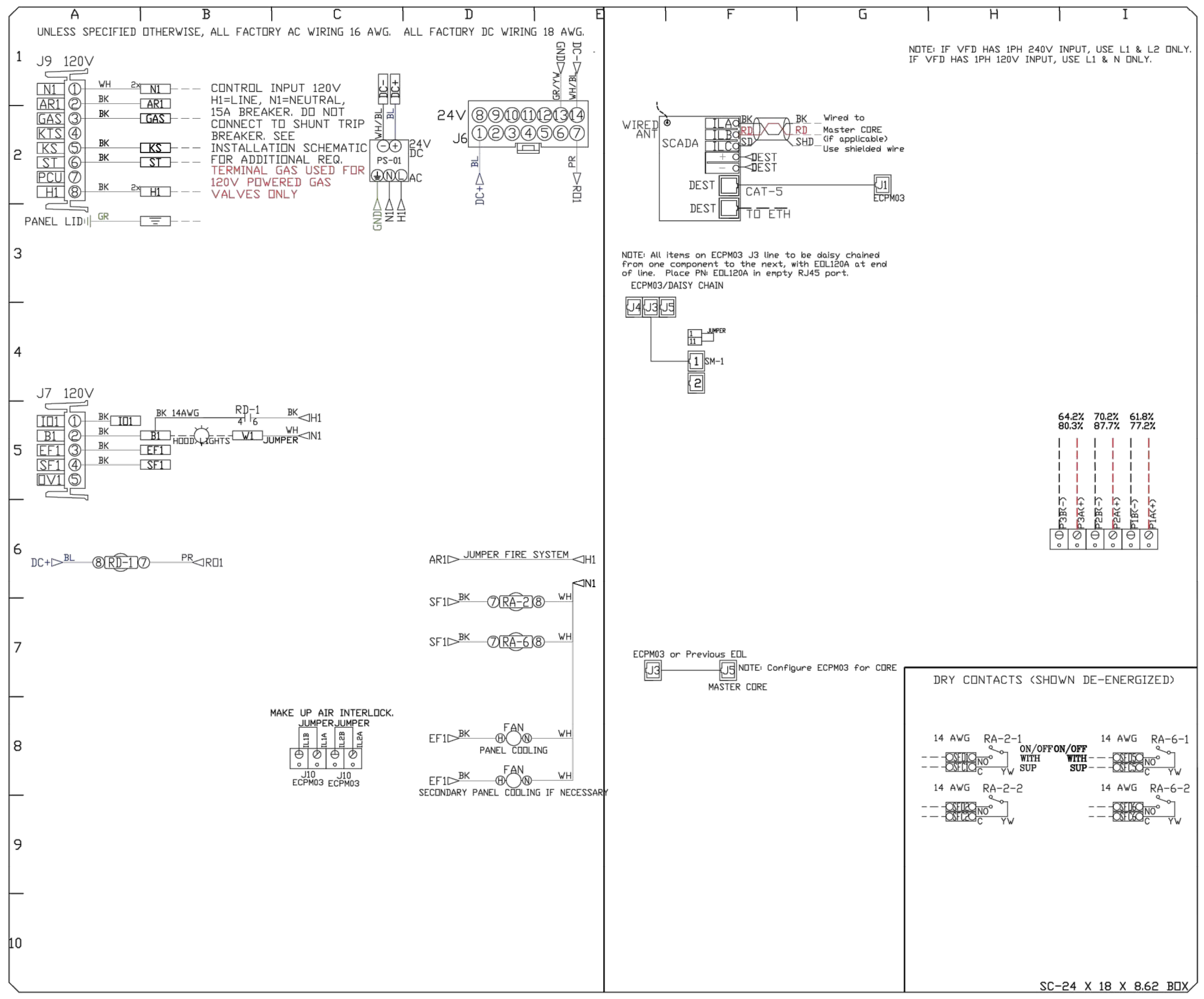
WIRING CONNECTIONS FOR CORE INTERLOCK FIGURE 3


BUILDING FIRE ALARM
CORE CONTROL PANEL TROUBLE CONTACT
SUPERVISION SWITCH
SUPERVISION SWITCH
SUPERVISION SWITCH
TROUBLE INPUT
TOK
TBL
TBC
NO
NC
C
1
2
C
1
2
C
END OF LINE DEVICE

WIRING CONNECTIONS FOR TROUBLE CONTACT FIGURE 4

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

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


A
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G
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2
3
4
5
6
7
8
9
10
UNLESS SPECIFIED OTHERWISE, ALL FACTORY AC WIRING 16 AWG. ALL FACTORY DC WIRING 18 AWG.
J9 120V
N1
AR1
GAS
KTS
KS
ST
PCU
H1
PANEL LID
WH
BK
GR
CONTROL INPUT 120V
H1=LINE, N1=NEUTRAL,
15A BREAKER. DO NOT CONNECT TO SHUNT TRIP BREAKER. SEE INSTALLATION SCHEMATIC FOR ADDITIONAL REQ.
TERMINAL GAS USED FOR 120V POWERED GAS VALVES ONLY
PS-01
24V DC
AC
GND
DC-
DC+
24V
J6
RO1
WIRED ANT
SCADA
Wired to Master CORE (if applicable) Use shielded wire
SHD
DEST
CAT-5
TO ETH
J1 ECPM03
NOTE: IF VFD HAS 1PH 240V INPUT, USE L1 & L2 ONLY. IF VFD HAS 1PH 120V INPUT, USE L1 & N ONLY.
NOTE: All items on ECPM03 J3 line to be daisy chained from one component to the next, with EOL120A at end of line. Place PN: EOL120A in empty RJ45 port.
ECPM03/DAISY CHAIN
J4
J3
J5
JUMPER
SM-1
64.2% 80.3%
70.2% 87.7%
61.8% 77.2%
P3B(-)
P3A(+)
P2B(-)
P2A(+)
P1B(-)
P1A(+)
J7 120V
IO1
B1
EF1
SF1
OV1
BK 14AWG
RD-1
HOOD LIGHTS
W1
JUMPER
DC+
RD-1
PR
RO1
AR1
JUMPER FIRE SYSTEM
SF1
RA-2
SF1
RA-6
MAKE UP AIR INTERLOCK.
JUMPER JUMPER
J10 ECPM03
J10 ECPM03
EF1
FAN
PANEL COOLING
EF1
FAN
SECONDARY PANEL COOLING IF NECESSARY
ECPM03 or Previous EOL
J3
J5
NOTE: Configure ECPM03 for CORE
MASTER CORE
DRY CONTACTS (SHOWN DE-ENERGIZED)
14 AWG RA-2-1
14 AWG RA-2-2
14 AWG RA-6-1
14 AWG RA-6-2
ON/OFF WITH SUP
ON/OFF WITH SUP
NO
C
YW
SC-24 X 18 X 8.62 BOX

FACTORY WIRING SCHEMATIC CIRCUIT BOARDS ECPM03

DCV Rev. 2.14.00

HMI Rev. 2.14.00

RA-x 120 VAC RELAY			RD-x 24 VDC RELAY		
NO	4	3	NO	4	3
NC	2	1	NC	2	1
COIL	8	7	COIL	8	7
COM	6	5	COM	6	5

COMPONENT LIST

LABEL	DESCRIPTION
ST-X	Starter varies
OL-X	Overload varies
C-X	Contactor varies
PS-1	Power Sup. 24VDC MDP18-24A-1C
RA-x	120V Relay DPDT 34.110.0184.0
RD-x	24VDC Light Relay 34.110.0188.0
TS-x	Duct Thermostat A/CP-PO-T4"-EXPL
SCADA	SCADA Module

LEGEND

- - - FIELD WIRING
—— FACTORY WIRING

BK- BLACK	YW- YELLOW
BL- BLUE	GY- GREY
BR- BROWN	PR- PURPLE
OR- ORANGE	RD- RED
WH- WHITE	
OR/BL- OR/BL STRIPE	
BL/RD- BL/RD STRIPE	
RD/GN- RD/GN STRIPE	
WH/BL- WH/BL STRIPE	

JOB NAME Perry's-Vernon H...

DRAWING TITLE DCV-4011_MA4

DESCRIPTION OF OPERATION
Demand Control Ventilation, w/ control for 4 Exhaust Fan, Exhaust on in Fire, Lights out in Fire, Fans modulate based on duct temperature. 4 Dry Contacts On/Off with Supply. INVERTER DUTY 3 PHASE MOTOR REQUIRED FOR USE WITH VFD. Room temperature sensor shipped loose for field installation.Verify distance between VFD and Motor; additional cost could apply if distance exceeds 50 feet

JOB NO 5539822

DRAWN BY

TYPE FACTORY

DATE 7/6/2022

DWG NO ECP #1-9

REVISIONS

	DESCRIPTION	DATE:
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△		
△		
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Perry's-Vernon Hills, IL_R1
VERNON HILLS, IL, 60061

DATE: 7/6/2022

DWG.#: 5539822

DRAWN BY: ML

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

MASTER DRAWING

SHEET NO. 26

VERNON HILLS, IL 60061

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	04/19/23	PERMIT UPDATES
	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERMIT/BID
	06/17/22	STEEL PACKAGE

REVISIONS

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Date

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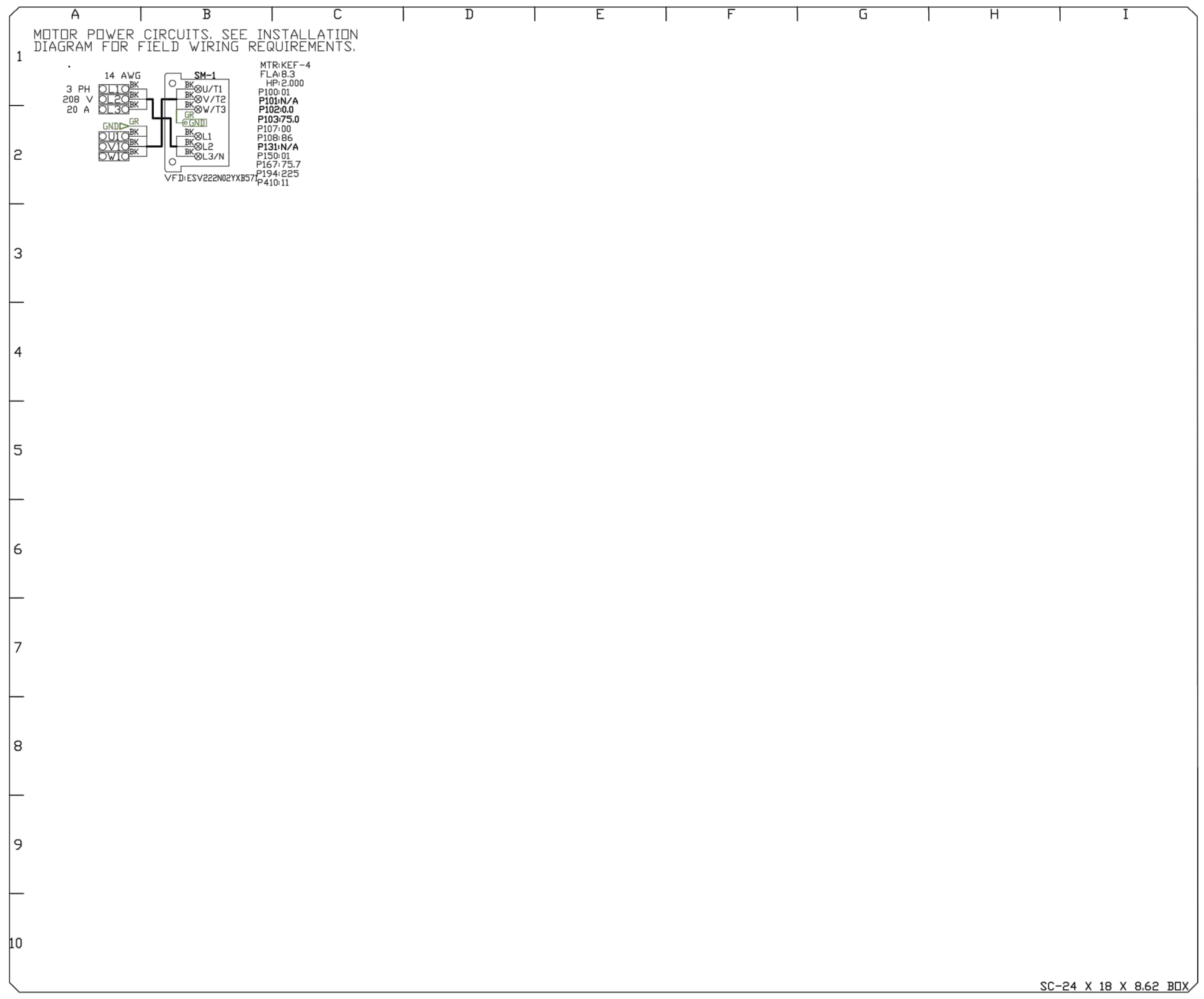
MOTOR POWER CIRCUITS. SEE INSTALLATION DIAGRAM FOR FIELD WIRING REQUIREMENTS.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14 AWG
3 PH
208 V
20 A
L1
L2
L3
GND
GR
U1
V1
W1
BK
SM-1
U/T1
V/T2
W/T3
GND
L1
L2
L3/N
VFD:ESV222N02YXB571
MTR:KEF-4
FLA:8.3
HP:2.000
P100:01
P101:N/A
P102:0.0
P103:75.0
P107:00
P108:86
P131:N/A
P150:01
P167:75.7
P194:225
P410:11
SC-24 X 18 X 8.62 BOX

FACTORY WIRING SCHEMATIC CIRCUIT BOARDS ECPM03
DCV Rev. 2.10.00
HMI Rev. 2.10.00

RA-x 120 VAC RELAY			RD-x 24 VDC RELAY		
NO	4	3	NO	4	3
NC	2	1	NC	2	1
COIL	8	7	COIL	8	7
COM	6	5	COM	6	5

COMPONENT LIST

LABEL	DESCRIPTION
ST-X	Starter varies
C-X	Contactor varies
SM-X	VFD varies
LR-X	Line/Load Reactor varies

LEGEND

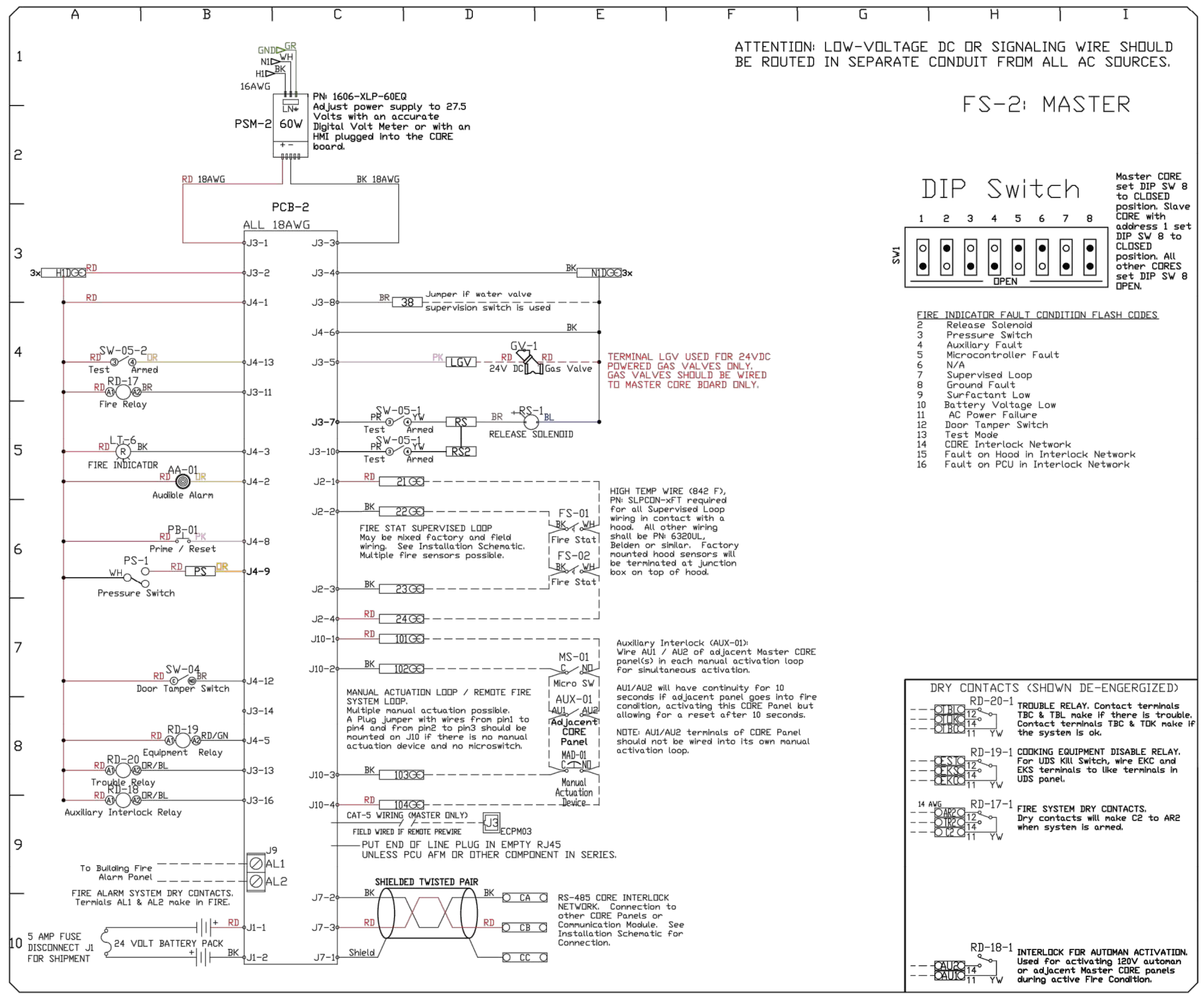
- – – – FIELD WIRING
- ——— FACTORY WIRING

BK- BLACK	YW- YELLOW
BL- BLUE	GY- GREY
BR- BROWN	PR- PURPLE
OR- ORANGE	RD- RED
WH- WHITE	
OR/BL- OR/BL STRIPE	
BL/RD- BL/RD STRIPE	
RD/GN- RD/GN STRIPE	
WH/BL- WH/BL STRIPE	

JOB NAME
Perry's-Vernon H...
DRAWING TITLE
DCV-4011_MA4
DESCRIPTION OF OPERATION
Demand Control Ventilation, w/ control for 4 Exhaust Fan, Exhaust on in Fire, Lights out in Fire, Fans modulate based on duct temperature. 4 Dry Contacts On/Off with Supply. INVERTER DUTY 3 PHASE MOTOR REQUIRED FOR USE WITH VFD. Room temperature sensor shipped loose for field installation.Verify distance between VFD and Motor; additional cost could apply if distance exceeds 50 feet.
JOB NO 5539822
DRAWN BY
TYPE FACTORY
DATE 7/6/2022
DWG NO ECP #1-10

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

FS-2: MASTER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8
9
10
GND
GR
N1
WH
H1
BK
16AWG
PSM-2
60W
RD 18AWG
BK 18AWG
PCB-2
ALL 18AWG
J3-1
J3-3
3x
H1
RD
J3-2
J3-4
N1
3x
J4-1
J3-8
BR
38
J4-6
SW-05-2
Test
Armed
OR
J4-13
J3-5
PK
LGV
GV-1
24V DC
Gas Valve
RD-17
A1
A2
Fire Relay
J3-11
J3-7
SW-05-1
PR
YW
Test
Armed
RS
RS-1
BL
RELEASE SOLENOID
J3-10
RS2
LT-6
R
FIRE INDICATOR
J4-3
AA-01
Audible Alarm
J4-2
J2-1
21
J2-2
22
FS-01
Fire Stat
FS-02
Fire Stat
PB-01
Prime / Reset
J4-8
PS-1
PS
Pressure Switch
J4-9
J2-3
23
J2-4
24
J10-1
101
J10-2
102
MS-01
C
NO
Micro SW
AUX-01
AU1
AU2
Adjacent CORE Panel
MAD-01
Manual Actuation Device
SW-04
Door Tamper Switch
J4-12
J3-14
RD-19
RD/GN
Equipment Relay
J4-5
RD-20
OR/BL
Trouble Relay
J3-13
RD-18
Auxiliary Interlock Relay
J3-16
J10-3
103
J10-4
104
CAT-5 WIRING (MASTER ONLY)
FIELD WIRED IF REMOTE PREWIRE
J3
ECPM03
J9
AL1
AL2
To Building Fire Alarm Panel
SHIELDED TWISTED PAIR
J7-2
CA
J7-3
CB
J7-1
Shield
CC
J1-1
J1-2
24 VOLT BATTERY PACK
5 AMP FUSE DISCONNECT J1 FOR SHIPMENT
DIP Switch
SW1
1
2
3
4
5
6
7
8
OPEN
RD-20-1
TBL
TOK
TBC
12
14
11
YW
RD-19-1
EST
EKS
EKC
14 AWG
RD-17-1
AR2
TR2
C2
RD-18-1
AU2
AU1

PN: 1606-XLP-60EQ
Adjust power supply to 27.5 Volts with an accurate Digital Volt Meter or with an HMI plugged into the CORE board.

Jumper if water valve supervision switch is used

TERMINAL LGV USED FOR 24VDC POWERED GAS VALVES ONLY. GAS VALVES SHOULD BE WIRED TO MASTER CORE BOARD ONLY.

FIRE STAT SUPERVISED LOOP
May be mixed factory and field wiring. See Installation Schematic. Multiple fire sensors possible.

HIGH TEMP WIRE (842 F), PN: SLPCON-xFT required for all Supervised Loop wiring in contact with a hood. All other wiring shall be PN: 6320UL, Belden or similar. Factory mounted hood sensors will be terminated at junction box on top of hood.

MANUAL ACTUATION LOOP / REMOTE FIRE SYSTEM LOOP.
Multiple manual actuation possible.
A Plug jumper with wires from pin1 to pin4 and from pin2 to pin3 should be mounted on J10 if there is no manual actuation device and no microswitch.

Auxiliary Interlock (AUX-01):
Wire AU1 / AU2 of adjacent Master CORE panel(s) in each manual activation loop for simultaneous activation.

AU1/AU2 will have continuity for 10 seconds if adjacent panel goes into fire condition, activating this CORE Panel but allowing for a reset after 10 seconds.

NOTE: AU1/AU2 terminals of CORE Panel should not be wired into its own manual activation loop.

PUT END OF LINE PLUG IN EMPTY RJ45 UNLESS PCU AFM OR OTHER COMPONENT IN SERIES.

FIRE ALARM SYSTEM DRY CONTACTS.
Termials AL1 & AL2 make in FIRE.

RS-485 CORE INTERLOCK NETWORK. Connection to other CORE Panels or Communication Module. See Installation Schematic for Connection.

Master CORE set DIP SW 8 to CLOSED position. Slave CORE with address 1 set DIP SW 8 to CLOSED position. All other CORES set DIP SW 8 OPEN.

FIRE INDICATOR FAULT CONDITION FLASH CODES

2	Release Solenoid
3	Pressure Switch
4	Auxiliary Fault
5	Microcontroller Fault
6	N/A
7	Supervised Loop
8	Ground Fault
9	Surfactant Low
10	Battery Voltage Low
11	AC Power Failure
12	Door Tamper Switch
13	Test Mode
14	CORE Interlock Network
15	Fault on Hood in Interlock Network
16	Fault on PCU in Interlock Network

DRY CONTACTS (SHOWN DE-ENGERGIZED)

RD-20-1 TROUBLE RELAY. Contact terminals TBC & TBL make if there is trouble. Contact terminals TBC & TOK make if the system is ok.

RD-19-1 COOKING EQUIPMENT DISABLE RELAY. For UDS Kill Switch, wire EKC and EKS terminals to like terminals in UDS panel.

RD-17-1 FIRE SYSTEM DRY CONTACTS. Dry contacts will make C2 to AR2 when system is armed.

RD-18-1 INTERLOCK FOR AUTOMAN ACTIVATION. Used for activating 120V automan or adjacent Master CORE panels during active Fire Condition.

FACTORY WIRING SCHEMATIC CORE FIRE PROTECTION

RA-x 120 VAC RELAY			RD-x 24 VDC RELAY		
NO	4	3	NO	4	3
NC	2	1	NC	2	1
COIL	8	7	COIL	8	7
COM	6	5	COM	6	5

COMPONENT LIST

LABEL	DESCRIPTION
MAD-01	MANUAL ACTIVATION DEVICE
PCB-2	CORE PCB PCBCORE-APP
PSM-2	CORE POWER SUPPLY 1606-XLP-50E
WS-x	Water Solenoid varies
LT-06	24V Red Ind. Light PNL-1163-0UR
LL-01	Surf. Level Sensor AQ5510
AA-01	Audible Alarm SCE120LA3FP1B
PB-01	Prime/Reset Switch D7-F2X11
SW-05	TEST/ARM Switch ZB5AD2
SW-04	Tamper Switch BZ-2RQ1-A2
SP-1	Surfactant Pump 50000-805
GV-1	24v DC Gas Valve varies
FS-XX	Duct Fire Sensor 12-F28021-000360
LT-05	24V YLW Ind. Light PNL-1163-0UY
PS-01	Remote Puill/Push Station STI-SS2431
PWS-01	24VDC Power Suppl 24VDC 18W POWER
RD-XX	24VDC Phoenix Relay PLC-RPT-24DC/21
PS	Pressure Switch EWC-PRESSURE

LEGEND

- – – – FIELD WIRING
- ——— FACTORY WIRING

BK- BLACK	YW- YELLOW
BL- BLUE	GY- GREY
BR- BROWN	PR- PURPLE
OR- ORANGE	RD- RED
WH- WHITE	GR- GREEN
OR/BL- OR/BL STRIPE	
BL/RD- BL/RD STRIPE	
RD/GN- RD/GN STRIPE	
WH/BL- WH/BL STRIPE	

JOB NAME
Perry's-Vernon H...
DRAWING TITLE
DCV-4011_MA4
DESCRIPTION OF OPERATION
Fire System #2 TANK FS - 4.0. Tank-based Fire Protection System equipped with Electronic Detection utilizing CORE board as a Listed Release Mechanism. Installed in Hood Utility Cabinet with integral hood prewire panel.
JOB NO 5539822
DRAWN BY
TYPE FACTORY
DATE 7/6/2022
DWG NO ECP #1-11

REVISIONS

	DESCRIPTION	DATE:
△		
△		
△		
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St. Louis Mechanical
2 City Place Drive, Suite #200, St. Louis, MO, 63141 PHONE: (636) 229-9777 EMAIL: reg109@captiveaire.com

Perry's-Vernon Hills, IL_R1
VERNON HILLS, IL, 60061

DATE: 7/6/2022

DWG.#:
5539822

DRAWN BY: ML

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

MASTER DRAWING

SHEET NO.
27

NOTE:

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FIELD VERIFICATION
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No	Date	Remarks
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	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERMIT/BID
	06/17/22	STEEL PACKAGE

REVISIONS

Drawing Title
CAPTIVEAIRE DRAWINGS

Job No.

Drawn

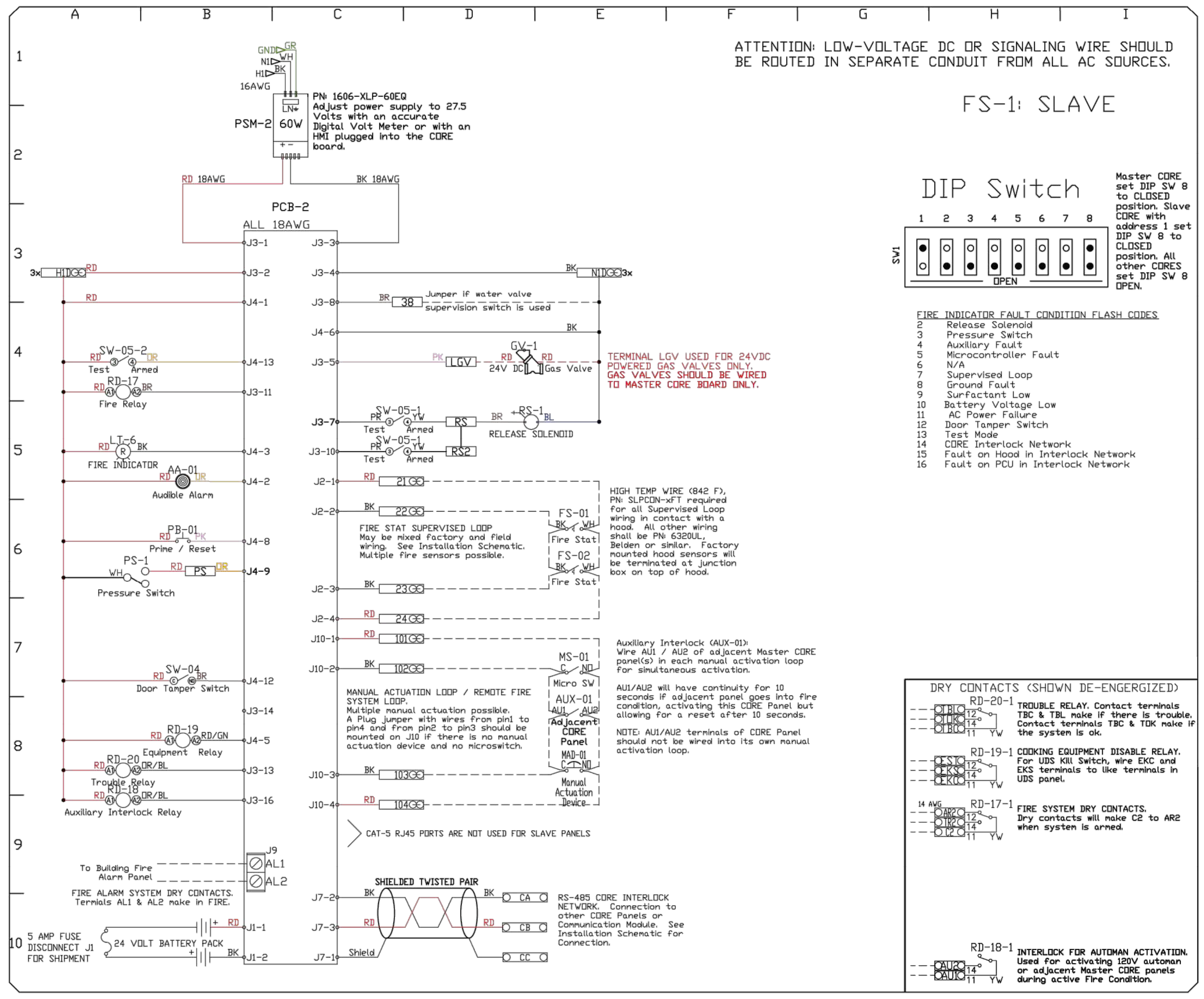
Scale
AS NOTED

Date

Sheet No.
M6.17

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

FS-1: SLAVE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GND GR
N1 WH
H1 BK
16AWG
LN
PSM-2 60W
RD 18AWG
BK 18AWG
PCB-2
ALL 18AWG
J3-1
J3-3
3x H1
N1 3x
RD
BK
BR
J3-2
J3-4
J4-1
J3-8
38
J4-6
J3-5
PK
LGV
GV-1
24V DC
Gas Valve
SW-05-2
Test
Armed
J4-13
RD-17
Fire Relay
J3-11
J3-7
SW-05-1
PR
YW
RS
RS-1
BL
RELEASE SOLENOID
J3-10
RS2
LT-6
FIRE INDICATOR
J4-3
AA-01
OR
Audible Alarm
J4-2
J2-1
21
J2-2
22
FS-01
WH
Fire Stat
FS-02
PB-01
Prime / Reset
J4-8
PS-1
PS
Pressure Switch
J4-9
J2-3
23
J2-4
24
J10-1
101
J10-2
102
MS-01
C
NO
Micro SW
AUX-01
AU1
AU2
Adjacent CORE Panel
MAD-01
Manual Actuation Device
SW-04
Door Tamper Switch
J4-12
J3-14
RD-19
RD/GN
Equipment Relay
J4-5
RD-20
OR/BL
Trouble Relay
J3-13
RD-18
Auxiliary Interlock Relay
J3-16
J10-3
103
J10-4
104
J9
AL1
AL2
To Building Fire Alarm Panel
SHIELDED TWISTED PAIR
J7-2
J7-3
J7-1
Shield
CA
CB
CC
J1-1
J1-2
24 VOLT BATTERY PACK
SW1
OPEN
14 AWG
TBL
TOK
TBC
EST
EKS
EKC
AR2
TR2
C2
AU2
AU1
12
14
11
YW

PN: 1606-XLP-60EQ
Adjust power supply to 27.5 Volts with an accurate Digital Volt Meter or with an HMI plugged into the CORE board.

Jumper if water valve supervision switch is used

TERMINAL LGV USED FOR 24VDC POWERED GAS VALVES ONLY. GAS VALVES SHOULD BE WIRED TO MASTER CORE BOARD ONLY.

FIRE STAT SUPERVISED LOOP
May be mixed factory and field wiring. See Installation Schematic. Multiple fire sensors possible.

HIGH TEMP WIRE (842 F), PN: SLPCON-xFT required for all Supervised Loop wiring in contact with a hood. All other wiring shall be PN: 6320UL, Belden or similar. Factory mounted hood sensors will be terminated at junction box on top of hood.

MANUAL ACTUATION LOOP / REMOTE FIRE SYSTEM LOOP.
Multiple manual actuation possible.
A Plug jumper with wires from pin1 to pin4 and from pin2 to pin3 should be mounted on J10 if there is no manual actuation device and no microswitch.

Auxiliary Interlock (AUX-01):
Wire AU1 / AU2 of adjacent Master CORE panel(s) in each manual activation loop for simultaneous activation.

AU1/AU2 will have continuity for 10 seconds if adjacent panel goes into fire condition, activating this CORE Panel but allowing for a reset after 10 seconds.

NOTE: AU1/AU2 terminals of CORE Panel should not be wired into its own manual activation loop.

CAT-5 RJ45 PORTS ARE NOT USED FOR SLAVE PANELS

FIRE ALARM SYSTEM DRY CONTACTS.
Termials AL1 & AL2 make in FIRE.

5 AMP FUSE DISCONNECT J1 FOR SHIPMENT

RS-485 CORE INTERLOCK NETWORK. Connection to other CORE Panels or Communication Module. See Installation Schematic for Connection.

DIP Switch

Master CORE set DIP SW 8 to CLOSED position. Slave CORE with address 1 set DIP SW 8 to CLOSED position. All other CORES set DIP SW 8 OPEN.

FIRE INDICATOR FAULT CONDITION FLASH CODES

2	Release Solenoid
3	Pressure Switch
4	Auxiliary Fault
5	Microcontroller Fault
6	N/A
7	Supervised Loop
8	Ground Fault
9	Surfactant Low
10	Battery Voltage Low
11	AC Power Failure
12	Door Tamper Switch
13	Test Mode
14	CORE Interlock Network
15	Fault on Hood in Interlock Network
16	Fault on PCU in Interlock Network

DRY CONTACTS (SHOWN DE-ENGERGIZED)

RD-20-1 TROUBLE RELAY. Contact terminals TBC & TBL make if there is trouble. Contact terminals TBC & TOK make if the system is ok.

RD-19-1 COOKING EQUIPMENT DISABLE RELAY. For UDS Kill Switch, wire EKC and EKS terminals to like terminals in UDS panel.

RD-17-1 FIRE SYSTEM DRY CONTACTS. Dry contacts will make C2 to AR2 when system is armed.

RD-18-1 INTERLOCK FOR AUTOMAN ACTIVATION. Used for activating 120V automan or adjacent Master CORE panels during active Fire Condition.

FACTORY WIRING SCHEMATIC CORE FIRE PROTECTION

RA-x 120 VAC RELAY			RD-x 24 VDC RELAY		
NO	4	3	NO	4	3
NC	2	1	NC	2	1
COIL	8	7	COIL	8	7
COM	6	5	COM	6	5

COMPONENT LIST

LABEL	DESCRIPTION
MAD-01	MANUAL ACTIVATION DEVICE
PCB-2	CORE PCB PCBCORE-APP
PSM-2	CORE POWER SUPPLY 1606-XLP-50E
WS-x	Water Solenoid varies
LT-06	24V Red Ind. Light PNL-1163-0UR
LL-01	Surf. Level Sensor AQ5510
AA-01	Audible Alarm SCE120LA3FP1B
PB-01	Prime/Reset Switch D7-F2X11
SW-05	TEST/ARM Switch ZB5AD2
SW-04	Tamper Switch BZ-2RQ1-A2
SP-1	Surfactant Pump 50000-805
GV-1	24v DC Gas Valve varies
FS-XX	Duct Fire Sensor 12-F28021-000360
LT-05	24V YLW Ind. Light PNL-1163-0UY
PS-01	Remote Puill/Push Station STI-SS2431
PWS-01	24VDC Power Suppl 24VDC 18W POWER
RD-XX	24VDC Phoenix Relay PLC-RPT-24DC/21
PS	Pressure Switch EWC-PRESSURE

LEGEND

- – – – FIELD WIRING
- ——— FACTORY WIRING

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BL- BLUE	GY- GREY
BR- BROWN	PR- PURPLE
OR- ORANGE	RD- RED
WH- WHITE	GR- GREEN
OR/BL- OR/BL STRIPE	
BL/RD- BL/RD STRIPE	
RD/GN- RD/GN STRIPE	
WH/BL- WH/BL STRIPE	

JOB NAME
Perry's-Vernon H...

DRAWING TITLE
DCV-4011_MA4

DESCRIPTION OF OPERATION
Fire System #1 TANK FS - 4.0/4.0/4.0/4.0. Tank-based Fire Protection System equipped with Electronic Detection utilizing CORE board as a Listed Release Mechanism. Installed in Hood Utility Cabinet separate from prewire. Includes 12" box housing circuit board, batteries, and terminals for connection to main control panel.

JOB NO	DRAWN BY
5539822	
TYPE	DATE
FACTORY	7/6/2022
DWG NO ECP #1-12	

REVISIONS

	DESCRIPTION	DATE:
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Perry's-Vernon Hills, IL_R1
VERNON HILLS, IL, 60061

DATE: 7/6/2022

DWG.#: 5539822

DRAWN BY: ML

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

MASTER DRAWING

SHEET NO. 28

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	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

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Job No.

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Date

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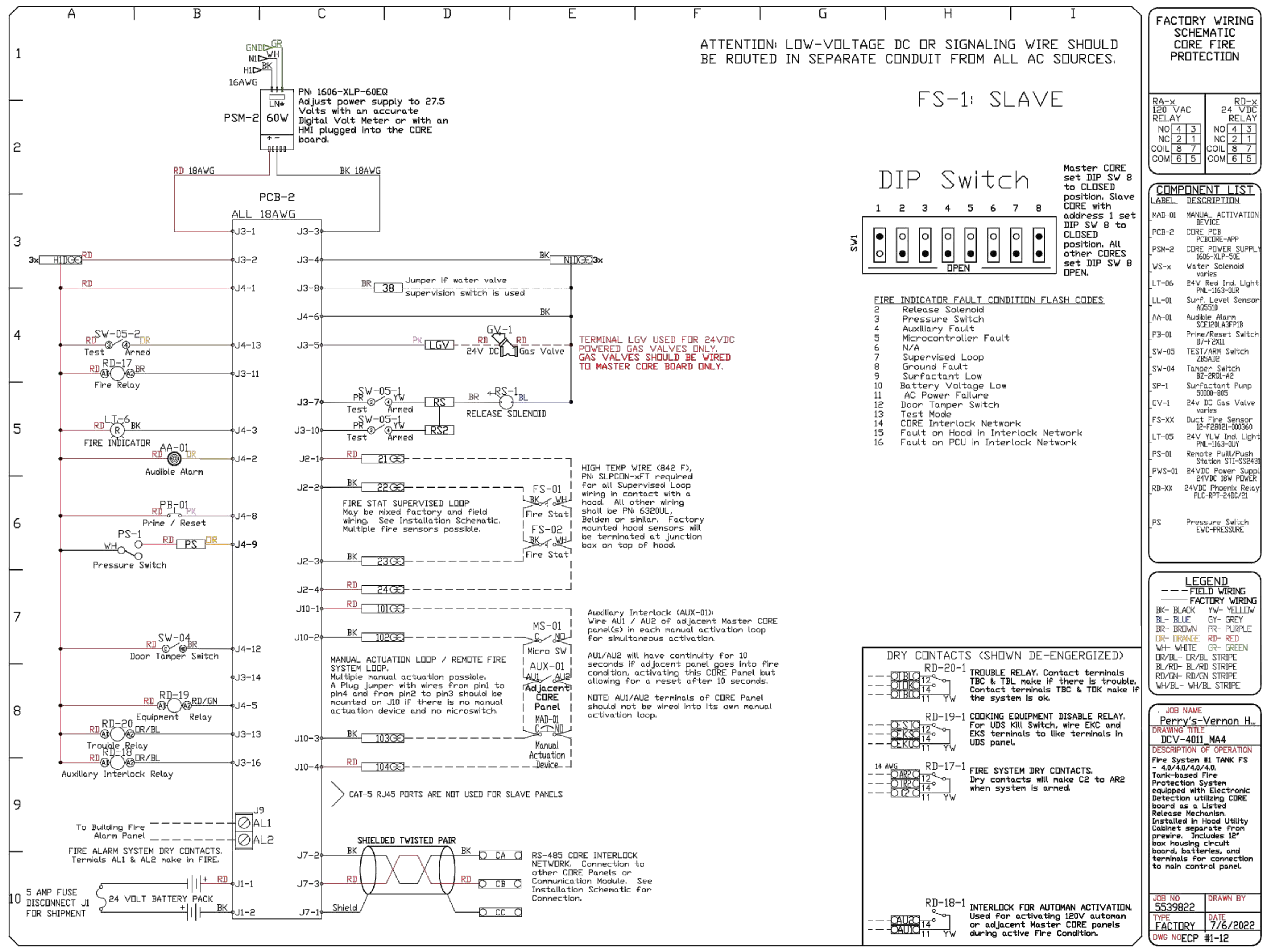
ATTENTION: LOW-VOLTAGE DC OR SIGNALING WIRE SHOULD BE ROUTED IN SEPARATE CONDUIT FROM ALL AC SOURCES.

FS-1: SLAVE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GND GR
N1 WH
H1 BK
16AWG
LN
PSM-2 60W
RD 18AWG
BK 18AWG
PCB-2
ALL 18AWG
J3-1
J3-2
J4-1
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3x H1
N1 3x
RD
BK
BR
PK
OR
YW
PR
BL
WH
RD/GN
OR/BL
SW-05-2
Test
Armed
RD-17
Fire Relay
LT-6
FIRE INDICATOR
AA-01
Audible Alarm
PB-01
Prime / Reset
PS-1
PS
Pressure Switch
SW-04
Door Tamper Switch
RD-19
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Trouble Relay
RD-18
Auxiliary Interlock Relay
J9
AL1
AL2
To Building Fire Alarm Panel
FIRE ALARM SYSTEM DRY CONTACTS. Termials AL1 & AL2 make in FIRE.
5 AMP FUSE DISCONNECT J1 FOR SHIPMENT
24 VOLT BATTERY PACK
38
Jumper if water valve supervision switch is used
LGV
GV-1
24V DC
Gas Valve
SW-05-1
RS
RS2
RS-1
RELEASE SOLENOID
21
22
23
24
101
102
103
104
FS-01
Fire Stat
FS-02
Fire Stat
MS-01
C
NO
Micro SW
AUX-01
AU1
AU2
Adjacent CORE Panel
MAD-01
Manual Actuation Device
SHIELDED TWISTED PAIR
Shield
CA
CB
CC
SW1
OPEN
1
2
3
4
5
6
7
8
TBL
TOK
TBC
EST
EKS
EKC
AR2
TR2
C2
AU2
AU1
12
14
11
YW
14 AWG
RD-20-1
RD-19-1
RD-17-1
RD-18-1

PN: 1606-XLP-60EQ
Adjust power supply to 27.5 Volts with an accurate Digital Volt Meter or with an HMI plugged into the CORE board.

TERMINAL LGV USED FOR 24VDC POWERED GAS VALVES ONLY.
GAS VALVES SHOULD BE WIRED TO MASTER CORE BOARD ONLY.

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May be mixed factory and field wiring. See Installation Schematic. Multiple fire sensors possible.

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CAT-5 RJ45 PORTS ARE NOT USED FOR SLAVE PANELS

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DIP Switch

Master CORE set DIP SW 8 to CLOSED position. Slave CORE with address 1 set DIP SW 8 to CLOSED position. All other CORES set DIP SW 8 OPEN.

FIRE INDICATOR FAULT CONDITION FLASH CODES

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SP-1	Surfactant Pump 50000-805
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PS	Pressure Switch EWC-PRESSURE

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OR- ORANGE	RD- RED
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OR/BL- OR/BL STRIPE	
BL/RD- BL/RD STRIPE	
RD/GN- RD/GN STRIPE	
WH/BL- WH/BL STRIPE	

JOB NAME
Perry's-Vernon H...
DRAWING TITLE
DCV-4011_MA4
DESCRIPTION OF OPERATION
Fire System #1 TANK FS - 4.0/4.0/4.0/4.0. Tank-based Fire Protection System equipped with Electronic Detection utilizing CORE board as a Listed Release Mechanism. Installed in Hood Utility Cabinet separate from prewire. Includes 12" box housing circuit board, batteries, and terminals for connection to main control panel.
JOB NO 5539822
DRAWN BY
TYPE FACTORY
DATE 7/6/2022
DWG NO ECP #1-12

REVISIONS

	DESCRIPTION	DATE:
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△		
△		
△		

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St. Louis Mechanical
2 City Place Drive, Suite #200, St. Louis, MO, 63141 PHONE: (636) 229-9777 EMAIL: reg109@captiveaire.com

Perry's-Vernon Hills, IL_R1
VERNON HILLS, IL, 60061

DATE: 7/6/2022
DWG.#: 5539822
DRAWN BY: ML
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 28

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Perry's
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VERNON HILLS, IL 60061
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	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

REVISIONS

Drawing Title
CAPTIVEAIRE DRAWINGS

Job No.
Drawn ---
Scale AS NOTED
Date

Sheet No.
M6.19

DEMAND CONTROL VENTILATION HOOD CONTROL PANEL SPECIFICATIONS:

- CONTROLS SHALL BE LISTED BY ETL (UL 508A) AND SHALL COMPLY WITH DEMAND VENTILATION SYSTEM TURNDOWN REQUIREMENTS OUTLINED IN IECC 403.2.8 (2015).

- THE CONTROL ENCLOSURE SHALL BE NEMA 1 RATED AND LISTED FOR INSTALLATION INSIDE OF THE EXHAUST HOOD UTILITY CABINET. THE CONTROL ENCLOSURE MAY BE CONSTRUCTED OF STAINLESS STEEL OR PAINTED STEEL.

- TEMPERATURE PROBE(S) LOCATED IN THE EXHAUST DUCT RISER(S) SHALL BE CONSTRUCTED OF STAINLESS STEEL.

- A DIGITAL CONTROLLER SHALL BE PROVIDED TO ACTIVATE THE HOOD EXHAUST FANS DYNAMICALLY BASED ON A FIXED DIFFERENTIAL BETWEEN THE AMBIENT AND DUCT TEMPERATURES SENSORS. THIS FUNCTION SHALL MEET THE REQUIREMENTS OF IMC 507.1.1.

- A DIGITAL CONTROLLER SHALL PROVIDE ADJUSTABLE HYSTERESIS SETTINGS TO PREVENT CYCLING OF THE FANS AFTER THE COOKING APPLIANCES HAVE BEEN TURNED OFF AND/OR THE HEAT IN THE EXHAUST SYSTEM IS REDUCED.

- A DIGITAL CONTROLLER SHALL PROVIDE AN ADJUSTABLE MINIMUM FAN RUN-TIME SETTING TO PREVENT FAN CYCLING.

- VARIABLE FREQUENCY DRIVES (VFDS) SHALL BE PROVIDED FOR FANS AS REQUIRED. THE DIGITAL CONTROLLER SHALL MODULATE THE VFDS BETWEEN A MINIMUM SETPOINT AND A MAXIMUM SETPOINT ON DEMAND. THE DUCT TEMPERATURE SENSOR INPUT(S) TO THE DIGITAL CONTROLLER SHALL BE USED TO CALCULATE THE SPEED REFERENCE SIGNAL.

- THE VFD SPEED RANGE OF OPERATION SHALL BE FROM 0% TO 100% FOR THE SYSTEM, WITH THE ACTUAL MINIMUM SPEED SET AS REQUIRED TO MEET MINIMUM VENTILATION REQUIREMENTS.

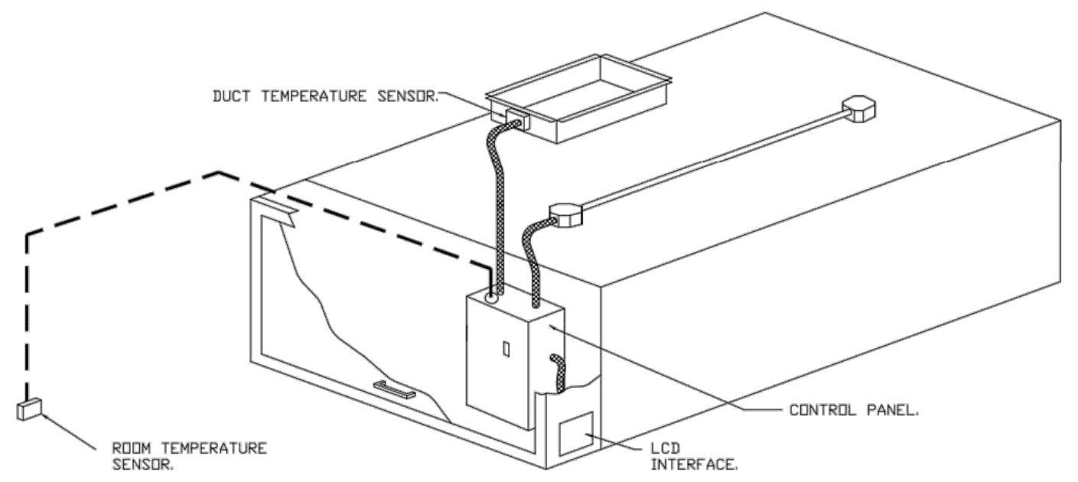
- AN INTERNAL ALGORITHM TO THE DIGITAL CONTROLLER SHALL MODULATE SUPPLY FAN VFD SPEED PROPORTIONAL TO ALL EXHAUST FANS THAT ARE LOCATED IN THE SAME FAN GROUP AS THE SUPPLY FAN.

- THE SYSTEM SHALL OPERATE IN PREP MODE DURING LIGHT COOKING LOAD OR COOL DOWN MODE WHEN SUFFICIENT HEAT REMAINS UNDERNEATH THE HOOD SYSTEM AFTER COOKING OPERATIONS HAVE COMPLETED. OPERATION DURING EITHER OF THESE PERIODS WILL DISABLE THE SUPPLY FANS AND PROVIDE AN EXHAUST FAN SPEED THAT IS EQUAL TO THE MINIMUM VENTILATION REQUIREMENT.

- A DIGITAL CONTROLLER SHALL DISABLE THE SUPPLY FAN(S), ACTIVATE THE EXHAUST FAN(S), ACTIVATE THE APPLIANCE SHUNT TRIP, AND DISABLE AN ELECTRIC GAS VALVE AUTOMATICALLY WHEN FIRE CONDITION IS DETECTED ON A COVERED HOOD.

- A DIGITAL CONTROLLER SHALL ALLOW FOR EXTERNAL BMS FAN CONTROL VIA DRY CONTACT (EXTERNAL CONTROL SHALL NOT OVERRIDE FAN OPERATION LOGIC AS REQUIRED BY CODE).

- AN LCD INTERFACE SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
  A. ON/OFF PUSH BUTTON FAN & LIGHT SWITCH ACTIVATION.
  B. INTEGRATED GAS VALVE RESET FOR ELECTRONIC GAS VALVES (NO RESET RELAY REQUIRED).
  C. VFD FAULT DISPLAY WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  D. DUCT TEMPERATURE SENSOR FAILURE DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  E. MIS-WIRED DUCT TEMPERATURE SENSOR DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  F. A SINGLE LOW VOLTAGE CAT-5 RJ45 WIRING CONNECTION.
  G. AN ENERGY SAVINGS INDICATOR THAT UTILIZES MEASURED KWH FROM THE VFDS.



TYPICAL HOOD CONTROL PANEL INSTALLATION

SEQUENCE OF OPERATIONS:

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

- AUTOMATIC: THE SYSTEM OPERATES BASED ON THE DIFFERENTIAL BETWEEN ROOM TEMPERATURE AND THE TEMPERATURE AT THE HOOD CAVITY OR EXHAUST DUCT COLLAR. FANS ACTIVATE AT A CONFIGURABLE TEMPERATURE DIFFERENTIAL THRESHOLD. DEPENDING ON THE JOB CONFIGURATION EACH FAN ZONE CAN BE CONFIGURED AS STATIC OR DYNAMIC. THESE TERMS REFER TO WHETHER A VARIABLE MOTOR (SUCH AS EC MOTORS OR VFD DRIVEN MOTORS) MODULATE WITH TEMPERATURE. IF THE PANEL IS EQUIPPED WITH VARIABLE SPEED FANS AND THE ZONE IS DEFINED AS "DYNAMIC", THESE WILL MODULATE WITHIN A USER-DEFINED RANGE BASED ON THE TEMPERATURE DIFFERENTIAL. PANELS EQUIPPED WITH VARIABLE SPEED FANS AND A FAN ZONE DEFINED AS "STATIC", FANS WILL RUN AT A SET SPEED CALCULATED FOR THE DRIVE. DEMAND CONTROL VENTILATION SYSTEMS ARE CAPABLE OF MODULATING EXHAUST AND MAKE UP AIR FAN SPEEDS PER THE REQUIREMENTS OUTLINED IN IECC 403.2.8.

- MANUAL: THE SYSTEM OPERATES BASED ON HUMAN INPUT FROM AN HMI.

- SCHEDULE: A WEEKLY SCHEDULE CAN BE SET TO RUN FANS FOR A SPECIFIED PERIOD THROUGHOUT THE DAY. THERE ARE THREE OCCUPIED TIMES PER DAY TO ALLOW FOR THE USER TO SET UP A TIME THAT IS SUITABLE TO THEIR NEEDS. ANY TIME THAT IS WITHIN THE DEFINED OCCUPIED TIME, THE SYSTEM WILL RUN AT MODULATION MODE AND FOLLOW THE FAN PROCEDURE ALGORITHM BASED ON TEMPERATURE DURING THIS TIME. DURING UNOCCUPIED TIME, THE SYSTEM WILL HAVE AN EXTRA OFFSET TO PREVENT UNINTENDED ACTIVATION OF THE SYSTEM DURING A TIME WHERE THE SYSTEM IS NOT BEING OCCUPIED.

- OTHER: THE SYSTEM OPERATES BASED ON THE INPUT FROM AN EXTERNAL SOURCE (DDC, BMS OR HARD-WIRED INTERLOCK).

- FIRE: UPON ACTIVATION OF THE HOOD FIRE SUPPRESSION SYSTEM, THE EXHAUST FAN WILL COME ON OR CONTINUE TO TO RUN, THE HOOD MAKEUP AIR WILL SHUTDOWN, AND A SIGNAL WILL BE SENT FOR ACTIVATING THE SHUNT TRIP BREAKER PROVIDED BY THE ELECTRICIAN. FUEL GAS WILL SHUT OFF VIA A MECHANICAL/ELECTRICAL GAS VALVE ACTUATED BY THE HOOD FIRE SUPPRESSION SYSTEM.

REVISIONS		
	DESCRIPTION	DATE:
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Perry's-Vernon Hills, IL_R1
VERNON HILLS, IL, 60061

DATE: 7/6/2022
DWG.#: 5539822
DRAWN BY: ML
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 29

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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DATE: 7/6/2022
DWG.#: 5539822
DRAWN BY: ML
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 30

NOTE:

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

VERNON HILLS, IL 60061

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STEAKHOUSE & GRILLE ®

1050 N MILWAUKEE AVE

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

No	Date	Remarks
	04/19/23	PERMIT UPDATES
	04/04/23	PERMIT UPDATES
	02/23/23	PERMIT COMMENTS
	11/17/22	ISSUED FOR PERIMT/BID
	06/17/22	STEEL PACKAGE

REVISIONS

Drawing Title
CAPTIVEAIRE DRAWINGS

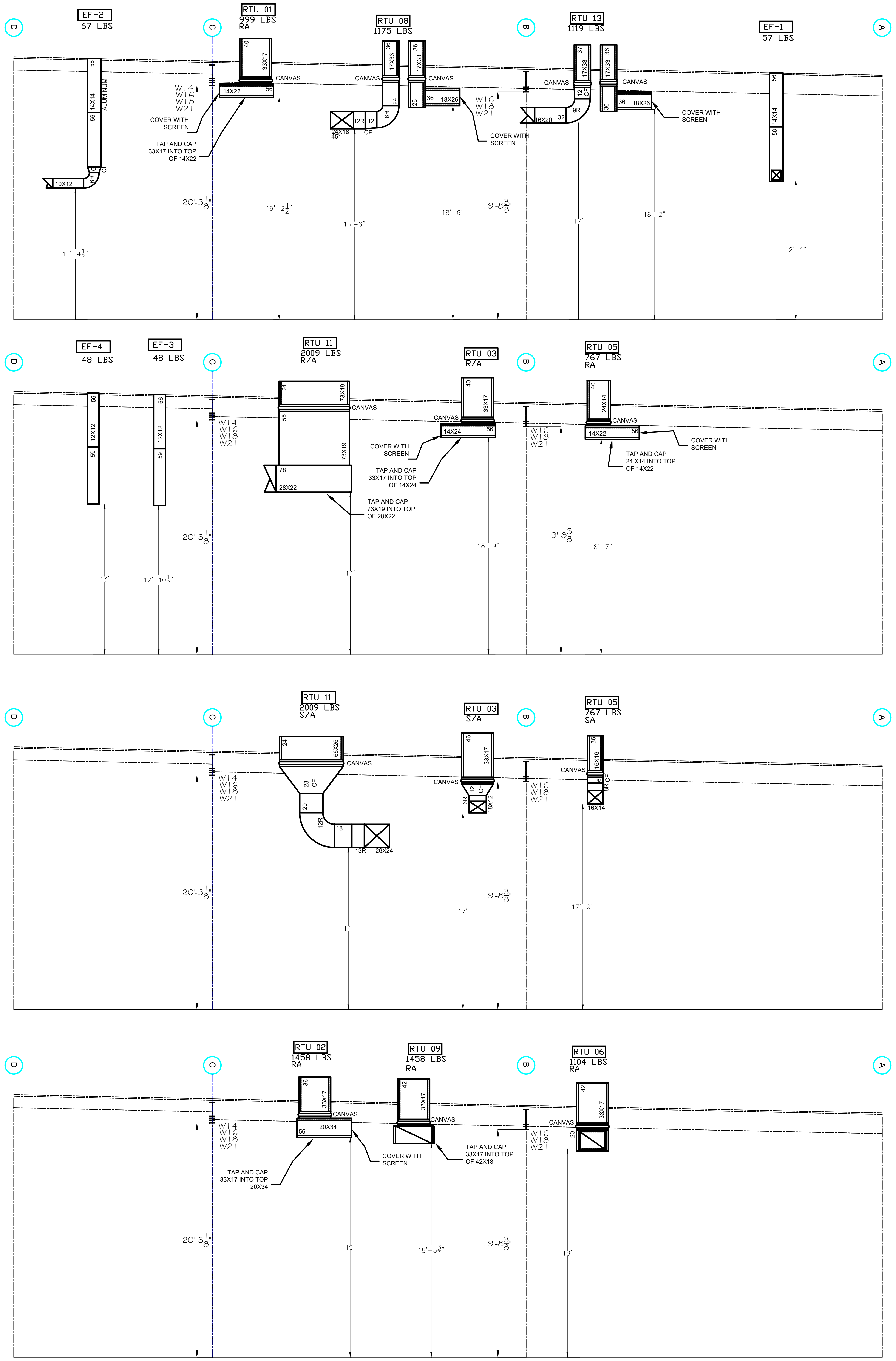
Job No.

Drawn
- - -

Scale
AS NOTED

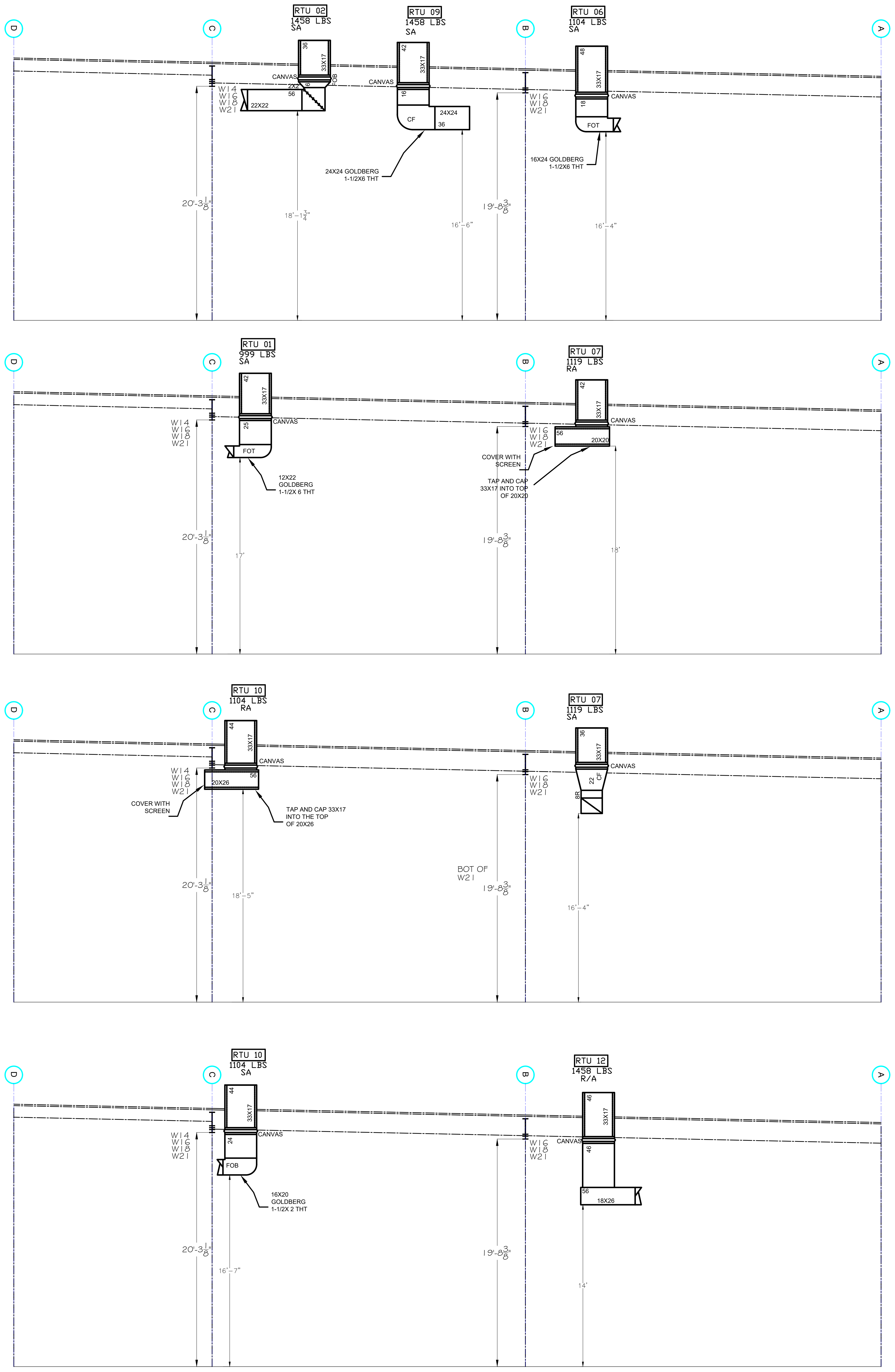
Date

Sheet No.
M6.20


EF-2
67 LBS
RTU 01
999 LBS
RA
RTU 08
1175 LBS
RTU 13
1119 LBS
EF-1
57 LBS
ALUMINUM
14X14
10X12
6R
CF
33X17
14X22
CANVAS
W14
W16
W18
W21
COVER WITH SCREEN
TAP AND CAP 33X17 INTO TOP OF 14X22
17X33
24X18 45°
12R
CF
6R
18X26
16X20
9R
20'-3 1/8"
19'-2 1/2"
16'-6"
18'-6"
19'-8 3/8"
17'
18'-2"
12'-1"
11'-4 1/2"
EF-4
48 LBS
EF-3
48 LBS
RTU 11
2009 LBS
R/A
RTU 03
R/A
RTU 05
767 LBS
RA
12X12
73X19
28X22
14X24
24X14
TAP AND CAP 33X17 INTO TOP OF 14X24
TAP AND CAP 73X19 INTO TOP OF 28X22
TAP AND CAP 24 X14 INTO TOP OF 14X22
13'
12'-10 1/2"
14'
18'-9"
18'-7"
RTU 11
2009 LBS
S/A
RTU 03
S/A
RTU 05
767 LBS
SA
66X26
16X16
18X12
16X14
26X24
13R
12R
17'
17'-9"
RTU 02
1458 LBS
RA
RTU 09
1458 LBS
RA
RTU 06
1104 LBS
RA
20X34
TAP AND CAP 33X17 INTO TOP 20X34
TAP AND CAP 33X17 INTO TOP OF 42X18
19'
18'-5 3/4"
18'

LOOKING NORTH

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


RTU 02
1458 LBS
SA
RTU 09
1458 LBS
SA
RTU 06
1104 LBS
SA
CANVAS
FOB
22X22
24X24
CF
FOT
24X24 GOLDBERG 1-1/2X6 THT
16X24 GOLDBERG 1-1/2X6 THT
W14
W16
W18
W21
20'-3 1/8"
18'-1 3/4"
16'-6"
19'-8 3/8"
16'-4"
RTU 01
999 LBS
SA
RTU 07
1119 LBS
RA
12X22 GOLDBERG 1-1/2X 6 THT
20X20
COVER WITH SCREEN
TAP AND CAP 33X17 INTO TOP OF 20X20
17'
18'
RTU 10
1104 LBS
RA
RTU 07
1119 LBS
SA
20X26
TAP AND CAP 33X17 INTO THE TOP OF 20X26
BOT OF W21
18'-5"
16'-4"
RTU 10
1104 LBS
SA
RTU 12
1458 LBS
R/A
16X20 GOLDBERG 1-1/2X 2 THT
18X26
16'-7"
14'

LOOKING NORTH

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

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MARK	DATE	DESCRIPTION
2	6.06.23	FOR CONSTRUCTION
1	3.24.23	FOR COORDINATION

PROJECT NO: ----
CAD DWG FILE: M1.0 FOR CONSTRUCTION 6.06.23.DWG
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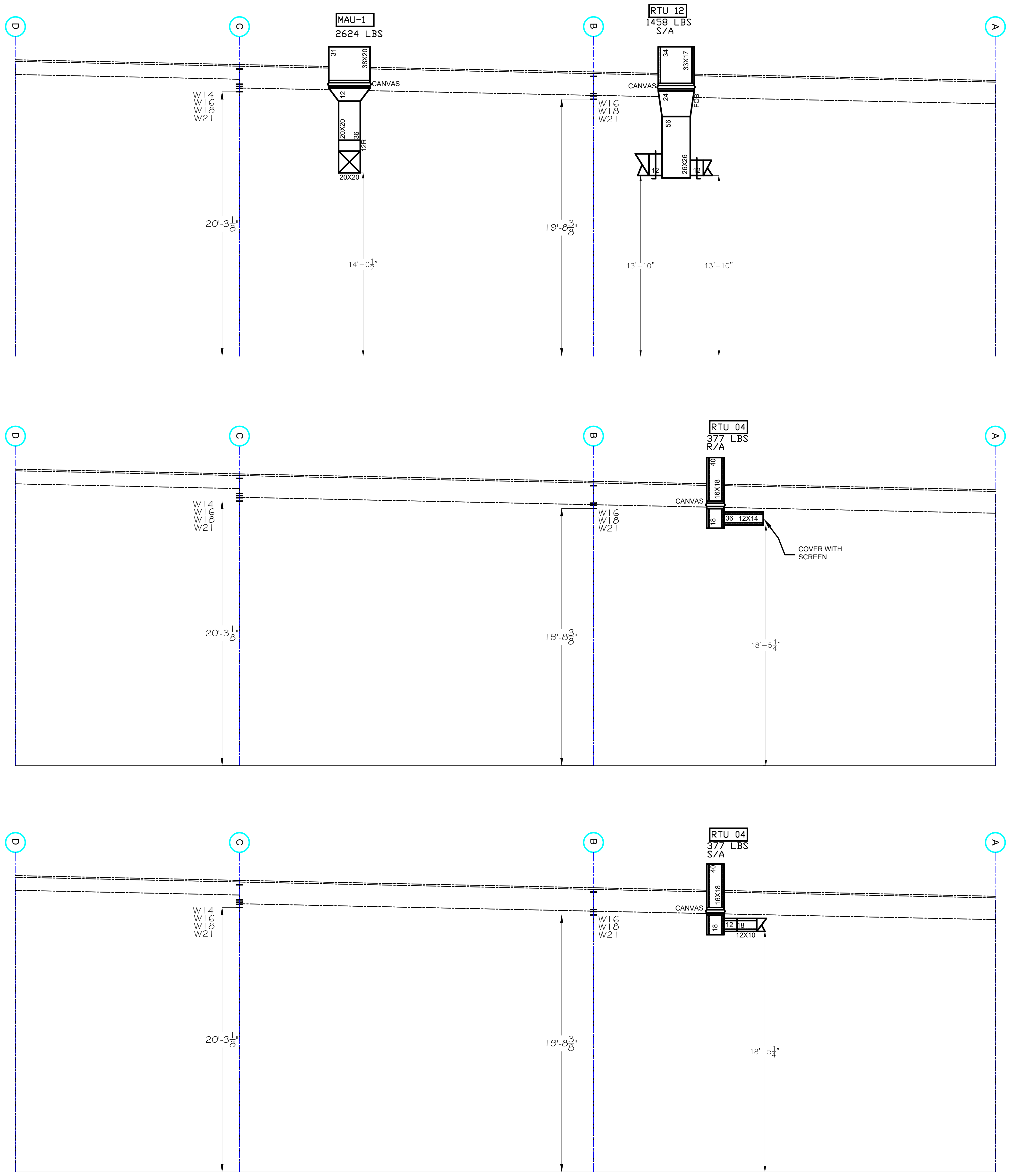
SHEET TITLE

ELEVATIONS

M1.1

SHEET SHEET INDEX OF TOTAL SHEETS


D
C
B
A
MAU-1
2624 LBS
31
38X20
CANVAS
12
20X20
36
12R
20X20
W14
W16
W18
W21
20'-3 1/8"
14'-0 1/2"
19'-8 3/8"
RTU 12
1458 LBS
S/A
34
33X17
CANVAS
24
FOB
56
26X26
12
12
13'-10"
13'-10"
RTU 04
377 LBS
R/A
40
16X18
CANVAS
18
36 12X14
COVER WITH SCREEN
18'-5 1/4"
RTU 04
377 LBS
S/A
40
16X18
CANVAS
18
12 18
12X10
18'-5 1/4"

LOOKING NORTH

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

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1	3.24.23	FOR COORDINATION

PROJECT NO: ----
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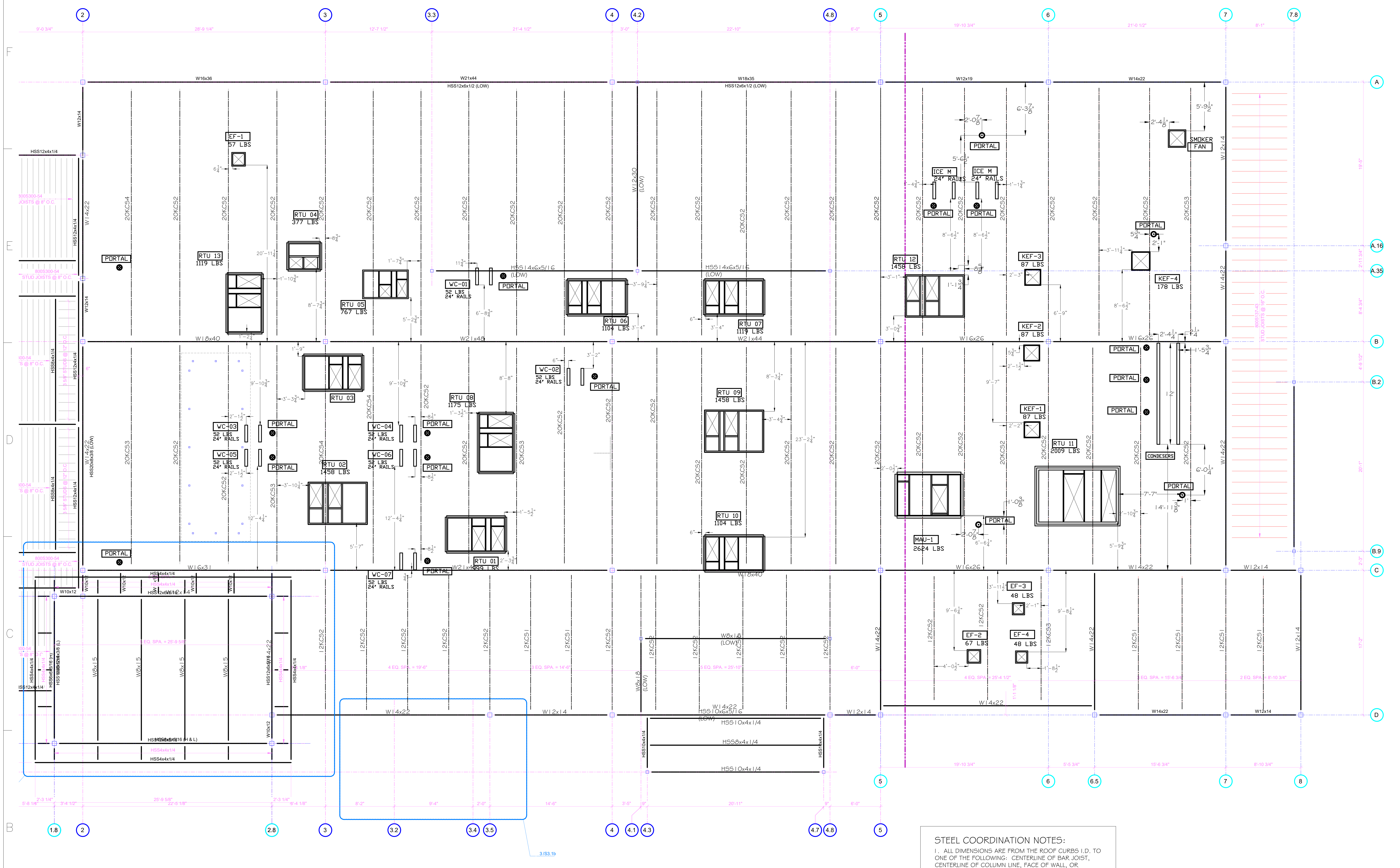
SHEET TITLE

ELEVATIONS

M1.2

SHEET SHEET INDEX OF TOTAL SHEETS



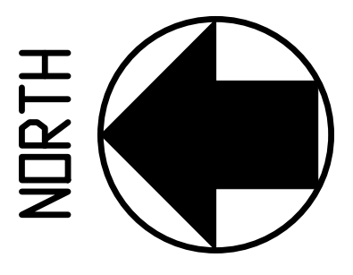
RTU 01
RTU 02 1458 LBS
RTU 03
RTU 04 377 LBS
RTU 05 767 LBS
RTU 06 1104 LBS
RTU 07 1119 LBS
RTU 08 1175 LBS
RTU 09 1458 LBS
RTU 10 1104 LBS
RTU 11 2009 LBS
RTU 12 1458 LBS
RTU 13 1119 LBS
EF-1 57 LBS
EF-2 67 LBS
EF-3 48 LBS
EF-4 48 LBS
KEF-1 87 LBS
KEF-2 87 LBS
KEF-3 87 LBS
KEF-4 178 LBS
WC-01 52 LBS 24" RAILS
WC-02 52 LBS 24" RAILS
WC-03 52 LBS 24" RAILS
WC-04 52 LBS 24" RAILS
WC-05 52 LBS 24" RAILS
WC-06 52 LBS 24" RAILS
WC-07 52 LBS 24" RAILS
ICE M 24" RAILS
MAU-1 2624 LBS
SMOKER FAN
CONDESERS
PORTAL
W16x36
W21x44
W18x35
W12x19
W14x22
W18x40
W21x48
W16x26
W16x31
W21x44
W12x14
HSS12x6x1/2 (LOW)
HSS14x6x5/16
HSS10x6x5/16
HSS10x4x1/4
HSS8x4x1/4
20KCS2
20KCS3
20KCS4
12KCS1
12KCS2
12KCS3
W12x30 (LOW)
W8x15
W8x18 (LOW)
A
A.16
A.35
B
B.2
B.9
C
D
1.8
2
2.8
3
3.2
3.3
3.4
3.5
4
4.1
4.2
4.3
4.7
4.8
5
6
6.5
7
7.8
8
3/S3.1b

STEEL COORDINATION NOTES:

1. ALL DIMENSIONS ARE FROM THE ROOF CURBS I.D. TO ONE OF THE FOLLOWING: CENTERLINE OF BAR JOIST, CENTERLINE OF COLUMN LINE, FACE OF WALL, OR CURB I.D.

2. THE AREA OF DECK THAT WILL BE REMOVED FOR DUCT DROP PENETRATION IS NOTED BY THE "X". THIS AREA IS ALSO DIMENSIONED.

3. THESE LOCATIONS REFLECT THE LOCATIONS OF THE UNITS AS SHOWN ON THE DESIGN MECHANICAL DRAWINGS. THESE LOCATIONS MAY NOT ALWAYS REFLECT THE SAME LOCATIONS AS SHOWN ON THE DESIGN STRUCTURAL DRAWINGS.



STEEL COORDINATION

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

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MARK	DATE	DESCRIPTION
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1	3.24.23	FOR COORDINATION

PROJECT NO: ----
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SHEET TITLE
STEEL
COORDINATION

M2.0
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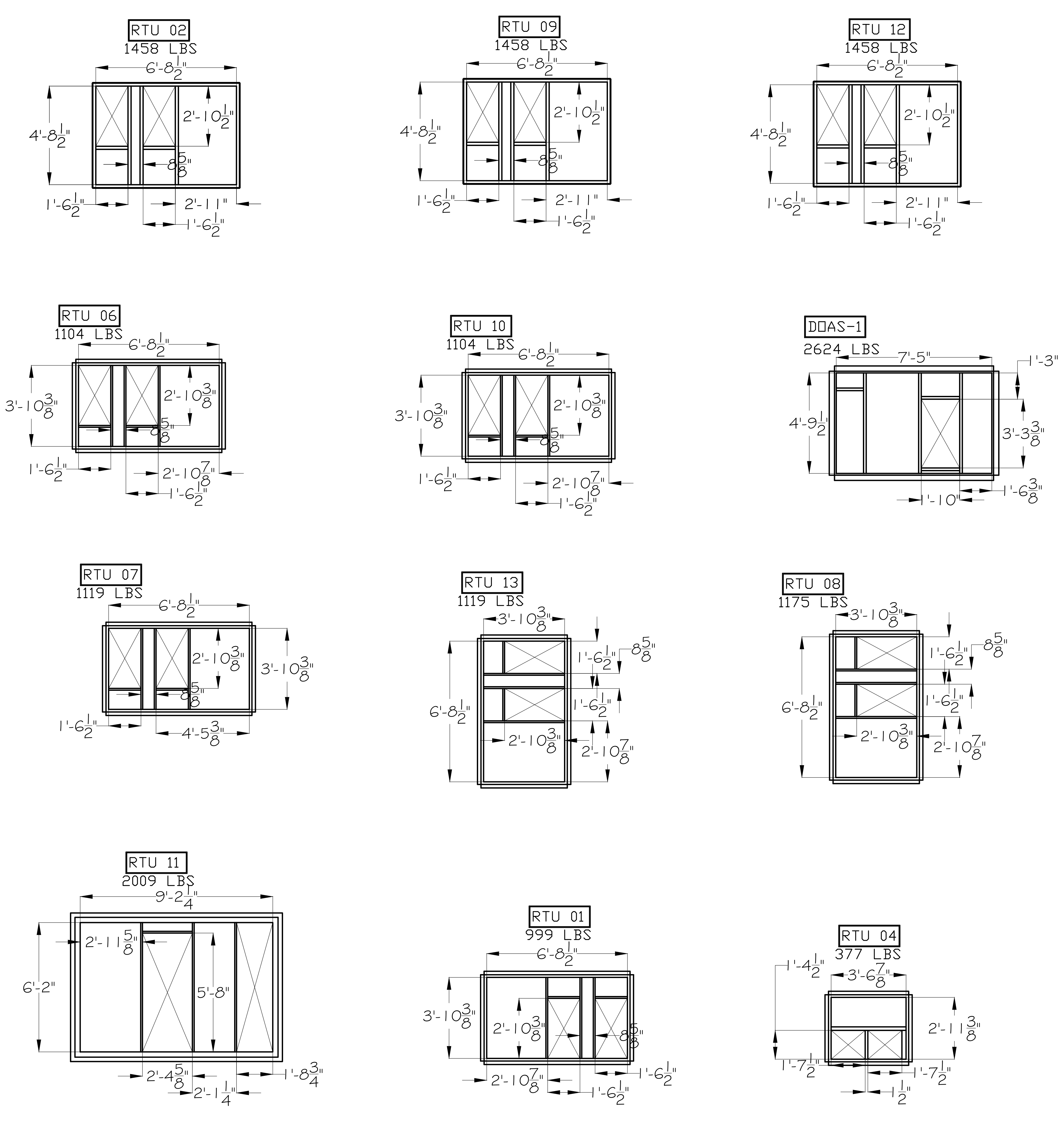
RTU 02
1458 LBS
6'-8 1/2"
4'-8 1/2"
2'-10 1/2"
8 5/8"
1'-6 1/2"
2'-11"
1'-6 1/2"
RTU 09
1458 LBS
6'-8 1/2"
4'-8 1/2"
2'-10 1/2"
8 5/8"
1'-6 1/2"
2'-11"
1'-6 1/2"
RTU 12
1458 LBS
6'-8 1/2"
4'-8 1/2"
2'-10 1/2"
8 5/8"
1'-6 1/2"
2'-11"
1'-6 1/2"
RTU 06
1104 LBS
6'-8 1/2"
3'-10 3/8"
2'-10 3/8"
8 5/8"
1'-6 1/2"
2'-10 7/8"
1'-6 1/2"
RTU 10
1104 LBS
6'-8 1/2"
3'-10 3/8"
2'-10 3/8"
8 5/8"
1'-6 1/2"
2'-10 7/8"
1'-6 1/2"
DOAS-1
2624 LBS
7'-5"
1'-3"
4'-9 1/2"
3'-3 3/8"
1'-10"
1'-6 3/8"
RTU 07
1119 LBS
6'-8 1/2"
2'-10 3/8"
3'-10 3/8"
8 5/8"
1'-6 1/2"
4'-5 3/8"
RTU 13
1119 LBS
3'-10 3/8"
1'-6 1/2"
8 5/8"
6'-8 1/2"
1'-6 1/2"
2'-10 3/8"
2'-10 7/8"
RTU 08
1175 LBS
3'-10 3/8"
1'-6 1/2"
8 5/8"
6'-8 1/2"
1'-6 1/2"
2'-10 3/8"
2'-10 7/8"
RTU 11
2009 LBS
9'-2 1/4"
2'-11 5/8"
6'-2"
5'-8"
2'-4 5/8"
2'-1 1/4"
1'-8 3/4"
RTU 01
999 LBS
6'-8 1/2"
3'-10 3/8"
2'-10 3/8"
8 5/8"
2'-10 7/8"
1'-6 1/2"
1'-6 1/2"
RTU 04
377 LBS
1'-4 1/2"
3'-6 7/8"
2'-11 3/8"
1'-7 1/2"
1'-7 1/2"
1/2"

STEEL COORDINATION NOTES:

1. ALL DIMENSIONS ARE FROM THE ROOF CURBS I.D. TO ONE OF THE FOLLOWING: CENTERLINE OF BAR JOIST, CENTERLINE OF COLUMN LINE, FACE OF WALL, OR CURB I.D.

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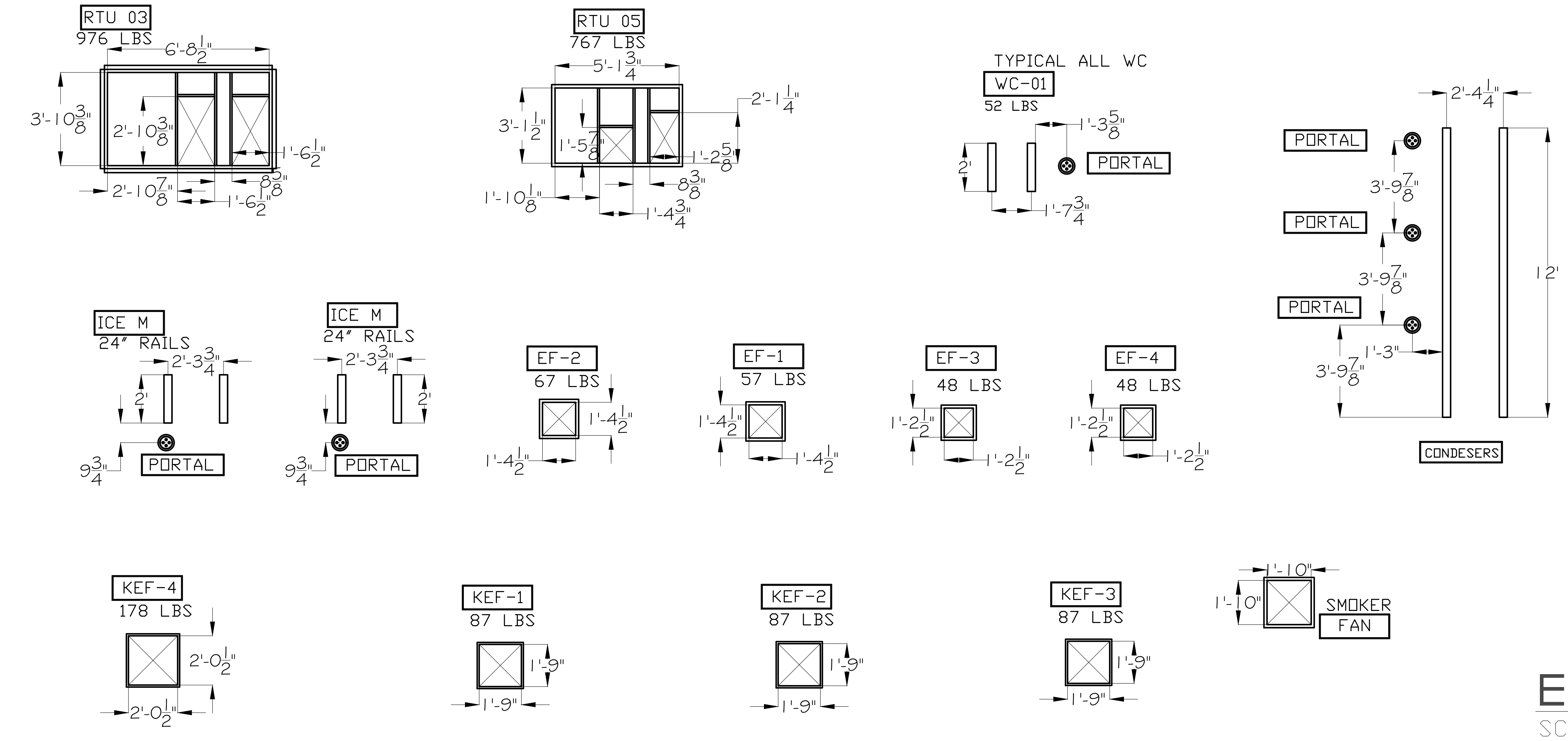
RTU 03
976 LBS
6'-8 1/2"
3'-10 3/8"
2'-10 3/8"
1'-6 1/2"
2'-10 7/8"
8 5/8"
1'-6 1/2"
RTU 05
767 LBS
5'-1 3/4"
2'-1 1/4"
3'-1 1/2"
1'-5 7/8"
1'-2 5/8"
8 3/8"
1'-10 1/8"
1'-4 3/4"
TYPICAL ALL WC
WC-01
52 LBS
1'-3 5/8"
2'
PORTAL
1'-7 3/4"
2'-4 1/4"
PORTAL
3'-9 7/8"
PORTAL
3'-9 7/8"
12'
PORTAL
1'-3"
3'-9 7/8"
CONDESERS
ICE M
24" RAILS
2'-3 3/4"
2'
9 3/4"
PORTAL
ICE M
24" RAILS
2'-3 3/4"
2'
9 3/4"
PORTAL
EF-2
67 LBS
1'-4 1/2"
1'-4 1/2"
EF-1
57 LBS
1'-4 1/2"
1'-4 1/2"
EF-3
48 LBS
1'-2 1/2"
1'-2 1/2"
EF-4
48 LBS
1'-2 1/2"
1'-2 1/2"
KEF-4
178 LBS
2'-0 1/2"
2'-0 1/2"
KEF-1
87 LBS
1'-9"
1'-9"
KEF-2
87 LBS
1'-9"
1'-9"
KEF-3
87 LBS
1'-9"
1'-9"
1'-10"
1'-10"
SMOKER FAN

ENLARGED CURB DETAILS

SCALE: 3/8" = 1'-0"

DRAFTING AND DETAILING

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MARK	DATE	DESCRIPTION
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1	3.24.23	FOR COORDINATION

PROJECT NO: ----
CAD DWG FILE: M2.0 STEEL COORDINATION FOR CONSTRUCTION 6.06.23.DWG
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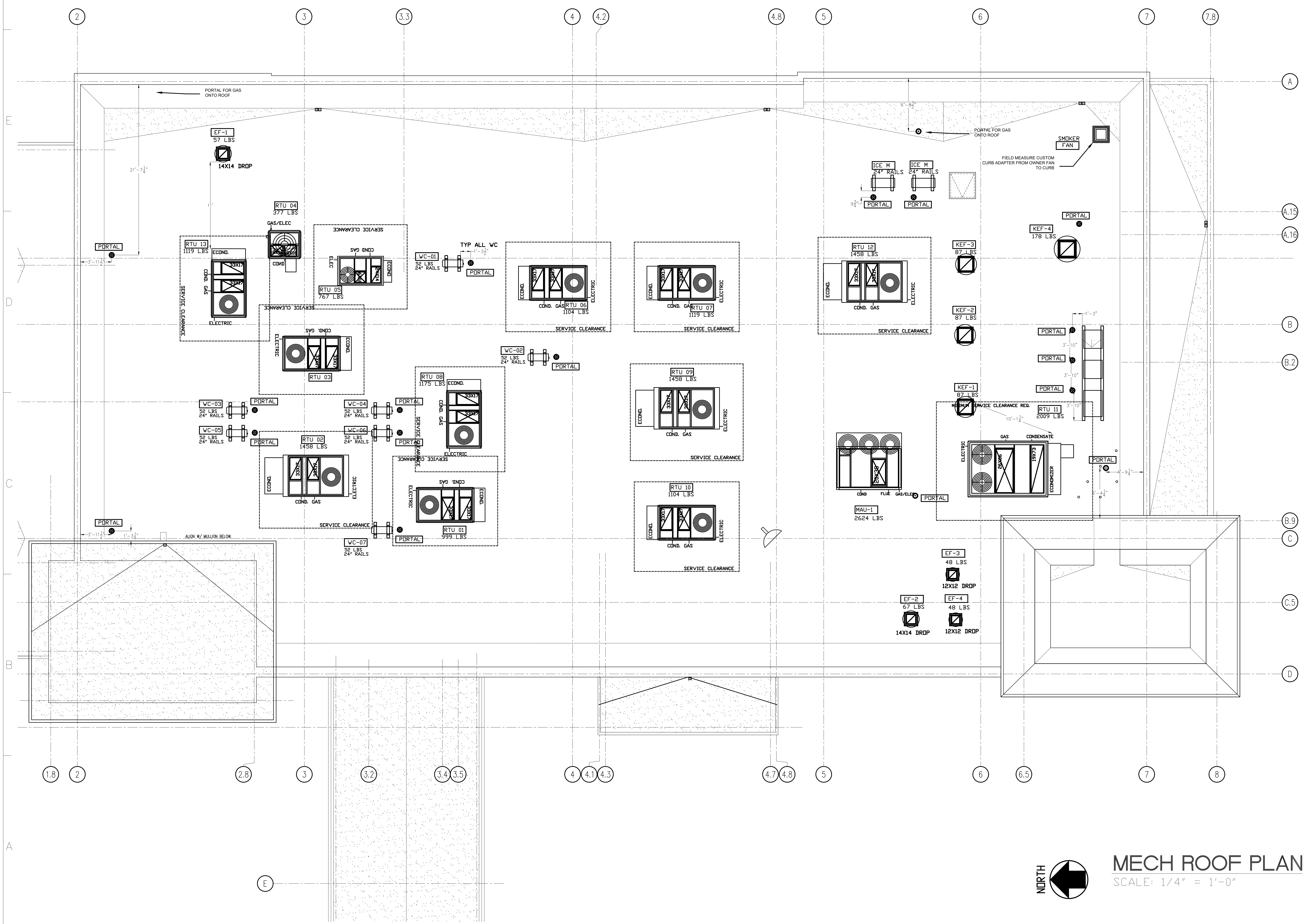
SHEET TITLE
ENLARGED CURB DETAILS

M2.1
SHEET SHEET INDEX OF TOTAL SHEETS



2
3
3.3
4
4.2
4.8
5
6
7
7.8
A
A.15
A.16
B
B.2
B.9
C
C.5
D
1.8
2.8
3.2
3.4
3.5
4.1
4.3
4.7
6.5
8
E
PORTAL FOR GAS ONTO ROOF
21'-7 3/4"
EF-1
57 LBS
14X14 DROP
RTU 04
377 LBS
GAS/ELEC
COND
RTU 13
1119 LBS
ECONO.
33X17
COND. GAS
ELECTRIC
SERVICE CLEARANCE
PORTAL
3'-11 1/2"
RTU 05
767 LBS
ELEC
COND GAS
ECONO.
WC-01
52 LBS
24" RAILS
TYP ALL WC
1'-3 1/2"
PORTAL
RTU 03
RTU 06
1104 LBS
COND. GAS
ELECTRIC
RTU 07
1119 LBS
WC-02
52 LBS
24" RAILS
PORTAL
RTU 08
1175 LBS
WC-03
WC-04
WC-05
WC-06
WC-07
52 LBS
24" RAILS
RTU 02
1458 LBS
RTU 01
999 LBS
RTU 09
1458 LBS
RTU 10
1104 LBS
SERVICE CLEARANCE
ALIGN W/ MULLION BELOW
6'-8 1/2"
PORTAL FOR GAS ONTO ROOF
SMOKER FAN
FIELD MEASURE CUSTOM CURB ADAPTER FROM OWNER FAN TO CURB
ICE M
24" RAILS
9 3/4"
PORTAL
RTU 12
1458 LBS
KEF-3
87 LBS
KEF-4
178 LBS
KEF-2
87 LBS
KEF-1
87 LBS
1'-3"
3'-10"
MINIMUM SERVICE CLEARANCE REQ.
RTU 11
2009 LBS
10'-1 1/4"
GAS
CONDENSATE
ELECTRIC
26X66
19X73
ECONOMIZER
4'-9 1/4"
6'-4 1/4"
MAU-1
2624 LBS
COND
FLUE
GAS/ELEC
EF-3
48 LBS
12X12 DROP
EF-2
67 LBS
14X14 DROP
EF-4
48 LBS
12X12 DROP
NORTH

MECH ROOF PLAN

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

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WOLF MECHANICAL DRAFTING SERVICES
Bartlett, IL
847-980-0578

PERRY'S STEAKHOUSE
122 HAWTHORN CENTER
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BARTLETT, IL
OFFICE 847-697-9600
FAX 847-697-9400

MARK	DATE	DESCRIPTION
2	6.06.23	FOR CONSTRUCTION
1	3.24.23	FOR COORDINATION

PROJECT NO: ----
CAD DWG FILE: M3.0 MECH ROOF PLAN FOR CONSTRUCTION 6.06.23.DWG
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SHEET TITLE

MECHANICAL
ROOF PLAN

M3.0
SHEET SHEET INDEX OF TOTAL SHEETS