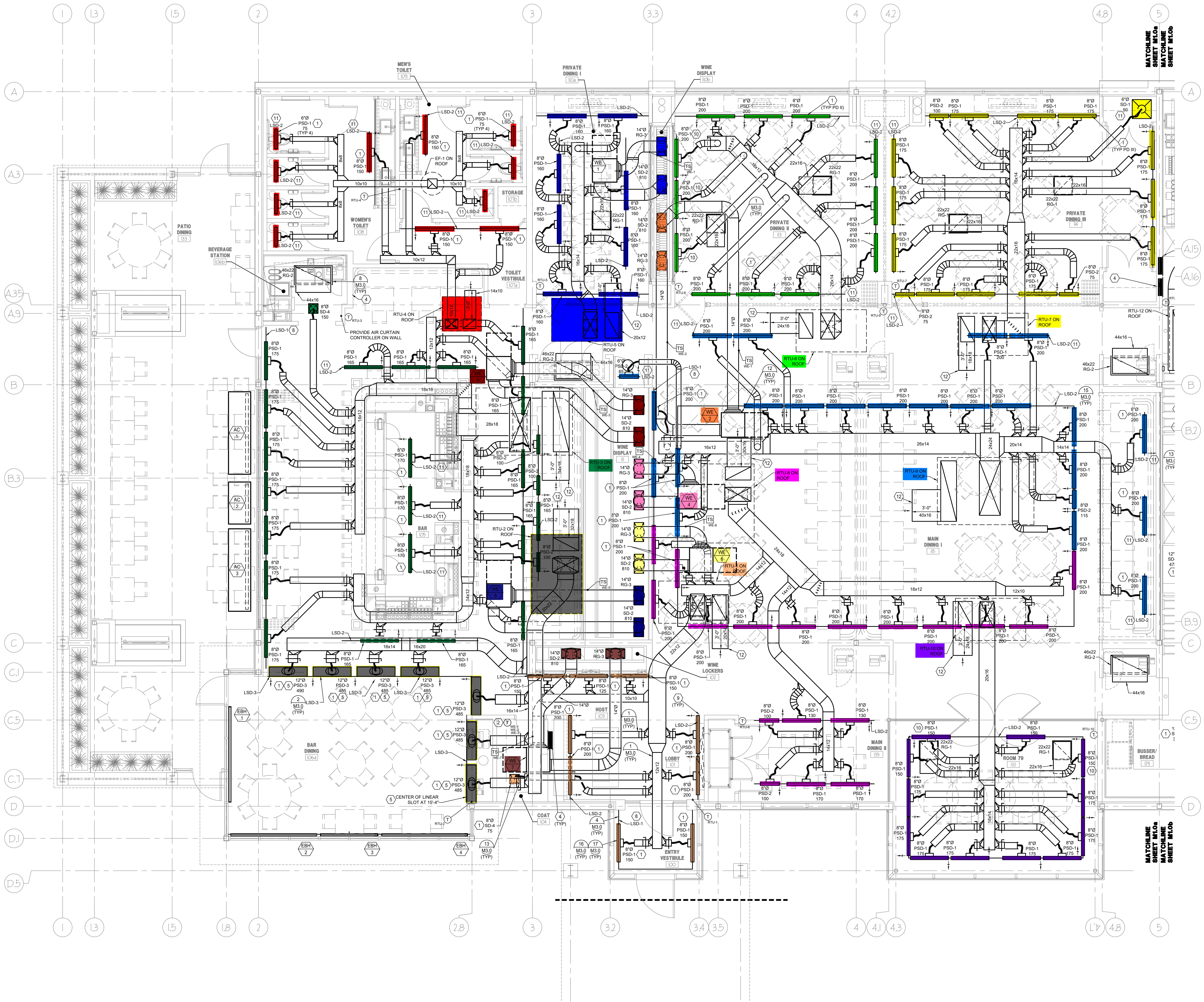

MECHANICAL FLOOR PLAN - SEGMENT A

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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FIELD VERIFICATION
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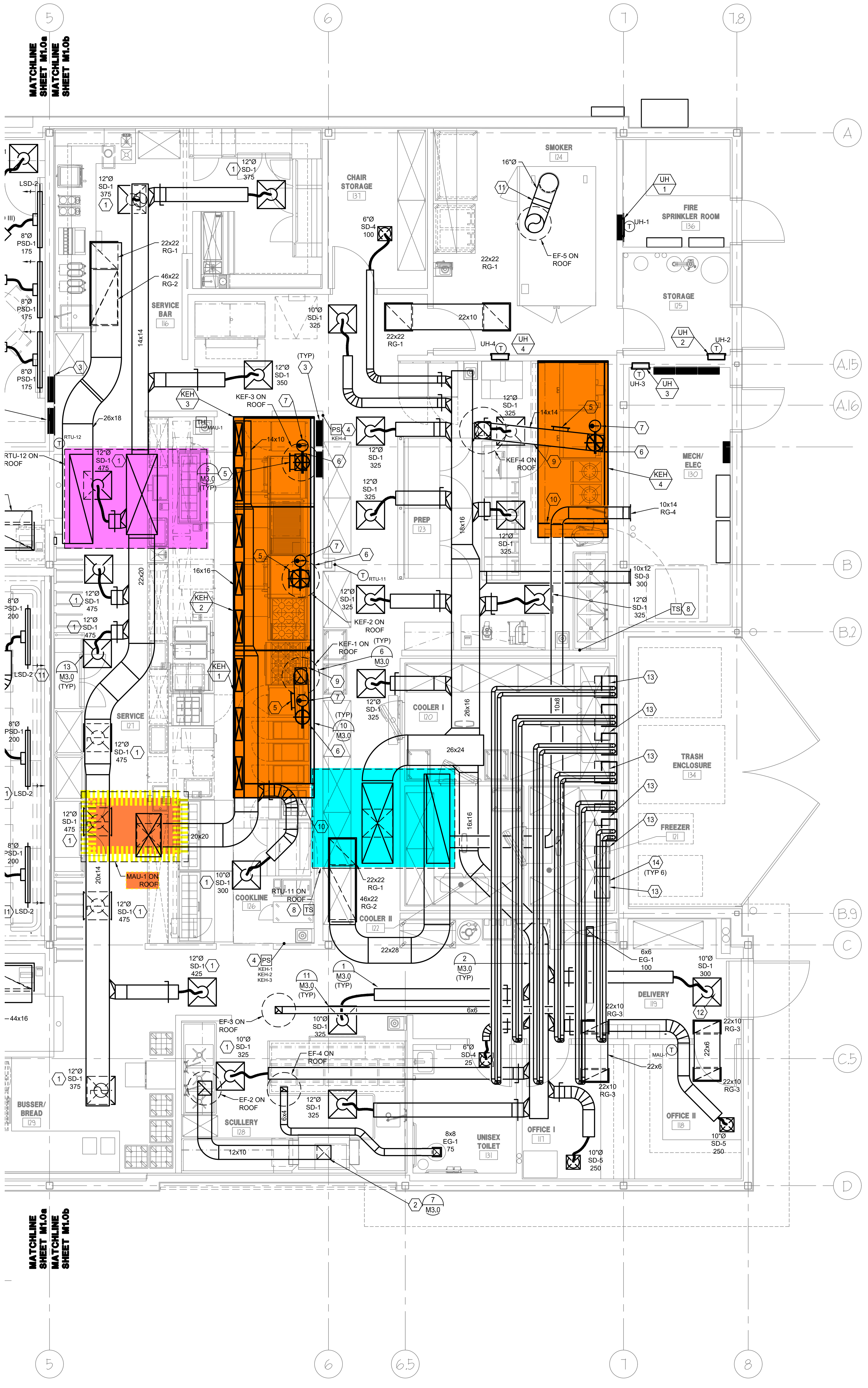
Drawing Title
MECHANICAL
FLOOR PLAN
SEGMENT A

Job No. 214679
Drawn DLJ
Scale AS NOTED
Date 04/29/22
Sheet No.
M1.0a

J:\Lenexa\Programs\P-T\Perry's Steakhouse\2150003829 Perry's Short Pump - Richmond - VA\001\Mech\2150003829 M1.0a MECHANICAL FLOOR PLAN.dwg, Plot, 5/2/2022 3:08 PM, Coy Macy

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.



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

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Drawing Title
MECHANICAL
FLOOR PLAN
SEGMENT B

Job No. 214679
Drawn DLJ
Scale AS NOTED
Date 04/29/22
Sheet No.
M1.0b

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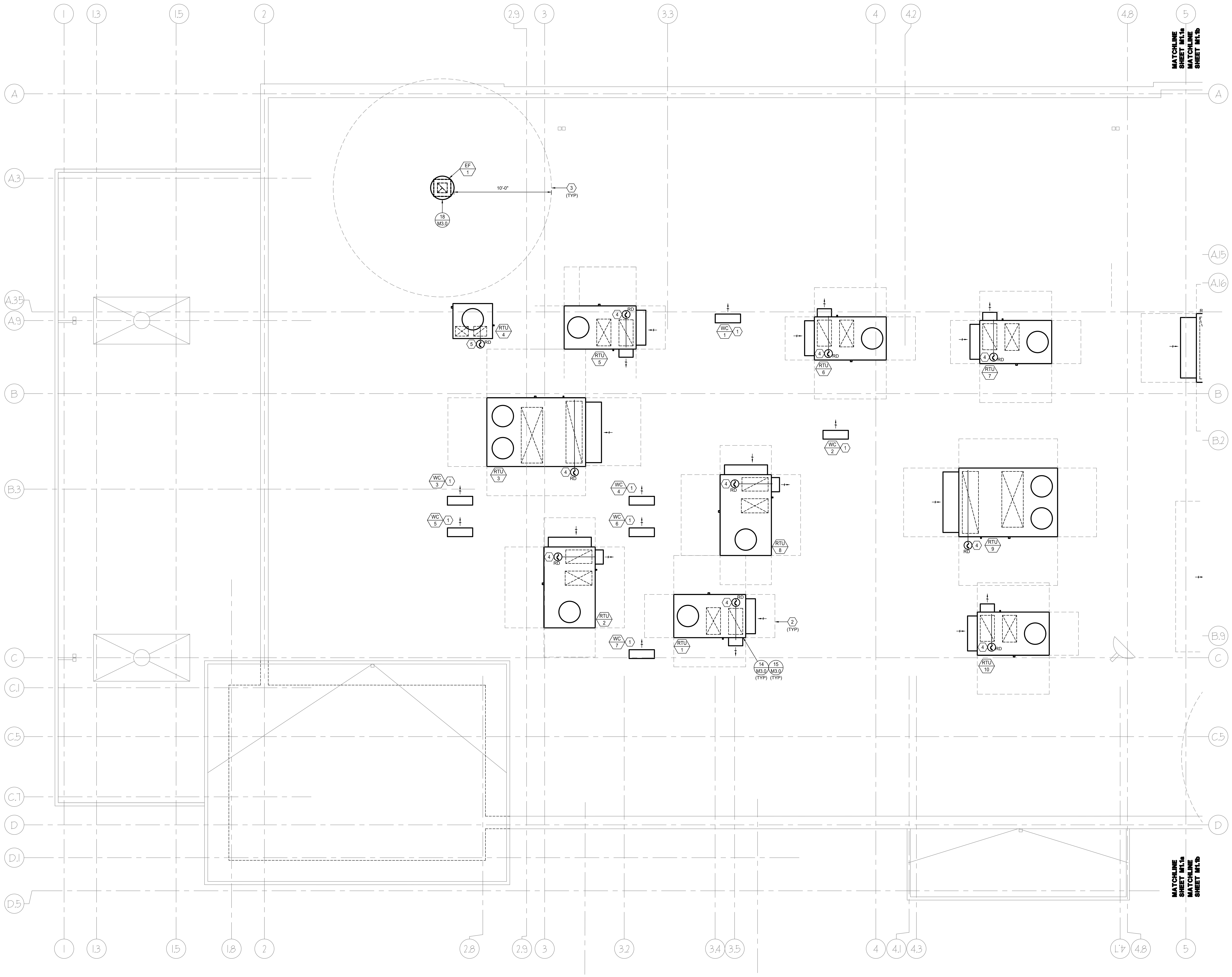
MECHANICAL PLAN NOTES:

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.



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

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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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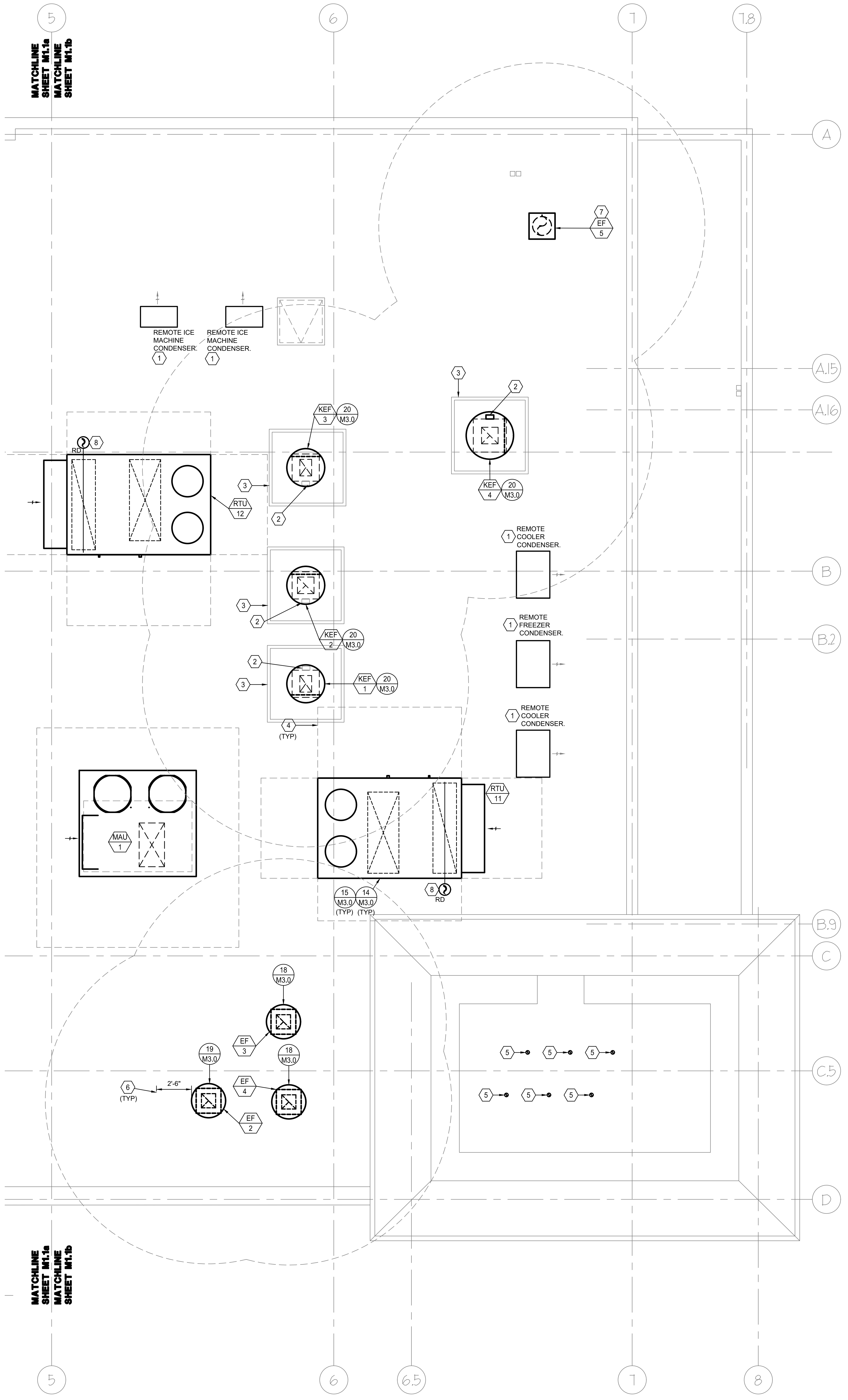

1 MECHANICAL ROOF PLAN - SEGMENT B
SCALE: 1/4"=1'-0"

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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	CASRTU-3-I.300-18-20T	SZVAV	3,000	2,000	0.75	1.98	3.0	241.4	142.5	94.9	75.3	52	51.1	R410A	12.7	VARIABLE	240.0	300	80	15.9	68	VARIABLE	3000	480/3	43.7	45	NON-FUSED	2563	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 100°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 EXHUAST RATE.

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	46.4	32.2	74.9	63.8	56.6	54.1	R410	11.9	14.2	1	41	60	80	61.5	85	1	200	480/3	12	15	NON-FUSED	1095	A-P
RTU-2	TRANE	YHC120	MULTI-SPEED	3,400	0.75	1.19	2.75	110.7	77.8	75.6	64.6	54.8	53.7	R410	12.4	15.2	2	106	150	80	56.4	85	2	760	480/3	22	25	NON-FUSED	1550	A-G,J-P
RTU-3	TRANE	YHD150	MULTI-SPEED	4,000	0.75	2.19	3.00	123.2	84.1	74.3	63.5	55.1	53.1	R410	12.1	15	2	112	150	80	59.1	85	2	680	480/3	32	40	NON-FUSED	2350	A-G,J-P
RTU-4	TRANE	4YCC4030	CV	600	0.75	-	0.33	21.8	16.6	76.3	65.3	57.5	56.6	R410	11.5	-	1	20	55	80	55.0	85	1	150	208/1	19	30	NON-FUSED	475	A-P
RTU-5	TRANE	YHC047	VAV	1,280	0.75	0.54	1.00	36.0	27.0	75.6	63.9	56.4	54.5	R410	13	17.5	1	35	60	80	59.9	85	1	200	480/3	14	20	NON-FUSED	930	A-G,J-P
RTU-6	TRANE	YHC092	MULTI-SPEED	2,400	0.75	0.83	2.75	66.7	49.1	75.9	65.1	57.3	56.1	R410	12.6	14.5	2	68	120	80	59.1	85	1	410	480/3	20	25	NON-FUSED	1220	A-G,J-P
RTU-7	TRANE	YHC092	MULTI-SPEED	2,400	0.75	0.83	2.75	75.7	53.6	77.0	65.7	56.7	55.5	R410	12.6	15	2	74	120	80	56.7	85	1	520	480/3	20	25	NON-FUSED	1220	A-P
RTU-8	TRANE	YHC120	MULTI-SPEED	3,200	0.75	0.84	2.75	111.8	75.1	79.5	67.2	58.2	56.2	R410	12.4	15.2	2	118	150	80	51.1	85	2	1040	480/3	22	25	NON-FUSED	1500	A-G,J-P
RTU-9	TRANE	YHD150	MULTI-SPEED	4,400	0.75	2.46	3.00	131.5	89.7	76.4	65.4	57.9	55.7	R410	12.1	15	2	129	250	80	58.1	85	2	840	480/3	32	40	NON-FUSED	2325	A-G,J-P
RTU-10	TRANE	YHC060	CV	2,000	0.75	0.95	1.00	46.1	37.0	74.5	63.3	57.7	55.7	R410	11.9	14.2	1	49	60	80	62.4	85	1	215	480/3	12	15	NON-FUSED	1095	A-G,J-P
RTU-11	TRANE	YHD180	MULTI-SPEED	4,800	1	2.49	3.00	144.1	114.4	77.8	64.9	56.2	55.1	R410	12.1	15	2	138	250	80	58.5	85	2	875	480/3	35	45	NON-FUSED	2400	A-P
RTU-12	TRANE	YHD150	MULTI-SPEED	4,800	1	2.77	3.00	130.5	103.9	77.8	65.4	58.2	56.6	R410	12.1	15	2	138	150	80	58.5	85	2	875	480/3	32	40	NON-FUSED	2350	A-C,E-Q

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B. EQUIPMENT SIZED FOR 100°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.
Q. DISCONNECT SWITCH FURNISHED BY DIVISION 26 CONTRACTOR.

OUTSIDE AIR REQUIREMENTS, VMC-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	558	0.180	33	7.50	435	760	
RTU-3	SINGLE ZONE	BAR DINING	0.80	1,287	0.180	76	7.50	1,002	680	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
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 VMC-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.

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 WALL MOUNTED THERMOSTAT QMARK M602W OR EQUAL.
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

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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).

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	1662
KEF-2	ROOF	KEH-2	2306
KEF-3	ROOF	KEH-3	1444
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			8,487

TOTAL KITCHEN POSITIVE/NEGATIVE AIR FLOW -3737
PERCENT POSITIVE/NEGATIVE AIR FLOW -78.7%

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	3400	710	20.9%
RTU-3	BAR	4000	630	15.8%
RTU-4	RESTROOMS	600	150	25.0%
RTU-5	PDR I	1280	200	15.6%
RTU-6	PDR II	2400	380	15.8%
RTU-7	PDR III	2400	500	20.8%
RTU-8	MAIN DINING	3200	925	28.9%
RTU-9	MAIN DINING	4400	840	19.1%
RTU-10	ROOM 79	2000	195	9.8%
TOTAL AIRFLOW		25,280	4,730	18.7%

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

TOTAL DINING POSITIVE/NEGATIVE AIR FLOW 4130
PERCENT POSITIVE/NEGATIVE AIR FLOW 87.3%

TOTAL BUILDING POSITIVE AIR FLOW 393
PERCENT BUILDING POSITIVE AIR FLOW 4.1%

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

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.

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

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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.

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

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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.

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.

ALL EQUIPMENT AND APPLIANCES, INCLUDING THE HVAC EQUIPMENT AND WATER HEATERS, SHALL BE INSTALLED IN ACCORDANCE WITH THEIR LISTINGS AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. A COPY OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS SHALL BE PROVIDED ON SITE FOR EACH INSPECTION.

A COPY OF THE TYPE I HOOD DUCT WRAP SPECIFICATIONS SHALL BE AVAILABLE AT THE TIME OF ROUGH AND ABOVE CEILING INSPECTIONS TO VERIFY APPLICATION AND CLEARANCE REQUIREMENTS.

A CAPTURE AND CONTAINMENT TEST SHALL BE CONDUCTED ON THE TYPE I EXHAUST HOODS, A COPY OF THE REPORT SHALL BE SUBMITTED TO THE VILLAGE PRIOR TO FINAL INSPECTION.

A COPY OF THE REQUIRED TEST AND BALANCE REPORT SHALL BE SUBMITTED TO THE VILLAGE PRIOR TO THE FINAL INSPECTION.

ROOFTOP UNIT CONTROL MATRIX

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

AIR CURTAIN SCHEDULE

MARK	SERVICE AREA	MANUFACTURER	MODEL	UNIT SPECS NOZZLE LENGTH (IN)	UNIT SPECS MAX. AIRFLOW	UNIT SPECS MOTOR (HP)	V/PH	AMPS	MOCP	WEIGHT (LBS)	NOTES
AC-1	PATIO	BERNER	ARC16-3096A	99	5996	3 @ 1	480/3	9.6	15	253	A-C
AC-2	PATIO	BERNER	ARC16-1048A	48	2351	1 @ 1	480/3	3.2	15	117	A-C
AC-3	PATIO	BERNER	ARC16-3096A	99	5996	3 @ 1	480/3	9.6	15	253	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 SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED.THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:

A. MOUNT UNIT PER MANUFACTURERS RECOMMENDATIONS AND PER ARCHITECTURAL DRAWINGS. UNIT SHALL BE RECESSED.
B. PROVIDE INTEGRAL STARTER AND DISCONNECT SWITCH.
C. CONTROL AIR CURTAINS IN EACH OPENING AS ONE UNIT. UNITS SHALL BE CONTROLLED BY A SINGLE DOOR SWITCH PER OPENING. AIR CURTAIN SHALL ENERGIZE WHEN DOOR OPENS. PROVIDE ONE MANUFACTURER WALL MOUNTED INTELLISWITCH 2 SPEED CONTROLLER PER OPENING.

PROJECT DESIGN CONDITIONS

CLIMATE CONDITONS

WEATHER STATION:		HANOVER COUNTY MUNICIPAL, VA, USA					
CLIMATE ZONE:		4					
HEATING (DB):	99.6%	15.9	°F				
DESIGN HEATING CONDITIONS (DB):		15.9	°F				
COOLING (DB/MCWB):	0.4%	94.9	°F/	75.3	°F/		
DESIGN COOLING CONDITIONS DINING (DB/ MCWB):		94.9	°F/	75.3	°F/		
DESIGN COOLING CONDITIONS KITCHEN (DB/ MCWB):		94.9	°F/	75.3	°F/		
DEHUMIDIFICATION (DP/ HR/ MCDB):	0.4%	81.7	°F/	133.4	gr/lb	83.5	°F

BUILDING OPERATING HOURS:	
MONDAY - FRIDAY	7am - 2am
SATURDAY	7am - 2am
SUNDAY	7am - 2am

SPACE / UNIT DESCRIPTION	COOLING / DE-HUMIDIFICATION OCC °F	COOLING / DE-HUMIDIFICATION UNOCC °F	COOLING / DE-HUMIDIFICATION MAX RH %	COOLING / DE-HUMIDIFICATION MIN RH %	HEATING OCC °F	HEATING UNOCC °F	SPACE OPERATING HOURS OCCUPIED / UNOCCUPIED 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

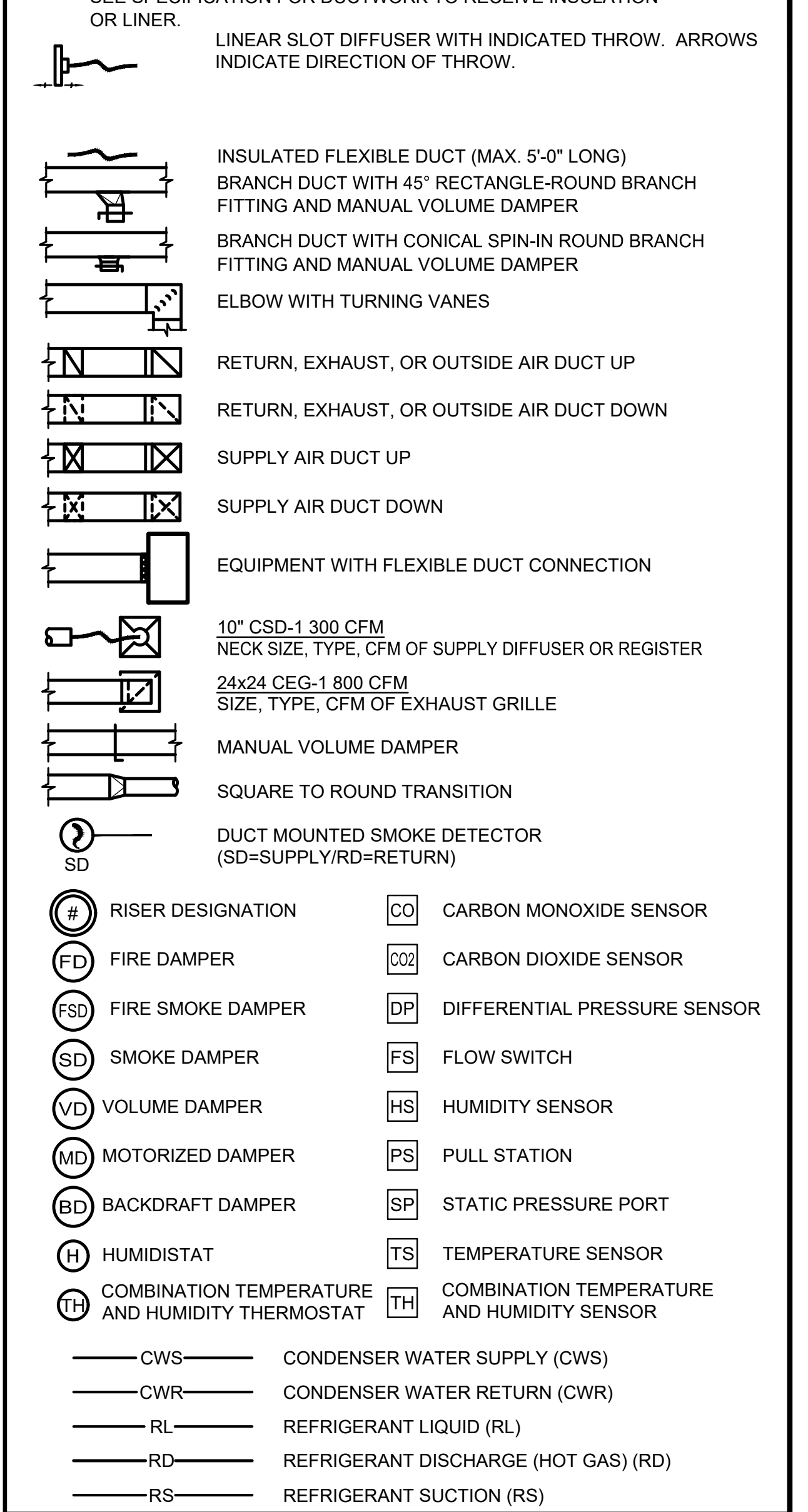
NOTES:

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.

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
- 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.

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2150003829
VA. CORPORATE NUMBER: 0405001357
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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.

No	Date	Remarks
	04/29/22	ISSUED FOR BID

REVISIONS

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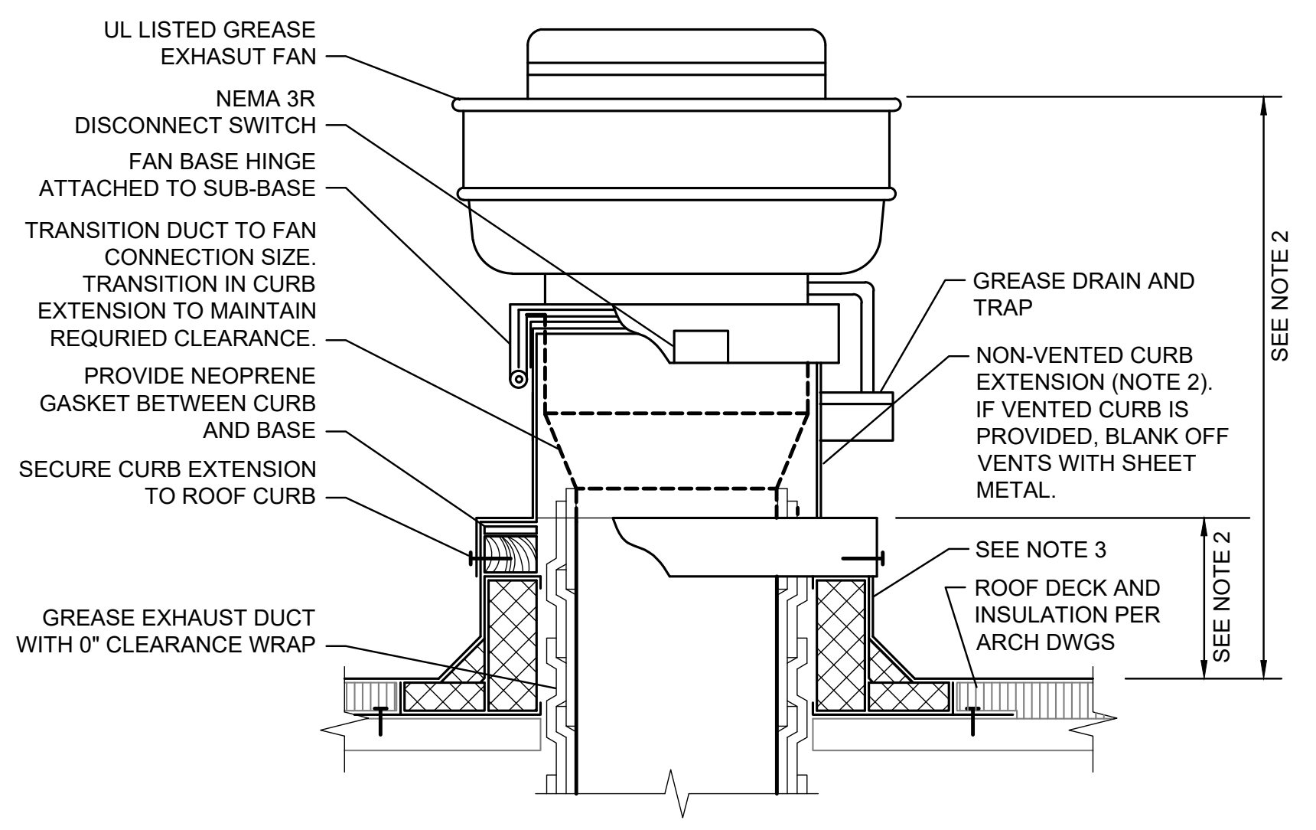
Drawing Title
MECHANICAL SCHEDULES

Job No.	Drawn
214679	CMM

Scale	Date
AS NOTED	04/29/22

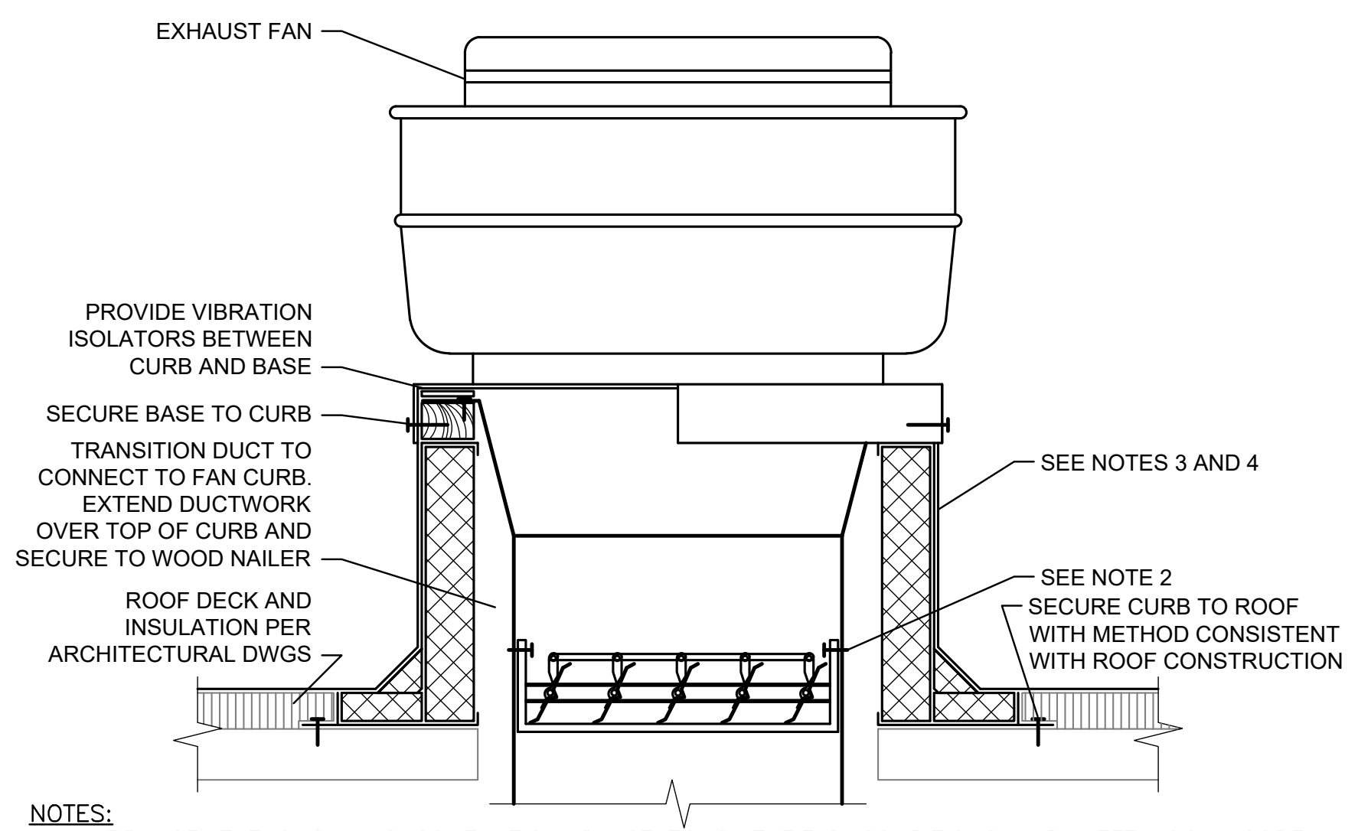
Sheet No.
M2.0


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.

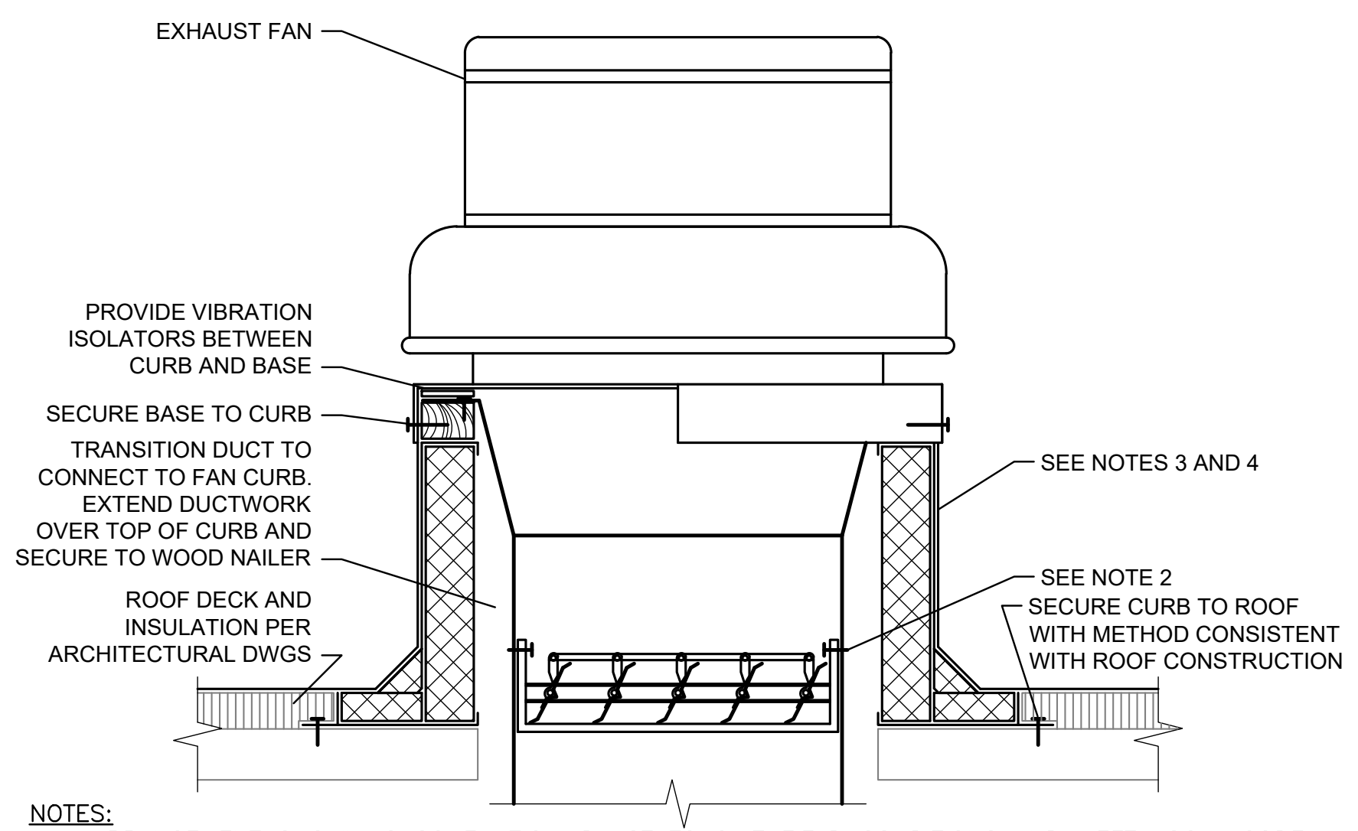
20 UPBLAST GREASE EXHAUST FAN DETAIL
NO SCALE


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
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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:

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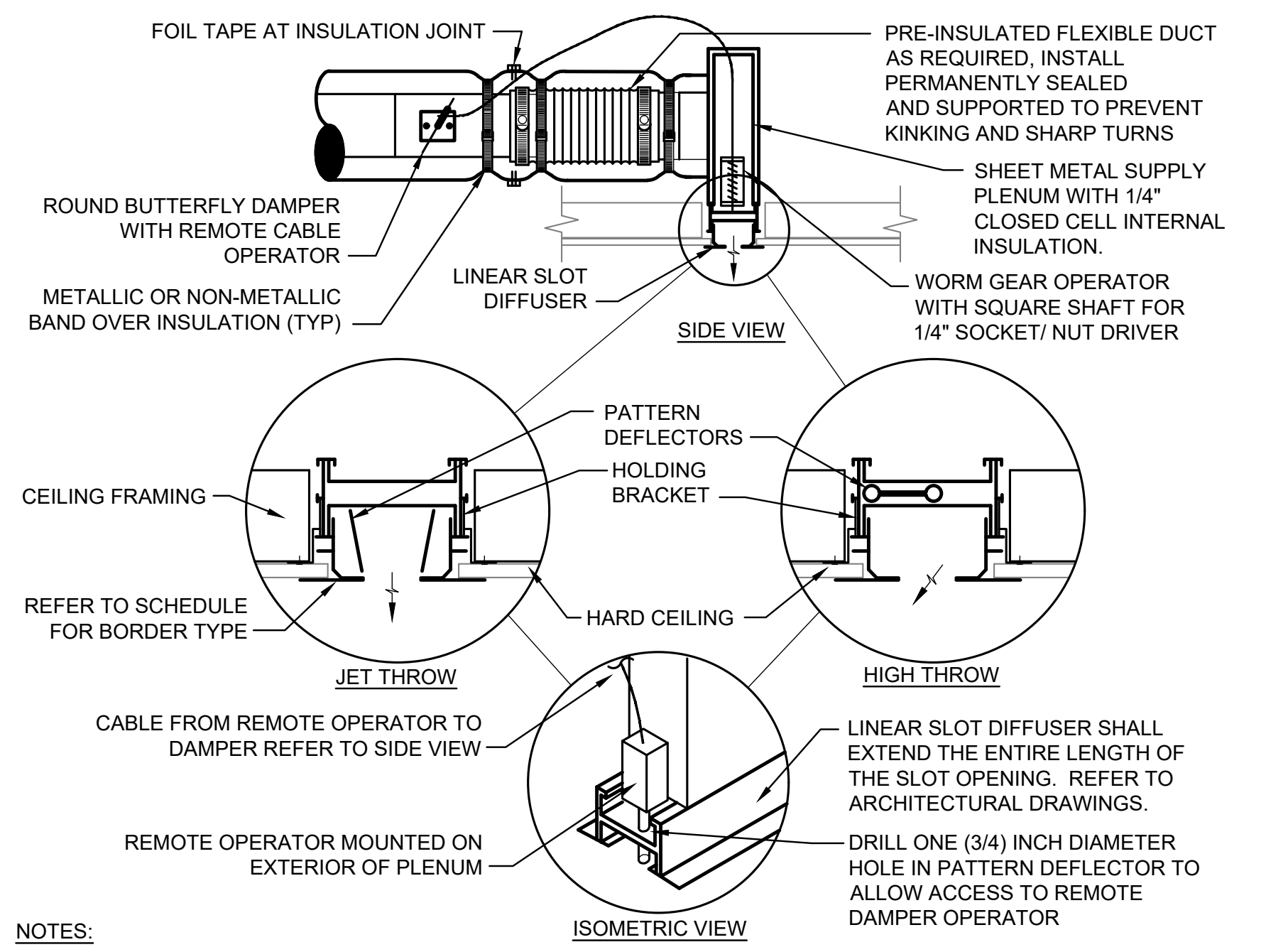
3. PREFABRICATED INSULATED ROOF CURB WITH TREATED WOOD NAILER, CANT, AND STEP AS REQUIRED TO ACCOMMODATE ROOF INSULATION. FRAME AND SECURE CURB TO ROOF WITH METHOD CONSISTENT WITH ROOF CONSTRUCTION. ROOF CURB SHALL BEAR ON ROOF STRUCTURE. REFER TO ARCHITECTURAL DRAWINGS AND CURB MANUFACTURER'S DETAILS FOR MORE INFORMATION.
4. FOR SLOPED ROOFS, PROVIDE CURB WITH DIMENSIONS CAPABLE OF COMPENSATING ROOF SLOPE TO ENSURE FAN IS INSTALLED LEVEL.

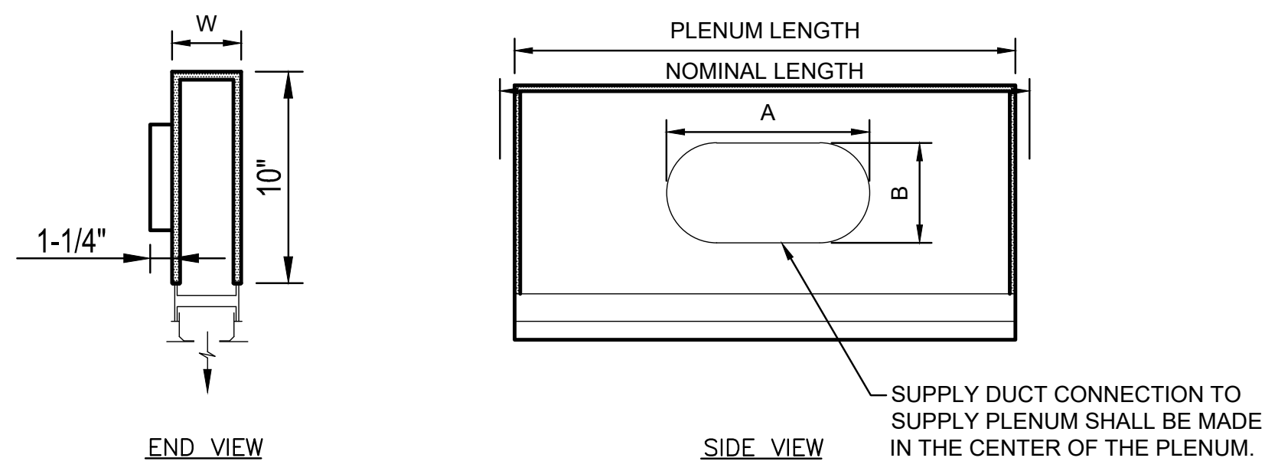
18 ROOF MOUNTED DOWNBLAST FAN DETAIL
NO SCALE


FOIL TAPE AT INSULATION JOINT
PRE-INSULATED FLEXIBLE DUCT AS REQUIRED, INSTALL PERMANENTLY SEALED AND SUPPORTED TO PREVENT KINKING AND SHARP TURNS
SHEET METAL SUPPLY PLENUM WITH 1/4" CLOSED CELL INTERNAL INSULATION.
ROUND BUTTERFLY DAMPER WITH REMOTE CABLE OPERATOR
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
ISOMETRIC VIEW
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

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

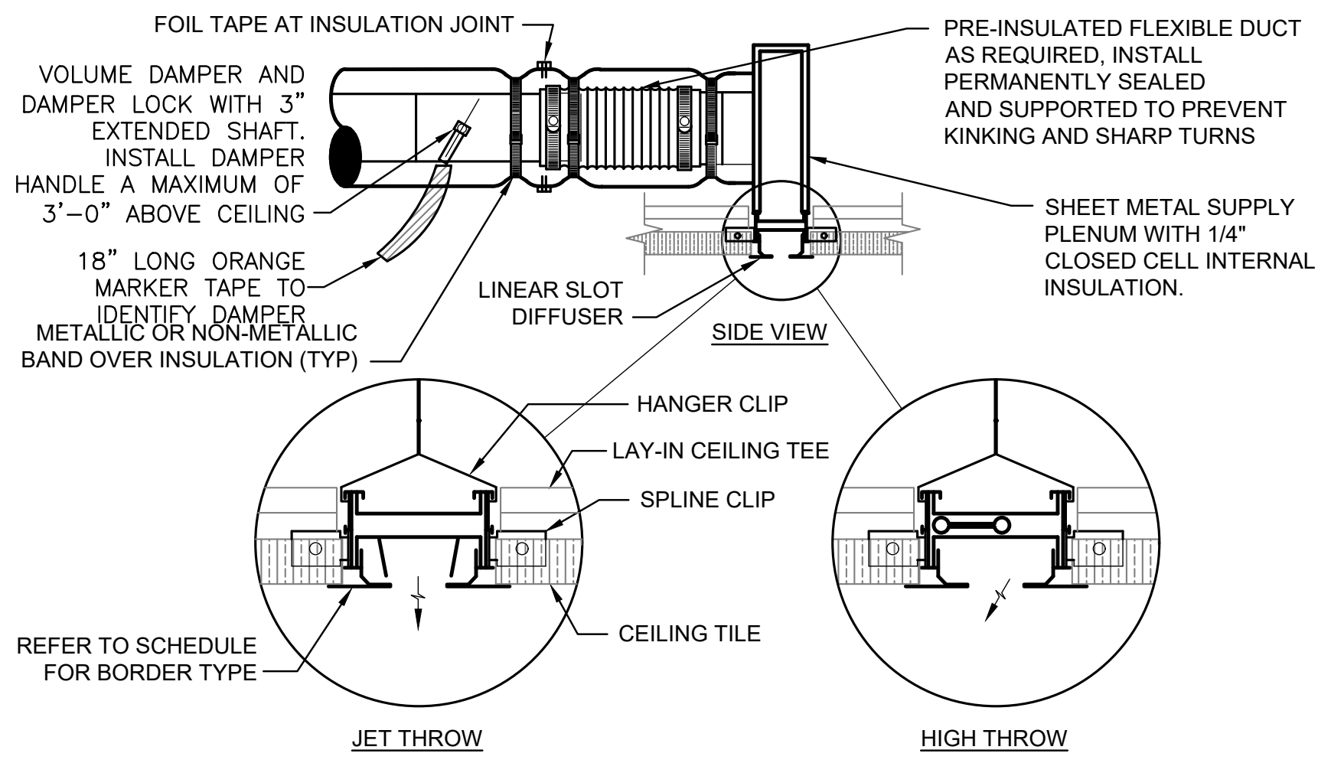
SLOT WIDTH	MIN. WIDTH (W)	NOMINAL LENGTH	PLENUM LENGTH
1"	2-3/4"	22, 34, 46, 58	19-3/4", 31-3/4", 43-3/4", 55-3/4"
1-1/2"	3-3/4"	22, 34, 46, 58	19-3/4", 31-3/4", 43-3/4", 55-3/4"
2"	4-3/4"	22, 34, 46, 58	19-3/4", 31-3/4", 43-3/4", 55-3/4"

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.

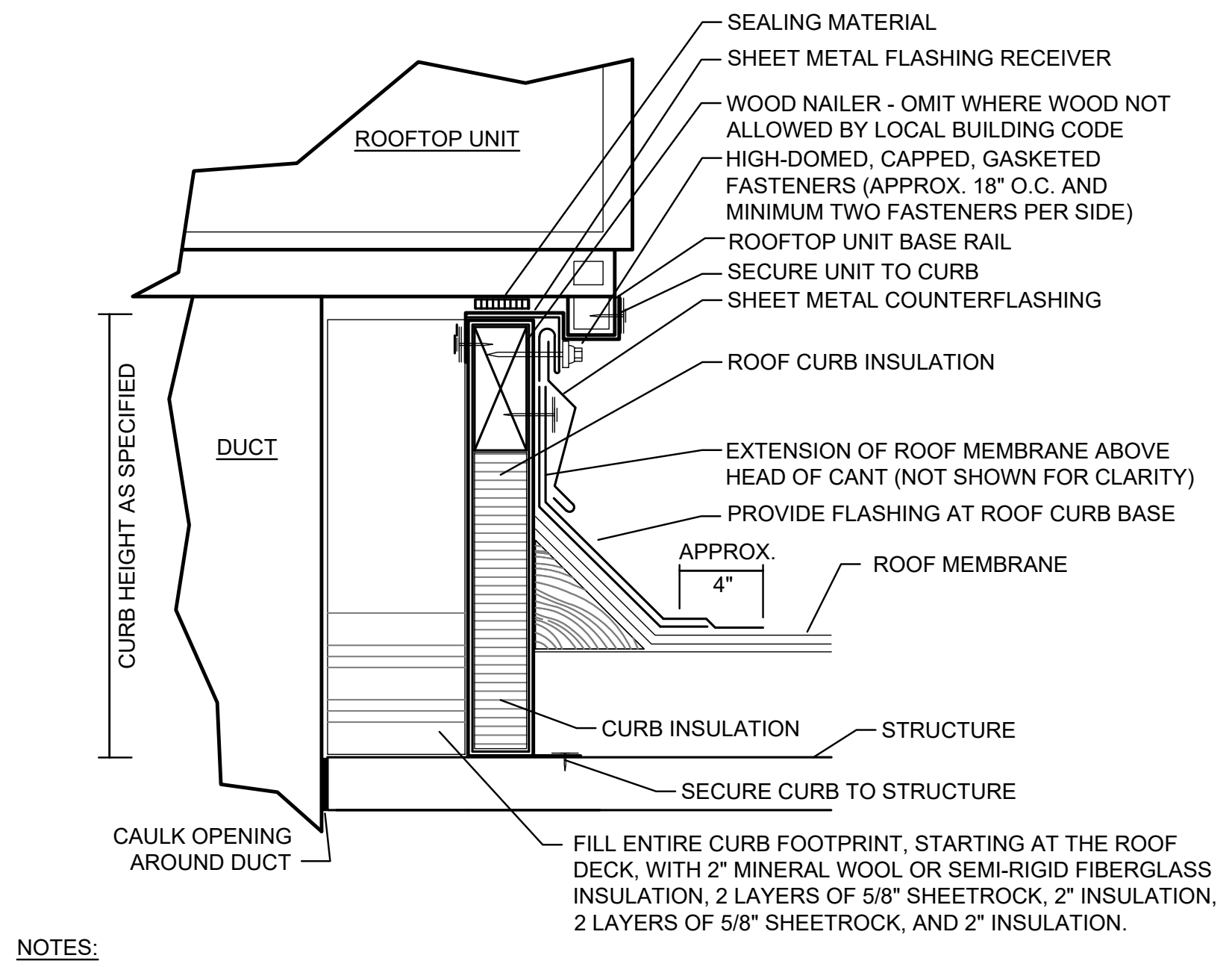
16 SUPPLY PLENUM CONSTRUCTION DETAIL
NO SCALE


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.

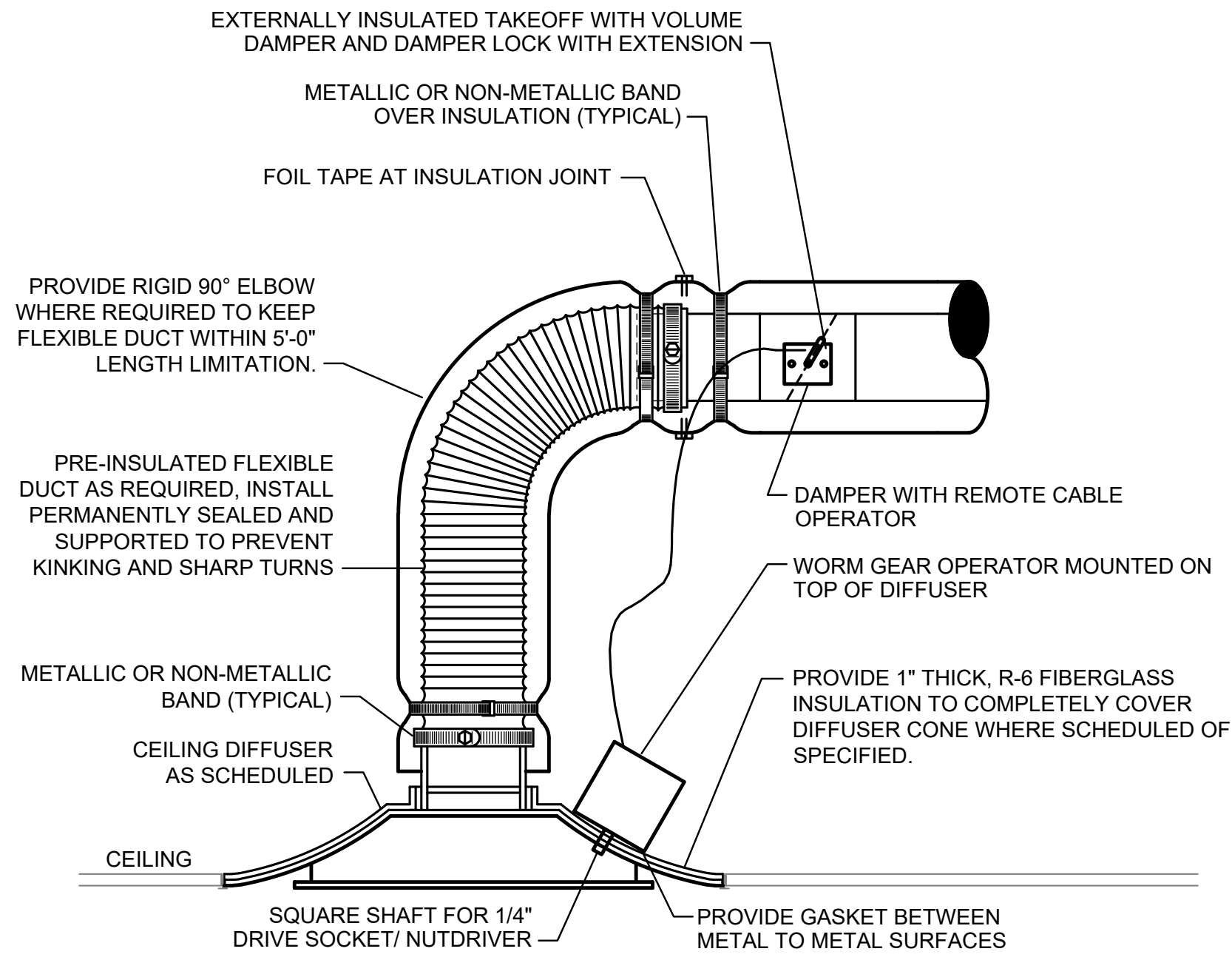
15 LINEAR SLOT DIFFUSER IN LAY–IN CEILING DETAIL
NO SCALE


SEALING MATERIAL
SHEET METAL FLASHING RECEIVER
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
EXTENSION OF ROOF MEMBRANE ABOVE HEAD OF CANT (NOT SHOWN FOR CLARITY)
PROVIDE FLASHING AT ROOF CURB BASE
APPROX. 4"
ROOF MEMBRANE
ROOFTOP UNIT
DUCT
CURB HEIGHT AS SPECIFIED
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.

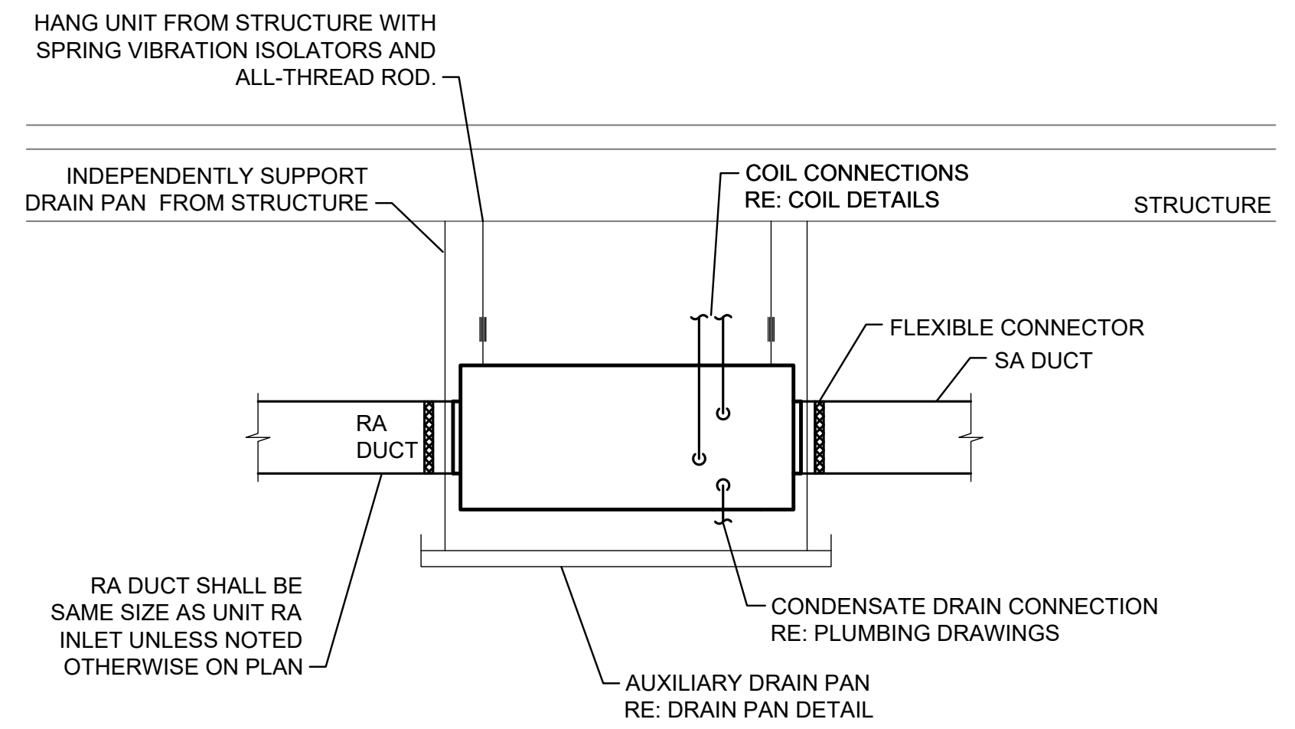
14 ROOF CURB DETAIL
NO SCALE


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
METALLIC OR NON-METALLIC BAND (TYPICAL)
CEILING DIFFUSER AS SCHEDULED
CEILING
DAMPER WITH REMOTE CABLE OPERATOR
WORM GEAR OPERATOR MOUNTED ON TOP OF DIFFUSER
PROVIDE 1" THICK, R-6 FIBERGLASS INSULATION TO COMPLETELY COVER DIFFUSER CONE WHERE SCHEDULED OF SPECIFIED.
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.

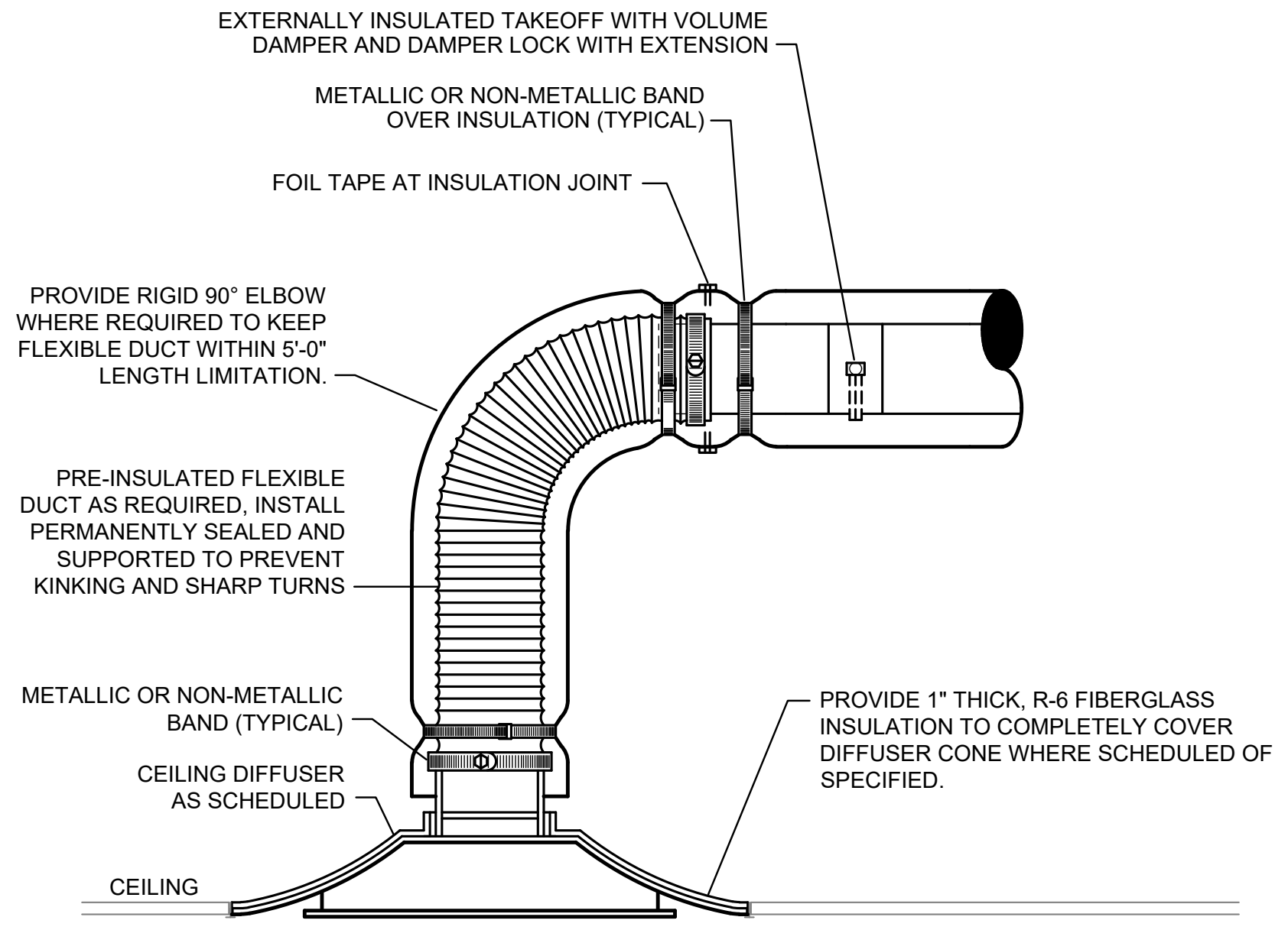
13 HARD CEILING DIFFUSER DETAIL
NO SCALE


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.

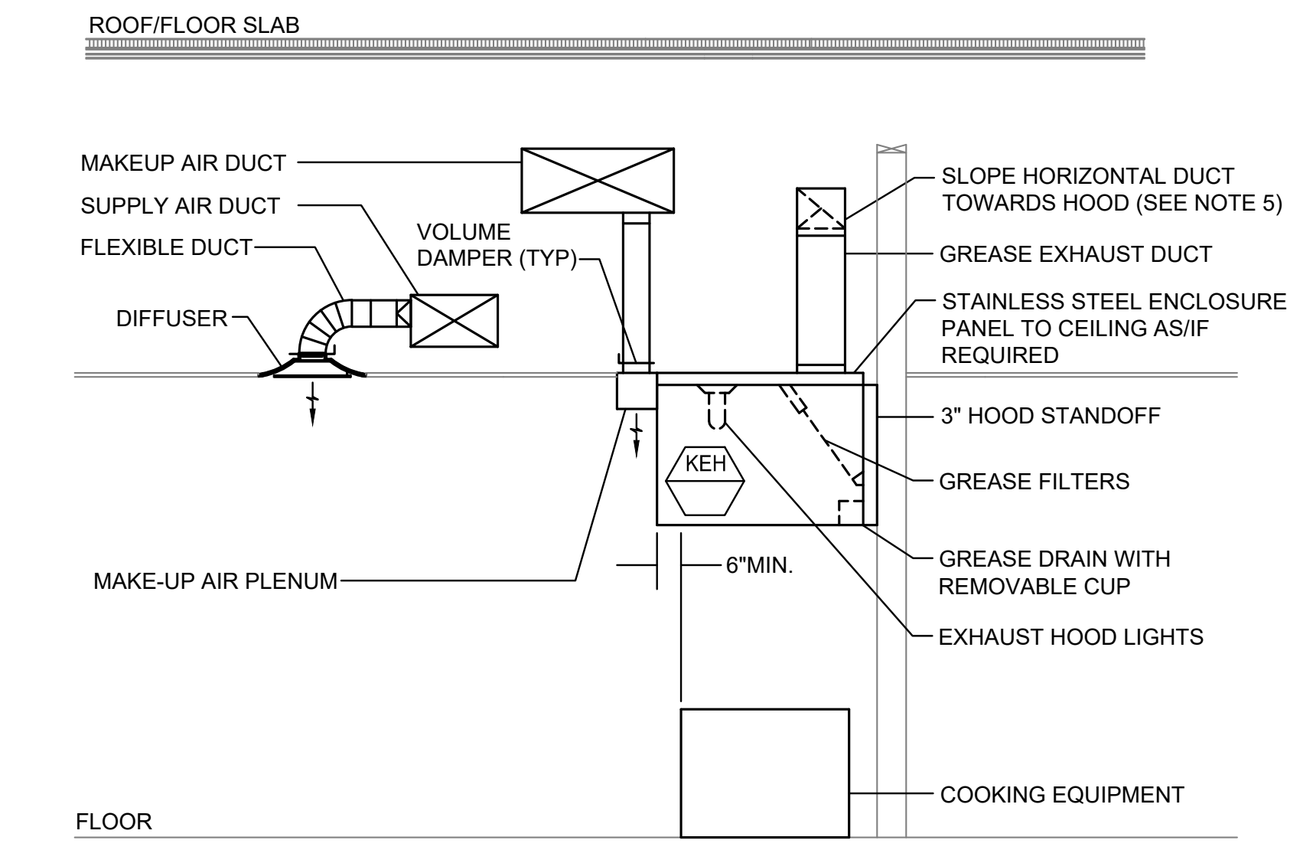
12 HORIZONTAL HVAC UNIT DETAIL
NO SCALE


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
CEILING
PROVIDE 1" THICK, R-6 FIBERGLASS INSULATION TO COMPLETELY COVER DIFFUSER CONE WHERE SCHEDULED OF SPECIFIED.

NOTES:

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

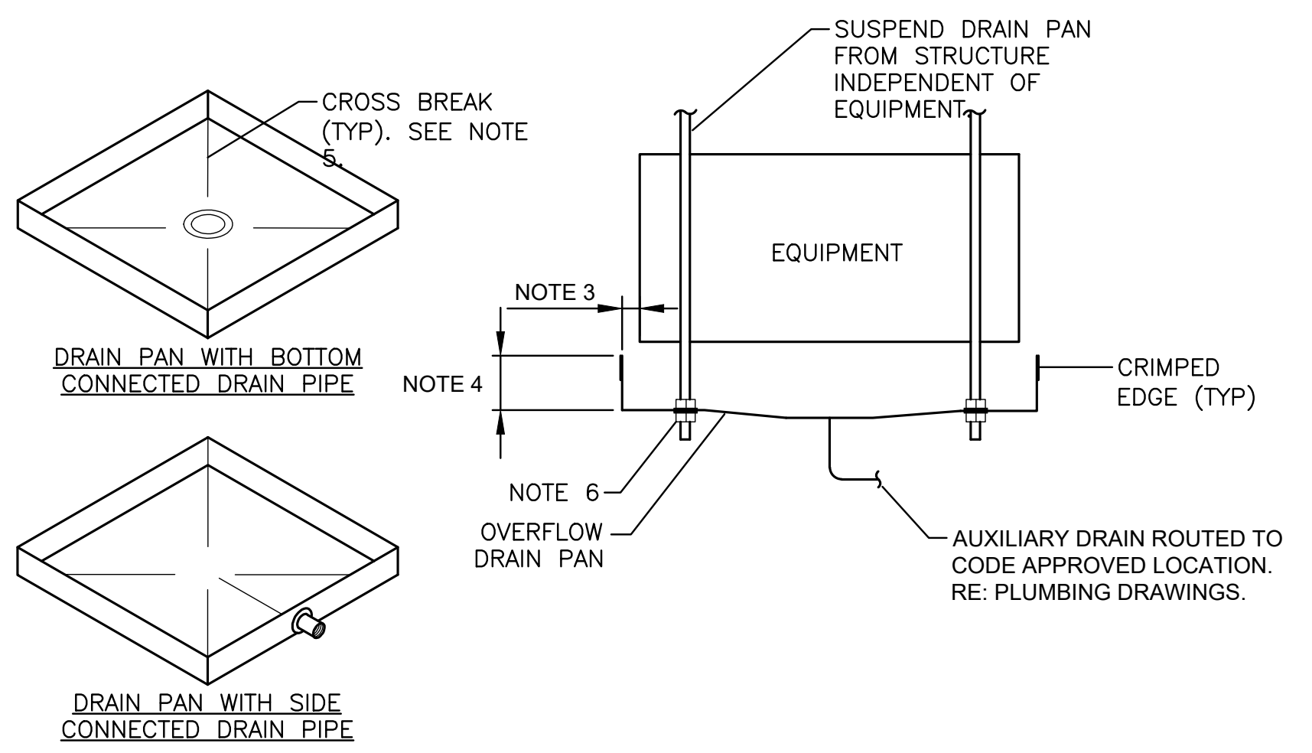
11 LAY–IN CEILING DIFFUSER DETAIL
NO SCALE



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.

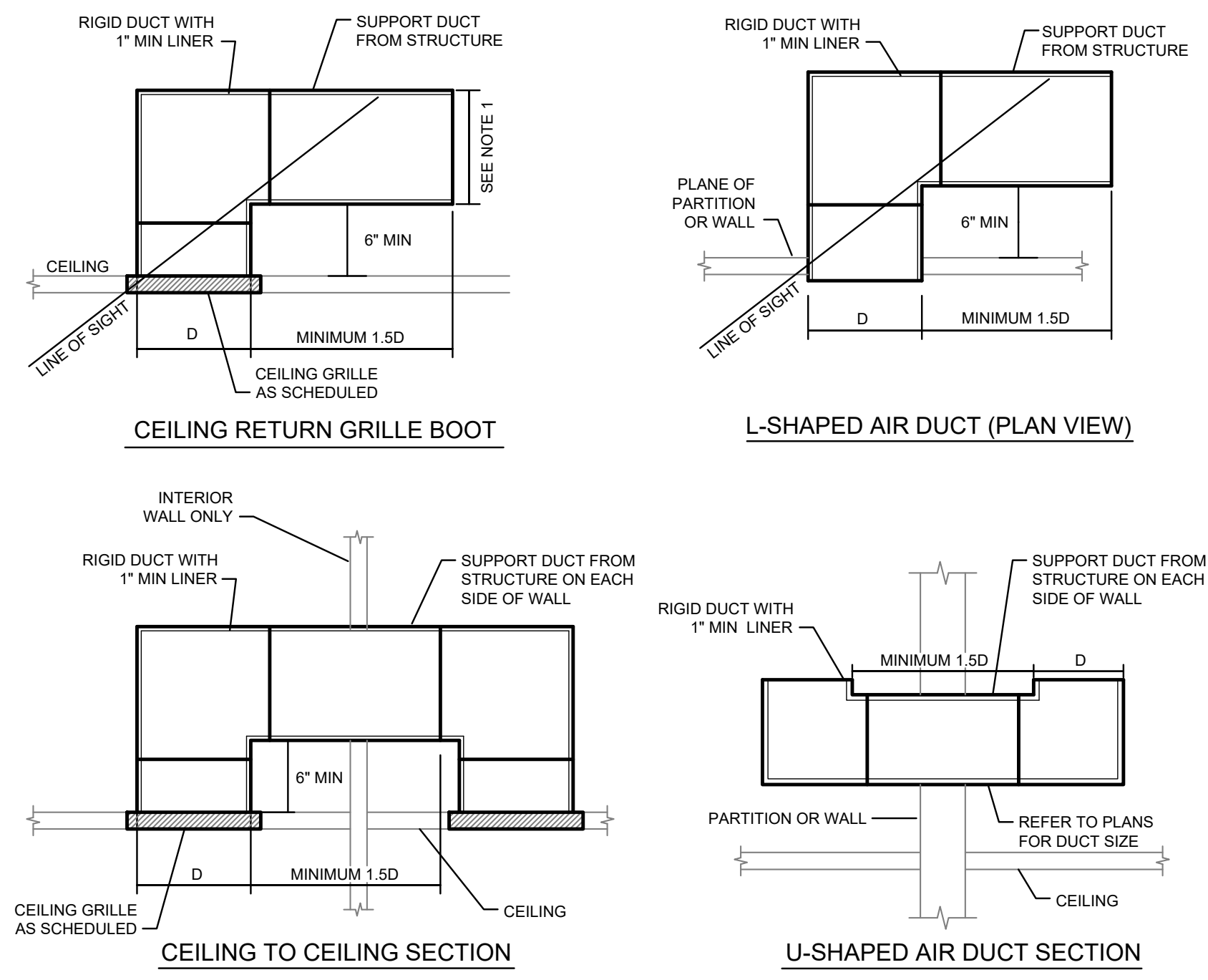
10 KITCHEN EXHAUST HOOD ELEVATION DETAIL
NO SCALE


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.
EQUIPMENT
NOTE 3
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
PLANE OF PARTITION OR WALL
INTERIOR WALL ONLY
SUPPORT DUCT FROM STRUCTURE ON EACH SIDE OF WALL
PARTITION OR WALL
REFER TO PLANS FOR DUCT SIZE

CEILING RETURN GRILLE BOOT

L-SHAPED AIR DUCT (PLAN VIEW)

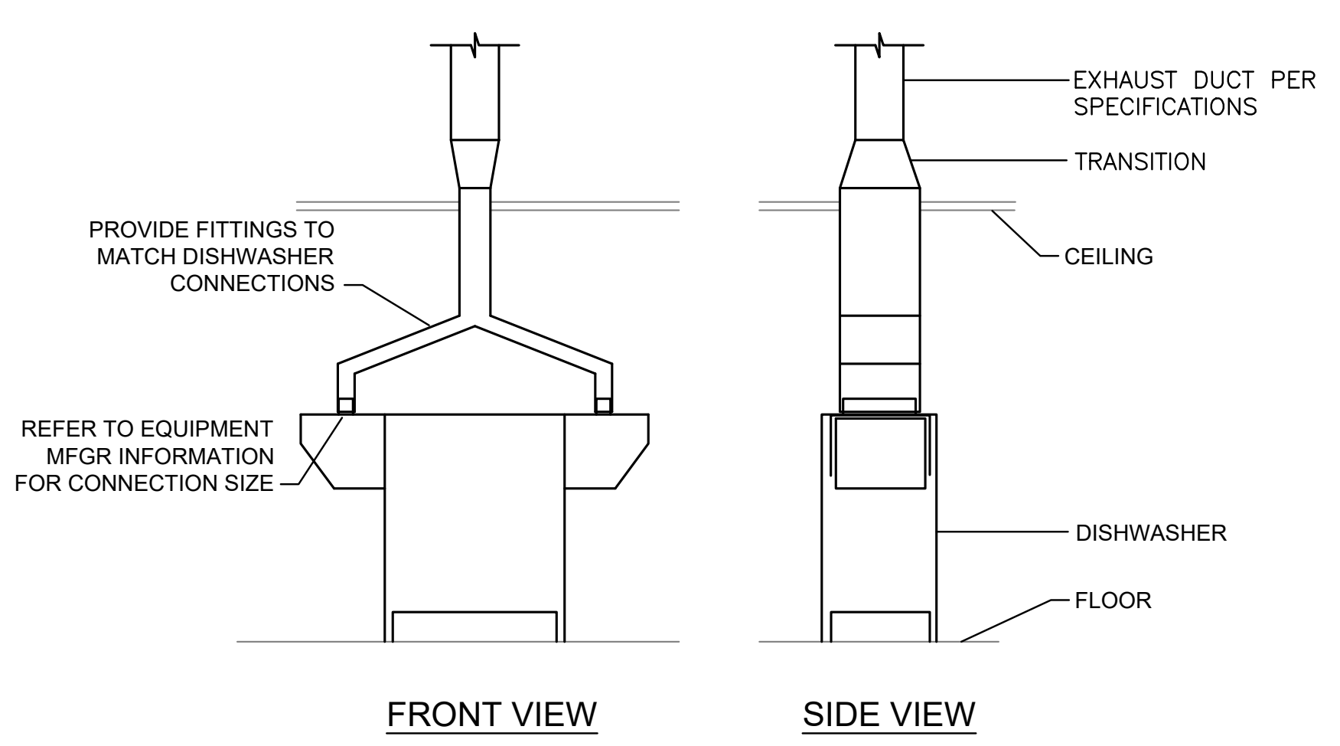
CEILING TO CEILING SECTION

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.

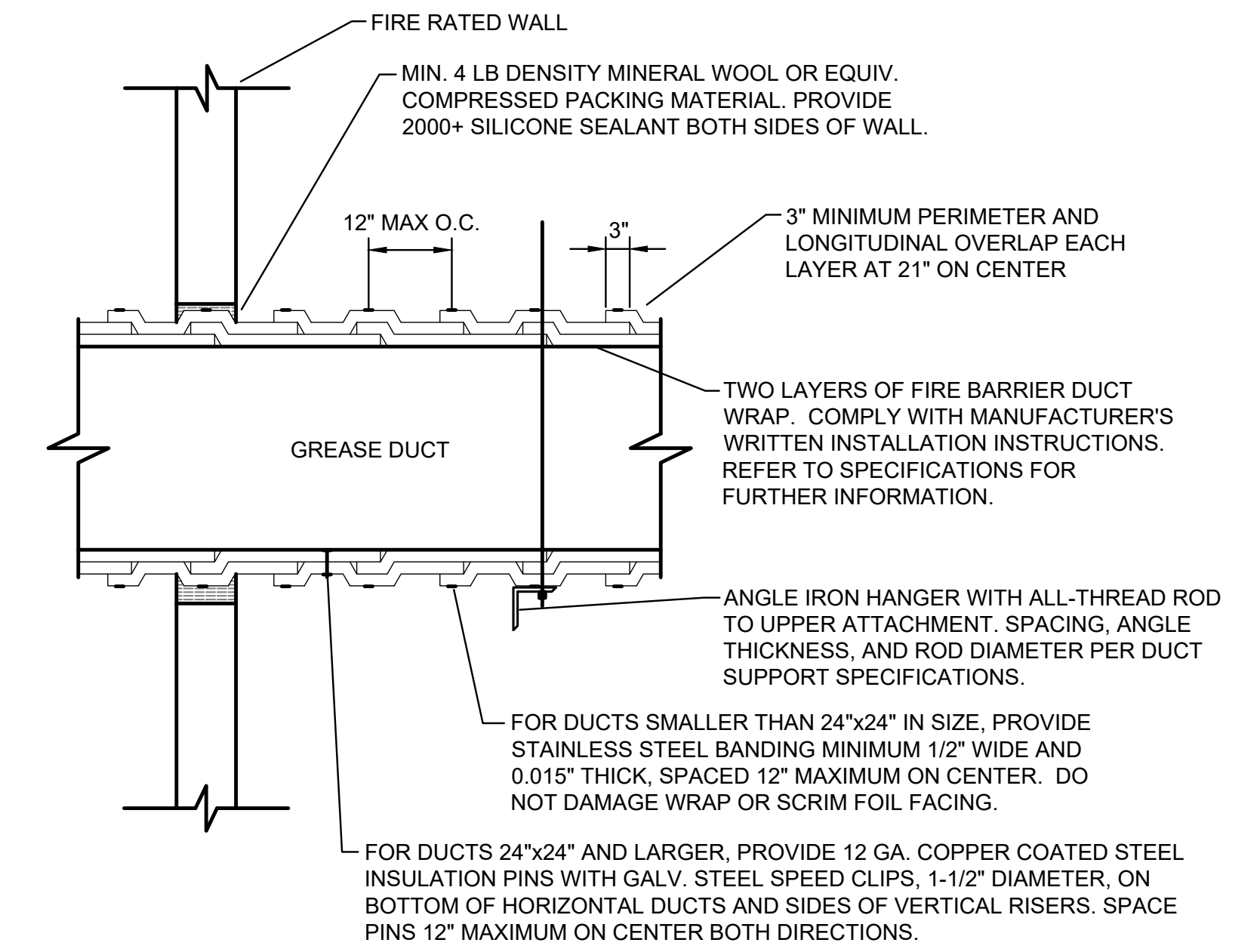
8 RETURN/TRANSFER AIR DUCT DETAILS
NO SCALE


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.

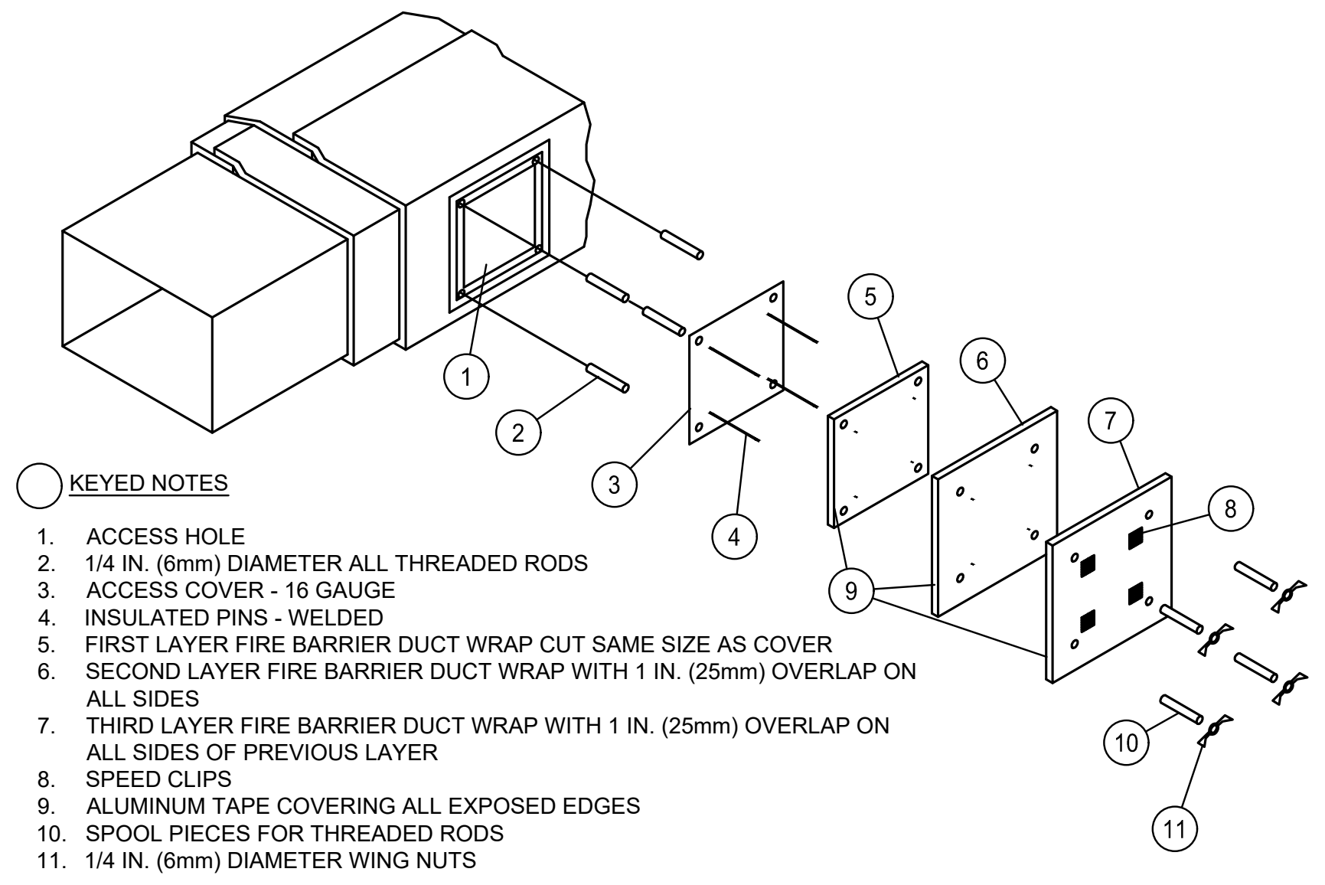
7 DISHWASHER EXHAUST DUCT DETAIL
NO SCALE


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



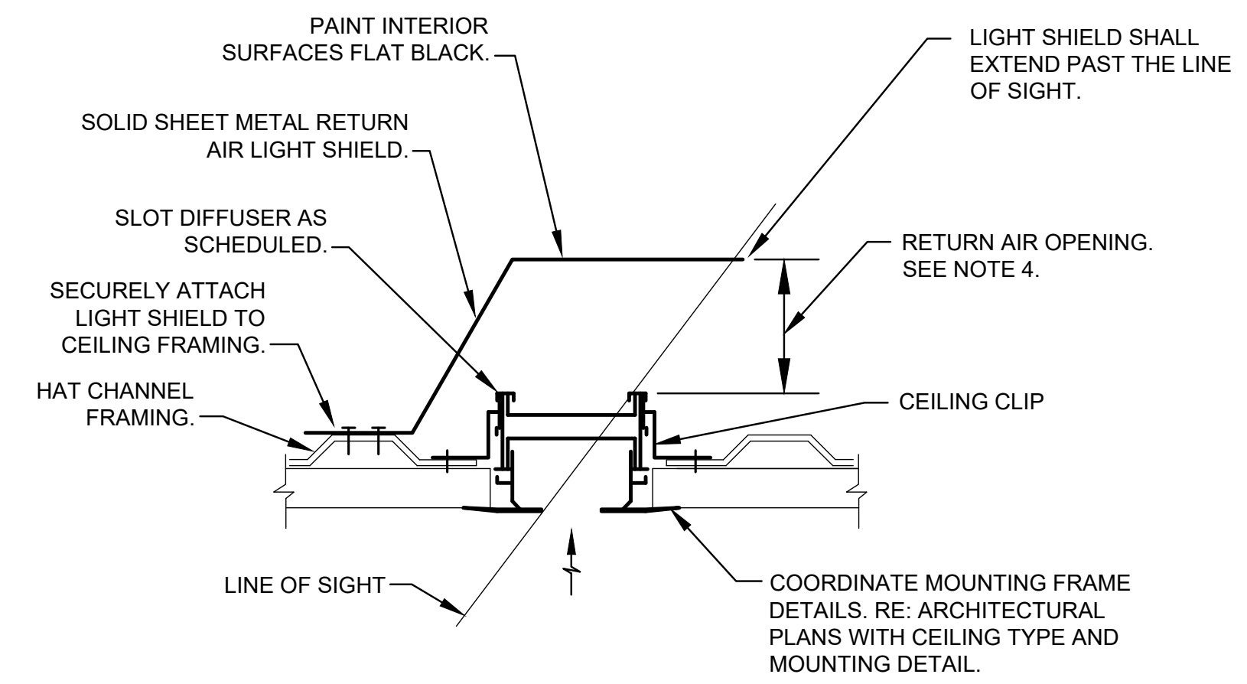
○ KEYED NOTES

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.

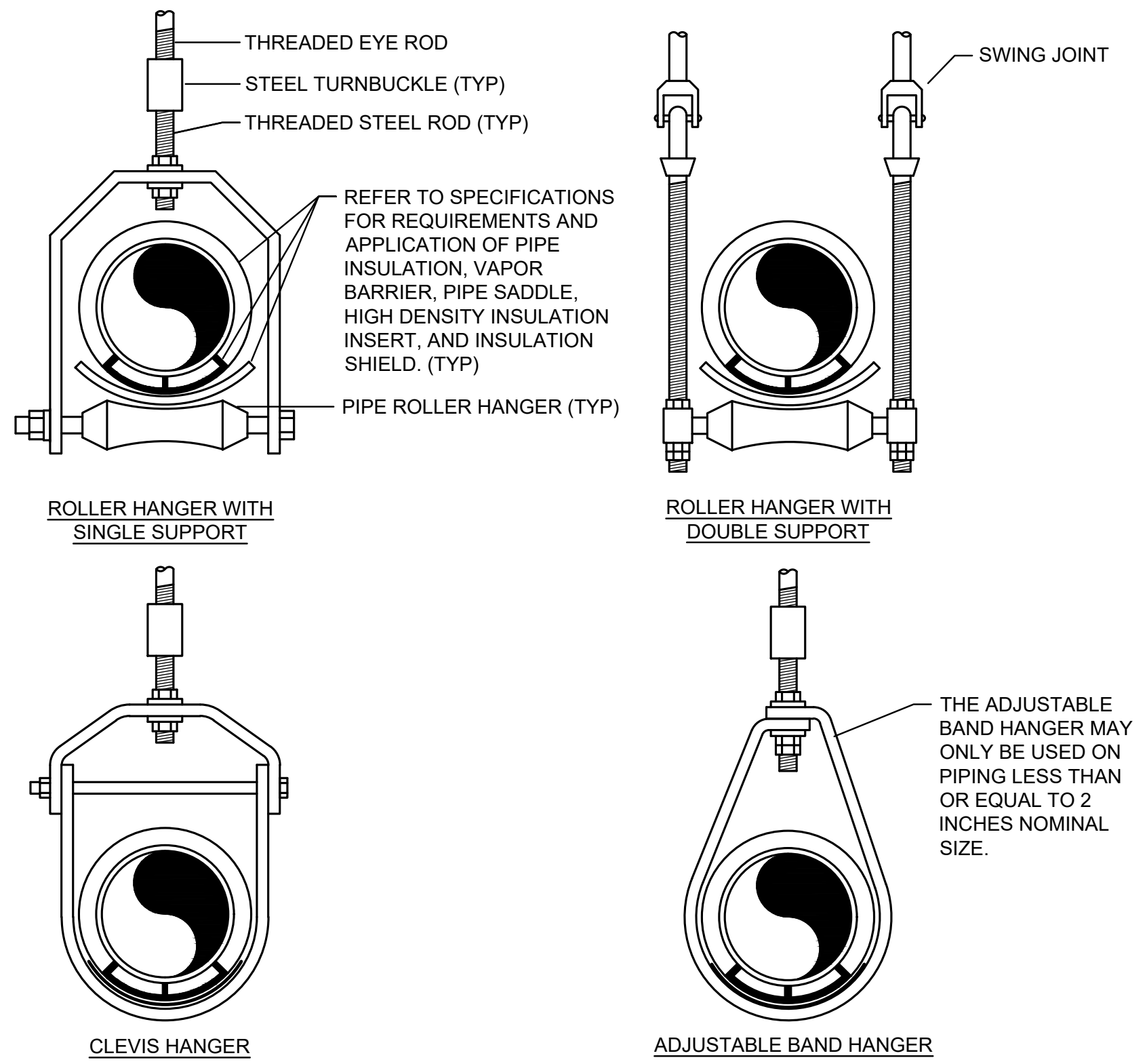
5 GREASE DUCT CLEANOUT ACCESS DOOR DETAIL
NO SCALE


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.
LINE OF SIGHT
LIGHT SHIELD SHALL EXTEND PAST THE LINE OF SIGHT.
RETURN AIR OPENING. SEE NOTE 4.
CEILING CLIP
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
THE ADJUSTABLE BAND HANGER MAY ONLY BE USED ON PIPING LESS THAN OR EQUAL TO 2 INCHES NOMINAL SIZE.

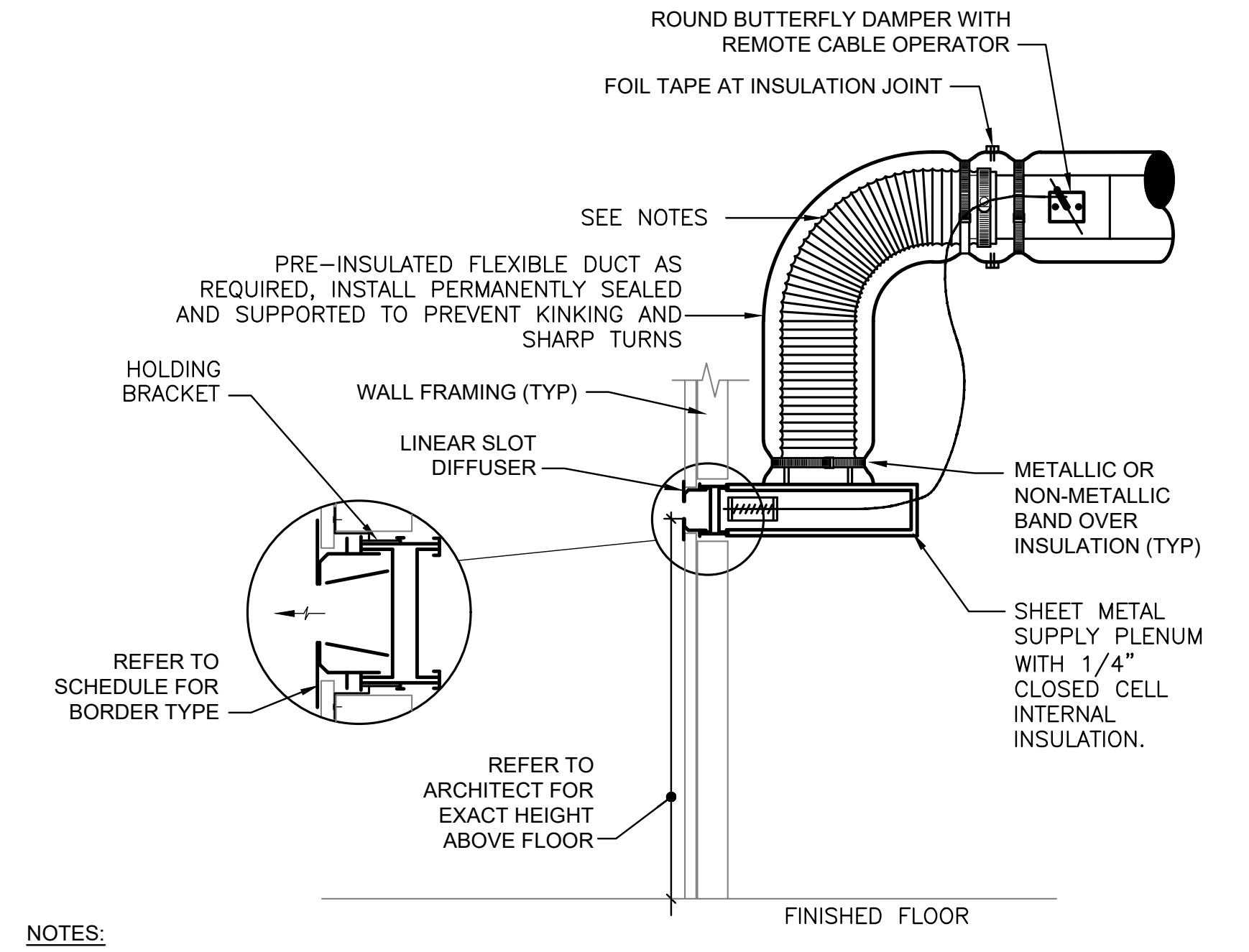
ROLLER HANGER WITH SINGLE SUPPORT

ROLLER HANGER WITH DOUBLE SUPPORT

CLEVIS HANGER

ADJUSTABLE BAND HANGER

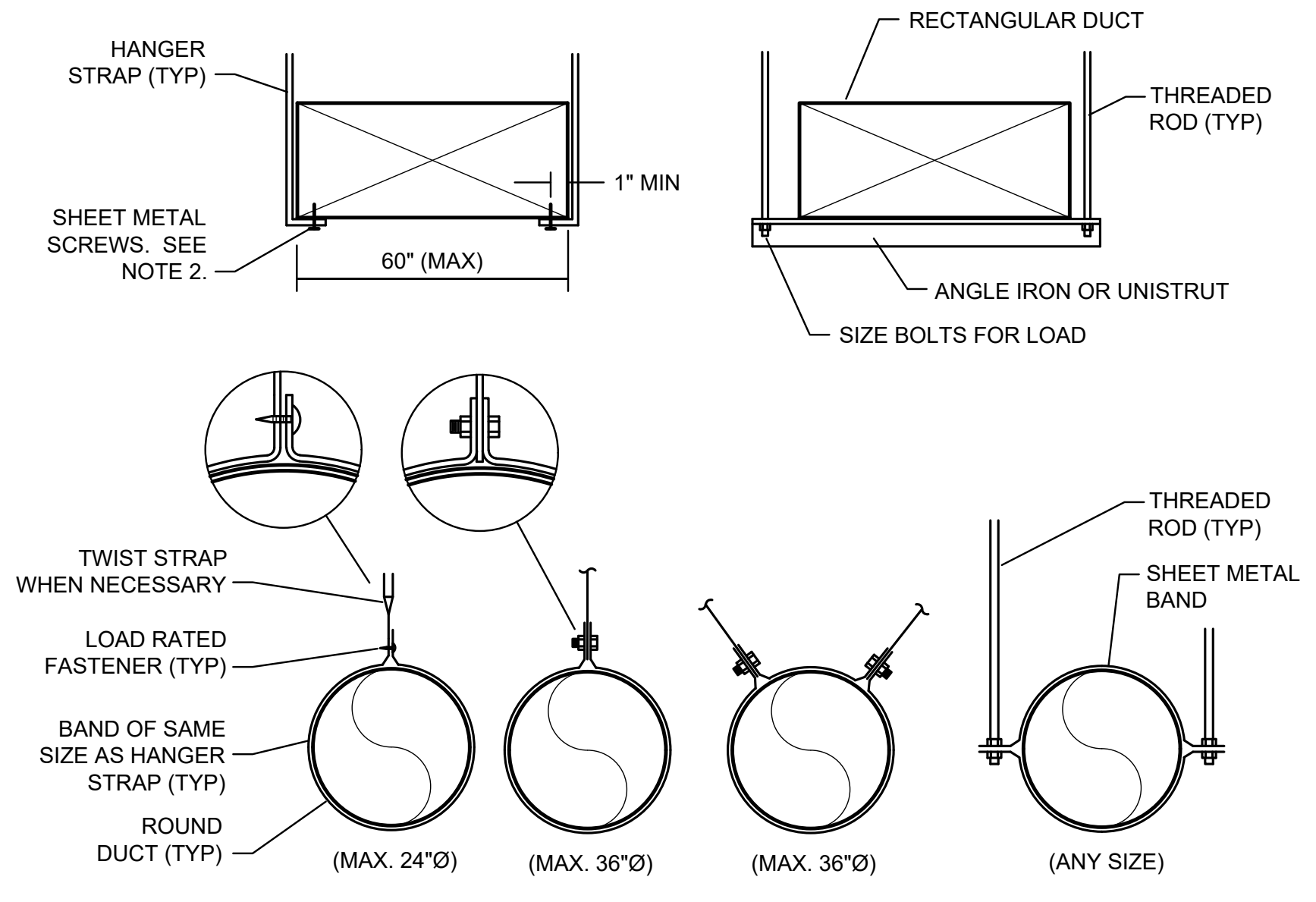
3 PIPE HANGER DETAILS
NO SCALE


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
REFER TO SCHEDULE FOR BORDER TYPE
REFER TO ARCHITECT FOR EXACT HEIGHT ABOVE FLOOR
METALLIC OR NON-METALLIC BAND OVER INSULATION (TYP)
SHEET METAL SUPPLY PLENUM WITH 1/4" CLOSED CELL INTERNAL INSULATION.
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



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

J:\Lenexa\Programs\P-T\Perry's Steakhouse\2150003829 Perry's Short Pump - Richmond - VA\001\Mech\2150003829 M3.0 MECHANICAL DETAILS.dwg, Plot, 5/2/2022 3:10 PM, Coy Macy

HENDERSON ENGINEERS
8345 LENEXA DRIVE, SUITE 300
LENEXA, KS 66214
TEL 913.742.5000 FAX 913.742.5001
WWW.HENDERSONENGINEERS.COM
2150003829
VA. CORPORATE NUMBER: 0405001357
12/31/23

Perry's STEAKHOUSE & GRILLE®
RARE & WELL DONE®

RICHMOND, VA 23233

11788 W. BROAD ST.

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
	04/29/22	ISSUED FOR BID

REVISIONS

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JUSTIN M. OLDER
LICENSE # 0402059047

IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

Drawing Title
MECHANICAL DETAILS

Job No. 214679
Drawn CMM
Scale AS NOTED
Date 04/29/22
Sheet No. M3.0

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.

F. AIR CURTAINS

Provide air curtains manufactured by Berner, Marley, Mars, or Powered Air, of sizes and capacities shown on drawings. Units shall comply with AMCA 220, AHRI 410 and NSF 37. Unit housing shall be constructed of aluminum, aluminized steel, or galvanized steel with powder coated finish (assume custom color when bidding, coordinate color with architect prior to ordering), with steel mounting brackets. Unit shall have air adjustment by way of multi-speed motors or adjustable intake louvers. Unit shall have an adjustable integral discharge nozzle. Units shall have statically and dynamically balanced fans with direct drive fan drives. Motors shall be two speed resiliently mounted, continuous duty, with permanently sealed pre-lubricated ball bearings, and internal disconnect. Unit shall be recessed in ceiling. Unit shall not require remote disconnects or motor control center.

Furnish unit with washable panel filters with welded galvanized steel mounting frames, gasketed, with fasteners for bolting together built-up filter banks. Furnish unit with field installed controllers, grouping air curtains by opening and using a single controller per opening. Furnish with plunger-type or magnetic-type automatic door switch, start-stop pushbutton switch, factory-installed time-delay relay, and mounting brackets and accessories. Furnish unit with motor control panel complete with motor starter, 115V transformer with primary and secondary fuses, terminal strip, and NEMA 250 enclosure as necessary.

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. AIR CURTAIN CONTROL

Air curtains shall have switch that energizes fan upon detection of opening of associated door.

C. 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.

D. 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.

E. DISHWASHER EXHAUST FAN CONTROL

Dishwasher exhaust fan shall be interlocked with associated dishwasher.

F. 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
2150003829
VA. CORPORATE NUMBER: 0405001357
12/31/23

Perry's STEAKHOUSE & GRILLE®
RARE & WELL DONE®

11788 W. BROAD ST.
RICHMOND, VA 23233

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
	04/29/22	ISSUED FOR BID

REVISIONS

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF PRELIMINARY SUBMITTAL
JUSTIN M. OLDER
LICENSE # 0402059047

IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

Drawing Title
MECHANICAL SPECIFICATIONS

Job No.	Drawn
2146T9	CMM

Scale	Date
AS NOTED	04/29/22

Sheet No.
M4.0

J:\Lenexa\Programs\P-T\Perry's Steakhouse\2150003829 Perry's Short Pump - Richmond - VA\001\Mech\2150003829 M4.0 MECHANICAL SPECIFICATIONS.dwg, Plot, 5/2/2022
3:10 PM, Coy Macy

COM*check* Software Version COMcheckWeb

Mechanical Compliance Certificate

Project Information

Energy Code: 2018 IECC
Project Title: Perry's Steakhouse - Short Pump
Location: Richmond, Virginia
Climate Zone: 4a
Project Type: New Construction

Construction Site:
Owner/Agent:
Designer/Contractor:

Additional Efficiency Package(s)

Credits: 1.0 Required 0.0 Proposed

Mechanical Systems List

Quantity System Type & Description

1 RTU-1 (Single Zone):
Heating: 1 each - Duct Furnace, Gas, Capacity = 60 kBtu/h
Proposed Efficiency = 80.00% Ec, Required Efficiency: 80.00 % Ec
Cooling: 1 each - Single Package DX Unit, Capacity = 46 kBtu/h, Air-Cooled Condenser, Unknown Economizer
Proposed Efficiency = 14.20 SEER, Required Efficiency: 14.00 SEER
Fan System: RTU-1 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
RTU-1 Supply, Single-Zone VAV, 1600 CFM, 1.0 motor nameplate hp, 0.0 fan efficiency grade, 0.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Single fan <= 5HP

1 RTU-2 (Single Zone):
Heating: 1 each - Duct Furnace, Gas, Capacity = 150 kBtu/h
Proposed Efficiency = 80.00% Ec, Required Efficiency: 80.00 % Ec
Cooling: 1 each - Single Package DX Unit, Capacity = 108 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 15.20 EER, Required Efficiency: 11.00 EER + 12.6 IEER
Fan System: RTU-2 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
RTU-2 Supply, Single-Zone VAV, 3400 CFM, 2.8 motor nameplate hp, 0.0 fan efficiency grade, 0.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Fan array <= 5 total HP

1 RTU-3 (Single Zone):
Heating: 1 each - Duct Furnace, Gas, Capacity = 150 kBtu/h
Proposed Efficiency = 80.00% Ec, Required Efficiency: 80.00 % Ec
Cooling: 1 each - Single Package DX Unit, Capacity = 120 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 15.00 EER, Required Efficiency: 11.00 EER + 12.6 IEER
Fan System: RTU-3 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
RTU-3 Supply, Single-Zone VAV, 4000 CFM, 2.2 motor nameplate hp, 0.0 fan efficiency grade, 0.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Fan array <= 5 total HP

1 RTU-4 (Single Zone):
Heating: 1 each - Duct Furnace, Gas, Capacity = 55 kBtu/h
Proposed Efficiency = 80.00% Ec, Required Efficiency: 80.00 % Ec
Cooling: 1 each - Single Package DX Unit, Capacity = 21 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 14.00 SEER, Required Efficiency: 14.00 SEER
Fan System: RTU-4 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
RTU-4 Supply, Single-Zone VAV, 600 CFM, 0.3 motor nameplate hp, 0.0 fan efficiency grade, 0.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Single fan <= 5HP

Quantity System Type & Description

1 RTU-5 (Single Zone):
Heating: 1 each - Duct Furnace, Gas, Capacity = 60 kBtu/h
Proposed Efficiency = 80.00% Ec, Required Efficiency: 80.00 % Ec
Cooling: 1 each - Single Package DX Unit, Capacity = 36 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 17.50 SEER, Required Efficiency: 14.00 SEER
Fan System: RTU-5 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
RTU-5 Supply, Single-Zone VAV, 1280 CFM, 1.0 motor nameplate hp, 0.0 fan efficiency grade, 0.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Single fan <= 5HP

1 RTU-6 (Single Zone):
Heating: 1 each - Duct Furnace, Gas, Capacity = 120 kBtu/h
Proposed Efficiency = 80.00% Ec, Required Efficiency: 80.00 % Ec
Cooling: 1 each - Single Package DX Unit, Capacity = 65 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 14.50 EER, Required Efficiency: 11.00 EER + 12.6 IEER
Fan System: RTU-6 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
RTU-6 Supply, Single-Zone VAV, 2400 CFM, 2.8 motor nameplate hp, 0.0 fan efficiency grade, 0.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Single fan <= 5HP

1 RTU-7 (Single Zone):
Heating: 1 each - Duct Furnace, Gas, Capacity = 120 kBtu/h
Proposed Efficiency = 80.00% Ec, Required Efficiency: 80.00 % Ec
Cooling: 1 each - Single Package DX Unit, Capacity = 74 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 15.00 EER, Required Efficiency: 11.00 EER + 12.6 IEER
Fan System: RTU-7 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
RTU-7 Supply, Single-Zone VAV, 2400 CFM, 2.8 motor nameplate hp, 0.0 fan efficiency grade, 0.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Single fan <= 5HP

1 RTU-8 (Single Zone):
Heating: 1 each - Duct Furnace, Gas, Capacity = 150 kBtu/h
Proposed Efficiency = 80.00% Ec, Required Efficiency: 80.00 % Ec
Cooling: 1 each - Single Package DX Unit, Capacity = 106 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 15.20 EER, Required Efficiency: 11.00 EER + 12.6 IEER
Fan System: RTU-8 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
RTU-8 Supply, Single-Zone VAV, 3200 CFM, 2.8 motor nameplate hp, 0.0 fan efficiency grade, 0.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Single fan <= 5HP

1 RTU-9 (Single Zone):
Heating: 1 each - Duct Furnace, Gas, Capacity = 150 kBtu/h
Proposed Efficiency = 80.00% Ec, Required Efficiency: 80.00 % Ec
Cooling: 1 each - Single Package DX Unit, Capacity = 131 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 15.00 EER, Required Efficiency: 11.00 EER + 12.6 IEER
Fan System: RTU-9 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
RTU-9 Supply, Single-Zone VAV, 4400 CFM, 3.0 motor nameplate hp, 0.0 fan efficiency grade, 0.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Single fan <= 5HP

1 RTU-10 (Single Zone):
Heating: 1 each - Duct Furnace, Gas, Capacity = 60 kBtu/h
Proposed Efficiency = 80.00% Ec, Required Efficiency: 80.00 % Ec
Cooling: 1 each - Single Package DX Unit, Capacity = 45 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 14.20 SEER, Required Efficiency: 14.00 SEER
Fan System: RTU-10 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
RTU-10 Supply, Single-Zone VAV, 2000 CFM, 1.0 motor nameplate hp, 0.0 fan efficiency grade, 0.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Single fan <= 5HP

1 RTU-11 (Single Zone):
Heating: 1 each - Duct Furnace, Gas, Capacity = 250 kBtu/h
Proposed Efficiency = 80.00% Ec, Required Efficiency: 80.00 % Ec
Cooling: 1 each - Single Package DX Unit, Capacity = 144 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 15.00 EER, Required Efficiency: 10.80 EER + 12.2 IEER

Quantity System Type & Description

Fan System: RTU-11 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
RTU-11 Supply, Single-Zone VAV, 4800 CFM, 3.0 motor nameplate hp, 0.0 fan efficiency grade, 0.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Single fan <= 5HP

1 RTU-12 (Single Zone):
Heating: 1 each - Duct Furnace, Gas, Capacity = 150 kBtu/h
Proposed Efficiency = 80.00% Ec, Required Efficiency: 80.00 % Ec
Cooling: 1 each - Single Package DX Unit, Capacity = 130 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 15.00 EER, Required Efficiency: 11.00 EER + 12.6 IEER
Fan System: RTU-12 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
RTU-12 Supply, Single-Zone VAV, 4800 CFM, 3.0 motor nameplate hp, 0.0 fan efficiency grade, 0.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Single fan <= 5HP

1 MAU-1 (Single Zone):
Heating: 1 each - Duct Furnace, Gas, Capacity = 300 kBtu/h
Proposed Efficiency = 80.00% Ec, Required Efficiency: 80.00 % Ec
Cooling: 1 each - Single Package DX Unit, Capacity = 241 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 12.70 EER, Required Efficiency: 9.80 EER + 11.4 IEER
Fan System: MAU-1 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
FAN 12 Supply, Single-Zone VAV, 3000 CFM, 3.0 motor nameplate hp, 0.0 fan efficiency grade, 0.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Single fan <= 5HP

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2018 IECC requirements in COM*check* Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

DALTON JUENEMANN - DESIGNER   Dalton Juenemann   4/20/2022
Name - Title   Signature   Date

COM*check* Software Version COMcheckWeb

Inspection Checklist

Energy Code: 2018 IECC

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

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

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR2]^{1}	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C406 [PR9]^{1}	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

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

Section # & Req.ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
C403.12.2, C403.12.3 [FO9]^{3}	Snow/ice melting system and freeze protection systems have sensors and controls configured to limit service for pavement temperature and outdoor temperature. future connection to controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

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

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2 [PL6]^{3}	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.5, C404.5.1, C404.5.2 [PL6]^{3}	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.5, C404.5.1, C404.5.2 [PL6]^{3}	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.5, C404.5.1, C404.5.2 [PL6]^{3}	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.5, C404.5.1, C404.5.2 [PL6]^{3}	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.5, C404.5.1, C404.5.2 [PL6]^{3}	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.5, C404.5.1, C404.5.2 [PL6]^{3}	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.5, C404.5.1, C404.5.2 [PL6]^{3}	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.5, C404.5.1, C404.5.2 [PL6]^{3}	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
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C404.5, C404.5.1, C404.5.2 [PL6]^{3}	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

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

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2 [PL6]^{3}	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.5, C404.5.1, C404.5.2 [PL6]^{3}	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.3 [PL7]^{3}	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.3 [PL7]^{3}	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.3 [PL7]^{3}	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.3 [PL7]^{3}	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.3 [PL7]^{3}	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.3 [PL7]^{3}	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.3 [PL7]^{3}	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.3 [PL7]^{3}	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.3 [PL7]^{3}	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.3 [PL7]^{3}	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

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

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.6.3 [PL7]^{3}	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.3 [PL7]^{3}	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.3 [PL7]^{3}	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8]^{3}	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8]^{3}	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8]^{3}	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8]^{3}	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8]^{3}	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8]^{3}	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

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

HENDERSON ENGINEERS
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2150003829
VA. CORPORATE NUMBER: 0405001357
12/31/23

Perry's STEAKHOUSE & GRILLE®
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11788 W. BROAD ST.
RICHMOND, VA 23233

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
	04/29/22	ISSUED FOR BID

REVISIONS

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF PRELIMINARY SUBMITTAL
JUSTIN M. OLDER
LICENSE # 0402059047

IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

Drawing Title
MECHANICAL COMPLIANCE FORMS

Job No. 214679
Drawn CMM
Scale AS NOTED
Date 04/29/22
Sheet No. M5.0

J:\Lenexa\Programs\P-T\Perry's Steakhouse\2150003829 Perry's Short Pump - Richmond - VA\001\Mech\2150003829 M5.0 MECHANICAL COMPLIANCE FORMS.dwg, Plot,
5/2/2022 3:10 PM, Coy Macy

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.7 [PL8]^3	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8]^3	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8]^3	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8]^3	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8]^3	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8]^3	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8]^3	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

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

Project Title: Perry's Steakhouse - Short Pump
Report date: 04/14/22
Data filename:

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C402.2.6 [ME41]^3	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.8.4 [ME142]^2	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.8.4 [ME142]^2	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.8.4 [ME142]^2	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.8.4 [ME142]^2	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.8.4 [ME142]^2	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.8.4 [ME142]^2	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.8.4 [ME142]^2	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.8.4 [ME142]^2	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.8.4 [ME142]^2	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

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

Project Title: Perry's Steakhouse - Short Pump
Report date: 04/14/22
Data filename:

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.8.4 [ME142]^2	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.8.4 [ME142]^2	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.8.4 [ME142]^2	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.8.4 [ME142]^2	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.8.5 [ME143]^2	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.8.5 [ME143]^2	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.8.5 [ME143]^2	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.8.5 [ME143]^2	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.8.5 [ME143]^2	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.8.5 [ME143]^2	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

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

Project Title: Perry's Steakhouse - Short Pump
Report date: 04/14/22
Data filename:

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.8.5 [ME143]^2	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.8.5 [ME143]^2	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.8.5 [ME143]^2	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.8.5 [ME143]^2	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.8.5 [ME143]^2	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.8.5 [ME143]^2	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.8.5 [ME143]^2	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.12.1 [ME71]^2	Systems that heat outside the building envelope are radiant heat systems controlled by an occupancy sensing device or timer switch.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. **Location on plans/spec:** ARCHITECTURAL SHEETS
C403.2.3 [ME55]^2	HVAC equipment efficiency verified.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Mechanical Systems list for values.*
C403.5.5 [ME113]^2	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.5 [ME113]^2	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

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

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Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.5.5 [ME113]^2	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.5 [ME113]^2	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.5 [ME113]^2	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.5 [ME113]^2	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.5 [ME113]^2	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.5 [ME113]^2	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.5 [ME113]^2	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.2 [ME59]^1	Natural or mechanical ventilation is provided in accordance with International Mechanical Code Chapter 4. Mechanical ventilation has capability to reduce outdoor air supply to minimum per IMC Chapter 4.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.7.1 [ME59]^1	Demand control ventilation provided for spaces >500 ft2 and >25 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Spaces where the supply airflow rate minus makeup air and minus outgoing transfer air is less than 1200 cfm.
C403.7.2 [ME115]^3	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.7.6 [ME141]^3	HVAC systems serving guestrooms in Group R-1 buildings with > 50 guestrooms: Each guestroom is provided with controls that automatically manage temperature setpoint and ventilation (see sections C403.7.6.1 and C403.7.6.2).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.7.4 [ME57]^1	Exhaust air energy recovery on systems meeting Table C403.7.4(1) and C403.7.4(2).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

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

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Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.7.5 [ME116]^3	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.11.1, C403.11.2 [ME60]^2	HVAC ducts and plenums insulated in accordance with C403.11.1 and constructed in accordance with C403.11.2, verification may need to occur during Foundation Inspection.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5, C403.5.1, C403.5.2 [ME62]^1	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5, C403.5.1, C403.5.2 [ME62]^1	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5, C403.5.1, C403.5.2 [ME62]^1	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5, C403.5.1, C403.5.2 [ME62]^1	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5, C403.5.1, C403.5.2 [ME62]^1	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5, C403.5.1, C403.5.2 [ME62]^1	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

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

Project Title: Perry's Steakhouse - Short Pump
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Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.5, C403.5.1, C403.5.2 [ME62]^1	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5, C403.5.1, C403.5.2 [ME62]^1	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.3 [ME124]^1	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.3 [ME124]^1	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.3 [ME124]^1	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.3 [ME124]^1	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.3 [ME124]^1	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.3 [ME124]^1	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.3 [ME124]^1	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

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

Project Title: Perry's Steakhouse - Short Pump
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Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.5.3.3 [ME124]^1	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.3 [ME124]^1	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.4 [ME125]^1	System capable of relieving excess outdoor air during air economizer operation to prevent overpressurizing the building. The relief air outlet located to avoid recirculation into the building.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.4 [ME125]^1	System capable of relieving excess outdoor air during air economizer operation to prevent overpressurizing the building. The relief air outlet located to avoid recirculation into the building.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.4 [ME125]^1	System capable of relieving excess outdoor air during air economizer operation to prevent overpressurizing the building. The relief air outlet located to avoid recirculation into the building.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.4 [ME125]^1	System capable of relieving excess outdoor air during air economizer operation to prevent overpressurizing the building. The relief air outlet located to avoid recirculation into the building.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
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1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

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Data filename:

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Perry's
STEAKHOUSE & GRILLE®
RARE & WELL DONE®

11788 W. BROAD ST.

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
	04/29/22	ISSUED FOR BID

REVISIONS

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CONSTRUCTION
PURPOSES.

Drawing Title
MECHANICAL COMPLIANCE FORMS

Job No. 214679
Drawn CMM
Scale AS NOTED
Date 04/29/22
Sheet No. M5.1

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Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.5.3.4 [ME125]^1	System capable of relieving excess outdoor air during air economizer operation to prevent overpressurizing the building. The relief air outlet located to avoid recirculation into the building.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.5 [ME126]^1	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.5 [ME126]^1	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.5 [ME126]^1	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.5 [ME126]^1	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.5 [ME126]^1	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.5 [ME126]^1	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.5 [ME126]^1	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.5 [ME126]^1	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.5 [ME126]^1	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

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

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.4.1.4 [ME63]^2	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperatures > 45F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint <= 60F and cooling setpoint >= 80F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.3 [ME35]^1	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.3 [ME35]^1	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.3 [ME35]^1	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.3 [ME35]^1	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.3 [ME35]^1	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.3 [ME35]^1	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.3 [ME35]^1	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.3 [ME35]^1	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.3 [ME35]^1	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.3 [ME35]^1	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.3 [ME35]^1	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

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

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.3.3 [ME35]^1	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.3 [ME35]^1	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.2.1 [ME53]^3	Air outlets and zone terminal devices have means for air balancing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5, C403.5.1, C403.5.2 [ME123]^3	Refrigerated display cases, walk-in coolers or walk-in freezers served by remote compressors and remote condensers not located in a condensing unit, have fan-powered condensers that comply with Sections C403.5.1 and refrigeration compressor systems that comply with C403.5.2..	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

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

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.6 [EL26]^2	Low-voltage dry-type distribution electric transformers meet the minimum efficiency requirements of Table C405.6.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C405.7 [EL27]^2	Electric motors meet the minimum efficiency requirements of Tables C405.7(1) through C405.7(4). Efficiency verified through certification under an approved certification program or the equipment efficiency ratings shall be provided by motor manufacturer (where certification programs do not exist).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C405.8.2, C405.8.2.1 [EL28]^2	Escalators and moving walks comply with ASME A17.1/CSA B44 and have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C405.9 [EL29]^2	Total voltage drop across the combination of feeders and branch circuits <= 5%.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

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

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5.3 [FI8]^3	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.2 [FI27]^3	HVAC systems and equipment capacity does not exceed calculated loads.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1 [FI47]^3	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1 [FI47]^3	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1 [FI47]^3	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1 [FI47]^3	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1 [FI47]^3	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1 [FI47]^3	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1	Heating and cooling to each zone is controlled by a thermostat control.	☐Complies ☐Does Not	Requirement will be met.

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C403.2.4.1 [FI47]^3	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1 [FI47]^3	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1 [FI47]^3	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1 [FI47]^3	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1 [FI47]^3	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.4.1.2 [FI38]^3	Thermostatic controls have a 5 °F deadband.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1.3 [FI20]^3	Temperature controls have setpoint overlap restrictions.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2 [FI39]^3	Each zone equipped with setback controls using automatic time clock or programmable control system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2.1, C403.2.4.2.2	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup	☐Complies ☐Does Not ☐Not Observable	Requirement will be met.

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C403.2.4.2.3 [FI41]^3	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2.3 [FI41]^3	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2.3 [FI41]^3	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2.3 [FI41]^3	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2.3 [FI41]^3	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2.3 [FI41]^3	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2.3 [FI41]^3	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2.3 [FI41]^3	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2.3 [FI41]^3	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2.3 [FI41]^3	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C408.2.1 [FI28]^1	Commissioning plan developed by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.3.1 [FI31]^1	HVAC equipment has been tested to ensure proper operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.3.2 [FI10]^1	HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.3.3 [FI32]^1	Economizers have been tested to ensure proper operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.4 [FI29]^1	Preliminary commissioning report completed and certified by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5.1 [FI7]^3	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5.3 [FI43]^1	An air and/or hydronic system balancing report is provided for HVAC systems.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5.4 [FI30]^1	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

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RICHMOND, VA 23233

Perry's STEAKHOUSE & GRILLE®
RARE & WELL DONE®

11788 W. BROAD ST.

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
	04/29/22	ISSUED FOR BID

REVISIONS

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Drawing Title
MECHANICAL COMPLIANCE FORMS

Job No. 214679
Drawn CMM
Scale AS NOTED
Date 04/29/22
Sheet No. M5.2

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