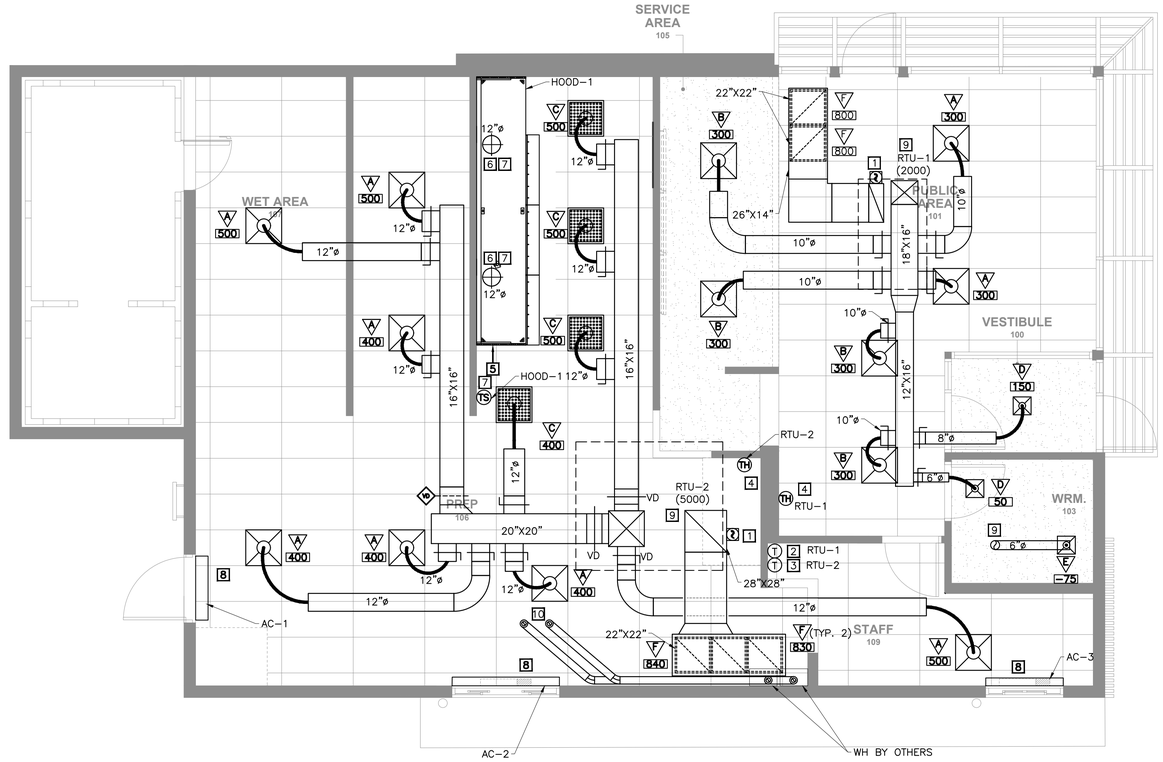

1 MECHANICAL FLOOR PLAN

1/4"=1'-0"

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MECHANICAL KEY NOTES

1. PROVIDE DUCT MOUNTED SMOKE DETECTOR. TIE IN AUDIO-VISUAL ANNUNCIATOR. UPON DETECTION OF SMOKE, ROOFTOP UNIT SHALL SHUT DOWN AND ACTIVATE ALARM. COORDINATE INSTALLATION LOCATION WITH ACCESS REQUIREMENTS.
2. PROVIDE HONEYWELL VISION PRO 8000 TOUCHSCREEN 7-DAY PROGRAMMABLE THERMOSTAT WITH AUTO-CHANGEOVER AND AUTOMATIC START CAPABILITY. MOUNT THERMOSTAT 48" ABOVE FINISHED FLOOR. COORDINATE FINAL INSTALLATION LOCATION OF THERMOSTAT WITH OWNER'S REPRESENTATIVE.
3. PROVIDE MICROPROCESSOR REMOTE INTERFACE. MOUNT MICROPROCESSOR REMOTE INTERFACE 48" ABOVE FINISHED FLOOR. COORDINATE FINAL INSTALLATION LOCATION OF MICROPROCESSOR REMOTE INTERFACE WITH OWNER'S REPRESENTATIVE.
4. PROVIDE COMBINATION TEMPERATURE/HUMIDITY SENSOR. MOUNT SENSOR 48" ABOVE FINISHED FLOOR. HUMIDITY SENSOR SHALL OPERATE REFRIGERATION SYSTEM AND INITIATE HOT GAS REHEAT AS REQUIRED TO MAINTAIN SPACE HUMIDITY AT 55% RH.
5. INSTALL OWNER FURNISHED TYPE I GREASE EXHAUST HOOD. SUPPORT HOOD PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE TRAPEZE HANGERS FOR ALL THREAD SUPPORT UNDER DUCTWORK AS REQUIRED. REFER TO HOOD DRAWING SET ON SHEET M3.1-M3.4 FOR HOOD SPECIFICATION AND ADDITIONAL INFORMATION.
6. INSTALL OWNER FURNISHED UL-2221 LISTED DOUBLE-WALL GREASE DUCT, EQUAL TO FRANKE SYSTEMS MODEL FRDW-2R ROUND 20 GAUGE 430 STAINLESS INNER DUCT INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL FROM HOOD COLLAR EXHAUST FAN ON ROOF. INSTALL EXHAUST DUCT PER MANUFACTURER'S INSTRUCTIONS. PROVIDE CLEANOUTS AT EVERY CHANGE OF DIRECTION IN THE DUCT AND/OR EVERY 10 FEET WITH MINIMUM OF 3 FEET OF CLEARANCE IN FRONT OF CLEAN-OUT.± DUCT UP TO EQUIPMENT ON ROOF. REFER TO SHEET M1.2 FOR EQUIPMENT LOCATION.
7. INSTALL ROOM TEMPERATURE SENSOR FOR HOOD THERMOSTATIC CONTROL. SEE HOOD DRAWING SET ON M3.1-M3.4 FOR HOOD SPECIFICATIONS AND ADDITIONAL INFORMATION.
8. PROVIDE AIR CURTAIN. MOUNT UNIT ON WALL DIRECTLY ABOVE DOOR PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
9. DUCT UP TO EQUIPMENT ON ROOF. REFER TO SHEET M1.2 FOR EQUIPMENT LOCATION.
10. 3"ø/5"ø WATER HEATER CONCENTRIC PIPE UP THROUGH ROOF WITH VENT CAP. TERMINATE AS PER MANUFACTURER RECOMMENDATION.

AIR DISTRIBUTION SIZING - ROUND DUCT

UNLESS NOTED OTHERWISE ON PLANS, THE FOLLOWING CHART SHALL APPLY TO ROUND DUCT SIZES FOR SUPPLY AIR*, EXHAUST AIR, AND RETURN AIR.

SUPPLY AND EXHAUST AIR CFM RANGE	DUCT SIZE	RETURN AIR CFM RANGE
0-100	6"ø	0-70
105-200	8"ø	75-155
205-395	10"ø	160-285
400-605	12"ø	290-465
610-920	14"ø	470-710
925-1200	16"ø	715-1015

* DIFFUSER NECK SIZES SHALL MATCH SUPPLY AIR DUCT SIZING.

GENRAL NOTES

A. CONTRACTORS AND SUB-CONTRACTORS SHALL CAREFULLY REVIEW THE CONSTRUCTION DOCUMENTS. INFORMATION REGARDING THE COMPLETE WORK IS DISPERSED THROUGHOUT THE DOCUMENT SET AND CANNOT BE ACCURATELY DETERMINED WITHOUT REFERENCE TO THE COMPLETE DOCUMENT SET.

B. COORDINATE WITH THE WORK OF OTHER SECTIONS, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE. PROVIDE DUCT RISES AND DROPS AS REQUIRED FOR FIELD INSTALLATION AND TRADE COORDINATION. NOTIFY ARCHITECT OF ANY DISCREPANCIES BEFORE STARTING WORK.

C. DRAWINGS FOR HVAC WORK ARE DIAGRAMMATIC, SHOWING THE GENERAL LOCATION, TYPE, LAYOUT, AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENT. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS. REFER TO MANUFACTURER'S STANDARD INSTALLATION DRAWINGS FOR EQUIPMENT CONNECTIONS AND INSTALLATION REQUIREMENTS. PROVIDE DUCTWORK, CONNECTIONS, ACCESSORIES, OFFSETS, AND MATERIALS NECESSARY FOR A COMPLETE SYSTEM.

D. ALL WORK SHALL COMPLY WITH STATE AND LOCAL CODE REQUIREMENTS AS APPROVED AND AMENDED BY THE GOVERNING CITY. PURCHASE ALL PERMITS ASSOCIATED WITH THE WORK. OBTAIN ALL INSPECTIONS REQUIRED BY CODE.

E. CONTRACTOR SHALL BALANCE EACH DEVICE WITH THE CFM SHOWN ON PLAN.

F. NEW DUCTWORK SHOWN ON PLAN ARE SCHEMATIC ONLY. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR PIPING AND DUCTWORK ROUTING. OFFEST AND RUN PIPING, DUCTWORK INSIDE THE STRUCTURE IF REQUIRED. PROVIDE ANY EXTRA PIPING, DUCTWORK, FITTINGS, INSULATIONS AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATION.

G. COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND STRUCTURAL ENGINEERS.

H. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.

I. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.

J. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.

K. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.

L. COORDINATE WITH ALL TRADES FOR MATERIALS IN RATED AND PLENUM SPACES.

M. MOUNT DUCTWORK AS HIGH AS POSSIBLE.

N. TEST AND BALANCE AIR SYSTEMS. PROVIDE REPORT TO G.C AND OWNER.

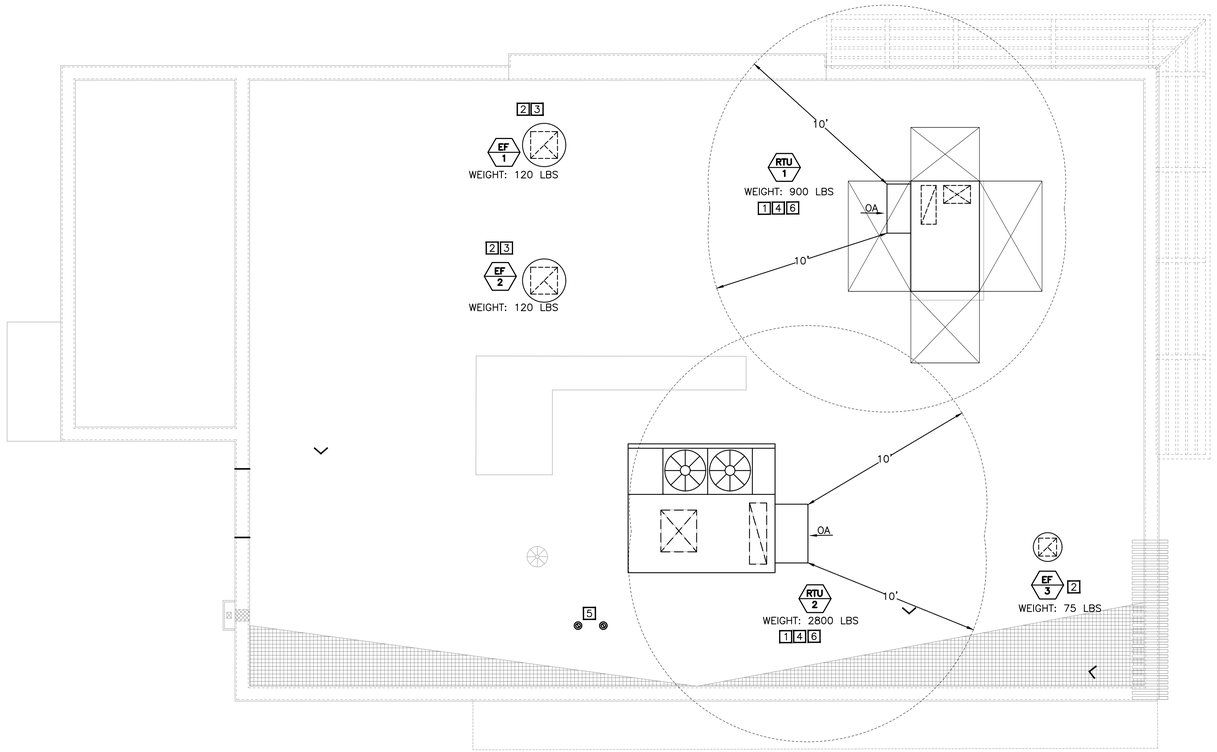
O. MECHANICAL CONTRACTOR TO COORDINATE INSTALLATION OF WATER HEATER EXHAUST FLUE WITH PLUMBING CONTRACTOR.

P. NEW DUCTWORK IN CONCEALED AREAS MAY BE RECTANGULAR WITH EQUIVALENT CROSS SECTIONAL FLOW AREA.

Q. PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/ BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWING FOR FIRE RATING OF THE WALLS.

R. PROVIDE CORD-OPERATED DAMPERS IN INACCESSIBLE CEILINGS.

S. PROVIDE 1.5'' FIRE WRAP TO KITCHEN EXHAUST DUCT AS PER MANUFACTURERS RECOMMENDATIONS.



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1 MECHANICAL ROOF PLAN

1/4"=1'-0"

MECHANICAL KEY NOTES ☐

1. PROVIDE ROOFTOP UNIT AND CURB. COORDINATE UNIT WITH STRUCTURE. SHIM UNIT AND CURB LEVEL FOR PROPER CONDENSATE DRAINAGE. PROVIDE FLEXIBLE CONNECTORS ON SUPPLY AND RETURN AIR DUCT CONNECTIONS. TRANSITION TO DUCT SIZES SHOWN ON SHEET M-1.1
2. INSTALL OWNER FURNISHED ROOF MOUNTED EXHAUST FAN AND CURB.
3. INSTALL OWNER FUNISHED WIND BAND EXTENSION FOR GREASE EXHAUST FAN. EXHAUST TERMINATION MUST BE EQUAL OR HIGHER THAN ANY WALL OR PARAPET WITHIN 5'-0" OF FAN. VERIFY REQUIRED HEIGHT PRIOR TO BID AND COORDINATE WITH HOOD MANUFACTURER FOR ADDITION TO EQUIPMENT PRIOR TO BID.
4. PROVIDE FLEXIBLE CONNECTORS ON SUPPLY AND RETURN DUCT CONNECTIONS. SET OUTSIDE AIR AS INDICATED ON ROOFTOP UNIT SCHEDULES. MECHANICAL CONTRACTOR SHALL SCRIBE INTO UNIT POSITION OF OUTSIDE AIR DAMPER AND LABEL OUTSIDE AIR VOLUME AND PERCENT OF OUTSIDE AIR.
5. 3"ø/5"ø WATER HEATER CONCENTRIC PIPE UP THROUGH ROOF WITH VENT CAP. TERMINATE AS PER MANUFACTURER RECOMMENDATION.
6. CONTRACTOR TO CONNECT CONDENSATE DRAIN FROM ALL RTUS TO NEAREST ROOF DRAIN OR DOWN SPOUTS.

GENERAL NOTES

A. SEAL ALL ROOF PENETRATIONS WATER TIGHT. COORDINATE ALL PENETRATIONS WITH GENERAL CONTRACTOR AND ROOFING CONTRACTOR.

B. ALL OUTDOOR INTAKES SHALL BE LOCATED AT LEAST 10 FEET FROM EXHAUST OUTLETS, APPLIANCE FLUES AND PLUMBING VENTS.

C. MAINTAIN ALL CODE AND MANUFACTURER'S RECOMMENDED CLEARANCES AROUND ALL ROOF EQUIPMENT.

ROOFTOP UNIT SCHEDULE

MARK (RTU- #)	1	2	
MANUFACTURER	CARRIER	GREENHECK	
MODEL	48GCFN06	RV-25-15	
AIR FLOW (CFM)	2,000	5,000	
OA FLOW (CFM)	400	2,500	
AMBIENT OAT (°F)	100	100	
EXTERNAL STATIC (IN. W.C.)	0.75	1.00	
DX COOLING COIL			
EAT (°FDB/WB)	78.8/66.2	85.5/71.5	
TOTAL (BTU/HR)	63,910	2,15,100	
SENSIBLE (BTU/HR)	45,860	1,44,100	
GAS HEAT			
FUEL	NATURAL GAS	NATURAL GAS	
THERMAL EFFICIENCY	0.8	0.8	
INPUT (BTU/HR)	1,50,000	3,00,000	
OUTPUT (BTU/HR)	1,20,000	2,40,000	
ELECTRICAL			
VOLTS/Ø/HZ	208/3/60	208/3/60	
UNIT MCA	33	84.2	
MOCP AMPS	45	100	
APPROX. WEIGHT (LBS)	810	2,750	
EER (SEER)	(16.1)	10.8	
NOTES	1-14	1-11,13-15	

NOTES:

1) PROVIDE FACTORY FABRICATED 14" HIGH ROOF CURB. CURB SHALL MATCH SLOPE OF ROOF. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION
2) PROVIDE FACTORY MOUNTED WEATHERHOOD AND BIRDSCREEN AT OUTSIDE AIR INTAKE.
3) PROVIDE FACTORY INSTALLED LOW-LEAK DRY BULB ECONOMIZER WITH FAULT DETECTION AND DIAGNOSTICS.
4) PROVIDE UNIT WITH LOUVERED HAIL GUARDS.
5) PROVIDE 5 MINUTE COMPRESSOR RESTART TIME DELAY.
6) PROVIDE FILTER RACK AND 2 SETS OF MERV 8 FILTERS.
7) PROVIDE FACTORY MOUNTED AND WIRED DISCONNECT SWITCH.
8) CONTRACTOR SHALL INSTALL ALL COMPONENTS SHIPPED LOOSE TO THE FIELD.
9) PROVIDE WITH FACTORY CONDENSATE OVERFLOW SWITCH, FOIL FACED INSULATION, AND HINGED ACCESS PANELS.
10) SET MINIMUM OUTSIDE AIR AS SPECIFIED ABOVE. FIELD SET 2 MINIMUM POSITIONS TO MAINTAIN SCHEDULED OUTSIDE AIR FLOW RATE AT SUPPLY FAN MINIMUM AND MAXIUM SPEEDS. OUTSIDE AIR DAMPER SHALL FULLY CLOSE UPON UNIT SHUTDOWN
11) PROVIDE POWERED GFCI CONVENIENCE OUTLET. OUTLET TO BE POWERED BY LINE SIDE OF DISCONNECT.
12) PROVIDE FAN WITH 2-SPEED FAN CONTROL.
13) PROVIDE FACTORY MOUNTED POWER EXHAUST.
14) PROVIDE HOT GAS REHEAT COIL FOR DEHUMIDIFICATION WITH HUMIDISTAT SET TO 55% R.H.
15) PROVIDE FACTORY MOUNTED SINGLE ZONE VAV AND DIGITAL SCROLL COMPRESSOR.

AIR CURTAIN SCHEDULE

MARK (AC-#)	1	2	3
MANUFACTURER	MARS	MARS	MARS
MODEL	LPV242-1UA-OB	LPV272-1-UA-OB	LPV248-1UA-OB
AIR FLOW (CFM)	900	1,800	1,200
ELECTRICAL			
VOLTS/Ø/HZ	115	115	115
MOTOR QUANTITY	1	1	1
MOTOR HP	1/6	1/6	1/6
MCA (AMPS)	2.4	2.6	2.4
MOCP (AMPS)	15	15	15
FINISH	OBSIDIAN BLACK	OBSIDIAN BLACK	OBSIDIAN BLACK
NOTES	1-4	1-4	1-4

NOTES:

1) PROVIDE WITH INTREGRAL DISCONNECT SWITCH.
2) PROVIDE WITH DOOR MICRO-SWITCH.
3) PROVIDE WITH FILTER.
4) PROVIDE MOUNTING HARDWARE REQUIRED BY MANUFACTURER FOR COMPLETE INSTALLATION.

EXHAUST AND VENTILATION FAN SCHEDULE - OWNER FURNISHED

MARK (EF-#)	1	2	3	
MANUFACTURER	FRANKE	FRANKE	FRANKE	
MODEL	FR-DU50HFA	FR-DU50HFA	FR-DR10HFA	
TYPE	UPBLAST	UPBLAST	DOWNBLAST	
DRIVE TYPE	DIRECT	DIRECT	DIRECT	
PERFORMANCE				
AIR FLOW (CFM)	1,230	1,230	75	
EXT. STATIC (IN W.C.)	0.8	0.8	0.125	
FAN SPEED (RPM)	1,500	1,500	1,015	
ELECTRICAL				
VOLTS/Ø/HZ	120/1/60	120/1/60	120/1/60	
FAN MOTOR HP	1/2	1/2	1/8	
ACCESSORIES	GDC,RC,WB	GDC,RC	BD,BS,DS,RC,SC	
APPROX. WEIGHT (LBS)	120	120	75	
SERVES	HOOD	HOOD	RESTROOM	
NOTES	1,2,3	1,2,3	3,4	

ACCESSORIES:
BD-BACKDRAFT DAMPER, BS-BIRD SCREEN, DS-DISCONNECT SWITCH, GDC-GREASE DRAIN AND CUP,
RC-ROOF CURB PER HOOD PACKAGE SPECIFICATION, SC-FACTORY MOUNTED AND WIRED SPEED CONTROL,
WB-WIND BAND EXTENSION, WP-NEMA 3R DISCONNECT SWITCH

NOTES:

1) FAN SHALL BE CONTROLLED BY SWITCH AT KITCHEN HOOD. INTERLOCK RTU-1 AND RTU-2 TO OPERATE IN OCCUPIED MODE WHILE HOOD EXHAUST FAN IS ENERGIZED. SEE HOOD PACKAGE ON M3.x SHEETS FOR MORE INFORMATION.
2) PROVIDE WITH VARIABLE SPEED CONTROLLER.
3) COORDINATE WITH MANUFACTURER FOR FINAL SELECTION.
4) ELECTRICAL CONTRACTOR SHALL INTERLOCK FAN WITH TIMECLOCK.

GRILLE, REGISTER, AND DIFFUSER SCHEDULE

MARK	A	B	C
MANUFACTURER	TITUS	TITUS	TITUS
MODEL	TMS-AA	TMS-AA	PAR-AA
TYPE	SQUARE CONE DIFFUSER	SQUARE CONE DIFFUSER	PREFORATED FACE DIFFUSER
NECK SIZE (L"XW")	PER PLAN	PER PLAN	PER PLAN
FACE SIZE (L"XW")	24"X24"	24"X24"	24"X24"
FRAME TYPE	LAY-IN	LAY-IN	LAY-IN
FINISH	WHITE	WHITE	WHITE
NOISE CRITERIA LEVEL	<30	<30	<30
ACCESSORIES		TRM	

MARK	D	E	F
MANUFACTURER	TITUS	TITUS	TITUS
MODEL	TMS-AA	355FL	50F
TYPE	SQUARE CONE DIFFUSER	LOUVERED EXHAUST GRILLE	EGGCRATE GRILLE
NECK SIZE (L"XW")	PER PLAN	10"X10"	22"X22"
FACE SIZE (L"XW")	12"X12"	12"X12"	24"X24"
FRAME TYPE	LAY-IN	SURFACE	LAY-IN
FINISH	WHITE	WHITE	WHITE
NOISE CRITERIA LEVEL	<30	<30	<30
ACCESSORIES	TRM	STR	

ACCESSORIES:
STR-SQUARE TO ROUND TRANSITION (AS REQUIRED), TRM-RAPID MOUNT SHEETROCK FRAME

2018 INTERNATIONAL MECHANICAL CODE - TABLE 403.3.1.1 VENTILATION SUMMARY

OCCUPANCY CATEGORY	PEOPE OUTDOOR AIR RATE - (Rp)	AREA OUTDOOR AIR RATE - (Ra)	OCCUPANCY DENSITY	LARGEST NUMBER OF PEOPLE EXPECTED TO OCCUPY THE ZONE - (Pz)	Rp*Pz	Ra*Az	AREA - (Az)	ZONE AIR DISTRIBUTION EFFECTIVENESS - Ez	BREATHING ZONE OUTDOOR AIRFLOW - (Vbz) Vbz=Rp*Pz+Ra*Az	ZONE OUTDOOR AIRFLOW (Voz) Voz=Vbz/Ez	ZONE PRIMARY AIRFLOW (Vpz)	PRIMARY OUTDOOR AIR FRACTION (Zp) Zp=Voz/Vpz	OCCUPANT DIVERSITY RATIO (D)	UNCORRECTED OUTDOOR AIR INTAKE (Vou) Vou=D*RpPz+RaAZ	SYSTEM VENTILATION EFFICIENCY	CORRECTED OUTDOOR AIRFLOW (Vot)	PROVIDED OUTDOOR AIRFLOW
	(CFM/PERSON)	(CFM/SQ.FT.)	P/1,000 SQ.FT.				SQ.FT.		CFM					CFM	Ev	CFM	CFM
RTU-1																	
VESTIBULE	0.0	0.00	0	0	0	0	45	0.8	0	0	150	0.00		0		0	
PUBLIC AREA	7.5	0.18	70	14	105	67	370	0.8	172	215	2200	0.10		172		204	
RESTROOMS	0.0	0	0	0	0	0	55	0.8	0	0	50	0.00		0		0	
SERVICE AREA	5.0	0.12	5	1	4	17	140	0.8	20	25	600	0.04		20		24	
SYSTEM POPULATION INCLUDING DIVERSITY (Ps) =				15							MAX. Zp =	0.10	1	192	0.84	228	400
RTU-2																	
STAFF	5.0	0.12	5	1	3	15	122	0.8	18	22	500	0.04		18		21	
WET AREA	7.5	0.12	20	4	30	25	210	0.8	55	69	900	0.08		55		66	
PREP AREA	7.5	0.12	20	14	105	89	740	0.8	194	242	3600	0.07		194		231	
SYSTEM POPULATION INCLUDING DIVERSITY (Ps) =				19							MAX. Zp =	0.08	1	267	0.84	317	2500

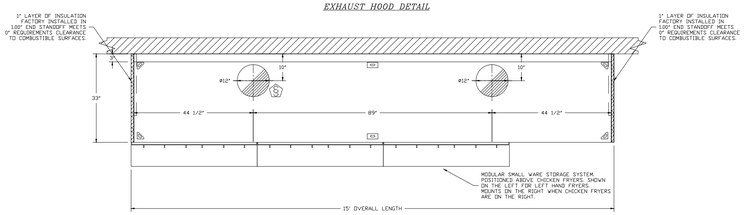
AIR BALANCE

UNIT	AREA SERVED	SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	RETURN AIR (CFM)	EXHAUST AIR(CFM)
RTU-1	SEE PLAN	2000	400	1600	0
RTU-2	SEE PLAN	5000	2500	2500	0
EF-1	SEE PLAN	0	0	0	1230
EF-2	SEE PLAN	0	0	0	1230
EF-3	SEE PLAN	0	0	0	75
TOTAL:		7000	2900	4100	2535
BUILDING PRESSURE:			365	POSITIVE	

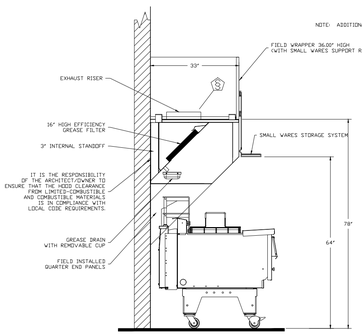
NOTES:

1. CONTRACTOR TO ADJUST MOTORIZED DAMPER ON FRESH AIR TAP TO PROVIDE OUTSIDE AIR AS MENTIONED IN ABOVE TABLE.

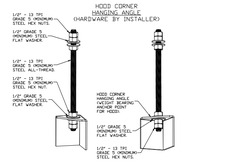
EXHAUST HOOD DETAIL



PLAN VIEW – HOOD #1
15' LONG 3347FR-BD-2
NOTE: ADDITIONAL HANGING ANGLES PROVIDED FOR HOODS 12' AND LONGER



SECTION VIEW – MODEL 3347FR-BD-2
HOOD – #1



ASSEMBLY INSTRUCTIONS

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

1 EXHAUST HOOD DETAIL
1 SCALE: NO SCALE

FRANKE

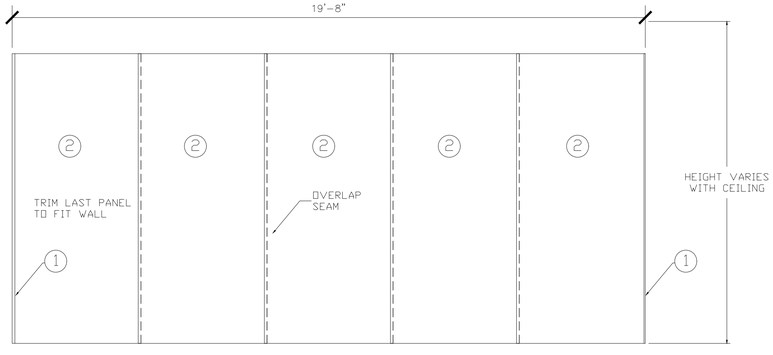
PLK 2112
15' HOOD PACKAGE

FRANKE FOODSERVICE SYSTEMS AMERICAS, INC.

800 AVIATION PARKWAY
SMYRNA, TN USA 37167

PHONE: 1-800-877-5178
WWW.FRANKESUPPLY.COM
FS-BKSALES.US@FRANKE.COM

FRYER HOOD DETAIL



COVERS ENTIRE WALL BEHIND HOOD

ITEM	QTY	DESCRIPTION
1	2	S/S CAP STRIP
2	5	WALL FLASHING 48" WIDE

2 BACKSPLASH DETAIL
1 SCALE: NO SCALE

EXHAUST FAN DATA

EXHAUST FAN INFORMATION – PLK 2136 PROTO

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	Ø	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SONES
1	EF-LEFT	1	FR-DU50HFA	FRANKE FOODSERVICE	1231	0.800	1501	TEAO-ECM	0.500	0.3500	1	115	6.3	468 FPM	78	15.9
2	EF-RIGHT	1	FR-DU50HFA	FRANKE FOODSERVICE	1231	0.800	1501	TEAO-ECM	0.500	0.3500	1	115	6.3	468 FPM	78	15.9

FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION
1	EF-LEFT	1	GREASE BOX.
		1	EXHAUST FAN HEAT BAFFLE.
		1	ECM WIRING PACKAGE - PWM SIGNAL FROM ECPM03 PREWIRE (TELCO MOTOR), CCW ROTATION.
2	EF-RIGHT	1	GREASE BOX.
		1	EXHAUST FAN HEAT BAFFLE.
		1	ECM WIRING PACKAGE - PWM SIGNAL FROM ECPM03 PREWIRE (TELCO MOTOR), CCW ROTATION.

FAN ACCESSORIES

FAN UNIT NO	TAG	EXHAUST			SUPPLY			
		GREASE CUP	GRAVITY DAMPER	WALL MOUNT	SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1	EF-LEFT	YES						
2	EF-RIGHT	YES						

CURB ASSEMBLIES

NO	ON FAN	TAG	WEIGHT	ITEM	SIZE
1	# 1	EF-LEFT	34 LBS	CURB	19.500"W X 19.500"L X 24.000"H HINGED.
2	# 2	EF-RIGHT	34 LBS	CURB	19.500"W X 19.500"L X 24.000"H HINGED.

FEATURES:

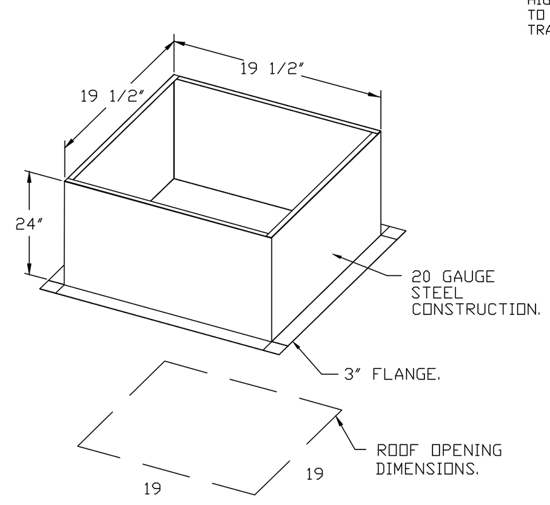
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT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

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

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

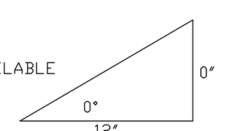
OPTIONS

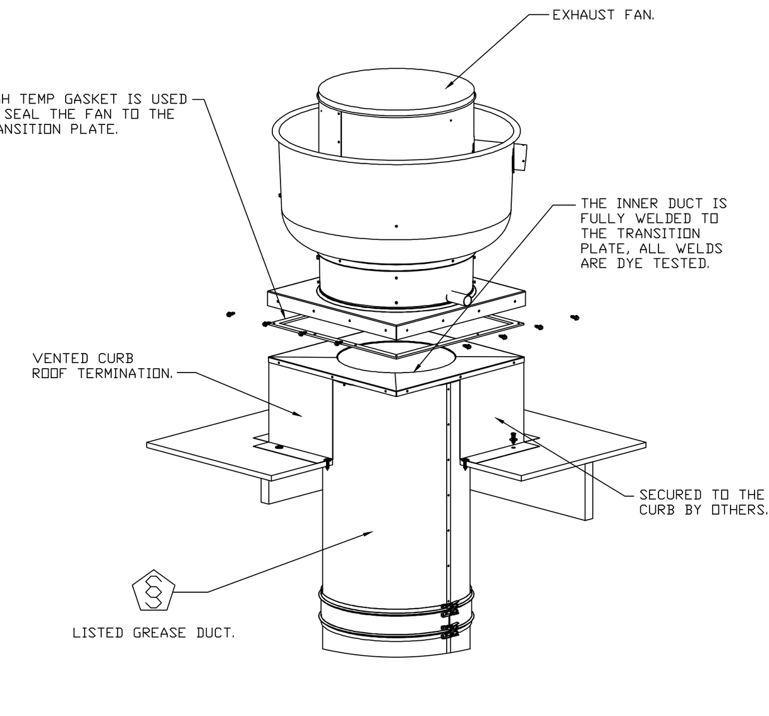
GREASE BOX.
EXHAUST FAN HEAT BAFFLE.
FAN BASE CERAMIC SEAL - SHIP LOOSE - FOR GREASE DUCTS.
ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL (TELCO MOTOR), CCW ROTATION.



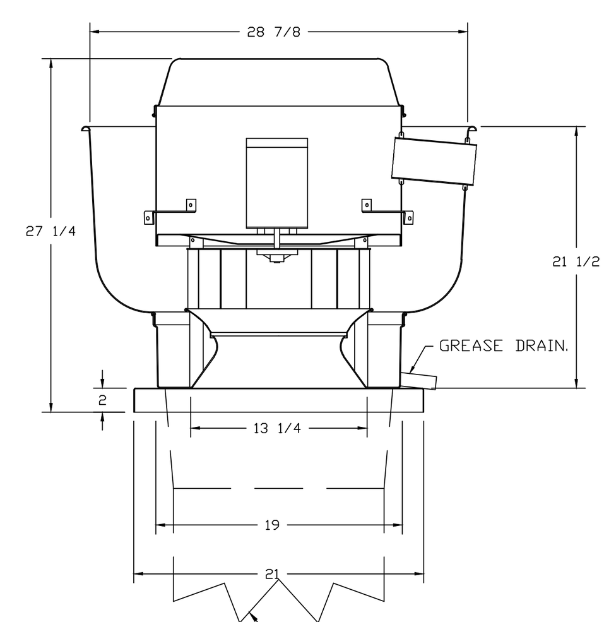
PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.

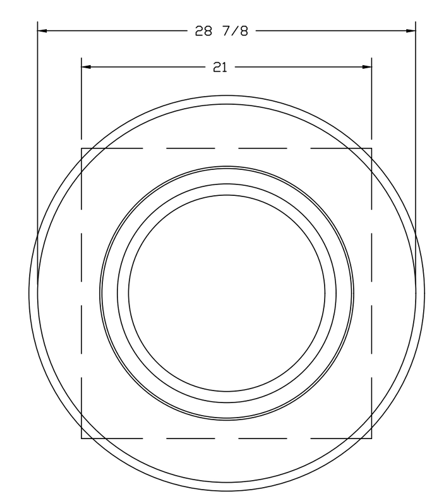
SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE.





FANS #1 (EF-LEFT), #2 (EF-RIGHT) - FR-DU50HFA EXHAUST FAN





4 / 2 EXHAUST FAN DATA
SCALE: NO SCALE

EXHAUST HOOD DATA

HOOD INFORMATION – PLK 2136 PROTO

HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL EXH CFM	EXHAUST PLENUM WIDTH	EXHAUST PLENUM LENG	RISER(S) HEIGHT	RISER(S) DIA	RISER(S) CFM	RISER(S) VEL	RISER(S) SP	HOOD CONSTRUCTION	HOOD CONFIG END TO END	HOOD CONFIG ROW
1		3347 FR-BD-2	FRANKE FOODSERVICE	14' 10"	450 DEG	I	MEDIUM	166	2462			4"	12"	1231	1567	-0.734"	430 SS WHERE EXPOSED	ALONE	ALONE
												4"	12"	1231	1567	-0.734"			

HOOD INFORMATION

HOOD NO	TAG	FILTER(S) TYPE	FILTER(S) QTY	FILTER(S) HEIGHT	FILTER(S) LENGTH	FILTER(S) EFFICIENCY @ 7 MICRONS	LIGHT(S) QTY	LIGHT(S) TYPE	LIGHT(S) WIRE GUARD	UTILITY CABINET(S) LOCATION	UTILITY CABINET(S) SIZE	FIRE SYSTEM TYPE	FIRE SYSTEM SIZE	ELECTRICAL MODEL #	SWITCHES QUANTITY	FIRE SYSTEM PIPING	HOOD HANGING WEIGHT
1		HIGH EFFICIENCY	11	16"	16"	>70%	0									YES	449 LBS

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

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

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

HVAC DISTRIBUTION NOTE

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

VERIFY CEILING HEIGHT

__' - __"

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

CUSTOMER APPROVAL TO MANUFACTURE:

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

3 / 2 EXHAUST HOOD DATA
SCALE: NO SCALE

RESTROOM EXHAUST FAN DATA

EXHAUST FAN INFORMATION – JOB PLK PROTO

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	Ø	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SONES
3	RESTROOM	1	FR-DR12HFA	150	0.375	1042	TEAO-ECM	0.250	0.0490	1	115	2.9		49	4.4

FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION
3	RESTROOM	1	I 12-BDD DAMPER.
		1	ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL (TELCO MOTOR), CCW ROTATION.

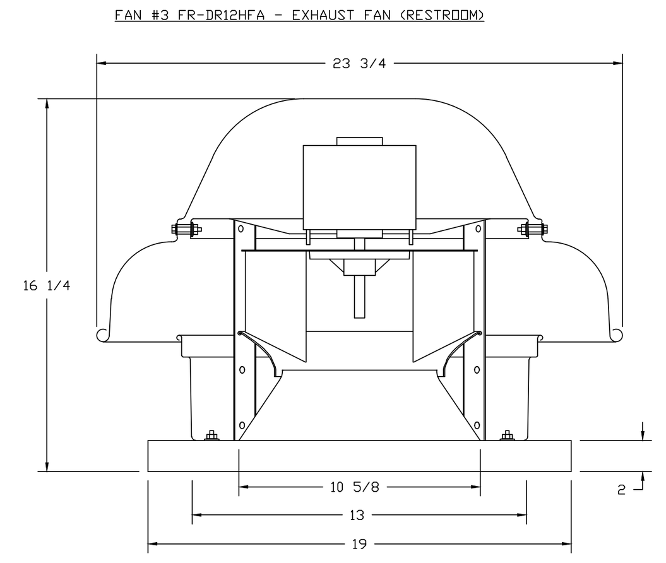
FAN ACCESSORIES

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

CURB ASSEMBLIES

NO	ON FAN	TAG	WEIGHT	ITEM	SIZE
3	# 3	RESTROOM	25 LBS	CURB	17.500"W X 17.500"L X 20.000"H .

FAN #3 FR-DR12HFA - EXHAUST FAN (RESTROOM)

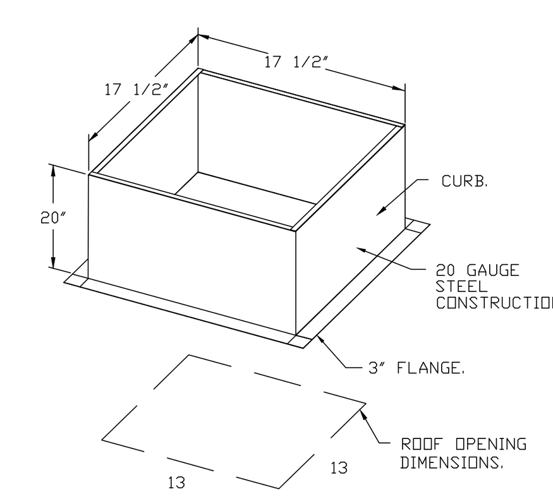


FEATURES:

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

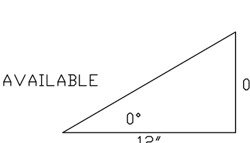
OPTIONS

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

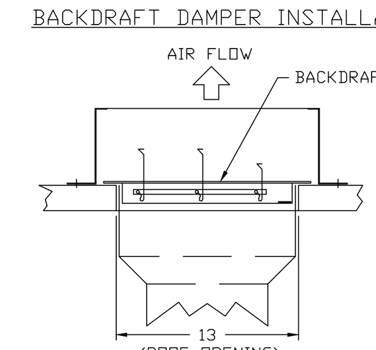


PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.

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



BACKDRAFT DAMPER INSTALLATION



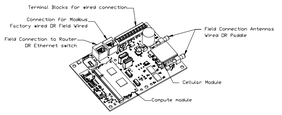
CUSTOMER APPROVAL TO MANUFACTURE:

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

5 / 2 RESTROOM EXHAUST FAN DATA
SCALE: NO SCALE

ELECTRICAL PACKAGE – JOB#4702950

NO	TAG	PACKAGE #	LOCATION	SWITCHES		OPTION	FANS CONTROLLED				
				LOCATION	QUANTITY		FAN TAG	TYPE	Φ	HP	VOLT	FLA
1		SC-120110MA_MA4	WALL MOUNT IN SS BOX	05 - SS WALL MOUNT BOX	1 LIGHT 1 FAN	SMART CONTROLS THERMOSTATIC CONTROL W/ RELAY ON/OFF WITH SUPPLY	EF-LEFT	EXHAUST	1	0.500	115	6.3
							EF-RIGHT	EXHAUST	1	0.500	115	6.3



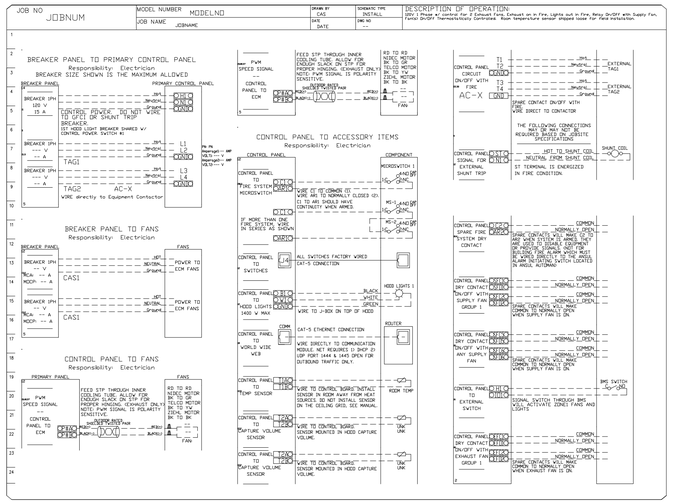
CASlink Monitor and Control

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

MONITORING AND CONTROL POINTS LIST

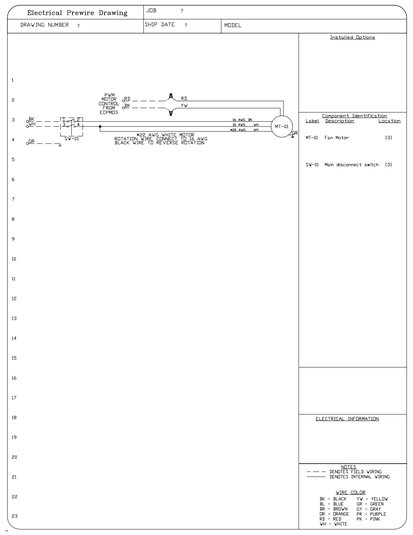
DC Packages	Function
Room Temperature	MONITOR
Duct Temperature(s)	MONITOR
MUA Discharge Temperature	MONITOR
Kitchen RTU Discharge Temperature	MONITOR
Fan Speed	MONITOR
Fan Amperage	MONITOR
Fan Power	MONITOR
VFD Faults	MONITOR
Controller Faults	MONITOR
Fan Faults	MONITOR
Fan Status	MONITOR
PCU Faults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

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

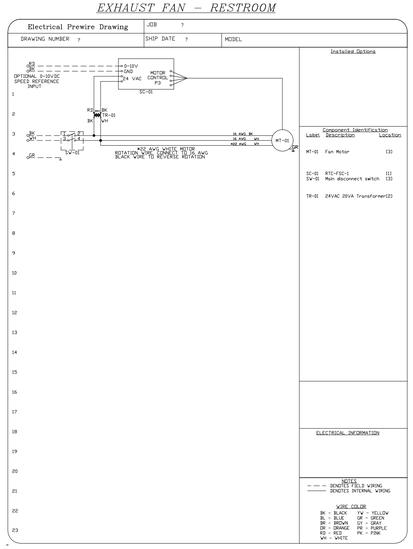


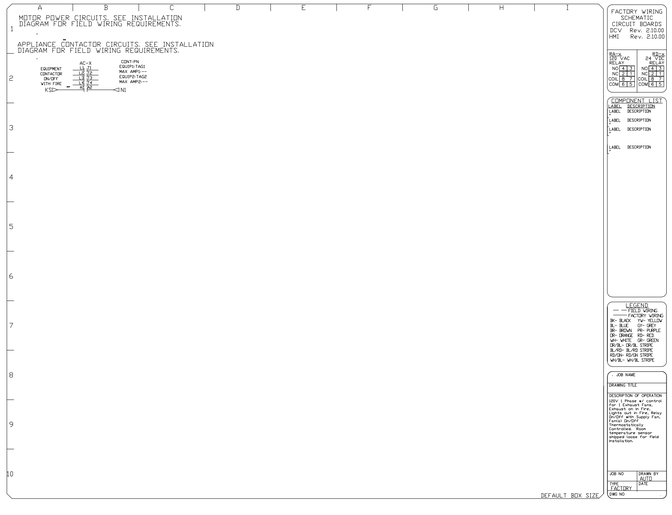
CONTROL SCHEMATIC – EXHAUST FANS

EXHAUST FAN – 12' HOOD



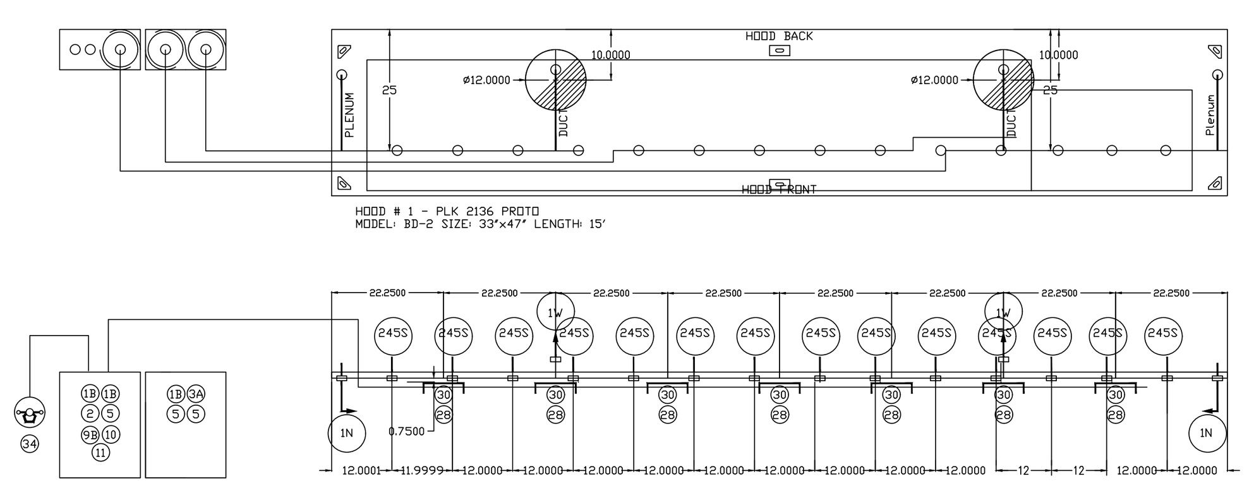
EXHAUST FAN – RESTROOM



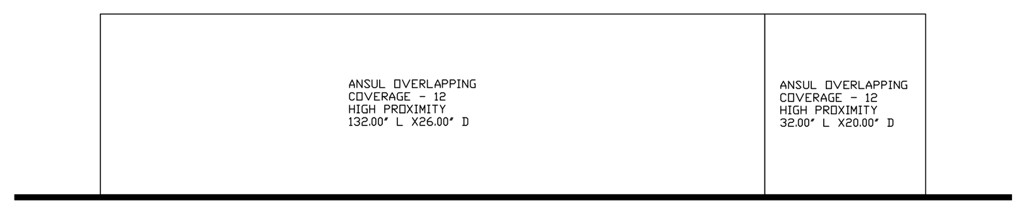


6 3 CONTROL SCHEMATIC
SCALE: NO SCALE

DUAL ANSUL SYSTEM – CHICKEN AND FRY HOODS



SHOWN WITH CHICKEN FRYERS ON LEFT END. COVERAGE IS THE SAME WHEN CHICKEN FRYERS ARE ON THE RIGHT END.



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

NOTES
- FIELD PIPE DROPS AS SHOWN
  SLEEVING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY CAS.
- RELOCATE NOZZLES IF FLOW PATTERN IS BLOCKED BY SHELVING, SALAMANDERS, ETC.
- MAXIMUM 9 ELBOWS IN SUPPLY LINE.
- MINIMUM 72 INCHES OF AGENT LINE FROM TANK TO FIRST NOZZLE COVERING A RANGE, FRYER, OR WOK TO REFLECT GENERAL PIPING REQUIREMENTS.
- IF APPLICABLE, PRE-PIPED CHARBROILER DROPS ARE SHIPPED LOOSE.
- FACTORY PIPING EXTENDS A MAXIMUM OF 6" ABOVE THE TOP OF THE HOOD.
- APPLIANCE DIMENSIONS LISTED REPRESENT THE COOKING SURFACE SIZE, NOT THE OVERALL APPLIANCE SIZE.

SPECIFICATIONS

THE RESTAURANT FIRE SUPPRESSION SYSTEM SHALL BE THE PRE-ENGINEERED TYPE WITH A FIXED NOZZLE AGENT DISTRIBUTION NETWORK. IT SHALL BE LISTED WITH UNDERWRITERS LABORATORIES, INC. (UL)

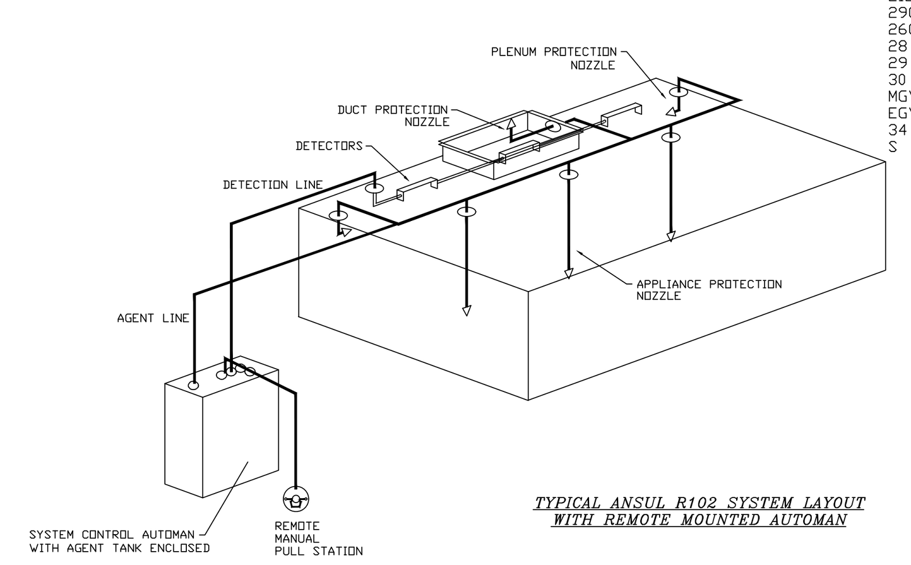
THE SYSTEM SHALL BE CAPABLE OF AUTOMATIC DETECTION AND ACTUATION WITH LOCAL OR REMOTE MANUAL ACTUATION. ACCESSORIES SHALL BE AVAILABLE FOR MECHANICAL OR ELECTRICAL GAS LINE SHUT-OFF APPLICATIONS.

THE EXTINGUISHING AGENT SHALL BE A POTASSIUM CARBONATE, POTASSIUM ACETATE-BASED FORMULATION DESIGNED FOR FLAME KNOCKDOWN AND SECUREMENT OF GREASE RELATED FIRES. IT SHALL BE AVAILABLE IN PLASTIC CONTAINERS WITH INSTRUCTIONS FOR LIQUID AGENT HANDLING AND USAGE.

THE REGULATED RELEASE MECHANISM SHALL BE COMPATIBLE WITH A FUSIBLE LINK DETECTION SYSTEM. THE FUSIBLE LINK SHALL BE SELECTED AND INSTALLED ACCORDING TO THE OPERATING TEMPERATURE IN THE VENTILATING SYSTEM. THE FUSIBLE LINK SHALL BE SUPPORTED BY A DETECTOR BRACKET/LINKAGE ASSEMBLY.

JOB #: 4531075.
JOB NAME: ** POPEYES - 2020 PROTO.

SYSTEM SIZE: ANSUL-3.0/3.0/3.0 TOTAL FP REQUIRED: 33.
HOOD # 1 12' 0.00" LONG x 33" WIDE x 47" HIGH.
RISER # 1 SIZE: 0" x 0".
HOOD # 2 4' 0.00" LONG x 30" WIDE x 44" HIGH.
RISER # 1 SIZE: 0" x 0".



TYPICAL ANSUL R102 SYSTEM LAYOUT WITH REMOTE MOUNTED AUTOMAN

NOTES
- FIELD PIPE DROPS AS SHOWN
  SLEEVING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY CAS.
- RELOCATE NOZZLES IF FLOW PATTERN IS BLOCKED BY SHELVING, SALAMANDERS, ETC.
- MAXIMUM 9 ELBOWS IN SUPPLY LINE.
- MINIMUM 72 INCHES OF AGENT LINE FROM TANK TO FIRST NOZZLE COVERING A RANGE, FRYER, OR WOK TO REFLECT GENERAL PIPING REQUIREMENTS.
- IF APPLICABLE, PRE-PIPED CHARBROILER DROPS ARE SHIPPED LOOSE.
- FACTORY PIPING EXTENDS A MAXIMUM OF 6" ABOVE THE TOP OF THE HOOD.
- APPLIANCE DIMENSIONS LISTED REPRESENT THE COOKING SURFACE SIZE, NOT THE OVERALL APPLIANCE SIZE.
- THIS FIRE SYSTEM COMPLIES WITH U.L. 300 REQUIREMENTS.

JOB #: PLK 2136 PROTO
JOB NAME: POPEYES -"KITCHEN OF THE FUTURE" STRAIGHT DUC.

SYSTEM SIZE: ANSUL-3.0/3.0/3.0 TOTAL FP REQUIRED: 32.
HOOD # 1 15' LONG x 33" WIDE x 47" HIGH.
RISER # 1 SIZE: 12" DIA.
RISER # 2 SIZE: 12" DIA.
HOOD # 1 METAL BLOW-OFF CAPS INCLUDED.

LEGEND – WALL MOUNTED ANSUL SYSTEM

1A 1.5 GALLON TANK
1B 3.0 GALLON TANK
2 AUTOMAN RELEASE
3 3 GALLON TANK ENCLOSURE
3A 6 GALLON TANK ENCLOSURE
4 REGULATED ACTUATOR
5 ANSULEX LIQUID AGENT (3 GAL.)
6 ANSULEX LIQUID AGENT (1.5 GAL.)
7 CARTRIDGE (101-20)
8 CARTRIDGE (101-10)
9 CARTRIDGE (101-30)
9A CARTRIDGE (LT-A-101-30)
9B DOUBLE TANK CARTRIDGE
10 TEST LINK
11 DOUBLE MICROSWITCH
2W DUCT NOZZLE (419337)
1W NOZZLE ASSEMBLY (419336)
1F NOZZLE ASSEMBLY (419333)
1N NOZZLE ASSEMBLY (419335)
1/2N NOZZLE ASSEMBLY (419334)
3N NOZZLE ASSEMBLY (419338)
245 NOZZLE ASSEMBLY (419340)
230 NOZZLE ASSEMBLY (419339)
2120 NOZZLE ASSEMBLY (419343)
290 NOZZLE ASSEMBLY (419342)
260 NOZZLE ASSEMBLY (419341)
28 DETECTOR BRACKET
29 LOW TEMP FUSIBLE LINK
30 HIGH TEMP FUSIBLE LINK
MGV MECHANICAL GAS VALVE
EGV ELECTRICAL GAS VALVE
34 REMOTE MANUAL PULL STATION
S SWIVEL ADAPTOR

8 / 4 ANSUL PIPING
SCALE: NO SCALE

UL LISTED NON-WELDED DUCT WORK

DUCTWORK PARTS – JOB#2136 PROTO – DOUBLE WALL SINGLE WALL DUCT

TAG	PART #	CFM	SP	WEIGHT	VELOCITY	QTY	DESCRIPTION
P1	DW1235DWLT-2R-S	1245	-0.0151	40.86	1585.18	1	DOUBLE WALL DUCT – 12" INNER DUCT, 35" LONG – 2 LAYERS REDUCED CLEARANCE – 16" STAINLESS STEEL OUTER SHELL.
P2	DW1247DWAJD-2R-S	1245	-0.0119	83.19	1585.18	1	DOUBLE WALL ADJUSTABLE DUCT – 12" INNER DUCT – 2 LAYERS REDUCED CLEARANCE – 16" STAINLESS STEEL OUTER SHELL. MIN LENGTH = 11" / MAX LENGTH = 48.5" / ADJUSTMENT = 30.5" / ADJUSTABLE SECTION MAY NEED TO BE CUT. INCLUDES SINGLE AND DOUBLE WALL "V" CLAMPS.
P3 ASSEMBLED W/P4	DW124550DWLTTP-2R-S	1245	-0.02	53.52	1585.18	1	DOUBLE WALL DUCT – 12" INNER DUCT, 45.5" LONG – 2 LAYERS REDUCED CLEARANCE – 16" STAINLESS STEEL OUTER SHELL – USED WITH TRANSITION PLATE.
P4 ASSEMBLED W/P3	DW1912TPDBEX	1245		7.50	1585.18	1	DUCT TO CURB TRANSITION 3/4" DOWN TURN, 19-1/2" CURB TO 12" DUCT, 16 GA ALUMINIZED STEEL. FOR USE WITH EXHAUST FANS.
SYSTEM AT P4			-0.799	0.00			
P5	DW1235DWLT-2R-S	1245	-0.0151	40.86	1585.18	1	DOUBLE WALL DUCT – 12" INNER DUCT, 35" LONG – 2 LAYERS REDUCED CLEARANCE – 16" STAINLESS STEEL OUTER SHELL.
P6	DW1247DWAJD-2R-S	1245	-0.0119	83.19	1585.18	1	DOUBLE WALL ADJUSTABLE DUCT – 12" INNER DUCT – 2 LAYERS REDUCED CLEARANCE – 16" STAINLESS STEEL OUTER SHELL. MIN LENGTH = 11" / MAX LENGTH = 48.5" / ADJUSTMENT = 30.5" / ADJUSTABLE SECTION MAY NEED TO BE CUT. INCLUDES SINGLE AND DOUBLE WALL "V" CLAMPS.
P7 ASSEMBLED W/P8	DW124550DWLTTP-2R-S	1245	-0.02	53.52	1585.18	1	DOUBLE WALL DUCT – 12" INNER DUCT, 45.5" LONG – 2 LAYERS REDUCED CLEARANCE – 16" STAINLESS STEEL OUTER SHELL – USED WITH TRANSITION PLATE.
P8 ASSEMBLED W/P7	DW1912TPDBEX	1245		7.50	1585.18	1	DUCT TO CURB TRANSITION 3/4" DOWN TURN, 19-1/2" CURB TO 12" DUCT, 16 GA ALUMINIZED STEEL. FOR USE WITH EXHAUST FANS.
SYSTEM AT P8			-0.799	0.00			
	3M-2000PLUS			0.80		1	DUCT – 3M FIRE BARRIER 2000 PLUS SILICONE – USED AS SEALANT TO SEAL DUCT JOINTS.
TOTAL WEIGHT				370.94			

DOUBLE WALL FACTORY BUILT DUCTWORK

- ALL DUCTWORK IS REQUIRED TO BE INSTALLED WITH THE MAXIMUM SUPPORT SPACING LISTED BELOW.
- FOR A COMPLETE LIST OF APPROVED SUPPORT METHODS, SEE THE ENTIRE INSTALLATION AND OPERATION MANUAL
- DUCTWORK SHALL SLOPE NOT LESS THAN 1/16" PER LINEAR FOOT TOWARDS THE HOOD OR AN APPROVED GREASE COLLECTION RESERVOIR.
- WHERE HORIZONTAL DUCTS EXCEED 75 FEET IN LENGTH, THE SLOPE SHALL NOT BE LESS THAN 3/16" PER LINEAR FOOT.

DUCT DIAMETER	HORIZONTAL SUPPORT (FT)	VERTICAL WALL SUPPORT (FT)	VERTICAL CURB SUPPORT (FT)
12"	10'	10'	24'

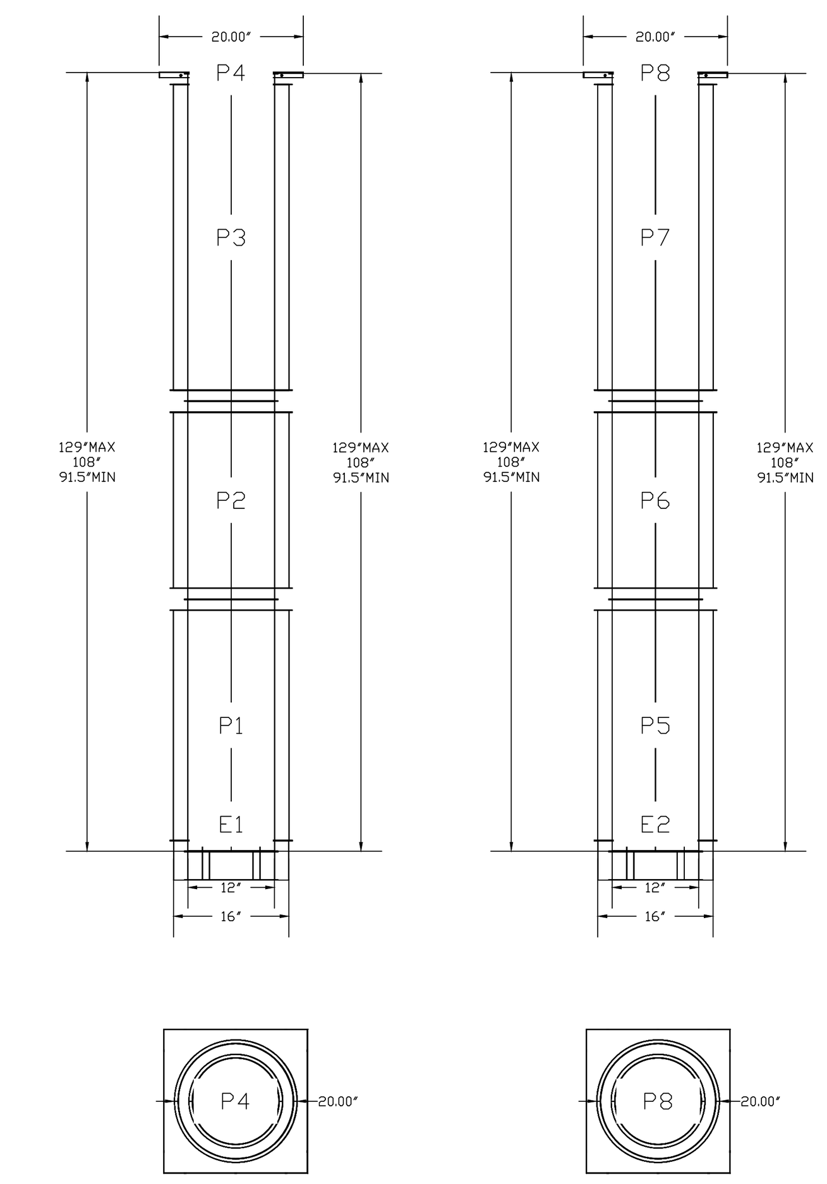
CONFORMS TO UL STD 2221 AND UL STD 1978
CERTIFIED TO CAN/UL-S115, CAN/ULC-S662 AND ASTM E814
MODEL # FRDW-2R
Double Wall Duct - 10" Inner Duct, 2 Layers Reduced Clearance - 14" Stainless Steel Outer Shell

Intertek
2001474

Notes:
- This duct has been evaluated for use as a 2 hour fire rated grease duct system. It is classified as an alternative to 2 hour fire resistive rated shaft enclosure systems.
- For grease duct systems installed without a continuous fire-rated enclosure, an evaluated through-penetrated fire stop assembly shall be used.
- Complies all applicable requirements of the referenced standards as required by the National Building Code of Canada (NBCC). International Mechanical Code (IMC) or NFPA96, and when installed in accordance with the manufacturers's recommended installation instructions.

Clearances:
- This duct may be installed with 3/4 inch clearance from the outer surface of the duct to combustible materials. The outer v-band may be installed in contact with combustible materials.

DUCTWORK #1 FRONT VIEW
DOUBLE WALL DUCT



DO NOT LEAK TEST USING SMOKE BOMBS CONTAINING CHLORINES/CHLORIDES.

7 / 4 UL LISTED NON-WELDED DUCT WORK
SCALE: NO SCALE

ANSUL FIRE SYSTEM EQUIPMENT SCHEDULE

FIRE SYSTEM INFORMATION – JOB PLK 2136 PROTO

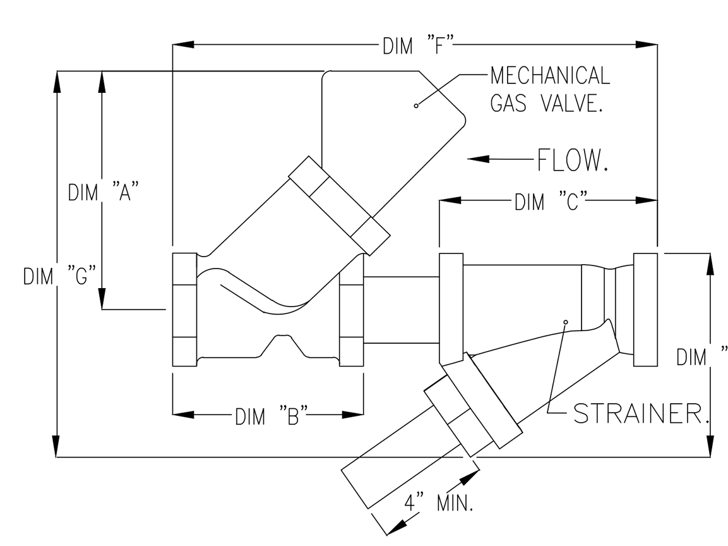
FIRE SYSTEM NO	TAG	TYPE	SIZE	FLOW POINTS	INSTALLATION: SYSTEM	INSTALLATION: LOCATION ON HOOD
1		ANSUL R102	3.0/3.0/3.0	32	WALL MOUNT LEFT	N/A

GAS VALVE(S)

FIRE SYSTEM NO	TAG	TYPE	SIZE	SUPPLIED BY
1		MECHANICAL	1.500	FRANKE FOODSERVICE SYSTEMS

FIRE SYSTEM PARTS LIST KEY

FIRE SYSTEM NO	TAG	KEY NUMBER - PART DESCRIPTION	QTY BY FACTORY	QTY BY DIST
1		0 - 0 - 439861 LARGE BLOWOFF CAP, METAL, TO FIT NEW LASER-ETCHED ANSUL NOZZLES, A0024201.	18	0
		1 - 1 - AT - 3.0 TANK(#1B) - 3.0 GALLON SS TANK (FOR USE WITH AUTOMAN RELEASE, ACTUATOR, OR SS ENCLOSURE (UL/ULC)) MACOLA # 01-429862.	3	0
		2 - 2 - AP - AR AUTOMAN RELEASE - ANSUL AUTOMAN MECHANICAL RELEASE (UL). TANK SOLD SEPARATELY. ANSUL PART # 429853; MACOLA # 01-429853.	1	0
		3 - 3 - AP - ADE ENCLOSURE (DOUBLE) - DOUBLE STAINLESS STEEL ENCLOSURE (UL), ANSUL PART # 429872; MACOLA # 03-429872.	1	0
		3 - 3 - AP - AE ENCLOSURE - STAINLESS STEEL ENCLOSURE ASSEMBLY (UL), ANSUL PART # 429870; MACOLA # 01-429870.	0	0
		5 - 5 - LIQ-3.0 AGENT - ANSULEX LOW PH WET CHEMICAL AGENT, 3 GALLON (UL) 79372.	3	0
		9 - 9 - DT-CART DOUBLE TANK NITROGEN CARTRIDGE.	0	1
		10 - 10 - TLINK LINK - TEST LINK (1 TEST LINK) ANSUL PART # 24916, MACOLA # 20-24916.	1	0
		11 - 11 - MICRO-SDA MICROSWITCH KIT- INCLUDES 2 SWITCHES AND MOUNTING HARDWARE. SINGLE DUAL ELECTRIC SWITCH, ONE STANDARD SWITCH, ONE ALARM DUTY SWITCH ANSUL PART # 437155, MACOLA # 08-437155.	1	0
		14 - 14 - 419336 NOZZLE - 1W NOZZLE, DUCT/APPLIANCE (REPLACES ANSUL PART# 419347, CAS PART# 419336) A0001266.	2	0
		16 - 16 - 419335 NOZZLE - 1N NOZZLE, PLENUM/APPLIANCE (REPLACES ANSUL PART# 419346, CAS PART# 419335) A0001265.	2	0
		20 - 20 - 419340 NOZZLE - 245 NOZZLE, APPLIANCE (REPLACES ANSUL PART# 419351, PART# 419340) A0001270.	14	0
		25 - 25 - 418569 NOZZLE ADAPTOR - SWIVEL NOZZLE ADAPTOR (REPLACES CAS PART # 418569) A0001274.	14	0
		26 - 26 - QSA-3/8 QUIK SEAL - 3/8" (UL).	18	0
		27 - 27 - QPSA-1/2 PULLEY SEAL - 1/2" HOOD SEAL (UL) ANSUL PART # 423253, MACOLA # 32-79768.	1	0
		28 - 28 - S-DET DETECTOR - SERIES (SCISSOR LINKAGE) ANSUL PART # 435547/435548 (OLD # 417369/434480); MACOLA # 05-417369.	7	0
		30 - 30 - ANS-500FL FUSIBLE LINK - 500DEG F, R-102 AND PIRANHA, ANSUL PART # 439232.	7	0
		34 - 34 - RPS-A REMOTE PULL STATION - RED COMPOSITE (WITHOUT WIRE ROPE) 434618 (OLD MACOLA #06-4835).	1	0
		35 - 35 - PE-LT PULLEY ELBOW - LOW TEMP. PULLEY ELBOW, SET SCREW TYPE ANSUL PART # 415670, MACOLA # 11-415671.	0	10
		36 - 36 - PE-HT PULLEY ELBOW - HIGH TEMP PULLEY ELBOW, COMPRESSION TYPE, ANSUL PART # 423251, MACOLA # 10-45771.	1	0



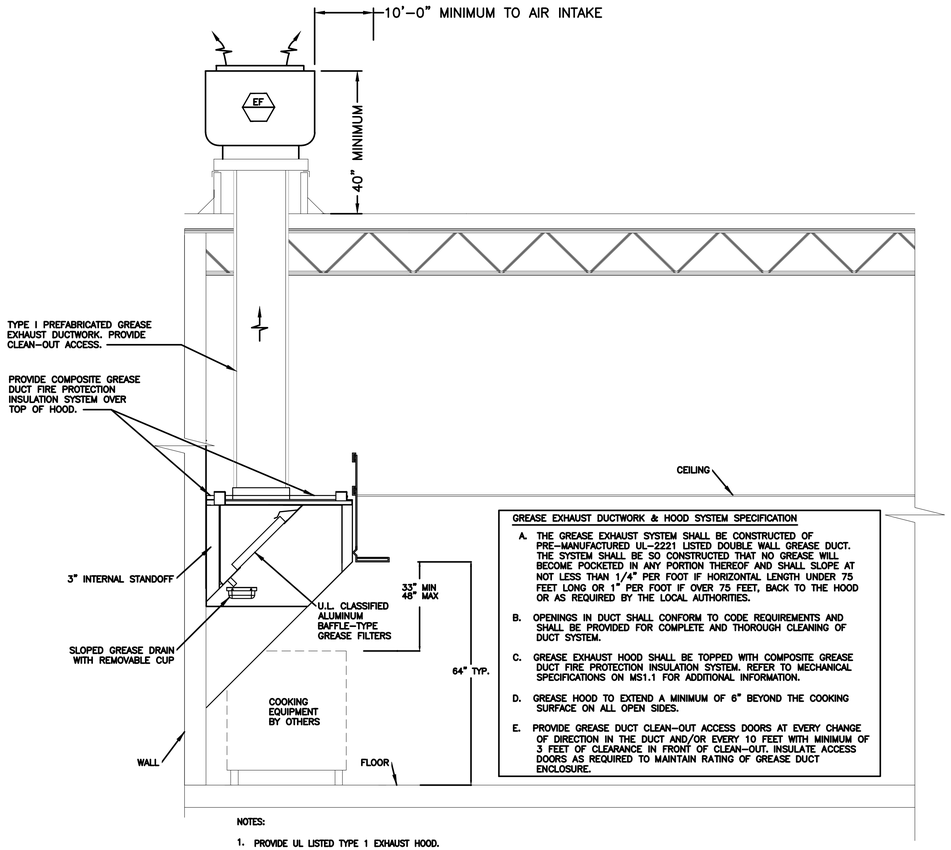
GAS VALVES AND STRAINERS

	GAS VALVE SIZING: TYPE	SIZE	VOLTAGE	MIN. INLET PRESSURE	MAX. INLET PRESSURE	FLOW AT 1 IN.W.C. DROP NATURAL GAS	FLOW AT 1 IN.W.C. DROP PROPANE	GAS VALVE DIMENSIONS: DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "F"	DIM "G"	INSTALLATION: MOUNTING ORIENTATION	PART NUMBERS: GAS VALVE PART NUMBER	STRAINER PART NUMBER	GAS VALVE/STRAINER KIT
GAS VALVE FOR FS#1 →	MECHANICAL	1-1/2"	N/A	0 PSI (0 IN.W.C.)	10 PSI (277 IN.W.C.)	2,630,000 BTU/HR	1,706,569 BTU/HR	6-3/8"	4-7/8"	5-3/4"	6-3/16"	12-5/8"	11-3/8"	HORIZONTAL	27-55607	4417K67	MGVA1-1/2

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

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

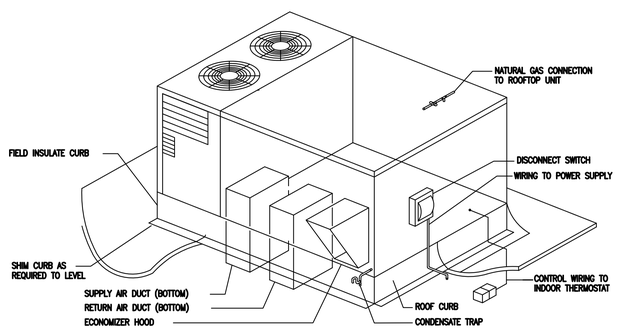
9 / 4 ANSUL FIRE SYSTEM EQUIPMENT SCHEDULE
SCALE: NO SCALE



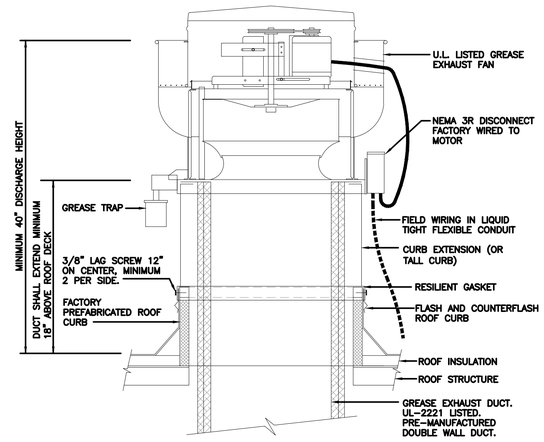
NOTES:

1. PROVIDE UL LISTED TYPE 1 EXHAUST HOOD.
2. GREASE HOOD SHALL MEET THE REQUIREMENTS OF MECHANICAL CODE, NSF AND NFPA FOR A TYPE I HOOD.
3. FIRE DEPARTMENT APPROVAL SHALL BE REQUIRED ON FIRE PROTECTION SYSTEM FOR GREASE HOODS AND DUCTS AS REQUIRED BY MECHANICAL AND FIRE CODES.
4. PROVIDE CHEMICAL FIRE SUPPRESSION SYSTEM AS REQUIRED BY NFPA 17A.
5. PERFORM SMOKE TEST ON GREASE EXHAUST DUCTWORK AFTER DUCTWORK INSTALLATION IS COMPLETE BUT PRIOR TO DUCTWORK CONCEALMENT PER REQUIREMENTS OF LOCAL CODE AUTHORITIES.

05 KITCHEN HOOD SCHEMATICS
NOT TO SCALE

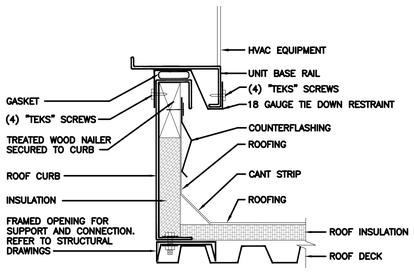


06 TYPICAL ROOF TOP UNIT DETAIL
NOT TO SCALE

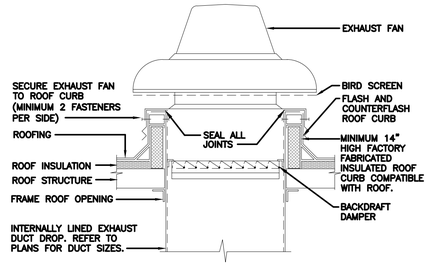


NOTE: INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA 96 REQUIREMENTS.

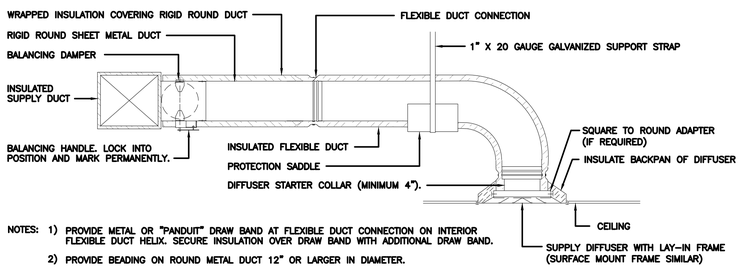
01 ROOF MOUNTED GREASE EXHAUST FAN DETAIL
NOT TO SCALE



03 ROOFTOP UNIT CURB DETAIL
NOT TO SCALE



02 EXHAUST FAN DETAIL
NOT TO SCALE



NOTES:
1) PROVIDE METAL OR "PANDUIT" DRAW BAND AT FLEXIBLE DUCT CONNECTION ON INTERIOR FLEXIBLE DUCT HELIX. SECURE INSULATION OVER DRAW BAND WITH ADDITIONAL DRAW BAND.
2) PROVIDE BEADING ON ROUND METAL DUCT 12" OR LARGER IN DIAMETER.
3) PROVIDE MINIMUM 4" COLLARS FOR ATTACHMENT OF FLEXIBLE DUCT TO ROUND DUCT, DAMPERS AND DIFFUSERS.
4) BAND RIGID ROUND DUCT INSULATION TO DUCT AND PROVIDE TAPE FOR INSULATION OVERLAP.

04 DIFFUSER CONNECTION DETAIL
NOT TO SCALE

SMYRNA BUILDING DEPARTMWENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF INTERNATIONAL BUILDING CODE 2018 AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

1. THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS.

2. TESTS WILL BE CONDUCTED UNDER DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS. THE TESTS WILL SHOW COMPLIANCE WITH BUILDING CODE REQUIREMENTS AS OUTLINES IN SECTION [BC 1704].

3. THE LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS AND CONDUCTING SUCH TESTS WILL FILE DOCUMENTATION AND REPORTS OF TESTS THAT THE SYSTEM COMPLIES WITH THE CONSTRUCTION DOCUMENTS AND APPLICABLE LAWS.

4. TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE 2018 INTERNATIONAL MECHANICAL CODE :

   A. VENTILATION SYSTEM MC 403
   B. REFRIGERATION SYSTEMS MC 1108

5. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
   A. STANDARDS OF HEATING – MC 309.1
   B. DUCT CONSTRUCTION AND INSTALLATION– MC 603
   C. AIR INTAKES, EXHAUSTS AND RELIEFS – MC 401.5
   D. AIR FILTERS – MC 605

6.MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.

7.VENTILATION FOR ALL AREA SHALL COMPLY WITH MC 401.

8.A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE AS REQUIRED BY IMC 2018 (MECHANICAL CODE 2018 OF DELAWARE), SECTION 403.3.

9.ALL FIRE DAMPERS SHALL BE ACCEPTED FOR USE BY THE DEPARTMENT OF BUILDINGS. FIRE DAMPERS SHALL BE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH UL 555, STANDARDS FOR FIRE DAMPERS.

10. SMOKE DETECTION SYSTEMS SHALL BE INSTALLED AND SEQUENCED TO FOLLOW CONTROLS OPERATIONS WITH THE REQUIREMENTS OF SECTION IMC 2018 (MECHANICAL CODE 2018 OF DELAWARE), SECTION 606 TO CLOSE DAMPERS AND AUTOMATICALLY STOP THE FAN.

11.FIRE DAMPERS LOCATED WITHIN THE AIR DISTRIBUTION AND SMOKE CONTROL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION IMC 2018 (MECHANICAL CODE 2018 OF DELAWARE), SECTION 607.

12.REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.

13.THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

14.SMOKE DETECTOR SHALL MEET UL268A.

15.ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.

16.THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

17.INDOOR DUCT AND PLENUM INSULATION SCHEDULE;

A. CONCEALED, RECTANGULAR, ROUND AND FLAT–OVAL, SUPPLY–RETURN, OUTDOOR–AND EXHAUST–AIR DUCT AND AIR PLENUM INSULATION:

B. FLEXIBLE ELASTOMERIC, MINERAL–FIBER BLANKET, MINERAL–FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:

UNCONDITIONED SPACES WITHIN BUILDING:	R–6
WITHIN BUILDING ENVELOPE ASSEMBLY:	R–8
OUTSIDE OF BUILDING:	R–8

THERMOSTATIC CONTROL NOTES

THERMOSTATIC CONTROLS:

C403.4 HEATING AND COOLING SYSTEM CONTROLS

EACH HEATING AND COOLING SYSTEM SHALL BE PROVIDED WITH THERMOSTATIC CONTROLS AS SPECIFIED IN SECTION C403.4.1, C403.4.1.2, C403.4.1.3 AND C403.4.2

C403.4.1 THERMOSTATIC CONTROLS

THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, AT LEAST ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM.

C403.4.1.2 DEADBAND

WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CAPABLE OF PROVIDING A TEMPERATURE RANGE OR DEADBAND OF AT LEAST 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS CAPABLE OF BEING SHUT OFF OR REDUCED TO A MINIMUM.

EXCEPTIONS:

1. THERMOSTATS REQUIRING MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.
2. OCCUPANCIES OR APPLICATIONS REQUIRING PRECISION IN INDOOR TEMPERATURE CONTROL AS APPROVED BY THE CODE OFFICIAL.

C403.4.1.3 SET POINT OVERLAP RESTRICTION

WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, A LIMIT SWITCH, MECHANICAL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE PROVIDED WITH THE CAPABILITY TO PREVENT THE HEATING SET POINT FROM EXCEEDING THE COOLING SET POINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION C403.4.1.2.

C403.4.2 OFF–HOUR CONTROLS

EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM.

C403.4.2.1 THERMOSTATIC SETBACK CAPABILITIES

THERMOSTATIC SETBACK CONTROLS SHALL HAVE THE CAPABILITY TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C).

C403.4.2.2 AUTOMATIC SETBACK AND SHUTDOWN CAPABILITIES

AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR AT LEAST 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS; A MANUALLY OPERATED TIMER CAPABLE OF BEING ADJUSTED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR.

C403.4.2.3 AUTOMATIC AND OPTIMUM START CAPABILITIES

AUTOMATIC START CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM. THE CONTROLS SHALL BE CONFIGURED TO AUTOMATICALLY ADJUST THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY.

INDIVIDUAL HEATING AND COOLING SYSTEMS WITH SETBACK CONTROLS AND DIRECT DIGITAL CONTROL SHALL HAVE OPTIMUM START CONTROLS. THE CONTROL ALGORITHM SHALL, AS A MINIMUM, BE A FUNCTION OF THE DIFFERENCE BETWEEN SPACE TEMPERATURE AND OCCUPIED SET POINT, THE OUTDOOR TEMPERATURE, AND THE AMOUNT OF TIME PRIOR TO SCHEDULED OCCUPANCY. MASS RADIANT FLOOR SLAB SYSTEMS SHALL INCORPORATE FLOOR TEMPERATURE INTO THE OPTIMUM START ALGORITHM.

HVAC SEQUENCE OF OPERATIONS

PROVIDE ALL NECESSARY SENSORS, DAMPER ACTUATORS, CONTROL TRANSFORMERS WITH SECONDARY OVERLOAD PROTECTION, WIRING AND CONDUIT TO ACCOMPLISH FOLLOWING SEQUENCE OF OPERATION:

ROOFTOP UNIT:

THERMOSTATS SHALL BE SET TO DETERMINE OCCUPIED AND UNOCCUPIED HOURS OF OPERATION. HOURS SHALL BE COORDINATED WITH OWNER. ROOFTOP UNITS SHALL BE INTERLOCKED WITH KITCHEN EXHAUST FANS TO PROVIDE MAKE–UP AIR FOR HOODS.

OCCUPIED MODE:

SUPPLY FAN SHALL RUN CONTINUOUSLY AND OUTSIDE AIR DAMPER SHALL OPEN TO MINIMUM POSITION TO DELIVER SCHEDULED QUANTITY OF VENTILATION AIR.

SUPPLY FAN SPEED SHALL VARY AIRFLOW AS A FUNCTION OF LOAD. DURING NON–COOLING, FIRST STAGE COOLING, AND NON–HEATING TIMES, SUPPLY FAN SHALL RUN AT MINIMUM SPEED. DURING SECOND STAGE COOLING AND HEATING TIMES, SUPPLY FAN SHALL RUN AT FULL SPEED. OUTSIDE AIR DAMPER SHALL MODULATE POSITION TO MAINTAIN REQUIRED QUANTITY OF OUTSIDE AIR AS SUPPLY FAN VARIES SPEED.

COOLING:

WHEN SPACE TEMPERATURE RISES ABOVE OCCUPIED COOLING SET POINT, PACKAGED DIRECT EXPANSION COOLING SHALL BE ENERGIZED AND STAGE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE.

ECONOMIZER:

WHEN OUTDOOR AIR TEMPERATURE IS BELOW 65°F (ADJUSTABLE), ECONOMIZER SHALL MODULATE BETWEEN ITS MINIMUM SET POINT AND FULL OPEN TO MAINTAIN SPACE COOLING SET POINT, SUBJECT TO A MIXED AIR TEMPERATURE LOW LIMIT CONTROLLER SET POINT OF 55°F. IF OUTDOOR TEMPERATURE IS ABOVE COMPRESSOR LOCKOUT THERMOSTAT SETTING, MECHANICAL COOLING SHALL BE ENABLED AS SECOND STAGE OF COOLING.

DEHUMIDIFICATION (WHERE APPLICABLE):

WHEN SPACE HUMIDITY READING EXCEEDS 55%RH (ADJUSTABLE), REFRIGERATION SYSTEM SHALL OPERATE AND INITIATE HOT GAS REHEAT AS REQUIRED TO MAINTAIN SPACE HUMIDITY.

HEATING:

WHEN SPACE TEMPERATURE FALLS BELOW OCCUPIED HEATING SET POINT, GAS HEATER SHALL BE ENERGIZED IN STAGES (WHERE APPLICABLE) TO MAINTAIN SPACE TEMPERATURE.

UNOCCUPIED MODE:

COOLING:

UPON SIGNAL FROM THERMOSTAT, SUPPLY FAN SHALL BE DEENERGIZED AND OUTSIDE AIR DAMPER SHALL CLOSE. IF SPACE TEMPERATURE RISES 2 DEGREES OR MORE ABOVE UNOCCUPIED SET POINT, OUTSIDE AIR DAMPER SHALL REMAIN CLOSED, SUPPLY FAN SHALL BE ACTIVATED AND DX COOLING SHALL BE STAGED AS REQUIRED TO MAINTAIN UNOCCUPIED SPACE TEMPERATURE. WHEN TEMPERATURE FALLS 2 DEGREES BELOW SET POINT, COMPRESSOR SHALL BE DE–ENERGIZED AND SUPPLY FAN SHALL SHUT OFF.

HEATING:

UPON A SIGNAL FROM THERMOSTAT, SUPPLY FAN SHALL BE DE–ENERGIZED AND OUTSIDE AIR DAMPER SHALL CLOSE. IF SPACE TEMPERATURE FALLS 2 DEGREES OR MORE BELOW SET POINT, OUTSIDE AIR DAMPER SHALL REMAIN CLOSED, SUPPLY FAN SHALL BE ACTIVATED AND GAS HEAT SHALL BE ENERGIZED UNTIL UNOCCUPIED SPACE TEMPERATURE IS SATISFIED. WHEN TEMPERATURE RISES 2 DEGREES ABOVE SET POINT, GAS HEAT SHALL BE DISABLED AND SUPPLY FAN SHALL BE DE–ENERGIZED.

MORNING WARM–UP/COOL DOWN:

CONTROLS SHALL BE CAPABLE OF AUTOMATICALLY ADJUSTING DAILY START TIME OF UNIT IN ORDER TO BRING EACH SPACE TO DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY.

OCCUPIED COOLING SET POINT	75 DEGREES
OCCUPIED HEATING SET POINT:	70 DEGREES
UNOCCUPIED COOLING SET POINT:	85 DEGREES
UNOCCUPIED HEATING SET POINT:	55 DEGREES

A SMOKE DETECTOR SHALL DE–ENERGIZE ROOFTOP UNIT SUPPLY FAN AND CLOSE OUTSIDE AIR DAMPER IN BOTH OCCUPIED AND UNOCCUPIED MODES WHENEVER SMOKE IS SENSED BY SMOKE DETECTORS.

MECHANICAL SPECIFICATIONS

PROVIDE EQUIPMENT INDICATED ON DRAWINGS, AND AS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM.

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

WARRANTY: PROVIDE LABOR AND MATERIALS TO REPAIR OR REPLACE DEFECTIVE PARTS AND MATERIALS AS REQUIRED FOR ONE YEAR AFTER SUBSTANTIAL COMPLETION OR OWNER ACCEPTANCE OF COMPLETED PROJECT. PROVIDE SEPARATE LINE ITEM DEDUCT AMOUNT ON THE PROPOSAL FORM TO DELETE WARRANTY SERVICE, AT OWNER'S OPTION.

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

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

SHEET METAL DUCTWORK: PROVIDE SHEET METAL DUCTWORK FABRICATED AND INSTALLED IN ACCORDANCE WITH ASHRAE AND SMACNA STANDARDS, FOR 1" W.G. PRESSURE CLASS, SEAL CLASS "A". SHEET METAL SHALL BE GALVANIZED SHEET STEEL OF LOCK FORMING QUALITY, WITH G90 ZINC COATING. SHEET STEEL SHALL COMPLY WITH ASTM A653 STANDARD SPECIFICATION FOR STEEL SHEET METAL, ZINC COATED (GALVANIZED) OR ZINC–IRON ALLOY–COATED (GALVANNEALED) BY HOT DIP PROCESS, AND A924 STANDARD SPECIFICATION FOR GENERAL REQUIREMENTS FOR SHEET, METALLIC–COATED BY HOT DIP PROCESS. ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES AT ALL 90° ELBOWS.

REFRIGERANT PIPING: TYPE ACR HARD DRAWN COPPER TUBING MEETING THE REQUIREMENTS OF ASTM B280, WITH WROUGHT COPPER FITTINGS MEETING REQUIREMENTS OF ANSI B16.22, WITH BRAZED JOINTS MEETING REQUIREMENTS OF AWS A 5.8, USING BAG–1 (SILVER) FILLER MATERIAL. INSULATE SUCTION LINE PIPING WITH 1" THICK ARMAFLEX TYPE AP. PAINT INSULATION LOCATED OUTDOORS WITH ARMAFLEX WB FINISH.

ROUND SHEET METAL DUCT: PROVIDE SPIRAL SEAM (ALL SIZES) OR SNAP LOCK (CONCEALED DUCT SIZES UP TO 10") GALVANIZED STEEL COMPLYING WITH SMACNA STANDARDS. SPIRAL SEAM DUCTWORK SHALL HAVE SMACNA SEAM TYPE RL–1.

FLEXIBLE DUCT: PROVIDE FACTORY ASSEMBLED CLASS 1 AIR DUCT (UL 181) WITH 1" THICK 1 PCF FIBERGLASS INSULATION AND REINFORCED OUTER PROTECTIVE COVER/VAPOR BARRIER. FLEXIBLE DUCT SHALL MEET NFPA 90A WITH FLAME SPREAD UNDER 25, SMOKE DEVELOPED UNDER 50, AND SHALL BE RATED FOR MINIMUM 2" W.G. PRESSURE AND 0 TO 250°F TEMPERATURE. PROVIDE SCREW–OPERATED METAL ADJUSTABLE CLAMPING DEVICES. USE TWIST–LOCK TAP COLLARS AT CONNECTIONS INTO SHEET METAL DUCTWORK. MAXIMUM EXTENDED LENGTH OF FLEXIBLE DUCT SHALL NOT EXCEED 6 FEET.

DUCT SEALANT: PROVIDE WATER BASED SYNTHETIC LATEX EMULSION PERMANENTLY FLEXIBLE HIGH VELOCITY DUCT SEALANT, DUCTMATE INDUSTRIES INC., PRO SEAL OR EQUAL. SEALANT TO BE LOW VOC LEED COMPLIANT CAPABLE OF 15" W.G., NFPA 90A AND 90B APPROVED, UL 181B–M LISTED AND UL 723 CLASSIFIED. INSTALL PER MANUFACTURER INSTRUCTIONS. SEALANT SHALL BE APPROVED FOR PLENUM INSTALLATIONS AND MEET FLAME SPREAD AND SMOKE DEVELOPED RATINGS FOR PLENUM APPLICATIONS.

DUCT INSULATION (ALL ROUND SUPPLY DUCT AND ROUND RETURN DUCT ABOVE CEILING): PROVIDE MINIMUM 1–1/2" THICK BLANKET TYPE FIBERGLASS INSULATION COMPLYING WITH ASTM C–553, TYPE II, WITH FACTORY APPLIED KRAFT BONDED TO ALUMINUM FOIL REINFORCED WITH FIBERGLASS VAPOR BARRIER/JACKET. JACKET SHALL CONFORM TO ASTM C–1136, TYPE II. INSTALLED R VALUE SHALL BE 6 OR HIGHER WITH 0.75 PCF DENSITY.

DUCT LINER (ALL RECTANGULAR SUPPLY AND RETURN DUCT): PROVIDE MINIMUM 1" THICK, 2 PCF DENSITY, LONG TEXTILE FIBER TYPE DUCT LINER, WITH COATING ON AIR STREAM SIDE CONFORMING TO NFPA 90A. DUCT LINER SHALL BE SECURED TO DUCT WITH BOTH ADHESIVE AND MECHANICAL FASTENERS. ADHESIVE SHALL BE LEED COMPLIANT LOW VOC AS RECOMMENDED BY DUCT LINER MANUFACTURER, AND SHALL COMPLY WITH ASTM C–916. DUCT LINER FASTENERS SHALL COMPLY WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS", LATEST EDITION. THERMAL CONDUCTIVITY SHALL BE EQUAL TO OR LESS THAN 0.24 AT 75°F.

ROUND VOLUME DAMPERS: PROVIDE MINIMUM 20 GAUGE GALVANIZED STEEL FRAME AND BLADES, MINIMUM 3/8" SQUARE STEEL AXLE, MOLDED SYNTHETIC BEARINGS, WITH LOCKING POSITION REGULATOR. REGULATOR SHALL BE POSITIONED WITH SHEET METAL BRACKET BEYOND DUCT COVERING. WHERE POSITIONING REGULATOR IS NOT ACCESSIBLE, PROVIDE COUPLING AND EXTENSION ROD WITH REGULATOR FOR CEILING OR WALL INSTALLATION, AS REQUIRED.

RECTANGULAR VOLUME DAMPERS: PROVIDE MINIMUM 16 GAUGE GALVANIZED STEEL CHANNEL FRAME, 16 GAUGE GALVANIZED STEEL BLADES, MINIMUM 1/2" HEXAGONAL AXLE, MOLDED SYNTHETIC BEARINGS, WITH 3/8" SQUARE PLATED STEEL CONTROL SHAFT. LINKAGES SHALL BE CONCEALED IN FRAME. OPERATING SHAFT SHALL EXTEND BEYOND FRAME AND DUCT TO A LOCKING QUADRANT WITH ADJUSTABLE LEVER. MAXIMUM BLADE WIDTH SHALL NOT EXCEED 6".

DUCT TURNING VANES: PROVIDE FABRICATED TURNING VANES AND VANE RUNNERS CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS". PROVIDE TURNING VANES CONSTRUCTED OF CURVED BLADES, SUPPORTED WITH BARS PERPENDICULAR TO BLADES, AND SET INTO SIDE STRIPS SUITABLE FOR MOUNTING IN DUCTWORK. FOLLOW SMACNA GUIDELINES FOR SPACING SUPPORT, AND CONSTRUCTION. ALL BLADES SHALL BE DOUBLE THICKNESS AIRFOIL TYPE.

FLEXIBLE DUCT CONNECTORS: PROVIDE UL LABELED 30 OUNCE NEOPRENE COATED FIBERGLASS FABRIC DUCT CONNECTORS AT DUCT CONNECTIONS TO VIBRATING EQUIPMENT.

DUCT ACCESS DOORS: PROVIDE HINGED ACCESS DOORS IN DUCTWORK WHERE REQUIRED FOR ACCESS TO EQUIPMENT. PROVIDE INSULATED ACCESS DOORS FOR INSULATED DUCTWORK. CONSTRUCT OF SAME OR THICKER GAUGE SHEET METAL AS DUCT IN WHICH IT IS INSTALLED. PROVIDE FLUSH FRAMES FOR UNINSULATED DUCTS, AND EXTENDED FRAMES FOR EXTERNALLY INSULATED DUCTS. PROVIDE CONTINUOUS HINGE ON ONE SIDE, WITH ONE HANDLE–TYPE LATCH FOR ACCESS DOORS 12" HIGH AND SMALLER, AND TWO HANDLE–TYPE LATCHES FOR LARGER ACCESS DOORS.

DUCT ACCESS DOORS: PROVIDE HINGED ACCESS DOORS IN DUCTWORK WHERE REQUIRED FOR ACCESS TO EQUIPMENT. PROVIDE INSULATED ACCESS DOORS FOR INSULATED DUCTWORK. CONSTRUCT OF SAME OR THICKER GAUGE SHEET METAL AS DUCT IN WHICH IT IS INSTALLED. PROVIDE FLUSH FRAMES FOR UNINSULATED DUCTS, AND EXTENDED FRAMES FOR EXTERNALLY INSULATED DUCTS. PROVIDE CONTINUOUS HINGE ON ONE SIDE, WITH ONE HANDLE–TYPE LATCH FOR ACCESS DOORS 12" HIGH AND SMALLER, AND TWO HANDLE–TYPE LATCHES FOR LARGER ACCESS DOORS.

GREASE EXHAUST DUCTWORK: FACTORY FABRICATED DOUBLE WALL DUCTWORK COMPLIANT WITH UL 2221 AND UL 1978. SEE HOOD SYSTEM DRAWINGS FOR MORE INFORMATION.

COMPOSITE GREASE DUCT FIRE PROTECTION INSULATION ASSEMBLY: PROVIDE FLEXIBLE BLANKET–TYPE INSULATION COMPOSED OF FIBER BLANKET ENCAPSULATED IN AN ALUMINUM FOIL SCRIM, PROVIDING A NONCOMBUSTIBLE WRAP TO PROVIDE A VAPOR AND DUST BARRIER. DUCT WRAP SYSTEM SHALL HAVE FLAME SPREAD INDEX OF NOT MORE THAN 5 AND SMOKE DEVELOPED INDEX NOT EXCEEDING 5, WHEN TESTED PER ASTM E–84 METHOD. INSULATION AND JACKET SHALL BE RATED FOR OPERATING TEMPERATURES UP TO 2000°F. DUCT WRAP SYSTEM MUST COMPLY WITH ALL FIVE FIRE TESTS OF STANDARD ASTM E2336, GREASE DUCT ENCLOSURE SYSTEM, AND THE DUCT FIRESTOP SYSTEM SHALL BE ASTM E 814 CLASSIFIED. PROVIDE COMPOSITE GREASE DUCT FIRE PROTECTION INSULATION FROM ONE OF THE FOLLOWING: THERMAL CERAMICS FIREMASTER FASTWRAP XL, UNIFRAX FYREWRAP 2.0 MAX.

MECHANICAL EQUIPMENT IDENTIFICATION: PROVIDE ENGRAVED PLASTIC LAMINATE LABEL FOR EACH MAJOR ITEM OF MECHANICAL EQUIPMENT AND EACH OPERATIONAL DEVICE. LETTERS SHALL BE MINIMUM OF 1/2" HIGH. PROVIDE SIGNS TO INFORM OPERATOR OF OPERATIONAL REQUIREMENTS, TO INDICATE SAFETY AND EMERGENCY PRECAUTIONS, AND TO WARN OF HAZARDS AND IMPROPER OPERATION.

TESTING AND BALANCING: TEST AND ADJUST ALL MECHANICAL SYSTEMS AND EQUIPMENT TO ASSURE PROPER BALANCE AND OPERATION. PERFORM TESTS IN ACCORDANCE WITH THE MOST CURRENT NEBB OR AABC, AND ASHRAE STANDARDS. ELIMINATE OBJECTIONABLE NOISE AND VIBRATION, AND ASSURE PROPER FUNCTION OF CONTROLS. BALANCING CONTRACTOR SHALL BE AN INDEPENDENT CERTIFIED TEST AND BALANCE CONTRACTOR, WITH NEBB OR AABC CERTIFICATION. SUBMIT COMPLETED AND CERTIFIED TEST AND BALANCE REPORT TO OWNER'S REPRESENTATIVE. BALANCE ALL SYSTEMS TO WITHIN 5% OF AIR FLOWS INDICATED ON THE DRAWINGS, AND REPORT DISCREPANCIES TO HVAC INSTALLER FOR CORRECTION. MARK FINAL BALANCE POSITIONS ON DAMPERS WITH PERMANENT MARKER.

OPERATIONS AND MAINTENANCE MANUALS (O&M): AT COMPLETION OF PROJECT PROVIDE A MINIMUM OF TWO O&M MANUALS IN THREE RING BINDERS TO OWNER/TENANT. MANUALS SHALL HAVE TABS LABELED WITH ALL SECTIONS SEPARATED WITH A CLEAR INDEX AT FRONT. PROVIDE WARRANTY LETTER AT FRONT OF MANUAL STATING DATES OF WARRANTY (START DATE AND END DATE) AND CONTACTS WITH PHONE NUMBERS FOR WARRANTY WORK. PROVIDE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE INCLUDING RECOMMENDED SETPOINTS. MANUALS SHALL INCLUDE SUBMITTALS OF ALL EQUIPMENT, SIZE AND OPTIONS SELECTED. PROVIDE ALL BALANCING REPORTS. PROVIDE MANUFACTURER LITERATURE FOR OPERATIONS AND MAINTENANCE FOR ALL EQUIPMENT ON PROJECT. ALL PERIODIC AND ROUTINE MAINTENANCE SHALL BE CLEARLY IDENTIFIED. PROVIDE CONTROLS SECTION LISTING SYSTEM OPERATING AND CONTROL INSTRUCTIONS, MAINTENANCE, CALIBRATION, WIRING DIAGRAMS, SCHEMATICS AND CONTROL SEQUENCE DESCRIPTIONS.

SHOP DRAWINGS/SUBMITTALS: SUBMIT ELECTRONIC SUBMITTALS AND SHOP DRAWINGS VIA EMAIL AS PDF ELECTRONIC FILES. PROVIDE SEPARATE PDF SUBMITTALS ON ALL MECHANICAL EQUIPMENT (INCLUDING CONTROLS PACKAGES), AIR DISTRIBUTION DEVICES, DUCTWORK, DAMPERS, AND INSULATION. SUBMITTALS AND SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING INFORMATION:

- PROJECT NAME
- DATE
- NAME AND ADDRESS OF ARCHITECT AND MEP ENGINEER
- NAME OF CONSTRUCTION MANAGER
- NAME OF CONTRACTOR
- NAME OF FIRM OR ENTITY THAT PREPARED SUBMITTAL
- NAMES OF SUBCONTRACTOR, MANUFACTURER, AND SUPPLIER.
- CATEGORY AND TYPE OF SUBMITTAL
- SUBMITTAL PURPOSE AND DESCRIPTION
- MANUFACTURER NAME
- PRODUCT NAME
- DRAWING NUMBER AND DETAIL REFERENCES, AS APPROPRIATE
- INDICATION OF FULL OR PARTIAL SUBMITTAL
- TRANSMITTAL NUMBER
- REMARKS

IDENTIFY DEVIATIONS FROM THE CONTRACT DOCUMENTS ON SHOP DRAWINGS AND SUBMITTALS. FURNISH COPIES OF FINAL SUBMITTALS TO MANUFACTURERS, SUBCONTRACTORS, SUPPLIERS, FABRICATORS, INSTALLERS, AUTHORITIES HAVING JURISDICTION, AND OTHERS AS NECESSARY FOR PERFORMANCE OF CONSTRUCTION ACTIVITIES. SHOW DISTRIBUTION ON TRANSMITTAL FORMS.

SUBMITTALS SHALL INCLUDE (AS APPLICABLE):

- MANUFACTURER'S CATALOG CUTS
- MANUFACTURER'S PRODUCT SPECIFICATIONS
- STATEMENT OF COMPLIANCE WITH SPECIFIED REFERENCED STANDARDS
- TESTING BY RECOGNIZED TESTING AGENCY
- APPLICATION OF TESTING AGENCY LABELS AND SEALS
- WIRING DIAGRAMS SHOWING FACTORY–INSTALLED WIRING
- PERFORMANCE CURVES
- OPERATIONAL RANGE DIAGRAMS
- CLEARANCES REQUIRED TO OTHER CONSTRUCTION, IF NOT INDICATED ON SHOP DRAWINGS.

FULL SIZE SHOP DRAWINGS SHALL INCLUDE (AS APPLICABLE):

- IDENTIFICATION OF PRODUCTS
- SCHEDULES
- COMPLIANCE WITH SPECIFIED STANDARDS
- NOTATION OF COORDINATION REQUIREMENTS
- NOTATION OF DIMENSIONS ESTABLISHED BY FIELD MEASUREMENT
- RELATIONSHIP AND ATTACHMENT TO ADJOINING CONSTRUCTION CLEARLY INDICATED.

MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING DUCT SHOP DRAWINGS TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION AND INSTALLATION.

MECHANICAL SYMBOLS LEGEND

ABBREVIATIONS:

AHJ	AUTHORITY HAVING JURISDICTION
BTU	BRITISH THERMAL UNIT
CFM	CUBIC FEET PER MINUTE
DB	DRY BULB
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
ESP	EXTERNAL STATIC PRESSURE
GC	GENERAL CONTRACTOR
HZ	FREQUENCY
LAT	LEAVING AIR TEMPERATURE
MC	MECHANICAL CONTRACTOR
NC	NOISE CRITERIA
RTU	ROOFTOP UNIT
WB	WET BULB
AC	AIR CURTAINS
EF	EXHAUST FAN
WB	WET BULB
EER	ENERGY EFFICIENCY RATIO

GRILLES/DIFFUSERS:

- SUPPLY DIFFUSER
- RETURN GRILLE
- EXHAUST GRILLE

DOUBLE LINE DUCT SYMBOLS:

- NEW SHEET METAL DUCTWORK & SIZE
- SUPPLY OR OUTSIDE AIR DUCT
- RETURN AIR DUCT
- EXHAUST AIR DUCT
- DUCTWORK TRANSITION
- DUCTWORK TRANSITION – RECTANGULAR TO ROUND
- SUPPLY DUCT ELBOW UP OR DOWN
- RETURN DUCT ELBOW UP OR DOWN
- EXHAUST DUCT ELBOW UP OR DOWN
- DUCT ELBOW WITH FIXED TURNING VANES
- DUCT BRANCH TAKE–OFF
- ROUND SPIN–IN WITH DAMPER
- VOLUME DAMPER
- FLEXIBLE DUCTWORK

GENERAL REFERENCES/NOTATIONS:

- SQUARE NOTE DESIGNATION
- REVISION DESIGNATION
- MECHANICAL EQUIPMENT DESIGNATION (TYPE X)
- DIFFUSER DESIGNATION AND CFM

EQUIPMENT:

- ROOF MOUNTED EXHAUST FAN
- ROOFTOP UNIT
- THERMOSTAT – ELECTRIC
- TEMPERATURE SENSOR
- TEMPERATURE/HUMIDITY SENSOR
- DUCT SMOKE DETECTOR

SYMBOLS LEGEND NOTES:
1. REFER TO SPECIFICATIONS AND PLAN NOTES FOR DETAILED DESCRIPTION OF ALL DEVICES SHOWN IN THIS SCHEDULE, PROVIDED BY THIS CONTRACTOR.