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REVISIONS		
#	DESCRIPTION	DATE

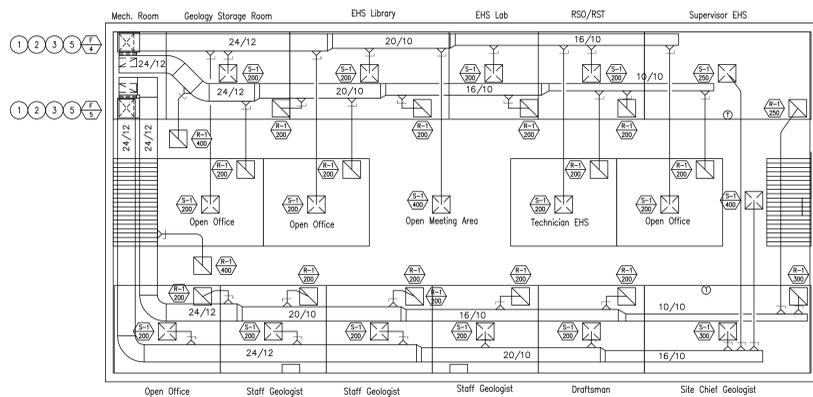
PLANT FLOOR PLAN - HVAC  
 LOST CREEK ISR  
 CENTRAL PROCESSING PLANT  
 NEAR BAROIL, WYOMING

PROJECT #:	C08028
CADFILE:	C08028 M1
DESIGNED:	SI
DRAWN:	JM
APPROVED:	SI
DATE:	11/11/08

**PROGRESS PRINT FOR REVIEW ONLY**

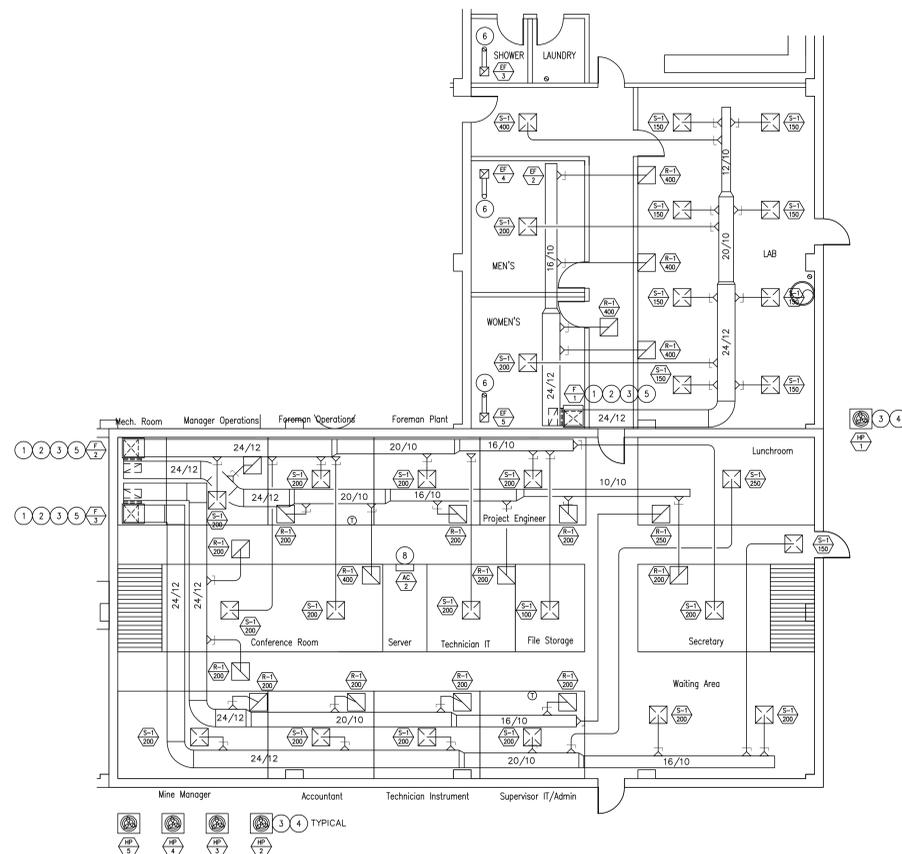
SHEET:  
**M1**  
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HVAC - PLANT  
 SCALE: 1/8" = 1'-0"



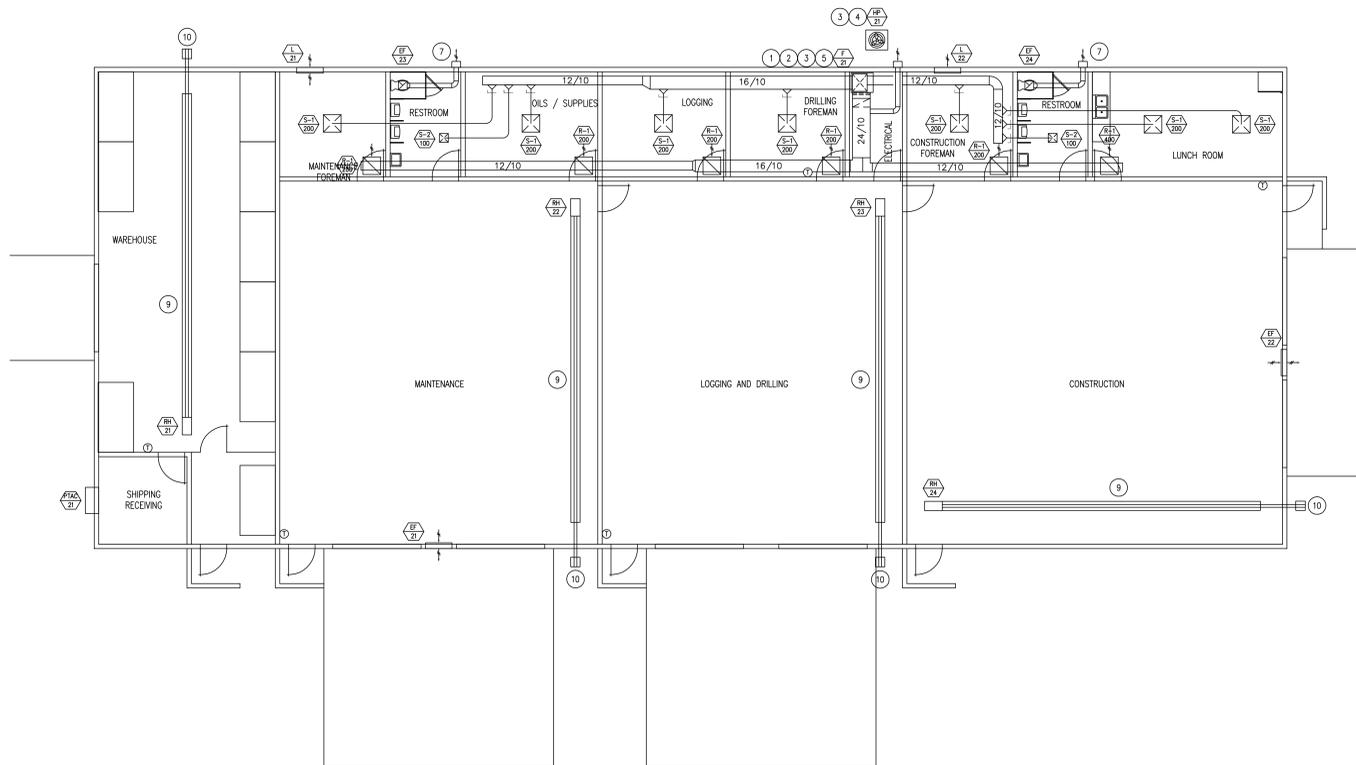
HVAC - SECOND FLOOR PLANT OFFICES

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



HVAC - FIRST FLOOR PLANT OFFICES

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



HVAC - SHOP BUILDING

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



MISCELLANEOUS NOTES:

- A. DO NOT ROUTE DUCT/PIPING ABOVE ELECTRICAL PANELS. MAINTAIN ALL CODE REQUIRED CLEARANCES.
- B. COORDINATE ALL FLOOR AND WALL PENETRATIONS WITH GENERAL CONTRACTOR. SEAL EXTERIOR PENETRATIONS WEATHER TIGHT.
- C. ROUTE DUCTS UP IN JOIST SPACE WHEREVER POSSIBLE. ROUTE ALL DUCTS AS HIGH AS POSSIBLE. CONTRACTOR SHALL COORDINATE ALL DUCT AND PIPE ROUTING WITH ALL OTHER TRADES. PROVIDE ALL ADDITIONAL OFFSETS AND TRANSITIONS AS REQUIRED TO COMPLETE INSTALLATION.
- D. LOCATE VOLUME DAMPERS IN ACCESSIBLE LOCATIONS.

SPECIFIC NOTES:

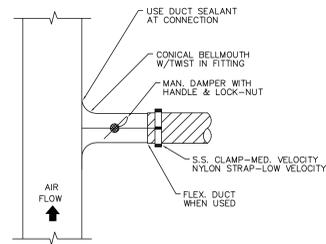
1. SEE HIGH EFFICIENCY FURNACE DETAIL ON SHEET Mx.
2. PROVIDE PVC INTAKE AND EXHAUST PIPING TO FURNACE. SIZE PER MANUFACTURER'S RECOMMENDATIONS. TERMINATE THROUGH WALL/ROOF WITH CONCENTRIC TERMINATION KIT. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN MIN. 10'-0" CLEAR TO FRESH AIR INTAKES.
3. PROVIDE REFRIGERANT PIPING FROM COIL TO OUTSIDE HEAT PUMP UNIT. SIZE REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS. ROUTE REFRIGERANT PIPING IN JOIST SPACE WHEN PARALLEL TO JOISTS. OTHERWISE, ROUTE REFRIGERANT PIPING AS HIGH AS POSSIBLE. ROUTE REFRIGERANT PIPING DN IN EXTERIOR WALL TO CONDENSING UNIT.
4. PROVIDE 4" CONCRETE EQUIPMENT PAD FOR HEAT PUMP UNIT. PAD SHALL BE 6" LARGER THAN EQUIPMENT ON ALL SIDES.
5. ROUTE 8" ROUND O.A. THROUGH WALL. TERMINATE WITH WALL CAP. PROVIDE BIRD SCREEN. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
6. ROUTE 6" ROUND E.A. THROUGH ROOF. TERMINATE WITH VENT CAP. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
7. ROUTE 6" ROUND E.A. THROUGH WALL. TERMINATE WITH WALL CAP. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
8. PUMP CONDENSATE TO NEAREST FLOOR DRAIN.
9. INSTALL RADIANT HEATER PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN CLEARANCE TO COMBUSTIBLES. MOUNT AS HIGH AS POSSIBLE. BOTTOM OF HEATER SHALL BE MINIMUM 12'-0" A.F.F. SUPPORT FROM STRUCTURE PER MANUFACTURER'S RECOMMENDATIONS. COORDINATE EXACT LOCATION WITH LIGHTS AND STRUCTURE.
10. 4" FLUE THROUGH SIDEWALL. PROVIDE HIGH WIND VENT CAP. INSTALL PER NFPA 54 REQUIREMENTS. SEAL PENETRATION WEATHER TIGHT. COORDINATE PENETRATION WITH METAL BUILDING SUPPLIER.

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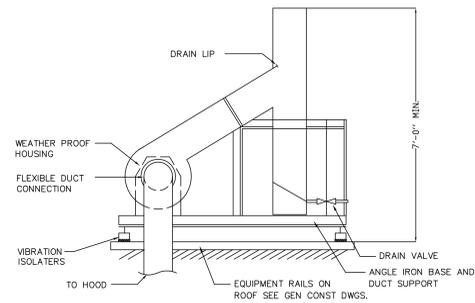
REVISIONS		
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PROJECT #:	C08028
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DESIGNED:	SI
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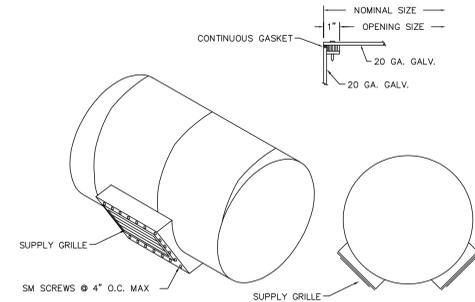


**ROUND DUCT TAKE-OFF DETAIL**  
NO SCALE

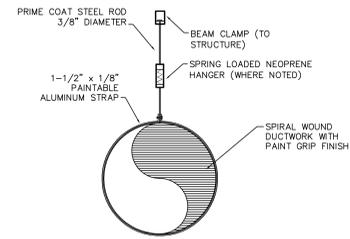


NOTE: COMPLETE ASSEMBLY, LESS FAN, PRIMER PAINTED THEN ENAMEL PAINTED. COLOR BY ARCHITECT.

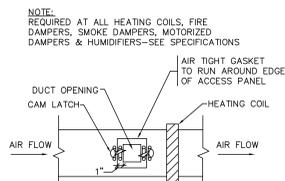
**FUME HOOD EXHAUSTER DETAIL**  
NO SCALE



**ROUND DUCT BOOT DETAIL**  
NO SCALE



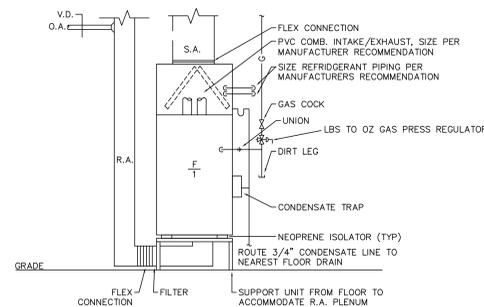
**SPIRAL DUCT SUPPORT DETAIL**  
NO SCALE



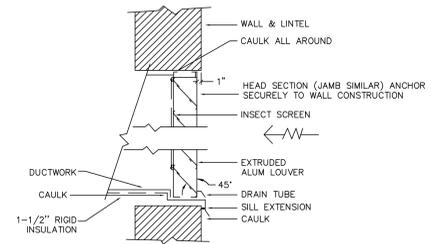
ACCESS PANEL SIZE SCHEDULE	
DUCT SIZE	ACCESS PANEL SIZE
6" TO 15"	10" W X (DUCT DEPTH-2") D
15" TO 21"	12" W X (DUCT DEPTH-2") D
21" AND ABOVE	18" W X (DUCT DEPTH-2") D

ALL OTHER ACCESS PANELS TO BE A MINIMUM OF 15" X 15" WHERE DUCT SIZE ALLOWS. USE FOUR CAM LATCHES ON PANELS LARGER THAN 18" X 18" SIZE.

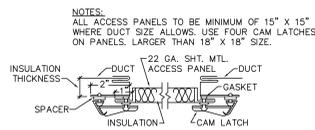
**ACCESS PANEL DETAIL**  
NO SCALE



**HIGH EFFICIENCY FURNACE DETAIL**  
NO SCALE

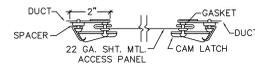


**LOUVER-INTAKE AIR DETAIL**  
NO SCALE



**INSULATED DUCTS**

PROVIDE TRACK FULL LENGTH OF ACCESS PANEL RIVETED OR SPOT WELDED TO DUCT SIDE AT BOTTOM OF ACCESS PANEL FOR PANEL ALIGNMENT



**UNINSULATED DUCTS**

**LOW PRESSURE DUCTWORK ACCESS PANELS**  
NO SCALE

VENTILATION SYMBOLS			
	SUPPLY DUCT (UP & DOWN)		MANUAL VOLUME DAMPER
	RETURN DUCT (UP & DOWN)		BRANCH DUCT INTO SIDE OF MAIN DUCT
	EXHAUST DUCT (UP & DOWN)		DUCT RISE OR DROP IN DIRECTION OF AIR FLOW
	STANDARD RADIUS ELBOW		DUCT DIMENSION- WIDTH x DEPTH
	DUCT TURN WITH TURN VANES		DUCT INSULATION (SEE SPECIFICATION)
	FLEXIBLE DUCT CONNECTION		DUCT TURN AND AIR SPLIT TYPE TAKEOFF (NON-ADJUSTABLE)
	SPIRAL DUCTWORK		GRILLE, REGISTER & DIFFUSER DESIGNATION (SUPPLY, RETURN, EXHAUST, & TRANSFER)
	F-FIRE DAMPER		M-MOTORIZED DAMPER
	S-SMOKE DAMPER		B-BACKDRAFT DAMPER
	C-COMBINATION FIRE SMOKE DAMPER		-W- FLEX DUCT (5' MAXIMUM)

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MAKE-UP AIR SCHEDULE												
UNIT NO	MANUFACTURER'S DESIGNATION	SERVES	CFM	E.S.P (INCHES)	EAT	CAP MBH	FUEL	HP	FILTERS	ELECTRIC V/PH	INTERLOCK MCA	REMARKS
MAU-1	CAMBRIDGE M130	PLANT	25,000	0.75	-20	2069	LPG	15	(2)	460/3	-	EF-1
MAU-2	CAMBRIDGE M130	PLANT	25,000	0.75	-20	2069	LPG	15	(2)	460/3	-	EF-2

- NOTES:
- PROVIDE WITH 2-POSITION O.A. MOTORIZED DAMPER.
  - PROVIDE WITH 2" PERMANENT FILTER FRAME WITH REPLACEABLE MEDIA.
  - SINGLE POINT POWER CONNECTION.
  - PROVIDE REMOTE CONTROL PANEL WITH FAN/OFF/AUTO, DISCHARGE SET POINT, AND ROOM OVERRIDE THERMOSTAT.
  - PROVIDE MODULATING GAS BURNER.
  - PROVIDE WITH CONTACTOR TO INTERLOCK UNIT WITH EF.
  - SELECT AT SITE ALTITUDE OF 5500 FASL.

FAN SCHEDULE												
UNIT NO	MANUFACTURER'S DESIGNATION	LOCATION	SERVICE	VIBRATION ISOLATION	CFM	S.P.D. (IN)	MAX RPM	MOTOR			REMARKS	
								HP	ELEC.	SONES		
EF-1	GREENHECK SBE-2L48-30	PLANT	AC/HR EXHAUST	-	25,000	0.25	500	3	460/3	22	6,7,8	
EF-2	GREENHECK SBE-2L48-30	PLANT	AC/HR EXHAUST	-	25,000	0.25	500	3	460/3	22	6,7,8	
EF-3	GREENHECK SP-B110	SHOWER	EXHAUST	-	95	0.375	950	80 W	115/1	2.7	1,2,3,4,5	
EF-4	GREENHECK SP-A410A	MENS RR	EXHAUST	-	250	0.375	1000	121 WATTS	115/1	4.2	1,2,3,4,5	
EF-5	GREENHECK SP-A410A	WOMENS RR	EXHAUST	-	250	0.375	1000	121 WATTS	115/1	4.2	1,2,3,4,5	
EF-6	GREENHECK SP-B110	PLANT RR	EXHAUST	-	95	0.375	950	80 W	115/1	2.7	1,2,3,4,5	
EF-7A	UTILITY SET FAN	IX COLUMN	EXHAUST	-	-	-	-	-	115/1	-	SWITCH ON/OFF	
EF-7B	UTILITY SET FAN	IX COLUMN	EXHAUST	-	-	-	-	-	115/1	-	SWITCH ON/OFF	
EF-8A	UTILITY SET FAN	WASTEWATER	EXHAUST	-	-	-	-	-	115/1	-	ALWAYS ON	
EF-8B	UTILITY SET FAN	WASTEWATER	EXHAUST	-	-	-	-	-	115/1	-	ALWAYS ON	
EF-9A	UTILITY SET FAN	ELUTION	EXHAUST	-	-	-	-	-	115/1	-	SWITCH ON/OFF	
EF-9B	UTILITY SET FAN	ELUTION	EXHAUST	-	-	-	-	-	115/1	-	SWITCH ON/OFF	
EF-10A	UTILITY SET FAN	SHAKER SCREENS	EXHAUST	-	-	-	-	-	115/1	-	SWITCH ON/OFF	
EF-10B	UTILITY SET FAN	SHAKER SCREENS	EXHAUST	-	-	-	-	-	115/1	-	SWITCH ON/OFF	
EF-11A	UTILITY SET FAN	RESIN WATER	EXHAUST	-	-	-	-	-	115/1	-	ALWAYS ON	
EF-11B	UTILITY SET FAN	RESIN WATER	EXHAUST	-	-	-	-	-	115/1	-	ALWAYS ON	
EF-12A	UTILITY SET FAN	PRECIP	EXHAUST	-	-	-	-	-	115/1	-	INTERLOCK W/ PLC	
EF-12B	UTILITY SET FAN	PRECIP	EXHAUST	-	-	-	-	-	115/1	-	INTERLOCK W/ PLC	
EF-13A	UTILITY SET FAN	RESTORATION	EXHAUST	-	-	-	-	-	115/1	-	SWITCH ON/OFF	
EF-13B	UTILITY SET FAN	RESTORATION	EXHAUST	-	-	-	-	-	115/1	-	SWITCH ON/OFF	
EF-14	UTILITY SET FAN	TRANSFER BAY	GENERAL EXH	-	7000	0.50	-	-	460/3	-	SWITCH ON/OFF	
EF-15	INLINE FAN	DRYER	PRESSURIZATION	-	1000	1.0	-	-	460/3	-	HEPA FILTER	
EF-21	GREENHECK SBE-2L48-30	(SHOP) MAINT.	GEN. EXHAUST	-	1500	0.25	500	1	460/3	22	6,7,9	
EF-22	GREENHECK SBE-2L48-30	(SHOP) CONSTR.	GEN. EXHAUST	-	1800	0.25	500	1	460/3	22	6,7,9	
EF-23	GREENHECK SP-A410A	(SHOP) MENS RR	EXHAUST	-	250	0.375	1000	121 WATTS	115/1	4.2	1,2,3,4,5	
EF-24	GREENHECK SP-A410A	(SHOP) WOMENS RR	EXHAUST	-	250	0.375	1000	121 WATTS	115/1	4.2	1,2,3,4,5	

- NOTES:
- PROVIDE WITH STANDARD PRE-WIRED DISCONNECT AND THERMAL OVERLOAD.
  - PROVIDE WITH WHITE PLASTIC GRILLE.
  - PROVIDE WALL CAP AND GRAVITY BACK DRAFT DAMPER.
  - SWITCH WITH LIGHTS.
  - BASE FAN SELECTION AT SITE ALTITUDE OF 5500 F.A.S.L.
  - SIDEWALL PROPELLER EXHAUST FAN.
  - PROVIDE WITH SAFETY CAGE, WALL SLEEVE, AND GRAVITY BACKDRAFT DAMPER.
  - PROVIDE HAND/OFF/AUTO TO CONTROL MAU & EF. INTERLOCK EF WITH RESPECTIVE MAU.
  - PROVIDE HAND/OFF/AUTO TO CONTROL EF. INTERLOCK EF WITH RESPECTIVE MOTORIZED DAMPER ON LOUVER.

FURNACE SCHEDULE												
UNIT NO	MANUFACTURER'S DESIGNATION	SERVES	CFM	EXT. S.P.	FUEL	HP	MBH		FILTERS	ELECTRICAL	CONFIGURATION	REMARKS
							IN	OUT				
F-1	LENNOX GS1MP-600-135	LAB	1990	0.6	PROPANE	1	132	123	(3)	115/1	MULTI-POSITION	1,2,3,4,5,6,7,8
F-2	LENNOX GS1MP-600-135	1ST FL INT OFFICES	1990	0.6	PROPANE	1	132	123	(3)	115/1	MULTI-POSITION	1,2,3,4,5,6,7,8
F-3	LENNOX GS1MP-600-135	1ST FL EXT OFFICES	1990	0.6	PROPANE	1	132	123	(3)	115/1	MULTI-POSITION	1,2,3,4,5,6,7,8
F-4	LENNOX GS1MP-600-135	2ND FL INT OFFICES	1990	0.6	PROPANE	1	132	123	(3)	115/1	MULTI-POSITION	1,2,3,4,5,6,7,8
F-5	LENNOX GS1MP-600-135	2ND FL EXT OFFICES	1990	0.6	PROPANE	1	132	123	(3)	115/1	MULTI-POSITION	1,2,3,4,5,6,7,8
F-21	LENNOX GS1MP-48C-110	SHOP BLDG OFFICES	1600	0.6	PROPANE	1/2	110	103	(3)	115/1	MULTI-POSITION	1,2,3,4,5,6,7,8

- NOTES:
- INTEGRATED SOLID STATE CONTROLS WITH BLOWER AND LIMIT CONTROLS.
  - PROVIDE CASED DX COOLING COIL TO MATCH FURNACE AND OUTDOOR AIR TO AIR HEAT PUMP UNIT.
  - PROVIDE 1" PLEATED DISPOSABLE FILTER.
  - PROVIDE PVC INTAKE AND EXHAUST PIPING AND CONCENTRIC WALL TERMINATION KIT. SIZE PER MANUFACTURERS RECOMMENDATIONS.
  - PROVIDE PROGRAMMABLE THERMOSTAT WITH 7-DAY SETBACK, HEAT/COOL/AUTO, FAN ON/OFF/AUTO
  - PROVIDE HEAT EXCHANGER WITH 10 YEAR WARRANTY.
  - BASE SELECTION ON SITE ELEVATION OF 5500 F.A.S.L. PROVIDE HIGH ALTITUDE KIT.
  - PROVIDE LPG/PROPANE CONVERSION KIT.

AIR TO AIR HEAT PUMP UNIT SCHEDULE												
UNIT NO	MANUFACTURER'S DESIGNATION	SERVES	CAPACITY MBH	AMBIENT TEMP.	COIL EAT		REF TYPE	ELECTRICAL			REMARKS	
					DB	WB		V/PH	MCA	MOCP		SEER
HP-1	LENNOX TP060S4	F-1	57	95	80	67	R-410A	460/3	10.7	15	13	1,2,3
HP-2	LENNOX TP060S4	F-2	57	95	80	67	R-410A	460/3	10.7	15	13	1,2,3
HP-3	LENNOX TP060S4	F-3	57	95	80	67	R-410A	460/3	10.7	15	13	1,2,3
HP-4	LENNOX TP060S4	F-4	57	95	80	67	R-410A	460/3	10.7	15	13	1,2,3
HP-5	LENNOX TP060S4	F-5	57	95	80	67	R-410A	460/3	10.7	15	13	1,2,3
HP-21	LENNOX TP048S4	F-21	46	95	80	67	R-410A	460/3	8.7	15	13	1,2,3

- NOTES:
- PROVIDE 5 YEAR COMPRESSOR WARRANTY.
  - PROVIDE 6" LEG STANDS FOR HEAT PUMP.
  - PROVIDE COIL HAIL GUARDS.

REGISTER GRILLES AND DIFFUSER SCHEDULE												
UNIT NO	MANUFACTURER'S DESIGNATION	NOMINAL SIZE	THROAT SIZE	MAX CFM	THROW	S.P.D. (IN)	NC	FRAME	REMARKS			
									LAY-IN	SURFACE	1	
S-1	KRUEGER PLQ	24"x24"	6"	150	-	0.1"	<25	LAY-IN		1,2		
			8"	250	-	0.1"	<25	LAY-IN		1,2		
			10"	400	-	0.1"	<25	LAY-IN		1,2		
S-2	KRUEGER PLQ	12"x12"	6"	100	-	0.1"	<25	LAY-IN		1,2		
DL-1	KRUEGER DPL	25"x15"	25"x15"	1000	33-41-57	0.1"	<25	SURFACE				
R-1	KRUEGER 6690	24"x24"	6"	150	-	0.1"	<25	LAY-IN		1		
			8"	250	-	0.1"	<25	LAY-IN		1		
			10"	400	-	0.1"	<25	LAY-IN		1		

- NOTES:
- VERIFY CEILING CONSTRUCTION PRIOR TO FURNISHING MATERIAL.
  - PROVIDE WITH OPPOSED BLADE DAMPER.

RADIANT HEATER SCHEDULE												
UNIT NO	MANUFACTURER'S DESIGNATION	INPUT MBH	FUEL	TUBE LENGTH	MOUNTING HEIGHT	ELECTRICAL		REMARKS				
						V/PH	MCA					
RH-1	CO-RAY-VAC	200	PROPANE	50'	SEE PLANS	115/1	1.2	1,2,3,4,5,6				
RH-2	CO-RAY-VAC	200	PROPANE	50'	SEE PLANS	115/1	1.2	1,2,3,4,5,6				
RH-3	CO-RAY-VAC	200	PROPANE	50'	SEE PLANS	115/1	1.2	1,2,3,4,5,6				
RH-4	CO-RAY-VAC	200	PROPANE	50'	SEE PLANS	115/1	1.2	1,2,3,4,5,6				
RH-5	CO-RAY-VAC	200	PROPANE	50'	SEE PLANS	115/1	1.2	1,2,3,4,5,6				
RH-6	CO-RAY-VAC	200	PROPANE	90'	SEE PLANS	115/1	1.2	1,2,3,4,5,6				
RH-21	CO-RAY-VAC	80	PROPANE	30'	SEE PLANS	115/1	1.2	1,2,3,4,5,6				
RH-22	CO-RAY-VAC	125	PROPANE	40'	SEE PLANS	115/1	1.2	1,2,3,4,5,6				
RH-23	CO-RAY-VAC	125	PROPANE	40'	SEE PLANS	115/1	1.2	1,2,3,4,5,6				
RH-24	CO-RAY-VAC	150	PROPANE	40'	SEE PLANS	115/1	1.2	1,2,3,4,5,6				

- NOTES:
- PROVIDE RADIANT TUBE HEATER WITH REFLECTOR SHIELD. OVERALL LENGTH APPROX. 47'-4"
  - PROVIDE 4" WALL VENT & W/ HIGH WIND CAPS. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
  - PROVIDE LOCK IN PLACE 1-PIECE, TOP-SIDE, 24 GA. ALUMASTEEL HIGH WIND REFLECTOR SYSTEM.
  - PROVIDE LINE VOLTAGE THERMOSTAT WITH POSITIVE-OFF.
  - PROVIDE 3 YEAR WARRANTY ON ALL COMPONENTS.
  - SELECT BASED ON SITE ELEVATION OF 5500 FEET ABOVE SEA LEVEL.

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