MECHANICAL MATERIAL SPECIFICATION

CODES AND STANDARDS:

ALL WORK SHALL BE INSTALLED TO COMPLY WITH LATEST APPLICABLE ADDITIONS OF THE BOCA CODE, STATE OF VERMONT DEPARTMENT OF LABOR & INDUSTRY STANDARDS, ASHRAE, SMACNA, NFPA, STATE GAS CODE, UNDERWRITERS LABORATORIES AND ALL STATE, MUNICIPAL AND FEDERAL CODES AND REGULATIONS WHICH HAVE JURISDICTION. IN EACH CASE CODES ARE MINIMUM REQUIREMENTS. PAY FOR ALL PERMITS REQUIRED FOR THE WORK.

SUBMITTALS:

SUBMIT SHOP DRAWINGS FOR ALL EQUIPMENT AND ACCESSORIES FOR APPROVAL PRIOR TO CONSTRUCTION. ANY EQUIPMENT INSTALLED WITHOUT ENGINEERS APPROVAL SHALL BE DONE AT THE RISK OF THE CONTRACTOR.

DUCTWORK:

ALL DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH THE LATEST SMACNA REQUIREMENTS. ALL DUCTS SHALL BE FREE FROM THUMPING OR RATTLING WHEN FANS ARE TURNED OFF. PROVIDE ACCESS DOORS IN DUCTWORK AT EACH DUCT MOUNTED CONTROL DEVICE. DOORS SHALL BE HINGED WITH CAM LOCKS AND GASKETED DOOR SEALS. HANGERS AND SUPPORTS FOR SHEET METAL DUCTWORK AND FLEXIBLE DUCTWORK SHALL MEET THE LATEST SMACNA STANDARDS. SEAL ALL DUCTWORK WITH UL LISTED DUCT SEALANT TO MAINTAIN A MAXIMUM FIVE PERCENT (5%). FLEXIBLE DUCTWORK SHALL BE EQUAL TO "BUCKLEY", TRIPLE LOCK ALUMINUM 3008, UL LISTED. FLEXIBLE DUCTWORK SHALL BE ENCASED WITH 1" THICK 3/4 POUND, DENSITY FIBERGLASS BLANKET WITH VINYL VAPOR BARRIER. SECURE TO DUCT WITH METAL STRAPS BOLTED TO DUCT AT EACH CONNECTION.

DUCTWORK INSULATION

INSULATE ALL INTAKE LOUVER DUCTWORK WITH 2" THICK, SIX POUND DENSITY RIGID FIBERGLASS DUCT BOARD INSULATION WITH FACTORY APPLIED REINFORCED ALUMINUM FOIL JACKET EQUAL TO "MANVILLE" TYPE FSK. INSTALL PER MANUFACTURER'S INSTRUCTIONS USING STAPLES AND APPROVED TAPE TO MAINTAIN VAPOR BARRIER. ALL RAW ENDS OF INSULATION SHALL BE SEALED WITH APPROVED MASTIC OR FOIL FACED TAPE.

EXHAUST FANS:

WALL EXHAUST FANS: FURNISH AND INSTALL WALL EXHAUST FAN UNITS AND ACCESSORIES AS SCHEDULED FOR THIS PROJECT. FANS SHALL BE EQUIPPED WITH OSHA FAN GUARDS, SPARK-PROOF ALUMINUM FAN BLADES AND EXPLOSION PROOF MOTORS. FANS SHALL BE DIRECT DRIVE TYPE FANS AND SHALL BE PROVIDED WITH WALL MOUNTING COLLAR, LOW-LEAKAGE BACKDRAFT DAMPER AND EXTERIOR WALL LOUVER. INSTALL FAN UNIT PER DETAIL. PROVIDE ALL NECESSARY DUCTWORK TO CONNECT FAN UNIT TO EXHAUST LOUVER. ALL UNITS SHALL BE AMCA LABELED FOR PERFORMANCE.

CEILING EXHAUST FAN: FURNISH AND INSTALL CEILING EXHAUST FAN, DUCTWORK AND WALL CAP AS SCHEDULED ON THE DRAWINGS. FAN SHALL BE PROVIDED WITH A LINE VOLTAGE SPEED CONTROL SWITCH MOUNTED AT THE FAN FOR FAN BALANCING.

EXTERIOR WALL LOUVERS:

EXTERIOR WALL LOUVERS SHALL BE EQUAL TO THE RUSKIN MODELS SCHEDULED. ALL UNITS SHALL BE SIZED TO FIT IN THE EXISTING MASONRY COURSING. ALL LOUVERS SHALL BE FURNISHED WITH A BAKED ENAMEL FINISH, GALVANIZED BIRDSCREEN, AND EXTENDED SILL AND INSTALLATION CLIPS. THE COLOR OF LOUVER SHALL BE SELECTED BY THE ARCHITECT. PROVIDE COLOR CHART FOR SELECTION.

GAS FIRED UNIT HEATERS:

FURNISH AND INSTALL SEALED COMBUSTION LP GAS FIRED UNIT HEATERS, CONTROLS AND ACCESSORIES AS SCHEDULED. PROVIDE ALL NECESSARY CEILING SUPPORT STEEL AND RODS TO PROPERLY AND ADEQUATELY SUPPORT UNITS. PROVIDE NEOPRENE VIBRATION ISOLATORS ON ALL STRUCTURAL MOUNTED SUPPORTS FOR UNIT HEATERS TO ELIMINATE EXCESSIVE VIBRATION AND NOISE.

ALL UNITS SHALL BE INSTALLED PER MANUFACTURERS INSTRUCTIONS. PROVIDE GAS VENTING AND INTAKE DUCTING INSTALLED AS DETAILED AND REQUIRED BY THE MANUFACTURER. ALL UNITS AND VENTING SYSTEMS SHALL BE INSTALLED PER THE U.L. LISTING. ALL UNITS SHALL BEAR THE A.G.A LABEL.

TEMPERATURE CONTROLS

PROVIDE CONTROLS FOR UNIT HEATERS, EXHAUST FANS AND DAMPERS AS SPECIFIED HEREIN. COORDINATE WITH ELECTRICAL CONTRACTOR FOR 120 VAC WIRING OF ALL MECHANICAL COMPONENTS. FURNISH AND INSTALL ALL 24 VAC WIRING AND CONTROLS. PROVIDE ALL 120 VAC CONTROLS COMPONENTS TO THE ELECTRICAL CONTRACTOR FOR WIRING. MOUNT ALL CONTROL DAMPERS AND ACTUATORS REQUIRING 120 VAC WIRING.

1. EXHAUST FANS EF-1 AND EF-2:

PROVIDE A WALL MOUNTED MANUAL CONTROL SWITCH AND WALL MOUNTED CARBON MONOXIDE SENSOR TO CONTROL EACH EXHAUST FAN SYSTEM. ACTIVATION OF EITHER THE CARBON MONOXIDE SENSOR OR WALL SWITCH SHALL OPEN THE RESPECTIVE INTAKE MOTORIZED DAMPER. THE END SWITCH ON THE MOTORIZED DAMPER SHALL MAKE AND ENERGIZE THE EXHAUST FAN. WHEN UNIT IS DE-ENERGIZED THE POWER TO THE INTAKE DAMPER SHALL BE DE-ENERGIZED, THE END-SWITCH SHALL OPEN AND DE-ENERGIZE FAN AND THE MOTORIZE DAMPER SHALL CLOSE USING THE INTERNAL SPRING RETURN.

2. EXHAUST FAN EF-3:

A 120 VAC WALL SWITCH FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR SHALL START-STOP FAN.

3. UNIT HEATERS:

A WALL MOUNTED TWO STAGE THERMOSTAT SHALL CYCLE THE FAN AND HEATER THROUGH THE ELECTRONIC IGNITION AND FLAME SAFETY CONTROLS TO MAINTAIN SETPOINT.

EXHAUST FAN SCHEDULE

PLAN SYMBOL (EF #)

No.	MANUFACTURER	MODEL	CFM	E.S.P.	TYPE	RPM	MODEL H.P.	MODEL VOLT	MODEL PH	REMARKS
EF-1	GREENHECK	SCB-20-617-B4	2529	0.25"	WALL	-	1/4	115	1	NOTE 1
EF-2	GREENHECK	SCB-20-617-B4	2529	0.25"	WALL	-	1/4	115	1	NOTE 1
EF-3	GREENHECK	SP-A	100	0.25"	CEILING	-	1291A	115	1	NOTE 2, 3

NOTES:
1) PROVIDE MODEL WD-320 LOW LEAKAGE BACKDRAFT DAMPER, WALL COLLAR, OSHA MOTOR EXPLOSION RESISTANT SINGLE SPEED FAN MOTOR, SPARK PROOF ALUMINUM FAN BLADES, CLOSURE ANGLES.

2) PROVIDE MODEL SW SPEED CONTROL SWITCH MOUNTED AT FAN FOR BALANCING, PROVIDE MODEL WG-4 WALL CAP WITH B.D.D.

3) PROVIDE TIME DELAY FAN CONTROL SWITCH.

GAS FIRED UNIT HEATER SCHEDULE

PLAN SYMBOL (UH #)

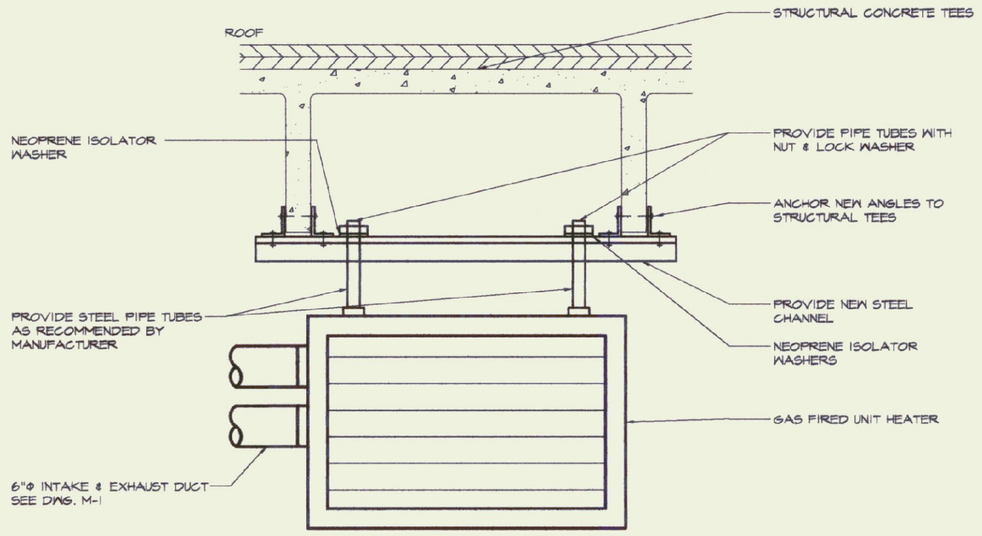
No.	MANUFACTURER	MODEL	CFM AT 0" E.S.P.	MBH LP GAS INPUT	MBH LP GAS OUTPUT	FAN DRIVE	MODEL H.P.	MODEL VOLT	MODEL PH	REMARKS
UH-1	NOT USED	-	-	-	-	-	-	-	-	-
UH-2	REZNOR	SCB-100	1230	100	80	DIRECT	1/8	115	-	NOTE 2
UH-3	REZNOR	SCB-100	1230	100	80	DIRECT	1/8	115	1	NOTE 2

NOTES:
1) NOT USED.
2) PROVIDE CONCENTRIC VENTING KIT FOR SEALED COMBUSTION, CONVERTED FOR PROPANE GAS, STAINLESS STEEL HEAT EXCHANGER, STAINLESS STEEL BOTTOM PAN, STAINLESS STEEL BURNERS, SPARK IGNITED SAFETY PILOT WITH ELECTRONIC FLAME SUPERVISION, TOTALLY ENCLOSED MOTOR, 2 STAGE GAS VALVE (50/100%), BURNER AIR SHUTTERS, SUMMER/WINTER SWITCH, 2 STAGE THERMOSTAT A.G.A. LABELED.

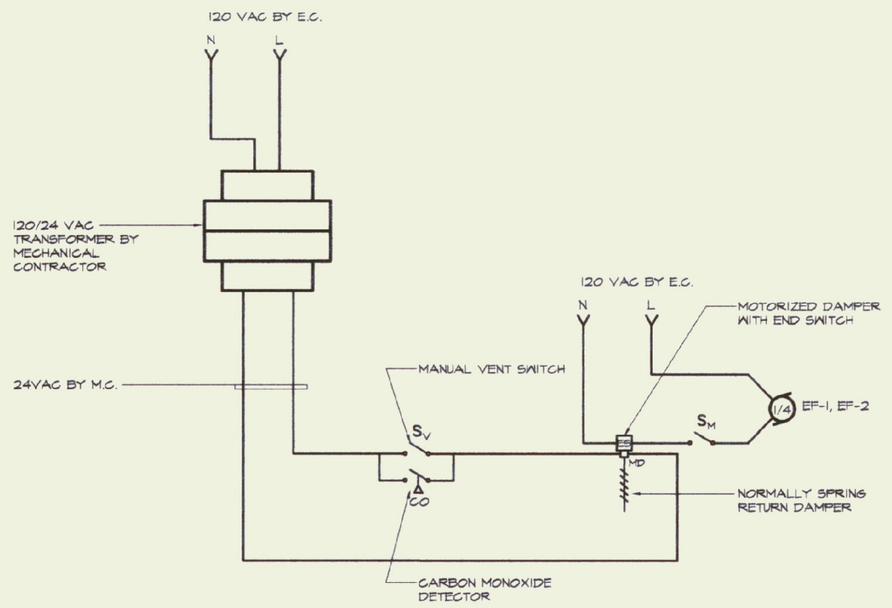
LOUVER SCHEDULE

PLAN SYMBOL (L #)

No.	MANUFACTURER	SERIES	MODEL	SIZE	AIR PAT	DAMPER	FINISH	REMARKS
L-1	RUSKIN	ELF-375DX	-	32"x32"	FIXED	-	B.E.	PROVIDE GALVANIZED BIRDSCREEN
L-2	RUSKIN	ELF-375DX	-	32"x32"	FIXED	-	B.E.	PROVIDE GALVANIZED BIRDSCREEN
L-3	RUSKIN	ELF-375DX	-	32"x32"	FIXED	-	B.E.	PROVIDE GALVANIZED BIRDSCREEN
L-4	RUSKIN	ELF-375DX	-	32"x32"	FIXED	-	B.E.	PROVIDE GALVANIZED BIRDSCREEN



UNIT HEATER HANGER DETAIL
NOT TO SCALE



TYPICAL EXHAUST FAN WIRING DIAGRAM
NOT TO SCALE

THE STATE OF VERMONT
DANIEL W. DUPRAS
NO. 7438
REGISTERED
PROFESSIONAL ENGINEER

NO.	ISSUED FOR	DATE
2	COST REDUCING CHANGES	7-22-02
1	BIDDING	5-24-02

LANE ASSOCIATES CONSULTING ENGINEERS, P.C.

HEATING, VENTILATION, & AIR CONDITIONING, PLUMBING, FIRE PROTECTION, & ELECTRICAL

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MECHANICAL SCHEDULES AND SPECIFICATIONS

RUTLAND STATE AIRPORT
CLARENDON, VERMONT
ADDITION TO FIRE/CRASH/ RESCUE BUILDING

M2

APPR: DWD | DRAWN: BWM | SCALE: AS NOTED | PROJ. NO. 0132-01

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