ELECTRICAL GENERAL SPECIFICATIONS

GENERAL REQUIREMENTS

THE GENERAL CONDITIONS OF THE CONTRACT ARE HEREBY MADE A PART OF THIS SPECIFICATION.

CONTRACTOR SHALL PROVIDE ALL ITEMS, ARTICLES, MATERIALS OR METHODS LISTED, MENTIONED OR SCHEDULED, INCLUDING ALL LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS NECESSARY AND REQUIRED FOR THE COMPLETION OF THE PROJECT.

DRAWINGS AND SPECIFICATIONS

CONTRACT DRAWINGS FOR ELECTRICAL WORK ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY SCOPE OF WORK AND INDICATE THE GENERAL ARRANGEMENT OF EQUIPMENT. ELECTRICAL TRADES SHALL FOLLOW THESE DRAWINGS IN LAYING OUT THEIR WORK; CONSULT GENERAL CONSTRUCTION DRAWINGS TO FAMILIARIZE THEMSELVES WITH CONDITIONS AFFECTING THEIR WORK, AND SHALL VERIFY SPACES IN WHICH THEIR WORK WILL BE INSTALLED BY MEASUREMENTS ON THE JOB. DO NOT SCALE DRAWINGS.

EACH CONTRACTOR OR HIS REPRESENTATIVE SHALL VISIT THE SITE AND MAKE AN ESTIMATE OF FACILITIES AND DIFFICULTIES ATTENDING EXECUTION OF THIS WORK. NO CLAIMS WILL BE ALLOWED BECAUSE OF DISCREPANCIES IN SUCH ESTIMATES.

SCOPE OF WORK

PROVIDE ALL LABOR, MATERIAL, EQUIPMENT AND INCIDENTALS FOR COMPLETE AND FULLY OPERATING ELECTRICAL SYSTEMS AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN, INCLUDING, BUT NOT LIMITED TO REMOVALS, LIGHTING, POWER OUTLETS, BRANCH CIRCUITS AND DISCONNECTING MEANS, SAVE AND MAINTAIN ALL WORK NOT DESIGNATED TO BE REMOVED OR RELOCATED.

WORKMANSHIP

ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER IN PERFECT OPERATING ORDER, TO THE SATISFACTION OF THE OWNER. REPAIR OR REPLACE ALL WORK REJECTED BY THE ENGINEER AT NO ADDITIONAL COST. ALL WORK SHALL BE IN ACCORDANCE WITH THE N.E.C.

MATERIAL AND SUBSTITUTIONS

EXCEPT WHERE INDICATED OTHERWISE, ALL MATERIALS SHALL BE NEW AND CONFORM TO STANDARDS ESTABLISHED IN PLANS AND SPECIFICATIONS. REFER TO ENGINEER'S GENERAL CONDITIONS FOR SUBMITTAL AND SHOP DRAWING REQUIREMENTS.

EQUIPMENT, MATERIALS OR ITEMS OF OTHER MANUFACTURERS, OF EQUIVALENT DESIGN, QUALITY AND CAPACITY, WILL BE CONSIDERED AS SUBSTITUTES TO THOSE SPECIFIED OR NOTED ON THE DRAWINGS. ENGINEER RESERVES THE RIGHT TO REJECT ANY SUBSTITUTE OFFERED FOR ITEMS SPECIFIED OR NOTED ON DRAWINGS.

SUBSTITUTE MATERIAL AND EQUIPMENT, WHERE REQUESTED OR PROPOSED BY CONTRACTOR, SHALL BE ITEMIZED AND SHALL SHOW COST TO OWNER WHETHER IT IS AN "ADDITION" OR "DEDUCTION" OR "NO CHANGE IN COST" TO THE BASE BID PRICE. IT SHALL BE HELD THAT NO CHANGE IN CONTRACT COMPLETION TIME WILL OCCUR SHOULD ENGINEER ELECT TO ACCEPT ANY ALTERNATES UNLESS SUCH TIME IS SPECIFICALLY STATED IN THE CONTRACTOR'S BID.

MATERIALS AND EQUIPMENT NOT APPROVED SHALL NOT BE USED IN CONSTRUCTION.

ALL EQUIPMENT SHALL BE U.L. LISTED AND LABELED, WHENEVER U.L. STANDARDS HAVE BEEN DEVELOPED AND APPLIED FOR SAID EQUIPMENT.

WORK AND MATERIALS PROVIDED BY OTHER TRADES

RELOCATION OF GATE OPERATOR AND CONTROL STATION, SEWAGE PUMP STATION AND CONTROLS, NEW UNIT HEATERS AND EXHAUST FANS, MOTORIZED DAMPERS, TEMPERATURE CONTROL DEVICES AND LOW VOLTAGE (24VAC) WIRING. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL POWER AND CONTROL WIRING AT 120VAC AND ABOVE.

CLEANING

EACH CONTRACTOR SHALL CLEAR AWAY ALL DEBRIS, SURPLUS MATERIALS, ETC., RESULTING FROM HIS WORK OR OPERATION, LEAVING THE JOB AND EQUIPMENT FURNISHED IN A CLEAN, FIRST-CLASS CONDITION.

GUARANTEE, SERVICE AND REPLACEMENT

EXCEPT AS A LONGER PERIOD MAY BE PROVIDED IN THIS SPECIFICATION, THIS CONTRACTOR SHALL GUARANTEE THE WORK TO THE FULL EXTENT OF THE PROVISION OF THE DRAWINGS, THIS SPECIFICATION AND THE GENERAL CONDITIONS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE BY THE ENGINEER AS EVIDENCED BY THE ENGINEER'S FINAL CERTIFICATE.

THIS CONTRACTOR SHALL SERVICE ALL INSTALLED EQUIPMENT FREE OF CHARGE DURING THE GUARANTEE PERIOD.

ANY APPARATUS OR EQUIPMENT THAT REQUIRES EXCESSIVE SERVICE DURING THE GUARANTEE PERIOD SHALL BE CONSIDERED DEFECTIVE AND SHALL BE REPLACED BY THIS CONTRACTOR WITHOUT ADDITIONAL COST TO OWNER.

CODES, RULES AND REGULATIONS

COMPLY WITH THE LATEST EDITION OF ALL APPLICABLE CODES, RULES, LAWS, ORDINANCES, AND REGULATIONS, INCLUDING, BUT NOT LIMITED TO, STATE AND LOCAL LAWS AND ORDINANCES, AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), B.O.C.A., BASIC BUILDING CODE AND SUPPLEMENTS, INSULATED POWER CABLE ENGINEERS ASSOCIATION (IPCEA), INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE), NATIONAL ELECTRICAL CODE (NEC), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), UNDERWRITERS LABORATORIES (U.L.), OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AND NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA).

OBTAIN AND PAY FOR STATE OF VERMONT CERTIFICATE OF INSPECTION AND APPROVAL.

SUBMITTALS

PROVIDE SUBMITTAL DATA AND/OR SHOP DRAWINGS IN ACCORDANCE WITH THE GENERAL PROVISIONS FOR EACH OF THE FOLLOWING: CIRCUIT BREAKERS, LIGHTING FIXTURES, LAMPS AND BALLASTS, WIRING DEVICES, SURFACE RACEWAY, AND MOTION SENSORS.

GENERAL MATERIALS

GENERAL MATERIALS SHALL BE THE MANUFACTURER AND MODEL NUMBER INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN, OR EQUAL.

CONDUCTORS

CONDUCTORS SHALL BE COPPER, 600 VOLT INSULATION, SOLID THROUGH #10 AWG, STRANDED ABOVE. INSULATION TYPES XHHW OR XHHW-2 - 75 DEGREES CELSIUS DAMP OR WET LOCATIONS.

ALL CONDUCTORS SHALL BE COLOR-CODED AS FOLLOWS: PHASE A - BLACK, PHASE B - RED, NEUTRAL - WHITE AND BOND - GREEN OR BARE.

RACEWAY

CONDUIT SHALL BE PVC SCHEDULE 40, LIQUID TIGHT FLEXIBLE METAL EMT, INTERMEDIATE METAL OR GALVANIZED RIGID STEEL, EQUAL TO CARLON JONES AND LAUGHLIN, ANACONDA, OR ALLIED TUBE.

CONNECTORS

AT EACH SPLICE, TAP OR TERMINATION PROVIDE A COMPLETE ASSEMBLY OF LUGS, TERMINATORS, CONNECTORS AND INSULATION AS REQUIRED. USE PRESSURE TYPE CONNECTORS AND SET SCREW LUGS FOR COPPER CONNECTIONS.

CONNECTORS AND TERMINATORS AS MANUFACTURED BY BURNDY, 3-M, ILSCO OR EQUAL.

BOXES AND FITTINGS

PROVIDE OUTLET, PULL AND JUNCTION BOXES AS REQUIRED FOR EACH APPLICATION. BOXES SHALL BE MINIMUM 1-1/2" DEEP. INTERIOR BOXES SHALL BE STANDARD STAMPED STEEL. EXTERIOR BOXES SHALL BE CAST TYPE WITH GASKETED WEATHERPROOF COVERS WITH SPRING LOADED DEVICE LIDS EQUAL TO HUBBELL OR BELL.

CIRCUIT BREAKERS

PROVIDE THERMAL/MAGNETIC TRIP CIRCUIT BREAKERS AS REQUIRED TO FIT EXISTING SQUARE D PANELBOARD. BREAKERS SHALL HAVE A MINIMUM RATING OF 10,000 A.I.C. UNLESS OTHERWISE INDICATED BREAKERS SHALL BE 20A - 1P.

WIRING DEVICES

ALL WIRING DEVICES SHALL BE COMMERCIAL SPECIFICATION GRADE, NEMA STANDARD CONFIGURATION GROUNDING TYPE, WHITE COLOR. EQUIP EACH WIRING DEVICE WITH OUTLET BOX, STEEL OR WEATHERPROOF WALL PLATE AND ACCESSORIES AS INDICATED AND REQUIRED. DUPLEX RECEPTACLE-15A, 120V, LEVITON #5362-W, G.F.C.I. RECEPTACLE-20A, 120V, LEVITON #8898-W (WITH TEST AND RESET BUTTONS AND LED INDICATOR), SINGLE POLE SWITCH-20A, 120V, LEVITON # CSB1-20W, RATED 1 HP @120VAC WHEN USED FOR MOTOR DISCONNECT. BURNER EMERGENCY SWITCHES SHALL HAVE RED STEEL WALL PLATES WITH LABEL "EMERGENCY BURNER OFF", FIR-O-MATIC SWITCHES SHALL BE PLATE MOUNTED, HEAT SENSING SWITCHES EQUAL TO SMITH-MORSE NO. T-300.

SUPPORTING DEVICES

PROVIDE HANGERS, STAPLES, STRAPS, ETC., BY THOMAS AND BETTS OR EQUAL. WIRE, CHAIN OR PERFORATED STRAP SHALL NOT BE USED FOR SUPPORTING DEVICES. ACOUSTICAL CEILING TIE WIRES SHALL NOT BE USED TO SUPPORT CABLES.

LIGHTING SYSTEM AND FIXTURES

PROVIDE LIGHTING FIXTURES AS SCHEDULED ON THE DRAWINGS COMPLETE WITH HOUSINGS, DIFFUSERS, TRIMS, LAMPS, BALLASTS AND ACCESSORIES NECESSARY FOR COMPLETE INSTALLATION.

PROVIDE LAMPS AS FOLLOWS:

FLUORESCENT: T8, 32 WATT, and 3500 DES. K COLOR TEMP. INCANDESCENT: 'A' STYLE, LONG LIFE OR 130 VOLT RATED.

FLUORESCENT BALLASTS: PROVIDE ELECTRONIC BALLASTS WITH LESS THAN 15% TOTAL HARMONIC DISTORTION AT MAXIMUM LAMP-BALLAST RATING, CREST FACTOR MAINTAINED BELOW 1.7 AND BALLAST FACTOR GREATER THAN .75. BALLASTS SHALL BE U.L. LISTED AND CBM CERTIFIED, SOUND RATED A AND POWER FACTOR EXCEEDING 90% WHEN OPERATING AT 20 kHz OR HIGHER OUTPUT FREQUENCY. PROVIDE MOTION SENSOR EQUAL TO STONCO MD-501.

GENERAL INSTALLATION

INSTALL ALL EQUIPMENT AT THE LOCATIONS INDICATED IN ACCORDANCE WITH N.E.C., U. L. AND B.O.C.A. REQUIREMENTS.

WIRING METHODS

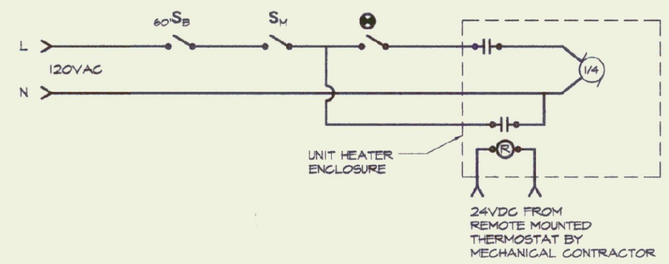
ALL WIRING SHALL BE INSTALLED IN CONDUIT. USE EMT FOR INTERIOR DRY LOCATIONS, RIGID OR INTERMEDIATE STEEL FOR SEWAGE PUMP PIT AND PVC FOR OTHER UNDERGROUND WORK. USE FLEXIBLE METAL CONDUIT FOR FINAL CONNECTIONS TO MOTORS, LIQUID TIGHT FOR OUTDOOR USE.

TESTING AND CLEANING

TEST ALL SYSTEMS, IN THE PRESENCE OF THE ENGINEER, AND DEMONSTRATE FREEDOM FROM SHORTS AND GROUNDS AND PROPER OPERATION OF ALL SWITCHES AND CONTROLS. CORRECT ANY DEFECTS NOTED DURING TESTING, AND RE-TEST UNTIL PROPER OPERATION IS OBTAINED. AFTER TESTING, CLEAN ALL EQUIPMENT, TOUCH-UP PAINT ALL RUSTY, SCRATCHED OR MARRED EQUIPMENT, ADJUST AND LUBRICATE ALL MECHANISMS AS REQUIRED AND REPLACE ANY LAMPS THAT ARE NOTICEABLY DIM.

COMBINED RUNS

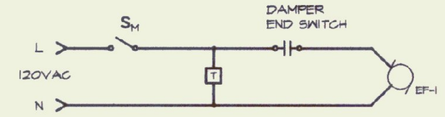
CIRCUITS ON OPPOSITE PHASES SHALL NOT BE COMBINED WITH COMMON NEUTRALS EXCEPT WHERE MULTI-POLE CIRCUIT BREAKERS ARE USED.



UNIT HEATER (UH-2) WIRING DIAGRAM

NOT TO SCALE

NOTE:
1. BONDING CONDUCTOR NOT SHOWN.
2. SIMILAR FOR UH-3.



EXHAUST FAN DETAIL (EF-1)

NOT TO SCALE

NOTE:
1. BONDING CONDUCTOR NOT SHOWN.
2. DAMPER END SWITCH PROVIDED BY M.C.
3. EF-2 SIMILAR.

EXHAUST FAN DETAIL (EF-3)

NOT TO SCALE

NOTE:
1. BONDING CONDUCTOR NOT SHOWN.
2. NOT USED
3. NOT USED

THE STATE OF VERMONT — CHARLES F. LANE No. 4100 — PROFESSIONAL ENGINEER

Charles F. Lane

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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ELECTRICAL SPECIFICATIONS AND DETAILS

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

E 3

APPR: CFL | DRAWN: PJE | SCALE: AS NOTED | PROJ. NO. 0192-01

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