

GENERAL REQUIREMENTS FOR ELECTRICAL WORK

PART ONE: GENERAL

- 1.1 General Requirements
- 1.1.1 Scope: It is the intent of these Drawings to define the equipment and materials for installation at Project **Secure Exit Portal and associated renovations**.
- 1.1.2 Provisions: As used in this section, "provide" means " furnish and install." "Install" means "to purchase and deliver to the project site complete with every necessary apparatus and support and to store in a secure area in accordance with manufacturers' instructions," and "install" means "to unload at the delivery point at the site or retrieve from storage, move to point of installation and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project."
- 1.1.3 Existing Site Conditions – Responsibilities: Prior to Bid, Before submitting a bid, the Electrical Subcontractor shall visit and carefully examine site to identify existing conditions and difficulties that may affect the work of this Section. No extra payment will be allowed for additional work caused by unfamiliarity with site conditions.
- 1.1.4 Existing Site Conditions – Responsibilities: Prior to Starting Work, Before starting work in a particular area of the project, the Electrical Subcontractor shall examine the conditions under which work must be performed including preparatory work performed under other Sections of the Contract, or by the Owner and report conditions which might adversely affect the work in writing to the Engineer. Do not proceed until work conditions have been corrected. The Engineer shall be notified. Changes or variations of work shall be considered as contractor acceptance of existing conditions and preparatory work.
- 1.1.5 Coordination of Work: The General Contractor shall coordinate the work of all trades including the Electrical Subcontractor with all other trades. The Electrical Subcontractor shall be notified of any interference with the electrical work. If the Electrical Subcontractor fails to check with the General Contractor and the electrical work is later found to interfere with the work of other subcontractors, then he shall make necessary changes, without additional cost to the Owner, to eliminate such interference.
- 1.1.6 Intent of Design: This performance specification is not intended to indicate and specify each component required, but does require that the components and materials be provided for a complete and operational installation.
- 1.1.7 Discrepancies in Documents: Each bidder shall be responsible for examining the specifications carefully before submitting his bid, with particular attention to errors, omissions, conflicts with provisions of laws and codes imposed by authorities having jurisdiction, conflicts between provisions of specifications, and ambiguous definition of the extent of coverage in the contract. Any such discrepancy, discovered shall be brought to the immediate attention of the Engineer for correction. Should any of the aforementioned errors, omissions, conflicts or ambiguities exist in the specification, the Electrical Subcontractor shall have the same explained and adjusted in writing before signing the contract or proceeding with work. Failure to notify the Engineer in writing of such irregularities prior to signing the Contract will cause the Engineer's interpretation of the Contract Documents to be final. No additional Claims and Standards will be approved because of discrepancies thus resolved.
- 1.2 Applicable Codes and Standards
- 1.2.1 Work: All work shall be in accordance with the laws, rules, codes, and regulations set forth by Local, State, and Federal authorities having jurisdiction. All products and materials shall be manufactured, installed and tested as specified, but not limited to the latest accepted edition of the following codes, standards and regulations:
- | | |
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| NFPA | National Fire Protection Association |
| OSHA | Occupational Safety and Health Act |
| NBC | National Electrical Code (NFPA 70) |
| UL | Underwriters Laboratory |
| NFESC | National Electrical Safety Code |
| FM | Factory Mutual Association |
| MBC | Maine State Building Code |
| IECC | International Energy Conservation Code - 2009 |
| Local AHJ | Local and State building, electrical, fire and health department and public safety codes agencies. |

1.2.2 Code Conflicts: When requirements cited in this Paragraph conflict with each other or with Contract Documents, the most stringent requirements shall govern control of work. The Engineer may relax this requirement when such relaxation does not violate the intent of authorities that have jurisdiction. Approval for such relaxation shall be obtained in writing. Should the Electrical Subcontractor perform any work that does not comply with the requirements of the applicable building codes, state laws, and industry standards, he shall bear all costs arising in correcting these deficiencies.

PART TWO: SCOPE OF WORK

- 2.1 General Requirements
- 2.1.1 General Scope: The work to be accomplished under this section includes providing all labor, materials, equipment, consumable items, supervision, administrative tasks, tests and documentation required to install complete and fully operational electrical systems as described.
- 2.1.2 Administrative Responsibilities: The Electrical Subcontractor shall file plans, obtain permits and licenses, pay fees and obtain necessary inspections and approvals from authorities that have jurisdiction, as required to perform work in accordance with all legal requirements.
- 2.2 Work to be Provided Under this Division
- 2.2.1 General Scope: The Work shall be complete from point of service to each outlet or device with all necessary construction and materials required to make each item of equipment or system complete and ready for operation. The work shall include but not be limited to the following: The Electrical Subcontractor shall provide:
- A. **Grounding System:** Provide all equipment and wiring to connect new feeders, equipment and other systems as required by the National Electrical Code to the existing building grounding.
 - B. **Power Distribution Systems:** Install to provide additional equipment to the existing power distribution systems including panelboards, overcurrent devices, conduits, cables and wire, equipment and convenience receptacles. This includes branch wiring to system control panels furnished under other sections.
 - D. **Motor Circuit Wiring:** Provide all motor wiring, safety disconnects, and motor starters unless integral with equipment.
 - E. **Interior Lighting Systems:** Provide complete interior lighting system including normal and emergency fixtures, exit signs, lamps, controls, trim and accessories.
 - F. **Security Systems:** Furnish conduits and power for security equipment as shown on the plans.
 - G. **Cable Television Systems:** Provide conduit and wiring for CATV outlets.
 - H. **Supports and Fittings:** Provide all support material and hardware for raceway, cable tray and electrical equipment.

2.2 General Equipment and Materials Requirements

- 2.2.1 General Equipment: All equipment and materials shall be new and of the quality specified. All materials shall be free from defects at the time of installation. Materials or equipment damaged in shipment or otherwise damaged during construction shall not be repaired at the jobsite, but shall be replaced with new materials.
- 2.2.2 Reinstallation of Equipment: All equipment installed on this project shall have local representation, local factory authorized service and a local stock of repair parts.
- 2.2.3 Warranties: No equipment or material shall be installed in such a manner as to void a manufacturer's warranty. The Electrical Subcontractor shall notify the Engineer of any discrepancies between the Contract Documents and manufacturer's recommendations prior to execution of the work. Refer to Division R General Requirements for Warranty Requirements.
- 2.3 Shop Drawings
- 2.3.1 General Requirements: After the Contract is awarded, but prior to proceeding with the Work, the Electrical Subcontractor shall submit shop drawings for all equipment and materials specified herein, including but not limited to: panelboards, circuit breakers, switches, fuses, disconnects, conductors, and conduit. Shop drawings shall be submitted to the Engineer for review. Submission of such items shall follow the guidelines set in the General Section of the Specification Document. Prior to submission of the shop drawings, product data and samples to the Engineer, the Electrical Subcontractor shall review and certify that the shop drawings, product data and samples are in complete accordance with the Contract Documents. Further, the Electrical Subcontractor shall check all materials and equipment after their arrival on the jobsite and verify their compliance with the Contract Documents. A minimum period of ten working days, exclusive of transmission time will be required in the Engineer's office each time shop drawings, product data and/or samples are submitted or resubmitted for review. This time period shall be considered by the Electrical Subcontractor when scheduling his Work.
- 2.3.2 Information to be included in Submittals: The shop drawing submittal shall include all data necessary for interpretation as well as manufacturer's name and catalog number. Sizes, capacities, colors, etc., specified on the drawings shall be specifically noted or marked on the shop drawings.
- 2.3.3 Responsibility of Submittal Equipment: The Engineer's review of such drawings shall not relieve the Subcontractor of responsibility for deviations from the Contract Specifications, unless the Engineer's review shall not relieve the Electrical Subcontractor from responsibility for errors or omissions in such drawings.
- 2.3.4 Proposal of Other Equipment: If the Electrical Subcontractor proposes an item of equipment other than that specified which requires any change of the wiring or any other part of the mechanical, electrical or architectural layout, the required changes shall be marked at the expense of the trade furnishing the changed equipment at no cost to the Owner.
- 2.3.5 Substitution of Equipment of Equal Quality: Manufacturer's name are listed herein and on the drawings to establish a standard for quality and design. Where one manufacturer's name is mentioned, products of other manufacturers will be acceptable if, in the opinion of the Engineer, the substitute material is of a quality equal to or better than that of the material specified. Where two or more manufacturer's names are specified, material shall be by one of the named manufacturers only.
- 2.4 Record Drawings
- 2.4.1 General Requirements: As work progresses, and for duration of the Contract, the Electrical Subcontractor shall maintain a complete and separate set of prints of Contract Drawings at job site at all times and record work completed and all changes from original Contract. Drawings shall clearly and accurately include work installed as a modification or added to the original design. A completion of work and prior to final payment, the Electrical Subcontractor shall submit a complete set of reproducible record drawings showing all systems as actually installed.

2.5 Equipment Specifications

- 2.5.1 Panelboards: Panelboards shall be of the sizes, rating and arrangement shown on the attached sheets. Panelboards shall be provided complete with all overcurrent devices, accessories and trim. All circuit breakers shall be provided with safety handles for dead front construction. The required short circuit ratings of assembled panelboards are shown on the Drawings. The short circuit rating of every overcurrent device in the panel shall meet or exceed the panel rating. Unless otherwise noted on the Drawings, series rated combinations will not be permitted.
- A. Enclosures: Boxes shall be code gauge galvanized sheet steel. Trim shall be code gauge steel, ANSI-61 gray finish with stainless steel flush type lock/latch construction. All locks shall be keyed alike. Trim for surface mounted panels shall be door-in-door construction such that the keyed space may be exposed by a hinged door. Directory frames shall be metal frame with plastic covers.
 - B. Bus Work: All bus work shall be 1000 ampig, in copper or 750 ampig, in aluminum, unless otherwise noted on the drawings, neutral buses shall be 100% rated with adequate connections for all outgoing neutral conductors. Panelboards shall be provided with copper or aluminum ground buses.
 - C. Circuit Breakers: Overcurrent devices shall be trip-free molded case, hot-bolt, thermal magnetic circuit breakers. Main circuit breakers shall be individually mounted and bolted to the assembly. Back-fed branch mounted circuit breakers are prohibited. Front faces of all circuit breakers shall be flush. Trip indication shall be clearly shown by the handle position between the ON and OFF positions. All connections shall be made for 75°C copper conductors.
- 2.5.2 Grounding System:
- A. A ground equipment grounding conductor shall be run with each branch circuit. Grounding conductor shall be soft drawn bare copper.
- 2.5.3 Feeder and Branch Circuit Wiring:
- A. Provide feeder and branch circuit conductors and devices for power to equipment and convenience receptacles. This includes branch wiring to system control panels furnished under other sections.
 - B. All circuits feeding panels, circuit feeders and circuit wiring shall be copper, minimum size #12 AWG. Conductors shall be 600V rated with THHN/THWN insulation.
 - C. All wiring shall be in EMT conduit. Wiring above acoustic ceiling this may be in conduit or an MC cable whip not to exceed 8'-0".
 - D. EMT conduit shall be properly supported with hangers or clips at a spacing not to exceed 10 feet. Minimum conduit size is 1/2".
 - E. Flexible metal conduit shall be used for connections to vibrating equipment.
 - F. All conduits or penetrations in fire rated walls shall be furnished with fire stopping material to maintain the integrity of the rating.
- 2.5.4 Lighting Systems:
- A. Light fixtures shall be provided with housings, trims, bellows, lamps, lamp holders, sockets, reflectors, wiring and other components required, as a factory-assembled unit for a complete installation. Provide electrical wiring within light fixtures suitable for connecting to branch circuit wiring in accordance with applicable codes. Provide a minimum of 100 lumens per fixture from the front of the fixture and ratings indicated and specified in the Lighting Fixture Schedule on the Contract Drawings.

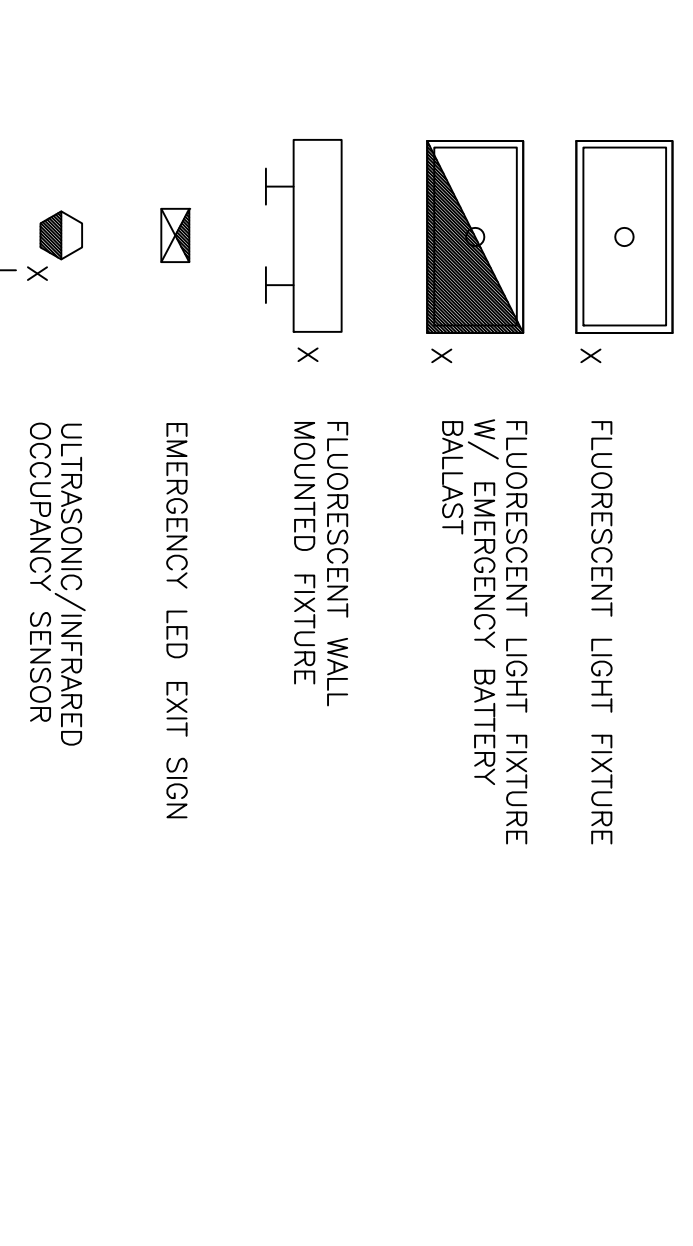
PART THREE: EXECUTION

- 3.1 Equipment Arrangement and Access
- 3.1.1 Location of Equipment: Locate all equipment which must be serviced, operated or maintained in fully accessible positions. Minor deviations from the drawings may be made to allow for better accessibility at no additional cost to the Owner, but changes shall conform to the items applicable to the equipment. Minimum clearances in front of or around equipment shall be as follows:
- 3.1.2 Arrangement of Equipment: The size of equipment shown on the drawings is based on the dimensions of a particular manufacturer. Where other manufacturers are acceptable, it is the responsibility of the Electrical Subcontractor to determine if the equipment he proposed to furnish will fit the space available. Layout drawings shall be prepared by the Subcontractor when required by the Engineer or Owner to indicate a suitable arrangement.
- 3.2 Equipment Labeling
- 3.2.1 Panelboards: All panelboards, cabinets and other specified equipment shall be labeled with engraved laminated plastic plates, minimum 3/4" high with 3/8" engraved letters. Punch marks with metric backing are not acceptable.
- 3.2.2 Energy Cords: All energy cords shall have labels tied to the pull ring at each end of each cord. Labels shall be color-coded and numbered to identify each cord and junction boxes with circuit provided for future use shall be labeled with appropriate circuit designation.
- 3.2.3 Panelboard Directories: Cash drawers for panelboards shall be filled out with typewritten entries. The entries shall be typed on one side of the sheet. The word "space" shall be written in soft pencil to identify all circuit breakers identified that are not used.

SYSTEMS SYMBOLS

(SP)	SPEAKER
(WK)	WATCHER COLOR CAMERA
(MD)	MOTION DETECTOR
(SS)	SPEAKER/STROBE
(SV)	DETECTOR CAMERA
(CTV)	CLOSED CIRCUIT TELEVISION CAMERA
(CATV)	CABLE TELEVISION JACK

LIGHTING SYMBOLS



GENERAL NOTES

- ALL WORK SHALL BE IN COMPLIANCE WITH NFPA-70, NATIONAL ELECTRICAL CODE.
- ALL MOTOR SAFETY SWITCHES, DISCONNECTS AND MOTOR STARTERS ARE FURNISHED BY DIVISION 16000 UNLESS NOTED AS FURNISHED WITH EQUIPMENT (FWE).
- UNLESS OTHERWISE NOTED, CONVENIENCE RECEPTACLES SHALL BE MOUNTED 18 INCHES AFF AND LIGHTING TOGGLE SWITCHES 48 INCHES AFF.
- ALL PENETRATIONS THROUGH FLOORS, RATED WALLS AND PARTITIONS SHALL BE SEALED WITH A APPROVED FIRE SEALANT MATERIAL TO MAINTAIN THE RATING OF THE SEPARATION.
- LIGHTING TOGGLE SWITCHES SHALL BE COMMERCIAL SPECIFICATION GRADE, 277 VOLT, SIDE WIRED AS MANUFACTURED BY LEVITON, PASS & SEYMOUR, OR APPROVED EQUAL.
- CONVENIENCE RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION GRADE UNLESS SHOWN OTHERWISE. GROUNDING TYPE, NEMA 5-20R, SIDE WIRED, AS MANUFACTURED BY LEVITON, PASS & SEYMOUR, OR APPROVED EQUAL.
- DEVICE COVERPLATES SHALL BE BRUSHED STAINLESS STEEL IN ALL SPACES.
- UNLESS OTHERWISE NOTED ALL HOMERUNS FOR 15 OR 20A CIRCUITS SHALL BE #12AWG & #12 GND. HOMERUNS FED FROM 20A, 1P CIRCUITS IN EXCESS OF 100 FEET (FOR 120V CIRCUITS) OR 200 FEET (FOR 277V CIRCUITS) SHALL BE #10AWG. ALL WIRING SHALL BE COPPER.
- CONDUIT SYSTEMS: ALL WIRING BOTH POWER AND SYSTEMS SHALL BE IN EMT, 3/4" MINIMUM. MC WHIPS SHALL BE ALLOWED BUT SHALL NOT EXCEED 8'-0". FLEXIBLE LIQUIDTIGHT CONDUIT WHIPS SHALL BE USED FOR CONNECTION TO VIBRATING EQUIPMENT IN THE MECHANICAL ROOM.

FIRE ALARM SYMBOLS

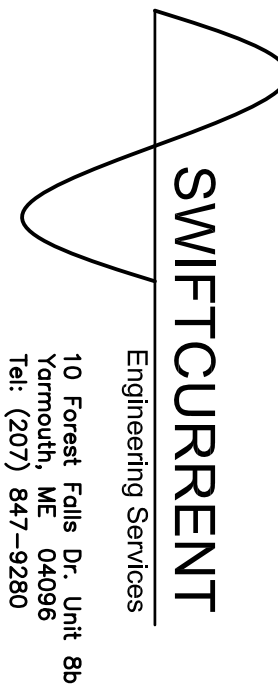
(X)	FIRE ALARM AUDIBLE/VISIBLE NOTIFICATION APPLIANCE (GENERAL EVACUATION)
(S)	STROBE UNIT XX = CANDELA
(SD)	SMOKE DETECTOR

POWER SYMBOLS

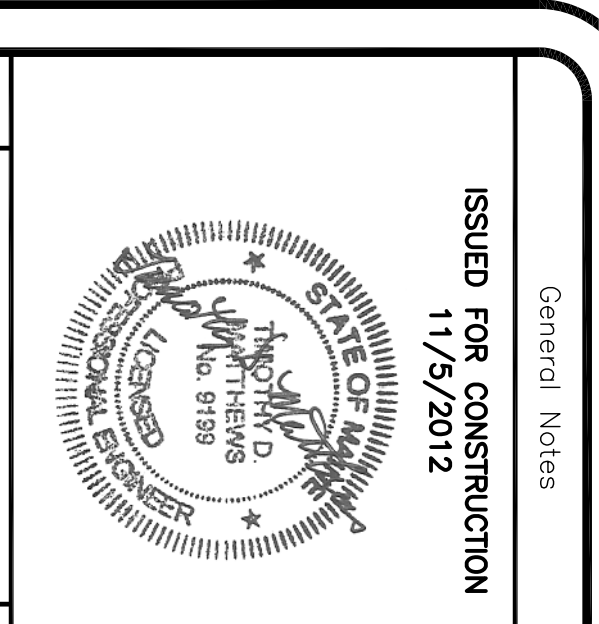
(LP)-2	HOME RUN TO PANEL (CMT. NO. AS SHOWN)
(20)	20 AMPERE, 120 VOLT DUPLEX RECEPTACLE, +18" AFF
(J)	JUNCTION BOX
(P)	PANLEBOARD NORMAL POWER
(F)	FLOOR RECEPTACLE CONDUIT INSTALLED IN SLAB

ABBREVIATIONS

A	AMPERE
AC	ALTERNATING CURRENT
AF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERES INTERRUPTING CAPACITY
AL	ALUMINUM
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
BKR	BREAKER
CB	CIRCUIT BREAKER
CC	CIRCUIT
CU	COPPER
DC	DIRECT CURRENT
DISC	DISCONNECT
EQUIP	ELECTRICAL METALLIC TUBING EQUIPMENT
FA	FIRE ALARM
FC	FOOT-CANDLE
FDR	FEEDER
FLUR	FLUORESCENT
GF	GROUND FAULT
GFI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
HP	HORSE POWER
HZ	HERTZ
KV	KILOVOLT
KVA	KILO VOLT-AMPERE
KWH	KILOWATT HOUR
LV	LOW VOLTAGE
MGB	MAIN CIRCUIT BREAKER
MLO	MAIN LUGS ONLY
PH	PUSH BUTTON
PHL	PANEL
PNL	PANEL
SW	SWITCH
TBD	TO BE DETERMINED
TEL	TELEPHONE
V	VOLT
VA	VOLT-AMPERE



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ISSUED FOR CONSTRUCTION
11/5/2012

No.	Revision/Issue	Date

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Project Name and Address
SECURE EXIT PORTAL AND ASSOCIATED RENOVATIONS

Sheet Title
ELECTRICAL LEGEND, ABBREVIATIONS & GENERAL NOTES.

Project Number: 12-102
Date: 11/5/2012
Scale: Reference: Referenced Drawings
Sheet: **E-0**