

SECTION 16010

BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings, Division 0, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY OF ELECTRICAL WORK

- A. The electrical work includes, but is not limited to, the following:
 1. Underground duct bank for primary electric service and telecommunications and concrete foundation for pad mounted transformer.
 2. Site lighting and related underground wiring.
 3. Underground secondary electric service and distribution.
 4. Grounding system.
 5. Roughing in and branch circuit wiring.
 6. Interior and emergency lighting system.
 7. Fire alarm system.
 8. Telecommunications wiring system.
 9. Public Address and Master clock System.
 10. Gymnasium Sound System.
 11. Security Alarm System.
 12. Coordination with mechanical subcontractor including supervision of HVAC temperature control system wiring work.
 13. Other work as required to provide a complete and operating system.
 14. Demolition and alterations.

1.03 SITE INSPECTION

- A. Visit the site, before submitting bid, to become familiar with the procedural manner, materials, labor, quantities, and expenses involved in completing the work. No allowances for extra work will be granted to accomplish these ends if the need for which could have been foreseen or anticipated by such a visit.

1.04 WORK SEQUENCE & COORDINATION

- A. Install work under this section so as to conform to the progress of the work of other sections. Complete the electrical work as soon as conditions of the building will permit.
- B. Coordinate in advance with other trades the shape, size and position of all necessary openings, sleeves, supports and related and coordinate electrical installation with mechanical equipment, piping and ductwork to avoid conflicts and to provide electric service and wiring as required for a complete and operating system.
- C. Refer to Division 15 for electrical work required for mechanical. Prior to roughing in, verify that the electrical characteristics of the mechanical equipment being provided is compatible with the electric power circuits specified; if in doubt consult Engineer.
- D. Wiring for H&V temperature controls is specified under Division 15 but shall be supervised by and wired to the standards of this section. Coordinate electrical work with controls requirements to provide a complete and operating system.

- E. Supervise installation of wiring provided under Division 15 to ensure that such wiring is installed according to the standards of Division 16. Report discrepancies to Engineer.

1.05 ALLOWANCES

- A. Cash Allowance: \$10,000. Refer to Section 01020 for allowance procedures.
- B. Allowance includes payment to Central Maine Power Company for their work in providing primary electric service conductors and a pad mounted transformer for the project.

1.06 STANDARDS OF MATERIALS

- A. Electrical materials, devices, and equipment shall be new. Where standards have been established by the following, they shall conform to those standards as to quality, fabrication, application, and installation and be not less than further required under this specification.
 - 1. Underwriters Laboratories, Inc. (UL).
 - 2. National Electrical Manufacturers Association (NEMA).
 - 3. American National Standards Association (ANSI).
 - 4. National Fire Protection Association (NFPA).
 - 5. Occupational Safety and Health Administration (OSHA).
 - 6. National Electrical Contractors Association (NECA).
 - 7. Verizon.
 - 8. Central Maine Power Co. (CMP).
 - 9. Standards of local Building Codes, Electrical, and Fire Departments, City of Portland.

1.07 WIRING STANDARD

- A. Follow wiring coding as indicated on the drawings. Use only the approved wiring methods as marked in Table 1 (unmarked items are not permitted):
- B. Where specifically detailed on drawings, follow wiring method indicated.
- C. In the event an application location is encountered that is not listed in the wiring standards, consult Engineer for instructions.

TABLE 1

		Building Wire & Cables in Raceway							Cable	
	Application Location	RSC	EMT	PVC	Cable Tray	Surf. Rc'wy	LiqTgt	Flex	MC	NM
1	Underground, 5' away from foundation Concrete encased	SFBC		BC SFBC						
2	In/Under concrete slab to 5' away from foundation	SFBC		SFBC						
3	In slab above grade	BC		BC						
4	Exposed outdoor	SFBC								
5	Wet interior	SFBC	SFBC							
6	Concealed dry interior Wall stud spaces Ceiling void	FBC FBC	FBC FBC					BC BC	BC BC	
7	Accessible dry interior Ceiling void Lighting fixture whip Casework	SFBC	FBC				BC BC	BC BC BC	BC BC BC	
8	Exposed dry interior Finished space Unfinished space	SFBC	BC			BC				
9	Motor/Equipment connection						B	B	B	

Key: S=Secondary Service, F=Feeders, B=Branch Circuits, C=Control Circuits

1.08 SUBSTITUTIONS

- A. Electrical materials and equipment have generally been specified by referencing one or more manufacturer's standard product. Materials of similar quality by listed "Acceptable Manufacturers" will generally not be considered a substitute and will be reviewed for conformance with these specifications. Materials not of similar quality, or by manufacturers not listed as acceptable, will be considered a substitute; submittals of substitutes shall follow the procedures given in Section 01630.
- B. In the event a proposed substitution for material or equipment has been rejected, Engineer will only review subsequent submittals for that material or equipment that are not substitutes.

1.09 SUBMITTALS

- A. Submit under procedures given in Section 01300.
- B. Submit shop drawings and product data grouped in sets to include complete submittals of related systems, products, and accessories in a single submittal. Clearly mark each submittal with appropriate specification section and paragraph reference.
- C. Mark dimensions and values in units to match those specified.
- D. Electrical submittals shall be reviewed by, and carry the approval stamp of, the electrical subcontractor and be initialed and dated by the reviewer.

- E. Submit certificate of final inspection and approval from authority having jurisdiction, and record electrical drawings.
- F. Upon request, provide samples for inspection. Samples will be returned after inspection is completed.

1.10 REGULATORY REQUIREMENTS

- A. Electrical: Conform to ANSI/NFPA 70.
- B. Utility: Conform to the standards of Central Maine Power Co. (CMP) and Verizon.
- C. Obtain permits and request inspections from local building inspector.

1.11 PROJECT/SITE CONDITIONS

- A. Install work in locations shown on drawings, unless prevented by project conditions.
- B. Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to Work specified in other sections. Obtain permission of Engineer before proceeding.

1.12 WORKMANSHIP

- A. Workmanship shall be by licensed electricians well skilled in the trade. A Master Electrician licensed in the State of Maine shall be on site and supervise all work.
- B. Install all work according to the best practices of the trade and in accordance with NECA -1-2000, "Standard Practices for Good Workmanship in Electrical Construction."
- C. In the event of a conflict with required codes or an obvious misapplication of equipment, material, wiring practice, or other installation, before proceeding, promptly notify the Engineer. In no event shall any work be installed that is contrary to applicable codes.

1.13 DEVIATIONS AND DISCREPANCIES

- A. The drawings are intended to indicate only diagrammatically the extent, general character, and approximate locations of the electrical work. Work indicated, but having minor details obviously omitted, shall be furnished complete to perform the functions intended without additional cost to the Owner. Follow the architectural, structural, and mechanical drawings so that work under this section is properly installed and coordinated with other sections.
- B. The drawings and specifications are complementary each to the other and what is called for in one shall be as binding as if called for by both. In the event of conflicting information on the electrical drawings, or between or within drawings and specifications, or between trades, that which is better, best, most stringent, or most expensive will govern, except as may otherwise be permitted by Engineer.
- C. Bidders shall study plans and specifications and in the event there are any apparent errors, omissions, conflicts, or ambiguities, shall contact Engineer for clarification prior to submitting their bid.

1.14 TEMPORARY LIGHT AND POWER

- A. Arrange for, obtain permits, and provide temporary lighting and power for the duration of the project. Electric energy consumed under this provision will be paid for by the Owner or General Contractor.
- B. Provide lighting stringers and lamps to provide reasonable general illumination (20 footcandles) in work areas, plus task lighting as needed, outlets for hand tools at accessible locations reasonably spaced (within 40 feet of all work areas), power for motors not larger than 1.5 hp each, and cooperate with trades in other sections to provide adequate temporary facilities.

- C. The use of electric heaters for temporary heating is prohibited.
- D. Conform to NFPA 70, OSHA regulations, and other codes and agencies having jurisdiction.
- E. Coordinate to provide wiring for welding and larger motors or unusual lighting under other sections as needed.

1.15 CHANGE ORDERS

- A. No change shall be made from the work, equipment, or materials under this section except as directed in writing by Engineer.
- B. All requests for change in contract price and scope shall be accompanied by a breakdown list of materials with unit and extended prices and labor hours with unit and extended price, plus markups that have been applied.

1.16 RECORD DRAWINGS

- A. Keep in good condition at the job, apart from all other prints used in actual construction, one complete set of diazo blue/line white print electrical drawings. Record on these drawings, completely and accurately, any and all differences between the work as actually installed and the design as shown on the drawings. Record all changes within one week of the time that the changes are authorized. Record drawings shall be maintained in site construction office and be available for inspection by Engineer. At the completion of the work, deliver Record Drawings in accordance with requirement for submittals.

1.17 TESTING AND TRAINING

- A. Conduct operating test for approval in presence of Engineer. The electrical work shall be demonstrated to operate as specified. Furnish instruments, materials, and personnel required for tests. Notify Engineer at least 10 days in advance of proposed test date.

END OF SECTION