

SECTION 16025

ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Description Of Systems

1. Incoming Service to Site. 13,800 volts, 3 phase, 3 wire, 60 hertz, low resistance grounded system.
2. Service Entrance. 4160 volts, 3 phase, 3 wire, 60 hertz, neutral resistance grounded at the source.
3. Primary Distribution System. 480/277 volts, 3 phase, 4 wire, 60 hertz, ungrounded.
4. Primary System for Service to Large Motors: 4160 volts, 3 phase, 3 wire, 60 hertz or neutral solidly grounded.
5. Power System. 480 volts, 3 phase, 3 wire, 60 hertz, neutral solidly.
6. Lighting Systems. 480/277 volts, 3 phase, 4 wire, 60 hertz, solidly grounded neutral and 120/208 volts, 3 phase, 4 wire, 60 hertz, solidly grounded neutral
7. Small Power System. 120/208 volts, 3 phase, 4 wire, 60 hertz, solidly grounded neutral.
8. Emergency Lighting. 12 volt, DC battery operated.
9. Primary Switchgear Control Power. 125 volts AC, 2 wire.

B. Work Specified In 16000 Series Sections

1. Furnish all labor, materials, equipment, technical supervision, and incidental services required to complete, test and leave ready for operation the electrical systems as specified in the 16000 Series SECTIONS or as indicated.
2. Provide all power wiring, required for equipment specified under Article "RELATED WORK SPECIFIED UNDER OTHER SECTIONS" hereinafter.
3. Provide control wiring for all equipment/systems provided under these 16000 Series SECTIONS. In addition, within motor control centers and other 16000 Series SECTIONS electrical equipment/control panels, provide control devices and wiring as indicated (on the applicable CI drawing schematic diagrams).

C. Related Work Specified Under Other Sections

1. Excavating, trenching and backfilling for electrical work - SECTION 02300, except as specified in SECTIONS 16115, 16120 and 16402.
2. Furnishing and mounting of all electric motors – 08000, 11000 and 15000 Series SECTIONS.
3. Furnishing and mounting of starters, disconnect switches, remote and integral controls on "packaged" or "packaged self-contained" building service equipment, and furnishing and installing all power and control wiring on "packaged" or "packaged self-contained" building service equipment, except for power service – 08000 and 15000 Series SECTIONS, except as otherwise indicated.
4. Furnishing and mounting of disconnect switches on roof mounted exhaust fans; furnishing and installing conduit and wire between the disconnect switch and motor; and furnishing and installing service conduit within the fan housing between the disconnect

switch and a point approximately six inches below the roof line – 15000 Series
SECTIONS.

5. Furnishing and installing field prime and finish painting – SECTION 09900, except as specified in SECTION 16400.
6. Furnishing, installing and wiring of control devices not contained within starters, motor control centers or packaged self contained equipment – SECTION 13800 (,except as shown on the applicable CI schematic drawings.)

D. Provided By Owner

1. Telephone equipment and wiring.

1.2 QUALITY ASSURANCE

A. Source Quality Control

1. Furnish equipment and materials listed by Underwriters' Laboratories, Inc., and bearing the UL Label wherever standards have been established and label service is regularly furnished. Furnish equipment and materials conforming to the latest standards of IEEE, ASTM, ANSI, ICEA and NEMA for equipment referenced to such standards in the CONTRACT DOCUMENTS. Latest current issue date to be prior to issue date of the CONTRACT DOCUMENTS. Furnish equipment and materials conforming to the requirements of the National Electrical Code and the requirements of the CONTRACT DOCUMENTS.

B. Field Quality Control

1. Install equipment and material in compliance with the regulations of Local, State and Governmental laws governing electrical installations, the latest edition of the National Electrical Code, NFPA and the requirements of the CONTRACT DOCUMENTS.

PART 2 PRODUCTS
(NOT USED)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Contractor shall seal openings in fire rated wall with a material having the same rating as the wall.
- B. Supply voltage, fuse sizes, breaker sizes, conduit and wire sizes shown on the DRAWING for equipment provided in other SECTIONS are based on design loads. Contractor shall verify and coordinate actual voltage requirements, horsepower, starting characteristics, and KVA loads for the actual equipment supplied and provide required power source, fuses, breakers, conduit and wire.
- C. Contractor shall be responsible for coordinating space allocations with other equipment, orientation of equipment, floor and wall openings and interfacing with equipment.

- D. Provide additional support for all bus plug-in units 200 amperes and larger.
- E. Coordinate the installation of electrical equipment with other trades and field conditions to avoid interferences with duct work, piping, structural sway framing, and other electrical equipment.
- F. Where mechanical and electrical utilities are installed in the truss area, coordinate support members and hanger rods prior to installation of equipment.
- G. Contractor shall provide miscellaneous steel supports as required for mounting electrical equipment. Clamp to walls, floors or columns. Welding to the structural steel is prohibited.
- H. Provide expansion fitting and expansion joints to all conduits, busways at building expansion joints.
- I. All debris, grease and foreign material shall be cleaned from the interior and exterior of electrical equipment prior to any testing of equipment and prior to hand over to the owner.
- J. All work to be done in existing areas shall have prior approval from the OWNER. Contractor shall notify owner of work to be scheduled in existing areas at least one week prior to commencement of work.

3.2 OWNER-FURNISHED EQUIPMENT INSTALLATION

- A. Uncrate and examine all equipment furnished by the OWNER which is to be installed, and immediately notify the OWNER, in writing, of any damaged material or missing parts. Moving, erecting, or installing of any OWNER-furnished equipment shall be construed to indicate that it has been accepted in good condition; assume the responsibility and liability for its protection, unless it can be proven that any later-discovered damage is due to faulty workmanship or inferior material furnished by the manufacturer. Equipment includes the component parts thereof, necessary to the satisfactory and safe operation of the item.
- B. Protect all materials and equipment from all damage from the time it is removed from the point of receipt or storage until acceptance by the OWNER.
- C. All tolerances in leveling, alignment and vibration and other specific installation requirements for each classification of work shall be subject to manufacturer's installation instructions.
- D. Perform installation, assembly of items shipped "loose" by manufacturer including intercomponent wiring, field terminal hook-up, start-up, testing, debugging and related work based on approved shop drawings, and under the direction of an authorized representative of manufacturer.

3.3 DEMOLITION WORK

- A. Demolition, alteration and extension of existing electrical systems shall conform to general requirements specified in SECTION 01100.

- B. Where the DRAWINGS show existing electrical devices to be removed, this work shall include the removal of all conduit and wiring from the removed equipment back as far as is possible without disturbing other equipment remaining in service. Where it is not possible to remove wiring back to the source, wire ends shall be taped and coiled in a J-box or other enclosure (as permitted by the NEC) in the part of the wiring system that is to remain. Plug all holes left by removed conduits with plugs suitable for the type of enclosure. All equipment removed shall become the property of the Contractor, unless otherwise indicated on the DRAWINGS or elsewhere in these SPECIFICATIONS, and shall be promptly removed from the site.
- C. Where the DRAWINGS show existing wiring systems to be rerouted, the Contractor shall replace the wiring systems being rerouted with identical, new wiring systems, utilizing the same type and size of wires. Where splicing is required, terminal blocks and ring type lugs shall be used for control wiring and compression terminals for power wiring.
- D. No equipment shall be de-energized or taken out of service without prior written approval of the OWNERS REPRESENTATIVE. Provide temporary wiring as required for equipment that must remain in service during the time that permanent wiring system is being rerouted.
- E. It shall be the responsibility of the Contractor to verify the sources and destination of all wiring systems shown on the Drawings to be rerouted. The Contractor shall also identify any wiring systems not shown on the Drawings that are required to be rerouted and advise the OWNERS REPRESENTATIVE as to the source and destination of these wiring systems as well as the sizes of conduits and sizes and quantities of wires or cables involved.
- F. Where the DRAWINGS show existing fluorescent or HID lighting to be removed, the CONTRACTOR shall be responsible for the legally-proper disposal of all hazardous material, including lamps , - ballasts containing PCB and ballasts containing DEHP unless the OWNER has a hazardous material disposal facility. In such case, the CONTRACTOR shall coordinate with the OWNER to comply with the requirements of the OWNER'S disposal procedures. All ballasts which are not marked "non-PCB" shall be assumed to be PCB type. Ballasts which are marked "non-PCB" and not having a code letter indicating a dry film dielectric shall also be considered as hazardous waste. Housings from which lamps and ballasts have been removed may be treated as ordinary trash or scrap unless there is evidence that a PCB ballast has been leaking so that the entire unit, being contaminated, must be considered as hazardous material. Fixtures with clearly-marked "non-PCB" ballasts may be left intact (except for the lamps) for scrapping.

- G. Contractor shall be responsible for all devices, supports and incidental equipment required for a complete and functional system.

END OF SECTION

Revision History	
Date	Rev. No.
A	0
B	0
D	0
E	0
F	0
02-19-09	0

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