

SECTION 16050

ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. The Drawings and standard terms and conditions of the Contract, including General Conditions, apply to this Division.

1.02 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required for a complete electrical system as hereinafter specified and shown on the Drawings. Electrical work to be performed under this Contract includes, but is not limited to, the following:
 - 1. Coordinate with the electric utility company to provide electric service to the project site.
 - 2. Provide and install all equipment, conduit, and wiring for the electrical work indicated on the electrical drawings in accordance with Division 16 of the specifications.
- B. The work, apparatus and materials which shall be furnished under these Specifications and accompanying Drawings shall include all items listed hereinafter and/or shown on the Drawings. Certain equipment will be furnished as specified in other Sections of these Specifications which will require wiring thereto and/or complete installation as indicated. All materials necessary for the complete installation shall be furnished and installed by the Contractor to provide complete power, communication systems, instrumentation, wiring and control systems as indicated on the Drawings and /or as specified herein.
- C. The work shall include complete testing of all equipment and wiring at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment. All workmanship shall be of the highest quality; sub-standard work will be rejected.

1.03 GENERAL INFORMATION

- A. Each bidder or his authorized representatives shall, before preparing his proposal, visit all areas of the site in which work under this Section is to be performed and inspect carefully the existing conditions. The submission of the proposal by the bidder shall be considered evidence that he or his representative has visited the site and noted the locations and conditions under which the work will be performed and that he takes full responsibility for a complete knowledge of all factors governing his work.

- B. It is the intent of these Specifications that the electrical system shall be suitable in every way for the service required. All material and all work which may be reasonably implied as being incidental to the work of this Section shall be furnished at no extra cost.

1.04 CODES AND INSPECTION

- A. All material and installation shall be in accordance with the latest edition of the National Electrical Code and all applicable national, local and state codes.
- B. All equipment and material shall be U.L. listed.
- C. Pay all fees required for permits and inspections.

1.05 UTILITY COORDINATION

- A. The Contractor shall coordinate with local representatives of the power utility to ensure the proper installation of these utilities at the project site. Utility installation(s) shall be in accordance with the requirements of the Contract Documents and meet all requirements of the respective utility.

1.06 TEMPORARY ELECTRICAL FACILITIES

- A. The Contractor shall furnish, install, and maintain all materials and equipment required to provide temporary light and power to perform the work of all trades during construction until work is completed. Adequate lighting and receptacle outlets for operation of hand tools shall be provided throughout the project, including trailers, field offices, etc. and shall be extended as construction progresses.
- B. All reasonable safety requirements shall be observed to protect workers and the public from shock and fire hazards.
 - 1. Ground fault circuit interrupters shall be employed in accordance with codes.
 - 2. Ground wires are required in all circuits. Ground poles are required on all outlets. All metallic cases shall be grounded.
 - 2. Raintight cabinets shall be used for all equipment in wet locations.

1.07 INTERPRETATION OF DRAWINGS

- A. The Drawings are not intended to show exact locations of conduit runs.

- B. All three-phase circuits shall be run in separate conduits unless otherwise shown on the Drawings.
- C. Unless otherwise approved by the Engineer conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed.
- D. Where circuits are shown as "home-runs" all necessary fittings and boxes shall be provided for a complete raceway installation.
- E. All wire, conduit, circuit breaker, and motor starter sizes shown on the drawings are indicative of the sizes required based upon the equipment shown. These may vary depending upon the actual equipment furnished. The Contractor shall make adjustments as required to meet the installation requirements of equipment.
- F. The locations of equipment and devices shown on the Drawings are approximate only. Exact locations shall be as approved by the Engineer during construction. Obtain in the field all information relevant to the placing of electrical work and in case of any interference with other work, proceed as directed by the Engineer and furnish all labor and materials necessary to complete the work in an approved manner.
- G. Circuit layouts shown are not intended to show the number of fittings, or other installation details. Furnish all labor and materials necessary to install and place in satisfactory operation all power, lighting, and other electrical systems shown. Additional circuits shall be installed whenever needed to conform to the specific requirements of the equipment.
- H. All floor mounted electrical equipment, including but not limited to motor control centers, transformers, control panels, etc., shall be placed on a minimum four inch (4") concrete housekeeping pad.
- I. All connections to equipment shall be made as shown, specified, and directed and in accordance with the approved shop drawings.
- J. Provide and place all sleeves for conduits penetrating floors, walls, partitions, etc. Locate all necessary slots for electrical work and form before concrete is poured.
- K. All cutting and patching necessary throughout the existing site shall be done in a thoroughly workmanlike manner.

1.08 HANDLING OF EQUIPMENT

- A. The equipment shall be kept upright at all times. When equipment has to be tilted for ease of passage through restricted areas during transportation and installation, the Manufacturer shall be required to brace the equipment suitably, to insure that the tilting does not impair the functional integrity of the equipment.

1.09 COMPONENT INTERCONNECTIONS

- A. Component equipment furnished under this Specification will not be furnished as integrated systems.
- B. Analyze all systems components and their shop drawings; identify all terminals and prepare drawings or wiring tables necessary for component interconnection.

1.10 MATERIALS

- A. The materials used in all systems shall be new, unused, of the manufacturer's latest design, and as hereinafter specified. All materials where not specified shall be of the very best of their respective kinds. Samples of materials or Manufacturer's Specifications shall be submitted for approval as required by the Engineer.
- B. Materials and equipment used shall be Underwriters Laboratories, Inc. listed.
- C. Electrical equipment shall at all times during construction be adequately protected against mechanical injury or damage by water. Electrical equipment shall not be stored out-of-doors. Electrical equipment shall be stored in dry permanent shelters. If any apparatus has been damaged, such damage shall be repaired by the Contractor at his own cost and expense. If any apparatus has been subject to possible injury by water, it shall be thoroughly dried-out and put through such special tests as directed by the Engineer, at the cost and expense of the Contractor, or shall be replaced by the Contractor at his own expense.
- D. All electrical panels, enclosures, raceways, conduits, wireways, boxes, cabinets, etc., shall be fabricated of metal, Non-metallic substitutes are not acceptable. This does not apply to buried work.

1.11 SHOP DRAWINGS

- A. Shop drawings shall be submitted for approval of all materials, equipment, apparatus, and other items as required by the Engineer.
- B. Shop drawings shall be submitted for all equipment supplied under Division 16 of the specifications.
- C. Prior to submittal by the Contractor, all shop drawings shall be checked for conformance with the Contract requirements. Shop drawings shall bear the date checked, checker's name and indication of approval. Provide an itemized list noting all discrepancies with the Specifications and Drawings. Shop drawings not so checked and noted shall be returned.
- D. The Engineer's check shall be only for conformance with the design concept of the project and compliance with the Specifications and Drawings.

- E. No material shall be ordered or shop work started until the Engineer's approval of shop drawings has been given.

1.12 WARRANTY

- A. All equipment furnished and installed, and all work performed under Division 16 shall be guaranteed by the Contractor against defects of workmanship, materials, and proper installation for a minimum period of one (1) year from date of acceptance. This time shall be increased to the periods stated within individual specification sections as required.

1.13 RECORD DRAWINGS

- A. As the work progresses, legibly record all field changes on a set of project Contract Drawings. When the project is complete, furnish a complete set of "as-built" drawings for the project record documents.

1.14 TESTS

- A. Test all systems in the presence of the Engineer and repair or replace all defective work. Make all necessary adjustments to the systems and instruct the Owner's personnel in the proper operation of the systems.
- B. Subsystem testing shall occur after the proper operation of alarm and status contacts has been demonstrated or otherwise accepted by the Engineer and after process control devices have been adjusted as accurately as possible. It is intended that the Contractor will adjust level switches to their operating points prior to testing and will set timing relays and/or adjust programming as dictated by operating results. Subsystems, in the context discussed here, shall mean individual and groups of pumps.
 - 1. After initial settings have been completed, each subsystem shall be operated in the manual mode and it shall be demonstrated that operation is in compliance with the Contract Documents. Once the manual mode of operation has been proven, automatic operation shall be demonstrated to verify such items as proper start and stop sequence of pumps, etc.
 - 2. Motor operated pumps shall be operated only after having been phased and tested for correct motor rotation and current draw by a representative of the pump Manufacturer. Tests shall verify status indication, and correct command control from local and remote devices.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. CC Control Corporation is the only approved manufacturer for the Gate Control Panel, the RTU Panel, and all instrumentation and controls required for this project.

END OF SECTION