

SECTION 26 04 00

GENERAL REQUIREMENTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Division 26, Electrical, covers the work necessary for the complete electrical system. Furnish materials, labor and equipment in accordance with these specifications and the accompanying drawings. Furnish, install, connect and identify conduits and conductors to all equipment, devices, and other items under this contract.

See Division 01 which contains additional information and requirements that apply to the work specified herein and are mandatory for this project.

- B. This section covers general requirements applying to all sections included in Division 26, Electrical.
- C. The requirements of this section also apply to all electrical work and equipment specified under other divisions of these specifications.

1.2 INSPECTION OF THE SITE AND EXISTING CONDITIONS

- A. After award of Contract, verify the location of existing underground utilities. Protect all existing underground utilities during construction.

1.3 RESPONSIBILITY

- A. The Contractor shall be responsible for:
1. Complete systems in accordance with intent of these Contract Documents.
 2. Coordinating the details of facility equipment and construction for all Specifications Divisions, which affect the work covered under Division 26, Electrical.
 3. Furnishing and installing all incidental items not actually shown or specified, but which are required by good practice to provide complete functional systems.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: All electrical work shall be performed by experienced electricians or under the direct supervision of a experienced electrician.
- B. Manufacturer Qualifications: Unless specifically exempted in the detailed specifications for any specific electrical product, the manufacturer shall have similar products in successful installation under similar installation conditions for at least 3 years, and shall, if requested, submit a list of representative installations.
- C. Standard Products: Provide materials and equipment that are products of manufacturers regularly engaged in the manufacture of the products and are the latest standard design.
- D. Codes and Regulations:

1. Work shall meet requirements of governing codes and regulations; National Electric Code; the San Francisco Electrical Code; the requirements of the Power Utility; and other national fire codes of NFPA. Advise the Engineer of conflicting codes or conflicts between codes and Drawings and Specifications in accordance with Section 01 31 13, Coordination. When the requirements of the Drawings or Specifications are more stringent than the codes, regulations, or standards, the Drawings or Specifications shall prevail.
 2. The electrical installation shall meet the requirements of National Electrical Contractors Association Standard of Installation, except where otherwise specified.
 3. UL Listing: Electrical materials and equipment shall meet requirements of the applicable standards of UL (Underwriters Laboratories), if UL standards exist for such materials and equipment. The UL authorized listing mark is acceptable as evidence that the materials meet this requirement. In lieu of UL authorized listing mark, the Contractor may submit independent proof satisfactory to the Engineer that the materials meet the published standards. Materials and equipment shall be used only for their intended use.
- E. Seismic Design: Refer to Section 01 41 00, Regulatory Requirements for seismic loading design requirements for electrical equipment and accessories.
- F. For traffic signal work, all electrical work shall be done by qualified electricians. Electricians' qualifications shall be verifiable and provided by the electricians through the Contractor. The minimum experience requirement shall be 4 years of journeyman level equivalent experience. The City reserves the right to reject an electrician if his/her experience cannot be verified.

1.5 INTENT OF CONSTRUCTION DRAWINGS

- A. Electrical plan Drawings are diagrammatic and show only general locations of equipment, devices and conduit, unless specifically dimensioned. The Contractor shall be responsible for the proper routing of conduit due to actual field conditions, subject to the approval of the Engineer.

Electrical Drawings do not attempt to show complete details of building/street construction that affect installation. Diagrams are schematic only and do not necessarily show physical arrangement of equipment. Refer to drawings of other trades for additional details, which affect work.

- B. Conduit and ground connections are shown diagrammatically only. Layout does not necessarily show total number of conduits or conductors for circuits required and should not be used for obtaining quantities for linear runs of conduits or wires. Locations of indicated runs are only approximate. Provide additional conduits and wire wherever needed to complete installation of specific equipment furnished.

1.6 COORDINATION OF WORK

- A. Coordinate electrical work with the work of the various trades on the project.
- B. Obtain and review shop drawings, product data, and manufacturer's instructions for equipment furnished under other Sections of these Specifications but to be electrically connected under these electrical Sections.
1. Determine connection locations and requirements.

2. Sequence rough-in of electrical connections to coordinate with installation schedule for equipment.
3. Sequence electrical connections to coordinate with start-up and cut over schedule for equipment. Refer to Section 34 41 13.

1.7 SUBMITTALS

- A. Refer to Section 01 33 00- Submittal Procedures, Section 34 41 13- Traffic Signal.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Unless otherwise indicated, provide all first-quality, new materials and equipment, free from any defects, in first- class condition, and to fit the space provided. Provide materials and equipment listed by UL wherever standards have been established by that agency.
- B. Where two or more units of the same class of material or equipment are required, provide products of a single manufacturer. Component parts of materials or equipment need not be products of the same manufacturer.

2.2 STANDARD PRODUCTS

- A. Unless otherwise indicated, provide materials and equipment which are standard products of manufacturers regularly engaged in the production of such materials and equipment. Provide the manufacturer's latest standard design modified as required to conform to these specifications.

2.3 EQUIPMENT FINISH

- A. Provide materials and equipment with manufacturer's standard finish color, except where specific color is indicated.
- B. For specific equipment, cabinet, pole, luminaire and fixture refer to other section for specific color.

2.4 OUTDOOR EQUIPMENT

- A. Provide equipment and devices to be installed outdoors or in unheated enclosures capable of continuous operation within an ambient temperature range of 20 degrees F to 105 degrees F.

PART 3 EXECUTIONS

3.1 GENERAL

- A. Install materials and equipment in a workmanlike manner utilizing craftsmen skilled in the particular trade. Provide work, which has a neat and finished appearance. Provide appropriate conduit fittings and bushings to minimize surface friction that do not cause abrasion on the cable insulation. Carry out work in accordance with NECA Standard of Installation unless otherwise specified.

- B. Abandoned concrete foundation shall be cut and removed at least 36" below grade including rebars and conduit, unless otherwise noted.
- C. Coordinate electrical work with work of other trades to avoid conflicts, errors, delays and unnecessary interference during construction.

3.2 MATERIAL AND EQUIPMENT INSTALLATION

- A. Follow manufacturer's installation instructions explicitly, unless otherwise indicated. Wherever any conflict arises between the manufacturer's instruction, codes and regulations and these contract documents, follow Engineer's decision. Keep copy of manufacturer's installation instructions on the job site available for review at all times.
- B. Prior to backfilling trenches, the Contractor shall obtain approval from the Engineer so that the Engineer may verify conduit bends and depths.
- C. Coordinate with other agencies for trenching and back filling of conduits and inspection as required per the agencies requirements.

3.3 CUTTING AND PATCHING

- A. Lay out work carefully in advance. Carefully carry out any cutting, channeling, chasing or drilling of paving or other surfaces required for the installation, support or anchorage of conduit, or other electrical materials and equipment. Following such work, restore surfaces neatly to original condition. Use skilled craftsmen of the trades involved.

3.4 CLEANING AND TOUCHUP

- A. Keep the site free at all times from accumulation of waste material, litter and rubbish. Upon completion of work, remove all materials, scraps and debris from site and from interior and exterior of all devices and equipment. The interior of all electrical equipment shall be vacuumed and wiped free of dust just before final acceptance. De-energization of equipment shall be approved by the City. Touch up scratches, scrapes or chips in interior and exterior surfaces of devices and equipment with finishes matching the type, color, consistency and type of surface of the original finish.
- B. If extensive damage is done to equipment paint surfaces, refinish the entire equipment in a manner that provides a finish equal to or better than the factory finish, that meets the requirements of the Specifications and that is acceptable to the Engineer.

3.5 STANDARD, CODES, PERMITS AND REGULATIONS

- A. Perform all work; furnish and install all materials and equipment in full accordance with the latest applicable rules, regulations, requirements and specifications of the following
 1. Local Laws, Codes, Ordinances and Regulating Agencies
 2. State and Federal Laws
 3. National Electrical Code (NEC)
 4. Underwriters' Laboratories (UL)
 5. National Electrical Safety Code (NESC)
 6. American National Standards Institute (ANSI)
 7. National Electrical Manufacturer's Association (NEMA)

8. National Electrical Contractor's Association (NECA);
Standard Installation
9. Institute of Electrical and Electronics Engineers
(IEEE)
10. Caltrans Standard Specification (CTSS); Unless Otherwise Noted
11. Standard Specification Department of Public Works, City and County of San
Francisco (SSDPWSF)
12. California Public Utilities Commission General Orders 95 and 128
13. PG&E Greenbook

END OF SECTION