

## 1.11 IDENTIFICATION

- A. Panelboards, terminal cabinets, circuit breakers, disconnect switches, starters, relays, time switches, contactors, pushbutton control stations, and other apparatus used for the operation or control of feeders, circuits, appliances, or equipment shall be properly identified by means of descriptive nameplates or tags permanently attached to the apparatus and wiring.
- B. Nameplates shall be engraved laminated phenolic. Shop drawings with dimensions and format shall be submitted to the District before installation. Attachment to equipment shall be with escutcheon pins, rivets, self-tapping screws or machine screws. Self-adhering or adhesive backed nameplates shall not be used.
- C. Plates: All cover and device plates shall be furnished with engraved or etched designations under any one of the following conditions:
1. Three gang or larger gang switches.
  2. Keyed and/or locking switches.
  3. Pilot light switches.
  4. Switches in locations from which the equipment or circuits controlled cannot be readily seen.
  5. Manual motor starting switches.
  6. Switches which serve other than lighting loads.
  7. Where so indicated on the drawings.
  8. As required on all control circuit switches, such as heater controls, etc.
  9. Where receptacles are other than standard duplex receptacles to indicate voltage and phase.
- D. Provide black-on-white laminated plastic nameplates engraved in minimum 1/4" high letters to correspond with the designations on the drawings. Provide other or additional information on nameplates where indicated.
- E. For equipment containing or operating on circuits of more than 240 volts nominal, provide red-on-white laminated warning signs engraved in 1/2" high letters to read: "CAUTION - 480 (or as applicable) VOLTS AUTHORIZED PERSONNEL ONLY".
- F. Wire and Cable Identification
1. Provide identification on individual wire and cable including sign systems, fire alarm, electrical power systems (each individual phase, neutral and ground), empty conduit pull ropes, and control circuit.
  2. Identification shall be provided at each termination location, splice location, pullbox, junction box and equipment enclosure.

utility company circuits, will be ready for installation, energizing and activation of the service.

- D. In addition to the requirements of the serving utility companies, all power, telephone and cable television service conduits for utility company circuits, shall be completely encased with concrete including under buildings.

#### **1.07 QUALITY ASSURANCE**

- A. Work and materials in full accordance with the latest rules and regulations of the California Code of Regulations Title 24, Part 3 "California Electrical Codes", Title 8 "Division of Industrial Safety" the National Life Safety Code, and other applicable Federal and State laws and regulations.
- B. All material and equipment shall be new and shall be delivered to the site in unbroken packages. All material and equipment shall be listed and labeled by Underwriters Laboratories or other recognized testing laboratories, where such listings are available. Comply with all installation requirements and restrictions pertaining to such listings.
- C. Work and material shown on the drawings and in the specifications is new and included in the contract unless specifically indicated as existing or N.I.C. (not-in-contract).
- D. Keep a copy of all applicable codes available at the job site at all times while performing work under this section. Nothing in plans or specifications shall be construed to permit work not conforming to the most stringent of codes.

#### **1.08 CLEANING EQUIPMENT, MATERIALS, PREMISES**

All parts of the equipment shall be thoroughly cleaned of dirt, rust, cement, plaster, etc., and all cracks and corners scraped out clean. Surfaces to be painted shall be carefully cleaned of grease and oil spots and left smooth, clean and in proper condition to receive paint finish.

#### **1.09 JOB CONDITIONS - PROTECTION**

Protect all work, materials and equipment from damage from any cause whatever and provide adequate and proper storage facilities during the progress of the work. All electrical equipment shall be stored in a weather-tight structure. Provide for the safety and good condition of all the work until final acceptance of the work by the District and replace all damaged or defective work, materials and equipment before requesting final acceptance.

#### **1.10 CUTTING AND PATCHING**

Perform cutting and patching of the construction work which may be required for the proper installation of the electrical work. Patching shall be of the same material, thickness, workmanship and finish as existing and accurately match surrounding work to the satisfaction of the District. Cutting of structural members shall not be done without notifying the District and obtaining approval.

## 1.84 LOCATIONS OF EQUIPMENT

- A. The drawings indicate diagrammatically the desired locations or arrangements of conduit runs, outlets, equipment, etc., and are to be followed as closely as possible. Proper judgment must be exercised in executing the work so as to secure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structure conditions encountered.
- B. Where outlets are placed on a wall, locate symmetrically with respect to each other and other features or finishes on the wall.
- C. In the event changes in the indicated locations or arrangements are necessary, due to developed conditions in the building construction or rearrangement of furnishings or equipment, such changes made without cost, providing the change is ordered before the conduit runs, etc., and work directly connected to same is installed and no extra materials are required.
- D. Lighting fixtures in mechanical spaces are shown in their approximate location only. Do not install light outlets or fixtures until mechanical piping and duct work is installed, then install lights in a location to provide best lighting.
- E. The locations of existing utilities, building, equipment and conduit shown on the drawings is approximate. Verify exact locations and routing of existing systems in the field. Include all costs in contract price for adjustment required to accommodate existing conditions.
- F. Coordinate and cooperate in every way with other trades in order to avoid interference and assure a satisfactory job.

## 1.85 AIR CONDITIONING, HEATING, PLUMBING EQUIPMENT WIRING

Provide electrical work, materials, and control components required for proper operation of the air conditioning, heating and plumbing systems.

## 1.86 POWER, TELEPHONE AND CABLE TV UTILITIES' SERVICES

- A. Utility Co. services and metering facilities shall conform to the requirements of the serving utility companies. Contractor shall verify service locations and requirements prior to rough-in.
- B. Conforms to all requirements of the serving utility companies. Location of transformer slab box and/or manholes and pull boxes and routing of service conduits indicated on the drawings are approximate and shall be verified with the serving utility company prior to installation. Installation of service shall not begin until approved drawings have been received from the serving utility company.
- C. Within 30 calendar days of receipt of notice that the contract award has been made, the Contractor shall notify the New Business Departments of the District Office of the serving utility companies and shall provide information as to the total power, telephone, and signal requirements of the contract. The Contractor shall furnish at the same time information as to the estimated completion date of job or the date when the respective

- C. Before submitting a bid, the Contractor shall familiarize himself with all features of the building drawings and site drawings which may affect the execution of the work. No extra payment will be allowed for failure to obtain this information.
- D. If there are omissions or conflicts between the drawings and specifications, clarify these points with the District before submitting bid.

## District

- E. **Portable or Detachable Parts:** The Contractor shall retain in his possession, and shall be responsible for all portable and detachable parts or portions of the installation such as fuses, keys, locks, adapters, locking clips, and inserts until final completion of contract work. These parts shall then be delivered to the District or his authorized representative and an itemized receipt obtained, with copies of receipt sent to the District.
- F. **Record Drawings**
1. Provide and maintain in good order at the job site a complete set of electrical contract prints. Changes to the contract to be clearly recorded on this set of prints. No pay request by the Contractor will be granted without verification that the jobsite prints are up-to-date and current with the project construction. At the end of the project, the Contractor shall transfer all changes to one set of transparencies to be delivered unfolded to the District. Transparency drawings shall be prepared in an organized and clearly legible fashion by persons skilled in drafting techniques.
  2. The actual location and elevation of all buried lines, boxes, monuments, vaults, stub-outs and other provisions for future connections shall be referenced to the building lines or other clearly established base lines and to approved bench marks. All measurements shall be witnessed by the job inspector who shall make his own record of the dimensions. Before the inspector signs the record drawings, he shall check his own dimensions against those on the drawings. If any necessary dimensions are omitted from the record drawings, the Contractor shall, at his own expense, do all excavation required to expose the buried work and to establish the correct locations.
  3. The Contractor shall keep the "record" prints up to date and current with all work performed.
  4. A mandrel shall be pulled through each conduit upon completion of the duct bank. All mandrelling must be done in the presence of the job inspector.

### 1.03 GENERAL SUMMARY OF ELECTRICAL WORK

- A. The specifications and drawings are intended to cover a complete installation of systems. The omission of expressed reference to any item of labor or material for the proper execution of the work in accordance with present practice of the trade shall not relieve the Contractor from providing such additional labor and materials.
- B. Refer to the drawings and shop drawings of other trades for additional details which affect the proper installation of this work. Diagrams and symbols showing electrical connections are diagrammatic only. Wiring diagrams do not necessarily show the exact physical arrangement of the equipment.

Installation of Electrical and Data Wiring.....

At All District School Sites

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BASIC ELECTRICAL MATERIALS AND METHODS

drawings shall not be submitted before approval of manufacturers list. The right is reserved to require submission of samples of any material whether or not particularly mentioned herein.

2. Within three weeks after approval of the material and equipment manufacturers list, submit shop drawings for approval. Shop drawings shall be submitted in completed bound groups of materials (i.e., all lighting fixtures or all switchgear, etc.). Shop drawing shall be prepared by factory authorized representatives. Departure from the above procedure will result in resubmittals and delays.
  3. Submittals which are intended to be reviewed as substitution or departure from the contract documents must be specifically noted as such or the requirements of the contract documents will prevail regardless of the acceptance of the submittal.
  4. Shop drawings shall include dimensioned plans, elevations, details, wiring diagrams and descriptive literature of components parts where applicable.
  5. The Contractor shall verify dimensions of equipment and be satisfied as to fit and that they comply with all code requirements relating to clear working space about electrical equipment prior to submitting shop drawings for approval.
  6. Shop drawings shall include the manufacturer's projected days for shipment from the factory of completed equipment, after the equipment is released for production by the Contractor. It shall be the responsibility of the Contractor to insure that all material and equipment is ordered and installed in time to provide an orderly progression of the work, and to allow full occupancy and full operation of the facility at the scheduled completion date. The Contractor shall  
notify the District of any changes in delivery which would affect the project completion date.
- C. The Contractor shall be responsible for incidental, direct and indirect costs resulting from the substitution of specified contract materials or work.
- D. Maintenance and Operating Manuals
1. The Contractor shall furnish three copies of typewritten maintenance and operating manuals for all electrical equipment, fire alarm equipment, sound system equipment, etc., to the District and instruct District's personnel in correct operation of all equipment at completion of project.
  2. Where these specifications indicate to provide District personnel with instructional training sessions, the Contractor shall videotape all such instructional sessions. The Contractor shall provide all equipment and personnel required to create a color VHS video and audio recording and shall turn over to the District a total of two (2) copies of each tape prepared.
  3. Maintenance and operating manuals shall be bound in three-ring, hard-cover, plastic binders and shall be delivered to the District with letter of transmittal,  
carbon copy to the



**SECTION 16010**  
**ELECTRICAL GENERAL PROVISIONS**

**PART 1 - GENERAL**

**1.01 SCOPE**

- A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for and incidental to performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete, as shown on the drawings and/or specified herein. Work includes, but is not necessarily limited to, the following:
1. Examine all other sections for work related to those other sections and required to be included as work under this section.
  2. General provisions and requirements for electrical work.

**1.02 SUBMITTALS**

- A. General
1. Review of contractors submittals is for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. Contractor is responsible for quantities; dimensions which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of work with that of all other trades and satisfactory performance of their work.
  2. The Contractor shall review each submittal in detail for compliance with the requirements of the contract documents prior to submittal to the District. The Contractor shall "Ink Stamp" and sign each item of the submittal with a statement "CERTIFYING THE SUBMITTAL HAS BEEN REVIEWED BY THE CONTRACTOR AND COMPLIES WITH ALL THE REQUIREMENTS OF THE CONTRACT DOCUMENTS".
  3. Where the construction documents indicate specific manufacturer(s) for any given product, it shall be considered a substitution if the contractor proposes to use any manufacturer other than those specifically named. The Contractor shall clearly and specifically identify each individual proposed substitution or proposed deviation from the requirements of the contract documents with a statement "THIS ITEM IS A SUBSTITUTION".
- B. Material Lists and Shop Drawings:
1. Submit material list and equipment manufacturers for approval within 35 days of award of contract. Give name of manufacturer and where applicable, brand name, type and/or catalog number of each item. Listing of more than one manufacturer for any one item of equipment, or listing items "as specified", without both make and model or type designation, is not acceptable. Shop