

SECTION 26 05 53 – ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 CODES AND STANDARDS

- A. UL Compliance: Comply with UL Std 969.
- B. NEC and NEMA Compliances: Comply with NEC and NEMA WC-1 and WC-2.
- C. ANSI Compliance: Comply with ANSI Std A13.1.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Except as otherwise indicated, provide Manufacturer's standard products of categories and types required for each application. Where more than single type is specified for an application, selection is installer's option, but provide single selection for each application.
- B. The Electrical Identification, as outlined in this specification, shall be provided in addition to the labeling requirements listed in other specification sections.

2.2 UNDERGROUND-TYPE PLASTIC LINE MARKER

- A. Manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct-burial service; not less than 6" wide x 4 mils thick. Provide tape with printing which most accurately indicates type of service of buried cable.
 - 1. Provide line marker with detectable metallic core for installation above primary power, secondary power and communications service ductbanks.
 - 2. Provide standard plastic line markers for all other installations.

2.3 CABLE/CONDUCTOR IDENTIFICATION BANDS

- A. Provide Manufacturer's standard vinyl-cloth self-adhesive cable/conductor markers of wrap-around type; either pre-numbered plastic-coated type, or write-on type with clear plastic self-adhesive cover flap; numbered to show circuit identification.

2.4 SELF-ADHESIVE PLASTIC SIGNS

- A. Provide Manufacturer's standard, self-adhesive or pressure-sensitive, pre-printed, flexible vinyl signs for operational instructions or warnings; of sizes suitable for application areas and adequate for visibility, with proper wording for each application areas and adequate for visibility, with proper wording for each application (e.g., "EXHAUST FAN FED FROM PANEL PD1").

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- B. Colors: Unless otherwise indicated, or required by governing regulations, provide white signs with black lettering.

2.5 ENGRAVED PLASTIC-LAMINATE SIGNS

- A. Provide engraving stock melamine plastic laminate with black face and white core plies (letter color), complying with FS L-P-387, in sizes and thicknesses indicated. Engrave laminate with engraver's standard letter style of sizes and wording indicated, and punch for mechanical fastening except where adhesive mounting is necessary because of substrates.
- B. Thickness: 1/16", for units up to 20 sq. in. or 8" length; 1/8" for larger units.
- C. Fasteners: Self-tapping stainless-steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate substrate.

2.6 LETTERING AND GRAPHICS

- A. Coordinate names, abbreviations and other designations used in electrical identification work, with corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by Manufacturers or as required for proper identification and operation/maintenance of electrical systems and equipment systems and equipment. Comply with ANSI A13.1 pertaining to minimum sizes for letters and numbers.

2.7 MANUFACTURER

- A. Provide electrical identification products of one of the following (for each type marker):
 - 1. Ideal Industries, Inc.
 - 2. LEM Products, Inc.
 - 3. Markal Company
 - 4. National Band and Tag Co.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install electrical identification products as indicated, in accordance with Manufacturer's written instructions, and requirements of NEC.

3.2 COORDINATION

- A. Where identification is to be applied to surfaces which require finish, install identification after completion of painting.

3.3 REGULATIONS

- A. Comply with governing regulations and requests of governing authorities for identification of electrical work.

3.4 UNDERGROUND CABLE IDENTIFICATION

- A. During backfilling/topsoiling of each exterior underground electrical, signal or communication cable, install continuous underground-type plastic line marker, located directly over buried line at 6" to 8" below finished grade. Where multiple small lines are buried in a common trench and do not exceed an overall width of 16", install a single line marker.
- B. Install line marker for every buried cable, regardless of whether direct-buried or protected in conduit.

3.5 CABLE/CONDUCTOR IDENTIFICATION

- A. Apply cable-conductor identification where wires of communication/signal system are present, except where another form of identification (such as color-coded conductors) is provided. Match identification with marking system used in panelboards, shop drawings, Contract Documents, and similar previously established identification for project's electrical work.
- B. Install engraved plastic-laminate tags on new power cables in all manholes and in pullboxes to identify over current device number. Use tie wraps to attach tag to cables. The nameplate shall bear the following information: Building served; voltage, cable size, class of insulation, phase designation.

3.6 CONDUIT IDENTIFICATION

- A. Where spare conduits are installed, labels shall be provided at each end clearly identifying destination. Where one end is located in a handhole or manhole, provide label directly above spare conduit.
- B. Where spare conduit path includes intermediate pull boxes, conduit bodies, wireways, etc., provide label at each location indicating the next termination point. The label at each end shall identify quantity of intermediate pull boxes, conduit bodies, wireways, etc. as well as location.
- C. Where spare conduits are provided above ceilings on either side of an inaccessible area, provide small label on T-bar to indicate location of spare conduit.
- D. Where low voltage and conduit sleeves enter floor or below grade, provide label identifying termination point.

3.7 DANGER SIGNS

- A. In addition to installation of danger signs required by governing regulations and authorities, install appropriate danger signs at locations indicated and at locations subsequently identified by Installer of electrical work as constituting similar dangers for persons in or about project.
- B. High Voltage: Install danger signs wherever it is possible, under any circumstances, for persons to come into contact with electrical power of voltages higher than 110-120 volts.
- C. Critical Switches/Controls: Install danger signs on switches and similar controls, regardless of whether concealed or locked up, where untimely or inadvertent operation (by anyone) could result in significant danger to persons, or damage to or loss of property.

3.8 MEDIUM AND HIGH VOLTAGE WARNING SIGNS

- A. Contractor shall provide warning signs as described in 225.70 of the most current version of NEC. Signs shall include, but not be limited to:
 - 1. "DANGER – HIGH VOLTAGE" signs located at the following areas:
 - a. All entrances to electrical equipment vault, room, area or enclosure.
 - b. On all panel doors of medium and high voltage switchgear and unit substations that provide access to live parts over 600 volts.
 - c. At points of access to conductors on all conduit and cable systems over 600 volts.
 - d. On all cable trays containing conductors over 600 volts with the maximum spacing of warning notices not to exceed 10 feet.
 - 2. Provide warning signs at medium and high voltage fuse cabinets warning operators not to replace fuses while the circuit is energized.
 - 3. A permanent, legible, single-line diagram of the switchgear shall be laminated and provided in a readily visible location within sight of the switchgear. Coordinate location with owner.

3.9 ARC FLASH LABELS

- A. Provide arc flash labels on equipment per NEC and NFPA. Labels shall be placed in a prominent position that is clearly visible before access to a dangerous area is reached. This includes the front of devices similar to disconnect switches, motor starters, switchboards, etc. and just inside the front cover of panelboards. The labels shall be of sufficient durability to withstand the environment involved.
- B. Provide signs for each unit of the following categories of electrical work.
 - 1. Panelboards, electrical cabinets and enclosures.
 - 2. Major electrical switchgear.
 - 3. Combination starter / disconnect switches.
 - 4. Power transfer equipment.
 - 5. Elevator Power module.
 - 6. Disconnect switches.
 - 7. Transformers.
 - 8. Low Voltage Lighting Control Panels.
 - 9. Medium Voltage Switchgear.
 - 10. Unit Substations.
 - 11. Motor control Centers.

3.10 SERVICE ENTRANCE FAULT CURRENT LABELS

- A. Provide label at service entrance equipment (switchboard, distribution panelboard, etc.) The label shall be of sufficient durability to withstand the environment involved. The label shall indicate the following information per NEC and NFPA:
 - 1. Nominal system voltage.
 - 2. Maximum available fault current.
 - 3. Clearing time of service overcurrent protective device(s) based on the available fault current.
 - 4. The date the label was applied.
- B. The contractor shall coordinate with the utility to determine the available fault current at the point of utility connection, and calculate the maximum available fault current available at the service entrance. All

calculations shall be made available at the service entrance gear, as well as being located in the Operations and Maintenance manuals.

3.11 EQUIPMENT/SYSTEM IDENTIFICATION

- A. Install engraved plastic-laminate sign on each major unit of electrical equipment in building; including central or master unit of each electrical system including communication/control/signal systems, unless unit is specified with its own self-explanatory identification or signal system. Except as otherwise indicated, provide single line of text, 1/2" high lettering on 1-1/2" high sign (2" high where 2 lines are required), White lettering in Black field. Provide text matching terminology and numbering of the Contract Documents and shop drawings. Each listed piece of equipment below shall have a sign that has the following: 1. Equipment Name, 2. Where the equipment is fed from. Example: PANEL "PD1" (FED FROM PANEL DPD).
- B. Provide signs for each unit of the following categories of electrical work.
 - 1. Panelboards, electrical cabinets and enclosures.
 - 2. Access panel/doors to electrical facilities.
 - 3. Major electrical switchgear.
 - 4. Combination starter / disconnect switches.
 - 5. Power transfer equipment.
 - 6. Elevator Power module.
 - 7. Disconnect switches.
 - 8. Transformers.
 - 9. Low Voltage Lighting Control Panels.
 - 10. Medium Voltage Switchgear.
 - 11. Unit Substations.
 - 12. Motor control Centers.
- C. Install signs at locations indicated or, where not otherwise indicated, at location for best convenience of viewing without interference with operation and maintenance of equipment. Secure to substrate with fasteners, except use adhesive where fasteners should not or cannot penetrate substrate.

3.12 DIRECTORIES

- A. Provide typed circuit directory cards in all panelboards (both breaker and fuse type) and low voltage lighting control panels indicating the room number or area, and the item or items controlled by each circuit. Provide typed circuit directory cards for all "Existing" panelboards and low voltage lighting control panels where the Contractor has added, deleted or moved circuits with in an "Existing" panelboard.
 - 1. Contractor shall trace existing circuits within existing panelboards and low voltage lighting control panels to properly identify all circuits within the panelboards and low voltage lighting control panels.
- B. Switchboards, unit substations, motor control centers and switchgear shall be provided with plastic-laminate tags similar to those specified in under "Equipment/System Identification". The tags shall indicate what the circuit feeds and the location of the device.
- C. Directories shall use actual room numbers to indicate locations of all devices, including, but not limited to receptacles, lighting, mechanical equipment, etc. When preparing schedule, use a room number schedule generated by the architect and/or the owner, which indicates the actual room numbers that will be used when the building is occupied. If the schedule is not available, request, in writing, a schedule to reflect the proper room numbers.

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- D. Provide sufficient information to meet requirements of Article 408 of the National Electric Code. Specifically, location of device fed shall be added to directory cards.

3.13 ADDITIONAL FUSE LABELING

- A. At the exterior enclosure of all fused switches, provide additional labeling designating fuse sizes, types and quantity.

3.14 EMERGENCY POWER SOURCE NOTIFICATION

- A. Provide a sign at the main service location indicating type and location of emergency power source in accordance with the requirements of Section 700-8 of the National Electrical Code.

3.15 FIRE PUMP IDENTIFICATION

- A. Provide marking on switchboard showing fire pump tap stating switchboard section is used for a "Fire Pump Tap". Label location on front of switchboard as to where the fire pump is located within the building.

3.16 RECEPTACLE CIRCUIT IDENTIFICATION

- A. At each receptacle, identify panelboard and circuit number from which receptacle is served. Use machine printed, pressure sensitive, abrasion resistant label tape on **backs and fronts** of the wall plate and durable wire markers or tags within outlet boxes.

3.17 ADDITIONAL EQUIPMENT LABELS

- A. Refer to Division 26 "Switchboards," "Unit Substation," and "Motor Control Centers" for floor marking requirements.
- B. Refer to individual Division 27 and 28 sections for labeling requirements of low voltage systems.

END OF SECTION 26 05 53