

## SECTION 16195 ELECTRICAL IDENTIFICATION

## PART 1 GENERAL

## 1.1 SUMMARY:

- A. This Section includes identification of electrical materials, equipment, and installations. It includes requirements for electrical identification components including but not limited to the following:
1. Buried electrical line warnings.
  2. Identification labeling for raceways, cables, and conductors.
  3. Operational instruction signs.
  4. Warning and caution signs.
  5. Equipment labels and signs.

## 1.2 SUBMITTALS:

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
1. Product Data for each type of product specified.
  2. Schedule of identification nomenclature to be used for identification signs and labels for each piece of equipment shall include, but not be limited to, the following equipment types as specified in Division 16.
    - a. Cabinets and enclosures
    - b. Switchboards and Switchgear
    - c. Transformers
    - d. Bus duct
    - e. Panelboards
    - f. Disconnect switches
    - g. Circuit breakers and switches for installation in distribution centers
    - h. Motor control centers
    - i. Starters
    - j. Variable frequency drives
    - k. Transfer switches
    - l. Engine generators and all ancillary cabinets and equipment
    - m. Fire alarm system panels and all ancillary cabinets and equipment
    - n. Paging, intercom and background music system cabinets.
    - o. Lighting control cabinets including dimmer cabinets.
  3. Samples of each color, lettering style and other graphic representation required for identification materials; samples of labels and signs.
  4. Identification required in this section shall apply to equipment furnished in Division 16 and any other applicable Divisions including Division 15.

## 1.3 QUALITY ASSURANCE:

- A. ANSI Compliance: Comply with requirements of ANSI Standard A13.1, "Scheme for the Identification of Piping Systems," with regard to type and size of lettering for raceway and cable labels.

## PART 2 PRODUCTS

## 2.1 MANUFACTURERS:

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. Ideal Industries, Inc.
  2. LEM Products, Inc.
  3. Markal Corp.
  4. Panduit Corp.
  5. W.H.Brady, Co.
  6. 3M Company

## 2.2 ELECTRICAL IDENTIFICATION PRODUCTS:

- A. Adhesive Marking Labels for Raceway and Busway: Pre-printed, flexible, self-adhesive labels with legend indicating voltage and service (Emergency, Lighting, Power, Power d.c., HVAC, Communications, Control, Fire).
1. Label Size for Raceways and Busway: Kroy or Brother labels 1 inch high by 12 inches long (minimum) with 5/8 inch minimum height letters.
  2. Color: As specified for various systems.
- B. Colored Adhesive Marking Tape for banding Raceways, Wires, and Cables: Self-adhesive vinyl tape not less than 3 mils thick by 1 inch to 2 inches in width.
- C. Pretensioned Flexible Wraparound Colored Plastic Sleeves for Cable Identification: Flexible acrylic bands sized to suit the cable diameter and arranged to stay in place by pre-tensioned gripping action when coiled around the cable.
- D. Underground Line Marking Tape: Metal-detector detectable, permanent, bright-colored, continuous-printed, plastic tape compounded for direct-burial service not less than 6 inches wide by 4 mils thick. Printed legend indicative of general type of underground line below.
- E. Wire/Cable Designation Tape Markers: Vinyl or vinyl-cloth, self-adhesive, wraparound, cable/conductor markers with preprinted numbers and letter.
- F. Engraved, Plastic-Laminated Labels, Signs and Instruction Plates: Engraving stock melamine plastic laminate, 1/16 inch minimum thick for signs up to 20 square inches, or 8 inches in length; 1/8 inch thick for larger sizes. Engraved legend in white letters on black face for normal and white letters on red face for emergency, black letters on yellow face for UPS and punched for mechanical fasteners. Where required for ground connections, provide engraved legend in white letters on green face.
- G. Baked-Enamel Warning and Caution Signs for Interior Use: Preprinted aluminum signs, punched for fasteners, with colors, legend, and size appropriate to the location.
- H. Exterior Metal-Backed Butyrate Warning and Caution Signs: Weather-resistant, nonfading, preprinted cellulose acetate butyrate signs with 20-gage, galvanized steel backing, with colors, legend and size appropriate to the location. Provide 1/4 inch grommets in corners for mounting.
- I. Fasteners for Plastic-Laminated and Metal Signs: Self-tapping stainless steel screws or number 10/32 stainless steel machine screws with nuts and flat and lock washers.

- J. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking nylon cable ties, 0.18-inch minimum width, 50 lb minimum tensile strength, and suitable for a temperature range from minus 50 degrees F to 350 degrees F. Provide ties in specified colors when used for color coding.
- K. Adhesive Marking Tape for Device Cover Plates: 3/8 inch Kroy tape or Brother labels with 3/16 inch minimum height letters. Tape shall have black letters on clear background for normal and red letters on clear background for emergency. Embossed Dymo-Tape labels are not acceptable.

## PART 3 EXECUTION

### 3.1 INSTALLATION:

- A. Lettering and Graphics: Coordinate names, abbreviations, colors, and other designations used in electrical identification work with corresponding designations specified or indicated. Install numbers, lettering, and colors as approved in submittals and as required by code.
- B. Install identification devices in accordance with manufacturer's written instructions and requirements of NEC.
- C. Sequence of Work: Where identification is to be applied to surfaces that require finish, install identification after completion of finish work.
- D. Conduit Identification: Use adhesive marking tape labels to identify all exposed conduits. Conduits located above non-accessible ceiling or in floors and walls shall be labeled within 3 feet of becoming accessible. Labels for multiple conduits shall be aligned and read the same direction. Use the following colors:
  - 1. Above 600 Volts: Black letters on orange background indicating source equipment designation, circuit number (if applicable), and voltage. Alternate identification labels with "DANGER - HIGH VOLTAGE" warning signs of the same color.
  - 2. 600 Volt and Below Normal: White letters on black background indicating source equipment designation, circuit number(s), and voltage.
  - 3. 600 Volt and Below Emergency: White or black letters on red background indicating source equipment designation, circuit number(s), and voltage.
  - 4. Fire Alarm: Red letters on white background indicating "FIRE ALARM".
  - 5. Temperature Control: White or black letters on blue background indicating "TEMP. CONTROL."
  - 6. Ground: White or black letters on green background indicating "GROUND" and equipment and designation.
  - 7. Network Fiber: Black letters on white background indicating "NETWORK FIBER."
  - 8. Where conduits enter or exit a panelboard, pull or junction box, switchboard, or other distribution equipment, conduit labels shall include circuit number in addition to feeder identification and voltage.
- E. Identify Junction, Pull and Connection Boxes: Identification of systems and circuits shall indicate system voltage and identity of contained circuits on outside of box cover. Color code shall be same as conduits for pressure sensitive labels. Use self adhesive marking tape labels at exposed locations and indelible black marker at concealed boxes. All fire alarm boxes shall have covers painted red. All temperature control boxes shall have covers painted blue.
- F. Underground Electrical Line Identification: During trench backfilling, for exterior underground power, signal and communications lines, install continuous underground plastic line marker,

located directly above line at 6 to 8 inches below finished grade. Where multiple lines installed in a common trench or concrete envelope, do not exceed an overall width of 16 inches; install a single line marker. Tape shall be 6 inches wide, 0.004 inches thick and 1750 psi minimum strength, trace wire run continuous length manhole to manhole and to equipment. Provide 3 feet slack rolled at each end.

1. Install line marker for underground wiring, both direct-buried and in raceway. Red for electrical, orange for phone and cable.
- G. Circuit Identification: Tag or label conductors as follows:
1. Future Connections: Conductors indicated to be for future connection or connection under another contract with identification indicating source and circuit numbers.
  2. Multiple Circuits: Where multiple branch circuits, control wiring or communications/signal conductors are terminated or spliced in a box or enclosure, label each conductor or cable with circuit number. For control and communications/signal wiring, use wire/cable marking tape at terminations in wiring boxes, troughs and control cabinets. Use consistent letter/number conductor designations throughout on wire/cable marking tapes.
  3. Match identification markings with designations used in panelboards shop drawings, Contract Documents, and similar previously established identification schemes for the facility's electrical installations.
- H. Apply warning, caution and instruction signs and stencils as follows:
1. Install warning, caution or instruction signs where required by NEC, where indicated, or where reasonably required to assure safe operation and maintenance of electrical systems and of the items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions or explanations are needed for system or equipment operation. Install butyrate signs with metal backing for outdoor items.
  2. Emergency Operating Signs (when applicable): Install, where required by NEC, where indicated, or where reasonably required to assure safe operation and maintenance of electrical systems and of the items to which they connect, engraved laminate signs with white legend on red background with minimum 3/8 inch high lettering for emergency instructions on power transfer, or other emergency operations.
    - a. Provide sign at main service entrance switch, indicating type and location of on-site stand-by generator as required by NEC. Sign shall read "Secondary Source Provided by Engine Generator Located In Room #\_\_\_\_\_".
- I. Install equipment/system circuit/device identification as follows:
1. Apply equipment identification labels of engraved plastic-laminate on each major unit of electrical equipment in building, including central or master unit of each electrical system. This includes communication/signal/alarm systems, unless unit is specified with its own self-explanatory identification. Text shall match terminology and numbering of the Contract Documents and shop drawings. Apply labels for each unit of the following categories of electrical equipment.
    - a. Panelboards, electrical cabinets and enclosures.
    - b. Access doors and panels for concealed electrical items.

- c. Electrical switchgear and switchboards.
  - d. Motor control centers.
  - e. Motor starters.
  - f. Pushbutton stations.
  - g. Power transfer equipment.
  - h. Contactors.
  - i. Remote-controlled switches.
  - j. Dimmers.
  - k. Control devices.
  - l. Transformers.
  - m. Power generating units.
  - n. Telephone switching equipment.
  - o. Clock/program master equipment.
  - p. TV/audio monitoring master station.
  - q. Fire alarm master station or control panel.
- J. Apply circuit/control/item designation labels of engraved plastic laminate for disconnect switches, breakers, pushbuttons, pilot lights, motor control centers, and similar items for power distribution and control components above, except panelboards and alarm/signal components, where labeling is specified elsewhere.
- K. For panelboards, provide framed, typed circuit schedules (label all spares and spaces in pencil) with explicit description and identification of items controlled by each individual circuit breaker.
- L. Tag all grounding electrode conductors, associated bonding conductors, and C.O. grounding conductors at their point of attachment to any ground bus and grounding electrode (where possible) with a 2 inch diameter round, green phenolic nameplate. Lettering shall be 1/4 inch high with 1/5 inch between lines centered on the tag stating "DO NOT DISCONNECT", "MAIN (OR C.O.) GROUND." Nameplate shall attach to conductor with a short length of small chain.
- M. Install labels at locations as required and at locations for best convenience of viewing without interference with operation and maintenance of equipment.
- N. Provide tape labels for identification of individual receptacle and light switch wallplates. Locate tape on front of plate and identify branch circuit serving the receptacle. Provide tape labels for identification of individual switches or thermal overload switches which serve as equipment disconnects. Locate the tape on the front of the coverplate and identify the branch circuit serving the equipment.

END OF SECTION 16195