

SECTION 16075 - ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. All sections of Division 16 apply to this section.
- C. Other related Divisions are as follows:
 - 1. Division 9 – Painting.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Identification for raceway.
 - 2. Identification for conductors and communication and control cable.
 - 3. Underground-line warning tape.
 - 4. Warning labels and signs.
 - 5. Instruction signs.
 - 6. Equipment identification labels.
 - 7. Miscellaneous identification products.

1.3 DEFINITIONS

- A. ANSI – American National Standards Institute.
- B. UL – Underwriter’s Laboratories.

1.4 SUBMITTALS

- A. Product Data: For each electrical identification product indicated.
- B. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.
- C. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.

1.5 QUALITY ASSURANCE

- A. Comply with ANSI A13.1 and ANSI C2.
- B. Comply with the City of Chicago Electrical Code.
- C. Comply with 29 CFR 1910.145.

1.6 DELIVERY, STORAGE AND HANDLING – NOT APPLICABLE

1.7 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- C. Coordinate installation of identifying devices with location of access panels and doors.
- D. Install identifying devices before installing acoustical ceilings and similar concealment.

1.8 REFERENCES

- A. American National Standards Institute (ANSI): ANSI A 13.1 – Identification of Piping Systems.
- B. Manufacturer's catalogs: Specification manufacturers' catalogs are incorporated by reference to same force and effect as if repeated herein in full. WARRANTY – NOT APPLICABLE

1.9 WARRANTY – NOT APPLICABLE

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:
 - 1. Equipment Identification Plates:

- a. Quentin D. Schwab, 606 E. Dodson Drive, Urbana, IL 61801.
- b. Joe Halm Building Specialties, Box 525, LaGrange, IL.
- c. Mechanical Tag Systems, Box 1565, Cedar Rapids, IA 52406.
- d. Seton Name Plate Corp., 592 Boulevard, New Haven, CT 06505.
- e. N&E Specialty Co., Box 3518, Peoria, IL 61614.

2.2 RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Color for Printed Legend:
 1. Power Circuits: Black letters on an orange field.
 2. Legend: Indicate system or service and voltage, if applicable.
- C. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- D. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches wide; compounded for outdoor use.

2.3 CONDUCTOR AND COMMUNICATION- AND CONTROL-CABLE IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
- B. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking nylon tie fastener.

2.4 UNDERGROUND-LINE WARNING TAPE

- A. Description: Permanent, bright-colored, continuous-printed, polyethylene tape.
 1. Not less than 6 inches wide by 4 mils thick.
 2. Compounded for permanent direct-burial service.
 3. Embedded continuous metallic strip or core.
 4. Printed legend shall indicate type of underground line.

2.5 WARNING LABELS AND SIGNS

- A. Comply with the City of Chicago Electrical Code and 29 CFR 1910.145.

- B. Self-Adhesive Warning Labels: Factory printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment, unless otherwise indicated.
- C. Baked-Enamel Warning Signs: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application. 1/4-inch grommets in corners for mounting. Nominal size, 7 by 10 inches.
- D. Metal-Backed, Butyrate Warning Signs: Weather-resistant, non-fading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application. 1/4-inch grommets in corners for mounting. Nominal size, 10 by 14 inches.
- E. Warning label and sign shall include, but are not limited to, the following legends:
 - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

2.6 INSTRUCTION SIGNS

- A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. in. and 1/8 inch thick for larger sizes.
 - 1. Engraved legend with black letters on white face.
 - 2. Punched or drilled for mechanical fasteners.
 - 3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.7 EQUIPMENT IDENTIFICATION LABELS

- A. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Permanent adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.
- B. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

2.8 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Accessible Raceways and Cables of Auxiliary Systems: Identify the following systems with color-coded, self-adhesive vinyl tape applied in bands:
1. Fire Alarm System: Red.
 2. Fire-Suppression Supervisory and Control System: Red and yellow.
 3. Security System: Blue and yellow.
 4. Mechanical and Electrical Supervisory System: Green and blue.
 5. Telecommunication System: Green and yellow.
 6. Control Wiring: Green and red.
- B. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use metal tags. Identify each ungrounded conductor according to source and circuit number.
- C. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source and circuit number.
- D. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, signal, sound, intercommunications, voice, and data connections.
1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and Operation and Maintenance Manual.
- E. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable. Install underground-line warning tape for both direct-buried cables and cables in raceway.
- F. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Comply with 29 CFR 1910.145 and apply baked-enamel warning signs. Identify system voltage with black letters on an orange background. Apply to exterior of door, cover, or other access.
1. Equipment with Multiple Power or Control Sources: Apply to door or cover of equipment including, but not limited to, the following:
 - a. Power transfer switches.
 - b. Controls with external control power connections.
 2. Equipment Requiring Workspace Clearance According to the City of Chicago Electrical Code: Unless otherwise indicated, apply to door or cover of equipment but not on flush panel boards and similar equipment in finished spaces.

G. Instruction Signs:

1. Operating Instructions: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
2. Emergency Operating Instructions: Install instruction signs with white legend on a red background with minimum 3/8-inch- high letters for emergency instructions at equipment used for power transfer.

H. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:
 - a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where 2 lines of text are required, use labels 2 inches high.
 - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label with non-corroding screws.
 - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
2. Equipment to Be Labeled:
 - a. Panel boards, electrical cabinets, and enclosures.
 - b. Access doors and panels for concealed electrical items.
 - c. Electrical switchgear and switchboards.
 - d. Transformers.
 - e. Emergency system boxes and enclosures.
 - f. Disconnect switches.
 - g. Enclosed circuit breakers.
 - h. Motor starters.
 - i. Push-button stations.
 - j. Power transfer equipment.
 - k. Contactors.
 - l. Battery inverter units.
 - m. Voice and data cable terminal equipment.
 - n. Master clock and program equipment.
 - o. Intercommunication and call system master and staff stations.
 - p. Television/audio components, racks, and controls.
 - q. Fire-alarm control panel and annunciators.
 - r. Security and intrusion-detection control stations, control panels, terminal cabinets, and racks.
 - s. Monitoring and control equipment.

- t. Uninterruptible power supply equipment.
- u. Terminals, racks, and patch panels for voice and data communication and for signal and control functions.

3.2 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Attach non-adhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.
- F. System Identification Color Banding for Raceways and Cables: Each color band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- G. Color-Coding for Phase and Voltage Level Identification, 600 V and Less: Use the colors listed below for ungrounded service, feeder, and branch-circuit conductors.
 - 1. Color shall be factory applied.
 - 2. Colors for 208/120-V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - d. Neutral – White.
 - e. Ground – Green.
 - 3. Colors for 277/480V, 3 Phase Circuits:
 - a. Phase A: Brown.
 - b. Phase B: Orange.
 - c. Phase C: Yellow.
 - d. Neutral – Gray.
 - e. Ground – Green.
- H. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- I. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use

multiple tapes where width of multiple lines installed in a common trench exceeds 16 inches overall.

- J. Painted Identification: Prepare surface and apply paint according to Division 9 painting Sections.
- K. Provide on device plates for local toggle switches, toggle switch type manual starters, pilot lights, and other electrical items, whose function is not readily apparent, engraved suitable inscriptions or plastic laminate nameplates describing the equipment controlled or indicated.
- L. For exterior installations, conduits, except branch lighting circuit conduits, shall be tagged at the ends and in intermediate boxes, chambers, manholes, hand holes, and other enclosures in accordance with the same inscriptions as shown on the Drawings.
- M. In each switchboard room, electrical closet, or other space containing electrical equipment, provide a vitreous enameled metal sign, red on white, reading "Electrical Equipment Room – No Storage Permitted". Signs shall be mounted a clearly visible locations within the rooms or on the inside of doors where wall space within the room is not available.
- N. In main switchboard rooms install a framed behind-glass black line print of the feeder diagram complete with the feeder schedules. The print shall be made from an updated a neatly prepared Mylar drawing, which includes the field record information. Lettering shall not be smaller than 1/8 inch.

3.3 PATHWAY IDENTIFICATION

- A. Conduit labels shall be made adhesive and a minimum of 3/4 inch wide, embossed with the designations in 5/16-inch high letters (numbers placed in 2 locations for all spaces and on all pathways at both ends) and legibly written with a permanent marker.
- B. Minimum of two (2) labels, one at each end of the pathway and any exposed points (i.e., screw cover boxes, pull points, etc.).
- C. Exposed raceways do not need to be labeled unless transitioning into or out of an inaccessible space. When necessary, raceway designation will be (RW).
- D. All pathways shall be identified with an alphanumeric identifier to designate locations for the origin and the end of the pathway.
- E. Pathways shall follow the hierarchy.
- F. Type of pathway (i.e. CN - conduit, TCN- Telecommunications conduit from service entrance to MDF, RK - rack, W - workstation outlet/work area, and when necessary RW - raceway, raceway identification shall list the next accessible room or area that the concealed raceway becomes available)
- G. Numbered from each origin point in series starting from 1 (i.e. CN1, CN2, CN3 ...)

CPS Control Rev: 2_3/30/06
Project Rev: A_3/30/06
CPS Control Rev: 1_2/28/06
Project Rev: A_xxx

MAIN DISTRIBUTION
FRAME

TELECOMMUNICATIONS
SWITCH FOR VOICE

CONDUIT 2

3.4 CLEANING – NOT APPLICABLE

3.5 CONTRACTOR STARTUP AND REPORTING – NOT APPLICABLE

3.6 COMMISSIONING AND DEMONSTRATION – NOT APPLICABLE

END OF SECTION 16075