SECTION 26 05 53 – IDENTIFICATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Color and legend requirements for raceways, conductors, and warning labels and signs.
2. Labels.
3. Bands and tubes.
4. Tags.
5. Signs.
6. Paint for identification.
7. Fasteners for labels and signs.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.

B. Samples: For each type of label and sign to illustrate composition, size, colors, lettering style, mounting provisions, and graphic features of identification products.

C. Identification Schedule: For each piece of electrical equipment and electrical system components to be index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.

D. Delegated-Design Submittal: For arc-flash hazard study.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with ASME A13.1.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Comply with NFPA 70E and Section 260573.19 "Arc-Flash Hazard Analysis" requirements for arc-flash warning labels.

F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 degrees F, ambient; 180 degrees F, material surfaces.

2.2 COLOR AND LEGEND REQUIREMENTS

A. Raceways and Cables Carrying Circuits at 600V or Less:

1. 480/277V: Black letters on yellow field.
2. 208/120V: White letters on blue field.
3. Two-inch main lettering, 1/4-inch secondary lettering.
4. Legend: Indicate voltage and system or service type.
5. Secondary Legend (See example that follows):
   a. First Line: “Origination: C-112E-1-5-HDP1” (example). Origination shall be labeled with distribution equipment label identification (e.g., panelboard number, switchgear number, etc.).
   b. Second Line: “Destination: C-112E-1-5-HPB1” (example). Destination shall be labeled with equipment label identification (e.g., switchgear number. panelboard number, air handling unit number, etc.) and room name, if applicable.
   c. Third Line: “Contract: #9500728/DP3” (example). This shall be construction contract number.

480V	Origination: C-112E-1-5-HDP1 Destination: C-112E-1-5-HPB1 Contract#: 9500728/DP3

Main Legend Secondary Legend

(Vertical Bar separating legends shall be same color as letters.)

B. Color-Coding for Phase- and Voltage-Level Identification, 600V or Less: Use colors listed below for ungrounded service, feeder, and branch-circuit conductors.

1. Color shall be factory applied or field applied for sizes larger than 8 AWG if authorities having jurisdiction permit.

2. Colors for 208/120V Circuits:
    a. Phase A: Black.
    b. Phase B: Red.
    c. Phase C: Blue.
    d. Neutral: White.
3. Colors for 480/277V Circuits:
    a. Phase A: Brown.
    b. Phase B: Orange.
    c. Phase C: Yellow.
    d. Neutral: Gray.
4. Color for Equipment Grounds: Green.
5. Colors for Isolated Grounds: Green with 2 or more yellow stripes.

C. Warning Label Colors: Identify system voltage with black letters on orange background.

D. Warning labels and signs shall include, but are not limited to, following legends:
1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace clearance warning for equipment rated for more than 250V and less than 1000V: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 42 INCHES."
3. Workspace clearance warning for equipment rated for less than 250V and more than 100V: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

E. Equipment Identification Labels: White letters on black field.

2.3 LABELS

A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.

B. Self-Adhesive Wraparound Labels: Preprinted, 3-mil-thick, vinyl flexible label with acrylic pressure-sensitive adhesive.
1. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over legend. Labels sized such that clear shield overlaps entire printed legend.
2. Marker for Labels: Permanent, waterproof, black ink marker recommended by tag manufacturer.
3. Marker for Labels: Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.

C. Self-Adhesive Labels: Vinyl, thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.

1. Minimum Nominal Size:

a. 1-1/2 by 6 inches for raceway and conductors.

b. 3-1/2 by 5 inches for equipment.

c. As required by authorities having jurisdiction.

2.4 TAPES

A. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by one to 2 inches wide; compounded for outdoor use.

B. Underground-Line Detectable Warning Tape:

1. Tape:

a. Recommended by manufacturer for method of installation and suitable to identify and locate underground electrical utility lines.

b. Printing on tape shall be permanent and shall not be damaged by burial operations.

c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.

2. Color and Printing:

a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.

b. Inscriptions for 3-Inch-Wide Polyethylene Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".

2.5 SIGNS

A. Laminated Acrylic or Melamine Plastic Signs:

1. Engraved legend.

2. Thickness:

a. For signs up to 20 square inches, minimum 1/16 inch thick.

b. For signs larger than 20 square inches, 1/8 inch thick.

c. Engraved legend with white letters on black background.

d. Punched or drilled for mechanical fasteners with 1/4-inch grommets in corners for mounting.

2.6 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).

B. 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 PREPARATION

A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

B. Install identifying devices before installing acoustical ceilings and similar concealment.

C. Verify identity of each item before installing identification products.

D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

E. Apply identification devices to surfaces that require finish after completing finish work.

F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.

G. System Identification for Raceways and Cables under 600V: Identification shall completely encircle cable or conduit. Place identification of 2-color markings in contact, side by side.

1. Secure tight to surface of conductor, cable, or raceway.

H. Emergency Operating Instruction Signs: Install instruction signs with white legend on red background with minimum 3/8-inch-high letters for emergency instructions at equipment used for power transfer.

I. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from floor.

J. Accessible Fittings for Raceways: Identify covers of each junction and pull box of following systems with wiring system legend and system voltage. System legends shall be as follows:

1. "POWER."

2. "UPS."

K. Self-Adhesive Wraparound Labels: Secure tight to surface at location with high visibility and accessibility.

L. Self-Adhesive Labels:

1. On each item, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.

2. Unless otherwise indicated, provide 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.

M. Self-Adhesive Vinyl Tape: Secure tight to surface at location with high visibility and accessibility.

1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for minimum distance of 6 inches where splices or taps are made. Apply last 2 turns of tape with no tension to prevent possible unwinding.

N. Underground Line Warning Tape:

1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in common trench **or** concrete envelope exceeds 16 inches overall.

2. Install underground-line warning tape for direct-buried cables and cables in raceways.

O. Laminated Acrylic or Melamine Plastic Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to location and substrate.

2. Unless otherwise indicated, provide single line of text with 1/2-inch-high letters on 1-1/2-inch-high sign; where 2 lines of text are required, use labels 2 inches high.

3.3 IDENTIFICATION SCHEDULE

A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

C. Accessible Raceways and Metal-Clad Cables, 600V or Less, for Feeder and Branch Circuits, More Than 30A and 120V to Ground: Identify with self-adhesive raceway labels.

1. Locate identification 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.

D. Accessible Fittings for Raceways and Cables within Buildings: Identify covers of each junction and pull box of following systems with self-adhesive labels containing wiring system legend and system voltage. System legends shall be as follows.

1. "POWER."

2. "UPS."

E. Power-Circuit Conductor Identification, 600V or Less: For conductors in pull and junction boxes, and handholes, use vinyl wraparound labels to identify phase.

1. Locate identification 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.

F. Locations of Underground Lines: Underground-line warning tape for power and lighting cable.

G. Instructional Signs: Self-adhesive labels, including color code for grounded and ungrounded conductors.

H. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive labels.

1. Apply to exterior of door, cover, or other access.

2. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, following:

a. Power-transfer switches.

b. Controls with external control power connections.

I. Arc Flash Warning Labeling: Self-adhesive labels.

J. Operating Instruction Signs: Self-adhesive labels.

K. Emergency Operating Instruction Signs: Self-adhesive labels with white legend on red background with minimum 3/8-inch-high letters for emergency instructions at equipment used for power transfer.

L. Equipment Identification Labels:

1. Indoor or Outdoor Equipment: Laminated acrylic or melamine plastic sign.

2. Equipment to Be Labeled:

a. Each section of each switchgear, switchboard, and distribution panelboard shall be labeled with panelboard name, voltage, phase, and source name and location.

b. Panelboards: Typewritten, 8.5-inch by 11-inch, directory of circuits in location provided by panelboard manufacturer. Panelboard identification shall be in form of self-adhesive, engraved, laminated acrylic or melamine label.

c. Each section of each lighting and appliance panelboard shall be labeled with panelboard name and source name and location. Identification shall be above panelboard door. Circuit numbers shall be permanently labeled at factory; stick-on decals are unacceptable.

d. Panelboard main circuit breakers: Breaker identification shall be adjacent to breaker in form of self-adhesive, engraved, laminated acrylic or melamine label, labeled “MAIN ####.”

e. Distribution circuit breakers: Breaker identification shall be adjacent to breaker in form of self-adhesive, engraved, laminated acrylic or melamine label.

f. Spare circuit breakers shall be labeled “SPARE.”

g. Access doors and panels for concealed electrical items.

h. Battery-inverter units.

i. Contactors.

j. Dry-Type Transformers: Label shall be directly above manufacturer nameplate and wiring diagram. Transformer name shall be in one-inch high letters; kVA rating, high voltage, low voltage, phase, primary source and circuit number(s)that includes tag designation indicated on Drawings for transformer, feeder, and panelboards or equipment supplied by secondary, and secondary load or panelboard shall be 0.5-inch letters.

k. Enclosed circuit breakers.

l. Enclosed controllers.

m. Enclosed safety switches: Label shall be on outside cover and shall include source and circuit number(s) and load served.

n. Enclosures and electrical cabinets.

o. Exhaust fan switch: Label shall be on outside cover and shall include source and circuit number(s) and load served and high and low speed if required, in 0.25-inch letters.

p. Exterior lighting switch or controls: Label shall be on outside cover and shall include source and circuit number(s) and load served, in 0.25-inch letters.

q. Junction box: Label shall be on outside cover and include designations of circuits in box.

r. Monitoring and control equipment: Label shall be on outside cover or door.

s. Push-button stations.

t. Receptacles and switches: Label shall be on inside of cover plate and shall include source and circuit number(s) in all capital letters, in 0.25-inch letters.

u. Switch for load that cannot be seen from control point: Label shall be on outside cover plate and shall include source and circuit number(s) and load served.

v. Switchboards.

w. Switchgear.

x. Time clocks: Label shall be on outside cover.

y. UPS equipment.

z. Variable frequency drive: Label shall be on outside cover and shall include source and circuit number(s) and load served.

END OF SECTION