

## **SECTION 26 05 53 - ELECTRICAL IDENTIFICATION**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. The purpose of this section is to provide electrical identification for electrical equipment, raceway, and conductors
- B. Provide labels, nameplates, panel directories and color-coding as specified herein and according to attached electrical identification drawings.

#### **1.2 SUMMARY**

- A. This Section includes electrical identification materials and devices required to comply with ANSI A13.1, NFPA 70, OSHA standards, and authorities having jurisdiction. Provide labels, nameplates, panel directories and color-coding as specified herein.

#### **1.3 SUBMITTALS**

- A. Submittals shall be in accordance with Conditions of the Contract and Division 01 Specification Sections
- B. Product Data: For each electrical identification product indicated.
- C. Prior to making nameplates, submit a complete schedule indicating nameplate size, lettering size, color, and actual nameplate information
- D. Samples: For each type of label and sign to illustrate color, lettering style, and graphic features of identification products.

#### **1.4 MEETINGS**

- A. Within one month after "Notice to Proceed", schedule a meeting with UW representatives to review electrical identification requirements.

## PART 2 - PRODUCTS

### 2.1 RACEWAY AND CABLE LABELS

- A. Identify medium/high voltage conduits within buildings and electrical rooms by painting on its full length the following:
  - 1. Stenciling in 2-inch black letters: Stencil to be placed once in each room and at a minimum of every 50 feet. Place where convenient for tracing. Exception: Stencil not required if conduit does not exit room.
  - 2. Stencil to include source equipment name, voltage, load equipment name (i.e. PCU-BB01-E01/4160V/TR-SW01-E01)
  - 3. Paint medium voltage conduits: Emergency system conduit, (4.16kV and 2.4kV) - red; normal system conduit, (13.8kV) -yellow. For other medium or high voltage systems, contact UW Engineering Services for the color scheme.
- B. Feeder and branch circuit conduits
  - 1. No labeling required for raceways with readily identifiable terminations within the same room.
  - 2. In accessible ceiling spaces and exposed in unfinished areas, label conduit with panel and circuit numbers of conductors routed through the conduit. Label conduit at all wall penetrations and connections to all panels, junction boxes, and equipment served.
  - 3. Use a black indelible marker and hand print label in a clear workmanlike manner, or use stencil and black paint to provide a clearly legible label.
- C. Empty conduits
  - 1. Provide labels with description of purpose, and location of opposite end, on each end of conduits provided for future.
  - 2. Equipment or those abandoned as a result of this contract: Cardboard or plastic handwritten tags are permissible. Note accurately on as-built drawings.
- D. Adhesive Labels: Preprinted, flexible, self-adhesive vinyl with legend overlaminated with a clear, weather- and chemical-resistant coating.
- E. Pretensioned, Wraparound Plastic Sleeves: Flexible, preprinted, color-coded, acrylic band sized to suit the diameter of the line it identifies and arranged to stay in place by pretensioned gripping action when placed in position.
- F. Colored Adhesive Tape: Self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide (0.08 mm thick by 25 to 51 mm wide).

## 2.2 EQUIPMENT NAMEPLATES, DEVICE LABELS AND SIGNS

### A. Materials

1. Provide nameplates constructed of 1/16 -inch thick plastic laminated material. Engrave through colored surface material to contrasting colored sub-layer.
2. Use receptacle labels by electronic labeler Brother P-Touch, model PT-20/25, Dymo-Tape or approved equal.

### B. Provide nameplates for the following:

1. Equipment identification labels for all electrical equipment including, but not limited to, switchgear, switchboards, panels, transfer switches, disconnect switches, transformers, capacitors, fixed equipment, motor starters, MCC's, motors, etc.
2. Sub classification labels for all emergency power system equipment as listed for equipment identification labels, and all junction and pull boxes.
3. Fire Alarm equipment per the Fire Alarm specification.
4. Cubicle/space labels for all MCC's, substations, and distribution switchboards.
5. Identify fuse type and size on the cover of fusible equipment.
6. Special equipment outlet labels (1/4 -inch letters)
7. GFCI receptacles: "Series GFCI Protected"
8. Time delays: Provide 1/8 -inch lettering at the control location to identify a motor having a time delay relay- "Time Delay Start to Limit System Inrush."
9. Cover plate receptacle labels shall indicate panel and circuit identification for all receptacles.
10. In addition to receptacle labels, provide labels for fixed equipment at a visible location mounted on or near the equipment. Examples of fixed equipment are refrigerators, water fountains, hoods, ranges, dishwashers, etc. Coordinate location of labels with the University.
11. Pathway Lighting. Indicate power source. (Bldg name, panel and circuit number).

### C. Safety Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145.

## 2.3 BRANCH CIRCUIT PANELBOARD DIRECTORIES

### A. Provide neatly typed schedule under plastic jacket or protective cover for protection from damage or dirt.

1. Number each single pole space: Odd-numbered circuits on the left side or top, even on right side or bottom.
2. Securely mount on inside face of panelboard door.
3. When no cover, provide individual nameplates for each overcurrent and other device.
4. Define briefly, but accurately, nature of connected load (I.e., Lighting Office, Receptacles, Mechanical/Electrical Room, etc.) as approved.
5. Provide room locations for all loads and indicate panel name on schedule.
6. Multiple circuits to utilize first pole space number as its circuit number.

### B. Confirm room numbers with UW Construction Coordinator prior to noting on schedules.

- C. Spare circuit breakers and space positions shall be noted in pencil.
- D. Panel schedules and as-built circuit numbers shall agree.

## 2.4 WIRE AND CABLE LABELING

### A. Control Wing

- 1. All control-wire terminations are to be identified by tubular sleeve heat shrink-type markers to agree with wire marking identification on manufacturer's equipment drawings.

### B. Power conductor wire, cable and buses

- 1. Buses, feeders, branch circuit conductors and medium voltage cables shall be properly phased and identified throughout. Individual conductors shall be color coded as noted below:

Conductor	102/208V & Medium Voltage	277/480V
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green
Isolated Ground	Green/Yellow	Green/Yellow

- a. Buses and connections shall be identified left to right, top to bottom , or front to rear; shall read A-B-C: and shall be color-coded as per the table above.
  - b. Feeders for all new construction shall have color-coded phase identification at all junction boxes and wherever feasible, and shall have solid color-coded insulation for phase designation. Where the proper color wire insulation cannot be obtained, black insulation shall be used and the conductors shall be coded with plastic vinyl tape 3m #190-A, 3/4 -inch or equal.
  - c. Identify color-coded conductors with appropriately colored plastic vinyl tape (3m #190-A) in the panel when the branch circuits are reconnected for balancing panel load.
- C. "Low Voltage" cable and special systems, See individual functional specification sections.

2.5 COLOR SCHEME FOR LABELS (SEE ATTACHED STANDARD DRAWINGS FOR EXAMPLES):

System	Label Color	Lettering Color	Identification
2.4kV & 4.16kV Emergency	Red	White	
13.8kV Normal	Yellow	Black	
2.4kV Normal	Orange	White	
Normal Power and Control	White	Black	
Emergency Power and Control			
Emergency- Life Safety	Red	White	"EM-LS"
Emergency-Critical	Red	White	"EM-CR"
Emergency- Legally Req. Standby	Red	White	"EM-LRS"
Emergency Optional Standby	Red	White	"EM-OS"
Fire Alarm	Red	White	"FA"
Halon	Dk. Blue	Black	"FP"
Security	Green	Black	"SEC"
Intercom, Public Address, Nurse Call	Orange	Black	"IC","PA","NC"
Clock	Lt. Blue	Black	(Symbol for clock)
TV	Yellow	Black	"TV"
Communication Data	Black	White	"C/D"

2.6 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking, Type 6/6 nylon cable ties.
  - 1. Minimum Width: 3/16 inch (5 mm).
  - 2. Tensile Strength: 50 lb (22.3 kg) minimum.
  - 3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
  - 4. Color: According to color-coding.
- B. Paint: Formulated for the type of surface and intended use.
  - 1. Primer for Galvanized Metal: Single-component acrylic vehicle formulated for galvanized surfaces.
  - 2. Primer for Concrete Masonry Units: Heavy-duty-resin block filler.
  - 3. Primer for Concrete: Clear, alkali-resistant, binder-type sealer.
  - 4. Enamel: Silicone-alkyd or alkyd urethane as recommended by primer manufacturer.

## PART 3 - EXECUTION

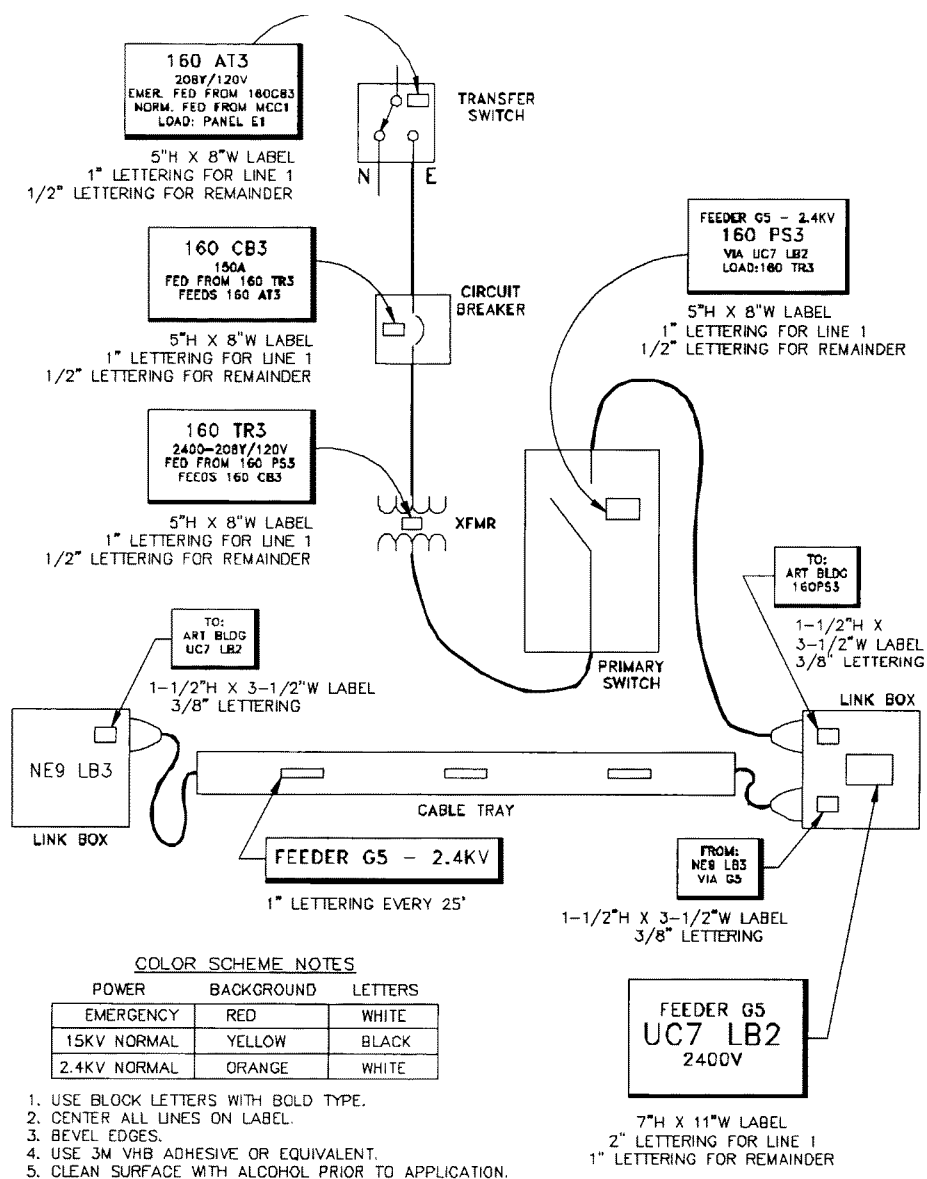
### 3.1 INSTALLATION

- A. Securely attached engraved labels and nameplates with rivets, screws, 3M tape, or suitable epoxy cement. Labeling abbreviations permitted only as approved
- B. No temporary markings permitted to remain on equipment. Remove all temporary markings where possible. Where markings cannot be removed, repaint trims, housing, etc. to cover markings. Refinish defaced finishes.
- C. Identification Materials and Devices: Install at locations for most convenient viewing without interference with operation and maintenance of equipment.
- D. Motor Labeling: Drill hole in nameplate and attach to motor flexible conduit with plastic tie-wrap.
- E. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other designations with corresponding designations in the Contract Documents or with those required by codes and standards. Use consistent designations throughout Project.
- F. Sequence of Work: If identification is applied to surfaces that require finish, install identification after completing finish work.
- G. Self-Adhesive Identification Products: Clean surfaces thoroughly before attaching all labels. Use solvent on device plates before attaching electronic or Dymo-tape labels. (Without proper cleaning, electronic or Dymo-tape labels will soon curl off.)
- H. Install painted identification according to manufacturer's written instructions and as follows:
  - 1. Clean surfaces of dust, loose material, and oily films before painting.
  - 2. Prime surfaces using type of primer specified for surface.
  - 3. Apply one intermediate and one finish coat of enamel.
- I. Caution Labels for Indoor Boxes and Enclosures for Power and Lighting: Install pressure-sensitive, self-adhesive labels identifying system voltage with black letters on orange background. Install on exterior of door or cover.
- J. Circuit Identification Labels on Boxes: Install labels externally.
  - 1. Exposed Boxes: Pressure-sensitive, self-adhesive plastic label on cover.
  - 2. Concealed Boxes: Plasticized card-stock tags.
  - 3. Labeling Legend: Permanent, waterproof listing of panel and circuit number or equivalent.
- K. Equipment Identification Labels: Engraved plastic laminate. Install on each unit of equipment, including central or master unit of each system. This includes power, lighting, communication, signal, and alarm systems, unless units are specified with their own self-explanatory

identification. Apply labels for each unit of the following categories of equipment using mechanical fasteners:

1. Panelboards, electrical cabinets, and enclosures.
2. Access doors and panels for concealed electrical items.
3. Electrical switchgear and switchboards.
4. Emergency system boxes and enclosures.
5. Motor-control centers.
6. Disconnect switches.
7. Enclosed circuit breakers.
8. Motor starters.
9. Push-button stations.
10. Power transfer equipment.
11. Contactors.
12. Dimmers.
13. Transformers.

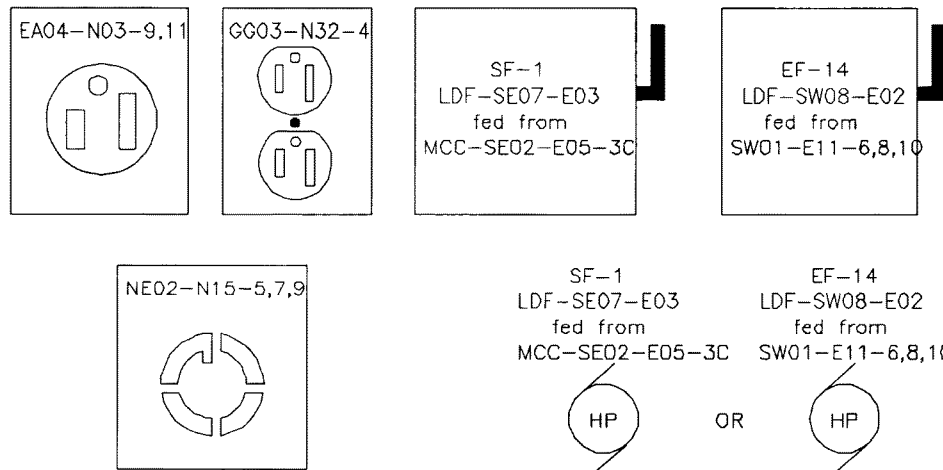
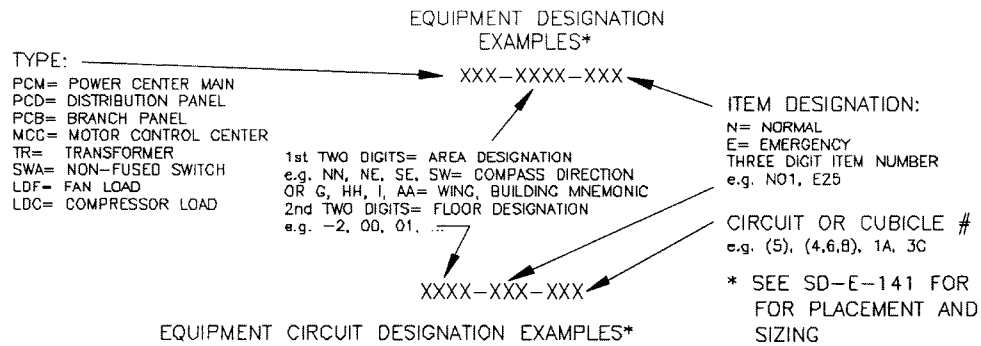
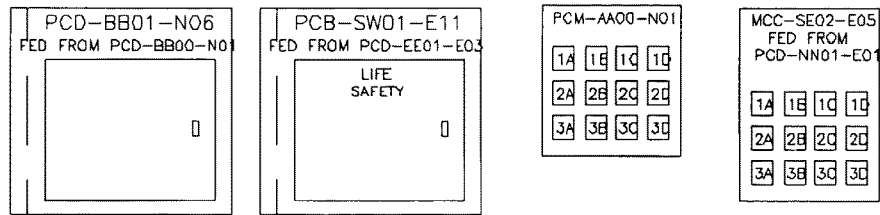
- L. Refer to following pages showing equipment labeling schemes:



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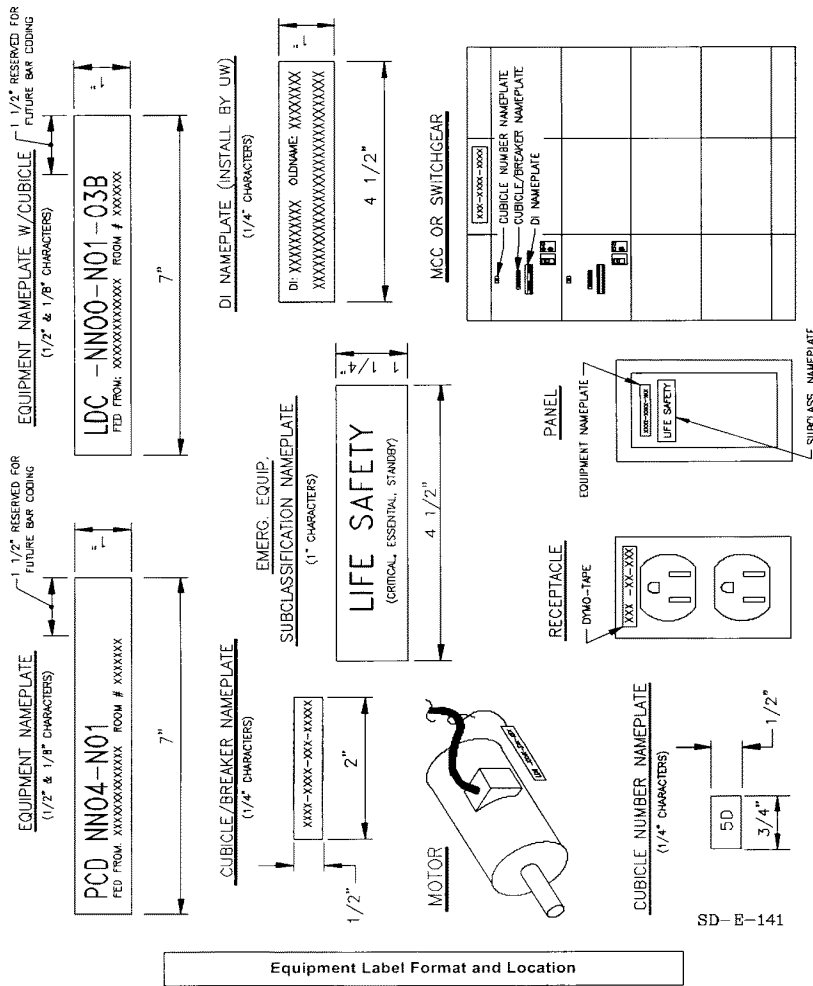
Medium Voltage Equipment Label





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Equipment "Fed From" Label



**END OF SECTION 26 05 53**