

## SECTION 26 27 26 - WIRING DEVICES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  1. General-use switches, dimmer switches, and fan-speed controller switches.
  2. General-grade single straight-blade receptacles.
  3. General-grade duplex straight-blade receptacles.
  4. Hospital-grade straight-blade receptacles.
  5. Receptacles with arc-fault and ground-fault protective devices.
  6. Locking receptacles.
  7. Pin-and-sleeve receptacles.
  8. Special-purpose power outlet assemblies.
  9. Connectors, cords, and plugs.
  10. Wall switch sensor light switches with dual technology sensors.
  11. Wall switch sensor light switches with passive infrared sensors.
  12. Wall switch sensor light switches with ultrasonic sensors.
  13. Digital timer light switches.
  14. Wall-box dimmers.
  15. Wall plates.
  16. Floor service outlets.
  17. Poke-through assemblies.
  18. Prefabricated multioutlet assemblies.

#### 1.3 DEFINITIONS

- A. Abbreviations of Manufacturers' Names:
  1. Cooper: Cooper Wiring Devices; Division of Cooper Industries, Inc.
  2. Hubbell: Hubbell Incorporated: Wiring Devices-Kellems.
  3. Leviton: Leviton Mfg. Company, Inc.
  4. Pass & Seymour: Pass& Seymour/Legrand.
- B. BAS: Building automation system.
- C. EMI: Electromagnetic interference.
- D. GFCI: Ground-fault circuit interrupter.

- E. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- F. RFI: Radio-frequency interference.
- G. SPD: Surge protective device.
- H. UTP: Unshielded twisted pair.

#### 1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Attendees: Installers, fabricators, representatives of manufacturers, and administrators for field tests and inspections. Notify Architect, Construction Manager, and Owner's Commissioning Authority of scheduled meeting dates.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
- C. Samples: One for each type of device and wall plate specified, in each color specified.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Sustainable Design Closeout Documentation:
- B. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

#### 1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Extra Stock Items: Furnish extra materials to Owner that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Extra Keys for Key Lock Switches: One of each kind.
  - 2. SPD Receptacles: Equal to 10 percent of quantity installed for each kind specified, but no fewer than one units.
  - 3. Controlled Receptacles: Equal to 10 percent of quantity installed for each kind specified, but no fewer than one units.
  - 4. Cord Connectors: One of each kind.

B. Special Tools:

1. Proprietary equipment and software required to maintain, repair, adjust, or implement future changes to controlled receptacles.
2. Proprietary equipment required to maintain, repair, adjust, or implement future changes to cord connectors.

1.9 WARRANTY FOR DEVICES

A. Special Manufacturer Extended Warranty: Manufacturer warrants that devices perform in accordance with specified requirements and agrees to provide repair or replacement of devices that fail to perform as specified within extended warranty period.

1. Initial Extended Warranty Period: Three years from date of Substantial Completion; prorated coverage for labor, materials, and equipment.
2. Follow-On Extended Warranty Period: Eight years from date of Substantial Completion; prorated coverage for materials that failed because of transient voltage surges only, free on board destination, freight prepaid.

PART 2 - PRODUCTS

2.1 GENERAL-USE SWITCHES, DIMMER SWITCHES, AND FAN-SPEED CONTROLLER SWITCHES

A. Provide devices from one of the following manufacturers:

1. Cooper
2. Hubbell
3. Leviton

B. Toggle Switch:

1. Regulatory Requirements:

- a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
- b. Switches, 120/277 V, 20 A:
  - 1) Description: Single pole or double pole and three-way or four way switches as indicated on plans.
- c. Key-Operated Switches: 120/277 V, 20 A.
  - 1) Description: Single pole, with factory-supplied key in lieu of switch handle.
- d. Single-Pole, Double-Throw, Momentary-Contact, Center-off Switches: 120/277 V, 20 A; for use with mechanically held lighting contactors.

## 2.2 GENERAL-GRADE SINGLE STRAIGHT-BLADE RECEPTACLES

### A. Single Straight-Blade Receptacle:

#### 1. Regulatory Requirements:

- a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

#### 2. General Characteristics:

- a. Reference Standards: UL CCN RTRT and UL 498.

#### 3. Options:

##### a. Configuration:

- 1) General-duty, NEMA 5-20R.
- 2) General-duty, smooth face, NEMA 5-20R.
- 3) General-duty, NEMA 6-20R.
- 4) General-duty, smooth face, NEMA 6-20R.
- 5) Extra-heavy-duty, NEMA 5-20R.
- 6) Extra-heavy-duty, NEMA 6-20R.

#### 4. Accessories:

- a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
- b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

## 2.3 GENERAL-GRADE DUPLEX STRAIGHT-BLADE RECEPTACLES

### A. Duplex Straight-Blade Receptacle:

#### 1. Regulatory Requirements:

- a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

#### 2. General Characteristics:

- a. Reference Standards: UL CCN RTRT and UL 498.

#### 3. Options:

##### a. Configuration:

- 1) General-duty, NEMA 5-20R.

- 2) General-duty, smooth face, NEMA 5-20R.
- 3) General-duty, NEMA 6-20R.
- 4) General-duty, smooth face, NEMA 6-20R.
- 5) Heavy-duty, NEMA 5-20R.
- 6) Heavy-duty, smooth face, NEMA 5-20R.
- 7) Heavy-duty, NEMA 6-20R.
- 8) Heavy-duty, smooth face, NEMA 6-15R.
- 9) Heavy-duty, NEMA 7-15R.
- 10) Extra-heavy-duty, NEMA 5-20R.
- 11) Extra-heavy-duty, smooth face, NEMA 5-20R.
- 12) Extra-heavy-duty, NEMA 6-20R.
- 13) Extra-heavy-duty, smooth face, NEMA 6-20R.

4. Accessories:

- a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
- b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

B. Tamper-Resistant Duplex Straight-Blade Receptacle:

1. Regulatory Requirements:

- a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

2. General Characteristics:

- a. Reference Standards: UL CCN RTRT and UL 498.

3. Options:

- 1) General-duty, NEMA 5-20R.
- 2) General-duty, smooth face, NEMA 5-20R.
- 3) Heavy-duty, NEMA 5-20R.
- 4) Heavy-duty, smooth face, NEMA 5-20R.
- 5) Extra-heavy-duty, NEMA 5-20R.

4. Accessories:

- a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
- b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

C. Isolated Ground Duplex Straight-Blade Receptacle:

1. Regulatory Requirements:

- a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
- 2. General Characteristics:
  - a. Reference Standards: UL CCN RTRT and UL 498.
  - b. Dedicated Isolated ground circuits shall have orange colored receptacle devices.
- 3. Options:
  - a. Configuration:
    - 1) General-duty, NEMA 5-20R.
    - 2) General-duty, smooth face, NEMA 5-20R.
    - 3) Heavy-duty, NEMA 5-20R.
    - 4) Heavy-duty, smooth face, NEMA 5-20R.
    - 5) Extra-heavy-duty, NEMA 5-20R.
    - 6) Extra heavy-duty, NEMA 6-20R.
- 4. Accessories:
  - a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
  - b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.
- D. Isolated Ground Duplex Straight-Blade Receptacle with Type 3 Surge Protective Device:
  - 1. Regulatory Requirements:
    - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  - 2. General Characteristics:
    - a. Reference Standards:
      - 1) UL CCN RTRT and UL 498.
      - 2) Surge Protective Devices: UL 1449, Type 3.
    - b. Dedicated Isolated ground circuits shall have orange colored receptacle devices.
  - 3. Options:
    - a. Configuration: Heavy-duty, smooth face, NEMA 5-20R.
  - 4. Accessories:

- a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
  - b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.
  
- E. Tamper-Resistant Duplex Straight-Blade Receptacle with USB Outlet to Power Class 2 Equipment:
  - 1. Regulatory Requirements:
    - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  - 2. General Characteristics:
    - a. Reference Standards: UL CCN RTRT and UL 498.
  - 3. Options:
    - a. Configuration:
      - 1) General-duty, NEMA 5-20R; two USB-A ports.
      - 2) General-duty, NEMA 5-20R; two USB-C ports.
      - 3) General-duty, NEMA 5-20R; one USB-A port; one USB-C port.
      - 4) General-duty, smooth face, two USB-A ports.
      - 5) General-duty, smooth face, four USB-A ports.
  - 4. Accessories:
    - a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
    - b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.
  
- F. Wired Half-Controlled Duplex Straight-Blade Receptacle:
  - 1. Regulatory Requirements:
    - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  - 2. General Characteristics:
    - a. Reference Standards: UL CCN RTX1 and UL Subject 498B.
  - 3. Options:
    - a. Configuration: NEMA 5-20R.
  - 4. Accessories:

- a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
- b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

## 2.4 RECEPTACLES WITH ARC-FAULT AND GROUND-FAULT PROTECTIVE DEVICES

### A. General-Grade, Tamper-Resistant Duplex Straight-Blade Receptacle with AFCI Device:

#### 1. Regulatory Requirements:

- a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

#### 2. General Characteristics:

- a. Reference Standards: UL CCN AWBZ, UL 498, UL 1699, and UL Subject 1699A.
- b. Configuration: Heavy-duty, NEMA 5-20R.

#### 3. Accessories:

- a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
- b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

### B. General-Grade, Tamper-Resistant Duplex Straight-Blade Receptacle with AFCI and GFCI Device:

#### 1. Regulatory Requirements:

- a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

#### 2. General Characteristics:

- a. Reference Standards: UL CCN KCXX, UL 498, UL 943, UL 1699, and UL Subject 1699A.

#### 3. Options:

- a. Configuration: Heavy-duty, NEMA 5-20R.

#### 4. Accessories:

- a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
  - b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.
  
- C. General-Grade, Weather-Resistant, Tamper-Resistant Duplex Straight-Blade Receptacle with GFCI Device:
  - 1. Regulatory Requirements:
    - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  - 2. General Characteristics:
    - a. Reference Standards: UL CCN KCXS, UL 498, and UL 943.
  - 3. Options:
    - a. Configuration: Heavy-duty, NEMA 5-20R.
  - 4. Accessories:
    - a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
    - b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.
  
- D. General-Grade, Weather-Resistant, Tamper-Resistant, Nightlight-Type, Lighted Duplex Straight-Blade Receptacle with GFCI Device :
  - 1. Regulatory Requirements:
    - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  - 2. General Characteristics:
    - a. Reference Standards: UL CCN KCXS, UL 498, and UL 943.
  - 3. Options:
    - a. Configuration: Heavy-duty, NEMA 5-20R.
  - 4. Accessories:
    - a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.

- b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.
- E. NEMA, 125 V, Locking Receptacle:
  - 1. Regulatory Requirements:
    - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  - 2. General Characteristics:
    - a. Reference Standards: UL CCN RTRT and UL 498.
  - 3. Options:
    - a. Device Color: Black with yellow voltage indication on face.
- F. NEMA, 125 V, Isolated Ground Locking Receptacle:
  - 1. Regulatory Requirements:
    - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  - 2. General Characteristics:
    - a. Reference Standards: UL CCN RTRT and UL 498.
  - 3. Options:
    - a. Device Color: Black with yellow voltage indication on face.
- G. NEMA, 250 V, Locking Receptacle:
  - 1. Regulatory Requirements:
    - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  - 2. General Characteristics:
    - a. Reference Standards: UL CCN RTRT and UL 498.
  - 3. Options:
    - a. Device Color: Black with blue voltage indication on face.
- H. NEMA, 250 V, Isolated Ground Locking Receptacle:

1. Regulatory Requirements:
  - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. General Characteristics:
  - a. Reference Standards: UL CCN RTRT and UL 498.

## 2.5 PIN-AND-SLEEVE RECEPTACLES

### A. C2 Series, 125/250 V, Pin-and-Sleeve Receptacles:

1. Regulatory Requirements:
  - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. General Characteristics:
  - a. Reference Standards: UL CCN QLIW, UL 1682, and UL 1686.
  - b. Series: UL 1686 C2 and IEC 60309-2 Series II.
  - c. Voltage Rating: 125/250 V.

## 2.6 SPECIAL-PURPOSE POWER OUTLET ASSEMBLIES

### A. Power Outlet Cord Management Assembly:

1. Source Limitations: Obtain all components for each power outlet cord management assembly from single manufacturer.
2. Regulatory Requirements: Components listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
3. General Characteristics: Provide the following specified products with fabricated power outlet cord management assembly:

## 2.7 CONNECTORS, CORDS, AND PLUGS

### A. Outdoor-Use, Watertight, Sealed Cord Connector:

1. Regulatory Requirements:
  - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. General Characteristics:

a. Reference Standards: UL CCN AXUT and UL 498.

3. Options:

a. Configuration:

- 1) NEMA 5-15
- 2) NEMA 5-20
- 3) NEMA 6-15.
- 4) NEMA 6-20.
- 5) NEMA L5-15.
- 6) NEMA L5-20
- 7) NEMA L5-30.
- 8) NEMA L6-15.
- 9) NEMA L6-20.
- 10) NEMA L6-30.
- 11) NEMA L7-15.
- 12) NEMA L7-20.
- 13) NEMA L7-30.
- 14) NEMA L14-20.
- 15) NEMA L14-30.
- 16) NEMA L15-20.
- 17) NEMA L15-30.
- 18) NEMA L16-20.
- 19) NEMA L16-30.
- 20) NEMA L17-30.
- 21) NEMA L18-30.

2.8 WALL SWITCH SENSOR LIGHT SWITCH, DUAL TECHNOLOGY

A. Description: Switchbox-mounted, combination lighting-control sensor and conventional switch lighting-control unit using dual technology.

1. Rated 960 W at 120-V ac for tungsten lighting, 10 A at 120-V ac or 10 A at 277-V ac for fluorescent or LED lighting, and 1/4 hp at 120-V ac.
2. Integral relay for connection to BAS.
3. Adjustable time delay up to 30 minutes.
4. Able to be locked to either Automatic-On or Manual-On mode.
5. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.
6. Comply with NEMA WD 1, UL 20, and FS W-S-896.

2.9 WALL SWITCH SENSOR LIGHT SWITCH, PASSIVE INFRARED

A. Description: Switchbox-mounted, combination, lighting-control sensor and conventional switch lighting-control unit using passive infrared technology.

1. Rated 960 W at 120-V ac for tungsten lighting, 10 A at 120-V ac or 10 A at 277-V ac for fluorescent or LED lighting, and 1/4 hp at 120-V ac.
2. Integral relay for connection to BAS.
3. Adjustable time delay of 30 minutes.
1. Able to be locked to either Automatic-On or Manual-On mode.

2. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.
3. Comply with NEMA WD 1, UL 20, and FS W-S-896.

#### 2.10 WALL SWITCH SENSOR LIGHT SWITCH, ULTRASONIC

- A. Description: Switchbox-mounted, combination, lighting-control sensor and conventional switch lighting-control unit using ultrasonic technology.
  1. Rated 960 W at 120-V ac for tungsten lighting, 10 A at 120-V ac or 10 A at 277-V ac for fluorescent or LED lighting, and 1/4 hp at 120-V ac.
  2. Integral relay for connection to BAS.
  3. Adjustable time delay up to 30 minutes.
    1. Able to be locked to either Automatic-On or Manual-On mode.
    2. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.
    3. Comply with NEMA WD 1, UL 20, and FS W-S-896.

#### 2.11 WALL-BOX DIMMERS

- A. In all locations, contractor or lighting supplier shall verify compatibility of dimmer control with fixtures to be supplied.
- B. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.
- C. Control: Continuously adjustable with single-pole or three-way switching. Comply with UL 1472.
- D. Incandescent Lamp Dimmers: 120 V; control shall follow square-law dimming curve. On-off switch positions shall bypass dimmer module.
  1. 600 W; dimmers shall require no derating when ganged with other devices.
- E. LED Lamp Dimmer Switches: Modular; compatible with LED lamps; trim potentiometer to adjust low-end dimming; capable of consistent dimming with low end not greater than 20 percent of full brightness.

#### 2.12 WALL PLATES

- A. Single and combination types shall match corresponding wiring devices.
  1. Plate-Securing Screws: Metal with head color to match plate finish.
  2. Material for Finished Spaces: Coordinate with architect for color and material. Where plastic is required, plates shall be unbreakable nylon.
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant thermoplastic with lockable cover.

## 2.13 FLOOR SERVICE FITTINGS

- A. Type: Modular, flush-type, dual-service units suitable for wiring method used.
- B. Compartments: Barrier separates power from voice and data communication cabling.
- C. Service Plate: Round, with satin finish, verify color with architect.
- D. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.
- E. Voice and Data Communication Outlet: Blank cover with bushed cable opening.

## 2.14 FINISHES

- A. Device Color:
  - 1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
  - 2. Wiring Devices Connected to Emergency Power System: Red.
  - 3. Standby Power System Receptacles: Orange.
- B. Wall Plate Color: For plastic covers, match device color.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Receptacles:
  - 1. Verify that receptacles to be procured and installed for Owner-furnished equipment are compatible with mating attachment plugs on equipment.

### 3.2 INSTALLATION OF SWITCHES

- A. Comply with manufacturer's instructions.
- B. Reference Standards:
  - 1. Unless more stringent requirements are specified in Contract Documents or manufacturers' instructions, comply with installation instructions in NECA NEIS 130.
  - 2. Mounting Heights: Unless otherwise indicated in Contract Documents, comply with mounting heights recommended in NECA NEIS 1.
  - 3. Consult Architect for resolution of conflicting requirements.
- C. Identification:

1. Identify cover or cover plate for device with panelboard identification and circuit number in accordance with Section 26 05 53 "Identification for Electrical Systems."
  - a. Mark cover or cover plate using hot, stamped, or engraved machine printing with black-filled lettering, and provide durable wire markers or tags inside device box or outlet box.
  - b. Healthcare Facilities: Distinctively identify covers or cover plates of device boxes and outlet boxes that are supplied from life safety and critical branch power supplies following facility's standard practice.

### 3.3 INSTALLATION OF STRAIGHT-BLADE RECEPTACLES

- A. Comply with manufacturer's instructions.
- B. Reference Standards:
  1. Unless more stringent requirements are specified in Contract Documents or manufacturers' instructions, comply with installation instructions in NECA NEIS 130.
  2. Mounting Heights: Unless otherwise indicated in Contract Documents, comply with mounting heights recommended in NECA NEIS 1.
  3. Receptacle Orientation: Unless otherwise indicated in Contract Documents, orient receptacle to match configuration diagram in NEMA WD 6.
    - a. Hospital-Grade Receptacle Orientation: Orient receptacle with ground pin or neutral pin at top.
  4. Consult Architect for resolution of conflicting requirements.
- C. Identification:
  1. Identify cover or cover plate for device with panelboard identification and circuit number in accordance with Section 26 05 53 "Identification for Electrical Systems."
    - a. Mark cover or cover plate using hot, stamped, or engraved machine printing with black-filled lettering, and provide durable wire markers or tags inside device box or outlet box.
    - b. Healthcare Facilities: Distinctively identify covers or cover plates of device boxes and outlet boxes that are supplied from life safety and critical branch power supplies following facility's standard practice.
- D. Interfaces with Other Work:
  1. Do not install Type 3 SPD, including surge-protected relocatable taps and power strips, on branch circuit downstream of GFCI device.

### 3.4 INSTALLATION OF LOCKING RECEPTACLES

- A. Comply with manufacturer's instructions.

B. Reference Standards:

1. Unless more stringent requirements are specified in Contract Documents or manufacturers' instructions, comply with installation instructions in NECA NEIS 130.
2. Mounting Heights: Unless otherwise indicated in Contract Documents, comply with mounting heights recommended in NECA NEIS 1.
3. Receptacle Orientation: Unless otherwise indicated in Contract Documents, orient receptacle to match configuration diagram in NEMA WD 6.
4. Consult Architect for resolution of conflicting requirements.

C. Identification:

1. Identify cover or cover plate for device with panelboard identification and circuit number in accordance with Section 26 05 53 "Identification for Electrical Systems."
  - a. Mark cover or cover plate using hot, stamped, or engraved machine printing with black-filled lettering, and provide durable wire markers or tags inside device box or outlet box.

### 3.5 INSTALLATION OF PIN-AND-SLEEVE RECEPTACLES

A. Comply with manufacturer's instructions.

B. Reference Standards:

1. Unless more stringent requirements are specified in Contract Documents or manufacturers' instructions, comply with installation instructions in NECA NEIS 130.
2. Mounting Heights: Unless otherwise indicated in Contract Documents, comply with mounting heights recommended in NECA NEIS 1.
3. Receptacle Orientation: Unless otherwise indicated in Contract Documents, orient receptacle to match configuration diagram in UL 1686.
4. Consult Architect for resolution of conflicting requirements.

C. Identification:

1. Identify cover or cover plate for device with panelboard identification and circuit number in accordance with Section 26 05 53 "Identification for Electrical Systems."
  - a. Mark cover or cover plate using hot, stamped, or engraved machine printing with black-filled lettering, and provide durable wire markers or tags inside device box or outlet box. t
2. inspections.

### 3.6 FIELD QUALITY CONTROL

A. Test Instruments: Use instruments that comply with UL 1436.

- B. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- C. Perform the following tests and inspections:
  - 1. In healthcare facilities, prepare reports that comply with recommendations in NFPA 99.
  - 2. Test Instruments: Use instruments that comply with UL 1436.
  - 3. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- D. Tests for Convenience Receptacles:
  - 1. Line Voltage: Acceptable range is 105 to 132 V.
  - 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
  - 3. Ground Impedance: Values of up to 2 ohms are acceptable.
  - 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
  - 5. Using the test plug, verify that the device and its outlet box are securely mounted.
  - 6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.
- E. Test straight-blade hospital-grade convenience outlets for the retention force of the grounding blade according to NFPA 99. Retention force shall be not less than 4 oz..
- F. Wiring device will be considered defective if it does not pass tests and inspections.
- G. Prepare test and inspection reports.

### 3.7 SYSTEM STARTUP FOR SWITCHES

- A. Engage a factory-authorized service representative to perform startup service.
  - 1. Complete installation and startup checks for momentary switches, dimmer switches, and fan-speed controller switches in accordance with manufacturer's instructions.

### 3.8 ADJUSTING

- A. Occupancy Adjustments for Controlled Receptacles: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

### 3.9 PROTECTION

- A. Devices:

1. Schedule and sequence installation to minimize risk of contamination of wires and cables, devices, device boxes, outlet boxes, covers, and cover plates by plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other materials.
2. After installation, protect wires and cables, devices, device boxes, outlet boxes, covers, and cover plates from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

B. Connectors, Cords, and Plugs:

1. After installation, protect connectors, cords, and plugs from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

END OF SECTION 26 27 26