

## SECTION 262726 - WIRING DEVICES

### PART 1 - GENERAL

#### 1.1 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. Receptacles with arc-fault and ground-fault protective devices.
5. Locking receptacles.
6. Pin-and-sleeve receptacles.
7. Kitchen Exhaust Roof Fan Timer Controls and Communications outlets.
8. Wall Plates.

##### B. Related Requirements:

1. Section 260010 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.
2. Section 260533 "Raceways and Boxes for Electrical Systems" for mounting of electrical boxes.
3. Section 260923 "Lighting Control Devices" for occupancy sensors, timers, control-voltage switches, and control-voltage dimmers.

#### 1.2 ADMINISTRATIVE REQUIREMENTS

##### A. Coordination:

1. Receptacles for Owner-Furnished Equipment: Match plug configurations.

#### 1.3 ACTION SUBMITTALS

##### A. Product Data: For each type of product indicated.

##### B. Field Quality-Control Submittals:

1. Field quality-control reports.

#### 1.4 CLOSEOUT SUBMITTALS

##### A. Operation and maintenance data.

## PART 2 - PRODUCTS

### 2.1 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.
- B. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with NFPA 70.
- D. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
  - 1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
  - 2. Devices shall comply with the requirements in this Section.
- E. All receptacles, switches and cover plates shall be white.
- F. All 15 and 20 ampere receptacles must be Tamper Resistant type complying with NEC 406.11.
- G. All 15 and 20 ampere, 120 volt lighting and receptacle circuits in living rooms, bedrooms, dining rooms, closets, hallways, or similar rooms or areas shall be protected by a listed Arc-Fault Circuit Interrupter.
- H. All receptacle circuits in kitchens, bathrooms, outdoors, cellar/basement areas and laundry areas shall be protected by a listed Ground-Fault Circuit Interrupter.
- I. All receptacles and toggle switches must meet Federal Specification grade.

### 2.2 GENERAL-USE SWITCHES, DIMMER SWITCHES, AND FAN-SPEED CONTROLLER SWITCHES

- A. Toggle Switch:
  - 1. Comply with NEMA WD 1, UL 20, and FS W-S-896.
    - a. Configuration:
      - 1) General-duty, 120-277 V, 20 A.
- B. WALL-BOX DIMMERS:
  - 1. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.
  - 2. Control: Continuously adjustable on/off pushbutton with side rocker arm for dimming; with single-pole or three-way switching. Comply with UL 1472.
  - 3. Incandescent Lamp Dimmers: 120 V; control shall follow square-law dimming curve. On-off switch positions shall bypass dimmer module.
    - a. 1. 600 W; dimmers shall require no derating when ganged with other devices.

4. LED Lamp Dimmer Switches: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 20 percent of full brightness.

## 2.3 GENERAL-GRADE SINGLE STRAIGHT-BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 15 A: Comply with NEMA 5, Configuration 5-15R, UL 498, and FS W-C-596.
- B. Air Conditioner Receptacles, 125 V, 20 A: Comply with NEMA 5, Configuration 5-20R, UL 498, and FS W-C-596.
- C. GFCI RECEPTACLES
  1. General Description:
    - 1) Straight blade, non-feed-through type.
    - 2) Comply with NEMA WD 1, UL 498, UL 943 Class A, and FS W-C-596.
    - 3) Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.
- D. Duplex GFCI Convenience Receptacles, 125 V, 20 A:
- E. Weather Resistant, Duplex GFCI Convenience Receptacles, 125 V, 20 A: Comply with UL WC-596.

## 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. General-Grade, Tamper-Resistant Duplex Straight-Blade Receptacle with AFCI and GFCI Device:
  - 1.
  2. 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.

3. General Characteristics:

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

C. 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.

2.5 LOCKING RECEPTACLES

A. NEMA, 125 V, Locking Receptacle:

1.

2. 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.

3. General Characteristics:

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

B. 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.

2.6 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.

## 2.7 RESIDENTIAL DEVICES

- A. Kitchen Exhaust Roof Fan Timer Controls:
  1. 60-minute, 120-V, 20 amp, for on/off operation roof mounted kitchen exhaust fan.
- B. Telephone Outlet:
  1. Description: Single 4-Conductor Telephone Jack Flush mount telephone jacks for use in Cat. 3 RJ11, RJ14 and RJ25 applications.

## 2.8 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: Smooth, high-impact thermoplastic .
  3. Material for Unfinished Spaces: Galvanized steel .
  4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

## 2.9 FINISHES

- A. Device Color:
  1. Wiring Devices Connected to Normal Power System: White or as selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
- B. Wall Plate Color: For plastic covers, match device color.
- C. Wall Plate Insulating Gasket: Install air-sealing gaskets under wall plates on all interior wall devices located on exterior walls, gaskets as manufactured by IC Pro, model#OS200 or approved equal.

## 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.

#### B. Cord Reels:

1. Examine roughing-in for cord reel mounting and power connections to verify actual locations of mounts and power connections before cord reel installation.
2. Examine walls, floors, and ceilings for suitable conditions where cord reel will be installed.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 General requirements for installation:

#### A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

#### B. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

### 3.3 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 260553 "Identification for Electrical Systems."

D. Interfaces with Other Work: Coordination with Other Trades:

3.4 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:
  - a. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.
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 260553 "Identification for Electrical Systems."

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 260553 "Identification for Electrical Systems."

3.6 Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.

3.7 Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than **6 inches (152 mm)** in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.
10. Interior Walls between Units: Provide gasket to create air and fire-resistive seal.
11. Exterior Walls: Provide air/water-tight seal. Provide installation around full perimeter of boxes to prevent thermal conductance through wall.

3.8 Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

1. Install air-sealing gaskets under wall plates on all interior wall devices located on exterior walls, gaskets as manufactured by IC Pro, model#OS200 or approved equal.

3.9 Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

- A. Adjust locations of service poles to suit arrangement of partitions and furnishings.



### 3.10 GFCI RECEPTACLES

- A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

### 3.11 FIELD QUALITY CONTROL:

- A. Perform the following tests and inspections:
  - 1. Test Instruments: Use instruments that comply with UL 1436.
  - 2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- B. 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.
- C. Wiring device will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

### 3.12 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. Cord Reels and Fittings:
  - 1. After installation, protect cord reels and fittings 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.
- C. 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 262726