

SECTION 26 27 26

~~~ PROJECT NOTE ~~~~~

ARCHITECT OF RECORD/ENGINEER OF RECORD IS RESPONSIBLE FOR REVIEWING THIS SPECIFICATION SECTION IN DETAIL FOR COORDINATION WITH THE PROJECT SCOPE OF WORK.

ALL "PROJECT NOTE" TEXT IS TO BE REMOVED FOLLOWING REVIEW OF THE CONTENT OF EACH NOTE BY THE ARCHITECT OF RECORD/ENGINEER OF RECORD.

EDIT THE DOCUMENT FOOTER TO INCLUDE THE PROJECT NAME AND NUMBER.

EDIT THE DOCUMENT HEADER TO INDICATE THE ARCHITECT OF RECORD PROJECT ISSUE" DATE. THE "CPS CONTROL" DATE SHOULD NOT BE EDITED.

ANY MODIFICATIONS TO THE TECHNICAL STANDARDS IN THIS SECTION - INCLUDING THE REMOVAL OR ADDITION OF MANUFACTURERS - MUST BE APPROVED BY CPS.

REQUESTS FOR MODIFICATION ARE TO BE SUBMITTED TO THE DESIGN MANAGER DURING THE DESIGN PHASE FOR REVIEW AND APPROVAL.

~~~ END OF PROJECT NOTE ~~~~~

WIRING DEVICES

~~~ PROJECT NOTE ~~~~~

INDOOR SERVICES POLES ARE LOCATED IN SPECIFICATION SECTION 26 27 23 - LIGHTING CONTROL DEVICES.

MOTION SENSING DEVICES ARE LOCATED IN SPECIFICATION SECTION 26 09 23 - LIGHTING CONTROL DEVICES.

COMMUNICATION OUTLETS ARE LOCATED IN 27 15 00 - COMMUNICATIONS HORIZONTAL CABLING.

~~~ END OF PROJECT NOTE ~~~~~

PART 1 GENERAL

~~~ PROJECT NOTE ~~~~~

SELECT ALL DEVICES ASSOCIATED WITH PROJECT SCOPE.

~~~ END OF PROJECT NOTE ~~~~~

1.01 SECTION INCLUDES

- A. Wall switches.
- B. Wall dimmers.
- C. Fan speed controllers.
- D. Receptacles.
 - 1. Tamper Resistant Devices
 - 2. GFCI Devices
 - 3. Isolated Ground Devices
 - 4. Weather Resistant Devices

~~~ PROJECT NOTE ~~~~~

USB CHARGING DEVICES NOT TYPICAL.

~~~ END OF PROJECT NOTE ~~~~~

- 5. USB Charging Devices
 - 6. Surge Protective Devices
 - 7. Locking Devices
 - 8. Hazardous Location Devices
- E. Wall plates.

~~~ PROJECT NOTE ~~~
COORDINATE USAGE OF FLOOR BOXES AND POKE-THROUGH DEVICES WITH ARCHITECT AND STRUCTURAL SPECIFICATIONS.

~~~ END OF PROJECT NOTE ~~~

- F. Floor box service fittings.
- G. Poke-through assemblies.
- H. Multi-outlet assemblies.
- I. Cord and plug set.
- J. Pendant cord connector devices.

1.02 REFERENCE STANDARDS

- A. FS W-C-596 - Connector, Electrical, Power, General Specification for; Revision H, 2014.
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- C. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.
- D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.
- E. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2015).
- F. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2016.
- G. NFPA 101 - Life Safety Code; 2017.
- H. UL 20 - General-Use Snap Switches; Current Edition, Including All Revisions.
- I. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.
- J. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.
- K. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.
- L. UL 1310 - Class 2 Power Units; Current Edition, Including All Revisions.
- M. UL 1449 - Standard for Surge Protective Devices; Current Edition, Including All Revisions.
- N. UL 1472 - Solid-State Dimming Controls; Current Edition, Including All Revisions.
- O. UL 1917 - Solid-State Fan Speed Controls; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
 - 2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
 - 3. Coordinate the placement of outlet boxes for wall switches with actual installed door swings.
 - 4. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
 - 5. Coordinate the core drilling of holes for poke-through assemblies with the work covered under other sections.
 - 6. Notify Architect/Engineer of Record of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

- B. Sequencing:
 - 1. Do not install wiring devices until final surface finishes and painting are complete.

~~~ PROJECT NOTE ~~~~~
EDIT BELOW TO INCLUDE / EXCLUDE DEVICES THAT ARE REQUIRED FOR PROJECT SCOPE.
~~~ END OF PROJECT NOTE ~~~~~

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. See Section 01 33 29 - LEED Sustainable Design Reporting, when required.
- C. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.
 - 1. Wall Dimmers: Include derating information for ganged multiple devices.
 - 2. Surge Protection Receptacles: Include surge current rating, voltage protection rating (VPR) for each protection mode, and diagnostics information.
- D. Shop Drawings: List of legends and description of materials and process used for pre-marking wall plates.
- E. Certificates for Surge Protection Receptacles: Manufacturer's documentation of listing for compliance with UL 1449, 3rd Edition.
- F. Field Quality Control Test Reports.
- G. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- H. Operation and Maintenance Data:
 - 1. GFCI Receptacles: Include information on status indicators.
 - 2. Surge Protection Receptacles: Include information on status indicators.
 - 3. Acceptable cleaners and recommended cleaning practices for all wiring devices.
 - 4. Replacement parts list for all wiring devices.
 - 5. Manufacturer's service department contact information.
- I. Project Record Documents: Record actual installed locations of wiring devices.

~~~ PROJECT NOTE ~~~~~
IT IS RECOMMENDED FOR LARGER PROJECTS TO PROVIDE A PERCENTAGE OF TOTAL IN LIEU OF NUMBER OF DEVICES. COORDINATE WITH BOARD'S REPRESENTATIVE.

~~~ END OF PROJECT NOTE ~~~~~

- J. Maintenance Materials: Furnish the following for Board's Representative's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Screwdrivers for Tamper-Resistant Screws: Two (2) for each type of screw.
 - 3. Extra Keys for Locking Switches: Two (2) of each type.
 - 4. Extra Surge Protection Receptacles: Two (2) of each type.
 - 5. Extra Wall Plates: One (1) of each style, size, and finish.
 - 6. Extra Flush Floor Service Fittings: One (1) for every ten, but not less than one (1) of each type.
 - 7. Extra Poke-Through Core Hole Closure Plugs: One (1) for every ten, but not less than two (2) for each core size.

1.05 QUALITY ASSURANCE

- A. Conform to NFPA 101.
- B. Comply with the City of Chicago Electrical Code.

- C. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- D. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- E. Products: Listed and labeled as suitable for the purpose intended.
- F. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.
- G. Source Limitations: Obtain all wiring devices and associated wall plates from a single manufacturer and one source if available. Obtain each type of wiring device and associated wall plate through one source from a single manufacturer if not all wiring devices are available from a single source.

1.06 DELIVERY, STORAGE, AND PROTECTION

- A. Store in a clean, dry space in original manufacturer's packaging until ready for installation.

*~~~ PROJECT NOTE ~~~~~
EDIT BELOW TO INCLUDE/EXCLUDE DEVICES THAT ARE TO BE REQUIRED WITHIN THE SCOPE OF THE PROJECT.
~~~ END OF PROJECT NOTE ~~~~~*

## PART 2 PRODUCTS

### 2.01 WIRING DEVICE APPLICATIONS

- A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
- B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.
- C. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.
- D. Provide GFCI protection for receptacles installed within 6 feet of sinks.
- E. Provide GFCI protection for receptacles installed in kitchens.
- F. Provide GFCI protection for receptacles serving electric drinking fountains.

*~~~ PROJECT NOTE ~~~~~  
GFCI PROTECTION REQUIRED FOR VENDING MACHINES PER NEC 422.51.  
~~~ END OF PROJECT NOTE ~~~~~*

- G. Provide GFCI protection for receptacles serving vending machines.
- H. Provide isolated ground receptacles for receptacles serving computers and electronic cash registers and as requested by AV consultants.
- I. Unless noted otherwise, do not use combination switch/receptacle devices.
- J. For flush floor service fittings, use tile rings for installations in tile floors.

*~~~ PROJECT NOTE ~~~~~
FLUSH SERVICE FITTING NOT TYPICAL. INCLUDE BELOW IF REQUIRED FOR SCOPE OF PROJECT.*

~~~ END OF PROJECT NOTE ~~~~~

- K. For flush floor service fittings, use carpet flanges for installations in carpeted floors.

2.02 WIRING DEVICE FINISHES

- A. Provide wiring device finishes as described below unless otherwise indicated.

1. Wiring Devices, Unless Otherwise Indicated: Ivory with satin-finished stainless steel wall plate.
2. Wiring Devices Installed in Finished Spaces: Ivory with satin-finished stainless steel wall plate.
3. Wiring Devices Installed in Unfinished Spaces: Gray with galvanized steel wall plate.
4. Wiring Devices Installed Damp Locations: White with cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet location".
5. Isolated Ground Convenience Receptacles: Orange.
6. Surge Protection Receptacles: Blue.
7. Wiring Devices Connected to Emergency Power: Red with red nylon wall plate.
8. Flush Floor Box Service Fittings: Gray wiring devices with aluminum cover and ring/flange.
9. Flush Poke-Through Service Fittings: Gray wiring devices with aluminum cover and aluminum flange.
10. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with type 3R weather-resistant, die-cast aluminum with lockable cover.

2.03 WALL SWITCHES

- A. Manufacturers subject to compliance with requirements, provide products by one of the following manufacturers:
 1. Hubbell Incorporated: www.hubbell-wiring.com.
 2. Leviton Manufacturing Company, Inc: www.leviton.com.
 3. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us
 4. Cooper Wiring Devices, a division of Cooper Industries, Inc.;
<http://www.cooperindustries.com>.
- B. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20; types as indicated on the drawings.
 1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.
- C. Standard Wall Switches: Heavy Duty specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.
- D. Lighted Wall Switches: Heavy Duty specification grade, 20 A, 120/277 V with illuminated standard toggle type switch actuator and maintained contacts; illuminated with load off; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.
- E. Pilot Light Wall Switches: Heavy Duty specification grade, 20 A, 120/277 V with red illuminated standard toggle type switch actuator and maintained contacts; illuminated with load on; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.
- F. Locking Wall Switches: Heavy Duty specification grade, 20 A, 120/277 V with lever type keyed switch actuator and maintained contacts; switches keyed alike; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.
- G. Momentary Contact Wall Switches: Heavy Duty specification grade, 20 A, 120/277 V with toggle type three position switch actuator and momentary contacts; single pole double throw, off with switch actuator in center position.
- H. Locking Momentary Contact Wall Switches: Heavy Duty specification grade, 20 A, 120/277 V with lever type keyed three position switch actuator and momentary contacts; switches keyed alike; single pole double throw, off with switch actuator in center position.

2.04 WALL DIMMERS

- A. Manufacturers subject to compliance with requirements, provide products by one of the following manufacturers:
 - 1. Leviton Manufacturing Company, Inc: www.leviton.com.
 - 2. Lutron Electronics Company, Inc: www.lutron.com/#sle.
 - 3. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us.
 - 4. Cooper Wiring Devices, a division of Cooper Industries, Inc.; <http://www.cooperindustries.com>.
 - 5. Hubbell Incorporated: www.hubbell-wiring.com.
- B. Wall Dimmers - General Requirements: Solid-state with continuous full-range even control following square law dimming curve, integral radio frequency interference filtering, power failure preset memory, air gap switch accessible without removing wall plate, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 1472; types and ratings suitable for load controlled as indicated on the drawings.
- C. Control: Continuously adjustable slide control type with separate on/off switch..
- D. Power Rating, Unless Otherwise Indicated or Required to Control the Load Indicated on the Drawings:
 - 1. Incandescent: 600 W.
 - 2. Magnetic Low-Voltage: 600 VA.
 - 3. Electronic Low-Voltage: 400 VA.
 - 4. Fluorescent: 600 VA.
 - 5. LED: 600 VA
- E. Provide locator light, illuminated with load off.
- F. Provide accessory wall switches to match dimmer appearance when installed adjacent to each other.
- G. 600W dimmers shall require no derating when ganged with other devices.
- H. Florescent 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.

2.05 FAN SPEED CONTROLLERS

- A. Manufacturers subject to compliance with requirements, provide products by one of the following manufacturers:
 - 1. Leviton Manufacturing Company, Inc: www.leviton.com.
 - 2. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us.
 - 3. Hubbell Incorporated: www.hubbell-wiring.com.
 - 4. Cooper Wiring Devices, a division of Cooper Industries, Inc.; www.cooperindustries.com.
- B. Description: 120 V AC, solid-state, full-range variable speed, slide control type with separate on/off switch, with integral radio frequency interference filtering, fan noise elimination circuitry, field-adjustable trim, power failure preset memory, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 1917.
 - 1. Continuously adjustable slider, 5A.
 - 2. Three-speed adjustable slider, 1.5A.

2.06 RECEPTACLES

- A. Manufacturers subject to compliance with requirements, provide products by one of the following manufacturers:
 - 1. Hubbell Incorporated: www.hubbell-wiring.com.
 - 2. Leviton Manufacturing Company, Inc: www.leviton.com.
 - 3. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us.
 - 4. Cooper Wiring Devices, a division of Cooper Industries, Inc.; <http://www.cooperindustries.com>.

5. Source Limitations: Where wall controls are furnished as part of lighting control system, provide accessory matching receptacles and wallplates by the same manufacturer.
- B. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.
 1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
 2. NEMA configurations specified are according to NEMA WD 6.
- C. Convenience Receptacles:
 1. Standard Convenience Receptacles: Heavy duty specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.
 2. Automatically Controlled Convenience Receptacles: Heavy duty specification grade 20A, 125V, NEMA 5-20R; controlled receptacle marking on device face per the City of Chicago Electrical Code; single or duplex as indicated on the drawings. Permanent power control signage affixed to face plate.
 3. Isolated Ground Convenience Receptacles: Heavy duty specification grade, 20A, 125V, NEMA 5-20R, with ground contacts isolated from mounting strap; isolated ground triangle mark on device face; single or duplex as indicated on the drawings.
 - a. Isolation shall be integral to receptacle construction and not dependent on removable parts.
 4. Weather Resistant Convenience Receptacles: Heavy duty specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations; single or duplex as indicated on the drawings.
 5. Tamper Resistant Convenience Receptacles: Heavy duty specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as tamper resistant type; single or duplex as indicated on the drawings.
 6. Tamper Resistant and Weather Resistant Convenience Receptacles: Heavy duty specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as tamper resistant type and as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations; single or duplex as indicated on the drawings.
 7. Illuminated Convenience Receptacles: Heavy duty specification grade 20A, 125V, NEMA 5-20R; illuminated face or indicator light to indicate power is being supplied to receptacle; single or duplex as indicated on the drawings.
- D. GFCI Receptacles:
 1. GFCI Receptacles - General Requirements: Self-testing, non-feed-through type with light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
 - a. Provide test and reset buttons of same color as device.
 2. Standard GFCI Receptacles: Heavy duty specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style.
 3. Weather Resistant GFCI Receptacles: Heavy duty specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.
 4. Tamper Resistant GFCI Receptacles: Heavy duty specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as tamper resistant type.
- E. Tamper Resistant and Weather Resistant GFCI Receptacles: Heavy duty specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as tamper resistant type and as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.
- F. USB Charging Devices:
 1. USB Charging Devices - General Requirements: Listed as complying with UL 1310.

- a. Charging Capacity - Two-Port Devices: 2.1 A, minimum.
 - b. Charging Capacity - Four-Port Devices: 4.2 A, minimum.
 2. USB Charging/Tamper Resistant Receptacle Combination Devices: Two-port (Type A) USB charging device and receptacle, commercial specification grade, duplex, 20A, 125V, NEMA 5-20R, listed and labeled as tamper resistant type; rectangular decorator style.
 3. USB Charging Noncombination Devices: Four-port (Type A); rectangular decorator style.
- G. Surge Protection Receptacles:
1. Surge Protection Receptacles - General Requirements: Listed and labeled as complying with UL 498 and UL 1449, Type 2 or 3.
 - a. Energy Dissipation: Not less than 240 J per mode.
 - b. Protected Modes: L-N, L-G, N-G.
 - c. UL 1449 Voltage Protection Rating (VPR): Not more than 700 V for L-N, L-G modes and 1200 V for N-G mode.
 - d. Diagnostics:
 - 1) Visual Notification: Provide indicator light to report functional status of surge protection.
 - 2) Audible Notification: Provide audible alarm to report that surge protection is not functional.
 - e. Multiple metal-oxide varistors; with a nominal clamp-level rating of 400 volts.
 2. Standard Surge Protection Receptacles: Heavy duty specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style.
 3. Isolated Ground Surge Protection Receptacles: Heavy duty specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, with ground contacts isolated from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.
- H. Locking Receptacles: Heavy duty specification grade, configuration as indicated on the drawings.
1. Standard Locking Convenience Receptacles: Single, 20A, 125V, NEMA L5-20R.
- I. Clock Hanger Receptacles: Single, 15A, 125V, NEMA 5-15R.
- J. Hazardous Location Receptacles: Wiring Devices for Hazardous (Classified) Location: Comply with NEMA FB 11 and UL 1010.

2.07 WALL PLATES

- A. Manufacturers:
1. Hubbell Incorporated: www.hubbell-wiring.com.
 2. Leviton Manufacturing Company, Inc: www.leviton.com.
 3. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us
 4. Cooper Wiring Devices, a division of Cooper Industries, Inc.;
<http://www.cooperindustries.com>.
 5. Source Limitations: Where wall controls are furnished as part of lighting control system, provide accessory matching receptacles and wallplates by the same manufacturer.

~~~ PROJECT NOTE ~~~
WALL PLATES TO BE UTILIZED WITH DEVICES TO BE SELECTED. TURN OFF DEVICES THAT ARE NOT TO BE USED WITHIN THE PROJECT SCOPE.
~~~ END OF PROJECT NOTE ~~~

- B. Wall Plates: Comply with UL 514D.
1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
 2. Size: Standard.
 3. Screws: Metal with slotted heads finished to match wall plate finish.
 4. Provide screwless wallplates with concealed mounting hardware where indicated.

- C. Finish Spaces shall use Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.
- D. Aluminum Wall Plates: Smooth satin finish, clear anodized, factory-coated to inhibit oxidation.
- E. Unfinished Spaces shall use Galvanized Steel Wall Plates: Rounded corners and edges, with corrosion resistant screws.
- F. Weatherproof Covers for Damp Locations: Gasketed, cast aluminum, with self-closing hinged cover and corrosion-resistant screws; listed as suitable for use in wet locations with cover closed.
- G. Weatherproof Covers for Wet Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected and identified as extra-duty type.
 - 1. NEMA 250, flush-type, units suitable for wiring method used. Die-cast aluminum with satin finish.

2.08 FLOOR BOX SERVICE FITTINGS

- A. Manufacturers:
 - 1. Hubbell Incorporated: www.hubbell-wiring.com.
 - 2. Thomas & Betts Corporation: www.tnb.com.
 - 3. Wiremold, a brand of Legrand North America, Inc: www.legrand.us
- B. Description: Service fittings compatible with floor boxes provided under Section 26 05 33.16 - Boxes for Electrical Systems with components, adapters, and trims required for complete installation.
- C. Flush Floor Service Fittings:
 - 1. Modular, flush-type, units suitable for wiring method used. Die-cast aluminum with satin finish.
 - 2. Single Service Flush Convenience Receptacles:
 - a. Cover: Rectangular.
 - b. Configuration: One standard convenience duplex receptacle(s) with duplex flap opening(s).
 - 3. Single Service Flush Communications Outlets:
 - a. Cover: Rectangular.
 - b. Configuration: As indicated on drawings.
 - c. Voice and Data Jacks: As specified in Section 27 15 00 - Data Communications Horizontal Cabling.
 - 4. Single Service Flush Furniture Feed:
 - a. Cover: Rectangular.
 - b. Configuration: One 2-1/8 inch by 3/4 inch combination threaded opening(s).
 - 5. Dual Service Flush Combination Outlets:
 - a. Cover: Rectangular.
 - b. Configuration:
 - 1) Power: One standard convenience duplex receptacle(s) with duplex flap opening(s).
 - 2) Communications: As indicated on drawings.
 - 3) Voice and Data Jacks: As specified in Section 27 15 00 - Data Communications Horizontal Cabling.
 - 4) Compartment barrier to separate power from voice and data communication cabling.
 - 6. Dual Service Flush Furniture Feed:
 - a. Cover: Rectangular.
 - b. Configuration:
 - 1) Power: One 2-1/8 inch by 3/4 inch combination threaded opening(s).
 - 2) Communications: One 2-1/8 inch by 1 inch combination threaded opening(s).

- 3) Compartment barrier to separate power from voice and data communication cabling.
7. Accessories:
 - a. Tile Rings: Finish to match covers; configuration as required to accommodate specified covers.
 - b. Carpet Flanges: Finish to match covers; configuration as required to accommodate specified covers.

2.09 POKE-THROUGH ASSEMBLIES

- A. Manufacturers:
 1. Hubbell Incorporated: www.hubbell-wiring.com.
 2. Pass & Seymour, a brand of Legrand North America, Inc.: www.legrand.us
 3. Wiremold, a brand of Legrand North America, Inc: www.legrand.us
- B. Description: Assembly comprising floor service fitting, poke-through component, fire stops and smoke barriers, and junction box for conduit termination; fire rating listed to match fire rating of floor and suitable for floor thickness where installed.
- C. Wiring Raceways and Compartments: Sized for a minimum of four (4) No. 12 AWG conductors and a minimum of four (4) 4-pair Category 6 UTP communication cables. Comply with requirements of Section 27 15 00 - Data Communications Horizontal Cabling for Category 6 UTP components.
- D. Flush Floor Service Fittings:
 1. Single Service Flush Convenience Receptacles:
 - a. Configuration: One standard convenience duplex receptacle(s) with duplex flap opening(s).
 2. Single Service Flush Communications Outlets:
 - a. Configuration: As indicated on drawings.
 - b. Voice and Data Jacks: As specified in Section 27 15 00 - Data Communications Horizontal Cabling.
 3. Single Service Flush Furniture Feed:
 - a. Configuration: One 2 inch by 1-1/4 inch combination threaded opening(s).
 4. Dual Service Flush Combination Outlets:
 - a. Cover: Hinged door(s).
 - b. Configuration:
 - 1) Power: One standard convenience duplex receptacle(s).
 - 2) Communications: As indicated on drawings.
 - 3) Voice and Data Jacks: As specified in Section 27 15 00 - Data Communications Horizontal Cabling.
 5. Dual Service Flush Furniture Feed:
 - a. Configuration:
 - 1) Power: One 3/4 inch threaded opening(s).
 - 2) Communications: One 1-1/4" threaded opening(s).
 6. Accessories:
 - a. Closure Plugs: Size and fire rating as required to seal unused core hole and maintain fire rating of floor.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with the City of Chicago Electrical Code.
- C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- D. Verify that final surface finishes are complete, including painting.

- E. Verify that floor boxes are adjusted properly.
- F. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- G. Verify that core drilled holes for poke-through assemblies are in proper locations.
- H. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 26 05 33.16 - Boxes for Electrical Systems as required for installation of wiring devices provided under this section.
 - 1. Mounting Heights: Unless otherwise indicated, as follows:
 - a. Wall Switches: 48 inches above finished floor.
 - b. Wall Dimmers: 48 inches above finished floor.
 - c. Fan Speed Controllers: 48 inches above finished floor.
 - d. Receptacles: 18 inches above finished floor or 6 inches above counter.
 - 2. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.
 - 3. Where multiple receptacles, wall switches, or wall dimmers are installed at the same location and at the same mounting height, gang devices together under a common wall plate.
 - 4. Locate wall switches on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Architect/Engineer of Record to obtain direction prior to proceeding with work.
 - 5. Locate receptacles for electric drinking fountains concealed behind drinking fountain according to manufacturer's instructions.
- C. Install wiring devices in accordance with manufacturer's instructions.
- D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- E. Conductors:
 - 1. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.
 - 2. The length of free conductors at outlets for devices shall meet provision of the City of Chicago Electrical Code, without pigtails.
 - 3. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
 - 4. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
 - 5. Strip insulation evenly around conductors using tooler designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 - 6. Pigtailing existing conductors is permitted provided the outlet box is large enough.
 - 7. Damaged existing conductors shall be removed and replaced.
- F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.
- G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

- H. For isolated ground receptacles, connect wiring device grounding terminal only to identified branch circuit isolated equipment grounding conductor. Do not connect grounding terminal to outlet box or normal branch circuit equipment grounding conductor.
- I. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.
- J. Where split-wired duplex receptacles are indicated, remove tabs connecting top and bottom receptacles.
- K. Install wiring devices plumb and level with mounting yoke held rigidly in place.
- L. Install wall switches with OFF position down.
- M. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.
 - 1. Install dimmers with terms of their listings.
 - 2. Verify that dimmers used for fan speed are listed for that application.
 - 3. Install unsharded neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.
- N. Do not share neutral conductor on branch circuits utilizing wall dimmers.
- O. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.
- P. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
- Q. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.
- R. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings. Isolated Ground Receptacles: Connect to isolated grounding conductor routed to designated isolated equipment ground terminal of electrical system.
- S. Identify wiring devices in accordance with Section 26 05 53 - Identification for Electrical Systems.
 - 1. Receptacles: Identify panelboard and circuit number from which served. Use hot, stamped or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.
 - 2. Switches: Where three or more switches are ganged, and elsewhere where indicated, identify each switch with approved legend engraved with black-filled lettering on face of wall plate.
- T. Install poke-through closure plugs in each unused core holes to maintain fire rating of floor.
- U. Do not used 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.
- V. Pendant Cord-Connector Devices:
 - 1. Matching, locking-type plug and receptacle body connector; NEMA WD 6 configurations L5-20P and L5-20R, heavy-duty grade.
 - a. Body: Nylon with screw-open cable-gripping jaws and provision for attaching external cable grip.
 - b. External Cable Grip: Woven wire-mesh type made of high-strength galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.
- W. Comply with Section 26 05 53 - Identification for Electrical Systems for labeling of wiring devices.

1. Receptacles: Identify panelboard and circuit number from which served. Use hot stamped or engraved machine printing with black-filled lettering on face plate, and durable wire markers or tags inside of outlet boxes.
2. Switches: Where 3 or more switches are ganged, and elsewhere where indicated, identify each switch with approved legend engraved with black-filled lettering on face of wall plate.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. Inspect each wiring device for damage and defects.
- C. Operate each wall switch, wall dimmer, and fan speed controller with circuit energized to verify proper operation.
- D. Test each receptacle to verify operation and proper polarity.
 1. Perform tests and inspections and prepare test reports.
 - a. Test Instruments: Use instruments that comply with UL 1436.
 - b. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.
 - c. Test Wiring Devices: Test wiring devices for proper polarity and ground continuity. Operate each operable device at least 6 times.
 2. Tests for Convenience Receptacles:
 - a. Line Voltage: Acceptable range is 105 to 132 V.
 - b. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is not acceptable.
 - c. Ground Impedance: Values of up to 2 ohms are acceptable.
 - d. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 - e. Using the test plug, verify that the device and its outlet box are securely mounted.
 - f. The 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. Inspect each surge protection receptacle to verify surge protection is active.
- F. Correct wiring deficiencies and replace damaged or defective wiring devices.
- G. Contactor Startup and Reporting:
 1. Contractor shall prepare and submit a complete set of record drawings, test reports, operation and maintenance data and certificates as outlined in this Section.
- H. Commissioning and Demonstration:
 1. After system checkout and adjustment, the Contractor shall operate the system for the review of the Board and Architect/Engineer of Record. Necessary adjustments or modifications shall be made as required by the Board or Architect/Engineer of Record.

3.05 ADJUSTING

- A. Adjust devices and wall plates to be flush and level.
- B. Adjust presets for wall dimmers according to manufacturer's instructions as directed by Architect/Engineer of Record.

3.06 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.
- B. 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.

END OF SECTION 26 27 26