

## SECTION 16140 - WIRING DEVICES

## PART 1 - GENERAL

## 1.1 SUBMITTALS

- A. Product Data: For each product specified.

## 1.2 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- B. Comply with NEMA WD 1.
- C. Comply with NFPA 70.

## 1.3 COORDINATION

- A. Receptacles for Owner-Furnished Equipment: Match plug configurations.
  - 1. Cord and Plug Sets: Match equipment requirements.

## PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Wiring Devices:
    - a. Hubbell, Inc.; Wiring Devices Div.
    - b. Leviton Manufacturing Co., Inc.
    - c. Pass & Seymour/Legrand; Wiring Devices Div.

## 2.2 RECEPTACLES: All receptacles shall be ivory.

- A. Straight-Blade and Locking Receptacles: Heavy duty, specification grade, side wired, rated 20 A, minimum.
- B. GFCI Receptacles: Feed-through type, with integral NEMA WD 6, side wired, Configuration 5-20R duplex receptacle arranged to protect connected downstream receptacles on same circuit. Design units for installation in a 2-3/4-inch- deep outlet box without an adapter.
- C. Weatherproof Receptacles shall consist of a duplex GFI, specification grade, receptacle, as specified, mounted in box with a gasketed, weatherproof, cast metal cover plate and cap over each receptacle opening. The cap shall be permanently attached to the cover plate by a spring hinged flap. The weatherproof integrity shall not be affected when heavy-duty specification or hospital grade attachment plug caps are inserted. Cover plates on outlet boxes mounted flush in the wall shall be gasketed to the wall in a watertight manner.

### 2.3 CORD AND PLUG SETS

- A. Description: Match voltage and current ratings and number of conductors to requirements of equipment being connected.
1. Cord: Rubber-insulated, stranded-copper conductors, with type SOW-A jacket. Green-insulated grounding conductor, and equipment-rating ampacity plus a minimum of 30 percent.
  2. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

### 2.4 SWITCHES shall be ivory

- A. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on/off switches and audible and electromagnetic noise filters.
1. Control: Continuously adjustable slide. Single-pole or three-way switch to suit connections.
  2. Incandescent Lamp Dimmers: Modular, 120 V, 60 Hz with continuously adjustable slide; single pole with soft tap or other quiet switch; electromagnetic filter to eliminate noise, RF, and TV interference; and 5-inch wire connecting leads.
- B. Toggle Switches shall be ivory, totally enclosed tumbler type with bodies of phenolic compound.
1. Fed. Spec. W-S-896/2 shall apply.
  2. Single unit toggle, butt contact, quiet AC type, heavy-duty general use with an integral mounting strap with provisions for back wiring with separate metal wiring clamps and side wiring with captively held binding screws.
  3. Shall be color coded for current rating, listed by Underwriter's Laboratories, Inc., and meeting the requirements of NEMA WD 1-Heavy Duty and Fed. Spec W-S-896.
  4. Ratings: 20 ampere unless noted otherwise at 120 volts AC, side wired.
- C. Contactors and Relays:
1. Contactors shall be arranged for two or three wire control as necessary to interface with control devices indicated on the drawings.
  2. Provide electrically operated, magnetically-latched mechanically-held type lighting contactors with form "C" auxiliary Contacts and number of poles required to connect items shown on drawings.
  3. Minimum amp rating 125% of load.
  4. Relays shall be rated for 125% of connected load, electrically held, with number of poles as needed.
  5. Contactors and relays shall be furnished in enclosures that have NEMA ratings appropriate for the environment in which they are installed.
- D. Disconnect Switches:
1. Disconnect switches for single phase fractional horsepower motors shall be HP rated toggle switches.
  2. Disconnect switches for integral horsepower motors and all three phase loads shall be NEMA Type HD, HP rated safety switches with visible blades. All current carrying parts shall be plated. Switch operating handle shall be color and position indicating. Switches shall be horsepower rated for AC circuits at the applied voltage.
  3. Fused disconnect switches shall have class R fuse clips through 600 amps. Over 600 amps fuses shall be Class L current limiting.

4. Switches on the roof or exposed to the weather shall be NEMA-3R. Switches in wet areas shall be NEMA 4 unless otherwise noted. Switches in all other areas shall be NEMA-1.
5. Switch mechanism shall be the quick-make, quick-break type.
6. Copper blades shall be visible in the OFF position.
7. External operating handle shall indicate ON and OFF position and shall have lock-open padlocking provisions.
8. Mechanical interlock shall permit opening of the door only when the switch is in the OFF position, defeatable by a special tool to permit inspection.
9. Solid neutral for each switch being installed in a circuit which includes a neutral conductor.
10. All disconnect switches shall be sized for the load. Single phase switches shall be minimum 20 amps and three phase switches shall be minimum 30 amps.

E. Occupancy Sensing Switches

1. Switch box type occupancy sensors: Watt Stopper model WA-200 or approved equal.
  - a. PIR type with integral power-switching contacts rated for 800 W at 120-V ac, suitable for incandescent light fixtures, fluorescent light fixtures with magnetic or electronic ballasts, or 1/6-hp motors; and rated for 1000 W at 277-V ac, suitable for incandescent light fixtures, fluorescent light fixtures with magnetic or electronic ballasts, or 1/3-hp motors, minimum.
  - b. Include ground wire.
  - c. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc; keeps lighting off when selected lighting level is present. This feature shall be capable of being enabled or disabled in the field. Set for disabled.
  - d. Configure occupancy sensors for manual-on/automatic-off operation.
2. Indoor occupancy Sensors
  - a. General Description: Wall- or ceiling-mounting, solid-state units with a separate relay unit.
    - 1) Operation: Unless otherwise indicated, turn lights on when covered area is occupied and off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
    - 2) Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor shall be powered from the relay unit.
    - 3) Relay Unit: Dry contacts rated for 20-A ballast load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Power supply to sensor shall be 24-V dc, 150-mA, Class 2 power source as defined by NFPA 70.
    - 4) Mounting:
      - a) Sensor: Suitable for mounting in any position on a standard outlet box.
      - b) Relay: Externally mounted through a 1/2-inch knockout in a standard electrical enclosure.
      - c) Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
    - 5) Indicator: LED, to show when motion is being detected during testing and normal operation of the sensor.
    - 6) Bypass Switch: Override the on function in case of sensor failure.
  - b. Corridor/Stairway Occupancy Sensors: Watt Stopper WT2255 or approved equal.
    - 1) Ultrasonic Type: detect occupancy by sensing a change in pattern of reflected ultrasonic energy in area of coverage.

- 2) Wall mount at 72" AFF in stairways.
- c. Dual-Technology Type: Watt Stopper DT200 or approved equal
  - 1) Wall mounting; detect occupancy by using a combination of PIR and ultrasonic detection methods in area of coverage. Particular technology or combination of technologies that controls on and off functions shall be selectable in the field by operating controls on unit.
  - 2) Sensitivity Adjustment: Separate for each sensing technology.
  - 3) Detector Sensitivity: Detect occurrences of 6-inch minimum movement of any portion of a human body that presents a target of at least 36 sq. in., and detect a person of average size and weight moving at least 12 inches in either a horizontal or a vertical manner at an approximate speed of 12 inches/s.
  - 4) Detection Coverage: Detect occupancy anywhere within an area of 2000 sq. ft. when mounted on a 96-inch- high ceiling.

## 2.5 WALL PLATES shall be ivory nylon

- A. Single and combination types match corresponding wiring devices.
  1. Plate-Securing Screws: Metal with head color to match plate finish.
- B. Provide blank plates for all junction or device boxes that are left unused as spare or future use.

## 2.6 LIGHTING

- A. Provide light fixtures as listed in schedule.
- B. General notes:
  1. Catalog series numbers are used to establish a level of quality and not intended to limit competition. Series numbers are not complete catalog numbers. Comply with additional requirements in specifications and drawings.
  2. Except as indicated otherwise on fixture schedule, suspended light fixtures shall be furnished and installed complete with steel stem sets, and pieces and aligners with aligner type canopies as manufactured by respective fixture manufacturer.
  3. Pendant mounting heights are to bottom of fixture. Verify exact mounting heights of pendant fixtures with architect prior to roughing.
  4. Wall mount fixture heights are to centerline unless noted otherwise. Verify exact mounting heights and locations of wall mounted lighting with architect prior to roughing.
  5. Refer to reflected ceiling plans for exact location of ceiling mounted lighting and devices.
  6. Provide trim and mounting accessories for recessed lighting fixtures which are compatible with the type of ceiling construction in which they are to be mounted. Refer to reflected ceiling plans and room finish schedules.
  7. Light fixture locations in mechanical rooms and electric rooms are approximate. Install lighting to avoid ductwork, piping and electrical items.

## 2.7 DOOR ANSWERING SYSTEM

- A. Provide building door answering system with telephone entry control by Jeron, Silent Knight, Viking Electronics or approved equal. The master entry station shall be handsfree, flush mounted. Unit shall be programmable and shall include a keypad where tenants can gain access via their individual security code. Provide a lobby directory panel with names and unit numbers

in typewritten text. Apartments shall not be required to have utility telephone service in order to use the system.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install devices and assemblies plumb and secure.
- B. Install wall plates when painting or wall-finish application is complete.
- C. Install wall dimmers to achieve indicated rating after derating for ganging as instructed by manufacturer.
- D. Do not share neutral conductor on load side of dimmers.
- E. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.
- F. Protect devices and assemblies during painting.

#### 3.2 IDENTIFICATION

- A. Comply with Division 16 Section "Basic Electrical Materials and Methods."
  - 1. Switches: Where three or more switches are ganged, and elsewhere as indicated, identify each switch with approved legend engraved on wall plate.
  - 2. Receptacles: Identify panelboard and circuit number from which served. Use machine-printed, pressure-sensitive, abrasion-resistant label tape on inside of plate and durable wire markers or tags within outlet boxes.

#### 3.3 CONNECTIONS

- A. Connect wiring device grounding terminal to branch-circuit equipment grounding conductor.
- B. Tighten electrical connectors and terminals according to manufacturers published torque-tightening values. If manufacturers torque values are not indicated, use those specified in UL 486A and UL 486B.

#### 3.4 FIELD QUALITY CONTROL

- A. Test wiring devices for proper polarity and ground continuity. Operate each device at least six times.
- B. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.
- C. Replace damaged or defective components.

#### 3.5 CLEANING

- A. Internally clean devices, device outlet boxes, and enclosures. Replace stained or improperly painted wall plates or devices.

END OF SECTION 16140