Wiring Devices

Scope

All wiring devices shall be UL -extra-heavy duty. See Preferred Manufacturer's List for specific information on acceptable products.

Devices shall have a minimum rating of 20-amperes.

Wiring devices connected to 'normal power' shall be supplied in the manufacturer's standard color closest to 'Ivory', unless noted otherwise. If Ivory is not available, in special application devices, use the manufacturer's standard brown.

Wiring devices connected to 'emergency power' shall be supplied in the manufacturer's standard color closest to 'Red', unless noted otherwise. If red is not available in special application devices use the manufacturer's standard ivory or brown. Exception: 'Special Power' receptacles installed in the Medical School shall be gray.

When multiple circuits serve a series of receptacles the circuits shall be alternated so adjacent receptacles are not on the same circuit.

Receptacles shall be installed so the ground terminal is below, or to the left of the neutral terminal. If the building standard is other than this, follow the existing building standard

All receptacles and switches shall be labeled to note the source of power.

Receptacles within 6-feet of a water source shall be GFCI type. Receptacles dedicated to sump pumps and water fountains are excluded.

GFCI receptacles shall not be wired to protect downstream standard receptacles. Each GFCI, when it operates shall only interrupt 'its own' receptacles

Coverplates shall be 'high-quality', Type 302, stainless steel unless noted otherwise.

'Futura' class devices shall not be used, unless the needed device is only available in that style, or otherwise noted.

Lighting Controls

A. General

Toggle switches shall be rated 120/277 volts, 20-amperes, single-pole, double-pole, 3-way, or 4-way as required

Dimmer switches shall be rated 1000 watts minimum, specification grade, heavy duty, with radio noise filter - UL listed for 'heavy duty' use.

Lighting control switches, serving areas 'not visible' at the switch location shall have a pilot light function.

B. Occupancy Sensors

1. Wall mounted occupancy sensors shall be rated 600 watts minimum, 180 degrees coverage, 300 sq. ft. minimum coverage, infrared type
2. Ceiling mounted occupancy sensors shall be rated 1000 watts minimum, 180 degrees coverage, 1000 sq. ft. minimum coverage, infrared type,
3. All sensors shall have adjustable range or sensitivity, and adjustable time delay.
4. Ceiling mounted sensors (especially) shall utilize low voltage control circuits and be interlocked with the switch circuit for local auto/off control.
5. Dual technology occupancy sensors shall be used in applications where false operations must be minimized. These dual technology devices shall have a power ratings of at least 1000 watts load rating, shall cover at least 180 +/- degrees (from device), 1000 sq. ft. +/- coverage, and combination ultrasonic/infrared type. The ultrasonic component shall be of a frequency compatible with hearing aids.
6. Occupancy sensors shall be of a type that does not make any noise when the sensors switch from the on state, to the off state.
7. NOTE: Some ultrasonic occupancy sensors operate at frequencies that interfere with proper hearing aid operation. Any ultrasonic sensors shall therefore be specified to operate beyond the interference frequencies with hearing aids.

C. Light Dimming Control Systems

1. The wiring devices, as applicable for the dimming system, shall be in accordance with the above requirements.

2. Such systems shall be placed, labeled, and configured to be 'user friendly and intuitive. See Section 16550 for more information.

D. Lighting control systems

1. The wiring devices, as applicable for the lighting control system, shall be in accordance with the above requirements.

2. Such systems shall be placed, labeled, and configured to be 'user friendly and intuitive. See section 16550 for more information.

Receptacles

Duplex and single (simplex) receptacles shall be rated 125 volts, 20 amps, 2-pole, 3-wire, NEMA Type 5-20R.

GFCI duplex receptacles shall be rated 125 volts, 20 amps, 2-pole, 3-wire straight blade type with nylon or Lexan bodies. GFCI receptacles shall trip when ground currents exceed 5-mA, shall trip in 25-milliseconds maximum, and shall have an interrupting rating of 2000 amperes.

TVSS receptacles shall clamp at 330 volts or less, and shall have visual indication of the failure of their protective circuitry.

Child resistant receptacles shall require the simultaneous insertion of both line and neutral plug blades before power is applied to the receptacle contacts.

'Special receptacles' shall be of the voltage, amperage, number of poles, number of wires, configuration, and NEMA Type required by the (to be) supplied load.

Ceiling mounted and/or critical application receptacles shall be 'twist-lock' type with the NEMA configuration required for the (to be) supplied load.

'Receptacle Strips'

Commercially available surface mounted receptacle strips shall not be used unless the receptacles meet the above noted minimum requirements. Alternately, use surface raceway with receptacles separately installed. The receptacles shall be spaced as required for the application.

Power Poles

Power poles shall be painted steel unless shown otherwise, with an internal barrier to separate power wiring from telecommunications wiring. If power outlets are installed they shall meet the minimum requirements noted above. A green ground wire shall connect all receptacles. The pole shall not be used as the ground conductor.

The poles shall be firmly affixed at the top and bottom. The power and/or telecommunications wiring shall exit the poles through separate flex conduits connected to ceiling mounted junction boxes

Floor Boxes

In general, floor boxes shall be avoided. When there is no good alternative, however, the boxes shall be of the 'Flush-Poke-Thru' type, with multi-service capability, and be UL listed for 2-hour fire resistance.

Boxes shall be have a minimum capacity of 30 cubic inches, split into 2 or 3 compartments of equal capacity by removable partitions

These 'Flush Poke-Thru' type floor boxes shall meet ADA and Accessibility Guidelines and be UL listed for scrub water exclusion.

Multi-service devices shall have the necessary channels in the insert body to provide complete separation of power & communication services.

Pin And Sleeve Connectors

Pin and sleeve connectors shall comply with IEC Standard 309. They shall consist of nylon housings with integral locking rings and cord grips that are color coded by voltage. Pins and sleeves shall be sized, arranged, and keyed to prevent incorrect assembly.

Timers

A. General

1. Acceptable manufacturers are noted in the Preferred Manufacturers List.
2. All devices shall be UL listed and labeled for the application
3. Inside mounted devices shall have a NEMA 1 enclosure. Outdoor applications shall have a NEMA 3R enclosure. In either case, the cover shall be lockable.
4. Controls shall be easy to understand, and adjust.
5. Power control contacts shall be provided, capable of switching 20-ampere, 120 or 277-volt circuits. These contacts shall be capable of controlling incandescent, fluorescent, or HID lighting.

B. 24-Hour and 7- Day Timers.

1. Where BAS control panels are not available, or too expensive to upgrade, install timers.
2. Timers shall be electronic type, with battery back up and appropriate charging circuits to keep the battery charged. The battery shall supply only the internal date, and time circuitry.
3. Timers for control of indoor lighting applications shall include automatic switching to accommodate daylight savings time changes, standard holidays, and special other specific dates.
4. Timers for control of outdoor lighting applications shall include astronomical type of controls to automatically adjust on and off times to accommodate time of year.
5. Two or more power control contacts shall be provided, as noted above.
6. Provide at least one, Form C, control contact rated for 120-volts.

C. Spring Wound Timers

1. Where an application requires a timer, to allow an erratically scheduled 'On Times' of a specific length, use manually, spring wound, timers.
2. Timer shall allow 3-way switching of lights, i.e. control of tunnel lighting from either end of the tunnel segment.
3. The construction of the timer shall be appropriate for the environment where it is to be used, i.e., hot and high humidity environments in tunnels.

Installation Requirements

D. Provide No. 10 AWG wire to NEMA Type 6-20R receptacles serving freezers, window air conditioners, or other large appliances.

E. Where circuits are supplying a high portion of non-linear load, provide a separate neutral conductor for each single-phase branch circuit. The neutrals of these single-phase circuits shall not be shared or daisy-chained.

F. Provide ground fault circuit interrupter (GFCI) receptacles for new and existing 120 volt duplex receptacles located outdoors, in toilet rooms and within 6 feet of water sources including sinks, cup sinks, fume hood sinks, faucets, hose bibs and water coolers. Standard receptacles protected by an upstream GFCI receptacle or a GFCI circuit breaker is not acceptable.

G. Provide waterproof enclosures for duplex receptacles located outdoors. Enclosures shall remain watertight even while in use.

H. Provide a label on the cover plate of new, or existing, light switches and receptacles in the project area. Identify the panel and circuit number feeding the device. Embossed plastic tape labels are not acceptable.

I. Color code junction boxes and box covers of emergency circuits with red paint.

J. Mark lighting and power junction box covers in indelible ink with the panel and breaker numbers of the circuits contained within.