City of La Puente

Division of Building and Safety

RESIDENTIAL WIRING

This handout is not intended to replace the 2005 National Electric Code® (NEC) as adapted into the 2007 California Electric Code (CEC). It focuses only on the materials, methods, and requirements most commonly used in this area for residential wiring. This Handout is limited to single family residences with services of 200 amps or less, no sub panels, and three stories or less above grade. If more detailed information is needed, the NEC is available at many libraries and may be reviewed at the Building Department.

Use UL® approved wire nuts to make connections. Read the box to see how many wires may be fastened with which size wire nut. Never use solder

Splice wires only in boxes. All boxes must remain accessible.

Secure cable as it exits the box. Plastic boxes used in walls without internal clamps are stapled closer to the box. All others boxes must have internal clamps or a clamp must be installed. Staple cable within 8" of plastic boxes without a clamp and within 12" of boxes with a clamp. Staple cable at least every 4 ½ feet.

Leave at least 6" of free conductor inside all boxes. Extend the insulation of the cable into boxes ¼" minimum,

Use black or red conductors to supply power. Use white for neutrals (grounded conductor) except you may use #6 or larger in a non-white color and marked with green tape.

Switches are required to be grounded and Installed so that "ON' is up.

Using un-spliced wire sized per sec. 250, 2004 CEC below, ground the system by connecting the neutral buss to a grounding rod or Ufer ground (UFER will only be allowed on new construction or where the UFER is verified) . Using the same size and type of wire (This wire should be continuous), bond metal piping systems to the neutral buss. Use approved clamps at the rod and piping. (Bonding required for the water and gas pipes). All clamps shall remain accessible.

Using bare or green wire, ground all metal parts of the system. If a switch, Fixture, receptacle, appliance frame or other device has a connection point for a ground, use it. Ground metal boxes using a green grounding screw in the pre-threaded hole in the bottom of the box. Never leave metal parts of a system un-grounded. The grounding wire stray current someplace to go so that, in the event of an insulation failure, a circuit will be closed and a circuit breaker will do its job and turn off the power. If you do not give the stray current a grounding path it may end up going through you.

Wires are sized in accordance with the power requirements of the appliance being run. Size circuit breakers to protect wires and prevent them from starting fires in walls. Check the nameplate on the appliance and read the installation instructions for the wiring requirements. Never connect a wire to a circuit breaker that is rated at a higher amperage than the wire capacity.

Connect the service enclosure box to the neutral buss (Install the "main bonding jumper" this is usually done with a special screw that comes with the box in a little plastic bag. Read the directions that come with the equipment.

Ranges, cook tops, ovens, and clothes dryers run on a 240 volt power but often have components that use 120 volts. A 4 wire cable is required (3 conductor cable w/ ground).

Plug and receptacles have different styles depending on the voltage and amperage of the circuit. Read the label and use only the plug style that matches the voltage and amperage of the circuit breaker.

The 2005 California Energy Efficiency Standards require all residential lighting to comply with strict standards. A breakdown of the requirements are: Residential lighting shall comply with section 150(K) High efficacy = 40 lumens per watt

a. Kitchen lighting shall be high efficacy luminaries. Provide worksheet WS-5R. 50% of kitchen lighting to comply. (based on wattage)
b. Bathrooms, Garages, Laundry Rooms, and Utility Rooms shall be high efficacy luminaries or controlled by an occupancy sensor certified to comply with sec.119(d)

c. General residential Lighting shall be high efficacy luminaries or controlled by a dimmer switch certified to comply with sec.119(d)
d. Recessed luminaries installed in insulated ceiling shall be IC rated (zero clearance) and AT rated (air tight) and shall be sealed and/or gasketed between ceiling and housing.
e. Outdoor lighting shall be high efficacy luminaries or controlled by a motion sensor with integral photo-control certified to comply with sec.119(d)
f. Fluorescent lighting used to comply with the energy standards must be of a pin base type. (Screw base fixtures do not comply)

Ground fault protection is required for all outlets in bathrooms. In garages, Outside outlets, outlets in crawl spaces, in unfinished basements, within 6 feet of a sink in a wet bar, and in all kitchen counter top outlets

Arc fault protection is required for all bedroom circuits. This includes outlets, lighting, and smoke detection power outlets.

A minimum of 2 – 20 amp. small appliance circuits shall be provided for the kitchen counter top outlets. All other major appliances shall be on separate circuits.

Provide an outlet, switch, and work light in the attic when HVAC equipment is installed in the attic

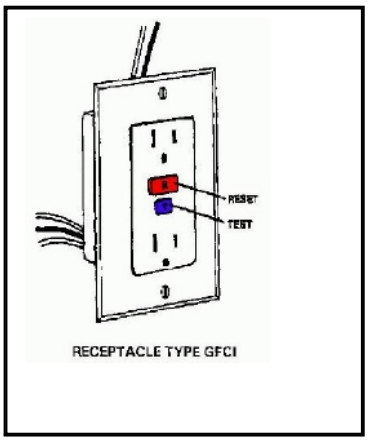
Bathrooms are required to be provided with a separate 20 amp. circuit for the outlets. This circuit may serve more than one bathroom but shall have no other outlets.

Outside outlets (GFCI Protected) shall be provided at the front and rear of the residence. A bubble type cover is required regardless of whether a cord is attached.

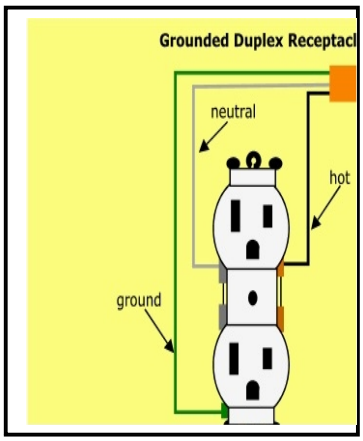
Smoke detectors are required at the following locations: Centrally located in the corridor leading to the sleeping rooms, inside each sleeping room, on each floor level, and at the top of stairways. Smoke detectors shall be hard wired with a battery backup and be interconnected. Battery operated detectors are permitted in existing conditions.

For plan check submittals, include a basic layout showing the lighting, switch locations, outlets, smoke detectors and service panel location for review. Outlet spacing for kitchens require that no point along the counter be more than 24” from an outlet. Each counter wider than 12” require an outlet. For general residential outlets, an outlet is required on walls 2 feet wide or greater and spaced a maximum of 12 feet apart and a maximum of 6 feet from end of walls. Hallways over 10 feet in length require an outlet

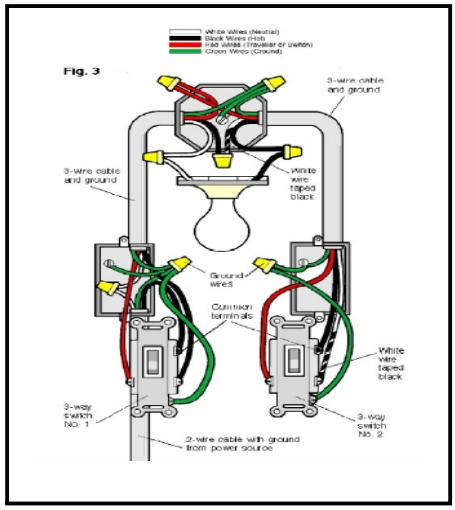
GFCI RECEPTICAL



STANDARD RECEPTICAL



TYPICAL 3-WAY CIRCUIT



TYPICAL ADD FAN LIGHT SWITCH DIAGRAHM FROM PANEL