



**BASIC CODE REQUIREMENTS**  
**ELECTRICAL INFORMATION**  
Based on the 2011 NEC  
*One-Family Residential*

*In accordance with Municipal Code Section 4-416 an electrical permit is required before any electrical work is performed. Inspections are required for electrical wiring before insulating or covering.*

**BOXES**

Switch, receptacle, and fixture boxes shall be of sufficient size to provide free space for all the conductors according to this table.

#14 Wire	2.0	Cubic inches for each wire
#12 Wire	2.25	Cubic inches for each wire
#10 Wire	2.5	Cubic inches for each wire
# 8 Wire	3.0	Cubic inches for each wire

Cable clamps and spliced grounding conductors reduce the number of conductors in the box by one each. Each receptacle or switch reduces conductors in the box by two each.

All junction boxes shall be so installed that the wiring contained in them can be accessible without removing any part of the building. Boxes in attics shall be accessible.

In walls or ceilings constructed of wood or other combustible material, boxes, plaster rings, and extensions shall be flush with the finished surface.

**GROUNDING**

Grounding continuity between a grounded metallic outlet box and the grounding circuit of the receptacle shall be established by means of a bonding jumper between the box and the receptacle grounding terminal.

All equipment grounds present in a junction box must be spliced together.

All metal boxes shall be grounded.

**CABLES**

Where exposed or concealed cables are installed through bored holes in studs, joists, or other wood members, holes shall be bored at the approximate centers or at least 1-1/4 inches from the nearest edge. Where this is not possible, a steel plate at least 1/16 inch in thickness shall cover the cables for protection against the driving of nails into them. Cables shall be fastened to the surface every 4-1/2 feet and within 12 inches of each box, when secured to that box.

Where nonmetallic sheathed (NM) cable is used with single gang non-metallic boxes, the cable should be stapled within 8 inches of the box.

Cables that are run horizontally in a wall cavity and exposed on either side of a wall will need to be protected by a six (6) inch wide strip of plywood or sheetrock.

Raceways and cable assemblies shall be continuous from outlet box to outlet box. (No open splices)

At least six (6) inches of free conductor shall be left at each outlet and switch point. This measurement is taken from the end of the conductors to the cut in the outer non-metallic jacket that encases these wires.

All conductors shall be spliced with approved splicing devices, including the bare grounding wires.

Cables should not be run in the hollow spaces used as ducts for cold air returns except for short straight through runs. All openings, where wires penetrate the duct, need to be sealed.

Cables shall either be run through bored holes in joists or on running boards.

In unfinished basements, it is permissible to secure cables not smaller than #8 directly to the lower edges of the joists. Smaller cables shall be drilled through or strapped to side of joist.

## **ELECTRICAL PANELS**

Electrical panels are not allowed in bathrooms or closets.

Electrical panels must have a clear working space 30 inches wide and 36 inches in front. No cabinets or obstructions allowed.

## **UNDERGROUND INSTALLATIONS**

All conductors, whether direct burial or in a raceway, must be approved for a wet location.

PVC conduit shall be a minimum depth of 18 inches.

Metallic raceways installed in direct contact with the earth must contain an equipment grounding conductor.

Direct buried cables shall be 24 inches deep, except residential branch circuit rated 20 amps or less and GFCI protected may be installed 12" below grade. These measurements are taken from the top of the cable or conduit to final grade.

## **CIRCUITS**

All habitable rooms, closets and hallways supplied by a 120 volt, 15 or 20 amp circuit must be protected by an arc-fault circuit interrupter.

For the small appliance load in kitchen, dining room and breakfast room, two or more 20-amp circuits shall be provided for all receptacle outlets in these areas and such circuits shall have no other outlets or lighting. At least two appliance circuits shall serve the kitchen counter with ground fault circuit interrupter (GFCI) protection required for all counter top receptacles.

At least one 20-amp circuit shall be provided for laundry receptacles.

For fixed appliances (disposal and dishwasher), separate circuits are required and shall not be counted as part of the appliance circuits required in kitchens.

Bathroom receptacles are required to be on 20 amp circuit serving only the bathroom.

## **LIGHTS AND RECEPTACLES**

Tamper resistant receptacles are required in all locations of a residential dwelling except for receptacles located five and a half (5 ½) feet above the floor or a receptacle that is behind a dedicated appliance that is not easily moved.

Receptacle outlets shall be installed so that no point along the floor line in any wall space is more than six feet, measured horizontally, from an outlet in that space, including any wall space two feet in width. In kitchen areas, a receptacle shall be installed at each counter space wider than 12 inches.

At least one wall receptacle shall be installed in the bathroom (adjacent to the basin), outdoors, in attached garages, and in each basement (in addition to the required laundry outlet).

All 120 volt 15 and 20-amp receptacles, installed in bathrooms, garages, unfinished basements, and outdoors shall have ground-fault circuit interrupter (GFCI) protection.

At least one lighting outlet shall be installed in an attic, underfloor space, utility room, and basement where these spaces are used for storage, or containing equipment requiring servicing.

At least one wall switch controlled lighting outlet shall be installed in every room, hallway, stairway, attached garage and outdoor entrance. Where lighting outlets are installed in interior stairways, there shall be a wall switch at each floor level to control the lighting outlet where the difference between floor levels is six risers or more. A neutral (white) wire is required to be installed at all switch boxes.

Fixtures in closets are restricted to:

1. A surface mounted incandescent and LED fixtures must clear the front edge of the storage shelf by a 12-inch horizontal clearance, with a completely enclosed lamp.
2. A recessed fixture with a solid lens or a fluorescent fixture shall maintain a 6-inch horizontal clearance from the front edge of the storage shelf. The use of all recessed fixtures is restricted. Check with the Electrical Inspector before the purchase and installation of such fixtures. IC rating fixtures only.