

Village of Bartlett Electrical Code Amendments



Chapter 9

ELECTRICAL REQUIREMENTS:

9-9-1: AMENDMENTS:

9-9-2: LISTING; LABELING:

9-9-3: ELECTRICAL SERVICES:

9-9-4: WIRING METHODS:

9-9-5: ROUGH INSPECTION REQUIREMENTS FOR RESIDENTIAL, COMMERCIAL AND INDUSTRIAL:

9-9-6: ELECTRICAL REQUIREMENTS FOR ATTACHED OR DETACHED GARAGE:

9-9-7: SWIMMING POOL:

9-9-8: ELECTRICAL REQUIREMENTS FOR SIGNS:

9-9-1: AMENDMENTS:

Electrical work including the planning, installing, altering, extending, repairing, maintaining or inspecting electrical systems within the Village limits shall be performed only by a person, firm, corporation, limited liability company or entity that undertakes or offers to undertake electrical contractor services to plan for, lay out, supervise, or install, or to make additions, alterations, or maintenance of wiring apparatus or equipment for electric, light, heat or power with or without compensation and possess an electrical contractor's license issued by an approved testing municipality in the State of Illinois, and the Village electrical contractor's license. Electrical work in or on commercial or industrial properties in the Village limits shall be performed by an electrical contractor possessing a commercial and industrial electrical contractor's license. New residential construction and home remodeling work involving electrical work shall be performed only by electrical contractor's license. except an owner/occupant of a single family home, or the owner of a single family home being remodeled or repaired for his or her occupancy within six (6) months after the date of completion of the remodeling or repair work, provided the owner has filed an affidavit in compliance with Section 9-4-2F of this Chapter with the building department at the time of application for a building permit, may perform minor electrical work that does not include the hook up or extension of electrical wiring to the electric panel. Homeowners shall not be permitted to install electrical services.

The following articles have been deleted, added, modified, clarified, elected or amended from the 2011 National Electrical Code:

Articles:	
310-.106(B)	Aluminum, copper-clad conductors (deleted)
320	Armored cable type AC (deleted)
322	Flat cable assemblies type FC (deleted)
324	Flat conductor cable type FCC (deleted)

326	Integrated gas spacer cable (deleted)
328	Medium voltage cable type MV (deleted)
330	Metal-clad cable type MC (deleted)
332	Mineral-insulated, metal-sheathed cable type MI. It may be used for fire pumps, fire alarms, or hazardous locations (modified)
334 336	Nonmetallic sheathed cable types MN, NMC, NMS, NM-B (deleted) Power and control Tray Cable. Type TC (deleted)
338	Service entrance cable type SE and USE (deleted)
348	Limited to indoor use only and shall be limited to 6 ft. length (modified)
350	Not in direct contact with earth or concrete and shall be limited to 6 ft. length (modified)
353 354 355	High density polyurethane conduit type HDPE conduit (deleted) Nonmetallic Underground Conduit With Conductors Type NUCC (deleted) Reinforced Thermosetting Rein Conduit Type RTRC (deleted)
358	Not permitted in concrete or in direct contact with earth or outside (modified)
362 370 372 374	Electrical nonmetallic tubing (deleted) Cablebus (deleted) Cellular Concrete Floor Raceway (deleted) Cellular METAL Floor Raceway (deleted)
382	Nonmetallic extension (deleted)
394	Concealed knob-and-tube wiring (deleted)
396	Messenger supported wiring (deleted)
398	Open wiring on insulators (deleted)
590.4(B)&(C)	Type NM and type NMC or similar wiring methods (deleted)
604	Manufactured wiring (deleted)
Annex H	Administration and enforcement (deleted) Any voltage over 24 volts shall be in conduit system (added)

(Ord. 2007-45, 5-1-2007)

9-9-2: LISTING; LABELING: All electrical equipment shall be listed and labeled by a third party agency to U.S. standards. (Ord. 2007-45, 5-1-2007)

9-9-3: ELECTRICAL SERVICES:

Meter sockets on new construction must be installed on the side of the house closest to the source.

A. Metering: For all new construction, underground wiring and metering must be used.

B. Rigid metallic conduit shall be used from the meter socket to the panel. For elements below grade, rigid nonmetallic conduit shall be permitted.

C. Service Requirements:

1. Services for residential shall be a minimum of one hundred (100) amps and shall comply with the following table: New Construction shall comply with the following:

1 to 1,199 square foot home = 100 amps
1,200 to 3,500 square foot home = 200 amps
3,501 and larger square foot home = 400 amps

2. Commercial and industrial services shall be a minimum of two hundred (200) amps.

D. Article 310.15(B) (7) and its table 310.15(B) (7) have been deleted from the 2011 NEC.

E. Overhead Electrical Services: All overhead electrical services shall be in rigid metal pipe for the riser (conduit) and shall be installed with galvanized backs and straps (a type of clamp to hold the conduit in place), with three-eighths inch ($\frac{3}{8}$ ") galvanized mounting hardware. No zinc parts shall be used.

F. Grounding Electrodes and Ground Electrode Conductors: Rod electrodes shall be five-eighths inch ($\frac{5}{8}$ ") copper rods eight feet (8') in length and delete 250.52(A) (5) (a). There shall be two rods in all cases. The rods shall be not less than 6(six) feet apart. Modifying 250.53(2) and the exception from the 2011 NEC. Ground electrode conductors shall be protected from physical damage by means of RMC 344, EMT 358, electrical PVC 352. Modifying 250.64 (B) Exception: The wire between ground rods will not be required to be in pipe.

G. Main Disconnect: Each service shall be provided with one (1) main disconnect. Shunt trip capability shall be required for all services other than those serving Dwelling units. Shunt trip shall be remotely operated from a Knox box as located and installed per direction of the Fire District. One main disconnect shall be provided per building.

H. Fusible Disconnecting: Fusible disconnecting means shall be installed for more than five feet (5') of conduit between the panel and the metering device or a transformer. This includes under a building.

I. Mogul LB: Mogul LB shall be used for all conductors larger than #8.

J. Panel Sizing:

Size	100 amp	150 amp	200 amp
Circuit spaces available	24/30	24/30	42/60
Service conductor sizing	#3 THHN	1/0 THHN	3/0 THHN

K. Prohibited Circuit Breakers: No tandem, buddy, duplex, piggyback and half circuit breakers.

L. Subpanels Prohibited: No subpanels for any new construction dwelling unit.

M. Identification: Identification of the contractor shall be permanently displayed on the main service panel board upon completion of the project (Ord. 2007-45, 5-1-2007).

9-9-4: WIRING METHODS:

A. All two hundred twenty (220) volt electric ranges shall be installed with a minimum of three-fourths inch ($3/4$ ") conduit and wired with two (2) #6s, one (1) #8 white and green one (1) #10.

B. The microwave shall be on its own circuit (20 amps).

C. The family room shall be on its own circuit (20 amps).

D. Wires terminated on receptacles or switches shall be under the screw of the device. Backstabbing shall not be permitted.

E. Article and table 210.21(B) (3) have been changed to all outlets or receptacles. Must be rated at the branch circuit rating.

15 amp = 15 amp receptacle on circuit rating

20 amp = 20 amp receptacle on circuit rating

F. The minimum wire size for commercial and industrial shall be #12 AWG. Exception: Control wiring installation.

G. Bracketed boxes shall be used in new construction and remodeling if the wall cavity has been made accessible.



H. All center ceiling boxes in rooms that are not listed in article 210.70(A) shall be fan rated.



I. For one- and two-family and apartment buildings, a GFCI protected outlet shall be installed at all balconies with doors (amending 210.52E).

J. All closets at least five (5) square feet or larger in area shall have an approved lighting fixture installed. All walk-in closets shall have a wall control switch for the light fixture(s).

K. There shall be no electrical device(s) within three feet (3') of a bathtub or shower (low voltage or 110/220 voltage). Exception: Power for hydromassage bathtub or listed steamer showers.

L. All furnace areas shall be equipped with a lighting fixture within six feet (6') of the furnace service panel and this light shall not be on the furnace circuit. In the same area there shall be a single outlet for a future water softener.

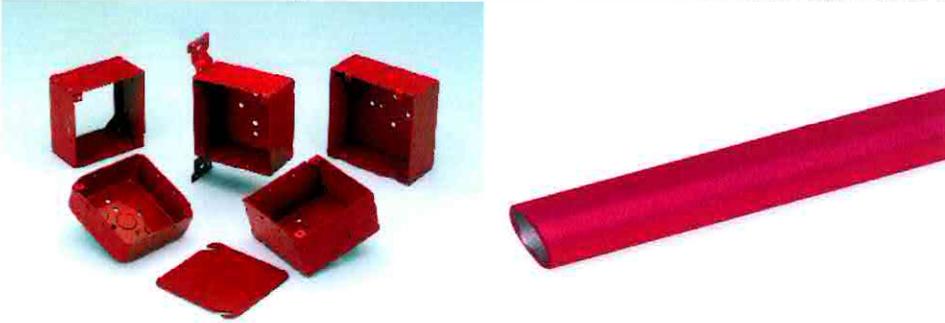
M. All flexible cords shall be grounded and rated for loads. The use of cords from fixture to fixture is not permitted (daisy chaining).

N. All underground conductors shall be installed in heavy wall metal conduit, elect PVC.



O. All commercial low voltage wiring that is not accessible or is subject to damage shall be in conduit and the stubs must have connectors and bushings and in bridle rings a maximum of ten feet (10') apart. All residential doorbell and thermostat wiring shall be in conduit system.

P. The fire alarm wiring shall be in conduit. Fire alarm conduit and boxes shall be red in color.



Q. All conduit systems and raceways and like systems shall have a green equipment grounding conductor sized in accordance with 250.122.

R. There shall be a minimum of two (2) kitchen appliance circuits that are required to be for countertop use only. Both circuits shall be available on all countertops if there is more than one outlet present.

S. There shall be additional supports for floor boxes by expander braces or two by four (2 x 4) means or a listed/approved device.

T. All island and peninsular outlets shall be hard piped into place.

U Residential smoke detectors shall be wall mounted to manufacturer's installation instructions. If ceiling mounted, pipes shall enter the sides of the boxes. (No overhead entry) Smoke detectors shall be located within 15 feet of a sleeping room doorway and with-in all sleeping rooms (bedrooms). Carbon monoxide detectors shall be installed within fifteen feet (15') of a sleeping room on all levels that have sleeping rooms. These detectors shall be one hundred twenty (120) volts with battery backup interconnected.

V. All dishwashers shall have a kill switch within six feet (6') of the unit. (Ord. 2007-45, 5-1-2007)

W. Separately Derived System- All bonding and grounding shall be done at the first point of disconnect.

X. A single receptacle (Simplex outlet) shall be required for all sump and ejector pits. Amending 210.8 No GFCI protection is required.

Y. A single receptacle (Simplex outlet) shall be required for all washer and gas dryers. Amending 210.8 No GFCI protection is required. GFCI protection shall be required for finished or non finished basements for receptacle only.

Z. A single receptacle with Garvin cover (Simplex outlet) shall be required for all Radon vent pipes in the attic. This receptacle shall be with-in three feet (3') of the Radon vent pipe.

9-9-5: ROUGH INSPECTION REQUIREMENTS FOR RESIDENTIAL, COMMERCIAL AND INDUSTRIAL:

- A. All wires shall be in at the time of rough inspection. This includes low voltage thermostat and doorbell wiring.
- B. The basement must be roughed in and the wire pulled at the time of the rough inspection.
- C. All splices shall have been made.
- D. All drywall rings and flexible whips shall be installed at the time of the rough inspections (Ord. 2007-45, 5-1-2007).

9-9-6: ELECTRICAL REQUIREMENTS FOR ATTACHED OR DETACHED GARAGE:

- A. All garages shall be provided with at least one branch circuit.
- B. A separate twenty (20) amp circuit shall be installed to a GFCI protected wall receptacle in the garage.
- C. Overhead outlets shall be installed for future garage door openers. These outlets shall be of a single receptacle type. (Simplex outlet) Amending 210.8 No GFCI protection is required (Ord. 2007-45, 5-1-2007).

9-9-7: SWIMMING POOL:



- A. All swimming pool lighting fixtures shall be low voltage having not more than fifteen (15) volts between conductors (Ord. 2007-45, 5-1-2007).
- B. The maintenance disconnecting means shall be six (6) feet from the inside wall of the pool. For above ground and in ground pools only. Hot Tubs disconnect shall be located a minimum of five (5) feet from the inside wall of the spa. But all shall be readily accessible and within sight.

9-9-8: ELECTRICAL REQUIREMENTS FOR SIGNS:

- A. All signs' metal parts shall be grounded.

B. All signs shall have a disconnect means outside.

C. All signs shall be third party listed and labeled to U.S. standards (Ord. 2007-45, 5-1-2007).



**ALL OF THE FOLLOWING INFORMATION IS TAKEN FROM THE
2011 NATIONAL ELECTRIC CODE**

1. All electric services, the bonding method in section 250.92(B) must be met. The bond wire in the panel must go to the enclosure via solid lug or a ground bar and be sized to 250.66 prior to the first disconnect and 250.122 after the first means of disconnect.
2. Concrete-encased electrode (Ufer ground) shall be encased in a minimum of 2" of concrete, located near the bottom of the concrete foundation or footing. 20' of bare #4 copper wire 20' in length or 1/2 in rebar 20' in length. 250.52(A)(3)
3. Duct seal will be required at the electrical services on the meter socket side of the pipe run to the panel. (230.8, 300.5(G) and 300.7(A))
4. The grounding electrode rod(s) must have 25 ohms or less or a second rod must be installed not less than 6 feet from the first rod to comply with section 250.53.
5. Interior metal water piping system shall be bonded. In addition, commercial buildings only; the structural steel shall be bonded and the wire shall be sized to 250.66 to comply with 250.104.
6. All outlets must be the self-grounding type per 250.146(B). Outlets of the non self grounding type shall have a bonding jumper installed to the box via a listed clip or screw and the wire must be sized to comply with 250.122.
7. When using raised Garvin cover outlets; There shall be a bonding jumper installed to the box via a listed clip or screw per 250.146(A) and the wire sized to comply with 250.122.
8. All center ceiling boxes in the room that are not listed in the 210.70(A)(1) and (A)(2) must have ceiling fan boxes and meet 422.18 and 314.27(C). (The boxes must be installed with four #12 sheet metal screws one inch or longer.) If exceeding 35 lbs., it must meet 314.27(C).
9. All outside outlets must meet 406.9. (In-use covers)
10. 3/8" Greenfield cannot be used for wiring an outlet per section 348.20(A).
11. All hydromassage tubs and spa motors must be bonded with a solid #8 wire to the cold water pipe at the time of the rough inspection. (680.74)
12. Grounding conductors #6 and smaller shall be identified by being bare, green or green with a yellow stripe, (not tape-marked). (250.119) Neutral (Grounded) Conductors #6 and smaller shall be identified by white or gray (not tape-marked)(200.6).
13. Class 2 wiring must remain separate from Class 1 wiring. (725.154)
14. All panels, meter sockets and air conditioner disconnects shall be installed to comply with the working clearances specified within section 110.26.
15. Wire fill for boxes and junction boxes shall be installed in accordance 314.16.
16. Wires shall be looped or pigtailed to outlets in multiwire branch circuits. (300.14)
17. All branch circuits that supply receptacle outlets, lighting, smoke /co detectors, etc. in a dwelling unit shall be provided comply with arc-fault circuit interrupter(s) protection . (210.12(A))

BASEMENT BUILDOUT REQUIREMENTS FOR ELECTRIC WORK

The following information is taken from the 2011 National Electric Code.

1. All outlets must follow the 6'/12' rule. (210.52(A)(1))
2. The bathroom GFCI outlet must be on a 20-amp circuit and shall follow 210.52(D).
3. Smoke detectors shall meet sections R314. of the 2012 IRC. Carbon monoxide detector shall meet sections R315. of the 2012 IRC. Smoke detector shall be installed in open area and one in the mechanical room, and any room that has a closet. Smoke detector/ Carbon monoxide shall be installed within 15 feet of all sleeping rooms. The smoke detectors/ Carbon monoxide must be 110 volts, battery back up and interconnected if possible.
4. The wall switch for the room must meet section 210.70(A)(2) and the stairs must have a 3-way switch installed at the top and bottom. Provide lighting inside the stairwell and landing.
5. Make sure there are no more than 360° of bends between pull points in the conduit runs. (358.26)
6. All cuts on conduit must be reamed out to remove all rough edges. (358.28)
7. Receptacles shall not be depended upon for splicing. The wires shall be looped or they shall have a pig tail jumper to the device. (300.13(B))
8. The length of the free conductor at all junction boxes, outlets or switch points shall be a minimum of 6 inches. (300.14)
9. All outlets including GFCIs must be the self-grounding type per 250.146(B) Outlets of the non self grounding type shall have a bonding jumper installed to the box via a listed clip or screw and the wire must be sized to comply with section 250.122.
10. 3/8" flexible metal conduit (Greenfield) cannot be used for wiring to an outlet. (348.20(A))