




## MEMORANDUM

**TO:** Board of Building Appeals Members

**FROM:** William J. Heniff, AICP, Community Development Director 

**MEETING DATE:** February 5, 2020

**SUBJECT:** **Text Amendments to Section 150.060 et. seq. of the Village Code:  
Adoptions of the 2017 National Electrical Code and Local  
Amendments**

The Village of Lombard is currently following the provisions of the 2011 National Electrical Code (NEC). As part of our overall goal of updating our respective building codes throughout 2019, staff is bringing forward amendments to adopt the 2017 NEC by reference and offer a few local amendments to our code provisions.

### NEC Provisions

Attached is a summation of the material changes between the 2011 and 2017 versions of the NEC. Staff will provide a summary of these changes at the meeting itself.

### Local Amendments

In addition to the code change to reference the 2017 NEC document, staff offers the following amendment to the local code, as noted below (changes are in bold and underlined)

#### Section 210.52

(G) (3) *Where an installation includes a sump pump or pumps and an ejector pump or pumps, each pump shall be provided an Individual Branch Circuit (dedicated circuit) compliant with Section 210.21(B)(1), (2) and (3). That is, a receptacle with a rating of not less than the branch circuit rating (20 amperes) and compliant with Section 210.8, (GFCI protected) and with Section 406.12, TR (Tamper Resistant). Where in wet locations Section 406.9(B) WR (Weather Resistant) outlets are required in addition to "In Use" covers.*

**Exception: A single receptacle (Simplex type and rated for the branch circuit ampacity) installed exclusively for sump pump or pumps and ejector pump or pumps, no GFCI protection is required, amending 210.8**

The proposed 2020 NEC will likely include a provision to require GFCI protection for sump pumps. However, staff's concern is that based upon experiences, leakage concerns could result

in the GFCI being tripped, thereby resulting in a power failure of a given sump pump. The proposed local amendment is intended to preclude such protection.

**ACTION REQUESTED**

Staff is placing this item on the February 5, 2020 Village Board agenda for consideration and approval. Staff recommends approval of amendment to provide for the adoption of the 2017 National Electrical Code and the companion local amendments thereto.

## Proposed NEC Changes

Below is a listing of the substantive changes between the 2011 and 2017 versions of the National Electrical Code. Staff commentary is offered below in red text.

**110.16 Arc-Flash Hazard Warning.** Electrical equipment, such as switchboards, switchgear, panelboards, industrial control panels, meter socket enclosures, and motor control centers, that are in other than dwelling units, and are likely to require examination, adjustment, servicing, or maintenance while energized, shall be field or factory marked to warn qualified persons of potential electric arc flash hazards. The marking shall meet the requirements in 110.21(B) and shall be located so as to be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

**Locations for new Arc flash warning labels**

**(B) Service Equipment.** In other than dwelling units, in addition to the requirements in (A), a permanent label shall be field or factory applied to service equipment rated 1200 amps or more. The label shall meet the requirements of 110.21(B) and contain the following information:

- (1) Nominal system voltage
- (2) Available fault current at the service overcurrent protective devices
- (3) The clearing time of service overcurrent protective devices based on the available fault current at the service equipment
- (4) The date the label was applied

**Non-dwelling Services 1200 amps or more must have new Arc flash warning labels on electrical equipment**

**110.14 (D) Installation.** Where a tightening torque is indicated as a numeric value on equipment or in installation instructions provided by the manufacturer, a calibrated torque tool shall be used to achieve the indicated torque value, unless the equipment manufacturer has provided installation instructions for an alternative method of achieving the required torque.

**Screws, nuts and bolts must be tightened to manufacture specs on electric equipment or devices.**

**110.21 (A) Equipment Markings.**

**(2) Reconditioned Equipment.** Reconditioned equipment shall be marked with the name, trademark, or other descriptive marking by which the organization responsible for reconditioning the electrical equipment can be identified, along with the date of the reconditioning.

Reconditioned equipment shall be identified as “reconditioned” and approval of the reconditioned equipment shall not be based solely on the equipment’s original listing.

**Recondition equipment must bear a label tested by 3<sup>rd</sup> party when reinstalling in electrical systems**



**(B) Field-Applied Hazard Markings.** Where caution, warning, or danger signs or labels are required by this *Code*, the labels shall meet the following requirements:

(1) The marking shall adequately warn of the hazard using effective words and/or colors and/or symbols.

Informational Note: ANSI Z535.4-2011, *Product Safety Signs and Labels*, provides guidelines for suitable font sizes, words, colors, symbols, and location requirements for labels.

(2) The label shall be permanently affixed to the equipment or wiring method and shall not be hand written.

*Exception to (2): Portions of labels or markings that are variable, or that could be subject to changes, shall be permitted to be hand written and shall be legible.*

(3) The label shall be of sufficient durability to withstand the environment involved.

Informational Note: ANSI Z535.4-2011, *Product Safety Signs and Labels*, provides guidelines for the design and durability of safety signs and labels for application to electrical equipment.

**Label requirements**

#### **110.24 Available Fault Current.**

**(A) Field Marking.** Service equipment at other than dwelling units shall be legibly marked in the field with the maximum available fault current. The field marking(s) shall include the date the fault-current calculation was performed and be of sufficient durability to withstand the environment involved. **The calculation shall be documented and made available to those authorized to design, install, inspect, maintain, or operate the system.**

**Non-dwelling electrical equipment must have new Arc flash calculation document**

Informational Note: The available fault-current marking(s) addressed in 110.24 is related to required short circuit current ratings of equipment. *NFPA 70E-2012, Standard for Electrical Safety in the Workplace*, provides assistance in determining the severity of potential exposure, planning safe work practices, and selecting personal protective equipment.

**110.25 Lockable Disconnecting Means.** If a disconnecting means is required to be lockable open elsewhere in this *Code*, it shall be capable of being locked in the open position. The provisions for locking shall remain in place with or without the lock installed.

**Any time a disconnecting means is required by the NEC to be lockable in the open position**

#### **200.4 Neutral Conductors.**

**(B) Multiple Circuits.** Where more than one neutral conductor associated with different circuits is in an enclosure, grounded circuit conductors of each circuit shall be identified or grouped to correspond with the ungrounded circuit conductor(s) by wire markers, cable ties, or similar means in at least one location within the enclosure.

**Grouping shared neutrals circuits other than panel enclosures**

#### **210.8 Ground-Fault Circuit-Interrupter Protection for Personnel.**

**(A) Dwelling Units.**

(7) Sinks — where receptacles are installed within 1.8 m (6 ft) from the top inside edge of the bowl of the sink

GFCI protection for receptacles for all sink locations within 6ft

(9) Bathtubs or shower stalls — where receptacles are installed within 1.8 m (6 ft) of the outside edge of the bathtub or shower stall

GFCI protection for receptacles for bathtubs or shower stalls within 6ft

(10) Laundry areas

GFCI protection for receptacles for all laundry areas

**210.8(B) Other Than Dwelling Units.** All single-phase receptacles rated 150 volts to ground or less, 50 amperes or less and three phase receptacles rated 150 volts to ground or less, 100 amperes or less installed in the following locations shall have ground fault circuit interrupter protection for personnel.

GFCI protection for receptacles other than dwelling according to amps and voltage ranges

**210.8(B)(9) Crawl Spaces.** At or below grade level

GFCI protection for receptacles other than dwelling in crawl spaces

**210.8(B)(10) Unfinished portions or areas** of the basement not intended as habitable rooms.

GFCI protection for receptacles other than dwelling in unfinished portions or areas

**210.8(E) Crawl Space Lighting Outlets.** GFCI protection shall be provided for lighting outlets not exceeding 120 volts install in crawl spaces.

GFCI Protection for dwelling and other than dwelling for lighting outlets in crawl space not exceeding 120v

**210.8(D) Kitchen Dishwasher Branch Circuit.** GFCI protection shall be provided for outlets that supply dishwashers installed in dwelling unit locations.

GFCI protection for receptacle devices or direct connected dishwasher in Kitchen

**210.11(C)(4) Garage Branch Circuits.** In addition to the number of branch circuits required by other parts of this section, at least one 120-volt, 20-ampere branch circuit shall be installed to supply receptacle outlets in attached garages and in detached garages with electric power. This circuit shall have no other outlets.

Dedicated 20-amp circuit for garage receptacles only

**210.12 Arc-Fault Circuit-Interrupter Protection.**

**(A) Dwelling Units.** All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets or devices installed in dwelling unit **kitchens**, family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways,



**laundry areas**, or similar rooms or areas shall be protected by any of the means described in 210.12(A)(1) through (6):

**Arc fault protection not required in bathrooms, garages and exterior areas**

**210.12(B) Dormitory Units.** All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets installed in dormitory unit bedrooms, living rooms, hallways, closets, and similar rooms shall be protected by a listed arc-fault circuit interrupter meeting the requirements of 210.12(A)(1) through (6) as appropriate.

**Arc fault protection for dormitory units**

**210.12(C) Guest Rooms and Guest Suites.** All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets and devices installed in guest rooms and guest suites of hotels and motels shall be protected by any of the means described in 210.12(A)(1) through (6)

**Arc fault protection for hotels and motels**

**210.52(G)(1) Garages.** In each attached garage and in each detached garage with electric power, at least one receptacle outlet shall be installed in each vehicle bay and not more than (5½ ft.) above the floor.

**One Receptacle opening per vehicle bay and not higher than 66 inches**

#### **210.71 Meeting Rooms(A) General.**

Each meeting room of not more than 93 m<sup>2</sup> (1000 ft<sup>2</sup>) in other than dwelling units shall have outlets for nonlocking-type, 125-volt, 15- or 20-ampere receptacles. The outlets shall be installed in accordance with 210.71(B). Where a room or space is provided with movable partition(s), each room size shall be determined with the partition in the position that results in the smallest size meeting room.

Informational Note No. 1: For the purposes of this section, meeting rooms are typically designed or intended for the gathering of seated occupants for such purposes as conferences, deliberations, or similar purposes, where portable electronic equipment such as computers, projectors, or similar equipment is likely to be used.

**Receptacle requirements for meeting rooms 1000 ft<sup>2</sup> and less**

**(B) Receptacle Outlets Required.** The total number of receptacle outlets, including floor outlets and receptacle outlets in fixed furniture, shall not be less than as determined in (1) and (2). These receptacle outlets shall be permitted to be located as determined by the designer or building owner.

**(1) Receptacle Outlets in Fixed Walls.** Receptacle outlets shall be installed in accordance with 210.52(A)(1) through (A)(4).

**The designer or building owner can determine receptacle placement but it also states that the receptacles outlets in fixed walls must be in accordance with 210.52(A)(1-4) which is where the 6ft. and 12 ft. receptacle spacing rules come from.**

**(2) Floor Receptacle Outlets.** A meeting room that is at least 3.7 m (12 ft) wide and that has a floor area of at least 20 m<sup>2</sup> (215 ft<sup>2</sup>) shall have at least one receptacle outlet located in the floor at a distance not less than 1.8 m (6 ft) from any fixed wall for each 20 m<sup>2</sup> (215 ft<sup>2</sup>) or major portion of floor space.

Floor receptacles in meeting rooms that measure at least 12 ft. wide with a floor area of at least 215 ft<sup>2</sup>. These meeting rooms must have at least one floor receptacle located at least 6 ft. from any fixed wall for each 215 ft<sup>2</sup> or major portion of floor space.

**406.12 Tamper Resistant Receptacles.** All 15- and 20-ampere, 125- and 250-volt nonlocking-type receptacles in the areas specified in 406.12(1) through (7) shall be listed tamper resistant receptacles.

1. Dwelling units in all areas specified in 210.52 and 550.13
2. Guest rooms and guest suites of hotels and motels
3. Child care facilities
4. Preschool and elementary education facilities
5. Business offices, corridors, waiting rooms, and the like in clinics, medical, and dental offices and outpatient facilities
6. Subset of assembly occupancies describe in 518.2 to include places of waiting transportation, gymnasiums, skating rinks, and auditoriums
7. Dormitories

Tamper resistant receptacle requirements for dwelling and other than dwelling locations

**422.5(A) General.** Appliances identified in 422.5(A)(1) through (5) rated 250 volts or less and 60 amperes or less, single or 3-phase, shall be provided with GFCI protection for personnel. Multiple GFCI protective devices shall be permitted but shall not be required.

1. Automotive vacuum machines provided for public use
2. Drinking water coolers
3. High pressure spray washing machines – cord and plug – connected
4. Tire inflation machines provided for public use
5. Vending machines

GFCI protection for appliances for other than dwelling according to amps and voltages

**440.9 Grounding and Bonding.** Where multi-motor and combination-load equipment is installed outdoors on a roof, an equipment grounding conductor of the wire type shall be installed in outdoor portions of metallic raceway systems that use non-threaded fittings.

Provide equipment grounding conductor in conduit when not using fully threaded fittings on roof

**625.40 Electric Vehicle Branch Circuit.** An outlet(s) installed for the purpose of charging electric vehicles shall be supplied by a separate branch circuit. This circuit shall have no other outlets.

Dedicated circuit for car charging

**625.54 Ground-Fault Circuit-Interrupter Protection for Personnel.** All single-phase receptacles installed for the connection of electric vehicle charging that are rated 150 volts to ground or less, and 50 amperes or less shall have ground-fault circuit-interrupter protection for personnel.

GFCI Protection for car charging receptacles according to amps and voltages

**680.11 Underground Wiring Location.** Underground wiring shall be permitted where installed in rigid metal conduit, intermediate metal conduit, rigid polyvinyl chloride conduit, reinforced thermosetting resin conduit, or Type MC cable, suitable for the conditions subject to



that location. Underground wiring shall not be permitted under pool unless this wiring is necessary to supply pool equipment permitted by this article. Minimum cover depths shall be as given in Table 300.5.

Underground electrical can be next to pool as long as its enclosed in conduit or listed MC

**680.22(A)(2) Circulation and Sanitation System, Location.** Receptacles that provide power for water-pump motors or for other loads directly related to the circulation and sanitation system shall be located at least (6 ft.) from the inside walls of the pool. These receptacles shall have GFCI protection and be of the grounding type.

Twist lock receptacle has been removed

**680.28 Gas-Fired Water Heater.** Circuits serving gas-fired swimming pool and spa water heaters operating at voltages above the low-voltage contact limit shall be provided with ground-fault circuit-interrupter protection for personnel.

GFCI Protection for gas fired water heaters receptacle device or direct connected

**700.8 Surge Protection.** A listed SPD shall be installed in or on all emergency systems switchboards and panelboards.

Surge Protection for all emergency loads in panels