

COUNCIL ACTION FORM

SUBJECT: APPROVAL OF 2017 NATIONAL ELECTRICAL CODE WITH AMENDMENTS

BACKGROUND:

The National Electrical Code (NEC), published by the National Fire Protection Association (NFPA), is the model code of standards for electrical construction and maintenance in use throughout the United States. The Code is updated at three year intervals to reflect the latest improvements in public safety technologies. The State of Iowa historically adopts the most recent edition of the NEC and, in doing so, requires every local jurisdiction to do the same.

The State of Iowa has adopted the 2017 edition of the NEC effective on January 1, 2018. The City of Ames is required to follow the State in adopting the NEC and their adopted amendments to assure consistency of State and local standards. Electricians doing work within the City of Ames are required by their State licensure to follow the NEC adopted by the State, which as of January 1, 2018, is the 2017 NEC. The City of Ames is currently regulated by the last adopted NEC, which is the 2014 version of the code. **To be operating legally under the State Code, the City must, at a minimum, adopt the 2017 NEC and the two State amendments.**

The first step in the code adoption process is an in depth review of the 2017 NEC by Inspections staff. Inspections staff receives not only the 2017 NEC code book, but also reference materials that describe the significant changes between the 2014 and 2017 versions of the code. Once a thorough review is complete, the process moves onto City Legal Staff and to the Building Board of Appeals.

The Building Board of Appeals is a seven member board appointed by the Mayor with the approval of the City Council. Each member is qualified by experience and training in matters pertaining to building construction. The membership of the Board consists of the following professionals:

- Licensed Architect
- Professional Engineer
- General Contractor
- Homebuilder
- Licensed Journeyman or Master Electrician, or Electrical Contractor
- Licensed Journeyman or Master Plumber, or Plumbing Contractor
- Licensed Master HVAC Technician, or Mechanical Contractor

The Building Board of Appeals is tasked with reviewing proposed text amendments to Ames *Municipal Code*, Chapter 5, Building, Electrical, Mechanical and Plumbing Code. Proposed text amendments are reviewed by the Board with a public hearing and recommendation to the City Council.

On October 25, 2017, Inspections staff sent an e-mail to all contractors who have done business with the Inspection Division within the last year to notify them of the proposed 2017 NEC adoption process and that their attendance and input at the November 6, 2017, Building Board of Appeals meeting would be welcome.

The Building Board of Appeals held a public hearing on November 6, 2017. There were no contractors present for the meeting and no public input submitted. As a result, the Board made a motion to recommend to the City Council approval of the 2017 NEC with the two State of Iowa amendments and one local amendment.

CODE CHANGES:

Revisions made in the 2017 edition of the NEC reflect modifications in the industry related to energy efficiency, energy production, residential uses, and special needs for health care facilities, and offer better protection for people and their property as the demands on electrical service increase. Attachment A highlights some of the more notable changes. This list is not inclusive as the actual book of changes, with analysis of each change, is over 500 pages long.

One Local Amendment:

The local amendment allows nonmetallic-sheathed cable to continue to be used in single and multi-family structures, but restricts the use in commercial structures, as it has in years past. The prohibition of Nonmetallic-sheathed cable for commercial structures and allowable use in single and multi-family structures is consistent with other jurisdictions:

Section 334.10, Nonmetallic-Sheathed Cable, Uses Permitted, is amended by deleting Subsection (3) therefrom and inserting in lieu thereof a new Subsection (3): All other structures shall be wired using other methods as allowed by the NEC.

Two State Amendments:

In the 2014 NEC, there was a change that required AFCI protection for existing circuits and receptacle replacements. The State has adopted two amendments to the 2017 NEC that address the potential difficulty in providing arc fault protection on existing circuits for contractors and owners. They have amended out the following sections:

Section 210.12(D) Branch Circuit Extensions or Modifications – Dwelling Units and Dormitory Units. In any of the areas specified in 210.12.(A) or (B), where branch-circuit wiring is modified, replaced, or extended the branch circuit shall be protected by one of the following:

- 1) A listed combination-type AFCI located at the origin of the branch circuit
- 2) A listed outlet branch-circuit-type AFCI located at the first receptacle outlet of the existing branch circuit

Exception: AFCI protection shall not be required where the extension of the existing conductors is not more than 1.8m (6 ft) and does not include any additional outlets or devices.

Section 406.4(D)(4) Arc-fault Circuit Interrupter Protection. Where a receptacle outlet is located in any areas specified in 210.12(A) or (B), a replacement receptacle at this outlet shall be one of the following:

- 1) A listed outlet branch-circuit type arc-fault circuit-interrupter receptacle

- 2) A receptacle protected by a listed outlet branch-circuit type arc-fault circuit-interrupter type receptacle
- 3) A receptacle protected by a listed combination type arc-fault circuit-interrupter type circuit breaker

Exception No.1: Arc-fault circuit-interrupter protection shall not be required where all of the following apply:

- 1) *The replacement complies with 406.4(D)(2)(b).*
- 2) *It is impracticable to provide an equipment grounding conductor as provided by 250.130(C)*
- 3) *A listed combination type arc-fault circuit-interrupter circuit breaker is not commercially available.*
- 4) *GFCI/AFCI dual function receptacles are not commercially available.*

Exception No.2: Section 210.12(B), Exception shall not apply to replacement of receptacles.

ALTERNATIVES:

1. Set the public hearing for February 13, 2018 to review the proposal to adopt the 2017 edition of the National Electrical Code (NEC) with one local amendment and two State of Iowa amendments as explained above.
2. Direct staff to work with the Building Board of Appeals to develop further local amendments to the recommended codes.

MANAGER'S RECOMMENDED ACTION:

The Legal Department and the Building Board of Appeals have reviewed the proposal and has recommended approval to the City Council. Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative No. 1, thereby setting a public hearing for February 13, 2018.

ATTACHMENT A

The following is an overview of some of the changes made by the NFPA in the 2017 edition of the NEC. Although this is not an inclusive list it does highlight the most notable changes from the 2014 edition. Many of these changes are being implemented to create safer working environments for electrical workers as well as safer living conditions for everyone.

- 110.14(D) – Torqueing of connections is now required if on equipment or in instructions.
 - This was previously an informational note. It was determined that the importance of making a proper connection was significant enough that the informational note should be entered into the code so that it would be enforceable.
- 210.8(B) – GFCI protection for other than dwellings is expanded to all 1-phase receptacles 150V to ground or less, 50A or less and 3-phase 150V to ground or less, 100A or less in listed locations.
 - The installation of GFCI devices has been proven to save lives and reduce shock injuries. The new code section expands the requirement for GFCIs to receptacles with higher currents and voltage, especially those in workplaces.
- 210.8(B)(9) & (10) – GFCI protection is now required for receptacles in non-dwelling crawl spaces and finished basements.
 - The change in subsection 9, expands the requirement for GFCI protection to include all crawl spaces, not just those in dwelling units.
 - The change in subsection 10, expands the GFCI requirement to include unfinished commercial basements and receptacles with stronger currents like 210.8(B) above.
- 210.8(E) – GFCI protection is now required for lighting outlets in crawl spaces.
 - This section adds the requirement for GFCI protection in crawl spaces. This increases safety for electrical contractors.
- 210.12(C) – All guest rooms and suites must now have AFCI protection.
 - AFCI protection is now required in all hotel rooms. Previously, they were only required if there were permanent cooking provisions in the room. This increases the level of safety for hotel guests.
- 210.64 – The indoor service area receptacle must now be accessible, within 25', and in the same room.
 - This distance has been shortened from 50 feet to 25'. The intent is to reduce the use of extension cords which have been proven to decrease the level of safety.
- 320.6 – AC cable and fittings must be listed.
 - This change requires cables and their fittings to be listed as other equipment does.
- 406.3(F) – Receptacles with USB chargers must be listed and have integral Class 2 circuitry.
 - This code section adds listing requirements for receptacles with USB chargers and requires the circuitry to be integral to the device. This code change reflects updated technology.
- 406.6(D) – Receptacles faceplates with night lights or USB chargers must be listed and the night light and/or Class 2 circuitry must be integral.

- This is a result of increased technology. It requires the installation of these receptacles to be listed.
- 409.22(B) – Available short-circuit current at industrial control panels must be documented and available.
 - This code section requires short-circuit current data to be made available so that installation could be evaluated by an inspector. Previously, there was no way to know what the current rating was and, therefore, no way to know if the proper equipment was installed.
- 422.16(B)(2) – Receptacles for built-in dishwashers must be in adjacent space.
 - This brings the code in line with the manufacturer specifications on dishwashers and trash compactors.

In addition to the above changes, one new article, Article 425, has been added to the 2017 NEC. It addresses industrial process heating equipment.