

**COUNCIL ACTION FORM**

**SUBJECT: 2020 NATIONAL ELECTRICAL CODE ADOPTION**

**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 throughout the United States. The NEC is updated at three-year intervals to reflect the latest improvements in 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 2020 edition of the NEC effective April 1, 2021. Electricians doing work within the City are required by their State licensure to follow the NEC adopted by the State. The City is currently regulated by the last adopted NEC, which is the 2017 version of the code. **To operate legally under the State Code, the City must, at a minimum, adopt the 2020 NEC and the two State amendments. The City is permitted to adopt local amendments that are more restrictive than the NEC and State amendments.**

**CODE REVIEW AND ADOPTION PROCESS:**

The first step in the code adoption process is an in-depth review of the 2020 NEC by Inspections staff. Inspections staff receives not only the 2020 NEC code book, but also reference materials that describe the significant changes between the 2017 and 2020 versions of the code. Once a thorough review is complete, the process moves to City Legal staff and to the Building Board of Appeals. The Building Board of Appeals consists of members qualified by experience and training in matters pertaining to building construction. Proposed text amendments are reviewed by the Board with a public hearing and recommendation to the City Council.

On January 18, 2021, Inspections staff e-mailed the Ames Home Builders Association (AHBA) and all electrical contractors who have done business with the Inspection Division within the last year to notify them of the proposed 2020 NEC adoption process and the February 1 Building Board of Appeals meeting where their feedback would be welcome. **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 2020 NEC with the two State of Iowa amendments and one local amendment.**

A follow-up email was sent to the same contractors on March 2, 2021, making them aware of the April 1, 2021 effective date for the State's adoption of the 2020 NEC. Staff was also present at the March AHBA meeting to update the Board and answer questions regarding the upcoming adoption.

To adopt the revised NEC, state law requires the City Council to set a date for a public hearing, then adopt the Code by ordinance within 30 days of the hearing. **To meet this timeframe, City staff plans to set the public hearing and first passage on March 23, then request that the City Council suspend the rules at the second reading of the ordinance on April 13 in order to approve third reading and final passage of the ordinance before the 30-day limit expires.**

### **CODE CHANGES:**

Revisions made in the 2020 edition of the NEC reflect industry changes 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 exhaustive; the actual book of changes and the accompanying analysis is over 500 pages long.

#### **State Amendments:**

The 2014 NEC contained a change that required arc-fault circuit interrupter (AFCI) protection for existing circuits and receptacle replacements. The State adopted two amendments to the 2017 NEC that address the potential difficulty in providing arc fault protection on existing circuits for contractors and owners. The idea behind the amendment was to allow contractors additional time to comply with the requirements. **These two amendments the State adopted in 2017 are being deleted during the 2020 adoption because contractors should now be familiar with the requirement.**

The below sections are reinstated in the 2020 State Code:

**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.*

**The State also intends to adopt two new amendments to the 2020 NEC.** The first amendment is to delay until January 1, 2022 a change to Section 210.8(A) which will require ground-fault circuit interrupter (GFCI) protection on receptacles up to 250 volts, instead of just on those up to 125 volts in dwelling units. Requiring the added protection on larger receptacles in the 2020 version will increase the cost of electrical work without providing an equivalent amount of protection.

The second amendment by the State removes Section 210.8(F) pertaining to Outdoor Outlets from the 2020 Code. The State's amendment will require, after January 1, 2022, that all outdoor outlets have ground-fault circuit interrupter (GFCI) protection which was not required for every outlet in the 2017 State Code.

#### Local Amendment:

The proposed local amendment continues to restrict the use of nonmetallic-sheathed cable in commercial structures. This local amendment is currently in effect for the 2017 NEC. The prohibition of nonmetallic-sheathed cable for commercial structures while still allowing their use in single and multi-family structures is consistent with other jurisdictions.

#### **ALTERNATIVES:**

1. Set the public hearing for March 23, 2021 to adopt the 2020 edition of the National Electrical Code (NEC) with two State of Iowa amendments (which expire on January 1, 2022) and one local amendment (Currently described in Section 5.205(1) of the Ames Municipal Code).
2. Direct staff to work with the Building Board of Appeals to develop further local amendments to the recommended codes.

**CITY MANAGER’S RECOMMENDED ACTION:**

The Legal Department and the Building Board of Appeals have reviewed the 2020 National Electric Code and state amendments. The Building Board of Appeals has recommended approval of the NEC to the City Council with the addition of one local amendment, which currently exists. The NEC will be in effect on April 1, 2021 and all local jurisdictions are required to adopt, at minimum, the State Code at that time.

It is the recommendation of the City Manager that the City Council adopt Alternative No. 1, thereby setting a public hearing for March 23, 2021.

## Attachment A

The following is an overview of some of the changes made by the NFPA in the 2020 edition of the NEC. Although this is not an inclusive list it does highlight some of the more notable changes from the 2017 edition. Many of these changes are being implemented to create safer living conditions for the building occupants.

- 210.8(A)(5) – GFCI protection is now required for all dwelling basement receptacles
  - 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 located in dwelling unit basement areas where the possibility of wet or damp floors exist.
- 210.52(C)(2) – The number of required receptacles for islands and peninsulas are now based on a calculation of the square footage of the island or peninsula area.
  - In order to discourage the use of extension cords additional receptacles are required for large islands and peninsulas.
- 230.67 – All new and replacement dwelling services will be required to have surge protection.
  - The installation of surge suppression is required to protect sensitive electronic equipment and devices such as smoke detectors and AFCI, GFCI protective devices.
  - The surge suppression will also protect sensitive electronics present in most modern appliances.
- 230.85 – Each service on a dwelling will be required to have an emergency disconnect on the exterior of the structure.
  - The installation of emergency service disconnects on the exterior of the structure is to help protect emergency responders from accidental electrocution by being able to turn off the electricity to the structure from in the exterior.
- 314.27(C) – Ceiling mounted outlet box locations in habitable rooms where ceiling fans are acceptable for installation are required to be boxes listed for ceiling paddle fan support.
  - The change acknowledges that ceiling fans may be installed in locations other than those identified during original construction.
- 406.12 – Tamper resistant receptacles are now also required in dwelling garages, common areas of multifamily dwellings and hotels/motels, all educational facilities, dormitories and assisted living facilities.

- Tamper resistant outlets have been proven to prevent children from placing metal objects in receptacles and getting shocked or burned and were previously required in specific areas.
- The areas where tamper resistant receptacles are required have been extended to include the areas listed above where children are routinely present.
- 625.54 – All receptacles that are to be utilized for EV charging are required to be GFCI protected.
  - The intent is to ensure that the frequently used EV charging receptacles are provided personal Ground Fault Circuit Interrupting protection.

In addition to the above changes, the five new articles listed below have been added to the 2020 NEC.

- **Article 242-** is a new article that provides the requirements for overvoltage protection. Surge protection and surge arresters to protect electrical equipment and system components.
- **Article 311-** is a new article that provides the requirements for medium voltage cable. Medium voltage is defined as 2001 volts up to and including 35,000 volts nominal.
- **Article 337-** is a new article that provides the requirements for type P cable.
- **Article 410 Part XVI-** is a new addition of special provisions for horticultural lighting equipment. These requirements were included to address the large number of new indoor growing facilities that utilize special lighting to grow plants.
- **Article 800-** is a new article that provides requirements for the installation of communication systems cabling and equipment