

700.5(E)

550.13(B)

445.13(B)

240.67



110.14(D)

690.13

370.80

**NEC 2017**

250.30(A)(6)(a)

555.24

620.51(D)(2)

210.11(C)(4)

# ANALYSIS OF CHANGES

110.16(B)

680.14

300.5(D)(4)

700.10(A)

An Educational Partnership



840.48

770.100(B)(3)(2)

314.27(E)



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**This book conveys the information related to each change as of July 1, 2016, but does not reflect any subsequent appeal or action taken by the NFPA Standards Council.**

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# Preface

The *National Electrical Code* is updated on a three-year *Code* cycle. The International Association of Electrical Inspectors publishes its *Analysis of Changes* every three years on the same publishing schedule as the *NEC*. This publication is based on the revisions to the 2017 *NEC*.

The 2017 *NEC* experienced a change in the revision process. In the past, the first public meeting for the *NEC* revision process was known as the Report on Proposals. This was replaced with the 2017 *NEC* First Draft meeting. Suggested changes to the *NEC*, which were known as Proposals, were replaced with Public Inputs. The PIs that were acted upon favorably resulted in a First Revision to the First Draft of the 2017 *NEC*.

The second public meeting for the *NEC* revision process was known as the Report on Comments meeting, which was replaced with the 2017 *NEC* Second Draft meeting. Submitted Comments were replaced with Public Comments. Successful PCs resulted in Second Revisions to the Second Draft of 2017 *NEC*. Appeals will be heard and voting for acceptance of the 2017 *NEC* will take place at the NFPA Annual Conference in June 2016. The NFPA Standards Council will issue the 2017 *NEC* in August 2016 with a publication date of September of 2016.

There were 4102 Public Inputs submitted from interested participants, which resulted in 1233 First Revisions to the First Draft of the 2017 *NEC*. A total of 1513 Public Comments resulted in 559 Second Revisions to the Second Draft of the *NEC*.

In this book, IAEI has reported on the most significant changes to the 2017 *NEC*. The revisions reported on in this publication were based on the Second Draft of the 2017 *NEC*. While IAEI takes every precaution to deliver the most accurate account of the changes to the latest edition of the *NEC*, these revisions are subject to alterations from the time of publication of the *Analysis of Changes* to the deliverance of the final version of the 2017 *NEC*.

## **Key terms and abbreviations that are used in the *Analysis of Changes*:**

*NEC* National Electrical Code

FD First Draft (*NEC*)

SD Second Draft (*NEC*)

PI Public Input

PC Public Comment

FR First Revision

FCR First Committee Revision

SR Second Revision

SCR Second Committee Revision

CMP Code Making Panel

CI CMP Committee Input

*NEC* CC *NEC* Correlating Committee

NITMAM Notice of Intent to Make a Motion

CAM Certified Amending Motion

TIA Tentative Interim Amendment

AHJ Authority Having Jurisdiction. An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure (*NEC* Article 100). This AHJ could be the Building Official, Electrical Inspector, Fire Marshal, etc.

**Chapter 1**

# General

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## **Articles 100 – 110**

**100** Definitions

**110** Requirements for Electrical Installations

## Article 100 — Definitions

### *Accessible, Readily (Readily Accessible)*



100

#### 100 Accessible, Readily (Readily Accessible)

- **Type of Change:** Revision
- **Change at a Glance:** The use of a key is not considered taking an action such as the use of a “tool” to gain ready access. Crawling under something is not considered readily accessible.
- **Code Language: Article 100 Definitions**

**Accessible, Readily (Readily Accessible).** Capable of being reached quickly for operation, renewal, or inspections without requiring those to whom ready access is requisite to take actions such as to use tools (other than keys), to climb over or under, to remove obstacles, or to resort to portable ladders, and so forth.

**Informational Note:** Use of keys is a common practice under controlled or supervised conditions and a common alternative to the ready access requirements under such supervised conditions as provided elsewhere in the *NEC*.

- **2014 NEC Requirement**  
To have to resort to the use of a “tool” to gain access to something to be “readily accessible” does not meet the definition of *readily accessible*.



Equipment that can only be reached by “climbing over” an obstacle would also not meet the definition of readily accessible.

**Accessible, Readily (Readily Accessible).** Capable of being reached quickly for operation, renewal, or inspections without requiring those to whom ready access is requisite to actions such as to use tools, to climb over or remove obstacles, or to resort to portable ladders, and so forth.

■ **2017 NEC Change**

Revisions were made to indicate that the use of a key does not fall under the “use of tools.” Having to resort to “crawling under” (as well as “climbing over”) an obstacle was added to actions that do not meet the definition. This change aligns with the language in 110.26(F), which indicates that electrical rooms or enclosures controlled by a lock are considered accessible to qualified persons.

**Analysis of the Change:**

The definition of *readily accessible* has once again been revised for clarity. The phrase “to actions such as to use tools” was added in the 2014 *NEC* revision cycle. This added phrase concerning tools was interpreted by some *Code* users as a prohibition against the use of a key to gain access to an object needing ready access. CMP-1 clarified that locks do not prevent equipment from being readily accessible by adding the phrase “other than keys” follow the word “tools” in this definition for the 2017 *NEC*. This revision will continue to allow a panelboard cover to be locked with a key while recognizing that the overcurrent devices located behind the panelboard's operable lid or door are still “readily accessible.”

This definition also described having “to climb over or remove obstacles, or to resort to portable ladders, and so forth” as actions that would prohibit meeting the definition of “readily accessible.” For the 2017 *NEC*, having to crawl “under” obstacles was added to the definition. It is not unusual for equipment such as panelboards and disconnects (which are required to be readily accessible) to be installed between rows of conveyor belts and similar obstacles. This installation method often requires maintenance workers to have to crawl under the conveyor belt or other obstacles to access such equipment. Crawling under an obstacle is no better than climbing over an obstacle to reach a piece of electrical equipment.

It is interesting to note that in the Committee Statement for FR 8, CMP-1 indicated that the list items included in the definition of Readily Accessible are “not intended to be an all-inclusive list.”

First Revisions: FR 8

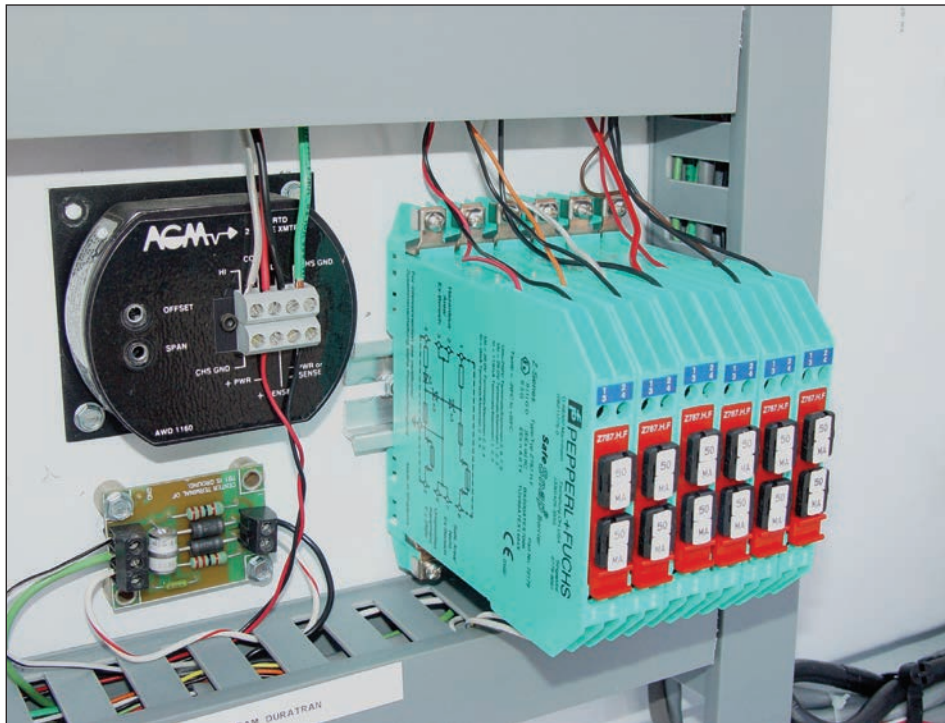
Second Revisions: SR 6

Public Inputs: PI 3361, PI 2892, PI 2317

Public Comments: PC 300, PC 199, PC 1039, PC 1731

# Article 100 — Definitions

## *Associated Apparatus*



100

### 100 Associated Apparatus

- **Type of Change:** Relocation
- **Change at a Glance:** The definition of *Associated Apparatus* was relocated to Article 100.
- **Code Language:** Article 100 Definitions

**Associated Apparatus [as applied to Hazardous (Classified) Locations].** Apparatus in which the circuits are not necessarily intrinsically safe themselves but that affects the energy in the intrinsically safe circuits and is relied on to maintain intrinsic safety. Such apparatus is one of the following:

- (1) Electrical apparatus that has an alternative type of protection for use in the appropriate hazardous (classified) location
- (2) Electrical apparatus not so protected that shall not be used within a hazardous (classified) location

**Informational Note No. 1:** Associated apparatus has identified intrinsically safe connections for intrinsically safe apparatus and also may have connections for non-intrinsically safe apparatus.

**Informational Note No. 2:** An example of associated apparatus is an intrinsic safety barrier, which is a network designed to limit the energy (voltage and current) available to the protected circuit in the hazardous (classified) location, under specified fault conditions.

■ **2014 NEC Requirement**

The definition of *Associated Apparatus* was located in Article 504 (Intrinsically Safe Systems), in Section 504.2.

■ **2017 NEC Change**

The definition of “Associated Apparatus” was relocated to Article 100 for application across the hazardous location *NEC* articles.

**Analysis of the Change:**

Whenever a definition is included in an Article other than Article 100, it is required to be located in the “.2” section. The term *Associated Apparatus* appears in Articles 500, 504, 505, and 506. For the 2014 *NEC*, this definition was located in Article 504 (Intrinsically Safe Systems) at 504.2. This location was not in compliance with the *NEC Style Manual* as Section 2.2.2.1 states that in general, definitions of terms that appear in two or more articles shall be located in Article 100. The addition of the words “[as applied to Hazardous (Classified) Locations]” will make it clear that the definition pertains to Articles 500 through 516 as applicable.

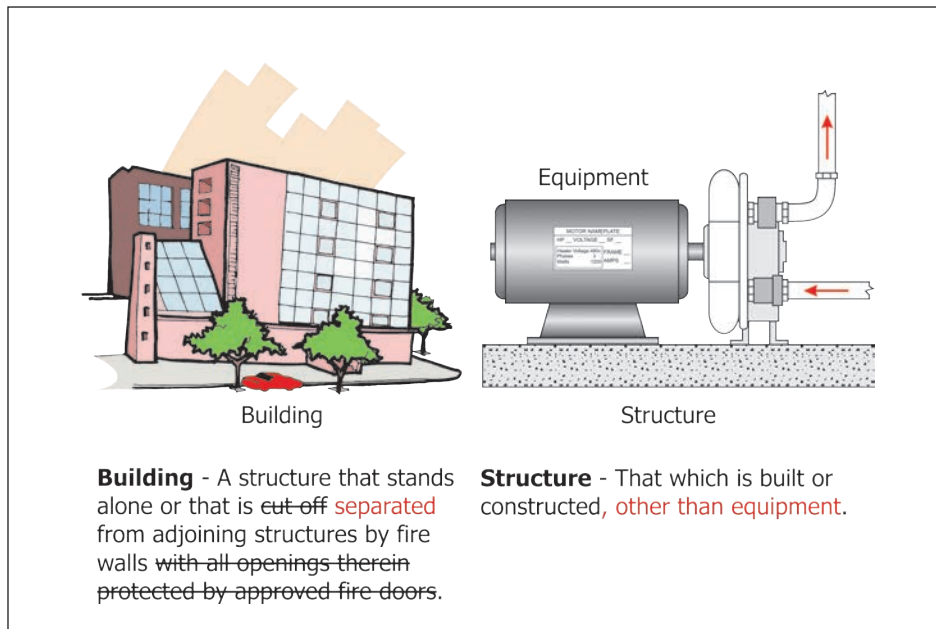
This relocation coincides with the relocation of 14 existing definitions that were located at 500.2 that will now be located in Article 100. These multiple definition relocations will be reported on in more detail in Chapter 5 of this publication.

First Revisions: FR 3919

Public Inputs: PI: PI 1756, PI 1821

# Article 100 — Definitions

## *Building, Structure*



100

### 100 Building, Structure

- **Type of Change:** Revision
- **Change at a Glance:** The definitions for *building* and *structure* were revised to align with current Building Code terms.
- **Code Language: Article 100 Definitions**

**Building.** A structure that stands alone or that is ~~cut-off~~ separated from adjoining structures by fire walls with all openings therein protected by approved fire doors.

**Structure.** That which is built or constructed, other than equipment.

- **2014 NEC Requirement**  
*Building* was defined in Article 100. The definition included unnecessary text that was better suited for the Building Code. *Structure* was defined as “that which was built or constructed” and could be interpreted as including equipment.
- **2017 NEC Change**  
These terms were revised to eliminate Building Code provisions and to clarify that a structure is something other than equipment.

**Analysis of the Change:**

These two related definitions were revised for the 2017 *NEC*. The revisions were based on the work of the Task Group assigned by the *NEC* Correlating Committee to address structures, including recreational vehicle (RV) pedestals, and to resolve issues with actions taken by CMP-19 on proposals and comments during the 2014 *NEC Code* cycle relative to comparing the definitions of “Structure” and “Building.”

The addition of the phrase “other than equipment” at the end of the definition of *Structure* provides clarification that structures do not include equipment. Part of the recommendation of the Task Group was to establish a difference between a “structure” and “equipment” for the purpose of establishing a grounding electrode system as compared to installing optional or auxiliary electrodes at something like an RV pedestal. Among CMP members, as well as users of the *Code*, there seemed to be confusion about what is considered equipment versus what is considered a structure. Based on the previous definition of a structure, everything built or constructed is a structure, including equipment. With the revised definition of “Structure,” equipment can be mounted on a structure, but the equipment itself is not a structure. An electric vehicle (EV) charging station is a good example of equipment that is not a structure, but which could be mounted to a structure. Another example would be a motor or an air-conditioner compressor mounted on a concrete pad. The electrical equipment is mounted to the structure (concrete pad or footing). The motor or AC unit is manufactured equipment; the concrete pad or footing is the structure.

The definition of *building* was revised to replace “cut off” with “separated.” This change makes the definition more consistent with building code terminology. The reference to “fire doors” was deleted as well; the term could be misleading as not all openings in firewalls are doors. Building codes determine openings permitted in firewalls, and these openings are not limited to fire doors. When such openings are included within a firewall, the building code should dictate the level of protection required for the opening (*not the NEC*).

First Revisions: FR 9, FR 13  
Public Inputs: PI 2894, PI 2109

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# ANALYSIS OF CHANGES

NEC 2017

## 5 New Articles

- Energy Storage Systems, Article 706
- Large-Scale PV Electric Power Production, Article 691
- Stand-Alone Systems, Article 710
- Direct-Current Microgrids, Article 712
- Fixed Industrial Process Heating, Article 425

## 5 Improvements

- Single-Phase Dwelling Services & Feeders, 310.15(B)(7)
- GFCI Protection for Non-Dwelling Units, 210.8(B)
- Reconditioned Equipment, ID & Traceability, 110.21(A)(2)
- Short-Circuit Current Documentation, 9 locations throughout
- Limited Access Working Space Requirement, 110.26(A)(4)

## 255 Reported Changes

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