



CITY OF AURORA, ILLINOIS

DIVISION OF BUILDING & PERMITS

ELECTRICAL COMMISSION MEETING MINUTES

Meeting held

**March 12th 2014, at 2:30 PM, at the
Building and Permits Division, 65 Water Street, Aurora, Illinois.**

Committee Members Present: Thomas, Kluber, Martin, Marshall, Chief Lehman, Beneke, Curley
Additional Attendees: Doug Schomer
Additional Staff Present: Gary Rowe, Martin Gidzinski

The purpose of this Electrical Commission Meeting is to consider the following:

1. Approval of Last Meetings Minutes

- a. Minutes printed, read individually and approved unanimously per below.
 - i. Lehman motion
 - ii. Thomas second
 - iii. 5 Aye votes by Lehman, Kluber, Thomas, Martin, and Marshall.
 - iv. 0 votes in decent.

2. Staff laid out the 5 documents we will be deliberating over the next several meetings and the purpose of each.

- a. 2011 Annex H. Administrative Provisions (based upon the adopted 2009 IBC appendix K)
- b. 2011 NEC – Electricity (non- 1&2 family structures)
- c. 2009 IBC - Licensing and Permitting Provisions
- d. 2012 IRC - Part VIII – Electrical Chapters 34-43 (one & two family structures)
- e. 2012 IRC Appendix J – Existing Buildings and Structures (one & two family structures)
- f. 2012 IEBC -- Existing Buildings and Structures (non- 1&2 family structures)

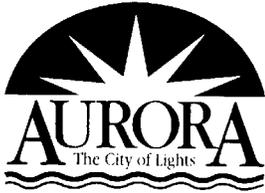
3. Deliberation of Proposed 2011 National Electrical Article III. Electricity Annex H. Administrative Provisions (dated March 12, 2014)

- a. Staff presented draft, purpose of section and, section by section discussion of newly proposed and items carried over from the adoption of the 2009 IBC Appendix K.
- b. We covered the entire proposed document including
 - i. Listing and Labeling modifications for manufacturing equipment
 - ii. Conditions deemed as imminently dangerous
 - iii. Work exempt from permits
 - iv. Liability clauses
- c. Staff was charged with further research on the following items
 - i. 102.2.1 (1) Conditions deemed as imminently dangerous
 - ii. 102.6 Materials and Products not yet available
 - iii. 103.2 Work exempt from permits
- d. Discussion of document intended to be left open for forthcoming Electrical Commission meetings with voting at a later meeting.

- 4. Deliberation of Proposed 2011 National Electrical Article III. Electricity** (dated March 12, 2014)
- a. Staff presented draft, purpose of section and, section by section discussion of newly proposed and items carried over from the adoption of the 1999 NEC.
 - b. We covered up to the beginning of Chapter 04
 - c. Staff was charged with further research on the following items
 - i. 210.12 Arc-Fault move these provisions to the Multifamily Dwelling Unit remodeling in the IEBC - Delete them from here.
 - ii. 230.70 (1) Service Entrance Conductors (Need to follow up internally with the AFD)
 - iii. 230.70 Access to Occupants - Delete from here and move to IRC appendix J
 - iv. 310 looks like it needs to be re-ordered per the section numbers
 - v. 355 RTRC – research for hazardous locations
 - vi. 356 LFNC – longer lengths in hazardous locations desired by staff
 - vii. 388 Surface Non-Metallic Raceways – desire to restrict uses with ground
 - d. Discussion of document intended to be left open for forthcoming Electrical Commission meetings with voting at a later meeting.
- 5. Next Meetings**
- i. March 26th 2:30 PM Building and Permits 65 Water street and then every two weeks thereafter through end of April.
 - ii. Plan on circling back to items open from this meeting as old business then licensing and permitting provisions then IRC chapter 34-43.
- 6. Adjourn to next meeting** – Motion by Kluber Second by Thomas.

John P. Curley AIA, CBO

Director Division of Building & Permits



CHAPTER 12 BUILDINGS AND BUILDING REGULATIONS* ELECTRICITY

Comment [E12Mar14-1]: Elect Commission deliberated up to Chapter 04 on 12 march 14.

*Cross reference(s)--Airport zoning, § 5-36 et seq.; erosion and sedimentation control, Ch. 15; fire prevention codes and standards, § 17-101 et seq.; floodplain management, Ch. 18; open housing, § 22-41 et seq.; planning and development, Ch. 34; preservation, Ch. 37; awnings, § 42-176 et seq.; subdivisions, Ch. 43; zoning, App. A. --State law reference(s)--Powers of home rule units, Ill. Const. art. VII, § 6.

ARTICLE III. ELECTRICITY*

Sec. 12-32. Electrical code ordinance adopted.

That certain document, three (3) copies of which are on file in the office of the Building Code Official, being marked and designated as the City of Aurora Electrical Ordinance,

- ~~2008-2011~~ NFPA -70 National Electrical Code; ~~Annex H -Electrical Code Administrative Provisions~~

As published by the National Fire Protection Association and adopted as the Electrical Ordinance of the City of Aurora, Illinois in the State of Illinois: for the control and regulation of installation and/or alteration of electrical systems and electrical equipment; for the utilization of electricity for light, heat or power. Each and all of the regulations, penalties, conditions and terms of said edition of NFPA-70 are hereby referred to and amended in part hereof as if fully set out in this article, with the additions, insertions, deletions, and changes prescribed in ARTICLE III. sections 12-32 through 12-100. Ord. No. 092-37, § 1, 6-2-92; Ord. No. 099-41, §§ 1, 11, 6-8-99)

Section 12-33 through Section ~~12-39-38~~ reserved.

~~Section 12-39: Annex H. Electrical Code Administrative Provisions: adopted and amended under separate ordinance.~~

~~Section 12-40; Adopted 2008-2011 NEC shall be amended as follows: The provisions herein shall govern installations in Non-One & Two Family structures. Electrical provisions within One & Two Family structures additionally shall refer to the current International Residential Code Part VIII – Electrical (e.g. chapters 34-43 of the 2009 IRC)as amended.~~

2011 NEC Chapter 1 General

Article 110 Requirements for electrical installations

~~Section 110.2 Approval shall be added to as follows:~~

~~110.2.1 Listing and Labeling. Electrical materials, components, devices, fixtures and equipment shall be listed for the application, shall bear the label of an approved agency and shall be installed, and used, or both, in accordance with the manufacturer's installation instructions. [IRC E3403.3 — highlights indicated thus represent IRC references]~~

Comment [JPC2]: Referencing to the IRC here will allow us to remove one & two family items from this document and relocate and collate them with the IRC adoption.

Comment [23Jan12-3]: Carried forward from '99 NEC adoption Sec.12-43

Chapter 2 Wiring and Protection

Article 210 Branch Circuits

I. General Provisions

210.12 Arc-Fault Circuit-Interrupter Protection.

~~(B) Branch Circuit Extensions or Modifications – Dwelling Units. shall be amended as follows:~~

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

- ~~(1) Extensions or modifications of existing circuits shall not require the installation of AFCI protection.~~
- ~~(2) Replacement or upgrading of a service or panel board shall not require that existing circuits be protected by AFCI devices.~~

Comment [2013Apr4]: AFCI Provisions from OR state adoption. 05Apr13 Need to revisit this after we discuss appendix J and IEBC. New AFCI receptacle devices are available for this so we may not need to take this lesser level of safety stance.

Comment [JPC5]: Need to determine whether or not to leave this here to cover Multi-Family Dwelling Units – Could take a different stance between the two if desired.

Comment [E12Mar14-6]: Delete from NEC and discuss in IEBC - ungrounded applications.

II. Branch-Circuit Ratings

Subsection to 210.23 shall be added as follows:

~~210.23 (E) Existing 12 AWG branch circuits: Existing branch circuits with 12 AWG conductors that cannot be completely traced throughout the circuit shall be served by no more than 15 ampere breakers [IRC E3702.2.1 added].~~

Comment [23Jan12-7]: Carried forward from '99 NEC adoption Sec.12-49

Comment [23Jan12-8]: Carried forward from '99 NEC adoption Sec.12-44

Article 230 Services shall be added to/amended as follows:

II. Overhead Service-Drop Conductors

~~Section 230.23 (B) Minimum Size. The conductors shall not be smaller than 6 AWG copper or 1/0 aluminum [IRC E3603.1 table deleted and refer to NEC 310.16].~~

Comment [JPC9]: Arlington Heights min is #3 Cu THW in 1 ¼ inch rigid

Comment [23Jan12-10]: Carried forward from '99 NEC adoption Sec.12-44

III. Underground Service Lateral Conductors

~~Section 230.31(B) Minimum Size: The conductors shall not be smaller than 3 AWG copper or 1/0 AWG aluminum [IRC E3603.1 table deleted and refer to NEC 310.16].~~

Comment [03aug11-11]: 1/0 provides more consistency

IV. Service-Entrance Conductors

Comment [JPC12]: Arlington Heights #3AWG Cu only

Section 230.43 **Wiring Methods for 600 Volts, Nominal, or Less** shall be amended as follows [IRC E3801.2 & E3801.4 amended tables]:

- 230.43(1) **Open Wiring on Insulators**: Deleted
 - 230.43(2) **Type IGS Cable**: Deleted.
 - 230.43(5) **Electrical Metallic Tubing (EMT)**: Deleted.
 - 230.43(6) **Electrical Nonmetallic Tubing (ENT)**: Deleted.
 - 230.43(7) **Service-entrance Cables**: Deleted.
 - 230.43(8) **Wireways**: Deleted.
 - 230.43(10) **Auxiliary Gutters**: Deleted.
 - 230.43(11) **Rigid Non-metallic Conduit**: Shall only be permitted for underground use.
 - 230.43(12) **Cablebus**: Deleted.
 - 230.43(13) **Type MC Cable**: Deleted.
 - 230.43(14) **Mineral-insulated, metal-sheathed cable**: Deleted.
 - 230.43(15) **Flexible metal conduit**: Deleted.
 - 230.43(16) **Liquid-tight flexible nonmetallic conduit**: Deleted.
- 230.43.1 All service entrance conduit for overhead service drops shall be supported by galvanized 2 piece back-straps or an approved equal [IRC E3801.2 added].

Comment [23Jan12-13]: Itemized raceway and wiring types for clarification. Carried forward from '99 NEC adoption Sec.12-46

Comment [staff4/1614]: Per concerns of the Elec Commission meeting 29 march 12 still will allow listed Auxillary Gutters

Comment [23Jan12-15]: Itemized raceway and wiring types for clarification. Carried forward from '99 NEC adoption Sec.12-46

Comment [23Jan12-16]: New item. Problem with supports that are not listed fur the application. Clarification.

Comment [23Jan12-17]: Carried forward from '99 NEC adoption Sec.12-46

Comment [JPC18]: Decatur permits 10 feet, Elgin is 5 feet.

Comment [E12Mar14-19]: Look at this provision for remodeling provisions.

Comment [E12Mar14-20]: Speak with AFD about this and the possibility of the disconnect.

Comment [JPC21]: Elgin

Comment [JPC22]: We have struggled with this provision in remodeling at multi-unit building remodelings

Comment [E12Mar14-23]: Delete from NEC and then discuss in the IEBC section

Comment [23Jan12-24]: Carried forward from '99 NEC adoption Sec.12-51 (f)

Comment [23Jan12-25]: New Item to clarify existing code requirement.

VI. Service Equipment – Disconnecting Means

Section 230.70 **General** shall be amended as follows

230.70 (1) Readily Accessible Location: Service entrance conductors shall not travel over five (5) feet inside a structure before reaching the main service disconnecting means. If this distance would be exceeded, the main service disconnecting means shall be located outside of the structure, adjacent to, or in the same enclosure as, the metering equipment [IRC E3601.6.2.1 added].

Section 230.70 (C) **Access to Occupants**: shall be amended as follows

230.70 (C) Access to Occupants: In newly constructed or remodeled multi-occupancy buildings, each occupancy shall have access to the occupant's service disconnecting means. Each service main, or branch feeder, disconnect must be marked so it is easily identified as to which unit is being served by that disconnect.

Exception: In a multi-occupancy building where electric service and electrical maintenance are provided by the building management and where these are under continuous building management supervision, the service disconnecting means supplying more than one occupancy shall be permitted to be accessible to authorized management personnel only.

Article 250 **Grounding & Bonding** shall be added to/amended as follows:

VII. General

Section 250.8 **Connection of Grounding and Bonding Equipment** shall be added to as follows:

250.8(B)(1) Methods not Permitted: Sheet-metal strap type ground clamps shall not be used for connecting a grounding electrode conductor to a grounding electrode [IRC E3611.1.1 added].

XI. Grounding Conductors shall be added to as follows:

250.53 Grounding Electrode System Installation.

250.53(D)(2) Revise/Replace with the following:

(A) **Rod, Pipe, and Plate Electrodes**. Rod, pipe, and plate electrodes shall meet the requirements of 250.53(A)(1) through (A)(3).

(1) **Below Permanent Moisture Level**. If practicable, rod, pipe, and plate electrodes shall be embedded below permanent moisture level. Rod, pipe, and plate electrodes shall be free from nonconductive coatings such as paint or enamel.

(2) **Supplemental Electrode Required**. A single rod, pipe, or plate electrode shall be supplemented by an additional electrode of a type specified in 250.52(A)(2) through (A)(8). The supplemental electrode shall be permitted to be bonded to one of the following:

- (1) Rod, pipe, or plate electrode
- (2) Grounding electrode conductor
- (3) Grounded service-entrance conductor
- (4) Nonflexible grounded service raceway
- (5) Any grounded service enclosure

Exception: If a single rod, pipe, or plate grounding electrode has a resistance to earth of 25 ohms or less, the supplemental electrode shall not be required.

(3) **Supplemental Electrode**. If multiple rod, pipe, or plate electrodes are installed to meet the requirements of this section, they shall not be less than 1.8 m (6 ft.) apart.

Informational Note: The paralleling efficiency of rods is increased by spacing them twice the length of the longest rod.

(B) **Electrode Spacing**. Where more than one of the electrodes of the type specified in 250.52(A)(5) or (A)(7) are used, each electrode of one grounding system (including that used for strike termination devices) shall not be less than 1.83 m (6 ft) from any other electrode of another grounding system. Two or more grounding electrodes that are bonded together shall be considered a single grounding electrode system [IRC E 3608.1.1 — 3608.1.1(4)].

Section 250.191-192 Underground / Under-slab / Concrete Encased Raceway:

250.191(A)192 Equipment Grounding Conductor: A wire to serve as a redundant Equipment Grounding conductor shall be installed in all underground raceways and raceways in concrete. [IRC E3908.21 added].

Comment [JPC26]: This is verbatim from the 2011 NEC – We were contemplating adding when discussing the 2008 NEC

Comment [23Jan12-27]: New Item.

Chapter 3 Wiring Methods and Materials

Article 310 Conductors for General Wiring

Section 310.106 (A) Minimum Size of Conductors shall be added to as follows:

310.106 (A) (1) Min Conductor Size: Minimum size conductor shall be 12 AWG, except for One and Two family or individually metered units of R-2, R-3 or R-4 uses (as defined in the IBC).

Section 310.2-106 (B) Conductors shall be added to as follows:

310.106(B)(1) Aluminum Conductors : Aluminum or copper-clad aluminum wires shall be 1/0 AWG or larger [IRC E 3406.3].

Section 310.5 Minimum Size of Conductors shall be amended as follows:

310.5 (A) Min Conductor Size: Minimum size conductor shall be 12 AWG, except for One and Two family or individually metered units of R-2, R-3 or R-4 uses (as defined in the IBC).

Section 310.15 Ampacities for conductors Rated 0-2000 volts shall be amended as follows:

310.15 (B)(67) 120/240-Volt, 3 wire, single phase dwelling service and feeders. and Table 310.15 (B)(67) shall be deleted in their entirety [IRC E 3603.1 and table added].

Comment [JPC28]: Arlington Heights and Bolingbrook are also 12 AWG

Comment [2013Feb29]: Relocated from 310.5 below

Comment [17AUG11-30]: Clarification. Carried forward from '99 NEC adoption Sec.12-52

Comment [23Jan12-31]: Carried forward from '99 NEC adoption Sec.12-49

Comment [23Jan12-32]: Carried forward from '99 NEC adoption Sec.12-44

Comment [E12Mar14-33]: reorder

Article 314 Outlet, Device, Pull, and Junction Boxes: Conduit Bodies; Fittings and Hand Hole Enclosure

Section 314.3 Non-Metallic Boxes: shall be amended as follows

Plastic device and junction boxes shall not be installed, except in corrosive locations or in non-grounded circuits when they are permitted to remain [IRC E 3905.3 added].

Comment [23Jan12-34]: Carried forward from '99 NEC adoption Sec.12-68 but modified to include non-grounded circuits (knob & Tube)

Article 320 Armored Cable: Type AC [IRC E 3801.2 and E3801.4 modified].

Section 320.10 Uses Permitted shall be deleted and replaced with the following:

320.10 Uses Permitted : Type AC cable shall not be permitted

Exception (1) Except where included as a factory assembled sub component of a manufactured system.

Comment [23Jan12-35]: Carried forward from '99 NEC adoption Sec.12-58 with more restrictions

Comment [23Jan12-36]: New Item. Not addressed in the 99 NEC

Article 322 Flat Cable Assemblies: Type FC shall be deleted in its entirety [IRC E 3801.2 and E3801.4 modified].

Article 324 Flat Conductor Cable: Type FCC shall be deleted in its entirety [IRC E 3801.2 and E3801.4 modified].

Article 326 Integrated Gas Spacer Cable: Type IGS shall be deleted in its entirety [IRC E 3801.2 and E3801.4 modified].

Article 330 Metal-Clad Cable: Type MC [IRC E 3801.2 and E3801.4 modified].

Section 330 shall be amended as follows :

330.10 Uses Permitted : Type MC cable shall not be permitted.

Exception (1) Except where included as a factory assembled sub component of a manufactured system.

Article 332 Mineral-Insulated, Metal-Sheathed Cable: Type MI shall be deleted in its entirety [IRC E 3801.2 and E3801.4].

Article 334 Nonmetallic-Sheathed Cable: Types NM, NMC, and NMS [IRC E 3801.2 and E3801.4 modified].

Section 334.10 shall be amended as follows:

334.10 Uses Permitted: Type NM, NMC, and Type NMS cables shall not be permitted. .

Exception (1) Existing installations that met code at the time of installation shall be permitted to remain if the installation is deemed safe and unaltered.

Comment [23Jan12-37]: New Item

Comment [23Jan12-38]: New Item

Comment [23Jan12-39]: Carried forward from '99 NEC adoption Sec.12-59. More restrictive

Comment [23Jan12-40]: New Item

Comment [JPC41]: Joliet allows when residential structures are <4stories

Comment [23Jan12-42]: Carried forward from '99 NEC adoption Sec.12-60. More restrictive

Comment [JPC43]: Covered by Annex H

Article 338 Service-Entrance Cable: Types SE and USE

Section 338.10 shall be amended as follows:

338.10 Uses Permitted: SE and USE cable shall not be allowed [IRC E 3801.2 and E3801.4 modified].

Article 340 Underground Feeder and Branch Circuit Cable: Type UF [IRC E 3801.2 and E3801.4 modified].

Section 340.10 shall be amended as follows:

340.10 Uses Permitted: Type UF cables shall be permitted when remodeling existing one and two family dwellings, only in exterior applications, and, in conformance with the cable listing [IRC E added].

Article 348 Flexible Metal Conduit: Type FMC [IRC E 3801.2 and E3801.4 modified].

Section 348.10 Uses Permitted: FMC where exposed shall only be permitted in lengths not to exceed (6) six feet.

Article 350 Liquid-tight Flexible Metal Conduit: Type LFMC [IRC E 3801.2 and E3801.4 modified].

Section 350.10 Uses Permitted: LFMC shall only be permitted in lengths not to exceed (6) six feet.

Article 352 Rigid Polyvinyl Chloride Conduit: Type PVC [IRC E 3801.2 and E3801.4 modified].

Section 352.10 shall be amended as follows:

352.10.1 When permitted the transition at grade shall be 90 degree galvanized rigid metal conduit.

Exception (1) Conduits and sleeves used exclusively for utility cables.

Exception (2) Conductors encased in concrete at Light Pole Bases.

352.10(A) Concealed shall be deleted in its entirety.

Exception (1) Conduits encased in min 2 inches of concrete.

352.10(C) Cinders: shall be deleted in its entirety.

352.10(E) Dry and Damp Locations: shall be deleted in its entirety.

352.10(F) Exposed: shall be deleted in its entirety unless approved by the authority having jurisdiction for hazardous locations.

Comment [23Jan12-44]: Carried forward from '99 NEC adoption Sec.12-61. More restrictive

Comment [23Jan12-45]: Carried forward from '99 NEC adoption Sec.12-62. More restrictive

Comment [staff4/1646]: Clarification from elec march 29th commission meeting. IRC Appendix J

Comment [JPC47]: Joliet allows when residential structures are <4stories

Comment [23Jan12-48]: Carried forward from '99 NEC adoption Sec.12-65. More restrictive

Comment [23Jan12-49]: New Item

Comment [23Jan12-50]: Carried forward from '99 NEC adoption Sec.12-57. Less restrictive

Comment [staff4/1651]: Clarification from Elec march 29th Commission meeting

Comment [23Jan12-52]: New Item

Comment [E12Mar14-53]: Research for hazardous locations

Comment [staff4/1654]: Limiting the allowable

Comment [E12Mar14-55]: Longer lengths in hazardous locations desired – Research by staff

Article 355 Reinforced Thermosetting Resin Conduit: Type RTRC shall be deleted in its entirety [IRC E 3801.2 & E3801.4].

Article 356 Liquid Tight Flexible Non-Metallic Conduit: Type LFNC

Section 356.10 uses permitted shall be amended as follows:

Section 356.10 (5) shall be deleted in its entirety.

Section 356.12 uses not-permitted shall be amended as follows:

Section 356.12 (3) ...in lengths longer than 6 feet.

Article 358 Electrical Metallic Tubing [IRC E 3801.2 and E3801.4 modified].

Section 358.12 (7) shall be added.

Comment [23Jan12-56]: Carried forward from '99 NEC adoption Sec.12-64.

Proposed 2014 -- Aurora Electrical Code - CHAPTER 12 - Article III

- (a) Electrical metallic tubing ("EMT") shall not be used underground or in concrete bases or slabs.
 - (1) Exception: EMT may be used in poured concrete only when installed above-grade with intermediate metal conduit ("IMC") or rigid metal conduit used to exit from the concrete.
- (b) EMT shall not be installed using indenter type couplings and connectors.

Article 362 Electrical Non-Metallic Tubing: Type ENT

Section 362 Electrical Non-Metallic Tubing: Type ENT shall be deleted in its entirety.

Article 378 Non-Metallic Wireways:

Section 378 Non-Metallic Wireways shall be deleted in its entirety.

Article 382 Non-Metallic Extensions:

Section 382 Non-Metallic Extensions shall be deleted in its entirety.

Article 386 Surface Metal Raceway

Section 386.60.1 -Grounding - All surface metal raceways shall contain an equipment grounding conductor sized per table 250.122

Article 388 Surface Non-Metallic Raceways:

Section 388 Surface Non-Metallic Raceways shall be deleted in its entirety.

Article 394 Concealed Knob and Tube Wiring shall be amended as follows [IRC E 3801.2 and E3801.4 modified]:

Section 394.10 Uses Permitted. New installations of Knob-and-tube wiring shall not be installed. Existing knob-and-tube wiring shall not be extended.

Chapter 4 Equipment for General Use [IRC Appendix J 301.4 shall be deleted]:

Article 406 Receptacles, Cord Connectors, and Attachment Plugs: shall be amended as follows:

Section 406.3-4 (D) (32) Non-Grounding Type Receptacles. Where attachment to an equipment grounding conductor does not exist in the receptacle enclosure, the installation shall comply with (D)(32)(b) or (D)(32)(c) [IRC E 4002.2 adding exceptions].

Section 406.3-4 (D) (32.1) Existing Non-Grounding Type Receptacles within area of work. Non-grounded receptacles within rooms which are undergoing electrical work of any fashion shall be replaced. When they are permitted to remain non-grounded per 406.3-4 (D) (32) the replacement receptacles shall be "ungrounded" marked GFI receptacles. [IRC E 4002.2 adding exceptions].

Section 406.3-4 (D) (32.2) Existing Non-Grounding Type Receptacles at structures where remodeling work exceeds 50% of the tax assessor's valuation of the structure. Non-grounded receptacles and circuits shall be removed in their entirety and replaced with a grounded and fully code compliant system [IRC E 4002.2 adding exceptions].

Section 406.4 (D) (4) Arc-Fault Circuit Interrupter Protection. Shall be deleted in its entirety.

Section 406.4 (D) (12) Tamper-Resistant Receptacles for Dwelling Units. Shall apply to Bedrooms and Sleeping areas only.

Article 408 Switch Boards and Panel Boards: shall be added to as follows [IRC E 3705.7 item7 added]:

Section 408.54 (A) Mini-circuit breakers prohibited. All breakers shall be full sized, breakers known as mini, tandem, dual, twin, etc. shall not be permitted to be used in new service installations.

Chapter 6 Special Equipment

Article 600 Electrical Signs and Outline lighting. Shall be amended as follows:

Section 600.6 (1) Means of Disconnect. All outdoor electric signs shall have a means of disconnect at the sign.

Section 600.7 (A) 1 Equipment Grounding. An equipment grounding conductor shall be required in all installations.

Section 600.31 (F) Metallic Enclosures. On all neon signs, the high voltage transformer and high voltage equipment shall be installed in approved metal boxes and all metallic parts shall be grounded to the conduit.

Article 604 Manufactured Wiring Systems: Delete Article in it's entirety

Sec's. 12-74--12-100. Reserved.

Comment [JPC57]: Ungrounded System???

Comment [23Jan12-58]: New Item

Comment [E12Mar14-59]: Re-work for restricted uses with a ground. Use in plenums

Comment [23Jan12-60]: Carried forward from '99 NEC adoption Sec.12-56.

Comment [E12Mar14-61]: Deliberation of the Electrical Commission ended here on 12Mar14.

Comment [23Jan12-62]: New Item

Comment [JPC63]: Elgin

Comment [JPC64]: Elgin

Comment [JPC65]: For SING FAM Elgin requires min 100amp, 20 circuits with 4 unused for future use min. 230.79(C) Elgin

Additionally Elgin specifies 1 Circuit for 350sf of Dwelling Plus 1 circuit for each 700sf of basement, enclosed porches, garages and breezeways

Comment [23Jan12-66]: New Item

Comment [JPC67]: Why not permit a calculation for capacity for this?

Comment [JPC68]: We've struggled with listing of signage. Should we clarify listing and labeling requirements in 600.3

Comment [23Jan12-69]: Carried forward from '99 NEC adoption Sec.12-72(b).

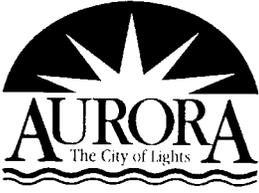
Comment [23Jan12-70]: New Item

Comment [23Jan12-71]: Carried forward from '99 NEC adoption Sec.12-72(d).

Comment [2013Feb72]: Note we wish to revisit this due to Neon fixture changes today.

Comment [23Jan12-73]: New Item

Comment [JPC74]: Double Check Looks like this should be 41



CHAPTER 12 BUILDINGS AND BUILDING REGULATIONS*
ARTICLE III. ELECTRICITY
ANNEX H. ADMINISTRATIVE PROVISIONS

Comment [E12Mar14-1]: Reviewed this entire document at the 12 Mar 14 Electrical Commission Meeting. Staff owes some research per notes below.

*Cross reference(s)--Airport zoning, § 5-36 et seq.; erosion and sedimentation control, Ch. 15; fire prevention codes and standards, § 17-101 et seq.; floodplain management, Ch. 18; open housing, § 22-41 et seq.; planning and development, Ch. 34; preservation, Ch. 37; awnings, § 42-176 et seq.; subdivisions, Ch. 43; zoning, App. A. --State law reference(s)--Powers of home rule units, Ill. Const. art. VII, § 6.

ARTICLE III. ELECTRICITY*

Sec. 12-39. ANNEX H. ELECTRICAL CODE ADMINISTRATIVE PROVISIONS adopted.

Annex H of the adopted Electrical Code shall be adopted, yet replaced in its entirety with the following. Further this adoption shall delete the 2010 adoption of International Building Code Appendix K as it is replaced and amended below.

With the exception of Section K111, this appendix contains only administrative provisions that are intended to be used by a jurisdiction to implement and enforce NFPA 70, the National Electrical Code. Annex H of NFPA 70 also contains administrative and enforcement provisions, and these provisions may or may not be completely compatible with or consistent with Chapter 1 of the IBC, whereas the provisions in IBC Appendix K are compatible and consistent with Chapter 1 of the IBC and other ICC codes. Section K111 contains technical provisions that are unique to this appendix and are in addition to those of NFPA 70.

The provisions of Appendix K are specific to what might be designated as an Electrical Department of Inspection and Code Enforcement and could be implemented where other such provisions are not adopted.

Comment [JPC2]: Below find the provisions of the adopted 2009 IBC Appendix K. with highlighted proposed modifications for this adoption. Staff feels that adopting this independent of the I Series adoption will simplify access for contractors as most would not have I series code books to simply reference our proposed modifications.

**SECTION 101
GENERAL**

101.1 Purpose. A purpose of this code is to establish minimum requirements to safeguard public health, safety and general welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation and maintenance or use of electrical systems and equipment.

101.2 Scope. This code applies to the design, construction, installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of electrical systems and equipment.

101.2.1 (A) Installation and Use of Equipment. Utilization Equipment shall be installed and used per the Manufacturer's written recommendations/instructions and if Listed or Labeled shall be installed and used in accordance with the listing or labeling.

101.2.1 (B) Examination and Inspection of Non-Labeled Manufacturing Equipment.

(1) Conditions deemed as posing an imminent danger shall be required to be removed from service until repaired; OR until labeled from a OSHA Nationally Recognized Testing Laboratory or field tested from a third party testing company as accepted by the Authority Having Jurisdiction.

(2) For Non-Labeled Manufacturing Equipment, equipment owner and equipment supplier shall verify that OSHA regulations are being met without assessment or inspection by City of Aurora personnel. Aurora's inspection responsibilities will end at the connection to the permanently installed power feed for the equipment. The suitability of the power to the equipment shall be the responsibility of the owner of the equipment or the manufacturer, and shall be verified by the equipment's owner prior to installation.

a. Non-Labeled Manufacturing Equipment may not be installed in the following locations:

1. Hazardous Locations,

Comment [JPC3]: Intention here is to limit the responsibility for Aurora to inspect/test and Accept the installation of equipment is not listed and labeled by an NRTL.

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2. Equipment using propane, gas or burning fossil fuels.

Comment [JPC4]: DesPlaines, Arlington Heights

101.3 Appeals: Appeals shall be conducted by the Electrical Commission as defined in Article I of the Aurora Building Code and per the adopted rules of the Commission.

Comment [2013Apr5]: Hoffman Estates specifies the link to the appeals in IBC adoption. Good 5Apr13

**SECTION 102
APPLICABILITY**

102.1 General. The provisions of this code apply to all matters affecting or relating to structures and premises, as set forth in Section K101.

102.2 Existing installations. Except as otherwise provided for in this chapter, a provision in this code shall not require the removal, *alteration* or abandonment of, nor prevent the continued utilization and maintenance of, existing electrical systems and equipment lawfully in existence at the time of the adoption of this code.

102.2.1 Practical Safeguarding for Existing Installations. Existing electrical installations that do not comply with the provisions of this code shall be permitted to continue in use unless the authority having jurisdiction determines that the lack of conformity with this code presents an imminent danger to occupants. Where changes are required for correction of hazards, a reasonable amount of time shall be given for compliance, depending on the degree of the hazard.

Comment [JPC6]: Comes from Annex H

1. Non-Compliant Existing Conditions and Installations at existing structures undergoing repairs, renovations, alteration, extensive alterations or reconstruction may remain unless indicated to be remedied in proportion to the extent of the project per the adopted existing structures code.

- a. One&Two Family structures; refer to the adopted International Residential Code -Appendix J.
- b. Non-One&Two Family structures; refer to the adopted International Existing Building Code.

2. In addition to further determination of the authority having jurisdiction, the following are hereby determined to constitute an imminent danger to occupants.

Comment [JPC7]: These examples are from Decatur

- a. Inadequate Service Capacity
- b. Inadequate Service Grounding
 - i. Grounding location more than 5 feet from water service entry and per Art 250.68 (C).
 - ii. Grounding or bonding locations where non-conductive materials interrupt the required conductive path per Art 250.68 (B).

Comment [JPC8]: Aurora Staff suggestion - this topic though has varied through past code editions.

Comment [E12Mar14-9]: Bonding Improvements staff research

Comment [StfMar14-10]: Referencing these sections seems prudent to staff.

- c. Improper fusing
- d. Insufficient outlets as defined by the adopted International Property Maintenance Code and the City of Aurora Occupancy Standards.

Comment [JPC11]: Feel this topic is better dealt with in the tiered approach of (residential code) Appendix J and likely not required in Commercial applications at all.

e. Improper wiring or installation that was not installed per the applicable code at the date of the installation.

f. Deterioration or Damage

g. Corroded, Rusted Switchgear, Bussing, Branch Circuit Panelboards

Comment [JPC12]: Arlington Heights, DesPlaines

h. Electrical wiring, of all types, not supported in an approved manner.

i. Splices unenclosed in approved boxes other than knob & tube wiring in areas where Knob and Tube are permitted to remain.

j. Absence of or use of unapproved connectors for splices and termination into boxes or cabinets.

k. Wiring with insulation deterioration or other damaged conditions.

Comment [JPC13]: Should mention be made of condition of K&T AND/OR where inappropriately buried in insulation materials.

l. Flexible cords used as a substitute for fixed wiring.

m. Flexible cords where running through or concealed within walls, ceilings, dropped-ceilings, baseboard and floors.

Comment [JPC14]: Has this been pretty constant through the years?

n. Boxes or conduit with excessive numbers of conductors based upon permitted installation date.

Comment [StfMar14-15]: Some fill requirements have modestly changed since '75 #6 & #8.

o. Knob and Tube wiring in areas other than concealed inside within walls/framing cavities and/or within limited access or lockable attics.

Comment [E12Mar14-16]: Staff will research

p. Exposed fuse blocks or exposed terminal-cleat type light fixtures in areas where Knob and Tube would not be permitted to remain.

Comment [JPC17]: Suggest adding additional definition to what Decatur has here---See the exception in NEC 410.5

q. Other items determined imminently dangerous by the Authority Having Jurisdiction.

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102.3 Maintenance. Electrical systems, equipment, materials and appurtenances, both existing and new, and parts thereof shall be maintained in proper operating condition in accordance with the original design and in a safe, hazard-free condition. Devices or safeguards that are required by this code shall be maintained in compliance with the code edition under which installed. The owner or the owner's designated agent shall be responsible for the maintenance of the electrical systems and equipment. To determine compliance with this provision, the *building official* shall have the authority to require that the electrical systems and equipment be re-inspected.

102.4 Additions, alterations and repairs. Additions, alterations, renovations and repairs to electrical systems and equipment shall conform to that required for new electrical systems and equipment without requiring that the existing electrical systems or equipment comply with all of the requirements of this code. Additions, alterations and repairs shall not cause existing electrical systems or equipment to become unsafe, hazardous or overloaded. Minor additions, alterations, renovations and repairs to existing electrical systems and equipment shall meet the provisions for new construction, except where such work is performed in the same manner and arrangement as was in the existing system, is not hazardous and is *approved*.

102.5 Subjects not regulated by this code. Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances or bylaws adopted by the jurisdiction, compliance with applicable standards of nationally recognized standards as are *approved* shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the *building official* to determine compliance with codes or standards for those activities or installations within the building official's jurisdiction or responsibility.

~~102.6 Materials and Products required but not yet available: Materials or products mandated by this code may be considered not yet available by the code official due to the following:~~

- ~~1. Lack of testing and listing approvals by manufacturers.~~
- ~~2. Lack of availability at local suppliers.~~

Comment [2013Apr18]: Language from MN adoption of the 2011 - specifically addressing AFCI's and the AFCI/GFCI requirement for ungrounded outlets in Jan 2014. Good 5Apr13

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Comment [JPC19]: Check if covered in the front end of the code so this can be eliminated

Comment [StfMar14-20]: Staff feels this is adequately covered in 90.4

SECTION 103

PERMITS

103.1 Types of permits. An owner, authorized agent or contractor who desires to construct, enlarge, alter, repair, move, demolish or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace electrical systems or equipment, the installation of which is regulated by this code, or to cause such work to be done, shall first make application to the *building official* and obtain the required *permit* for the work.

Exception: Where repair or replacement of electrical systems or equipment must be performed in an emergency situation, the *permit* application shall be submitted within the next working business day of the department of electrical inspection.

103.2 Work exempt from electrical permit(s). The following work shall be exempt from the requirement for a *permit*:

[Exemption from the permit requirements of this code shall not be deemed to grant authorization for work to be done in violation of the provisions of this code or other laws or ordinances of this jurisdiction.]

1. Listed cord- and plug-connected temporary decorative lighting.
2. Reinstallation of attachment plug receptacles, but not the outlets therefor.
3. Replacement of branch circuit overcurrent devices of the required capacity in the same location.
4. Temporary wiring for experimental purposes in suitable experimental laboratories.
5. ~~Electrical-Telecommunication~~ wiring, devices, appliances, apparatus or equipment operating at less than 25 50 volts, and not capable of supplying more than 50 watts of energy, AND not associated with fire alarm or other life safety systems.
6. ~~Minor maintenance such as changing a switch, receptacle, light fixture, ceiling fans less than 35 lbs., ballasts and bulbs; providing wiring and junction boxes are not altered.~~
7. ~~Repair or replacement of branch circuit overcurrent devices w/ devices appropriately sized for the conductors.~~
8. ~~Wiring replacement for mechanical equipment from existing switch or existing disconnect where the circuit conductors are of adequate size.~~

Comment [E12Mar14-21]: Staff to come back to this topic

Comment [JPC22]: Rockford

Comment [JPC23]: Does this appropriately cover low voltage

Comment [E12Mar14-24]: Add a note about swimming pools

Comment [JPC25]: Rockford

Comment [JPC26]: Rockford

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9. Wiring replacement for industrial machinery from existing switch or existing disconnect where the circuit conductors are of adequate size.
10. Wiring replacement for electrified signage from existing switch or existing disconnect where the circuit conductors are of adequate size.
11. Replacement of meter sockets or masts on services where no new conduit or conductors are changed enlarged or replaced.
12. Should we clarify the cost test \$100 materials \$250 materials + labor per IBC 117.1

Comment [JPC27]: Additional Signage Exemptions due to listing issues.

Comment [JPC28]: 2011 Decatur - amendments

Comment [E12Mar14-29]: Clause about less dangerous types of work.

SECTION 104

CONSTRUCTION DOCUMENTS

104.1 Information on construction documents. *Construction documents* shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted where *approved* by the *building official*. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that such work will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the *building official*.

104.2 Penetrations. *Construction documents* shall indicate where penetrations will be made for electrical systems and shall indicate the materials and methods for maintaining required structural safety, *fire-resistance rating* and *fireblocking*.

104.3 Load calculations. Where an *addition* or *alteration* is made to an existing electrical system, an electrical load calculation shall be prepared to determine if the existing electrical service has the capacity to serve the added load.

SECTION 105

ALTERNATIVE ENGINEERED DESIGN

105.1 General. The design, documentation, inspection, testing and approval of an alternative engineered design electrical system shall comply with this section.

105.2 Design criteria. An alternative engineered design shall conform to the intent of the provisions of this code and shall provide an equivalent level of quality, strength, effectiveness, *fire-resistance*, durability and safety. Materials, equipment or components shall be designed and installed in accordance with the manufacturer's installation instructions.

105.3 Submittal. The *registered design professional* shall indicate on the *permit* application that the electrical system is an alternative engineered design. The *permit* and permanent *permit* records shall indicate that an alternative engineered design was part of the *approved* installation.

105.4 Technical data. The *registered design professional* shall submit sufficient technical data to substantiate the proposed alternative engineered design and to prove that the performance meets the intent of this code.

105.5 Construction documents. The *registered design professional* shall submit to the *building official* two complete sets of signed and sealed *construction documents* for the alternative engineered design. The *construction documents* shall include floor plans and a diagram of the work.

105.6 Design approval. Where the *building official* determines that the alternative engineered design conforms to the intent of this code, the electrical system shall be *approved*. If the alternative engineered design is not *approved*, the *building official* shall notify the *registered design professional* in writing, stating the reasons therefor.

105.7 Inspection and testing. The alternative engineered design shall be tested and inspected in accordance with the requirements of this code.

SECTION 106

REQUIRED INSPECTIONS

106.1 General. The *building official*, upon notification, shall make the inspections set forth in this section.

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106.2 Underground. Underground inspection shall be made after trenches or ditches are excavated and bedded, piping and conductors installed, and before backfill is put in place. Where excavated soil contains rocks, broken concrete, frozen chunks and other rubble that would damage or break the raceway, cable or conductors, or where corrosive action will occur, protection shall be provided in the form of granular or selected material, *approved* running boards, sleeves or other means.

106.3 Rough-in. Rough-in inspection shall be made after the roof, framing, *fireblocking* and bracing are in place and all wiring and other components to be concealed are complete, and prior to the installation of wall or ceiling membranes.

106.4 Contractors' responsibilities. It shall be the responsibility of every contractor who enters into contracts for the installation or repair of electrical systems for which a *permit* is required to comply with adopted state and local rules and regulations concerning licensing.

SECTION 107

PREFABRICATED CONSTRUCTION

107.1 Prefabricated construction. Prefabricated construction [shall meet the Aurora Electrical code and](#) is subject to Sections K107.2 through K107.5.

107.2 Evaluation and follow-up inspection services.

Prior to the approval of a prefabricated construction assembly having concealed electrical work and the issuance of an electrical *permit*, the *building official* shall require the submittal of an evaluation report on each prefabricated construction assembly, indicating the complete details of the electrical system, including a description of the system and its components, the basis upon which the system is being evaluated, test results and similar information, and other data as necessary for the *building official* to determine conformance to this code.

107.3 Evaluation service. The *building official* shall designate the evaluation service of an *approved* agency as the evaluation agency, and review such agency's evaluation report for adequacy and conformance to this code.

107.4 Follow-up inspection. Except where ready access is provided to electrical systems, service equipment and accessories for complete inspection at the site without disassembly or dismantling, the *building official* shall conduct the in-plant inspections as frequently as necessary to ensure conformance to the *approved* evaluation report or shall designate an independent, *approved* inspection agency to conduct such inspections.

The inspection agency shall furnish the *building official* with the follow-up inspection manual and a report of inspections upon request, and the electrical system shall have an identifying label permanently affixed to the system indicating that factory inspections have been performed.

107.5 Test and inspection records. Required test and inspection records shall be available to the *building official* at all times during the fabrication of the electrical system and the erection of the building; or such records as the *building official* designates shall be filed.

SECTION 108

TESTING

108.1 Testing. Electrical work shall be tested as required in this code. Tests shall be performed by the *permit* holder and observed by the *building official*.

108.1.1 Apparatus, material and labor for tests.

Apparatus, material and labor required for testing an electrical system or part thereof shall be furnished by the *permit* holder.

108.1.2 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *building official* for inspection and testing.

SECTION 109

RECONNECTION

109.1 Connection after order to disconnect. A person shall not make utility service or energy source connections to systems regulated by this code, which have been disconnected or ordered to be disconnected by the *building official*, or the use of which has been ordered to be discontinued by the *building official* until the *building official* authorizes the reconnection and use of such systems.

**SECTION 110
CONDEMNING ELECTRICAL SYSTEMS**

110.1 Authority to condemn electrical systems. Wherever the *building official* determines that any electrical system, or portion thereof, regulated by this code has become hazardous to life, health or property, the *building official* shall order in writing that such electrical systems either be removed or restored to a safe condition. A time limit for compliance with such order shall be specified in the written notice. A person shall not use or maintain a defective electrical system or equipment after receiving such notice. Where such electrical system is to be disconnected, written notice as prescribed in this code shall be given. In cases of immediate danger to life or property, such disconnection shall be made immediately without such notice.

**SECTION 111
ELECTRICAL PROVISIONS**

111.1 Adoption. Electrical systems and equipment shall be designed, constructed and installed in accordance with the *International Residential Code* or NFPA 70 as applicable, except as otherwise provided in this code.

111.2 Abatement of electrical hazards. All identified electrical hazards shall be abated. All identified hazardous electrical conditions in permanent wiring shall be brought to the attention of the *building official* responsible for enforcement of this code. Electrical wiring, devices, appliances and other equipment which is modified or damaged and constitutes an electrical shock or fire hazard shall not be used.

111.3 Appliance and fixture listing. Electrical appliances and fixtures shall be tested and *listed* in published reports of inspected electrical equipment by an *approved* agency or OSHA Nationally Recognized Testing Laboratory and installed in accordance with all instructions included as part of such listing.

111.4 Nonmetallic-sheathed cable. ~~Deleted. The use of Type NM, NMC and NMS (nonmetallic-sheathed) cable wiring methods shall not be limited based on height, number of stories or construction type of the building or structure.~~

Comment [JPC30]: Section Deleted -- Specify Conduit ordinance here instead and refer to Art. 220???

111.5 Cutting, notching and boring. The cutting, notching and boring of wood and steel framing members, structural members and engineered wood products shall be in accordance with this code.

111.6 Smoke alarm circuits. Single- and multiple-station smoke alarms required by this code and installed within *new dwelling* units shall not be connected as the only load on a branch circuit. Such alarms shall be supplied by branch circuits having lighting loads consisting of lighting outlets in habitable spaces.

111.7 Equipment and door labeling. Doors into electrical control panel rooms shall be marked with a plainly visible and legible sign stating ELECTRICAL ROOM or similar *approved* wording. The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident.

**SECTION 112
LIABILITY FOR DAMAGES**

112.1 Liability for Damages. ~~This code shall not be construed to affect the responsibility or liability of any party owning, designing, operating, controlling, testing per NEC or OSHA requirements, or installing any electrical equipment for damages to persons or property caused by a defect therein, nor shall the Electrical Commission members or the City of Aurora or any of its employees be held as assuming any such liability by reason of inspection, re-inspection, other examination authorized or any lack of inspection thereof.~~

Comment [JPC31]: This comes from Annex H of the NEC

Comment [JPC32]: This is added to cover listing and labeling issues

Comment [JPC33]: Similar in DesPlaines, Downers Grove

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