

# **ELECTRICAL BULLETIN**

## **2015-01**

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**Subject: Adoption of the 2015 Canadian Electrical Code, Part 1- 23<sup>rd</sup> Edition**

Effective May 1, 2015, the 2015 Canadian Electrical Code, Part 1- 23 rd edition (CEC) will be adopted per the Electrical Code Regulations which are made under the authority of section 6 of the Electrical Installation and Inspection Act.

Compliance to the 2015 CEC will be required for any electrical work, installation or equipment within Nova Scotia and per any bulletins issued by this office or the electrical inspection authority.

To ensure uniformity in electrical inspections the code is adopted with no amendments.

Limited direction on new rules may be provided in this bulletin .Future bulletins may be issued from this office or the electrical inspection authorities to provide clarity and direction on how various rules are interpreted and should be reviewed by all users of the code.

Electrical work that started prior to May 1, 2015, may be inspected to the 2012 CEC if an electrical permit was obtained for that electrical work, and where applicable, the plans were accepted by the electrical inspection authority, prior to May1, 2015

Where electrical work starts or plans are submitted on or after May 1, 2015 design, review and inspections shall be per the 2015 CEC regardless of when the permit was issued.

The electrical inspection authority reserves the right to determine whether electrical work was started on any installation prior to May 1, 2015.

As in previous editions where a change to a section or rule has been made from the previous code the change is identified. In the 2015 CEC changes are identified by a small triangle located in the left- hand margin.

The following are **brief summaries** of some of changes in the 2015 CEC.

Code users should review all code changes identified in the code and incorporate them into their design and installations where appropriate.

## **Section 4**

### Ampacity of wires and cables

-Rule 4-004 –sub-rules 1(g) & 2(g) –these new sub-rules provide direction on obtaining ampacities for the underground installation of shielded cables rated 5kV to 46 kV and provides the various configuration and ampacity tables in Appendix D.

-Ampacities listed in the Tables D17A to D17N are valid only for the configurations shown. Where configurations as indicated are not used ampacities obtained by using the IEEE 835 calculation method shall be used.

-Rule 4-004-subrule (23) – this new sub-rule provides direction on obtaining the required service conductor sizes for single dwellings and feeder conductors supplying single dwelling units of row housing of apartment and similar buildings. Refer to Table 39 which indicates the service rating, the minimum service or feeder conductors required for that associated service rating and the maximum calculated load that can applied when the size of cable used is determined from the table.

### Temperature limitations

-Rule 4-006-this rule has been revised and sub-rule (2) clarifies what maximum conductor termination temperature shall be used when equipment is “not” marked.

Where the equipment in which the conductors are being terminated on has a maximum termination temperature rating marked on the equipment sub-rule (1) shall apply.

Sub-rule (4) also indicates that it is only the first 1.2 m of the conductor length measured from the point of termination on the equipment to which these rules apply and subrule (5) indicates that where a cable transition is made to comply with this rule (i.e. a splice) that the minimum length of the spliced conductor sized in accordance the appropriate Tables 1-4 and the appropriate temperature termination value must be at least 1.2 m.

Note: remember Rule 14-104 (2)-which provides limitations for the maximum over current device that can be used on small conductors ,No. 14, 12 & 10 AWG, and overrides rule 14-104 (1) (a ) and Table 13,except where provided by other rules in the CEC.

## **Section 8**

### Voltage Drop

-Rule 8-102- sub-rules (3) & (4) –these new sub-rules provide direction on voltage drop requirements for dwelling units and for industrial establishments.

-For dwelling units a new Table 68 has been added to provide to indicate the maximum conductor length that a branch circuit can be based on the conductor size and the overcurrent setting. Remember rule 14-104(2) for sizing of residential branch circuit cables.

-The conductor lengths indicated in Table 68 are measured from the point of connection of the consumer service to the supply service. Where the total distance from that point of connection to the furthest point of utilization exceeds the maximum conductor lengths indicated in Table 68, it is the responsibility of the installer or designer to complete a voltage drop calculation to ensure compliance with rule 8-102(1) of the CEC.

-For industrial establishments, where conditions of maintenance and supervision ensure use of electrical equipment by a qualified person, the design shall ensure that the voltage drop is not below the acceptable range of the electrical equipment being used as indicated by the nameplate or manufacturers information.

### Use of Demand Factors

-Rule 8-106(10) –this sub-rule indicates that feeder and service load calculations, for installations other than single dwellings and apartment and similar buildings, may be based on demonstrated loads, rather than the required calculated load per the CEC, provided that such calculations are performed by a qualified person.

In more complex projects the qualified person will most likely be a Professional Engineer that will be required to provide the appropriate documentation as requested by the inspection authority to support the calculations and rationale for determining the feeder and service sizes.

The inspection authority may deny any such submission where it is determined that:

- a) the documentation provided does not support the rationale used by the design person ,or
- b) where a comparative analysis to another similar installation is provided to support their rationale and the installation being used as a comparison is not considered as being appropriate.

The Provincial Chief Electrical Inspector (PCEI) shall make the final determination as to the acceptance of any such request where an agreement between the design person and inspection authority cannot be agreed upon.

**Any feeder or service conductors, that are sized based on demonstrated loads, cannot be installed until the design is accepted by the inspection authority or the PCEI.**

## **Section 10**

### Grounding and bonding conductors

-Rule 10-802- this rule has been revised to allow for other than copper as the ground conductor, sized in accordance with rule 10-812, however 10-802- sub-rule (2) does indicate that conductors shall be resistant to any corrosive condition and shall be properly protected against corrosion.

Grounding conductors other than all copper shall not be installed:

- in direct contact with masonry,
- the earth,
- outside and exposed to the environment, or
- where subject to corrosion, unless

the conductor is properly protected against corrosion using such means as appropriately rated insulated conductors for outdoors or where the conductors are run in an appropriate raceway for outdoor installations.

Proper connectors shall be used to prevent galvanic action when metals of dissimilar types are used and to prevent corrosion.

## **Section 12**

### Support of cable, conduit and tubing

Cable ties of a type specifically approved for the purpose are now permitted to be used to support the following types of cable, conduit and tubing:

- non-metallic sheathed cables
- armoured cables
- mineral-insulated cable
- aluminum-sheathed cable, and copper-sheathed cable
- flexible metal conduit
- liquid-tight flexible conduit
- electrical non-metallic tubing

Refer to the appropriate rule for type of cable, conduit or tubing in Section 12 and to the Appendix B note located on page 427 of the CEC to ensure the proper application of cable ties.

Any type of cable, conduit or tubing as identified above shall be independently supported by an approved method (i.e. they cannot be supported from existing electrical or mechanical equipment, conduits, pipes or T-bar tie wire supports).

Where open web steel joist exist, and is not spaced more than 1.5 m apart, the joist may be used for the support of any cable, conduit or tubing identified above.

**Cable ties of a type specifically approved for support means cannot be used for the support of communications or low voltage cables run indoors, in free air.**

**Communications or low voltage cables run indoors, in free air, must be installed in accordance with Electrical Bulletin 2011-02.**

Where a type of raceway, as identified above, is used for the installation of any communications or low voltage cables run indoors, then cable ties of a type specifically approved for the purpose are permitted to support that raceway in accordance with the appropriate rule and as indicated above.

## **Section 18**

### Classification of hazardous locations

-Section 18 has been rewritten to eliminate the use of “Class” associated with the various types of hazardous locations-there will no longer be Class I,II or III classifications.

-All hazardous locations will now be identified by Zone classifications –Zones 0, 1 and 2 will deal with explosive gas atmospheres as per the previous CEC and new zone classifications, Zone 20, 21 and 22 will now deal with explosive dust atmospheres.

-The previous Class III classification that dealt with readily ignitable fibres is now included in the definition for” explosive dust atmosphere” and covered in Zone 20, 21 or 22 classification.

### Equipment installed within Zone locations

-Rule 18-050 has been rewritten to accommodate the above identified changes to the use of the Zone classification and as such new Group designations are now identified. With the new type of group designations there may be new types of protection associated with those new group designations ( i.e. protection by enclosure “ta” or “tb” ) as indicated in the explosive dust atmospheres section of the CEC rules 18-190 to 18-254.

-The designer or installer is responsible to provide the appropriate documentation upon request where designations as being identified in the CEC are being used in an installation designed to the previous edition of the code.

-It is recommended that any person involved in the design or installation for a hazardous location ask for clarification prior to any installations should there be any question as to acceptability of a piece of equipment covered within section 18 of the CEC.

- Where new electrical equipment, **for installation in existing areas classified using the previous codes**, is identified using the new designations and new types of protections as identified in the CEC, **the Table in J1.2 of Appendix J may provide some guidance.**

-The requirement to submit drawings for hazardous locations per **Electrical Bulletin 2002-01** is required and shall incorporate the changes within the revised CEC section 18.

-Engineers required to classify hazardous location per the bulletin should review the new **Appendix L-Engineering guidelines for determining hazardous area classifications to provide guidance** for classifying hazardous areas.

The inspection authority may question any submission made with regard to compliance to the CEC.

## **Section 20**

### Commercial repair garages

-The scope has been revised to eliminate the reference to “storage”.

-The scope now only applies for commercial garages where vehicles are serviced or repaired.

-The section on residential storage garages has also been eliminated and as such do not need to be considered for hazardous classification.

-Showrooms, storage and parking garages do not fall within this section and are therefore not required to be classified unless such area is used on a regular basis for repairs and service and where electrical equipment is used for such work. Ventilation requirements may be required per the NBC for parking garages.

-Where a garage area is classified, adjacent areas such as an office, storage area or customer service area is also classified **unless** they are elevated by at least 50 mm above the garage floor or separated from the garage floor area by a tight fitting barrier such as a curb, ramp or partition at least 50 mm high

## Section 26

### Branch circuits for dwelling units

-Rule 26-724(f) has been revised, AFCI protection is required for all 15 or 20 A, 125 V branch circuits supplying receptacles except as noted:

- bathrooms
- kitchen fridge
- kitchen counter
- island and peninsular counters, and
- the single receptacle for a sump pump.

Review CEC rule 26-714(f) and the associated referenced rules for complete details of the AFCI exceptions.

-The type of protection has also changed to a **combination type AFCI breaker** which is different from what was previously required. The new requirement will provide both series and parallel arc fault protection.

-An exception to providing entire branch circuit protection by means of a combination AFCI type breaker is by using an outlet branch-circuit type AFCI installed on the first outlet on the branch circuit **and** the the wiring between the branch circuit overcurrent device and the first outlet must consist of metal raceway, armoured cable or non-metallic conduit or tubing.

It should be noted that NMD type cable is not permitted to be installed in conduit or tubing except for short sections of cable, as may be permitted by the electrical inspection authority, for compliance to CEC rules 12-516 and 12-518.

-Installers should note CEC rule 32-110 regarding the installation of smoke and carbon monoxide alarms in dwelling units. This rule does not permit the circuit supplying power to these devices to be on a circuit that is provided with AFCI or GFCI protection.

**Any questions regarding the CEC portion of this bulletin may be forwarded to the Provincial Chief Electrical Inspector: David MacLeod, C.E.I., P.Eng. @ 902-424-8018.  
Email: David.MacLeod@novascotia.ca  
Electrical safety website: <http://novascotia.ca/lae/electricalsafety/electricalbulletins.asp>**