

# STANDATA variance 18-ECV-012-102

## Electrical

### 2018 Canadian Electrical Code – Rule 12-102 Insulated conductors

Date Issued: August 2021

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#### Purpose

Underground service entrance (USE) cables, USEB and USEI, are listed for use in Table 19 as service entrance cables only. What about using them for feeders and branch circuits?

#### Discussion

1. USEB and USEI cables as listed for use in Table 19 for service conductors do not contain a bonding conductor as part of the cable as required by Rule 10-610. As such, USEB and USEI cables are not acceptable for use as feeders beyond the load side of the service equipment where the grounded conductor is bonded to ground.
2. The 2021 CE Code, Part 1 has a new, updated Table 19, which permits USEB and USEI cables to be used as feeders and branch circuits provided that they are installed in accordance with Rule 10-616.

#### Variance

##### 1. 2018 CE Code Rule 12-102

As an alternative solution regarding USEB and USEI cables, Table 19 of the 2021 CE Code, Part 1 may be used which permits USEB and USEI cables to also be used as feeders and branch circuits provided that they are installed in accordance with 2021 CE Code Rule 10-616.

This variance provides approximately equivalent or greater safety performance with respect to persons and property as that provided for by the Safety Codes Act.

This Variance is applicable throughout the province of Alberta and remains in force until the adoption of the 2021 CE Code, Part 1.

Unless stated otherwise, all Code references in this STANDATA are to the 2018 CE Code, Part 1

Issued by the Provincial Electrical Administrator

*[Original Signed]*

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**Code References****2018 CE Code, Part 1 states:****10-610 Bonding means — Fixed equipment (see Appendix B)**

- 1) The bonding means for fixed equipment shall consist of one of the following:
  - a) an effective metallic interconnection between fixed equipment, consisting of metal raceway, metal sheath, or cable armour except
    - i) armour as specified in Subrules 2) and 3);
    - ii) the sheath of mineral-insulated cable when not of copper or aluminum, as specified in Subrule 4); or
    - iii) where the raceway or cables are
      - A) run underground;
      - B) run in locations coming within the scope of Section 22; or
      - C) otherwise subject to corrosion;
  - b) a bonding conductor that is run with circuit conductors as a part of a cable; or
  - c) a bonding conductor that is run with circuit conductors installed in raceways.

**12-102 Insulated conductors (see Appendix B)**

- 3) Except as provided for by Rules 12-122, 12-400, and 12-406, or as otherwise required by other Sections of this Code, insulated conductors and cables shall be of the types specified in Table 19 for the specific condition of use and shall be suitable for the particular location involved with respect to, but not limited to
  - a) moisture;
  - b) corrosive action;
  - c) temperature;
  - d) degree of enclosure; and
  - e) exposure to mechanical damage.

**2021 CE Code, Part 1 states:****10-616 Size of system bonding jumper or bonding conductor (see Appendix B)**

- 1) The size of a field-installed system bonding jumper shall not be less than that determined in accordance with Table 16 based on the ampere rating or setting of the overcurrent device protecting the ungrounded conductors.
- 2) The size of a bonding conductor installed in accordance with Rule 10-604 at service equipment shall not be less than that determined in accordance with Table 16 based on the allowable ampacity of the largest ungrounded conductor.
- 3) The size of a field-installed bonding conductor installed at other than service equipment shall not be less than that determined in accordance with Table 16 based on
  - a) the ampere rating or setting of the overcurrent device protecting the ungrounded conductors; or
  - b) the allowable ampacity of the largest ungrounded conductor for installations where the size of the circuit conductors is increased to compensate for voltage drop.
- 4) The size of a field-installed bonding conductor installed with each group of parallel conductors run in separate raceways or cables shall be in accordance with Subrule 3) divided by the number of groups of parallel conductors.
- 5) Notwithstanding Subrules 2), 3), and 4), the bonding conductor shall not be required to be larger than the current-carrying conductors.
- 6) A metal raceway that is permitted to be used as a bonding conductor shall be considered to meet the requirements of this Rule.
- 7) A bonding means that is integral to a cable assembly shall be considered to meet the requirements of this Rule.

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**12-100 Types of insulated conductors and cables** (see Appendix B)

Insulated conductors and cables installed in any location shall be suitable for the condition of use as indicated in Table 19 for the particular location involved and with respect to, but not limited to

- a) moisture, if any;
- b) corrosive action, if any;
- c) temperature;
- d) degree of enclosure; and
- e) mechanical protection.

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