

# Electrical Code

## Extracts from the Canadian Electrical Code 2015

### SECTION 46 — EMERGENCY POWER SUPPLY, UNIT EQUIPMENT, EXIT SIGNS, AND LIFE SAFETY SYSTEMS

#### 46-000 SCOPE [SEE APPENDIX B]

1. This Section applies to the installation, operation, and maintenance of
  - a) emergency power supply and unit equipment intended to provide power to life safety systems; and
  - b) emergency power supply and unit equipment intended to provide illumination of exit signs, in the event of failure of the normal supply, where the emergency power supply is required by the National Building Code of Canada.
2. This Section applies to the wiring between the emergency power supply and life safety systems that are required by the National Building Code of Canada to be provided with an emergency power supply
3. This Section applies to the wiring of exit signs
4. The requirements of this Section supplement or amend the general requirements of this Code

#### 46-002 SPECIAL TERMINOLOGY [SEE APPENDIX B]

In this Section, the following definitions apply:

**Emergency power supply**

Emergency power, supplied by a generator, batteries, or a combination thereof, that is required by the National Building Code of Canada.

**Life safety systems**

Emergency lighting and fire alarm systems that are required to be provided with an emergency power supply from batteries, generators, or a combination thereof, and electrical equipment for building services such as fire pumps, elevators, smoke-venting fans, smoke control fans, and dampers that are required to be provided with an emergency power supply by an emergency generator in conformance with the National Building Code of Canada.

**Unit equipment**

Unit equipment for emergency lighting conforming to CSA C22.2 No. 141.

### GENERAL

#### 46-100 CAPACITY

Emergency power supply and unit equipment shall have adequate capacity and rating to ensure the satisfactory operation of all connected equipment when the principal source of power fails.

#### 46-102 INSTRUCTIONS

1. Complete instructions for the operation and care of an emergency power supply or unit equipment that shall specify testing at least once every month to ensure security of operation shall be posted on the premises in a frame under glass.
2. The form of instructions and their locations shall be in compliance with the National Building Code of Canada.

#### 46-104 MAINTENANCE

Where batteries are used as a source of the emergency power supply, the batteries shall be kept

- a) in proper condition; and
- b) fully charged at all times

#### 46-106 ARRANGEMENT OF LAMPS

1. Emergency lights shall be arranged so that the failure of any one lamp will not leave in total darkness the area normally illuminated by it.

2. No appliance or lamp, other than those required for emergency purposes, shall be supplied by the emergency circuits.

#### 46-108 WIRING METHOD [SEE APPENDICES B AND G]

1. Except as permitted by Subrule (3), Rule 46-304(3), and Rule 46-400(2), the following conductors shall be installed in accordance with Subrule (2):
  - a) conductors required for operation of life safety systems and installed between an emergency power supply and life safety systems;
  - b) conductors between an emergency power supply and exit signs; and
  - c) conductors between unit equipment and remote lamps.
2. Conductors described in Subrule (1) shall be
  - a) installed in metal raceway of the totally enclosed type;
  - b) incorporated in a cable having a metal armour or sheath;
  - c) installed in rigid non-metallic conduit; or
  - d) installed in electrical non-metallic tubing where embedded in at least 50 mm of masonry or poured concrete.
3. Not with standing Subrule (2), conductors installed in buildings of combustible construction in accordance with Rules 12-506 to 12-520 shall be permitted to be
  - a) run as a non-metallic-sheathed cable; or
  - b) installed in a totally enclosed non-metallic raceway.
4. Conductors installed in accordance with Subrule (1) shall be kept entirely independent of all other conductors and equipment and shall not enter a luminaire, raceway, box, cabinet, or unit equipment occupied by other conductors except where necessary
  - a) in transfer switches; and
  - b) in exit signs and emergency lights supplied from two sources.
5. Conductors between an emergency power supply and any electrical equipment that is not defined as a "life safety system" in accordance with this Section shall not enter a luminaire, raceway, box, or cabinet occupied by conductors installed as described in Subrule (1), except where necessary in busways, splitters, and other similar enclosures provided for connection to the overcurrent device for an emergency power supply described in Rule 46-208(1).

### EMERGENCY POWER SUPPLY

#### 46-200 EMERGENCY POWER SUPPLY [SEE APPENDIX B]

Rules 46-202 to 46-212 apply only to emergency power supply from central standby power sources.

#### 46-202 TYPES OF EMERGENCY POWER SUPPLY (SEE APPENDIX G)

1. The emergency power supply shall be a standby supply consisting of
  - a) a storage battery of the rechargeable type having sufficient capacity to supply and maintain at not less than 91% of full voltage the total load of the emergency circuits for the time period required by the National Building Code of Canada, but in no case less than 30 min, and equipped with a charging means to maintain the battery in a charged condition automatically; or
  - b) a generator.
2. Automobile batteries and lead batteries not of the enclosed glass-jar type are not considered suitable under Subrule (1) and shall be used only where a deviation has been allowed in accordance with Rule 2-030.

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3. Where a generator is used, it shall be
  - a) of sufficient capacity to carry the load;
  - b) arranged to start automatically without failure and without undue delay upon the failure of the normal power supply to any transfer switch connected to this generator; and
  - c) in conformance with CSA C282.

### 46-204 PROTECTION OF ELECTRICAL CONDUCTORS (SEE APPENDICES B AND G)

All power, control, and communication conductors between an emergency generator as described in Rule 46-202(3), and electrical equipment required to be installed as a part of the emergency power supply and located outside the generator room shall be protected against fire exposure to provide continued operation in compliance with the National Building Code of Canada.

### 46-206 CONTROL

1. An emergency power supply shall be controlled by automatic transfer equipment that actuates the emergency power supply upon failure of the normal current supply and that is accessible only to authorized persons.
2. An automatic light-actuated device, approved for the purpose, shall be permitted to be used to control separately the lights located in an area that is adequately illuminated during daylight hours without the need for artificial lighting.

### 46-208 OVERCURRENT PROTECTION

1. The overcurrent device for an emergency power supply shall be coordinated with the overcurrent devices of feeders and branch circuits supplying life safety systems and other electrical equipment connected to the emergency power supply in order to provide selective operation of the branch circuit overcurrent device when a fault occurs in that branch circuit.
2. The branch circuit overcurrent devices shall be accessible only to authorized persons.

### 46-210 AUDIBLE AND VISUAL TROUBLE-SIGNAL DEVICES

1. Every emergency power supply shall be equipped with audible and visual trouble-signal devices that warn of derangement of the current source or sources and that indicate when exit signs or life safety systems are supplied from the emergency power supply.
2. Audible trouble signals shall be permitted to be wired so that
  - (a) they can be silenced, but a red warning or trouble light shall continue to provide the protective function; and
  - b) when the system is restored to normal, the audible signal will
    - (i) sound, indicating the need to restore the silencing switch to its normal position;
    - or
    - (ii) reset automatically so as to provide sound for any subsequent operation of the emergency power supply.

### 46-212 REMOTE LAMPS

Lamps shall be permitted to be mounted at some distance from the current supply that feeds them, but the voltage drop in the wiring feeding such lamps shall not exceed 5% of the applied voltage.

## UNIT EQUIPMENT

### 46-300 UNIT EQUIPMENT (SEE APPENDIX B)

Rules 46-302 to 46-306 apply to individual unit equipment for emergency lighting only.

### 46-302 MOUNTING OF EQUIPMENT

Each unit equipment shall be mounted with the bottom of the enclosure not less than 2 m above the floor, wherever practicable.

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### 46-304 SUPPLY CONNECTIONS

Each unit equipment shall be mounted with the bottom of the enclosure not less than 2 m above the floor, wherever practicable.

1. Receptacles to which unit equipment is to be connected shall be not less than 2.5 m above the floor, where practicable, and shall be not more than 1.5 m from the location of the unit equipment.
2. Unit equipment shall be permanently connected to the supply if
  - (a) the voltage rating exceeds 250 V; or
  - (b) the marked input rating exceeds 24 A.
3. Where the ratings in Subrule (2) are not exceeded, the unit equipment shall be permitted to be connected using the flexible cord and attachment plug supplied with the equipment.
4. Unit equipment shall be installed in such a manner that it will be automatically actuated upon failure of the power supply to the normal lighting in the area covered by that unit equipment.

### 46-306 REMOTE LAMPS (SEE APPENDIX B)

1. The size of circuit conductors to remote lamps shall be such that the voltage drop does not exceed 5% of the marked output voltage of the unit equipment, or such other voltage drop for which the performance of unit equipment is certified when connected to the specific remote lamp being installed.
2. Remote lamps shall be suitable for remote connection and shall be included in the list of lamps provided with the unit equipment.
3. The number of lamps connected to a single unit equipment shall not result in a load in excess of the watts output rating marked on the equipment for the emergency period required by the National Building Code of Canada, and the load shall be computed from the information in the list of lamps referred to in Subrule (2).

## EXIT SIGNS

### 46-400 EXIT SIGNS

Location requirements for exit signs are set out in the NBCC. Rule 46-400 covers only their connection to a power supply. Rule 46-400 also covers connection of circuits supplying lighting in the area where externally illuminated exit signs are installed in accordance with the NBCC requirements.

If an exit sign is required by the NBCC and is electrically illuminated, Subrule (1) requires that the power for the exit sign be provided by a branch circuit that supplies only other exit signs.

Subrule (2) exempts the circuit supplying only exit signs to allow it to supply emergency lighting in the area where the exit signs are located.

However, in an area where exit signs are installed and where emergency lighting is required by the NBCC or local building codes, Subrule (3) requires that exit signs must also be illuminated by an emergency power supply. This ensures that the exit sign is provided with a minimum illumination whenever the emergency lighting is energized.

Subrule (4) requires that the luminaires used to illuminate exit signs are to meet the circuit requirements of Subrule (1) and (2) and the illumination requirements of Subrule (3).

Note (2) to Rule 46-400 in Appendix B cautions that the circuit supplying both emergency lighting and exit signs not be controlled by a switch, time clock, or other disconnecting means.