

# FIRE & BUILDING CODE

## CODE & STANDARDS

### EXTRACTS FROM THE NATIONAL FIRE CODE OF CANADA - 1995 (INCLUDES JUNE 2002 REVISIONS)

#### 6.7.1. GENERAL

##### 6.7.1.1. INSPECTION, TESTING AND MAINTENANCE

- 1) Except as provided in articles 6.7.1.2. to 6.7.1.5., emergency power systems shall be inspected, tested and maintained in conformance with CSA C282, "Electrical Power Supply for Buildings."

##### 6.7.1.2. NOTIFICATION

- 1) When an emergency power system or any part thereof is shut down, the supervisory staff shall be notified in conformance with Section 2.8.

##### 6.7.1.3. INSTRUCTIONS

- 1) Where an emergency power system is installed, instructions shall be provided for switching on essential loads and for starting the generator when this is not done automatically.

##### 6.7.1.4. NOTIFICATION

- 1) Written records shall be maintained as required in CSA C282 "Emergency Electrical Power Supply for Buildings."

##### 6.7.1.5. SUPPLY OF FRESH FUEL

- 1) Liquid fuel storage tanks shall be drained and refilled with fresh fuel at intervals not greater than 12 months (See Appendix A.)

##### 6.7.1.6. INSPECTION OF EQUIPMENT

- 1) Self-contained emergency lighting unit equipment shall be inspected at intervals not greater than one month to ensure that
  - a) pilot lights are functioning and not obviously damaged or obstructed,
  - b) the terminal connections are clean, free of corrosion and lubricated when necessary,
  - c) the terminal clamps are clean and tight as per manufacturer's specifications, and
  - d) the battery surface is kept clean and dry.
- 2) Self-contained emergency lighting unit equipment shall be tested
  - a) at intervals not greater than one month to ensure that the emergency lights will function upon failure of the primary power supply, and
  - b) at intervals not greater than 12 months to ensure that the unit will provide emergency lighting for a duration equal to the design criterion under simulated power failure conditions.
- 3) After completion of the test required in Clause (2)(b), the charging conditions for voltage and current and the recovery period shall be tested to ensure that the charging system is functioning in accordance with the manufacturer's specifications.

##### 6.7.1.7. INSPECTION OF EMERGENCY LIGHTS

- 1) Except as provided in Article 6.7.1.6., emergency lights shall be inspected at intervals not greater than 12 months to ensure that they are functional.

### SECTION 2.7 SAFETY TO LIFE

#### 2.7.3. EXIT LIGHTING, EXIT SIGNS AND EMERGENCY LIGHTING

##### 2.7.3.1. INSTALLATION AND MAINTENANCE

- 1) Exit lighting, exit signs and emergency lighting shall be provided in buildings in conformance with the National Building Code of Canada 1995 (See Appendix A.)
- 2) Exit lighting and exit signs shall be illuminated during time the building is occupied.
- 3) Emergency lighting shall be maintained in operating condition, in conformance with Section 6.7.

#### 3.2.6. ADDITIONAL REQUIREMENTS FOR HIGH BUILDINGS

(SEE APPENDIX B.)

#### 3.2.6.1. APPLICATION

- 1) This Subsection applies to a building
  - a) Of Group A, D, E or F major occupancy classification that is more than
    - (I) 36 m high, measured between grade and the floor level of the top storey or
    - (II) 18 m high, measured between grade and the floor level of the top storey, and in which the cumulative or total occupant load on or above any storey above grade, other than the first storey, divided by 1.8 times the width in metres of all exit stairs at that storey, exceeds 300.
  - b) Containing a Group B major occupancy in which the floor level of the highest storey of that major occupancy is more than 18 m above grade(c) containing a floor area or part of a floor area located above the third storey designed or intended as a Group B, Division 2 occupancy, and
  - d) Containing a Group C major occupancy whose floor level is more than 18 m above grade.

#### 3.2.7. LIGHTING AND EMERGENCY POWER SYSTEMS

##### 3.2.7.3. EMERGENCY LIGHTING

- 1) Emergency lighting shall be provided to an average level of illumination not less than 10 lx at floor or tread level in
  - (a) exits,
  - (b) principal routes providing access to exit in an open floor area,
  - (c) corridors used by the public,
  - (d) corridors serving patients' sleeping rooms,
  - (e) corridors serving classrooms,
  - (f) underground walkways,
  - (g) public corridors, and
  - (h) floor areas or parts thereof where the public may congregate in
    - (I) Group A, Division 1 occupancies, or
    - (II) Group A, Division 2 and 3 occupancies having an occupant load of 60 or more.
- 2) Emergency lighting to provides an average level of illumination of not less than 10 lx at floor or catwalk level shall be included in a service space referred to in Sentence 3.2.1.1.(7).
- 3) The minimum value of the illumination required by Sentences (1) and (2) shall be not less than 1 lx.

##### 3.2.7.4. EMERGENCY POWER FOR LIGHTING

- 1) An emergency power supply shall be
  - (a) provided to maintain the emergency lighting required by this Subsection from a power source such as batteries or generators that will continue to supply power in the event that the regular power supply to the buildings is interrupted and
  - (b) so designed and installed that upon failure of the regular power it will assume the electrical load automatically for a period of
    - (I) 2 h for a building within the scope of Subsection 3.2.6,
    - (II) 1 h for a building of Group B major occupancy classification that is not within the scope of Subsection 3.2.6. and
    - (III) 30 min for a building of any other occupancy. (See appendix A).
- 2) If self-contained emergency lighting units are used, they shall conform to CSA C22.2 No. 141-M, "Unit Equipment for Emergency Lighting."

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### 3.4.5.EXIT SIGNS

#### 3.4.5.1.EXIT SIGNAGE

- 1) Every exit door other than the main entrance to a room or building shall have an exit sign placed over or adjacent to it if the exit serves
  - (a) a building more than 2 storeys in building height,
  - (b) a building having an occupant load more than 150, or
  - (c) a room or floor area that has a fire escape as part of a required means of egress.
- 2) Every exit sign shall
  - (a) be visible from the exit approach.
  - (b) have the word EXIT or SORTIE displayed in plain legible letters, and
  - (c) be illuminated continuously while the building is occupied
- 3) Exit signs shall consist of
  - (a) red letters on a contrasting background or contrasting letters on a red background, with the letters not less than 114 mm high and having a 19 mm stroke, if the sign is internally illuminated, and
  - (b) white letters on a red background or red letters on a contrasting background that is white or light tint, with letters not less than 150 mm high and having a 19 mm stroke, if the sign is externally illuminated.
- 4) If illumination of an exit sign is provided from an electrical circuit, that circuit shall
  - (a) serve no equipment other than emergency equipment, and
  - (b) be connected to an emergency power supply as described in

#### SENTENCE 3.2.7.4.(1).

- 5) If necessary, the direction of egress in public corridors and passageways shall be indicated by a sign conforming to sentence (3) with a suitable arrow or pointer indicating the direction of egress.
- 6) Except for egress doorways described in Sentence 3.3.2.3(4) and except for the main entrance door, an Exit sign conforming to Sentences (2), (3) and shall be placed over adjacent to every egress doorway from rooms with an occupant load more than 60 in Group A, Division 1 occupancies, dance halls, licensed beverage establishments and other similar occupancies that, when occupied, have lighting levels below that which would provide easy identification of the egress doorway.

### 3.4.5.2 SIGNS FOR BASEMENT STAIRS AND RAMPS.

- 1) In a building more than 2 storeys in building height, any part of an exit ramp or stair that continues past an exterior exit door down to a basement shall be clearly marked.

### 9.9.10. SIGNAGE

#### 9.9.10.1. APPLICATION.

- 1) This Subsection applies to all exits except those serving not more than one dwelling unit.

#### 9.9.10.2. VISIBILITY OF EXITS.

- 1) Exits shall be located so as to be clearly visible or their locations shall be clearly indicated.

#### 9.9.10.3. REQUIRED EXIT SIGNS.

- 1) Except for the main entrance door to a building, every exit door in a building 3 storeys in building height or in a building having an occupant load greater than 150 shall have an exit sign over adjacent to it.

#### 9.9.10.4. EXIT DIRECTION SIGNS.

- 1) Exit direction signs shall be placed in corridors and passageways where necessary to indicate the direction of exit travel.

#### 9.9.10.5. VISIBILITY OF EXIT SIGNS.

- 1) Exit signs shall be installed so as to be visible from the exit approach and shall be illuminated continuously while the building is occupied.

### 9.9.10.6. LETTERING

- 1) Exit signs shall have the word EXIT or SORTIE in red letters on a contrasting background or a red background with contrasting letters when the sign is internally lighted, and white letters on a red background or red letters on a white background when the sign is externally lighted.
- 2) Lettering referred to in Sentence (1) shall be made with not less than 19 mm wide strokes and be not less than 150 mm high when the sign is externally lighted, and not less than 114 mm high when the sign is internally lighted.

### 9.9.10.7. ILLUMINATION

- 1) Illumination of exit signs required in Article 9.9.1 0.3. shall conform to sentences 9.9.11.3. (2) and (3).
- 2) Where illumination of exit signs required in article 9.9.10.3. is provided by an electrical circuit, that circuit shall serve no equipment other than emergency equipment.

### 9.9.10.7. EXITS CONTINUING TO A BASEMENT.

- 1) In buildings 3 storeys in building height any part of an exit ramp or stair that continues down to a basement past an exterior exit door shall be clearly marked to indicate that it does not lead to an exit where the portion below ground level may be mistaken as the direction of exit travel.

### 9.9.11. LIGHTING

#### 9.9.11.3. EMERGENCY LIGHTING

- 1) Emergency lighting shall be provided in
  - (a) exits
  - (b) principal routes providing access to exit in an open floor area.
  - (c) corridors used by the public
  - (d) underground walkways and
  - (e) public corridors
- 2) Emergency lighting required in Sentence (1) shall be provided from a source of energy separate from the electrical supply for the building.
- 3) Lighting required in Sentence (1) shall be designed to be automatically actuated for a period of at least 30 min. when the electric lighting in the affected is interrupted.
- 4) Illumination from lighting required in Sentence (1) shall be provided to average levels of not less than 10 LX at floor or tread level.
- 5) Where incandescent lighting is provided, lighting equal to 1 W/m<sup>2</sup> of floor area shall be considered to meet the requirement in Sentence (4).
- 6) Where self-contained emergency lighting units are used, they shall conform to CSA C22.2 No. 141-M, "Unit Equipment for Emergency Lighting".

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## CLASSIFICATION BY GROUP

EXAMPLES		GROUP	CLASS
Motion picture theatres Television studios admitting a viewing audience	Opera houses Theatres, including experimental theatres	A	1
Art galleries Auditoria Bowling alleys Churches and similar places of worship Club, nonresidential Community halls Court rooms Dance halls Exhibition halls (other than classified in Group E) Gymnasias	Lecture halls Libraries Licensed beverage establishments Museums Passenger stations and depots Recreational piers Restaurants Schools and colleges, non-residential Undertaking premises	A	2
Arenas Rinks	Indoor swimming pools with or without spectator seating	A	3
Amusement park structures (not elsewhere classified) Bleachers	Grandstands Reviewing stands Stadia	A	4
Jails Penitentiaries Police stations with detention quarters	Psychiatric hospitals with detention quarters Reformatories with detention quarters Prisons	B	1
Children's custodial homes Convalescent homes Hospitals Infirmaries Orphanages	Psychiatric hospitals without detention quarters Reformatories without detention quarters Sanitoria without detention quarters Nursing homes	B	2
Apartments Boarding houses Clubs, residential Colleges, residential Convents Dormitories	Hotels Houses Loading houses Monasteries Motels Schools, residential	C	
Banks Barber and hairdressing shops Beauty parlours Dental offices Dry cleaning establishments Self-service, not using flammable or explosive solvents or cleaners	Laundries, self-service Medical offices Offices Police stations without detention quarters Radio stations Small tool and appliance rental and service establishments	D	
Department stores Exhibition halls Markets	Shops Stores Supermarkets	E	
Bulk plants for flammable liquids Bulk storage warehouses for hazardous substances Lacquer factories Mattress factories Chemicals manufacturing or processing plants Distilleries Dry cleaning plants Feed mills	Flour mills Grain elevators Cereal mills Paint, varnish and pyroxylin product factories Rubber processing plants Spray painting operations Waste paper processing plants	F	1
Aircraft hangars Box factories Candy plants Cold storage plants Dry cleaning establishments not using flammable or explosive solvents or cleaners Storage rooms Television studios not admitting a viewing audience Warehouses Wholesale rooms Woodworking factories Workshops	Mattress factories Planning mills Printing plants Repair garages Salesrooms Services stations Electrical substations Factories Freight depots Helicopter landing areas on roofs Laboratories Laundries except self-service	F	2
Creameries Factoriesparking garages Storage rooms Power plants Workshops	Storage garages including open air Laboratories Warehouses Salesrooms Samples display rooms	F	3

# ELECTRICAL CODE

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### SECTION 46 - EMERGENCY SYSTEMS, UNIT EQUIPMENT, AND EXIT SIGNS

#### 46-000 SCOPE

- 1) This Section applies to the installation, operation, and maintenance of emergency systems and unit equipment intended to supply illumination and to emergency systems intended to supply power, in the event of failure of the normal supply, where required by the National Building Code of Canada.
- 2) The Section applies to the wiring of exit signs.
- 3) The requirements of this section are supplementary to, or amendatory if, the general requirements of this Code.

#### GENERAL

##### 46-100 CAPACITY

- 1) Emergency systems 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 system or unit equipment which 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

- 1) Where batteries are used as a source of 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 so arranged that the failure of any one lamps 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 METHOD OF WIRING (SEE APPENDICES B AND G)

- 1) Except as permitted by Subrule (2) and Rule 46-304(3), all conductors of systems, equipment, and devices installed in accordance with this Section shall be:
  - a) Installed in metal raceway of the totally enclosed type: or
  - b) Incorporated in a cable, having a metal armour or sheath: or
  - c) Installed in rigid nonmetallic conduit where embedded in at least 50mm of masonry or poured concrete.
  - d) Installed in electrical nonmetallic tubing where embedded in at least 50mm of masonry or poured concrete.
- 2) Conductors installed in buildings of combustible construction in accordance with Rules 12-506 to 12-520 shall be permitted to be incorporated in a nonmetallic sheathed cable.
- 3) Conductors of emergency systems and conductors between unit equipment and remote lamps shall be kept entirely independent of all other conductors and equipment and shall not enter a fixture, raceway, box, or cabinet occupied by other conductors except where necessary:
  - a) In transfer switches: and
  - b) In exit signs and emergency lighting fixtures supplied from two sources.

### EMERGENCY SYSTEMS

#### 46-200 EMERGENCY SYSTEMS (SEE APPENDIX B)

- 1) Rules 46-202 to 46-210 apply to emergency systems from central standby supplies only.

#### 46-202 SUPPLY (SEE APPENDIX G)

- 1) The emergency 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 1/2 h, and equipped with a charging means to maintain the battery in a charged condition automatically: or
  - b) A generator driven by a dependable prime mover.
- 2) Automobile batteries and lead batteries not of the enclosed glass-jar type are not considered suitable under Subrule (1) and shall only be used where a deviation has been allowed in accordance with Rule 2-030.
- 3) Where a generator is used, it shall be:
  - a) Of capacity sufficient to carry the load; and
  - b) Arranged to start automatically without failure and without undue delay upon the failure of the normal power supply of the equipment connected to this generator.

#### 46-204 CONTROL

- 1) The current supply for emergency systems shall be controlled by automatic transfer equipment that energizes the emergency system 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.

#### 46-206 OVERCURRENT PROTECTION

- 1) No device capable of interrupting the circuit, other than the overcurrent device for the current supply of the emergency system, shall be placed ahead of the branch circuit overcurrent devices.
- 2) The branch circuit overcurrent devices shall be accessible only to authorized persons.

#### 46-208 AUDIBLE AND VISUAL TROUBLE-SIGNAL DEVICES

- 1) Every emergency system shall be equipped with audible and visual trouble-signal devices that give warning of derangement of the current source or sources and that indicate when the emergency load is supplied from batteries or generators.
- 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, thus indicating the necessity of restoring the silencing switch to its normal position; or
    - ii) Reset automatically so as to sound for any subsequent operation of the emergency system.

#### 46-210 REMOTE LAMPS

- 1) 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.