Section 2 – General rules

2-002 Special requirements

Sections devoted to Rules governing particular types of installations are not intended to embody all Rules governing these particular types of installations but cover only those special Rules or regulations that add to or amend those prescribed in other sections covering installations under ordinary conditions.

In other words, sections particular to a certain installation are supplementary to and augment the normal Rules of the Code that must be followed.

2-004 Permit

Electrical contractors or others responsible for carrying out the work shall obtain a permit from the inspection department before commencing work with respect to installation, alteration, repair, or extension of any electrical equipment.

This aligns with the requirements found in the Electrical Safety Regulation. Work cannot be started before a permit is obtained.

2-030 *Deviation or postponement*
In any case where deviation or postponement of these Rules and regulations is necessary, special permission shall be obtained before proceeding with the work, but this special permission shall apply only to the particular installation for which it is given.

If there is any chance of work not conforming with Code Rules or the Safety Regulation, it is in the contractor's/homeowner's best interest to make sure it will be acceptable to inspection authorities before the change is enacted.

2-100 Marking of equipment (see Appendix B)

1) *Each piece of electrical equipment shall bear those of the following markings necessary to identify the equipment and ensure that it is suitable for the particular installation:*
   a) *the maker's name, trademark, or other recognized symbol of identification;*
   b) *catalogue number or type;*
   c) *voltage;*
   d) *rated load amperes;*
   e) *watts, volt amperes, or horsepower;*
   f) *whether for ac, dc, or both;*

g) *number of phases;*
h) *frequency in hertz;*
i) *rated load speed in revolutions per minute;*
j) *designation of terminals;*
k) *whether for continuous or intermittent duty;*
l) *short-circuit current rating or withstand rating;*
m) *evidence of approval, or;*
n) *other markings necessary to ensure safe and proper operation*

A piece of unmarked electrical equipment cannot be installed, as it cannot be determined to be safe for installation and operation. Additional information regarding acceptability of markings is found in Appendix B.

2-110 Circuit voltage-to-ground – Dwelling units

Branch circuits in dwelling units shall not have a voltage exceeding 150 volts-to-ground except that ……. shall be permitted to be used in the dwelling unit to supply the following fixed (not portable) equipment:

a) *space heating, provided that wall-mounted thermostats operate at a voltage not exceeding 300 volts-to-ground;*
b) *water heating; and*
c) *air conditioning*

In general, when tested between any hot wire connection and ground in a dwelling, there should not be more than 150 V read on the meter. The norm for a dwelling would be 120 V in most cases.

2-114 Material for anchoring to masonry or concrete

Wood or other similar material shall not be used as an anchor into masonry or concrete for the support of any electrical equipment.

Wood will absorb any moisture released from the curing of concrete and mortar, and will subsequently rot, causing the equipment to become unstable. Proper anchors of metal or plastic material are expected to be used.

2-122 Installation of electrical equipment (see Appendix G)

Electrical equipment shall be installed so as to ensure that after installation there is ready access to nameplates and access to parts requiring maintenance. This is self-explanatory and is coupled with Appendix G which lists requirements that aren't governed by the Canadian Electrical Code, Part 1 but are required by the National Building Code of Canada. For instance, Rule 2-122 refers to the mounting height of electrical controls in barrier-free areas.

2-126 Use of thermal insulation

1) *Where the hollow spaces between studding, joists, or rafters of buildings are to be filled with thermal insulation, the following restrictions, as applicable, shall apply to the installation of electrical wiring in such spaces:*
   d) *if thermal insulation made of or faced with metal is installed, the wiring shall conform to the following:*
      i) *A 25 mm separation shall be provided between the thermal insulation and knob-and-tube wiring; and*
      ii) *non-metallic-sheathed cable shall be permitted to be in contact with the insulation*

Metal-faced thermal insulation can conduct electricity, and therefore its installation in close proximity to electrical conductors must be scrutinized. Non-metallic-sheathed cable, such as NMD-90 with its dielectric sheath, is unlikely to conduct any current between the cable and insulation.

2-128 Fire spread (see Appendices B and G)

2) *Where a fire separation is pierced by a raceway or cable, any openings around the raceway or cable shall be properly closed or sealed in compliance with the National Building Code of Canada.*

Sections 3 and 9 of the NBC deal with penetrations of a fire assembly by electrical equipment.

2-304 Disconnection (see Appendix B)

1) *No repairs or alterations shall be carried out on any live equipment except where complete disconnection of the equipment is not feasible.*
2) *Three-way or four-way switches shall not be considered as disconnecting means.*

3) *Adequate precautions, such as locks on circuit breakers or switches, warning notices, sentries, or other equally effective means, shall be taken to prevent electrical equipment from being electrically charged when work is being done.*

Lockout of electrical equipment is an expectation of safely working on electrical equipment. A cord-and-plug attachment or single-pole single-throw switch, under direct sight of the person performing the electrical work, is also an acceptable means of disconnection. 3-way and 4-way switches, however, can be operated out of sight of the worker and are therefore not acceptable as a means of disconnection.

2-308 Working space around electrical equipment (see Appendix B)

1) *A minimum working space of 1m with secure footing shall be provided and maintained about electrical equipment that*
   a) *contains renewable parts, disconnecting means, or operating means; or*
   b) *requires examination, adjustment, operation, or maintenance.*

This is a fairly straightforward statement. Appendix B adds *"It is intended by this Rule that working space with secure footing be provided and maintained about electrical equipment such as switchboards, switchgear, panelboards, control panels, overcurrent devices, disconnecting means, motor control centres, etc."*

2-326 Electrical equipment near combustible gas equipment (see Appendix B)

The clearance distance between arc-producing electrical equipment and a combustible gas relief device or vent shall be in accordance with the requirements of CSA B149.1

Appendix B Rule 2-326 states "The clearance distances specified in CSA B149.1 between a source of ignition and a combustible gas relief discharge device or vent are as follows:

a) 1 m for natural gas; and
b) 3 m for propane gas.

2-402 Marking of enclosures

1) *Except for general-purpose enclosures, all enclosures described in Table 65 shall be marked with a type of enclosure definition.*
2) *In addition to the type or enclosure designation specified in Subrule 1), enclosures shall be permitted to be marked with an ingress protection (IP) designation.*

An electrical enclosure is a cabinet for electrical or electronic equipment to mount switches, knobs and displays, to prevent electrical shock to equipment users, and to protect the contents from the environment. Table 65, for non-hazardous locations, lists enclosures by type (indoor, outdoor, submersible) and protection from environmental conditions such as rain, snow, ice, dust, corrosion, etc.

2-404 Marking of motors

1) *Drip-proof, weatherproof, and totally enclosed motors for use in non-hazardous locations shall be marked as follows:*
    a. *if a drip-proof motor, with the word "Drip-proof" or the code letters "DP";*
    b. *if a weatherproof motor, with the word "Weatherproof" or the code letters "WP"; and*
    c. *if a totally enclosed motor, with the words "Totally Enclosed" or the code letters "TE".*

Drip-Proof motors are equipped with open enclosures (housings) and are suitable for indoor use and clean atmospheres. Their open design and built-in fan allow them to run cooler, with their openings designed to prevent liquids and solids from entering the machine from an angle of 0 to 15° from vertical. A weatherproof motor, although not sealed from water and atmosphere, can be operated in locations that experience some wetness. A totally enclosed motor does not have ventilation openings so is limited to operating in a cooler environment, with or without an external fan assisting with cooling.