CECA 1-2011

Standard for

Good Workmanship in Electrical Construction

A CANADIAN ELECTRICAL INSTALLATION STANDARD™ (CEIS™)

Published by
Canadian Electrical Contractors Association
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1. Scope

This standard describes what is meant by “quality of work” as required for electrical installations by Canadian Standards Association (CSA) C22.1, Canadian Electrical Code, Part I (CEC, Part I), Rule 2-108.

1.1 Regulatory and Other Requirements

a) All information in this publication is intended to conform to Canadian Standards Association (CSA) C22.1, Canadian Electrical Code, Part I (CEC, Part I) and CSA C22.2, Canadian Electrical Code, Part II (CEC, Part II). Installers should always follow the CEC, Part I, any applicable CEC, Part II standards, applicable provincial, territorial, and local codes, manufacturers' instructions, and contract documents.

b) Only qualified persons familiar with construction and installation should perform the technical work described in this publication. It is recommended that all work be performed in accordance with the edition of CSA Z462, Workplace electrical safety, in effect at the time of publication of this standard.

NOTE: For definitions of “qualified person,” see Section 0 of the CEC, Part I, and Clause 3 of CSA Z462.

c) See Annex B for imperial and metric conduit trade sizes (Table B.1) and guidance on metric conversion (Table B.2).

General requirements for installing electrical products and systems are described in CECA 1, Standard for Good Workmanship in Electrical Construction. Other CECA Canadian Electrical Installation Standards™ (CEIS™) provide additional guidance for installing particular types of electrical products and systems. A complete list of CECA CEIS™ is provided in Annex C.

1.2 Reference Publications

In addition to the CEC, Parts I and II, and CSA Z462, this standard refers to the following publications. All references are to the latest edition (including updates and amendments) unless a specific year date or edition number is given:

NRC (National Research Council Canada)
National Building Code of Canada

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### Table 2
**Minimum Raceway Spacing Guideline (Trade Size)** —
**Distance between Centres in Inches at Junction and Pull Boxes**
(Allows Approximately 1/4-inch Spacing between Locknuts)

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### Approximate Diameters

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j) Exposed parallel or banked raceways shall be run together to provide a neat appearance. Bends in parallel or banked runs shall be made from the same centreline so that the bends are parallel (see Figure 8).
Standard manufacturers' bends are allowed for groups of 90° bends if the conduits are close to the same sizes. This shall require that there be a change in the plane of the run, such as from wall to ceiling, and the raceways shall be of the same size. In other cases, parallel raceways shall be field bent.

k) Raceways shall be joined with fittings designed for the purpose and shall be made tight. Where the installation situation is such that joints cannot be made tight, bonding jumpers shall be used to provide electrical continuity of the raceway system.

l) Raceway terminations shall be made up tight. Where terminations are subject to vibration, bonding bushings or wedges shall be used to ensure electrical continuity. Where subject to vibration or dampness, insulating bushings shall be used to protect the conductors (see Figure 9).
m) The set screws of threadless fittings shall be made up tight with a suitable tool.

n) When raceways are terminated with locknuts and bushings, the raceway shall enter squarely and the locknuts shall be installed so that the convex (hollow) side is against the box. Two locknuts, one inside and the other outside the box, can also be used to facilitate the termination or to make it more secure.

o) When terminating in threaded hubs, the raceway shall be screwed tightly into the hub. The shoulder of a fitting shall rest securely against the hub. The threaded hub shall cut through painted surfaces to ensure that bonding is achieved.
Annex A

Typical Mounting Heights for Accommodating Persons with Disabilities

NOTE: All Canadian building codes supersede the informative values given in this Annex.

A.1 General

Consideration should be given to the practical installation situation, neatness, and good workmanship. For example, fire bridging, furring strips, or the like may not permit the installation of receptacles or wall switches at the heights listed here. Wainscotting may also cause variation. It is not considered good workmanship to have a finish plate span different types of building finishes.

a) Safety and convenience of users should be of prime consideration in the location and mounting height of devices and equipment.

b) Intercom stations or devices that require hand operations, such as switches or fire alarm pull stations, should be easily within reach by the average person without having to stretch or stoop or to use ladders or stools.

c) Switches should be a maximum of 1.2 m above the finished floor, and fire alarm annunciation units should be no lower than 80” above the finished floor.

d) Convenience as well as appearance and good workmanship calls for consistency in the mounting height and location of similar devices and equipment.

e) Special-use or special-purpose outlets should be located conveniently for the purpose intended.

A.2 Recommended Outlet Mounting Heights

Table A.1 describes typical mounting heights for various outlets and control devices. All heights are measured from the finished floor to the centreline of the device. These heights comply with the requirements of the Americans with Disabilities Act Guidelines.
(This annex is not a normative part of the standard.)

Annex B
Conversion Tables

Table B.1
Conduit trade sizes

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The following is a list of current CECA Canadian Electrical Installation Standards™:

CECA 1 Standard for Good Workmanship in Electrical Construction
CECA 90 Standard for Commissioning Building Electrical Systems
CECA 100 Standard for Symbols for Electrical Construction Drawings
CECA 101 Standard for Installing Steel Conduit (Rigid and EMT)
CECA 102 Standard for Installing Aluminum Rigid Metal Conduit
CECA 104 Standard for Installing Aluminum Building Wire and Cable
CECA 105 Standard for Installing Metal Cable Tray Systems
CECA 120 Standard for Installing Armoured Cable (Type AC) and Metai-Sheathed Cable (Type MC)
CECA 130 Standard for Installing and Maintaining Wiring Devices
CECA 169 Standard for Installing and Maintaining Arc Fault Circuit Interrupters (AFCIs) and Ground Fault Circuit Interrupters (GFCIs)
CECA 200 Standard for Installing and Maintaining Temporary Electrical Power at Construction Sites
CECA 230 Standard for Selecting, Installing, and Maintaining Electric Motors and Motor Controllers
CECA 301 Standard for Installing and Testing Fiber Optic Cables
CECA 331 Standard for Building and Service Grounding and Bonding
CECA 400 Standard for Installing and Maintaining Switchboards
CECA 402 Standard for Installing and Maintaining Motor Control Centres
CECA 404 Standard for Installing Generator Sets
CECA 406 Standard for Installing Residential Generator Sets
CECA 407 Standard for Installing and Maintaining Panelboards
CECA 408 Standard for Installing and Maintaining Busways
CECA 409 Standard for Installing and Maintaining Dry-Type Transformers
CECA 410 Standard for Installing and Maintaining Liquid-Filled Transformers
CECA 411 Standard for Installing and Maintaining Uninterruptible Power Supplies (UPS)
CECA 412 Standard for Installing and Maintaining Solar Photovoltaic (PV) Power Systems
CECA 420 Standard for Fuse Applications
CECA 430 Standard for Installing High-Voltage Metal-Enclosed Switchgear
CECA 500 Standard for Installing Indoor Commercial Lighting Systems
CECA 501 Standard for Installing Exterior Lighting Systems
CECA 502 Standard for Installing Industrial Lighting Systems
CECA 503 Standard for Installing Fiber Optic Lighting Systems
CECA 505 Standard for Installing and Maintaining High Mast, Roadway, Area, and Sports Lighting
CECA 568 Standard for Installing Commercial Building Telecommunications Cabling
CECA 600 Standard for Installing and Maintaining High-Voltage Cable
CECA 605 Standard for Installing Underground Non-metallic Utility Duct
CECA 700 Standard for Installing Overcurrent Devices to Achieve Selective Coordination