National Energy Code of Canada for Buildings 2020 (NECB)

2025 Revisions and Errata Package

Selected replacement pages have been produced for the NECB.

Please print and insert in your copy of the Code.

Preface

The National Energy Code of Canada for Buildings 2020 (NECB), together with the National Building Code of Canada 2020 (NBC), the National Plumbing Code of Canada 2020 (NPC) and the National Fire Code of Canada 2020 (NFC), was developed by the Canadian Commission on Building and Fire Codes (CCBFC) as an objective-based national model code that can be adopted by provincial and territorial governments.

In Canada, provincial and territorial governments have the authority to enact legislation that regulates building design and construction within their jurisdictions. This may involve the adoption of the NECB without change or with modifications to suit local needs, and the enactment of other laws and regulations regarding building design and construction, including requirements for professional involvement.

The NECB is a model code in the sense that it helps promote consistency among provincial and territorial energy codes for buildings. Persons involved in the design or construction of a building should consult the provincial or territorial jurisdiction concerned to find out which energy code is applicable.

This edition of the NECB succeeds the 2017 edition.

The development of the NECB 2020 was supported by the National Research Council of Canada (NRC), Natural Resources Canada and other stakeholders. The NECB 2020 will help to improve the energy efficiency of new buildings and reduce greenhouse gas emissions, contributing to long-term benefits for both Canada's economy and the environment.

Development of the National Model Codes

GOVERNANCE CHANGE NOTE: The national code development system underwent a governance change in November 2022 to support efforts to harmonize construction codes in jurisdictions throughout Canada. The CCBFC, which had been in place since 1991, was dissolved and replaced by a new governance model in which the Canadian Board for Harmonized Construction Codes (CBHCC) is responsible for developing, approving and maintaining the National Model Codes based on the strategic priorities set by the Canadian Table for Harmonized Construction Codes Policy. The 2020 National Model Codes were developed by the CCBFC. In this section, references to the CCBFC are written in the past tense to reflect the change in governance.

The CCBFC, an independent committee established by the NRC, was responsible for the content of the 2020 editions of the National Model Codes. The CCBFC was made up of volunteers from across the country and from all facets of the Codes-user community. Members of the CCBFC and its standing committees included builders, engineers, skilled trade workers, architects, building owners, building operators, fire and building officials, manufacturers, and representatives of general interests.

The CCBFC was advised on scope, policy and technical issues pertaining to the Codes by the Provincial/Territorial Policy Advisory Committee on Codes (PTPACC), which was a committee of senior representatives from provincial/territorial ministries responsible for building, fire, plumbing and energy regulation in their jurisdictions. The PTPACC was created by the provinces and territories, with provision of guidance to the CCBFC as one of its main functions. Through the PTPACC, the provinces and territories were engaged in every phase of the Codes development process.

Codes Canada staff within the Construction Research Centre at the NRC provided technical and administrative support to the CCBFC and its standing committees, and coordinated the provision of evidence-based research to inform Codes development. The NRC publishes the National Model Codes and periodic revisions to the Codes to address pressing issues.

The broader Codes-user community makes significant contributions to the Codes development process by submitting requests for changes or additions to the Codes and by commenting on the proposed changes during the public reviews that precede each new edition.

The CCBFC took into consideration the advice received from the provinces and territories as well as Codes users' comments at each stage of Codes development. The scope and content of the National Model Codes are determined on a consensus basis, which involves the review of technical, policy and practical concerns and discussion of the implications of these concerns.

More information on the Codes development process is available on the CBHCC's website.

National Energy Code of Canada for Buildings 2020

The NECB sets out technical provisions to address energy efficiency in the design and construction of new buildings and additions to existing buildings. In the context of the NECB, the term “energy efficiency” is understood to mean “energy use efficiency.”

Code provisions do not necessarily address all the characteristics of buildings that might be considered to have a bearing on the Code's objective. Through the extensive consensus process used to develop and maintain the National Model Codes (see the section entitled Development of the National Model Codes), the Codes-user community has decided which characteristics should be regulated through the NECB.

The provisions of the NECB can be considered as the minimum acceptable measures required to adequately achieve the Environment objective, as recommended by the CCBFC. Once they are adopted into law or regulation by an authority having jurisdiction, the provisions become minimum acceptable requirements representing the minimum level of performance required to achieve the objective that is acceptable to the adopting authority.

The NECB is a model code which, when adopted or adapted by a province or territory, becomes a regulation. It is not a guideline on the design or construction of energy-efficient buildings. The design of an energy-efficient building depends upon many factors beyond compliance with energy regulations. Such factors include the availability of knowledgeable practitioners who have received appropriate education, training and experience and who are familiar with the principles of good building practice and experience using reference manuals and technical guides.

The NECB does not list acceptable proprietary building products. It establishes the criteria that building materials, products and assemblies must meet. Some of these criteria are explicitly stated in the NECB while others are incorporated by reference to material or product standards published by standards development organizations. Only those portions of the standards related to the objective of this Code are mandatory parts of the NECB.

Relationship between the NBC and the NECB

The provisions in Section 9.36. of Division B of the NBC are tied to the Environment objective. These provisions, which apply to housing and small buildings, have a similar scope to that of the NECB, except that they do not address lighting and electrical power systems. The NECB is referenced in NBC Section 9.36. as an acceptable solution.

Code Requirements

The NECB establishes requirements that address one principal objective, Environment (OE), which comprises a second-level objective, Resources (OE1), and a sub-objective, Excessive Use of Energy (OE1.1). Every NECB requirement addresses sub-objective OE1.1.

In processing proposed changes or additions to any of the National Model Codes, many issues are considered, such as the following:

- Does the proposed requirement provide the minimum level of performance—and no more than the minimum—needed to achieve the Code's objectives?
- Will persons responsible for Code compliance be able to act on or implement the requirement using commonly accepted practices?
- Will enforcement agencies be able to enforce the requirement?
- Are the costs of implementing the requirement justifiable?
- Have the potential policy implications of the requirement been identified and addressed?
- Is there broad consensus on this requirement among Code users representing all facets of the design and construction industries as well as among provincial and territorial governments?

Guidelines for requesting changes to the NECB are available on the CBHCC's website.

Objective-Based Code Format

The NECB has been published in an objective-based code format since 2011.

As described in more detail in the section entitled Structure of the NECB, the Code comprises three Divisions:

- Division A, which defines the scope of the Code and contains the objective, the functional statements and the conditions necessary to achieve compliance;
- Division B, which contains acceptable solutions (commonly referred to as “technical requirements”) deemed to satisfy the objective and functional statements listed in Division A; and
- Division C, which contains administrative provisions.

Most of the requirements in Division B are linked to three types of information:

- sub-objective OE1.1, Excessive Use of Energy,
- functional statements (statements of the functions of the building that a particular requirement helps to achieve), and
- an intent statement (detailed statement of the specific intent of the requirement).

Objectives

The NECB's objectives are fully defined in Section 2.2. of Division A.

The objectives describe, in broad terms, the overall goals that the NECB's requirements are intended to achieve. They serve to define the boundaries of the subject areas the Code addresses. However, the Code does not address all the issues that might be considered to fall within those boundaries.

The objectives describe undesirable situations and their consequences, which the Code aims to prevent from occurring in buildings. The wording of the definitions of the objectives includes two key phrases: “limit the probability” and “unacceptable effect.” The phrase “limit the probability” is used to acknowledge that the NECB cannot entirely prevent the undesirable outcome from happening. The phrase “unacceptable effect” acknowledges that the NECB cannot eliminate all undesirable effects: the “acceptable effect” is the outcome remaining once compliance with the Code has been achieved.

The objectives are entirely qualitative and are not intended to be used on their own in the design and approval processes.

location of the new or revised content. No change indication is provided for editorial revisions or for renumbered or deleted content.

Units

All values in the NECB are given in metric units. Some of the metric values in the Code have been converted and rounded from imperial values. A conversion table of imperial equivalents for the most common units used in the design and construction of energy-efficient buildings is located at the end of the Code.

Complementary Publications

The following publications are referenced in the NECB 2020 or facilitate the application of its requirements:

National Building Code of Canada 2020
National Fire Code of Canada 2020
National Plumbing Code of Canada 2020
Supplement to the NECB 2020: Intent Statements
User's Guide – National Energy Code of Canada for Buildings 2020

These and other Code documents published by the NRC are made available in free electronic format on the NRC's website.

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Contact Information

The CBHCC welcomes comments and suggestions for improvements to the NECB. Persons interested in requesting a change to an NECB provision should refer to the guidelines available on the CBHCC's website.

To submit comments or suggestions, please contact:

The Secretary
Canadian Board for Harmonized Construction Codes
1200 Montreal Road
Ottawa, Ontario K1A 0R6
E-mail: CBHCCSecretary-SecretaireCCHCC@nrc-cnrc.gc.ca

Relationship of the NECB to Standards Development and Conformity Assessment

The development of many provisions in the NECB and the assessment of conformity to those provisions are supported by several of the member organizations of Canada's National Standards System (NSS).

The NSS is a network of accredited organizations concerned with standards development, certification, testing and inspection that is established under the auspices of the Standards Council of Canada Act. Activities of the NSS are coordinated by the Standards Council of Canada (SCC), which accredits standards development organizations, certification bodies, testing and calibration laboratories, and inspection bodies, among others.

The SCC is a non-profit federal Crown corporation responsible for the coordination of voluntary standardization in Canada. It also coordinates Canadian participation in voluntary international standardization activities.

Canadian Standards

Many of the standards referenced in the NECB are published by standards development organizations accredited in Canada. As part of the accreditation requirements, these organizations adhere to the principle of consensus, which generally means substantial majority agreement of a committee comprising a balance of producer, user and general interest members, and the consideration of all negative comments. The standards development organizations also have formal procedures for the balloting and second-level review of standards prepared under their oversight.

The following organizations are accredited as standards development organizations in Canada:

- Air-Conditioning, Heating and Refrigeration Institute (AHRI)
- ASTM International
- Bureau de normalisation du Québec (BNQ)
- Canadian General Standards Board (CGSB)
- CSA Group
- International Association of Plumbing and Mechanical Officials (IAPMO)
- ULC Standards
- Underwriters' Laboratories Inc. (UL)

Table 1.3.1.2. of Division B lists the standards referenced in the NECB. Standards proposed to be referenced in the NECB are reviewed to ensure that their content is compatible with the Code. Thereafter, referenced standards are reviewed as needed during each Code cycle. Standards development organizations are asked to provide information on any changes in the status of their standards referenced in the NECB—withdrawals, amendments, new editions, etc. This information is passed on to the CBHCC, its code development committees, and interested stakeholders, all of whom are given the opportunity to identify any problems associated with the changes. These bodies do not necessarily review in detail the revised standards; rather, the approach relies on the consensus process involved in the maintenance of the standards and on the extensive knowledge and experience of committee members, provincial or territorial staff, NRC staff, and consulted stakeholders to identify changes in the standards that might create problems in the Code.

Revisions and Errata

Issued by the Canadian Board for Harmonized Construction Codes

The Change Summary table that follows describes revisions, errata and editorial modifications that apply to the National Energy Code of Canada for Buildings 2020:

- Revisions are changes that have been approved by the Canadian Board for Harmonized Construction Codes for publication between Code editions.
- Errata are corrections to existing text.
- Editorial updates are provided for information purposes only.
- Editorial changes are modifications that improve clarity.

Code pages containing revisions and/or errata are identified with the words "Amended Page" in the footer; pages with editorial modifications are not flagged.

Code users should contact their local authority having jurisdiction to find out if these revisions and errata apply in their province or territory.

Change Summary (Date: 2025-02) — National Energy Code of Canada for Buildings 2020

Division	Code Reference	Change	Description of Change
Preface	n/a	editorial update	Preface was updated to reflect change in governance of national code development system
B	1.3.1.1.(1)	revision	Date stated in Sentence was revised to read "15 July 2022"
	Table 1.3.1.2.	revision	Document references were updated as applicable to reflect more recent editions published as of 15 July 2022
	1.3.2.1.	editorial update	List of abbreviations was updated to include "CBHCC"
	Table C-1	erratum	"Degree-Days Below 15°C" entries for several locations in the Northwest Territories and Nunavut were corrected
C	2.2.2.6.	editorial change	Article was revised as follows: Article title was revised to read "Documentation on Service Water Systems" Sentence (1) was revised to read "... on the *service water* system ..."
	A-2.3.1.	editorial update	Last paragraph of Note was updated to read "... on the CBHCC's website."
Index	Letter D	editorial change	"Documentation": "service water heating" was revised to read "service water systems"
	Letter I	erratum	"Integrated coefficient of performance (ICOP)": entry was deleted

Section 1.2. Terms and Abbreviations

1.2.1. Definitions of Words and Phrases

1.2.1.1. Non-defined Terms

1) Words and phrases used in Division B that are not included in the list of definitions in Article 1.4.1.2. of Division A shall have the meanings that are commonly assigned to them in the context in which they are used, taking into account the specialized use of terms by the various trades and professions to which the terminology applies.

2) Where objectives and functional statements are referred to in Division B, they shall be the objectives and functional statements described in Parts 2 and 3 of Division A.

3) Where acceptable solutions are referred to in Division B, they shall be the provisions stated in Parts 3 to 8 and 10.

1.2.1.2. Defined Terms

1) The words and terms in italics in Division B shall have the meanings assigned to them in Article 1.4.1.2. of Division A.

2) For the purposes of this Code, a semi-heated *building* is considered to be a *building* with a design set-point temperature of less than 15°C.

1.2.2. Symbols and Other Abbreviations

1.2.2.1. Symbols and Other Abbreviations

1) The symbols and other abbreviations in Division B shall have the meanings assigned to them in Article 1.4.2.1. of Division A and Article 1.3.2.1.

Section 1.3. Referenced Documents and Organizations

1.3.1. Referenced Documents

1.3.1.1. Effective Date

1) Unless otherwise specified herein, the documents referenced in this Code shall include all amendments, revisions, reaffirmations, reapprovals, addenda and supplements effective to 15 July 2022.

1.3.1.2. Applicable Editions

1) Where documents are referenced in this Code, they shall be the editions designated in Table 1.3.1.2. (See also Note A-1.5.1.1.(1) of Division A.)

Table 1.3.1.2.
Documents Referenced in the National Energy Code of Canada for Buildings 2020(1)
Forming Part of Sentence 1.3.1.2.(1)

Issuing Agency	Document Number(2)	Title of Document	Code Reference
AAMA	501.5-07	Test Method for Thermal Cycling of Exterior Walls	3.2.4.3.(3)
AHRI	ANSI/AHRI 210/240-2008	Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment	Table 5.2.12.1.-C
AHRI	AHRI 310/380-2014/CSA C744-14	Packaged Terminal Air-Conditioners and Heat Pumps	Table 5.2.12.1.-G

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number[2]	Title of Document	Code Reference
AHRI	ANSI/AHRI 340/360-2007	Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment	Table 5.2.12.1.-A Table 5.2.12.1.-C
AHRI	ANSI/AHRI 366 (SI/2009)	Performance Rating of Commercial and Industrial Unitary Air-Conditioning Condensing Units	Table 5.2.12.1.-D
AHRI	ANSI/AHRI 460-2005	Performance Rating of Remote Mechanical-Draft Air-Cooled Refrigerant Condensers	Table 5.2.12.2.
AHRI	ANSI/AHRI 551/591 (SI/2018)	Performance Rating of Water-chilling and Heat Pump Water-heating Packages Using the Vapor Compression Cycle	Table 5.2.12.1.-L Table 5.2.12.1.-M
AHRI	ANSI/AHRI 921 (SI/2015)	Performance Rating of DX-Dedicated Outdoor Air System Units	Table 5.2.12.1.-J
AHRI	1061 (SI/2013)	Performance Rating of Air-to-Air Exchangers for Energy Recovery Ventilation Equipment	5.2.10.1.(5) A-5.2.10.1.(4)
AHRI	1160 (I-P/2014)	Performance Rating of Heat Pump Pool Heaters (with Addendum 1)	Table 6.2.2.1.
AHRI	1230-2014	Performance Rating of Variable Refrigerant Flow (VRF) Multi-Split Air-Conditioning and Heat Pump Equipment (with Addendum 1)	Table 5.2.12.1.-I
AHRI	CAN/ANSI/AHRI 1330-2015	Performance Rating for Radiant Output of Gas Fired Infrared Heaters	Table 5.2.12.1.-P
AHRI	1361 (SI/2017)	Performance Rating of Computer and Data Processing Room Air Conditioners	Table 5.2.12.1.-H
AMCA	ANSI/AMCA 500-D-12	Methods of Testing Dampers for Rating	5.2.4.2.(2)
AMCA	ANSI/AMCA 500-L-12	Methods of Testing Louvers for Rating	5.2.4.2.(2)
ANSI/CSA	CSA/ANSI Z21.10.3:19/CSA 4.3:19	Gas-fired water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous	Table 6.2.2.1.
ANSI/CSA	CSA/ANSI Z21.47:21/CSA 2.3:21	Gas-fired central furnaces	Table 5.2.12.1.-O
ANSI/CSA	CSA/ANSI Z21.56:19/CSA 4.7:19	Gas-fired pool heaters	Table 6.2.2.1.
ANSI/CSA	ANSI Z83.8-2016/CSA 2.6-2016	Gas unit heaters, gas packaged heaters, gas utility heaters and gas-fired duct furnaces	Table 5.2.12.1.-O
ASHRAE	2011	ASHRAE Handbook – HVAC Applications	A-6.2.4.1.(1)
ASHRAE	2013	ASHRAE Handbook – Fundamentals	3.1.1.5.(4) 3.1.1.5.(5) A-8.4.4.4.(1)
ASHRAE	ANSI/ASHRAE 55-2013	Thermal Environmental Conditions for Human Occupancy	A-5.2.8.3.(1)
ASHRAE	ANSI/ASHRAE 62.1-2016	Ventilation for Acceptable Indoor Air Quality	A-5.2.3.4.(1)
ASHRAE	ANSI/ASHRAE 84-2013	Method of Testing Air-to-Air Heat/Energy Exchangers	5.2.10.1.(5)
ASHRAE/IES	ANSI/ASHRAE/IES 90.1-2013	Energy Standard for Buildings Except Low-Rise Residential Buildings	A-Table 3.2.2.2. A-5.2.3.4.(2)
ASHRAE/IES	90.1-2013	User's Manual	A-5.2.10.1.(4) A-5.2.10.4.(5) A-6.2.3.1.(1)
ASHRAE	ANSI/ASHRAE 111-2008	Testing, Adjusting, and Balancing of Building HVAC Systems	A-5.2.5.2.(1)
ASHRAE	ANSI/ASHRAE 140-2011	Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs	8.4.2.2.(4)
ASHRAE	RP-1365-2011	Thermal Performance of Building Envelope Details for Mid- and High-Rise Buildings	A-3.1.1.5.(5)(a)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number[2]	Title of Document	Code Reference
ASME/CSA	ASME A112.18.1-2018/CSA B125.1-18	Plumbing Supply Fittings	6.2.6.1.(1) 6.2.6.2.(1)
ASTM	C177-19	Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus	3.1.1.5.(1)
ASTM	C335/C335M-17	Standard Test Method for Steady-State Heat Transfer Properties of Pipe Insulation	5.2.5.3.(6) 6.2.3.1.(4)
ASTM	C518-21	Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	3.1.1.5.(1)
ASTM	C1363-19	Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus	3.1.1.5.(4) 3.1.1.5.(5)
ASTM	E283/E283M-19	Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen	3.2.4.3.(3) 3.2.4.3.(6) 3.2.4.3.(7) 3.2.4.3.(8) 3.2.4.3.(9)
ASTM	E779-19	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization	8.4.2.9.(2)
ASTM	E3158-18	Standard Test Method for Measuring the Air Leakage Rate of a Large or Multizone Building	3.2.4.2.(1)
BC Hydro	2014	Building Envelope Thermal Bridging Guide	A-3.1.1.5.(5)(a)
CCBFC	NRCC-CONST-56435E	National Building Code of Canada 2020	1.1.1.1.(1)[3] 1.1.1.3.(1)[3] 1.1.1.3.(2)[3] 1.4.1.2.(1)[3] A-3.2.1.1.(1)[3] 3.1.1.5.(1) A-3.2.3.1.(3) 5.2.1.1.(1) 5.2.2.1.(1) 5.2.2.8.(2) 5.2.5.1.(1) A-5.2.2.8.(2) A-5.2.8.4.(1) A-5.2.10.4.(1) A-5.2.10.4.(5)
CCBFC	NRCC-CONST-56437E	National Fire Code of Canada 2020	1.4.1.2.(1)[3] A-3.2.1.1.(1)[3]
CCBFC	NRCC-CONST-56436E	National Plumbing Code of Canada 2020	A-3.2.1.1.(1)[3] A-5.2.10.4.(1) 6.2.1.1.(1) A-6.2.6.1.(1) A-8.4.4.20.(6) A-8.4.4.20.(7)
CSA	AAMA/WDMA/CSA 101/I.S.2/A440-17	North American Fenestration Standard/Specification for windows, doors, and skylights	3.2.4.3.(4) 3.2.4.3.(5)
CSA	A440.2:19/A440.3:19	Fenestration energy performance/User guide to CSA A440.2:19, Fenestration energy performance	3.1.1.5.(3) A-3.1.1.6.(1)
CSA	B140.4:04	Oil-Fired Warm Air Furnaces	Table 5.2.12.1.-O
CSA	B140.12-03	Oil-Burning Equipment: Service Water Heaters for Domestic Hot Water, Space Heating, and Swimming Pools	Table 6.2.2.1.
CSA	CAN/CSA-B211-00	Energy Efficiency of Oil-Fired Storage Tank Water Heaters	Table 6.2.2.1.

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number[2]	Title of Document	Code Reference
CSA	B415.1:22	Performance testing of solid-biofuel-burning heating appliances	Table 5.2.12.1.-P
CSA	C22.1:21	Canadian Electrical Code, Part I	A-7.2.1.1.
CSA	CAN/CSA-C191-13	Performance of Electric Storage Tank Water Heaters for Domestic Hot Water Service	Table 6.2.2.1.
CSA	C368.1:14	Energy performance of room air conditioners	Table 5.2.12.1.-G
CSA	C390:10	Test methods, marking requirements, and energy efficiency levels for three-phase induction motors	7.2.4.1.(1)
CSA	CAN/CSA-C439-18	Laboratory methods of test for rating the performance of heat/energy-recovery ventilators	5.2.10.1.(5) 5.2.10.4.(2) Table 5.2.10.4. A-5.2.10.4.(2)
CSA	CAN/CSA-C654-14	Fluorescent lamp ballast efficacy measurements	4.2.1.2.(1) 4.2.1.2.(2)
CSA	C656-14	Performance standard for split-system and single-package air conditioners and heat pumps	Table 5.2.12.1.-A Table 5.2.12.1.-I
CSA	CAN/CSA-C743-09	Performance standard for rating packaged water chillers	Table 5.2.12.1.-K Table 5.2.12.1.-L
CSA	CAN/CSA-C745-20	Energy efficiency of electric storage tank water heaters and heat pump water heaters	Table 6.2.2.1.
CSA	CAN/CSA-C746-17	Energy performance rating for large and single packaged vertical air conditioners and heat pumps	Table 5.2.12.1.-A Table 5.2.12.1.-B Table 5.2.12.1.-C Table 5.2.12.1.-D
CSA	C748-13	Performance of direct-expansion (DX) ground-source heat pumps	Table 5.2.12.1.-F
CSA	CAN/CSA-C802.1-13	Minimum efficiency values for liquid-filled distribution transformers	7.2.3.1.(1)
CSA	CAN/CSA-C802.2-18	Test method and minimum efficiency values for dry-type transformers	7.2.3.1.(1)
CSA	C802.3-15	Minimum efficiency values for power transformers	7.2.3.1.(1)
CSA	CAN/CSA-C828:19	Performance requirements for line voltage thermostats used with individual room electric space heating devices	5.2.8.6.(4)
CSA	CAN/CSA-C860-11	Performance of internally lighted exit signs	4.2.1.1.(1)
CSA	C873.4:15	Building energy estimation methodology – Part 4 – Energy consumption for lighting	4.3.1.3.(1) 4.3.1.3.(2) 4.3.1.3.(3) 4.3.1.3.(4) 4.3.1.3.(5)
CSA	CAN/CSA-C13256-1-01	Water-Source Heat Pumps - Testing and Rating for Performance - Part 1: Water-to-Air and Brine-to-Air Heat Pumps (Adopted ISO 13256-1:1998, first edition, 1998-08-15, with Canadian Deviations)	Table 5.2.12.1.-E
CSA	CAN/CSA-C13256-2-01	Water-Source Heat Pumps - Testing and Rating for Performance - Part 2: Water-to-Water and Brine-to-Water Heat Pumps (Adopted ISO 13256-2:1998, first edition, 1998-08-15, with Canadian Deviations)	Table 5.2.12.1.-E
CSA	CAN/CSA-F379 SERIES-09 (excluding Supplement F379S1-11)	Packaged solar domestic hot water systems (liquid-to-liquid heat transfer)	6.2.2.3.(1)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number[2]	Title of Document	Code Reference
CSA	CAN/CSA-P.2-13	Testing method for measuring the annual fuel utilization efficiency of residential gas-fired or oil-fired furnaces and boilers	Table 5.2.12.1.-N Table 5.2.12.1.-O
CSA	CAN/CSA-P.3-15	Testing method for measuring energy consumption and determining efficiencies of gas-fired and fuel oil-fired water heaters	Table 6.2.2.1.
CSA	CAN/CSA-P.4.1:21	Testing method for measuring fireplace efficiency	Table 5.2.12.1.-P
CSA	P.6-09	Test method for measuring thermal efficiency of gas-fired pool heaters	Table 6.2.2.1.
CSA	CAN/CSA-P.8-09	Thermal efficiencies of industrial and commercial gas-fired package furnaces	Table 5.2.12.1.-O
CSA	CAN/CSA-P.11-07	Testing Method for Measuring Efficiency and Energy Consumption of Gas-Fired Unit Heaters	Table 5.2.12.1.-O
CTI	STD-201RS-04	Standard for the Certification of Water Cooling Tower Thermal Performance	Table 5.2.12.2.
CTI	ATC-105-00	Acceptance Test Code	Table 5.2.12.2.
CTI	ATC-105DS-18	Acceptance Test Code for Dry Fluid Coolers	Table 5.2.12.2.
CTI	ATC-105S-11	Acceptance Test Code for Closed Circuit Cooling Towers	Table 5.2.12.2.
CTI	ATC-106-11	Acceptance Test Code for Mechanical Draft Evaporative Vapor Condensers	Table 5.2.12.2.
DASMA	ANSI/DASMA 105-2017	Test Method for Thermal Transmittance and Air Infiltration of Garage Doors	3.2.4.3.(8)
DIN	EN 303-5:2012	Heating boilers – Part 5: Heating boilers for solid fuels, manually and automatically stoked, nominal heat output of up to 500 kW – Terminology, requirements, testing and marking; German version EN 303-5:2012	Table 5.2.12.1.-P
DIN	EN 416:2019	Gas-fired overhead radiant tube heaters and radiant tube heater systems for non-domestic use – Safety and energy efficiency; German version EN 416:2019	Table 5.2.12.1.-P
DIN	EN 419:2019	Gas-fired overhead luminous radiant heaters for non-domestic use – Safety and energy efficiency; German version EN 419:2019	Table 5.2.12.1.-P
DOE	10 CFR, Part 430-2011	Energy, Energy Conservation Program for Consumer Products	Table 5.2.12.1.-O Table 6.2.2.1.
DOE	10 CFR, Part 431-2011	Energy, Energy Efficiency Program for Certain Commercial and Industrial Equipment	Table 5.2.12.1.-N Table 6.2.2.1.
EPA	40 CFR, Part 60-2008	Protection of Environment, Standards of Performance for New Stationary Sources	Table 5.2.12.1.-P
HRAI	2017 Edition	HRAI Digest	1.1.4.2.(1) A-5.2.1.1.(1)
HVI	HVI Publication 911	Certified Home Ventilating Products Directory	A-5.2.10.4.(2)
ICC/SRCC	ICC 900/SRCC 300-2015	Solar Thermal System Standard	Table 6.2.2.1.
IES	HB-10-11	The Lighting Handbook, 10th Edition	A-Table 4.3.2.8.
IES	ANSI/IES RP-28-07	Lighting and the Visual Environment for Senior Living	Table 4.2.1.6. Table 4.3.2.10.-A A-8.4.3.2.(2)
ISO	13790:2008	Energy performance of buildings – Calculation of energy use for space heating and cooling	1.1.4.2.(1)
ISO	14683:2007	Thermal bridges in building construction – Linear thermal transmittance – Simplified methods and default values	3.1.1.5.(5)

Table 1.3.1.2. (Continued)

Issuing Agency	Document Number(2)	Title of Document	Code Reference
NEMA	ANSI_ANSLG C82.11:2011	American National Standard for Lamp Ballasts–High-Frequency Fluorescent Lamp Ballasts	4.2.1.2.(2)
NFRC	100-2010	Procedure for Determining Fenestration Product U-factors	3.1.1.5.(3)
NRCan	S.C. 1992, c. 36	Energy Efficiency Act	5.2.12.4.(1) A-5.2.12.1.(1) and 6.2.2.1.(1) 6.2.2.4.(2) 6.2.2.5.(1)
NRCan	SOR/2016-311	Energy Efficiency Regulations	Table 5.2.12.1.-A Table 5.2.12.1.-B Table 5.2.12.1.-C Table 5.2.12.1.-D Table 5.2.12.1.-E Table 5.2.12.1.-G Table 5.2.12.1.-I Table 5.2.12.1.-K Table 5.2.12.1.-N Table 5.2.12.1.-O 5.2.12.4.(1) A-5.2.12.1.(1) and 6.2.2.1.(1) Table 6.2.2.1. 6.2.2.4.(2) 6.2.2.5.(1)
SMACNA	ANSI/SMACNA 006-2006	HVAC Duct Construction Standards – Metal and Flexible	5.2.2.3.(1) Table 5.2.2.3. A-5.2.2.1.(1)
SMACNA	ANSI/SMACNA 016-2012	HVAC Air Duct Leakage Test Manual	5.2.2.4.(1) A-5.2.2.1.(1)
SMACNA	2003	Fibrous Glass Duct Construction Standards	A-5.2.2.1.(1)
SMACNA	2006	HVAC Systems Duct Design	A-5.2.2.1.(1)
TIAC	2013	Mechanical Insulation Best Practices Guide	A-5.2.2.5.(8) and 5.2.5.3.(7)
ULC	CAN/ULC-S741-08	Standard for Air Barrier Materials – Specification	3.2.4.3.(2)
ULC	CAN/ULC-S742:2020	Standard for Air Barrier Assemblies – Specification	3.2.4.3.(2) A-3.2.4.3.(1) and (2)

Notes to Table 1.3.1.2.:

(1) While every effort was made to ensure the accuracy of the information in this Table, the NRC is not responsible for the accuracy, timeliness or reliability of the content presented therein. For all purposes of interpreting and applying the referenced standards, Code users should refer to the most recent official versions of the referenced editions.

(2) Some documents may have been reaffirmed or reapproved. Check with the applicable issuing agency for up-to-date information.

(3) Code reference is in Division A.

1.3.2. Organizations

1.3.2.1. Abbreviations of Proper Names

1) The abbreviations of proper names in this Code shall have the meanings assigned to them in this Article.

AAMA ..... Fenestration and Glazing Industry Alliance (formerly American Architectural Manufacturers Association) (www.fgiaonline.org)

AHRI	Air-Conditioning, Heating and Refrigeration Institute (www.ahrinet.org)
AMCA	Air Movement and Control Association (www.amca.org)
ANSI	American National Standards Institute (www.ansi.org)
ANSLG	American National Standards Lighting Group (see NEMA)
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers (www.ashrae.org)
ASME	American Society of Mechanical Engineers (www.asme.org)
ASTM	ASTM International (www.astm.org)
CAN	National Standard of Canada designation (www.scc.ca)
CBHCC	Canadian Board for Harmonized Construction Codes (cbhcc-cchcc.ca)
CCBFC	Canadian Commission on Building and Fire Codes (see NRC)
CSA	CSA Group (www.csagroup.ca)
CTI	Cooling Technology Institute (www.coolingtechnology.org)
DASMA	Door and Access Systems Manufacturers Association International (www.dasma.com/dasma-standards)
DIN	Deutsches Institut für Normung e. V. (German Institute for Standardization) (www.din.de/en)
DOE	U.S. Department of Energy (www.energy.gov)
EPA	Environmental Protection Agency (U.S.) (www.epa.gov)
HRAI	Heating, Refrigeration and Air Conditioning Institute of Canada (www.hrai.ca)
HVI	Home Ventilating Institute (www.hvi.org)
ICC	International Code Council (www.iccsafe.org)
IES	Illuminating Engineering Society (www.ies.org)
ISO	International Organization for Standardization (www.iso.org)
NBC	National Building Code of Canada 2020
NECB	National Energy Code of Canada for Buildings 2020
NEMA	National Electrical Manufacturers Association (www.nema.org)
NFC	National Fire Code of Canada 2020
NFRC	National Fenestration Rating Council (www.nfrc.org)
NPC	National Plumbing Code of Canada 2020
NRC	National Research Council of Canada (nrc.canada.ca)
NRCan	Natural Resources Canada (www.nrcan.gc.ca)
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association (www.smacna.org)
SRCC	Solar Rating & Certification Corporation (www.solar-rating.org)
TIAC	Thermal Insulation Association of Canada (www.tiac.ca)
ULC	ULC Standards (canada.ul.com/ulcstandards)
WDMA	Window & Door Manufacturers Association (www.wdma.com)

Table C-1 (Continued)

Province and Location	Elev., m	Design Temperature				Degree-Days Below 18°C	Degree-Days Below 15°C	Hourly Wind Pressures, kPa[1]	
		January		July 2.5%					
		2.5% °C	1% °C	Dry °C	Wet °C			1/10	1/50
Wolfville	35	-19	-21	28	21	4140	3250	0.42	0.54
Yarmouth	10	-14	-16	22	19	3990	3100	0.44	0.56
Prince Edward Island									
Charlottetown	5	-20	-22	26	21	4460	3650	0.44	0.56
Souris	5	-19	-21	27	21	4550	3650	0.45	0.58
Summerside	10	-20	-22	27	21	4600	3690	0.47	0.60
Tignish	10	-20	-22	27	21	4770	3860	0.51	0.66
Newfoundland and Labrador									
Argentia	15	-12	-14	21	18	4600	3620	0.59	0.75
Bonavista	15	-14	-16	24	19	5000	4000	0.66	0.84
Buchans	255	-24	-27	27	20	5250	4240	0.47	0.60
Cape Harrison	5	-29	-31	26	16	6900	5920	0.47	0.60
Cape Race	5	-11	-13	19	18	4900	3900	0.82	1.05
Channel-Port aux Basques	5	-13	-15	19	18	5000	4000	0.61	0.78
Corner Brook	35	-16	-18	26	20	4760	3770	0.43	0.55
Gander	125	-18	-20	27	20	5110	4110	0.47	0.60
Grand Bank	5	-14	-15	20	18	4550	3570	0.58	0.74
Grand Falls	60	-26	-29	27	20	5020	4020	0.47	0.60
Happy Valley-Goose Bay	15	-31	-32	27	19	6670	5700	0.33	0.42
Labrador City	550	-36	-38	24	17	7710	6710	0.31	0.40
St. Anthony	10	-25	-27	22	18	6440	5380	0.68	0.87
Stephenville	25	-16	-18	24	19	4850	3860	0.45	0.58
St. John's	65	-15	-16	24	20	4800	3810	0.61	0.78
Twin Falls	425	-35	-37	24	17	7790	6880	0.31	0.40
Wabana	75	-15	-17	24	20	4750	3760	0.59	0.75
Wabush	550	-36	-38	24	17	7710	6710	0.31	0.40
Yukon									
Aishihik	920	-44	-46	23	15	7500	6500	0.27	0.38
Dawson	330	-50	-51	26	16	8120	7100	0.22	0.31
Destruction Bay	815	-43	-45	23	14	7800	6790	0.42	0.60
Faro	670	-46	-47	25	16	7300	6310	0.26	0.35
Haines Junction	600	-45	-47	24	14	7100	6120	0.24	0.34
Snag	595	-51	-53	23	16	8300	7280	0.22	0.31
Teslin	690	-42	-44	24	15	6770	5800	0.26	0.34
Watson Lake	685	-46	-48	26	16	7470	6470	0.26	0.35
Whitehorse	655	-41	-43	25	15	6580	5610	0.29	0.38
Northwest Territories									
Aklavik	5	-42	-44	26	17	9600	8540	0.31	0.40
Behchokǫ̀ / Rae-Edzo	160	-42	-44	25	17	8300	7280	0.31	0.40
Echo Bay / Port Radium	195	-42	-44	22	16	9300	8250	0.41	0.53

Table C-1 (Continued)

Province and Location	Elev., m	Design Temperature				Degree-Days Below 18°C	Degree-Days Below 15°C	Hourly Wind Pressures, kPa(1)	
		January		July 2.5%					
		2.5% °C	1% °C	Dry °C	Wet °C			1/10	1/50
Fort Good Hope	100	-43	-45	28	18	8700	7660	0.34	0.44
Fort McPherson	25	-44	-46	26	17	9150	8100	0.31	0.40
Fort Providence	150	-40	-43	28	18	7620	6620	0.27	0.35
Fort Resolution	160	-40	-42	26	18	7750	6740	0.30	0.39
Fort Simpson	120	-42	-44	28	19	7660	6660	0.30	0.39
Fort Smith	205	-41	-43	28	19	7300	6310	0.30	0.39
Hay River	45	-38	-41	27	18	7550	6550	0.27	0.35
Inuvik	45	-43	-45	26	17	9600	8540	0.31	0.40
Mould Bay	5	-44	-46	11	8	12900	11730	0.45	0.58
Norman Wells	65	-43	-45	28	18	8510	7480	0.34	0.44
Tungsten	1340	-49	-51	26	16	7700	6700	0.34	0.44
Ulukhaktok / Holman	10	-39	-41	18	12	10700	9600	0.67	0.86
Wrigley	80	-42	-44	28	18	8050	7040	0.30	0.39
Yellowknife	160	-41	-44	25	17	8170	7150	0.31	0.40
Nunavut									
Alert	5	-43	-44	13	8	13030	11860	0.59	0.75
Arctic Bay	15	-42	-44	14	10	11900	10760	0.43	0.55
Arviat	5	-40	-41	22	16	9850	8780	0.45	0.58
Baker Lake	5	-42	-44	23	15	10700	9600	0.42	0.54
Eureka	5	-47	-48	12	8	13500	12310	0.43	0.55
Igluligaarjuk / Chesterfield Inlet	10	-40	-41	20	14	10500	9410	0.44	0.56
Iqaluit	45	-40	-41	17	12	9980	8900	0.51	0.65
Iqaluktuuttiaq / Cambridge Bay	15	-41	-44	18	13	11670	10540	0.39	0.50
Isachsen	10	-46	-48	12	9	13600	12410	0.47	0.60
Kangiqiniq / Rankin Inlet	10	-41	-42	21	15	10500	9410	0.47	0.60
Kanngiqtugaapik / Clyde River	5	-40	-42	14	10	11300	10180	0.43	0.55
Kugluktuk / Coppermine	10	-41	-43	23	16	10300	9210	0.36	0.46
Nottingham Island	30	-37	-39	16	13	10000	8920	0.61	0.78
Resolute	25	-42	-43	11	9	12360	11210	0.46	0.59
Resolution Island	5	-32	-34	12	10	9000	7960	0.96	1.23
Salliq / Coral Harbour	15	-41	-42	20	14	10720	9620	0.45	0.58

Notes to Table C-1:

(1) The hourly wind pressure data are used in Subclause 3.2.4.3.(2)(b)(ii).

2.2.2.6. Documentation on Service Water Systems

1) The following documentation on the *service water* system shall be provided:

a) a description of each system detailing its function, design details, performance characteristics and distribution arrangement,
b) schematic and control diagrams and sequence of operation, and
c) start/stop and adjustment procedures.

2.2.2.7. Documentation on Electrical Power Systems and Motors

1) The following documentation on the electrical power systems and motors shall be provided:

a) an as-built single-line diagram of the *building*'s electrical distribution system indicating the locations of means to monitor energy consumption,
b) schematic diagrams of electrical control systems for systems other than heating, ventilating and air-conditioning, *service water* heating, and lighting, and
c) the manufacturers' operational manuals for all electrical equipment.

2.2.2.8. Documentation Requirements for Building Performance Compliance

1) If Part 8 of Division B is used to demonstrate compliance with Parts 3 to 7 of Division B, a *building* performance compliance calculation report shall be produced in accordance with this Article in addition to the documentation required by Articles 2.2.2.3. to 2.2.2.7.

2) The header of each page of the *building* performance compliance calculation report shall contain the following information:

a) project name,
b) date of analysis,
c) unique run number to identify all report pages as being the result of that analysis run,
d) report title, and
e) page number (consecutive within each report).

3) The following information shall be included in the *building* performance compliance calculation report:

a) the project information section of the report shall contain:
   i) project name or identifier,
   ii) project description,
   iii) project address,
   iv) geographic region in which proposed design is to be built,
   v) identifier for climate data set used for analysis, and
   vi) floor area of *conditioned spaces* of the proposed design,
b) the *building envelope* data summary section of the report shall contain the documentation required in Article 2.2.2.3. for both the proposed *building* and the reference *building*,
c) the lighting systems data summary section of the report shall contain the following data for both the proposed *building* and the reference *building*:
   i) *installed interior lighting power* in *conditioned spaces*, in kW,
   ii) average installed lighting power density, in W/m^2, obtained by dividing the *installed interior lighting power* by the total floor area,
   iii) *interior lighting power allowance*, in kW,
   iv) average lighting power allowance density, in W/m^2, obtained by dividing the *interior lighting power allowance* by the total floor area,
   v) *exterior lighting* power, and
   vi) if daylighting calculations are performed, the method of calculation and the results,
d) the HVAC data summary section of the report shall contain the following data for both the proposed *building* and the reference *building*:
   i) total heating capacity, by energy source used for heating,
   ii) total cooling capacity, by energy source used for cooling,

- descriptions of the different types of air barrier assemblies and their location,
- window dimensions,
- characteristics of fenestration, sliding glass doors and other doors separating conditioned space from unconditioned space or the exterior (e.g. overall thermal transmittance and air leakage control),
- required report on trade-offs, if applicable,
- details of required exterior lighting controls and exterior lighting power for exits, entrances and facades,
- details of required interior lighting controls and interior lighting power,
- identification of static pressure class and leakage class of ducts,
- thermal insulation of pipes and air ducts,
- location of required dampers and of thermostatic controls and cut-offs,
- location and extent of the airflow control areas and temperature-control zones,
- efficiency of unitary and packaged heating and cooling equipment,
- power requirements for the operation of heating, ventilating and cooling systems, with air volumes, and the type of control used for ventilation,
- types and capacities of and controls for the heating and cooling systems, including cooling with exterior air,
- details of pumping systems with variable flow,
- characteristics of heat-recovery ventilators, where required,
- efficiency of service water heating equipment,
- service water distribution layouts and controls,
- required report on performance compliance, if applicable,
- basis for ventilation design and justification for any variance from good practice, where applicable.

A-2.3.1. Documentation of Alternative Solutions. Beyond the purposes of demonstrating compliance and acquiring a building permit, there are other important reasons for requiring that the proponent of an alternative solution submit project documentation (i.e. a compliance report) to the authority having jurisdiction and for the authority having jurisdiction to retain that documentation for a substantial period following the construction of a building:

- Most jurisdictions require that a building be maintained in compliance with the codes under which it was built. Alternative solutions made possible by objective-based codes may have special maintenance requirements, which would be described in the documentation.
- Documentation helps consultants perform code compliance assessments of existing buildings before they are sold and informs current owners or prospective buyers of existing buildings of any limitations pertaining to their future use or development.
- Documentation provides design professionals with the basic information necessary to design changes to an existing building.
- An alternative solution could be invalidated by a proposed alteration to a building. Designers and regulators must therefore know the details of the particular alternative solutions that were integral to the original design. Complete documentation should provide insight as to why one alternative solution was chosen over another.
- Documentation is the “paper trail” of the alternative solution negotiated between the designer and the regulator and should demonstrate that a rational process led to the acceptance of the alternative solution as an equivalency.
- It is possible that over time a particular alternative solution may be shown to be inadequate. It would be advantageous for a jurisdiction to know which buildings included that alternative solution as part of their design: documentation will facilitate this type of analysis.
- Project documentation provides important information to a forensic team that is called to investigate an accident or why a design failed to provide the level of performance expected.

This subject is discussed in further detail in “Recommended Documentation Requirements for Projects Using Alternative Solutions in the Context of Objective-Based Codes,” which was prepared for the CCBFC Task Group on Implementation of Objective-Based Codes and is available on the CBHCC's website.

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