

Canada's Code Development System

1.0 Introduction

1.1 *Canadian Commission on Building and Fire Codes*

Canada has one of the best standards of construction in the world and a high degree of uniformity in building construction and fire safety across the country. Canada's centralized system for model code development and maintenance began in the 1930s. The first edition of the National Building Code was published in 1941. Subsequent adoption of the model national building, plumbing, and fire codes by the provinces and territories has resulted in a progressive system that is responsive to new construction products and techniques.

The Canadian Commission on Building and Fire Codes (CCBFC), funded by code sales and the National Research Council, is responsible for developing and updating six model national codes. It oversees the work of nine committees and several task groups involving as many as 300 members. The system is structured such that it is the members of the committees who establish the content of the model codes. Member expertise from industry, the regulatory community and general interest groups is balanced to ensure that all relevant sectors and geographical areas of the country are represented. These committees are administratively and technically supported by the Canadian Codes Centre of the Institute for Research in Construction at the National Research Council.

1.2 *Model National Code Documents*

On behalf of the CCBFC, the National Research Council publishes the model national code documents, which must be adopted by a regulatory authority in order to come into effect. In some cases, the national codes are amended and/or supplemented to suit regional needs, and then published as provincial codes.

- The **National Building Code of Canada** (NBC) addresses the design and construction of new buildings and the substantial renovation of existing buildings.
- The **National Fire Code of Canada** provides minimum fire safety requirements for buildings, structures and areas where hazardous materials are used, and addresses fire protection and fire prevention in the ongoing operation of buildings and facilities.
- The **National Plumbing Code** covers the design and installation of plumbing systems in buildings and facilities.
- The **National Farm Building Code** provides relaxations of the requirements in the NBC to address the particular needs of farm buildings.
- The **National Housing Code and Illustrated Guide** is a compendium of the requirements in the NBC that apply to housing without horizontal fire separations or shared egress, i.e. detached, semi-detached and row houses.
- The **Model National Energy Code of Canada for Buildings** and the **Model National Energy Code of Canada for Houses** provide technical requirements for the construction of energy-efficient buildings and houses.

To assist in the application of the codes, explanatory material is published in the form of **user's guides**. Descriptions of all the published documents and ordering information are available at www.nrc.ca/irc/publications.html.

The Canadian Electrical Code, the Natural Gas and Propane Installation Code and the Installation Code for Oil-Burning Equipment are published by the Canadian Standards Association.

2.0 Historical Background

2.1 Evolution of the Code Development System

Under the British North America Act and its successor, the Constitution Act, responsibility for building regulation in Canada rests with the provinces and territories. This responsibility was generally delegated to municipalities, which, not surprisingly, resulted in a multiplicity of regulations being developed over time as each municipality tried to deal with its own needs. These variations from one municipality to the next made it very difficult for designers, product manufacturers and contractors to conduct business in more than one region. It was also very difficult for national programs supporting housing and other construction work to be implemented. Thus, in 1937, the federal Department of Finance asked the National Research Council (NRC) to develop a model building regulation that could be adopted by all municipalities in Canada. The result of that initiative was the publication of the first edition of the National Building Code of Canada in 1941.

The post-war construction boom fuelled the demand for a revised NBC, particularly one that did not require houses and small buildings to be designed by architects and engineers. To respond to the needs of an industry that was rapidly expanding, NRC established the Division of Building Research (DBR) which became the Institute for Research in Construction (IRC) in 1986. One of DBR's original mandates was to provide research support for the NBC. Then in 1948, NRC created the Associate Committee on the National Building Code whose mandate was to update and maintain the NBC on an ongoing basis and to provide for broad input. The Associate Committee revised the NBC in 1953 and has subsequently published new versions about every five years. The National Building Code of Canada 1995 is the 11th edition.

In 1956, NRC created the Associate Committee on the National Fire Code which produced the first edition of the National Fire Code in 1963.

In October 1991, the two Associate Committees were replaced by the Canadian Commission on Building and Fire Codes (CCBFC).

2.2 Recent Changes to the System

A number of economic realities—increasing globalization, free trade, harmonization of standards, demands for better quality and performance, and a major shift from new construction to rehabilitation—created the need to make the codes more dynamic, more responsive, and better able to accommodate innovation. The CCBFC 1995-2000 Strategic Plan addressed this need by identifying opportunities to improve the code development system in several significant ways.

- **Core Codes**

Future editions of the model national codes will only address the issues agreed upon by all provinces and territories. This will facilitate the adoption of the national codes by the provinces and territories, with few or no deletions.

Technical differences among provincial and model national code requirements will be examined with a view to harmonizing as many as possible.

Issues that fall outside the scope of the core codes will be dealt with in separate documents published by that province or territory. If several provinces and territories wish to address the same issue, the CCBFC will consider developing a separate code on that issue. The two model energy codes are examples of such documents.

- **Provincial/Territorial Participation**

The provinces and territories may now examine proposed changes to the codes at every stage of the code development cycle. Their concerns are addressed by the CCBFC so that standing committees do not waste time developing changes that are unacceptable to the authorities having jurisdiction. This reduces the number of amendments that are required before provincial or territorial adoption thus allowing for faster adoption.

- **Joint Public Reviews**

Public reviews are now coordinated such that code users are consulted once rather than at separate national and provincial or territorial consultations. Thus, the input of all code users—even from code users in provinces that have their own codes—is made available to the national process.

- **Improved Policy Input**

The Provincial/Territorial Policy Advisory Committee on Codes (PTPACC) is a new committee made up of senior representatives appointed by provincial and territorial deputy ministers, which was formed to provide policy advice to the CCBFC. Three sub-committees were also created to deal with the administration and enforcement of the building, fire, and plumbing codes.

- **Equitable Sharing of Code Development Costs**

The revenue from code sales is an important source of funding for the production of the model codes. Arrangements are in the process of being put in place so that even provinces that publish and sell their own codes can make equitable contributions to the national code development system.

- **Objective-Based Codes**

The previous editions of the model national building, plumbing and fire codes have equivalency provisions that permit the use of materials, equipment, systems, methods of design or construction procedures not specifically prescribed. When something new is proposed, however, it must be demonstrated that it provides the level of performance required by the codes. The objective-based codes currently under development will provide additional information that will help proponents and regulators determine what minimum performance must be achieved, thereby facilitating the evaluation of new products and construction techniques. Also, proponents and regulators who assess code conformance will have a better common understanding of the compliance issues thanks to the additional information provided.

3.0 Codes and Standards

3.1 Scope and Application of the Model Codes

Building codes in Canada are generally concerned with health, safety, accessibility and the protection of buildings from fire or structural damage. They apply to the construction of new buildings and to the demolition or relocation of existing ones. They also apply when a building's use changes or when it is significantly renovated or altered. Some provincial building codes also address energy conservation.

Fire codes generally apply to buildings and facilities already in use and regulate activities that create fire hazards. They contain requirements regarding the maintenance of fire safety equipment and egress facilities. They also provide direction on the safe use of combustible materials and dangerous goods in both new and existing buildings or facilities. They require fire safety plans in anticipation of emergencies. In sum, fire codes aim to reduce the likelihood of fires, particularly those that may present a hazard to the

community, and to limit the potential damage caused by fires and by the handling and storage of hazardous materials.

In Canada, building and fire codes are developed cooperatively with the goal of achieving compatibility. Generally, when a new building code is adopted, it is not applied retroactively: existing buildings that comply with the code in effect at the time of their construction are therefore not required to be upgraded so that they comply with the new code. Unlike building codes, however, fire codes may contain retroactive requirements that apply to all buildings, regardless of when they were built.

Plumbing codes are concerned with health, safety, and the protection of buildings or facilities from water and sewage damage. They apply to the construction of new buildings and to the demolition or relocation of existing ones. They also apply when a building's use changes or when it is significantly renovated or altered.

Farm building codes address the special nature of the occupancies of non-residential farm buildings. Buildings that do not qualify are required to conform to building codes in all respects.

Model energy codes were designed to complement the building codes. They set out minimum requirements for energy efficiency that may be adopted in whole or in part into provincial or territorial legislation and codes or, alternatively, that may be used as guidelines for the construction of energy-efficient new buildings.

3.2 Differences Between a Code and a Standard

Canadian model codes and standards are developed through similar consensus-based committee processes and extensive public review. There is no precise and universally recognized definition of the differences between a code and a standard.

Generally, a code—

- is broad in scope, i.e. it covers a wide range of issues, and
- is intended to be given the force of law through adoption by a provincial, territorial or municipal authority.

In the construction context, generally a standard—

- is narrow in scope, i.e. it covers a limited range of issues, and
- is intended to be given the force of law by being referenced in a code adopted by a provincial, territorial or municipal authority.

Some standards do not become legal requirements but are simply used by a specific industry or trade as the recognized articulation of “good practice.”

A code will often reference several standards, thus giving them the force of law in jurisdictions where that code is adopted. For example, the National Building Code references more than 200 standards.

A standard may also reference a code, but seldom more than one.

3.3 Standards Development Organizations

Standards development organizations are major contributors to construction regulation in Canada. Hundreds of standards are used by the construction industry. The NBC references almost 200 documents directly (and many more indirectly) that are largely prepared by Canadian standards development organizations accredited by the Standards Council of Canada, such as

- the Canadian General Standards Board (CGSB),

- the Canadian Standards Association (CSA),
- Underwriters Laboratories of Canada (ULC), and
- the Bureau de normalisation du Québec (BNQ).

Standards from American organizations, such as the American Society for Testing and Materials and the National Fire Protection Association, are also referenced. Canadian codes may also reference “other recognized documents,” or ORDs, which are transitional documents used by industry and certifying bodies while standards are being developed.

4.0 Code Development: Roles and Responsibilities

4.1 Role of the Canadian Commission on Building and Fire Codes

The CCBFC is a governing board made up of voting and non-voting members from across Canada who are appointed by NRC on the recommendation of the CCBFC Chair. Voting members are volunteers who are chosen for their individual interests and expertise.

The CCBFC reports to NRC through the Institute for Research in Construction’s Advisory Board and receives policy direction from the Provincial/Territorial Policy Advisory Committee on Codes (PTPACC), which is made up of senior representatives from provincial and territorial ministries responsible for building, plumbing and fire protection regulations.

The CCBFC develops six of Canada’s model codes through a committee-based process. It formally approves all model code documents and technical revisions prior to publication by NRC. The CCBFC oversees the work of the following committees (see Figure 1 at the end of the document):

- Standing Committee on Houses
- Standing Committee on Building and Plumbing Services
- Standing Committee on Environmental Separation
- Standing Committee on Fire Safety and Occupancy
- Standing Committee on Hazardous Materials and Activities
- Standing Committee on Energy Conservation in New Buildings
- Standing Committee on Structural Design
- Canadian National Committee on Earthquake Engineering (This is a special advisory committee to the SC on Structural Design)
- CCBFC French Technical Verification Committee

4.2 Role of the Standing Committees

Each CCBFC standing committee is responsible for a code or sections of a code and related documents, such as user’s guides. Members are appointed on the recommendation of the CCBFC nominating committee for two- or three-year terms. The membership of each standing committee conforms to a matrix that provides for regulatory, industry, and general interest categories as well as equitable geographical representation. Non-members are welcome to observe the committee meetings or to address the committees on specific agenda items. Meetings are often held outside Ottawa to facilitate regional involvement. Guidelines for visitors attending meetings are available at www.nationalcodes.ca.

The CCBFC may approve the creation of short-term task groups to study specific issues and make recommendations to either itself or the applicable standing committee.

The CCBFC French Technical Verification Committee is responsible for verifying the technical accuracy of the translations of all code documents published in French.

4.3 Role of IRC

IRC is now involved in every aspect of the development of the national codes. The close link with IRC's research groups and its network of partners and collaborators has made the national codes world-class documents.

The essential link between the standing committees and IRC research staff is provided through the Canadian Codes Centre and the research advisors appointed as non-voting members to the standing committees.

When the committees need more information to make informed decisions, studies are performed to provide the missing data. These studies are not only performed by IRC but also by provinces, manufacturing groups and various consortia having similar interests. See www.nrc.ca/irc/ for more information.

4.4 Role of the Canadian Codes Centre

IRC houses the Canadian Codes Centre (CCC). The CCC's technical advisors, who are either architects or engineers, provide technical support to the CCBFC committees and task groups as well as administrative support, including the organization of meetings, the preparation and distribution of agenda packages, and the preparation of minutes.

Technical advisors receive proposed changes, review and evaluate them, and advise the appropriate committees on their implications. They are often required to prepare technical studies or committee papers that provide additional information and background data to the committees to assist them in their decisions. Technical advisors also facilitate access to research resources.

Technical advisors also help building officials, designers, and other code users understand the codes' requirements; however, final interpretation of the codes rests with the authorities having jurisdiction.

Most technical advisors also perform a coordinating function as members of various standards-writing committees.

Despite the involvement of CCC staff in the work of the standing committees, they do not have voting status. It is the volunteer committee members who decide what code changes should be recommended to the CCBFC, which in turn makes the final decisions.

4.5 Role of Other Groups at IRC

The Codes and Evaluation Production and Marketing Group is responsible for the editing, translation, and production of codes and related documents, including some provincial codes.

IRC's Client Services unit is responsible for sales and distribution of the products. More information is available at www.nrc.ca/irc/publications.html.

4.6 Role of the Provinces, Territories and Municipalities

Canada's constitution gives the ten provinces and three territories jurisdiction over construction. Some cities also have this authority through a special relationship with their provincial authority. The provincial governments of Newfoundland and Labrador and Prince Edward Island have not taken up the jurisdiction over construction and allow their major municipalities to make their own decisions regarding codes. To

enact building and fire regulations, the provinces, territories, and municipalities pass legislation that references the relevant model national code or provincial code.

The authorities having jurisdiction are responsible for:

- enforcing regulations and arranging for inspections (these responsibilities are usually delegated to municipalities),
- providing legal interpretations of the codes within their jurisdictions,
- training building, fire, and plumbing officials,
- licensing trades and professions, and
- providing policy guidance to the CCBFC.

In 2001, as part of the improvements to the code development system, the Provincial/Territorial Policy Advisory Committee on Codes (PTPACC) was formed to provide policy advice to the CCBFC. Three PTPACC sub-committees were also set up to deal with each code individually.

5.0 Process for Developing National Code Documents

Codes are continuously evolving to accommodate new technologies, materials, construction practices, research, social policy, and the changing needs of Canadian society. Globalization and free trade, for example, have led to the harmonization of some North American standards. Code changes to reference new or updated standards are the result.

Development of code content is a consensus-based process that relies on the voluntary contributions of standing committee and task group members, and the public. A common process—from the initial proposing and consideration of proposed changes to the publication of approved changes—is followed for all codes. An important feature of the code development and maintenance process is the extent of public involvement. Canada’s code-writing process has one of the most extensive public review procedures in the world.

5.1 Proposed Changes

1. Submission

Code change requests can be submitted to the Canadian Codes Centre by regulatory officials, design and safety professionals, manufacturers and suppliers, contractors, building managers or owners, consumers, and other public and private sector stakeholders—in fact, by anyone with an interest in the codes. CCBFC standing committee members and Canadian Codes Centre staff may also propose changes.

2. Review

Each proposed change is reviewed by the appropriate standing committee. If the proposed change is complex and requires significant analysis, a task group may be established to study it and make recommendations. When a change has implications for a part of a code that is the responsibility of another committee, both committees review the change. For example, a proposed change to NBC Part 9, Housing and Small Buildings, may also need to be reviewed by the committees responsible for Parts 3, 4, 5 or 6, and may also lead to a corresponding change in one of those parts.

A standing committee may reject a proposal, amend the wording, defer it pending receipt of more information or research, or approve the proposed change.

The provinces and territories also have the opportunity to review submissions and draft proposed changes. If any of them has serious concerns about the inclusion of a certain requirement for policy or other reasons, the proposed change can be withdrawn prior to consideration by a standing committee or prior to public review.

3. Public Review

All proposed changes approved by the standing committees are made available for public review for three months. This allows those most affected by a proposed change to provide feedback and increases the range of expertise available on any subject. For example, during the review period prior to publication of the 1995 codes, over 15,000 people requested documents explaining the proposed changes and 900 persons submitted more than 4,000 comments. The availability of the public review documents is announced in *Construction Innovation* (IRC'S quarterly newsletter which is posted at www.nrc.ca/irc/newsletter/toc.html), in several trade publications, and on the National Code Documents Web site at www.nationalcodes.ca.

To assist in the understanding of the proposed changes, CCC staff conduct Code Change Forums across Canada. They explain the changes and the rationale for them. As a result, commenters submit more informed, and thus more useful, comments.

Previously, the Canadian Codes Centre and the provinces and territories held separate public reviews. Beginning in 2003, public review and the Code Change Forums are a coordinated effort. To improve access, technical changes are available on-line and comments can be submitted electronically.

4. Post Public Review

Following the public review period, the standing committees review the submitted comments. About one third of all changes proposed for the 1995 Codes were altered as a result of the comments received during the 1993 public review period, and some were withdrawn. A proposed change moves forward only once all comments have been taken into consideration. The provinces and territories then review the final version of the proposed changes from a policy perspective and identify their concerns before the changes are submitted to the CCBFC.

5. CCBFC Approval

Following review of the proposed changes by the provinces and territories, the recommended changes are submitted to the CCBFC, and then, if approved, they are published in the next edition of the codes.

6. Translation

The approved changes are translated into French. The translation is reviewed by the French Technical Verification Committee to ensure that it accurately reflects the intent of the originating committee and that it is enforceable within the typical legislative framework of the provinces and territories. This committee also ensures editorial accuracy and consistency within the French documents.

6.0 Evaluation of New Technology and Systems

The evaluation of building products, materials, or systems as to their conformance to the codes is a difficult and time-consuming activity. A number of organizations, such as the Canadian Standards Association and Underwriter's Laboratories of Canada, provide full third-party certification for safety-related products or systems for which standards exist. The model national codes do not require such certification, only that the product or system meet certain minimum requirements. Code enforcement officials, however, often rely on certification as evidence that such is the case.

To provide the construction industry with a national evaluation service for innovative materials, products and systems, NRC created the Canadian Construction Materials Centre (CCMC) at the Institute for Research in Construction. This service includes the evaluation of new and innovative products for which no standards exist, and of products for which standards exist but for which no third-party certification program has been established. Most provinces, territories and municipalities use CCMC's evaluation reports as a basis for accepting new products. See www.nrc.ca/ccmc/home_e.shtml for more information.

7.0 Summary

The model national code documents are developed and maintained using a broad-based consensus process. Individuals from all segments of the Canadian construction industry have the opportunity to contribute to the development of the codes, either directly, through committee membership, or indirectly, by submitting or commenting on proposed changes.

The improvements to the code development system for the 21st century are innovative, at the leading edge, and uniquely Canadian. They will minimize disruption to the design and construction industries while responding to the realities and opportunities of the modern global economy.

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Figure 1: Structure of the Canadian Commission on Building and Fire Codes

