



**CCBFC | CCCBPI**

Canadian Commission on Building and Fire Codes

Commission canadienne des codes  
du bâtiment et de prévention des incendies

# **SIGNIFICANT TECHNICAL CHANGES 2020 NATIONAL MODEL CODES**

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# Significant Technical Changes – 2020

## National Model Codes

Nearly 400 technical changes approved by the Canadian Commission on Building and Fire Codes are introduced in the 2020 editions of Canada's National Model Codes. The most significant technical changes are summarized below.

### NATIONAL BUILDING CODE OF CANADA (NBC)

#### Division A

##### Part 1: Compliance

###### *Large farm buildings*

Application provisions are added to allow requirements for large farm buildings to be introduced into the NBC. A new major occupancy classification is also added: Group G, agricultural occupancy.

#### Division B

##### Part 2: Farm Buildings

###### *Large farm buildings*

Technical requirements for large farm buildings are introduced as new Part 2 of Division B. This Part contains Sections focussing on general provisions, fire protection and occupant safety, structural loads and procedures, and heating, ventilating and air-conditioning (HVAC).

##### Part 3: Fire Protection, Occupant Safety and Accessibility

###### *Encapsulated mass timber construction*

A new construction type, encapsulated mass timber construction (EMTC), is introduced, enabling the construction of wood buildings with up to 12 storeys. Mass timber elements are encapsulated (using prescriptive or performance solutions) in order to delay their involvement in a fire, and a number of compensatory measures are implemented.

###### *Mid-rise combustible construction*

To increase design options for mid-rise buildings of combustible construction, the requirement that 25% of the building perimeter be located within 15 m of a street may be reduced to 10% if certain criteria are met.

###### *Residential sprinklers*

The application of NFPA 13D, "Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes," is extended to row houses, allowing more economical and consistent approaches to sprinkler design.

### *Fire alarm systems*

The effectiveness of fire alarm systems is increased by requiring a low-frequency audible signal in sleeping rooms, as well as visible signals in public corridors, washrooms, and at least 10% of the guest suites in hotels and motels.

### *Safety glazing (Parts 3 and 9)*

To reduce the hazard posed by wired glass, safety glazing is required in windows and doors where human impact is possible in assembly occupancies. Safety glazing is also required in shower and bathtub enclosures regulated by Parts 3 and 9.

### *Accessibility*

The accessibility of buildings is improved by revising the minimum dimensions of building elements to accommodate persons using various types of mobility devices and by increasing the visibility, detectability and ease of use of building elements by persons with reduced dexterity, vision or hearing. Requirements are introduced for universal washrooms and shower rooms, for visible and audible feedback signals, and for tactile safety signage. More pedestrian entrances and floor levels are required to be accessible.

## Part 4: Structural Design

### *Earthquake design*

Site coefficients are replaced by site designations, which allow uniform hazard spectra and amplified hazard curves to be determined directly from average shear wave velocity. Log-log interpolation is added as an option for determining seismic hazard values at intermediate time periods. Seismic categories are introduced to represent the expected magnitude of inertial seismic force in a more realistic manner.

### *Earthquake load and effects*

A definition of sloped column irregularity is introduced, and requirements for buildings with sloped columns are added. Requirements for buildings with large gravity-induced lateral demand are revised. The definition of vertical stiffness irregularity and the method of analysis permitted for buildings with this irregularity are revised, as are the related system restrictions for post-disaster buildings. System restrictions are introduced for High Importance Category buildings, which are likely to be used as post-disaster shelters, to improve their seismic performance. Additional performance requirements are added for post-disaster and High Importance Category buildings to improve their resistance to more frequent but less intense earthquakes.

### *Seismic force resisting systems*

Two new types of steel seismic force resisting systems (SFRSs) are introduced. Two new types of SFRSs with cross-laminated timber shear walls (platform-type construction) are also introduced.

### *Solar panels*

Procedures based on guidance from the Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B) are introduced for the determination of wind loads on roof-mounted solar panels to ensure that these additional wind loads are accounted for in the design of the building structure. Procedures are also introduced for the determination of snow loads on roofs with solar panels, as the installation of solar panels affects the quantity and distribution of snow on the roof.

### *Canopies and parapets*

Procedures are introduced for the determination of wind loads on canopies attached to low buildings, on parapets, and on balcony guards near the roof to ensure that these additional loads are accounted for in the design of the building structure.

### *Serviceability*

Guidance from the Structural Commentaries (User's Guide – NBC 2015: Part 4 of Division B) on serviceability loading criteria is revised and moved into the NBC to ensure that appropriate load combinations are used for serviceability limit state design.

## Part 5: Environmental Separation

### *Material standards*

New material standards applicable to environmental separators and assemblies exposed to the exterior are added: CAN/CSA-A123.16, "Asphalt-coated glass-base sheets," ASTM C1280, "Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing," CAN/CGSB-12.9, "Spandrel glass," and CAN/ULC-S717.1:2017, "Standard for Flat Wall Insulating Concrete Form (ICF) Units – Material Properties."

### *Air leakage*

Air leakage requirements are revised to establish performance classes for air barrier assemblies and to provide a standardized method of testing both proprietary and generic assemblies.

## Part 6: Heating, Ventilating and Air-conditioning

### *Legionella*

Requirements for evaporative equipment and drain pans are revised to minimize the growth and transmission of Legionella and other bacteria.

## Part 9: Housing and Small Buildings

### *Protection of windows*

To minimize the risk of falls through windows, requirements for the protection of openable windows in residential occupancies are strengthened by removing exemptions related to dwelling type and window opening size, increasing the minimum sill height for unprotected windows, and prescribing more reliable control mechanisms.

### *Home-type care occupancy*

Provisions for a new home-type care occupancy (Group B, Division 4) are introduced to allow safe and affordable care in a home-type setting.

### *Flat insulating concrete form (ICF) construction*

The use of flat ICF construction is expanded to all types of Part 9 buildings with up to 2 storeys. Lateral support of flat ICF foundation walls is clarified. Screw sizes and spacings are specified for the attachment of cladding to the web fastening strips of ICF units.

## Section 9.36.: Energy Efficiency

### *Tiered energy performance compliance*

A performance compliance path is established with 5 tiers, each successive tier being increasingly stringent in terms of house energy consumption and heat loss. In addition, a prescriptive compliance path based on energy conservation points is provided for Tier 2.

### *HVAC and service water heating*

Performance requirements for HVAC and service water heating equipment are updated to align them with Canada's Energy Efficiency Regulations and relevant standards, and to add new equipment types.

### *EnerGuide Rating System*

NBC Subsection 9.36.5. is aligned with the EnerGuide Rating System, and this system is established as an acceptable compliance path.

## Appendix C: Climatic and Seismic Information

### *Climatic data*

The wind data in Table C-2, Climatic Design Data for Selected Locations in Canada, are updated based on the latest observed data to ensure that recent climate trends are reflected.

### *Seismic data*

The seismic data in Table C-3, Seismic Design Data for Selected Locations in Canada for Part 9 Design, are limited to use in the application of prescriptive requirements in Part 9. Seismic hazard values for design under Part 4 are updated and, for 679 locations in Canada, relocated to the NRC Publications Archive. The values for these locations can also be obtained from the [2020 National Building Code of Canada Seismic Hazard Tool](#), which provides seismic hazard values for any site in Canada. In general, seismic hazard values for design under Part 4 have increased across Canada.

## NATIONAL PLUMBING CODE OF CANADA (NPC)

### Water temperature control

The maximum temperature for water discharging from shower heads or into bathtubs is reduced in healthcare facilities and seniors' residences to prevent scalding. The use of a temperature-limiting device or an automatic compensating valve to control discharge water temperature is extended to all types of shower heads, as well as bathtubs.

### Materials and equipment

Fibrocement pipe and fittings are introduced as acceptable solutions to replace asbestos-cement pipe and fittings, which were removed from the NPC 2015 as an interim change. Polyethylene of raised temperature (PE-RT) tube, cellular core polyvinyl chloride (PVC) pipe, and their fittings are also introduced as acceptable solutions; the use of cellular core PVC pipe is limited to residential buildings containing 1 or 2 dwellings and row houses with up to 3 storeys. The prohibition on the use of copper tube is extended to all urinals. The list of standards to which back-siphonage and backflow preventers must conform is expanded.

### Drainage systems

The criterion for determining the minimum pipe size and the hydraulic load for shower drains is changed to the volume of discharge from all shower heads and body sprays. Gate valves and screw caps, which require manual intervention, are removed as options for backflow protection to reduce the risk of basement flooding.

### Rainwater harvesting systems

Requirements are introduced for non-potable rainwater harvesting systems to ensure that they are designed, fabricated and installed in accordance with good engineering practice.

### Non-potable water systems

Requirements for non-potable water systems are revised to ensure that these systems are safely connected to potable water systems and that their piping and outlets are properly identified. Requirements for service connections are updated to allow wastewater and rainwater to be diverted to non-potable water systems. The use of non-potable water systems to supply fixtures (water closets and urinals) in healthcare facilities is prohibited to reduce the potential for exposure to chemicals or pathogenic micro-organisms.

## NATIONAL FIRE CODE OF CANADA (NFC)

### Fire safety plans

Fire safety plan requirements are consolidated in Section 2.8. of Division B to facilitate compliance and enforcement. A requirement for a fire safety plan is introduced for areas where treatment (e.g., day surgery) is provided in business and personal services occupancies to ensure that appropriate fire emergency procedures are in place for patients who may be unable to self-evacuate. Assembly occupancies with an occupant load of 30 or less are exempted from having a fire safety plan, except for schools, colleges, universities, daycare facilities, licensed beverage establishments, and licensed restaurants.

### Large farm buildings

Technical requirements for large farm buildings are introduced, which address the inspection of mechanical equipment and electrical systems, the control of flammable gases and vapours, and the storage of flammable or combustible liquids.

### Fire warning systems

A requirement is added for the inspection, testing and maintenance of residential fire warning systems in accordance with CAN/ULC-S540, "Standard for Residential Fire and Life Safety Warning Systems: Installation, Inspection, Testing and Maintenance."

### Water-miscible liquid mixtures

Classifications are established for 5 widely used water-miscible liquid mixtures (mixtures of methanol, ethanol, 2-propanol, acetone, or acetic acid with water) to ensure that appropriate fire safety measures are applied in their storage, handling, use and processing.

### Encapsulated mass timber construction

Measures are included to address fire safety during the construction of encapsulated mass timber buildings.



## NATIONAL ENERGY CODE OF CANADA FOR BUILDINGS (NECB)

### Application

The application of the NECB is extended to cover alterations, such as tenant improvements, to buildings originally constructed in accordance with the Code.

### Building envelope

Whole-building airtightness testing is introduced as an option for complying with air leakage requirements. Maximum overall thermal transmittance values for opaque building assemblies and fenestration are reduced to improve the thermal performance of the building envelope.

### Lighting

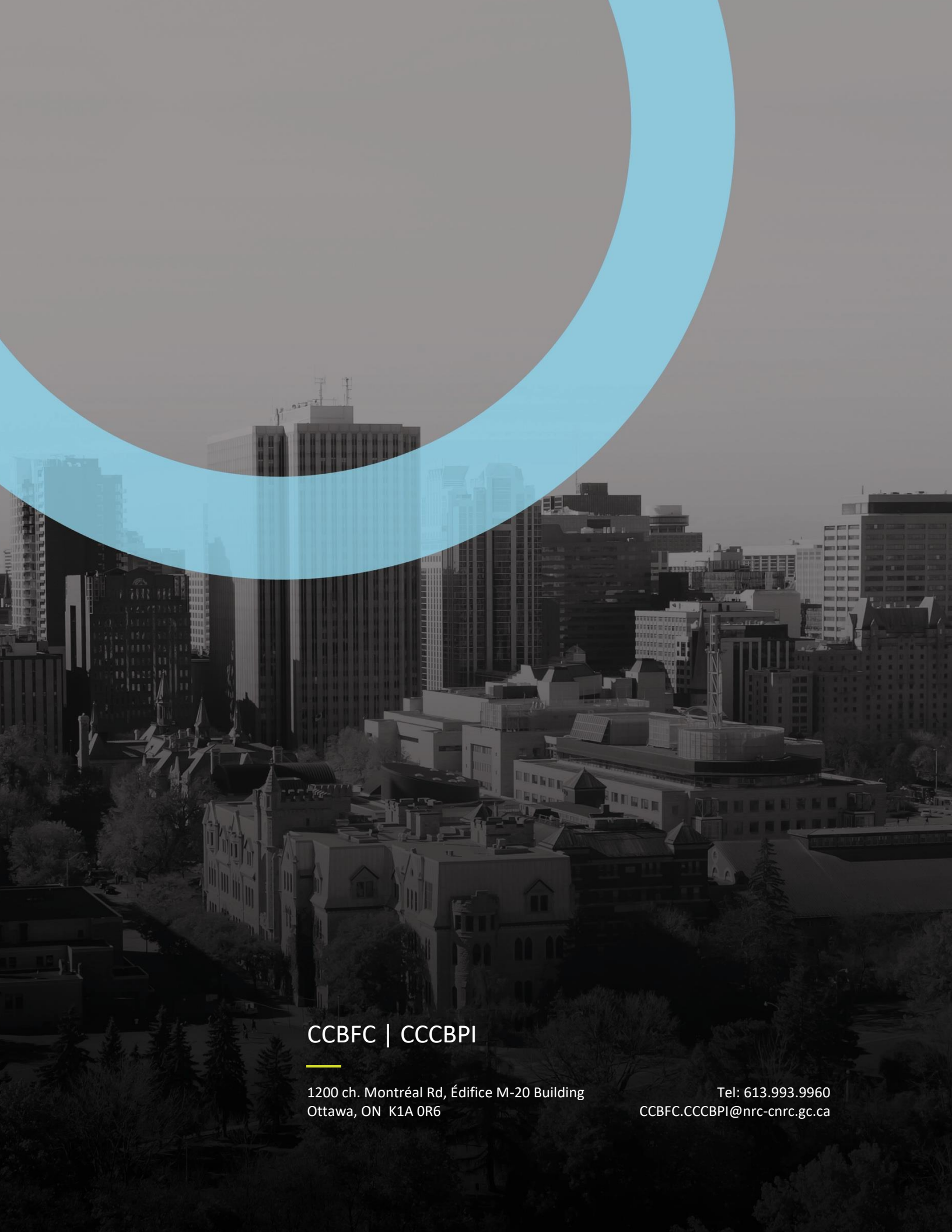
Lighting power densities are updated to reflect improvements in the efficacy of lighting products available in the North American market. Lighting power allowances are provided for use in additional exterior applications, including applications not listed in the Code.

### HVAC and service water systems

The trade-off compliance paths for HVAC and service water systems, which were complex and not widely used, are removed. Performance requirements for HVAC and service water heating equipment are updated to align them with Canada's Energy Efficiency Regulations and relevant standards, and to add new equipment types.

### Tiered energy performance compliance

New Part 10 is introduced to establish a performance compliance path with 4 tiers, each successive tier being increasingly stringent in terms of building energy consumption.



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