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2010 National Model Construction Codes

Building magazine

by Jim Gallagher

This article summarizes key changes to the 2010 National Model Construction Codes, with emphasis on the National Building Code.

The 2010 editions of the National Model Construction Codes were published recently by the National Research Council's Institute for Research in Construction (NRC-IRC). These model codes – the National Building Code of Canada (NBC), the National Fire Code of Canada (NFC) and the National Plumbing Code of Canada (NPC) – are adopted or form the basis for building codes in most of the provinces and territories.

This article summarizes some of the key changes contained in these new editions, with primary emphasis on the NBC. The changes discussed pertain to both small and large buildings but exclude houses.

Although the national model construction codes apply to new construction, it is important for property managers to be aware of new or revised code requirements because they may apply in cases where an owner wishes to rehabilitate a building, change its use or build an addition, or when an enforcement authority decrees changes in the interest of public safety.

NATIONAL BUILDING CODE

Structural Safety

Changes have been made to live loads due to use and occupancy in Part 4, Structural Design. Crane and vehicle loads are more explicitly defined. The minimum live loads for areas in arenas, grandstands and stadia having fixed seats with backs have been reduced and the requirement extended to include churches, lecture halls and theatres.

For wind loads, buildings with very long periods of vibration must now be designed by means of experimental methods. For design to resist the effect of earthquakes, revisions were made to requirements related to site properties, irregularities, steel structures, static and dynamic procedures, and diaphragms.

To address concerns that modern construction practices of large rooms and window openings for Part 9 buildings have reduced structural rigidity, a three-level risk method has been introduced to ensure buildings are resistant to high-wind and earthquake risks. The concept of braced wall panels was introduced for areas with low and moderate exposure to earthquake and high-wind risk. Small buildings in areas of extreme exposure require professional design.

In Part 5, seismic effects will now be taken into account only for post-disaster buildings (i.e., buildings essential to the continued provision of services in the event of a disaster).

Building Envelope

A new, harmonized North American standard for windows, doors and skylights is now referenced in Parts 3 and 9. This has resulted in a substantial reorganization of Sections 9.6. and 9.7. With this standard, there is now a new procedure for specifying windows, doors and skylights, as the previous rating system

has been replaced with actual design load and pressure ratings. Performance grades for windows, doors, and skylights will now need to be selected according to a Canadian Supplement to the harmonized standard.

Outdated standards for sealants were replaced with current ASTM standards that address relevant product categories and contain equivalent or similar performance criteria. This improvement reflects changes in technology, materials and design, and replaces standards that were out of date.

An approach was introduced to simplify positioning and properties for low air and vapour permeance materials in building envelopes for Part 9 buildings.

Climatic data and localities were updated and the equation derived to fit the seismic observational data was improved. Climatic tables pertaining to wind, rain and temperature were updated using recent data from Environment Canada (snow load data will be updated in the 2015 code). Refinements in data used for seismic design have also been incorporated.

Fire and Occupant Safety

Measures have been introduced in the NBC to ensure the spatial separation between buildings provides reasonable protection against fire spread from one building to another. These affect the construction of building walls and soffits in proximity to one another or to the property line.

New requirements and clarifications were introduced for smoke alarm placement, commissioning of life safety and fire safety systems, and when fire alarm components must be installed.

Definitions for “fire stops” and “fire blocks” have been added, as were several changes addressing penetrations through fire separations. Requirements for attics that are unsprinklered were clarified.

Beginning with the 2010 NBC, exit signs for Canadian buildings will be shifting to green pictograms conforming to ISO standards. These signs are language-independent and are internationally recognized.

A provision has been added to Part 3 to protect against falls from windows in residential occupancies. Windows higher than 380 mm must be protected by either a guard or a by mechanisms that prevent them from opening more than 100 mm.

Several adjustments were made to correct inconsistencies between Part 3 and Part 9 requirements for stairs, ramps, handrails and guards. Many clarifications were also added.

Air Quality

Because air brought in from outside is not always fresh, a new requirement in Part 6 stipulates that intake air must be cleaned if atmospheric pollution measurements indicate that levels of particulate matter, ground-level ozone and carbon monoxide in the vicinity of an air intake exceed code-stipulated maximums.

The new Health Canada guideline of 200 Bq/m³ for indoor radon concentration has been referenced in the Appendix. Parts 5 and 6 now require that engineers and designers consider radon protection in all buildings that are occupied more than four hours a day.

NATIONAL FIRE CODE

Changes dealing with the leak detection and monitoring of flammable materials, as well as the handling of certain dangerous goods, have been introduced in the National Fire Code. Existing requirements for the detection and monitoring of storage tanks, sumps, and piping systems containing flammable and combustible liquids were revised and new ones added.

The NFC now requires that adjacent buildings or facilities must be protected from fires originating from demolition or construction sites. Requirements for fire safety plans and fire department access to sites were improved. Specific requirements on the commissioning and decommissioning of standpipe systems, as well as restrictions on rooftop bitumen kettle placement, have been added.

Other key changes in the NFC deal with aggregate capacity of above-ground storage tanks at fuel-dispensing stations. Storage tank construction requirements and limits to quantities of flammable and combustible liquids stored within buildings have also been updated.

To draw a clear line between the roles of the NFC and the NBC, building design requirements in the NFC were moved to the NBC (except for spill control measures and where conflicts with current NBC provisions were identified). Appropriate cross-referencing between the two codes was added.

NATIONAL PLUMBING CODE

Water pipe sizing requirements have been updated in the National Plumbing Code to accommodate the current standard practice of using water-conserving appliances and fixtures in buildings and facilities.

Purchasing the New Codes

Printed versions of the new codes are available in both binder and soft-cover formats. Electronic versions are available as downloadable PDF documents, replacing the CD-ROM versions. On-line subscriptions are also offered.

The codes can be purchased from NRC-IRC by telephone, regular mail or the virtual store: www.nrc.gc.ca/virtualstore

Beginning in late February, NRC-IRC will provide online presentations reviewing key code changes on the Web site (www.nationalcodes.ca).

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