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Technical Changes in the 2005 National Building Code

By Jim Gallagher and John Burrows

This is the third in a series of articles on the National Construction Codes, new versions of which will be published in September. This article is intended to inform readers about some of the important technical changes to the National Building Code.

In the March/April issue of On Site we reviewed the new approach being taken with the 2005 versions of the three national construction codes. These codes – the National Building Code, the National Fire Code and the National Plumbing Code – will be published in an objective-based format, which will help you and your clients evaluate alternative solutions should you wish to propose them.

The new codes will, of course, contain many technical changes as well, as all new editions of codes do. These changes reflect the many technological advances that have occurred and the health and safety concerns that have been expressed since the 1995 editions. The changes also reflect a need for the codes to harmonize with trends in international codes and standards, and to clarify and simplify the content for the benefit of you, the user. This article summarizes some of the key changes that will appear in the National Building Code. These changes will affect designers, contractors and builders to varying degrees.

Part 3: Fire Protection, Occupant Safety and Accessibility

Noncombustible materials: Changes have been made to allow the use of materials of limited combustibility based on specific criteria. This change was made because the noncombustibility requirement excludes materials that pose a low risk but have other desirable properties. This change will allow various products, such as washable interior finishes, to be used in buildings in which they were not previously permitted.

Firewalls: The requirement for masonry or concrete to be used for the construction of 2-hour firewalls has been changed from a prescriptive requirement to a more performance-based requirement. This change was made in response to provincial and builder requests and to facilitate construction under adverse climatic conditions.

Mezzanines: A number of changes have been made regarding mezzanines including the calculation of building area, fire-resistance rating and exit travel distance. These changes will facilitate plan review and design, and reduce the number of technical inquiries that are submitted.

Nonmetallic raceways: This change will allow larger-sized non-metallic conduits within a fire compartment (without penetrating a fire separation). In some cases, there will be a cost benefit in permitting a wider choice of code-complying materials.

Part 4: Structural Design

Live loads: Snow load is no longer considered to be a live load. This will allow a more rational treatment of the load combinations because the full design snow load will not have to be taken into account in combination with the full design live load derived from the use and occupancy.

Importance categories: A table of importance categories and environmental loads based on building use and occupancy has been established to determine the degree of functionality required in the event of a natural catastrophe or emergency situation.

Earthquake design: The earthquake acceleration values have been adjusted to provide a more geographically accurate calculation of the earthquake effects on structures. Eight categories of structural irregularities have been defined to better categorize buildings for earthquake design. Dynamic analysis has been established as the default analysis method for earthquake design. (The use of the equivalent static force procedure is allowed if certain criteria are met.) Requirements have been added for the interconnection of deep foundation units and spread footings, the magnitude of the tying force, and the transfer of earthquake loads between the superstructure and substructure.

Part 5: Environmental Separation

Air leakage and vapour diffusion: Information has been added to clarify the treatment of air leakage, vapour diffusion, precipitation ingress, and ingress of moisture from the ground. The requirements for controlling air leakage and vapour diffusion have been amended to present the basic requirements in more performance-based terms and to recognize the role of venting to achieve the intents of the requirements.

Heat transfer and ice damming: Changes to the heat transfer control requirements acknowledge that providing means to dissipate heat can be as important in some instances as providing means to control heat transfer (e.g., in reducing the likelihood of ice damming).

Part 6: Heating, Ventilating and Air Conditioning

Ventilation: Wording has been revised to clarify the types of spaces that do not require ventilation. In addition, revisions have been made to permit natural ventilation where climatic conditions make it feasible and where suitable substantiating information is provided to the authority having jurisdiction.

Carbon monoxide alarms: Carbon monoxide alarms are to be required in buildings that contain a residential occupancy and a fuel-burning appliance or a storage garage.

Part 9: Housing and Small Buildings

Application of Part 4 versus Part 9 structural requirements: Changes have been made to clarify when Part 9 applies, when Part 9 loads can be used for design under Part 4, and when the design must be done under Part 4.

Simplified snow load calculation: A change has been made to extend the simplified approach to structures made of any material (previously it applied only to wood-frame construction) where the structure has a high degree of redundancy created by the closely spaced, repetitive members of frame construction, where the total roof area does not exceed that for Part 9 buildings (regardless of firewalls), and where there are no obstructions on the roof that would contribute to significant snow accumulation.

Support of decks: Several changes clarify the requirements for foundations and lateral bracing for decks, and identify exceptions and alternative solutions to existing requirements.

Insulated concrete form (ICF) walls: Detailed prescriptive requirements for engineered insulated concrete form walls for small houses have been added and apply to both foundations and above-ground walls. Other changes will permit higher masonry foundation walls for a given thickness if the masonry incorporates reinforcing.

Keeping the rain out: A new climatic indicator, the moisture index, has been added to identify high moisture load regions. The indicator is a single number that reflects both the amount of rainfall that a location receives and the duration of drying periods. Two planes of protection are required to provide protection from precipitation – the first is the cladding and the second is the sheathing membrane and flashing, with or without a drained and vented air space. All residential buildings will be required to be constructed with two planes of protection (no face-sealed cladding). In high moisture load regions, the two planes of protection will need to be separated by a capillary break.

The Canadian Codes Centre of the National Research Council's Institute for Research in Construction (IRC) works with industry and the provinces and territories to advance Canada's codes and regulatory system. Further details on the 2005 codes are available at <http://www.nationalcodes.ca>.

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