Welcome to the 2nd edition of Codes Quarterly – your one-stop shop for Block-related summary updates on all things Codes, Standards, and Research.

In the 1st edition of Codes Quarterly, among other items, we shared an update and answered some FAQs regarding the Federal building code to Provincial building code harmonization happening in Canada.

(Missed the 1st edition? Check it out here >>> https://ccmpa.ca/2022/04/codes-quarterly-q1-2022/)

Now we continue our update journey in Canada's building codes. This issue? The recently released National Building Code of Canada: 2020 and its notable changes in the area of Seismic Design across Canada and its potential impacts for concrete masonry design and CCMPA members.

National Building Code of Canada 2020

The latest update of the Canada's NBC, 2020, was released at the end of March.

According to the National Research Council of Canada,

> *The National Building Code of Canada (NBC) 2020, developed by the Canadian Commission on Building and Fire Codes and published by the National Research Council of Canada, sets out technical requirements for the design and construction of new buildings, as well as the alteration, change of use and demolition of existing buildings.*
>
> *Over 280 technical changes have been incorporated in this new edition, improving the level of safety, health, accessibility, fire and structural protection, and energy efficiency provided by the Code, and expanding the NBC into new areas.*

A summary of what NRC considers the significant changes to this edition: https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada/codes-canada-publications/national-building-code-canada-2020

New for this release – for the first time, Canadians may access a FREE version of the NBC 2020 – available for download here: https://nrc-publications.canada.ca/eng/view/ft/?id=515340b5-f4e0-4798-be69-692e4ec423e8

We strongly recommend you bookmark this link and make note of some of the most common concrete block properties that architects are looking for:

Relevant Guide to the PDF for Common Block Properties

Commonly needed Block Property	Where to find it
Fire Ratings of Block Walls	Page 696 of the PDF (Table D-2.1.1)
Fire Protection for Steel Columns	Page 710 of the PDF (Table D-2.6.1.-A)
Part 9 Residential Block Foundation Wall Reinforcement	Page 915 of the PDF (Table 9.15.4.2.-B)
Fire and Sound Resistance Tables for Block Wall Configurations	Page 1228-1231 of the PDF (Table 9.10.3.1.-A)
Thermal Resistance Tables for Block	Page 1447-1448 of the PDF (Table A-9.36.2.4.(1)-D)

NBC 2020, Seismic Design changes & Concrete Masonry

Design for earthquakes is not limited to places like Vancouver, and NBC 2020 is more stringent for this than ever. Although earthquake loads may not "govern," the seismic zone a building is in can force designers to meet certain prescriptive requirements by limiting wall heights, adding more reinforcement, etc.

The biggest impacts for block are going to be in partition walls and for loadbearing walls above grade.

Consider the impacts for 20 cm concrete block in a normal mid-to-high rise residential/commercial structure ("Stiff Soil" conditions assumed).

Let's look at a few key cities and see what, if anything, is changing from 2015 to 2020:

City	2015 Partition Wall Notes Using Unreinforced Masonry	2020 Partition Wall Notes Using Unreinforced Masonry	Increase in Seismic Load from 2015 to 2020 on Shear Walls
Toronto (Liberty Village)	Up to 5.7m in height, but governed by wind	Light weight units and only up to 3.0 m	+34.5%
Mississauga (CMDC)	"	No Impact Expected	+40.4%
Ottawa (Old Ottawa South)	Light weight units and only up to 3.0 m	No Impact Expected	+36.2%
Montreal (Le Westin)	"	Partitions must be reinforced in both directions	+35.6%
Dartmouth (CMDC Office)	Up to 5.7m in height, but governed by wind	No Impact Expected	+83.6%
Moncton (AMI LB Site)	"	No Impact Expected	+68.0%
Winnipeg (MMI Office)	"	No Impact Expected	+48.6%
Saskatoon (CMDC Office)	"	No Impact Expected	+68.6%
Calgary (CMDC Office)	"	No Impact Expected	+30.9%
Vancouver (MIBC Office)	Partitions must be reinforced in both directions	No Impact Expected	+38.0%

Summary of Main Changes:

- Many partition walls are over-designed and reinforced (even though they do not NEED reinforcement, designers often opt for it anyways) and/or they are controlled by wind pressures. Hopefully, then, these seismic changes do not result in many differences in practice as indicated by the table.
- Earthquake loads may not "govern" but when a site is bumped into a new seismic zone (see Toronto above) there may be NEW minimum prescriptive requirements that come into play that were not there before (e.g. the need for reinforced masonry, limited use of smaller unit sizes, the need for lightweight block, etc.). So, look out for changes as offices will have to re-draft their boilerplate specifications.
- Look for new pre-qualification requirements for the types of anchors that can be used for partition walls (e.g. anything that is "post-installed" must now be tested and pre-qualified for cycling loads). This may lead to slight cost increases or jobsite conflicts if untested systems are employed.
- The increase in seismic force to shear walls MAY lead to more reinforcement in walls if new seismic loads govern over wind loads OR if the site is bumped up to a new seismic category

forcing some minimum detailing (e.g. the need for fully-grouted walls, increased reinforcement, the need for bond beams to be added, etc. a common prescriptive requirements).

- There are a lot more NEW design requirements for tall buildings, important buildings (e.g. schools, community centres) and "Post-Disaster" buildings (e.g. hospitals, courthouses, etc.) buried in NBC 2020. As a result, you may start to see more reinforcement, more grouting, and higher block strengths with NBCC 2020 being driven by these provisions.

We hope you have found this snapshot of NBC 2020 and seismic design changes helpful. Please do not hesitate to reach out to us at CCMPA for a more detailed discussion with one of our valuable technical resources. And stay tuned for the next edition of Codes Quarterly via members mail or always available here: https://ccmpa.ca/category/codes-quarterly/.

As always, all technical & industry related questions can be sent to Dr. Block (CCMPA.ca/dr-block/) and will receive a response in 2 business days.

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