

MID-RISE COMBUSTIBLE CONSTRUCTION

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A BUILDING CODE PERSPECTIVE

**PRESENTED ON FEBRUARY 13, 2014 TO:
THE SOCIETY OF FIRE PROTECTION ENGINEERS
NATIONAL CAPITAL REGION CHAPTER**

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www.codenews.ca

Topics

- Ontario's interest in mid-rise combustible construction
- Ontario's code consultations
- Fire safety during construction
- Ontario's policy dilemma

Ontario's interest in Mid-Rise Combustible Construction

- Design flexibility and affordability
 - Estimated to be 10% lower in cost than concrete or steel
- Supports sustainable design
- Supports City of Toronto “Avenues” development and intensification
 - Supports Growth Plan for the Greater Golden Horseshoe and Provincial Policy Statement objectives
- Supports economic development in Northern Ontario, through increased activity in the forestry sector

Sustainable Design

- Sustainable architecture is the creation of buildings for which only renewable resources are consumed throughout the process of design, construction and operation.
- Sustainability must also include the manufacture and transportation of materials, components and construction equipment.

Source:

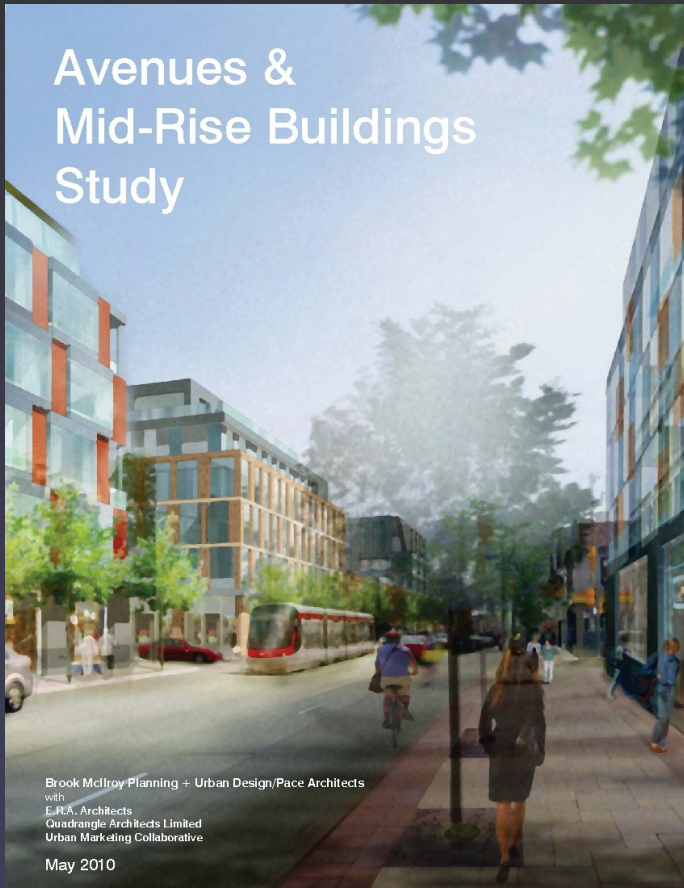
http://www.raic.org/architecture_architects/green_architecture/sustainability_e.htm

Photo: Alek Antoniuk

Carbon Storage and Avoidance Paths

- The use of wood in new construction sequesters carbon stored during growth. (storage pathway)
- Wood-based construction is an alternative to more energy-intensive processes, such as the production of steel, concrete, or aluminum. (avoidance pathway)

Avenues and Mid-Rise Buildings Study



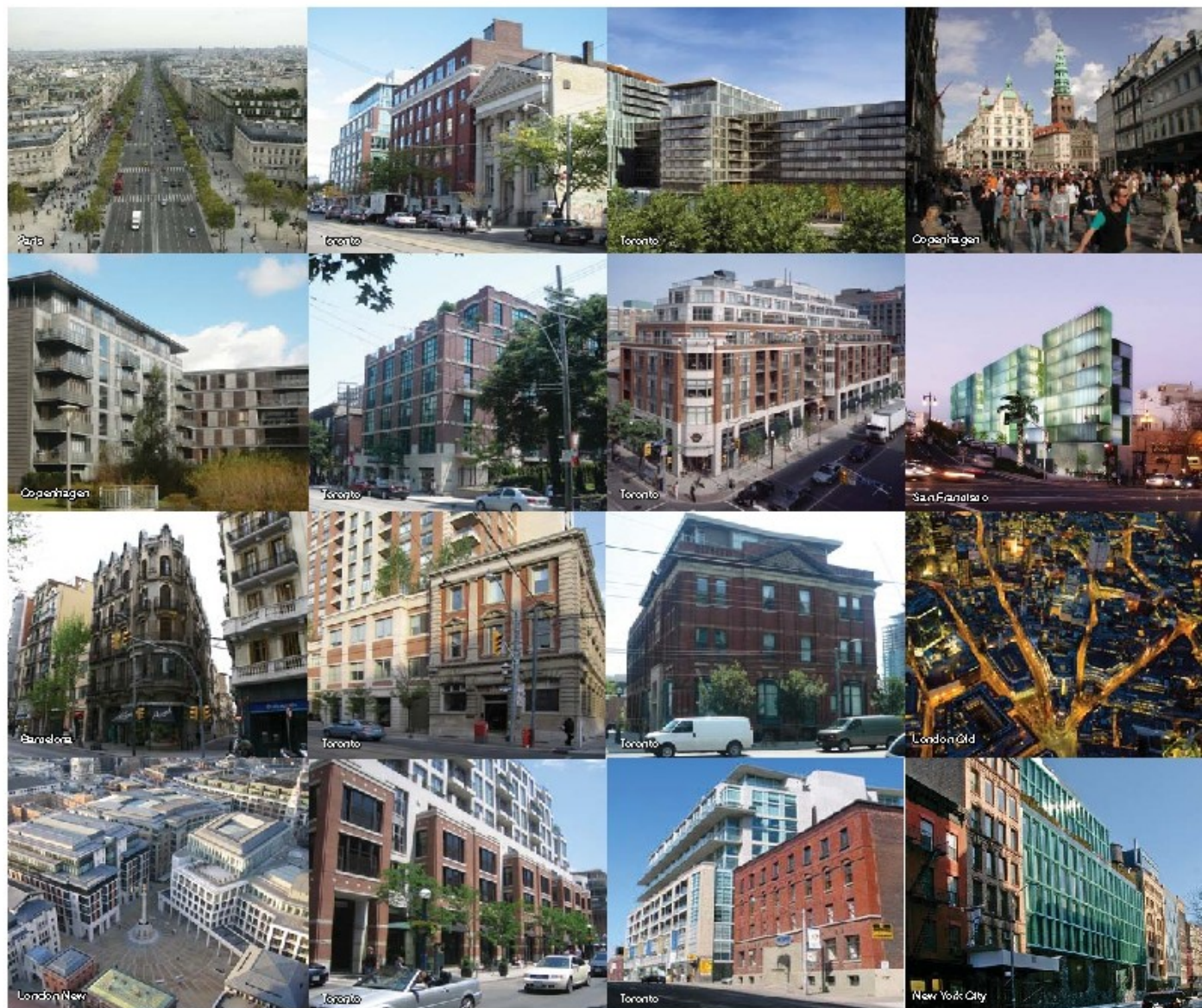
- The City of Toronto is forecast to have approximately 3.08 million residents by 2031 – (growth of approximately 500,000)
- The City's Official Plan encourages a significant portion of this growth to be directed towards intensification areas, one of which is the "Avenues".

Avenues and Mid-Rise Buildings Study

- An important component of the Avenues and Mid-Rise Buildings Study was to understand the role that mid-rise buildings on the Avenues can play in accommodating Toronto's growth.
- The Avenues amount to approximately 324 km. of property frontage.
- About 200 km. of this frontage can theoretically be redeveloped through mid-rise built form.
- Mid-rise redevelopment of the Avenues has the ability to address a significant portion of the City's anticipated growth needs over the next twenty years.

Mid-rise Urbanism is a city form embraced by popular culture. Iconic cities internationally recognized for their beauty, vibrant public realm and quality of life are typically associated with an urban form comprised of mid-rise buildings framing beautiful streets and avenues. These iconic city spaces include the avenues of London, Paris, Amsterdam, Copenhagen, Barcelona, and Milan to name a few.

Where Toronto's Avenues are well-used by local residents, where they have a strong link to local neighbourhoods, where the Avenue plays a significant role in defining the quality and identity of a community – mid-rise buildings are preferred.



Mid-Rise Urbanism

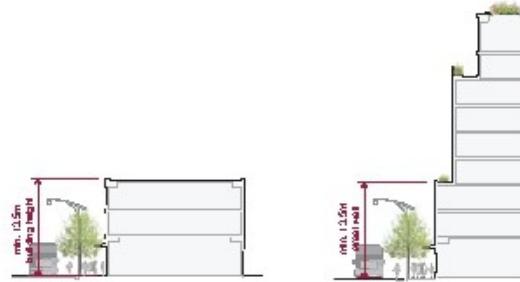
Toronto Avenues & Mid-Rise Buildings Study



Brook McIlroy Planning & Urban Design / Pace Architects
E.R.A. Architects
Quadrangle Architects Limited
Urban Marketing Collaborative

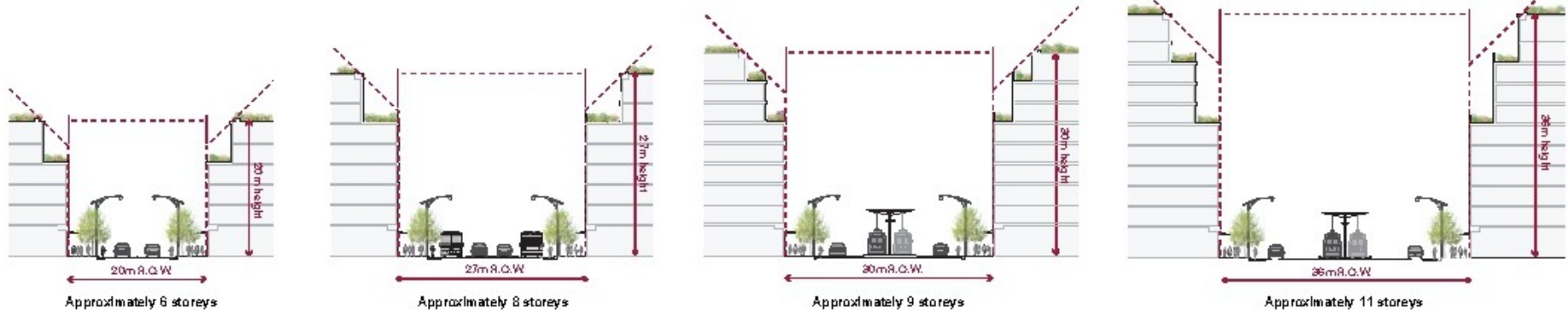
Minimum & Maximum Building Heights

New buildings on the Avenues must achieve a minimum height of 10.5 metres and 3 storeys at the street frontage. For mid-rise buildings taller than 6-storeys, the first step-back should not be below the top of the third storey.



The maximum allowable height of new buildings will be no taller than the width of the adjacent right-of-way (public street and sidewalk), up to a maximum mid-rise height of 36 metres (11 or 12 storeys). The maximum heights may only be achieved:

- If the building complies with all applicable Performance Standards.
- If the property contains sufficient lot depth to accommodate angular plane requirements.

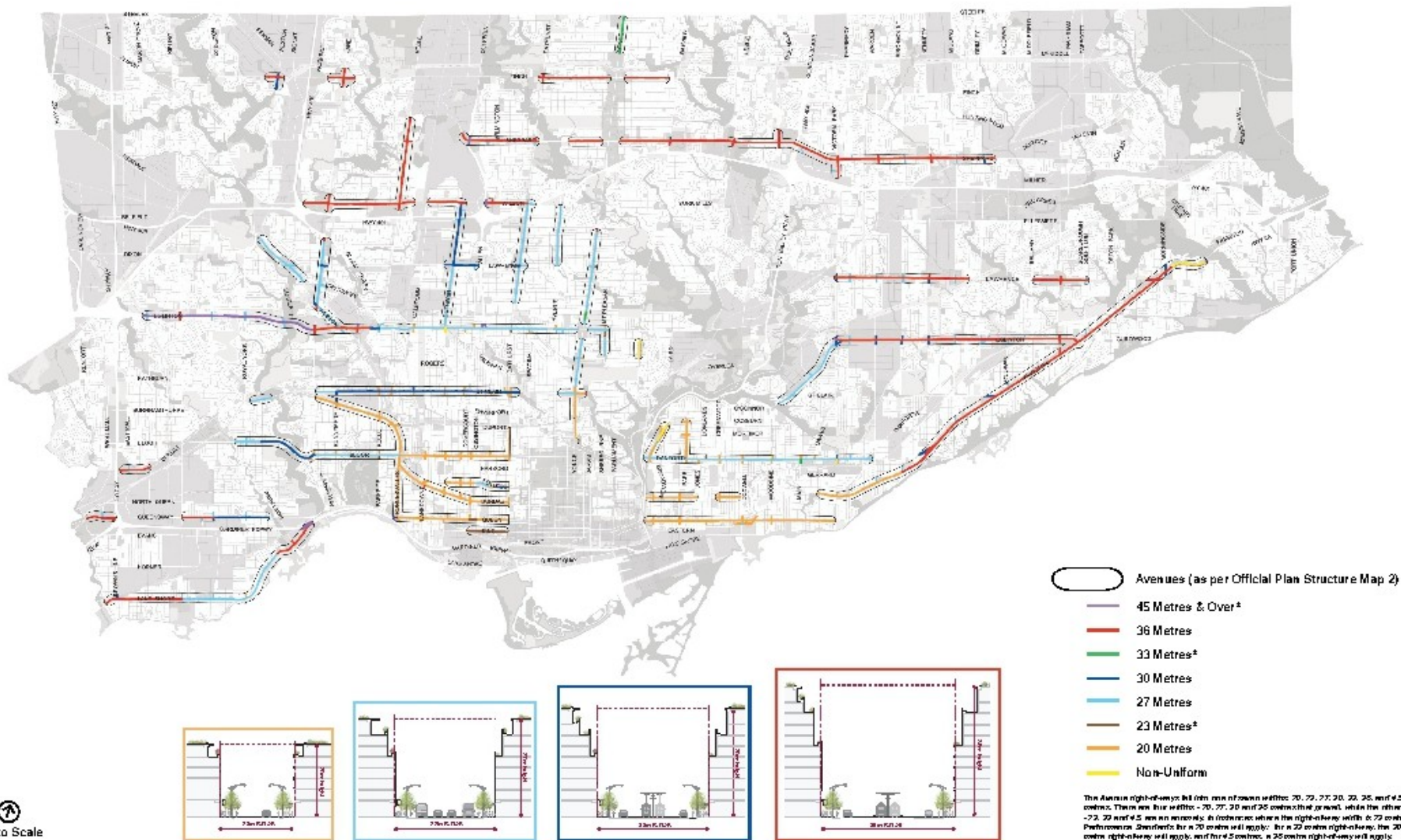


Performance Standards

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Avenues Right-of-Way Widths

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Bill 13

Ontario Forestry Industry Revitalization Act (Height of Wood Frame Buildings), 2013



Victor Fedeli, MPP
Nipissing

Bill 13 Status:

February 27, 2013

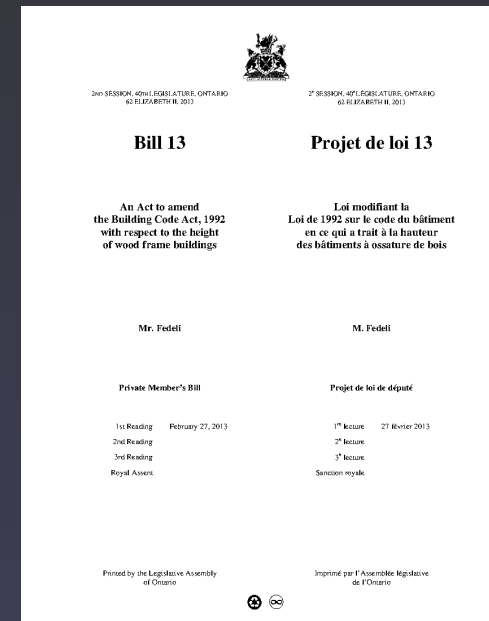
November 07, 2013

November 07, 2013

First Reading - Carried

Second Reading - Carried

Ordered referred to Standing Committee



Economic Development in Northern Ontario

Bill 13

2013

Projet de loi 13

2013

An Act to amend the Building Code Act, 1992 with respect to the height of wood frame buildings

Loi modifiant la Loi de 1992 sur le code du bâtiment en ce qui a trait à la hauteur des bâtiments à ossature de bois

Note: This Act amends the *Building Code Act, 1992*. For the legislative history of the Act, see the Table of Consolidated Public Statutes – Detailed Legislative History at www.e-Laws.gov.on.ca.

Remarque: La présente loi modifie la *Loi de 1992 sur le code du bâtiment*, dont l'historique législatif figure à la page pertinente de l'Historique législatif détaillé des lois d'intérêt public codifiées sur le site www.lois-en-ligne.gouv.on.ca.

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

Sa Majesté, sur l'avis et avec le consentement de l'Assemblée législative de la province de l'Ontario, édicte:

1. The *Building Code Act, 1992* is amended by adding the following section:

1. La *Loi de 1992 sur le code du bâtiment* est modifiée par adjonction de l'article suivant :

WOOD FRAME BUILDINGS

BÂTIMENTS À OSSATURE DE BOIS

Building code restriction, wood frame buildings

Restriction du code du bâtiment : bâtiments à ossature de bois

30.1 (1) The building code shall not prohibit a building that is six storeys or less in building height from being of wood frame construction.

30.1 (1) Le code du bâtiment n'interdit pas qu'un bâtiment dont la hauteur de bâtiment est de six étages ou moins ait une ossature de bois.

Same

Idem

(2) For greater certainty, subsection (1) does not prevent the building code from,

(2) Il est entendu que le paragraphe (1) n'empêche pas le code du bâtiment :

(a) imposing requirements on buildings of wood frame construction; and

a) d'imposer des exigences relativement aux bâtiments à ossature de bois;

(b) prohibiting specified classes of buildings from being of wood frame construction.

b) d'interdire que des catégories déterminées de bâtiments aient une ossature de bois.

Commencement

Entrée en vigueur

2. This Act comes into force four months after the day it receives Royal Assent.

2. La présente loi entre en vigueur quatre mois après le jour où elle reçoit la sanction royale.

Short title

Titre abrégé

3. The short title of this Act is the *Ontario Forestry Industry Revitalization Act (Height of Wood Frame Buildings), 2013*.

3. Le titre abrégé de la présente loi est *Loi de 2013 sur la revitalisation de l'industrie forestière de l'Ontario (hauteur des bâtiments à ossature de bois)*.

EXPLANATORY NOTE

NOTE EXPLICATIVE

The Bill amends the *Building Code Act, 1992* to provide that the building code shall not prohibit a building that is six storeys or less in building height from being of wood frame construction. This does not prevent the code from imposing requirements on or prohibiting specified classes of wood frame buildings.

Le projet de loi modifie la *Loi de 1992 sur le code du bâtiment* pour prévoir que le code du bâtiment n'interdit pas qu'un bâtiment dont la hauteur de bâtiment est de six étages ou moins ait une ossature de bois. Cela n'empêche pas le code d'imposer des exigences ou d'interdire des catégories déterminées de bâtiments à ossature de bois.

Ontario's Code Consultations

Amendments to Ontario's Building Code reflect:

- Government priorities
- Changing technology
- Stakeholder requests
- Emergency situations
- Changes at the national level and in other jurisdictions

Changes in Other Jurisdictions

British Columbia changed its Building Code to allow six storey combustible residential buildings

- Change introduced in January, 2009
- Change took effect in April, 2009
- British Columbia included additional restrictions on five and six storey combustible buildings to address concerns related to structural and fire safety
- British Columbia also developed:
 - Appendix note for designers to address wood shrinkage
 - Guideline for architects, engineers on mid rise wood design

Ontario Code Development - 2010

Development of Potential Amendments for Mid-rise Combustible Construction:

- The Ministry of Municipal Affairs & Housing (MMAH) held an initial information session in May, 2010
- MMAH held an information session with fire service and OFM in August, 2010
- MMAH retained a Consultant (Arencon/GHL) in September, 2010 to develop specific proposals
 - The consultant conducted focus groups involving fire service and building officials, municipal planners, builders and developers, designers, insurance industry and wood industry

Consultant's Recommendations - 2010

MMAH's consultant recommended additional requirements beyond those in British Columbia including:

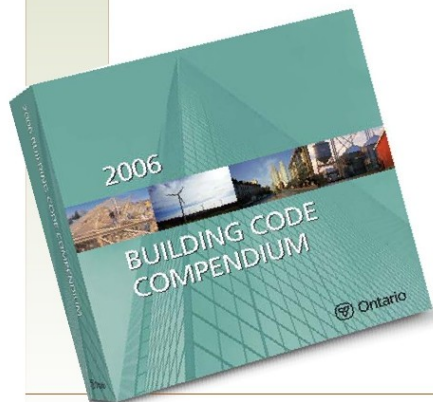
- Sprinklering of all balconies
- Additional requirements for fire resistant exterior cladding
- Access requirements to each building separated by a firewall
- Specific provisions for: podium construction and **office, mercantile and mixed use buildings**

Ontario Code Development - 2011



Potential Changes for the Next Edition of the Building Code:

Second Round of Consultation
(February-April 2011)



Ontario.ca/BuildingCode

MMAH held a public consultation on proposed Building Code amendments, including mid-rise combustible construction, from February to April, 2011

Ontario Code Development - 2011

- The original intent was to include the amendments in the new 2012 Building Code
- Ontario's Building Code Technical Advisory Committees did not support making changes for mid-rise wood due to perceived lack of analytical basis to demonstrate adequate fire safety measures

Wood First? First to go

Build with Concrete Block.

Storms. Fires. Insects. All can weaken a structure — and in some cases destroy it if it's made of wood.

Some members of Ontario's building industry are proposing a "Wood First" initiative. Others are proposing changes to the Ontario Building Code that would allow higher buildings — up to 6 storeys — to be constructed completely of wood. Currently the maximum is 4 storeys.

How would you feel about living in a 6-storey wooden building? A building that could face fire, severe weather or insects?

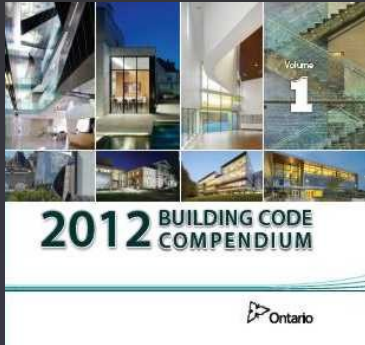
If you're concerned about the impact this could have on safety, take a moment to tell Ontario's Minister of Municipal Affairs and Housing: minister.mah@ontario.ca. Let's put public safety first, not industry lobbyists.



Learn more about the benefits of building with concrete block, including the role block plays in balanced design — a combination of education, detection, suppression and containment, the four principles of fire-safe construction. Contact the Canadian Concrete Masonry Producers Association. Information@ccmpa.ca www.ccmpa.ca



2012 Ontario Building Code



- The Ontario Building Code is a Regulation made pursuant to the *Building Code Act*
- Ontario Regulation 332/12:
 - was filed on November 2, 2012
 - came into effect on January 1, 2014
- Mid-rise combustible construction was not included in the 2012 Ontario Building Code
- O. Reg. 332/12 is freely available on the e-Laws web site at:

www.e-laws.gov.on.ca



2012 Building Code Technical Advisory Committees

Part 3 - Fire Protection and Occupant Safety

- Chair – Tony Crimi

Part 4 - Structural Design

- Chair – Chris Roney

Part 5/12 - Environmental Separation and Resource Conservation

- Chair – John Archer

Part 6 - Heating, Ventilating and Air Conditioning

- Chair – Demir Delin

Part 7 - Plumbing

- Chair – Bill Plewes

Part 8 – Sewage Systems

- Chair – Ray Hachigian

Part 9 – Housing and Small Buildings

- Chair – Aubrey LeBlanc

Sect. 3.8 – Barrier-Free & Accessibility

- Chair – Randal Brown

Ontario Code Development - 2013

- Ontario decided to continue support for the National Research Council's research in mid rise combustible construction and code development
- The Canadian Commission on Building and Fire Codes (CCBFC) held its annual public review of proposed changes to the 2010 National Model Construction Codes from October - December, 2013, including changes related to mid-rise combustible construction

Ontario Code Development - 2014

Code Requirement	B. C. Code	2011 OBC Proposal	2013 mNBC Proposal
Occupancy	Residential	Residential, Mercantile, Business	Same as OBC, plus some Assembly and Industrial
Maximum Floor Height	18 metres to top floor level	18 metres to top floor level	18 metres to top floor level
Maximum Roof height	Not addressed	Not addressed	25m if peaked roof and non-combustible surface
Exterior Cladding	Non-combustible	Non-combustible	5 th and 6 th stories Non-combustible

Ontario Code Development - 2014

Code Requirement	B. C. Code	2011 OBC Proposal	2013 mNBC Proposal
Balcony Sprinkler Protection	Required if balcony is over 1.2 m. deep	Required for all balconies	Required for all balconies
Concealed Spaces	No additional requirements	Additional fire blocking required	Additional fire blocking required
Ratio of perimeter Within 15m of street	Not addressed	Not addressed	25% of building must be within 15 m. of street
Non-combustible stairwell enclosure	1 hr. fire resistance rating performance level	1 hr. fire resistance rating performance level	1 hr. fire resistance rating performance level

Fire Safety During Construction

2013 NFC Public Review

Seven changes, dealing with fire safety during construction, to the National Fire Code were proposed:

CHANGE #	DESCRIPTION OF NFC CHANGE
315	Designated smoking area on construction and demolition sites
316	Site identification and stairway identification signs
317	Clearance between combustible refuse disposal bins and exits

2013 NFC Public Review

CHANGE #	DESCRIPTION OF NFC CHANGE
319	Water supply for firefighting when combustible material arrives on site
320	Markings and clearances for hydrants
321	Exit stairways at construction, alteration and demolition sites
324	Perimeter fencing to prevent unauthorized entry

Fire Safety During Construction

- The National Fire Code, as a model code, is able to address fire safety during construction
- The Ontario Fire Code is a regulation made pursuant to Ontario's *Fire Protection and Prevention Act*
- Section 12.(1) of the *Fire Protection and Prevention Act* lists what the Ontario Fire Code may regulate

Fire Safety During Construction

Section 12.(1) of the *Fire Protection and Prevention Act* states:

“Subject to subsection (4), the fire code does not apply to the unoccupied parts of a building that is under construction within the meaning of the *Building Code Act, 1992* or of a predecessor to that Act.”

The *Fire Protection and Prevention Act* is on the e-laws web site at:

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_97f04_e.htm

Fire Safety During Construction

- Options to regulate fire safety during construction:
 - *Occupational Health and Safety Act*
 - *Building Code Act*
 - Building Code
- Does the *Building Code Act* permit the Building Code to regulate fire safety during construction?

Fire Safety During Construction

- Section 34 of the *Building Code Act* lists what the Ontario Building Code may regulate
- Subsection 34.(1).3 lists:
 - “governing the manner of construction and types and quality of materials used therein”
- The proposed NFC requirements could be included in a supplementary standard (SB-14 – Fire Safety During Construction.....?)

Ontario's Policy Dilemma

Wood Sector	Support
Development + Design Sector	Support
Municipal Sector	Support
Emergency Responders	Concerns
Concrete and Steel Sector	Opposition

Affordability
Economic Development
Intensification
Sustainable Design



Concerns of
Emergency Responders
Concrete & Steel Sectors

Links

- City of Toronto Avenues and Mid-Rise Buildings Study
<http://www1.toronto.ca/City%20Of%20Toronto/City%20Planning/Urban%20Design/Mid-rise/midrise-FinalReport.pdf>
- Bill 13 - Ontario Forestry Industry Revitalization Act
http://www.ontla.on.ca/web/bills/bills_detail.do?locale=en&Intranet&BillID=2727
- Ontario 2011 Consultation on the Building Code
<http://www.mah.gov.on.ca/AssetFactory.aspx?did=9064>
- 2013 NFC Public Review Documents
http://www.nationalcodes.nrc.gc.ca/eng/public_review/2013/proposed_changes.html
- Ontario's Fire Protection and Prevention Act
http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_97f04_e.htm
- Ontario's Building Code Act
http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_92b23_e.htm



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