Notice

This presentation is intended for general information purposes only. It only identifies certain highlights of the Building Code. Code users are strongly advised to consult the official records for specific legislative and regulatory requirements, including:

- The *Building Code Act, 1992*, as amended; and
- The Building Code, including amendments not yet in force

Copies of these documents are available from Publications Ontario at 1-800-668-9938 or eLaws at www.e-laws.gov.on.ca

v.Aug 12, 2006

Part 4 & 5

This slide deck is part of a series of slide decks prepared to accompany the Ministry of Municipal and Affairs and Housing's information sessions on the 2006 Building Code. Other slide decks and locations for the Ministry's information sessions are available from the Building Code website at www.obc.mah.gov.on.ca.

The complete series of slides is intended to:

- Provide an overview of the 2006 Building Code's new objective-based format and
- Introduce certain technical highlights of Ontario's 2006 Building Code

Overview: Agenda

- The morning session:
  - Purpose
  - Introduction
  - Format and Structure
  - Highlights of changes to Part 3
  - Highlights of changes to Part 9
- The afternoon session:
  - Highlights of changes to Parts 4, 5, 6, 7, 8 and 11
  - Part 12: Resource Conservation (Energy and Water)

Ontario

2006 Building Code : Technical Changes

Division B – Part 4

Structural Design

Ontario

REORGANISATION OF PART 4

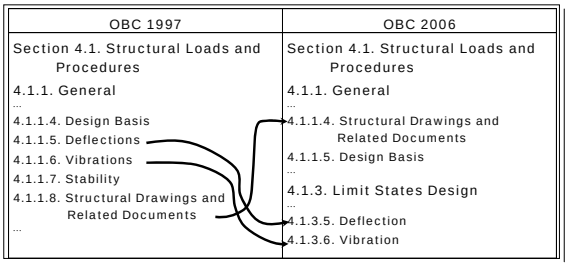
- Part 4 incorporated into Division B
- Relocation of articles

Ontario

General Reorganization

OBC 1997	OBC 2006
4.1.6 Live Load Due to Use and Occupancy	4.1.5. Live Load Due to Use and Occupancy
…	…
4.1.6.11. Bleacher Seats	4.1.5.11. Sway Forces in Assembly Occupancies
4.1.6.12. Helicopter Landing Areas	4.1.5.12. Crane-Supporting Structures and Impact of Machinery and Equipment
4.1.6.13. Roof Parking Decks	4.1.5.13. Bleacher Seats
…	4.1.5.14. Helicopter Landing Areas
4.1.10. Other Effects	4.1.5.15. Loads on Guards
4.1.10.1. Loads on Guards	4.1.5.16. Loads on Vehicle Guardrails
4.1.10.2. Loads on Vehicle Guardrails	4.1.5.17. Loads on Walls Acting As Guards
4.1.10.3. Loads on Walls Acting As Guards	4.1.5.18. Firewalls
4.1.10.4. Firewalls	
4.1.10.5. Vibrations and Impact of Machinery and Equipment	
4.1.10.6. Resonance and Sway Forces	

General Reorganization



Divisions A, B and C of OBC

- Relocation of Issues of Structural significance

Division A
- Designated Structures 1.3.1.1.

Division B
- Depth of frost penetration 1.1.2.2.
- Majority of design requirements Part 4

Division C
- Design and Review Section 1.2.

Climatic and Seismic Data

Now found in Supplementary Standard SB-1

Significant additions - Wind Turbine

Ontario

•**Designated Structures 1.3.1.1. Division A**

•structure that supports a **wind turbine generator** having a rated output >3 kW

Significant additions - Manure Storage Tanks

Ontario

1.3.1.2.(5) Division A
A manure storage tank shall comply with the requirements of Subsection 4.4.5. of Division B.

Significant additions - Manure Storage Tanks

Ontario

Must comply with 1995 model National Farm Building Code *except*:

- Constructed of Steel, reinforced concrete or prestressed concrete
- Concrete must be made using type 50 cement
- 32 MPa
- Water/cement materials ratio 0.45
- Placed on non-organic material
- If granular fill used must be >95% standard proctor

MAJOR CHANGES IN DESIGN REQUIREMENTS

Ontario

- Design methodology
  - has been revised
  - has been updated to reflect latest knowledge and data and to more closely reflect changes in other jurisdictions.
- End result will not be significantly different for most designs

Changes in design methodology - overview

Ontario

4.1.2. Specified Loads and Effects -Importance categories and factors

4.1.3. Limit States Design - Companion action format

- Working stress design eliminated
- Return period for snow and wind

4.1.6. Loads due to rain and snow - snow loads

4.1.7. Wind Loads

4.1.8. Earthquake Loads and Effects

Changes in design methodology

Ontario

4.1.2. Specified Loads and Effects - Importance categories and factors

4.1.3. Limit States Design - Companion action format

Working stress design eliminated

Return period for snow and wind

4.1.6. Loads due to rain and snow - snow loads

4.1.7. Wind Loads

4.1.8. Earthquake Loads and Effects

Snow, Wind and Earthquake Loads – 1997 Building Code

- Various methods of addressing loads on different types of buildings
- Importance factor in general load combination equation
  - 0.8 for low importance buildings
  - 1.0 for other buildings

	Snow	Wind	Earthquake
Post-Disaster	No Distinction 1-in-30 year	1-in-100 year	I = 1.5
School		1-in-30 year	I = 1.3
Other		1-in-30 year	I = 1.0

4.1.2. Importance Categories

Use and Occupancy	Importance Category
Low or indirect hazard to human life in event of a failure	Low
Others	Normal
Post-disaster shelters Facilities housing hazardous substances	High
Post-disaster buildings	Post-disaster

4.1.2. Compilation of Importance Factors

Harmonization of approach for wind, snow and earthquake

Importance Category	Snow, I_S **(Table 4.1.6.2.)**		Wind, I_W **(Table 4.1.7.1)**		Earthquake, I_E (Table 4.1.8.5.)	
	ULS	SLS	ULS	SLS	ULS	SLS
Low	0.8	0.9	0.8	0.75	0.8	Deflection Limits
Normal	1.0	0.9	1.0	0.75	1.0	
High	1.15	0.9	1.15	0.75	1.3	
Post-Disaster	1.25	0.9	1.25	0.75	1.5	

ULS = ultimate limit states SLS = serviceability limit states

Changes in Design Methodology

Ontario

4.1.2. Specified Loads and Effects -Importance categories and factors

4.1.3. Limit States Design - Companion action format

Working stress design eliminated

Return period for snow and wind

4.1.6. Loads due to rain and snow - snow loads

4.1.7. Wind Loads

4.1.8. Earthquake Loads and Effects

4.1.3.2. Companion Action Load Format

Ontario

Form of Limit States Design

Ultimate and serviceability limit states

1997 Building Code

- all variable loads at extreme values
- factoring them down

2006 Building Code

- one principal load at extreme value
- companion loads at largest expected value

4.1.3.2. Companion Action - Ultimate Limit State

Ontario

Generic Equation

$$\Sigma\alpha_{Gi}G_i + \alpha_{Q1}Q_1 + \Sigma\alpha_{CQi}Q_i$$

Companion Variable Loads
- at highest expected value

Principal Variable Load
- at extreme value

Permanent Loads

4.1.3.2. Companion Action Load Combinations

Case	Load Combination	
	Principal Loads	Companion Loads
1	1.4**D**	
2	(1.25**D*** or 0.9**D***) + 1.5**L***	0.5**S*** or 0.4**W**
3	(1.25**D*** or 0.9**D***) + 1.5**S**	0.5**L*** or 0.4**W**
4	(1.25**D*** or 0.9**D***) + 1.4**W**	0.5**L*** or 0.5**S**
5	1.0**D*** + 1.0**E***	0.5**L*** + 0.25**S***

- snow load vs live load
- factors were calibrated

New Definition

Changes in Design Methodology

4.1.2. Specified Loads and Effects -Importance categories and factors

4.1.3. Limit States Design - Companion action format

Working stress design eliminated

Return period for snow and wind

4.1.6. Loads due to rain and snow - snow loads

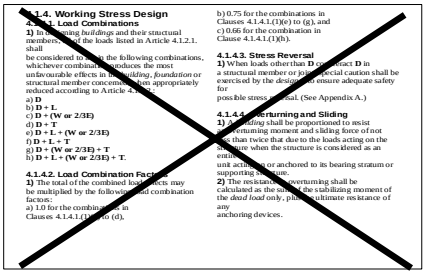
4.1.7. Wind Loads

4.1.8. Earthquake Loads and Effects

1997 OBC 4.1.4 – Working Stress Design

No longer used in applicable design standards

Has been gradually phased out of OBC Part 4



4.1.4. Working Stress Design

4.1.4.1. Load Combinations

1) In designing *buildings* and their structural members, each of the loads listed in Article 4.1.2.1. shall be considered to act in the following combinations, whichever combination produces the most unfavourable effects in the *building*, *foundation* or structural member concerned, when appropriately reduced according to Article 4.1.4.2.:

a) **D**
b) **D + L**
c) **D + (W or 2/3E)**
d) **D + T**
e) **D + L + (W or 2/3E)**
f) **D + L + T**
g) **D + (W or 2/3E) + T**
h) **D + L + (W or 2/3E) + T**.

4.1.4.2. Load Combination Factors

1) The total of the combined loads and effects may be multiplied by the following specified combination factors:

a) 1.0 for the combinations in Clauses 4.1.4.1.(1)(a) to (d),
b) 0.75 for the combinations in Clauses 4.1.4.1.(1)(e) to (g), and
c) 0.66 for the combination in Clause 4.1.4.1.(1)(h).

4.1.4.3. Stress Reversal

1) When loads other than **D** or the effect **D** in a structural member or joint, special caution shall be exercised by the designer to ensure adequate safety for possible stress reversal. (See Appendix A.)

4.1.4.4. Overturning and Sliding

1) A *building* shall be proportioned to resist overturning moment and sliding force of not less than twice that due to the loads acting on the structure when the structure is considered as an entire unit acting on or anchored to its bearing stratum or supporting structure.

2) The resistance to overturning shall be calculated as the sum of the stabilizing moment of the *dead load* only, plus the ultimate resistance of any anchoring devices.

Changes in Design Methodology

4.1.2. Specified Loads and Effects -Importance categories and factors

4.1.3. Limit States Design - Companion action format

Working stress design eliminated

Return period for snow and wind

4.1.6. Loads due to rain and snow - snow loads

4.1.7. Wind Loads

4.1.8. Earthquake Loads and Effects

Return Period – Snow and Wind

1997 Building Code

Snow

- 1-in-30 year ground snow load
- same for all

Wind

- 1-in-10 year for cladding, serviceability
- 1-in-100 year for post-disaster
- 1-in-30 year for other

2006 Building Code

1-in-50 year for all

Changes in Design Methodology

4.1.2. Specified Loads and Effects -Importance categories and factors

4.1.3. Limit States Design - Companion action format

Working stress design eliminated

Return period for snow and wind

4.1.6. Loads due to rain and snow - snow loads

4.1.7. Wind Loads

4.1.8. Earthquake Loads and Effects

Ontario

4.1.6. Snow and Rain

- Load differentiation
  - none in 1997 OBC
  - change prompted by ice storm
  - 2006 OBC to use importance factors
- Snow load **no longer** considered a live load
- Exposure factor
  - no reduction for High and Post-Disaster
  - tied to “open terrain” definition in Wind Subsection

Ontario

Changes in Design Methodology

4.1.2. Specified Loads and Effects -Importance categories and factors

4.1.3. Limit States Design - Companion action format

Working stress design eliminated

Return period for snow and wind

4.1.6. Loads due to rain and snow - snow loads

4.1.7. Wind Loads

4.1.8. Earthquake Loads and Effects

Ontario

4.1.7. Wind

	1997 Building Code	2006 Building Code
Load differentiation	• return periods – 1-in-10, 1-in-30, 1-in-100 year	• 1-in-50 year • use importance factors
Cladding	• 1-in-10 year for design	• 1-in-50 year

Ontario

4.1.7.1. Wind Exposure Factor

1997 Building Code

- one exposure equation
- $C_e = (h/10)^{1/5}$

2006 Building Code

- two exposure equations
- open terrain → same as 1997 Building Code equation
- rough terrain → extend 1 km or 10 h
- intermediate terrain

(h is the height of the building)

Ontario

4.1.7.1. Wind – Open Terrain

$C_e = (h/10)^{0.2}$

Ontario

4.1.7.1. Wind – Rough Terrain

$C_e = 0.7(h/12)^{0.3}$

Compensate for 1-in-50 year cladding basis

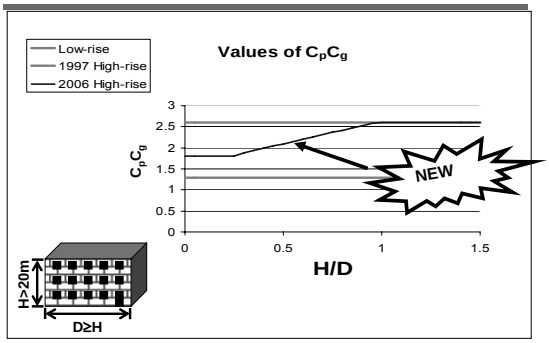
Ontario

4.1.7.1. Wind – Intermediate Terrain

Interpolation formula provided in Commentary

Ontario

4.1.7.1. Wind – Low-rise to High-rise



Ontario

Changes in Design Methodology

4.1.2. Specified Loads and Effects -Importance categories and factors

4.1.3. Limit States Design - Companion action format

Working stress design eliminated

Return period for snow and wind

4.1.6. Loads due to rain and snow - snow loads

4.1.7. Wind Loads

4.1.8. Earthquake Loads and Effects

4.1.8. Earthquake

4.1.8. Earthquake

- Significant advances in knowledge and data lead to:
  - updated hazard in spectral format
  - a change in return period
  - period dependant site factors
  - the delineation of overstrength and ductility
  - system restrictions
  - revised period calculations
  - defined structural irregularities
  - dynamic analysis as the default method

4.1.8. Earthquake

Significant advances in knowledge and data lead to:

- ***updated hazard in spectral format***
- a change in return period
- period dependant site factors
- the delineation of overstrength and ductility
- system restrictions
- revised period calculations
- defined structural irregularities
- dynamic analysis as the default method

Ontario

4.1.8.4. Spectral Acceleration

1997 Building Code
- peak ground velocity and acceleration
- sorted into discrete zones
- amplified to obtain period-dependant forces

2006 Building Code
- uniform hazard spectra at specific locations
- direct representation of structural response

Ontario

4.1.8.4. Seismic Data

1997 Building Code

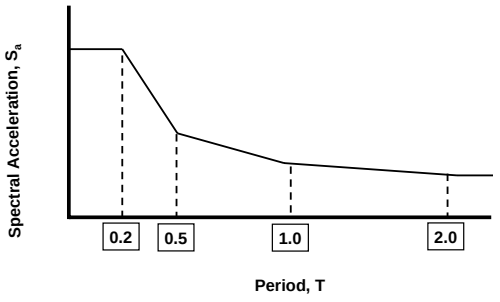
Location	Seismic Data		
	Z_a	Z_v	Zonal Velocity Ratio, v
Ottawa	4	2	0.10
. . .	. . .	. . .	. . .

2006 Building Code

Location	Seismic Data				
	$S_a(0.2)$	$S_a(0.5)$	$S_a(1.0)$	$S_a(2.0)$	PGA
Ottawa	0.66	0.32	0.13	0.044	0.42
. . .	. . .	. . .	. . .	. . .	. . .

Ontario

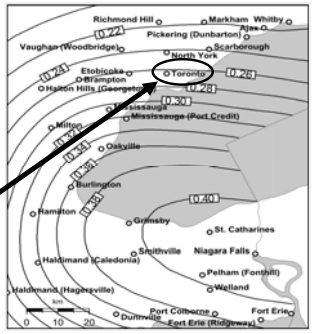
4.1.8.4. Spectral Acceleration



4.1.8. Detailed Spectral Acceleration Values

More detailed $S_a(0.2)$ values for The Toronto area in Structural Commentary

Toronto



4.1.8. Earthquake

Significant advances in knowledge and data lead to:

- updated hazard in spectral format
- ***a change in return period***
- period dependant site factors
- the delineation of overstrength and ductility
- system restrictions
- revised period calculations
- defined structural irregularities
- dynamic analysis as the default method

4.1.8. Probability of Exceedance

- From 10% in 50 year probability in 1997 OBC to a probability of 2% in 50 year for 2006 OBC
- This new methodology focuses on design criteria specific to the building location as well as the building itself. It takes into account:
  - Earthquake activity
  - Ground conditions
  - Building dependent criteria. (period of vibration, discontinuity, method of construction)
- Uniform margin of collapse.

4.1.8. Earthquake

Significant advances in knowledge and data lead to:

- updated hazard in spectral format
- a change in return period
- ***period dependant site factors***
- the delineation of overstrength and ductility
- system restrictions
- revised period calculations
- defined structural irregularities
- dynamic analysis as the default method

4.1.8.4. Period-Dependent Site Factors

- Six 'site classes' A,B,C,D,E and F
- Used in conjunction with spectral acceleration
- Seismic response of building to ground movement.

4.1.8.4. Site Classification

Site Class	Ground Profile Name	Average Properties in Top 30 m		
		Shear Wave Average Velocity, $\overline{V}_s$ (m/s)	Standard Penetration Resistance, $\overline{N}_{60}$	*Soil* Undrained Shear Strength, s_u
A	Hard *Rock*	$\overline{V}_s > 1500$	Not applicable	Not applicable
B	*Rock*	$760 < \overline{V}_s \leq 1500$	Not applicable	Not applicable
C	Very Dense *Soil* and Soft *Rock*	$360 < \overline{V}_s < 760$	$\overline{N}_{60} > 50$	$s_u > 100$kPa
D	Stiff *Soil*	$180 < \overline{V}_s < 360$	$15 \leq \overline{N}_{60} \leq 50$	$50 < s_u \leq 100$kPa
E	Soft *Soil*	$\overline{V}_s < 180$	$\overline{N}_{60} < 15$	$s_u < 50$kPa
		Any profile with more than 3 m of *soil* with the following characteristics: ▪ Plastic index PI > 20 ▪ Moisture content w ≥ 40%, and ▪ Undrained shear strength $s_u < 25$ kPa		
F	[1] Others	Site Specific Evaluation Required		

Ontario

4.1.8. Earthquake

Significant advances in knowledge and data lead to:

- updated hazard in spectral format
- a change in return period
- period dependant site factors
- ***the delineation of overstrength and ductility***
- system restrictions
- revised period calculations
- defined structural irregularities
- dynamic analysis as the default method

Ontario

4.1.8.9. Ductility and Overstrength

•Force modification factors revised.

Ontario

4.1.8. Earthquake

Significant advances in knowledge and data lead to:

- updated hazard in spectral format
- a change in return period
- period dependant site factors
- the delineation of overstrength and ductility
- ***system restrictions***
- revised period calculations
- defined structural irregularities
- dynamic analysis as the default method

Ontario

4.1.8.10 System Restrictions

2006 OBC will restrict certain types of building form.

- Force resisting system
- Spectral acceleration
- Soil properties
- Importance category

Ontario

4.1.8. Earthquake

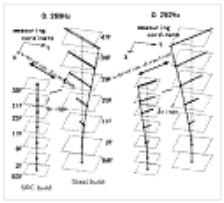
Significant advances in knowledge and data lead to:

- updated hazard in spectral format
- a change in return period
- period-dependant site factors
- the delineation of overstrength and ductility
- system restrictions
- ***revised period calculations***
- defined structural irregularities
- dynamic analysis as the default method

Ontario

4.1.8.11. Period Calculations

- Revised
- Braced frames and shear wall added



4.1.8. Earthquake

Significant advances in knowledge and data lead to:

- updated hazard in spectral format
- a change in return period
- period-dependant site factors
- the delineation of overstrength and ductility
- system restrictions
- revised period calculations
- ***defined structural irregularities***
- dynamic analysis as the default method

4.1.8.6. Structural Irregularities

Restrictions and special requirements:

- Irregular structures generally not permitted
- If they are, then design forces are increased
- dynamic analysis must be used

4.1.8.6. Structural Irregularities

- Regular buildings perform better than irregular ones
- Triggers based on period, seismicity, importance

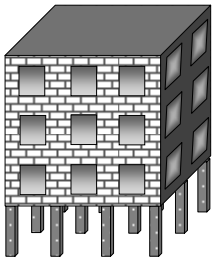
Type	Irregularity Type and Definition	Notes
1	Vertical Stiffness Irregularity	(2) (3)
2	Weight (mass) Irregularity	(2)
3	Vertical Geometric Irregularity	(2) (3) (4)
4	In-plane Discontinuity in vertical lateral force-resisting element	(2) (3) (4)
5	Out-of-Plane Offsets	(2) (3) (4)
6	Discontinuity in Capacity - Weak Storey	(3)
7	Torsional Sensitivity - to be considered when diaphragms are not flexible	(2) (3) (5)
8	Non-orthogonal Systems	(6)

Ontario

4.1.8.6. Structural Irregularities

Weak storeys:

- only in low seismic areas



Ontario

4.1.8.6. Structural Irregularities

Ontario

4.1.8.6. Structural Irregularities

Post-disaster buildings:

- weak storey not permitted
- $R_d \geq 2.0$
- severely restricted on type of irregularity

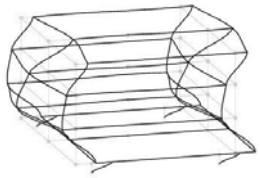
4.1.8. Earthquake

Significant advances in knowledge and data lead to:

- updated hazard in spectral format
- a change in return period
- period-dependant site factors
- the delineation of overstrength and ductility
- system restrictions
- revised period calculations
- defined structural irregularities
- ***dynamic analysis as the default method***

4.1.8.7. Method of Analysis -Dynamic

- Default method
- Better analysis
- Data now in spectral format
- Availability of software



4.1.8.11. Method of Analysis - Static

Equivalent static force procedure:

- may be used for very low seismic areas OR
- For specified building configurations that are not earthquake susceptible.

Ontario

Part 4 changes - summary

- Wind, Snow and Earthquake – loads
- Revised Design Codes for Steel, reinforced concrete, masonry and wood
- Companion Action now used for design.
- Earthquake design rewritten

Ontario

Overview:
Agenda

- The morning session:
  - Purpose
  - Introduction
  - Format and Structure
  - Highlights of changes to Part 3
  - Highlights of changes to Part 9
- The afternoon session:
  - Highlights of changes to Parts 4, 5, 6, 7, 8 and 11
  - Part 12: Resource Conservation (Energy and Water)

Ontario

Building Code 2006:
Technical Changes

Division B – Part 5

Environmental Separation

Outline

Scope and Application
Loads and Procedures
Performance Requirements
Sound Transmission
Referenced Standards

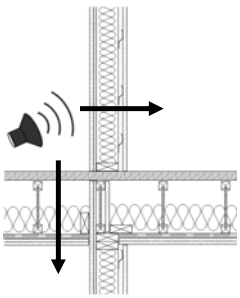
Outline

Scope and Application
Loads and Procedures
Performance Requirements
Sound Transmission
Referenced Standards

Scope and Application

Expansion

- 5.1.1. Scope
  - control of condensation
  - transfer of heat, air and moisture
  - ***airborne sound transmission***



Scope and Application

Expansion

- 5.1.2. Application
  a) environmental separators and ***assemblies exposed to the exterior***
  b) interior dissimilar environments
  c) site materials, components, assemblies and grading

Outline

Scope and Application
Loads and Procedures
Performance Requirements
Sound Transmission
Referenced Standards

Loads and Procedures

5.1.4.1.

- to include the ***design and construction of*** environmental loads and ***structural loads*** pertaining to the selection of materials, components and assemblies of a building

- selected elements and loads
  - performance addressed in Part 5
  - structural designed to Part 4

courtesy of
Heat & Moisture Performance of Envelopes, Institute for Research in Construction

Loads and Procedures

Resistance to Loads
Sentence 5.1.4.1.(1)

- Design
  - of all environmental separator elements
  - ***assemblies exposed to the exterior***
- to resist or accommodate all expected
  - environmental loads and effects
  - ***structural loads and effects***

courtesy of Performance of Roof Systems & Insulation, Institute for Research in Construction

Loads and Procedures

Resistance to Loads
All Across Part 5

- Refers to Part 4 for
  - those elements and loads identified in Part 4 (5.2.2.1.)
  - air pressure on air barrier systems (5.4.1.2 (4))
  - wind-uplift on roofing (5.2.2.2.)
  - hydrostatic pressure on waterproofing (5.8.2.2.(5))

Loads and Procedures

Resistance to Loads

For elements and loads
not addressed in Sentence 5.1.4.1.(3)

Sentence 5.1.4.1.(4)

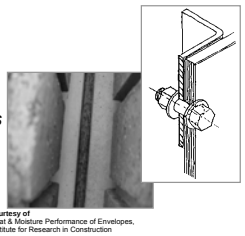
a) determine structural loads and design according to Subsection 5.2.2. (Part 4), or

b) for **common** materials, components, assemblies and their installation be based on proven past performance over several years

Loads and Procedures

Resistance to Loads
Sentence 5.1.4.1.(5)

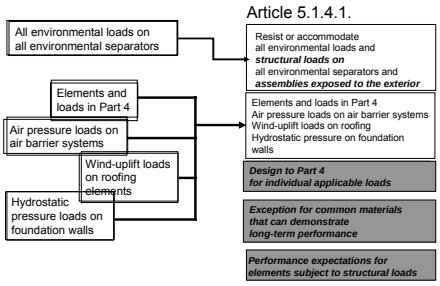
- Design of elements, ***assemblies, connections*** subject to ***structural*** loads must address:
  - Load Transfer
  - Deflection
  - ***Structural Movement***
  - ***Construction Tolerances***



courtesy of
Heat & Moisture Performance of Envelopes,
Institute for Research in Construction

Loads and Procedures

OBC 1997 OBC 2006



Loads and Procedures

- Resistance to Deterioration addressed in Article 5.1.4.2.
- Design and construction of assemblies exposed to exterior must be in accordance with good practice such as
- CSA S478, “Guideline on Durability in Buildings” Standard

Ontario

Loads and Procedures

Determination of Structural Loads
Article 5.2.2.1.

1) Determination of loads according to Part 4
2) Types of loads
   - dead loads
   - live loads
   - climatic loads
3) Consideration of other expected applicable loads

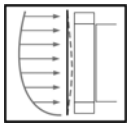
courtesy of Performance of Roof Systems & Insulation, Institute for Research in Construction

Ontario

Loads and Procedures

Determination of Wind Load
Article 5.2.2.2.

- Required:
  - ***for all elements subject to wind load***
  - ***where those elements are required to be designed to resist that load***
- Specified Load
  - 100% according to 4.1.7.1. ***based on***
    - ***reference velocity pressure***
    - ***gust effect factor***
  - Exception
    - smaller loads allowed – if based on test or analysis



Ontario

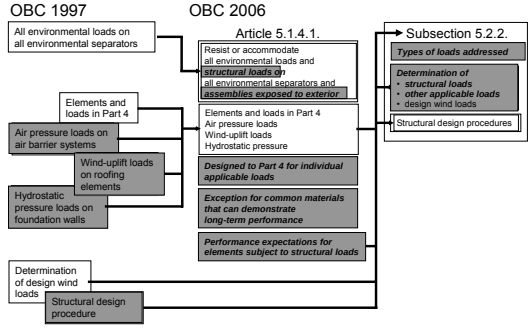
Loads and Procedures

Design Procedure
Article 5.2.2.3.

- Structural design shall be carried out
  - in accordance with Subsection 4.1.3. and
  - other applicable requirements in Part 4

courtesy of Performance of Roof Systems & Insulation, Institute for Research in Construction

Loads and Procedures



Loads and Procedures

Why not just reference Part 4?

Simple reference to Part 4:

- considers only direct consequences, such as structural failure and damage
- addresses only structural safety and structural sufficiency

Requirements in Part 5 + reference to Part 4:

- considers ***indirect consequences*** from damage or failures, such as inadequate performance of environmental separators
- addresses structural ***and health*** objectives

Loads and Procedures

Intent – Part 5 – Structural Safety

- displacements of the structural system as a whole or in part,
  - component buckling, or
  - ***failure of required environmental separator elements***
    - structural failure
      - » harm to persons

Loads and Procedures

Intent – Part 5 – Indoor Conditions

- displacements of the structural system as a whole or in part,
  - component buckling, or
  - ***failure of required environmental separator elements***
    - ***…***
    - ***air infiltration and exfiltration***
      - » ***negative effects on thermal comfort***
      - » …
      - » harm to persons

Outline

Scope and Application
Loads and Procedures
Performance Requirements
Sound Transmission
Referenced Standards

5.3. Heat Transfer

OBC 2006

Control of Heat Transfer

- materials to resist the transfer of heat
- ***means to dissipate the heat***

Performance Target

- minimize condensation
- ***minimize ice damming***

Design Parameters

- ***conditions on either side of the separator***

Ontario

5.4. Air Leakage

courtesy of
Real Property Programs Branch
Public Works and Government
Services Canada

OBC 2006

Control of Air Leakage

- materials to resist the transfer of air
- ***means to permit venting***

Performance Target

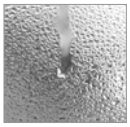
- ***provide & maintain acceptable conditions***
- ***minimize condensation & precipitation ingress***
- ***avoid ice damming***
- ***not compromise operation of building services***

Design Parameters

- air permeance of material to resist air leakage

Ontario

5.5. Vapour Diffusion



OBC 2006

Control of Vapour Diffusion

- materials to resist vapour diffusion
- ***means to permit venting***

Performance Target

- minimize condensation on surfaces and within assemblies

Design Parameters

- temperature
- relative humidity
- vapour permeance of material to resist vapour diffusion

Ontario

Outline

Scope and Application
Loads and Procedures
Performance Requirements
Sound Transmission
Referenced Standards

5.9. Sound Transmission

3.3.4.6. Requirements Moved to 5.9

- Airborne sound only
- Between dwelling units
  - STC Rating ≥ 50
- Between dwelling units and elevator shafts
  - STC Rating ≥ 55
- Compliance
  - ASTM E 336 STC measurement

Outline

Scope and Application
Loads and Procedures
Performance Requirements
Sound Transmission
Referenced Standards

5.10. Referenced Standards

OBC 2006 – Referenced Standards

- any material installed to fulfill Part 5 for which a standard is listed has to comply with that standard
- more materials referenced
- exceptions and additional specific requirements kept

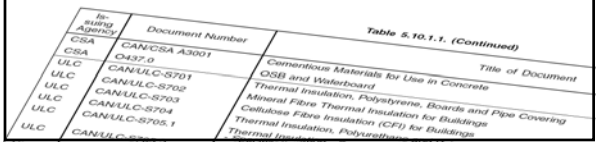


Table 5.10.1.1. (Continued)

Issuing Agency	Document Number	Title of Document
CSA	CAN/CSA A3001	Cementitious Materials for Use in Concrete
CSA	O437.0	OSB and Waferboard
ULC	CAN/ULC-S701	Thermal Insulation, Polystyrene, Boards and Pipe Covering
ULC	CAN/ULC-S702	Mineral Fibre Thermal Insulation for Buildings
ULC	CAN/ULC-S703	Cellulose Fibre Insulation (CFI) for Buildings
ULC	CAN/ULC-S704	Thermal Insulation, Polyurethane
ULC	CAN/ULC-S705.1	
ULC	CAN/ULC-	

Ontario

Summary

- Assemblies exposed to the exterior now addressed
- Structural loads on building envelope elements better addressed
- Part 5 is becoming more performance-based
- Sound transmission requirements moved to Part 5
- New single table of referenced standards

Ontario

Further Information

e-mail: codeinfo@mah.gov.on.ca

www.obc.mah.gov.on.ca