

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

23

Loads and Procedures



Intent – Part 4 – Structural Safety

- displacements of the structural system as a whole or in part,
 - component buckling,
 - structural failure
 - harm to persons

24

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

25

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

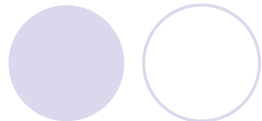
26

Loads and Procedures



BCBC 2006	Loads					
	Structural			Environmental		
	Dead Loads	Climatic and Seismic Loads	Live Loads	Temperature	Air Pressure	Water Pressure
Building Elements				Biological	Chemical	
Structural						
loadbearing	Part 4 Part 5	Part 4 Part 5	Part 4 Part 5	Part 4	Part 5	Part 5
not loadbearing	Part 4 Part 5	Part 4 Part 5	Part 4 Part 5	Part 4	Part 5	Part 5
Fasteners/Connections	Part 4 Part 5	Part 4 Part 5	Part 4 Part 5	Part 4	Part 5	Part 5
Non-structural						
nominally loadbearing	Part 5	Part 5	Part 5		Part 5	Part 5
not loadbearing	Part 5	Part 5	Part 5		Part 5	Part 5
Fasteners/Connections	Part 5	Part 5	Part 5		Part 5	Part 5

27



Outline

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

28

Performance Requirements



BCBC 1998 Provisions in Part 5

- mostly performance-oriented
- some prescriptive

Strategy

- provide performance-based requirements for all issues
- supplement prescriptive solutions with performance requirements
- do not include prescriptive solutions without performance-based alternatives



29

5.3. Heat Transfer



BCBC 1998

Control of Heat Transfer

- materials to resist the transfer of heat

Performance Target

- minimize condensation

Design Parameters

- design temperatures



courtesy of
Community & Government Services
Government of Nunavut

30

5.3. Heat Transfer



BCBC 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



31

5.4. Air Leakage



BCBC 1998

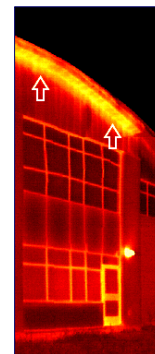
Control of Air Leakage

- materials to resist the transfer of air

Performance Target

Design Parameters

- air permeance of material to resist air leakage



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

32

5.4. Air Leakage



BCBC 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



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

33

5.5. Vapour Diffusion



BCBC 1998

Control of Vapour Diffusion

- materials to resist vapour diffusion

Performance Target

- minimize condensation on surfaces and within assemblies

Design Parameters

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



Material	Air Leakage Characteristic, $L/(s \cdot m^2)$ at 75 Pa	Water Vapour Permeance, $\mu p (Pa \cdot s \cdot m^2)$
Sheathing (low insulation value)		
12.7-mm foil-backed gypsum board	negligible	negligible
6.4-mm plywood	0.004	25
12.7-mm gypsum board sheathing	0.0091	
11-mm oriented strandboard	0.0108	
11-mm fibreboard sheathing		
17-mm wood sheathing		
Insulation		
25-mm foil-faced urethane	0.0001	negligible
25-mm glass wool		

5.5. Vapour Diffusion



BCBC 2006

Control of Vapour Diffusion

- materials to resist vapour diffusion
- means to permit venting



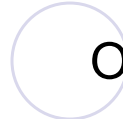
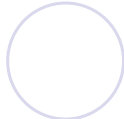
Performance Target

- minimize condensation on surfaces and within assemblies

Design Parameters

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

Material	Air Leakage Characteristic, $L/(s \cdot m^2)$ at 75 Pa	Water Vapour Permeance, $ng/(Pa \cdot s \cdot m^2)$
Sheathing (low insulation value)		
12.7-mm foil-backed gypsum board	negligible	negligible
6.4-mm plywood	0.0084	5%
12.7-mm gypsum board	0.0081	
12.7-mm oriented strandboard	0.0108	
11-mm fibreboard sheathing		
12-mm wood sheathing		
Insulation		
25-mm foil-faced urethane		
25-mm extruded polystyrene		



Outline

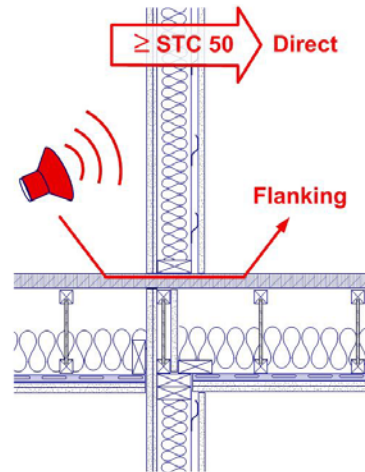
- Scope and Application
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5.9. Sound Transmission



BCBC 1998 Requirements Moved

- Airborne sound only
- Between dwelling units
 - STC Rating ≥ 50
- Between dwelling units and elevator shafts
 - STC Rating ≥ 55
- Compliance
 - Table A-9.10.13.1.
 - ASTM E 336 FSTC measurement



37

5.9. Sound Transmission



BCBC 1998 Appendix Note

- moved from A-3.3.4.6. to A-5.9.1.1.

New Appendix Note

- Clarifies that “dissimilar environments” includes different noise levels

More Guidance on Flanking and Detailing

- in A-9.11.1.1.
- on NRC-IRC’s publication web site

38



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39

5.10. Referenced Standards



BCBC 1998 – Referenced Standards

- Section-by-Section Approach
 - cumbersome
 - repetitive
 - duplication
 - in-context reference

1) Where materials or components applied to sloped or horizontal assemblies are installed to provide required protection from precipitation and are covered in the scope of the standards listed below, the materials or components shall conform to the requirements of the respective standards:

- ASTM D 2178, "Asphalt Glass Felt Used in Roofing and Waterproofing,"
- CAN/CGSB-37.4-M, "Fibrated, Cutback Asphalt, Lap Cement for Asphalt Roofing,"
- CAN/CGSB-37.5-M, "Cutback Asphalt Plastic Cement,"
- CAN/CGSB-37.8-M, "Asphalt, Cutback, Filled, for Roof Coating,"
- CGSB 37-GP-9Ma, "Primer, Unfilled, for Asphalt Roofing,"
- CGSB 37-GP-9Mb, "Primer, Filled, for Asphalt Roofing,"

5.10. Referenced Standards



BCBC 2006 – Referenced Standards

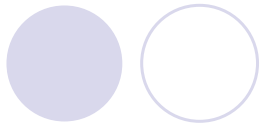
- any material installed to fulfill Part 5 for which a standard is listed has to comply with that standard
- more materials referenced
- out-of-context reference
- exceptions and additional specific requirements kept

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 Thermal Insulation (CFI) for Buildings
ULC	CAN/ULC-S704	Thermal Insulation, Polyurethane and
ULC	CAN/ULC-S705.1	Thermal Insulation, Polyurethane and
ULC	CAN/ULC-S705	Thermal Insulation, Polyurethane and

Summary

- 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



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- www.bccodes.ca