



Office of Housing and Construction Standards

New Energy Efficiency Requirements in BC

Zachary May

Codes Administrator

Building and Safety Standards Branch



**BRITISH
COLUMBIA**



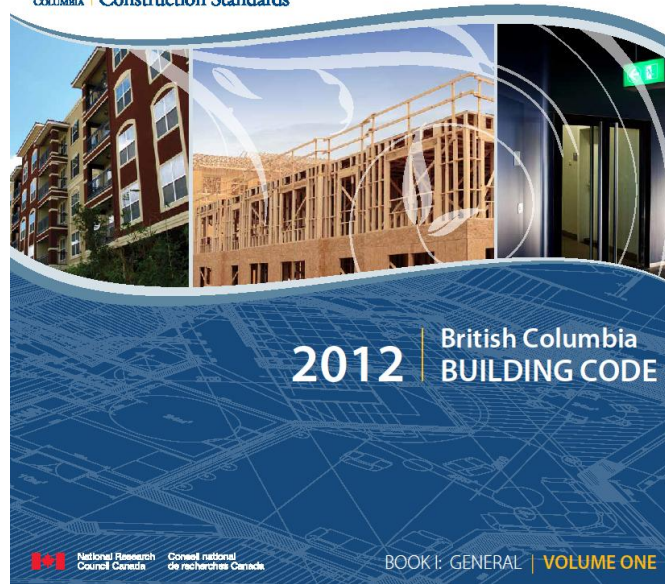
TODAY

**Dec. 20
2013**

**Dec. 19
2014**



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TODAY

Part 10 – Energy Efficiency

- **Part 3** (Large Buildings)
 - ASHRAE 90.1 (2004)
- **Part 9** (Small Buildings)
 - Insulation tables
- Water efficiency

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Part 10 (Compliance)

TODAY

- **Part 3** (Large Buildings)
 - Letters of Assurance
 - Single standard
 - Prescriptive / Trade-offs
- **Part 9** (Small Buildings)
 - “Stuff the gaps”

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- **Part 3 (Large Buildings)**

- ~~ASHRAE 90.1 (2004)~~

- ASHRAE 90.1 (2010)

updated

- National Energy Code for Buildings (NECB)

new

- Water efficiency

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- **Part 3 (Compliance)**
- Letters of Assurance



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Schedule B - Continued

Building Permit No. _____
(the address being the project location)

Project Address _____

Discipline _____

The undersigned also undertakes to notify the authority having jurisdiction in writing as soon as possible if the undersigned's contract for field review is terminated at any time during construction.

I certify that I am a registered professional as defined in the British Columbia Building Code.

Registered Professional's Name (Print) _____
Professional's Seal and Signature _____
Date _____

Address (street) _____

Phone No. _____

(If the Registered Professional is a member of a firm, please check the following.)

First name of firm

I am a member of the firm _____
and I sign this letter on behalf of the firm _____

Note: The above letter must be signed by a registered professional of record, who is a registered professional. The Public Complaints Resolution Panel (PCRP) is a registered professional to mean:

(a) a person who is registered or licensed to practise as an architect under the Architects Act, or
(b) a person who is registered or licensed to practise as a professional engineer under the Engineers and Geoscientists Act.

CPRA initials _____

3 of 4

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Schedule B - Continued

Building Permit No. _____
(the address being the project location)

Project Address _____

Discipline _____

SUMMARY OF DESIGN AND FIELD REVIEW REQUIREMENTS

(Initial applicable discipline below and cross out and initial only those items not applicable to the project.)

ARCHITECTURAL

- 1.1 Fire resisting assemblies
- 1.2 Fire separations and their continuity
- 1.3 Closures, including their continuity
- 1.4 Egress systems, including their operation
- 1.5 Performance and physical safety features (guardrails, handrails, etc.)
- 1.6 Structural capacity of architectural components, including anchorage and seismic restraint
- 1.7 Sound control
- 1.8 Landscaping: screening and site grading
- 1.9 Provisions for fire fighting access
- 1.10 Access requirements for persons with disabilities
- 1.11 Elevating devices
- 1.12 Functional testing of architecturally related fire emergency systems and devices
- 1.13 Development Permit and conditions therein
- 1.14 Interior signage, including acceptable materials, dimensions and locations
- 1.15 Review of all applicable shop drawings
- 1.16 Interior and exterior finishes
- 1.17 Dampproofing and/or waterproofing of walls and slabs below grade
- 1.18 Roofing and flashings
- 1.19 Wall cladding systems
- 1.20 Condensation systems
- 1.21 Exterior glazing
- 1.22 Environmental control and cavity ventilation
- 23 Environmental separation requirements (Part 9 Building Envelope, Part 10/ABO/RAE Requirements)

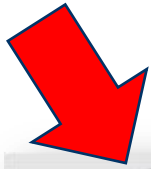
STRUCTURAL

- 1.1 Structural capacity of architectural components of the building, including anchorage and seismic restraint
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- 2.00 Structural capacity of architectural components of the building, including anchorage and seismic restraint

Professional's Seal and Signature _____
Date _____

CPRA initials _____

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MECHANICAL

- 3.1 HVAC systems and devices, including high *building* requirements where
- 3.2 *Fire dampers* at required *fire separations*
- 3.3 Continuity of *fire separations* at HVAC penetrations
- 3.4 Functional testing of mechanically related fire emergency systems and
- 3.5 Maintenance manuals for mechanical systems
- 3.6 Structural capacity of mechanical components, including anchorage and
- 3.7 Review of all applicable shop drawings
- 3.8 Mechanical Systems, Part 10/ASHRAE Requirements



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- **Part 3 (Compliance)**
 - Letters of Assurance
 - Available at bccodes.ca



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2012

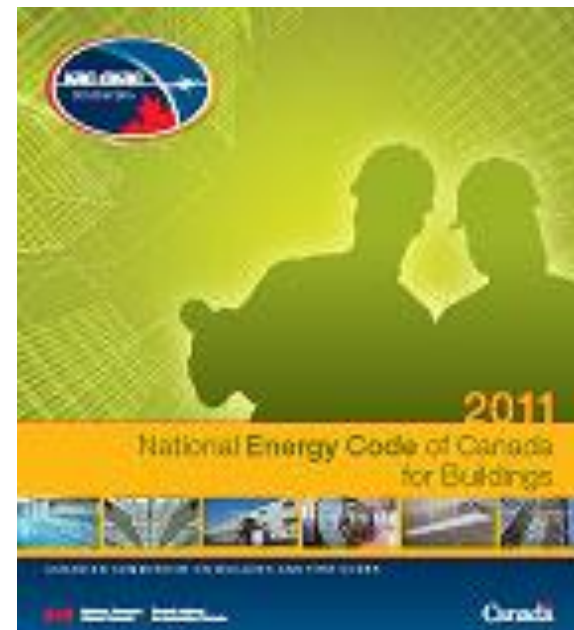
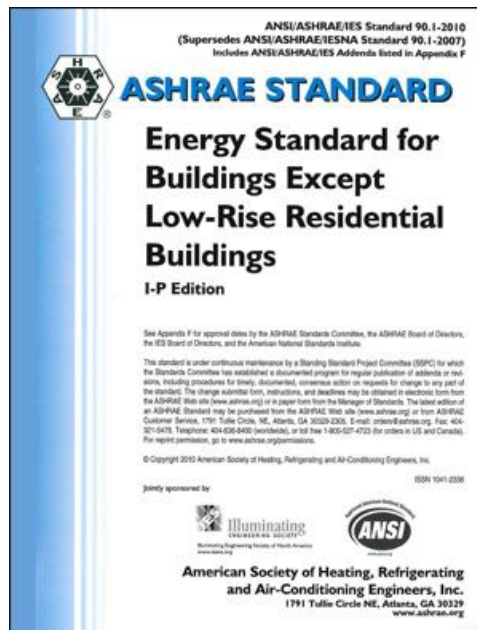
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ASHRAE 90.1 (2010) & NECB (2011)





BCBC 2012

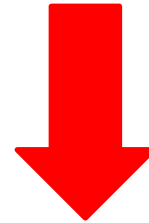
ASHRAE 90.1 (2004)



ASHRAE 90.1 (2010)
& NECB (2011)

Vancouver BB

ASHRAE 90.1 (2007)



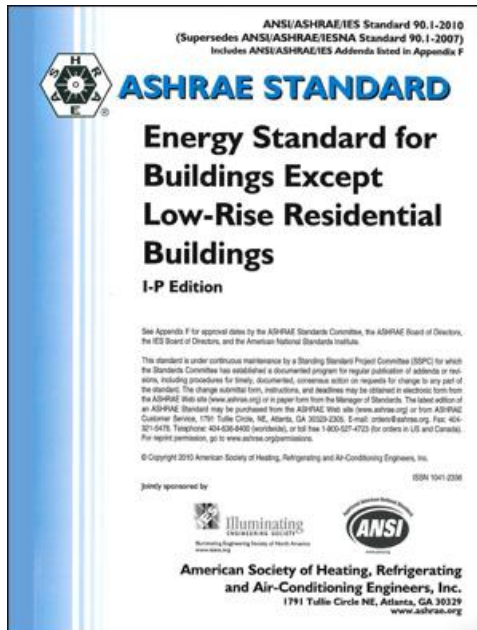
ASHRAE 90.1 (2010)
& NECB (2011)



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Where do they come from?



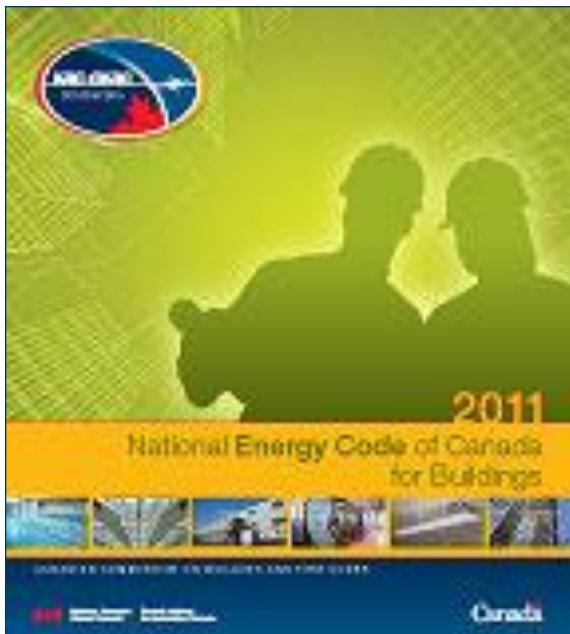
- American Society of Heating, Refrigerating and Air-Conditioning Engineers
- Now a global society with 50,000 members worldwide
- Industry standard



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Where do they come from?



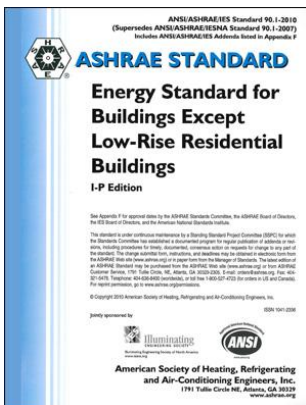
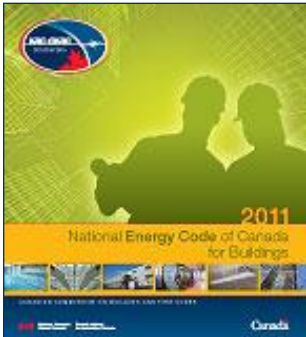
- National Energy Code for Buildings
- Canadian Commission on Building and Fire Codes (NRC)
- Canadian standard developed with input from NRCan and industry stakeholders



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What's the difference?



- Building construction materials
- Occupancy and building design
- Climate region
- Energy use vs. Cost of energy
- Industry familiarity
- New value opportunities



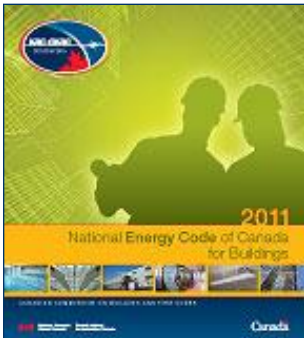
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What's the difference?

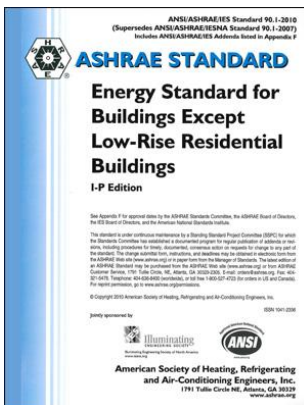
NECB

- Energy based
- Trade-offs throughout
- Reference to Canadian standards



ASHRAE

- Energy-cost based
- Trade-offs for envelope only
- Reference to performance requirements





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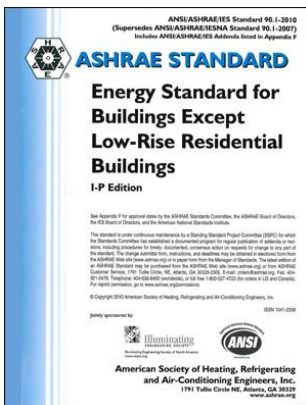
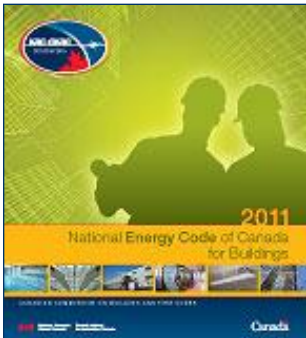
What's the difference?

NECB

- Flexible
- Complex compliance
- Good - excellent performance

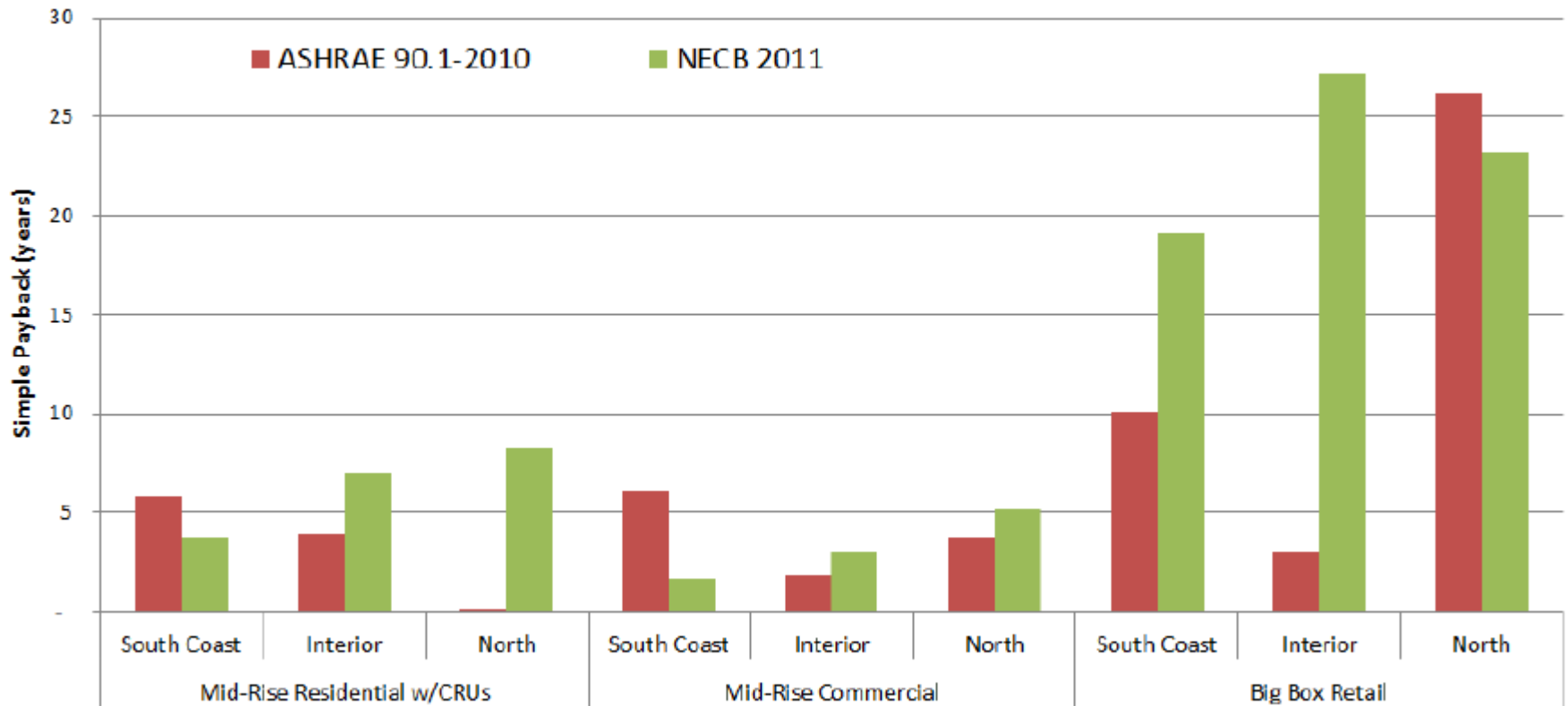
ASHRAE

- Prescriptive
- Less complex compliance
- Good - excellent performance



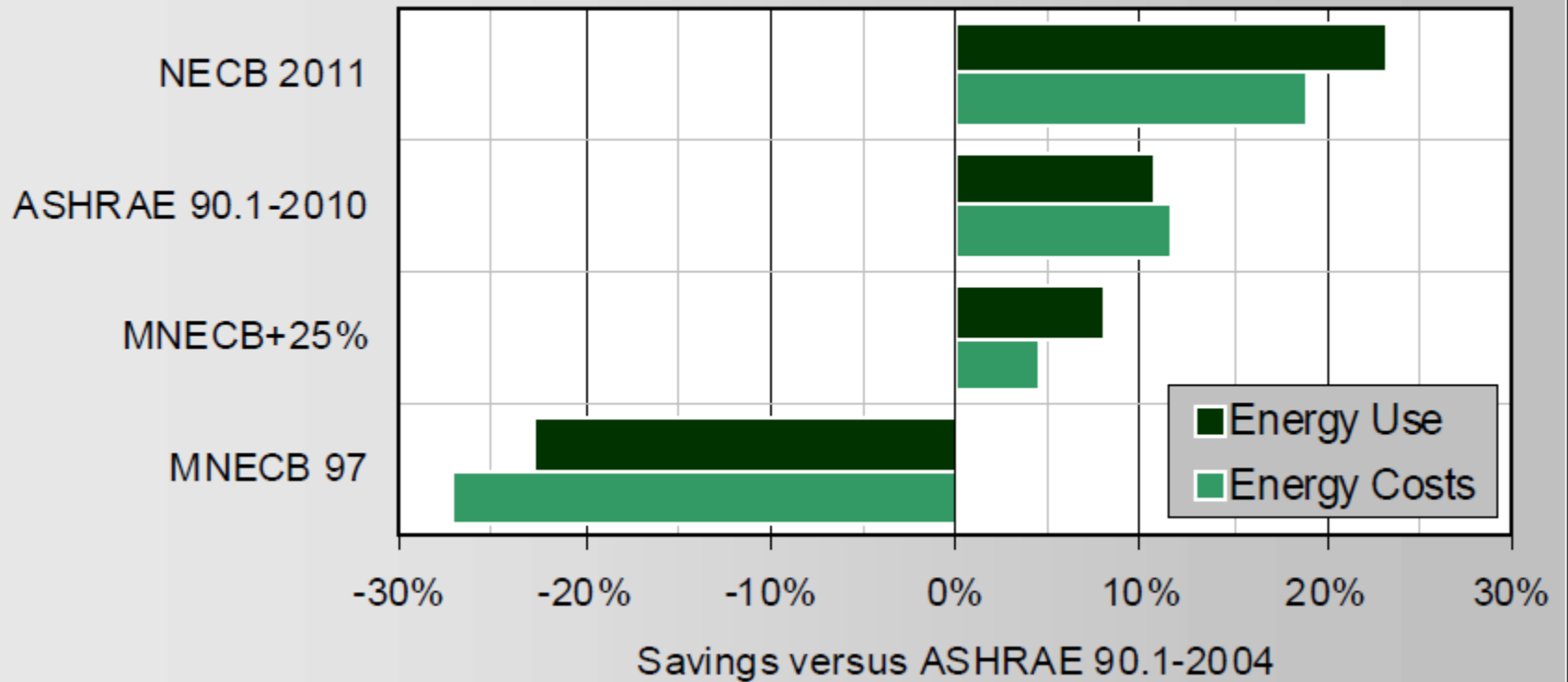


Simple Payback Comparison (years)





Code Requirements Comparison for B.C. (versus ASHRAE 90.1-2004, Regulated Energy)





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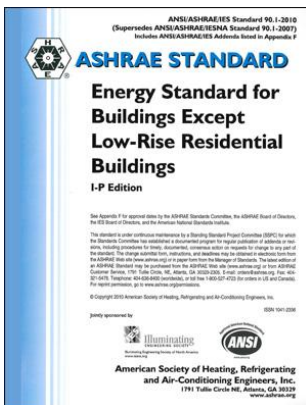
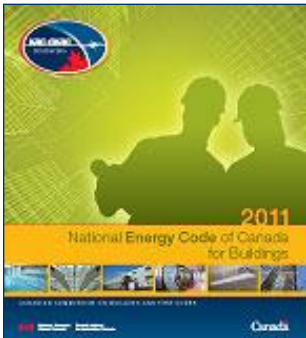
Key details:

NECB

- Clear values for envelope components
- Stringent air-leakage rates

ASHRAE

- Multiple values for envelope components
- Less stringent air-leakage rates





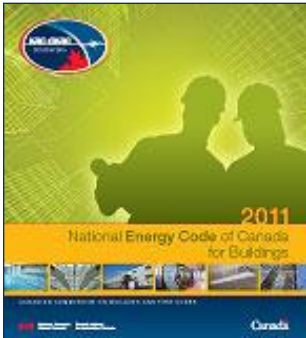
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Key details:

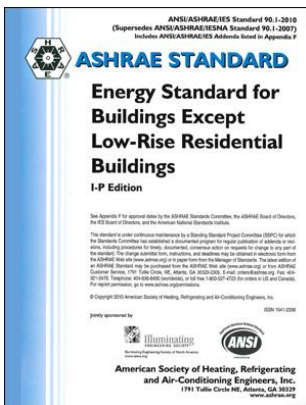
NECB

- 40 % FWR – few trade offs
- FWR indexed to heating degree days



ASHRAE

- 40% FWR across all regions
- Trade offs allow for up to 70% glazing
- Beyond 70% - ECB





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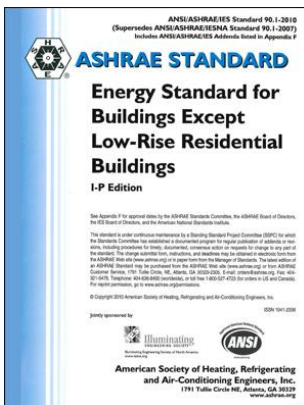
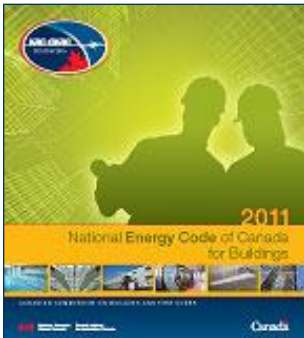
Key details:

NECB

- Stringent insulation requirements
- Walls/roofs/slabs
- Required full slab insulation (unheated)

ASHRAE

- Generally less stringent insulation requirements
- Optional slab insulation in some areas





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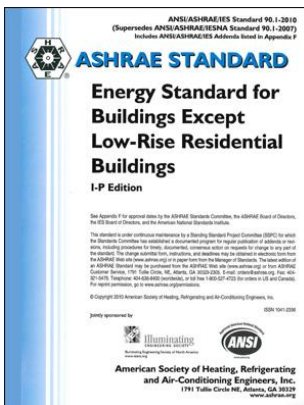
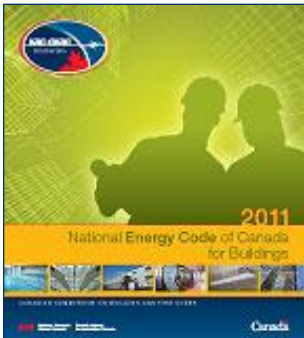
Key details:

NECB

- Window requirements are generally more stringent
- Some curtain wall assemblies may not comply

ASHRAE

- Complex thermal performance consideration





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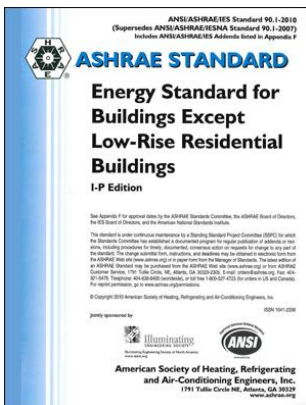
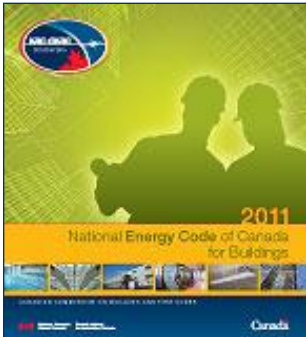
Key details:

NECB

- Heat recovery in ice arena equipment

ASHRAE

- Pool covers
- Heat recovery from fume and kitchen exhaust equipment



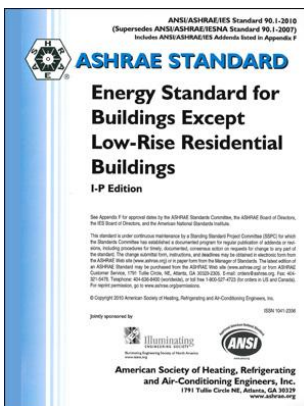
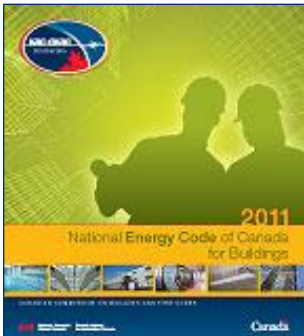


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What's the impact?

- Highly dependent on occupancy
- Possibly unfamiliar standards
- New approaches and designs
- Regional considerations



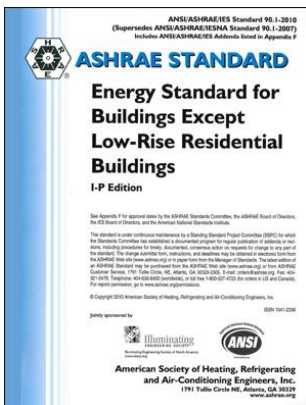
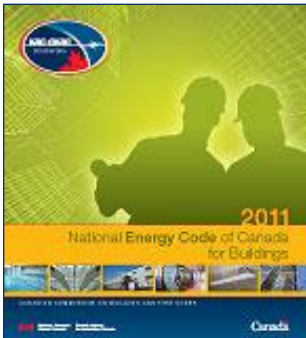


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What's the impact?

- Integrated design with trade-offs
- Controls and system maintenance vs. envelope design and thermal performance
- The tenant variable



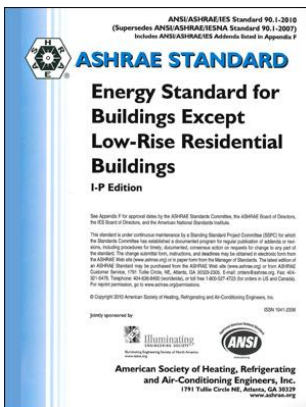
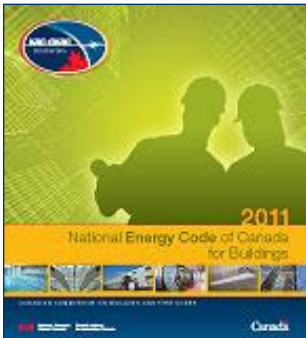


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Referenced studies:

- *BC Energy Code Comparison – Stantec (2012)*
- *ASHRAE 90.1 2010 and NECB 2011 Cross Canada Comparison – Caneta Research (2012)*
- *ASHRAE 90.1-2004, ASHRAE 90.1-2010 and NECB 2011 for British Columbia – Enersys Analytics (2011)*





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•ASHRAE Checklist

very soon

•NECB Checklist

soon

•Education



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- **Part 9 (Small Buildings)**

- ~~Insulation tables~~

- 9.36. – Energy Efficiency

new

- 9.32. – Ventilation

updated

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 - ~~Insulation tables~~
 - 9.32. – Ventilation

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National Research
Council Canada

Conseil national
de recherche Canada

BOOK I: GENERAL | VOLUME ONE

Public Review

housing.gov.bc.ca/building



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