



**Building to the Energy Step Code:  
Single Family Dwellings and Duplexes**

**No.: BUILDING-38**  
**Date: 2018-09-05**  
**Rev.: 2019-03-13**

**Purpose:**

To inform applicants and designers of new single family and duplex buildings about BC Energy Step Code requirements.

- Refer to Appendix 1 for Step Code Performance Targets.
- Refer to Bulletin Building-37 for projects requiring Development Permits.

**Background:**

On July 16, 2018, Richmond City Council adopted Bylaw 9769 that requires new buildings to be constructed to the energy efficiency targets set under the BC Energy Step Code.

**Implementation:**

**Requirements at Building Permit Submission:**

Effective September 1, 2018, all building permit applications for new single family and/or duplex buildings, must be accompanied with either:

Compliance Pathway	
9.36.6: Energy Step Code <i>Energy Advisor required</i>	9.36.5: Energy Performance <i>Registered Professional required</i>
<ol style="list-style-type: none"> <li>1. <b>BC Energy Compliance Report: Pre-Construction</b> form<sup>1</sup> completed by a <b>Certified Energy Advisor</b>, licensed by Natural Resources Canada.</li> <li>2. Printed copy of HOT2000 Full House report.</li> <li>3. Printout of an email from the Energy Advisor's Service Organization acknowledging receipt of the "p-file" corresponding to the HOT2000 Full House Report.</li> <li>4. For each Energy Advisor, a copy of a valid certificate of insurance for no less than \$2 million of general liability insurance and \$1 million in errors and omissions insurance.</li> <li>5. Plan drawings clearly showing all energy efficiency upgrades noted in Section B of the <i>BC Energy Compliance Report: Pre-Construction</i> form. List all Section B upgrades on the front sheet of plan drawings.</li> <li>6. A printed copy of a City of Richmond Business License for the Energy Advisor.</li> </ol>	<ol style="list-style-type: none"> <li>1. <b>BC Energy Compliance Report: Pre-Construction</b> form<sup>1</sup> completed by a <b>Registered Professional</b>.</li> <li>2. Printed copy of the HOT2000 Full House report or alternative energy model stamped and sealed by a Registered Professional.</li> <li>3. Electronic copy of the building energy model (provided on CD-ROM or USB flash drive).</li> <li>4. For each Registered Professional Schedule F, A, B, and E with a certificate of insurance.</li> <li>5. Plan drawings clearly showing all energy efficiency upgrades noted in Section B of the <i>BC Energy Compliance Report: Pre-Construction</i> form. List all Section B upgrades on the front sheet of plan drawings.</li> <li>6. A printed copy of a City of Richmond Business License for the Registered Professional.</li> </ol>

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<sup>1</sup> Download the *BC Energy Compliance Report: Pre-Construction* at: <https://energystepcode.ca/for-industry/>

**Requirements at Frames Building Inspection:**

1. Pre-drywall blower door test\* conducted by an Energy Advisor or a Registered Professional.
  - a. A pre-drywall blower door test result that is **more than 1.5 ACH<sub>50</sub> above** the proposed value in the energy compliance report OR with sub-standard energy-efficiency upgrades will be required to improve the airtightness and/or energy performance of the building.
  - b. A second pre-drywall blower door test\* and/or new verification report may be required.
2. A **BC Energy Compliance Report: Mid-Construction** form<sup>2</sup>, completed by the Energy Advisor or Registered Professional, indicating pre-drywall blower door test results and verification of all building energy efficiency upgrades.

<b>Compliance Pathway</b>	
<b>9.36.6: Energy Step Code</b> <i>Energy Advisor required</i>	<b>9.36.5: Energy Performance</b> <i>Registered Professional required</i>
1. Post-construction blower door test conducted by an Energy Advisor or a Registered Professional. <ul style="list-style-type: none"> <li>• <i>The building inspector must be provided two days advance notice of a scheduled blower door test so that they may choose to attend this test.</i></li> </ul>	1. Post-construction blower door test conducted by an Energy Advisor or a Registered Professional. <ul style="list-style-type: none"> <li>• <i>The building inspector must be provided two days advance notice of a scheduled blower door test so that they may choose to attend this test.</i></li> </ul>
2. A <b>BC Energy Compliance Report: As-Built</b> form, <sup>3</sup> completed by an Energy Advisor, indicating post-construction blower door test results and verification of all building energy efficiency upgrades. <ul style="list-style-type: none"> <li>• <i>Note: The post-construction blower door test result must be used by the Energy Advisor in the HOT2000 “n-file” energy model of the building as constructed.</i></li> </ul>	2. A <b>BC Energy Compliance Report: As-Built</b> form <sup>3</sup> , completed by the Registered Professional, indicating post-construction blower door test results and verification of all building energy efficiency upgrades. <ul style="list-style-type: none"> <li>• <i>Note: The outputs of the energy model must be signed and sealed by a Registered Professional.</i></li> </ul>
3. Printed copy of the as-built HOT2000 Full House report.	3. Printed copy of the as-built HOT2000 Full House report or alternative energy model, stamped and sealed by a Registered Professional.
4. Printout of an email from NRCan accepting the HOT2000 “n-file” energy model corresponding to the as-built HOT2000 Full House Report.	4. A revised electronic copy of the as-built energy model.
5. An EnerGuide Rating System home energy label affixed on or near the electrical panel within each dwelling unit in each building.	5. EnerGuide Rating System, Passive House Certification or other home energy label* affixed on or near the electrical panel within each dwelling unit in each building. <ul style="list-style-type: none"> <li>• <i>Information required for a valid Home Energy Label is listed in Appendix 3. Information on the Label may be available online and does not include any personal information.</i></li> </ul>

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<sup>2</sup> Download the *BC Energy Compliance Report: Mid-Construction* form here: [not yet available]

<sup>3</sup> Download the *BC Energy Compliance Report: As Built* at: <https://energystepcode.ca/for-industry/>

**Non-compliance with Energy Step Code targets:**

If a building does not meet the BC ESC targets, a building inspector *may* issue an inspection notice for occupancy, if the applicant demonstrates all reasonable measures were taken to improve the energy performance of the building. The following requirements must also be completed:

- a. Another post-construction blower door test conducted by a Certified Energy Advisor or Registered Professional.
- b. A revised **BC Energy Compliance Report: As-Built** form<sup>3</sup> completed by the Energy Advisor or Registered Professional, indicating post-construction blower door test results and verification of all building energy efficiency upgrades.
- c. The building constructed must demonstrate compliance to an alternative energy efficiency performance or prescriptive requirements set out in the building code for Part 9 construction

**For any further information, please contact the Sustainability Department at 604-276-4000.**

See attached



## Appendix 1: Energy Step Code Performance Targets (adopted December 2018)





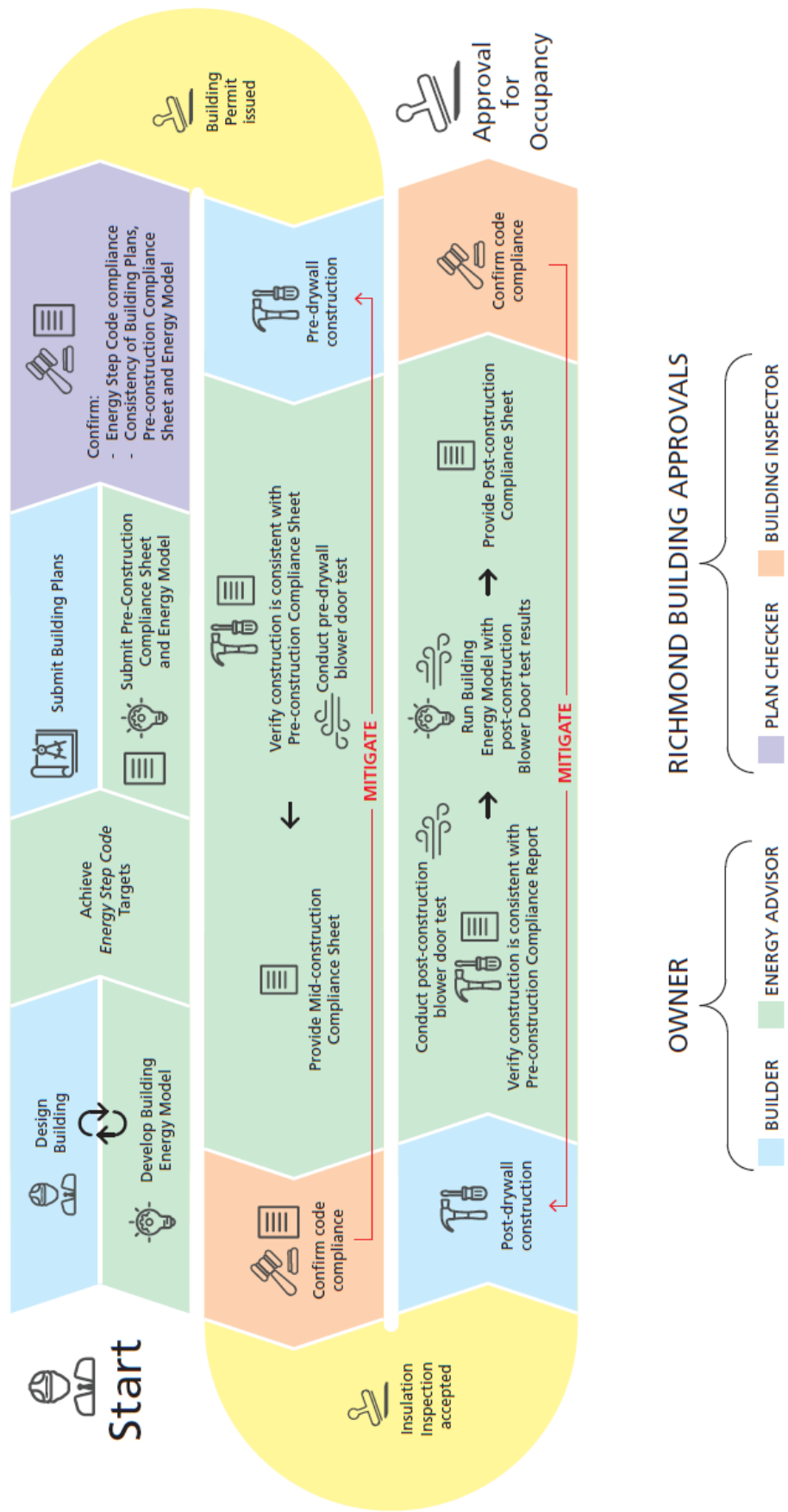
Requirements For Part 9 Buildings Located In Climate Zone 4						
	Airtightness		Equipment & Systems			Building Enclosure
	 Air changes per hour at 50 Pa pressure differential		 % < REF	OR	 MEUI	 TEDI (kWh/(m <sup>2</sup> ·year))
STEP 1			0%			
STEP 2	≤ 3.0		10%	OR	see below	35
STEP 3	≤ 2.5		20%	OR	see below	30
STEP 4*	≤ 1.5		40%	OR	see below	20
STEP 5*	≤ 1.0				see below	15
MEUI Targets per Building Size and Whether the Building is Designed and Constructed with or without a Cooling System (kWh/(m <sup>2</sup> ·year))						
	≤ 50 m <sup>2</sup> (538 ft <sup>2</sup> )	≤ 75 m <sup>2</sup> (807 ft <sup>2</sup> )	≤ 120 m <sup>2</sup> (1292 ft <sup>2</sup> )	≤ 165 m <sup>2</sup> (1776 ft <sup>2</sup> )	≤ 210 m <sup>2</sup> (2357 ft <sup>2</sup> )	> 210 m <sup>2</sup> (2357 ft <sup>2</sup> )
Buildings Designed and Constructed with No Cooling System						
STEP 2	135	120	90	75	65	60
STEP 3	120	100	75	63	53	50
STEP 4*	90	80	60	48	40	40
STEP 5*	65	55	40	30	25	25
Buildings Designed and Constructed with Cooling System						
STEP 2	170	148	108	85	73	65
STEP 3	155	128	93	73	60	55
STEP 4*	125	108	78	58	48	45
STEP 5*	100	83	58	40	33	30

Image Source: BC Housing, 2018

# How the Energy Step Code fits into the Building Permit Process for new Part 9\* Residential Development



\*detached, duplex, townhouse, 3-storey wood-frame apartment



## Appendix 3: Requirements for Home Energy Labels

As an administrative requirement for occupancy, the City of Richmond requires that an energy label be affixed on next to the electrical panel in each housing unit where an electrical panel is present.

The following energy labels are acceptable:

- EnerGuide Rating System energy label, OR
- Passive House Certificate OR
- An comparable energy label including all required information

The “comparable energy label” can be used when:

- Energy modellers are using software tested in accordance with ANSI/ASHRAE 140 Evaluation of Building Energy Analysis Computer Programs;
- Energy advisors not registered with the EnerGuide Rating System use Hot2000 to model a home and produce a BC Energy Compliance Report; OR
- Registered energy advisors are using HOT2000 but are unable to produce a formal EnerGuide Rating System home energy label. (e.g. when energy advisors use HOT2000 to model a townhome or row home as-a-building rather than as a unit). Note also that when EnerGuide Rating System energy advisors are using alternate energy modelling and blower door testing procedures they are not able to produce an EnerGuide home energy label.

“Comparable energy labels” must include the following information:

<b>Address:</b>	<ul style="list-style-type: none"> <li>• The street address of the home.</li> </ul>
<b>Modeller:</b>	<ul style="list-style-type: none"> <li>• The date that the evaluation was conducted.</li> <li>• The company name and name of energy modeller that conducted the evaluation.</li> <li>• The name of the entity that provides quality assurance.</li> </ul>
<b>Energy Rating:</b>	<ul style="list-style-type: none"> <li>• Energy Rating: Energy consumption of the home in GJ per year, including baseloads.</li> <li>• Reference House Energy Rating: Reference house energy consumption in GJ per year, with baseloads.</li> </ul>
<b>Energy Metrics:</b>	<ul style="list-style-type: none"> <li>• Rated Annual Energy Consumption: Energy consumption GJ per year, broken down by fuel type (Natural Gas, Electricity, Oil, and Propane).</li> <li>• Breakdown of Rated Annual Energy Consumption by system: Percentage of total energy consumption GJ per year by end use (space heating, space cooling, water heating, ventilation, lights &amp; appliances, and other electrical)</li> <li>• Rated On-site Renewable Energy Contributions: Energy generated annually from onsite renewable sources (solar PV, wind, solar hot water).</li> <li>• Rated Energy Intensity: Measured in gigajoules per square meter per year.</li> <li>• Rated Greenhouse Gas Emissions: Annual amount of greenhouse gases emitted in tonnes/year.</li> <li>• Total Heated Floor Area: The total usable heated floor area of the building unit, including all above-grade heated areas regardless of ceiling height, and all below-grade heated areas with a ceiling height of more than 1.2m (i.e. basements).</li> </ul>