City of Coquitlam | Planning and Development | Building Permits Division

# GUIDE

# ENERGY STEP CODE BUILDING PERMIT APPLICATION AND INSPECTION REQUIREMENTS

**OVERVIEW**

This guide is intended to assist the applicant with their Step Code building permit application and inspection requirements. This is only an example of the information required for a drawing set submission and is not intended to be reproduced for a building permit application.

**WHAT IS THE ENERGY STEP CODE?**

The Energy Step Code is currently a compliance path in the BC Building Code. It is a performance-based standard that establishes measurable requirements for energy efficiency in construction. To demonstrate compliance, a builder must prove that the building meets or exceeds a set of defined metrics for building envelope, equipment and systems, and air tightness. The adoption of the Energy Step Code system is expected to help reduce community-wide energy use and support the goals of the City's recently-adopted Climate Adaptation Strategic Plan and the upcoming Environmental Sustainability Plan.

The Province of British Columbia's CleanBC report has also indicated that all new construction will be required to be 20% more energy efficient by 2022 and "net zero ready" by 2032.

Staged adoption of the Energy Step Code will give builders and the City of Coquitlam time to work through the challenges associated with changes in building methods, prior to being mandated through the Provincial Building Code.

**IMPLEMENTATION**

Effective September 1, 2021, Step 2 of the BC Energy Step Code will apply to all new City of Coquitlam building permit applications for single family, two-family dwellings and City of Coquitlam Housing Choices buildings.

**COMPLIANCE PATHWAYS**

Compliance with the current Energy Step Code targets, required by the City of Coquitlam, shall be demonstrated through energy modelling provided by a National Resources Canada (NRCan) registered Energy Advisor or a Registered Professional.

All building permit applications for new single and semi-detached buildings must demonstrate compliance by either the EnerGuide Rating System or an Energy Performance Compliance Pathway.

**DOCUMENTATION FOR PERMIT APPLICATION**

Compliance with the current Energy Step Code targets, required by the City of Coquitlam, shall be demonstrated through energy modelling provided by a National Resources Canada (NRCan) registered Energy Advisor or a Registered Professional.

Documentation pertaining to the Energy Efficiency design shall be submitted electronically to stepcodeapplicationdocuments@coquitlam.ca. The email's subject line shall specify the site address, followed by "- Step Code Reports". For example: 3000 Guildford Way – Step Code Reports. Assessment of these documents will be performed during the regular building permit review process.

| **a) Compliance Pathway: 9.36.6 – Energy Step Code EnerGuide Rating System (City's preferred pathway)**<br>*Certified Energy Advisor (licensed by Natural Resources Canada) required* | |
|---|---|
| | Document |
| 1 | BC Energy Compliance Report: Pre-Construction Report, **including Section F**, completed by a Certified Energy Advisor[1] |
| 2 | Energy Model Full House Reports,<br>House with Standard Operating Conditions or the Proposed House, and EnerGuide Rating System Reference House or the Reference House |
| 3 | A copy of the BC Energy Step Code Compliance Calculator[2] (see Appendix 3, for an sample) |
| 4 | Two (2) sets of plan drawings clearly showing all energy efficiency upgrades noted in Section B of the BC Energy Compliance Report: Pre-Construction Form.<br>**First page of Pre-Construction Form must be duplicated on the assemblies sheet of the drawings** |
| 5 | If the EnerGuide Rating System is utilized, the EnerGuide Homeowner Information Sheet package[3] |
| 6 | 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 |

| **b) Compliance Pathway: 9.36.5 – Energy Performance Compliance Pathway**<br>*Registered Professional required* | |
|---|---|
| | Document |
| 1 | BC Energy Compliance Report: Pre-Construction Report, **including Section F**, completed by a Registered Professional |
| 2 | Full energy modelling report[4] signed and sealed by a Registered Professional for **both** reference and proposed houses |
| 3 | Two (2) sets of plan drawings clearly showing all energy efficiency upgrades noted in Section B of the BC Energy Compliance Report: Pre-Construction Form.<br>**Please list all upgrades on the front sheet of plan drawings** |
| 4 | For each Registered Professional, Schedule B |

**NOTE:** Specifications outlined in the Pre-Construction Report will be used as a reference for building inspections.

[1] Certified Energy Advisor

[2] BC Energy Step Code Compliance Calculator

[3] Information Sheet Package

[4] As per AIBC and EGBC's Joint Professional Practice Guidelines for Whole Building Energy Modelling Services (2018)

**GENERAL INFORMATION**

Any physical change to the building such as; adding floor area, door or window sizes/ locations, adding or removing a secondary suite that is not part of the approved design drawing package may result in the permit being suspended until either a:

i) decision is made to correct the building construction to reflect the approved design drawing package; or

ii) revised design drawing package and revised energy modeling has been submitted and approved.

**REQUIREMENTS FOR BUILDING INSPECTION**

- **MID-CONSTRUCTION AIRTHIGHTNESS TEST**
  An Air Tightness Test shall be performed by the Energy Advisor or Registered Professional and witnessed by a Building Official at the appropriate stage of construction. The appropriate stage will be dependent on the location of the air barrier system.
  **Example:** Interior air barrier; prior to the insulation inspection, before the interior finishes are installed. Exterior air barrier; after the exterior air barrier and capillary break (drainage cavity) is installed.

  Provide a completed copy of the Mid Construction: BC Standard Verification Report[5], to be submitted electronically. This shall be submitted electronically to the email address[6] below

  *The Building Official must be given two (2) days advance notice of the blower door test, so they may choose to attend this test.*

**Note:** The Mid Construction Airtightness Test Report includes confirmation from the Energy Advisor or Registered Professional stating the building, as constructed to date, conforms to the energy model submitted and is on track to achieve the required Energy Step Code performance.

**REQUIREMENTS AT FINAL BUILDING INSPECTION**

- **POST-CONSTRUCTION AIRTIGHTNESS TEST**
  An Airtightness Test shall be performed by the Energy Advisor or Registered Professional and witnessed by a Building Official.

  *The Building Official must be given two (2) days advance notice of the blower door test, so they may choose to attend this test.*

**Prior to booking a Final Building Inspection**, the following shall be submitted electronically to the email address[6] below:

i) BC Energy *As-Built* Construction Compliance Report, including Section F;

ii) *As-Build* Energy Model Full House Report:
   a. House with Standard Operating Conditions or the Proposed House; and
   b. EnerGuide Rating System Reference House or Reference House

iii) If applicable, confirmation email from National Resources Canada (NRCan), accepting the HOT2000 "N-file".

[5] BC Energy Step Code Mid-Construction BC Standard Verification Report
[6] stepcodeinspectiondocuments@coquitlam.ca

| a) Compliance Pathway: 9.36.6 – EnerGuide Rating System Energy Step Code<br>*Certified Energy Advisor (licensed by Natural Resources Canada) required* | | |
|---|---|---|
| | Document | Electronic (Emailed)[7] |
| 1 | BC Energy Compliance Report: **As-Built** Report, **including Section F,** completed by an Energy Advisor, indicating post-construction blower test results and verification of all building efficiency upgrades.<br>**NOTE:** The post-construction blower test result must be used by the Energy Advisor in the HOT2000 model of the As-Built house | ✓ |
| 2 | HOT2000 Full House Report for both the **As-Built** and **Reference** houses | ✓ |
| 3 | Confirmation email from NRCan, accepting the HOT2000 "N-file" corresponding to the **As-Built** HOT2000 Full House Report | ✓ |

| b) Compliance Pathway: 9.36.5 – Energy Performance Compliance Pathway<br>*Registered Professional required* | | |
|---|---|---|
| | Document | Electronic (Emailed) |
| 1 | BC Energy Compliance Report: **As-Built** Report, **including Section F**, completed by a Registered Professional, indicating post-construction blower door test results and verification of all building efficiency upgrades | ✓ |
| 2 | Full House Report or alternative energy modelling report, stamped and sealed by a Registered Professional for both the **As-Built** and **Reference** Houses | ✓ |

**HOME ENERGY LABELS**

The City of Coquitlam requires that the EnerGuide label, or a "comparable" home energy label, be affixed on or near the electrical panel within each dwelling unit in each building. See Appendix 1, for more details.

**REFERENCES**

BC Energy Step Code
BC Energy Compliance Reports
Certified Energy Advisor
BC Energy Step Code Compliance Calculator
Information Sheet Package
BC Energy Step Code Mid-Construction BC Standard Verification Report

**This information is provided for convenience only and is not in substitution of applicable City Bylaws, Provincial or Federal laws and regulations. Always refer to official documents. The City is not responsible for errors found in copies or alterations of this document.**

**APPENDIX 1: REQUIREMENTS FOR HOME ENERGY LABELS**

As an administrative requirement, the City of Coquitlam requires that an energy label be affixed on or 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
- A "comparable" energy label, as defined below.

A "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); OR
- Energy advisors are using alternative energy modelling tools and blower door testing procedures and hence are not able to produce an EnerGuide home energy label.

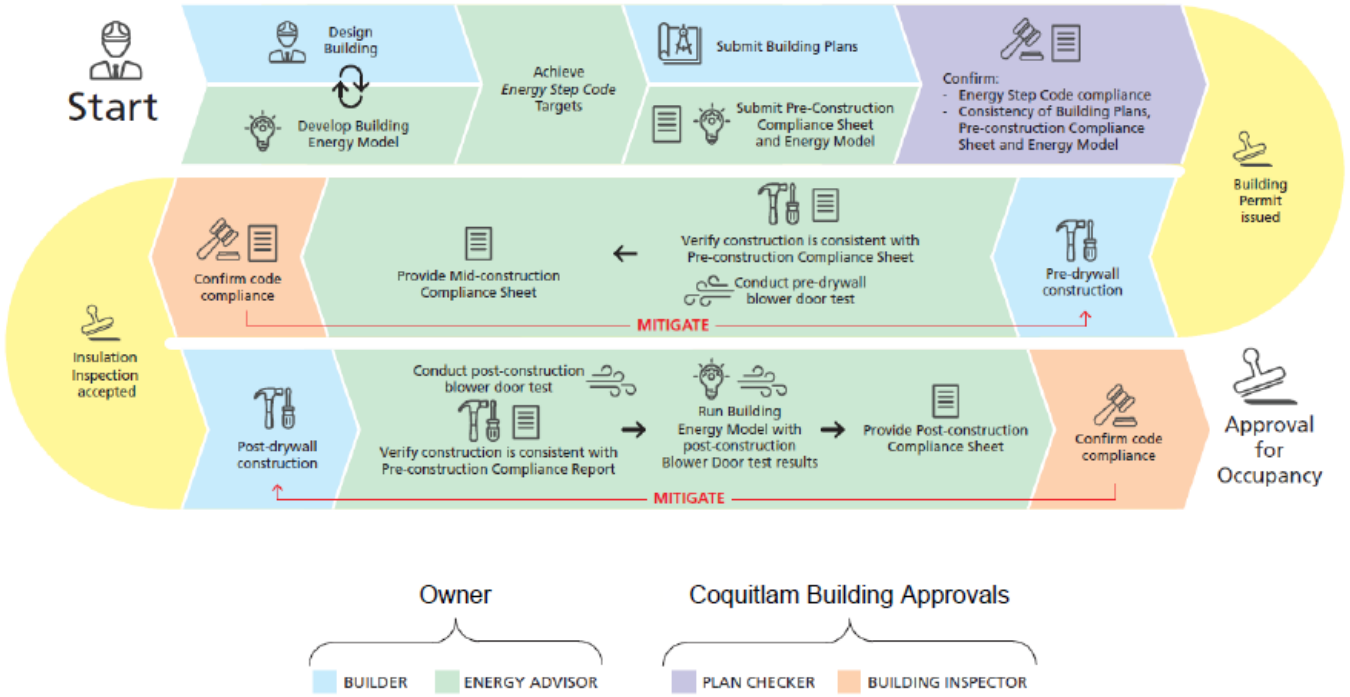
A "comparable" energy label must include the following information:

| | |
|---|---|
| **Address:** | • The civic address of the home |
| **Modeller:** | • The date that the evaluation was conducted<br>• The company name and name of the energy modeler that conducted the evaluation<br>• The name of the entity that provides quality assurance |
| **Energy Rating:** | • Energy Rating: Energy consumption of the home in GJ per year, including baseloads<br>• Reference House Energy Rating: Reference house energy consumption in GJ per year, including baseloads |
| **Energy Metrics:** | • Rated Annual Energy Consumption: Energy consumption GJ per year, broken down by fuel type (Natural Gas, Electricity, Oil and Propane)<br>• Breakdown of Rated Annual Energy Consumption by system: Percentage of total energy consumption GJ per year end use (space heating, space cooling, water heating, ventilation, lights & appliances, and other electrical)<br>• Rated On-site Renewable Energy Contributions: Energy generated annually from onsite renewable sources (solar PV, wind, solar hot water)<br>• Rated Energy Intensity: Measured in GJ per square meter per year<br>• Rated Greenhouse Gas Emissions: Annual amount of greenhouse gases emitted in tonnes of $CO_2$ per year<br>• 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 1.2 m (i.e. basements). |

**APPENDIX 2: ENERGY STEP CODE REGULATORY PROCESS**

# Energy Step Code Regulatory Process

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



# APPENDIX 3: ENERGY STEP CODE COMPLIANCE CALCULATOR

## BC Energy Step Code Compliance Calculator

BCBC 2018 REVISION 2 - EFFECTIVE 2019-12-12

**Instructions:**

**This calculator is to be used in conjunction with the BC Energy Compliance Report Instruction Manual**

**HOT2000 Data Colour Codes:** Proposed house data | As-Built house data

*Note: House data cells are formatted to no longer be coloured when data has been entered. Look for coloured cells to verify all required data has been entered. For Data Sources in the Reports, see the Report Guide tab.*

1) **Using HOT2000:** Set HOT2000 to metric. Enter data from the HOT2000 file in the Yellow Cells. Enter all values to the hundredth decimal place (2 numbers after the decimal).
See Hot2000 Data tab for alphabetically labelled screenshots to identify where to access the information for HOT2000 data.
2) **Climate & Cooling Information:** Select the step level. Select the climate zone. Enter the cooling system capacity in Watts only when the annual energy consumption of cooling is included in the MEUI Metric (i.e. in the ERS GJ rating)
3) **Results:** The Compliance Calculator will indicate which of the metrics are compliant (Green) or non-compliant (Red), and whether the house met the required Step
4) **Data Transfer:** All results and applicable numbers auto-populate in the appropriate Reports. See Report Guide tab for more infor as needed.
5) **Data Entry:** Contact and property information must be manually entered in the Pre-Construction Report. The As-Built Report auto-populates based on the Pre-Construction Report and As-Built Calculator results
6) **HOT2000 Entry:** In the HOT 2000 file enter "CODECO" into info field 8

| The following columns are used to calculate: | | A | | | B | C | D | E | F | G | H | H | H | I | J | K | L | M | N | O | P | Q | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P & N File #'s: | Heated Floor Area (m2) | | | Baseloads (GJ) | Total AEC (GJ) | ERS Reference House (GJ) | Building Envelope Surface Area ($m^2$) | ACH @ 50Pa | Airtightness NLA @ 10 Pa ($cm^2/m^2$) | Auxiliary Energy Required (MJ) | PROPOSED[1] Auxiliary Energy Required (MJ) | REFERENCE Auxiliary Energy Required (MJ) | Design Cooling Load (Watts) | Cooling System Capacity[2] (Watts) | Design Heat Loss (Watts) | Estimated Greenhouse Gas Emissions[3] (tonnes/year) | Electricity Consumption (kWh) | Natural Gas Consumption ($m^3$) | Propane Consumption (L) | District Energy Consumption (MJ) | On-Site Renewables (MJ) | Other (GJ) |
| | | Above Grade | Below Grade | Total | | | | | | | | | | | | | | | | | | | |
| Proposed | | 323.30 | 153.10 | 476.40 | 30.69 | 134.08 | 139.11 | 937.29 | 4.00 | 2.0971 | 76,272 | | | 9,901 | 11,515 | 13,545 | 13.752 | 11,021 | 2,534 | | | | |
| Proposed Reference | | | | | | | | | 2.50 | 1.3107 | 70,007 | | | | | 13,156 | 14.128 | 11,206 | 2,651 | | | | |
| As-Built | | | | 0.00 | | | | | | | | | | | | | | | | | | | |
| As-Built Reference | | | | | | | | | 2.50 | | | | | | | | | | | | | | |

**Climate & Cooling Information - MANDATORY**

| | | |
|---|---|---|
| SELECT Step Level: | Proposed: | 1 |
| | As-Built: | |
| Climate Zone (Enter HDD in cell D30): | 5 - 3000 to 3999 | |
| ENTER Heating Degree Days (HDD): | 3,200 | |
| Cooling System Capacity (Watts) | Proposed: | 11,515 |
| | As-Built: | 0 |

**NOTE: To assess compliance with the MUEI,** the percentage (%) of the building's conditioned space served by Space-Cooling Equipment uses the ratio of the Cooling System Capacity to the Design Cooling Load calculated by HOT2000 as a proxy for the building's conditioned space. See Appendix X in the manual.

More than 50% of the Building's Conditioned Space

**Footnotes**

1) see Section 5 in the Compliance Reports Instruction Manual for instructions on setting up the proposed house for %TEDI calculations

2) Cooling System Capacity will not be shown in the Full House Report if there is no cooling system modelled. In this case, leave the field blank.

3) Enter to the thousandth (3) decimal place for GHG

**D: 9.36.6. ENERGY STEP CODE COMPLIANCE**

**Proposed House Rated Energy Consumption (GJ/year):** 103 **Reference House Rated Energy Target (GJ/year):** 108

| Proposed House Metrics | Unit | Required | | Proposed Calculations: Proposed House | Proposed House |
|---|---|---|---|---|---|
| Step Code Level | Step 1, 2, 3, 4 or 5 | 1 | | | Pass or Fail |
| Mechanical Energy Use Intensity (MEUI) - *Requires HOT2000 Design Cooling Load (Watts) to be entered* | kWh/($m^2$-year) | - | *(max)* | 60 | Pass |
| ERS Rating % Lower Than EnerGuide Reference House, where applicable | % | 0 | *(min)* | 4.6 | |
| Thermal Energy Demand Intensity (TEDI) | kWh/($m^2$-year) | - | *(max)* | 44 | Pass |
| Adjusted TEDI | kWh/($m^2$-year) | - | *(max)* | 44 | |
| Building Envelope % Better | % | - | *(min)* | | |
| Airtightness in Air Changes per Hour at 50 Pa differential | ACH @ 50 Pa | - | *(max)* | 4.00 | Pass |
| | | | Step Code Requirements Met: | Yes | |

TRUE