



Working with an
Energy Advisor

Navigating BC
Energy Step
Code 9.36.6

1: Engage An Energy Advisor

Energy Advisors:

- ✓ Licenced by NRCan
- ✓ Construction knowledge
- ✓ Trained to use HOT2000 software
- ✓ Standard modeling and testing procedures through EnerGuide Rating System
- ✓ QA by Service Organization and NRCan.

1: Engage An Energy Advisor



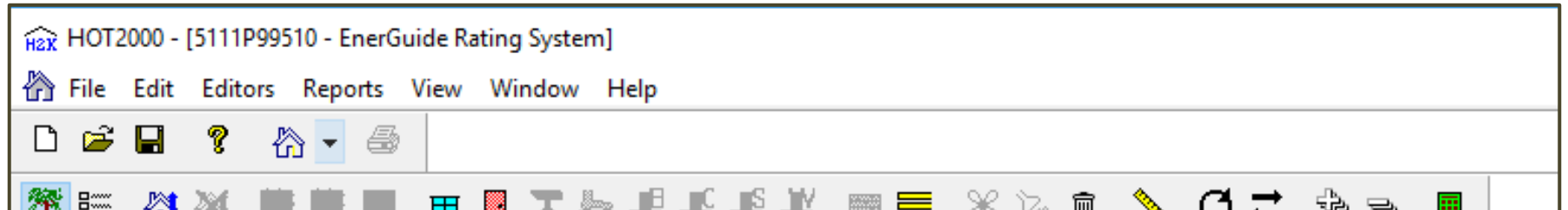
1: Engage An Energy Advisor

Prior to Building Permit Application:

Engage your Energy Advisor early in the design process!



2: Energy Advisor Models the Building



Base

Upgrade

Advanced

EnerGuide Rating System Results

Rating	128	GJ/a	Reference House	157	GJ/a
Energy Use Intensity	0.40	GJ/m ² /a	% Lower Than Ref Hse	18.5	%
Greenhouse Gases	5.3	t/a			

Generation

- Natural Air Infiltration
- Ventilation
- Heating/Cooling System
- Domestic Hot Water
- EnerGuide Rating System

Corners: 6 Intersections: 2

R-Value: 21.52 R

☐ Adjacent to Enclosed Unconditioned Space

3: Compare Baseline to Step Code Targets

HOT2000 outputs used to calculate Step Code Metrics:

- ✓ % lower energy than reference house
- ✓ MEUI
- ✓ TEDI
- ✓ PTL
- ✓ Air Changes per Hour

3: Compare Baseline to Step Code Targets

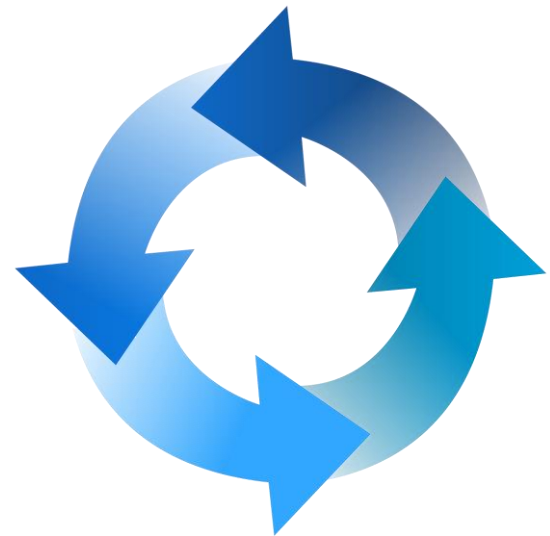
CLIMATE ZONE 4

Step level	Energy Modelling	AIRTIGHTNESS (AIR CHANGES PER HOUR AT 50 PA PRESSURE DIFFERENTIAL)	PERFORMANCE REQUIREMENT OF BUILDING EQUIPMENT AND SYSTEMS	PERFORMANCE REQUIREMENT OF BUILDING ENVELOPE
Step 1	Required	N/A	EnerGuide Rating % lower than EnerGuide Reference House: not less than 0% lower energy consumption or Conform to Subsection 9.36.5	
Step 2 10% Beyond Code	Required	+ 3.0 ACH ₅₀	+ 10% lower than ERS v15 ref. house OR MEUI ≤ 60kWh/m ² ·year	+ TEDI ≤ 45 kWh/m ² ·year OR PTL ≤ 35 W/m ²
Step 3 20% Beyond Code	Required	2.5 ACH ₅₀	20% lower than ERS v15 ref. house OR MEUI ≤ 45kWh/m ² ·year	TEDI ≤ 40 kWh/m ² ·year OR PTL ≤ 30 W/m ²
Step 4 40% Beyond Code	Required	1.5 ACH ₅₀	40% lower than ERS v15 ref. house OR MEUI ≤ 35kWh/m ² ·year	TEDI ≤ 25 kWh/m ² ·year OR PTL ≤ 25 W/m ²
Step 5	Required	1.0 ACH ₅₀	MEUI ≤ 25kWh/m ² ·year	TEDI ≤ 15 kWh/m ² ·year OR PTL ≤ 10 W/m ²

4: Energy Advisor & Builder Develop Plan of Action

HOT2000 iterations evaluate potential upgrades:

- ✓ Envelope upgrades (insulation, fenestration, air tightness, thermal bridging, etc)
- ✓ Mechanical system upgrades
- ✓ Heat recovery
- ✓ Mid-Construction Blower Fan Testing



5: Energy Advisor Completes BC Energy Compliance Report Pre Construction Building Permit Application Made

PRE-CONSTRUCTION

BC ENERGY COMPLIANCE REPORT - PERFORMANCE PATHS FOR PART 9 BUILDINGS

For Buildings Complying with Subsection 9.36.5. or 9.36.6. of the 2012 BC Building Code (see BCBC Article 2.2.8.3. of Division C)

A: PROJECT INFORMATION

Building Permit #:	<input type="text"/>	Building Type:	<input type="text" value="Please Select Building Type"/>
Builder:	<input type="text"/>	If Other, Please Specify:	<input type="text"/>
Project Address:	<input type="text"/>	Number of Dwelling Units:	<input type="text"/>
Municipality / District:	<input type="text"/>	Climate Zone:	<input type="text" value="Please Select Climate Zone"/>
Postal Code:	<input type="text"/>	PID or Legal Description:	<input type="text"/>

BC Building Code Performance Compliance Path (select one):

☐ 9.36.5. → Complete Sections A, B, C, & E ☐ 9.36.6. → Complete Sections A, B, D, & E

Software Name: Version: Climatic Data (Location):

B: BUILDING CHARACTERISTICS SUMMARY (see BCBC Clause 2.2.8.3 (2)(b) of Division C)

	DETAILS (ASSEMBLY / SYSTEM TYPE / FUEL TYPE / ETC.)	EFFECTIVE RSI-VALUE / EFFICIENCY
EXTERIOR WALLS & FLOOR HEADERS		
ROOF / CEILINGS		
FOUNDATION WALLS, HEADERS, & SLABS	Slab Is: <input type="checkbox"/> Below OR <input type="checkbox"/> Above Frost Line AND <input type="checkbox"/> Heated OR <input type="checkbox"/> Unheated	
FLOORS OVER UNHEATED SPACES		
FENESTRATION & DOORS	FDWR: <input type="text"/> %	
AIR BARRIER SYSTEM & LOCATION		
SPACE CONDITIONING (HEATING & COOLING)		
SERVICE WATER HEATING		
VENTILATION		
OTHER ENERGY IMPACTING FEATURES		

6: Builder Begins Construction

Make sure you build what you agreed on!

- ✓ If changes, notify your Energy Advisor
- ✓ The energy model will need to be updated
- ✓ The BC Energy Compliance Report will need to be updated
- ✓ The architectural plans will need to be updated
- ✓ The City will need to be updated
- ✓ City inspectors will be using the Energy Compliance Report to complete inspections

7: Mid-Construction Blower Door Tests



7: Mid-Construction Blower Door Tests



8: Builder Completes the House

Energy Advisor Confirms Construction Details

Make sure you build what you agreed on!

- ✓ If changes, notify your Energy Advisor, the energy model will need to be updated
- ✓ Complete and pass final Blower Door Test
- ✓ Energy Advisor completes BC Energy Compliance Report As-Built
- ✓ Occupancy Permit granted

Working with an Energy Advisor Recap

- ✓ Engage your Energy Advisor prior to Building Permit
- ✓ Model your house and check performance against Step Code Metrics
- ✓ Run iterations and develop your plan of action, including mid-construction blower door testing
- ✓ Stick to the plan and keep Energy Advisor in the loop throughout all stages of construction
- ✓ Pass final Blower Door Test

AS-BUILT REPORT: SECTION A

A: PROJECT INFORMATION

Building Permit #:

Builder:

Project Address:

Municipality / District:

Postal Code:

Building Type:

If Other, Please Specify:

Number of Dwelling Units:

Climate Zone:

PID or Legal Description:

BC Building Code Performance Compliance Path (select one):

☐ 9.36.5. ➔ Complete Sections A, B, C, & E

☒ 9.36.6. ➔ Complete Sections A, B, D, & E

Software Name:

Version:

Climatic Data (Location):

INSTRUCTIONS: SECTION B

B: BUILDING CHARACTERISTICS SUMMARY (see BCBC Clause 2.2.8.3.(2)(b) of Division C)

	DETAILS (ASSEMBLY / SYSTEM TYPE / FUEL TYPE / ETC.)	EFFECTIVE RSI-VALUE / EFFICIENCY
EXTERIOR WALLS & FLOOR HEADERS	2x6, 16" OC, R22; Headers w/ R22	RSI 2.85
ROOF / CEILINGS	Attic Truss, 24" OC, R40	RSI 6.93
FOUNDATION WALLS, HEADERS, & SLABS	8" Concrete, 2x4, 16" OC, R14; Headers w/ R22 Uninsulated Slab Slab Is: <input checked="" type="checkbox"/> Below OR <input type="checkbox"/> Above Frost Line AND <input type="checkbox"/> Heated OR <input checked="" type="checkbox"/> Unheated	RSI 2.02
FLOORS OVER UNHEATED SPACES	2x11 7/8 TJI, R40	RSI 7.44
FENESTRATION & DOORS	Doors: Steel Insulated Windows: Vinyl, Double Glazed, Argon, Low-E, Insulated Spacer FDWR: 21 %	Doors: U1.4 Win: U1.31 to 1.36 SGHG=0.25 to 0.30
AIR BARRIER SYSTEM & LOCATION	Interior Polyethylene Membrane Barrier	UV-stab 6mil polyethylene
SPACE CONDITIONING (HEATING & COOLING)	Natural Gas Furnace, no cooling Gas fireplace, direct-vented with no standing pilot	Furnace = 95% AFUE Fireplace = 76%
SERVICE WATER HEATING	On-demand Hot Water Heater	0.97 EF
VENTILATION	HRV	SRE at OC=61%, -25C=58%
OTHER ENERGY IMPACTING FEATURES	N/A	

SECTION C

C: 9.36.5. ENERGY PERFORMANCE COMPLIANCE (see Clause 2.2.8.3.(2)(c) of Division C)

Complete this section only if using the Energy Performance Compliance Path in Subsection 9.36.5.

AS-BUILT HOUSE RATED ENERGY CONSUMPTION (GJ/YEAR)	
HVAC	
Hot Water Heating	
SUM	

REFERENCE HOUSE RATED ENERGY TARGET (GJ/YEAR)	
HVAC	
Hot Water Heating	
SUM	

The airtightness value used in the energy model calculations for the As-Built House is:

☐ 4.5 ACH @ 50Pa ☐ 3.5 ACH @ 50Pa OR Tested At ACH @ 50Pa

The above calculation was performed in compliance with Subsection 9.36.5. of Division B: ☐ Yes ☐ No

SECTION D

D: 9.36.6. ENERGY STEP CODE COMPLIANCE (see Sentence 2.2.8.3(3) of Division C)

Complete this section only if using the Energy Step Code Compliance Path in Subsection 9.36.6.

As-Built House Rated Energy Consumption (GJ/year): 44

Reference House Rated Energy Target (GJ/year): 53

METRIC	UNITS	REQUIRED	PROPOSED	AS-BUILT
Step Code Level	Step 1, 2, 3, 4, or 5	3		3
Mechanical Energy Use Intensity (MEUI)	kWh/(m ² ·year)	45 (max)		38
ERS Rating % Lower Than EnerGuide Reference House, where applicable	%	20 (min)		17.1
Thermal Energy Demand Intensity (TEDI)	kWh/(m ² ·year)	40 (max)		26
Peak Thermal Load (PTL)	W/m ²	30 (max)		21
Airtightness in Air Changes per Hour at 50 Pa differential	ACH @ 50 Pa	2.5 (max)		1.8
Step Code Requirements Met: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				

The above calculation was performed in compliance with (see Clause 2.2.8.3.(2)(e) of Division C)

Select One:

- ☐ Subsection 9.36.5.,
- ☐ The Passive House Planning Package (PHPP), version 9 or newer, and the energy model was prepared by a Certified Passive House Designer or Certified Passive House Consultant,
- ☒ The EnerGuide Rating System (ERS), version 15 or newer, or
- ☐ The applicable requirements of NECB Part 8 and the City of Vancouver Energy Modelling Guidelines.

SECTION E

Enter the name of the Service Organization where the file was submitted.

E: COMPLETED BY

Full Name (Print): Jim Advisorman

Company Name: Advisorman Building Tech

Phone: 604-777-999

Address: 123 Cross Road, Vancouver BC

Email: jim@jimssso.ca

Date (dd/mm/yyyy): 01/01/2018

If applicable, enter ERS information:

Advisor ID Number: AAXX

Service Organization: Best SO Ltd

EnerGuide P #: AAXXP00184

EnerGuide N #: AAXXN00184

Enter the date the BC Energy Compliance Report was completed.

SECTION F

SUPPLEMENTARY INFORMATION

Supplementary information is not required for Code Compliance but may be requested by the local municipality/district.

If required, complete the applicable sections below.

F: OTHER ENERGY MODELLING METRICS

METRIC	UNITS	PROPOSED	AS-BUILT
Airtightness NLA@10Pa	cm ² /m ²		0.97
EnerGuide Rating	GJ/year		70
EnerGuide Reference House	GJ/year		79
EnerGuide Rating % Lower Than EnerGuide Reference House House with baseloads	%		11.4
Rated Energy Intensity	GJ/m ² /year		0.21
Rated Greenhouse Gas Emissions	kg/year		2395
Rated Greenhouse Gas Intensity	kg/m ² /year		7.4

SECTION G

G: OPTIONAL CERTIFICATIONS

PENDING:

- ☐ BUILTGREEN®, Level:
- ☐ Certified Passive House
- ☐ CHBA Net Zero House

- ☐ ENERGY STAR® for New Homes
- ☐ LEED® Canada for Homes, Level:
- ☐ R2000
- ☐ Other:

If there is a pending energy labelling certification check the appropriate box and, if relevant, write in the appropriate level of the certification (e.g BUILT GREEN, Level: Gold)

STEP CODE METRICS FOR ENERGY EFFICIENCY: CLIMATE ZONE 4

Step level	Energy Modelling	AIRTIGHTNESS (AIR CHANGES PER HOUR AT 50 PA PRESSURE DIFFERENTIAL)	PERFORMANCE REQUIREMENT OF BUILDING EQUIPMENT AND SYSTEMS	PERFORMANCE REQUIREMENT OF BUILDING ENVELOPE
Step 1	Required	N/A	<div>+</div> EnerGuide Rating % lower than EnerGuide Reference House: not less than 0% lower energy consumption or Conform to Subsection 9.36.5	
Step 2 10% Beyond Code	Required	3.0 ACH ₅₀	10% lower than ERS v15 ref. house OR MEUI ≤ 60kWh/m ² ·year	TEDI ≤ 45 kWh/m ² ·year OR PTL ≤ 35 W/m ²
Step 3 20% Beyond Code	Required	2.5 ACH ₅₀	<div>+</div> 20% lower than ERS v15 ref. house OR MEUI ≤ 45kWh/m ² ·year	<div>+</div> TEDI ≤ 40 kWh/m ² ·year OR PTL ≤ 30 W/m ²
Step 4 40% Beyond Code	Required	1.5 ACH ₅₀	40% lower than ERS v15 ref. house OR MEUI ≤ 35kWh/m ² ·year	TEDI ≤ 25 kWh/m ² ·year OR PTL ≤ 25 W/m ²
Step 5	Required	1.0 ACH ₅₀	MEUI ≤ 25kWh/m ² ·year	TEDI ≤ 15 kWh/m ² ·year OR PTL ≤ 10 W/m ²

Either/Or

ZONE 4 – Example 1

D: 9.36.6. ENERGY STEP CODE COMPLIANCE (see Sentence 2.2.8.3(3) of Division C)

Complete this section only if using the Energy Step Code Compliance Path in Subsection 9.36.6.

As-Built House Rated Energy Consumption (GJ/year):

70

Reference House Rated Energy Target (GJ/year):

73

METRIC	UNITS	REQUIRED	PROPOSED	AS-BUILT
Step Code Level	Step 1, 2, 3, 4, or 5	1		
Mechanical Energy Use Intensity (MEUI)	kWh/(m ² ·year)	- (max)	70	
ERS Rating % Lower Than EnerGuide Reference House, <i>where applicable</i>	%	0 (min)	4	
Thermal Energy Demand Intensity (TEDI)	kWh/(m ² ·year)	- (max)	51	
Peak Thermal Load (PTL)	W/m ²	- (max)	37	
Airtightness in Air Changes per Hour at 50 Pa differential	ACH @ 50 Pa	- (max)	4.5	
Step Code Requirements Met: <input type="checkbox"/> Yes <input type="checkbox"/> No				

ZONE 4 – Example 1

D: 9.36.6. ENERGY STEP CODE COMPLIANCE (see Sentence 2.2.8.3(3) of Division C)

Complete this section only if using the Energy Step Code Compliance Path in Subsection 9.36.6.

As-Built House Rated Energy Consumption (GJ/year):

70

Reference House Rated Energy Target (GJ/year):

73

METRIC	UNITS	REQUIRED	PROPOSED	AS-BUILT
Step Code Level	Step 1, 2, 3, 4, or 5	1		
Mechanical Energy Use Intensity (MEUI)	kWh/(m ² ·year)	- (max)	70	
ERS Rating % Lower Than EnerGuide Reference House, <i>where applicable</i>	%	0 (min)	4	
Thermal Energy Demand Intensity (TEDI)	kWh/(m ² ·year)	- (max)	51	
Peak Thermal Load (PTL)	W/m ²	- (max)	37	
Airtightness in Air Changes per Hour at 50 Pa differential	ACH @ 50 Pa	- (max)	4.5	
Step Code Requirements Met: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				

ZONE 4 – Example 2

D: 9.36.6. ENERGY STEP CODE COMPLIANCE (see Sentence 2.2.8.3(3) of Division C)

Complete this section only if using the Energy Step Code Compliance Path in Subsection 9.36.6.

As-Built House Rated Energy Consumption (GJ/year):

Reference House Rated Energy Target (GJ/year):

METRIC	UNITS	REQUIRED	PROPOSED	AS-BUILT
Step Code Level	Step 1, 2, 3, 4, or 5	3		
Mechanical Energy Use Intensity (MEUI)	kWh/(m ² ·year)	45 (max)	101	
ERS Rating % Lower Than EnerGuide Reference House, where applicable	%	20 (min)	29	
Thermal Energy Demand Intensity (TEDI)	kWh/(m ² ·year)	30 (max)	50	
Peak Thermal Load (PTL)	W/m ²	40 (max)	32	
Airtightness in Air Changes per Hour at 50 Pa differential	ACH @ 50 Pa	2.5 (max)	2.3	
Step Code Requirements Met: <input type="checkbox"/> Yes <input type="checkbox"/> No				

ZONE 4 – Example 2

D: 9.36.6. ENERGY STEP CODE COMPLIANCE (see Sentence 2.2.8.3(3) of Division C)

Complete this section only if using the Energy Step Code Compliance Path in Subsection 9.36.6.

As-Built House Rated Energy Consumption (GJ/year):

22

Reference House Rated Energy Target (GJ/year):

31

METRIC	UNITS	REQUIRED	PROPOSED	AS-BUILT
Step Code Level	Step 1, 2, 3, 4, or 5	3		
Mechanical Energy Use Intensity (MEUI)	kWh/(m ² ·year)	45 (max)	101	
ERS Rating % Lower Than EnerGuide Reference House, <i>where applicable</i>	%	20 (min)	29	
Thermal Energy Demand Intensity (TEDI)	kWh/(m ² ·year)	30 (max)	50	
Peak Thermal Load (PTL)	W/m ²	40 (max)	32	
Airtightness in Air Changes per Hour at 50 Pa differential	ACH @ 50 Pa	2.5 (max)	2.3	
Step Code Requirements Met: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				

YES: Either Or Case

Questions?

Emma Conway

Energy Advisor

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