



#### Fall 2018 Builder & Designer Breakfast

#### **Norm Connolly**

Community Energy Manager City of New Westminster

#### Ryan Coleman

Program Coordinator Energy Save New West

## Agenda

#### **Energy Step Code Implementation Framework for Part 9 Buildings**

- Section 9.36.6 implementation timeline for New Westminster Building Bylaw adoption
- City's draft approach for managing Step Code compliance and verification
- Sneak peak at draft mid-stage air tightness checklist

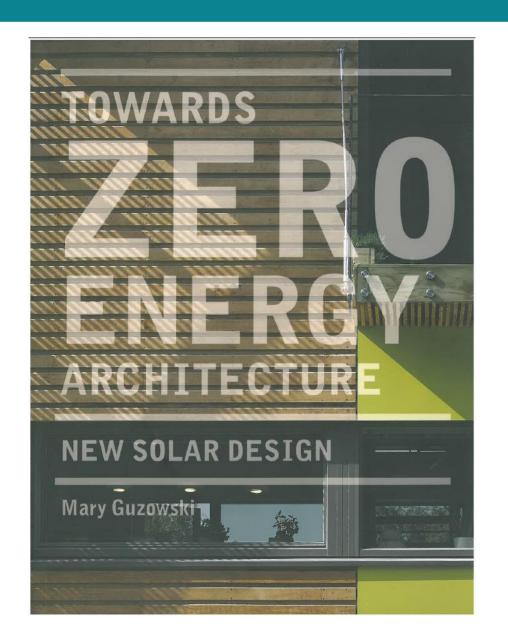
#### **Energy Step Code Performance Metrics**

 Overview of adjustments to Step Code performance metrics for all BC climate zones, effective December 10, 2018.

#### **FortisBC New Home Program**

- Overview of FortisBC's New Home Program supporting the BC Energy Step Code
- Summary of incentives, eligibility requirements and application processes

#### National and Provincial Code Direction



# Pan Canadian Framework on Clean Growth and Climate Change

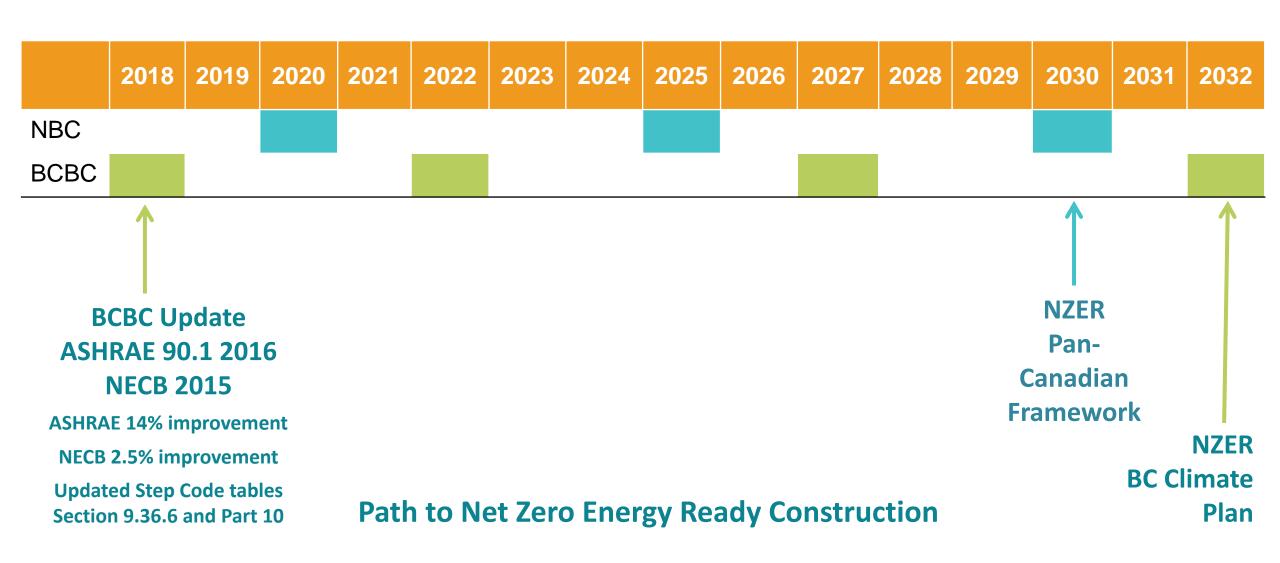
Federal direction for the National Building Code is to adopt increasingly stringent, model building codes starting in 2020, with the goal that all provinces and territories adopt 'net zero energy ready' building requirements by 2030.

#### **BC Climate Leadership Plan**

Intent is for phased updates to the BC Building Code so that all new buildings are 'net zero ready' by 2032, using the Step Code as the framework for setting beyond Code requirements.

Only three Building Code cycles away!

#### National and Provincial Code Updates



## Step Code Implementation in New Westminster

# PART 9 Endorsed by City Council April 2018





Regulated by Part 9 of BC Building Code

Buildings under 600 m<sup>2</sup> (6,458 ft<sup>2</sup>) in floor area





LARGE BUILDINGS
Regulated by Part 3
of BC Building Code
Buildings over 600 m<sup>2</sup>
(6,458 ft<sup>2</sup>) in floor area



PART 3
Recommendation to Council
November 2018



## Part 9 | Performance Path for New Construction



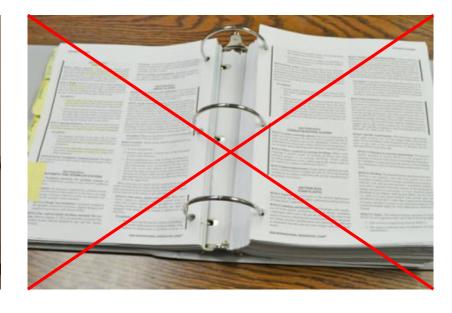
## **Existing Program Equivalencies**



## Performance Path Compliance





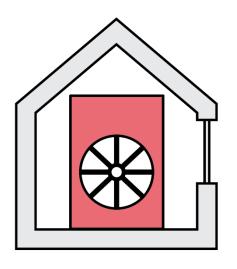


Energy Advisor + Building Energy Modeling

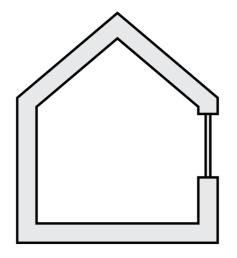
Air-Tightness Testing and Reporting

**No Prescriptive Requirements** 

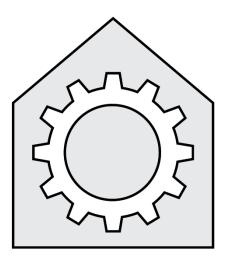
#### Part 9 Performance Metrics



**Airtightness** 



**Envelope** 

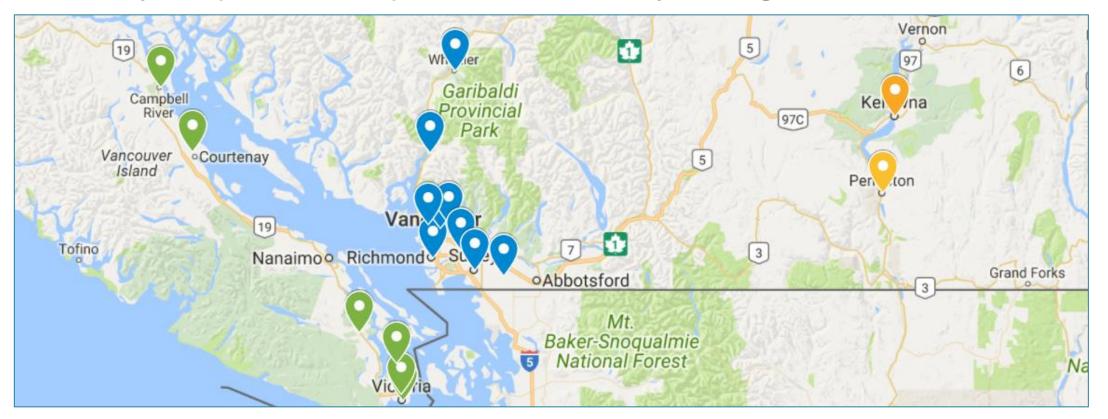


**Equipment & Systems** 

## Implementation Framework

#### MUNICIPAL CONTEXT

• To date, 30 municipalities have submitted a notification form to the Province of BC indicating that they are consulting with industry on the Energy Step Code or have already adopted the Step Code into local bylaw regulation.



## Step Code Implementation in BC

Local Government Notific	cation to Province of BC on	Step Code Engagement
City of Richmond	City of Victoria	Village of Belcarra
City of North Vancouver	District of Saanich	District of Peachland
District of North Vancouver	District of North Saanich	District of Oak Bay
District of West Vancouver	Comox Valley Regional District	City of West Kelowna
City of New Westminster	City of Duncan	District of Sparwood
City of Surrey	City of Campbell River	District of Summerland
Township of Langley	City of Kelowna	District of Lake Country
District of Squamish	City of Penticton	City of Nanaimo
City of Burnaby	City of Kimberley	City of Kamloops
Resort Municipality of Whistler	City of Vernon	District of Central Saanich

Cities with Part 3 development

## Step Code Implementation in BC

#### LEADING BY EXAMPLE

- The following municipalities have formally adopted the Energy Step Code with new bylaw requirements coming into effect on the following dates:
  - City of Richmond September 1<sup>st</sup>, 2018
  - City of Victoria November 1<sup>st</sup>, 2018
  - City of Surrey April 1<sup>st</sup>, 2019
- Three North Shore municipalities have also adopted a unified approach to adopting the Step Code (effective 2018).







## Implementation in New Westminster

#### **April 9, 2018: Council Policy**

- Council endorsed the proposed Step Code implementation framework for Part 9 buildings.
- Council instructed staff to develop a Step Code framework for Part 3 buildings and engage the development community.
- Council instructed staff to develop supportive administrative and regulatory processes for Step Code implementation.

#### **Action 1.1 in new Environmental Strategy and Action Plan**

• Adopt lower steps and incrementally move to higher Step Code levels over time, achieving net zero energy-ready levels of performance by 2032.



## Council Direction for Part 9 Buildings

Part 9 Residential	Late 2018	2019 / 2020	2022
Single Detached Home	Step 1	Step 3	Step 4
Laneway / Carriage Home	Step 1	Step 2	Step 3
Duplex, Triplex or Quadriplex	Step 1	Step 3	Step 4
Townhomes / Stacked Townhomes	Step 1	Step 3	Step 4

**Endorsed by City Council – April 9, 2018** 

## Implementation Framework

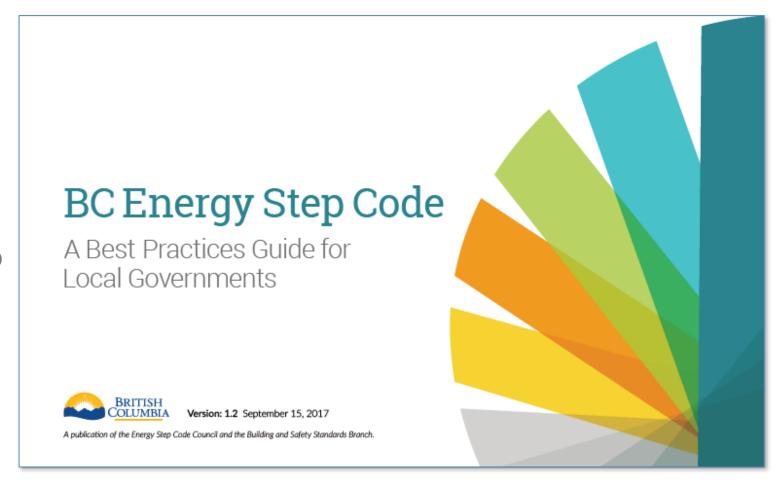
#### **FIVE YEAR IMPLEMENTATION 2018-2022**

• City of New Westminster is using a phased approach for Part 9 Energy Step Code adoption (March 1, 2019 effective date applicable to all new building permit applicants).

Part 9 Residential	March 1, 2019	January 1, 2020	January 1, 2022
Single Detached House	Step 1	Step 3	Step 4
Laneway / Carriage Home	Step 1	Step 2	Step 3
Duplex, Triplex or Quadplex	Step 1	Step 3	Step 4
Townhomes, Stacked Townhomes	Step 1	Step 3	Step 4
Industry Training	✓	✓	TBD
Incentives for Energy Modeling	✓	✓	TBD

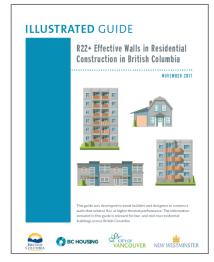
## Treatment of In-Stream Applications

"...Applicants that have previously initiated an application for a new building (rezoning, development permit, variance permit or building permit), are considered *in stream* and should be permitted to build to energy standards at place at time of application, as long as they have submitted a permit application within one year."



## Passive Design Exclusions

- On January 8, City Council adopted Zoning Bylaw No. 7953, 2018 which incentivizes / removes barriers for homes constructed to a verifiable high performance standard.
  - Nominally increases allowable floor space (FSR) to compensate for internal area lost to thicker insulated walls (R22 effective or higher) when constructing energy efficient buildings.
  - Supports local implementation of the BC Energy Step Code, and is applicable to homes achieving the top three performance levels.
    - Step Code Level 3 increase in FSR by 0.01
    - Step Code Level 4 increase in FSR by 0.03
    - Step Code Level 5 increase in FSR by 0.05





## Preparing our Local Market

#### PREPARING OUR LOCAL MARKET FOR THE ENERGY STEP CODE

 Launched in 2015, High Performance New Home program to support homebuilders, architects and designers with training, technical resources and incentives to prepare our local market for transition to the BC Energy Step Code.







**TRAINING** 



**POLICY** 



**AWARENESS** 

## **Program Incentives**

 EnerGuide Rating System – Energy modeling, plan evaluation report with upgrade options and home energy labeling



Air Tightness Test / Mid-Stage Diagnostic —
Testing at mid-construction and air tightness
training provides opportunity to improve practices



 Energy Coaching – Technical guidance on building envelope or mechanical upgrade options



## High Performance Home Program

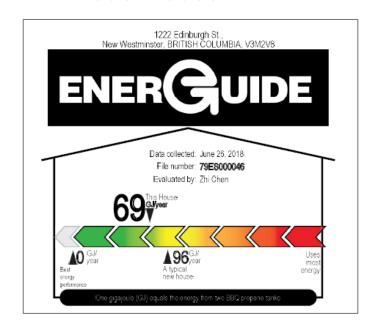
- **Projects** High Performance New Home Program is actively involved in over thirty-five (35) new construction projects with encouraging results.
  - ✓ **GJ Rating** Average completed project is <u>17% better</u> than "code built" reference house
  - ✓ Air Tightness Average air tightness is 3.0 ACH @ 50 Pa which is 45% better than industry average
  - ✓ Green Building Four ENERGY STAR® rated homes. All completed projects EnerGuide rated with voluntary disclosure on RateOurHome.ca
  - ✓ Training Nine local builders / trades completed 5-day Passive House Construction Course at BCIT (Fall 2017 / Spring 2018).



#### 1222 Edinburgh Street

#### **KEY FEATURES**

- R22+ Effective Walls
- ENERGY STAR® Windows
- 1.24 ACH @ 50Pa
- HRV @ 72% efficiency
- Tankless water heater (0.79 Energy Factor)
- 28% less energy than National Building Code model house



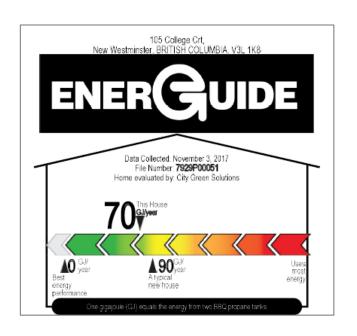




#### 105 College Court

#### **KEY FEATURES**

- R26 Effective Walls
- ENERGY STAR® Windows
- 0.49 ACH @ 50Pa (mid-stage blower door test)
- HRV @ 76% efficiency
- Tankless water heater (0.95 Energy Factor)



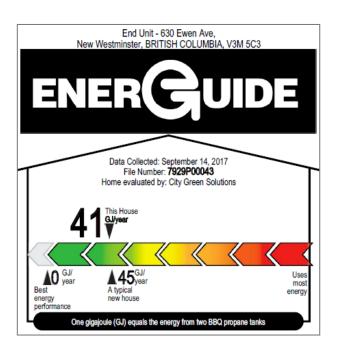




#### 630 Ewen Avenue

#### **KEY FEATURES**

- Exterior insulation (R22+)
- Targeting 2.5 ACH @ 50Pa
- HRV @ 65% efficiency
- Drain water heat recovery



#### 630 EWEN AVENUE,

NEW WESTMINSTER, BC

ISSUED FOR BUILDING PERMIT - SEPTEMBER 3, 2017

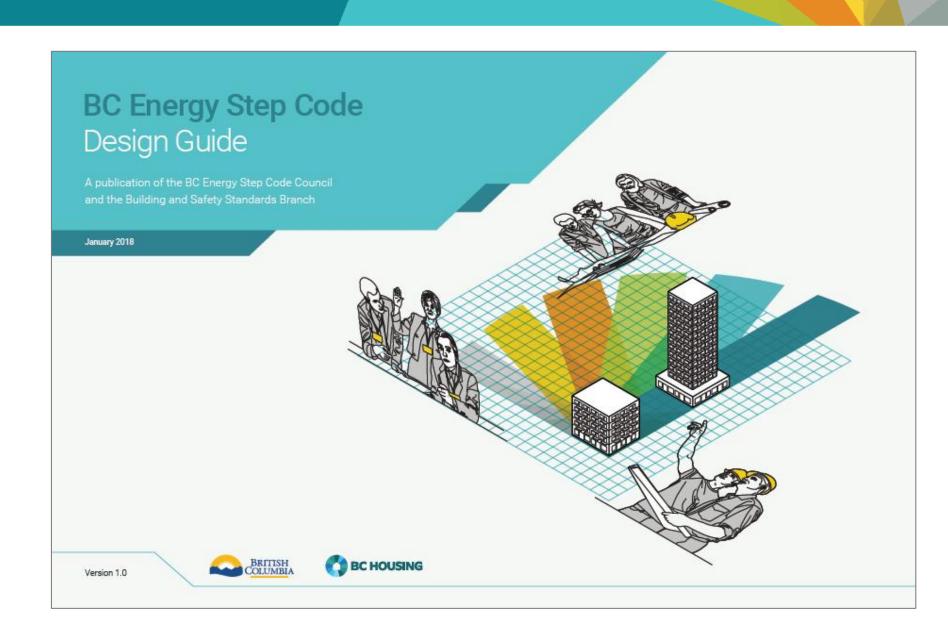




#### Part 3 Design Guide from BC Housing (available now)

Key resource for developers, architects and engineers

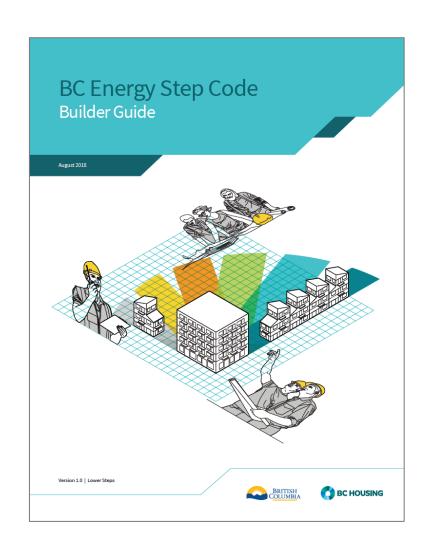
For mid-rise and high-rise multi-residential and larger commercial buildings

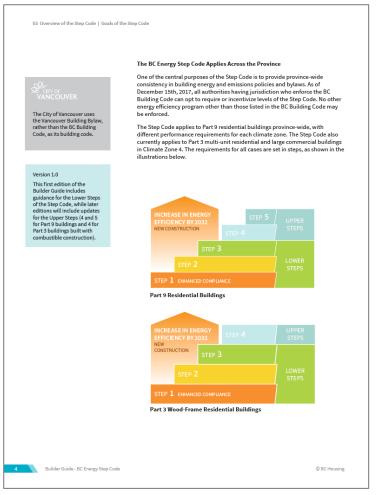


#### NEW! Part 9 Design Guide from BC Housing (10 / 2018)

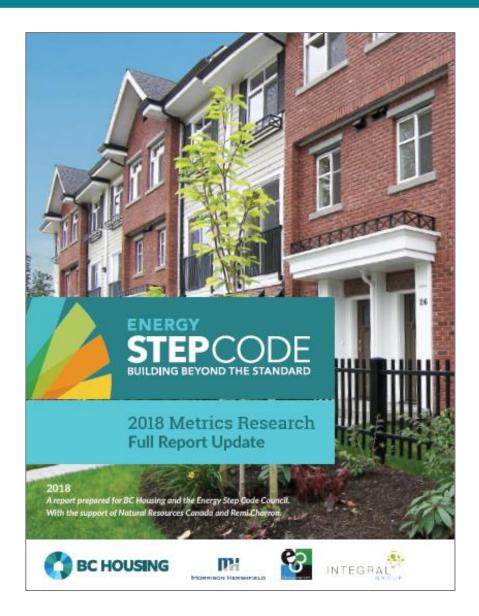
Key resource for builders, architects and designers

For single-family, duplexes and townhomes





## 2018 Metrics Research Report

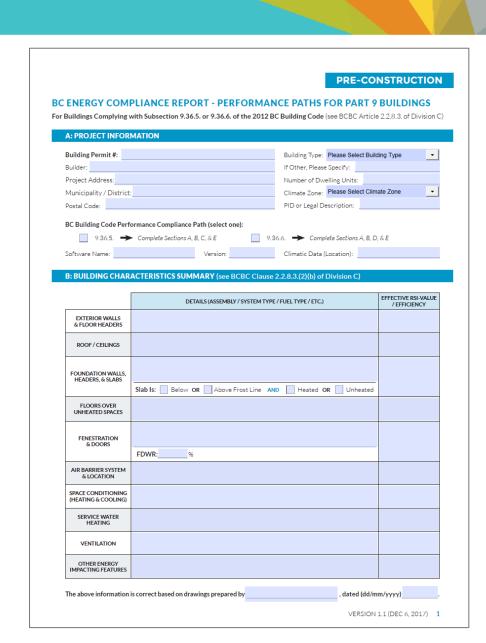


#### **COST MANAGEMENT**

- Enable homebuilders to minimize costs while supporting industry education and consumer awareness on value of high performance.
  - "Need a comparison of homes that look the same, but a high-performance home is more than look, its about higher quality."
  - "Incentives for floor space ratio and permit fee reduction could help minimize incremental costs."
  - "Consumer education on benefits of high performance (e.g. air quality, comfort, health) and payback period is what resonates."

#### Regulatory Compliance

- Pre-Construction and As-Built compliance verification forms already available and in practice.
  - "Implementation over 5-years starting in 2018 for Step 1 and then onwards is feasible. Industry needs time for learning, including trial and error, and trial and success."
  - "Require compliance forms completed by the Energy Advisor (like Letters of Assurance) as part of the permit process – This tool would ensure contractors were required to meet the standards."
  - "Standardizing processes across municipalities, and ensure that inspectors and plan checkers are trained so that everyone is on the same page."



## Plan Evaluation Report





**EnerGuide Rating System Plan Evaluation** 1106 Edinburgh St - Coach House **New Westminster** V3M 2V7

EnerGuide File Number: 7929P00055

Prepared by:

Peter Cho, CEA City Green Solutions 214 - 620 View St Victoria, BC V8W 1J6 778-316-9053 psw\_cho@hotmail.com

> Prepared For: Mike Bakshi

Prepared on Jan 16, 2018

214 - 620 View Street, Victoria, BC, V8W 116, P 1.866.381.9995, F 1.250.381.9997, newhomes@citygreen.ca

CityGreen Seletions

#### **Upgrade Packages Overview**

Please confirm that the current plan assumptions below are correct to the planned construction details.

		Current	Upgrade Case(see details section	Current Plans	pgrade Package 1	pgrade Package 2	pgrade Package 3	pgrade Package 4	ENERGY STAR
	,	Plans/Assumptions	for more info)	ð	'n	ŋ	'n	'n	ä
Air tightness	Air Changes per hour @ 50Pa	4.5	3.5		х	х	×		
			2.5					х	×
Foundation	Slab-on-grade	3" XPS (R-12) under slab	5" XPS (R-20) under slab		х			×	
Main Walls (inc. headers)	2x6 16"OC	2x6 16"OC w/R19 + 1.5" rigid board (R-22 effective)	2x6 16"OC w/R24 + 1.5" rigid board (R-23 effective)		х			x	
Attic and Roof	2x10 16"OC cathedrals& flat attics 2x4, 24"OC truss gables	R-28 batt insulation in cathedrals & flat attics R-40 in gables	A) R-31 batt insulation for cathedral     & flat ceiling, R-50 in gables     B) 9.5" full depth spray foam (R-56)     for cathedral & flat ceilings, R-40 in     gables		A			В	В
Exposed Floor	2×10, 16"OC	R-28 batt insulation	A) R-31 batt     B) Full depth 9.5" spray foam (R-56) in floor cavities		A			В	
Windows	Vinyl, Double Glazed	ENERGYSTAR vinyl windows, USI 1.60 (similar to previous projects) rated for zone 1	ENERGY STAR w/ USI 1.4 and rated for climate zone 1+2				A	×	
Doors	Exterior Doors	Wooden front door, 1 steel insulated rear door	Wooden front door; ENERGY STAR qualified for rear door				×	х	х
Heating System	Electric Baseboards	100% steady state efficiency							
Fireplace	N/A								
Hot Water	Electric 40 Gallon tank	0.82 EF	R-5 blanket around tank			х		х	
DWHR	N/A	Not Installed	56% or higher efficiency			х		×	
Ventilation	Range hood fans, bathroom fans, Whole House Ventilation	1) Standard range hood fans x 1 2) Standard bathroom fans x 1	1) ENERGYSTAR rated range hood fan 2) ENERGYSTAR bathroom fan 3) ENERGYSTAR and HVI certified HRV with 70%/65% efficiency			x		×	х
Appliances	Fridge; Dishwasher; Clothes Washer	Standard	ENERGY STAR qualified models						х
Lighting	Fixtures/bulbs	Standard fixtures and CFL/LED bulbs	100% ENERGY STAR qualified bulbs/fixtures						х
		Mo	odelled Potential EnerGuide Rating (GJ)	43	43	41	43	40	82

#### **EnerGuide Homeowner Information Sheet**

Home address: 1106 Edinburgh St-Coach House, New Westminster, British Columbia, VSM 2V7

#### HOMEOWNER INFORMATION SHEET

Your EnerGuide" rating and this report are based on data. collected and, where necessary, presumed, from your home: evaluation. Rating calculations are made using standard operating conditions.



43 GJ/year

- 0 GJýcar

= 43 GJ/year

#### ENER GUIDE

lested floor area: 41 3 mf 1445 0 ft<sup>-1</sup> Rated energy intensity if 06 GU/n6/year Evaluated by City Green Soutions. File number: 7929P00055

NRCan oc.ca/myenerguide

#### HOW YOUR RATING IS CALCULATED:

- Rated annual energy consumption
- II. Minus renewable energy contribution

Equals your EnerGuide rolling

I. Your rated annual energy consumption is the total amount of energy your house would use in a year based on the EnerGuide Rating System standard operating conditions. For your house, this includes 2.38 GJ of passive solar gain.

Energy Sugrous	Ruled Consumption (GJ/year)	liquivolent Units (por year)	Greenhouse Guz Enfectione (formes/year)
Electricity	43	12056.3 kWh	0.3
Total	43		0.3

II. On-site renewable power generation systems can offset some or even all of your home's energy consumption. Renewable energy contributions are factored differently for your rating and your greenhouse gas emissions calculations.

On-Sile Renogable Energy	Definated Contribution (GJ/year)	Equivalent Units (per year)	Office! Greenhouse Goo Enforious (lonnes/year)
Electricity	0	D KiWh	0.0
Solar water heating	0	- 0	0.0
Total	0		0.0

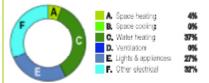
#### YOUR RATED GREENHOUSE GAS **EMISSIONS CALCULATION:**

Total greenhouse gas emissions 0.3 tonnes/year Minus emissions offset by on-site renewables Equals your reled greenhouse gas emissions =0.3 termos/year

#### HOW YOUR RATED ENERGY IS USED:

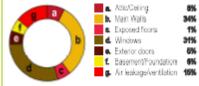
Data collected: January 2, 2018 Year built 2018

The chart below represents the breakdown of rated annual energy consumption in your home under standard operating conditions. fou cari use thése figures as a guide to help identify where you can lower home energy costs through proper home maintenance. efficient home operation, energy efficiency renovations or equipment replacement



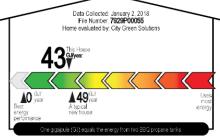
#### WHERE YOUR HOME LOSES HEAT:

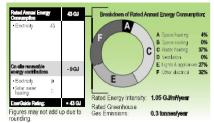
Houses lose heat through their exterior shell, or building envelope. The chart below shows where and how your home loses heat. The quality and upkeep of your home can have a major impact on the amount of energy your heating and cooling systems use annually.



"EnerGuide is an official mark of Natural Resources Canada. Refer to the glassery section for an explanation of relevant terms. Home address: 1106 Edinburgh St-Coach House, New Westminster, British Columbia, V3M 2V7







The energy consumption indicated on your utility bills may thingher or lower than your Energiable draing. This is because standed assumptions have been made regarding how may people like in your house and how the home is objected. Ye rating is the your house and how the home is objected. Ye rating sheet on the condition of your house on the day it. The energy consumption indicated on your utility bills may be higher or lower than your EnerGuide rating. This is because standard assumptions have been made regarding how many people live in your house and how the home is operated. Your

Visit NRCan.gc.ca/myenerguide



#### NEXT STEPS

If you have had a Renovation Upgrade Service, refer to your report for the roadmap to making your home more energy efficient. If you have not yet had a Renovation Upgrade Service. why not contact your service organization to learn what you can do to save on energy costs, reduce greenhouse gas emissions and improve home comfort?

Everyone uses energy in their house differently. This report was developed using standard operating conditions as explained in the glossary. Therefore, your EnerGuide rating will not match

#### UPGRADE CONSIDERATIONS

Before undertaking upgrades or renovations, find out about appropriate products and installation techniques, and ensure that all renovations meet local building codes and by-laws. Natural Resources Canada does not endorse the services of any contractor, nor any specific product, and accepts no liability in the selection of materials, products, contractors nor performance of workmanship.

Where your energy advisor has identified a potential health or safety concern such as insufficient outdoor air, risk of combustion furnes entering your house or risk of exposure to asbestos, they have endeavoured to provide a warning in this report. However, energy advisors are not required to have expertise in health and safety matters, and homeowners are solely responsible for consulting a qualified professional to determine potential hazards before undertaking any upgrades or renovations.

This is an updated EnerGuide rating system. For an explanation of the changes from the previous system. loase see NRCan.gc.ca/myenerguide.

Your Energy Advisor makes it easy by completing these forms, reports and EnerGuide submittals.

Visit us today at:

NRCan.gc.ca/myenerguide

Page 5 of 5 Report date: January 16, 2018 Figures may not add up due to rounding Page 1 of 5i Report date: January 16, 2018.

## Mid-Stage Airtightness Form

- A mid-stage air tightness compliance form is in development in collaboration with several local governments.
- City of New Westminster planning to have our midstage air tightness form ready for a test drive on November 1<sup>st</sup> with our EA's and builders, and in advance of Step Code regulation in March 2019.

r Buildings Complying with	LIANCE REPORT - PERFORMANCE PATHS FO h Subsection 9.36.5. or 9.36.6. of the 2012 BC Building Code (see I		BUILDINGS
	it subsection 5.36.5. or 5.36.6. or the 2012 BC building Code (see	OCDC Adiala 2.2.0	2 of Division (C)
		SCBC Afficie 2.2.0	.s. of Division C)
A: PROJECT INFORMAT			
Building Permit #: Project Address:	Building #: Building  Step Required:	ng Type:Please s	elect Building Type
Builder:	Company:		
E-Mail:	Phone #:		
B: BUILDING CHAPACT	FERISTICS SUMMARY (see BCBC Clause 2.3.8.3.(2)(b) of Div	rision C	
or DoleDing on Marco	Z. NOTICS COMMENT (SCO DOSC CIACOS E.C. O. A. Z. R. J. O. D. I.	ision o	
	DETAILS (ASSEMBLY / SYSTEM TYPE / FUEL TYPE / ETC.  Note: Any changes from specifications in the building permit application must be <u>UNDERLINED</u> .	EFFECTIVE RSI-VALUE / EFFICIENCY	SPECS & INSTALLATION VERIFIED
EXTERIOR WALLS & FLOOR HEADERS			
ROOF / CEILINGS			
FOUNDATION WALLS,			
HEADERS & SLABS	Slab Is: Below Above Frost Line & Heated Unheated		
FLOORS OVER UNHEATED SPACES			
FENESTRATION & DOORS	FDWR:%		
SPACE CONDITIONING (HEATING & COOLING)			
SERVICE WATER HEATING			
VENTILATION			
OTHER ENERGY IMPACTING FEATURES			
OTHER ENERGY	e information is correct:, dat	ed (dd/mm\ <sub>\$200</sub> )_	

AIR BARRIER SYSTEM & LOCATIO	N·			
Interior: N / A Inte	rnal poly 🗌 🛮 Tape	ed drywall 🔲 Other 🛭	(describe <u>):</u>	
Exterior: N / A  Taped m	embrane 🗌 Taped s	sheathing Other C	(describe <u>):</u>	
AIRTIGHTNESS				
ADDRESS / BUILDING	REQUIRED ACH <sub>30</sub> :	PROPOSED ACH <sub>50:</sub>	ACTUAL PRE-DRYWALL ACH <sub>50</sub> *;	DATE
			ACH59:	
Interior volume of building (m <sup>3</sup> ):				
	Temperature (	°C):		
TEST CERTIFICATION BY EN	FRGY ADVISOR			
		rmation is accurate a	and determined using standa	rd industry protoco
I hereby certify that the above BI				
			cable, enter ERS informatio	n:
Signature:		If applic	cable, enter ERS information	
Signature: Full Name (Print):		If applic		
Signature: Full Name (Print): Company:		If applic Advisor Service	r ID Number:	
Signature:		If applic Advisor Service EnerGu	r ID Number:	
Signature:  Full Name (Print):  Company:  Phone:  Email:		If applic Advisor Service EnerGu	r ID Number:	
Signature:  Full Name (Print):  Company:  Phone:  Email:		If applic Advisor Service EnerGu	r ID Number:	
Signature:  Full Name (Print):  Company:  Phone:  Email:		If applic Advisor Service EnerGu	r ID Number:	
Signature:  Full Name (Print):  Company:  Phone:  Email:		If applic Advisor Service EnerGu	r ID Number:	
Signature:  Full Name (Print):  Company:  Phone:  Email:		If applic Advisor Service EnerGu	r ID Number:	
Signature:  Full Name (Print):  Company:  Phone:  Email:		If applic Advisor Service EnerGu	r ID Number:	
Signature:  Full Name (Print):  Company:  Phone:  Email:		If applic Advisor Service EnerGu	r ID Number:	
Signature:  Full Name (Print):  Company:  Phone:  Email:		If applic Advisor Service EnerGu	r ID Number:	
I hereby certify that the above Bi Signature: Full Name (Print): Company: Phone: Email: Date:		If applic Advisor Service EnerGu	r ID Number:	

## Training Opportunities & Next Steps

- City is hosting a **FREE** Half-day air tightness training at BCIT's High Performance Building Lab in Burnaby.
  - Hands-on workshop on effective air barrier strategies
  - o 20 seats available on a first come, first served basis
  - Wednesday, October 24<sup>th</sup> from 8AM to 12PM
- Next Builder & Designer Breakfast is planned for early 2019 to walk through City approach to compliance and verification – from pre design through to occupancy.



#### Thank You!

# QUESTIONS?

Norm Connolly
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