BC Step Code Part 3 Energy & Zero Carbon Checklist
User Guide

Version 3.0 | July 2023

General Guidance

The Part 3 Energy & Zero Carbon Checklist (the Checklist) is a voluntary Excel-based tool that can be used by energy modellers and designers to summarize and submit energy modelling results to local governments, verifying compliance with the BC Energy Step Code and Zero Carbon Step Code (the Step Code). This tool gives industry and local governments a consistent, standardized way to gather and review modelled energy performance characteristics of Part 3 Step Code buildings at both the building permit and occupancy permit stages.

The local governments may require this Checklist.

Regardless, professionals responsible for energy modelling must continue to document energy modelling information in the form of an Energy Modelling Report as per the [Joint Professional Practice Guidelines on Whole Building Energy Modelling Services](#).

Instructions in the Excel file: This document is intended as an instruction manual, while additional guidance and tips are included in the Excel file.

> **Tip –** If you can't see a cell or its note completely in the Checklist, zoom in to make it larger.

> **Tip –** The Checklist can be unlocked with no password; however, this is not recommended. If unlocked, remember to re-lock to avoid unintentionally changing formulas.

Alignment with BCBC Versions: This version of the Part 3 Checklist is intended to be used for Step Code models completed under BCBC 2018 Revision 5 only.

> **Tip -** If you are modelling under an older Step Code version, visit the [Step Code Website](#) to download the applicable Checklist version. Supporting information for legacy versions of the tool (sometimes referred to as the "Energy Design Report") is also available at this link.

> **Tip -** All references to the City of Vancouver Energy Modelling Guidelines (CoV EMG) refer to version 2. In case of conflict between the BCBC and the City of Vancouver Energy Modelling Guidelines, the BCBC shall govern.

Application: The Part 3 Checklist is for buildings containing occupancies that are required to comply with:

- BC Energy Step Code, per BC Building Code (BCBC) Subsection 10.2.3, and
- BC Zero Carbon Step Code, per BCBC Article 10.3.1.3.

This form can not be used to summarize energy models that demonstrate compliance exclusively with:

- ASHRAE 90.1, per BCBC Clause 10.2.2.1.(1)(a). or,
- The National Energy Code for Buildings (NECB), per BCBC Clause 10.2.2.1.(1)(b).

If a project uses 90.1 or the NECB exclusively for compliance refer to the applicable checklists and forms for those standards.

It is intended to capture the requirements of Articles 2.2.2.1. and 2.2.9.2. of BCBC Division C, as well as local government bylaw requirements for energy use and emissions reductions in buildings. Portions of the building subject to Clauses 10.2.2.1.(1)(a) or (b) of BCBC Division B are also to be included in the Checklist in the case of mixed occupancy buildings according to the CoV EMG Section 5.2.

> **Tip -** Not all Checklist sections apply to all buildings, so read the instructions carefully. The Checklist may be used for any of the following review stages of larger buildings:
>
> - Building Permit
> - Revised Permit
> - Occupancy Permit
>
> **Tip -** To demonstrate compliance with the Step Code, information must be submitted at the following stages (using this Checklist if required by the AHJ):
>
> - The Building Permit stage, showing the *As Designed* results.
> - The Occupancy Permit stage, showing the *finished building* results.

Using the same Checklist for different stages makes it easier for those who prepare the energy models and those who review them.

The following sections describe each tab on the Checklist and provide general user guidance on completing each entry.

Summary Tab

The *Step Code Summary* tab provides an overview of the project based on the data entered on the *Part 3 Checklist* tab. No user inputs are required on the summary tab. This tab may be printed and provided as an informative summary of the project's energy and carbon performance.

> **Tip -** The only potential user entry on this tab is a blank area on the top right, for local government to add a logo if desired.

Checklist Tab

These descriptions have been listed by section (A to G) and relate to a specific entry or calculation. The row numbers provided are based on Checklist version 3.0 June 2023. Depending on the version you are using the sections, rows, or entries may differ.

Legend

- Yellow cells are for user entry
- Hashed cells have drop-down with user-override if necessary
- Look for notes (red flag in top right of cell) for user tips

The following table provides a description & tips for each cell that is available for user entry.

Section	Entry	Row/Cell	Description/ Tips
A	Project Name	9	Many Part 3 projects have a name, beyond the project address.
	Project Address	10	Project address used for permitting purposes.
	Project Stage	11	This tool was designed for use at Building Permit and post-airtightness testing; however, it's recognized that it can summarize step code results at other stages. Choose the current stage from the drop-down menu.
	Project Identifier	12	For example, building permit number.
	BP Date	13	If building permit submission date is known, enter exact day, otherwise enter approximation.
	Building Height	14	Number of above grade storeys. If half-storeys or relevant below-grade, add brief explanation (cell is open to user entry).
	MFA	15	Calculated from entries provided in Sections B and C.
	Applicable version of BCBC	16	Auto-filled based on row 13. Can be over-written with a user entry if necessary; be sure to include both the BCBC version and the revision number.
	Jurisdiction	17	Dropdown menu to select appropriate AHJ; user entry if AHJ not listed.
	HDD	18	Auto-filled based on row 17; cell can be over-written with a user entry if necessary. Value used must be consistent with AHJ requirements.
	Climate Zone	19	Auto-filled based on row 18; cell can be over-written with a user entry if necessary.

B	Occupancy Classification (OC)	A24:A27	OC for the building or building portion as defined under BCBC Division A, Section 1.4. Section B includes occupancies not included under Tables 10.2.3.3-G to J.
	Modelled Floor Area (MFA)	B24:B27	MFA, as defined by CoV EMG, for the associated OC.
	Performance Requirement	C24:C27	Applicable performance requirement for the OC.
	% Better Requirement	E24:E27	If percent better than NECB or ASHRAE 90.1 is selected as the performance requirement, this is the % required to be achieved over the reference/ baseline model.
	Ref. Bylaw / Policy / Rezoning Condition	G24:G27	If applicable, the bylaw, policy, rezoning condition, etc. that determines this performance requirement.
	Thermal Energy Demand	31	Thermal energy demand (kWh) results for the baseline or reference building (or building portion) used for calculating whole building TEDI requirements for mixed use buildings with Step Code and non-Step Code occupancies.
	Baseline/Reference Energy Results	B33:B38	Energy results for the baseline or reference building (or building portion) by fuel type.
C	Occupancy Classification (OC)	A46:A49	OC for the building or building portion as defined under BCBC Division A, Section 1.4. Section C includes occupancies covered under Tables 10.2.3.3-G to J.
	Modelled Floor Area (MFA)	B46:B49	MFA, as defined by CoV EMG, for the associated OC.
	Step Required	C46:C49	The applicable Step requirement for the occupancy.
	GHG Emissions Level	D46:D49	The applicable Level requirement for the OC based on BCBC Table 10.3.1.3 and the AHJ's requirements. Note that if one OC is subject to a requirement (above EL-1, measure only), all OCs must have a Level selected to calculate a whole building requirement.
	Ref. Bylaw / Policy / Rezoning Condition	E46:E49	If applicable, the bylaw, policy, rezoning condition, etc. that determines this performance requirement.
	Performance Requirements	G46:I49	Performance requirements auto-populated from BCBC tables 10.2.3.3-G to J and table 10.3.1.3 based on the inputs selected to the left. May be overwritten if different requirements are applicable based on the AHJ or BCBC version.

D	Whole Building Performance Requirements	G57:I57	Overall building performance requirements as determined by sections B and C. If the building only contains 1 occupancy these values will equal section B or C. These metrics are defined under Division B, Section 10 of the BCBC.
E	Modelled Outputs for Entire Building	B64:C81	Annual energy consumption by end use and fuel type in kWh. For end uses served by multiple fuels or fuel mixtures enter as separate end uses. If additional end use entries are required rows 76-81 can be expanded using the + symbol on the left.
	Annual Thermal Energy Demand for TEDI	B90, H90	Annual thermal energy demand from all heating equipment in the building, reported in kWh, for calculating the building TEDI. If building includes Step Code portions (section C) also enter the demand for only the Step Code building areas in column H.
	Annual Cooling Energy Demand for CEDI	91	Annual thermal energy demand from all cooling equipment in the building, reported in kWh, for calculating the building cooling energy demand intensity (CEDI). This is required as an informative reporting input but does not form a part of the building performance requirements.
	Emissions Factor (EF): Electricity and Natural Gas	96:97	Electricity and natural gas emissions factors are prescribed by the BCBC (Division B, 10.3.1.3.(2)) and not to be adjusted for different local utility providers.
	Emissions Factor (EF): District Energy System (DES) and Renewable Energy	B98:E101 C110	Emissions factors for other building fuels, to be used in sections B and E, if applicable. Any fuel source, including DES and off-site generated renewable energy, to be named, with EF source provided. On-site generated electricity, annual kWh entered in row 110. Emissions factors not specified by the BCBC must be determined to the satisfaction of the AHJ.
	Makeup Air Unit Fuel Mixture Calculation Section	B104:E106	If the make-up air unit is served by multiple fuels (e.g. a heat pump with natural gas auxiliary heating) this section may be used to calculate a blended emissions factor to be used on row 125 for determining the GHGI corridor adjustment.
	Total Electricity Generated On-Site	109	The annual on-site generated electricity to determine the adjusted electricity emissions factor according to CoV EMG section 1.4.1.
	Overheating Requirements Section	113 :117	If regularly occupied space is not fully cooled and subject to requirements per CoV EMG Section 4.

	Overheating Hours Limit	115	Set limit per CoV EMG, Section 4.
	Number of Overheating Hours for Worst Case Suite/Zone	116	All passively cooled spaces must be analyzed according to CoV EMG Section 4, with limits specific to the modelled weather file; hours for worst space are reported here.
	Corridor Pressurization Adjustment	B119:B128	Entries are used to calculate the adjustment to the TEUI, TEDI, and GHGI for residential corridor pressurization according to CoV EMG Section 2.5.2.
	Make-up Air Emissions Factor	B125	If MUA served by fuel mixture, adjusted emissions factor may be calculated in rows 103-105, to be used here for GHGI adjustment calculation.
	Suite Sub-Metering Adjustment	B131:B132	If suites are heated by a hydronic system without sub-metering the heating energy used for the TEUI calculation will increase by 15% according to CoV EMG Section 2.7. If applicable heating energy for suites only is entered on row 131, to be adjusted by 15% for reported TEUI results.
F	Software Used	135	Dropdown for the modelling software used. If "Other" describe the software in cell D135.
	Simulation Weather File	136	Weather file used in the energy model simulation, selected according to CoV EMG Section 1.5.
	Document References	B140:G144	List of documents or drawing sets referenced for the energy model. Include drawing set name, issued for, date (YYYY-MM-DD), and firm that issued.
	Modelled Above-Ground Wall Area	B146	The total above-ground wall area, including vertical window area, of the building, as modelled.
	Window-to-Wall Area Ratio	B147	The percent of gross above-ground wall area (row 138) that is window area.
	Assumed Design Airtightness	B149	Design Stage: The equivalent airtightness (normalized air leakage rate or q_{75Pa}) based on the modelled infiltration rate (I_{AGW}), per CoV EMG Section 2.4.1 equation.
	Modelled Design Infiltration Rate	B150	Design Stage: The assumed continuous infiltration rate used in the energy model according to CoV EMG Section 2.4.
	Tested Airtightness	I149	Post-Construction: The airtightness result (q_{75pa}) from the post-construction whole building airtightness test, once complete.

As-Built Modelled Infiltration Rate	I150	Post-Construction: The equivalent modelled infiltration rate, calculated per CoV EMG Section 2.4.1, based on the tested results (used in the post-construction energy model results).
Average Clear Field R-Values	B152:B153	Area-weighted average clear field wall and roof performances (metric R-value input) accounting for uniformly distributed thermal bridges (e.g. studs), prior to derating for thermal bridging at interface details. See CoV EMG Section 1.3 for definitions.
Average Effective R-Values	I152:I153	Area-weighted average effective wall and roof performances (metric R-value) after accounting for thermal bridging effects at interface details, per CoV EMG Section 3.1.
Average Window Effective U-Value	B154	Area-weighted average window effective thermal performance (metric U-value) according to CoV EMG Section 3.2.
Average Window Solar Heat Gain Coefficient	I154	Area-weighted average window solar heat gain coefficient used in energy model.
Average Occupancy Density	B156	MFA divided by total occupant count as input into energy model (not egress peak or other occupancy rates). Not accounting for operating schedules.
Average Ventilation Rate	B157	Total summed peak building ventilation rate (O/A in L/s), divided by MFA, not accounting for operating schedules or demand control reduction. Only include ventilation that serve spaces within MFA.
Is demand control ventilation used?	B158	Mark **Yes** if any ventilation systems in the project (excluding parkade systems or systems not servings spaces within MFA) are modelled with a demand control ventilation strategy.
Average Lighting Power Density	I156	Area weighted average lighting power density for the whole building. Total lighting power divided by MFA, not accounting for operating schedules or lighting control adjustments. Only include lighting power serving MFA (e.g. excluding parkade lighting).
Total Building DHW Low-Flow Savings	I157	Percent savings representing reduction over code minimum flow rates, if a rate below the peak hourly is being used, per CoV EMG Section 2.2.1.
Average HRV/ERV Sensible Efficiency	I158	Volume weighted average sensible recovery efficiency for all HRV and ERV units in building. If some units are without H/R, exclude from calculation (i.e. do not include with 0% SRE).

	HVAC System Descriptions	161:166	Most appropriate plant and system selections from the dropdown menus. If "Other" selected provide additional description in the space available.
G	Contact Information for Checklist User	170:175	Contact information for the user and organization completing Checklist.

Data Tab

This (hidden) tab is for background calculations only; do not change anything on this tab to avoid impacting the Checklist functionality.