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Climate Ready New Homes – Information for Applicants

The Climate Ready New Homes Bulletin provides guidance for the New Westminster building community to ensure new homes in New Westminster produce fewer greenhouse gas emissions and are more resilient to the impacts of climate change. The purpose of this bulletin is to outline the City's expectations for meeting energy efficiency, emissions, and overheating protection requirements in new construction, and to support a streamlined building permit submission, review, and approval process.

This bulletin covers expectations for:

- Heating and cooling system compliance with Energy Step Code and Zero Carbon Step Code requirements, and
- Compliance with the BC Building Code provision for overheating in dwelling units (9.33.3.1(2))

Energy and Zero Carbon Step Codes

The Energy and Zero Carbon Step Codes establish a framework for improving energy efficiency and reducing greenhouse gas emissions in new buildings. In New Westminster, the Energy Step Code was first adopted in 2018, while the Zero Carbon Step Code was adopted in 2024. The highest levels of both Step Codes will be mandatory in New Westminster starting January 1, 2027.

This section outlines recommended mechanical system design and specifications to demonstrate compliance with the City's Step Code requirements, as well as required reporting. Additional guidance on the Energy and Zero Carbon Step Codes can be found on the City's Buildings and Climate Action webpage and Energy Save New West's Step Code webpage.

Right-Size Heating and Cooling System (applies to Part 9 residential buildings)

To ensure that space heating and cooling equipment in Part 9 buildings is correctly sized, applicants must use the CSA F280 standard to size the equipment, as required by the BC Building Code, Section 9.33.5.1 Capacity of Heating and Cooling Appliance which states: "The required capacity of heating and cooling appliances located in a dwelling unit, shall be determined in accordance with CSA F280". Additionally, the City requests that applicants use CSA F280-12 verified software tools when performing the CSA F280 calculation, and submit F280-12 compliant load calculation reports to verify applicants have met BCBC 9.33.5.1.

Please note, the primary space heating equipment must be sized to provide heating for **all conditioned space** of the dwelling unit.

Model all Space Heating Systems (applies to all residential dwellings)

Applicants proposing natural gas back-up space heating must provide two BC Energy Step Code Compliance Reports and associated documents such as HOT2000 and Energuide Reports:

1. One BC Energy Step Code Compliance Report and associated documents must model the proposed primary heating system as the primary heating system.

2. The other Report and associated documents must model the natural gas back-up space heating system as the primary heating system.

Having both sets of documents will allow City staff to more accurately calculate and forecast the City's greenhouse gas emissions from buildings.

Document Secondary Suite Heating and Cooling Systems (applies to Part 9 residential buildings)

For Part 9 homes that contain a secondary suite, in addition to reporting the principal unit's mechanical systems, applicants must also report the secondary suite's space heating and cooling system, domestic hot water equipment, and ventilation system in the appropriate sections of the BC Energy Step Code Compliance Report.

Overheating Protection Guidance (all residential dwellings)

In response to the extreme heat experienced across BC during the 2021 heat dome, the Province of BC updated the BC Building Code to ensure that all new dwelling units have a living space, also known as a refuge room, where occupants of the dwelling unit can gather during heat events and be protected from overheating:

From the BC Building Code 9.33.3.1(2): "*At the outside summer design temperature, required cooling facilities shall be capable of maintaining an indoor air temperature of not more than 26°C in at least one living space in each dwelling unit.*"

BCBC 9.33.3.1(2) can be met through active and/or passive cooling measures; the following section outlines the City's recommended compliance pathway for meeting the requirement.

Compliance Pathway Methodologies

Option 1: Central Cooling

Where the dwelling unit is equipped with central mechanical cooling through a heat pump or air conditioner, serving all conditioned spaces of the dwelling unit and sized in accordance with CSA F280, compliance with BC Building Code 9.33.3.1(2) shall be met.

Required documentation: No additional documentation, beyond that noted above, is required.

Option 2: Localized Mechanical Cooling (No Central Cooling)

Where the dwelling does not have central cooling and will demonstrate compliance with localized mechanical cooling, such as an air conditioner in one living space, please see below for the methodology that will size cooling output for the designated refuge room. Alternatively, the HVAC Designers of Canada and Thermal Environmental Comfort Association have developed a Guideline on Single Zone Cooling in Dwelling Units for how to use CSA F280-12 to meet BCBC requirements.

1. Select a CSA F280 approved software. Identify a space in the home to be the refuge room.
2. Conduct CSA F280 sizing output calculation, per instructions below. Note: this sizing calculation is independent of the sizing calculations for mechanical systems sizing, per 9.33.3.1(2)
    a. The refuge room is to be modelled as a standalone house. i. All walls, ceiling and floor shall use their existing envelope characteristics and be calculated to be exposed to outdoor air, at summer design temp, as laid out in the drawings unless floor or walls are at or below grade.
    b. Minimum electrical load is 800W.

i. The electrical load may be higher, per CSA F280 section 6.2.5, where it states the minimum load shall be 800W or when the calculation of 4W/m2 exceeds 800W, the higher value shall be used.

c. Cooling setpoint set to 26°C, or lower/cooler.
d. The refuge room shall include all occupants of the dwelling unit when conducting the calculation.
    i. The number of occupants shall be calculated as two occupants per number of sleeping rooms in the dwelling unit, per 3.1.17.1 (b).
    ii. General guideline is 4.5m^2 (48 sq.ft.) per person
e. Internal blinds and shades shall not be in included in calculations as they are user operated, and performance will be unreliable.
f. External fixed shading devices can be included in calculations if present.

3. The Total Building Value for heat gain shall be used for output sizing and not Minimum Installed Output Capacity.
    a. CSA F280 allows for sizing to be 80% of the calculated value, however for purposes of meeting the 9.33.3.1 requirement, output must be 100% of the calculated value or higher.

Required documentation: A heat loss heat gain report, specifically for the refuge room.

Option 3: Passively Cooled Dwelling Unit (No Mechanical Cooling Serving the Dwelling)

Where design for 9.33.3.1(2) proposes to not include any form of mechanical cooling and intends on demonstrating compliance through the use of passive cooling strategies, the below method should be followed:

1. Identify a space in the home to be the refuge room.
    a. The refuge room shall be modelled as a house, per Option 2 above, 2(a) to 2(f).
2. Conduct a whole building energy simulation on the refuge room and submit a summary report, including inputs, any assumptions, and results.
    a. Report must be signed and sealed by a Registered Professional.
    b. Software must be capable of conducting calculations at hourly or smaller time increments.
        i. See Engineers and Geoscientists of British Columbia's Professional Practice Guidelines - Whole Building Energy Modelling Services for guidance on software requirements.
        ii. HOT2000 is not an approved software to demonstrate compliance with 9.33.3.1 and a passively cooled refuge room.
    c. Weather file shall be for Pitt Meadows B.C. Buildings shall be designed using the 2080 RCP8.5 weather file, which represents a worst-case scenario.
    d. The simulation shall not consider window ventilation, the use of blinds or any other user-operated passive cooling strategy as those are user-driven and not reliable during heat events. Window ventilation and blinds may be used if automatically operated based on weather sensors and indoor temperature and humidity readings.
    e. The simulation shall not consider the effects of cooling features that are not located on the property, such as trees on neighbouring or City property.
    f. Fixed external shading devices may be included in calculations.
3. Results must demonstrate that at no time during the cooling season does the dry bulb temperate of the refuge room exceed 26°C.

Required documentation: A signed and sealed energy simulation report, with all inputs, assumptions, and results. A Section 219 Covenant must also be registered on title, stating that if passive cooling should become unfeasible, that a mechanical cooling system shall be installed.

Notes on the Overheating Protection Guidance:

- Mechanical systems that provide cooling must be permanently installed and fixed to the building. Portable air conditioners and window mounted units are not considered acceptable compliance methods.
- Documentation is required at building permit submission. If there are any changes to the building design during construction which may impact mechanical system sizing, updated documentation, including updated CSA F280 calculations will be required. This must be submitted before Final Inspection is requested.