Bulletin

Larger Zero Emission Buildings Bulletin

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Authority: Director of Planning

CITY OF VANCOUVER

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RELEVANT BY-LAWS AND POLICIES

- Zoning & Development By-law
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BACKGROUND AND CONTEXT

Removing barriers to zero emissions building is part of the City's efforts to reduce carbon emissions. The Zero Emissions Building Plan, Renewable City Strategy, and Climate Emergency Action Plan all prioritize removing regulatory barriers to the development of zero emission buildings.

This bulletin explains the regulations and submission material for projects seeking variances of the Zoning and Development By-law for zero emission buildings. This bulletin should be read in conjunction with the by-law as well as other applicable guidelines and bulletins.

For projects with 1 to 8 dwelling uses in the R1, RT, or RA districts, see the *Zero Emission Buildings in R1, RT, and RA Districts Bulletin*.

DEFINITIONS

The following definitions apply in this bulletin:

- **Certified Passive House Consultant (CPHC) or Certified Passive House Designer (CPHD):** A CPHC or CPHD is a person certified by the Passive House Institute as an accredited Passive House Consultant or Designer respectively. The CPHD or CPHC is responsible for designing the building to meet the Passive House standard. The two designations are interchangeable in this guide.
- **Heat Recovery Ventilator (HRV) or Energy Recovery Ventilator (ERV):** An HRV is a mechanical device that exchanges indoor air with outdoor air while recovering heat at the same time using a heat exchanger. An ERV performs the same function and also provides humidification or dehumidification. The terms are interchangeable in this bulletin.
- **Passive House (PH):** An energy efficiency standard for buildings established by the international Passive House Institute.
- **Passive House Building Certifier (Certifier):** In this bulletin, a Passive House Building Certifier is one that meets the definition in the Zoning and Development By-law. A general description is a person accredited by the international Passive House Institute for the purpose of certifying buildings as being designed in accordance with its Passive House standards.

- **Passive House Planning Package (PHPP):** A PHPP is an energy model used to design a Passive House building.

- **Registered Professional:** In this bulletin, a Registered Professional is one that meets the definition in Vancouver's Building By-Law. A general description is a person who is registered as an architect or professional engineer under the Professional Governance Act.

- **Variance:** For readability, this term refers to various allowances for zero emission buildings in the Zoning and Development By-law, including relaxations and exclusions, as variances.

ADMINISTRATION

1. ZERO EMISSION STANDARDS

In this bulletin, acceptable zero emission standards include Passive House Classic, Premium, or Plus; Passive House EnerPHit in the case of an existing building; and ILFI Zero Energy. Projects must achieve the standard using on-site, installed equipment. Consideration may be given to equivalent rating systems, but applicants should confirm the suitability of other standards with City staff before making an application.

2. VARIANCES

Achieving a zero emission building usually requires more insulation, advanced air tightness, renewable energy equipment, or other features not found on typical buildings.

Applicants may apply for variances to floor area, height, yard, and building depth regulations, if they demonstrate that they will achieve Passive House certification or another accepted standard. These relaxations may be granted at the discretion of the Director of Planning upon consideration of all applicable guidelines and policies. See section 10.33.2 of the Zoning and Development By-law for typical variances for larger projects.

Because these conditional variances may allow extra height or massing, the design of the project should show how impacts on neighbouring properties such as privacy, daylight, or shadowing have been considered in the application.

Some regulations that control building size, such side yards, may not be varied by the Director of Planning under section 10.33 and will still apply.

Applicants must show how the building has been designed to achieve the relevant standard before seeking related variances and follow the process and requirements in this document. Projects that apply for variances must meet the standard chosen and achieve final certification or labeling.

Applicants are encouraged to obtain early advice on meeting the requirements of Vancouver's Building By-law from a Registered Professional.

2.1 Floor Area – Calculated Exclusions

Section 10.15 of the Zoning By-law permits a floor area exclusion to accommodate the additional thickness of walls for thermal insulation by excluding some of the floor area used for insulation. The exclusion is intended to mitigate the reduction of usable floor area. For detailed information on this exclusion and its submission requirements, see the *Floor Area Exclusions for Improved Building Performance Bulletin*.

Section 10.33.3 allows an application for a floor area exclusion of the additional area occupied by heat recovery ventilators and connected shafts in a Passive House. The exclusion is intended only for equipment that is shown to require more floor space than a conventional system. An HRV that is a Passive House "Certified Component" should be specified.

2.2 Relaxation of Height

Applicants may apply for a relaxation of height under section 10.33.2 to accommodate thicker roof and deck assemblies that are required to improve energy performance.

2.3 Simplified Process for Solar Shading Devices

The use of solar shading devices can be a key way for buildings to avoid unwanted solar heat gain. In particular, multi-unit residential buildings that are highly insulated should be tested for overheating to ensure thermal comfort. Carefully designed shading may allow buildings to pass this test without requiring the use of mechanical air conditioning.

Solar shading devices are expected to be located and designed to provide a significant decrease in solar heat gain, and they are included in the normal development permit review of applicable policies and guidelines.

Solar shading devices are currently permitted to project into a required yard within a private property site, and there is no requirement for solar shading devices projecting into side yards to be demountable. For more information regarding shades located in yards, please consult the *Shading Devices and Yard Projections Bulletin*.

Applicants should use thermal breaks for best building practice. A thermal break is an element of low thermal conductivity placed in an assembly to reduce or prevent the flow of thermal energy between conductive materials.

Vancouver's Building By-law has also been amended to provide clarity on how solar shading devices can meet building code requirements, in Division C, Part 1, Section 1.8.9.

In some cases, the optimal dimensions of a solar shade extend beyond the private property site. Solar shading devices proposed over City streets previously required a registered encroachment agreement. Revisions to the process to further support the use of effective shading devices in building designs now allow staff to issue a “Permit to Use City Property” instead of securing an encroachment agreement.

- If solar shading devices are to be considered, staff will require notation on drawings from the Registered Professional of record that the design complies with appropriate requirements of the Building By-law.
- Staff will review designs to ensure solar shading devices have appropriate clearances and are demountable. Applicants must supply (through a separate application to Engineering Services) and receive approval within the DP process by submitting the following:
    - Completed “Permit to Use City Property” application form; and
    - Supporting documents, including drawings of the proposed solar shading devices that clearly show dimensions of the shades, property lines, clearances, adjacent curb alignment and street poles, as well as method of demountability.

Generally, solar shading device encroachments into City streets can be accepted under a Permit to Use City Property if they are in compliance with the Building By-law. In some instances, at the discretion of the General Manager of Engineering Services, a registered Easement and Indemnity Agreement prepared in accordance with the Encroachment By-law will be required.

Applicants are advised that building encroachments onto City street may inhibit subdivision by strata plan due to Section 244(1) (f) of the Strata Property Act. The City of Vancouver may not support the provision of easements for any parts of the building on a City street.

2.4 Other Variances

The following table provides a general reference for conditional zoning variances that are available for larger zero emission projects.

Before making an application, read the current and relevant regulation in the Zoning and Development By-law, and related policies, guidelines, and bulletins. These documents can be found on the City of Vancouver Zoning and Land Use Document Library web page. For example, information on floor area increases and floor plate limits in multi-family buildings can be found in the *Zero Emissions Building Catalyst Policy* and the related bulletin.

Table 1: Summary of Zoning and Development By-law Variances

Variance	Section
Building depth or yard	10.33.2
Building height	10.33.2
Green roof access and infrastructure – height	10.1.1(d)

Variance	Section
HRVs and connected shafts	10.33.3
Insulation	10.15.1 and 10.15.2
Mechanical rooms with zero emission equipment	10.18.1
Roof-mounted energy equipment – height	10.1.1(d)
Shading devices, eaves, and overhangs – yards	10.8.1(f)
Venting skylights and clerestory window – height	10.1.1(e)

3. SUBMISSION REQUIREMENTS

This section describes the submission requirements at each project phase for larger zero emission projects seeking relaxations. These requirements are in addition to those of the development and building permit process for a conventional building. Applications that follow a rezoning should also see the recommended conditions of approval for sustainability.

For projects pursuing building standards other than Passive House or ILFI Zero Energy Certification, applications must include a comparable level of submission material. Before making an application under another standard, contact green.buildings@vancouver.ca.

3.1 Scheduling an Enquiry Appointment

When requesting an enquiry meeting, the applicant should:

- Consult this document and other applicable policies and guidelines,
- Note that the application will be for a project that meets an identified zero emission standard, and that the project team will be requesting related relaxations, and
- Request assignment of a Development Planner or Project Facilitator with zero emission building experience.

3.2 Enquiry Meeting

In advance of a meeting, enquirers should provide:

- A design strategy that identifies the zoning relaxations sought and any alternative solutions that are anticipated under the Building By-law, and describes the primary design elements intended to achieve the standard, and shows the elements on conceptual drawings,

- Drawings or diagrams that show how potential impacts on neighbouring houses such as privacy, massing, and shadowing have been considered in their designs, and
- A letter from a consultant who is qualified to administer the proposed zero emission standard, confirming they have been engaged to advise on the project.

> *Passive House applications:* Provide a letter from the CPHC confirming that they have been engaged to do energy modelling and advise on the project. A member of the project team may serve in this role if they are a CPHC.
>
> *Zero Energy applications:* Provide confirmation of registration with ILFI's Zero Energy Certification, and a letter from a Qualified Green Building Consultant confirming they have been engaged to advise on the project.

3.3 Following the Pre-application Meeting

There are no submission materials required at this stage. Applicants should prepare a preliminary energy model or other material as specified in the chosen zero emission standard, and revise the design as necessary to meet or exceed the standard. If specific challenges to meeting the standard are identified, these must be resolved before applying for a Development Permit.

3.4 Development Permit Application

As part of your application, provide:

1. An updated design strategy that:
    - identifies the proposed zero emission standard;
    - specifies the related zoning relaxations being sought; and
    - provides a rationale for the relaxations, and identifies the design elements proposed to meet the zero emission standard on the application drawings, and
2. A letter of commitment by the owner to complete the steps set out in the selected zero emission standard, including registration, certification, or labeling. For Passive House applications, commitment shall include certification of the building through Passive House International.

Zero Energy applications must also include:

- Proof of an established energy target and a narrative as to how this target will be achieved, including strategies around energy efficiency, electrification of building systems, and on-site renewable energy generation, from a Qualified Green Building Consultant.

Passive House applications must also include:

- A compliant preconstruction PHPP model (electronic copy of the Excel file) provided by a CPHC,
- A printout of the completed "verification" page with relevant notes, signed by a CPHC, and
- A memo providing modelling input values for the PHPP.

Applications for the exclusion of area for an HRV under section 10.33.3 must also include:

- A signed letter from a CPHC, or a letter provided by a Mechanical Engineer and then approved by the CPHC, that recommends the proposed mechanical system and notes the dimensions required,
- Dimensioned drawings in the application set showing the additional floor area required for the Passive House system as compared to a conventional system, and
- A summary table of the proposed exclusion for each building level.

Projects intending to seek Alternative Solutions should also include:

- Documents and materials to show the intended approach. Note that application for an Alternative Solution is a separate process.

Solar shades over City property:

If solar shades that encroach over City property are part of the design, submit to Engineering Services a “Permit to Use City Property” application form with supporting documents (drawings of the proposed solar shading devices that clearly show dimensions of the shades, property lines, clearances, adjacent curb alignment and street poles, as well as method of demountability).

3.5 Building Permit Application

If there are known challenges to meeting the criteria of the chosen zero emission standard, these should be resolved before applying for a Building Permit.

Passive House applications must include:

1. An updated and compliant PHPP model,
2. A letter from a Passive House Building Certifier that notes the key design strategies which allow the building to achieve Passive House certification, and confirms that the project design and specifications have been reviewed and, in the opinion of the Passive House Building Certifier, the project is capable of achieving Passive House certification, and
3. A written Passive House Verification Plan, with completed fronting checklist (found on the last page of this document). The Plan will be used to verify construction assemblies, components, insulation, air barrier, air tightness performance etc., and is designed to be a similar step to the energy checklists (ASHRAE, NECB) provided by Registered Professionals at this point in the permit process for projects not pursuing Passive House. The Verification Plan and checklist will be prepared by the project team and verified by the Passive House Building Certifier (as part of his/her design stage review) on behalf of the project team. If any element of the Verification Plan should become non-compliant, this must be immediately brought to the attention of the City of Vancouver by the Passive House Building Certifier who holds the responsibility for the Verification Plan.

3.6 Prior to Final Inspection

Zero Energy projects must provide:

- A letter from a Qualified Green Building Consultant that includes:
    - a statement that the construction of the house and that the installed assemblies and components match those specified in the consultant's narrative; and
    - a statement that there are no known barriers to the project achieving Zero Energy certification.

Passive House projects must provide:

- A signed letter from a Passive House Building Certifier confirming that work implemented was as prescribed in the Passive House Verification Plan and that they are not aware of any reason the project will fail to certify.
- A letter from the Passive House Building Certifier stating that the final PHPP and relevant documentation have been received and are being reviewed for final certification. The Passive House Building Certifier's letter must include a suggested date by which the City may expect to be notified of final certification to the Passive House Institute standard.

3.7 Building Certification

Passive House projects:

- When the project is certified by PHI, send a copy of the certificate to green.buildings@vancouver.ca.

Zero Energy projects:

- When the project is certified by ILFI, send a copy of the certificate to green.buildings@vancouver.ca.