



## REFERRAL REPORT

Report Date: December 9, 2019  
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Meeting Date: January 21, 2020

TO: Vancouver City Council

FROM: General Manager, Planning, Urban Design and Sustainability in consultation with the Director of Development Services; and Director of Legal Services

SUBJECT: Simplified and Expanded Zoning and Development Regulations for Passive House Projects

### **RECOMMENDATION**

- A. THAT the General Manager of Planning, Urban Design and Sustainability be instructed to make application to amend the Zoning and Development By-law provisions for Certified Passive House projects (except laneway houses), as generally set out in Appendix A, and that the application be referred to Public Hearing;

FURTHER THAT the Director of Legal Services be instructed to prepare the necessary amending by-law, generally in accordance with Appendix A, for consideration at Public Hearing.

- B. THAT, subject to approval of the amendments to the Zoning and Development By-law, the General Manager of Planning, Urban Design and Sustainability be instructed to bring forward for Council's adoption, at the time of enactment of the by-law amendments, related amendments to the documents "Passive House Relaxations: Guidelines for Larger Projects" and "Passive House Relaxations: Guidelines for Residences in RS Districts".

### **REPORT SUMMARY**

This report recommends amendments to the Zoning and Development By-law that will respond to the directives in Vancouver's Climate Emergency Response Accelerated Action 3C – Improved Floor Space Incentives for Zero Emission Buildings. As well, these amendments build upon past efforts to remove barriers to building to the Passive House standard, and make

building to this standard simpler for both: 1) voluntary leaders in the zero emissions building field, and 2) staff that process related permits.

### ***COUNCIL AUTHORITY/PREVIOUS DECISIONS***

May 2009: Council endorsed the Passive Design Toolkits, and directed staff to report back on ways to integrate Passive House into the City's regulatory framework.

January 2011: Council adopted the revised Greenest City 2020 Plan, including a target that all buildings constructed from 2020 onward should be carbon neutral in operations.

September 2015: Council approved amendments to the Zoning and Development By-law to conditionally allow height, rear yard, and building depth relaxations for Certified Passive House projects.

November 2015: Council approved the Renewable City Strategy, putting Vancouver on a path to achieve 100% renewable energy use before 2050.

July 2016: Council approved the Zero Emissions Building Plan to establish limits on GHG emissions for newly constructed buildings and directed staff to develop tools to support: voluntary leadership, building industry capacity, reducing zero emission building costs, as well as enable future GHG reduction requirements.

Nov 2017: Council approved amendments to the Zoning and Development By-law to expand height, rear yard, and building depth relaxations for Passive House projects.

April 2019: Council approved the Climate Emergency motion and response. Accelerated Action 3C specifically targets improved floor space incentives for zero emission buildings.

### ***CITY MANAGER'S/GENERAL MANAGER'S COMMENTS***

The City Manager recommends approval of the foregoing.

### ***REPORT***

#### ***Background/Context***

In 2015 and 2017, Council approved amendments to zoning that reduced barriers to building to the Passive House standard. In 2016, the Zero Emissions Building Plan directed staff to create tools to catalyze leadership and build capacity for low/zero emission buildings in the development and construction sectors so as to reduce costs for the broader market. Recently Council approved the climate emergency motion and requested staff recommendations on how to ramp up the City's climate actions in line with efforts to limit global warming. In response, staff created a series of accelerated actions. A key component of Accelerated Action 3, "Land Use Incentives for Green Buildings" was to develop improved floor space incentives for zero emission buildings.

Building on all of the above-noted policy directives, staff sought opportunities to add to past work and not only streamline these measures but also make further changes to encourage and support early adopters of low carbon construction approaches. This report recommends zoning amendments that will move toward effectively facilitating and simplifying the construction of Passive House and similar zero emission buildings at the one- and two-family scale.

### ***Strategic Analysis***

Passive House is a well-established, ultra-low energy building performance standard and certification process that is applicable to nearly every building type. A Passive House building has a thick layer of insulation, high performance windows and doors, an airtight envelope, and mechanical ventilation to recover waste heat while supplying fresh air. As a result, a Passive House building requires very little energy for heating while maintaining a quiet interior, stable indoor temperatures, and very good indoor air quality. This results in very low greenhouse gas (GHG) emissions and significantly reduced energy costs.

Encouraging more Passive House buildings in Vancouver is an effective way to help meet our Climate Emergency Response targets. For example, in 2018, there were approximately 2,165,000 square feet of new single family and duplex development in Vancouver. Slightly lower but similar numbers are anticipated for 2019, indicating the impact that improving the quality and performance of even a portion of Vancouver's construction and development can have on reducing our GHG emissions and meeting our targets.

Achieving a low-energy, high-efficiency home through high quality thermal envelope design results in thicker walls than a typical building, which in turn affects floor area. Similarly, larger mechanical systems for Passive House can affect floor area, reducing habitable space. In addition to the loss of floor area for insulation and mechanical equipment, owners considering Passive House must consider the potentially higher costs of building to a leading-edge building standard.

Applicants who pursue Passive House projects are currently able to recoup some of these floor area losses by applying for variations to a number of separate regulations that accommodate the increase in floor area for insulation and larger heat recovery ventilator, and operable skylights. Totalled together, these regulations can allow for the exclusion of approximately 12 to 13% of floor area for a typical Passive House. These exclusions may in turn require adjustments to height, yard, and building depth regulations that exist currently in different locations within the Zoning and Development By-law. These exclusions and variations require complex calculations and a series of extra steps that take time and effort for applicants to effectively use, and for staff to check.

### **Proposed Changes**

To address this complexity issue, this report recommends amendments to the Zoning and Development by-law to help make regulations for Passive House projects simpler to calculate, easier to administer and provide a modest increase in floor area for a limited time to offset additional costs. Regulations for Passive House projects will also be consolidated into a separate section of the By-law. Proposed amendments will support Passive House residential projects by simplifying the development permit process and allowing more flexibility in regulations for projects that meet this standard.

## 1. Floor Area

A proposed simple flat percentage floor space ratio exclusion for Passive House and related zero emission standards in RA, RS and RT areas will simplify calculations and provide a modest incentive to adopt zero emissions buildings that would help recognize the additional cost of a better building. The regulation would offer a flat exclusion that combines and replaces the current separate exclusions for insulation, mechanical equipment, and operable skylights, and includes a slight increase in floor area. The amendments are proposed to be limited to a five year period in order to line up with an anticipated new building code. Single-family houses would be eligible for a flat exclusion of 16% and duplexes eligible for an exclusion of 18%, to reflect the increased number of mechanical areas required for two dwelling units. The proposed exclusion amounts have been tested and can be accommodated within the existing zoning regulations, including those that limit overall site coverage, for new houses on typical Vancouver lots. Laneway homes and very large houses have unique challenges, and are not included in this simplified approach.

## 2. Height and Yard

In order to accommodate the additional thickness of roof insulation needed for Passive House dwellings in RS districts, staff recommend increasing the ability of the Director of Planning to conditionally increase height by an additional 0.5 m to 1.0 m. As RA and RT dwellings have a similar form of development, the maximum height increase in those areas is also set to 1.0 m, or 0.25 m less than the current maximum. The ability of other projects to access up to 1.25 m in variation is unchanged. To allow for more flexibility in accommodating wall insulation, staff recommend allowing the Director of Planning to vary the front yard by 0.5 m to complement existing regulations on the rear yard and building depth.

## 3. Other Related Regulations

During consultation with industry, designers identified improvements to the regulations to better manage solar heat gain and other issues. The proposed amendments will allow for larger solar shading devices, permit more latitude in the design of below-grade features to improve solar access for residential basements in a Passive House, and allow variation in external design regulations, ceiling heights, and partial storeys.

## 4. Content Location

Finally, building on the work that the Regulation Redesign team is doing to clarify and organize the Zoning and Development By-law, staff propose relocating the new and existing Passive House regulations to a single section of the Zoning and Development By-law. These regulations will be located in section 10.23A, shown in the appended proposed amendments. Subsection 1 consolidates the regulations applicable to houses and duplexes in the RA, RS and RT districts that are currently distributed in multiple schedules. Subsection 2 consolidates regulations for other types of development. Subsection 3 addresses mechanical systems for all scales of development. Subsection 4 contains the time-limited floor space exclusion. Subsection 5 allows the Director of Planning to consider other third party standards in exercising discretion. Revised explanatory guidelines will also be provided to explain the process and intent of these regulations.

These proposed By-law amendments, in conjunction with the associated guidelines, will simplify development permits for Passive House projects. Ultimately, these changes will support voluntary innovators and leaders, facilitate the construction of more Passive House buildings, and improve the capacity of industry to lower energy use and emissions for all new houses/duplexes.

### ***Financial Implications***

The simplified floor area exclusion for Passive House/ zero emission single family homes and duplexes is expected to provide a time-limited 3-4% floor area incentive as compared to current regulations. This modest floor area incentive and the simplified regulatory process will further reduce disincentives to development of Passive House and other zero emission single family homes and duplexes.

### ***Human Resources/Labour Relations***

There are no HR implications.

### ***Environmental***

The amendments contained in this report will contribute to meeting the goals and targets of the Climate Emergency response, the Renewable City Strategy, and the Zero Emission Building Plan.

### ***CONCLUSION***

Approving the recommendations in this report will improve and simplify a suite of regulatory tools that support the construction of Passive House/zero emission buildings in Vancouver.

As the City facilitates Passive House development and better integrates the standard into policy and regulation, the design and development communities will be more likely to build better buildings. Increasing the quality and efficiency of new construction will help form one part of a multi-pronged response to the global climate emergency.

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**DRAFT By-law to amend  
Zoning and Development By-law No. 3575  
regarding Passive House amendments**

***Note: A By-law will be prepared generally in accordance with the provisions listed below, subject to change and refinement prior to posting.***

1. This By-law amends the indicated provisions of the Zoning and Development By-law No. 3575.
2. In section 10, Council:
  - (a) strikes out section 10.12.1, including the heading, and substitutes “Deleted”;
  - (b) strikes out section 10.14.1, including the heading, and substitutes “Deleted”;
  - (c) strikes out 10.18.4; and
  - (d) strikes out section 10.32.3.
3. In section 10, Council adds the following new section 10.23A in the correct numerical order:

**“10.23A Passive House**

- 10.23A.1 For a one-family dwelling, a one-family dwelling with secondary suite, a two-family dwelling, or a two-family dwelling with secondary suite in an RA, RS or RT district, the Director of Planning may vary the following regulations to accommodate building features designed to reduce energy consumption in a Passive House, if the Director of Planning first considers the intent of the relevant district schedule and all applicable Council policies and guidelines:
- (a) height, including secondary envelopes, by a maximum of 1 m;
  - (b) the floor area of a partial storey or a half-storey;
  - (c) front yards expressed as a dimension, by a maximum of 0.5 m;
  - (d) rear yards expressed as a dimension, by a maximum of 1.25 m;
  - (e) building depth, and front and rear yards expressed as a percentage, by a maximum of 5%;
  - (f) the computation of floor space ratio where the distance from a floor to the floor above, or where there is no floor, to the top of the roof joists, exceeds 3.7 m, by excluding the area of the floor below the excess height, up to maximum of 10% of the permitted floor area;
  - (g) external design regulations; and
  - (h) the dimensions of below grade features including window wells and entrances designed to increase solar gain to a basement.

- 10.23A.2 For any district or use not included in section 10.23A.1, except a laneway house, the Director of Planning may vary a height, yard, or building depth regulation by a maximum of 1.25 m to accommodate building features designed to reduce energy consumption in a Passive House, if the Director of Planning first considers the intent of the relevant district schedule and all applicable Council policies and guidelines.
- 10.23A.3 The Director of Planning may exclude any floor area occupied by heat recovery ventilators and connected shafts in a Passive House that exceeds the floor area required in order for these features to meet the requirements of the Building By-law, to a maximum exclusion of 2% of permitted floor area.
- 10.23A.4 In an RA, RS or RT district, except where the floor area exceeds 465 m<sup>2</sup>, computation of floor area in a Passive House shall exclude 16% of the floor area in a one-family dwelling or a one-family dwelling with secondary suite, and 18% of the floor area in a two-family dwelling or two-family dwelling with secondary suite, unless exclusions are sought under section 10.11, 10.23A.1 (f), 10.23A.3, or section 4.7 of an applicable district schedule for bay windows. This section 10.23A.4 shall not apply to applications made after December 31, 2025.
- 10.23A.5 The Director of Planning may exercise the discretion in this section 10.23A to accommodate a building designed for certification under the Passive House Institute's EnerPHit standard, the International Living Future Institute's Zero Energy standard, or an equivalent standard acceptable to the Director of Planning.”.
4. In section 10.32.1(f), Council:
- (a) strikes out “fixed external shading devices” and substitutes “building projections, including shading devices, eaves, and overhangs”; and
  - (b) in paragraph (iii), strikes out “1.2 m” and substitutes “1.5 m”.
5. In the RS-1, RS-1B and RS-5 District Schedules, Council strikes out section 4.3.6.
6. In the RS-1A, RS-2, and RS-7 District Schedules, Council strikes out section 4.3.2.
7. In the RS-3 and RS-3A Districts Schedule, Council strikes out section 4.3.4.
8. In the RS-6 District Schedule, Council strikes out sections 4.3.7 and 4.6.7.
9. In the RS-1 District Schedule, Council strikes out section 4.6.6.
10. In section 4.7.2(c) of the RS-1, RS-3 and RS-3A, RS-5, and RT-10 and RT-10N District Schedules, Council strikes out “, except that the Director of Planning may exclude an area designed with venting skylights, opening clerestory windows or other similar features if: (i) in the opinion of the Director of Planning, the area is designed to reduce energy consumption or improve natural light and ventilation, and (ii) the area excluded does not exceed one percent of the permitted floor area”.

11. In section 4.7.2(c) of the RS-6 District Schedule, Council strikes out “, except that the Director of Planning may exclude an area designed with venting skylights, opening clerestory windows or other similar features if: (i) in the opinion of the Director of Planning, the area is designed to reduce energy consumption or improve natural light and ventilation, and (ii) the area excluded does not exceed one percent of the permitted floor area.”.
12. In section 4.7.3(c) of the RS-7 District Schedule, Council strikes out “, except that the Director of Planning may exclude an area designed with venting skylights, opening clerestory windows or other similar features if: (i) in the opinion of the Director of Planning, the area is designed to reduce energy consumption or improve natural light and ventilation, and (ii) the area excluded does not exceed one percent of the permitted floor area”.
13. In section 4.7.4(c) of the RT-11 and RT-11N Districts Schedule, Council strikes out “, except that the Director of Planning may exclude an area designed with venting skylights, opening clerestory windows or other similar features if: (i) in the opinion of the Director of Planning, the area is designed to reduce energy consumption or improve natural light and ventilation, and (ii) the area excluded does not exceed one percent of the permitted floor area”.
14. In section 4.7.3 of the RS-1, RS-1A, RS-1B, and RS-2 District Schedules, Council:
  - (a) in subsection (h), adds “and” to the end of the subsection; and
  - (b) strikes out subsection (i).
15. In section 4.7.3 of the RS-3 and RS-3A, and RS-5 District Schedule, Council:
  - (a) in subsection (h), adds “and” to the end of the subsection;
  - (b) in subsection (i), strikes out “; and” and substitutes “.”; and
  - (c) strikes out subsection (j).
16. In section 4.7.3 of the RS-6 District Schedule, Council:
  - (a) in subsection (i), adds “and” to the end of the subsection;
  - (b) in subsection (j), strikes out “; and” and substitutes “.”; and
  - (c) strikes out subsection (k).
17. In section 4.7.4 of the RS-7 District Schedule, Council:
  - (a) in subsection (i), adds “and” to the end of the subsection;
  - (b) in subsection (j), strikes out “; and” and substitutes “.”; and
  - (c) strikes out subsection (k).
18. In section 4.7.3 of the RA-1, RT-1, and RT-2 District Schedules, Council:
  - (a) in subsection (e), strikes out “.” at the end of the subsection and substitutes “; and”;
  - (b) in subsection (f), strikes out “; and” and substitutes “.”; and
  - (c) strikes out subsection (g).

19. In section 4.7.3 of the RT-3 District Schedule, Council:
  - (a) in subsection (g), adds “; and” to the end of the subsection;
  - (b) in subsection (h), strikes out “; and” and substitutes “.”; and
  - (c) strikes out subsection (i).
20. In section 4.7.3 of the RT-4, RT-4A, RT-4N, and RT-4AN Districts Schedule, and the RT-7, RT-8, and RT-9 District Schedules, Council:
  - (a) in subsection (f), adds “; and” to the end of the subsection;
  - (b) in subsection (g), strikes out “; and” and substitutes “.”; and
  - (c) strikes out subsection (h).
21. In section 4.7.6 of the RT-5 and RT-5N Districts Schedule, Council:
  - (a) in subsection (f), adds “; and” to the end of the subsection;
  - (b) strikes out subsection (g).
22. In section 4.7.6 of the RT-6 District Schedule, Council:
  - (a) in subsection (f), adds “; and” to the end of the subsection;
  - (b) in subsection (g), strikes out “; and” and substitutes “.”; and
  - (c) strikes out subsection (h).
23. In section 4.7.3 of the RT-10 and RT-10N Districts Schedule, Council:
  - (a) in subsection (e), adds “; and” to the end of the subsection;
  - (b) in subsection (f), strikes out “; and” and substitutes “.”; and
  - (c) strikes out subsection (g).
24. In section 4.7.5 of the RT-11 and RT-11N Districts Schedule, Council:
  - (a) in subsection (f), adds “; and” to the end of the subsection;
  - (b) strikes out subsection (g).
25. In the RS-1 District Schedule, Council:
  - (a) strikes out section 4.16.4;
  - (b) renumbers section 4.16.5 as 4.16.4;
  - (c) in newly renumbered section 4.16.4, strikes out “4.16.4” and substitutes “10.23A.1”.
26. In the RS-1A, RS-1B, and RS-2 District Schedules, Council strikes out section 4.16.2.
27. In the RS-3 and RS-3A Districts Schedule, Council strikes out section 4.16.6.
28. In the RS-5 and RS-7 District Schedules, Council strikes out section 4.16.4.
29. In the RS-6 District Schedule, Council strikes out section 4.16.8.
30. In the RT-11 and RT-11N Districts Schedule, Council strikes out section 4.16.3.

31. In section 4.17.11 of the RS-1 and RS-5 District Schedules, Council strikes out “, or to facilitate a building designed for certification under the Passive House standard or International Living Future Institute’s Zero energy standard, or equivalent to the satisfaction of the Director of Planning”.
32. In section 4.17.7 of the RS-1A, RS-1B, and RS-2 District Schedules, Council strikes out “, or to facilitate a building designed for certification under the Passive House standard or International Living Future Institute’s Zero energy standard, or equivalent to the satisfaction of the Director of Planning”.
33. In section 4.17.44 of the RS-6 and RS-7 District Schedules, Council strikes out “, or to facilitate a building designed for certification under the Passive House standard or International Living Future Institute’s Zero energy standard, or equivalent to the satisfaction of the Director of Planning”.

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