CITY OF VANCOUVER

POLICY REPORT

Report Date: June 25, 2018
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Meeting Date: July 25, 2018

TO: Standing Committee on Policy and Strategic Priorities

FROM: General Manager, Planning, Urban Design & Sustainability

SUBJECT: Updates to Rezoning Policy for Sustainable Large Developments

RECOMMENDATION

THAT Council adopt a new policy entitled "Rezoning Policy for Sustainable Large Developments" generally as described in Appendix A, to replace the existing policy of the same name.

Note, the above recommendation is subject to approval of the Policy Report dated June 25, 2018, entitled "Parking By-law Updates to Achieve Transportation 2040 Actions", on the agenda for the Regular Council meeting on July 24, 2018. Should Council not approve the recommendations outlined in the above-noted Policy Report, staff recommend the following:

THAT Council adopt a new policy entitled "Rezoning Policy for Sustainable Large Developments" generally as described in Appendix B, to replace the existing policy of the same name.

REPORT SUMMARY

This report proposes to replace the City's existing Rezoning Policy for Sustainable Large Developments with an updated policy. The proposed new policy, if adopted, will improve clarity for developers and better align with the City's goals and strategies including the Greenest City Action Plan, Rain City Strategy, Transportation 2040, Zero Waste 2040, the Vancouver Food Strategy, and the Climate Change Adaptation Strategy. The proposed update is informed implementation experience of staff and developers over the past five years, and effort has been made to clarify and streamline the requirements. The new policy will ensure large developments continue to deliver leading-edge sustainability measures that align with the City's current priorities while improving the process for developers.

COUNCIL AUTHORITY/PREVIOUS DECISIONS

June 2008: Council approved the Rezoning Policy for Greener Larger Sites - a policy to achieve higher sustainability standards as an essential component in the rezoning of large development sites.

July 2011: Council adopted the Greenest City 2020 Action Plan, which included ten goal areas and targets.

October 2012: Council received the report of the Mayor's Task Force on Housing Affordability. The Task Force emphasized the importance of providing certainty for the development community, and recommended that the City develop a more creative inclusionary housing approach for major projects.

May 2013: Council adopted an update to the Rezoning Policy for Greener Larger Sites to refine the definition of a large site and an expanded Administrative Bulletin was drafted to better articulate the requirements relative to the Greenest City 2020 goals and targets. The policy was renamed the Rezoning Policy for Sustainable Large Developments.

CITY MANAGER'S/GENERAL MANAGER'S COMMENTS

Vancouver's large developments should continue to drive excellence and demonstrate leadership in sustainable design. The proposed update to the Rezoning Policy for Sustainable Large Developments aligns with the goals of the Greenest City Action Plan, and a number of other citywide strategies, including the provision of affordable housing.

The City Manager supports the recommendations in this report.

REPORT

Background/Context

In 2008, Council approved the Rezoning Policy for Greener, Larger Sites (often referred to as the "large sites policy" or "A2"), which established requirements to achieve higher sustainability standards as a condition of the rezoning of large development sites. The large sites policy mandated that for rezoning applications involving a site area of more than 8000 sq. m (1.98 acres) the City would require plans or studies in the following six areas: (i) District Energy, (ii) Sustainable Site Design, (iii) Green Mobility, (iv) Rainwater Management, (v) Solid Waste Diversion, and (vi) Sustainable Housing. To guide applicants, an administrative bulletin was also developed.

The policy was developed because previous large site redevelopments in the city had demonstrated that positive environmental outcomes increased in viability as projects increased in scale. More specifically, the greatest opportunities were found in the realms of transportation, waste and rainwater management, urban food production and renewable energy planning. These outcomes could be achieved at lower costs when developing what could be several parcels of contiguous land, under consolidated

ownership. Rezoning was identified as an appropriate tool to leverage these opportunities.

As well, this program provides learning and market development to highlight new sustainability innovations that could eventually be found in all forms of development city-wide.

In 2013, Council approved an update to the policy, which expanded it to include large buildings (larger than 45,000 sq. m of development floor area), in recognition that large buildings—like large sites--offer unique opportunities to demonstrate sustainable practices.

A number of large developments have been rezoned under the existing Rezoning Policy for Sustainable Large Developments and have delivered a variety of sustainability measures, including district energy systems, community gardens, urban farms, and improved green mobility options.

Over the past five years a number of the City's strategies, policies and bylaws have been updated and sustainability practices have advanced. Major new initiatives such as Zero Waste 2040 and the Rain City Strategy were not contemplated when the policy was last updated. Other areas such as water conservation have also risen in priority. The Rezoning Policy for Sustainable Large Developments, while still relevant and valuable, needs to be updated to reflect current conditions. This proposed update will ensure not only that the City is advancing its sustainability goals but also that the requirements for developers are streamlined, clearer, and focused on current priorities.

Strategic Analysis

The key proposed revisions to the Rezoning Policy for Sustainable Large Developments are summarized below:

1. Removal of low carbon energy supply assessment requirements
    a. The requirements for achieving Vancouver's low carbon leadership outcomes for buildings are now articulated in the Green Buildings Policy for Rezonings and the Higher Building Policy, therefore this section is no longer needed.

2. Restructuring of Access to Nature and Sustainable Site Design sections
    a. Tree retention, biodiversity, open space and park planning objectives and requirements have been taken from the Access to Nature section and updated to reflect current City and Park Board approaches to these topics. These requirements have been moved into the Sustainable Site Design section to encourage more integrated site planning. (The Access to Nature section has been deleted.)
    b. Sustainable Site Design requirements related to building orientation and passive design approaches have been removed. Leadership in energy efficient and passive building design are now achieved via the Green Buildings Policy for Rezonings.

3. Addition of potable water conservation requirements
    a. This addition addresses a Greenest City goal that is not part of the current policy. Water is an emerging priority in the region with hotter, drier summers due to climate change. Metro Vancouver forecasts a potable water supply gap as early as 2030. The key proposed requirements are that large developments must achieve a 20 percent reduction on indoor water usage and that outdoor water usage must be reduced by 50 percent. These requirements are expected to lead to greater use of water-efficient fixtures and appliances, more rainwater harvesting (particularly for outdoor irrigation) and more drought-tolerant landscaping.

4. Updates to rainwater management requirements
    a. The proposed updates reflect the target and approaches outlined in the Rain City Strategy, and incorporate measures to protect our local groundwater system, which could be an important resource in the future. The proposed requirements are expected to lead to significantly more green infrastructure to reduce the amount of stormwater runoff from development sites, and to improve the water quality of the runoff. These requirements match what is typical of other metro municipalities.

5. Update to the local food requirement
    a. For very large development sites (over 40,470 sq. m or 10 acres), applicants will be required to arrange for programming and maintenance of the proposed food asset for a minimum of five years. This requirement is meant to ensure that major proposed food assets on very large sites—often community gardens or kitchens—have adequate stewardship post-development to be successful and sustainable.

6. Updates to green mobility requirements
    a. Traffic Demand Management (TDM) requirements for large developments have been integrated into the new Parking Bylaw (pending Council approval of RTS 012403) and therefore have been removed from the proposed updated policy.
    b. Specific measures around the provision of public electric vehicle charging infrastructure have been added to ensure large developments support Vancouver's goal to be a 100% Renewable City. A publically-accessible fast charging hub will be required for sites 40,470 sq. m (10 acres) and larger. Level-two charging infrastructure will also be required for 10 percent of commercial parking stalls, in projects with a commercial/office component.

7. Addition of resilience reporting requirements
    a. As part of the City's efforts to advance climate adaptation and broader community resilience, the updated policy will require applicants to fill out a Resilience Worksheet to identify the hazards, shocks, and stresses that applicants have designed for and the design features they have incorporated to improve resilience. The worksheet will identify design features to consider, such as provision of back-up

power, on-site renewable energy, and common rooms to facilitate social connections.

8. Updates to the Zero Waste section
    a. Language has been updated to reflect the Zero Waste 2040 Strategic Plan. The intent and expectations of this section remain the same but the approach and submission documents have been adjusted to make it easier for applicants and staff to confirm compliance.

9. Implementation of Affordable Housing update
    a. The Affordable Housing section of the policy has been updated as per the Housing Strategy, adopted by Council in November of 2017 and the Affordable Housing Delivery and Financial Strategy adopted by Council on June 20, 2018. The inclusionary housing requirements for Sustainable Large Developments has been increased to require that a minimum of 30% of residential floor area is set aside for affordable housing. The policy is structured to include two key components, including a minimum 20% social housing target and a 10% moderate income housing target, as detailed in the Affordable Housing Delivery and Financial Strategy report.

With the changes outlined above, the Rezoning Policy for Sustainable Large Developments is expected to continue to ensure large development projects provide leading practices and advance the City's sustainability goals. A summary table of the proposed changes can be found in Appendix C.

A draft revised administrative bulletin has been prepared and is attached for reference in Appendix D. This bulletin provides additional detail to assist applicants in meeting the requirements of the updated policy.

Staff recommend that if Council approves the updates to the Rezoning Policy for Sustainable Large Developments (Appendix A), that the new requirements come into effect for relevant rezoning applications accepted as complete on or after September 1st, 2018. Projects that submit rezoning applications prior to September 1, 2018 can choose to comply with the old or the new policy. For affordable housing requirements an exemption to the implementation date will be made for applications with an accepted Letter of Enquiry as of June 20, 2018, which will be allowed to proceed under the previous policy's affordable housing requirements, as per Council decision made June 20, 2018 (the remainder of the updated policy will apply).

Public/Civic Agency Input

The Urban Development Institute was consulted regarding this update.

Implications/Related Issues/Risk

Financial

The proposed policy update is not expected to result in material financial implications to the City. Staff do not anticipate any material financial impact on the development community above what is currently required.

Human Resources/Labour Relations

There are no HR implications.

Environmental

The proposed policy updates will further advance several Greenest City Action Plan goals, notably water conservation, sustainable local food, zero waste, rainwater management as well as contributing to the objectives of the Urban Forest Strategy and the Board of Park and Recreation's Biodiversity Strategy.

Legal

There are no Legal implications.

CONCLUSION

Updating the Rezoning Policy for Sustainable Large Developments simplifies and clarifies development applications while bringing consistency and focus to the sustainability outcomes for the largest redevelopments in the City. These updates will deliver sustainability leadership outcomes that will inform city-wide developments.

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REZONING POLICY FOR SUSTAINABLE LARGE DEVELOPMENTS

Adopted by City Council on [July 25, 2018]
*Effective Date September 1, 2018**
Note: This policy replaces Revised Action A-2 of the EcoDensity/EcoCity Revised Charter and Initial Actions

** Note: The affordable housing requirements in this policy apply to all large developments city-wide, except those areas that have recently adopted community plans (e.g. Cambie Corridor Unique Sites, large inclusionary housing projects in the West End) and large developments that have submitted a formal rezoning enquiry (application for rezoning advice) as of June 20, 2018. Those projects with an accepted letter of enquiry will proceed under the previous affordable housing requirements contained in the Rezoning Policy for Sustainable Large Developments amended December 16, 2014*.

This policy is effective September 1, 2018 and is mandatory for all large development rezoning applications accepted as complete on or after September 1, 2018.

Large developments are those that:

- Involve a land parcel or parcels having a total site size of 8,000 sq. m (1.98 acres) or more, or
- Contain 45,000 sq. m (484,375 sq. ft) or more of new development floor area

Projects that are limited in scope may be excluded from the requirements of this policy, including:

- Text amendments to the existing zoning for minor changes to large developments
- Projects that contain less than 4,700 sq. m (50,590 sq. ft) of new development.

In such cases, a request for partial or total exemption from the policy requirements should be discussed with the rezoning planner prior to rezoning application submission. Alternatives can be considered and, if warranted, some of the requirements may be waived by the Director of Planning in cases of hardship or conflict between requirements.

OVERALL POLICY INTENT

Large developments are expected to demonstrate leadership in sustainable design. While the policy is divided into sections for ease of readability and implementation, it is expected that large developments will use an integrated design approach and employ district-scale solutions where appropriate.

Note that City staff may involve external agencies such as TransLink, Vancouver School Board, and Vancouver Coastal Health to inform the rezoning review.

REQUIREMENTS

A. Sustainable Site Design

A.1 Objective

The proposal must contribute to meeting the City's Greenest City 2020 Action Plan targets of improving access to nature and planting trees. The proposal must also contribute to meeting the Urban Forest Strategy, Biodiversity Strategy and Rain City Strategy objectives.

A.2 Intent

Principles of sustainable site design should be applied to large site land development and management practises. This can be done by retaining or mimicking natural processes and re-modelling healthy systems. Including nature in the city improves the health and wellbeing of the community, provides habitat, enhances ecosystem function and services, creates public open spaces for people to gather and socialize, and creates opportunities for people to directly experience nature in the city. Sustainable site design is directly linked to rainwater management and proposed designs should reflect this by providing integrated solutions that meet the requirements of Sections A and E. In addition to natural systems, large developments should ensure a rich mix of uses to bring the majority of daily needs within a 5 minute walk of residents, contributing to walkable communities with the associated health, social, and environmental benefits. Consideration of building orientation and shading will be important for meeting energy performance requirements of the Green Buildings Policy for Rezonings.

A.3 Requirement

A.3.1 Development projects should consider current and future need for parks and incorporate design responses suitable for the site. Provision of parks space and recreation amenities shall be determined on a case by case basis, in consultation with the Vancouver Board of Parks and Recreation (Park Board).

Park dedication will be required where the Park Board determines that the site size is able to support it. At times, the Park Board may consider park dedication on smaller sites. On smaller sites where park dedication is not achievable, sites should be evaluated to determine how they can contribute to improving the connectivity of the park system. Anticipated population density and site size will be significant drivers in determining appropriate land dedicated for park. The Park Board's 1992 Management Plan metric of 1.1ha/1000 residents will be updated as Vancouver Board of Parks and Recreation strategies are updated.

Reference should be made to Vancouver Board of Parks and Recreation city wide strategic plans to guide delivery of parks and recreation opportunities, these plans will assist in identifying requirements, including, but not limited to, site area per capita metrics.

A.3.2 At the parcel scale, maximize opportunities for a variety of open spaces that are contiguous, such as accessible rooftops, courtyards, or ground-level spaces. Non-accessible roofs should include extensive green roof treatment in combination with other sustainable features (e.g. solar panels, water storage). Accessible rooftops should prioritize common use (rather than private) with intensive green roof areas. Residential

uses proposing significant private rooftop patios and decks may be subject to rooftop vegetative cover targets that strike a balance between hardscape and softscape ratio.

A.3.3 Setbacks to some underground parking structures will be required to achieve benefits such as:

- access to continuous soil volumes for rainwater management practises
- soil conservation by minimizing site disturbance
- significant tree retention
- establishing long lived trees, planting, habitat and food production

Note: Consideration to relax this requirement may be given to highly urbanized or sites with unique conditions causing conflict with this requirement.

A.3.4 Sites should explore and identify opportunities to maximize ecosystem benefits, biodiversity, and habitat provision through the redevelopment. Sites with existing high value ecosystems or significant established habitat or biodiversity areas should explore retention and enhancement of those items where possible. This could include creating connections between adjacent existing parks or biodiversity hotspots, habitat corridors, etc.

A.3.5 Protect and retain healthy site trees and their soil protection zones, where feasible.

A.3.6 Projects should strive to meet the canopy cover and vegetative cover targets specified in the Sustainable Large Developments Admin Bulletin.

A.3.7 Incorporate opportunities for long-living “legacy” trees and landscape approaches that mimic natural environments (such as forest succession and habitat) by providing adequate growing conditions to support large species (e.g. typology A as per the Sustainable Large Developments Admin Bulletin).

A.3.8 Adequate soil volumes are required for all plantings. For soil depth requirements on development projects, refer to the most recent version of the BCLNA Landscape Standard. In many cases, staff will require that the standards be exceeded, and specify a performance standard for soil volumes, depending on the particular application and site context. Also refer to recommended topsoil/ growing medium requirements specified in the City’s Integrated Rainwater Management Plan.

A.3.9 To protect natural and planted areas from damage, residential buildings with an occupant load greater than 30 (excluding townhouse developments) shall have at least one dog relief area marked with a legible sign.
Note: A dog relief area is for the sole purpose of allowing dogs to relieve themselves. It is not intended to be an off leash space for socialising of dogs, and should not be fully enclosed. Dog relief areas are well-draining areas, ideally at grade, that are easily cleaned, designed and constructed to be low maintenance, and suitable for intensive use.

A.4 Submission Checklist

At time of rezoning application, applicants must provide the following that show how items A.3.1 to A.3.9 will be achieved, noting that for large master-planned sites, staff may defer some detailed submission documents to development permit stage.

- A Parks and/or Open Space plan(s), as per the Sustainable Large Developments Admin Bulletin.
- A schematic Site plan, Landscape plans and sections for each development parcel to verify the location of open spaces in relation to the parking garage setbacks, tree retention (where applicable) and excavation limits. Additional details can be provided in the design guidelines for the project.
- A written Landscape/ Planting Strategy with landscape plans showing details for soft and hard landscaping, including a plant palette for drought tolerant, native, or adaptive plant species.
- An assessment of existing high value ecosystems or significant established habitat or biodiversity areas, both on-site and adjacent to the site.
    - Incorporate retained and proposed elements on Open Space Plan or Landscape plan and a written strategy to highlight ecological and biodiversity benefits, in response to the Biodiversity Strategy, Bird-Friendly Guidelines and Re-Wilding Strategy.
- Overlay sheets showing vegetation cover area and ratio percentage, including:
    - overall vegetative cover locations and calculations,
    - separate calculations for types of vegetative cover, including soft landscape area, tree canopy, extensive and intensive green roof cover, (excluding hardscape area). Note: the calculations should forecast canopy cover of trees at time of maturity.
- An overall Tree Strategy, including: detailed arborist report documenting status of all existing tress, a written rationale for proposed retention plan, proposed tree planting plan, proposed tree management plan.
- A Soils Strategy (written and plans) with an accurate soil volume overlay sheet to describe the area and type/quality of soils. This is to be informed by the Rainwater Management Plan, but should consider soil conservation practises, low impact construction practises, site constraints, enhancement opportunities and landscape soil standards.

At time of development permit application, for individual development parcels, applicants must provide the following to show how requirements A.3.1 to A.3.9 will be achieved:

- A detailed site plan, landscape plans, sections for each development parcel to verify the location of open spaces in relation to the parking garage setbacks, tree retention (where applicable) and excavation limits. Additional details can be provided in the design guidelines for the project.
- A written rationale and Landscape Plan/Planting Plan verifying details for soft and hard landscaping, including a plant palette for drought tolerant, native, or adaptive plant species.
- A written rationale and verification on the Landscape plan of retained and proposed ecological and biodiversity benefits, in response to the Biodiversity Strategy, Bird-Friendly Guidelines and Re-Wilding Strategy. This should include a detailed assessment of existing high value ecosystem resources or significant established habitat or biodiversity areas, both on-site and adjacent to the site.
- Detailed overlay sheets showing vegetation cover area and ratio percentage, including:
    - overall vegetative cover locations and calculations,
    - separate calculations for types of vegetative cover, including soft landscape area, tree canopy, extensive and intensive green roof cover, (excluding hardscape

area). Note: the calculations should forecast canopy cover of trees at time of maturity.

- A detailed Arborist Report and Tree Management Plan;
- A site specific soil volume overlay sheet to describe the area, volume and type/quality of soils with emphasis on specifications for tree planting, re-landscape specifications, special soils and rainwater infiltration/absorption.

B. Sustainable Food Systems

B.1 Objective
The proposal will contribute to increasing city and neighbourhood food assets and supporting local and sustainable food systems as outlined in the Greenest City 2020 Action Plan and the Vancouver Food Strategy.

B.2 Intent
The City will require the applicant to demonstrate the overall increase of food system assets. Food assets are defined as resources, facilities, services, and spaces that are available to residents of the city (either at the citywide or neighbourhood scale) that enable a healthy, just, and sustainable food system.

B.3 Requirements
B.3.1 Deliver a minimum of three food assets.

B.3.2 If site is greater than 40,470 sq. m (10 acres), food assets will be expected to have more significant presence and impact than for smaller sites. Arrangements must be made for programming and maintenance of food assets for a minimum of five years (starting from date of occupancy).

B.4 Submission Checklist
At time of rezoning application, applicants must provide the following to show how items B.3.1 to B.3.2 will be achieved:

- Identification and description of a **minimum of three food assets** to be delivered
- Description of how selected food assets fit with the site context
- Early indication of how the food asset may be effectively programmed and maintained
- Drawings showing food asset locations and adequate space provision and infrastructure
- If site is greater than 40,470 sq. m (10 acres), provide a summary of arrangements for programming and maintenance of food assets for a minimum of five years

At time of development permit application, applicants must provide the following to show how items B.3.1 to B.3.2 will be achieved:

- Detailed design and layout for the three food assets
- If site is greater than 40,470 sq. m (10 acres), provide documentation for operationalizing the asset, including any confirmed programmers, coordinators, or operators where relevant and outline of maintenance plans.

C. Green Mobility

C.1 Objective

The proposal will contribute to meeting the following citywide goals:

- Transportation 2040 and Greenest City targets of having walking, cycling, and public transit trips make up at least 66% of all trips by 2040 and to reduce motor-vehicle kilometer traveled per resident by 20% from 2007 levels.
- Greenest City target to reduce community-based greenhouse gas emissions by 33% by 2020 levels and the Renewable City target to reduce greenhouse gas emissions 80% below 2007 levels before 2050
- Greenest City Clean Air target to always meet or beat the most stringent air quality guidelines.

C.2 Intent

The intent is to encourage sustainable transportation to:

- Make walking and cycling safe, convenient and enjoyable
- Support access to fast, frequent, and reliable transit
- Reduce reliance on private automobiles
- Accelerate the transition to electric vehicles, particularly for shared vehicles
- Improve air quality and resident health

C.3 Requirements

C.3.1 Provide a Transportation Demand Management Plan meeting the requirements of the Administrative Bulletin for Transportation Demand Management for New Developments in Vancouver.

C.3.2 Provide charging outlets for 10% of commercial structured parking, where applicable.

C.3.3 For sites 40,470 sq. m (10 acres) and larger, provide one publically-accessible fast charging hub with at least two chargers.

C.4 Submission Requirements:

At time of rezoning application, applicants must provide the following to show how items C.3.1 to C.3.3 will be achieved:

- Submit a Transportation Demand Management Plan
- Include a summary of electric vehicle charging provisions in the project statistics
- Identify fast charging hub locations on site plans, where applicable.

At time of development permit application, applicants must provide the following to show how items C.3.1 to C.3.3 will be achieved:

- Submit a finalized Transportation Demand Management Plan
- Include a summary of electric vehicle charging provisions in the project statistics.
- Identify fast charging hub locations on site plans, where applicable.

D. Potable Water Management

D.1 Objective

The proposal will contribute to the Greenest City goals of reducing potable water use by 33% from 2006 levels and meeting stringent water quality standards.

D.2 Intent:

The City of Vancouver is moving to an integrated water management approach, where all water within and around the city will be managed together as one system. This approach improves resiliency against climate change, allows the City to address current and future water demands and to protect aquatic systems. The City's objective for potable water management (conservation and efficiency) is to promote the sustainable use of the City's potable water supply, aspiring to offset growth impacts on water demand and avoid, defer, or minimise the financial, environmental and social costs associated with expanding potable water infrastructure. At a building scale, water conservation and efficiency can provide a beneficial reduction in water use by reducing waste, using less water to accomplish the same function or task and by using alternative non potable sources water that match the appropriate level of water quality to its end use. Water conservation and efficiency can provide operation cost management benefits and on site supply resiliency.

D.3 Requirements

Integrated Water Management Approach

D.3.1 An integrated approach to water management at the site scale should be used. Opportunities to conserve water and use it more efficiently, as well as methods for managing rainwater more effectively through green infrastructure and harvesting rainwater for non-potable use should be taken advantage of.

The integrated water management approach for the building(s) and the site shall be demonstrated through the production of a Water Balance for the building(s) and parcel that quantifies water inputs, uses, and outputs. This shall include input water sources including potable water, and rainwater, and outflows to the sanitary, combined, and storm sewers. The Water Balance shall be produced for the 'baseline' and 'proposed' scenarios and demonstrate compliance with the minimum potable water use reductions over baseline specified in D.3.2 and D.3.3, achieved by taking an integrated approach to water management at the site scale.
Note: The Water Balance and accompanying supporting data, calculations, plans, reports and other materials shall be prepared by subject matter experts (such as an Engineer, Geoscientist, or other professional) and signed/sealed by same, subject to review by the City. Refer to Sustainable Large Developments Admin Bulletin for baseline calculation assumptions and other details.

D.3.2 A minimum 20 percent reduction in indoor potable water use is to be achieved through any combination of water conservation, efficiency and/or onsite non-potable water re-use. The reduction in potable water use shall be demonstrated by provision of 'baseline' and 'proposed' indoor water use figures, which shall be calculated as outlined in the Sustainable Large Developments Admin Bulletin.

D.3.3 A minimum 50 percent reduction in outdoor potable water is to be achieved through a combination of water conservation, efficiency and/or onsite non potable water re-use.

The reduction in potable water use shall be demonstrated through the use of the City of Vancouver's Water Wise Landscape Guidelines and the provision of 'baseline' and 'proposed' outdoor water use figures, calculated using the most recent version of the LEED Outdoor Water Use Reduction Calculator or other approved method. Note that planted landscapes on structures will require irrigation and as such these areas must be included when preparing the landscape plan and determining outdoor water use.

D.4 Submission Checklist
At time of rezoning application, applicants must provide the following to show how items D.3.1 to D.3.3 will be achieved:

- Provide a preliminary Water Balance for the building(s) and parcel with the content and supporting documentation as per the specifications outlined in the Sustainable Large Developments Admin Bulletin.

At time of development permit application, applicants must provide the following to show how items D.3.1 to D.3.3 will be achieved:

- Provide a refined Water Balance for the building(s) and parcel using final proposed occupancy figures.

E. Rainwater & Groundwater Management

E.1 Objective
The proposal will contribute to the City's Rain City Strategy and Integrated Rainwater Management Plan's target of capturing and treating 90% of annual rainfall on public and private property. It also aims to preserve sewer capacity, reduce the risk of combined sewer overflows and maintain wastewater treatment effectiveness through the prohibition of groundwater flows entering the sewer system in alignment with the Metro Vancouver 2010 Integrated Liquid Waste and Resource Management Plan.

E.2 Intent
Rainwater should be recognized as a resource to enhance the community and environment. The use of water-sensitive site design and green infrastructure practices or source controls adds resiliency to the City's drainage system in a changing climate and keeps harmful stormwater pollutants from entering our receiving waters. Green infrastructure approaches are to be maximized on site to the greatest extent possible, following a tiered approach, with onsite infiltration and rainwater re-use and being the most preferred approach, and detention being the least preferred.

City sewers are limited in their capacity and are not designed to convey groundwater. Problems arise when developments with deep basements and/or underground parkades that intercept the water table implement sub-drain systems that pump water to the sewer as a means to intercept groundwater seepage and limit hydrostatic forces on foundation walls and floor slabs. The intent of this policy is to prevent long-term groundwater discharges to the City sewers. Accordingly, developments are required to wholly manage groundwater onsite.

Definitions:
Groundwater: Water within voids within a soil or rock matrix
Water table: The level below which the soil or rock voids are saturated with water at a pressure of 1 atmosphere or greater

E.3 Requirements

E.3.1 All buildings and the site as a whole shall be designed such that no groundwater from systems at or below the yearly high water table is discharged to City sewers. Exceptions may be made for temporary construction dewatering.

E.3.2 A Hydrogeological Study shall be undertaken at the site that evaluates the potential for the proposed building(s) and site design to intercept the yearly high water table. The study shall be prepared by a subject matter expert, and include at minimum the items identified in the Sustainable Large Developments Admin Bulletin. If any groundwater interception is proposed (post-construction), a Groundwater Management Plan must be submitted as part of the Hydrogeological Study. The Groundwater Management Plan will demonstrate that no permanent groundwater discharge to City sewers will occur, and must include at a minimum the items identified in the Sustainable Large Developments Admin Bulletin.

Note: If temporary construction dewatering is proposed, an Impact Assessment must be submitted as part of the Hydrogeological Study. The Impact Assessment will demonstrate that no significant negative impacts result from groundwater extraction, and must include at a minimum the items identified in the Sustainable Large Developments Admin Bulletin.

E.3.3 The rainwater management system for the building(s) and site shall be designed such that the peak stormwater flow rate discharged to the sewer under post-development conditions is not greater than the pre-development peak flow rate for the return period specified in the City of Vancouver's Intensity-Duration-Frequency curves (IDF curves). The City of Vancouver's 2014 IDF curve shall be utilized for pre-development design flow calculations, and the City of Vancouver's 2100 IDF curve, which takes into account the effects of climate change, shall be utilized for post-development design flow calculations. Refer to the Sustainable Large Developments Admin Bulletin for further details.

E.3.4 The first 24 mm of rainfall falling on all pervious and impervious surfaces across the site shall be retained on site by means of infiltration, evapotranspiration, and/or re use for the purpose of reducing the volume of rainfall entering the City's sewers. To achieve this on-site retention target the rainwater management system shall manage rainfall in accordance with the green infrastructure tiered approach outlined in the Sustainable Large Developments Admin Bulletin.

Note: Landscaped areas designed with the appropriate depth of growing medium over native subsoil may be deemed to meet the 24 mm retention criteria. Appropriate growing medium depths shall be based on providing sufficient storage volume within the media to meet the retention criteria and meet horticultural needs as outlined in the Metro Vancouver Source Control Guidelines.

E.3.5 The first 24 mm of rainfall from all pervious and impervious surfaces shall be treated to remove 80% Total Suspended Solids (TSS) by mass prior to discharge from the site. For impervious surfaces with high pollutant loads, including roads, driveways, and parking lots the rainfall depth to be treated increases to the first 48 mm of rainfall. Treatment can

be provided by either one green infrastructure practice or by means of a treatment train comprised of multiple green infrastructure practices that can be demonstrated to meet the 80% TSS reduction target.

E.4 Submission Checklist

At time of rezoning application, applicants must provide the following to show how items E.3.1 to E.3.5 will be achieved:

- A preliminary Rainwater Management Plan completed by a certified professional Engineer as per the specifications outlined in the Sustainable Large Developments Admin Bulletin.
- A Hydrogeological Study completed by a professional with experience in hydrogeology as per the specifications outlined in the Sustainable Large Developments Admin Bulletin.
- A Geotechnical Study shall be undertaken at the site that evaluates the potential and risks for onsite rainwater infiltration. The study shall be prepared by a subject matter expert and certified professional, and include at minimum:
    - Infiltration testing at likely locations for infiltration practices and a proposed design infiltration rate;
    - Soil stratigraphy;
    - Depth to bedrock and seasonally high groundwater; and
    - Assessment of infiltration risks such as slope stability and soil contamination.

At time of development permit application, applicants must provide the following to show how items E.3.1 to E.3.5 will be achieved:

- A final signed and sealed Rainwater Management Plan completed by a professional engineer and signed and sealed Geotechnical Study prepared by a subject matter expert and certified professional. The content and supporting documentation is to be updated to reflect all material changes to the proposed development and new/refined supporting data, calculations, plans, reports and other materials following submission of the preliminary Plan and preliminary Geotechnical Study
- A final signed and sealed Hydrogeological Study, including Groundwater Management Plan and Impact Assessment, if applicable, completed by a certified professional with experience in hydrogeology. The content and supporting documentation is to be updated to reflect all material changes to the proposed development and new/refined supporting data, calculations, plans, reports and other materials following submission of the initial Hydrogeological Study submitted at time of Rezoning Application.

F. Zero Waste Planning

F.1 Objective

The proposal will contribute to the City's Greenest City target on Zero Waste and the objectives set out in the City's Zero Waste 2040 strategic plan with respect to waste avoidance, reduction, increased opportunities for material re-use and recycling, and reduced greenhouse gas emissions, and the overall goal of eliminating Vancouver waste disposed to landfill and incinerator by 2040.

F.2 Intent

Projects are expected to be leaders in waste minimization and waste diversion. The ultimate objective is to facilitate the reorientation of peoples' habits and practices toward the City's zero waste target. The key objectives of a project's Zero Waste Design and Operations Plan are to foster ongoing waste reduction and increased diversion of products and materials from the waste stream through avoidance, re-use, composting and recycling. The intent is to achieve the following:

- Infrastructure and systems to facilitate product repair and re-use.
- Infrastructure and systems to enable the reduction and/or elimination of single-use items (e.g. dishwashers to enable use of reusable dishware).
- Innovative and leading edge measures to support waste diversion and minimize the environmental impacts of waste collection activities, such as the use of a pneumatic collection system, high-capacity waste containers (i.e. deep burial), and communal composting.
- Increased opportunities to re-use/donate/exchange materials.
- Connections with charities and other non-profit organizations to support the rescue and redistribution of nutritious food that would otherwise be disposed.
- Reduce waste operations-related environmental emissions, notably GHG emissions, through strategies such as reduced service-vehicle trips.

F.3 Requirements:

F.3.1 Buildings must be designed with adequate and well-designed storage spaces/collection points for waste management materials, including multi-stream recycling, food scraps, and extended producer take back items - as described in the Sustainable Large Developments Admin Bulletin.

F.3.2 Zero waste/waste management communications and education programs for residents and businesses must be created and implemented, including a minimum number of actions from the Sustainable Large Developments Admin Bulletin.

F.3.3 Buildings must incorporate zero waste efforts beyond the provision of standard recycling bins. A number of additional zero waste actions are required, as per the Sustainable Large Developments Admin Bulletin.

F.3.4 Post Occupancy Plan Implementation Report - the applicant must provide the City with a report on implementation of the Zero Waste Design and Operations Plan within 18 months of occupancy. The implementation report shall include:

- Types and quantities of waste diverted.
- Types and quantities of waste disposed.
- Names and locations of recycling processing facilities used.
- Description of on-site re-use options, product stewardship facilities, NGO drop-off bins, etc. and estimates of the amount of waste reduced through those initiatives.
- Description of annual education initiatives undertaken.
- Overview of exterior litter removal program.
- Summary of initiatives to reduce GHG emissions related to waste.
- Summary of other initiatives undertaken to facilitate zero waste on-site.

F.4 Submission Checklist

At time of rezoning application, applicants must provide the following to show how items F.3.1 to F.3.4 will be achieved:

- A Zero Waste Design and Operations Plan that includes the sections outlined below. The Plan should identify which zero waste actions are included in the design (see Sustainable Large Developments Admin Bulletin for details on required actions):
  - Vision/goal statement
  - Description of project and diversion objectives
  - Space Allocations (site-wide and/or building scale)
  - Operations
    - Occupant/public education and outreach
    - Facility operations training and support
- Acknowledgement of intent to provide a Plan Implementation Report post-occupancy, with details regarding who will be responsible for submitting.

At time of development permit application, applicants must provide the following to show how items F.3.1 to F.3.4 will be achieved:

- A refined, detailed Zero Waste Design and Operations Plan for each building. The refined Plan should reference, in the Space Allocation section, plan drawings confirming physical spaces provided.
- Prior to DP issuance, a Letter of Commitment to supply a Plan Implementation Report post-occupancy will be required with details regarding who will be responsible for submitting.

G. Affordable Housing

G.1 Objective

The proposal will contribute to meeting the affordable housing objectives and targets of the Housing Vancouver Strategy (2018-2027), in particular to achieve the target of 12,000 new units of social, supportive and co-op housing through the delivery mechanisms outlined in the Affordable Housing Delivery and Financial Strategy (2018-2027).

G.2 Intent

The intent of this policy is to clarify the minimum requirements and priorities for delivering affordable housing on large development sites while providing flexibility in delivery to ensure financial viability and to accommodate varying development contexts. The Affordable Housing Delivery and Financial strategy identifies large developments as important sites to contribute to the delivery of social and supportive housing options for lower-income households and housing for moderate-income households. The priority for securing dirt sites under this policy contributes to the City's ability to provide publicly-owned sites for affordable housing development in a sustainable way to meet both current and future housing needs.

The affordable housing requirements in this policy apply to all large developments city-wide, except those areas that have recently adopted community plans (e.g. Cambie Corridor Unique Sites, large inclusionary housing projects in the West End) and large developments that have submitted a formal rezoning enquiry (application for rezoning advice) as of June 20, 2018. Those projects with an accepted letter of enquiry will proceed under the previous affordable housing requirements (the 20% policy) contained in the Rezoning Policy for Sustainable Large Developments amended December 16, 2014.

G.3 Requirements
The inclusionary housing requirements for large developments are a minimum of 30 percent of total residential floor area set aside for affordable housing. This includes two components: a minimum 20 percent social housing target and minimum 10 percent moderate income housing target, as detailed below:

G.3.1 A minimum of 20 percent of total residential floor area set aside for social housing, prioritizing the transfer of unencumbered dirt site(s) to the City of sufficient size to accommodate the 20 percent of floor area as social housing.
Note: If it can be demonstrated by the proponent that providing dirt site(s) is not possible due to project context, consideration will be given to delivery of all or a portion of the 20 percent floor area requirement as turn-key social housing designed in accordance with the Housing Design and Technical Guidelines, with ownership transferred to the City in the form of an Air Space Parcel.

G.3.2 A minimum of 10 percent of total residential floor area set aside for affordable rental housing targeted to households with moderate incomes of $30,000 to $80,000/year provided in a variety of unit types (studios, 1, 2 and 3 bedrooms). Rental rates for these units will be secured through a Housing Agreement with the City.

The approach described above clarifies the City's policy priorities and outlines a standard approach to affordable housing delivery on large development sites. However, given the diversity amongst large development sites in Vancouver, the General Manager of Planning, Urban Design and Sustainability may recommend alternative approaches to Council where there is clear rationale and evidence in the context of individual projects that demonstrates an alternative approach is merited and would contribute to the goals of the Affordable Housing Delivery and Financial Strategy.

G.4 Submission Checklist
Refer to the Sustainable Large Developments Admin Bulletin.

H. Resilience

H.1 Objective
To better position the city to deal with significant shocks and stresses, particularly: earthquakes, extreme weather, extreme temperatures, sea level rise; and to assist in improving disaster preparedness and social connection. To meet the objectives of the Climate Change Adaptation Strategy, including the objective to increase resilience of the built environment to future climate conditions.

H.2 Intent:
The City of Vancouver is undertaking two initiatives related to resilience:
- A broader Resilience Strategy, with forthcoming policies related to Vancouver specific shocks and stresses
- The Climate Change Adaptation Strategy update, adopted by Council in 2012, the adaptation strategy is being updated with new climate projections and actions

While specific resilience policies are being developed, development projects should consider social and physical resilience and incorporate design responses where possible. Projects must

identify building and design strategies that eliminate, reduce, and mitigate adverse impacts including those due to changing climate conditions.

H.3 Requirement

H.3.1 Show how resilience is incorporated in the design. Submit a resilience worksheet summarizing design features that improve resilience for the development.
Note: that this submission should be treated as a public disclosure and the City may display some or all of the information publically. Submission of the completed worksheet will meet this requirement, no further action is required.

H.3.2 All buildings with an occupant load greater than 30 (except townhouse developments) shall have at least one accessible, self-closing drinking water fountain, located in a common area inside buildings at or near the level 1 entrance and visible from the exterior. The fountain must be capable of operating on city water pressure alone and without electricity. The apparatus must also include an appropriate fitting for filling water bottles. Fountains are to be installed on the shortest dead leg possible off of a line that is flowing regularly; this line would preferably be serving a washroom.

H.4 Submission Checklist

At time of rezoning application, applicants must provide the following to show how items H.3.1 to H.3.2 will be achieved:

- A preliminary resilience worksheet and text summary of any design features that contribute to site/building resilience.
- Identification of location of self-closing drinking water fountain on a floorplan

At time of development permit application, applicants must provide the following to show how items H.3.1 to H.3.2 will be achieved:

- An updated resilience checklist and text summary of any design features that contribute to site/building resilience.
- Identification of location of self-closing drinking water fountain on a floorplan

If the Parking By-law updates presented to Council on July 24, 2018 for approval are not approved by Council, the wording of the Rezoning Policy for Sustainable Large Developments will be the same as Appendix A except that the sentence in section C.3.1, on page 6 of Appendix A, will be deleted and replaced with the following sentence:

"C.3.1 Provide a Transportation Demand Management Plan as per the Sustainable Large Developments Admin Bulletin."

Note that the Sustainable Large Developments Admin Bulletin shown in Appendix D is written assuming the Parking Bylaw updates presented to Council on July 24, 2018 are adopted and Appendix A is approved. If Appendix B is approved, the Green Mobility section of the Admin Bulletin will be adjusted to incorporate the Transportation Demand Management approach and details developed for the Parking Bylaw update.

Upon Council approval, staff will update the wording of the approved Rezoning Policy for distribution to the public.

SUMMARY OF PROPOSED POLICY REQUIREMENTS

SUST. SITE DESIGN	
A.3.1	Possible dedicated park space required, depending on site size & context
A.3.2	Maximize opportunities for contiguous, accessible open space on rooftops and at ground level
A.3.3	Setbacks to some underground parking structures will be required
A.3.4	Explore opportunities to maximize ecosystem benefits, biodiversity, and habitat provision
A.3.5	Protect and retain healthy, significant site trees
A.3.6	Strive to meet the canopy cover and vegetative cover targets specified
A.3.7	Provide adequate growing conditions to support large species, long lived “Legacy” trees
A.3.8	Provide adequate soil volumes for all plantings
A.3.9	Protect planted areas by providing dog relief areas (each multi-family building)
FOOD SYTEMS	
B.3.1	Delivery of a minimum of three food assets
B.3.2	If over 10 acres: description and evidence of arrangements for programming and maintenance of the food assets for minimum of 5 years
GREEN MOBILITY	
C.3.1	Provide a Transportation Demand Management Plan meeting the points requirement of the Parking Bylaw
C.3.2	Provide EV charging outlets for 10% of commercial structured parking
C.3.3	Provide public EV fast charging hub (sites over 10 acres)
WATER	
D.3.1	Use an Integrated Water Management approach
D.3.2	Achieve a 20% reduction in indoor potable water use
D.3.3	Achieve a 50% reduction in irrigation potable water use
RAINWATER & GROUNDWATER	
E.3.1	No groundwater discharged to city pipes
E.3.2	Hydrogeological study required
E.3.3	Pre/post peak flow rate comparison required to ensure sewer capacity is adequate
E.3.4	Rainwater: 24mm retained; manage rainfall using tiered approach
E.3.5	Rainwater: first 24mm treated to remove 80% of total suspended solids (TSS)
WASTE	
F.3.1	Designs must include adequate space for collection bins and zero waste initiatives
F.3.2	Occupant/Public communication, education program required; including min of 3 items from list
F.3.3	Must include additional zero waste actions; minimum of 7 from list
F.3.5	Post Occupancy Implementation Report submitted to City 18 months after occupancy
AFFORDABLE HOUSING	
G.3.1	20% of total residential floor area set aside for social housing
G.3.3	10% of total residential floor area set aside for affordable rental housing

RESILIENCE	
H.3.1	Completed resilience worksheet required
H.3.2	Resilient drinking water access in each building

City of Vancouver *Planning - By-law Administration Bulletins*
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SUSTAINABLE LARGE DEVELOPMENTS

Authority - Director of Planning, Urban Design and Sustainability
Effective September 1, 2018

Intent

This bulletin is intended to inform applicants seeking to comply with the Rezoning Policy for Sustainable Large Developments.

Large developments are those that:

- Involve a land parcel or parcels having a total site size of 8,000 sq. m (1.98 acres) or more, or
- Contain 45,000 sq. m (484,375 sq. ft) or more of new development floor area

Projects that are limited in scope may be excluded from the requirements of this policy, including:

- Text amendments to the existing zoning for minor changes to large developments
- Projects that contain less than 4,700 sq. m (50,590 sq. ft) of new development.

In such cases, a request for partial exemption from the policy requirements should be discussed with the rezoning planner prior to rezoning application submission. Alternatives can be considered and, if warranted, some of the requirements may be waived by the General Manager of Planning, Urban Design, and Sustainability (under Director of Planning authority).

Applicants should review the process and requirements articulated in this document. This document is to be used in conjunction with: typical permit application documents; the applicable District Schedule of the Zoning and Development By-law; and any other relevant policies or guidelines.

Note that this policy works with two other Sustainability policies, as follows. The Green Building Policy for Rezonings applies to rezoning applications of any size, some large development rezonings may fall under the Higher Building Policy; both of these policies are ***in addition*** to the requirements in this policy.

This policy has eight sections, as follows:

A. Sustainable Site Design
B. Sustainable Food Systems
C. Green Mobility
D. Potable Water Management
E. Rainwater and Groundwater Management
F. Zero Waste Planning
G. Affordable Housing
H. Resilience

A. Sustainable Site Design

General Information

Large site developments should follow principles of sustainable site design in land development and management practises.

Walkable neighbourhoods reduce driving, reduce GHG emissions, reduce the cost of living and reduce rates of obesity, high blood pressure, heart disease, and diabetes. Walkable neighbourhoods are characterized by proximity to amenities and services, a pedestrian orientation that minimizes car dependence, and well established density and land use diversity thresholds. Applications should contribute to creating a walkable, complete community.

Retaining or mimicking natural processes and modelling healthy living systems should be done wherever possible. Including nature in the city improves the health and wellbeing of the community, provides habitat, enhances ecosystem function and services, creates public open spaces for people to gather and socialize, and creates opportunities for people to directly experience nature in the city.

The allocation and design of public open space or spaces can provide significant public amenity and ecosystem services, such as rainwater management, urban forest canopy, food production and habitat. The response to open space and built form requirements will depend on the site typology which is divided for the sake of this section as follows:

- **Site Type A**: These sites are typically master planned and subject to one rezoning application. They contain multiple parcel or multiple buildings under individual development applications. By design, they are characterised by having at least one substantial, contiguous park or open space having a natural soil profile and growing conditions. In addition, there will be a mixture of private, semi-private and public open spaces throughout the site that are located at grade and on top of structure.
- **Site Type B:** These sites are typically master planned and subject to one rezoning application. They contain multiple parcel or multiple buildings under individual development applications. As differentiated from Type A, the majority of open space is provided on top of building structure, roofs, plazas and at the perimeter of buildings.
- **Site Type C:** These sites are single parcel large sites subject to a rezoning application and occasionally qualify under the *Policy for Higher Buildings*. They are generally characterised by building(s) on top of excavated underground parking garages. Open space is typically provided through a mixture of publicly accessible plazas, semi-private common courtyards and amenity decks, private decks and rooftops. Landscapes are established on slab in non-continuous soils. Access to grade oriented, continuous natural soil profile is challenged or limited to the perimeter of the building.

Sustainable Site Design should, in addition to the requirements specified in the policy, consider the following.

- The Rainwater Management Plan must be coordinated with the open space plan, site plan, and landscape plan. This requires an integrated approach to site planning throughout the design process. See the Rainwater Management section of this policy for complete rainwater management requirements.
- Consider the effects of micro-climate, solar aspect, shading, wind, elevation, temperature in the overall landscape design and plant selection. By looking at wind effects and other site conditions, buildings can be pre-modelled early in the design process to optimise growing conditions and improve the quality of outdoor space for habitants. This can result in changes to building location and shape.

- The grading plan and the landscape design must demonstrate water conservation and rainwater management. This can be done by employing landscape grading techniques and hardscape design strategies, such as: use permeable hardscaping materials that allow sub-grade water infiltration, direct water to soil infiltration zones and/or sub-grade or rooftop water storage systems, employ “treatment train” strategies. Refer to the Rainwater Management section for more details. Refer to the City of Vancouver’s Waterwise Landscape Guidelines.
- For sites with open space having continuous soils (Type A), irrigation requirements should be phased out following an establishment period of two (2) years.
- Early in the design process, the structural design should anticipate slab strength and modifications (lowering or angling) to ensure that sufficient soil volumes are provided for trees. Tree planters on roofs should be permanent, substantial and cast in place, wherever possible. Avoid ‘container’ planting.
- Biodiversity - from micro-organisms living in the soil to all the flora and fauna sharing the urban landscape - is essential to the health of city wide and regional ecosystems. All proposals should incorporate habitat design, plant diversity and soil health principles. For further direction on these requirements, refer to the *Urban Forest Strategy*, *Bird-Friendly Design Guidelines, Biodiversity Strategy and ReWilding Strategy.*

Dog Relief Area Design Considerations:

These are well-draining areas, ideally at grade, that are easily cleaned. Elements should include deep pea gravel surfacing (minimum 500mm), a hose bib for cleaning and dog washing, trash receptacle and bag dispenser, pee post and decorative elements, and other attractive landscaping elements. Dog relief areas are small in size with a minimum area of approximately 9 sq. m.

Submission Requirements, Additional Information

Trees

Applications must provide an arborist report evaluating the condition of existing trees on site (refer to Protection of Trees By-law, No. 9958, section 7.2). Applications should refer to Vancouver’s Urban Forest Strategy to understand the citywide goals and objectives related to protecting and enhancing the urban forest. The current Urban Forestry Strategy goal is to increase tree canopy cover to a city-wide average of 22 % by 2050. Tree canopy cover is generally proportional to permeable surface cover. At the neighborhood and development site scale, there are many factors that determine feasibility of tree canopy coverage. Larger sites (Type A & B) should target the minimum of 22% tree canopy cover on public and private property, to the greatest extent practicable.

Targets:

Tree canopy (Total site)		Vegetative cover		Continuous soils at grade	
Type A	20-25 %	Total site	30 %	Private property parcel	10 %
Type B	15-20 %	Private property parcel	40 %		
Type C	10-15 %				

Definitions:
Total site = public and private property

Vegetative cover = sum of all vegetation cover forecast at maturity, including tree canopy, landscaped areas, green roofs
Continuous soils at grade = soil zones that maintain the qualities of the existing disturbed or undisturbed natural soil profile and hydrology through to bedrock and are not located on top of structure and are generally open to the sky

Calculations:
Tree canopy and vegetative cover should be calculated by using forecasted tree canopy cover area at time of tree maturity in an urban setting, which will vary based on species, expressed as a ratio of total site area. Existing tree canopy cover can use the current canopy size or the forecasted maturity size, whichever is greater. The canopy and vegetation plans can be presented in plan view (two dimensional) using an area overlay sheet with calculations.

At the scale of the overall large site (Type A & B), the site area is the defined by the boundary of the project, including all public and private property. At the development parcel scale, calculations include all tree and vegetation on private property; and, adjacent canopy coverage and plantings on city property in the immediate proximity, but cannot be counted twice for different parcels.

Park and Open Space Plan contents:

- area calculations to differentiate between accessible open space with continuous soil and non-continuous soil (landscapes on structure);
- area calculations to differentiate between outdoor open spaces shown as public, semi-private, and private to highlight how access to nature is provided. City streets, sidewalks and lanes are necessary public corridors and should not be included in the calculations. Pedestrian oriented, alternate street types such as a mews or woonerf can be counted.
- site analysis to identify any natural site features, including existing tree protection that can be integrated into the open space plan.

B. Sustainable Food Systems

General Information

The City of Vancouver's overarching food related policy and guidelines include:

- Vancouver Food Strategy (2013) http://vancouver.ca/files/cov/vancouver-food-strategy-final.PDF
- Greenest City 2020 Action Plan (GCAP) (2011, 2015)
- Vancouver Food Charter (2007) http://vancouver.ca/files/cov/Van_Food_Charter.pdf
- Park Board's Local Food Action Plan (2013) http://vancouver.ca/files/cov/Local-food-action-plan.pdf

Available food asset options to be included in the development:

- Community gardens, shared garden plots, and community learning gardens
- Urban farm
- Edible landscaping
- Community kitchen
- Community food market
- Farmers market
- On-site organics management
- Other food system assets (e.g. other food processing, storage, or distribution infrastructure)

To select food assets to deliver, explore the community context and needs, and any positive or negative impacts on the surrounding neighbourhoods. Replacing or enhancing any previous on-site food assets is encouraged. Opportunities for on-site delivery of food assets are preferred.

The City will consider other food asset proposals that are in accordance with the vision, principles and goals defined in the Vancouver Food Strategy or the Park Board's Local Food Action Plan. Consider linkages between the food assets and other sustainable site infrastructure goals such as rainwater management, access to nature, and zero waste planning.

Community Gardens, Shared Garden Plots, or Community Learning Gardens

Characteristics

Community gardens or shared garden plots are managed by groups of individuals to grow and harvest food and ornamental crops. The harvested food is typically used by those cultivating the land and their households, or can be used in the programs of non-profit organizations such as community centres, neighbourhood houses or neighbourhood food networks. Community gardens can occur at various scales and entail a variety of methods including raised garden plots, balcony pots, rooftops, vertical growing, or growing in soilless mediums.

Urban agriculture is ideally suited for many locations in new developments:

• Rooftops	• Courtyards
• Balconies	• Boulevards
• Around buildings	• Open space

For reference:

- Urban Agriculture Guidelines for the Private Realm (2009) - http://vancouver.ca/files/cov/urban-agriculture-guidelines.pdf

Design Guidelines

Community gardens and shared garden plots can be provided as part of consolidated common outdoor amenity space. The incorporation of garden plots should enhance the overall design of that common outdoor amenity and should be considered as one of the variety of programmed uses of those spaces.

Siting and Access

(a) Locate garden plots to maximize sunlight access.
(b) Where garden plots are located on rooftops, consider the need for windscreens.
(c) Provide easy access to and from the garden plots for hauling larger items, such as soil and produce. Consider the need to use wheelbarrows for this purpose.
(d) Some garden plots should incorporate enhanced accessibility features to accommodate wheelchairs, strollers and gardeners who have mobility restrictions.

Co-locating with Other Amenities

Consider incorporating a covered outdoor space for shelter; an outdoor children's play area; an indoor amenity room with kitchen, washroom and an eating area; and/or outdoor seating areas.

Number and Size of Garden Plots

(a) Garden plots should be provided for 30% of the residential units that do not have private outdoor space of more than 100 square feet.
(b) Each garden plot should be a minimum of 24 square feet, with a minimum soil depth of 18". Plots with enhanced universal accessibility features should have a height of 2.5 feet.

(c) Large, undivided planting areas equal in square footage to individually separated plots may be provided in cases where individual plots are not desired or suitable.

Support Facilities

(a) Must provide hose bibs within 20 feet of any garden plot.
(b) Must provide a storage room or shed for tools, a composting system, and a potting bench.
(c) Consider additional facilities such a greenhouse, electrical outlets, and area lighting.

Urban Farms

Characteristics

Urban farms differ from community gardens and other urban agriculture in that the food is primarily grown for sale. Urban farms grow fruits and vegetables and are typically managed or operated by a for-profit, non-profit, or a social enterprise organization. In addition to creating economic opportunities, urban farms provide many benefits such as greening the city, engaging community members, and educating residents about local food systems.

Many factors enable the success of an urban farm including location, size, on-site infrastructure, and business model. Because there are a number of different business and operational models, there is no one factor that will enable a farm to flourish. For that reason, there may be opportunity to modify the infrastructure list below.

For reference:

- Urban farm guidelines - http://guidelines.vancouver.ca/U003.pdf

Design Guidelines

Size

- If growing in soil, an ideal minimum space size would be 20,000 sq ft. Minimum size of space for other growing mediums depends on business and market plan.

Location

- May be indoors or outdoors. If outdoors, may be on the ground, on a podium, or on a roof.

Access

- Incorporate the design and interface of the farm into the overall design of the building; including, allowing for other users/uses of the building to have passive and active interactions and access in the farm area.
- If located on a roof, must have elevator access (e.g. receiving annual soil amendments).
- Should have access to a loading bay.

Access to water

- Must have water access for growing
- Must have a handwashing station, preferably with hot water, as well as a washing station for cleaning, sorting and packaging produce

Storage and packaging

- Should have an indoor and/or covered area to store, prepare, package produce, and provide administration functions
- Should have storage space for tools and equipment

Other

- Consider an on-site organics composting system, one of sufficient size and utility to match the needs of the urban farm, to be available and utilized on site
- Should have an access to a washroom

Edible Landscape Design

Characteristics

Edible landscape design is the use of plants that produce food in place of more commonly used ornamental plants. Many of these trees and other plants provide ornamental quality while also producing edible leaves, fruits, flowers, nuts and berries. Edible landscape design is encouraged in areas that are easily accessible for harvesting, and that are protected from potential contamination. Edible landscape design can be incorporated as part of any landscaped areas.

For reference:

- Summary of plants commonly used for edible landscape design (2009) http://vancouver.ca/files/cov/urban-agriculture-guidelines.pdf
- Guidelines for Urban Honey Beekeeping (2015) http://bylaws.vancouver.ca/bulletin/U001.pdf

Design Guidelines

(a) Must demonstrate comprehensive edible landscape design efforts that integrate with existing and proposed landscape features. In addition to urban agriculture, edible plants can be used as ornamentals as part of the landscape design.
(b) Must provide educational or interpretive signage adjacent to plantings.
(c) Should locate edible trees and other plants in areas that are accessible to residents or the public.
(d) Should consider co-locating near complementary amenities such as picnic benches, bbq areas, and / or community kitchens.

Community Kitchens

Characteristics

Community kitchens are designed for food skills programing including teaching and demonstrating food preparation, healthy eating and preservation skills. Community kitchens may also be used for preparing and serving meals and snacks to community members. Community kitchens can be organized to serve specific populations groups or people with dietary interests and function as community gathering place where space, skills and resources are shared.

Community kitchens are ideally suited in facilities such as neighbourhood houses or other social service facilities, community centres, social housing, or churches.

In some circumstances, contributions could be made to renewal or upgrading of an existing community kitchen or new community kitchen located off-site

For reference:

- City-affiliated facility kitchen design guidelines - http://vancouver.ca/files/cov/kitchen-design-guidelines.pdf

Design Guidelines

Community kitchens function best when they are designed with all of their intended uses in mind. Comprehensive design considerations are outlined in the City-affiliated facility design guidelines document. At a minimum, ensure:

a) Sufficient space to accommodate a minimum of 12 people in a teaching environment.
b) Appropriate equipment (cold / freezer storage; dry storage; dishwasher and sink configuration, stove/oven and ventilation, sink configuration) for the intended use.
c) Adjacent multi-purpose space or room for eating and congregating.

d) Incorporation of enhanced accessibility features to accommodate wheelchairs, mobility devices and teaching and demonstration screens/aids.
e) Consider co-locating near complementary amenities such as picnic benches, bbq areas, and / or community gardens.

Community Food Markets

Characteristics

Community food markets are venues or sites that enable farmers or third party operators to sell healthy, fresh foods directly to the public. The emphasis for community food markets is on providing access to fresh, healthy and affordable foods to individuals and families who may not be able to afford to shop at a farmers market or have the means to travel to one. In some cases, community food markets provide opportunities to promote healthy eating for employees in large organizations or offices. Combined with unique public realm elements, they can contribute to vibrant public space while offering a focal point for residents and/or employees to gather.

Community food markets are ideally suited to facilities such as neighbourhood houses or other social service facilities, community centres, social housing, churches, or office spaces.

For reference:

- Administration of Community Food Markets (2014) http://bylaws.vancouver.ca/BULLETIN/C005.pdf

Design Guidelines

a) The space provided should be sufficient for a minimum of ten (10) stalls or booths, with a minimum size of 3 sq. m for each stall.
b) Space can be provided indoor or outdoor, and if outdoor, a covered area would be encouraged.
c) The design of the area or structure should encourage social interaction and be publically accessible.
d) Consideration should be given to a design that is flexible for other uses.
e) Incorporate double receptacle outlets at a minimum of every 3 m, if stalls are 3 m wide.
f) Provide access to a class B loading bay without reliance on stairs.
g) Consider co-locating near complementary amenities such as picnic benches, bbq areas, gardens, and / or community kitchens

Farmers Markets

Characteristics

Farmers markets bring together a community of farmers, fishers, artisans, and food producers who supply locally-grown foods to neighbourhoods. They provide several functions including: vendor sales, meal provision through food trucks, and live entertainment. Farmers markets may run during any season of the year and they can be held indoors or outdoors.

Many factors enable the success of a farmers market including location, size, accessibility for customers and vendors, and on-site infrastructure. There is typically no one factor that will cause a market to flourish and for that reason, there may be opportunity to modify the infrastructure listed below if there are many other strong elements for the proposed site. Farmers markets could occur on private or public land, including park, plaza or other open space.

There are a limited number of farmers in BC, and starting a new farmers' market location needs to be done thoughtfully to avoid over-saturating the market or causing loss of sales to BC farmers.

For reference

- Farmers Market policy (2013) http://guidelines.vancouver.ca/F013.pdf

Design Guidelines

Size

- An ideal space would allow for 45-50 vendors or more (15,000-25,000sf). Sites that fit a minimum of 30 vendors could be considered, though ideally are able to grow over time.

Location

- Visibility to and access by pedestrians, cyclists, and vehicle traffic is required.
- Consider business proximity. If further than 1.5km from an existing business community, then the market should be a destination / larger scale market.
- Maintain a distance from existing farmers markets to avoid oversaturating the market.
- A flat surface grade is required.

Power access

- Access to power ensures food safety especially for products such as meat, poultry, and eggs, and helps limit loud on-site generators.
- The number of vendors will dictate the number of power hook ups needed. E.g. for every 11 vendors, install one high voltage to support food trucks / coffee and two regular outlets to support freezers, refrigerators, etc.

Access to water

- Vendors need water access for hand washing, cleaning, and food preparation.
- Preferably, in addition to a hose bib for water access, there is a handwashing station, ideally with hot water. The stations could also include a water fountain. For larger markets, a second water / handwashing station is beneficial.

Vehicle access and vendor parking

- Farmer and artisan products can be very heavy and they must be able to unload product at the location where they will be selling. Most vendors will be arriving by car or truck.
- Larger /destination markets: the ability to park next to their vendor booths is required.
- Smaller/ neighbourhood markets: Vendors may be able to unload and park nearby. In this case, a flow through design works best, allowing vendors to unload product and then exit via a second access point, and park nearby.
- For every vehicle that cannot be parked on-site, nearby parking must be available.

Washrooms

- Vendors, staff, and volunteers may be on-site 8 hours or more. They must have washroom access.
- Nearby washroom access is also helpful for customers, including accessible stalls.

On-site storage

- Farmers markets require large and heavy equipment including tents, tables, wagons, sand bags for tents, and at times road barricades.
- Larger /destination markets: require a minimum of 10’x20’ on-site storage container or space nearby.
- Smaller/ neighbourhood markets require a minimum of 10’x10’ on-site storage container or space nearby.

Coverage from the elements

- Partial or full coverage are helpful in summer and winter alike. Consider alternate uses for the covered space to add advantage for other users.

Consider other value added amenities such as outdoor /indoor kitchen space to enable food demonstration and cooking classes; seating areas. Be aware of how the location of these elements may restrict access or layout, including vehicle access. Consider designing for additional uses of the space when the farmers market is not operating (e.g. festivals, performances, sports).

On-Site Organics Management

Characteristics

An on-site organics management system is used to process organic compostable materials (food scraps and yard trimmings) into products that can be beneficially used such as compost, mulches, and soil conditioners. The on-site system is intended for residents, restaurants or other commercial tenants to bring their food scraps to a communal system. Once decomposed, the compostable materials can be used as nutrient rich soil conditioners in local gardens.

Installation and use of an on-site system should be considered as an alternative or an additional option to complement any food scraps collection program used to divert compostable materials away from being disposed as garbage.

For reference:

- On-site Composting Technology Study - Information and examples of various composting systems available (2012) http://www.metrovancouver.org/services/solid-waste/SolidWastePublications/MV-ON-SITECOMPOSTINGTECHNOLOGYREVIEWOct2012.pdf
- Metro Vancouver On-site Organics Management Options Review Report (2014): www.metrovancouver.org/services/solid-waste/SolidWastePublications/On-site_Organics_Management_Options_Review-Dec-14.pdf
- More information about on-site composting: http://vancouver.ca/home-property-development/on-site-organics-management-systems.aspx

Design Guidelines

The applicant is encouraged to provide innovative infrastructure solutions and technologies to increase compostable organics management, while maintaining the end product (e.g. compost) for on-site use. There are different on-site systems available depending on requirements of the building.

Recognizing each system will have different specifications and requirements, applicant should consider whether the following features will be required to accommodate the on-site system:

(a) Accessible to all users
(b) Located on a relatively flat surface
(c) Access to power
(d) Access to water and sewer connection
(e) Concrete pad
(f) Cover
(g) Ventilated
(h) Fire Proofing/sprinkler
(i) Odour and pest control
(j) Sufficient size to match local garden, residence and/or retailer capacity

Other food assets

The City will consider other food asset proposals that are in accordance with the vision, principles and goals defined in the Vancouver Food Strategy and the Park Board Local Food Action Plan.

Opportunities for on-site delivery of food assets are preferred. Examples of possible off-site food assets could include:

- Funding to secure caretakers or operators of a food asset, or ensuring active programing and maintenance. (e.g. funding a non-profit organization to offer programming at a community kitchen) *Note that sites over 40,500 sq. m (ten acres) are required to provide this in addition to three food assets.*
- Contributions to a neighbourhood food network or non-profit organization to support food programming or infrastructure improvements to expand the organization's impact
- Contributions to community centre or park food assets

C. Green Mobility

General Information

For information on Transportation Demand Management Requirements, refer to the Parking By-law and the Administrative Bulletin: Transportation Demand Management for New Developments in Vancouver

[pending approval of RTS 12403; update this text if RTS 12403 is not approved by Council]

Submission Requirements, Additional Information

TDM Requirements:
The primary deliverable is a separate Transportation Demand Management (TDM) Plan or additional chapter within a Transportation Assessment and Management Study (TAMS) which outlines TDM measures that will be incorporated into the Development Project as well as information detailing how the program will be delivered. This is a requirement of the Parking By-law.

Electric Vehicle Charging Requirements
If applicable, evidence of compliance with electric vehicle charging requirements should be included in the project statistics tables or where other vehicular parking information is documented. Publicly accessible fast charging hub locations should be identified on site plans.

D. Potable Water Management

Submission Requirements, Additional Information

Water Balance
The water balance provides a framework for understanding and planning for an integrated systems approach to water resource management on the site and within its buildings. The aim in taking the integrated water approach is to achieve sustainable, reliable and resilient water systems.

The water balance shall include input water sources including potable water, and rainwater, and outflows to the sanitary, combined, and storm sewers. The Water Balance shall be produced for the 'baseline' and 'proposed' scenarios and demonstrate compliance with the minimum potable water use reductions over baseline specified in D.3.2 and D.3.3, achieved by taking an integrated approach to water management at the site scale

Indoor Potable Water Use Baseline

The indoor potable water use baseline shall be calculated using the specified fixtures, baseline flow rate / water use per flush values, duration and daily uses specified in Table 1 for the estimated occupancy. Where sufficient justification is provided, daily uses can be modified based on the proposed occupancy type(s) proposed for the building(s) or site. Occupancy shall be based on projected occupancy figures, or where not available, estimated based on floor area using the following:

- Detached Dwellings: 55 m^2/capita
- Apartments: 35 m^2/capita
- Commercial: 23 m^2/capita

The indoor potable water use for the proposed scenario shall utilize the same number of occupants, fixture types, duration and daily uses as the baseline scenario. Potable water use reduction shall be demonstrated through the use of more efficient fixtures with a reduced baseline flow rate / water use per flush and/or supplementing toilet and urinal flushing with non-potable water. Note: calculations must be provided to quantify the volume of non-potable water sources collected and utilized to demonstrate compliance with the potable water reduction target.

Table 1: Indoor Potable Water Use Baseline

Fixture Type	Baseline Flow Rate & Water Use per Flush[1]	Duration	Daily Uses[2]
Lavatory Faucet (for private use)	5.7 L/min	0.25 min	5
Lavatory Faucet (for public use)	1.9 L/min	0.25 min	3
Kitchen Faucet (non-residential)	8.3 L/min	0.25 min	1
Kitchen Faucet (residential)	6.3 L/min	1 min	4
Shower Head	7.6 L/min	8 min	1
Water Closet (Tank Type & Direct Flush) – Male	4.8 L/flush	1 flush	1 male
Water Closet (Tank Type & Direct Flush) – Female	4.8 L/flush	1 flush	3 female
Urinal (Tank Type & Direct Flush) - Male	1.9 L/flush	1 flush	2 male

(1) Baseline Flow Rates and Flush Cycle figures from the City of Vancouver Plumbing By-Law.
(2) Note that daily use can vary based on type of occupant (i.e., Employees, Visitors, Retail Customers, Students and Residential). Daily uses may be adjusted as appropriate based on type of occupant.

Outdoor Potable Water Use Baseline

The outdoor water use baseline shall be calculated using the most recent version of the LEED Outdoor Water Use Reduction Calculator or other approved method. The following instructions refer to the use of the LEED v4 Outdoor Water Use Reduction Calculator[1].

The outdoor water use baseline shall be calculated by inputting the site's proposed total landscaped area (including all pervious / landscaped areas, such as planted landscapes on structures) along with the historical average monthly rainfall and average monthly

[1] LEED calculator https://www.usgbc.org/RESOURCES/INDOOR-WATER-USE-CALCULATOR

evapotranspiration (ETo) figures provided in Table 2 into the 'Baseline Calculation' tab in the LEED calculator.

Table 2: Historical Average Rainfall and Evapotranspiration Rates for Vancouver

Month	Historical Average Monthly Rainfall (mm)[1]	Historical Average Monthly Evapotranspiration (ETo) (mm)[2]	Watering Demand (mm)
January	207	14	-193
February	107	24	-83
March	123	41	-82
April	102	64	-38
May	75	92	17
June	68	105	37
July[3]	43	120	77
August	48	102	54
September	59	66	7
October	157	35	-122
November	234	18	-216
December	191	13	-178

(1) Source: Environment Canada Climate Normals 1981-2010 Station Data for Vancouver Oakridge (http://climate.weather.gc.ca/climate_normals/index_e.html)
(2) Source: Farmwest Historical Average Data for Vancouver Airport (http://farmwest.com/climate/et)
(3) The month of July requires the greatest outdoor watering demand in the City of Vancouver.

The outdoor water use baseline is determined using the evapotranspiration figure for the month with the peak watering demand. For the City of Vancouver, the peak watering demand takes place in the month of July, and as such the baseline monthly outdoor potable water use shall be calculated as:

Outdoor Potable Water Use Baseline (L/month) = 120mm x Site's Total Proposed Landscaped Area (m^2)

The outdoor water use for the proposed scenario shall be calculated using the 'Landscape Water Requirement' tab of the LEED calculator. The total proposed landscaped area shall be the same for both the baseline and the proposed scenarios unless sufficient justification is provided. Potable water use reduction shall be demonstrated through more water efficient plant type / landscape features, irrigation type and/or supplementing outdoor irrigation with non-potable water. Note: calculations must be provided to quantify the volume of non-potable water sources collected and utilized to demonstrate compliance with the potable water reduction target.

E. Rainwater and Groundwater Management

Submission Requirements, Additional Information

GROUNDWATER MANGEMENT

All buildings and the site as a whole shall be designed such that any groundwater extraction has no adverse negative impacts, and no groundwater from systems at or below the yearly high water table is discharged to City sewers. Exceptions may be made for temporary pumping of groundwater during construction. A Hydrogeological Study is required to ensure compliance with this policy requirement. Details on what this study must include are below.

Hydrogeological Study

The Hydrogeological Study must include the following components:

1) Review of site hydrogeology, including but not limited to: underlying stratigraphy, existing and planned wells, local groundwater extraction (e.g. construction dewatering) rates and locations, approximate water levels (historical and current), and any relevant known information about the site's groundwater regime, as appropriate.
2) A minimum of 3 months of uninterrupted water table monitoring, capturing the yearly high water table. Monitoring wells are to be located within the development site, and the depths shall exceed the anticipated foundation depth by 2 m;
3) Written statement indicating whether the proposed development will intercept the yearly high water table;
4) As an alternative to 2) and 3) above, a signed report by a Certified Professional with experience in hydrogeology confirming that the proposed development will not intercept the high water table;
    a. If the applicant submits an alternative report, but the water table is intercepted at any time during construction, the Certified Professional must immediately report this to the City of Vancouver, and work shall cease until a Hydrogeological Study can be completed.
    b. An alternative report under 4) is not considered for developments on underlying peat layers
    c. An alternative report under 4) is not considered for developments greater than 3.7 m (12 ft) below ground surface.
5) If the development will intercept the water table, the following items will be required in the Hydrogeological Study:
    a. Aquifer characteristics (including water level record, estimated hydraulic conductivity, and estimated hydraulic gradient);
    b. A plan of elevation contours for the seasonal water table elevation, superimposed on a ground surface elevation plan;
    c. A site cross-section indicating the elevation of the deepest subsurface works (e.g. elevator shafts, parkades) and the low and high water table elevations;
    d. A Groundwater Management Plan that outlines how no groundwater is discharged to City sewers post-construction. Every Groundwater Management Plan must include:
        i. An estimate of the groundwater flow rate into the proposed development, if applicable;
        ii. A site plan and/or cross-sections showing groundwater management solutions; and
        iii. The anticipated groundwater flow rate to be temporarily discharged during construction, and location (i.e. sanitary, combined, or storm sewer), if applicable.
6) If any groundwater extraction is proposed, an Impact Assessment must be submitted as part of the Hydrogeological Study in order to be considered for City approval. The Impact Assessment must demonstrate that no significant negative impacts result from groundwater extraction, and must include:
    a. Anticipated flow rates;
    b. Ground subsidence;
    c. Impact to nearby wells;
    d. Evaluation of potential effects on known contaminant plumes; and
    e. Discharge water quality.

RAINWATER MANAGEMENT

To meet the intent of the Rain City Strategy, the use of naturalized, green approaches to rainwater management are to be prioritized as much as possible. The three tier system below is structured to facilitate that outcome in a structured but flexible manner.

Use of Tier 1 approaches are to be prioritized. Justification must be provided for the use of a lower tier (i.e. Tier 2 or Tier 3). The tiers are as follows:

Tier 1 Priority Green Infrastructure Practices: Provide volume reducing green infrastructure practices. For example, rainwater can be kept on site for rainwater harvesting for re-use, green roofs, and soil infiltration.

Tier 2 Priority Green Infrastructure Practices: Provide treatment and retention in non-infiltrating landscapes. For example, rainwater can be directed to absorbent landscape on slab, closed bottom planter boxes, and lined bioretention systems.

Tier 3 Priority Green Infrastructure Practices: Provide treatment and detention as per the permitted peak flow rate discharged to the sewer.

Acceptable Exemptions:

Justifications for not using Tier 1 green infrastructure practices will be reviewed at the discretion of the City Engineer. Exemptions may include, but are not limited to, the following:

Tier 1 Priority Green Infrastructure Practices Exemptions:

- Low infiltration capacity (e.g. less than 1.5 mm/hr)
- Limited available space for engineered infiltration systems due to onsite tree retention
- Seasonally high groundwater table or bedrock within 0.6m of the bottom of the practice
- Contamination concerns (as supported by a preliminary geotechnical study, see submission requirements below)
- Slope stability concerns (as supported by a preliminary geotechnical study, see submission requirements below)

Tier 2 Priority Green Infrastructure Practices Exemptions:

- Limited available space for non-infiltrating facilities due to onsite tree retention

Design Resources:

The Metro Vancouver Stormwater Source Control Design Guidelines is available as a design resource.

http://www.metrovancouver.org/services/liquid-waste/LiquidWastePublications/StormwaterSourceControlDesignGuidelines2012StormwaterSourceControlDesignGuidelines2012.pdf

Rainwater Management Plan

A Rainwater Management Plan (RMP) shall be provided that details how the proposed rainwater management system meets the requirements specified in the Policy. The Plan shall be prepared by a subject matter expert, and include at minimum:

1) Pre-development site plan showing orthophoto and existing drainage areas and appurtenances;
2) A proposed site plan that delineates drainage areas, including the area measurements for pervious/impervious areas, and identifies appropriately sized green infrastructure practices for each of those areas;
3) Geotechnical study, as described below;
4) Hydrologic and hydraulic analysis prepared by a qualified professional in the area of rainwater management showing how the site will meet the requirements of the Policy;

5) If lower tier green infrastructure options are chosen, then justifications must be included in the RMP report;
6) Details on how the targets will be achieved through the development phases AND once all development phases are complete; and
7) Include supplementary documentation for any proprietary products that clearly demonstrates how they contribute to the targets;

A Geotechnical Study shall be undertaken at the site that evaluates the potential and risks for onsite rainwater infiltration. The study shall be prepared by a subject matter expert, and include at minimum:

1) Infiltration testing at likely locations for infiltration practices and a proposed design infiltration rate;
2) Soil stratigraphy;
3) Depth to bedrock and seasonally high groundwater; and
4) Assessment of infiltration risks such as slope stability and soil contamination.

F. Zero Waste Planning

General Information

Mandatory Requirements for Zero Waste Initiatives

The site design must provide dedicated space to accommodate waste diversion initiatives, in addition to residual waste collection. Ample space allocations must be provided in all domains of occupancy – in the individual unit, within each building, and in shared public spaces. Detailed considerations for each type of development are shown below. The Zero Waste Design and Operations Plan must show how the application meets these design requirements.
Note that multi-use buildings must meet the requirements contained in all relevant tables.

Multifamily complexes

Must provide:	
Each residential unit	1. Space for organics bin under the sink. 2. Space for recycling bins under the sink (Recycle BC program requires separation of paper, containers, glass).
Common areas (e.g. lobby and corridors)	3. Recycling and organics containers always placed with garbage containers (twinning).
Re-use, Recycling and Organics storage space in building	4. A sufficient number of carts/containers to meet the needs of the entire building.* **see City of Vancouver -Garbage and Recycling Storage Facility Design Supplement.* 5. Signage to instruct occupants on the appropriate use of the organics and recycling containers. 6. Create a program for managing reuse, recycling and removal of bulky items. 7. Programs to ensure items banned from disposable as garbage are not put in garbage http://www.metrovancouver.org/services/solid-waste/bylaws-regulations/banned-materials/Pages/default.aspx 8. Designed to ensure all waste collection day activities occur on-site (as opposed to placing bins onto City property for collection)
Exterior areas (e.g. public sidewalks, pathways and	9. Infrastructure and maintenance plan to maintain a litter-free environment.

landscaping)	

Office and retail buildings

Must provide:	
Each retail/office unit	1. Design to accommodate recycling bin(s) in each working space. 2. Provide a common area space that can accommodate recycling and organics carts.
Common/public areas (e.g. lobby and corridors)	3. Recycling containers always placed with garbage containers (twinning). 4. Provision of organics containers with garbage and recycling containers where appropriate (eg. In eating/kitchen areas)
Re-use, Recycling and Organics storage space in building	5. A sufficient number of recycling and organics carts/containers to meet the needs of the entire building.* **see City of Vancouver -Garbage and Recycling Storage Facility Design Supplement.* 6. Signage to instruct occupants on the appropriate use of the organics and recycling containers. 7. Programs to ensure items banned from disposable as garbage are not put in garbage http://www.metrovancouver.org/services/solid-waste/bylaws-regulations/banned-materials/Pages/default.aspx 8. Designed to ensure all waste collection day activities occur on-site (as opposed to placing bins onto City property for collection)
Exterior areas (e.g. public sidewalks pathways and landscaping)	9. Infrastructure and maintenance plan to maintain a litter-free environment.

Food Services

Must provide:	
Work spaces	1. Design to accommodate convenient source segregation of organics, greases and recyclables in food handling and preparation work spaces. 2. Allocate space for organics and recycling containers in all other work spaces.
Customer/public spaces for food consumption	3. Convenient customer/public source segregation of organics, beverage containers and other recyclables in clearly marked disposal containers (twinning) which follow Metro Vancouver's suggested colour schemes for material streams: http://www.metrovancouver.org/services/solid-waste/recycling-signage-campaigns/recycling-signage-colours/Pages/default.aspx .
Organics and recycling storage space in building/complex	4. A sufficient number of carts/containers to meet the needs of the entire building (including organics, grease and recycling).* **see City of Vancouver -Garbage and Recycling Storage Facility Design Supplement.* 5. Signage to instruct occupants on the appropriate use of the organics and recycling containers. 6. Programs to ensure items banned from disposable as garbage are not put in garbage http://www.metrovancouver.org/services/solid-waste/bylaws-regulations/banned-materials/Pages/default.aspx 7. Designed to ensure all waste collection day activities occur on-site (as opposed to placing bins onto City property for collection

Exterior areas (e.g. public sidewalks, pathways and landscaping)	8. Infrastructure and maintenance plan to maintain a litter-free environment.

Large venues (greater than 2,000 visitors per day)

Must provide:	
Individual units	1. Design to accommodate recycling bin(s) in each working space. 2. Provide a common area space that can accommodate recycling and organics carts.
Common/public areas (e.g. mall corridors, green spaces, public washrooms)	1. Recycling containers always placed with garbage containers (twinning). 2. Convenient customer/public segregation of beverage containers, organics and other recyclables in clearly marked disposal containers. 3. Allocate space and provision of organics bins for staff or customers, as appropriate, to ensure organics diversion .
Recycling/organics storage space in building	4. A sufficient number of carts/containers to meet the needs of the entire building.* **see City of Vancouver -Garbage and Recycling Storage Facility Design Supplement.* 5. Signage to instruct occupants on the appropriate use of the organics and recycling containers. 6. Programs to ensure items banned from disposable as garbage are not put in garbage http://www.metrovancouver.org/services/solid-waste/bylaws-regulations/banned-materials/Pages/default.aspx 7. Designed to ensure all waste collection day activities occur on-site (as opposed to placing bins onto City property for collection)
Exterior areas (e.g. public sidewalks and landscaping)	8. Infrastructure and maintenance plan to maintain a litter-free environment.

Additional Zero Waste Actions: Recycling, Organics, and Waste Collection Systems

Waste is generated at numerous points in a large development. It is expected that the system as a whole will be designed to facilitate zero waste (through waste avoidance, reduction, re-use, composting and recycling infrastructure, programs and services), increase collection efficiency and minimize GHG and other emissions.

The Zero Waste Design and Operations Plan must show how the applicant intends to meet this expectation by **choosing and implementing at least seven** of the initiatives listed below:

1. Maintain space on-site for a re-use/freeware/materials exchange facility (shelving and signage) and for the temporary storage of bulky items (e.g. furniture). [Multifamily complexes only]
2. Facilitate establishment of on-site product stewardship take-back program or take-back depot (for large venues with public access).
3. Installation of additional ***publicly accessible*** on-site diversion initiatives via non-profit/charitable programs for items such as clothing, textiles and used books.
4. Engage a single hauler for all waste streams generated on site in order to reduce pick up vehicle trips.
5. Reduce GHG emissions related to collection. Example: compactor systems to reduce trip frequency.

6. Provide a service or billing model that offers occupants incentives to reduce, re-use or recycle rather than to dispose waste.
7. Ensure that any residual waste is disposed in facilities operated by the City of Vancouver or Metro Vancouver.
8. Create “depots” on each floor for residents to centralize disposal of recycling and organics. [Multifamily complexes only]
9. Implement waste reduction strategies in the design of public washrooms, such as hot-air hand-dryers instead of paper towels.
10. Space (in the recycling room) and collection programs for recycling of three or more provincial product stewardship programs (e.g. electronics, batteries, soft plastics, foam packaging). [Multifamily complexes only]
11. Space and collection programs for recycling of three or more provincial product stewardship programs (e.g. electronics, batteries, soft plastics, foam packaging) [large venues or office and retail only).
12. Provide leading edge on site processing of compostable organic material.
13. Allocate space in the recycling storage area or in another common areas for an interoffice materials exchange, bulletin board, and zero waste information kiosk. [Office/retail only]
14. Allocate space to enable the reduction of disposable foodware (e.g. include space for dishwashers, reusable dishware storage and return in food service areas). [Food services only – e.g. food court]
15. Allocate space and implement a reusable bag or dish share program (Office/retail only)
16. Allocate space and outfit a designated area for residents to repair items for re-use. [Multifamily complexes only]
17. Provide reusable dishware and a dishwasher for residents to use in shared common areas where food is consumed. [Multifamily complexes only]
18. Specific innovation proposed by applicant that is an acceptable alternative to items listed here, as determined by the General Manager of Engineering.

<u>Occupant/Public Education and Outreach Actions</u>

The provision of training and ongoing outreach to occupants of the development is a critical factor in the successful implementation of the Zero Waste Design and Operations Plan. Therefore the plan must include the following:

1. Educate new occupants, and all occupants annually, in the implementation of the zero waste initiatives and collection systems (as per Solid Waste By-Law). It may be necessary to provide a hands-on training program for large-scale occupants such as anchor retailers.
2. Direct occupants and the public to use the zero waste collection systems provided on site via use of signage and visual cues such as bin colour and shape.
3. **Choose at least <u>three</u> of the following** procedures and actions that provide occupants with continuous encouragement and support in implementing/participating in the Zero Waste Design and Operations plan:
    1. Employ a “Greencierge” or Zero Waste support staff to assist residents and business owners to adopt the most sustainable practices as possible. The Greencierge would be a staff resource to spearhead the zero waste effort, provide information, source products, track diversion rates, troubleshoot diversion problems, etc.
    2. Establish a building-level zero waste/sustainability team among occupants to engender a community culture around zero waste.
    3. Provide regular newsletters to occupants/tenants that report on successes and identify issues and challenges.

4. Establish a zero waste leadership award program for occupants on site and promote it.
5. Provide or facilitate annual on-site consultations on ways occupants can improve their performance.
6. Conduct an annual waste audit and share the results with occupants to assess additional opportunities for diversion.
7. Specific innovation proposed by applicant that is an acceptable alternative to items listed here, as determined by the General Manager of Engineering.

Submission Requirements, Additional Information

Zero Waste Design and Operations Plan

The Zero Waste Design and Operations Plan must clearly illustrate how the applicant will meet the City's requirements and how the plan will be implemented. The following are expectations and considerations that must be addressed in the plan. The applicant is encouraged to put forward additional or alternative ideas that meet the intent of this policy.

1. Vision Statement

The vision statement should reflect the intent of this policy – to facilitate achievement of the City of Vancouver's Zero Waste 2040 target by fostering waste reduction, by increasing diversion through re-use, composting and recycling, and by reducing GHG emissions in the design and operation of the proposed development's solid waste system.

2. Description of Project and Diversion Objectives

- Consideration of deconstruction opportunities and practices in the removal of any existing buildings on site, to reduce landfilled waste material and create opportunities for building material re-use and recycling;
- A summary of the types and number of units in the development (e.g. residential, retail, food, etc.);
- The types and estimated quantities of waste generated by unit type, consistent with City expectations for waste diversion in each type of unit;
- The types and estimated quantities of waste avoided/reduced/diverted, based on the proposed design and operations plan.

3. Site/Development Infrastructure Design

The site design should provide dedicated space to accommodate waste diversion initiatives (i.e., re-use, organics, recycling), in addition to residual waste collection. Ample space allocation should be provided in all domains of occupancy – in the individual unit, within each building, and in shared public spaces. The plan should show how the applicant intends to meet these design expectations.

The plan must identify the seven specific zero waste actions that will be implemented from the list of options provided in this Admin Bulletin. The plan must provide implementation details for each planned action.

4. Operations

The zero waste objective of this policy should be integrated into the design of the development's ongoing, post-construction operating systems. Therefore an operations component is required in the Zero Waste Design and Operations Plan that addresses the following.

Occupant/Public Education and Outreach

The provision of training and ongoing outreach to occupants of the development is a critical factor in the successful implementation of the Zero Waste Design and Operations Plan. Therefore the plan should identify:

- How new occupants, and all occupants at least annually, (as required by the Solid Waste By-Law) will be educated in the implementation of the zero waste initiatives and collection systems. It may be necessary to provide a hands-on training program for large-scale occupants such as anchor retailers.
- How, through signage and visual cues such as bin colour and shape, occupants and the public will be directed toward using the zero waste collection systems provided on site.
- Procedures and actions that provide occupants with continuous encouragement and support in implementing/participating in the Zero Waste Design and Operations Plan.

The plan must identify which three actions from the list provided in the Admin Bulletin will be implemented.

Facility Operations Training and Support

The success of the Zero Waste Design and Operations Plan will depend on regular oversight, education and enforcement on the part of the designated property manager. Therefore the plan should indicate:

- Which zero waste actions will be implemented from the list of Recycling, Organics, and Waste Collection Systems list and how they will work operationally.
- How the property will be managed (i.e. directly by the applicant or by a property management firm).
- The responsibilities of the property manager.
- The steps taken to ensure that the property manager is trained to implement and oversee the plan.
- Identification of maintenance plans to ensure a litter-free environment.
- The documents or standard procedures that are used to train staff on zero waste initiatives.

  Consideration should also be given to how the operations plan will be implemented with respect to the selection, training and oversight of janitorial services. Janitorial services in large complexes play a significant role in aspects of the collection system such as whether and how recyclables are segregated. Janitorial services can also be addressed in terms of the minimization of toxic cleaning products and reduction of cleaning related wastes, such as containers and paper toweling, and development of on-going litter collection programs.

Plan Implementation Report

The applicant is expected to provide the City with a report on implementation of the Zero Waste Design and Operations Plan within 18 months of occupancy. The Plan should include confirmation of the intent to submit this plan, including details for how the report will be delivered and by whom.

5. Value Added

The applicant is encouraged to consider innovative ideas that will enhance the Zero Waste Design and Operations Plan, such as smart metering for waste diversion measurement or centralized vacuum systems for waste removal.

The final prepared Zero Waste Design and Operations Plan should be structured so as to replicate all of the numbered headings and their sub-headings in this bulletin and should meaningfully address each of these headings.

Plan Implementation Report

The applicant is expected to provide the City with a report on implementation of the Zero Waste Design and Operations Plan within 18 months of occupancy. The implementation report shall include:

- Types and quantities of waste diverted.
- Types and quantities of waste disposed.
- Names and locations of recycling processing facilities, and landfills used.
- Identification of which seven zero waste actions were implemented and the successes and challenges associated with each.
- Description of on-site re-use options, product stewardship facilities, non-profit/charitable drop-off bins, etc. and estimates of amount of waste reduced through those initiatives.
- Overview of exterior litter removal program.
- Description of annual education initiatives undertaken.
- Summary of initiatives to reduce GHG emissions related to waste and diversion.
- Summary of any other initiatives undertaken to facilitate zero waste on-site.

Additional References

- City of Vancouver Garbage and Recycling Storage Facility Design Supplement, Revised November 2016
  vancouver.ca/files/cov/Garbage_and_Recycling_Storage_Facility_Supplement.pdf
- City of Vancouver Solid Waste By-law 8417
- City of Vancouver Greenest City Action Plan 2020 (Goal 5: Zero Waste)
  vancouver.ca/greenestcity
- City of Vancouver Green Demo By-law
  vancouver.ca/home-property-development/demolition-permit.aspx
  - City of Vancouver Zero Waste 2040 Strategic Plan https://vancouver.ca/green-vancouver/zero-waste-vancouver.aspx
- Metro Vancouver's Banned and Prohibited Materials List (see Metro Vancouver web-site)
- Extended Producer Responsibility (EPR) Stewardship Programs (see Recycling Council of BC web-site).

G. Affordable Housing

General Information

The Affordable Housing requirements in the Rezoning Policy for Sustainable Large Developments is one of the mechanisms outlined in the 10 Year Affordable Housing Delivery and Financial Strategy to deliver deeper affordability for moderate- and lower-income households. Its purpose is to contribute to the delivery of the "right supply" of housing as set out in the Housing Vancouver Strategy (2018-2027).

Applicants should meet with City staff at the pre-application stage to discuss the appropriate mix of incomes, household types and tenures.

Set out below are further details with regards to the Affordable Housing requirements for large developments:

1. Moderate Income Housing

Moderate income housing is rental housing affordable to households with moderate incomes of between $30,000 and $80,000/year. These units may be privately owned, however the units will be secured as rental housing with below-market rents through a Housing Agreement with the City.

2. Affordability in Moderate Income Housing Units

The moderate income housing target (10% housing target) is designed to encourage the delivery of secured affordable rental housing targeted to households earning between $30,000 and $80,000 /year.

Targeted Rents in Moderate Income Rental Units (at project opening):

Unit Type	Rental Rate
Studio	$950
1-Bed	$1,200
2-Bed	$1,600
3-Bed	$2,000

For further information on moderate income rental housing, refer to the Moderate Income Rental housing Pilot Program Administration Bulletin (http://vancouver.ca/files/cov/moderate-income-rental-housing-pilot-program-bulletin.pdf).

3. Moderate Income Housing Requirements for Project Proponents

As a condition of development approval, applicants will be required to enter into a Housing Agreement with the City of Vancouver. The agreement will include the following requirements for the proponent regarding the operation of the moderate income rental units.

The Proponent will verify eligibility for new tenants in Moderate Income Rental Units:

- For new tenants, household income cannot exceed 4 times the annual rent for the unit (i.e. at least 25% of income is spent on rent).
- There should be at least one occupant per bedroom in the unit.

The Proponent will verify eligibility for existing tenants in Moderate Income Rental Units:

- Building operator will test existing tenants to ensure eligibility every 5 years after initial occupancy.
    - For existing tenants, household income cannot exceed 5 times the annual rent for the unit (i.e. at least 20% of income is spent on rent)
    - There should be at least one occupant per bedroom in the unit.
- If an existing tenant no longer qualifies for their moderate income rental unit, the operator will issue a notice to end tenancy in accordance with the BC Residential Tenancy Act. The notice will take effect 6 months after the date of issuance.
- Note: in order to support stability of tenure, Provincial regulations allow additional flexibility for operators who meet the definition of a “housing society.” The City will consider alternative proposals for ensuring that moderate income units continue to serve targeted households over the long term while ensuring that existing tenants have stability of tenure.

The Proponent will provide an Annual Report to the City of Vancouver on the operation of the Moderate Income Rental Housing Units:

- The report will be designed to ensure that the City can confirm that the building is operating as agreed and will include information on:
    - Rents collected in all units
    - Unit turnover and incomes of new tenants
    - Updated incomes for households who have occupied the unit for 5 years
- The City may audit the information provided in the annual report.

4. Consideration for alternate delivery of affordable housing requirements

Inclusionary housing requirements for large developments are a minimum of 30% of total residential floor area set aside for affordable housing comprising a 20% social housing target and 10% moderate income housing target. Developing large sites is complex and each site has a unique set of opportunities and constraints. Unencumbered dirt sites are the priority mechanism to enable the delivery of the minimum 20% social housing.

In special circumstances all or some of the social housing requirement may be delivered with ownership transferred to the City in the form of an Air Space Parcel. In these circumstances supporting evidence must be provided by the proponent to demonstrate that the requisite unencumbered dirt site cannot be provided. Evidence may include supporting drawings, legal or technical information and should be presented at pre-application stage. An example of an exception site may be high-density areas where separating out a largely residential land parcel in a mixed-use development is not feasible.

On complex sites, the General Manager of Planning, Urban Design and Sustainability may recommend alternative approaches to Council when there is clear rationale in the context of the project. If an alternate approach to delivery of the affordable housing requirements is proposed, that approach must demonstrate clear progress towards Housing Vancouver objectives and targets.

5. Affordable Housing Design

Both Social Housing and Moderate Income Housing must be provided designed in accordance with all applicable City by-laws and policies.

The design of the social housing must comply with the Housing Design and Technical Standards (see: http://vancouver.ca/files/cov/housing-design-and-technical-guidelines.pdf). This document provides guidance on a broad range of topics including:

- Location and Site Planning
- Indoor and outdoor Amenity Spaces
- Dwelling Unit Floor Areas
- Wheelchair Accessible and Adaptable Units
- Energy and Environmental Design
- Crime Prevention Through Environmental Design
- Construction Standards

Additional References

The City of Vancouver's overarching strategic direction for affordable housing, and related policy and guidelines include:

- Housing Vancouver Strategy (2018-2027): http://council.vancouver.ca/20171128/documents/rr1appendixa.pdf
- Affordable Housing Delivery and Financial Strategy (2018-2027): http://vancouver.ca/files/cov/affordable-housing-delivery-and-financial-strategy.pdf
- Housing Design and Technical Guidelines: http://vancouver.ca/files/cov/housing-design-and-technical-guidelines.pdf
- Rental Housing Stock ODP: https://bylaws.vancouver.ca/odp/RHS.pdf
- Tenant Relocation and Protection Policy: http://vancouver.ca/files/cov/Tenant-relocation-and-protection-policy.pdf

Submission Requirements, Additional Information

At the time of rezoning application, provide the following that show how the affordable housing requirements will be achieved:

- Summary table demonstrating how the minimum 20% social housing target will be met including:

    - total proposed residential floor area for the development
    - proposed residential floor area set aside for social housing
    - assumptions regarding unit type (i.e. number of bedrooms) and size etc. which were used to determine the site size to be transferred to the City
- Summary table demonstrating how the minimum 10% affordable rental housing target will be met including:
    - total proposed residential floor area for the development
    - proposed residential floor area set aside for affordable rental housing
    - proposed unit types, sizes and associated rental rates
- If applicable, a Tenant Relocation Application Form and supporting documents (http://vancouver.ca/people-programs/tenant-relocation-resources-for-owners-and-developers.aspx)
- If the proponent is proposing an alternative delivery option for the minimum 30% requirement than what is outlined above, written rationale for why the requirement cannot be met as outlined in this policy and proposed alternate approach with associated floor area for affordable housing, unit types and sizes and proposed rental rates.

At the time of development permit application:

- Updated summary tables demonstrating how the minimum 20% social housing target and minimum 10% social housing target will be met.
- If applicable, an updated Tenant Relocation Plan and supporting documents.

H. Resilience

General Information

Projects should consider social and physical resilience and incorporate design responses that increase resilience.

A resilient project is one built to withstand, or recover quickly from natural and human-caused hazards and disasters, and that delivers co-benefits to people and systems in the absence of hazards and disasters. In Vancouver, we are exposed to a range of hazards including but not limited to flooding, sea level rise, earthquakes, fires, and hazardous materials incidents. Investing in resilience today will protect lives and investments in the future.

In the context of hazards, Vancouver's geography and dense population means that evacuation is a major challenge. The safety and resilience of residents and our community is closely tied to the ability to remain in, or return quickly, to their homes or workplaces when hazards strike. Sites that are designed to be inherently resilient will ensure the least amount of disruption to community and business.

Preventing damage and ensuring capacity to withstand future threats and disasters also enhances the wellbeing of people and systems regardless of if disaster strikes. Many features that contribute to resilience also contribute to meeting the City's Healthy City Strategy goals.

Note that the City of Vancouver is undertaking two initiatives related to resilience:

- A broader Resilience Strategy, with forthcoming policies related to Vancouver specific shocks and stresses

- The Climate Change Adaptation Strategy, adopted by Council in 2012, is being updated with new climate projections and actions.

The outcomes of these two initiatives should be referred to in future to inform resilient design.

Submission Requirements, Additional Information

The following Resilience Worksheet must be submitted at time of rezoning application, filled out to the degree possible given the level of design detail available at the time. For large, master-planned sites with multiple buildings, a refined worksheet may be required at Development Permit application when building-level details are better known.

Resilience Worksheet

Planning	
What is the estimated full useful project life? _____ years	
Have you considered the risks and hazards to your project and occupants both today and throughout the useful project life? Please list them:	
Identify below any local risk or hazard studies that you have completed or are referencing. Example: Floodplain mapping (http://guidelines.vancouver.ca/F014.pdf), seismic assessment, hazardous materials list.	
Have hazard mitigation and risk management efforts been included in the project? Have impacts and risks to inhabitants been considered and mitigated? Describe how:	Y/N

Have projected climate conditions for the useful project life been consulted? Please consult Vancouver specific climate projections attached to this worksheet. Please indicate projection year used: 2050s, 2080s, 2100, other_____	☐
Describe any strategies or design features that support rapid recovery after a hazard event:	
Describe how your project fosters community connections and interaction (including trusted spaces for people to congregate, communication mechanisms, etc):	
Have you set targets for recoverability / re-occupancy of the project in the event of structural damage? Has this been incorporated into design? Describe below:	Y/N
Describe how the project has been designed to ensure accessibility of spaces for people with mobility challenges and for an aging population:	

Essential Safety

Will there be emergency plans in place for buildings?	Y/N
Can drinking water be supplied without power?	Y/N

Will toilets and sinks work without power?	Y/N
Can the project maintain habitable temperatures without power during a heat wave and during the winter? (please consult Vancouver climate projections for future summer and winter maximums and minimum temperatures.)	Y/N
Describe the back-up power capacity: what is it, which systems will it power and for how long? If fuel is needed, is there a contract in place to obtain it following a disaster? Note that renewable energy systems avoid the anticipated difficulty of accessing and transporting fuel post event.	
Will the project include hook-ups for temporary generators and boilers?	Y/N
Has solar energy been considered to provide some back-up power capacity? If yes, what is system size? _____kW	Y/N
Are there safe, accessible locations for occupants to gather in the event of an earthquake, flood, or other event causing structural damage to the project?	Y/N
Is there space for 72 hours of emergency supplies in the facility? Describe:	Y/N

Climate Resilience

HEAT – review climate projections for temperature, cooling degree days and summer extremes. Consider the Urban Heat Island Effect resulting in higher temperatures in urban areas.

Have impacts of heat on the project been considered, including:

- Material change or degradation of structural integrity at accelerated rates
- Health and safety impacts on occupants vulnerable to heat
- Increased failure or reduced efficiency of electrical or mechanical systems
- Need for landscape material hardy to summer drought

Summarize:

Describe how the building and its systems will be adapted to efficiently manage future higher average temperatures, higher extreme temperatures, additional annual heatwaves, longer heatwaves and longer periods of drought:

Describe all the building and site measures to reduce heat-island effect at the site and in the surrounding areas:

PRECIPITATION – Review climate projections for annual rainfall, rainfall extremes and precipitation as snow. Review Vancouver IDF curves – both current and future-proofed.

Have impacts of changing precipitation patterns on the project been considered, including:

- Increasing instances of mould
- Potential for greater frequency of stormwater management systems being overwhelmed, low areas flooded and sewer back-ups
- Impacts to the durability of materials

Summarize:

Describe main strategies employed to infiltrate, evaporate, detain or reuse rainwater to achieve water volume reductions for system resiliency:	
Is there a program in place to keep catch basins clear?	Y/N
How are areas below grade protected from flooding? Are there mechanical or electrical systems below grade? If so, how are they flood-proofed?	
Coastal Storms and Sea Level Rise	
Is the project located in a floodplain? Map: http://guidelines.vancouver.ca/F014.pdf *If no, the remaining questions can be left blank.*	Y/N
What flood construction level is the project designed to? _____m or Not Applicable	
If in a flood plain, describe site design strategies for adapting to sea level rise including building access during flood events, elevated site areas, hard and soft barriers, etc.	

If in a flood plain, is the design adaptable – can the flood construction level be raised further in future or can increased protection of critical systems be implemented?
If in a flood plain, confirm that mechanical and electrical systems are not located below the flood construction level. (Please also ensure all hazardous materials will be stored above the FCL.)

City of Vancouver Climate Change Projections

Table 1: 2016 climate projections - All projections to year 2050:

Climate Variable	Description of Metric
Precipitation	
5% in winter increase 7% in spring and 12% in fall with 19% decrease in summer	Average seasonal changes
Length of dry spells increase 23% (from 23 to 29 days on avg. per year)	Max length of consecutive days with precipitation less than 1mm
63% more precipitation on extremely wet days	Annual total precipitation that falls on days where precipitation exceeds 99th percentile of precipitation (intensity and frequency)
33% more precipitation on very wet days	As above but 95th percentile
A 1:20 year return precipitation event will increase in intensity by 36%	Max daily precipitation expected to occur on average once in 20 years (intensity only)
Temperature	
2.9°C average increase	Annual average temp increase
Summer days above 25°C more than double from 18-43	Frequency of summer days where maximum temperature is above 25°C
Warmest summer day is 3.9°C warmer	Maximum temperature of the warmest summer days
Coldest winter nights 4.9°C warmer (from -9.4°C to -4.7°C)	Min temp of the coldest day in winter
Very cold days are projected to warm from -16°C to -11°C Very hot days increase in intensity from 32°C to 37 °C	Minimum and maximum daily temp expected to occur on average 1:20 years
Hot summer days that occur only once per year on average are projected to occur 12 times annually	Days above 30°C
Heating and Cooling	
29% fewer HDD	Total of the number of degrees below 18°C that occur daily, summed over each day of the year. Indicator for heating demand.
CDD from 60 to 250 days (25% more than Portland's historic average)	Total of the number of degrees above 18°C that occur daily, summed over each day of the year. Indicator for cooling demand.
Snowpack	
For our watersheds as a whole, April 1 snowpack projected decrease 58%	Lower elevations will no longer have snowfall
Growing Season	
15% increase in length of growing season	Growing season length is the length between the first span of six days above 5°C in spring, and the first span of six days below 5°C in the fall.
72% decrease in number of frosty days	Annual count of days when maximum temperature is below 0°C
44% increase in Growing degree days	Total of the number of degrees above 5°C that occur daily, summed over each day of the year. Indicator for plant growth.