SUSTAINABILITY STRATEGIES

The Oak Green redevelopment will be a high-performance sustainable and resilient community, designed to meet and exceed future standards of design and livability. Our approach is to anticipate the elements of a sustainable community ten or twenty years into the future, with the goal to future-proof the site for the next century. Oak Green aims to provide to the next generation an exemplar of sustainable community design.

OVERARCHING PROJECT OBJECTIVES

A CARBON NEUTRAL COMMUNITY

The proposed high performance building design and energy systems support the goal of developing a carbon neutral community. Energy demand will be significantly reduced by way of sophisticated envelope design, passive considerations on each façade, heat recovery and other potential on-site energy efficiency solutions. Future photovoltaic systems could also supplement the energy supply to achieve a carbon neutral balance for the project overall.

DAYCARE CENTRE TO SHINE A SPOTLIGHT ON SUSTAINABILITY

This building, as a community amenity along with the new park, will be designed to the highest standard, to stand out above and beyond the remainder of the high-performance and resilient community. The building will be designed to meet Passive House standards, and will target net zero potable water use by way of a rainwater capture and recycling system.

LOW EMISSION GREEN BUILDINGS FOR NEIGHBOURHOOD DEVELOPMENTS

As per the City of Vancouver's Green Building Policy for Rezonings adopted in April of 2017, along with the objectives under the Rezoning Policy for Sustainable Large Developments, Oak Green will apply the rigour, metrics and globally accepted standards to support achieving development-scale and ultimately city-wide social, environmental and resiliency objectives. Special focus will be paid to support neighbourhood-wide holistic strategies to address the future needs of the South Cambie and Oakridge neigbourhoods, including transportation, habitat restoration, carbon neutral, social sustainability and community resiliency.

LARGER SITES REZONING SUMMARY

SUSTAINABLE SITE DESIGN

A Sustainable Site Plan is required by the City to show how site layout, structure and orientation have been considered to reduce energy needs, emphasize passive design, and support carbon neutral operations. The Oak Green development will ensure passive design opportunities are maximized, including the following measures under consideration:

- Higher than usual floor-to-floor heights to maximize passive daylighting. The position and massing of buildings will be tailored to maximize sun penetration throughout the day, allowing the capture of solar gains on south-facing facades and reducing winter heating demand

- Solar shading measures to minimize solar gain on select facades – systems in consideration include: vertical fins of various length and depth, dynamic glass, operable windows, glazing fritting, increased wall areas where appropriate and shadow boxes. Analysis to determine applicability

- Inclusion of architectural shading, vegetation and large tree canopies to provide protection from sun and rain, while always considering the human scale and experience

ACCESS TO NATURE

A detailed Access to Nature Plan is required by the City which outlines how the Oak Green development intends to improve the health and wellbeing of the community, making space for new and existing habitats to enhance ecosystem functions and services, while improving public access to nature and creating spaces for socialization. The Oak Green development intends to exceed current requirements to guarantee future significance - elements in consideration include the following:

- Increase Vegetated Biomass: Diversity of local tree plantings in accordance with City requirements along street and public spaces, will provide shading, aesthetic and habitat benefits. Intensive and extensive vertical greening of the built environment will exceed current rooftop garden requirements. Residential tenants to have access to these open and green spaces

- Habitat creation and restoration targeting 10% of the total development site area, with creation of ongoing ecological management plans to ensure the habitat area is protected. This includes measures to specifically address sustainable shoreline habitat.

SUSTAINABLE FOOD SYSTEMS

The City's goal to guarantee resiliency of local food mandates an increase in city and neighbourhood food assets by 50% over 2010 levels. To contribute to the City's goal to be global leaders in urban food systems, The Plaza of Nations development is considering three key areas in which local and sustainable food will be provided to boost social sustainability and improve resiliency within the community:

- Urban Agriculture and Edible Landscapes: Edible plant species throughout terraces to provide a local source of harvestable food for building occupants. Community gardening workshops may be held in the plaza and park area in conjunction with the Community Centre.

- Community Food Market: The Corner Entry Plaza may be used as a site for local Farmers' Markets, promoting the consumption of sustainable, locally harvested goods and socialization of the site

- On-Site Organics Management: The development will evaluate the use of an on-site, in-vessel bio-digester to manage organic waste resulting from the preparation and consumption of food in the commercial retail units, as well as from residential occupants. This strategy contributes to the achievement of the City's ambitious 2040 Zero Waste goal.

GREEN MOBILITY

Mobility objectives will be detailed in a Green Mobility Plan that outlines measures and strategies to prioritize more sustainable travel to and from the site, including the prioritization of walking, cycling, and public transit over automobile use, and support for low-carbon vehicles, such as electric vehicles. The Oak Green site is located adjacent to the 37th Avenue bicylcle corridor and is close to current bus routes, and Canada Line stations. State-of-the-art cycling infrastructure would support The Oak Green development's aspiration to be a showcase sustainable community. Additional elements in consideration include:

- Ample secure bike parking, both in the public and private realms, charging infrastructure for electric bikes, end-of-trip facilities, bicycle share infrastructure

- The introduction of a bicycle co-op, offering access to maintenance and parts for both residents and the thousands of people who pass through the site while using the Seaside Greenway for leisure or daily commute.

- The supply of Level 3 electric charging stations, above and beyond the City's existing requirements for electric vehicle infrastructure and additional charging stations

- Strong pedestrian connectivity throughout public areas, promoting the use of various alternative modes of transportation and incorporation of bus shelter facilities to the site design as required

RAINWATER MANAGEMENT

The City of Vancouver requires a Rainwater Management Plan to help achieve the Greenest City target of reducing water consumption by 20% by 2020. The overall intent of this requirement is to reduce stormwater discharge, reduce the generation of runoff, treat surface runoff to reduce contaminants and where possible, conserve potable water use.

The overall stormwater quantity strategy for the site is to ensure the post-development runoff rate and volume is not greater than, and ideally less than the pre-development rate and volume for the 5-year 24-hour duration storm event. The Oak Green development design team is considering a rainwater capture and reuse system to offset 100% of irrigation and support a 40% reduction in indoor potable water use, including net zero potable water use for the community centre.

ZERO WASTE PLANNING

The City requires a Zero Waste Design and Operations Plan that considers deconstruction, infrastructure design, and post-construction operations, to contribute to the Greenest City target on Zero Waste to reduce solid waste going to the landfill or incinerator by 50% from 2008 levels. The Oak Green redevelopment seeks to be a model for waste diversion, and will support the regional and Greenest City target of achieving a minimum of 70% waste diversion on site.

Due to the extent of the residential component, opportunities for on-site waste water management treatment will be explored, which would alleviate pressure on municipal systems and increase the resiliency of the development.

AFFORDABLE HOUSING

To address the demand for more housing in the city, the project will introduce a range of unit types to accommodate individuals and families of all ages and abilities. The project will meet the City's Affordable Housing in New Neighbourhoods Policy, supporting more housing affordability, types and choices, including housing for individuals and families that fall under the Housing Income Limits published by BC Housing and purpose-built rental housing for moderate income households.

LOW CARBON ENERGY SUPPLY

A low carbon energy supply study has been conducted for the area by the developers at Oakridge Centre, which will inform decision making around low carbon energy supply and on-site district energy at Oak Green.

The Oak Green development is considering carbon neutral ready design, to set a benchmark for the next generation of sustainable community projects. Should the Oakridge Centre ditrict energy utility come online within a timeframe that will support supply of energy to this development, Oak Green will consider connection to this future low carbon source.

In the case that connection to such a low carbon system is not available, the project team will be exploring various carbon neutral energy supply opportunities, including:

- On-site Geoexchange or supported via the nearby dedicated fire protection main

- On-site sewage heat recovery

- Solar PV applications oriented for maximum solar gains while providing building and hardscape shading

GREEN BUILDING POLICY FOR REZONING 2016: LOW EMISSIONS GREEN BUILDING

GREEN BUILDING CERTIFICATION

In keeping with the City's goals for net zero and low emission buildings, Oak Green will provide a new Childcare Centre to be built to Passive House standards, along with other opportunities to be explored to ensure the sustainability goals of Oak Green will shine a spotlight on sustainable design. This community will incorporate the most aggressive and successful sustainability strategies throughout its design.

As per the City's Green Building Rezoning policy, Oak Green will be comprised of low emissions green buildings, which will include meeting the energy targets as outlined in the City of Vancouver Energy Modelling Guidelines.

Additionally, strategy would be shaped by the development's overarching areas of focus, which include:

- Green Transportation Development: public EV fast charging, provision of bicycle facilities, expanding bicycle networks, new transit stops, subsidizing transit passes, providing vehicle sharing and bicycle sharing infrastructure, unbundling of parking from real estate sales, bicycle co-op

- Waterbody and Habitat Restoration: focus on shoreline and aquatic habitat, restoration equaling 10% of development footprint, ecologically driven management plan, easement of conservation areas, long-term commitment to restoration efforts

- Carbon Neutrality and Energy Efficiency: energy performance optimization, energy use reduction, renewable energy production, community-scale central heating and cooling, infrastructure energy efficiency

- Social Sustainability through Site and Amenity design: Housing and jobs proximity, façade, building entry, plaza and accessible space design catered to the human scale, access to civil, public, recreation and natural amenities, visitability and universal design considerations, solid waste management

- Rainwater Management: reduce runoff volumes and improve water quality by replicating the natural hydrology and water balance of the site, based on historical conditions and undeveloped ecosystems in the region

- Community Resiliency: Floodplain study and avoidance, restoration of habitat, contamination remediation, local food production, on-site wastewater treatment

PERFORMANCE LIMITS

Upon completion, Oak Green aims to be carbon neutral-ready and to be seen as a sustainable community ten or twenty years into the future. One strategy under consideration to accomplish these goals include exceeding current performance targets by at least 10%. The design of buildings within Oak Green will exceed the current performance limits related to total energy use intensity, thermal energy demand intensity and greenhouse gas intensity as identified in the Green Building Policy for Rezoning 2016. Preliminary and robust energy analyses conducted early in design will drive the parameters related to envelope, electrical and mechanical system, orientation and shading, and fuel source selections.

ENHANCED AND ONGOING BUILDING PERFORMANCE

The importance related to ongoing building performance and access to performance feedback regarding potential areas of future improvement are paramount to ensure the community remains a beacon of sustainable innovation. The design, construction and operations of the Oak Green development would be supported through the following possible programs:

- Airtightness Testing: The airtightness of entire buildings, paired with suite-to-suite compartmentalization verification will be addressed in design and construction to guarantee envelope performance and limit the possibility of indoor air contamination

- Enhanced Commissioning: Through integrated activities intended to ensure project targets are met and building systems perform as intended, enhanced commissioning will verify performance expectations are met and future recommissioning will identify areas for further improvement

- Energy System Sub-Metering and Reporting: This level of energy monitoring allows access to a continual stream of information to help identify operational issues as they occur

REFRIGERANT EMISSIONS AND EMBODIED EMISSIONS

In pursuit of carbon neutrality, the Oak Green development is considering utilizing life cycle assessment of building materials and refrigerants to minimize the impact of embodied emissions in relation to global warming potential, along with other deleterious environmental impacts such as acidification of land and water sources and eutrophication.

Oak Green is considering to go beyond the City's requirements and utilize these life cycle assessments to identify the most appropriate and impactful areas for material and refrigerant substitutions to verify embodied emissions related to Oak Green's construction are minimized.

ENHANCED INDOOR ENVIRONMENTAL QUALITY

The Oak Green development will provide enhanced indoor environments to protect the health of building occupants by controlling pollutant sources, reducing the source of contaminants, while also diluting pollutants through ventilation.

- Verified Direct Ventilation: Outdoor air will be provided directly to all occupiable spaces

- Low-Emitting Materials: The introduction of volatile organic compounds will be limited through selection of low-emitting and nonemitting finish products

- Indoor Air Quality Testing: Testing airborne pollutant levels will confirm that source control strategies have been effectively implemented, and demonstrate spaces are suitable for occupancy

INTEGRATED RAINWATER MANAGEMENT AND GREEN INFRASTRUCTURE

The Oak Green development design team is considering a rainwater capture and reuse system to offset 100% of irrigation and support a 40% reduction of indoor potable water use, including net zero potable water use for the community centre. Additional green infrastructure will be utilized throughout the site to ensure the project's rainwater management goals can be met. Green Infrastructure considerations at the Oak Green development includes the following measures:

- Absorbent Landscapes & Green Roofs: The Vertical Greening Terraces will include sufficient soil and plant species quality, depth and variety to successfully intercept and retain rainwater

- Tree Well Structures: To optimize tree growth and manage stormwater from adjacent hardscape areas, this strategy provides benefits to the health of trees while contributing to overall rainwater management

- Rainwater Harvesting: An extensive opportunity for rainwater management includes collection of rainwater from inaccessible and non-vegetated surfaces and diversion to a cistern for reuse through irrigation applications. It is proposed the Community Centre would utilize captured rainwater for toilet-flushing, assisting the goal of net zero potable water use

- Constructed Wetlands: The biological processes associated with emergent aquatic plants and sedimentation allows for natural opportunities of water quality processing

- Rain Gardens: Utilizing bioretention facilities to capture and filter runoff from adjacent impervious surfaces offers opportunities for rainwater quantity management and increasing the biodiversity on the site

RESILIENT DRINKING WATER ACCESS

Publically accessible potable water sources will be available with the aim of increasing the resiliency of the community. Providing unencumbered access to safe drinking water is one example of how the Oak Green development contributes to the City's goal of ensuring vibrant, liveable and resilient communities in the face of climate change.