Harbourside Waterfront

SUSTAINABILITY STRATEGIES MATRIX

Concert is approaching Harbourside Waterfront as an opportunity to make an important contribution to the City's ongoing efforts to reduce the negative impacts of energy usage and mitigate and adapt to the impacts of climate change. This means doing things differently, working outside the current box and considering a variety of issues relating to sustainability, livable community and resiliency, all at once. The sustainability matrix developed for Harbourside Waterfront expands on these concepts, with a detailed description of each sustainability goal initiative with a goal, target, strategy and verification lead. The sustainability strategy for Harbourside Waterfront addresses three scales:

- i. BUILDINGSii. SITE AND PUBLIC REALMiii. NEIGHBOURHOOD

	Goal	Target	Strategy	Verification
BUILDINGS				
Overview	Achieve high standards of sustainability and green building performance.	LEED-Canada NC or CS Gold Residential/Mixed-Use – Concert will deliver building projects that are certified to the LEED-NC Gold credit requirements. Office – Concert will deliver building projects that are certified to the LEED-CS Gold credit requirements. Hotel – the owner/developer of this parcel will deliver a building that is certified to the LEED-NC Gold credit requirements.	 Construct the first phase with an aim to exceed ASHRAE 90.1 2010 energy standards by 5% Subsequent phases shall target a 5%improvement on the higher of either ASHRAE 90.1 2010 or the energy performance requirements in the British Columbia Building Code 	ConsultantCaGBCLEED Certification
Energy	Reducing energy demand and use at the scale of building and residential unit and balancing energy efficiency with district energy, to achieve emissions reductions.	LEED-Canada NC Gold Concert's commitment is to deliver building projects that meet applicable LEED Gold credit requirements, retain accredited green building professionals, and execute the LEED/CaGBC project certification process.	 Whole-building energy modelling, including optimization for District Energy connectivity and performance. Priority on building envelope efficiency and passive design - optimized solar exposure and passive ventilation Efficient lighting and HVAC systems Energy conservation information for residents ENERGY STAR appliances 	ConsultantCaGBCLEED Certification
Water	Reducing potable water use and generation of wastewater by each residential unit.	Exceeding LEED-Canada NC Prerequisite WEp1: Water Use Reduction	 Low-Flow Fixtures Dual-Flush or High-Efficiency Toilets ENERGY STAR appliances Educational rainwater collection systems (e.g. rain barrels) where possible. Drought tolerant and water efficient species. Moisture detection control systems where irrigation is required. 	ConsultantCaGBCLEED Certification
Materials	Considering the whole lifecyc	cle of materials and their impact on the environm		
Waste Management	Reducing the amount of all streams of waste to landfill	Full achievement of LEED-Canada NC Credit MRc2 Construction Waste Management – targeting 50%	 Develop and Implement construction waste management plan Recycling storage space in all buildings Recycling education program for residents Organic waste management (Green Bin program in collaboration with CNV) 	ConsultantCaGBCLEED Certification
Healthy Materials	Minimizing environmental and human exposure to emissions from products, materials and finishes	LEED Canada-NC Credits EQc4.1 to EQc4.4: Low-Emitting Materials	 Compliance with 3rd party indoor environmental quality (SCAQMD) rules Educational program for residents Formaldehyde-free materials 	ConsultantCaGBCLEED Certification
Low-Impact Materials	Reducing the environmental impact of materials and products used in the construction of the buildings	Minimum 10% recycled content as calculated in LEED-Canada Minimum 50% of wood to be FSC-Certified or equivalent, Pine Beetle killed or salvaged	 Using materials with high recycled content Incorporate BC-based manufactured and harvested materials and products, where possible Look for opportunities to salvage and reuse materials 	ConsultantCaGBCLEED Certification
End-of-Trip Facilities	Reducing the adverse effects of vehicle use by providing facilities for alternative means of transportation especially cycling.	Meeting LEED Canada-NC requirements for the provision of end-of-trip facilities.	 Provision secure bike lockers Provide end-of-trip facilities to exceed CNV minimum requirements 	ConsultantCaGBCLEED Certification

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Ecological and Habitat	Protecting the existing hebitet within	 Protection of existing ecologically 	 Control and manage known invasive 	■ Consultant
Protection	Protecting the existing habitat within the site boundary and its immediate adjacency	sensitive areas including existing riparian habitat in conformance to Vegetation and soil protection zones (VSPZ) The latest version of the CaGBC LEED standards for Neighbourhood Development will be used at the time of DP. The current one at the time of this rezoning application is the 2009 version.	plants found on site Use appropriate, non-invasive plants Preserve all vegetation designated as special status Preserve or restore appropriate plant biomass on site Use native plants Preserve plant communities native to the eco-region	 External 3rd Party Consultant
Ecological Enhancement	Improving the ecological conditions of site, where possible, to encourage the expansion of existing natural habitat or creation of new ones	Targeting of CaGBC LEED-ND: Smart Location and Linkage Prerequisite 2, 3 and Credit 8. The latest version of the CaGBC LEED standards for Neighbourhood Development will be used at the time of DP. The current one at the time of this rezoning application is the 2009 version.	 Protect riparian, wetland, and shoreline buffers Restore plant communities native to the eco-region Marine & riparian habitat enhancements 	 Consultant External 3rd Party Consultant
Microclimatic Impact	Providing a comfortable and sustainable outdoor environment and to reduce the adverse microclimatic impacts of the development through a seasonal approach to design	 Targeting of CaGBC LEED ND: Green Infrastructure and Buildings Credits 9 and 10 Acoustic comfort, e.g. blocking noise while enhancing natural sounds of ocean and wildlife Visual comfort e.g. reducing glare The latest version of the CaGBC LEED standards for Neighbourhood Development will be used at the time of DP. The current one at the time of this rezoning application is the 2009 version. 	 Where possible, design building mass to minimize unwanted microclimatic conditions such as excessive local wind speeds, frozen streets and sidewalks and over exposure to rain and precipitation Where possible, maximize desirable effects such as ocean breeze, shading by buildings and trees in summer, Use of deciduous trees to provide shading in summer and allow daylight to pass through in winter Take advantage of landscape features (e.g. berms, shrubs or dense vegetation) to block noise or undesirable visual impact 	 Consultant External 3rd Party Consultant
Land Contamination Management	Minimizing risks of soil contamination caused by construction activities as well as remediation of contaminated sites when required	Observe and follow Sustainable Sites Initiative Guidelines and Performance Benchmarks 2009 Prerequisite 4.3 and Credits 4.4, 7.2 and 7.3 The latest version of the CaGBC LEED standards for Neighbourhood Development as well as the Sustainable Sites Initiative Guidelines and Performance Benchmarks will be used at the time of DP. The current one at the time of this rezoning application is the 2009 version.	Prepare and communicate to contractors a soil management plan	 Consultant External 3rd Party Consultant

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SITE AND PUBLIC REALM	: Green Space			
Vegetation and Plants	Enhancing the local ecological conditions through landscape deign	Observe and follow Sustainable Sites Initiative Guidelines and Performance Benchmarks 2009 Prerequisites 4.1, 4.2 and Credits 4.7 and 4.9 The latest version of the CaGBC LEED standards for Neighbourhood Development as well as the Sustainable Sites Initiative Guidelines and Performance Benchmarks will be used at the time of DP. The current one at the time of this rezoning application is the 2009 version.	 Native plants Use appropriate, non-invasive indigenous plants Restore plant communities native to the ecoregion 	 Landscape Architect External 3rd Party Consultant
Irrigation	Minimizing, and where possible eliminating, use of potable water for irrigation	Targeting of CaGBC LEED NC: Water Efficiency – Water Efficient Landscaping Credit The latest version of the CaGBC LEED standards for Neighbourhood Development will be used at the time of DP. The current one at the time of this rezoning application is the 2009 version.	 High efficiency irrigation – e.g., drip or emitter Weather-based irrigation controllers Any irrigation systems to divide irrigated landscape into hydrozones Utilize a Water Budget Calculator for landscape areas 	 Landscape Architect External 3rd Party Consultant
Low-Impact Landscape Maintenance	Reducing the adverse effects of landscape maintenance activities on the environment	Minimizing the use of petrochemical fertilizers. No pesticides permitted.	 Encourage the use of environmentally friendly lawn mowers such as manual or electric mowers leaf blowers and power tools 	 Concert External 3rd Party Consultant
Rainwater Management	Play a responsible role in the local water cycle, and protect water quality to avoid significant impacts in Vancouver Harbour	 Targeting of CaGBC LEED NC: Sustainable Sites Credit 6 Meet requirements of Urban Runoff Quality Control Guidelines for BC, during and after construction Total Suspended Solids at the point of discharge to receiving waters: 25 mg/l during dry conditions 75 mg/l during storm events Landscape areas meet BC Landscape Standard and meet depth and hydraulic conductivity requirements (300 mm, 12 mm/hr) The latest version of the CaGBC LEED standards for Neighbourhood Development will be used at the time of DP. The current one at the time of this rezoning application is the 2009 version. 	 Erosion & Sediment Control Plan Surface parking areas subject to motor vehicles provide water quality treatment – e.g., pervious pavement with reservoir, soil infiltration systems, or constructed wetlands Green roofs Rain gardens Rainwater collection tanks or cisterns for irrigation Design of features highlighting interaction of site with rainfall, runoff and the sea. 	 Landscape Architect Civil Engineer External 3rd Party Consultant
Urban Agriculture	Creating opportunities for local food production	Provide plots for residents on at least 50% of the green roof areas of residential buildings.	 Provide urban agricultural plots and edible landscaping in common areas within private development sites for use by residents 	■ Concert

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SITE AND PUBLIC REALM:	SITE AND PUBLIC REALM: Urban Space					
Diverse Social/Community Spaces	Creating open spaces in a range of types and scales catering to various social and community activities	 Providing usable, appropriately sized open spaces (e.g. plazas, squares, etc.) within walking distance of all residential buildings within the development boundary Designing open flexible spaces dedicated to or capable of accommodating outdoor community activities 	 Urban agriculture Outdoor patio space Children's play areas The plaza at the foot of Fell street as open community space 			
Heat Island Effect	Reducing Heat Island Effect caused by the development	Meeting the requirements of LEED- Canada NC Credit SS-7.1: Heat Island Effect, Non-Roof (excluding City owned infrastructure and streets)	 Shade the ground plane and roof though increased tree canopy coverage, Light colour materials where appropriate Green roofs 	 Landscape Architect External 3rd Party Consultant 		
Outdoor Lighting	Minimizing adverse impacts of lighting without compromising the safety and security of the public	 Meeting the requirements of LEED- Canada NC Credit SS-8: Light Pollution Reduction for outdoor lighting where it does not interfere with safety and security 	 Full cut-off LED lighting on streets Low level lighting Timed and photosensor-equipped lighting 	 Landscape Architect External 3rd Party Consultant 		
Air Pollution/Minimizing Exposure to Tobacco Smoke	Controlling and managing sources of air pollution and mitigating its impact on environment and human health	 Minimizing exposure to tobacco smoke during construction and after occupancy Minimizing dust generation from construction activities Minimizing engine idling 	 Implement a construction air quality management plan No smoking policy for all indoor spaces and common areas within residential and commercial buildings 	■ Concert		

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NEIGHBOURHOOD: Climate,	Energy & Emissions				
Climate Adaptation	Create resiliency in the community infrastructure and its facilities to support adaptation to a changing climate change with minimal property damage and disruption to community life. The design of the development will consider managing increasing frequency and duration of droughts, extreme temperatures, and over-precipitation as they affect the occupants, natural settings and habitat, landscaping and structures.				
Sea Level Rise & Flood Management	 Develop a strategy framework that manages the growing flood risk over the century and supports a resilient Harbourside Waterfront, meeting specific socioeconomic and environmental objectives Exploit design features through adaptation Improve ecosystem health and functions within site constraints 	 Design the development to meet the bylaw for flood construction level Manage flood risks of Harbourside Waterfront buildings, sites and roads Develop flexible building, site, park and street designs that permit sea level rise adaptations over time 	 Establish a concrete band dike feature seaward of all buildings at the flood construction level to protect the most critical infrastructure Establish a series of terraces from the shore up to the concrete band that dissipate wave energy and can be used for recreation and leisure, and active transportation along a greenway Design edge conditions to maximize adaptability to new circumstances 	City of North Vancouver + Consultant	
Energy & Power	Minimizing GHG emissions for	rom the community's various sources of energy			
District Energy Supply	Complying with Bylaw 7575 we will work with Lonsdale Energy Corporation (LEC) in a collaborative process, to connect to the district energy system.	All buildings to have hydronic heating systems, to meet LEC connectivity requirements	 Design in-building hydronic systems that work with LEC Provide LEC mini-plant space in phase 1 	■ City of North Vancouver	
Transportation & Land Use	Maximize transportation choi	ce and minimizing community GHG emissions th	nrough integrated land use and transportation pl	anning and design.	
Mixed-Use Development	To create a multi-modal community where vehicle trips would be minimized by providing work and live opportunities within walking distance of each other	 Reduce by 10% the projected peak period vehicle trips 	 Develop land uses supportive of the existing and future needs at Harbourside to reduce external trips and lower peak vehicle demand periods (i.e. 4:30 to 5:30pm) 	■ Concert + Consultant	
Mixed Mode Street Design	Pedestrian- and bicycle- friendly streets with integrated sustainable features such as planting and storm water control features	 Maximizing pedestrian safety and comfort Facilitating safe and comfortable use of streets by bicycle 	 Increase route choice / permeability both on and off-street Reduce pedestrian crossing distances at intersections and look to introduce speed tables 	■ Consultant	
TDM-Transit Initiative	To extend the operational hours of the existing service to cover a 15 hour per day period.	 Increase transit use from 20% to 30% for employees and target 30% for new residents 	 Work with TransLink to introduce a new bus service or introduce new private shuttle service, subject to fair and realistic time and cost parameters 	 Concert + City of North Vancouver 	
TDM-Bicycle Initiatives	Develop innovative bicycle strategies to support projected bike parking supply	■ Achieve 4% to 6% of all trips by cycling	Introduce a public bike stationDesign bike lanes within the development	■ Concert + Consultant	
TDM-Parking	Provide on-site parking at a level consistent with the sustainability objectives and market demands, and look to manage street demand for visitor use	 Provide parking to minimum market demand Discourage the use of car by restricting parking time 	 Increase street parking to support existing and future demands Extend time-limit restrictions to prioritize parking for visitor use, with possible onstreet metering Allow for shared parking opportunities to maximize utilization 	■ Concert + Consultant	
TDM-Ride Sharing	Review best practice in developing a practical and safe ride sharing program amongst all businesses.	Increase passenger in vehicle proportion from 4% to 8% amongst employees.	 Work with TransLink's Travel Smart to develop a practical and safe system for Harbourside 	■ Concert	
TDM-Car-Sharing	Studying the viability of car-sharing programs	Provide 5 vehicles (total) and associated parking spaces	 Work with a local operator to introduce vehicles as the residential units are built out 	■ Concert	
TDM-Greenway Development	Work with the City of North Vancouver to identify locations where greenway improvements can be introduced	Improving the existing network of trails and creating new open spaces within the development for public use	 Fund the completion of the greenway on Bewicke to 2nd Street Work with Squamish First Nation and the City to open up the waterfront Spirit Trail Complete elements of the Spirit Trail along the development frontages 	■ Concert + Consultant	
Sustainable Transportation Hub	Develop an arrival and departure gateway for transit users on Harbourside Drive with strong pedestrian, cycling infrastructure and social vitality.	Support the extended bus operations to achieve 30% of trips by transit, and cycling and pedestrian trips	 Provide Wi-Fi access (for bus tracking) Provide weather-protected, safe and secure location 	■ Concert + Consultant	
TDM-Marketing and Monitoring Transportation Demand Management	Develop a system where existing and future employees and visitors along with new residents are aware of the diverse modal choices.	Linked with the initiatives for increased walking, cycling, transit, and passenger levels	 Employ a travel coordinator and work with TransLink's TravelSmart program to promote TDM options 	■ Concert + Consultant	
TDM-Pedestrian Facilities and Network	Prioritizing pedestrian accessibility and comfort in the design of public realm and open spaces	15% of all new development trips by walking	 Provide pedestrians with more route choices than other street users 	■ Consultant	
Electric/Alternative Fuel Vehicle Infrastructure	Facilitating and promoting the use of alternative-fuel and electric vehicles by incorporating the necessary infrastructure	20% of structured parking spaces to have access to electric supply, through supply of rough-in conduits only. Provide 2 Level 2 Electric vehicle charge stations per commercial building.	 Investigate the practicalities of how this infrastructure can be introduced over time as demand increases 	■ Concert + Consultant	

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NEIGHBOURHOOD: SOCIA	L AND ECONOMIC WELL-BEII	NG		
Social Diversity & Vitality	Creating a socially diverse community accommodating various layers of society regardless of their race, age, and economic status	Creating a unique gathering place with abundant social, cultural and recreational opportunities, supported by robust connections to surrounding places - by Spirit Trail, by road and potentially by water.	 Ensure the development design caters to a wide range from seniors and families to single-occupant households Provide a range of housing types such as 1-bedrooms, 2-bedrooms, 2-bedrooms+ and townhomes Plaza at the foot of Fell street as a community space serving the larger community, the City residents Street-level retail and commercial to enliven Harbourside Drive 	■ Concert + City of North Vancouver
Equitable Access	Providing easily accessible public and private spaces based on principles of Universal Design	Exceeding code requirements	 Considering a comprehensive range of users with special needs such as people with disabilities, the elderly, mothers with strollers, young kids, etc A minimum of 25% of units designed for 	 Concert + City of North Vancouver
Safe Community	Providing safe, secure and pleasant public and private spaces	Creating a safe and welcoming community where residents and visitors could safely enjoy its commercial and recreational services and spaces at all time.	 level 2 or better guidelines. Implement principles of CPTED (Crime Prevention Through Environmental Design) 	■ Concert + Consultant
Healthy Community	Enhancing physical and mental health and well- being of the community by facilitating a healthy lifestyle	Creating a walkable community with ample outdoor spaces for physical activity and social interaction	 Provide places for social interaction (mental health) Integrate with the existing network of trails and bicycle routes Create indoor spaces that have access to daylight and fresh air Use low-emitting materials and finishes 	■ Concert + Consultant
Community Outreach & Involvement	To follow a transparent process of development which is inclusive and respectful of the community and neighbours	Implementing an Integrated Design Process (IDP) to welcome feedback and involvement of various stakeholders in the process of design	 Several public presentations Use various media (development web site, bulletins and brochures, local newspaper, etc.) to promote public engagement and input in the process of designing the development 	■ Concert + Consultant
Services and Amenities	Providing necessary community services and amenities within easy reach of the residents, occupants and visitors	 Provide a range of neighbourhood servicing retail amenities to meet the basic needs of residents and employees Targets are developed in consultation with the City of North Vancouver. 	 Provide retail in key locations within the development Provide a minimum of 2.5 acres of open space within the development Commitment to working with the City of North Vancouver for on-site amenities or financial contributions that support community and city initiatives. 	■ Concert
Economic Well-Being	Enhancing local economy by attracting investment, enhancing existing economic infrastructure and providing new economic opportunities	Committing to working co-operatively with the City, local residents and municipal authorities to create an innovative development that is suited to the needs of the community, achieves the highest quality construction and generates an attractive economic return for both the City and Concert shareholders.	 Mixed-Use development with 0.7 FSR of commercial development area Colourful and inviting streets featuring a continuum of entrepreneurial activity Local employment through generating construction job opportunities 	■ Concert
Mixed-Income Development	Providing a range of housing options to create a economically diverse community	 A true mixed-used community, offering exceptional opportunities to live, work, shop, and play A waterfront hub on the Spirit Trail, a place for all with exceptional and varied opportunities for recreation, culture and community, on the City's longest stretch of accessible waterfront. 	 Provide a minimum of 10% of the development area as market rental housing Provide a range of housing types and costs to ensure a continuum of housing affordability Consider live/work uses in key at-grade locations to create affordable opportunities for entrepreneurs 	■ Concert
Education	Educating the public, as a whole, and the development residents, in particular, about sustainability, climate change, resiliency and complete communities	Qualitative Target	 Provide sustainability manuals for residential occupants Signage in commercial buildings and public spaces 	■ Concert

Goal Target Strategy Verification