Social Sustainability

In this document Social Sustainability refers to actively supporting healthy and livable communities through urban, landscape and building design.

"the village fabric defined by the pedestrian system and the location and scale of public places"

Eldon Beck

The fabric of Whistler is shaped by the desire to create spaces for high intensity social interaction. The scale of the public space and the active uses framing it are at the heart of Whistler Village.

4500 Northlands Blvd is a unique opportunity to contribute something new to Whistler's social fabric. It presents an opportunity to mix a new type of public space - where nature and urban space are combined - within a residential neighbourhood.

The plaza and community hub are the most public spaces. The plaza accommodates large scale community gatherings as well as casual, smaller scale spaces for individuals and groups. The shops and restaurants will add to the social life and provide an activity hub distinct from Whistler Village. A daycare is included in the development program. Daycares have a "social force" on the places around them including surges at drop-off and pick-up times. They often create community for young families. The daycare is located beside the green, open space where there is opportunity for the daycare community to mix with the larger one and for kids to play.

Employee rental housing will be included in the mixed use building contributing to housing and tenure diversity.

The green open space provides an all season shared community place - it is envisioned with a balance of passive recreation (games / picnics / a sunny green place to hang out) and "nodes" for public art, table tennis, seating area, play structure, etc. which could evolve over time. The central open green space is accessible to everyone - it could become a new green Whistler heart.

The network of on-site trails connects with the larger Valley Trail system, inviting the community into and/or through the neighbourhood with sitting walls and seating pods to provide social choices.

Residential buildings are envisioned with a range of social spaces including:

- bright, double height lobbies designed for residents to gather and possibly areas for working
- strata amenities near the lobby to increase social opportunities
- roof top terraces with indoor/outdoor social spaces (with a view)
- natural meeting places including elevator lobbies and corridors designed with daylighting and seating
- generous private outdoor spaces (balconies, patios, terraces) for families and friends to gather privately outside

The two options included in this document shape social outdoor space in different ways. Northlands Village Green has a contiguous, accessible central public space made of natural green and plaza/ community hub areas.

The Boulevard focuses on building enclaves that define more "intimate" semi-public spaces that may extend neighbours' sense of "home" to common outdoor space and increase the potential to grow communities.

4500 Northlands Boulevard is envisioned as a new mixed use village in Whistler, inspired by Eldon Beck's thinking:

"a goal of the village is to provide spaces that encourage a connection of people to people and a connection of people to the environment"

Eldon Beck

Energy and Carbon Sustainability

The energy strategy and sustainability narrative for the development has been designed with the Climate Action Big Moves Strategy in mind.

Big Move 4, “Build Zero Emission Buildings”, the development will construct buildings with higher levels of insulation to use less energy, and implement a Low Carbon Energy System (LCES) to provide renewable energy for heating and cooling.

These steps will reduce operating greenhouse gas (GHG) emissions by 80-90% compared to “traditional” fossil fuel-based heating systems, and reduce embodied carbon where possible.

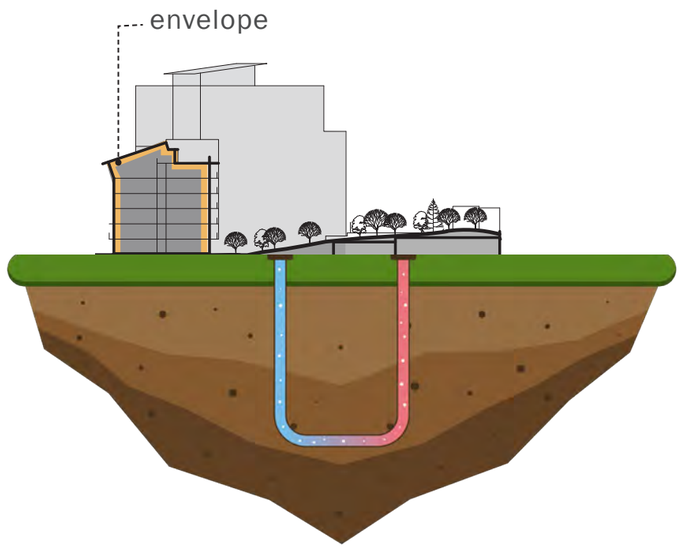
Geo-Exchange is the preferred energy source for the LCES. Connected to a Geo-Exchange system, heat pumps will provide the development’s heating and cooling energy. A vertical borehole ground heat exchanger will be constructed underneath the footprint of the building. Heat from air conditioning in the summer will be stored in the ground. In the winter, heat pumps will recover that heat to provide space heating. Like a big energy battery, the ground stores the heat from the summer to be re-used in the winter.

With a LCES system, BC Energy Step Code targets will comply as follows:

- LCES – Geo-Exchange
- Part 9 Residential: Step code 4 with LCES
- Part 3 Residential: Step code 3 with LCES

Big Move 2
Decarbonize Passenger and Commercial Transportation

the development is committed to providing Level 2 EV charging capabilities

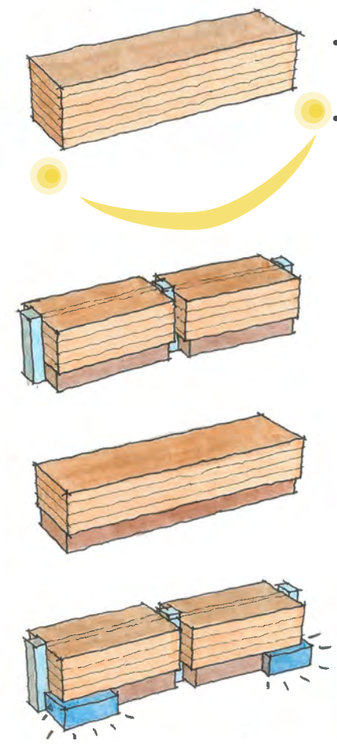


a good building envelope combined with a LCES yields big GHG savings

A New Climate Responsive Architectural Vernacular

Support the development of a new architectural vernacular for Whistler through regional influences, simple forms with efficient building envelopes that reduce heat loss/solar heat gain, passive design strategies, encouraging wood-frame and mass timber options, and reducing underground parking requirements.

Ensure buildings are all designed with livability and functionality in mind, including access to daylight, natural ventilation, views to nature, flexibility for evolving needs, and usable outdoor spaces with comfortable and accessible design.



- simple, energy efficient envelope emphasizing south orientation, where possible
- reduce the overall number of buildings by optimizing building length

- articulate the building base to ensure human scale
- differentiate through materiality, colour, or ground floor massing inset/offset

- bend or break the massing length to reduce overall scale and respond to site conditions
- daylight corridors and stairwells to enrich social spaces and reduce lighting requirements

- lobbies and amenity spaces provide social spaces and animate the ground plane
- make these elements architecturally distinct and inviting

Environmental Sustainability

Landscape Design

Three key considerations to support environmental sustainability include:

- enhancing the existing 20 m tree buffer
- retaining stands of trees where possible, including along the southeast portion of the site (refer to adjacent illustration)
- extending the tree canopy / buffer eastward into the site
- a stormwater management plan for vehicular surfaces (streets, underground parking), building roofs and hardscapes.

The Green Building Strategy provides the framework for sustainable building and landscape design. The following list outlines the key environmental responses that impact the concept site plans outlined in this document. A detailed Green Building policy response is appended to this document.

Sustainable Site Design

Heat Island Effect

- Coniferous trees for year-round shading / deciduous trees for summer shading
- Green roofs
- Reflective paving materials

Carbon Footprint

- Plant coverage including intensive and extensive green roofs

Ecological Planting

- Low requirement planting for irrigation, pesticides, herbicides, fertilizers, maintenance, labour
- Naturalized planting, indigenous and/or adapted plant species for drought resistance, resiliency (all subject to bear and wildfire considerations)
- Increased tree canopy to provide shading where appropriate
- Bird friendly strategy (includes lighting and architectural considerations)
- Re-wilding
- Meadow (subject to wildfire consideration)

Example hardy low-maintenance and drought-resistance species.

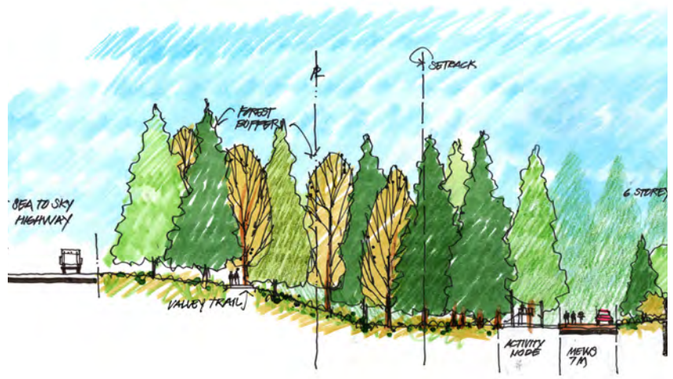
- Hardy low-maintenance and drought-resistant species primarily consist of indigenous species supplemented by adapted species. Planting of hardy and drought-resistant plant species contributes to resiliency in the landscape and minimizes the requirements for irrigation. The following indigenous and native-like adapted species are recommended species for Whistler Village, provided by the RMOW.
- Indigenous deciduous tree species may include: Vine Maple, Red Alder, Red Oak, Trembling Aspen, Bitter Cherry, Western Mountain Ash. Adapted deciduous native-like tree species may include: Amur Maple, Red Maple, Silver Maple, European Mountain Ash.
- Indigenous evergreen tree species may include: Whistler Hybrid Spruce, White Spruce, Lodgepole Pine, Interior Douglas Fir. Adapted evergreen native-like tree species may include: Korean Fir, Serbian Spruce, Austrian Pine.
- Indigenous deciduous shrub species may include: Serviceberry, Red-Osier Dogwood, Black Twinberry, Mock Azalea, Indian Plum, Mock Orange, Shrubby Cinquefoil, Nootka Rose, Red Elderberry, Common Snowberry, Highbush Cranberry. Adapted deciduous native-like shrub species may include: Deciduous Azalea, Rugosa Rose, Gold Flame Spirea, Burkwood Spirea, Ninebark.
- Indigenous evergreen shrub species may include: Common Juniper, Oregon Grape, Oregon Boxwood, Shrubby Penstemon, Spreading Yew. Adapted naïve-like evergreen shrub species may include: Bearberry Cotoneaster, Dwarf Mugo Pine, Mountain Pine.

Design Landscaping for all seasons to provide opportunities for interaction with nature.

- Cycle of seasonal change in the form of new growth, flowering, fragrance, fruiting, and fall colour is provided by deciduous plant materials with evergreen plant materials providing structure, winter form and additional flowering and fruiting interest. A sequence of change in the landscape across each season will draw residents and visitors to explore nature at the site.
- Screening and structure in the landscape is provided primarily by evergreen plant materials planted either informally as single plants or in drifts, or formally as hedging or edgers.
- A layered landscape design consisting of both deciduous and evergreen plant materials provides a sequence of year -round colour, form, and seasonal interest.
- Planting of complimentary flowering perennials further emphasizes the change of the seasons with plants selected for interesting attributes such as flowering that attracts pollinators or butterflies or fruiting that attracts birds.

Examples of long-living legacy trees and landscape approaches that mimic the natural Whistler environment.

- Many coniferous trees and many deciduous hardwood trees can live for hundreds of years.
- Long-living tree species, with careful placement, could with time become ‘legacy’ trees. Example species include Douglas Fir, Whistler Hybrid Spruce or White Spruce.
- Successional deciduous species such as Alder, Big Leaf Maple, Trembling Aspen and Cottonwood tend to be shorter living to roughly 60 - 80 years. These trees are important as they contribute character and seasonal change to the naturalized environment.
- To mimic the natural Whistler environment, tree and shrub species should be predominately indigenous, planted in drifts, arranged in a manner pleasing to the eye, and located in grouped plant associations as found in nature (upland vs. wetland associations for example).



concept sketch illustrating the “green zone” between the highway and proposed new mews

Environmental Sustainability

Tree Retention

possible new trees existing trees

A significant portion of the site has been cleared and graded but there are beautiful stands of trees that are important to the landscape and ecology and provide a local habitat corridor. Underground parking will impact the retention of trees in the centre of the site.

An extensive green zone, which includes the 20 m highway buffer, extends into the site on the west edge. As illustrated in this document, current concept options explore vehicular access around the west edge. New roads will be designed to retain existing trees and where possible new trees will be added to “extend” the green zone to the edge of the new road.

Another existing stand of trees along the southeast portion of the site will be incorporated into the landscape plan.

west edge / green buffer

southeast edge

Stormwater Management Overview

The fundamental objectives of the on-lot stormwater management system are to (1) protect environmentally-sensitive areas that will receive storm flows from the site and (2) protect storm conveyance infrastructure downstream. These objectives will be achieved through a variety of on-site Best Management Practices (BMP's).

Site runoff can be classified into the following four (4) broad categories based on point source generation:

- Roof Area
- Landscaped Area
- Underground Parking
- Roads / Plazas

Broadly, each category represents different runoff conditions and contaminant loading, and will be treated accordingly.

Roof Areas

Roof area runoff will be directed to surrounding grades which will be primarily landscaped areas. This arrangement is typical for Whistler where gutters and downspouts are avoided. Runoff directed to ground will be infiltrated or conveyed and collected by the on-site drainage system. Since roof areas contains little contaminants, runoff directed to landscape areas does not require any further treatment. Roof area that is directed to vehicle occupied impervious areas will be included in the treatment sizing of those receiving areas.

Landscaped Areas

The development site includes a generous amount of open space for landscaping with considerable opportunities for BMP's such as bioswales, absorbent soil, and rain gardens. Effectively, these areas provide runoff volume reduction, retention, infiltration, and cleansing. Where feasible, impervious areas will be directed to and enhance the effectiveness of these BMPs. All landscaped areas on-site will be graded away from buildings and towards sewer inlets to ensure safe conveyance of surface flows. Runoff generated from landscaped areas does not require any further treatment.

Underground Parking

Underground parking areas typically contain comparatively high levels of oils and road contaminants. This results from periods of build-up and low occurrences of runoff. Only small flow rates are generated with snow melt and runoff from vehicles. However, more considerable flow rates are generated during power washing, or other maintenance programs but do not occur frequently. As such, parkade runoff is comparatively higher in concentration and these flows will be directed to mechanical treatment systems within the building parkade before entering the storm sewer system. In general, treatment will include oil/water separation and total suspended solids (TSS) removal.

Roads and Plazas

Runoff from roads and plazas will be directed to naturalized surface BMP's such as bioswales, or rain gardens where feasible. Road runoff will enter a conventional underground storm sewer conveyed to a centralized on-site stormwater facility. The initial conception for this central facility is a constructed wetlands offering naturalized treatment in addition to detention for peak flow reduction. Treatment and detention from the site may still require additional mechanical devises to fully comply with the stormwater management objectives.

Proposed Detention and Treatment System

In addition to the measures mentioned above, there are further options for treatment and detention measures that may be deemed applicable. The applicability remains in discussion and will be selected to suit the evolving development layout. A short list of the features under consideration is provided below:

Detention Features:
- Constructed Wetlands
- Dry Ponds
- Underground Storage Tanks
- Underground Vaults
- Underground Storage Modules
- Oversized Storm Sewers

Treatment Features:
- Bioswales
- Constructed Wetlands
- Dry Points
- Vegetative Strips
- Stormceptor (or other mechanical separation devices)

Whistler Amenity Channel

The subject property is bisected by the Whistler Amenity Channel, which travels in a northeast direction through the site. Downstream from site, the Amenity Channel outlets to the Montebello Wetland before ultimately discharging into Fitzsimmons Creek. Discharge of storm runoff from the subject development to the Amenity Channel is not permitted. However, it is recognized that some of the infiltrated flows from site may seep into the channel.

Based on a review from Cascade Environmental, modifications to the Amenity Channel configuration are permitted from an environmental perspective as the channel is not considered a stream under the Riparian Areas Protection Act. Conveyance capacity of the Amenity Channel must be maintained throughout construction of the proposed development.

Stormwater Management Objectives

The objective of the proposed stormwater management plan is to mitigate changes in the quantity and quality of stormwater discharge, as well as to convey the minor and major storm events to neighbouring watercourses and major conveyance channels. The following stormwater management objectives are derived from DFO's 'Urban Stormwater Guidelines and Best Management Practices for Protection of Fish and Fish Habitat, 2001' and RMOW bylaw:

- A conventional underground storm sewer system to convey the post-development flow of the minor storm (10-year return period) event to the offsite storm system without surcharge.
- A conventional underground storm sewer and/or overland flow drainage system to convey the post-development flow up to the major 100-year return period storm event to the off-site storm system.
- Provide an emergency overland flow route.
- Retain the 6-month/24-hour post-development volume from impervious areas on-site and infiltrate to ground. If infiltration is not possible, the rate-of-discharge from volume reduction BMP's will be equal to the calculated release rate of an infiltration system.
- Capture and detain post-development peak flows to pre-development levels for the 10-year storm event.
- Collect and treat the volume of the 24-hour precipitation event equaling 90% of the total rainfall from vehicle driven areas with suitable BMP's. Quality targets include:
    - 80% removal of Total Suspended Solids (TSS) for influent event mean concentrations (EMCs) greater than 100mg/L but less than 200mg/L; for influent EMCs less than 100mg/L, meet a goal of 20mg/L effluent TSS.
    - Provision for removal of oils from vehicle driven areas.

concept sketch illustrating stormwater management strategies adjacent to the pond / amenity channel