Rodgers Creek Area Development Plan

Overview Report

March 7, 2008

Rodgers Creek ADP Area

Executive Summary

Background

The Rodgers Creek Area encompasses approximately 215 acres between Marr Creek and Cave Creek West above the Upper Levels Highway and below the 1200 foot contour in West Vancouver. The District of West Vancouver's Official Community Plan (OCP) identifies this area as a "Future Neighbourhoods Area" to be planned for future development. The OCP also requires the preparation of Area Development Plans in order to establish future land use and development objectives for neighbourhoods. The Rodgers Creek Area Development Plan will be the first ADP to be prepared.

The Overview Report for the Rodgers Creek Area Development Plan reflects the results of several years of work towards building a consensus on the development of these lands. The planning process has demonstrated an unprecedented level of cooperation and collaboration among all participants and included:

- The preparation of an Envisioning Notebook by British Pacific Properties Limited (BPP) which was presented to Council and District staff on May 18, 2006 to stimulate discussion of key directions for the Rodgers Creek Area.
- Extensive technical background investigation and assessment of the environmental, recreational and topographic features of the Rodgers Creek Area by specialist professional consultants and District staff.
- Many technical sessions among District staff, the landowners and their consultants to collect and evaluate background information for the Plan. These sessions evolved the Sieve Analysis that provides a concise and graphic representation of many layered categories of information including slope analysis, vegetation inventory, detailed assessment of all watercourses and their proper functioning condition, and mapping of trails and recreation and cultural features. The Sieve Analysis provides the basis for the identification of areas for conservation and for potential development.
- Establishment of the Rodgers Creek Area Plan Working Group by Council in January 2007 to guide the development of the Area Plan over more than a year of regular meetings that have involved presentations by staff, landowners and their consultants, and key stakeholders in response to requests by the Working Group.
- Public Open Houses held June 20, 2007 and December 4, 2007 to inform the community of the Area Plan Process and obtain public input on the proposed development plan.
- Series of meetings between District staff, BPP and recreational users.

Relationship of the Overview Report to the Area Development Plan

The Overview Report was prepared to provide a summary of the proposed Area Development Plan in a succinct and highly graphic form. Since its initial first draft in October 2007, it has been amended to reflect changes and new information that have resulted from community input and from guidance of the Working Group and supporting work by District staff, the landowners and their consultants. Contents of the Overview Report formed the display material at the two Public Open Houses and were refined in later drafts to reflect public input.

The Council of the District of West Vancouver will receive the overall report, consider it, and then direct District staff, as Council considers appropriate to prepare the regulatory documents that will amend the Official Community Plan and establish the zoning by-laws for the Rodgers Creek Area.

Rodgers Creek Area Working Group

Over the past 12 months, the Working Group undertook a range of activities including:

- Developing Key Organizing Principles, structured by the four Community Building Principles of the Official Community Plan, to set out the objectives for the Area Plan. These Principles were presented to the community at both Public Open Houses for comment and endorsement.
- Providing direction for the presentation of information at the two Public Open Houses and reviewing the results of the Open Houses.
- Providing direction for the refinement of the proposed development plans and the content of the Overview Report to reflect the Key Organizing Principles and community objectives.

Development Plan

Three key directions for the Rodgers Creek Area were established:

- Cypress Village - future plans for a new Village with shopping and services for residents of Rodgers Creek, as well as for the wider Upper Lands community. A new playfield, McGavin Field, is already under construction in this area.
- Mountain Path - A trail network to link the Village the Rodgers Creek neighbourhoods will be focussed on the Mountain Path, a wide path with gentle gradients for pedestrians, cyclists and other users. The Mountain Path is intended to be a well-used and valued community amenity with a series of view, open space, recreational and interpretive points of interest along its 3 kilometre long route.
- Concentrating Density Westward - higher density multiple family housing will be concentrated close to the Village.

Detailed planning was undertaken to develop concepts for Public Realm features such as trails, public open space and streetscapes and for design principles for fitting buildings to the land.

Development was clustered into six distinct areas within four neighbourhoods, each having its own architectural character:

- Areas 1 and 2 are located in the Chairlift Neighbourhood between Marr Creek and Rodgers Creek and includes a mix of single family homes and townhomes
- Areas 3 and 4 are located in the Mulgrave Neighbourhood between Rodgers Creek and Westmount Creek and includes a mix of single family homes, duplexes, townhomes and mid-rise apartment buildings
- Area 5 is located in the Lower East Village Neighbourhood between Westmount Creek and Cave Creek West below upper Cypress Bowl Road and includes a mix of ground-oriented townhomes and high-rise apartment buildings with a neighbourhood amenity building
- Area 6 is located in the Upper East Village Neighbourhood above upper Cypress Bowl Road and includes a mix of duplexes, ground-oriented townhomes and mid-rise and high-rise apartment buildings with a neighbourhood amenity building

Diversity of Housing

In the Upper Lands, the OCP allows for a gross density of 2.5 dwelling units per gross acre and requires a mix of dwelling types including single family homes, townhomes and apartments with at least 40% expected to be non-single family homes. The Working Group established a principle that single family housing accounts for no more than 20% of the total housing units. An upper limit of total floor area of 1,875,000 square feet was also established based on the number of units allowed under the existing zoning and supported by land use planning and building mass analysis.

Based on the above criteria, Housing Option A was developed for a total of 538 housing units with 19% single family, 5% duplex/triplex, 15% townhomes and 61% apartments. 10% of all apartments would be less than 1,000 square feet in size (net saleable area).

The Working Group asked the landowners to consider a second option with a more socially diverse housing mix within the same total floor area and same building massing as Option A without capping the total number of units at 2.5 units per acre. Based on this, Housing Option B was developed for a total of 736 housing units with 13% single family, 3% duplex/triplex, 14% townhomes and 70% apartments. 30% of all apartments would be less than 1,000 square feet in size (net saleable area). Although Option A and B share the same total floor area and the same road, trail and servicing network, Option B performs better in meeting sustainability and housing diversity objectives. The Working Group has recommended Option B as the preferred option.

The Working Group also supported providing the opportunity for accessory housing options such as coach houses, carriage house, suites over garages and in the main dwelling and “lock off” suites within multi-family units and excluding these types of housing from the total unit count.

Development Contributions

The development of the Rodgers Creek area will create a wide range of benefits for the new community and for the District of West Vancouver as a whole including:

- Conservation of over 55% of the land area as environmentally protected green space including creeks and their riparian corridors, rock bluffs, and large stands of forest.
- Environmental enhancement and restoration of man-made watercourses and natural drainage systems including the creation of new wetlands to help retain water on site and enhance biodiversity.
- Commitment to sustainable development practices such as green buildings, green infrastructure, facilitating alternative modes of transportation and integrated stormwater management planning.
- Creation of the Mountain Path through the heart of the development to connect neighbourhoods to each other and to the future Cypress Village with a number of social and recreational nodes along its way.
- An extensive network of parks and trails linking to the Mountain Path and to trails beyond the boundaries of the Rodgers Creek Area to enhance recreational opportunities and accessibility.
- A diversity of housing types that exceeds the requirements of the OCP.
- New road and infrastructure improvements with benefits beyond those of serving Rodgers Creek including a new truck route connecting Chippendale Road and Cypress Bowl Road.
- Development cost charges and increased property tax revenues to be used by the District for community-wide improvements and services as well as the creation of financial benefits that will result to the community from direct and indirect development-related jobs and services.

In summary, this Overview Report lays out the framework for a proposed Area Development Plan for Rodgers Creek that is based upon collaboration amongst all the stakeholders and will set new standards for sustainable development in the Upper Lands.

Table of Contents

The Mountain Path is envisioned to traverse the Rodgers Creek Area to connect its neighbourhoods to the future Cypress Village

Scope and Intent of the Area Development Plan

The Official Community Plan of the District of West Vancouver (OCP), adopted in 2004, established the Area Development Plan process. The Rodgers Creek Area Development Plan will be the first ADP to be prepared.

The OCP includes specific policies to guide development of the Upper Lands. These policies originated in the Upper Lands Study that was completed in 2001 and provide that "where development does occur it will be founded on sound environmental principles, topographic constraints and recognition of the natural heritage." (OCP, page 96) These policies are "intended to ensure that West Vancouver will continue to be a community of neighbourhoods, will focus on its environmental assets and will insist on the creation of great places to live." (OCP, page 95)

The OCP also indicates the scope and content for an Area Development Plan:

1. Describe how and the degree to which the plan achieves the four community building principles of the OCP:
   - Create a strong community
   - Establish a sensitivity and connection to the natural environment and mountain qualities
   - Encourage a diverse community
   - Focus on environmental and economic sustainability
2. Provide a comprehensive inventory and analysis of the area's terrain, creeks, other natural features
3. Include an analysis of how natural characteristics and environmental considerations are used to identify lands that are suitable for development and those that warrant special protection
4. Provide a proposed land use plan, including types of housing, overall square footage, coverage, local parks, open space and community facilities
5. Locate and develop preliminary design for major roads and trails and other public facility requirements and describe how the proposal integrates with existing systems
6. Describe implementation requirements including general servicing, sources of funding, legal agreements and guidelines for future development of specific sites
7. Assess the development's financial implications to the District.

The Overview Report

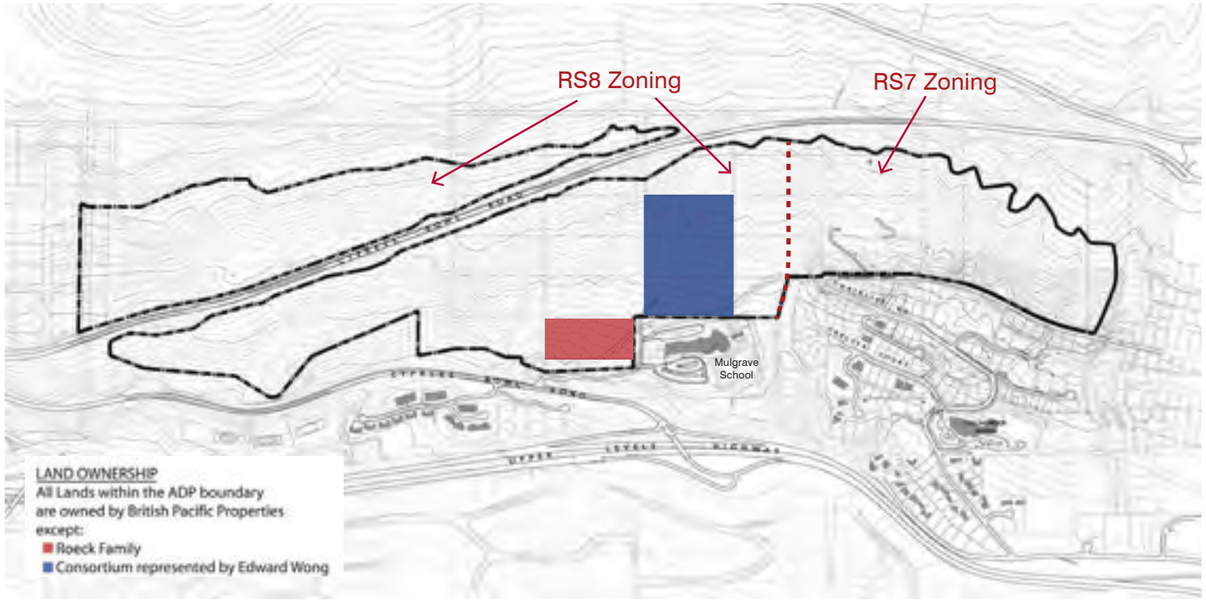
This Overview Report is intended to summarize the content of the proposed Rodgers Creek Area Development Plan in a succinct and highly graphic form to be used by the Working Group, Council, staff, and the public to understand its scope and intent. With support for the Overview, the regulatory document of the ADP will be prepared to ensure that the intents are realized in the development process.

Ownership within the ADP Area

Within the Rodgers Creek ADP lands, the majority of the land is owned by British Pacific Properties. There are two other land owners: one owner of a five acre lot and one consortium owning three five acre lots.

Existing Zoning

Most of the ADP area is currently zoned for single family housing and townhouses under the RS7 (1.5 upa) and RS8 (2.5 upa) zones. Some or all of the ADP lands will be rezoned to permit the forms of development envisioned by the Plan.

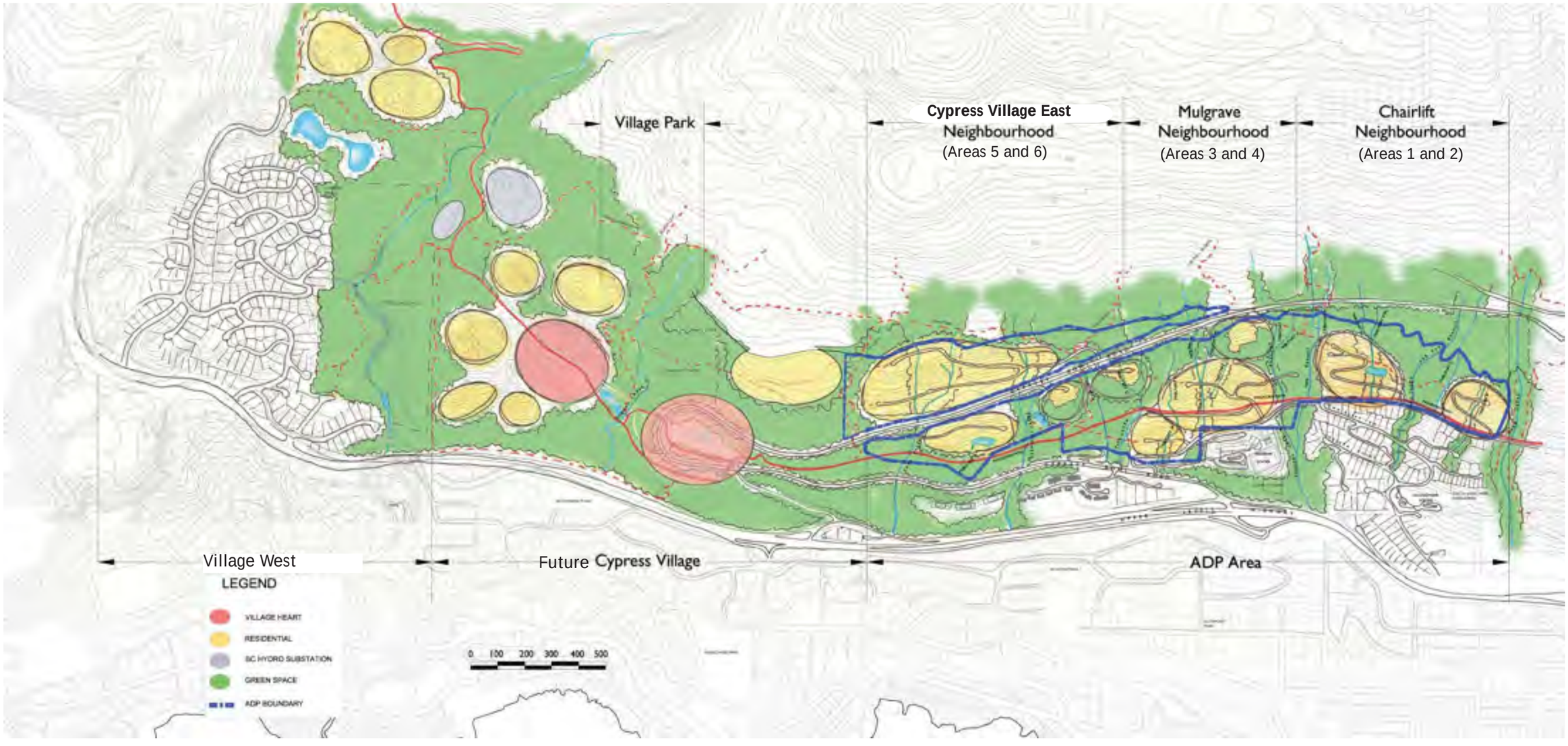


Context

The Rodgers Creek Area Development Plan is prepared in the context of the Upper Lands -- their long-range development opportunities and their environmental and recreational resources.

Development of the Upper Lands will occur in the context provided by the Official Community Plan and other relevant District plans, policies, and by-laws.

The images on this page through page 9 are reproduced from the Public Open House display panels of June 20, 2007.



Existing and Future Development Context

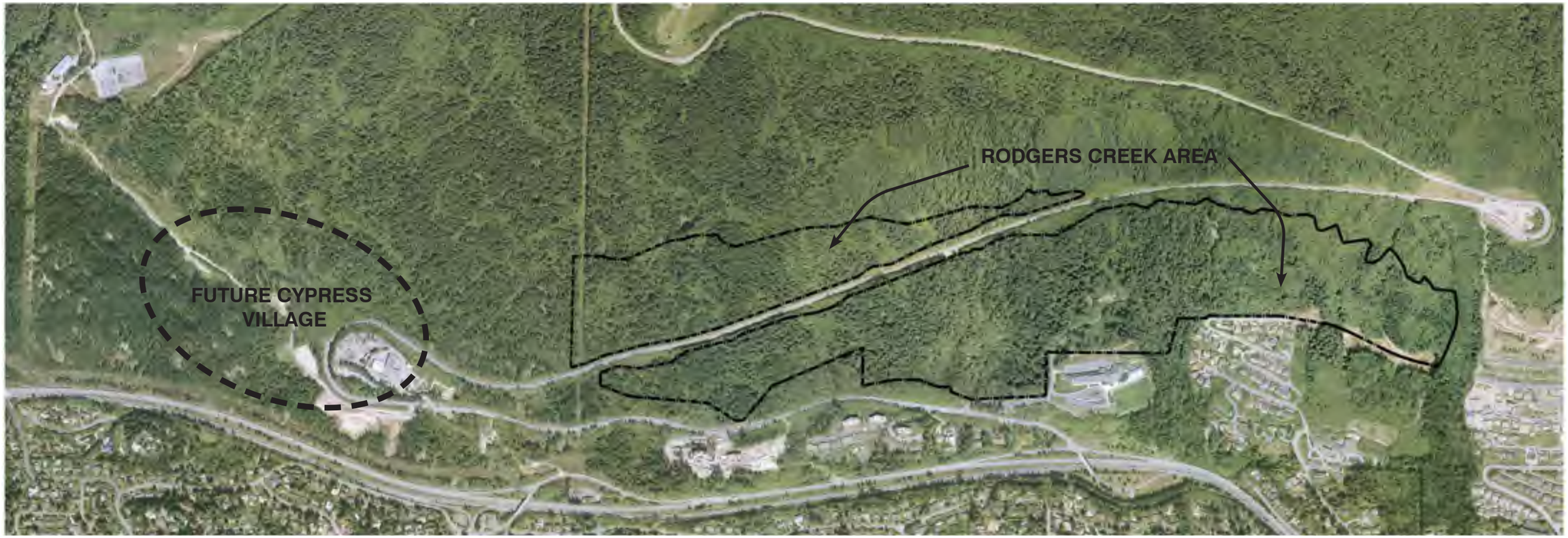
The Rodgers Creek Area is located immediately west of the Marr Creek corridor which is the conservation area on the western edge of Whitby Estates. Originally, the first phase of Rodgers Creek was to be Taylor's Lookout, the area between Marr Creek and the established subdivision around Chairlift Road. Taylor's Lookout was approved in advance of the Area Plan and is currently under development.

The Rodgers Creek Area is limited at its uphill boundary by the 1200 foot contour line as set by District policy. The downhill boundary is generally established by existing development, including Mulgrave School, and by the Cypress Bowl Road. Cave Creek West, a BC Hydro powerline corridor and highway road allowance form the western boundary.

Future Cypress Village

The location for a future Village to serve the Upper Lands has been identified in the Official Community Plan generally to the west of the Rodgers Creek Planning Area. The current District Works Yard, one of the areas of moderate topography in the Upper Lands, has the potential to become redeveloped as part of the Village, should the District choose to relocate the current uses at some time in the future. Other sites suited to mixed use development are located on the west side of Godman Creek on a series of terraces with superb view opportunities in the area east of Cypress Falls Park.

The first component of the Village, McGavin Field, is currently under construction. As the Village expands, a fieldhouse, children's playground, and other recreational amenities will be considered for this vicinity. Other land uses expected in the Village include: an elementary school, locally-oriented stores and services, a staging area and support services for mountain biking and hiking trail users, and residential development of a wide variety including different types of seniors housing, rental housing, units over retail, live/work, townhouses, and apartments.



The Landscape Informs the Plan

The Process of Preparing the Sieve Analysis

A series of maps have been prepared and carefully reviewed with District staff to provide an understanding of the land and its resources:

- Topography, Slope Analysis, and Geotechnical Conditions
- Environmental Resources, Watercourses and Setback Lines
- Watercourse Assessment and Proper Functioning Condition
- Recreation and Trail Resources
- Landscape and Heritage Resources.

Once completed, the inventory and assessment maps were overlaid in a process referred to as ‘sieve analysis’ to reveal the complex interrelationships among many factors in the landscape with the intent that development in the ADP area will ‘fit with the land’.

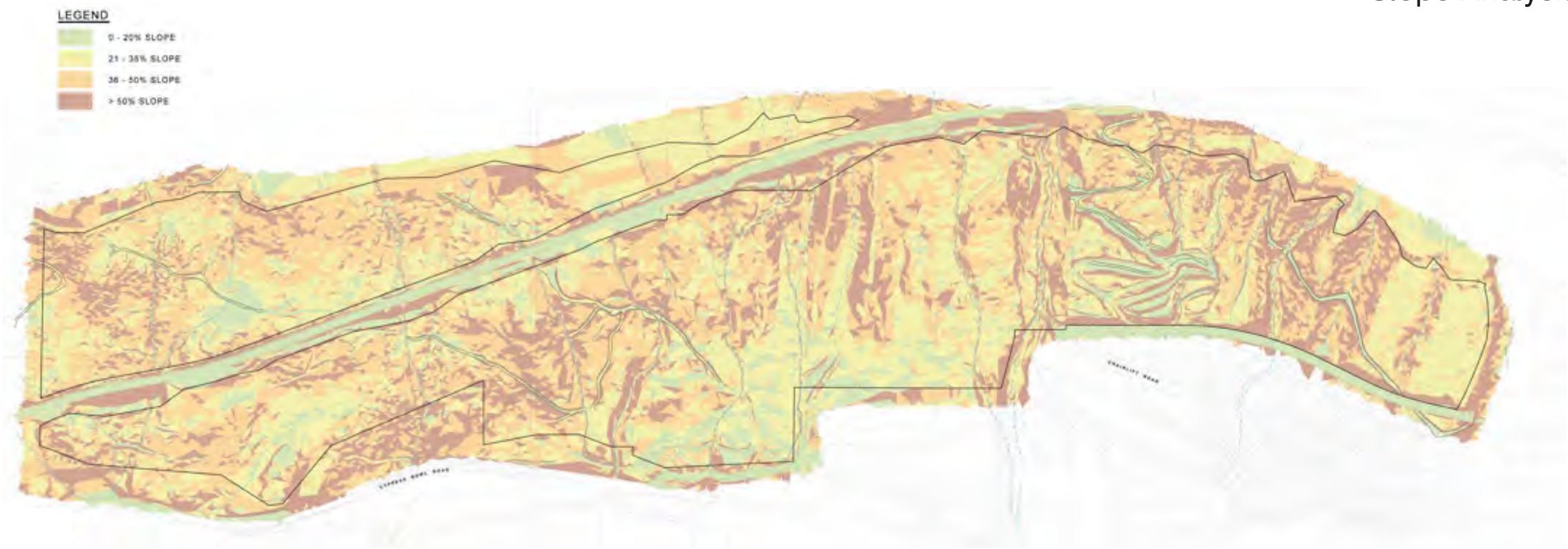
This method was pioneered by Ian McHarg in his book ‘Design with Nature’. Every site planner and designer learns this approach in school but it is not often used as rigourously in practice, as it has with the Rodgers Creek Area Plan.

Ian McHarg’s Landmark Book -- Design with Nature

British Pacific Properties has a long history of land planning to integrate development with the landscape going back to the first subdivision plan by the renowed Olmsted Brothers Landscape Architects. The Rodgers Creek Area Plan will continue this tradition while setting new standards for sustainable development in the Upper Lands.

First Development Plan for the British Pacific Properties by the Olmsted Brothers

Slope Analysis



Survey Work

All of the land within the Rodgers Creek Area has been surveyed on the ground to ensure a thorough and accurate understanding of the topography and the features of the site. The detailed survey provided much more detail than the earlier mapping of the Upper Lands that had been done through interpretation of aerial photographs. As a result of the survey work, some areas that appeared to have development potential were found to not be while a large terraced area north of the first switchback on Cypress Bowl Road emerged as a candidate for further study.

Topography

The survey maps were interpreted by computer to reveal the complexity of the topography. The slope classifications used in this slope assessment are based on the categories in the Official Community Plan that identify slopes over 35% as requiring detailed study.

Note: After the original mapping was completed, the western boundary of the ADP Area above Cypress Bowl Road was expanded. The rationale for this expansion is included in Appendix A.

Vegetation Polygons

The slopes of the Rodgers Creek Area have been logged several times over the years. Nevertheless, a few mature trees were found that had escaped logging, mostly by being in the ravines of watercourses. There is a diversity of forest types and characters across the hillside that have been mapped and assessed for their value as habitat. No old growth forest exists within the Rodgers Creek Area and more mature and diverse stands are located above the 1200 foot contour line and to the west.

ECOSYSTEM UNIT LABELS

Watercourse Protection Regulations

The regulations around the protection of watercourses are complex and involve both the District of West Vancouver's by-laws and the policies of senior government agencies. The map on this page illustrates all of the regulations used in preparing the sieve analysis:

- The Riparian Area Regulations (RAR) established by the Provincial government as prepared by Seacor Environmental Consultants and reviewed by District staff (dotted red line and coloured light green)
- The Environmental Development Permit (EDP) areas (dotted blue lines). The District may consider a reduced setback.
- Areas identified as having potential geotechnical stability concerns in a report by Golder Associates (gray dotted lines and light yellow shading).
- Creeks that flow year round are identified as dark blue
- Presence of fish and frogs is noted.

Approach to Stream Protection

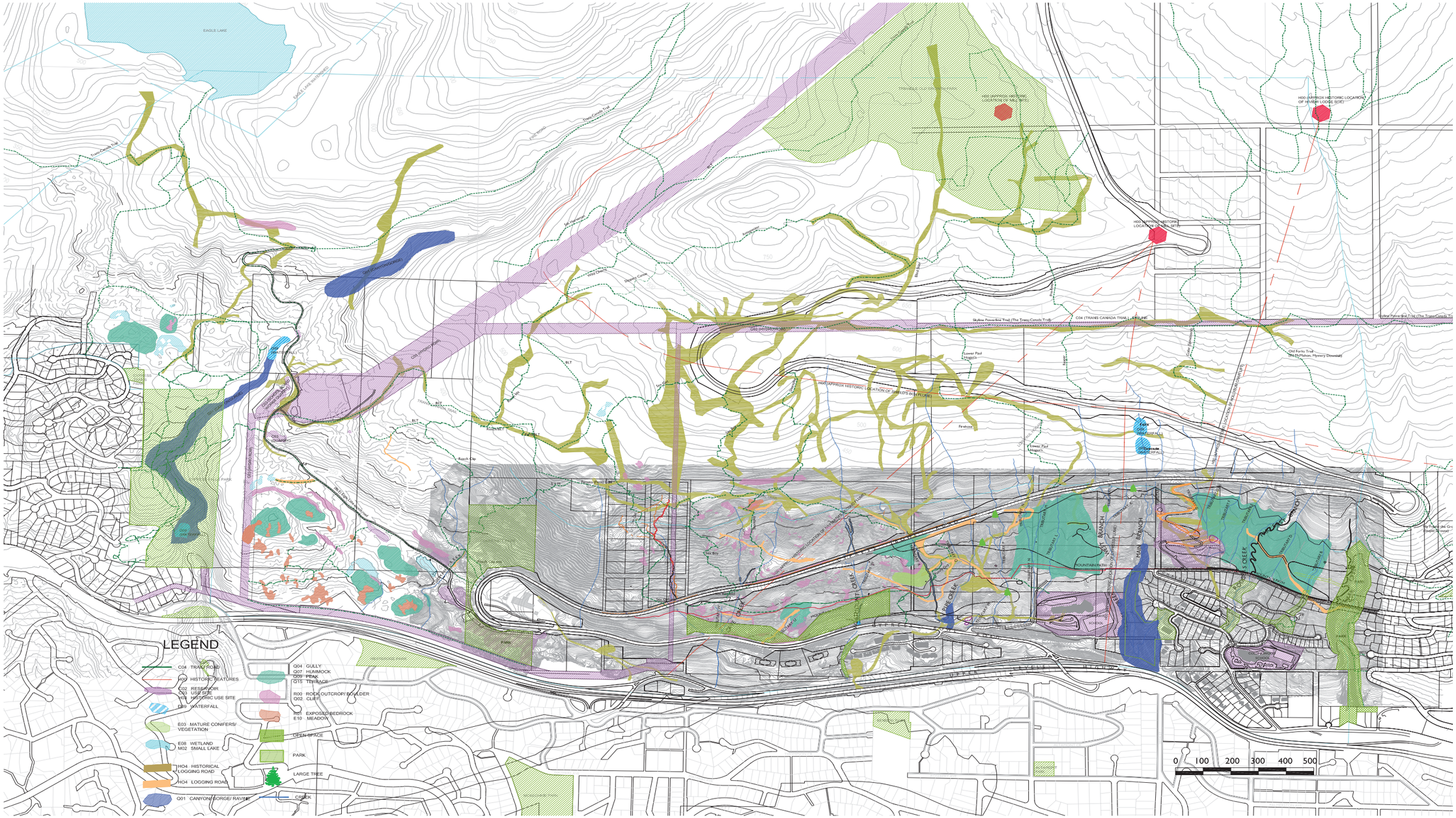
The following seven elements are the basis of the stream protection strategy:

- Watershed based land use planning
- Establish stream buffer network
- Reduce creation of impervious cover
- Limit the disturbance and erosion of soils during construction
- Treat the quantity and quality of stormwater (rainwater) runoff
- Maintain stream protection infrastructure
- Protect sensitive areas from development.

Note: After the original watercourse mapping was completed, the western boundary of the ADP Area above upper Cypress Bowl Road was expanded. The rationale for this expansion in included in Appendix A.

Existing Trails, Recreation and Landscape Features

An inventory of the recreation and landscape resources of the Rodgers Creek ADP Area and a larger context setting was prepared to identify and assess the resources affected by the Plan and to include key resources in the sieve analysis. The context provided the opportunity to compare resources within the Rodgers Creek Area with those in the surrounding Upper Lands to evaluate their prevalence and relative value. The categories used for the Recreation and Landscape Resources Inventory were based on the system developed and used throughout BC by the Ministry of Forests so as to be consistent with current best practices.



Assessment of Proper Functioning Condition

The Proper Functioning Condition (PFC) is a qualitative method for assessing the condition of riparian-wetland areas. The term PFC is used to describe both the assessment process, and a defined, on the-ground condition of a riparian-wetland area. The PFC assessment refers to a consistent approach for considering hydrology, vegetation, and erosion/deposition (soils) attributes.

The on-the-ground condition termed PFC refers to how well the physical processes are functioning. PFC is a state of resiliency that will allow a riparian-wetland area to hold together during high-flow events with a high degree of reliability.

The PFC for each watercourse was part of the technical information used in assessing their ratings of overall value as H (high), M (moderate), and L (low).

Summary Matrix

The matrix in Appendix B describes each watercourse in the Rodgers Creek Area, including its proper functioning condition.

LEGEND

- Proper Functioning Condition
- At Risk of Losing PFC
- Not in Proper Fuctioning Condition

Sieve Analysis

Sieve Methodology

The sieve analysis has been a work in progress and has been refined a number of times. The original sieve analysis was prepared in collaboration with the land owners and District staff in an intensive workshop session.

Each watercourse was evaluated as a collaborative process at technical meetings, including detailed field review, and categorized with respect to its environmental values as H (high), M (moderate), or L (low).

Note: After the original Sieve Analysis was completed, the western boundary of the ADP Area above upper Cypress Bowl Road was expanded. The rationale for this expansion and the Sieve Analysis for this expanded area is included in Appendix A.

LEGEND

- PROTECTED SENIOR GOVERNMENT SETBACK AREA
- STEEPER SLOPES
- POTENTIAL GEOTECHNICAL CONSTRAINTS - FURTHER INVESTIGATION REQUIRED
- STEEP SLOPES - FURTHER INVESTIGATION REQUIRED
- MUNICIPAL SETBACK AREA - FURTHER INVESTIGATION REQUIRED
- DEVELOPMENT AREA
- LARGE FEATURE TREE
- C04 TRAIL/ ROAD (EXISTING)
- C04 MOUNTAIN PATH (PROPOSED)

Preliminary Planning and Conservation Areas

Working together, District staff and the Rodgers Creek land owners identified areas where development planning should focus. These development planning areas are enclosed in black outlines on the above map. The configuration of these potential development areas depends on the confirmation of road alignments, especially for the extension of the Chippendale connector road. District staff have not approved development within all of the areas shown. Final boundaries will be determined at the Development Permit stage and may be smaller than the areas shown, resulting in more conservation area being transferred to the District. Lands outside of the outlines will not be developed and will be preserved and enhanced.

The preliminary planning areas have been numbered and lettered for reference purposes.

Note: After the original Sieve Analysis was completed, the western boundary of the ADP Area above upper Cypress Bowl Road was expanded. The rationale for this expansion and the Sieve Analysis for this expanded area is included in Appendix A.

LEGEND

- PROTECTED SENIOR GOVERNMENT SETBACK AREA
- STEEPER SLOPES
- POTENTIAL GEOTECHNICAL CONSTRAINTS - FURTHER INVESTIGATION REQUIRED
- STEEP SLOPES - FURTHER INVESTIGATION REQUIRED
- MUNICIPAL SETBACK AREA - FURTHER INVESTIGATION REQUIRED
- DEVELOPMENT AREA
- LARGE FEATURE TREE
- C04 TRAIL/ ROAD (EXISTING)
- C04 MOUNTAIN PATH (PROPOSED)

Planning Principles of the Working Group

The Working Group prepared Draft Planning Principles and refined them over the course of their meetings. The Draft Pinciples were included in the display materials presented for review at the Public Open House of June 20, 2007 and December 4, 2007. The Principles are now to be considered as final.

KEY ORGANIZING PRINCIPLES FOR THE RODGERS CREEK AREA PLAN

OCP Community Building Principle 1 for the Upper Lands – Establish a sensitivity and connection to the natural environment and mountain qualities:

1.01 Keep development outside of environmentally sensitive areas (i.e, riparian areas, steep slopes, geotechnical hazard lands) and protect significant natural features; place both environmentally sensitive areas and significant natural features in public ownership wherever possible (OCP Policy page 101 and 103)

1.02 Avoid fragmentation of environmentally sensitive lands by creating large, continuous forested / natural areas throughout the planning area (OCP Policy page 101)

1.03 Avoid wide-scale clearing intended soley to provide uninterrupted, panoramic views, and minimize tree clearing on single family lots

1.04 Employ site sensitive built forms by:
- designing buildings to step into the terrain and using material and colours that harmonize with the forest setting; and
- minimizing footprints and visual impacts (OCP Policy page 108)

1.05 Minimize the need for 'constructed' responses by providing for road layouts, design standards and alignments that are sympathetic to the terrain and minimize site disruption including clearing of entire road right-of-ways, as set out in the Roads Policy 1999

1.06 Watercourses remain open and unimpeded, and are protected from change of course, piping, unnatural erosion and other human impacts.*

1.07 Provide multi-use utility corridors to minimize impact on the landscape

1.08 Trails may be provided along creek corridors, when located so as to minimize the impacts on riparian areas (OCP Policy page 101)

1.09 Natural, undisturbed areas (open spaces) and green connectivity belts are maximized and planned into housing complexes, and horizontal connections are treated as importantly as vertical connections.*

OCP Community Building Principle 2 for the Upper Lands – Create a strong community

2.01 Concentrate higher densities in areas that will foster strong community interaction (including a proposed commercial centre located to the west of the planning area) and outside environmentally sensitive lands

2.02 Ensure that the concerns and impact of new development on existing development adjacent to the planning area are identified and considered

2.03 Provide a 'mountain pathway' defined as:
- an east-west multi-use path, with gentle grades, for future residents of the planning area and the community at large; an
- a path that provides a connection to the natural setting and a physical connection to each neighbourhood within the Rodgers Creek Planning Area, and to a future commercial centre and neighbourhoods to the west; and
- a path that provides a variety of experiences and opportunities for people to meet, interact and connect (OCP Policy page 101)

2.04 Ensure that all destinations and public spaces including the mountain pathway (both its primary and secondary routes) provide for multiple activities by a variety of age groups and capabilities

2.05 Within the future Collingwood and Mulgrave Neighbourhoods, provide activity nodes along the mountain pathway that bring neighbours into regular social contact with each other. In the future development area at the west end of the Rodgers Creek Planning Area, provide community amenity buildings and facilities in addition to activity nodes along the mountain pathway.

2.06 Incorporate cultural heritage (such as logging and skilift history) and natural features (such as viewpoints, boulders and waterfalls) in activity nodes

2.07 Connect pedestrian and vehicle networks (including transit and cycling) into existing networks and with future amenities, including trails to and from the mountain

2.08 Include appropriate vehicle staging areas to ensure access to various public amenities and facilities

2.09 Provide for clear way-finding

2.10 Ensure all residential buildings are integrated into the landscape and have easy access to the mountain pathway

2.11 Continue the 1000-foot connector as the major east-west connecting road above the Upper Levels Highway (OCP Policy page 101)

2.12 Consider potential areas of synergy through the integration of Rodgers Creek Planning Area with future developments west of the Rodgers Creek Planning Area.

2.13 Identify existing recreational activities within and adjacent to the planning area and consider opportunities to retain, enhance and/or connect with these recreational activities.

OCP Community Building Principle 3 for the Upper Lands – Encourage a diverse community

3.01 Facilitate a diverse and more complete community by providing a variety of housing types and unit sizes

3.02 Provide opportunities for accessory housing such as such as coach houses, carriage houses and suites over garages and in the main dwelling, and do so by excluding them from total unit count

3.03 Ensure non-single family housing types include ground-oriented options such as duplexes, triplexes and townhouses

3.04 Ensure single family housing accounts for no more than 20% of the total housing units in the Rodgers Creek Planning Area (OCP Policy page 102: this policy provides for at least 40% non-single family homes in the entire Upper Lands; a higher percentage of non-single family is anticipated in the Rodgers Creek Planning Area)

3.05 Integrate housing with public/quasi public spaces and facilities, and connect with schools within the planning area and with the proposed commercial centre to the west

OCP Community Building Principle 4 for the Upper Lands – Focus on environmental and economic sustainability

4.01 Reduce the car-centric nature typical of new development with a focus on an effective movement system for pedestrian, cyclists and transit (OCP Policy page 101)

4.02 Green / sustainable design and operation standards, to a municipal standard that is being developed, form the foundation for building design

4.03 Strive for innovative, green infrastructure design and operation standards that minimizes immediate and life cycle cost

4.04 Think of rainwater as a resource, not a problem

4.05 Contribute to a resilient natural environment including healthy, properly functioning watercourses. Minimizing impervious surfaces and designing storm water systems to enhance watercourses are examples of measures that should be used to contribute to a resilient natural environment.*

4.06 Ensure that sustainability encompasses social sustainability, along with environmental and economic sustainability

4.07 Fish and fish habitat are conserved and protected*

4.08 Native vegetation is retained*

* From “Principles and objectives for Rodgers Creek Area Plan”, adopted by West Vancouver Streamkeeper Society May 2, 2007.

Key Directions for the Rodgers Creek Area within the Upper Lands

Three key directions for the Rodgers Creek Area have received support through the planning process with the Working Group. One is the future plans for a new Village with shopping and services for residents of Rodgers Creek, as well as for the wider Upper Lands Community. A trail network to access the Village will be focussed on a Mountain Path. Higher density multiple family housing will be concentrated toward the Village.

Cypress Village

The Official Community Plan identifies the opportunity to create a new Village in the vicinity of the new McGavin Field (refer to page 3).

With a new village, the Upper Lands will have a social and economic focus with a number of commercial, recreational and institutional uses located together. Among these uses are envisioned: a community centre, a library branch, restaurants, shops and local services, an elementary school, and active recreational facilities. A range of residential housing will be available including units over shops, seniors housing, townhomes and apartments.

Mountain Path

A wide path with gentle gradients for pedestrians, cyclists, and other users is proposed to link all the neighbourhoods in the Rodgers Creek Area to each other and to Cypress Village. Direct and easy access to the Village that does not depend on the automobile is key to achieving the objectives of the Official Community Plan for a more sustainable and complete community.

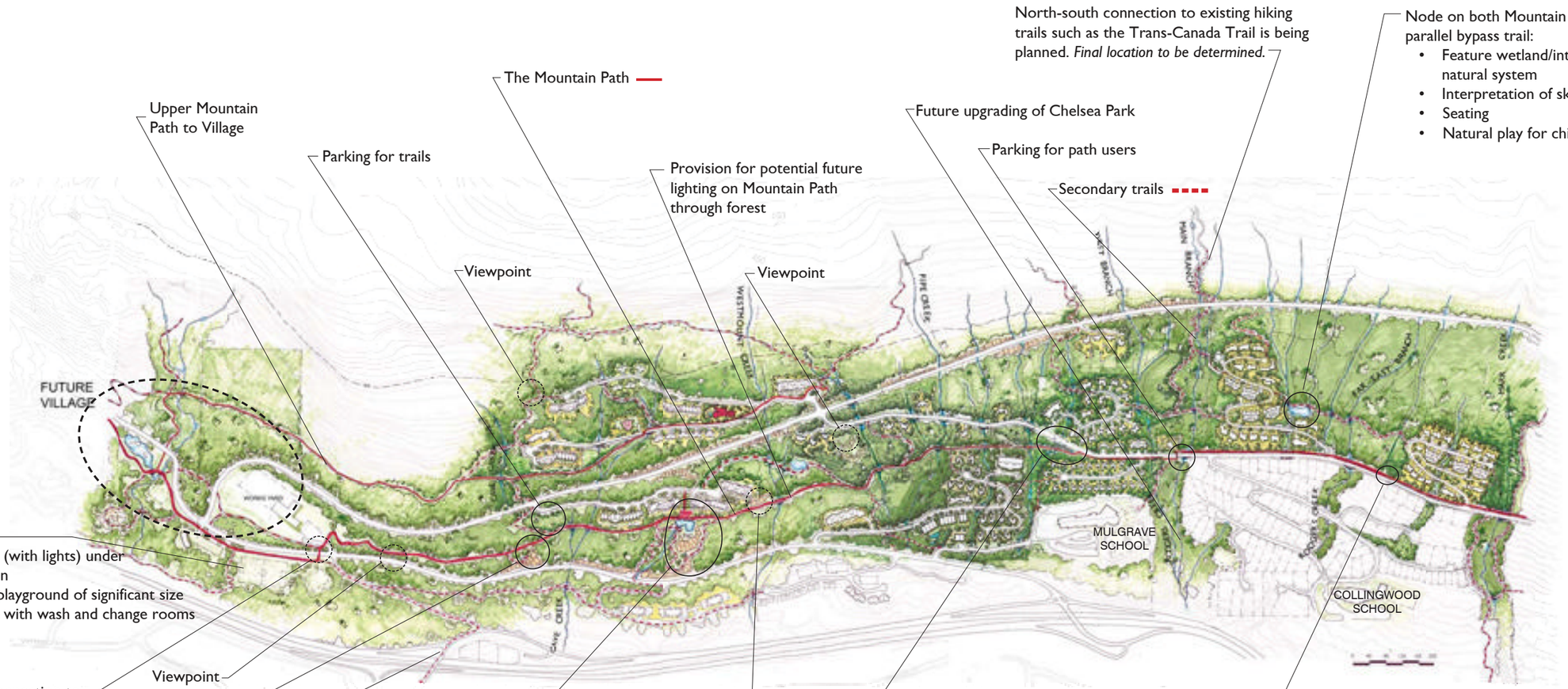
Modeled on the Valley Trail in Whistler, the Mountain Path is intended to be a well-used and valued community amenity with a series of view, open space, recreational, and interpretive points of interest along it.

The Mountain Path is integrated into the overall trail system that provides linkages among new and existing parks in Rodgers Creek and its surroundings. The trail system is intended to address the needs of all trail users including all types of mountain bikers, cyclists, hikers, and pedestrians.

Concentrating Density Westward

With the future Village as the intended site for amenities and services for the Upper Lands, the idea of increasing the density and the proportions of the multiple family housing in the neighbourhood mix in proximity to the Village has gained support. Concentrating density promotes the conservation of forested lands. It also places more people in proximity to the future Cypress Village. A higher proportion of the housing will be in multi-family buildings which are more readily suited to the rugged terrain. This approach will encourage residents to use trail systems to access the Village by foot or bicycle rather than by car.

A Sense of Place



McGavin Field:
- Sports field (with lights) under construction
- Children's playground of significant size
- Field house with wash and change rooms
- Parking

Upper Mountain Path to Village

Mountain Path connection to McGavin Field and future village. *Location and details to be determined.*

Parking for trails

Viewpoint

Interpretive Opportunity on Mountain Path:
- Trail to viewpoint
- Intersection with alignment of historic flume/interpretation of logging history

The Mountain Path

Connection to existing neighbourhoods south of Highway 1

Viewpoint

Provision for potential future lighting on Mountain Path through forest

Node on Mountain Path:
- Trail to viewpoints on bluff
- Wetland feature
- Children's play (minor)
- Seating
- Views
- Possible daycare / children's play associated with private amenity building

Viewpoint

Future upgrading of Chelsea Park

Parking for path users

Secondary trails

Node on Mountain Path:
- Trailhead with signage
- Parking for trail users and room for potential expansion
- Environmental Enhancement Area
- Frog pond

North-south connection to existing hiking trails such as the Trans-Canada Trail is being planned. *Final location to be determined.*

Node on both Mountain Path and parallel bypass trail:
- Feature wetland/interpretation of natural system
- Interpretation of ski area heritage
- Seating
- Natural play for children

Node on Mountain Path:
- Seating
- Views
- Trail setback from Chippendale with naturalized landscaping
- Interpretation of stormwater management
- Parking for trail users

District staff and the landowners have identified a number of elements that define the Rodgers Creek Area public realm and that provide a framework for more detailed planning and design.

Beyond streets, group mailboxes and public parking areas, other elements of the public realm address the non-developed lands of the Rodgers Creek Area. Known as conservation areas, these non-developed lands account for approximately 55% of the plan area and will serve a variety of purposes:

- Pedestrian connections between neighbourhoods and to existing and future parks and communities
- Recreational walking ranging from parents with strollers and on bicycles, to individuals out for a bit of exercise and enjoying the great views
- Play areas for children
- Informal gathering areas
- Dog walking on designated trails
- Hiking and mountain biking on designated trails
- Aquatic and terrestrial habitat
- Environmental enhancement and restoration, and
- Environmental conservation.

Recreational and natural elements in these conservation areas complement each other and include: a Mountain Path that provides an east-west recreational connector for residents and visitors; secondary trails that connect the neighbourhoods and the Mountain Path; hiking trails and mountain bike trails; activity nodes situated at strategic locations along the path and trail network; aquatic and terrestrial habitat areas; environmental enhancement and restoration areas; environmental and heritage interpretation areas; significant natural features such as bluffs; remnant forest areas; and the greenway along Cypress Bowl Road. The following discussion provides details of the key elements.

Mountain Path and Trail Network

The main Mountain Path extends for a distance of about 2.4 km across the Rodgers Creek Plan Area, from Marr Creek at Chippendale Road in the east, to the west boundary of the plan area. It then continues west for a further 0.6 km to McGavin Field on the south side of Cypress Bowl Road opposite the District's Operations Centre. The Mountain Path is to be designed and located based on the following guidelines:

- 3 m width with 0.5 m shoulders on each side; the shoulders allow for the surfaced width to be expanded to accommodate demand
- Permeable surfacing material along a majority of the Mountain Path, except where the trail is adjacent to Chippendale Road, crosses roadways or driveways and adjacent short intervening sections between bridges, roads, and driveways
- Gentle grades where possible with a goal to achieve a 12% maximum (by comparison, the City of Burnaby's urban trail standard is an average grade of 8% with up to 20% for short sections)
- District of West Vancouver park and trail signage system
- Stormwater management integrated into the trail design so that wherever possible rainwater is directed into swales or other surface features
- If appropriate, locate underground utilities in the Mountain Path corridor
- Trail design should consider its use for cross country skiing after snowfalls
- Trail nodes/staging areas will be provided at intervals

Three types of settings are envisioned for the main Mountain Path:

- *Adjacent to Chippendale Road,* with meanderings adjacent to the forested section if possible. This section of the Mountain Path accounts for approximately 40% of its length in the ADP Area and will have night-time light due to the street lighting along Chippendale Road; additional lighting will be used at nodes where needed. The goal for this portion of the Mountain Path is to have a trail character rather than the appearance of a sidewalk.

- *Through forested conservation areas*, with bridges over watercourses. This section of the Mountain Path accounts for approximately 45% of its length in the ADP Area. Compacted crush surfacing with permeable shoulders is planned. It is anticipated that pre-ducting for lighting would occur to facilitate adaptability of the Path over the long-term. Prior to commencing construction plans for the path, a detailed assessment of the purpose/impact of lighting this section of the Path is to take place, including the potential for solar-powered lights.

- *Through development areas* with fronting residential (such as Area 5) where the path should be provided with night-time lights and, possibly, special paving. This section of the Mountain Path accounts for approximately 15% of its length in the ADP Area.

The Upper Mountain Path will be a combination of the last two above conditions. It will be developed at a narrower width of 2m with shoulders of 0.5 m one each side. If levels of use warrant it in the future, as the Village is built, the surfaced width can be expanded to accommodate demand.

Mountain biking and hiking trails are presently under collaborative review with the recreational user groups:

- Discussions with mountain bike and hiking groups are ongoing in a process lead by District staff
- As part of a hiking trail network, a north-south hiking link from the Rodgers Creek Area to the Trans Canada Trail (Skyline Trail) and other existing hiking trails will be provided; the specific alignment(s) would be determined as part of the implementation of the Area Plan.
- Potential for a mountain bike trail network that incorporates existing trails above the future Village area promises to be a good long-term solution for achieving challenging, technical mountain bike routes and allows for the opportunity to secure a proper parking and staging area as part of the future Village
- The current location of existing mountain bike trails, e.g. "Sex Boy", will be assessed relative to the proposed development plan and relocated if necessary to new alignments on public-owned lands. (The feasibility of allowing continued use of trails until the neighbourhoods they cross are developed is being considered.)
- Realigned mountain bike trails would be located, built and maintained based on sustainable trail standards developed by the District of West Vancouver in conjunction with interested community groups, referencing the Metro Vancouver Mountain Bike Trail Guidelines, Whistler Trail Standards and other Best Practices.
- In general, downhill mountain bike trails should be separated from other types of trails and located in natural, forested areas away from roads and development to enhance the mountain biking experience and avoid conflict with other land uses and trail users. Longer trails that incorporate natural features such as rock faces and logs are desirable as long as they are consistent with the sustainable trail standards.

Activity Nodes

Several activity nodes are planned along the Mountain Path, the Upper Mountain Path, and its connecting secondary trail network. These nodes will complement the private amenity features proposed in Areas 5 and 6 and include:

- A forested setback area along Chippendale Road between Areas 1 and 2

- An interpretive node at the wetland east of Area 2
- A trail staging area with parking where the Mountain Path diverges from the Chippendale Road alignment
- Around the viewpoint and amenity building in Area 5 with children's play and a nearby interpretive wetland, and
- With Ministry of Transportation approval, a viewpoint at the rocky knoll west of Area 5 and outside the plan area with an interpretation of logging history and the historic flume that once crossed the site.

McGavin Field

McGavin Field is located on the south side of Cypress Bowl Road opposite the District Operations Centre. The facility is a sports field that is currently under construction. It is intended to be a lit, rugby-sized sports field with public spaces that include a field house, washrooms, change rooms, children's play area and parking. Current funding permits development of the facility to rough grade.

Although McGavin Field is sited to the west and outside of the Rodger Creek Plan Area, it will provide the residents of the Rodgers Creek Area with a major recreational facility that is easily reached. Residents will be able to access the facility by car or by the Mountain Path.

Village Recreation

Future school sites(s) and mountain recreation services such as bike wash, parking and commercial/services will eventually be available in Cypress Village to support open space and trail uses in Rodgers Creek.

Management Strategies

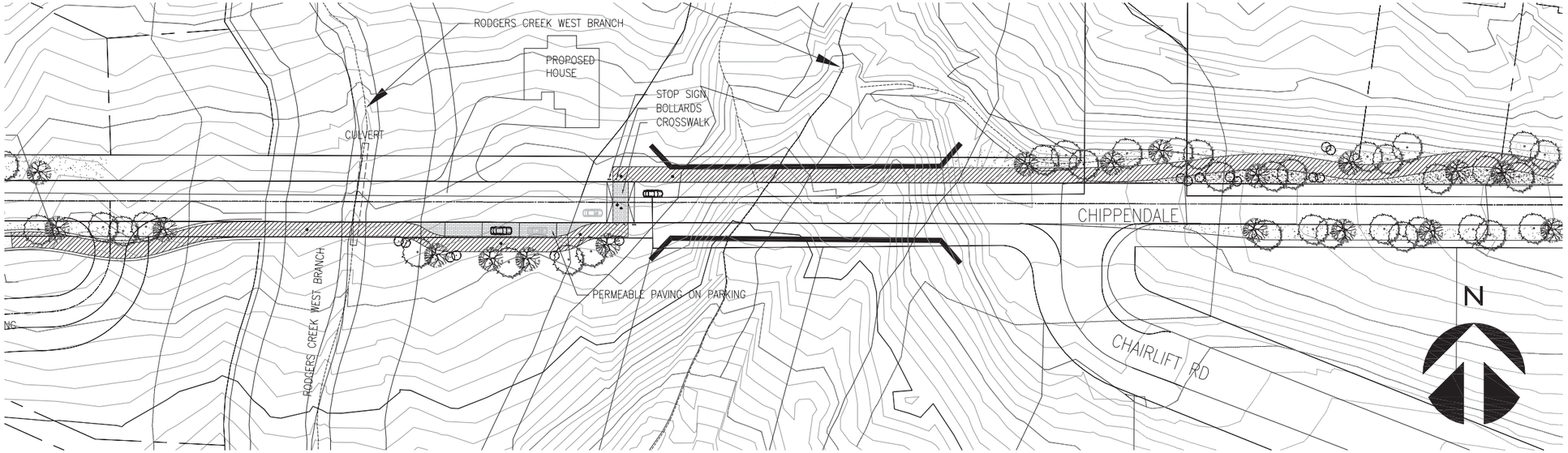
The key strategies for managing the conservation areas of the public realm are:

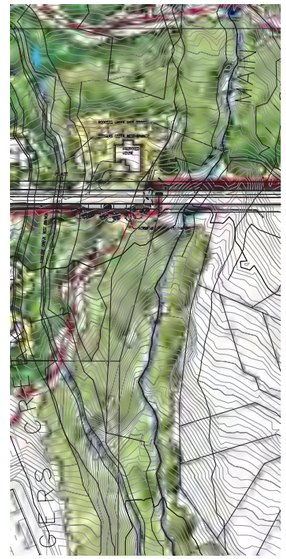
- Consider new approaches to stabilizing the forest along its interface with development areas including early and selective tree clearing
- Ensure that views are available and protected for the new development while maintaining the forested character and environmental assets of the public realm
- Incorporate bear-proof designs in new development areas
- Incorporate development design at the forest interface that is consistent with best forest fire prevention practices
- Use sustainable trail building techniques.

Supplementary Open Space Opportunities

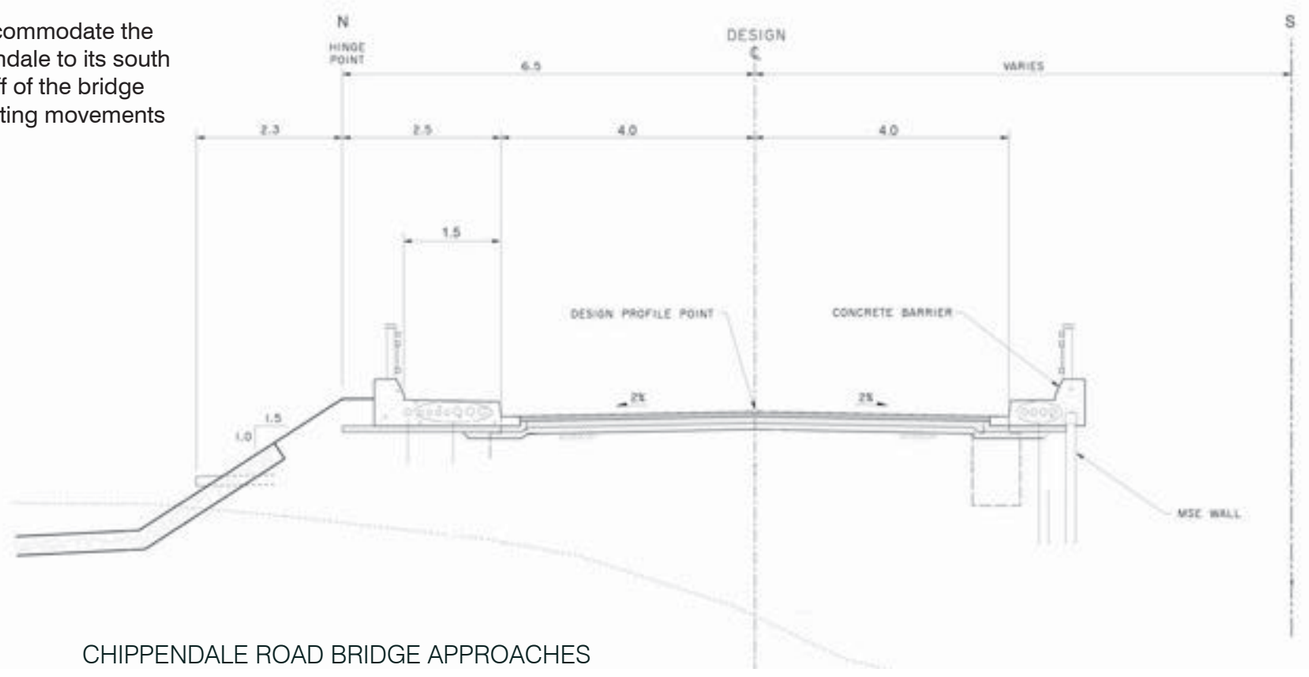
There is potential for public uses of outdoor facilities in off-hours on the sites of both Collingwood and Mulgrave Schools. These potential supplementary uses (such as trailhead parking and community use of facilities) will be addressed through on-going discussions between the District and the schools.

Chippendale at Rodgers Creek Crossing



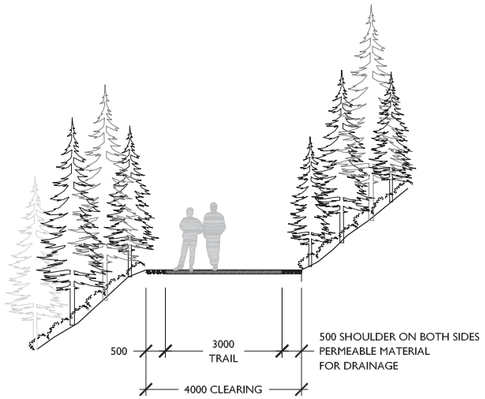


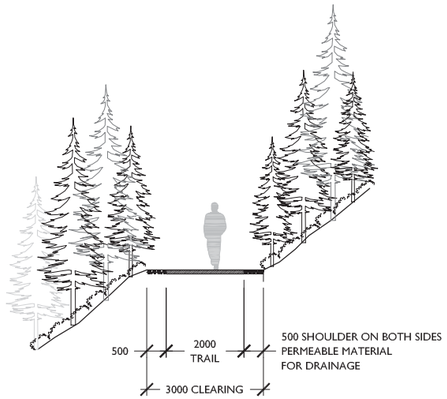
The Chippendale Road bridge across Rodgers Creek is a clear span bridge designed to accommodate the multi-user Mountain Path on its north side. The place for the Mountain Path to cross Chippendale to its south side is proposed immediately west of the bridge where traffic will slow as it moves onto or off of the bridge and where signage can be integrated with the bridge. This also removes potential for conflicting movements at driveways on the north side of the road.

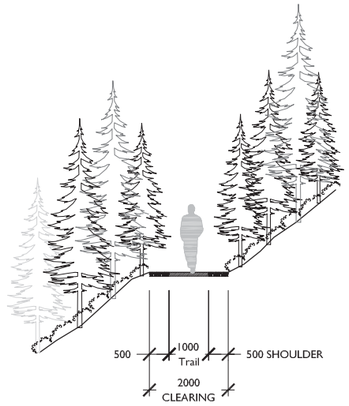


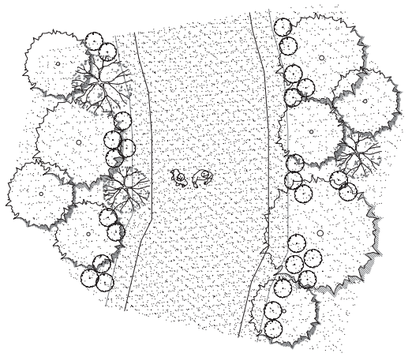
CHIPPENDALE ROAD BRIDGE APPROACHES

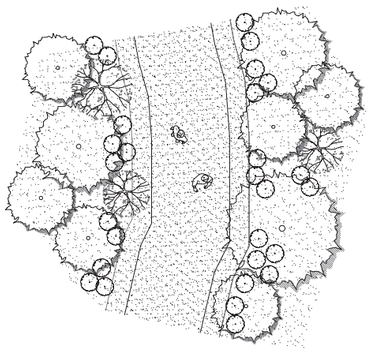
Trail Standards

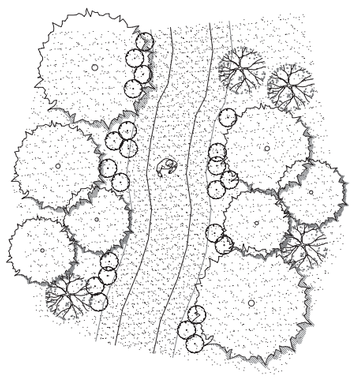












MOUNTAIN PATH
REFER TO TYPE 4 OF
WEST VANCOUVER TRAIL STANDARD

UPPER MOUNTAIN PATH
REFER TO TYPE 3 OF
WEST VANCOUVER TRAIL STANDARD

SECONDARY TRAILS
REFER TO TYPE 1 & 2 OF
WEST VANCOUVER TRAIL STANDARD

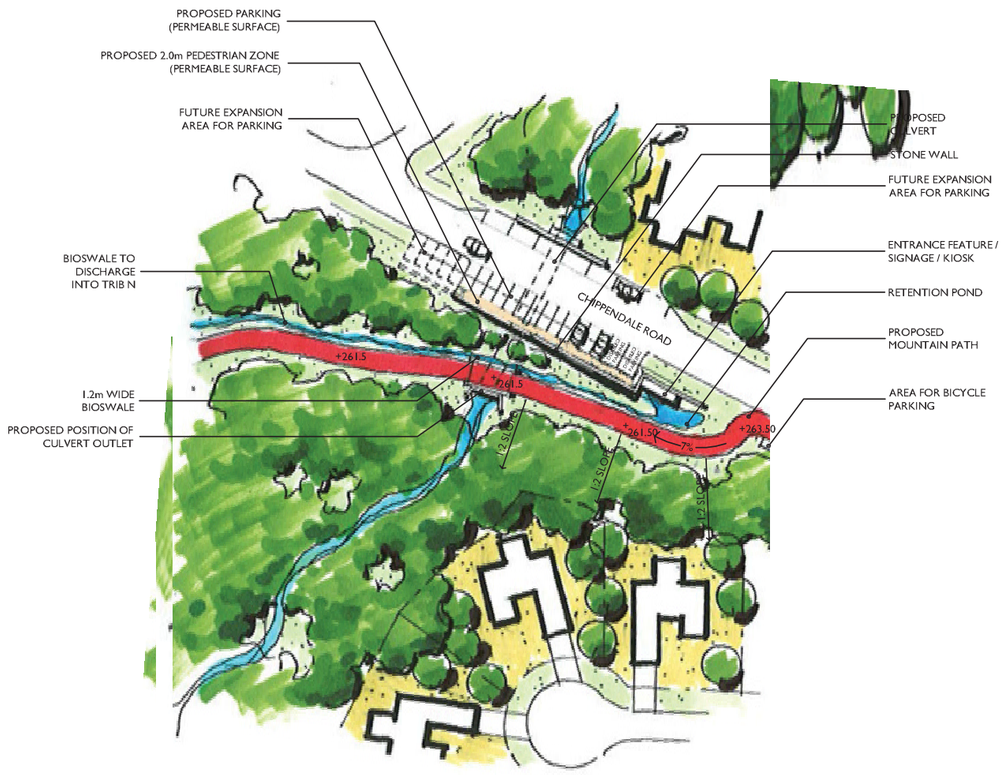
The West Vancouver Trail Standards will direct trail design and implementation. Trail widths vary from the Mountain Path at 3 meters surfaced width with 0.5 meter at grade shoulders (designed for permeability and to provide the flexibility for expanding trail width) to secondary trails, intended primarily for walking, with a 1 meter permeable clear trail and adjacent 0.5 meter shoulders. Where appropriate, trails may also be the corridor for underground utilities. Trails will be sited and constructed based on guidance from the Area Plan, the application of best practices, and ongoing consultation between Municipal staff and the developer. Specific or sensitive terrain conditions may become apparent during trail building. In these cases, sustainable trail-building techniques will be incorporated to preserve the resource and to maintain a quality recreational experience.

The photographs on this page illustrate trail details from Whitby and Canterbury neighbourhoods, excluding Chippendale Road areas, that demonstrate trail construction techniques that have been developed by the District to be environmentally sensitive in conservation areas. In particular, pedestrian bridges over watercourses will use a clear span that will be designed to be sensitive to the characteristics of the stream type.

Trailhead Staging Area along Chippendale

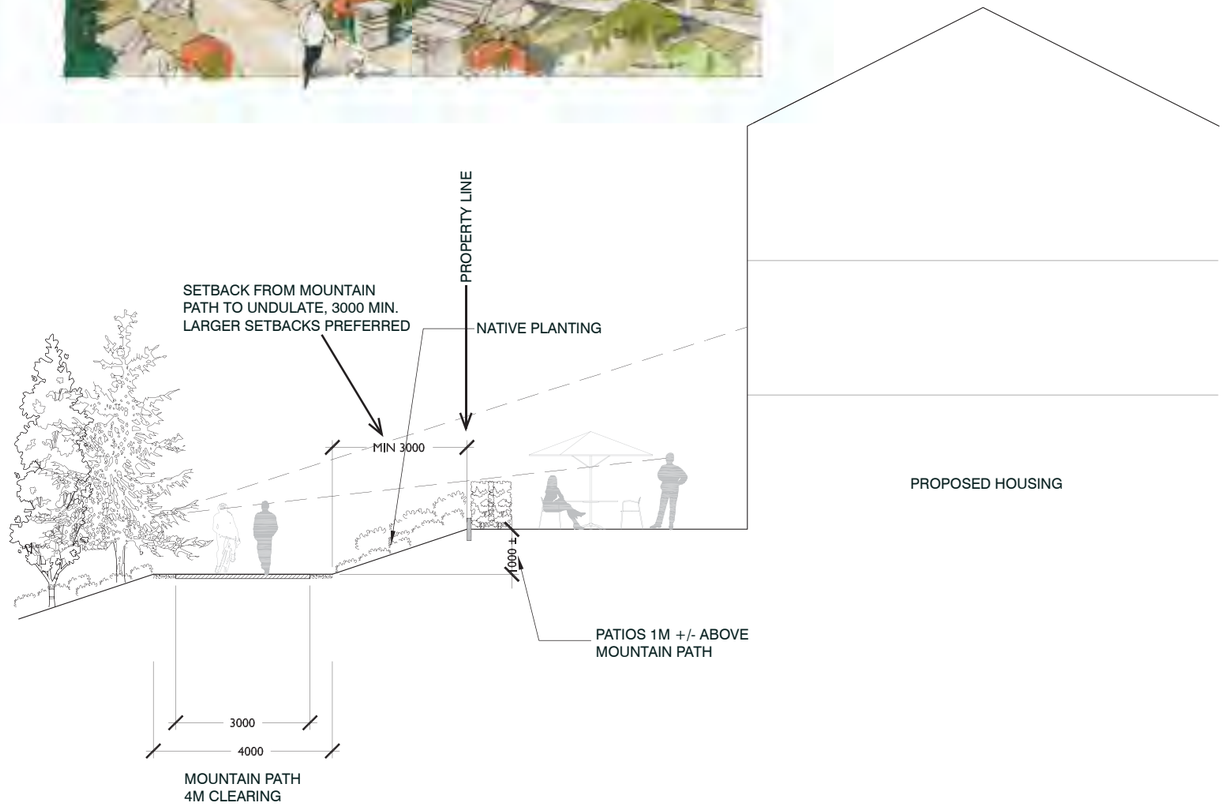
A trailhead staging area will be provided along Chippendale Road west of the Rodgers Creek bridge and in the area where the Mountain Path diverges from an adjacent alignment to the collector road. Features of this staging area are envisioned to include:

- 15 parking stalls including two handicapped parking space in a perpendicular orientation to Chippendale and with a surface of permeable pavers
- a kiosk with trail information and maps
- bicycle parking
- a stone-faced retaining wall around the parking area to maintain a level grade with Chippendale
- a surface stromwater management feature to collect rainwater and channel it for biofiltration to a new wetland enhancement area immediately south of the trailhead and the Mountain Path.



Typical Section of Mountain Path through a Residential Area

The Mountain Path, as well as the Upper Mountain Path, have been sited through residential areas as a feature of the public realm. Care will be taken to ensure that the Mountain Path is overlooked in these areas as a safety and security benefit for trail users while protecting the privacy of adjacent residents in their outdoor spaces and first floor rooms.



Streetscapes

The next three pages present a series of streetscape conditions in both plan and section. The first page shows typical sections along Chippendale Road to illustrate the progression of road standards from Canterbury to Whitby Estates to Talylor's Lookout that have reduced standard widths and achieved a more compact right-of-way. These reductions in paved surface have been achieved by such changes as eliminating a paved lane for on-street parking in favour of providing pockets of parking in lay-bys with permeable paving and locating some services below the roadway.

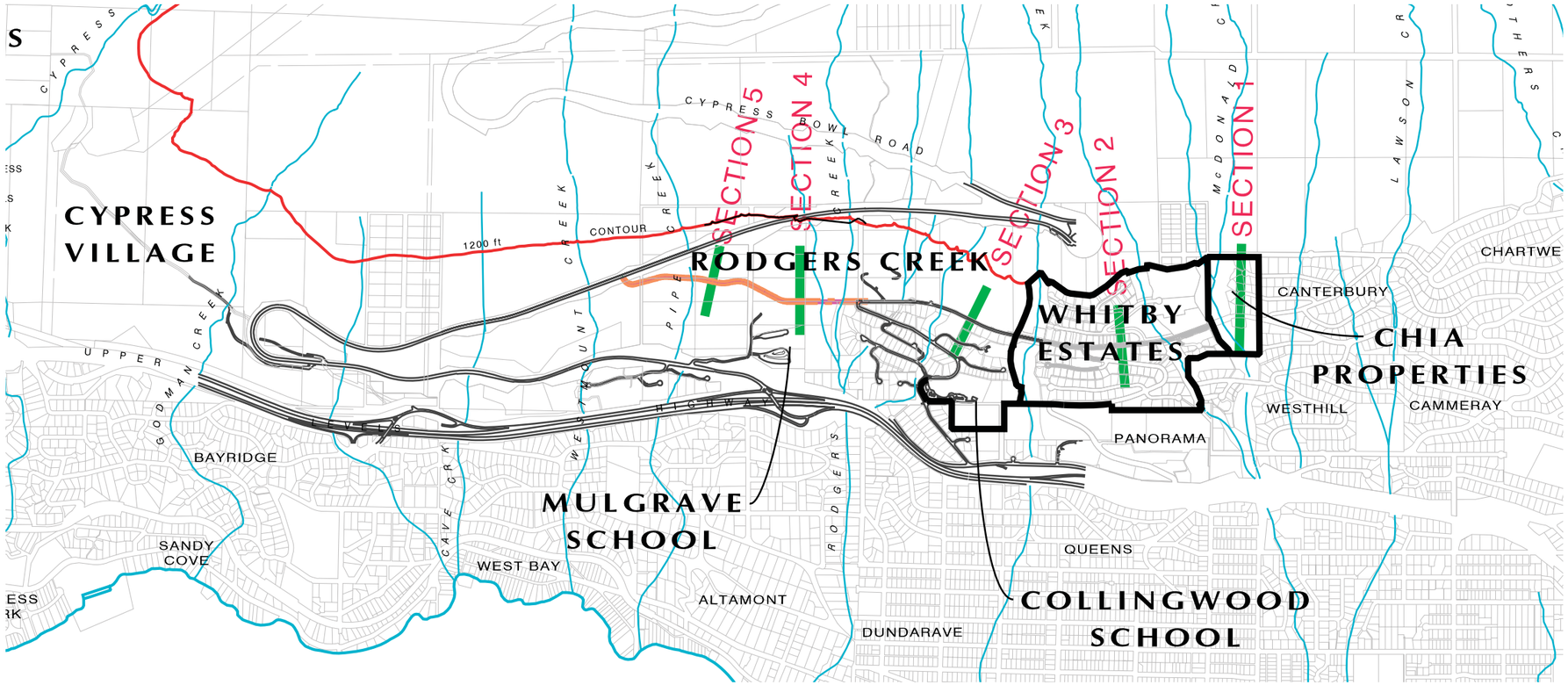
Within the Rodgers Creek Area, Chippendale Road will have a similar configuration to that in Taylor's Lookout from Marr Creek to the vicinity of Tributary N where it no longer shares an alignment with the Mountain Path. In the west section of Chippendale and along local roads, open shoulders will be used instead of curbs where possible to achieve both better stormwater integration and a more informal streetscape aesthetic that is consistent with the intention to have a naturalized groupings of trees and shrubs along the streetscape. Curbs will be used where required by the local conditions and land uses along the roads to channel water, protect pedestrian spaces and delineate parking places. Parking on Chippendale and local roads for the use of visitors will be provided in lay-bys with permeable surfacing where they can be achieved.

Traffic Calming Management

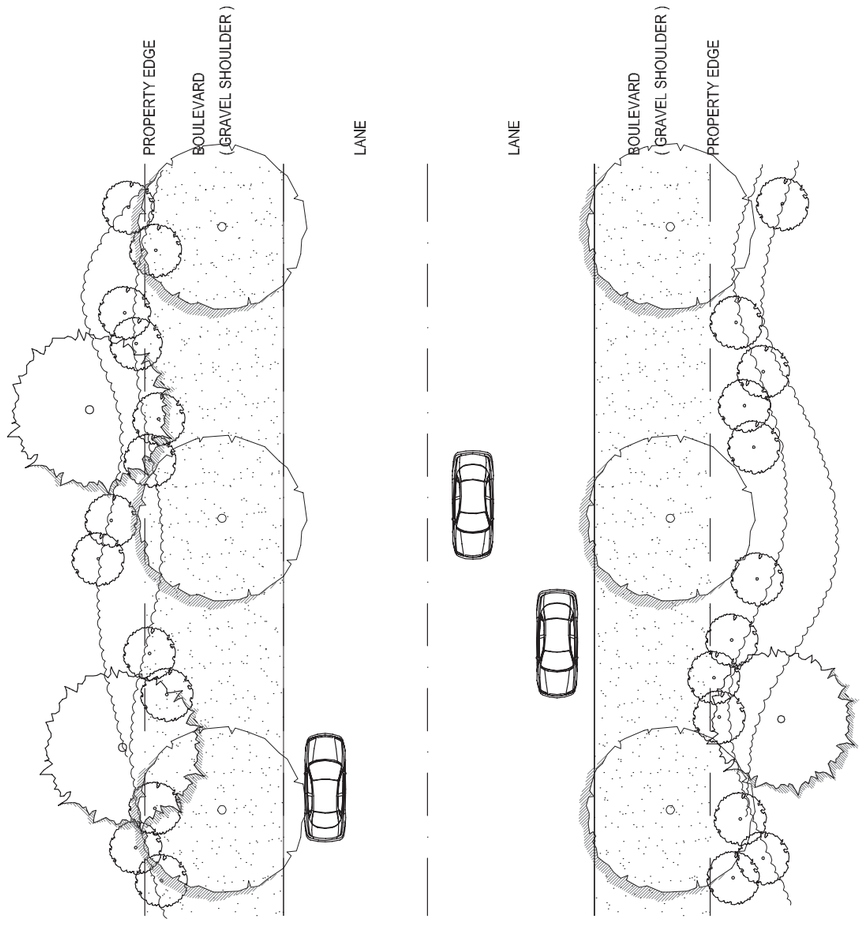
Chippendale Road from the Marr Creek Bridge to the forested section of the Mountain Path is a relatively straight section of road with a gentle grade. In order to discourage speeding and manage traffic on this section of road, traffic management measures such as localized road narrowing and raised medians (possibly three) are to be implemented at appropriate locations.

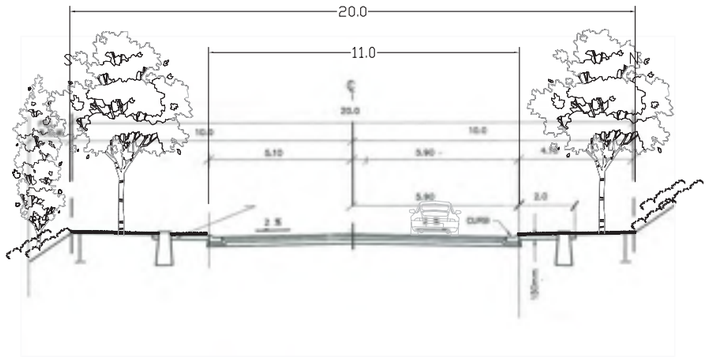
Pedestrian Movement

The Mountain Path and the Secondary Trail Network are the primary means of pedestrian movement within the Rodgers Creek ADP Area and to and from adjacent neighbourhoods. Safe pedestrian movement is also accommodated on roads. The street cross sections on the following pages show how pedestrians will be accommodated on Chippendale Road and local roads. Pedestrian movement on lower Cypress Bowl Road will be examined in more detail as part of the planning process for the future Cypress Village.

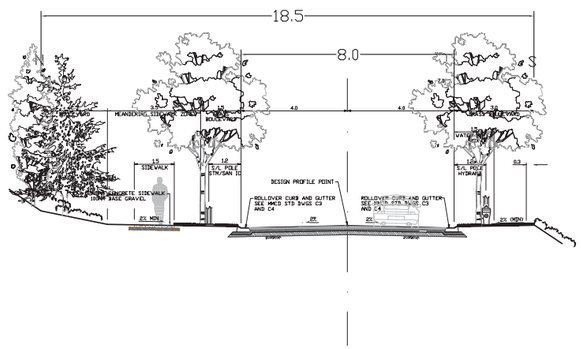


Historic Chippendale Streetscape Sections

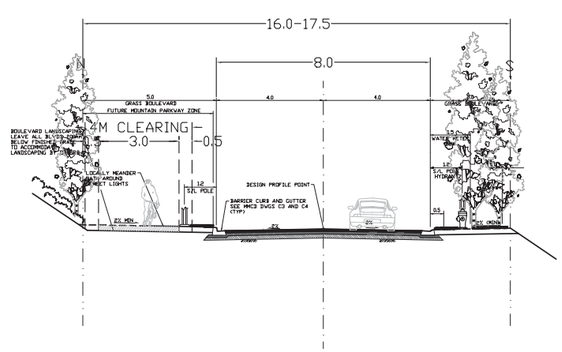




SECTION 1: EXISTING CHIPPENDALE RD - CANTERBURY

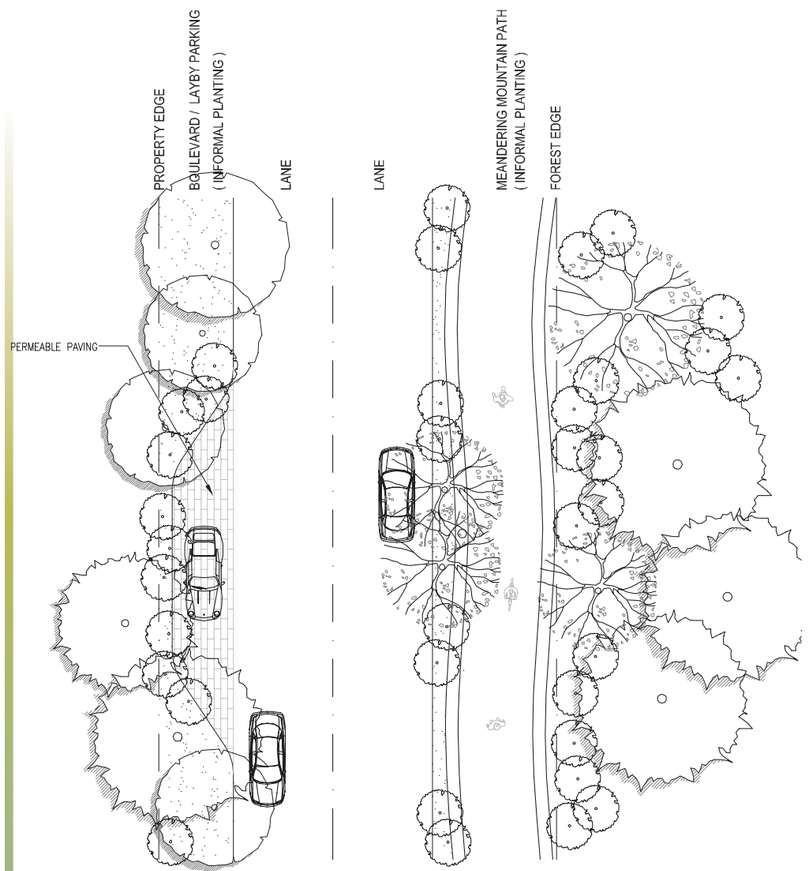


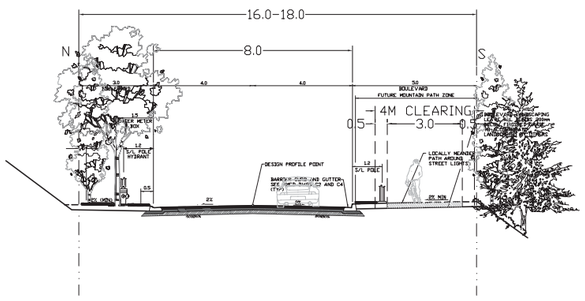
SECTION 2: CHIPPENDALE - WHITBY ESTATES



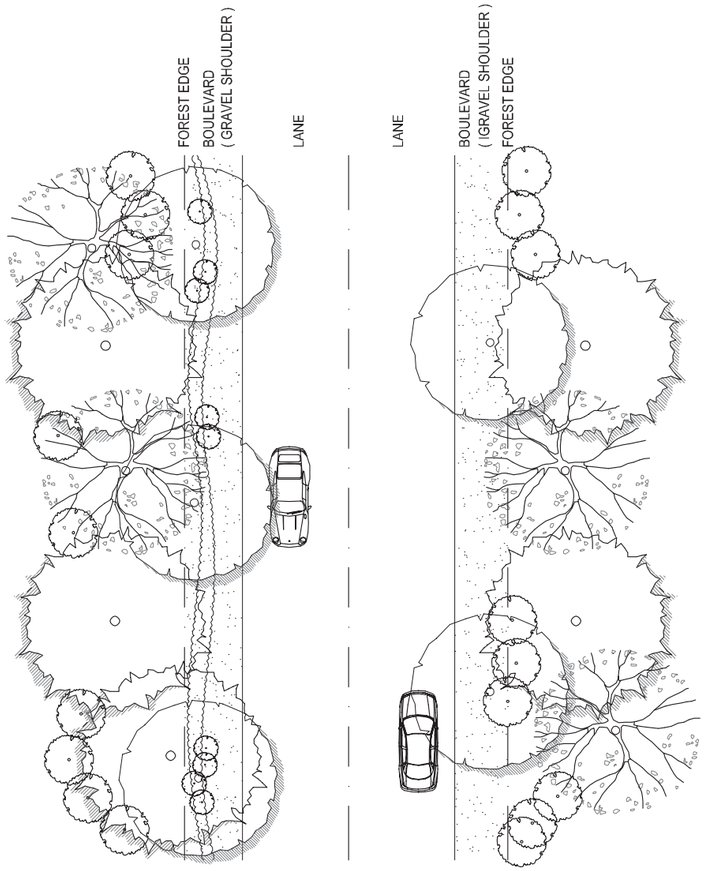
SECTION 3: CHIPPENDALE - TAYLOR'S LOOKOUT

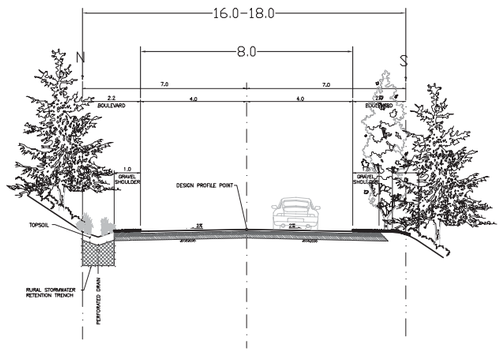
Streetscape - Proposed Street Sections within Rodgers Creek



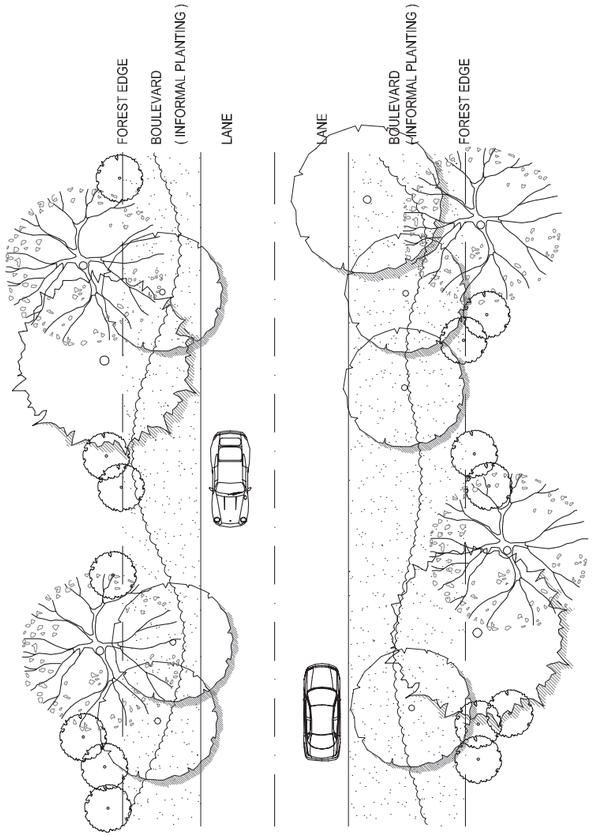


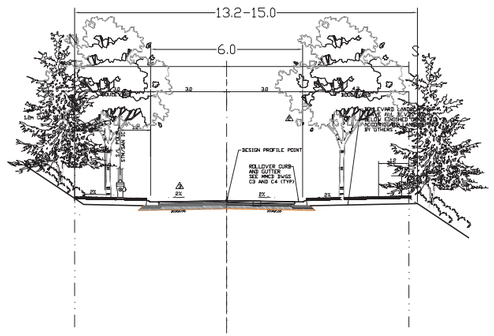
SECTION 4: CHIPPENDALE - MULGRAVE





SECTION 5: CHIPPENDALE - WEST OF TRIBUTARY N.*

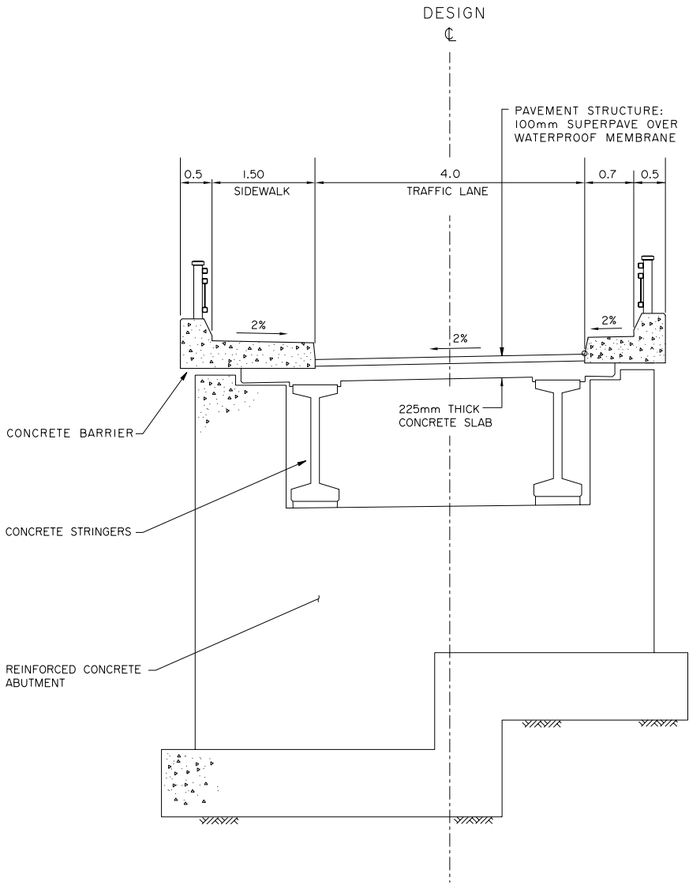




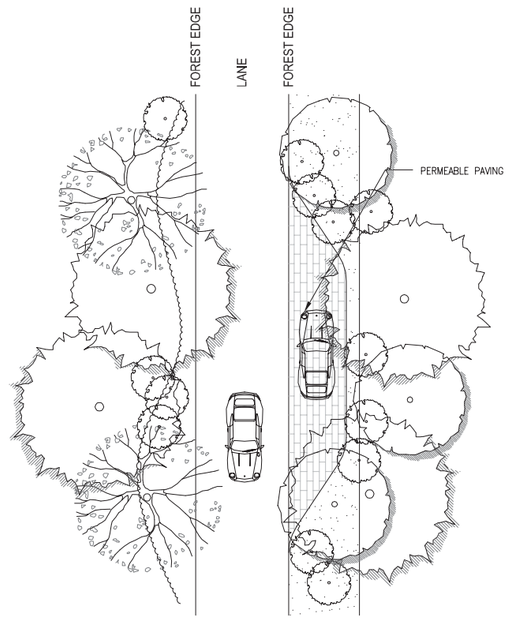
LOCAL ROAD - TYPICAL SECTION**

**Note: Curbs only where required by local conditions and adjacent land use. Hydrants as required to provide protection to buildings. Streetlights at intersections only.*
***Note: Curbs only where required by local conditions and adjacent land use. The boulevards and services for a rural local road would have similar dimensions to one with curbs.*

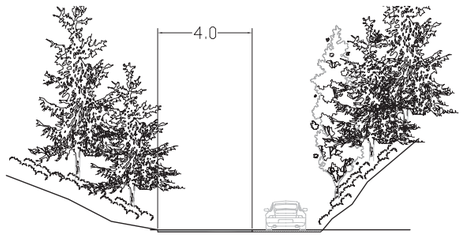
Streetscape - Proposed Lane Design



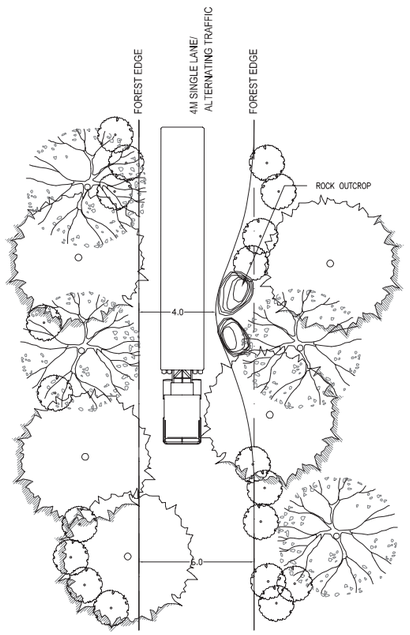
ONE LANE BRIDGE
CONCEPTUAL CROSS SECTION



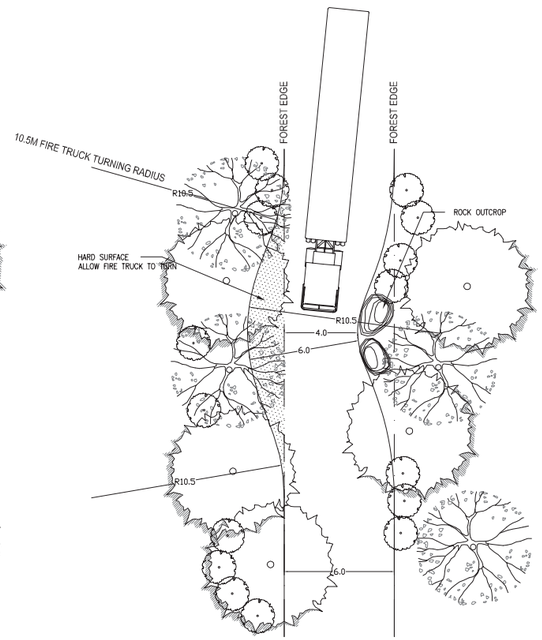
SCENARIO 1: 4M PRIVATE LANE
STRAIGHT ALIGNMENT



PRIVATE LANE / SHARED DRIVEWAY - TYPICAL
SECTION



SCENARIO 3: 4~6M PRIVATE LANE
STRAIGHT ALIGNMENT



SCENARIO 2: 4~6M PRIVATE LANE
CURVY ALIGNMENT

Comments regarding lane width of private lanes and shared driveways:

Designing the road for single-lane, alternating traffic could narrow the travelled width. It may be possible to narrow the roadway to 4 metres wide on extremely long radius curves or straight roads. For tighter curves and turnarounds, the narrowness of the private lane would depend on vehicle turning movements and sightlines.

A Diversity of Housing

Demographics and Housing Demand

The following is the Executive Summary from a recent study of demographics and housing demand in West Vancouver prepared by Colliers International:

"The recent population trend in West Vancouver has been the continued growth in the oldest age groups, compounded by the systemic out-migration of young adults. The housing supply in West Vancouver will not adequately accommodate the population as it ages. Based on the demand projection presented in their report and all known in existing and upcoming supply, the District can only accommodate its anticipated population for the next two years.

Three decades ago, in 1976, the most typical resident of West Vancouver was a 17-year-old. In 2006, the most typical resident was a 62-year-old. In 30 years, the most frequently-occuring age grew older by 45 years.

In West Vancouver, people are more likely to maintain apartments when they are over the age of 60 than at any other point in their lives. In the younger population, apartment maintainership reaches a peak in the 30 to 39 age group. Apartment rates then decline in the 45 to 49 age group, before climbing again to reach a peak in the 80 to 84 age group. The 85 plus age group averages 37% apartment maintainers, compared to 20% ground oriented maintainers.

From 2006 to 2014, annual demand for new dwelling units will be in the range of 149 to 216 units per year. After 2014, the annual demand is forecasted to decrease, and by 2020 demand will be 168 units. After 2020, the annual demand for dwellings in West Vancouver will drop again, and will continue to drop steadily for the life of this projection. In 2023, annual demand will fall below the 150 level, and by 2026, demand will be 122 units per year.

Demand for new dwelling units in West Vancouver in 2007 is at the lowest point it will be for the next 15 years. There will be a cumulative demand for almost 850 new dwelling units in West Vancouver to 2010.

In the following 5 years (2011 to 2015), roughly 1,015 more units will be demanded. Between 2016 and 2026 a further 1,800 dwelling units will be required.

In terms of structure type, the annual demand will initially be slightly greater for apartment dwellings. However, in the middle of the projection period demand for ground oriented units will be greater than for apartments, but by 2022 the majority of demand will again tilt towards apartments. Between 2006 and 2010, there will be an average new dwelling demand for approximately 63 to 105 ground oriented units, with the low point in demand occurring in 2007.

The demand for apartments over the next 5 years will be in the range of 78 to 89 units per year.

Over the entire 20-year projection horizon the population of West Vancouver is projected to increase by 9%, leading to a 16% increase in the number of private households.

Currently in West Vancouver there are approximately 582 dwelling units available for sale or under development. These include 420 apartment units and 162 ground oriented units. Our projections indicate these units will satisfy only five years of demand for apartments, and less than two years of ground oriented demand. After these units are absorbed a cumulative shortfall in supply will accrue unless other developments are brought on line to satisfy demand. The shortfall in ground-oriented dwellings will occur in early 2009, and the shortfall in the supply of apartments will occur in early 2012. It is important to note that an under supply of appropriate dwelling units will not only affect those looking to move to West Vancouver from elsewhere, but also those currently living in the District who would like to move into a different kind of home.

One strategy to increase the housing variety available to residents of the municipality would be to develop new, mixed-density communities within the municipality, outside of the currently developed areas. This would allow current residents the option of moving to a home that suits their current and future needs and still live within the municipality that they know, while allowing established neighbourhoods to retain their existing character through a turnover of occupancy rather than structure type.

Another strategy to provide a range of dwelling options for current residents would be to promote the practice of infill within existing West Vancouver neighbourhoods. Infill could come in the form of legal secondary suites, rezoning of land to allow multifamily dwellings, or reducing the minimum lot sizes in predominantly single-family neighbourhoods.

By providing new housing options for its residents, West Vancouver can use demographic changes to improve the efficiency of housing and land use; make more efficient use of current infrastructure (such as schools); and increase municipal revenues."

Townhouses and Condominium Apartments in the Upper East Village

Townhomes, apartments and an amenity building overlook the Mountain Path

Proposed Housing Mix and Density Options

The overall density and housing mix in the Rodgers Creek ADP were developed in accordance with the following OCP Policies and the Working Group Key Organizing Principles:

- OCP Upper Land Policies – "Allow for a gross density of 2.5 dwelling units per gross acre in the Future Neighbourhoods Area" and "Require a mix of dwelling types that could include, but would not be limited to, single family homes, townhouses and apartments" and "Provide a varied housing mix by area with at least 40% expected to be non-single family homes (such as duplex, townhouse, multi-family)."
- Working Group Key Organizing Principle 3.03 – "Ensure non-single family housing types include ground-oriented options such as duplexes, triplexes and townhomes."
- Working Group Key Organizing Principle 3.04 – "Ensure single family housing accounts for no more than 20% of the total housing units."

While the Sieve Analysis provided direction on where development could occur, careful consideration was also given to the "carrying capacity" of the potential development areas: how much development, expressed in total floor area, could be built in an environmentally sensitive and sustainable manner within the framework of the OCP Upper Land Policies and the Working Group's Key Organizing Principles. Using the maximum number of housing units allowed under the existing zoning, 375, and an average gross floor area of 5,000 square feet per housing unit, an upper limit to the total floor area allowed was set at 1,875,000 square feet. The land use planning and building massing analysis demonstrated that this floor area could be accommodated within the potential development areas utilizing a variety of building forms that minimized their footprint, fit the topography and were sensitive to the mountainside landscape.

The resultant housing mix includes a diversity of housing types ranging from apartments to townhomes to duplexes and triplexes to single family homes and is detailed as Option A in Table 1. Under Option A, less than 20% of the housing units are to be single family detached homes with the remainder to be multi-family units. Furthermore, 10% of the apartment product is to be less than 1,000 sq.ft. in size with an additional 40% to be between 1,000 sq.ft. and 2,100 sq.ft. in size (net saleable areas).

The Working Group asked the landowners to consider a second option with a more "socially diverse" housing mix and to look at what could be achieved with the same total floor area and the same building massing as Option A but without capping the total number of units at 2.5 units per acre.

The housing mix achievable with the second option is detailed as Option B in Table 1. Note that Option A and Option B share the same total floor area, the same building massing and the same road, trail and servicing network. However, Option B has 189 additional apartment units and a much higher percentage of smaller apartment units (less than 1,000 square feet) than Option A.

Under Option B, only 13% of the housing units are to be single family detached homes with the remainder to be multi-family units. Furthermore, 30% of the apartment product is to be less than 1,000 sq.ft. in size with an additional 45% to be between 1,000 sq.ft. and 2,100 sq.ft. in size (net saleable areas). **The Working Group has recommended Option B as the preferred option.**

The diversity of housing types in the Rodgers Creek ADP meets the community building principles of the OCP and the Working Group's Key Organizing Principles as well as addressing the needs of the aging population identified in the Colliers study. There are approximately 209 ground-oriented units and 329 apartment units proposed for the Rodgers Creek Area under Option A. The unit count rises to 218 ground-oriented units and 518 apartment units under Option B. The development of Rodgers Creek could defer the projected shortfall in ground-oriented housing identified in the Colliers study by approximately 2 years to early 2011 under Options A or B and the projected shortfall in apartments by approximately 4 years to early 2016 under Option A and approximately 6 years to mid 2018 under Option B.

Table 1 - Density Options

	OPTION A (maximum 2.5 upa)		**OPTION B**	
Apartment Size Distribution (based on net saleable area)	**NO. OF UNITS**	**% OF UNITS**	**NO. OF UNITS**	**% OF UNITS**
• 1,000 sq.ft. or smaller	33	10%	155	30%
• 1,000 to 2100 sq.ft.	132	40%	233	45%
• Over 2,100 sq.ft.	164	50%	130	25%
Total Apartment Units	**329**	**100%**	**518**	**100%**
Average Apt. size (net saleable)	**2,255 sq.ft.**		**1,635 sq.ft.**	
OVERALL STATISTICS				
Single Family	104	19.3%	98	13.3%
Duplex/Triplex	26	4.8%	20	2.7%
Townhomes	79	14.7%	100	13.6%
Apartments	329	61.2%	518	70.4%
Total Housing Units	**538**	**100%**	**736**	**100%**
Units per Acre	**2.5**		**3.4**	

Notes:
1. *Options above include BPP, Roeck & Wong lands.*
2. *Total floor area remains the same at 1,875,000 sq.ft.*
3. *A parking ratio of 1.5 spaces has been used for units 1,000 sq. ft. or less, and 2.0 spaces per unit for units larger than 1,000 sq.ft. (net saleable area)*
4. *Option B adds additional townhouse units in Areas 3 and 4 and additional apartment units in Areas 3, 4, 5 and 6. Areas 1 and 2 remain unchanged.*
5. *Under current zoning the maximum number of units is 375.*

Design Principles for Achieving a Fit of Buildings to the Land

Housing Form and Character

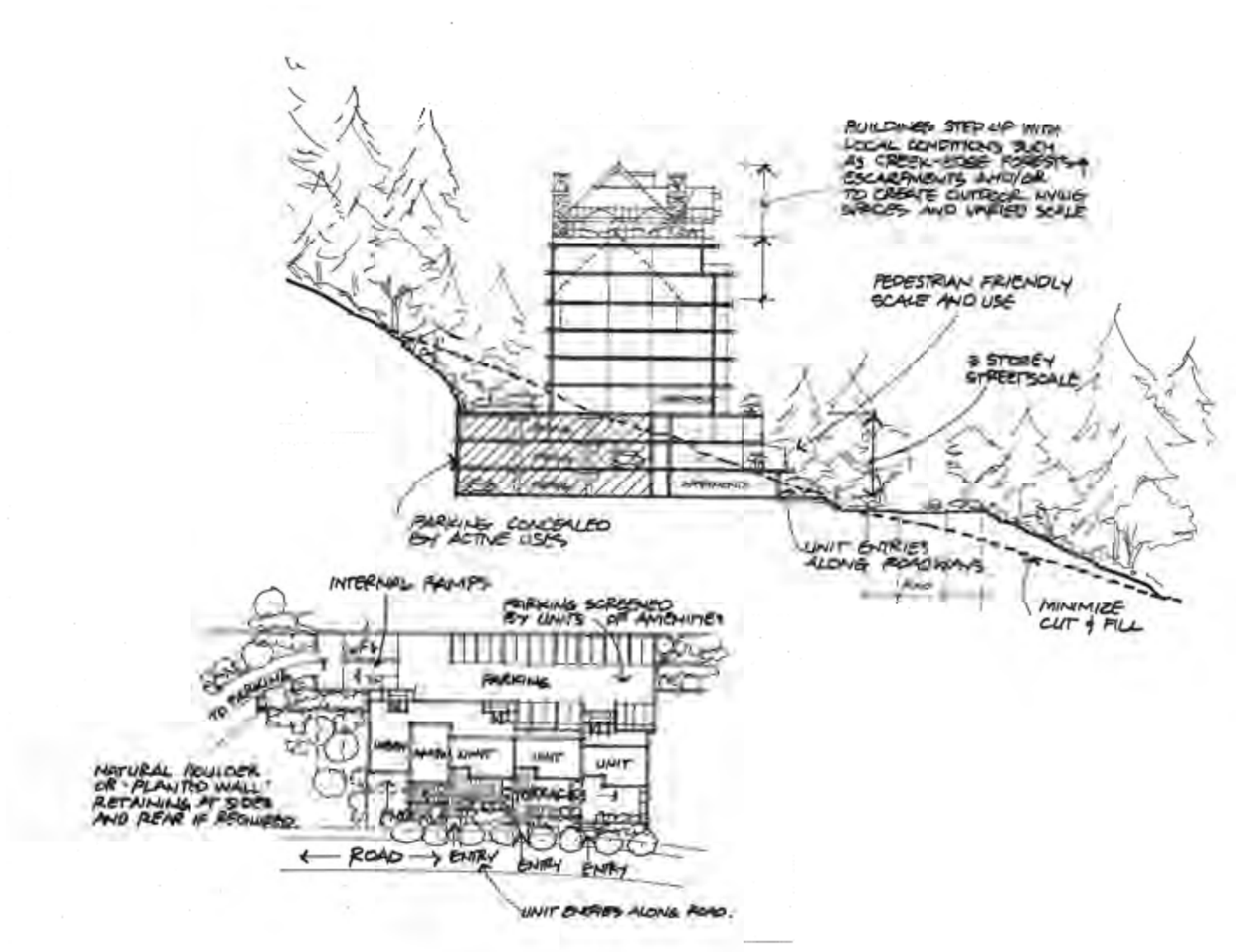
The current design work by BPP and the other involved landowners has explored a number of different housing forms and suggested a range of design character that could be suited to the land within the Rodgers Creek ADP area.

The design of buildings that suit the site conditions within the Rodgers Creek Area have sought to address the following design principles:

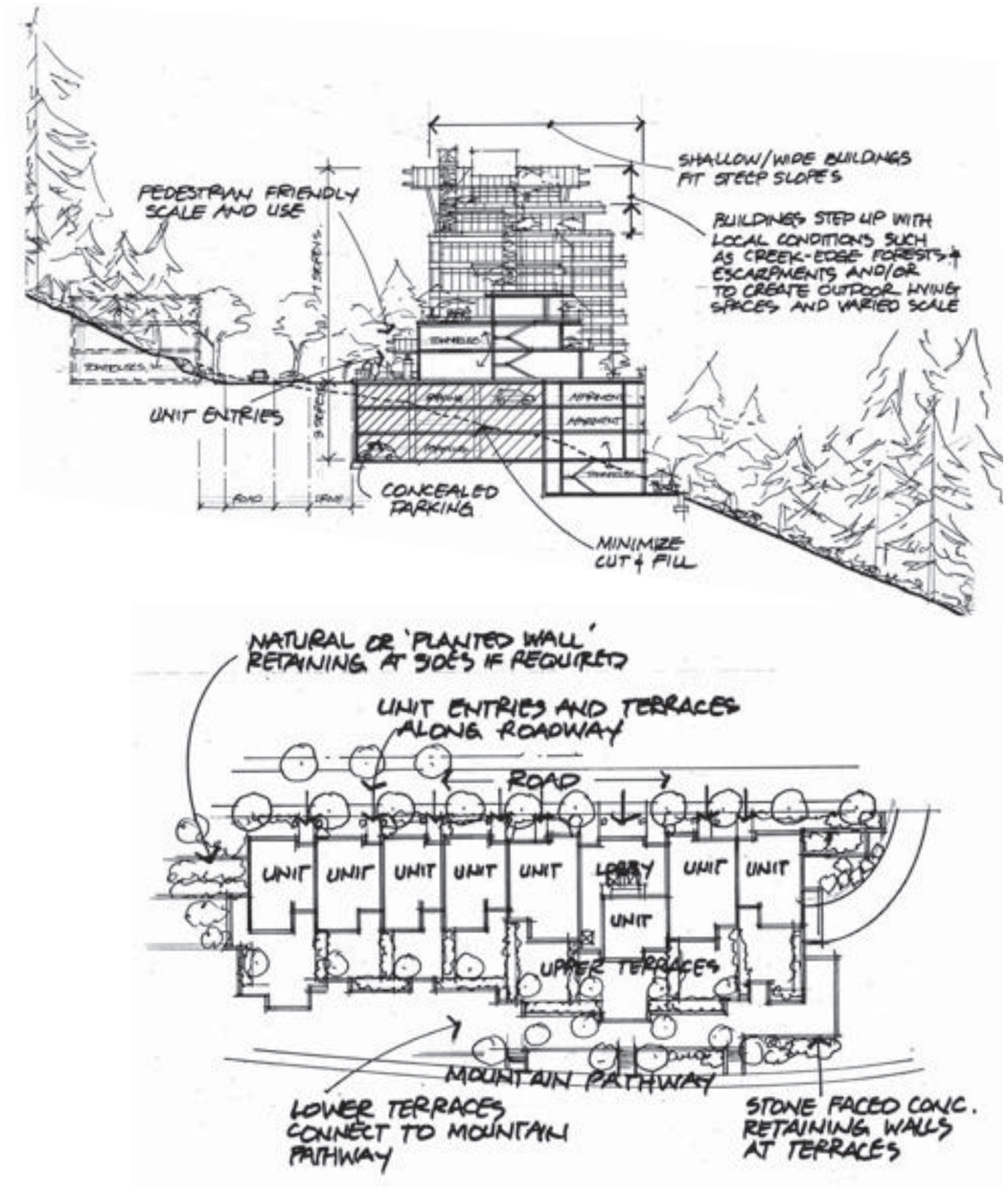
- Develop within the areas established by the Sieve Analysis
- Locate roads and buildings to follow the contours as much as possible
- Minimize cuts and fills
- Step buildings up to follow the cross-slope topography
- Design shallow and wide buildings to accommodate steep slopes
- Take advantage of uphill and downhill conditions when designing access to parking
- Minimize access points and external driveways to parking by using internal ramp systems
- Use building design and uses to produce animated streetscapes and a varied experience along the roadways and Mountain Path
- Maintain pedestrian scale of buildings at streets and along the Mountain Path (3 to 4 storey heights)
- Hide parking structures behind active building uses - townhouses, apartments, or commercial frontages
- Establish the heights of multiple family buildings to be compatible with the forested mountain setting.

The planning and design for the Rodgers Creek Area will employ a variety of techniques and strategies to ensure development fits into the mountainside slopes including:

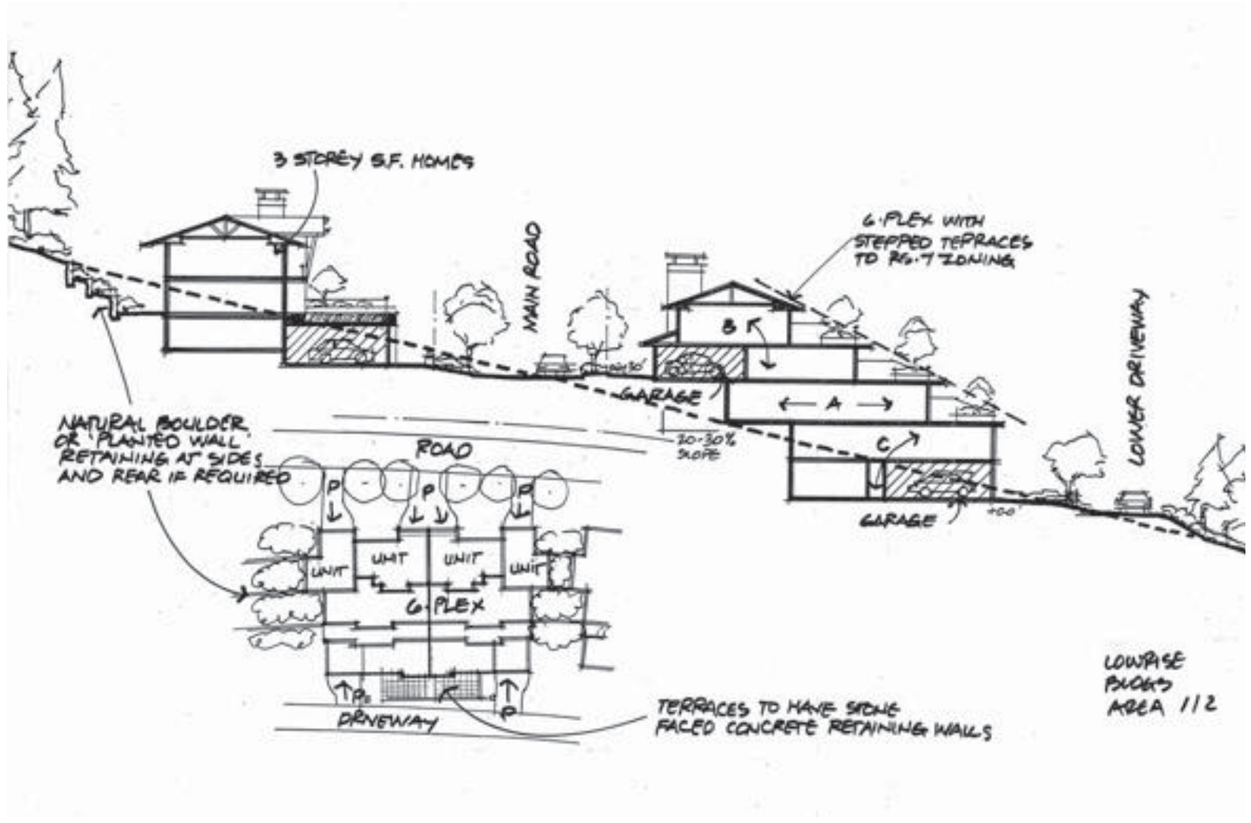
- Locate lower density housing forms such as single family lots, duplexes and triplexes on flatter slopes
- Locate higher density buildings such as townhouses and mid-rise apartment buildings on steeper slopes where the buildings can be used to take up the grade and provide slope retention
- Where cut and fill slopes are required, ensure grades can accommodate natural planting
- Where slope retaining systems are required, screen with buildings or natural planting.



Section Illustrating Design Principles for a Typical Uphill Building



Section Illustrating Design Principles for a Typical Downhill Building



Section Illustrating Design Principles for Lowrise Buildings Area 1 and 2

Chairlift Neighbourhood - Areas 1 and 2

Area 1 is bounded by Marr Creek to the east, Tributary D to the west, Chippendale Road to the south and the 1200 foot contour to the north. Area 2 is bounded by Rodgers Creek Far East Branch and Tributary G to the east, Rodgers Creek to the west, Chippendale Road to the south and the 1200 foot contour to the north. Both areas are characterized by moderately sloping land constrained by creek corridors and steeper sloping lands on either side.

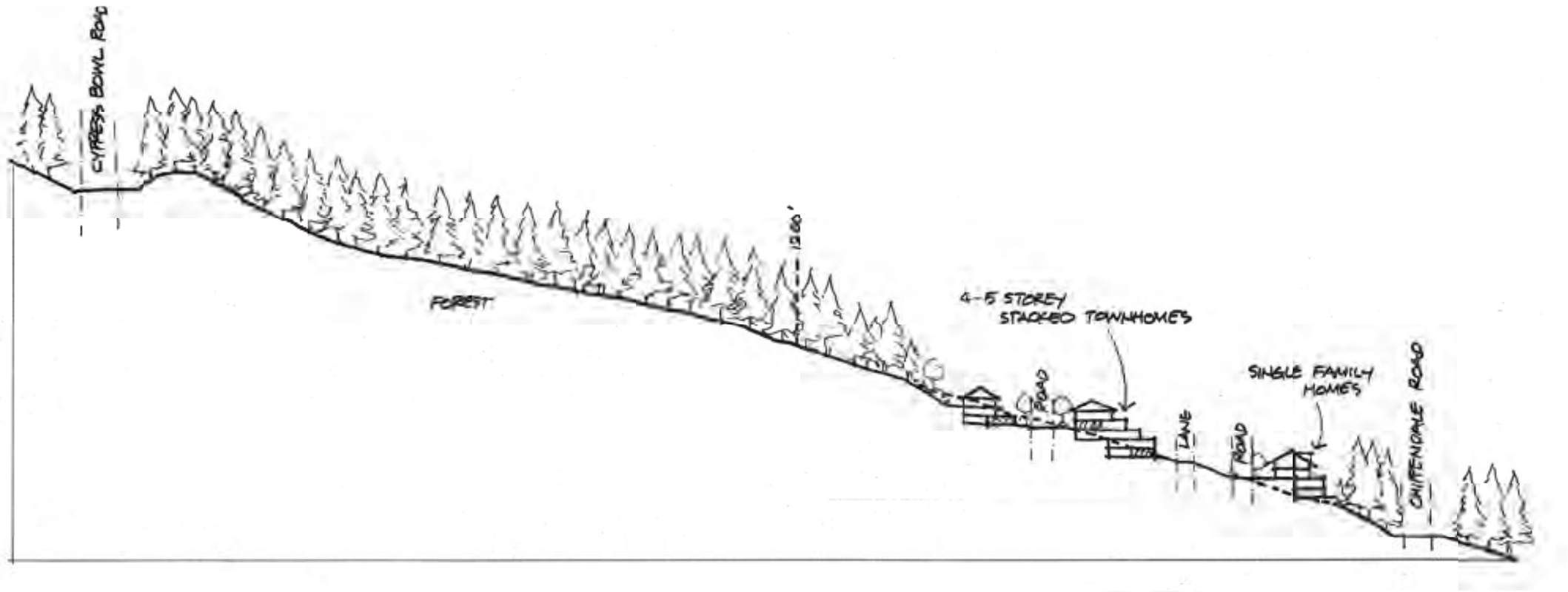
Areas 1 and 2 complete the Chairlift Neighbourhood that is being built around the existing Chelsea subdivision, Collingwood School and the recently approved Taylor's Lookout development. A substantial portion of the land above Chippendale Road is planned to remain undeveloped in order to protect watercourses and steeper slopes. Two pockets of development extend north of Chippendale that have suitable zoning already in place for a mix of housing with a range of single family lots and ground-oriented townhouses, compatible with the housing types in the adjacent Taylor's Lookout and Chelsea developments. It is proposed that these areas be developed in accordance with the existing RS-7 zoning and would include the following:

- single family lots on the north side of Chippendale to reflect the existing development on the south side of Chippendale;
- above that would be ground-oriented, stepped townhome buildings designed to take up changes in grade and fit the slope;
- on the upper areas, larger single family lots with homes designed to accommodate the slope, using the structure itself to achieve slope retention and minimize the need for retaining walls.

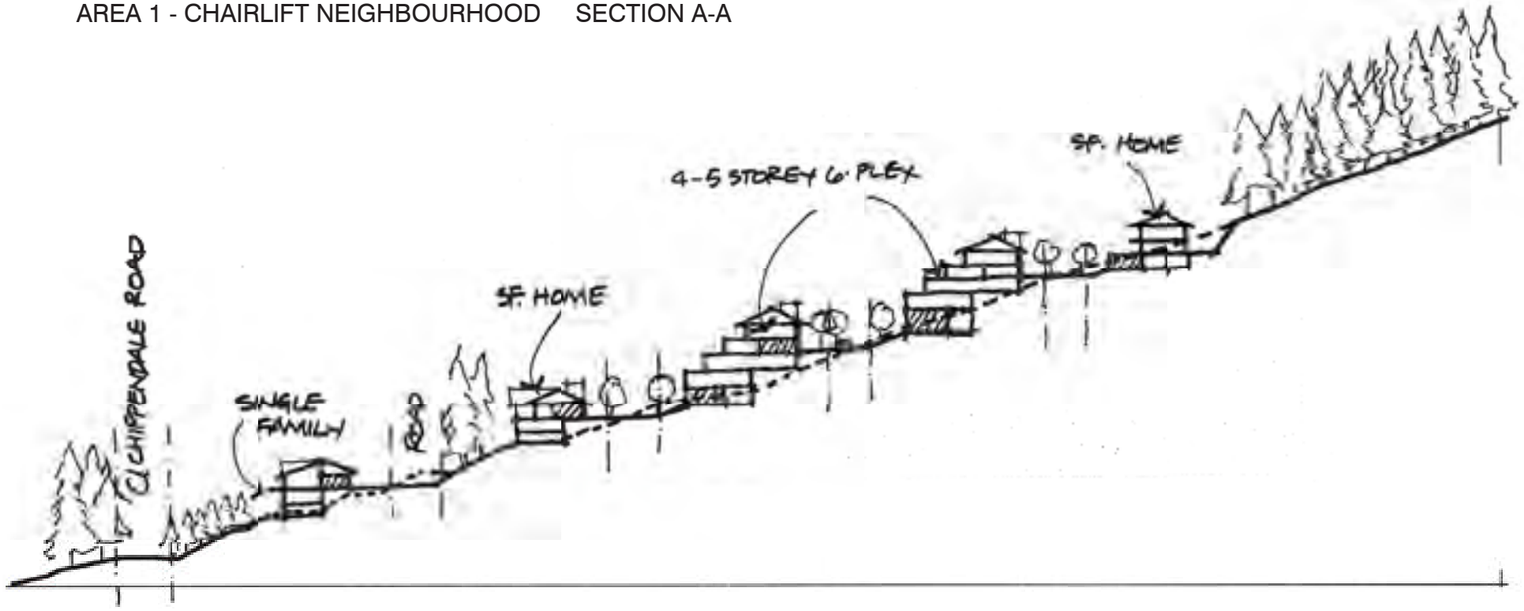
The proposed density would be approximately 1.37 units per acre based on gross acreage. The unused density (based on the 2.5 units per gross acre allowed under the existing zoning) would be transferred to areas further west, closer to the proposed Cypress Village.

Statistics for Areas 1 and 2 can be found in the table on page 56.

Site Plan of Areas 1 and 2



AREA 1 - CHAIRLIFT NEIGHBOURHOOD SECTION A-A



AREA 2 - CHAIRLIFT NEIGHBOURHOOD SECTION B-B

CHAIRLIFT NEIGHBOURHOOD
CONTEMPORARY ALPINE CHARACTER

These areas are characterized by a lower density built form with single family housing types and stacked townhomes.

Architecturally the buildings are of a low-pitched roof, alpine derived expression. Roofs are intended to contain snow in the winter rather than shed it. Because of the less urban nature of these areas, more natural wood components and finishes will predominate. Timber, glass, stone and metal roofs, as in other precincts, will form the basic material palette.

Large sloping roofs cap the structure and can collect rainwater for irrigation

Homes step down with topography

Expansive planted roof terraces provide outdoor space and “green” opportunites

Timber structure incorporated where possible

Bus stops and other shelters from timber

Precedents for the Contemporary Alpine Character

Natural indigenous materials together with details derived from nature, reflect the Contemporary West Coast Regional vocabulary and sustainability features

Natural wood cladding, timber structure, metal roofs and stone accents are principal materials palette

Natural wood cladding, timber structure, metal roofs and stone accents are principal materials palette

Mulgrave Neighbourhood - Areas 3 and 4

The Mulgrave Neighbourhood is bounded by Rodgers Creek to the east, Westmount Creek and municipally-owned lands to the west, Cypress Bowl Road and Mulgrave School to the south and the 1200 foot contour and Cypress Bowl Road to the north. The lands are characterized by moderately sloping lands in the south, with increasingly steeper slopes to the north and northwest.

With its more moderate terrain, this neighbourhoood is suited to a wide range of housing forms. Although the terrain and the proximity to the school make the area suitable for single family homes, the neighbourhood's proximity to the Chippendale collector and the future Cypress Village also make it suitable for higher density housing forms and higher overall densities than the Chairlift Neighbourhood. It is proposed that the Mulgrave Neighbourhood accommodate a mixture of housing types including small and large single family lots, duplexes, ground-oriented townhomes and mid-rise apartments. Its proximity to Mulgrave School suggests that family-oriented housing would benefit from use of school facilities made available to the community as well as to its students.

The Mulgrave Neighbourhood is transected by the extension of Chippendale Road from Chairlift Road to upper Cypress Bowl Road, creating two distinct enclaves of homes. Area 3 is accessed from the Chippendale connector and extends from Rodgers Creek to Cypress Bowl Road. Through the eastern part of Area 3, the Mountain Path follows Chippendale Road as it does in Areas 1 and 2. As Chippendale Road veers northwest to Cypress Bowl Road, the Mountain Path leaves the road and leads into the forest. At this point a trail head is proposed to create a central focal point for Area 3 and a staging area for the forested section of the Mountain Path. An activity node including parking, interpretative signage and wayfinding signal that the nature of the Mountain Path is changing. Below Chippendale Road and the Mountain Path lies a collection of single family homes, with smaller homes on the flatter bench immediately above Mulgrave School with larger lots on the steeper slopes above. Along Chippendale Road there are a number of estate lots nestled between creek corridors. Under Option B, a collection of ground-oriented townhomes are proposed on Chippendale Road just west of Rodgers Creek West Branch. Above Chippendale Road, a narrow road winds its way past a site designated for apartments under Option B to an area of larger single family lots located on a series of benches above. Immediately above this area, four more estate lots are proposed with access directly from upper Cypress Bowl Road and on-site tree retention guidelines.

Area 4 is located west of Mulgrave School and south of the Mountain Path and is accessed from lower Cypress Bowl Road. A stepped mid-rise apartment building with street-facing townhomes is proposed above the intersection of the access road with Cypress Bowl Road. This multi-family building form fits into the steeply sloping mountainside behind it and complements the Deer Ridge and Stonecliff residential areas on the south side of Cypress Bowl Road. As the road proceeds east it crosses Pipe Creek in a clear span, single lane bridge that minimizes the environmental impact on the creek corridor as well as providing traffic calming. East of Pipe Creek lies a collection of ground-oriented townhomes (under Option B) followed by two small clusters of single family homes. Above this, tucked away between two creeks, is a compact mid-rise apartment building with a townhome base. A duplex that is accessed from Cypress Lane completes the neighbourhood.

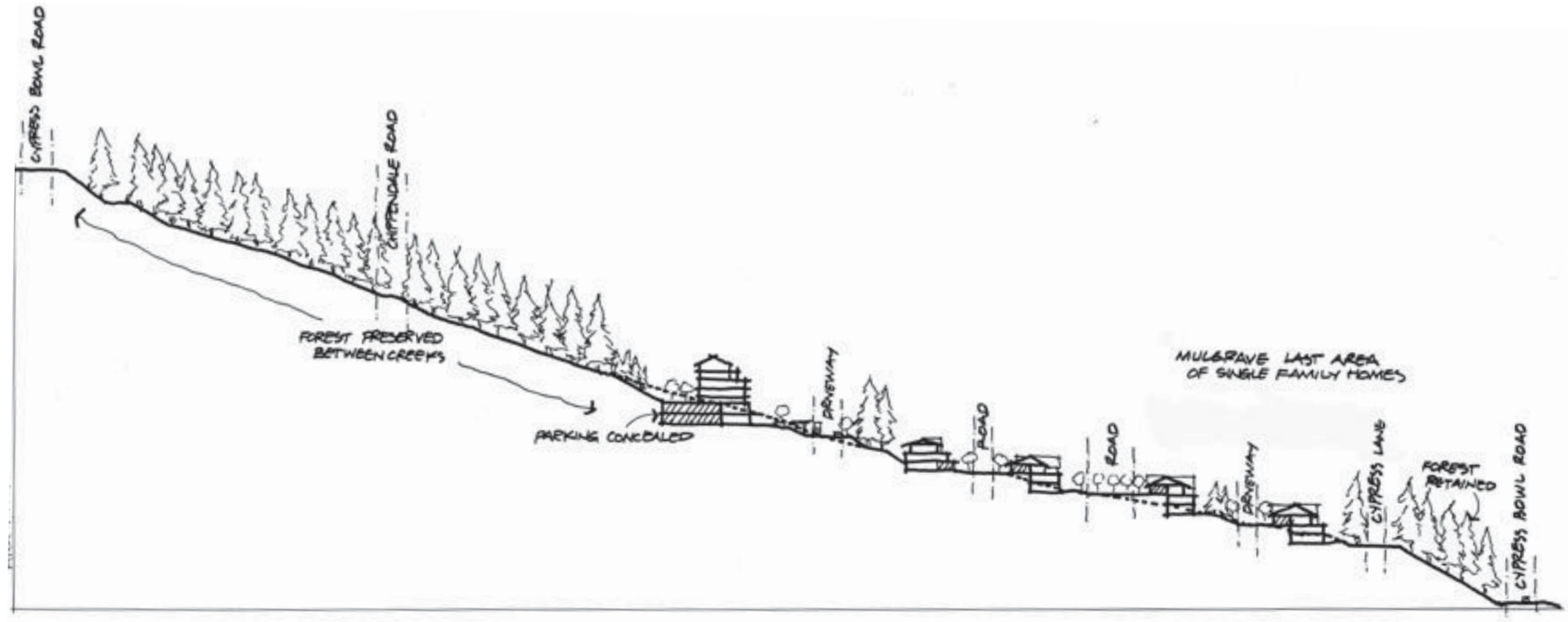
As the Mountain Path traverses the neighbourhood, it provides a direct link for pedestrians and cyclists to the future amenities planned for Cypress Village. Although Areas 3 and 4 include multiple landowners, all the landowners have agreed to apply the same architectural character and design guidelines to create a consistent look and quality across the neighbourhood.

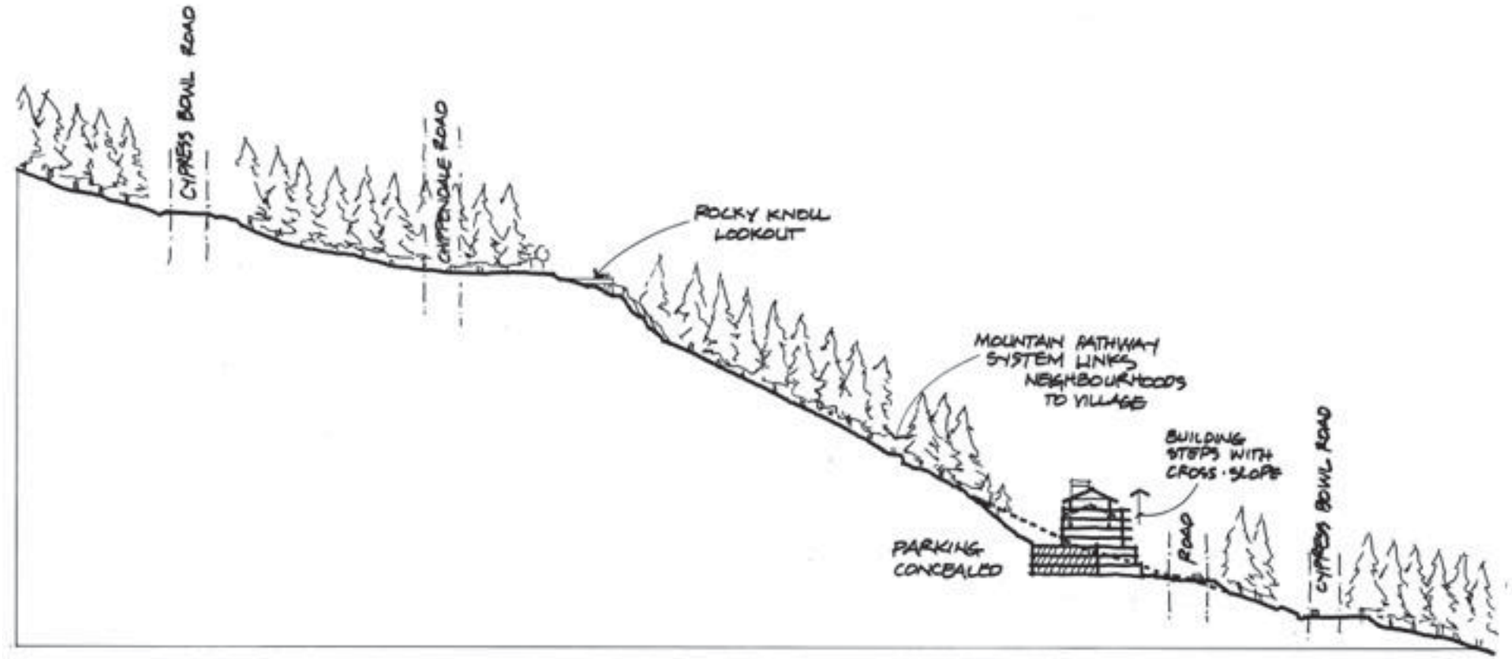
A number of environmental restoration and enhancement opportunities have been identified for the Mulgrave Neighbourhood: the restoration of the lower reaches of Tributaries L and N including the creation of additional amphibian habitat; the restoration of Tributary PP and the creation of a small adjacent wetland; and the creation of a small wetland adjacent to Tributary W.

The proposed density would be approximately 1.52 units per acre based on gross acreage under Option A and 1.98 units per acre under Option B. The unused density (based on 2.5 units per acre guidelines under the OCP) would be transferred to Areas 5 and 6. Statistics for Areas 3 and 4 can be found in the table on Page 56.

Mid-Rise Apartment Building stepping up against a steep mountain slope at entry to Area 4

Site Plan of Area 3 and 4





AREA 4 SECTION B-B

Midrise Building below the Mountain Path in the Mulgrave Neighbourhood

Architectural Character of Areas 3 and 4

Articulated pitched-roof forms add formal interest and can be used to collect rainwater for irrigation purposes

MULGRAVE - Large Buildings

CONTEMPORARY ALPINE CHARACTER

As in Areas 1 and 2, the larger buildings are characterized by a contemporary alpine stylistic influence.

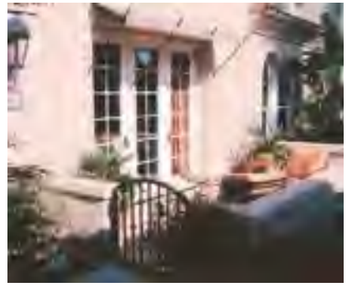
Architecturally the buildings are of a low-pitched roof, alpine derived expression. Roofs are intended to contain snow in the winter rather than shed it. Because of the less urban nature of these areas, more natural wood components and finishes will predominate. Timber, glass, stone and metal roofs, as in other precincts, will form the basic material palette.

Long, low roofs are part of the Alpine character of this neighbourhood and are meant to hold snow in the winter

Indigenous materials, and details from nature are characteristic of this neighbourhood and others

Arts and Crafts Style

European Hillside Style



MULGRAVE - Detached Home and Townhomes
MIXED STYLES

This area is characterized by a lower density built form which is largely comprised of single-family detached homes and townhomes.

These homes are intended to be created from a number of individual stylistic influences. Four styles have been selected with the intention to create a variety of appropriate expressions that work together harmoniously. It is important that each home be derived from one of these styles and try not to be a hybrid of several. As with all other areas, natural stone and timber are key materials, but since these are small scale and can be of combustible construction wood finishes including shingles, siding, and wood trim are heavily encouraged, subject to best management practices adjacent to the forest interface.

Coastal Mounatain Style

Prairie/Craftsman Style

Lower Village East Neighbourhood - Area 5

The Lower East Village, Area 5, is bounded by Westmount Creek to the east, Cave Creek to the west, municipally-owned lands and Cypress Bowl Road to the south and Cypress Bowl Road to the north. The lands are characterized by very steep slopes adjacent to lower Cypress Bowl Road, steep slopes adjacent to upper Cypress Bowl Road with a moderately sloping bench in between.

Given its proximity to the future Cypress Village, its challenging topography, and the central routing of the Mountain Path through it, a higher density, compact neighbourhood of ground-oriented townhomes and highrise apartment buildings is proposed for this neighbourhood. Concentration of the development into a compact cluster beside the Mountain Path allows for convenient access to the future Cypress Village site by foot or bicycle from Area 5.

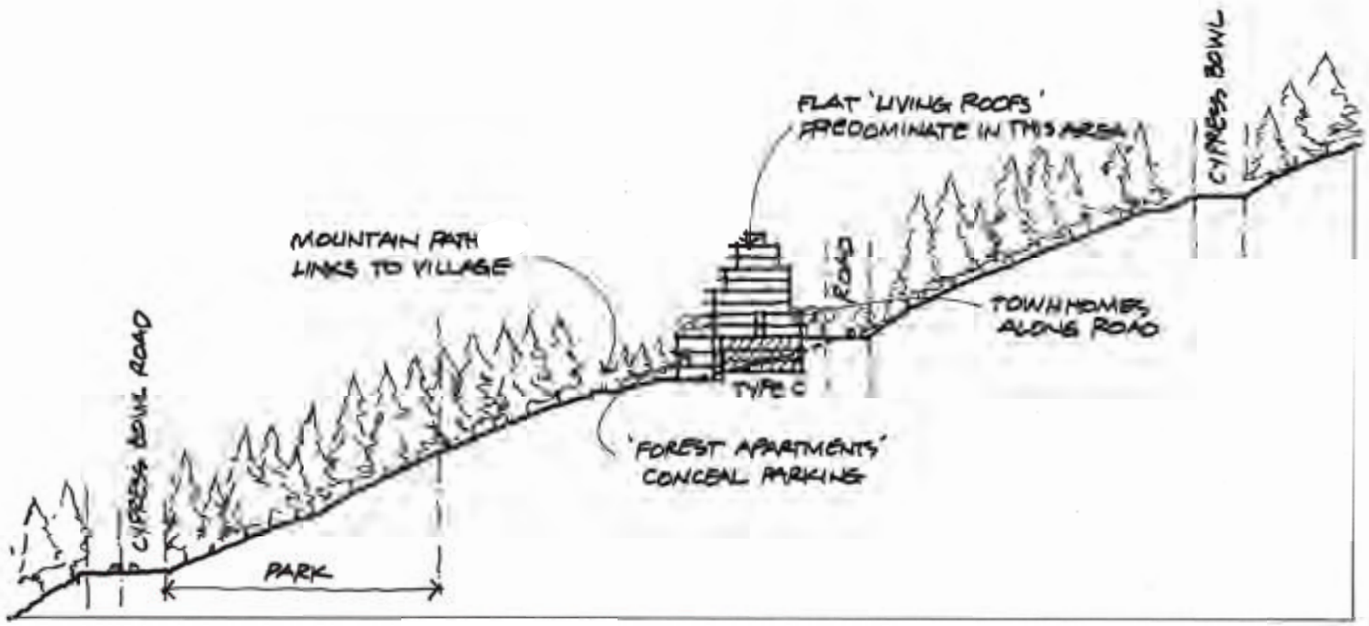
The area's access road has been located at the base of steeper slopes to provide access to three buildings located on a bench on the downhill side of the road. At the end of the road, a fourth building has been located on the uphill side to take advantage of a wider bench with steeply sloping lands behind. A central amenity building is envisioned adjacent to the Mountain Path across from a constructed wetland that will provide both ecological and stormwater functions as well as a visual feature in the landscape. The amenity building will house facilities for the use of the residents in the Lower East Village and be a social centre for this neighbourhood.

The proposed density would be approximately 7.57 units per acre under Option A and 10.5 units per acre under Option B, based on gross acreage.

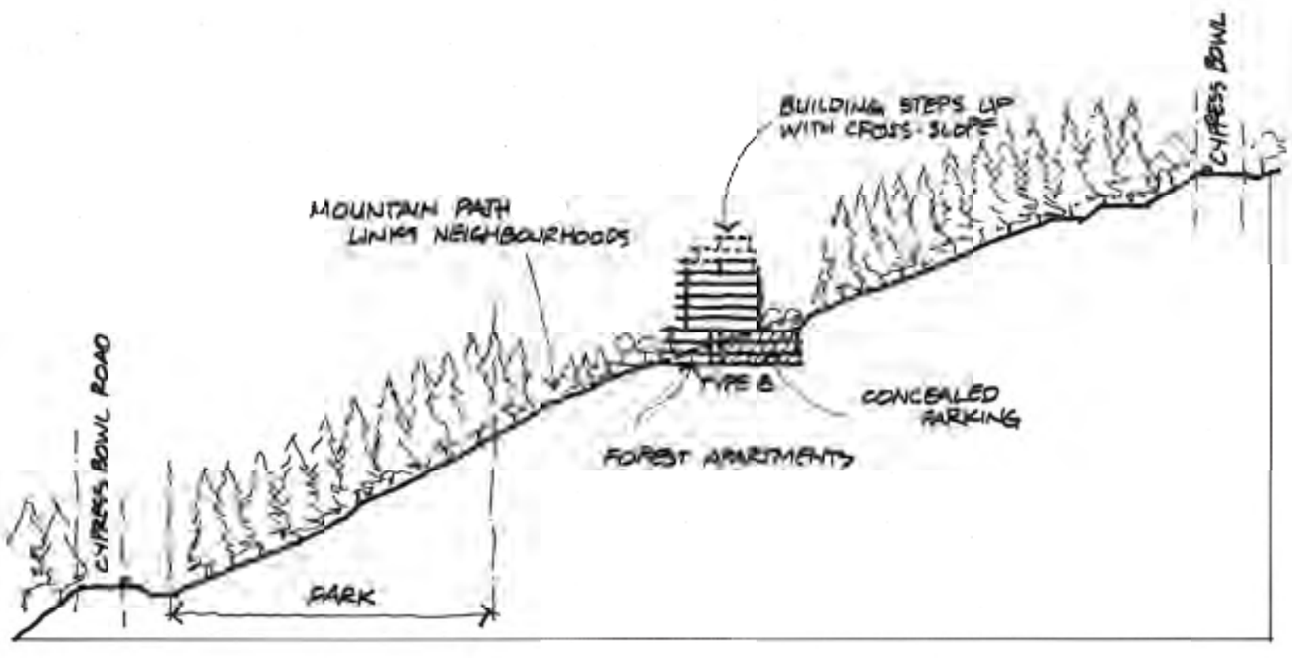
Statistics for Area 5 can be found in the table on page 56.

Buildings Engage the Mountain Path in Area 5

Site Plan of Area 5



AREA 5 SECTION E-E



AREA 5 SECTION F-F

Streetscape Looking South

LOWER VILLAGE EAST
WEST COAST MODERN CHARACTER

This area is characterized by a more contemporary type of building placed evenly along a rural roadway, again united by a common amenity facility located on a spectacular rock outcrop.

Architecturally the buildings feature flat slab roofs generally (many of them will be green), big cantilevers, a more horizontal expression form and detail, together with large wrap-around windows emphasize a lighter more glassy form. Stone, concrete, wood, metal and glass, as in all other areas of the Rodgers Creek Development form the palatte of materials, but in this case are combined in a more contemporary manner. Detailing is less Craftsman derived and more functional, driven by the creative use of current technology.

Architectural Character of Area 5

LOWER VILLAGE EAST
WEST COAST MODERN CHARACTER

Horizontal balconies with vertical chimneys

Signage integral with landscape

Amenity structure made from timber

Occasional timber structural elements add warmth

Natural landscape features encouraged

Metal brackets secure timber components

Small very low-pitch roofs okay

Very tall stone chimneys emphasize main entries

Horizontal window expression encouraged

Stone and painted concrete as principal materials

Ample terracing provides useable roofs

Individual unit entries along street

Horizontal balcony glazing

Wood in key locations

Architectural Character of Area 5

Upper Village East Neighbourhood - Area 6

The Upper East Village, Area 6, is bounded by Tributary R to the east, Cave Creek West and BC Hydro powerlines to the west, Cypress Bowl Road to the south and the 1200 foot contour to the north. The lands are characterized by a wide variety of topography from very steep rock slopes to relatively flat benches.

A concentration of housing density is proposed for Area 6 to achieve a neighbourhood of sufficient size to have its own identity and a variety of residents to support a central amenity building as its social heart. To make it a diverse neighbourhood, a variety of housing types, including duplexes, ground-oriented townhomes and midrise and highrise apartments, are proposed. A site has been identified for a possible community benefit such as non-market housing. The site could accommodate a 55-unit highrise apartment building.

Since it is separated from the main Mountain Path, a parallel trail connection, similar in design and function to the Mountain Path, has been planned connecting westward to the future Cypress Village to offer its residents the opportunity to easily access the village without the use of a vehicle. In addition, there will be several secondary trails that will provide access to the Mountain Path. These trails will cross Cypress Bowl Road at road intersection points to ensure a safe and well-marked crossing.

The proposed density would be approximately 3.14 units per acre based on gross acreage under Option A and 4.83 units per acre under Option B.

Statistics for Areas 6 can be found in the table on page 56.

Typical Townhouse and Apartment Building Streetscape in Area 6

Duplex housing to animate street

Stepped highrise residential building with two and three storey townhomes facing neighbourhood street

Neighbourhood amenity building

Highrise residential building stepping up towards rising topography and preserved forest background (10 stories)

Mountain trails

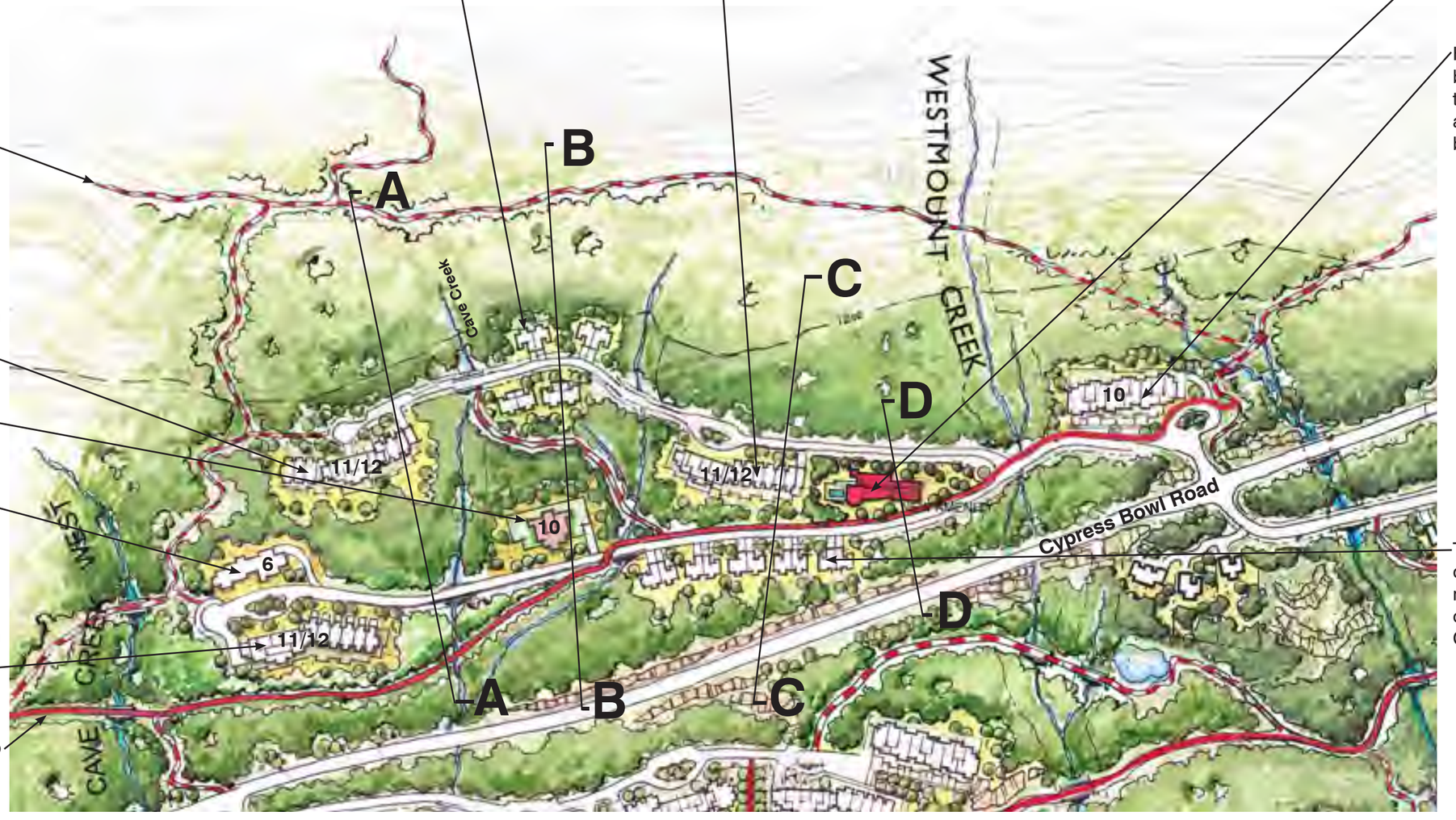
Stepped highrise residential building with townhouse base (11-12 stories)

Potential Community benefit site

Mid-rise residential building (6 stories)

Stepped highrise residential building with townhouse base (11-12 stories)

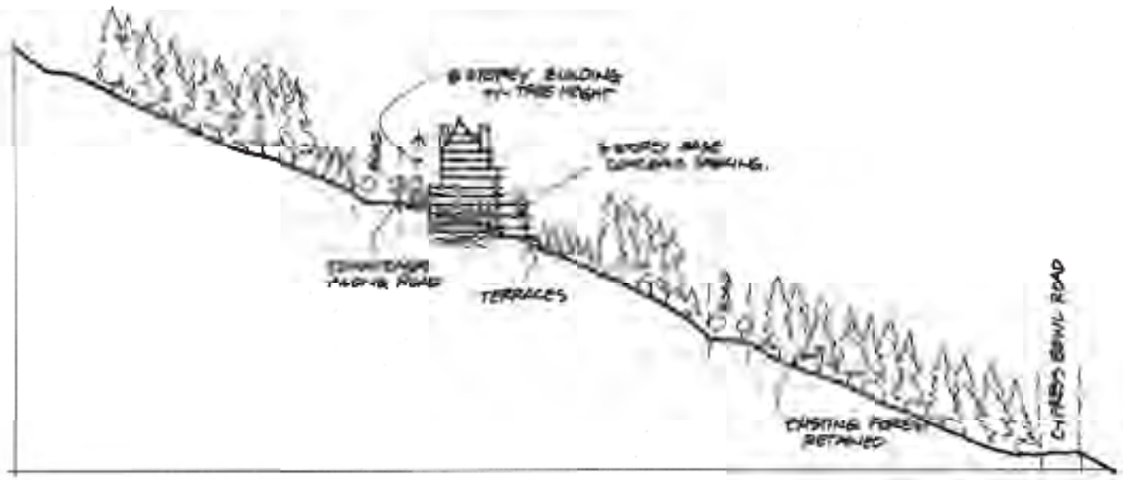
Upper Mountain Path to Cypress Village



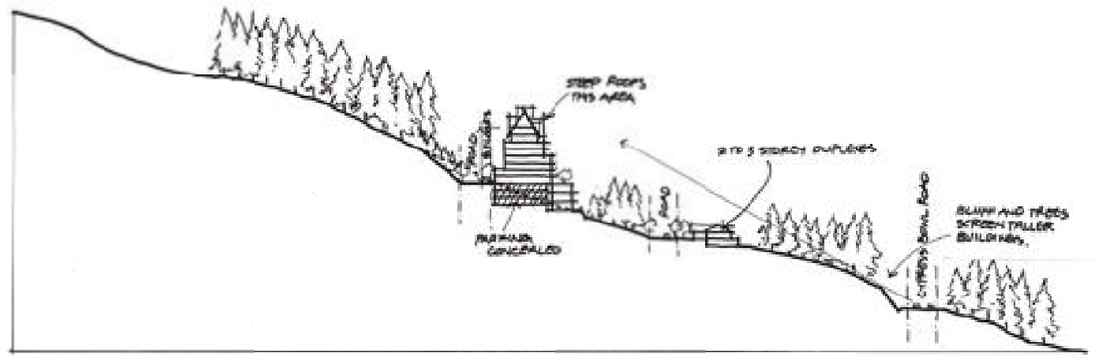
Two and three storey duplex housing forms to minimize visual impact of development along Cypress Bowl Road

N

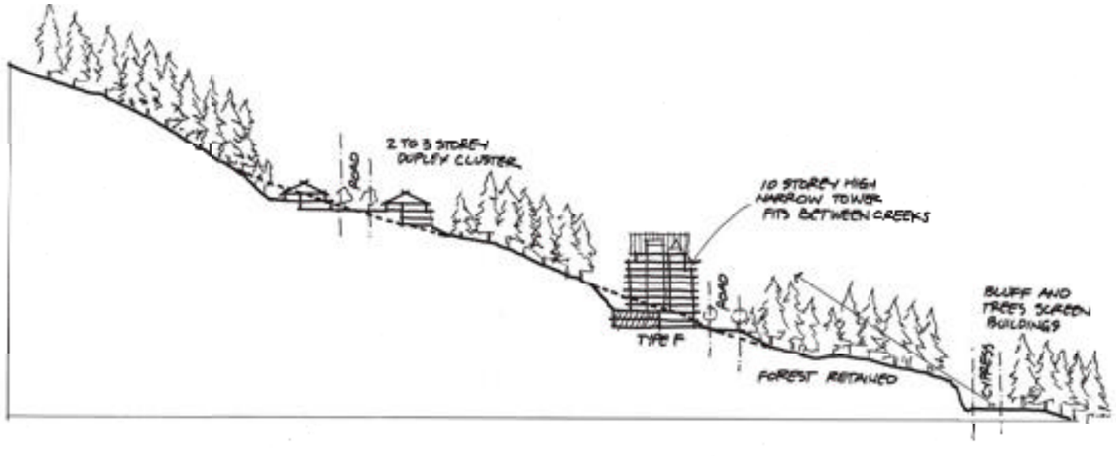
Site Plan of Area 6



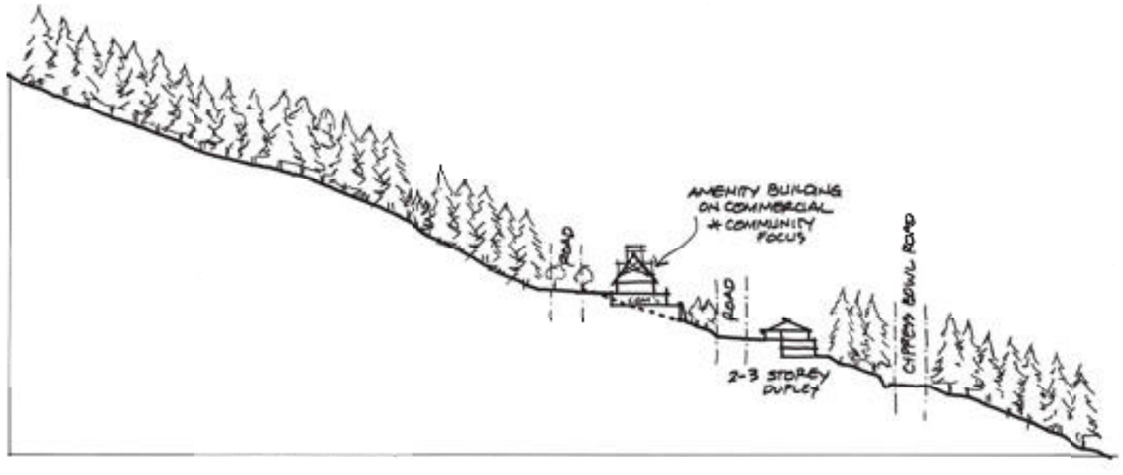
AREA 6 SECTION A-A



AREA 6 SECTION C-C



AREA 6 SECTION B-B



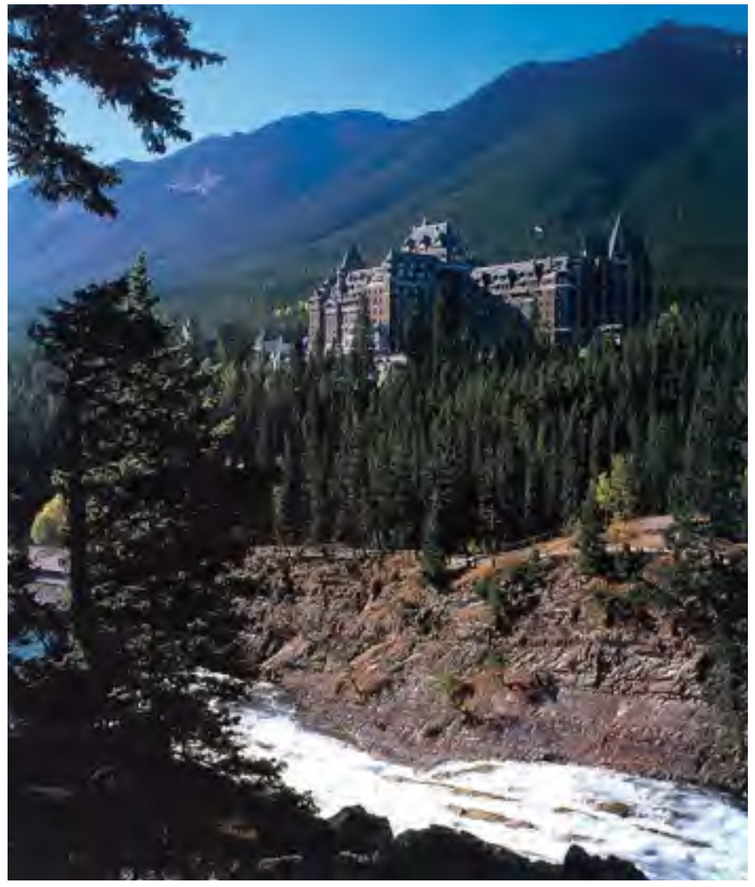
AREA 6 SECTION D-D

UPPER VILLAGE EAST
MOUNTAIN RESORT CHARACTER

This area is characterized by buildings scattered amongst the trees. separated by green space and tied together by a substantial common amenity area.

Architecturally the buildings feature a more prominent roof expression, with steep pitches up to 16/12 but accomodating lower pitches as well. The general character is of a mountain resort nature with rich craftsman derived detailingwood where possible in timber and finish materials, windows in walls as opposed to expanses of glass, and natural materials, but with a crafted finish instead of a rustic one.

Stone, painted concrete, hardy siding and shingles, finished timbers and painted steel form the material palette



Detailing is more ‘crafted’ in nature

Smaller homes incorporate natural wood siding with timber and stone

Steep roofs step down at building ends

Landscape features are natural and sustainable

Stone and timber elements found at base

Landscape shelter elements are finished timber with metal roofs and brackets

Native stone and timber accents are key in this area

Medium pitched roofs are encouraged for lower buildings

Covered terraces create outdoor rooms

Accessory Housing

The Rodgers Creek Working Group's Key Organizing Principle 3.02 states:

"Provide opportunity for accessory housing such as coach houses, carriage houses and suites over garages and in the main dwelling, and do so by excluding them from total unit count."

Accessory housing could also include "lock off suites" within multi-family units such as apartments.

Accessory Housing provides the ability to provide a diverse range of housing and uses to include:

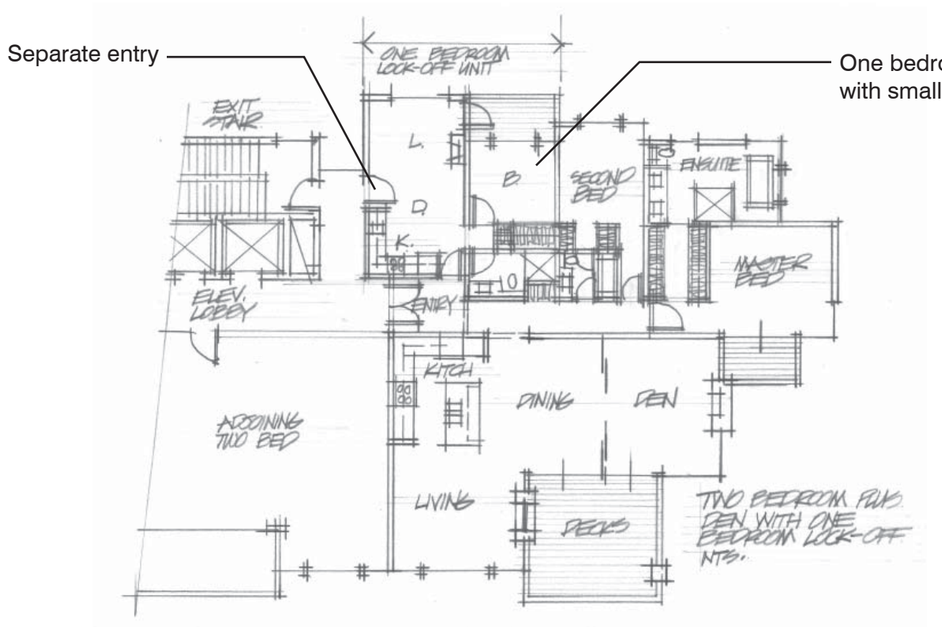
- Rental units ("mortgage helpers" for young families);
- Accommodation for child-care givers ("nanny suites");
- Independent living for elderly family members ("granny suites");
- Affordable accommodation for adult children in transition from living with their parents to moving out on their own.

Accessory Housing in the Rodgers Creek ADP area should be:

- located close to future transit routes;
- located close to alternative transportation routes such as the Mountain Path;
- located on single family lots with flatter terrain;
- provided with separate entries;
- provided with sufficient off-street parking.

Accordingly, accessory housing in the Rodgers Creek area could be accommodated on the flatter single family lots in Area 3 adjacent to Chippendale Road, in the apartment building off Chippendale Road in Area 3 and the apartment buildings closest to Cypress Bowl Road in Areas 4, 5 and 6. Developers should be encouraged during the Development Permit process to identify accessory housing units within their plans for these areas.

UniverCity at Simon Fraser University has "lock-off" units within apartments



Conceptual floor plan for apartment unit with optional lock-off suite

Accessory buildings in the District of West Vancouver that could be coach houses

Coach house in the City of Vancouver

Summary of Site Statistics

OPTION A (as of January 31, 2008)

OPTION B (as of January 31, 2008)

Neighbourhood/Area	Owner	Planning Area (acres)	Existing Zoning (upa)	Allow. Units @ 2.5 upa	Projected Number of Units: Single Family	Duplex/ Triplex	Townhomes	Apartments	Totals	Density (upa) based on Plan. Area	Projected Number of Units: Single Family	Duplex/ Triplex	Townhomes	Apartments	Totals	Density (upa) based on Plan. Area
Chairlift																
Area 1	BPP	18.5	2.5	46	11		18		29	1.57	11		18		29	1.57
Area 2	BPP	32.0	2.5	80	16		24		40	1.25	16		24		40	1.25
Sub-Total Chairlift		**50.4**		**126**	**27**	**0**	**42**	**0**	**69**	1.37	**27**	**0**	**42**	**0**	**69**	1.37
% of Units within Area					39%	0%	61%	0%	100%		39%	0%	61%	0%	100%	
Floor Area (sq.ft.)					**135,000**	**0**	**161,700**	**0**	**296,700**		**135,000**	**0**	**161,700**	**0**	**296,700**	
Mulgrave																
Area 3	BPP	49.3	1.5	124	19				19	0.39	17		4		21	0.43
	Wong et al	15.8	1.5	39	35	4			39	2.47	37		10	18	65	4.12
Area 4	BPP	17.4	1.5	44	12	2	3	45	62	3.56	9	2	4	55	70	4.02
	Roeck	5.3	1.5	13	11	2			13	2.47	8		10		18	3.42
Sub-Total Mulgrave		**87.7**		**220**	**77**	**8**	**3**	**45**	**133**	1.52	**71**	**2**	**28**	**73**	**174**	1.98
% of Units within Area					58%	6%	2%	34%	100%		53%	2%	21%	55%	131%	
Floor Area (sq.ft.)					**385,000**	**32,000**	**11,550**	**129,600**	**558,150**		**315,000**	**8,000**	**63,000**	**172,150**	**558,150**	
Lower East Village																
Area 5	BPP	21.3	1.5	53			15	146	161	7.57			15	209	224	10.54
Sub-Total LE Village		**21.3**		**53**	**0**	**0**	**15**	**146**	**161**	7.57	**0**	**0**	**15**	**209**	**224**	10.54
% of Units within Area					0%	0%	9%	91%	100%		0%	0%	9%	130%	139%	
Floor Area (sq.ft.)					**0**	**0**	**57,750**	**420,480**	**478,230**		**0**	**0**	**57,750**	**420,480**	**478,230**	
Upper East Village																
Area 6	BPP	55.7	1.5	139		18	19	138	175	3.14		18	15	236	269	4.83
Sub-Total UE Village		**55.7**		**139**	**0**	**18**	**19**	**138**	**175**	3.14	**0**	**18**	**15**	**236**	**269**	4.83
% of Units within Area					0%	10%	11%	79%	100%		0%	10%	9%	135%	154%	
Floor Area (sq.ft.)					**0**	**72,000**	**73,150**	**397,440**	**542,590**		**0**	**72,000**	**57,750**	**412,840**	**542,590**	
Totals		**215.1**		**538**	**104**	**26**	**79**	**329**	**538**	**2.50**	**98**	**20**	**100**	**518**	**736**	**3.42**
Percentage of Total Units					**19.3%**	**4.8%**	**14.7%**	**61.2%**	**100%**		**13.3%**	**2.7%**	**13.6%**	**70.4%**	**100%**	
Total Floor Area (sq.ft., total gross area not incl. garage or service areas)					**520,000**	**104,000**	**304,150**	**947,520**	**1,875,670**		**450,000**	**80,000**	**340,200**	**1,005,470**	**1,875,670**	
Overall Site Floor Area Ratio (FAR)									**0.20**						**0.20**	
Average Unit Size (sq.ft., total gross area not incl. garage or service areas)					5,000	4,000	3,850	2,880	3,486		4,592	4,000	3,402	1,941	2,548	

Option A

Apartment Size Distribution (based on net saleable area):

1,000 sq.ft. or smaller	10%
1,000 to 2,100 sq.ft.	40%
Over 2,100 sq.ft.	50%

Option B

Apartment Size Distribution (based on net saleable area):

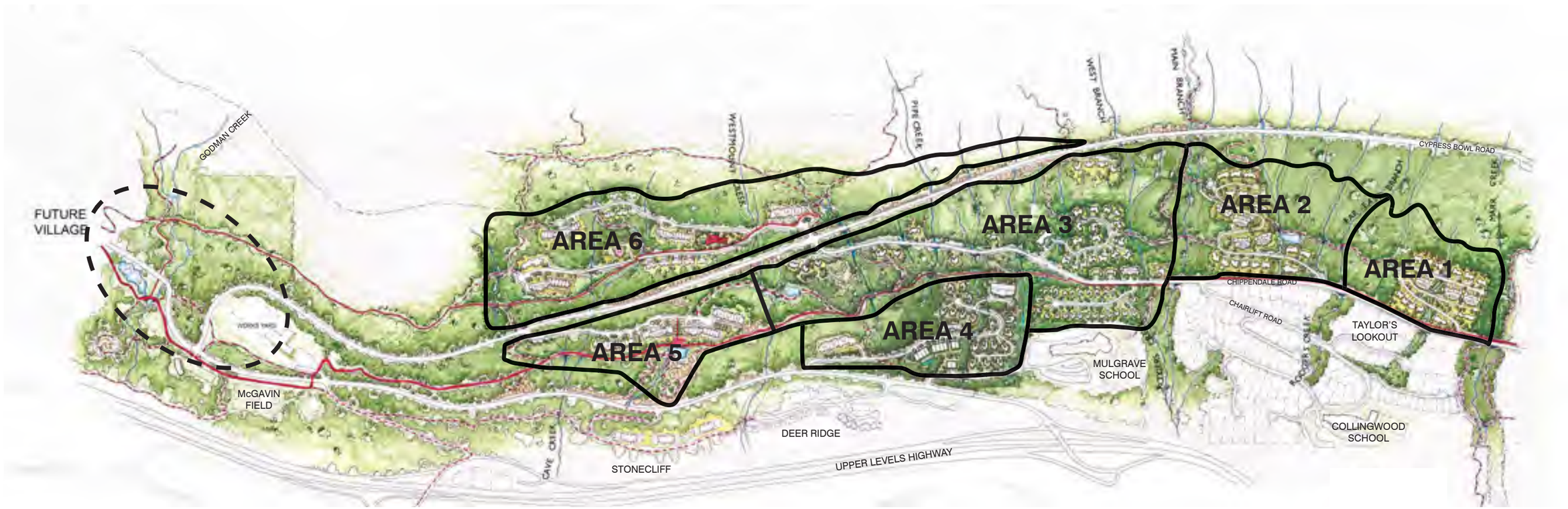
1,000 sq.ft. or smaller	30%
1,000 to 2,100 sq.ft.	45%
Over 2,100 sq.ft.	25%

Notes:

** Based on Preliminary Planning & Land Use Analysis as of January 31, 2008, including expansion of Area 6 to include an additional 5.61 acres.*

** Subject to change based on Working Group input.*

Overall Site Plan and Area Boundaries



The site statistics on the facing page are based on the area boundaries illustrated above.

The concept plan shown is for the Working Group's recommended plan, Option B, which includes a greater diversity of multi-family housing within the same total floor area as Option A.

Although Option A and Option B share the same road, trail and servicing network, Option B performs better in meeting sustainability and housing diversity objectives.

Effective and Sustainable Buildings and Infrastructure

Overview

The key considerations for designing and constructing the infrastructure for the Rodgers Creek development are:

- "Let the Landscape Inform the Development"
- Provide "Resilience" in design and construction
- Develop Green Buildings
- Minimize the Environmental Footprint
- Minimize Visual Impact
- Reduce, Reuse, Recycle

Green Buildings

The landowners have committed to a Green Building strategy that reduces energy and water consumption, reduces greenhouse gas emissions, enhances sustainability and creates a healthy living environment, including:

- LEED™ (Leadership in Energy & Environmental Design) Silver equivalency for multi-family concrete buildings as a minimum standard
- BuiltGreen Silver standard for single family, duplexes and townhouses (i.e., wood frame construction)
- Energy Conservation
  - Energy Efficient Light Fixtures
  - Energy Efficient Appliances
  - Energy Efficient Heating & Cooling systems
  - Real-time Energy Meters ("Smart Meters") inside units
- Water Conservation
  - Water-efficient fixtures
  - Capture rainwater in cisterns for irrigation
  - Water-efficient landscaping
- Green Roofs - where practical and if and as allowed by HPO
- Passive solar design, natural ventilation and daylighting

See Appendix C for the details of the Green Building Strategy.

Green Infrastructure

The Rodgers Area will be developed with a range of green infrastructure elements including:

- Low Impact Development Standards
- Alternative Transportation Choices
  - Mountain Pathway
  - Secondary trail network
  - Transit
- Alternative Energy Sources
  - Ground Source Heating & Cooling (e.g., geoexchange)
  - Consider Sanitary Sewer Heat Recovery, if feasible
  - Consider Solar Power, if feasible
- Stormwater BMP's & LID's, respecting steep, mountain terrain
- Solid Waste Management Strategy
  - Recycling Facilities within units, buildings and neighbourhoods
  - Recycling of site-generated organics from construction activities to produce topsoil
  - Plant salvage from construction areas for reuse as landscaping vegetation
  - Re-use of trees harvested from building sites
  - Use of recycled materials in construction.

See Appendix C - Green Building Strategy for further details.

Transportation and Mobility

In addition to the key considerations for the overall infrastructure, the Transportation Network has been developed based on:

- Minimizing road lengths
- Minimizing creek crossings
- Making roads as narrow as possible
- Maintaining the Cypress Bowl Greenway
- Providing safe access to/from Cypress Bowl Road
- Making provisions for Transit service
- Developing an extensive multi-user Trail System
- Appropriate traffic calming
- Accommodating cycling in the transportation system

The OCP identifies the development of the "1000' Connector" as a key component of the District's overall transportation network. The 1000' Connector provides another east-west link in addition to Marine Drive and Highway 1 and involves the extension of Chippendale Road to Cypress Bowl Road and connecting Cypress Bowl Road to Northwood Drive. Sections of the Connector have already been built by British Pacific Properties as part of the Whitby Estates and Taylor's Lookout developments. The development of Rodgers Creek will facilitate the construction of the Chippendale Connector from Chairlift Road to Cypress Bowl Road. The major road network is discussed in more detail in Appendix E.

Within the Rodgers Creek road network, consideration was given to alternate accesses to the longer cul-de-sac roads that end near the upper boundary of the development at the 1200' foot contour. In Area 6, a road alignment has been identified to connect the highest cul-de-sac to the Eagle Lake access road, south of the BC Hydro substation, to provide alternative emergency access and forest fire fighting access. This road could be upgraded in the future to municipal road standards if required as part of the development of the Cypress Village area. This road would also form part of the trail system.

A comprehensive Traffic Impact Study is being prepared to accompany the ADP. This Traffic Impact Study will examine integrating the traffic generated by the development with existing traffic including traffic generated by Mulgrave School.

Transit

While historically, there has been no regular transit service in Westhill, Whitby Estates or the Chelsea/Taylor's Lookout subdivision, the West Vancouver Transit Department is operating community shuttle bus service through the Westhill and Whitby Estates areas to the Community Centre and Marine Drive corridor on a trial basis. With the extension of Chippendale through to Cypress Bowl, there may be an opportunity to extend or augment this service to pick up in the Chairlift and Mulgrave Neighbourhoods, the Deer Ridge and Stonecliff developments, and the West Vancouver Works Yard if ridership and an efficient routing could be established. The future development of the Cypress Village and the McGavin Sports Field currently under construction would provide an opportunity to create a transit hub that could provide a catalyst for transit service in the Rodgers Creek area. Based on discussions with the West Vancouver Transit Department, the Rodgers Creek area will most likely be served by a community shuttle service rather than full size buses.

Trail System

One of the most significant social, transportation and recreational features of the development will be the Mountain Path which will run from Whitby Estates to the east to the future Cypress Village to the west, a distance of approximately 3 kilometers, and eventually on to Cypress Park Estates. The Mountain Path will travel through the heart of the development and connect the various neighbourhoods with each other, with the future Cypress Village and with the various social and recreational nodes along the way. The pathway will include multiple nodes for parking and access, social interaction, recreational and play opportunities and stunning view points.

The Mountain Path will form the backbone of the extensive trail system for the Rodgers Creek area. Secondary trails will link the Mountain Path to development sites and other destinations and trails. Other secondary trails will parallel the Mountain Path in some locations to allow "looping" trail systems. Low impact nature trails will be located near creeks and environmentally significant areas. This park and trail system will also include wayfinding, interpretative signage, benches, parking, road crossings and native landscaping as appropriate. Walking and hiking trails are discussed in more detail in the Sense of Place section.

Mountain Bike Trails

Downhill mountain bike trails have been constructed on the lower slopes of Hollyburn ridge, several of which transect the Rodgers Creek area. Mountain biking has been recognized as a growing sport that requires special consideration along with walking and hiking in the planning and development of the Upper Lands. Mountain bike trails are discussed in more detail in the Sense of Place section.

Water Distribution System

The Rodgers Creek area is presently serviced by the existing water distribution system in three different pressure zones: P2, P3 and P4. All water reservoirs required to service the development are already in place. There are existing watermains in Chippendale Road, Cypress Bowl Road and Cypress Lane. New watermains will generally follow road and major trail networks.

As part of improving the overall supply and distribution of water to West Vancouver residents, the District has expressed a desire to extend the Eagle Lake cross-country watermain to the P4 water reservoir located at the second switchback in the Cypress Bowl Road. This will allow the District to maximize its utility of the Eagle Lake water supply and distribute this water to the eastern portion of the municipality, thereby reducing the cost of purchasing water from the Greater Vancouver Water District (GVWD). The development of the Rodgers Creek area will facilitate the early implementation of this community water supply improvement.

To reduce water demand in the Rodgers Creek area, all homes including apartments will have water metering to encourage conservation and the use of rainwater harvesting for landscape irrigation, e.g., cisterns and rain barrels, will be encouraged.

Sanitary Sewer

Sanitary sewers will connect to the existing municipal system at two locations: 28th Street Trunk Sewer and 27th Street Trunk Sewer. New sewers will generally follow road and major trail networks. The District is willing to consider alternative sanitary sewer services such as grey water recycling and on-site sewage treatment.

Stormwater

One of the most important goals of the Rodgers Creek ADP is managing stormwater to maintain environmental functions of watercourses as well as public safety. The Rodgers Creek area is located within the catchments of 4 major watersheds: Rodgers Creek, Pipe Creek, Westmount Creek and Cave Creek. The goals of managing stormwater include:

- Protect streams and their hydrological performance and, where possible, enhance the ecological function of streams
- "Treat rainwater as a resource not a problem"
- Utilize watershed-based stormwater planning
- Develop Integrated Stormwater Management Plans (ISMP) for individual creeks
- Utilize stormwater control measures within private as well as public lands
- Effectively control Peak Flood Flows for Public Safety – this will require the construction of diversion pipes where necessary to protect existing downstream development.

Techniques and strategies for managing stormwater include:

- Collecting density to reduce pervious areas. This is the biggest single stormwater control feature of development as approximately 55% of site will be left in its natural state.
- Implementing Best Management Practices (BMP's) and Low Impact Development strategies (LID's) for the remaining 45% of the site that will be developed
- Rain Gardens and constructed wetlands
- Detention ponds and cisterns
- Road-side bioswales
- Absorbent Landscaping
- Rock pits
- Permeable Pavers to allow rainwater to seep back into the ground.
- Rainwater harvesting for irrigation, e.g., cisterns
- "No creeks in pipes" except for road crossings, e.g., wide, baffled culverts.

Other Utilities

Electrical, natural gas and communications utilities will be located underground within roads and utility corridors. The Rodgers Creek area will be serviced by high speed communication networks.

Development Contributions

Overview

The development of the Rodgers Creek area in accordance with the proposed ADP will create a legacy of a wide variety of benefits that will accrue not only to residents of the Rodgers Creek Area but also to the West Vancouver community at large. On December 3, 2007, the District of West Vancouver adopted a Public Amenity Contribution Policy that defines a public amenity contribution framework for West Vancouver. The evaluation of community benefits provided by the Rodgers Creek development and securing public amenity contributions will be in accordance with this Policy.

Some of the contributions associated with the Rodgers Creek development that extend beyond the immediate development area to help enhance the overall quality of life in West Vancouver are described below.

1. Conservation of Green Space

One of the main goals of the ADP was to collect density in clusters and preserve significant amounts of green space. Through the application of the Sieve Analysis and sensitive siting of roads and buildings, over 55% of the total Rodgers Area will be set aside as environmentally protected green space including creek and riparian corridors, rock bluffs, steep terrain, stands of mature trees and other significant natural landscape formations. Special attention was given to making larger contiguous green spaces rather than isolated pockets.

In addition to the environmentally protected green space, there will be extensive landscaping of other public lands such as road boulevards and private lands, with an emphasis on natural landscape materials and native species.

2. Environmental Enhancement and Restoration

While a significant amount of the Rodgers Creek ADP area will be set aside as green space, much of the area has been disturbed by past natural and human events most notably forest fire, logging and the construction of the Cypress Bowl Road. Development of the Rodgers Creek area brings several opportunities for enhancing the natural environment such as the removal of old culverts to daylight creeks, enhancing man-made watercourses, re-instating natural drainage systems disrupted by the construction and abandonment of logging roads, planting native trees and vegetation to supplement the existing forest and constructing ponds and wetlands to help retain water on site and enhance biodiversity.

3. Sustainability

In addition to the conservation of green space and environmental enhancement and restoration detailed above, the Rodgers Creek development will incorporate many sustainable development features such as green buildings and green infrastructure. These features are described in more detail in separate sections.

Following the direction provided by the OCP and the Working Group's Key Organizing Principles, the Rodgers Creek Area Development Plan is founded on a vision of environmental, social and economic sustainability. British Pacific Properties is actively pursuing a strategy for sustainability for the Rodgers Creek Area that delivers a new standard for community development in West Vancouver. This strategy is focused on the "8 Pillars of a Sustainable Community" which include:

1. A Complete, Diverse Community
2. A Progressive Transportation System
3. Green Buildings
4. Multi-Use Open Space
5. Green Infrastructure
6. Healthy Food Systems
7. Community Amenities
8. Economic Vitality.

The vision for sustainability contained within the Rodgers Creek Area Development Plan complements and supports the District of West Vancouver's OCP, the Working Group's Key Organizing Principles and British Pacific Properties' "8 Pillars" approach. Sustainability is a common thread that runs throughout the fabric of the Rodgers Creek ADP as well as the future planning of the Cypress Village area. For example, the conservation of green space and environmental enhancement and restoration are detailed above, the open space framework is outlined in the Sense of Place section, the Diversity of Housing section addresses providing a range of housing choices while green buildings and green infrastructure initiatives are described in the section on Sustainable Building and Infrastructure.

4. Mountain Path

One of the most significant social, transportation and recreational features of the development will be the Mountain Path which will run from Whitby Estates to the future Cypress Village and eventually on to Cypress Park Estates. The Mountain Path will travel through the heart of the development and connect the neighbourhoods with each other, with the future Cypress Village and with the various social and recreational nodes along the way. It is proposed that this path be similar in purpose to Whistler's very successful Valley Trail with a minimum width of 3 m and with bridges across the large creek crossings. Where possible grades will be kept gentle to allow a wide variety of users and maximize its accessibility. The pathway will include multiple nodes for parking and access, "wayfinding" (directional and place signage), interpretive signage, social interaction nodes, recreational and play opportunities and stunning lookouts and view points.

5. Parks and Trails

In addition to the Mountain Pathway, an extensive trail network is proposed including gravel paths linking the Mountain Path to development sites and other destinations, trails paralleling the Mountain Path in some locations to allow "looping" trail systems and low impact nature trails near creeks and environmentally significant areas. A number of public open spaces will be created along the trail network. This park and trail system will also include wayfinding, interpretative signage, benches, parking, road crossings and native landscaping as appropriate. There will also be the opportunity to develop park spaces within the neighbourhoods in accordance with the wants and needs of the new residents.

6. Diversity of Housing

While the OCP specifies a minimum of 40% of the housing units in the Upper Lands should be non-single family homes, the ADP proposes 80% of the housing units to be non-single family detached homes such as duplexes, triplexes, ground-oriented townhomes and apartments. The overall breakdown proposed under Option A would be approximately 19 % single family, including compact lots and estate lots, 5% duplex & triplex, 15% townhomes and 61% apartments. Further, the proponents have committed to a minimum 10% of all apartment units to be less than 1,000 square feet in size with an additional 40% to be between 1,000 square feet and 2,100 square feet in size (net saleable area).

The Working Group's recommended option, Option B, achieves an even higher level of housing diversity within the same total floor area and the same building massing with 13% single family, including compact lots and estate lots, 3% duplex and triplex, 14% townhomes and 70% apartments. Further, 30% of all apartments would be less than 1,000 square feet in size with an additional 45% to be between 1,000 square feet and 2,100 square feet in size (net saleable area).

7. Non-Market Housing

The plan provides for a site in Area 6 that could accommodate a multi-family building in a forested setting for non-market housing such as rental or seniors housing. As proposed, there is potential for 55 units ranging in size from 750 square foot apartments to two-level 1,400 square foot townhouses, with an average unit size of 1,000 square feet (net saleable area). This additional density is not included in the 538 units proposed for the Rodgers Creek Area under Option A or the 736 units proposed under Option B.

8. Chippendale Connector

As discussed in the Infrastructure section, the development of Rodgers Creek will facilitate the construction of the Chippendale Connector from Chairlift Road to Cypress Bowl Road. The benefits to the community from this Connector includes improved east-west transportation movements, the diversion of downhill truck traffic, improved access to Cypress Bowl Road from the upper British Properties and improved access for emergency vehicles. In order to meet community objectives regarding routing of truck traffic and impacts on Mulgrave School (see Appendix E), the proposed alignment of the Chippendale Connector was moved higher up the hillside resulting in a longer length of road and an additional bridge crossing over Pipe Creek. While this option costs more, it provides no tangible benefit to the proponents and therefore should be considered a benefit to the community.

9. Cross Country Watermain Extension

As detailed in the Infrastructure section, the development of the Rodgers Creek area will facilitate the early implementation of this community water supply improvement which will provide the District with more flexibility in the delivery of water to the eastern part of the municipality and annual cost savings from reducing the amount of water purchased from the GVWD and reducing water pumping costs.

10. Peak Stormwater Diversion

The 1973 West Vancouver Drainage Study prepared by Dayton & Knight recommended the construction of several stormwater diversions to reduce the risk of flooding lands adjacent to creeks below the Upper Levels Highway. One of these was a peak stormwater diversion from the Rodgers Creek area to Burrard Inlet. This diversion was recommended irrespective of development of the Rodgers Creek area to increase public safety by addressing low capacities in downstream creek channels and culverts. The development of the Rodgers Creek area will facilitate the implementation of this peak flow stormwater diversion.

11. Development Cost Charges

Although the developers will pay the full cost of all new on and off-site infrastructure required to service the new development, the District of West Vancouver also collects Development Cost Charges (DCC'S) to off-set the impact of these new developments on the existing community. DCC's include contributions for community-wide improvements to the water and sewer systems, the road network and public open spaces including the Ambleside waterfront and major and local public facilities. The DCC's of $15,657 per unit to be collected by the District for the Rodgers Creek Area generate a total of $8.4 million for 538 new housing units under Option A and a total of $11.5 million for 736 new housing units under Option B.

12. Property Taxes

The value of the Rodgers Creek area at build-out is estimated to be in the order of $1 billion. The associated increase in property taxes collected by the District would be approximately $2.5 million per year. The District is preparing a Fiscal Impact Analysis to determine what portion of the increase in property taxes is a net benefit to the municipality.

13. Regional Benefits

The benefits of the Rodgers Creek development extend beyond the boundaries of West Vancouver to the larger Metropolitan Vancouver region.

The Greater Vancouver Sewerage and Drainage District will collect approximately $520,000 from the developers of Rodgers Creek for regional infrastructure improvements under Option A and approximately $680,000 under Option B.

The development of the municipal services, amenities and housing in the Rodgers Creek area will create direct job and investment opportunities. In addition to direct construction investment, there is a multiplier effect from indirect investment on development-related goods and services such as real estate services, legal services, banking services, furniture and appliances, etc. The total direct and indirect investment in the regional economy is estimated to be in the order of $1 billion.

Acknowledgements

This Overview Report has been prepared by British Pacific Properties Limited and its consultants in collaboration with the other landowners and their consultants, District Staff and the Rodgers Creek Working Group. The community also provided valuable input at two Public Open House meetings held June 20, 2007 and December 4, 2007 and at a series of meetings with recreational users. The time and effort expended by the participants in this process has been considerable and is recognized below in their contribution in creating a community-based Area Development Plan, the District of West Vancouver's first.

Rodgers Creek Working Group led by Councillor Rod Day
John Barker
Harold Kalke
Dean Mailey
Frank Musson, MAIBC
Jak Redenbach, MAIBC
Julia Rylands
Brian Walker, P.Eng.
Michael Rosen, MCIP
Jennifer Bailey

District of West Vancouver Staff led by Geri Boyle, MCIP, Manager of Community Planning
Corinne Ambor
Jim Bailey, MCIP
Brent Dozzi, P.Eng.
Ray Fung, P.Eng.
Stephen Jenkins
Doug Leavers

Community Groups
West Vancouver Streamkeeper Society
North Shore Mountain Bike Association
Old Growth Conservancy Society
Members of local conservancy and hiking groups

Landowners within the ADP Area
British Pacific Properties Limited
P. Rock Limited represented by the Roeck family
Consortium represented by Edward Wong

Adjacent Landowners
Mulgrave Independent School Society

Consultants
Aqua-Tex Scientific Consulting Ltd.
Burrow Huggins Architects
Calum Srigley Design Consultant Ltd.
Chapman Land Surveying Ltd.
Creekside Architects
Golder Associates
Holland Barrs Planning Group
InterCAD Services Ltd.
iTrans Consulting Inc.
Jorden Cook Associates
Maurice Pez Architect
Murdoch & Associates Architecture + Planning Ltd.
Partington Real Estate Advisors Ltd.
Phillips Farevaag Smallenberg
Richard Henry Architect
Sartori Environmental Services
Seacor Environmental Inc.
Webster Engineering Ltd.

Appendix A - Sieve Analysis for the Area 6 Expansion

During the process of reviewing and revising the Overview Report, it was noted that the western boundary of the ADP Area above the upper section of Cypress Bowl Road in Area 6 had been established in relation to a historic unopened road right-of-way which lined up with the western boundary of Area 5. While the unopened road allowance forms a legal boundary, a BC Hydro powerline and Cave Creek West further to the west create a more logical physical and geographical boundary to development. Between the unopened road allowance and the BC Hydro powerline and Cave Creek West riparian corridor, lies a narrow strip of potentially developable land. Development of this narrow strip by itself is problematic, while adding it to Area 6 of the Rodgers Creek planning area provides an opportunity to site development in a more sensitive manner.

Consequently, it has been added to the Rodgers Creek ADP Area and the sieve analysis has been expanded using the methodolgy used for the rest of the Rodgers Creek Area. The added area of 5.6 acres (2.3 hectares) also adds the potential for an additional 14 units under Option A (using the OCP guideline of 2.5 units per gross acre) and 27 units under Option B with an additional floor area of 45,000 square feet of gross floor area under either option. The sieve analysis indicates that a majority of the additional 5.6 acres will be conserved as green space.

LEGEND

- PROTECTED SENIOR GOVERNMENT SETBACK AREA
- STEEPER SLOPES
- POTENTIAL GEOTECHNICAL CONSTRAINTS - FURTHER INVESTIGATION REQUIRED
- STEEP SLOPES - FURTHER INVESTIGATION REQUIRED
- MUNICIPAL SETBACK AREA - FURTHER INVESTIGATION REQUIRED
- DEVELOPMENT AREA
- LARGE FEATURE TREE
- C04 TRAIL/ ROAD (EXISTING)
- C04 MOUNTAIN PATH (PROPOSED)

Appendix B - Summary Matrix of Watercourses and Conservation Areas

Revised February 7, 2008

Rodgers Creek ADP Stream Summary Table

Development Area No.	Stream Name	Biophysical Characteristics	Proper Functioning Condition Description	Stream Ranking	Restoration Opportunities	Closest Point to Potential Development Area	EDP Setback Infringement	Stream Setback Rationale
1	Marr Creek	* Medium sized watercourse * Ravine 50 to 80 metres wide * Channel widths up to 20 metres * Maintains cutthroat trout and tailed frog populations * near year round flow conditions * large north/south tract of riparian interconnects with Rodgers Far East Branch and other watercourses above the 1200' line providing connectivity for terrestrial wildlife	reach above Cypress Bowl Road (CBR) is functional, with minor disturbance at culvert mouth (channel is Ab3/4); reach between two segments of CBR is non-functional, as it is encased in a buried culvert; upper reach, immediately below CBR is non-functional from disturbances associated with road construction and high velocity flows discharged from culvert; middle reach is functional, with active floodplain and a vegetated riparian zone; there is associated large wood from logging debris (this middle reach is a Cb4, with step-pool formation); the lower-most reaches are non-functional, with extensive damage to riparian vegetation, channel realignment and, in some cases, complete loss of bedload material, arising from a localized slope failure that created a temporary breach of the stream, followed by catastrophic breach failure; the stream channel was subjected to heavy and destructive scour action (A/b1/2).	High	Monitor old slides and logging road crossings, and revegetate where necessary.	37.8 metres HWM 15 meters ToB	Yes	Property line and setback historically set by Whitby development. Large (<90 metres) protected ravine area, sufficient to maintain the form, function and condition of Marr Creek.
1	Trib. B	* small watershed, originates within study area * no connection above Cypress Bowl Road * minimal year round flow conditions * average channel width of 1.24 metres	the upper channel is functional; the lower-most reach is non-functional, as it flows out of the forest into a short section that has been disturbed by road bank construction; the channel is A4/3 with B4/3a; narrow riparian vegetation; arises in seeps and wee springs below CBR	Low	Due to expected disturbances with the road crossings, restoration of the channel will be necessary.	10 metres HWM -21.8 metres ToB (right bank) -12.9 metres ToB (left bank)	Yes	Step/pool channel to be reconstructed during development
1	Trib. D	* intermittent flow conditions * average channel width 1.8 metres * no fish or frog populations * continuous connectivity for wildlife through large green space corridor between Trib.D and Trib.G	the upper channel is functional, with a small segment of non-functional habitat at the mouth of the culvert routing flows under CBR; the lower-most segment is non-functional, as it flows out of the forest into a short section that has been disturbed by road bank construction; the channel is A4/3 with B4/3a; narrow riparian vegetation; arises in the zone between the two sections of CBR; small segments have been damaged by historical logging roads and subsequent stream crossing failures	Low	Possible underplanting of conifers could be located within deciduous dominated areas.	26.4 metres HWM -27.0 metres ToB	Yes	EDP infringement on east side offset by large continuous green space to the west of Trib.D
2	Rodgers Far East	* average channel width of 6.38 metres * maintains tailed frog populations * productive substrates * near year round flow conditions * continuous connectivity for wildlife through large green space corridor between Trib.D and Trib.G	the upper channel is functional, including the small segment of functional channel at the mouth of the culvert routing flows under CBR; the lower-most segment is non-functional, as it flows out of the forest into a short section that has been disturbed by road bank construction; the channel is A4/3 with B4/3a; narrow riparian vegetation; arises in the forest above CBR; small segments have been damaged by historical logging roads and subsequent stream crossing failures and/or slumps; lower reaches, below Chippendale, are functional, with one reach non-function; these lower reaches are primarily Ab3/4, entrenched with dense riparian cover but with minimal LWD	High		24.2 metres HWM 6.2 metres ToB	Yes	No further riparian impact to Rodgers Far East. Road access to development area 2 mostly within existing Chippendale Road disturbance.
2	Trib. E	* average channel width of 2.49 metres * intermittent flow conditions * erosion visible in areas downstream of Cypress Bowl Road * no fish or frog populations * continuous connectivity for wildlife through large green space corridor between Trib.D and Trib.G	the upper channel is functional, with the channel arising in CBR road-bed material; the lower-most segment is non-functional, as it flows out of the forest into a short section that has been disturbed by road bank construction; Tributary E is a mix of A4/3 with B4/3a and some C4/3 pockets, arising from previous disturbance associated with Chairlift facility; remnant wetland pockets remain in the lower reach adjacent to Chairlift facility	Low	Potential bioswale connection to tributary G	10 metres HWM 8.7 metres ToB	Yes	No impacts to the upper portion of Trib.E. which forms part of a large contiguous green space to the east and west. Lower end presently disturbed and diverted to the west. Development impacts primarily within existing disturbance areas.
2	Trib. F	* average channel width of 2.77 metres * no fish/frogs identified in channel * lower end channelized within ditch system * cut-off from Rodgers Creek by a 250m long culvert under existing development * continuous connectivity for wildlife through large green space corridor between Trib.D and Trib.G	the upper channel is functional, with a small segment of non-functional habitat at the mouths of the two culverts routing flows under CBR; the lower-most segment is non-functional, receiving flows from Tributary G; this reach has been fully disturbed from historical activities associated with the Chairlift parking and road access from Chippendale; the channel is A4/3 with B4/3a; narrow riparian vegetation; Tributary F in lower reaches is a channelized ditch; much of the stream channel within this zone has been extensively entrenched, with some logging road-based disturbance in the upper reach	Medium	Potential to re-establish original channel location through old Hollyburn parking area	10 metres HWM (from realigned lower channel) 8 metres ToB (from realigned lower channel)	Yes	No impacts to the upper portion of Trib.F, and is part of a large contiguous green space to the east. The lower channelized section of stream to be relocated into its original location north of the proposed development pod. Lower section of Trib.F being impacted by road access.
2	Trib. G(b)	* minimal flow conditions * no fish/frogs identified in channel * cut-off from Rodgers Creek by a 250m long culvert under existing development * intact riparian proposed with connectivity to large green space between Trib.D & Trib.G	the upper channel is functional, with a small segment of non-functional habitat at the mouths of the culvert routing flows under CBR; the lower-most segment is non-functional, receiving flows from Tributary G and F; this reach has been fully disturbed from historical activities associated with the Chairlift parking and road access from Chippendale; the channel is A4/3 with B4/3a; narrow riparian vegetation; the middle reach is an Interrupted segment, being buried in a culvert; some remnant wetland	Low		No Impacts	No	No impacts to Trib G(b).
2	Trib.G	* average channel width of 2.49 metres * channelized and altered through Hollyburn parking area * culverted under road crossings of old parking area * cut-off from Rodgers Creek by a 250m long culvert under existing development * continuous connectivity for wildlife through large green space corridor between Trib.D and Trib.G and into Rodgers Creek riparian	the upper channel is functional, including that segment at the mouth of the culvert routing flows under CBR; the lower-most segment is non-functional, receiving flows from Tributary G(b) and F; this reach has been fully disturbed from historical activities associated with the Chairlift parking and road access from Chippendale; the channel is A4/3 with B4/3a; narrow riparian vegetation; the middle reach is an Interrupted segment, being buried in a culvert; some remnant wetland	Medium	Possible creation of wetland within paved parking area, and removal of culverted section	13.6 metres HWM (right bank) -3.2 metres ToB (right bank, localized topographic anomaly) 13.6 metres HWM (left bank) 8.5 metres ToB (left bank)	Yes	EDP infringements to the west and within the lower channelized section. No impacts to the upper area as it forms part of a large contiguous green space to the east. The lower impacted section of channel to be restored and removed from an existing culverted road crossing.

Rodgers Creek ADP Stream Summary Table

Development Area No.	Stream Name	Biophysical Characteristics	Proper Functioning Condition Description	Stream Ranking	Restoration Opportunities	Closest Point to Potential Development Area	EDP Setback Infringement	Stream Setback Rationale
2	Trib.H	* average channel width of 2.06 metres * minimal flow conditions, likely ephemeral * no fish/frogs identified in channel	the upper reach, above CBR, is functional, including that segment at the mouth of the culvert routing flows under CBR; the lower-most segment is functional-at risk; a mix of A2/3 with B3/4a and some A+1/2 and A+2/3 pockets; channel has moderate LWM chiefly as remnants from logging debris and some blow-down; confluence with Rodgers Main stem site of small slump	Medium		30.6 metres HWM 30 metres ToB	No	No impact to Trib. H
2	Rodgers Creek (left bank)	* average channel width of 12.09 metres * near year round flow conditions * tailed frogs throughout * no fish upstream of Highway 1 * full riparian setbacks proposed for wildlife migration corridor and connectivity to eastern watersheds	In Rodgers main Branch, the reach above CBR is functional, except for that segment at mouth of culvert routing flows under CBR, where there has been a large excavated pond dug during road construction; the remaining reaches are functional-at risk, and have been observed to have very high flow volumes and velocities during the past two winters; Rogers Main Branch is a deeply entrenched channel, dominated by a mix of A2/3 with B3/4a and some A+1/2 and A+2/3 pockets; channel has significant LWM chiefly as remnants from logging debris and some blow-down; this is a perennial stream that flows continuously and is likely associated with the water table in the sub-catchment through which they flow	High		36.2 metres HWM 21.8 metres ToB	Yes	Negligible infringements to Rodgers Creek EDP area. Single point of infringement at south end of proposed development due to anomalous top of bank condition. Near full setbacks maintained throughout.
3	Rodgers Creek (right bank)	* average channel width of 12.09 metres * near year round flow conditions * tailed frogs throughout * no fish upstream of Highway 1 * full riparian setbacks proposed for wildlife migration corridor and connectivity to eastern watersheds	In Rodgers main Branch, the reach above CBR is functional, except for that segment at mouth of culvert routing flows under CBR, where there has been a large excavated pond dug during road construction; the remaining reaches are functional-at risk, and have been observed to have very high flow volumes and velocities during the past two winters; Rogers Main Branch is a deeply entrenched channel, dominated by a mix of A2/3 with B3/4a and some A+1/2 and A+2/3 pockets; channel has significant LWM chiefly as remnants from logging debris and some blow-down; this is a perennial stream that flows continuously and is likely associated with the water table in the sub-catchment through which they flow	High		30 metres HWM 8.6 metres ToB (localized topographic anomaly)	Yes	Minimal infringement to Rodgers Creek setbacks will be located adjacent to the Chippendale Road alignment and within an already disturbed riparian area.
3	Trib.K	* average channel width of 0.25 metres * minimal flow conditions * no fish/frogs identified in channel * no upstream connection above Cypress Bowl Road	this short tributary arises in the CBR road-bed material and is functional-at risk; A2/3 with B3/4a; channel has some LWM from logging debris	Low		No impacts	No	No impacts to Trib.K
3	Rodgers West	* reach 1 very steep and an averaged channel width of 4.88 metres * reach 2 moderate grade with an average channel width of 4.44 metres * tailed frogs throughout * intermittent flow conditions * connectivity for wildlife migration to Rodgers Creek through large tract of greenspace at the northern extent of the ADP area	Rodgers West Branch is functional in its upper-most reaches, with a short segment that is non-functional at the mouth of the culvert routing flows under CBR; the remainder of the lower reaches are functional-at risk; it consists of a narrow channel of B4/5 and B4/5a, with small pockets of C4/3; irregular flows; upper NW corner reach consists of confluence of Tributary K and V; these streams are seasonal and/or intermittent	High		17.2 metres HWM 15 metres ToB	Yes	A 15 metre from top of bank setback on the west side is proposed and is offset by the large contiguous riparian area to the east. No development is proposed in between Rodgers West and Rodgers Main, except the single family lot adjacent to Chippendale Road.
3	Trib. V	* average channel width of 0.2 metres * minimal flow conditions * no fish/frogs identified in channel * no upstream connection above Cypress Bowl Road	this short tributary arises in the CBR road-bed material and is functional-at risk; A2/3 with B3/4a; channel has some LWM from logging debris	Low		No impacts	No	No impacts to Trib.V
3	Trib. L	* average channel width 1.82 metres * minimal flow conditions * no fish/frogs identified in channel * no direct upstream connection above Cypress Bowl Road; ditch connection * lower section channelized	Tributary L arises in the CBR road-bed material, being an ill-defined headwater channel; it is functional; however, it consists of a very small irregular channel in its upper reaches; braided throughout lower reaches; numerous segments are interrupted; following heavy 2006/2007 winter record rainfall, channel flows observed to be minor, with middle reach segments interrupted; this stream consists of A3/4b and B3/4 mix; narrow riparian plant community; some braided and interrupted segments in heavily disturbed lower reaches; there is no significant catchment above Cypress Bowl Road. lower most reach is culverted and confined within a vegetated ditch and flows through a second culvert, prior to discharging into Tributary N; portions of the lower most reach drain into a secondary road-side ditch, on the Wong property, that also flows into Tributary N.	Low	Removal of culvert crossings and potential re-location of Trib. L to be considered for purposes of enhancement	10 metres HWM -25.7 metres ToB	Yes	Lower portion of channel historically ditched and flowing adjacent to road. EDP infringement offset by relocated and reconstructed channel allowing amphibian passage into Trib.L
3	Trib. M	* average channel width of 2.4 metres * no tailed frogs identified * intermittent flow conditions * no direct connection above Cypress Bowl Road	Tributary M arises in the CBR road-bed material; it is functional in those reaches above the Mulgrave School property; it consists of a narrow channel in its upper reaches, beginning as a small headwater stream, with minor flows primarily from seepage under road bed with no significant catchment above Cypress Bowl Road; A4/5b, through Bc4/5; Tributary N and L forms a confluence at the Wong property boundary; in the lower reaches adjacent to Mulgrave School the channel is incised, ditched and deeply entrenched; this reach is non-functional	Low		10 metres HWM -17.8 metres ToB	Yes	
3	Trib. N	* average channel width of 3.5 metres * sparse tailed frog populations identified in channel * intermittent flow conditions * lower end channelized along Mulgrave access road	Tributary N arises in a small catchment above CBR; it is functional throughout its length, consisting of a very small narrow channel, with minor intermittent flows; A3/4b with some segments of B3/4, with a narrow riparian plant community; forms a confluence with Tributary M; some disturbance arising from remnant logging roads in mid-reaches; consisting of A3/4b and B3/4 mix	High	Potential to increase riparian zone with removal of paved road above Mulgrave School	32.1 metres HWM (Right Bank) 30 metres ToB (Right Bank) 10.5 metres HWM (Left Bank) 8.8 metres ToB (Left Bank)	Yes	Infringements within Trib.N are proposed on the left bank where historical impacts presently exist.

Rodgers Creek ADP Stream Summary Table

Development Area No.	Stream Name	Biophysical Characteristics	Proper Functioning Condition Description	Stream Ranking	Restoration Opportunities	Closest Point to Potential Development Area	EDP Setback Infringement	Stream Setback Rationale
3	Trib. P	* average channel width of 3.37 metres * no tailed frogs or fish found in Trib.P * intermittent flow conditions	Tributary P arises above CBR and is functional throughout its length, consisting of a mix of A3/4b and B3/4, with small step pools; there are a few segments in the middle reaches where remnant logging roads have failed, causing minor slumps; the channel is narrow with a narrow band of riparian vegetation	Medium		31.9 metres HWM (right bank) 30 metres ToB (right bank) 10.1 metres HWM (left bank) 8.4 metres ToB (left bank)	Yes	Development has been moved towards trib P to minimize the impact on the frog bearing stream Trib N. A 10.1 metre setback is proposed for Trib.P
3	Pipe Creek	* average channel width of 3.6 metres * no tailed frogs or fish identified * near year round flow conditions * substrates dominated by cobble/boulder * large tract of green space between Pipe Creek and Cave Creek provides connectivity in an east/west alignment and riparian areas provide connections in a north/south configuration	Pipe Creek is functional; however, it consists of narrow channel, entrenched within a gully in the lower reaches; mix of B3/4 and A3/4b; upper reach dominated by deciduous regeneration below Cypress Bowl Road, with conifers in the lower reaches; there is a former logging road that consists of a landscape change point, with the upper reaches not well entrenched and some channel braiding; the lower-most segment of the stream, from the confluence with tributary R, to the mouth of the culvert routing flows under CBR, is non-functional	High		16.8 metres HWM (right bank) 15 metres ToB (right bank) 31.8 metres HWM (left bank) 30 metres ToB (left bank)	Yes	No fish or frogs reside in this system, and development will lie outside of any geotechnical areas of concern.
3	Trib. Q	* average channel width of 1.1 metres * no tailed frogs or fish identified * intermittent flow conditions as source in primarily Cypress Bowl Road runoff * lower end disturbed along old logging road	Tributary Q is non-functional above CBR, however, this channel segment is very short; downstream of CBR the channel is functional but is downcut below CBR, arising from the culvert having become undermined; A3/4b with some B3/4; narrow riparian zone; upper western riparian zone of Tributary Q bordered by narrow terraced benches	Low		10 metres HWM 9.8 metres ToB	Yes	Impacts to Trib.Q EDP area are proposed and a 10 metre from HWM is sufficient to maintain the form, function and condition of this intermittent channel sourced primarily by Cypress Bowl Road runoff.
3	Trib. R	* average channel width of 2.5 metres * no tailed frogs or fish identified * intermittent flow conditions * lower end channelized into Pipe Creek	Upper reaches of tributary R, above CBR, are non-functional, consisting of downcut, deeply entrenched channels/ditches; damage arising from failing logging roads and recreational trails through the stream channel, it evidences extensive braiding and avulsions; flows are irregular; reaches downstream of CBR are functional, with significant logging LWM and blow-down; the channel consists of A3/4b with some B3/4; deeply incised and entrenched in lower reaches; lower-most segment, immediately above confluence with Pipe Creek is ditched and non-functional	Medium	Restoration opportunities exist within disturbed mountain bike crossing locations	24.1metres HWM (left bank) 22.9 metres ToB (left bank) 31.7 metres HWM (right bank) 30 metres ToB (right bank)	Yes	Minimal impacts to Trib.R's left bank are proposed with near full EDP setbacks along remainder of entire length.
3	Trib.W	* average channel width of 0.98 metres * no tailed frogs or fish identified * minimal flow conditions * no connection above Cypress Bowl Road	Tributary W is a short reach segment that is functional, whose channel begins as headwater seepage from Cypress Bowl Road; channel ill defined in this upper-most reach	Low	A creation of a stormwater pond near the headwaters is being assessed.	10 metres HWM 9.6 metres ToB	Yes	A minor infringement is proposed within the EDP setbacks near an ill defined portion of the creek channel. A 10 metre RAR setback is proposed and is sufficient to maintain the form, function and condition of the watercourse.
4	Trib. N	* average channel width of 3.5 metres * sparse tailed frog populations identified in channel * intermittent flow conditions * lower end channelized along Mulgrave access road	Tributary N arises in a small catchment above CBR; it is functional throughout its length, consisting of a very small narrow channel, with minor intermittent flows; A3/4b with some segments of B3/4, with a narrow riparian plant community; forms a confluence with Tributary M; some disturbance arising from remnant logging roads in mid-reaches; consisting of A3/4b and B3/4 mix	High	Potential to increase riparian zone with removal of paved road above Mulgrave School	16.8 metres HWM 15 metres ToB	Yes	A minimum of 15 metres ToB is being proposed with 30 metre setbacks to the north of Trib.L confluence.
4	Trib. P	* average channel width of 3.37 metres * no tailed frogs or fish found in Trib.P * intermittent flow conditions	Tributary P arises above CBR and is functional throughout its length, consisting of a mix of A3/4b and B3/4, with small step pools; there are a few segments in the middle reaches where remnant logging roads have failed, causing minor slumps; the channel is narrow with a narrow band of riparian vegetation	Medium		10.1 metres HWM (right bank) 8.4 metres ToB (right bank) 10.1 metres HWM (left bank) -11.2 metres ToB (left bank, localized topographic anomaly)	Yes	Development has been moved towards trib P to minimize the impact on the frog bearing stream Trib N. A 10 metre setback from HWM is proposed for Trib.P
4	Trib.PP	* average channel width of 1.1 metres * no tailed frogs or fish identified * minimal flow conditions * originates within study area	Tributary PP is functional, given that it has virtually no catchment and the minor flows reflect the ground water discharge and interflow arising from logging roads and seepage from depressional wet zone; Tributary PP consists of a mix of minor channels; remnant wetland arising from former log sorting landing	Low	Stormwater wetland opportunities are being assessed west of trib. PP	10 metres HWM 9.4 metres ToB	Yes	Development has been moved towards trib PP to minimize the impact on the frog bearing stream Trib N. A 10 metre setback from HWM is proposed for Trib.PP
4	Pipe Creek	* average channel width of 3.6 metres * no tailed frogs or fish identified * near year round flow conditions * substrates dominated by cobble/boulder * large tract of green space between Pipe Creek and Cave Creek provides connectivity in an east/west alignment and riparian areas provide connections in a north/south configuration	Pipe Creek is functional; however, it consists of narrow channel, entrenched within a gully in the lower reaches; mix of B3/4 and A3/4b; upper reach dominated by deciduous regeneration below Cypress Bowl Road, with conifers in the lower reaches; there is a former logging road that consists of a landscape change point, with the upper reaches not well entrenched and some channel braiding; the lower-most segment of the stream, from the confluence with tributary R, to the mouth of the culvert routing flows under CBR, is non-functional	High		31.8 metres HWM (right bank) 30 metres ToB (right bank) 16.8 metres HWM (left bank) 15.0 metres ToB (left bank)	Yes	Development setbacks proposed are varied and are no closer than 15 metres of ToB, as no fish or frogs reside in this system, and development will lie outside of any geotechnical areas of concern.
4	Trib. R	* average channel width of 2.5 metres * no tailed frogs or fish identified * intermittent flow conditions * lower end channelized into Pipe Creek	Upper reaches of tributary R, above CBR, are non-functional, consisting of downcut, deeply entrenched channels/ditches; damage arising from failing logging roads and recreational trails through the stream channel, it evidences extensive braiding and avulsions; flows are irregular; reaches downstream of CBR are functional, with significant logging LWM and blow-down; the channel consists of A3/4b with some B3/4; deeply incised and entrenched in lower reaches; lower-most segment, immediately above confluence with Pipe Creek is ditched and non-functional	Medium	Restoration opportunities exist within disturbed mountain bike crossing locations	31.7 metres HWM 30 metres ToB	No	No impacts to Trib R are proposed in Area 4

Rodgers Creek ADP Stream Summary Table

Development Area No.	Stream Name	Biophysical Characteristics	Proper Functioning Condition Description	Stream Ranking	Restoration Opportunities	Closest Point to Potential Development Area	EDP Setback Infringement	Stream Setback Rationale
5	Westmount Creek	* average channel width of 5.44 metres * no tailed frogs or fish identified * intermittent flow conditions * large watershed * large tract of green space between Pipe Creek and Cave Creek provides connectivity in an east/west alignment and riparian areas provide connections in a north/south configuration	Westmount Creek is functional throughout its length, with an extensive catchment above CBR; this channel is an A1/2/3, with steep reaches that have evidenced some slumping and blow down and that has steep chute-like sections in the lower reaches	Medium	Restoration opportunities exist within disturbed mountain bike crossing locations	No Impacts	No	No impacts to Westmount Creek.
5	Trib. U	* average channel width of 1.15 metres * no tailed frogs or fish identified * minimal flow conditions * originates within study area, 150 metres in length	Tributary U is functional, given that it has virtually no catchment and the minor flows reflect the ground water discharge and interflow arising from logging roads and seepage from depressional wet zone; Tributary U consists of a mix of minor braided interrupted channels, with a remnant headwater wetland arising from former log sort landing; lowest-most segment is ill-defined and drains into CBR drainage ditch	Low	Potential to construct a large wetland headwater pond which could also be used for biofiltration purposes for the development pod above.	No Impacts	No	No impacts to Trib.U
5	Cave Creek	* average channel width of 3.76 metres * no tailed frogs or fish identified * intermittent flow conditions * braided and unconfined between Cypress Bowl Roads * large tract of green space between Pipe Creek and Cave Creek provides connectivity in an east/west alignment and riparian areas provide connections in a north/south configuration	Cave Creek is functional throughout its length, except at the lowest segment where it flows into the culvert routing its flows under CBR; this channel is also an A1/2/3; there are, in the lower reaches, braided channels arising from historical slope failures, leaving multiple thread channels, that reconverge immediately above CBR; these creek channels have steep chute-like sections in the lower reaches; there is significant logging LWD and some blow down throughout the channels	Medium		11.3 metres HWM 9.4 metres ToB	Yes	A minor infringement within the EDP setbacks is proposed and is offset by the large contiguous riparian area to the west and south.
5	Trib VV	* average channel width of 1.5 metres * no tailed frogs or fish identified * intermittent flow conditions	Tributary VV is functional, except in that segment immediately above CBR; this channel is narrow, with segments of A3/4b with some B3/4; narrow riparian zone and intermittent flows	Low		No Impacts	No	No impacts to Trib.VV.
6	Trib R	* average channel width of 2.5 metres * no tailed frogs or fish identified * intermittent flow conditions * lower end channelized into Pipe Creek	Upper reaches of tributary R, above CBR, are non-functional, consisting of downcut, deeply entrenched channels/ditches; damage arising from failing logging roads and recreational trails through the stream channel, it evidences extensive braiding and avulsions; flows are irregular; reaches downstream of CBR are functional, with significant logging LWM and blow-down; the channel consists of A3/4b with some B3/4; deeply incised and entrenched in lower reaches; lower-most segment, immediately above confluence with Pipe Creek is ditched and non-functional	Medium	Restoration opportunities exist within disturbed mountain bike crossing locations. Headwater wetland opportunity presently being assessed.	10 metres HWM 9.4 metres ToB	Yes	An infringement within the EDP setbacks is proposed on the west side, however the proposed setback is sufficient to maintain the form, function and condition of the watercourse.
6	Westmount Creek	* average channel width of 5.44 metres * no tailed frogs or fish identified * intermittent flow conditions * large watershed * large tract of green space between Pipe Creek and Cave Creek provides connectivity in an east/west alignment and riparian areas provide connections in a north/south configuration	Westmount Creek is functional throughout its length, with an extensive catchment above CBR; this channel is an A1/2/3, with steep reaches that have evidenced some slumping and blow down and that has steep chute-like sections in the lower reaches	Medium	Restoration opportunities exist within disturbed mountain bike crossing locations	16.5 metres HWM (left bank) 12.4 metres ToB (left bank) 31.4 metres HWM (right bank) 30 metres ToB (right bank)	Yes	A minor infringement within the EDP setbacks is proposed on the east side, however the proposed setback is sufficient to maintain the form, function and condition of the watercourse.
6	Cave Creek	* average channel width of 3.76 metres * no tailed frogs or fish identified * intermittent flow conditions * braided and unconfined between Cypress Bowl Roads * large tract of green space between Pipe Creek and Cave Creek provides connectivity in an east/west alignment and riparian areas provide connections in a north/south configuration	Cave Creek is functional throughout its length, except at the lowest segment where it flows into the culvert routing its flows under CBR; this channel is also an A1/2/3; there are, in the lower reaches, braided channels arising from historical slope failures, leaving multiple thread channels, that reconverge immediately above CBR; these creek channels have steep chute-like sections in the lower reaches; there is significant logging LWD and some blow down throughout the channels	Medium	Restoration opportunities exist within disturbed logging road alignments	11.3 metres HWM (west trib) 9.8 metres ToB (west trib) 13.6 metres HWM (east trib) 13.6 metres ToB (east trib)	Yes	A minor infringement within the EDP setbacks is proposed on the west channel within previously disturbed road crossing areas. The reduced setback proposed is sufficient to maintain the form, function and condition of the watercourse.
6	Cave Creek West	* average channel width of 1.64 metres * no tailed frogs or fish identified * intermittent flow conditions * lower portion of channel within powerline ROW, and subject to a managed riparian.		Low	Restoration opportunities exist within three old logging road crossings and an area where the watercourse has avulsed onto a trail.	10 metres HWM 9.8 metres ToB	Yes	30 metre setback provided along entire length, except where the stream flows within the Hydro ROW, as the riparian zone is permanently managed due to the powerlines.

Note: This Summary Matrix of Watercourses and Conservation Areas provides a detailed analysis of each watercourse and associated conservation areas to direct future detailed development planning and design. This table is in the process of receiving final review by District Staff.

Appendix C - Green Building Strategy

Green Building Strategy

The landowners have committed to a Green Building Strategy that reduces energy and water consumption, reduces greenhouse gas emissions, enhances sustainability and creates a healthy living environment. This strategy includes the following.

> *Green Building Standards*
- o Committed to a minimum of LEED™ (Leadership in Energy & Environmental Design) Canada Silver equivalency for multi-family concrete buildings.
- o Committed to a minimum of BuiltGreen Silver for wood-frame construction (e.g. single family homes, duplexes and wood-frame townhomes).
- o Committed to exceeding performance standards set by new BC Green Building Code.
- o Exploring UBC's Residential Environmental Assessment Program (REAP) Silver level as a complementary standard for wood-frame construction.

> *Energy Conservation*
- o Passive solar design, natural ventilation and daylighting through site and building design, e.g., single loaded apartment buildings with more solar access and natural air circulation
- o Minimum EnerGuide Rating of 77 for all wood-frame construction and ASHRAE 90.1 (2004) for all multi-family buildings
- o Reduce design energy cost by 25% as compared to the energy cost of the ASHRAE 90.1 (2004) reference building for all concrete buildings
- o Minimum R40 for roof insulation
- o Minimum R20 for exterior wall insulation for non-glazed areas
- o Minimum R20 for floors above non-heated parkade areas
- o Energy Efficient Windows – all windows to be Energy Star-rated
- o Energy Efficient Light Fixtures – lighting power densities to meet ASHRAE recommendations
- o Energy Efficient Appliances – all appliances to be Energy Star-labeled
- o Energy Efficient Heating & Cooling systems – high efficiency furnaces, boilers and hot water heaters
- o Provide real-time Energy Meters ('Smart Meters') in all units
- o Provide Energy Star-labeled programmable thermostats
- o Minimum of 25% of all light fixtures to be fluorescent, compact fluorescent or LED in apartment buildings
- o Non-incandescent lighting (e.g., fluorescent, compact fluorescent or LED) to be provided in all common areas
- o Light Pollution to be reduced
- o Considering heat recovery systems (HRV) where appropriate

> *Water Conservation*
- o All units to have individual water meters to encourage conservation
- o The use of municipally provided potable water will be reduced by 30% for concrete multi-family buildings (not including irrigation) compared to baseline use
- o Water-efficient fixtures will be used:
  - Dual-flush toilets
  - Low flow faucets with aerators in all bathroom and kitchen sinks
  - Low flow showerheads
- o Dishwashers must be water efficient (less than 26L per normal wash cycle)
- o Clothes Washers must be water efficient (max. 62 L per standard cycle)
- o Capture rainwater in cisterns for irrigation, where feasible
- o Water-efficient landscaping will be installed
  - Use Drought-tolerant plants
  - Use Native plants
  - Irrigation systems, if required, shall be temporary (removed after planting is established) or will include an automated controller, rain or soil sensors and a pressure regulator

> *Green Roofs & Terraces*
- o Use Energy Star compliant reflective and high emissivity roofing for 75% of the roof surface to reduce heat islands to minimize the impact on the microclimate and habitat, where it is not in conflict with the objective of minimizing visual impact
- o Extensive green terraces will be provided in all concrete multi-family buildings, if and as allowed by HPO and insurance providers
- o Consider green roofs where practical and if and as allowed by HPO and insurance providers

> *Indoor Environmental Quality*
- o Use only low-emitting adhesives, sealants and sealant primers
- o Use only low-emitting paints and coatings
- o Use only low emitting floor covering systems
- o Design of concrete multi-family buildings will meet requirements of ASHRAE 55, Thermal Environmental Conditions for Human Occupancy and ASHRAE 62, Ventilation for Acceptable Indoor Air Quality
- o Considering installing permanent carbon dioxide (CO2) monitoring systems in all units

> *Efficient Use of Materials & Resources*
- o Use a minimum of 10% (by value) of building materials or products for which at least 80% of the mass is extracted, processed and manufactured within 800 km of the project site or within 2,400 km of the project site and shipped by rail or water
- o Consider use of rapidly renewable building materials and products (e.g., wool carpet) where practical to reduce the use and depletion of finite raw materials

> *Universal Design & Accessibility*
- o 100% of all apartment units to have 'basic' accessible features
- o Up to 20% of apartment units to have optional upgrade to Level Two accessible features, fixtures and finishes during pre-sale process
- o 20% of all apartment units to be designed to meet SAFERhome standards for accessibility, children's safety, seniors and aging in place
- o Site designs to be reviewed by Crime Prevention through Environmental Design (CPTED) practitioner

> *Sustainable Design*
- o At least one LEED Accredited Professional to be part of the design team for all multi-family projects
- o An Integrated Design Process (IDP) that brings all project team members together early in the design process will be adopted for all multi-family projects.
- o All refrigeration systems will be specified with hydrofluorocarbons (HFC) refrigerants only. The use of CFC based refrigerants will not be allowed.
- o Provide an educational package to all home buyers on the use of green cleaning products, recycling guidelines, the green features of their building and home and tips on and benefits of energy, water and resource conservation
- o Exploring implementing a Building Durability Plan in accordance with CSA S478-95 (R2001) to minimize materials use and construction waste over a building's life

- On-going review of new sustainable standards, technologies and strategies including exploring avenues for "future proofing" buildings to allow for the future installation of new technologies at Development Permit Stage

Green Infrastructure

The Rodgers Creek Area will be developed with a range of green infrastructure elements including the following.

> *Low Impact Development Standards*
  - Minimize road lengths and road widths
  - Minimize creek crossings
  - Minimize use of curbs and impervious surfaces
  - Landscape with native plants
  - Exploring reduced streetlighting levels, subject to District of West Vancouver approval

> *Alternative Transportation Choices*
  - A highly connective pedestrian and cycling network that is integrated with a multi-modal street network will be provided, including:
    - a multi-use path with gentle grades (Mountain Path) that runs through all the neighbourhoods and is located within 400 m of 100% of the units
    - an extensive secondary trail network to maximize pedestrian and bicycle linkages
  - Land use has been clustered to create more transit-supportive densities
  - The road pattern has been designed to support routing of transit
  - Bicycle storage to be provided in all underground garages
  - Provide one electrical service suitable for a charging station (either an outlet or conduit to allow the future installation of an outlet) for every two parking stalls for recharging of electric vehicles or hybrid vehicle battery support
  - Exploring strategies for Traffic Demand Management to reduce single occupancy vehicle trips such as:
    - transit passes
    - co-op cars or car sharing in multi-family buildings

> *Alternative Energy Sources & Energy Conservation*
  - Committed to Ground Source Heating & Cooling (e.g., geoexchange) for all concrete buildings
  - Considering Ground Source Heating & Cooling (e.g., geoexchange) for wood-frame multi-family buildings and larger single family homes.
  - Passive measures for cooling (shading, natural ventilation, etc.) will be implemented.
  - Exploring Solar Power and Wind Power, if feasible and allowed by approving authorities
  - Exploring Sanitary Sewer Heat Recovery, if feasible and allowed by approving authorities
  - Considering, in conjunction with the District of West Vancouver, more energy efficient streetlighting

> *Integrated Stormwater Management*

  - Stormwater runoff to be managed on a lot, a neighbourhood and a watershed level
  - Protect streams, and where possible, enhance streams
  - Clustering development and conserving a majority of the site as natural open space to reduce pervious areas
  - Integrated Stormwater Management Plans (ISMP's) prepared for each watershed will be used to set targets for rainfall capture
  - Implementing Best Management Practices (BMP's) and Low Impact Development strategies (LID's), for areas that are developed, respecting steep, mountain terrain
  - Techniques and strategies for managing stormwater include rain gardens, constructed wetlands, absorbent landscaping, percolation areas, rainwater harvesting, bioswales and permeable paving

Solid Waste Management Strategy

> A construction waste management plan that diverts a minimum of 75% (by weight) of construction, demolition and land clearing waste from landfills will be implemented.

> Recycling Facilities for simplified separation and collection of recyclable materials will be provided within units, buildings and neighbourhoods. Ensure facilities are properly sized.

> Recycling of site-generated organics from construction activities to produce topsoil to be re-used on site or on nearby sites

> Plant and tree salvage from construction areas for reuse as landscaping vegetation

> Re-use of site-harvested trees for construction of homes, landscaping, trails and other amenities

> Re-use of site-generated rock for retaining walls, house detailing and trim, road and trail gravels, landscaping and creek restoration (e.g., ponds, weirs, cascades)

> Re-use excess structural fill from construction activities in close proximity to the development site. For example, excess structural fill from Area 1 is proposed to be used in Area 2 for road building and for building the McGavin Field. Exploring new sites for later phases.

> *Use of recycled materials in new home construction*
  - Committed to using recycled materials in new home construction, e.g., siding, roofing
  - Exploring use of salvaged, refurbished, or reused materials for at least 5% of the total cost of building materials

> *Use of recycled materials in new infrastructure*
  - Using recycled materials (e.g., "Rapcon") for road base and some trails
  - Exploring the use of recycled materials in asphalt paving

Liquid Waste Management Strategy

> Although planning and engineering to date has been based on connecting the sanitary sewers to the municipal sewer system, dialogue is on-going with District staff on sustainable alternatives.

Appendix D - Visual Impact Analysis

Rodgers Creek Visual Impact Analysis

The District of West Vancouver identified four viewpoints to be considered: Jericho Beach in the City of Vancouver, Siwash Rock in Stanley Park, Ambleside Beach and the Dunderave Pier. High resolution photos were taken at each location and each viewpoint location was captured using a Global Positioning System (GPS) unit.

Topographic data for the Rodgers Creek Area and surrounding lands were imported in landscape modeling software. Ground survey data was used where available within the Rogers Creek area and new LIDAR survey data was used for the surrounding lands. A base landscape model was created and calibrated to the site photography to ensure the model's visual accuracy. Additional data overlays were applied to the landscape model to provide information for modeling forest cover, roadways, creek beds, urban fabric and development openings. Preview renderings were then created and calibrated to the site photography to ensure visual accuracy.

Architectural 3D CAD models were then imported into the landscape model and 3D buildings were located and integrated into the model. Again, renderings were created and calibrated to the site photography to ensure visual accuracy.

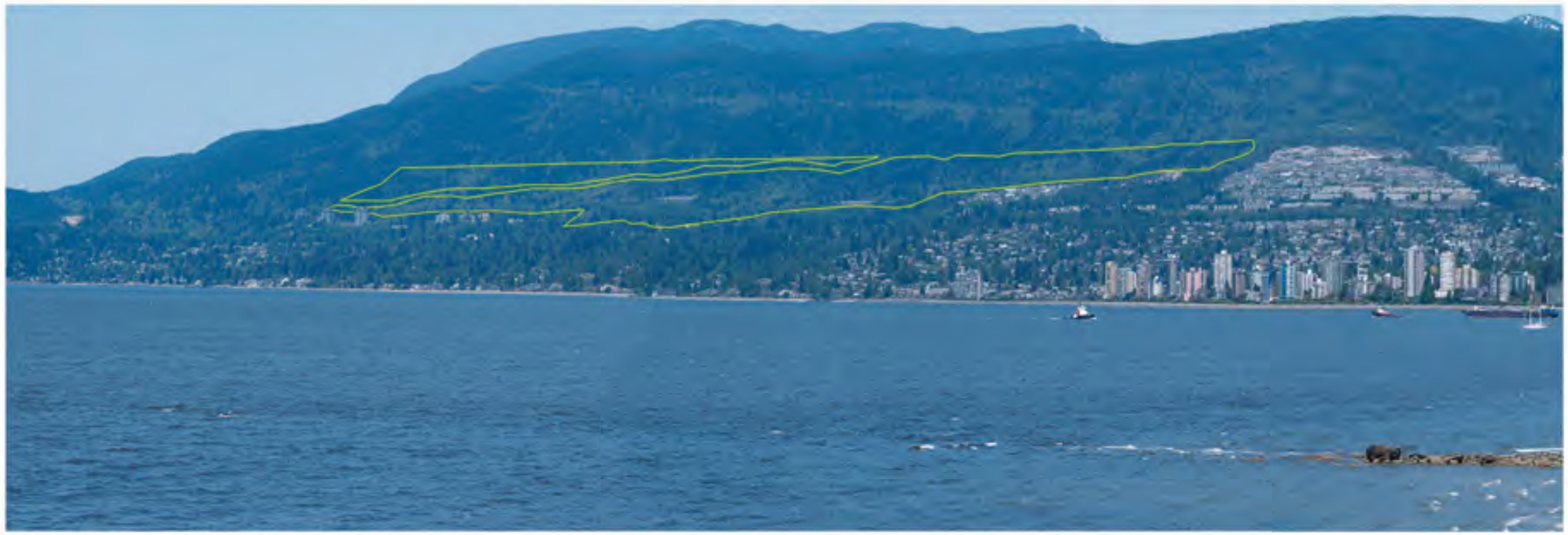
Finally, rendered images are blended with the site photography with the addition of digitized development boundaries to create merged layout images as shown.

Note: The images on these pages were prepared for the conceptual site plan of October 2007 and do not accurately reflect the changes that have been made to improve the site plan in the intervening time. This section is provided for reference only at this time. The visual impact analysis is being updated and will be presented to the public in the near future.

Rodgers Creek Development Areas

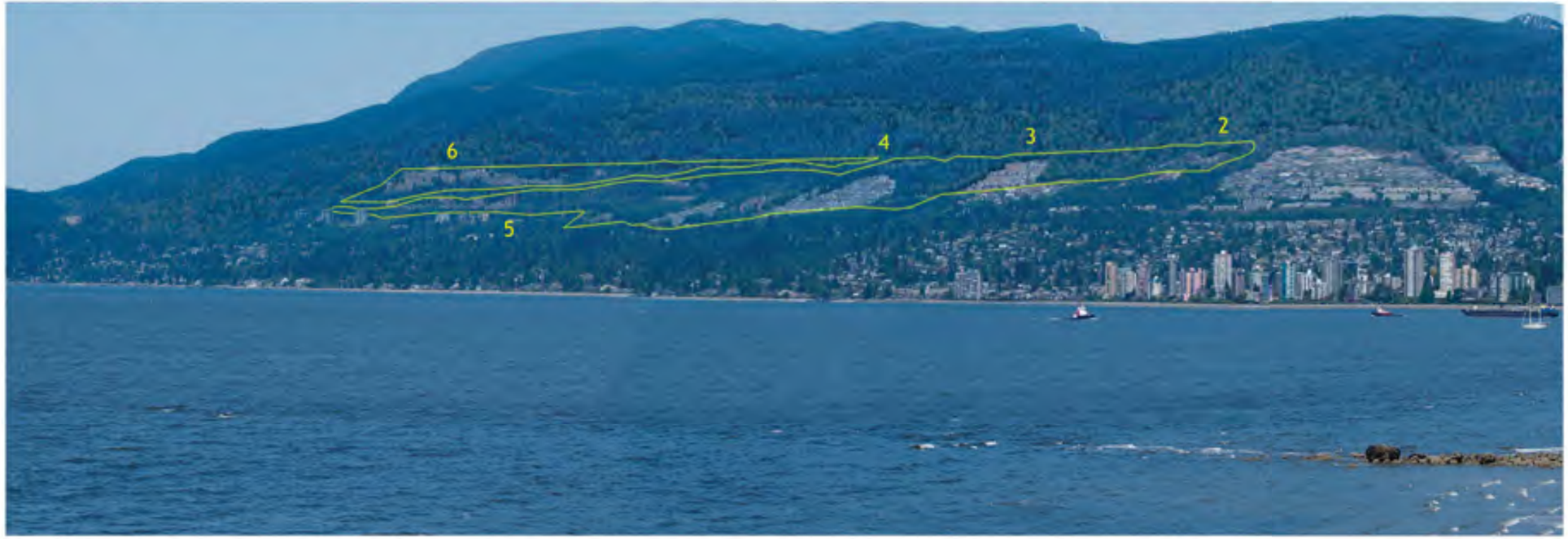
Jericho Viewpoint - Photograph of Existing Condition

Jericho Viewpoint - Model with New Development



Siwash Viewpoint - Photograph

Siwash Viewpoint - Model with New Development

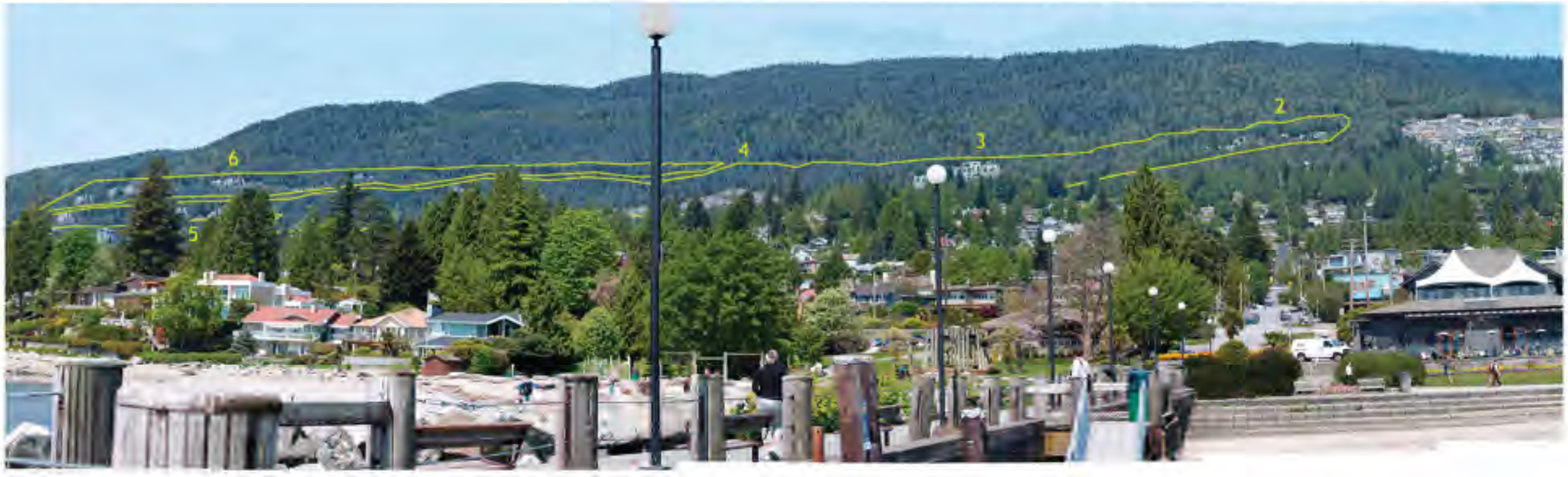


Ambleside Viewpoint - Photograph

Ambleside Viewpoint - Model with New Development

Dundarave Viewpoint - Photograph

Dundarave Viewpoint - Model with New Development



The Official Community Plan identifies the development of the "1000' Connector" as a key component of the District's overall transportation network. Within the Rodgers Creek Area, this involves the extension of the Chippendale Collector Road from Chairlift Road to Cypress Bowl Road. Many different routing options were examined in detail by District staff, the Rodgers Creek landowners, Mulgrave School and the consultants. Environmental impacts, short and long term traffic impacts, truck traffic management, traffic safety, impact on Mulgrave School and potential transit routing were all carefully considered in reviewing the various options. The preferred option was to extend Chippendale Road to the upper leg of Cypress Bowl Road as shown on the Transportation Context Plan.

Some of the key considerations that guided development of this major road network included the following:

> *Separate heavy truck traffic from residential traffic where possible*
- o Connect the Chippendale Collector Road to the upper leg of Cypress Bowl Road
- o Route heavy truck traffic westward only
- o Minimize driveway connections to the Chippendale Collector Road and Cypress Bowl Road

> *Separate Mulgrave School traffic from residential traffic*
- o Mulgrave School to retain existing access at Cypress Lane
- o Potential improvements for Mulgrave School traffic include:
  - Upgrade intersection geometrics at Cypress Lane and Cypress Bowl Road to improve traffic flow and sight lines
  - Stagger junior and senior school start times
  - Increase length of right turn storage bay

> *Provide a Road Pattern to support transit service*
- o The Chippendale Collector Road connection to the upper leg of Cypress Bowl Road facilitates a looping transit route that could service all of the Rodgers Creek Area, the District Operations Centre, the future McGavin Field, Mulgrave School and the existing Stonecliff, Deer Ridge and Taylor's Lookout developments.