PUBLIC HEARING BINDER

909 Clements Avenue

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7.1 Housing Diversity

The network of centres concept provides important opportunities for increasing housing diversity and approximately 75 - 90% of future development will be directed to the four planned centres (Chapter 2). While growth will be restricted in detached residential areas, opportunities will exist to sensitively introduce appropriate housing choices such as coach houses, duplexes and small lot infill that respect and enhance neighbourhood character. Some flexibility is encouraged to enable residents to better age in place, live closer to schools, or have a mortgage helper. **The District's objective is to provide more options to suit different residents' ages, needs and incomes.**

POLICIES

1. Encourage and facilitate a broad range of market, non-market and supportive housing

2. Undertake Neighbourhood Infill plans and/or Housing Action Plans (described in Chapter 12) where appropriate to:

    a) identify potential townhouse, row house, triplex and duplex areas near designated Town and Village Centres, neighbourhood commercial uses and public schools

    b) designate additional Small Lot Infill Areas

    c) develop criteria and identify suitable areas to support detached accessory dwellings (such as coach houses, backyard cottages and laneway housing)

3. Develop design guidelines to assist in ensuring the form and character of new multifamily development contributes to the character of existing neighbourhoods and to ensure a high standard of design in the new Town and Village Centres

4. Encourage and facilitate a wide range of multifamily housing sizes, including units suitable for families with an appropriate number of bedrooms, and smaller apartment units

5. Require accessibility features in new multifamily developments where feasible and appropriate

12.5 Consolidated List of Land Use Designations

A consolidated list of all of the land use designations used in the OCP Land Use Map (Map 2) is provided in the table below. Policies and objectives relating to these designations are provided in Parts One and Two and Schedule A of the OCP. The references to Floor Space Ratios (FSR) in the table provide guidance regarding the general massing and approximate density of development. The term "Floor Space Ratio", as used in the table, means generally the ratio of the floor area of a proposed development over the area of the lot or lots upon which the development is to be located. It does not regulate actual densities on individual lots, that being the function of the District's Zoning Bylaw. Council may, in its discretion, and with a public hearing, consider zoning bylaw amendments to permit density over and above that indicated in the table on a case by case basis where the proposed development is otherwise consistent with objectives and policies of the OCP.

RESIDENTIAL LEVEL 1: RURAL RESIDENTIAL. Areas designated for rural residential are intended for detached housing on large lots situated outside the urban boundary. The OCP does not envision further intensification of use through subdivision in this designation and/or through extension of services. Detached rural residences are generally allowed up to approximately 0.35 FSR.

RESIDENTIAL LEVEL 2: DETACHED RESIDENTIAL. Areas designated for detached residential are intended predominantly for detached housing within neighbourhoods. This designation accommodates secondary rental units such as suites or coach houses subject to the imposition and satisfaction of appropriate conditions. Detached residences (inclusive of suites and coach houses) are generally allowed up to approximately 0.55 FSR.

RESIDENTIAL LEVEL 3: ATTACHED RESIDENTIAL. Areas designated for attached residential are intended predominantly for ground-oriented multifamily housing within neighbourhoods, or as a transition between higher density sites and adjacent detached residential areas. Typical housing forms in this designation include duplex, triplex, and attached row houses up to approximately 0.80 FSR.

RESIDENTIAL LEVEL 4: TRANSITION MULTIFAMILY. Areas designated for transitional multifamily are intended predominantly for multifamily uses within or in close proximity to centres and corridors, or as a transition between higher density sites and adjacent detached and attached residential areas. This designation typically allows for a mix of townhouse and apartment developments up to approximately 1.20 FSR.

RESIDENTIAL LEVEL 5: LOW DENSITY APARTMENT. Areas designated for low density apartment are intended predominantly for multifamily housing in centres and corridors up to approximately 1.75 FSR. Development in this designation will typically be expressed in low rise apartments, but may include some townhouses. Some commercial use may be permitted at grade.

RESIDENTIAL LEVEL 6: MEDIUM DENSITY APARTMENT. Areas designated for medium density apartment are intended predominantly to provide increased multifamily housing up to approximately 2.50 FSR at strategic locations in centres and corridors. Development in this designation will typically be expressed in medium rise apartments. Some commercial use may also be permitted in this designation.

COMMERCIAL RESIDENTIAL MIXED USE LEVEL 1. Areas designated for commercial residential mixed use level 1 are intended predominantly for general commercial purposes, such as retail, service and offices throughout the District. Residential uses above commercial uses at street level are generally encouraged. Development in this designation is permitted up to approximately 1.75 FSR.

COMMERCIAL RESIDENTIAL MIXED USE LEVEL 2. Areas designated for commercial residential mixed use level 2 are intended predominantly for medium density general commercial purposes, such as retail, service and offices at limited sites within the District. Residential uses are typically expected to accompany commercial uses. Development in this designation is permitted up to approximately 2.50 FSR.

COMMERCIAL RESIDENTIAL MIXED USE LEVEL 3. Areas designated for commercial residential mixed use level 3 are intended predominantly to provide for high density uses up to approximately 3.50 FSR at limited appropriate sites in the District's Centres. Development in this designation may include residential or commercial uses which encompass retail, office and service uses, or a mix of these residential and commercial uses.

COMMERCIAL. Areas designated for commercial are intended predominantly for a variety of commercial and service type uses, where residential uses are not generally permitted. Development in this designation is permitted up to approximately 1.0 FSR.

INSTITUTIONAL. Areas designated for institutional are intended predominantly for a range of public assembly uses, such as schools, churches, recreation centres, and public buildings. Some commercial and accessory residential uses may be permitted.

INDUSTRIAL. Areas designated for industrial are intended predominantly for a range of manufacturing, warehousing, transportation, service, and port-related uses. Limited office, limited retail and residential caretaker uses may be permitted.

LIGHT INDUSTRIAL ARTISAN. Areas designated for light industrial artisan are intended predominantly for a mix of small-scale light industrial, warehouse, service, utility and residential uses up to approximately 2.50 FSR. Light industrial uses at street level are generally encouraged, and residential uses are typically expected above street level. Supportive uses including limitedoffice, and limited retail uses may be permitted.

LIGHT INDUSTRIAL COMMERCIAL. Areas designated for light industrial commercial are intended predominantly for a mix of industrial, warehouse, office, service, utility and business park type uses. Supportive uses including limited retail and limited residential uses may be permitted.

LIGHT INDUSTRIAL COMMERCIAL MIXED USE - INNOVATION DISTRICT. Areas designated for light industrial commercial mixed-use - innovation district are intended predominantly for a mix of industrial, warehouse, office, service, utility and business park type uses up to approximately 1.10 FSR. Light industrial uses at street level are generally encouraged, and commercial uses, such as retail, service and office, are typically expected above street level. Supportive uses including limited institutional, and limited recreational uses may be permitted.

LIGHT INDUSTRIAL RESIDENTIAL MIXED USE - INNOVATION DISTRICT. Area designated for light industrial residential mixed-use - innovation district are intended predominantly for a mix of industrial, warehouse, office, service, utility, and business park type uses up to approximately 1.10 FSR. Light industrial uses at street level are generally encouraged, and residential uses are typically expected above street level. Supportive uses including limited institutional, limited recreational, and residential-only uses may be permitted.

PARKS, OPEN SPACE, AND NATURAL AREAS. Areas designated for parks, open space and natural areas are intended for a range of public and private uses focussed principally on the protection and preservation of ecologically important habitat areas, the regional drinking water supply, or the provision of diverse parks, outdoor recreational, or tourism opportunities.

C.2 UPPER CAPILANO LOCAL PLAN

Upper Capilano is a mature, suburban community. Much of the existing development took place during the post war building boom between 1945 and 1960 and there has been comparatively little change since.

Some of the qualities that are special about Upper Capilano are its spectacular natural backdrop of forest and mountain; the quiet, low density, suburban character so close to downtown Vancouver; the convenience and small town atmosphere of the Village; and the safe and secure neighbourhoods.

The overall philosophy of the plan is that good maintenance of existing infrastructure and services is more important then obtaining new ones. The plan focuses on maintaining the qualities that make Upper Capilano a highly desirable community to live in and addressing those few areas where change would result in improvement. The Plan Map indicates the designated uses for each property. The objectives, policies and implementation statements will remain in effect for a period of ten years, 1999 - 2008, or until the plan is reviewed and amended by Council.

PLAN GOALS

i. Maintain and enhance the quality of the natural environment.
ii. Promote a healthy, safe and active community.
iii. Recognize and strengthen Edgemont Village as the heart of the community.
iv. Maintain the overall character of the existing single family residential neighbourhoods while accommodating in a sensitive manner a greater choice of housing types.
v. Develop a comprehensive and balanced heritage conservation program to ensure that the significant and representative heritage resources of the Upper Capilano area are conserved.

ENVIRONMENT

Natural environment is an important element in a plan for Upper Capilano as it provides the attractive backdrop views and treed character (both natural forest and urban landscaping) of the community. The creeks provide wildlife corridors (animals, fish and birds) between the mountains and Burrard Inlet. These corridors require maintenance and where possible, improvement. Natural environmental hazards exist in the community, e.g., creek flooding, debris torrents, landslides and erosion of steep slopes, which can be minimized in extent and in impact on development with appropriate human actions.

Objective 1.1 To ensure land uses respond to environmental qualities and hazards.

Policy 1.1.1 Creek ravines and steep slopes to be retained in a forested state to limit potential for floods and erosion and to protect wildlife habitat.

Implementation 1.1.1.1 Retain existing DPA designations on areas so designated in the District OCP.

Implementation 1.1.1.2 Extend in the District OCP, the areas designated as DPAs for

- protection of the natural environment
- protection of development from hazardous conditions

New areas to be designated as DPAs are shown on Detail Maps 1132, 1132a and 1133 and include all steep slopes, embankments and watercourses on both public and private property.

Implementation 1.1.1.3 Municipality to stringently enforce DPA and the Environmental Protection and Preservation (EPP) Bylaw regulations.

Implementation 1.1.1.4 Set a high priority on routine maintenance of watercourses/culverts to prevent flooding.

Policy 1.1.2 Encourage and educate residents to consider the environmental consequences of their land use actions.

Implementation 1.1.2.1 Where properties are designated as DPAs, and/or as areas protected through the EPP Bylaw all property owners should be notified annually of:

- the appropriate designation
- the limitation (if any) this designation places on property uses
- the conditions under which these uses can take place and the process for approvals
- penalties for contravention of the regulations

Implementation 1.1.2.2 Investigate the possibility of adding these DPA designations to certificates of title.

Implementation 1.1.2.3 Publicize creek names and publish a map of watersheds within Upper Capilano.

Implementation 1.1.2.4 Endorse the Storm Drain Program and encourage local groups to undertake the marking of storm drains.

Implementation 1.1.2.5 Promote partnerships with community groups to undertake community environmental projects such as fish enhancement, creek cleanup, and street tree planting. This assistance could be in the form of publicity, liaison with senior government programs, funding, equipment and/or staff assistance all within existing budgeted programs.

Implementation 1.1.2.6 Minimize fertilizers, pesticides and herbicides from sports fields and residences entering creeks especially MacKay Creek.

Policy 1.1.3 Support other jurisdictions in their efforts to enhance environmental qualities and protect the community from hazardous development.

Implementation 1.1.3.1 Endorse GVRD's green zone proposals in Upper Capilano including Capilano River Regional Park, the watershed and the area beyond the Hydro right-of-way; and encourage GVRD to acquire the remaining residentially zoned land in the Capilano River corridor north of the highway overpass to complete the Regional Park.

Implementation 1.1.3.2 Ensure the safe transportation of water treatment chemicals to the GVWD water treatment site at Cleveland Dam.

Objective 1.2 To establish a balance between environmental preservation and community use.

Policy 1.2.1 Watercourses shall be treated as environmental assets as well as public park wherever feasible.

Implementation 1.2.1.1 For MacKay Creek and its tributaries, maintaining its ability to support fish shall take precedence over public recreational use i.e. banks should retain natural vegetation and tree cover and bike use should be discouraged. Minimal paths upgrading and definition is needed to prevent the creek banks from erosion.

Implementation 1.2.1.2 Improvements on MacKay Creek at Cliffridge/Montroyal should increase riparian vegetation and discourage pedestrians and bike access to the streambed.

Implementation 1.2.1.3 Public park activities along watercourses should emphasize passive uses such as trails which require minimal clearing and disturbance.

Policy 1.2.2 Integrate green space in any redevelopment scheme.

Implementation 1.2.2.1 DPA guidelines for designated DP areas for commercial and multi-family development will include a requirement for green space.

Implementation 1.2.2.2 Green space around the perimeter of redevelopment sites will:

- incorporate public facilities e.g., benches
- tie into any adjacent public spaces
- follow a similar landscaping theme to adjacent sites where appropriate.

PARKS

Parks provide recreational opportunities for residents. They provide focal points for community activity and encourage the sense of community. Parks also contribute to the spacious, green, treed character of the community. The community preference is for improved maintenance and upgrading of existing parks rather than to incur major expenditures for new ones.

Objective 2.1 To maintain and upgrade existing park facilities.

Policy 2.1.1 Add new parks space where the opportunity arises.

Implementation 2.1.1.1 All applicants for subdivision of more than three lots are required to pay to the municipality 5% of the market value of the land proposed for subdivision, in lieu of a dedication of 5% of the property, for park purposes pursuant to the Municipal Act Section 992(2). This requirement will be waived only where the dedication of land for park purposes would implement a policy stated in this section of this official community plan.

Policy 2.1.2 Improve the path and trail system.

Implementation 2.1.2.1 Identify and define existing pedestrian and bike linkages in the community including the Trans-Canada Trail showing major paths in parks and their connections to streets by producing a map. This should also indicate which paths have benches, and which are accessible for people using wheelchairs and baby strollers.

Implementation 2.1.2.2 Add subtle signage at pathway/street connections at pathway intersections to indicate trail names and destinations.

Implementation 2.1.2.3 The locations where connections need to be improved and budgeted for in the next Five Year Capital Budget are the Eldon - upper Sunset Boulevard path[1]; the Dudley (Sunnycrest) access to MacKay Creek Park; the completion of the Mosquito Creek trail connection to the Baden Powell trail and the opening of the mid-block pathway from Lorraine Avenue to Sunset Boulevard. Furthermore, the feasibility of opening up the Emerald-Sunset path connecting Wellington-Hillcrest at Sunset should be investigated within a ten-year time frame. Standards for construction should include consideration for wheelchair accessibility (see also Implementation 5.4.1.2.).

Implementation 2.1.2.4 Unopened road and lane allowances are not to be consolidated with adjacent lots for subdivision or other purposes. Applications for permits to occupy unopened road and lane allowances will be considered for approval by Council only if they are not contrary to the public interest.

[1] This was approved by Council on June 8, 1998.

Implementation 2.1.2.5 Encroachment onto unopened road and lane allowances will be monitored annually and reported to Council with recommendations for appropriate action where the encroachments conflict with the public interest.

Policy 2.1.3 Ensure all existing areas developed and maintained for park purposes have a legal basis.

Implementation 2.1.3.1 To ensure that the following parks, creek areas and street ends are retained for parks usage they are to be rezoned to a "Parks, Recreation and Open Space" zone (current zoning in brackets) and have attached a Parks Reservation Bylaw:

- Sarita Park (RS3)
- MacKay Creek and tributaries between Malaspina - Ranger and around Montroyal Elementary School (RS3)
- Murdo Frazer Park off W. 26th Street (RS4 & PA) and the BC Hydro substation (I3).
- Dudley Park (RS3)
- Murdo Frazer trail access from Crescentview (RS3)
- Street ends at Laing Drive to Capilano (RM2 & RSMF)
- Street ends at Woods to Capilano (RM2) and Lyndene (RSMF)
- Lot 21, north end of Fairmont Road (RS3)
- street ends off Ridgewood at Monton and Bluebonnet (RS3)
- street end Emerald and Sunset (RS3)
- street end Handsworth Road at Canyon Heights School (RS3)
- street end Ayr at Ridgewood (RS3)
- all pathway allowances whether opened or unopened.

Objective 2.2 To provide for the community's present and future park needs.

Policy 2.2.1 Recognize the changing demographic structure and the changing trends in recreation demand and provision.

Implementation 2.2.1.1 Give priorities in future expenditures to facilities/uses supporting activities by all ages e.g. walking trails and benches.

Implementation 2.2.1.2 Give priority to small scale park improvements e.g. playgrounds, and basketball hoops.

Implementation 2.2.1.3 For those having special needs, integrate recreation opportunities with existing/proposed parks and recreation facilities.

Policy 2.2.2 Establish for each park its major role and future direction for park improvements (if any).

Implementation 2.2.2.1 See accompanying table.

Policy 2.2.3 Ensure existing facilities can be used by the increasingly diverse age groups and recreational interests.

Implementation 2.2.3.1 Publicize the memorial bench policy for Upper Capilano parks.

Implementation 2.2.3.2 Maintenance budgets for existing landscaping and trails should be given a high priority.

Table 2.2.2.1

PARK	EXISTING ROLE	FUTURE DIRECTION
Murdo Frazer	Predominantly natural area and trails with some community uses (pitch and putt and tennis courts)	Develop master plan and investigate options for more benches, limited expansion of pitch and putt and adding more connecting trails
Mosquito Creek	Creekside natural area with well developed trails	Add more benches
MacKay Creek	Creekside natural area with fish enhancement projects and rough trails	Purchase private property to provide a continuous trail link through park. Limit trail development to protect environmentally sensitive areas
Eldon	Active use park providing sports fields and tennis courts	Minor upgrade of basketball area; add benches; raise tennis practice wall; improve field drainage
Glenwood	Local use tot lot and tennis court	As is
Capilano	Limited use open space & picnic tables	Add signage for Park name, safety fences along side steep cliffs and improve the visibility of the park by tree thinning & pruning.
Fairmont	Local use playground	As is
Cleveland	Active use major park with sportsfield and tennis courts	As is
Grousewoods	Local use tennis and playground	As is
Sarita	Local use play equipment and pathways	As is
Malaspina	Undeveloped forest with informal trails	Add connections to the Baden Powell trail
Alpine	Local use playground	As is
Dudley (off Newmarket)	Viewpoint	Some pruning to re-establish views

Implementation 2.2.3.3 For public safety add lighting to parking lots and pathways to improve security where appropriate.

Implementation 2.2.3.4 Add more benches in Murdo Frazer and Mosquito Creek parks and at bus stops.

Policy 2.2.4 Ensure that maximum use of school sites is made to assist in remedying the lack of local park facilities.

Implementation 2.2.4.1 Work with School District 44 on maintenance and use agreements.

Implementation 2.2.4.2 Develop and implement, with School District 44, a plan for upgraded and extended recreational uses on the Canyon Heights School ground.

Implementation 2.2.4.3 Include the Handsworth Road end in an integrated plan for Canyon Heights School grounds including its current pedestrian access role..

Objective 2.3 To use parks and environmental features in defining the sense of community.

Policy 2.3.1 Publicize local community identity.

Implementation 2.3.1.1 To name pathways and new park areas after local features such as school/community facilities' names, creeks and major streets.

Policy 2.3.2 Enhance streetscapes by adding ornamental plantings and street trees.

Implementation 2.3.2.1 Add and name ornamental plantings at/close to major intersections when the opportunity arises, e.g., as part of any redevelopment.

Implementation 2.3.2.2 Publicize the District's Street Tree Master Plan and encourage community groups to undertake such street beautification.

Implementation 2.3.2.3 Encourage high standards of streetscape maintenance by presenting awards to outstanding efforts by individual residents and groups of residents.

Implementation 2.3.2.4 Promote efforts by community groups wishing to upgrade/maintain those small-scale elements of the parks system not currently budgeted for.

Implementation 2.3.2.5 Ensure that safety and accessibility are not compromised in improving streetscapes.

COMMUNITY FACILITIES & SERVICES

Community Services include social, health, educational, leisure and religious services. Even though the provision of most of these services is not a municipal responsibility, the community plan must take into account the space and location requirements for them as well as for the actual provision of the municipally funded services. The municipality also can play a role in working with community agencies and organizations to plan and co-ordinate the overall delivery of social services to the community.

Objective 3.1 To provide a full range of services in Upper Capilano to meet the needs of the community's residents.

Policy 3.1.1 Support the retention of existing services and the provision of new services in Upper Capilano.

Implementation 3.1.1.1 Encourage developers to provide space for a range of commercial, cultural and social services in Upper Capilano.

Implementation 3.1.1.2 Support the retention of health care services and clinics in Edgemont Village.

Objective 3.2 To provide public recreation, leisure and social opportunities in a cost-effective manner through the optimal use of existing facilities.

Policy 3.2.1 Properly maintain existing facilities.

Implementation 3.2.1.1 Allocate sufficient municipal funds for the maintenance of existing public facilities.

Implementation 3.2.1.2 Contribute to the maintenance of facilities and fields falling within Joint Use Agreements.

Policy 3.2.2 Optimize community use of existing public facilities.

Implementation 3.2.2.1 Continue to develop joint use agreements between the District of North Vancouver and School District 44 to allow for use of school facilities by the community, including after school hours.

Implementation 3.2.2.2 Provide adequate resources to support community use of public facilities, including schools.

Implementation 3.2.2.3 Encourage the designation of Handsworth Secondary School as a community school and pilot the use of Handsworth as a community centre within the context of the Joint Use Agreement.

Implementation 3.2.2.4 Encourage the School Board to utilize adaptable design principles when expanding existing schools, so as to accommodate community use.

Implementation 3.2.2.5 Explore ways of funding a community school coordinator to facilitate the community use of schools.

Implementation 3.2.2.6 Explore opportunities to open up fields, gymnasiums, washrooms, teachers' lounges, computer labs and home economics rooms for community use (for sports events, meetings , adult education courses, etc.).

Implementation 3.2.2.7 Work with the North Vancouver Recreation Commission, the Parks Department, School District 44 and organizations in Upper Capilano to provide recreation programs in existing public assembly facilities.

Implementation 3.2.2.8 Design new public buildings and renovate existing community buildings to accommodate multiple uses and changing uses over time.

Implementation 3.2.2.9 Recognizing the library's increasing importance as a meeting space, review its internal design to determine the potential for enlarging the meeting room.

Policy 3.2.3 Support the community use of privately owned facilities.

Implementation 3.2.3.1 Support the development of additional community uses within existing privately owned recreation, social and religious facilities.

Implementation 3.2.3.2 Require new multi-family developments to include amenities such as a multi-purpose meeting room, where appropriate, for the use of the residents of the development.

Objective 3.3 To encourage the provision of social programs and activities through all the life stages.

Policy 3.3.1 Support the development of programs for youth, seniors and specialized user groups.

Implementation 3.3.1.1 Continue to provide funding for outreach youth services, seniors' service organizations, and for specialized user groups.

Implementation 3.3.1.2 Ensure there is broad and inclusive consultation with relevant user groups when developing new programs or facilities.

Implementation 3.3.1.3 Consult with youth and service providers to explore the possibility of locating a freestanding Youth Centre at William Griffin Recreation Centre.

Objective 3.4 To ensure full access to all public facilities and services to all residents in the community.

Policy 3.4.1 Consult with the N.S. Advisory Committee on Disability Issues and other relevant user groups, when developing new facilities and services to ensure they are accessible to all residents.

Implementation 3.4.1.1 Consult with the North Shore Advisory Committee on Disability Issues and other relevant organizations when reviewing plans for public and commercial facilities, and multi-family housing.

Implementation 3.4.1.2 Evaluate plans for accessibility from the perspective of all disability groups.

Implementation 3.4.1.3 Apply accessibility guidelines for public and commercial facilities that exceed the current building code (using existing guidelines available or adapting these guidelines, in consultation with the North Shore Advisory Committee on Disability Issues and other relevant groups). These guidelines will address all disabilities.

Implementation 3.4.1.4 Review municipal signage to ensure it is clear and readable in accordance with accessible literature guidelines and allows for the inclusion of tactile signage where practical.

Implementation 3.4.1.5 Continue to consult with the public and community organizations when considering major changes to community facilities and services.

Implementation 3.4.1.6 Work with the N.S. Advisory Committee on Disability Issues, the N.S. Disability Resource Centre, the North Vancouver Recreation Commission and other relevant organizations to improve access to recreation and leisure opportunities for people with disabilities.

Policy 3.4.2 Use a range of fully accessible communication strategies to reach and involve all residents.

Implementation 3.4.2.1 Publicize events, programs and services in creative ways to people with a wide range of backgrounds and abilities and apply accessible literature standards and methods.

Implementation 3.4.2.2. Encourage the installation of assisted listening systems in public meeting places, including the Capilano Library meeting room.

Objective 3.5 To create informal opportunities for residents to meet and socialize.

Policy 3.5.1 To provide public places for informal gathering.

Implementation 3.5.1.1 The Community Planning Department will look for opportunities to provide public gathering places throughout Upper Capilano, including mini-parks or plazas, with an emphasis on Edgemont Village.

Implementation 3.5.1.2 The Community Planning Department will investigate opportunities for obtaining community amenities in Edgemont Village through the redevelopment design process, through Development Cost Charges and any future community amenity contributions. Community residents will be consulted regarding priorities, with multi-use of amenity spaces promoted wherever possible.

Implementation 3.5.1.3 Provide opportunities for socialization in outdoor community amenity areas in Edgemont village through the installation of benches, appropriate landscaping, etc.

Policy 3.5.2 Encourage the use of local parks for community events.

Implementation 3.5.2.1 The Parks Department & Recreation Commission will work with organizations in Upper Capilano to organize community days, open air festivals and other community events in the local parks.

Objective 3.6 To maintain an adequate supply of land for public assembly uses, such as schools and places of worship.

Policy 3.6.1 Existing institutional land uses, including schools and churches should be retained.

Implementation 3.6.1.1 Rezoning of Public Assembly zoned sites for other purposes will not be permitted.

Objective 3.7 To promote cultural activities and public art.

Policy 3.7.1 Look for opportunities to promote art & culture in Upper Capilano.

Implementation 3.7.1.1 Encourage the display of works from North Vancouver artists in the Capilano Library and other public buildings.

Implementation 3.7.1.2 Encourage the display of artwork from school students, both in public areas and through special school events that are open to the community.

Implementation 3.7.1.3 Examine the opportunities to obtain public art such as sculpture and artistic treatments of architectural features through the development process or donations.

Implementation 3.7.1.4 Explore opportunities for private sector and/or municipal funding for a public art component within the capital budget of any major re-development of existing publicly owned community buildings or in the construction of any additional public facilities.

Implementation 3.7.1.5 Develop a formal process for selection of public art, such as a review panel made up of local residents and art professionals.

Objective 3.8 To encourage provision of childcare at an adequate level.

Policy 3.8.1 Support the provision of highly needed childcare services in Upper Capilano.

Implementation 3.8.1.1 The District will look for opportunities to provide an additional preschool in the Grousewoods area, and additional out of school care in the Canyon Heights and Montroyal areas. The District will encourage out-of-school programs to be provided on school sites by revising zoning regulations as necessary.

Objective 3.9 To support a municipal role in providing access to communications technology such as the Internet.

Policy 3.9.1 Look for opportunities to improve access to communications technology.

Implementation 3.9.1.1 Provide the installation of fiber optics in existing public facilities and encourage it in new commercial and residential developments.

Implementation 3.9.1.2 Continue to support development of communications technology in North Vancouver schools.

Objective 3.10 To ensure that any new or redeveloped community buildings respect the character and density of the surrounding community.

Policy 3.10.1 Critical issues in the development or redevelopment of community buildings will be the density of surrounding uses, handling of traffic and parking, retention of existing views with regard to new heights of buildings, and exterior design materials and finishes.

Implementation 3.10.1.1 Follow the guidelines in the District OCP Schedule B Section 4.0 in reviewing applications for community buildings.

HOUSING AND NEIGHBOURHOODS

While maintaining the overall single family nature of Upper Capilano, housing policy responds to some anticipated changes in the specific housing needs of the community. The Plan designates the sites and conditions under which change can occur over the next 10 years. This provides the community at large with a significant degree of certainty as to the minimal likelihood of change.

Objective 4.1 To minimize overall change in character in existing low-density residential neighbourhoods.

Policy 4.1.1 No changes in zoning in the plan area except where specified in the plan.

Implementation 4.1.1.1 Rezone from RS3 to PRO the following areas:

- MacKay Creek channels between Sonora-Cliffridge and Sonora -Sarita
- Sarita Park and adjacent GVWD water tank area
- Lot 21, north end of Fairmont Road

Implementation 4.1.1.2 Rezone from RS4 to PRO areas within Murdo Frazer Park.

Implementation 4.1.1.3 Rezone from RS3 to PA the lot on the west side of Cleveland School currently used for school purposes.

Implementation 4.1.1.4 See **Objective 4.2** for other areas where rezoning may be permitted.

Policy 4.1.2 Adopt area specific (neighbourhood) zoning to ensure that any new single family housing is compatible with the housing character in the area regarding height, setbacks, garage locations, and other siting factors.

Implementation 4.1.2.1 Develop a zoning timetable for neighbourhoods which do not yet have neighbourhood zoning giving priority to the remaining areas of Highlands.

Implementation 4.1.2.2 Develop for the remaining areas of Highlands, neighbourhood zoning regulations restricting both new houses and additions to existing houses to the typical heights and massing of single family buildings in this neighbourhood.

Implementation 4.1.2.3 Change existing regulations for size, shape and siting of single-family houses in low-density multi-family zones to match regulations in adjacent single family areas.

Implementation 4.1.2.4 Amend the Zoning Bylaw regulations for the Grousewoods multi-family zones primarily occupied by single family style housing to regulate additions to existing units.

Policy 4.1.3 New development is permitted where it is already legally possible within the existing zoning and subdivision regulations and only then when it is in keeping with the character of surrounding housing.

Implementation 4.1.3.1 Consolidation of existing lots for the purpose of subdivision to a larger number of lots may be considered to be contrary to the public interest when the new lots would be out of character with the surrounding neighbourhood and may not be permitted.

Implementation 4.1.3.2 Rezoning from RS3 to a higher density RS zone to achieve a larger number of lots will not be permitted.

Implementation 4.1.3.3 In processing applications for subdivision the existing practices of requiring the submission, public review and the registration of house plans against title (Land Title Act, Section 219) will be continued.

Implementation 4.1.3.4 Where neighbourhood zoning is not yet in place, subdivision applications requiring the discretionary authority of the approving officer will be approved only if they are in keeping with the character of the surrounding community.

Policy 4.1.4 The Plan recognizes that secondary suites will provide some additional housing units throughout the community. These will respond to the community's needs for:

- income and support opportunities to enable senior residents to remain in a single family home for a longer time period.
- lower cost/smaller scale accommodation for young singles, couples and single parent families.

Implementation 4.1.4.1 The recently approved DNV secondary suite provisions regarding owner occupancy, parking and taxation are applicable to the Upper Capilano community.

Objective 4.2 To accommodate some limited options for multi-family housing.

Policy 4.2.1 The Plan makes provision for approximately 170 units (net) of new multi-family housing to be built between 1999 and 2008 or until the plan is reviewed and amended by Council.

Implementation 4.2.1.1 The attached table lists the sites designated to accommodate a total of approximately 170 net new multi-family units between 1999 and 2008 or until the plan is reviewed and amended by Council. The table also lists the appropriate density or density ranges and any site considerations specific to each site.

Implementation 4.2.1.2 New multi-family areas designated in this plan will only be rezoned for such purposes in conjunction with a development permit application.

Implementation 4.2.1.3 All multi-family areas are designated as Development Permit Areas and guidelines will be prepared to ensure that redevelopment respects the character of adjacent lower density residences minimizing impacts of overviewing and traffic flow, and from adjacent commercial sites, noise, lighting, and parking. The guidelines will also include adaptable design guidelines addressing all disabilities as well as specific provision for seniors' needs and other special needs where applicable.

Implementation 4.2.1.4 Sites specifically designed for "seniors" housing and seeking a reduction in the standard parking requirement must include an age covenant requiring one resident per household to be over age 55.

Policy 4.2.2 Accommodate some affordable and special needs housing for:

- seniors needing supportive living arrangements (congregate care)
- non-market units for low income seniors; and
- accessible units for people with disabilities.

Implementation 4.2.2.1 Encourage developers of market housing to include units for affordable and special needs groups by allowing a bonus of up to 10% of the number of units permitted under the Zoning Bylaw when at least an equal percentage of affordable or special needs housing units are included.

Implementation 4.2.2.2 Explore alternative forms of seniors' housing that bridge the gap between independent living and long term care (e.g. Abbeyfield houses) on suitable sites should they become available. Such housing should be designed to blend into the existing neighbourhood character.

Implementation 4.2.2.3 Sites including bonus provisions will be designated as a "site for affordable and special needs housing" under the provisions of the Municipal Act Section 904.1.

Implementation 4.2.2.4 Bonus arrangements will be enforced through a housing agreement between the developer and Council (under the provisions of the Municipal Act Section 905) to ensure that the benefit to the community is protected.

Objective 4.3 To retain and enhance Upper Capilano's heritage.

Policy 4.3.1 Acknowledge the Heritage Inventories (1900-1929, 1930-1965) as the basis for Upper Capilano's Heritage Management Plan.

Implementation 4.3.1.1 Support updating the heritage inventory every 5 years to keep it current and relevant for Upper Capilano.

Implementation 4.3.1.2 Expand the heritage inventories to include significant monuments, structures and archaeological resources.

Implementation 4.3.1.3 Complete the work of the Heritage Landscape Inventory, evaluate significance of resources in Phase 1, set a strategy for preservation for Upper Capilano.

TABLE 4.2.1.1 - UPPER CAPILANO REDEVELOPMENT SITES (Including amendments in Bylaws 7223, 7241, & 7322)

Address	Existing	Proposed		Unit Type	Considerations
		Zone Range[1]	Unit Numbers[2]		
Site 1A 3201 Edgemont	1 house on 1 lot	CD	20	Low Rise apts. (average unit size a maximum of 900 sq.ft.). Minimum of 50% units to be 1 bedroom	• Complementary design on the Connaught Cres. frontage required for Sites 1 & 1A • Seniors' orientation & age covenant required • Acknowledge site relationships with slope & church • No commercial use
Site 1 3115 Crescentview	1 house on 2 lots	RL3-RL2	25	Low Rise apts (a maximum unit size of 900 sq.ft.)	• Complementary design on the Connaught Crescent frontage required for Sites 1 & 1A. • Seniors orientation and age covenant preferred • Acknowledge site relationships with slope • Minor commercial use OK • Height an issue on SW lot line • Predominantly 1 bedroom units
Site 2 1055-1071 Ridgewood 3230 Connaught 3260 Edgemont	2 duplexes & 2 houses (6 units) on 4 lots Supermarket Medical clinic	Comprehensive Development Zone	75	Mixture of apts. (1-2BR), small townhouses, and stacked townhouses	• Ridgewood properties to be consolidated with SuperValu property • Preferred scheme is one comprehensive development, but clinic site could be redeveloped separately
Site 3 3065 Capilano Road 3105 Capilano Road 3115-3175 Capilano Crescent	1 house on 3 lots 1 house on 1 lot & 4 houses on 4 lots	RM3	50	Townhouses Or townhouse and apartment mix	• Access to Capilano Crescent only • Site consolidation necessary to design appropriate access to Capilano Cres. • Adjacent to multi-family • Empty nester orientation preferred over seniors orientation • Site limited by steep bank. Density to be calculated on area above top of bank ONLY. • Impact of redevelopment on single family lots to the north needs to be addressed during the rezoning process.
Site 4 3759-85 Edgemont Blvd.	8 units in 4 buildings	RM2	15[3]	Townhouses	• Building transition, siting, heights and landscaping critical considerations especially along west site line (adjacent single family)
Site 5 3431 Norcross	1 house on large lot	RM2	7	Townhouses	• Abuts RM2 on 2 sides • Could be subdivided into 3 lots • Frontage appearance should take single family across the street into account
Site 6 4650 & 4670 Capilano Road	2 houses on 2 large lots	RM3	17	Townhouses or townhouse and apartment mix	• Site consolidation preferred for single access to Capilano Road • Abuts commercial and RM3 townhouses • Design considerations critical on south and east where site abuts single family
Total (gross)			209 gross		
Total (net), i.e., deducting existing housing to be demolished	25 units		184 net		• Additional units possible if rebuilding on another commercial site occurs and includes apartments on upper floor

[1] Note: Comprehensive Development zones will be used in the rezoning of the six sites to meet the intent of use, density and design guidelines in the Local Plan.
[2] Note: all site unit totals need to be confirmed by detailed site survey.
[3] Note: Actual construction is 14 units.

Implementation 4.3.3.3 Produce walking tour guide of Capilano Highlands (significant "modern" homes by Thom, Erickson, Hollingsworth, Lewis Construction, modernist churches, "garden city" vision for Edgemont Village).

Implementation 4.3.3.4 Support and expand role of heritage in public events (North Shore Heritage weekend, Edgemont Village festival, etc.).

Implementation 4.3.3.5 Consider events/programs at Upper Capilano's schools related to the heritage of the area.

TRANSPORTATION AND UTILITIES

A road network has two principal functions: moving people and goods and the provision of access and other services (water, sewer, hydro etc.) to properties. A good street system balances the efficiency of vehicle routing with the protection of neighbourhood liveability and environmental integrity.

Although the configuration of the road network in Upper Capilano is mostly dictated by the physical terrain and historic development pattern it is generally adequate for present traffic needs, but improvements are required for non vehicular circulation.

All areas within Upper Capilano are fully serviced with power, gas, water, sewer and storm drainage etc. and capacity is adequate for anticipated future demands. All properties are below the 320-metre (1,050 foot) contour servicing limit for provision of water.

Objective 5.1 To maintain a safe and efficient vehicle circulation network.

Policy 5.1.1 Periodic reviews of the District's network of open roads and their designations in Upper Capilano will be undertaken to ensure its continuing validity.

Implementation 5.1.1.1 The Traffic Safety Committee will be requested to recommend appropriate traffic calming or speed monitoring and control options for Highland Boulevard including a school speed zone at Canyon Heights School.

Implementation 5.1.1.2 To facilitate more efficient traffic flow in Edgemont Village, a one-way circulation system through the lanes and Connaught Crescent will be implemented.

Policy 5.1.2 Public ownership of unopened road allowances will be retained to maintain future options for road or trail links.

Implementation 5.1.2.1 Unopened road allowances are considered part of the street classification system for purposes of the periodic review referred to in Policy 5.1.1.

Objective 5.2 To effectively segregate local and non-local traffic flows.

Policy 5.2.1 Local safety issues such as traffic calming, stop signs etc. should be addressed through the Neighbourhood Traffic Control Program.

Implementation 5.2.1.1 The Neighbourhood Traffic Control Program is initiated upon the request of residents of an area in question and is applicable only to local roads.

Implementation 5.2.1.2 The RCMP will consider conducting a "Speed Watch" operation if requested by neighbourhood residents.

Policy 5.2.2 The volume of through traffic on local roads is minimized by ensuring logical routes of collector and arterial roads are built.

Implementation 5.2.2.1 The Provincial Ministry of Highways will be requested to construct a frontage road along the Upper Levels Highway between Lloyd Avenue and Capilano Road when improvements to the Highway interchange are made.

Objective 5.3 To reduce dependency on the automobile through conveniently accessible public transit service.

Policy 5.3.1 Transit routes should serve North Shore destinations in addition to downtown and commuter destinations.

Implementation 5.3.1.1 Once the Greater Vancouver Transportation Authority is operational, they will be requested to consider the following transit priorities: an east-west route north of Highway 1 connecting Upper Capilano to Lynn Valley; express service along Highway 1 between Horseshoe Bay and Phibbs Exchange with stops at the major highway interchanges; a direct route between Edgemont Village and Lonsdale Quay; and, extension of the hours of service to downtown until 7:00 PM on the 246 route.

Policy 5.3.2 All homes should be located within walking distance of a bus stop.

Implementation 5.3.2.1 The GVTA will be requested to investigate the utilization of small, mini-buses for route service along collector roads.

Policy 5.3.3 Public transit should be barrier free.

Implementation 5.3.3.1 The GVTA will be requested to review the fare structure of zone rates to consider if transit demand to downtown is inadvertently discouraged.

Implementation 5.3.3.2 The GVTA will be requested to ensure that all bus service to Upper Capilano is wheelchair accessible and the Municipality will continue with its program of improving the accessibility of bus stops.

Implementation 5.3.3.3 An inventory will be undertaken to ensure all bus shelters are barrier free, adequately lit, served with sidewalks and pedestrian crossing and display transit schedule information.

Objective 5.4 To provide safe and convenient pedestrian linkages throughout the community inter-connecting all neighbourhoods and Edgemont Village.

Policy 5.4.1 Pedestrian routes should be direct, extensive and as fully accessible as possible.

Implementation 5.4.1.1 A systematic review of all unopened road and pathway allowances will be undertaken to determine the feasibility of installing or improving pedestrian pathways where key linkages to other parts of the pedestrian system would be provided.

Implementation 5.4.1.2 Where possible pedestrian pathways should be constructed to be wheelchair accessible including the provision of ramps and tactile indicators.

Implementation 5.4.1.3 In accordance with Pedestrian Access Guidelines and Standards, conduct an inventory of older sidewalks to identify and budget a program of provision of appropriately designed curb cuts.

Policy 5.4.2 Sidewalks should be provided on both sides of arterial streets and on at least one side of collector streets.

Implementation 5.4.2.1 A prioritized sequence of in-fill sidewalk provision will be phased and budgeted by the Engineering Department to meet service levels for arterial and collector streets.

Policy 5.4.3 Main access routes abutting schools and all bus stops should be serviced with sidewalks.

Implementation 5.4.3.1 A review will be undertaken of the inventory of sidewalks along bus routes and at schools with deficiencies being identified and included in the program of in-fill sidewalk provision noted above (Implementation 5.4.2.1).

Policy 5.4.4 All new multi-family, commercial and public assembly developments are required to install sidewalks on abutting public streets.

Implementation 5.4.4.1 Sidewalk provision at the applicant's expense will be made a condition of approval at the development permit or rezoning stage as appropriate.

Objective 5.5 To encourage the use of bicycles for recreation and travel to and from work and school without compromising pedestrian safety.

Policy 5.5.1 Safe bicycle routes should be available to and from Edgemont Village, Lions Gate Bridge, Marine Drive and Lonsdale Avenue.

Implementation 5.5.1.1 The Bicycle Master Plan recommendations will be implemented as applicable to Upper Capilano.

Implementation 5.5.1.2 It is recommended that Capilano Road and Sunset Boulevard be designated as a bike route in the Bicycle Master Plan.

Implementation 5.5.1.3 It is recommended that a dedicated bike lane be provided on Capilano Road.

Policy 5.5.2 Bicycle racks should be widely available.

Implementation 5.5.2.1 Bike racks will be installed on each block of Edgemont Boulevard within the Village.

Implementation 5.5.2.2 The provision of bicycle racks is to be required as a condition of all commercial and multi-family development.

Implementation 5.5.2.3 BC Transit will be requested to experiment with the provision of bicycle racks on buses.

Objective 5.6 To maintain an efficient system of streets and utilities without environmental degradation or detraction from the streetscape.

Policy 5.6.1 Services and utility connections should be as unobtrusive as possible.

Implementation 5.6.1.1 Electrical and communications services to new development will be placed underground.

Implementation 5.6.1.2 Electrical transformers, connection boxes, gas meters and other similar items of utilities infrastructure shall be located and appropriately screened to minimize their visibility.

Implementation 5.6.1.3 Relocating hydro lines underground shall be considered prior to any installation of new sidewalks.

Implementation 5.6.1.4 Request BC Hydro to discontinue the use of orange coloured sodium vapour streetlights replacing them with pedestrian-friendly white coloured lights.

Policy 5.6.2 Regular inspection and maintenance of municipal infrastructure will be undertaken.

Implementation 5.6.2.1 Catch basins and major culverts will be regularly monitored for debris accumulation.

Implementation 5.6.2.2 A review of pavement condition will be undertaken and a prioritized program of street repair drawn up accordingly.

EDGEMONT VILLAGE

Feedback from Upper Capilano residents clearly indicates they wish to preserve the small town character and charm of the Village. Since modern commercial buildings tend to be substantially larger and bulkier than the highly valued eclectic mixture of one and two storey buildings existing in the Village today, care must to be taken to ensure new developments are sympathetic in character with existing structures. The surrounding low density residential neighbourhood contributes significantly to the overall ambiance of the Village. There is strong support for maintaining the present boundary of the commercial core as it is and for paying special attention to building heights and massing when adjacent to single family residences or when significant view corridors would be affected.

Objective 6.1 To retain the compact physical form of Edgemont Village.

Policy 6.1.1 No expansion of the existing commercial boundaries of the Village will be undertaken during the term of the plan.

Implementation 6.1.1.1 The supply and demand for commercial land will be monitored periodically.

Policy 6.1.2 Use project design and site planning to emphasize the entry points at Highland Boulevard, West Queens Road and Ridgewood Avenue.

Implementation 6.1.2.1 The Edgemont Village Development Permit Area establishes a design concept to co-ordinate the siting of buildings, landscaping, entrance signage, open space and public amenities.

Objective 6.2 To encourage the continuation of a practical variety of commercial shops and services.

Policy 6.2.1 Support a healthy business climate conducive to small, independent merchants.

Implementation 6.2.1.1 A review of the permitted commercial uses in the Village will be undertaken in consultation with the business community and local residents to determine if changes are warranted.

Implementation 6.2.1.2 Consolidation of properties will only be permitted if it is consistent with **Policy 6.2.1**.

Policy 6.2.2 Support the retention of medical/dental services and a supermarket within the Village.

Implementation 6.2.2.1 A comprehensive development zone for the Ridgewood/Edgemont entrance property will include provision for medical/dental offices (8,000 – 12,000 square feet) and a supermarket (10,000 – 15,000 square feet).

Objective 6.3 To accommodate some housing in mixed use developments in a creative and sensitive way.

Policy 6.3.1 Encourage new developments in Edgemont Village to include apartments built over top of commercial space.

Implementation 6.3.1.1 Evaluation of mixed use projects will include consideration of: compatibility with adjacent residential neighbourhood, inclusion of a mix of unit sizes, suitability for seniors and empty nesters, and accommodation of home based business and live/work arrangements.

Implementation 6.3.1.2 At the development permit stage, provision of public open space such as small courtyards or rooftop gardens and other comparable amenities will be provided.

Objective 6.4 To identify and protect key view corridors.

Policy 6.4.1 Mountain views should be preserved through appropriate siting of buildings and by stepping back the second and third storeys.

Implementation 6.4.1.1 The Zoning Bylaw is to be amended to incorporate the height envelope guidelines specified in Figure 2 of the development permit area design guidelines.

Implementation 6.4.1.2 Second and third storeys, where permitted, should be stepped back from the first storey to maintain views and avoid shadowing at the street.

Implementation 6.4.1.3 Building site coverage may be varied at the development permit stage to provide additional on-site public open space or to preserve view corridors through height reductions.

Objective 6.5 To foster an interesting pedestrian environment and maintain a human scale in the relationship of buildings to the street.

Policy 6.5.1 The height of new buildings is generally limited to two storeys with exceptions for up to three storeys as noted in Figure 2 of the development permit area design guidelines.

Implementation 6.5.1.1 Building height is regulated by the Zoning Bylaw and development permit area guidelines.

Policy 6.5.2 Public initiatives and private development should be co-ordinated to better achieve an attractive and interesting streetscape.

Implementation 6.5.2.1 A municipal beautification strategy will be developed and budgeted according to the plan guidelines as part of a co-ordinated program of public improvements, private landscaping and amenity provision requirements.

Implementation 6.5.2.2 Design guidelines include small courtyards, seating areas, attractive street lighting, and a co-ordinated paving scheme. Weather protection includes overhangs, canopies, awnings or colonnades. Other amenities such as street trees, street furniture, public art, planters, flower baskets, benches and other amenities may also be provided.

Implementation 6.5.2.3 Commercial buildings must generally be sited at or near the front property line with parking provided at the rear. Buildings must retain small storefronts, or the appearance of small storefronts, with display windows and recessed shop entrances.

Implementation 6.5.2.4 Front entrances to commercial buildings must be fully accessible for persons with disabilities.

Objective 6.6 To encourage an eclectic but co-ordinated mix of building styles.

Policy 6.6.1 Building design guidelines do not include a specific architectural theme but building design should be complementary to the adjacent buildings.

Implementation 6.6.1.1 Building form, textures, materials, colour scheme and landscaping should reflect continuity with newer neighbouring development. Traditional looking building materials such as wood, brick and stone are encouraged for exterior use.

Implementation 6.6.1.2 Roofs should be sloped on multi-storey buildings with upper storeys stepped back and built into the roofline.

LAND USE DESIGNATIONS

These are the definitions for the designations shown on the Plan Map. This legend and the map must be used in conjunction with the relevant text to determine the exact potential for any site.

RESIDENTIAL: Areas presently developed or to be developed for residential housing at various densities.

- Detached Residential — Areas intended predominantly for detached single family dwellings at densities of 30 units or less per hectare (12 units or less per acre).

- Ground Oriented Residential — Areas intended predominantly for attached housing units with grade level access at densities of 45 units or less per hectare (18 units or less per acre).
- Low Rise Residential — Areas intended predominantly for low-rise apartments at densities of 140 units or less per hectare (55 units or less per acre).

INSTITUTIONAL: Existing sites for schools, churches, theatres, recreation centres and public buildings.

COMMERCIAL: Existing and proposed sites suitable for a range of local and community retail, office, service and residential uses.

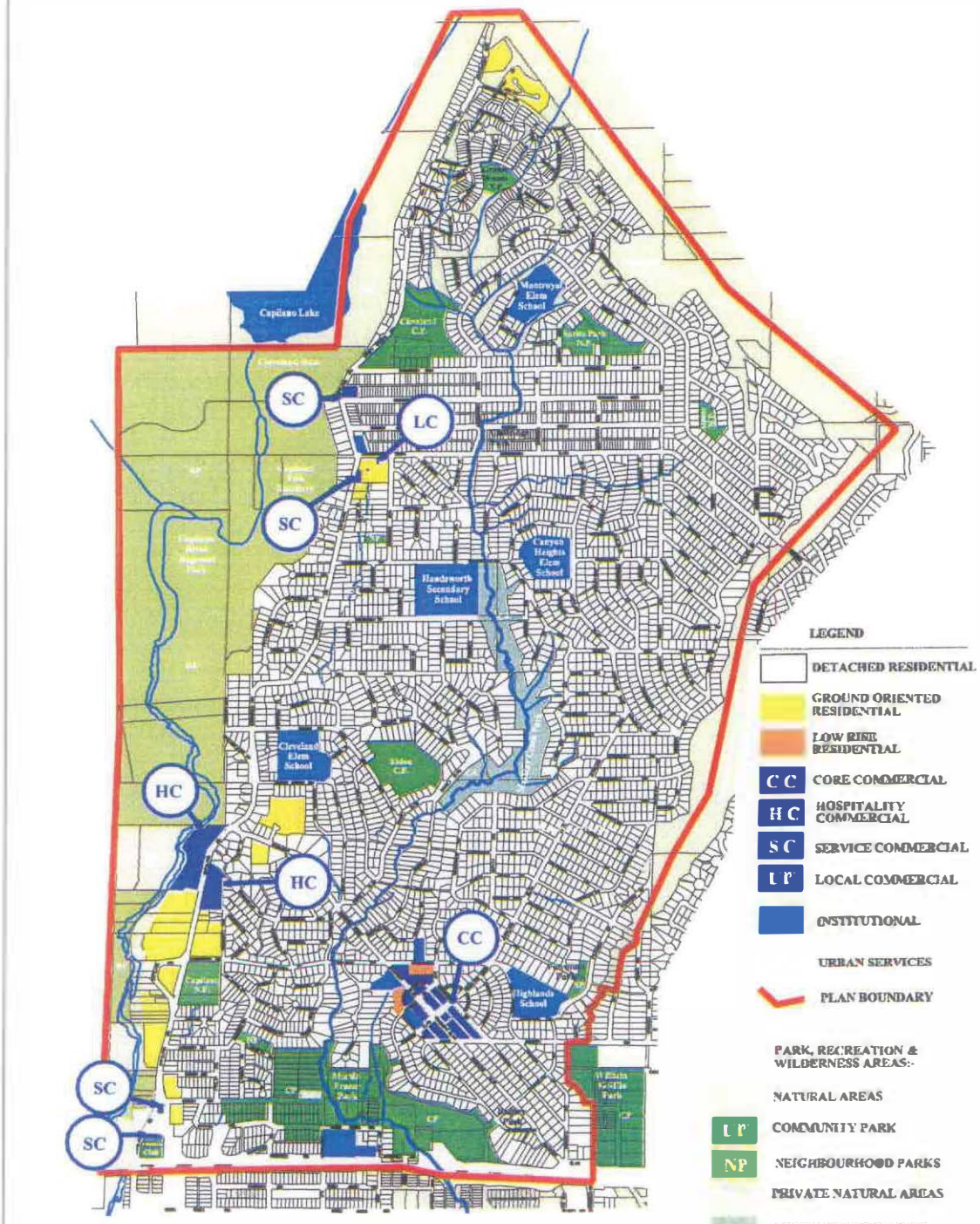
- Hospitality Commercial — Areas intended predominantly for tourist, entertainment and related uses.
- Service Commercial — Automobile oriented areas predominantly for retail, office and service uses.
- Core Commercial — Pedestrian oriented areas intended predominantly for retail shops and services at street level with residential units above.
- Local Commercial — Areas intended predominantly for small scale, commercial uses serving the adjacent neighbourhood.

URBAN SERVICES: Areas designated principally for public works, cemeteries, utilities, transportation and communications.

CONSERVATION AREAS: Areas designated principally for the protection of fish and wildlife habitat, and, environmentally sensitive areas.

PARKS, RECREATION AND WILDERNESS AREAS: Areas designated principally for the preservation and enjoyment of the natural environment, outdoor recreational use, and regional water supply.

- Natural area — Areas intended predominantly for creek and trail corridors, greenways and landscaped areas.
- Private natural area — Private landholdings in natural areas.
- Regional Park — Areas owned by the GVRD and intended predominantly for the use and enjoyment of the natural environment, wilderness areas and unorganized outdoor activities.
- Community Park — Public areas improved & maintained predominantly for athletic fields, outdoor recreation and other active recreational pursuits.
- Neighbourhood Park — Public areas improved and maintained predominantly for tot lots, playgrounds, seating areas and unorganized activities.



UPPER CAPILANO LOCAL PLAN MAP

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4.3.3 Upper Capilano Local Planning Area

4.3.3.1 Edgemont Village Development Permit Area

The Edgemont Village Development Permit Area (D.P.A.) is established for the purpose of regulating the form and character of commercial and multi-family building within the commercial core of Edgemont Village as defined by Figure 1 "Edgemont Village Development Permit Area". Special development guidelines unique to Edgemont Village apply over and beyond the zoning regulations to better achieve the intent and objectives of the Upper Capilano Local Plan.

The intent of the guidelines is to preserve the small town character and charm of the Edgemont Village by ensuring that any new development is sympathetic in form and character to the existing commercial core. The Village is a functional retail centre made up of small, independent shops and any new development should reflect this. Diversity is important, therefore building design generally should be in keeping with the eclectic mixture of one or two storey 1950's era buildings. Rather than dominating the environment, buildings should blend into the surrounding single family neighbourhood and take advantage of the scenic, mountain backdrop.

4.3.3.1.1 Objectives

i) To encourage a practical variety of commercial shops and services;
ii) To retain a compact physical form;
iii) To maintain a human scale in the relationship of buildings to the street;
iv) To accommodate some housing in mixed use developments in a creative and sensitive way;
v) To identify and protect key view corridors; and
vi) To foster an interesting pedestrian environment and maintain a human scale in the relationship of buildings to the street.

4.3.3.1.2 Guidelines

Building Design and Character

i) Building facades should be articulated with doorways, display windows or other recesses and features with sufficient frequency to suggest the appearance of small, independent shops.
ii) Building facades should form a continuous streetwall at or near the front property line unless it is to provide for a pedestrian passageway through to the lane.
iii) Traditional building materials such as wood, brick or stone should be used on building exteriors.
iv) Building design, materials and colour scheme should be complementary to that of the adjacent buildings.

Building Heights and Siting

v) Buildings should not exceed the maximum height indicated in Figure 2, "Maximum Building Height."
vi) Second and third storeys of building should be stepped back from the first floor to maintain a pedestrian scale, prevent shadowing on the street and to preserve significant mountain views.
vii) Building coverage may be varied to provide public amenities like pedestrian arcades, colonnades or decorative building features in which case at least half of the increase in site coverage should be devoted to the public amenity.

Streetscape and Public Amenities

viii) Public open space should be provided at intersections on Edgemont Boulevard and West Queens Road as indicated in Figure 2.
ix) At least 15% of the parcel should be landscaped or devoted to public amenities such as street trees, outdoor seating, courtyards or public art.
x) All building must incorporate awnings, canopies or overhangs to provide continuous weather protection along the street, over doorways and other pedestrian areas.
xi) The type, design and colour scheme of signs, awnings, and canopies may vary from building to building but must be complementary to one another.
xii) Freestanding signs are not permitted.

Lanes

xiii) All services and utilities should be underground, and refuse containers and storage areas should be well screened or hidden from view.
xiv) All paving, including parking and pedestrian areas, should be co-ordinated to achieve a unified pavement scheme throughout the lanes and appropriate intersections.
xv) Parking and garbage pick-up areas at the rear of buildings should be co-ordinated with the adjacent properties to achieve more efficient layouts.
xvi) Parking areas should be landscaped around their perimeter.
xvii) Underground public parking should be well lit.

4.3.3.2 Guidelines Affecting Site 3, Upper Capilano
3065 Capilano Road to 3175 Capilano Crescent

i) Site Access: vehicular access is limited to Capilano Crescent.

ii) The Southern Intersection of Capilano Crescent and Capilano Road: this intersection should be improved to eliminate the potential for left hand turns into and out of the intersection. South bound traffic will continue to be permitted to exit from Capilano Crescent onto Capilano Road, provided that the design can be done in a manner that is safe and minimises conflict with vehicles travelling south on Capilano Road.

iii) Screening Along Capilano Road and Capilano Crescent: tree preservation and buffer strip planting along the street frontages should be maximised.

iv) Screening Along the Southern Property Line: tree preservation and buffer landscaping along the southern property line should be maximised, and a 3 storey height limit (including roof structure) next to the property line is required.

v) Screening Along the Northern Property Line: tree preservation and buffer landscaping along the northern property line should be maximised, and a two storey height limit (including roof structure) next to the northern property line is required.

vi) Screening Along the River Canyon: in accordance with the Streamside Protection Regulations of the Fish Protection Act, tree retention must be maximised within the Fisheries' setback area, and restorative planting must be provided where buildings are removed.

vii) Construction must be in accordance with the District of North Vancouver's adaptable housing guidelines.

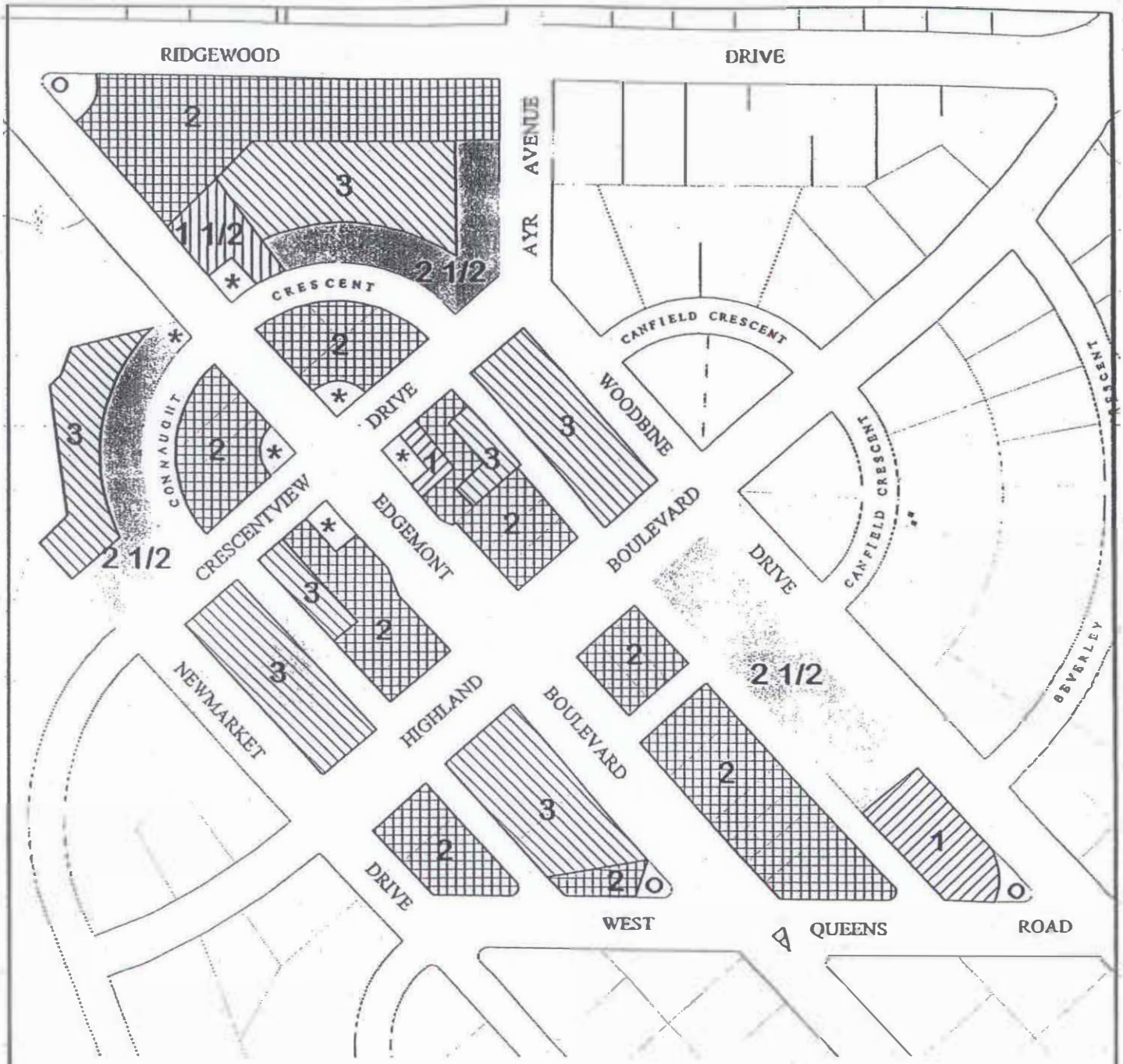


Figure 2 - MAXIMUM BUILDING HEIGHT

LEGEND :

1	1 storey	2 1/2	2 with partial 3rd storey
1 1/2	1 with partial 2nd storey	3	3 storey
2	2 storey	O	Mini parks
		*	public open space

Note:
Building coverage is normally limited to 50 % of site area except where varied in the text of the plan.

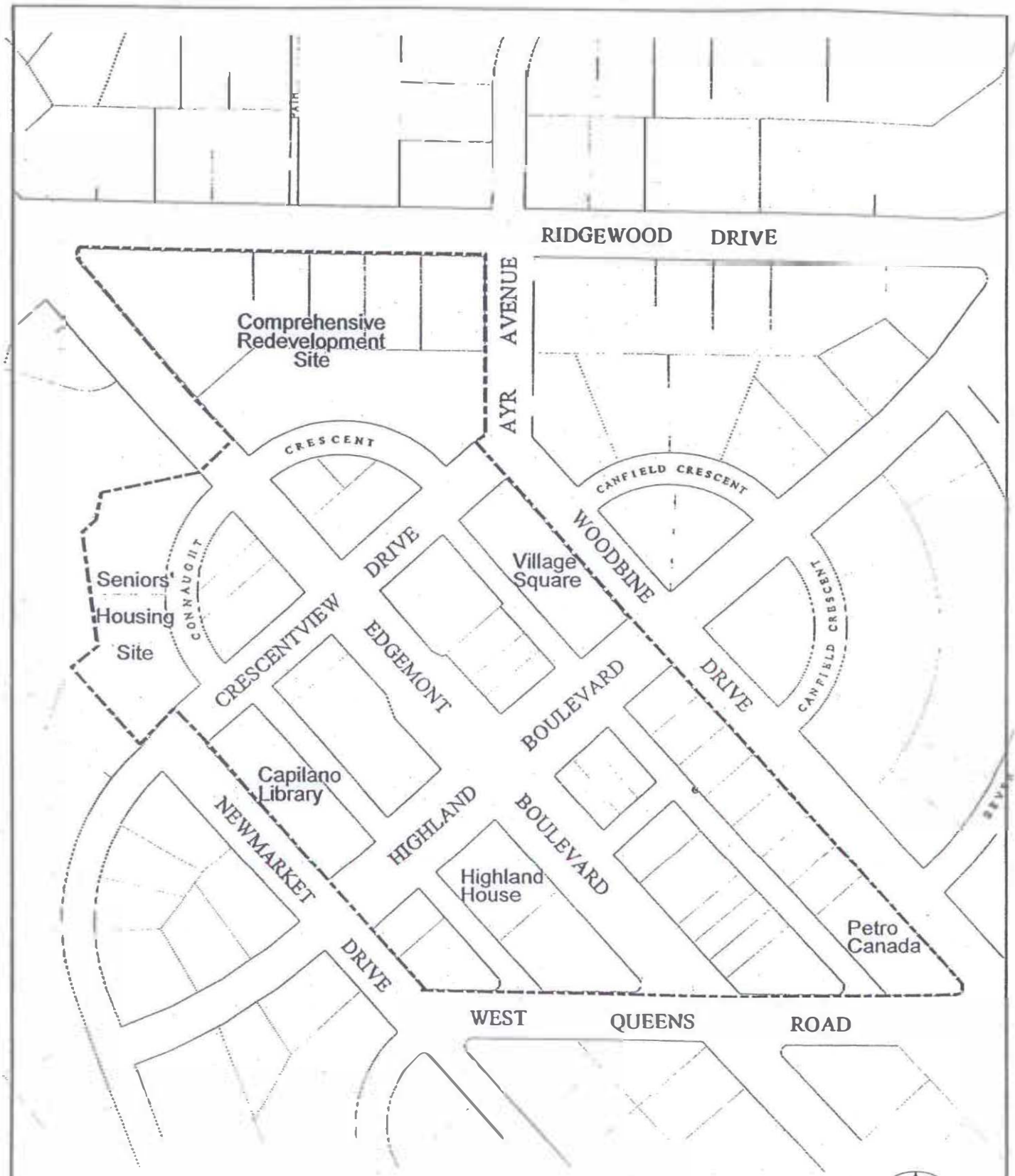
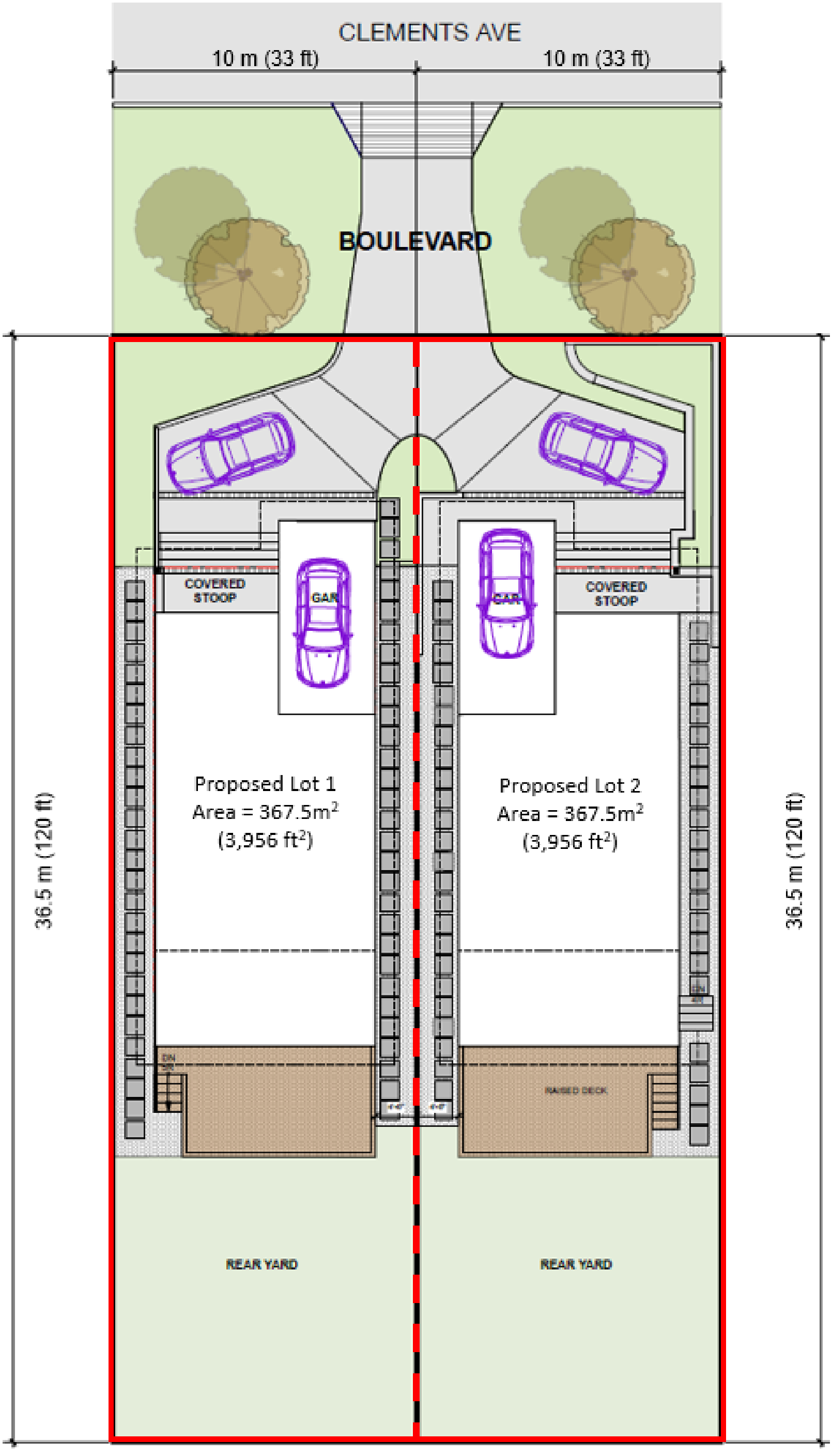
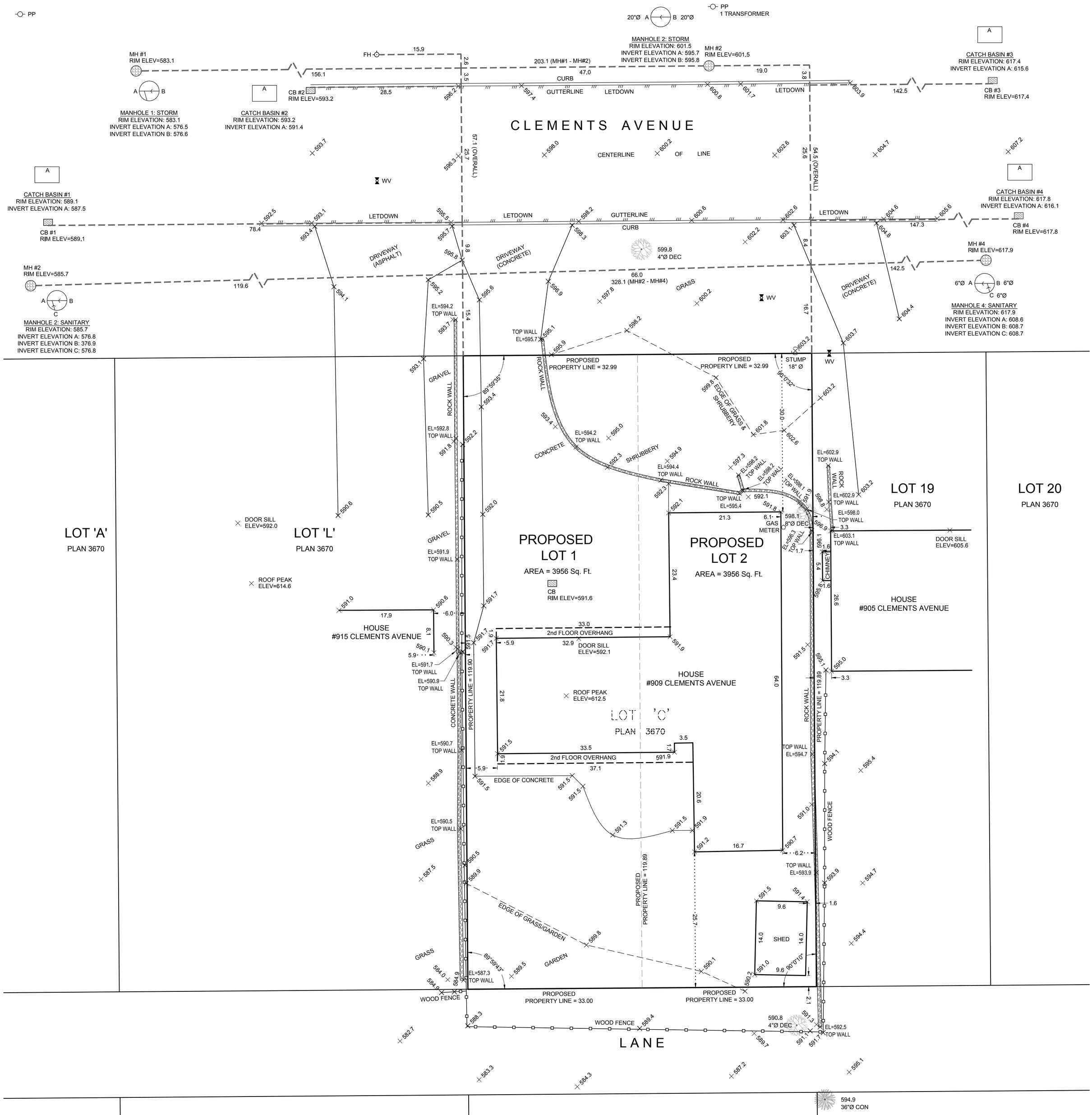


Figure 1

EDGEMONT VILLAGE DEVELOPMENT PERMIT AREA

Proposed Subdivision Plan





TOPOGRAPHIC SURVEY OF LOT C, BLOCK 4, DISTRICT LOT 594, G1, NWD, PLAN 3670.

DISTRICT OF NORTH VANCOUVER
INTEGRATED SURVEY AREA #16

CIVIC ADDRESS: 909 CLEMENTS AVENUE
PID: 012-383-490

SCALE 1 INCH = 10 FEET

5 0 5 15 25

ALL DISTANCES ARE IN FEET

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DATE:	BY:
2017-OCT-2th	JC
REVISION:	0

LEGEND:

- PP - DENOTES POWER POLE
- MH - DENOTES MANHOLE
- CB - DENOTES CATCH BASIN
- WV - DENOTES WATER VALVE
- FH - DENOTES FIRE HYDRANT
- 587.2 - DENOTES SPOT ELEVATION
- 31.5 0.5Ø DEC - DENOTES 0.5Ø DECIDUOUS TREE WITH A GROUND ELEVATION OF 31.5'.
- 31.5 0.5Ø CON - DENOTES 0.5Ø CONIFEROUS TREE WITH A GROUND ELEVATION OF 31.5'.

DATUM:

ELEVATIONS ARE TO DISTRICT OF NORTH VANCOUVER GEODETIC DATUM, AND ARE DERIVED FROM CONTROL MONUMENT 73H1416, PUBLISHED ELEVATION = 612.75 FEET, ISA NO. 16, NAD 83, (CVD28GVRD).

PROPERTY:

PROPERTY DIMENSIONS SHOWN ARE DERIVED FROM: FIELD SURVEY.

OFFSETS TO PROPERTY LINES ARE NOT TO BE USED TO DEFINE BOUNDARIES.

REFER TO CURRENT CERTIFICATE(S) OF TITLE FOR ADDITIONAL, EXISTING OR PENDING CHARGES.

GENERAL:

THIS PLAN SHOWS THE LOCATION OF VISIBLE FEATURES ONLY, AND DOES NOT INDICATE BURIED SERVICES THAT MAY EXIST ON OR AROUND THE SUBJECT SITE.

FEATURES SHOWN WITHOUT DIMENSIONS SHOULD BE CONFIRMED WITH BENNETT LAND SURVEYING LTD.

TREE SPECIES AND DIMENSIONS SHOULD BE CONFIRMED BY A QUALIFIED ARBOURIST. SHADED AREA IS NOT AN INDICATION OF DRIP LINE LOCATION UNLESS SPECIFICALLY LABELED.

BUILDING LOCATION BASED ON SURVEY TIES TO VISIBLE EXTERIOR SURFACES UNLESS OTHERWISE NOTED.

NOTE:

THIS PLAN HAS BEEN PREPARED FOR MORTGAGE AND OR MUNICIPAL PURPOSES ONLY AND IS FOR THE EXCLUSIVE USE OF OUR CLIENT.

BENNETT LAND SURVEYING LTD. ACCEPTS NO RESPONSIBILITY OR LIABILITY FOR ANY DAMAGES THAT MAY BE SUFFERED BY A THIRD PARTY AS A RESULT OF ANY DECISIONS MADE, OR ACTIONS TAKEN BASED ON THIS DOCUMENT.

CERTIFIED CORRECT

THIS _____ DAY OF _____ , 2017.

_____
TYSON COTNAM, B.C.L.S.

FIELD SURVEY COMPLETED ON SEPTEMBER 18th, 2017.

THIS DOCUMENT IS NOT VALID UNLESS ORIGINALLY SIGNED AND SEALED.

N:\C0010-NV-2017\14490.00-909-CLEMENTS-AVE-DNV\14490.00-DRAWINGS\14490.00-TOPOGRAPHIC ASBUILT\T14490.DWG

SERVICES LEGEND

DESCRIPTION	PROPOSED	EXISTING
	SYMBOLS	
EDGE OF ASPHALT		
CURB		
WATERMAIN		
SANITARY SEWER	100 SAN	EX. 150 SAN
STORM SEWER	150 STM	EX. 375 STM
FIRE HYDRANT	N/A	
WATER VALVE		
CATCH BASIN	N/A	
GAS	63 GAS	EX. 42 GAS
HYDRO		
POWER POLE	N/A	PP

GRADING LEGEND

PROPOSED ELEVATION	x (156.82)
PROPOSED TOP OF CURB ELEVATION	x TC 156.31
PROPOSED TOP OF WALL ELEVATION	x TW 183.76 GW 181.90
PROPOSED BOTTOM OF WALL ELEVATION	x GW 156.16±
EXISTING GUTTER ELEVATION	x G 156.16±
EXISTING ELEVATION	x (155.78)

CONTRACTOR TO VERIFY & LOCATE EXISTING MAINS & SERVICE CONNECTIONS & NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO BEGINNING CONSTRUCTION

CONTRACTOR TO PHONE B.C. ONE CALL AT LEAST TWO (2) BUSINESS DAYS PRIOR TO STARTING ANY EXCAVATION WORKS

LOT 1 – STM SERVICE CONNECTION BY DEVELOPER

INSTALL 18.2m–150 STM SERVICE CONNECTION @ MIN. 1.0% C/W
INSPECTION CHAMBER PER DNV STD. DWGS. SSD–S.3 & SSD–S.4
INV. OF EXST. 375 STM @ TIE–IN = 180.27±
SPRING EL. OF MAIN @ TIE–IN = 180.46±
INV. OF INSPECTION CHAMBER = 180.87
INSPECTION CHAMBER RIM ELEVATION = 181.75
DISTANCE FROM TIE–IN TO EXST. STM MH 3 = 13.5m±

LOT 1 – SAN SERVICE CONNECTION BY DEVELOPER

ABANDON EXST. SAN SERVICE CONNECTION (INSTALLED 1978), AND CAP AT MAIN. NEIGHBOURING ASPHALT DRIVEWAY TO BE REINSTATED TO ORIGINAL OR BETTER CONDITION INSTALL 5.0m–100 SAN SERVICE CONNECTION @ MIN 2.0% C/W INSPECTION CHAMBER TO DNV STD. DWGS. SSD–S.3 & SSD–S.4.
INV. OF EX. 150 SAN @ TIE–IN = 179.45±
SPRING EL. OF MAIN @ TIE–IN = 179.53±
INV. OF INSPECTION CHAMBER = 179.74
INSPECTION CHAMBER RIM ELEVATION = 181.70
DISTANCE FROM TIE–IN TO EXST. SAN MH 16.41.16.2 = 37.2m±

LOT 1 – WM SERVICE CONNECTION BY DNV CREWS AT OWNER'S EXPENSE

19mm WATER SERVICE CONNECTION C/W CURB STOP PER DNV STD. DWG. SSD–W.4

LOT 2 – STM SERVICE CONNECTION BY DEVELOPER

INSTALL 17.5m–150 STM SERVICE CONNECTION @ MIN. 1.0% C/W
INSPECTION CHAMBER PER DNV STD. DWGS. SSD–S.3 & SSD–S.4
INV. OF EXST. 450 STM @ TIE–IN = 182.07±
SPRING EL. OF MAIN @ TIE–IN = 182.29±
INV. OF INSPECTION CHAMBER = 182.73
INSPECTION CHAMBER RIM ELEVATION = 183.67
DISTANCE FROM TIE–IN TO EXST. STM MH 3 = 4.0m±

LOT 2 – SAN SERVICE CONNECTION BY DEVELOPER

INSTALL 6.0m–100 SAN SERVICE CONNECTION @ MIN. 2.0% C/W
INSPECTION CHAMBER PER DNV STD. DWGS. SSD–S.3 & SSD–S.4
INV. OF EXST. 150 SAN @ TIE–IN = 181.05±
SPRING EL. OF MAIN @ TIE–IN = 181.13±
INV. OF INSPECTION CHAMBER = 181.34
INSPECTION CHAMBER RIM ELEVATION = 183.48
DISTANCE FROM TIE–IN TO EXST. SAN MH 16.41.16.2 = 53.7m±

LOT 2 – WM SERVICE CONNECTION BY DNV CREWS AT OWNER'S EXPENSE

EXST. 19mm WATER SERVICE CONNECTION (INSTALLED IN 2005) TO BE CAPPED AT PROPERTY LINE AND RE–USED FOR LOT 2

STREET LIGHTING ON CLEMENTS AVENUE TO BE REVIEWED BY QUALIFIED PROFESSIONAL TO DETERMINE IF STREET LIGHTING IS REQUIRED

H/T/C SERVICE CONNECTIONS SHOWN FOR CO–ORDINATION PURPOSES ONLY. UTILITY COMPANIES TO PROVIDE DESIGN PRIOR TO CONSTRUCTION

GAS SERVICE CONNECTIONS SHOWN FOR CO–ORDINATION PURPOSES ONLY. FORTIS BC TO PROVIDE DESIGN PRIOR TO CONSTRUCTION (TYP.)

EXST. GAS SERVICE CONNECTION ON LOT 2 TO BE ABANDONED BY CAPPING AT MAIN

Water Demand Analysis

All calculations are per DNV Servicing Bylaw (2017)

1.) Pre-Development Demand

Single Family		1 lots
Population Density	x	3 capita/lot
Service Population	=	3 capita
Maximum Daily Unit Demand		1000 L/capita/day
Service Population	x	3 capita
Pre-Development Maximum Daily Demand	=	**3000 L/day**

2.) Post-Development Demand

Single Family		2 lots
Service Population	x	3 capita/lot
Total Service Area	=	6 capita
Unit Maximum Daily Demand		1000 L/capita/day
Total Service Area	x	6 capita
Post-Development Maximum Daily Demand	=	**6000 L/day**

3.) Change in Demand

Post-Development Maximum Daily Demand		6000 L/day
Pre-Development Maximum Daily Demand	-	3000 L/day
Net Increase with Subdivision	=	**3000 L/day**

Sanitary Demand Analysis

All calculations are per DNV Servicing Bylaw (2017)

1.) Pre-Development Demand

Average Daily Demand

Single Family		1 lots
Population Density	x	3 capita/lot
Service Population	=	3 capita
Average Daily Unit Demand		320 L/capita/day
Service Population	x	3 capita
Average Daily Demand	=	960 L/day

Peak Daily Demand

Average Daily Demand		960 L/day
Harmon Peaking Factor	x	3.3
Peak Daily Demand	=	3155 L/day

Infiltration Rate

Unit Infiltration Rate		1.68 L/m²/day
Site Area	x	368 m²
Infiltration Rate	=	618 L/day

Design Demand

Peak Daily Demand		3155 L/day
Total Infiltration	+	618 L/day
Pre-Development Design Flow	=	**3773 L/day**
	=	**0.044 L/s**

2.) Post-Development Demand

Average Daily Demand

Single Family		2 lots
Population Density	x	3 capita/lot
Service Population	=	6 capita
Average Daily Unit Demand		320 L/capita/day
Service Population	x	6 capita
Average Daily Demand	=	1920 L/day

Peak Daily Demand

Average Daily Demand		1920 L/day
Harmon Peaking Factor	x	4.4
Peak Daily Demand	=	8512 L/day

Infiltration Rate

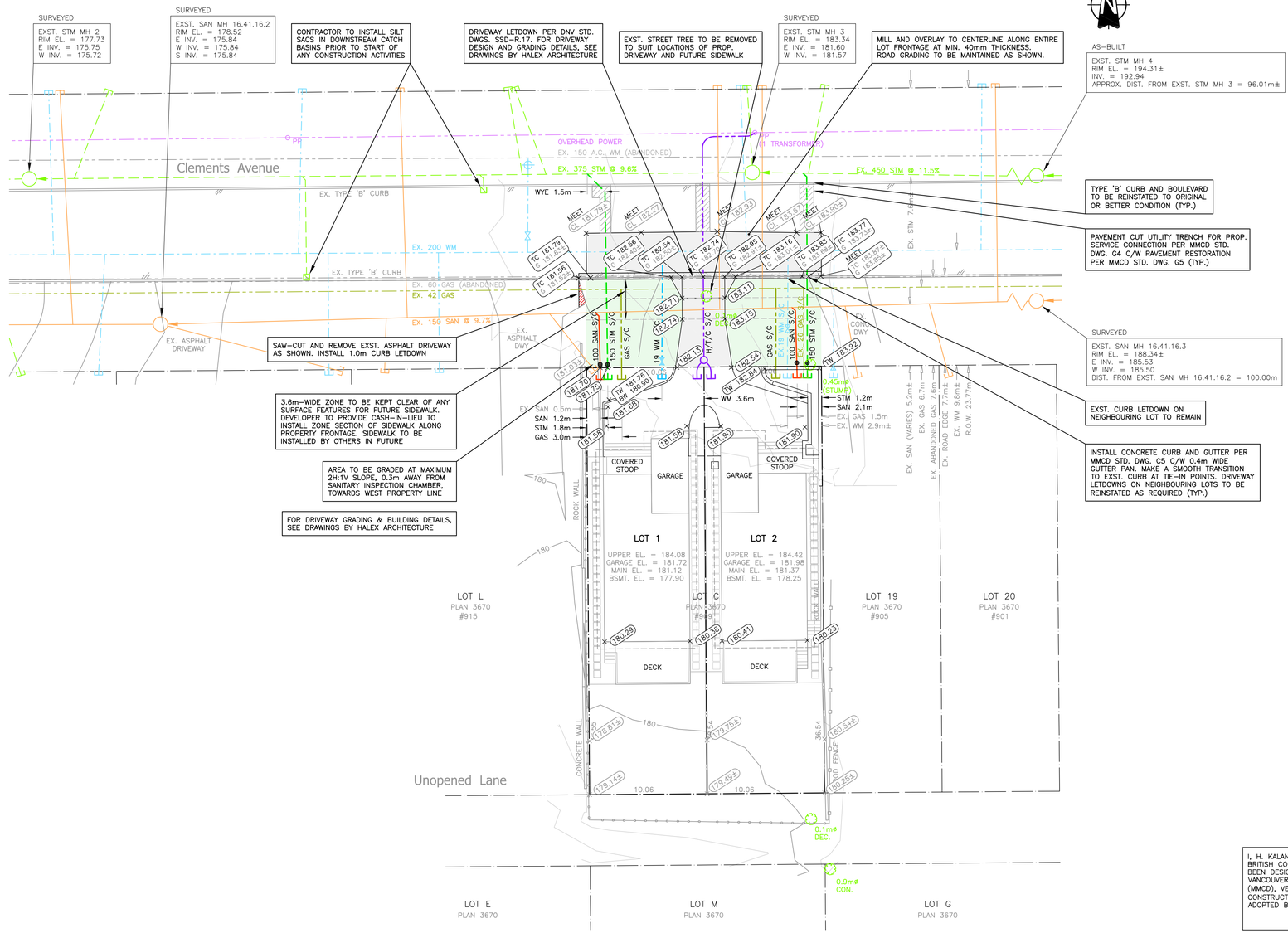
Unit Infiltration Rate		1.68 L/m²/day
Site Area	x	368 m²
Infiltration Rate	=	618 L/day

Design Demand

Peak Daily Demand		8512 L/day
Total Infiltration	+	618 L/day
Post-Development Design Flow	=	**9131 L/day**
	=	**0.106 L/s**

3.) Change in Demand

Post-Development Design Flow		9131 L/day
Pre-Development Design Flow	-	3773 L/day
Net Increase in Design Flow	=	**5358 L/day**
	=	**0.062 L/s**



LEGAL DESCRIPTION

PROPOSED SUBDIVISION PLAN OF LOT C, BLOCK 4, DISTRICT LOT 594, G1
NEW WESTMINSTER DISTRICT, PLAN 3670

BENCHMARK CONTROL

ELEVATIONS ARE TO NORTH VANCOUVER GEODETIC DATUM, AND ARE DERIVED FROM CONTROL MONUMENT 73H1416, PUBLISHED ELEVATION = 612.75 FEET, ISA NO 16, NAD 83, (CVD28GVRD)

GENERAL NOTES

1. ALL CONSTRUCTION IN DISTRICT OF NORTH VANCOUVER (DNV) ROAD R.O.W. MUST CONFORM TO THE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD) AND MUST PASS THE DNV'S AND ENGINEER'S INSPECTION. THE CONTRACTOR WILL GIVE THE DISTRICT 48 HOURS NOTICE PRIOR TO HIS REQUIREMENT FOR INSPECTIONS.
2. ALL CONSTRUCTION WITHIN THE PROPERTY MUST CONFORM TO THE MASTER MUNICIPAL CONSTRUCTION DOCUMENT'S SPECIFICATIONS AND THE B.C. PLUMBING CODE.
3. THE CONTRACTOR SHALL ENSURE THAT ALL APPROVALS REQUIRED FOR THE PROPOSED WORK HAVE BEEN OBTAINED PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION.
4. LOCATIONS OF EXISTING UNDERGROUND SERVICES DETERMINED FROM THE DNV, UTILITY AS–CONSTRUCTED DRAWINGS, AND CONFIRMED THROUGH SURVEY. CONTRACTOR TO VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO CONSTRUCTION AND TO NOTIFY ENGINEER OF ANY DISCREPANCIES, CONFLICTS OR OMISSIONS.
5. ALL CUTS IN EXISTING ASPHALT REQUIRED FOR TRENCHING SHALL BE VERTICAL, 40mm DEEP, WITH A DIAMOND SAW & REPLACED WITH MINIMUM 40mm ASPHALT AFTER BACKFILL AND COMPACTION; ALL PAVEMENTS, BOULEVARDS, DRIVEWAYS, FENCES ETC. ARE TO BE RESTORED TO ORIGINAL OR BETTER CONDITION WHEN NO IMPROVEMENT IS PROPOSED UNDER THIS CONTRACT.
6. THE CONTRACTOR SHALL USE EXTREME CARE WHEN WORKING NEAR EXISTING SERVICES AND ANY SERVICES DISTURBED ARE TO BE REPLACED TO THE SATISFACTION OF THE DISTRICT AND/OR APPROPRIATE UTILITY CORPORATION.
7. THE CONTRACTOR'S SURVEYOR WILL RECORD & CERTIFY CORRECT ALL INFORMATION REQUIRED FOR THE ENGINEER TO PROVIDE A COMPLETE SET OF AS–CONSTRUCTED DRAWINGS.
8. THE CONTRACTOR MUST NOTIFY THE DNV CONSTRUCTION OFFICE'S WORKS INSPECTOR @ 604–990–3886, 48 HOURS PRIOR TO STARTING CONSTRCUTION TO ESTABLISH AN INSPECTION SCHEDULE.
9. RESIDENTS DIRECTLY AFFECTED BY CONSTRUCTION OF THIS PROJECT SHALL BE GIVEN 48 HOURS WRITTEN NOTICE OF THE PROPOSED START OF CONSTRUCTION. IF CONSTRUCTION ENTERS ONTO PRIVATE PROPERTY, THE CONTRACTOR OR DEVELOPER'S AGENT WILL REQUIRE WRITTEN AUTHORIZATION FROM THE PRIVATE PROPERTY OWNER.
10. COVERS FOR INSPECTION CHAMBERS AND VALVE RISERS IN DRIVEWAY SHALL BE SUITABLE FOR TRAVELLED AREAS.
11. THE CONTRACTOR SHALL TAKE ALL STEPS NECESSARY TO ENSURE THAT NO SILT IS DISCHARGED TO THE STORM DRAINAGE SYSTEM, ROADWAYS OR ADJACENT PROPERTIES DURING THE COURSE OF CONSTRUCTION IN ACCORDANCE WITH DFO/ MOELP'S "LAND DEVELOPMENT GUIDELINES FOR THE PROTECTION OF AQUATIC HABITAT".
12. A PRECONSTRUCTION MEETING BETWEEN DNV STAFF, THE CONSULTANT AND CONTRACTOR IS REQUIRED PRIOR TO COMMENCEMENT OF CONSTRUCTION.

ROADWORKS NOTES

1. ALL DRIVEWAY CONSTRUCTION AND METHODS MUST BE IN ACCORDANCE WITH MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD).
2. ALL LOOSE AND ORGANIC MATERIAL TO BE EXCAVATED FROM DRIVEWAY AND DISPOSED OF ON–SITE IN A LOCATION APPROVED BY THE CIVIL ENGINEER.
3. ALL SUBGRADES TO BE COMPACTED TO 95% MODIFIED PROCTOR DENSITY. SUBGRADE TO BE INSPECTED BY ENGINEER PRIOR TO PLACEMENT OF GRAVEL SUBBASE. ANY WATER SOFTENED SUB GRADE SOIL SHALL BE OVER EXCAVATED AND THE GRADE RESTORED WITH GRANULAR SOILS COMPACTED TO 95% MODIFIED PROCTOR DENSITY.
4. THE BASE AND SUBBASE MATERIALS SHALL BE PROPERLY PLACED AND COMPACTED TO A MINIMUM OF 95% OF MODIFIED PROCTOR DRY DENSITY (ASTM D1557).
5. CHANGES IN GRADE TO BE FORMED WITH SMOOTH CURVES.
6. PAVING CAN ONLY PROCEED IN THE PRESENCE OF THE DNV'S & ENGINEER'S INSPECTORS.

WATERWORKS NOTES

1. WATER SERVICES TO BE 19mm DIA., TYPE K ANNEALED COPPER TO ASTM B88M. WATER SERVICE CONNECTION TO DNV STD. DRAWINGS SSD–W.4.
2. INSTALLATION, TESTING AND CHLORINATION TO BE PREPARED IN ACCORDANCE WITH THE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD) AND THE B.C. PLUMBING CODE.
3. SERVICE CONNECTIONS TO BE MARKED WITH A 50mm x 100mm POST PAINTED BLUE AT TERMINATION.
4. EXCAVATION AND PAVEMENT RESTORATION FOR WATERMAIN TIE–IN TO BE COMPLETED BY DEVELOPER'S CONTRACTOR. DNV UTILITIES DEPT. WILL SUPPLY WET TAP MATERIALS AND COMPLETE TIE–IN AT DEVELOPER'S COST.

STORM & SANITARY SEWER NOTES

1. STORM SERVICE TO BE DR 28 P.V.C., 150mm MIN. ø TO DNV STANDARD DRAWINGS SSD–S.3 & S.4, C/W INSPECTION CHAMBER AT PROPERTY LINE.
2. SANITARY SERVICE TO BE DR 28 P.V.C. 100mm MIN. ø TO DNV STANDARD DRAWINGS SSD–S.3 & S.4, C/W INSPECTION CHAMBER AT PROPERTY LINE.
3. STORM AND SANITARY SERVICE CONNECTIONS TO BE MARKED WITH A 50mm x 100mm POST PAINTED GREEN AND RED RESPECTIVELY. THE BELL END AND CAP AT THE TERMINATION IS ALSO TO BE PAINTED GREEN AND RED TO SUIT.

I, H. KALANA GUNAWARDANA, PROFESSIONAL ENGINEER, IN GOOD STANDING IN AND FOR THE PROVINCE OF BRITISH COLUMBIA, HEREBY CERTIFY THAT THE WORKS AS HEREIN SET OUT ON THE ATTACHED DRAWINGS HAVE BEEN DESIGNED TO GOOD ENGINEERING STANDARDS AND IN ACCORDANCE WITH: THE DISTRICT OF NORTH VANCOUVER DESIGN CRITERIA MANUAL, DATED 2017, THE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD), VERSION 2014 AND THE DISTRICT OF NORTH VANCOUVER SUPPLEMENTARY MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (SUPPLEMENTARY SPECIFICATIONS AND SUPPLEMENTARY STANDARD DRAWINGS), ADOPTED BY THE DISTRICT OF NORTH VANCOUVER.

D.N.V. DRAWING NO. XXXXXXX

no.	date	revision	chk'd
3	MAR.08.19	REVISED PER ARCHITECTURAL CHANGES	HKG
2	OCT.17.18	REVISED PER ARCHITECTURAL CHANGES	HKG
1	AUG.16.18	ZONING AMENDMENT - SUBMISSION #1	HKG

client: MR. ANDREW BUTLER

project: 909 CLEMENTS AVENUE
NORTH VANCOUVER, BRITISH COLUMBIA

PROFESSIONAL ENGINEERS
STEEP ROCKY TERRAIN SPECIALISTS
WEBSTER ENGINEERING LTD
LAND DEVELOPMENT CONSULTANTS
3745 DELBROOK AVENUE, NORTH VANCOUVER, B.C. V7N 3Z4 983-0458

approved

designed by B.J.W.
drawn by B.J.W.
checked by H.K.G.
date AUG.16.18

title: KEY PLAN

scales: hor. 1:200 vert. -
file no. 3777
drawing no. KEY-1
rev. 3

F:\3777\09\3777 909 Clements Ave, N Van\DESIGN\3777 - KEY PLAN.DWG, 3/8/2019 9:55:41 AM, BJW

Burley Boys
TREE SERVICE LTD.

MEMBER ISA CERTIFIED ARBORIST ISA CERTIFIED TREE WORKER ISA

ON STAFF

737 Burley Dr.
West Vancouver, BC
V7T 1Z7

PH. (604)-926-8733
office@burleyboys.com
www.burleyboys.com

Arborist Report

Authored by: Stuart Witt
ISA Certification #: UI1087T

File #:	18-074
Date:	05 July 2018
Weather:	Clear
Client:	Andrew Butler
Telephone:	604-983-3451
Email:	andrewbutler250@gmail.com
Site Address:	909 Clements North Vancouver, BC V7R 2K7

Purpose:

Burley Boys Tree Service Ltd. has been contracted to provide a tree inventory and tree removal / retention outline for the property at 909 Clements North Vancouver, BC. Plans for the development of the property include the proposed subdivision of the property and construction of two new homes

This report is intended to accompany a development permit for the property which includes the removal of 1 tree on District property which is inside/too close to required excavations; not suitable for retention.

Any recommended tree removal should be considered in conjunction with an approved replanting/landscape plan.

Method:

The site was visited with all trees being assessed from the ground only, using the Visual Tree Assessment (VTA) technique. No trees were climbed or cored during the site visit. Tree conditions and Critical root zones (CRZ) are noted in the appendix below.

Observations:

2 trees within or near the property were assessed. The trees are not individually tagged, but they are referred to in the Appendix below. All other trees/shrubs on the property are undersized and were not assessed for the purpose of this report. The proposed development includes the subdivision of the property and construction of 2 new homes with attached garages.

Tree #1 is a stewartia growing at the front of the property on the District Blvd. It measures 11.5cms DBH and is in good condition. This tree is inside grade changes required for the new driveway to the properties and is required to be removed. It is on District land; a permit is required.

Tree #2 is a hemlock located on the south neighbouring property at 920 Canyon Blvd. It has co-dominant stems, measuring 112 & 53cms DBH, respectively. These two trees are to be retained and tree protection barriers are to be installed. It should be noted that, these hemlocks were previously assessed for the neighbour in 2016 (File #16-016) and were recommended to be removed; The property has since changed in ownership and Burley Boys was not further involved. There is ongoing construction on the property. The trees have been retained for the development, but no tree protection barriers were present at the time of this site visit. There is no first hand knowledge of what steps, if any, were taken to protect the tree during the demolition, excavations or construction previously done on the property. It is unknown if any damage was caused to the root system of the tree during the construction.

Any other neighbouring trees are unaffected by the proposed development. Tree protection barriers can be placed at the property line.

Tree Retention Outline:

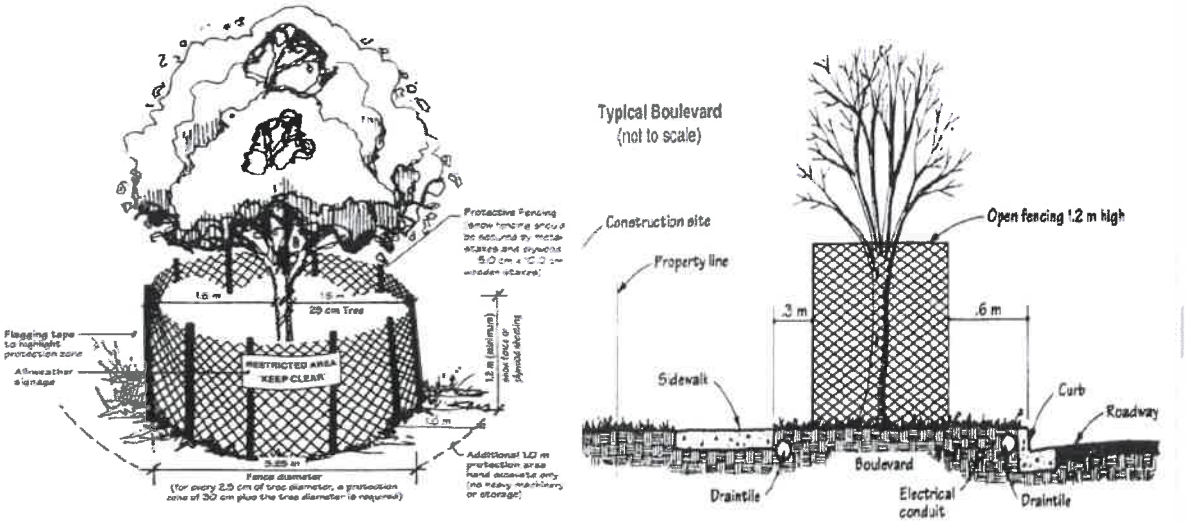
A tree preservation fence must be constructed around the root areas of all trees that are to be retained. Wherever possible, the radius of the tree preservation fence should extend as far as the drip line of the tree's canopy. If this is not possible, the fence should be located no closer than the determined CRZ for each individual tree. This will ensure that critical root zone for each tree is protected. Protecting the tree's critical root zones will help reduce the amount of soil compaction to the root areas, and will also aid in retaining the moisture in the soils during the construction period.

Should any excavations be required inside the determined critical root zone of any trees to be retained, a certified arborist must be on site to assess and document the roots being affected and mitigate appropriately. If any roots are expected to be uncovered, damaged or cut, it is recommended that a certified arborist be retained to supervise the excavations and mitigate any damaged roots accordingly.

Heavy machines should be kept out of the drip line of all trees on the property. Designated roadways for machines to move through the property may prove beneficial. Construction materials, particularly concrete should not be stored inside the root zones. Waste concrete should not, under any circumstances, be disposed of inside root zones. This includes hosing down of tools used to mix or spread concrete. Any large roots (over 15cm) exposed by excavation should have broken ends sawn off cleanly.

Standard and Boulevard Tree Protection Barrier (TPB) guide/outline (Fig 3)

TPB is to be erected in accordance with municipal bylaw. Traditionally it is composed of wooden 2x4 construction and orange snow fencing material. It is to be erected in a suitable geometrical form or shape to encompass the outlined areas in the above mentioned report, or as described by development services. It is to be a permanent structure that can be maintained for the entire development process. It is to be adhered to and the inside area is not to be used for storage of supplies or rubbish. Any reduction in TPB should be supervised and Arborist consultation is mandatory.



Conclusions:

Any removal / retention recommendations are based on both the trees' current health, condition, long-term viability as a retained tree and their relative proximities to required excavations. A permit is required for the removal of any Tree #1, which is on District property.

The critical root zones of retained trees should be observed and protected from any excavations, grade changes or storage of construction materials.

Any recommended tree removals should be considered in conjunction with a District approved re-planting / landscape plan.

Limitations:

 This report is to be used in its entirety, for its purpose only. Only the subject trees were inspected, and no others. This report does not imply or in any other way infer that other trees on neighboring sites are sound and healthy.

The inherent characteristics of trees or parts of trees to fall due to environment conditions and internal problems are unpredictable. Defects are often hidden within the tree or underground. The project arborist has endeavored to use his skill, education and judgment to assess the potential for failure, with reasonable methods and detail. It is the owner's responsibility to maintain the trees to reasonable standards and to carry our recommendations for mitigation suggested in this report.

It is the sole responsibility of the client or their representatives to follow through with all recommendations for future consultations or site inspections.

Appendix:

Below details the tree assessed. "DBH" is the main trunk diameter of the tree measured approximately 1.4m from grade. The determined condition of each tree is relative to its health, canopy structure, colour and vigor and any defects noted in the stem, canopy or root plate. "CRZ" is the determined Critical Root Zone of each tree. Preferred & Minimum CRZs are outlined below. The Preferred CRZ measurement is based on 12xDBH, as recommended by PNW-ISA; It should be noted trees with excavations required inside the Preferred CRZ can often be retained.Tree protection barriers should be located no closer to the trunk than this distance.

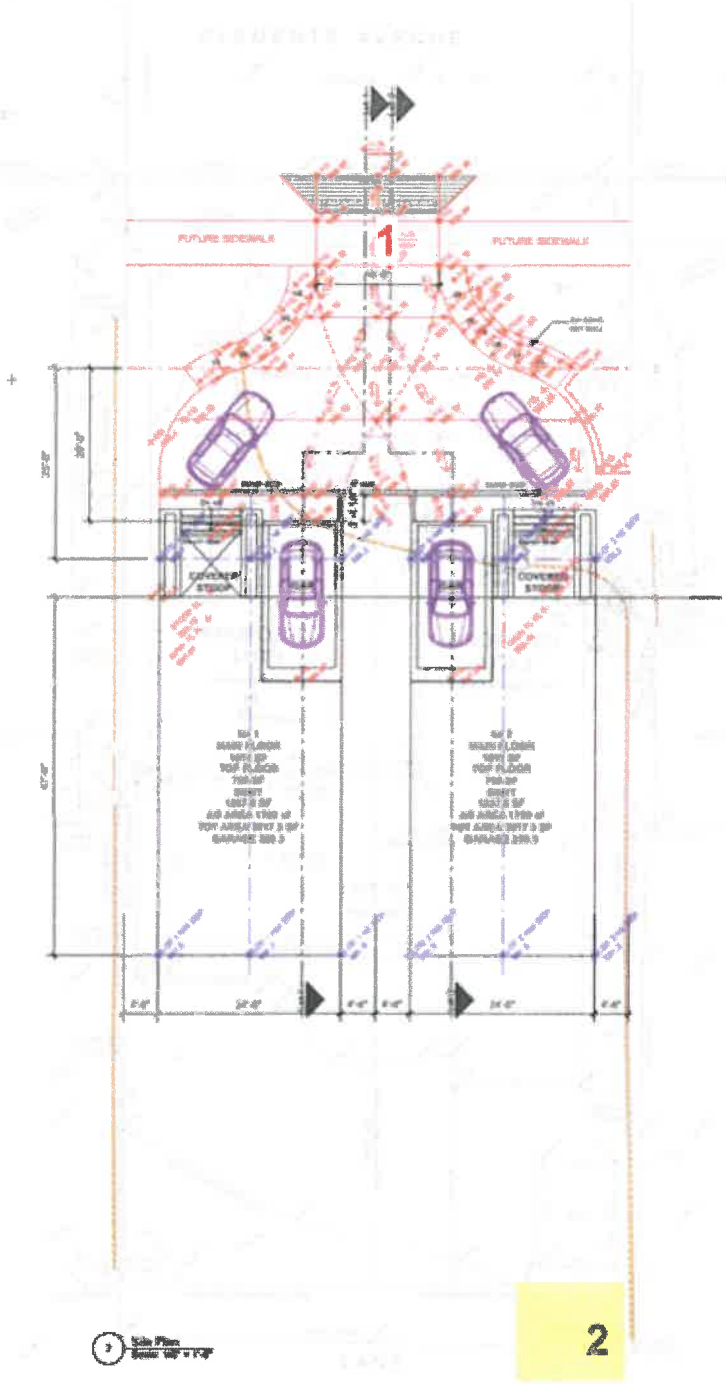
Tree/ Tag #	**Species**	**DBH (cm)**	**Condition** Good Fair Poor Dead/Dying	**CRZ** (Min) (m)	**CRZ** (Pref'd) (m)	**Comments & Recommendations**
1	Stewartia	11.5	Good	0.69	1.38	• District property • Inside grade changes for new driveway **Recommend:** • *Remove to facilitate new driveway - permit required*
2	Hemlock	112/ 53	Poor	9.90	19.80	• South neighbour's property (920 Canyon) • Co-dominant stems • Unknown what protection measures taken at neighbouring development **Recommend:** • *Retain. Install tree protection barriers.* • *Note: Previously assessed for neighbour in '16 (File #16-016) & recommended to be removed.*

Site Map:

The below site plan plots tree locations.

Site Plan:

The below site plan plots tree locations and outlines removal / retention recommendations (Retain, Remove, Relocate). Approximate Tree Protection Fencing locations are outlined in yellow. Retained Trees requiring Arborist Supervision are outlined in orange. ***An original large scaled copy of the site plan indicating trees marked for removal, and the locations of Tree Protection Zone fencing has not been included with this report; this is to be provided by the applicant, if required.***



Images:

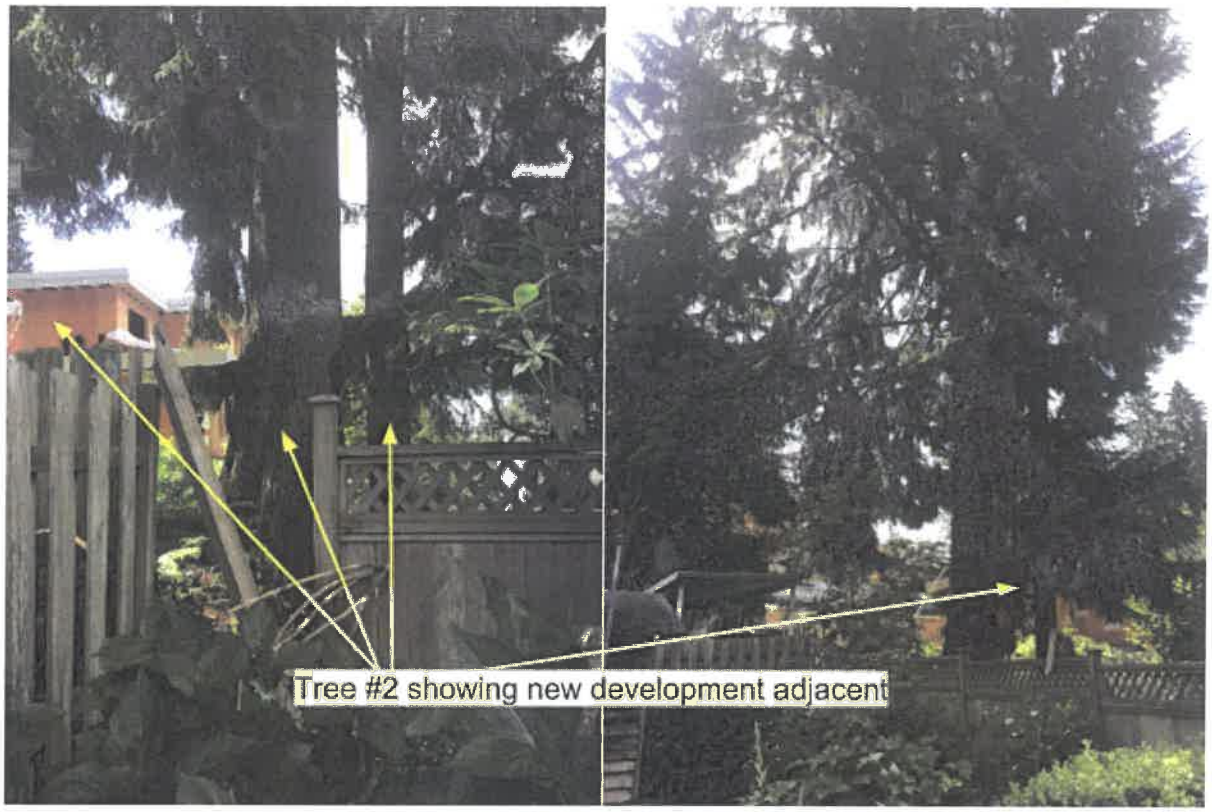

Tree #2 showing new development adjacent


Image showing possible construction damage/grade change inside CRZ of Tree #2

PUAR Engineering Consultants Inc
#200 - 100 Park Royal South
W.Vancouver, BC, Canada V7T 1A2
Fax: 1-866-246-9758; Tel: 604-913-7827

Puar Engineering CONSULTANTS

October 5, 2018 Project Number: 18-2-1880

ANDREW BUTLER
Ph: 778-980-7635
Email: andrewbutler250@gmail.com

Attention: Mr Andrew Butler

Re: GEOTECHNICAL REVIEW
PROPOSED SUBDIVISION
909 CLEMENTS AVE – NORTH VANCOUVER, BC
LOT C, BLOCK 4, DISTRICT LOT 594, G1, PLAN 3670, P.I.D. 012-383-490

1.0 TERMS OF REFERENCE

This report summarizes the results of Puar Engineering Consultants Inc's (herein referred to as "PECI") geotechnical review. This report presents preliminary geotechnical recommendations for input to the proposed subdivision of the above property. As architectural information is defined for each future residence, the recommendations contained within this report may be subject to an iterative process between the architectural, geotechnical engineering, and structural engineering consultants.

With regards to global slope stability, we have taken into account the District's requirements in accordance with the parameters defined in the November 10, 2009 Technical Memorandum "Natural Hazards Risk Tolerance Criteria". The District of North Vancouver Restrictive Covenant for sites sloping greater than 10° (per Master Requirement SPE-104) is accounted for.

Please refer to the attached Statement of Use of Study and Limitations (page 12) prior to reviewing the document.

2.0 SITE DESCRIPTION & PROPOSED DEVELOPMENT

Puar Engineering Consultants Inc's (herein referred to as "PECI") information about the site and proposed development is based on:

- our ongoing correspondence with the Client and Architect, (Halex Architecture),
- PECI's observations during our recent site reconnaissances,
- our experience in the vicinity of the site,
- Architectural design in PDF format (by Halex Architecture; Issued for Subdivision Application Aug.16/18)
- Data from the Geological Survey of Canada ("GSC").

- Bennett Land Surveying Ltd Topography (Oct.2, 2017).
- District of North Vancouver (DNV) Geoweb Mapping.

Project North is taken perpendicular to Clements Avenue at its location adjacent the subject property. The site is located on the west side of Capilano Road in the Canyon Heights sub-area of North Vancouver. The existing single-family residence is bounded to the east, west, and south by existing single-family parcels.

Topography in the general vicinity dips at 5° to 15°, (typ.) toward the west and less than 10° toward the west/ southwest. The existing lot occupies approximately 736 m^2 (7920 ft^2) in plan area.

Based on the above, it is understood that the proposed development consists of subdivision of the subject property into two parcels that each occupy 368 m^2 (3960 ft^2) (approx.) each. A two-level (with basement), wood-frame, single-family residence is proposed to be constructed on each new parcel. The west and east proposed lots are herein referred to as Lot 1 and Lot 2, respectively. Figure A-2 shows the proposed subdivision and architectural plan.

The proposed residence on Lot 2 is proposed to have the following floor elevations:

- Basement: El. 584.8’
- Main: El. 595.06’

The driveway would traverse the north extremity of each proposed lot. A series of concrete and rock/mortar retaining walls are present adjacent the east property line of Lot 2.

3.0 ESTIMATED SUBSURFACE CONDITIONS

Based on PECI’s experience in the vicinity of the subject property – spanning the 800 to 1000 block segments of Clements Ave – we envision foundation subgrade would consist of dense to very dense, moist, silty sand to gravely sand (till-like) containing trace to some silt, with an undefined proportion of cobbles and boulders. Based on information available from the Geological Survey of Canada (GSC), the native materials in the general vicinity are expected to consist of: raised deltaic medium sand to cobble gravel (Capilano/ Pleistocene Age Sediments) deposited by proglacial streams that is commonly underlain by silt to silty clay loam. Undivided Pre-Vashon glacial till deposits may also be encountered.

Surface and Subsurface Water

No surface or subsurface water was observed. Due to its comparatively low storage capacity, it is envisioned that groundwater flow primarily perches on the above-noted till-like deposits. Some of this flow would be retained by the surficial soils and be subject to evapotranspiration via local vegetation. Some of the flow would be expected to vent within local tributaries (creeks).

It should be noted that the impacts of water vary seasonally and in response to rainfall and snowmelt events, and/or special meteorological conditions. Groundwater conditions may also be altered by construction activity on or in the vicinity of the project site. Subsurface water conditions in the area may also be influenced by the nature of the upslope surface water drainage systems.

The potential impact of stormwater runoff from the proposed development is discussed below.

4.0 GEOTECHNICAL RECOMMENDATIONS

4.1. General

In general, based on the results of our geotechnical field investigation, the site is judged to be safe for the intended use based on the currently proposed development parameters described above. This conclusion is also contingent upon the implementation of the following recommendations and the performance of field reviews by PECI during construction. Risk tolerance criteria is described below.

Slope Stability

The District of North Vancouver's current approach to risk management is driven by the intent to, wherever reasonably practicable, reduce the incremental risks from the hazard ("ALARP"). With regards to global slope stability, we have taken into account the District's requirements in accordance with the parameters defined in the November 10, 2009 Technical Memorandum "Natural Hazards Risk Tolerance Criteria", as outlined below.

No indications of significant past ground movement were observed within the bounds of the subject property. Our design information, below, is based on the above observations, our experience and local geological data. At the time of construction, delays (adjustments in structural and geotechnical design, etc.) may result, if subsurface conditions are found to not be in conformance with the estimations applied in the above summary of subsurface conditions and in our preliminary design parameters below. In such a case, it is suggested that contingencies be in place to accommodate potential anomalies during construction.

The following provides our preliminary comments and recommendations for the proposed development.

4.2. Site Preparation

It is recommended that all deleterious materials (eg. organics) underlying any settlement-sensitive structures be removed to expose the undisturbed, till-like sand subgrade. The stripped subgrade should be reviewed by PECI prior to placement of Engineered Fill or formwork.

4.3. Temporary Excavation Preparation

As a general guide, unshored excavation cut-slopes less than 2.5 m high should be no steeper than 1V:1H through any loose to compact overburden soils. If the excavation walls are subject to seepage flows, they may require more shallow grading. If significant seepage is observed during construction, PECI should be notified immediately to confirm the suitability of the above excavation preparation recommendations.

We envision shoring will be required to support the east cutslope of the excavation at Lot 2. The shoring will be in accordance with our upcoming shoring design specifications drawings. The top of basement slab elevation at the residence at Lot 2 is proposed to be 584.8'. The top of the east excavation is expected to be at approximate elevations of 599' (north extremity) to 591' (south). The base of the cut is expected to be at approximately 583.3'.

4.4. Slope Stability

Field Investigation

Based on our past experience in the direct vicinity, comparatively favourable ground conditions are envisioned to be present from the slope stability viewpoint. To assess global stability, on and directly beyond the bounds of the subject properties, PECI performed an assessment of the surficial stability of the slope that was based on the above information. Our site reconnaissances included observation of signs of slope 'creep' to aid our understanding of the geology of the slope.

During our site reconnaissance, no signs of imminent failure (eg. tension cracks in the ground) were observed in the vicinity of the proposed development. No signs of historic, large-scale, deep-seated failures were observed. Vertical trees (ie. not curved or tilted) were observed beyond the north and south extremities. No seepage was observed across the façade of the slope during our site reconnaissances.

Slope Stability Analysis, Discussion, and Results

The static and dynamic (seismic) stability of the slope -- as it pertains to a slope failure that could significantly impact the proposed development -- was assessed, in terms of limit equilibrium stability (Bishop's Method). Soil layers were extrapolated based on our experience in the vicinity. The native, dense to very dense, sand strata (till-like) was assumed to be present at a depth of 1.2 m (max.) across the property. Topographic survey data was used to develop the slope geometry for input to the stability model. Structural loading is represented as a uniform 15 kPa pressure.

Seismic Loading

Current state-of-the-practice for the analysis of slopes under seismic loading is to utilize a pseudo-static procedure that simulates a mass of soil subject to an horizontal inertial force. The National Building Code of Canada (NBCC2015) estimates a peak ground acceleration of 0.36g

with a 2475-year return period for the North Vancouver area. As described below, we have estimated a Site Class "C" for the subject property. As such, firm ground motions have not been subject to modification (attenuation or amplification).

Failure Modes

Slope geometry and estimated subsurface conditions are comparatively favourable. As a result, even conservative parametric analyses show comparatively high factors of safety under both static and dynamic loading.

Results

Static factors of safety exceeded a value of 3.5 in all (parametric) instances. Pseudo-static safety factors exceeded 2.0. Our conservative lower bound estimates exceed the generally accepted factors of safety for static and pseudo-static loading (ie. 1.5 and 1.1, respectively). District-specific criteria is discussed below.

Recommendations and Conclusions

Based on the above, slope stability conditions are judged to be comparatively favourable for the subject property.

We have addressed slope stability under the general guidance of the Association of Professional Engineers & Geoscientists of BC's (APEGBC) "Guidelines for Legislated Landslide Assessments for Proposed Residential Development in British Columbia" (2010 Revision).

With regards to global slope stability, we have taken into account the District's requirements in accordance with the parameters defined in the November 10, 2009 Technical Memorandum "Natural Hazards Risk Tolerance Criteria". Given the current reduced societal acceptance of risk, the District's proposed tolerance criteria takes this into consideration by proposing two-tiered criteria. As such, more stringent criteria is applicable for new developments and subdivision, as follows:

a. under static conditions the slope stability FOS must be greater than 1.5; and
b. under non-static conditions (e.g. for earthquake ground motions), the slope stability FOS must be greater than 1.0; or predicted ground displacement must be less than 0.15 m with a 1:2475 annual chance of exceedance.

Based on the above, it is judged that the subject site has a comparatively low level of geotechnical complexity, as well as favourable hydrogeological conditions. Furthermore, in our experience, the low-permeability till-like sand stratum extends well below the failure surfaces that were estimated in our analyses. Based on these factors, a risk assessment was not considered to be warranted.

It is assumed that proper drainage practices will be implemented and all foundations will be placed on the surface of the till-like sand deposit.

Stormwater Management

It is judged that stormwater runoff discharged across the rear (south extremity) to the subject slope from the proposed developments would not have an adverse effect on slope stability.

Detention-based stormwater management systems (SWMP) that overflow to the municipal main (on Clements Ave) may be applied. Such systems would result in a considerable reduction in the peak flow rates from these properties during design storms. This would result in a significant reduction in the transient loading of the municipal stormwater main.

4.5. Footing Design

As noted, the following estimates will be subject to field verification during construction. The above-described undisturbed, native, dense, till-like sands are considered suitable for support of foundations, based on the Limit States bearing capacities described below. Minimum pad footing dimensions of 0.6 m (2.0') and minimum strip footing widths of 0.45 m (1.5') are recommended. It is recommended that foundations be placed a minimum of 0.45 m (18") below the adjacent final exterior grade for frost protection. Foundations within the approved subgrade should step at no more than 1.0 vertical to 2.0 horizontal (1V:2H).

A factored bearing capacity/ resistance of 300 kPa (6270 psf) would be applicable at the Ultimate Limit State (ULS) to the undisturbed, till-like sand subgrade (subject to field verification). A corresponding bearing capacity of 150 kPa (3130 psf) would be applicable under the Serviceability Limit State (SLS).

4.6. Seismic Design – Geotechnical Considerations

Current design ground motions have a reduced probability of occurrence of 2% in 50 years, or a return period of 2475 years. As shown in Table 2, 5% damped horizontal spectral acceleration values are defined for a range of periods. The four spectral values forming the Hazard Spectra illustrate the range and period dependence of seismic hazard.

NBCC 2015 assigns the ground profile to one of six site classes, which are defined based on the following soil parameters within the upper 30 m of the soil profile: Shear Wave Velocity (V_s), SPT blow count (N_{60}), Undrained Shear Strength (S_u), Plasticity Index (P.I.), and/or Natural Moisture Content (w_n). Different soil conditions affect the ground motion by increasing or decreasing the amplitude of frequency components present in the firm ground motion.

Table 2 – Surface Spectral Response – Local Ground Motions

Period (sec)	0.2	0.5	1.0	2.0
Spectral Acceleration* (g)	0.82	0.73	0.41	0.25

From a geotechnical stand-point, it is judged that surface spectral response would be expected to correspond most closely to Site Class C. Hence, the tabulated ground motions would not be modified (ie. F_a=1.0), and Spectral Response would correspond to the tabulated values. The locally applicable Peak Ground Acceleration (PGA) would be 0.36 g.

4.7. Slab-on-Grade

Generally, it is recommended that a minimum 150 mm (6") thick drainage layer of compacted 19-mm (3/4") clear crushed gravel be placed beneath all slabs-on-grade. This drainage layer should be separated from the slab-on-grade by a layer of 6-mil polyethylene sheeting (per CAN/CGSB-51.34-M86). At all locations, the sub-slab drainage layer should be reviewed by PECI prior to pouring of concrete.

4.8. Basement & Landscape Retaining Wall Design

4.8.1 General

The lateral earth pressure on basement and retaining walls depends upon a number of factors, including the backfill material, surcharge loads, backfill slope, drainage, rigidity of the wall, and method of construction including sequence and degree of compaction.

The lateral pressure estimates below **do not include hydrostatic components**, as it is envisioned that all retaining (including basement) walls will be suitably drained. If it is not possible to provide continuous drainage behind the walls, hydrostatic pressure must be assumed to act over the depth of the walls up to a level corresponding to locally applicable stormwater and/or groundwater design events; the hydrostatic pressure would be added to the static design lateral earth pressure. It should be noted that "continuous drainage" would be expected to include not only a drainage main, but also a suitable width of free-draining backfill.

The lateral earth pressure estimates provided below assume that the area behind the wall is horizontal and no adjacent structures or surcharges are situated within a horizontal offset from the base of the wall corresponding to a line projected at 3 Vertical to 2 Horizontal (3V:2H) from the base of the wall. Furthermore, the following design parameters are based on the assumption that all applicable walls will be backfilled with clean, granular, free-draining material such as Engineered Fill (described in a later section).

4.8.2 Static Design

Unrestrained Condition

For walls that can displace laterally an amount equivalent to 0.2% (min.) of the wall height, the condition is considered to be 'unrestrained'. For the unrestrained condition, we recommend that the wall be designed on the basis of a 6.4 x h (kPa) (ie. triangular earth pressure distribution where 'h' is the distance from the ground surface measured in metres). In imperial units this corresponds to 40 x h (psf), where 'h' is measured in feet.

Restrained Condition

"Restrained Condition" within the context of this report refers to walls that cannot displace laterally an amount equivalent to 0.2% (min.) of the wall height. If a restrained condition is present (eg. some basement walls) then we recommend that the wall be designed on the basis of a 9.6·h (kPa) triangular earth pressure distribution where 'h' is the distance from the ground surface measured in metres. In imperial units this corresponds to 60·h (psf), where 'h' is measured in feet.

4.8.3 Compaction-Induced Pressure

If the backfill is to support settlement-sensitive structures, it will require compaction. For this condition, a compaction-induced, uniformly-distributed, lateral earth pressure of 20 kPa can be used in the uppermost approximate 3 m. In imperial units this corresponds to a uniformly-distributed, compaction-induced earth pressure of 400 psf in the top approximate 10 ft.

4.8.4 Base Friction

It is envisioned that sliding resistance for footings would be derived from Engineered Fill (Working Mat) placed on the undisturbed, till-like or bedrock subgrade. A friction factor of 0.5 may be applied between the concrete and Engineered Fill (eg. 19 mm clear crushed gravel) interface.

4.8.5 Seismic Design

Seismic loading conditions can be assumed to represent an additional triangular pressure at the top of the wall that decreases to zero at the base of the wall. The seismic surcharge pressure can be assumed to be 3.2·(H-h) kPa, where 'h' is the distance from the top of the wall and 'H' is the total wall height in metres. In imperial units this corresponds to 20·(H-h) (psf), where the measurements are in feet.

The seismic loading is added to the static loading, but the compaction-induced loading represents a superimposed loading condition. Consequently, the maximum lateral earth pressure at any point over the depth of the wall would be the **greater of**:

1.) For the Unrestrained Condition:

- 3.2·(H+h) (kPa) [i.e., the sum of 6.4·h (static) and 3.2·(H-h) (dynamic)], and

- 20 kPa (ie. compaction-induced pressure).

In imperial units, this amounts to:

- 20·(H+h) (psf) [i.e., the sum of 40·h (static) and 20·(H-h) (dynamic)], and
- 400 psf (ie. compaction-induced pressure).

and,

2.) For the Restrained Condition:

- 3.2·H + 6.3·h (kPa) [i.e., the sum of 9.5·h (static) and 3.2·(H-h) (dynamic)], and
- 20 kPa (ie. compaction-induced pressure).

In imperial units, this amounts to:

- 20·H + 40·h (psf) [i.e., the sum of 60·h (static) and 20·(H-h) (dynamic)], and
- 400 psf (ie. compaction-induced pressure).

4.8.6 Additional Loading - Vehicle Surcharges, etc

PECI should be contacted to confirm changes to the above estimates if any dead and/or live loads will be present adjacent a particular retaining wall. Any loads associated with lateral earth pressure induced by surcharges present across the top of the backfill (such as vehicle loading at paved locations adjacent the subject walls) should be added to the above earth pressure estimates as instructed by PECI.

4.9. Engineered Fill & Backfill

Engineered Fill

Engineered Fill should extend beyond the outer edges of footings a minimum horizontal distance equal to the width of the foundation, plus the thickness of the Engineered Fill.

Engineered Fill should consist of select, clean, well-graded granular material with less than 5% fines content and 100% passing a 75 mm (3") sieve. Engineered Fill should be placed in suitable lifts (generally 0.3 m loose thickness, or less) and compacted to the equivalent of 95% of its maximum dry density as determined by ASTM D1557 (Modified Proctor).

In accordance with the issued Letters of Assurance, the Client is required to ensure that field reviews are conducted by PECI to confirm that fill selection and placement procedures are satisfactory and density test results are representative. Field density testing or equivalent field observation by PECI should be carried out on each lift of Engineered Fill placed.

Backfill

In order to minimize lateral earth pressure against below-grade walls, backfill placed against foundation and landscape retaining walls should consist of Engineered Fill as specified above. It should be noted that backfill can be expected to experience post-construction settlement of the order of 1% of the total fill thickness. Therefore, consideration should be given to the design of paved areas and/ or landscaping that spans the outer edge of the backfill.

4.10. Private Paved Areas

It should be noted that if pavement is to be constructed at the site, the following recommendations do not supercede or replace local municipal requirements. The recommendations below apply only to those areas that are not subject to municipal bylaws.

Upon removing all fill, topsoil, loosened, disturbed or otherwise deleterious material from beneath the new pavement footprint areas, we recommend placing the pavement section summarized in Table 2.

Table 2 – Recommended Minimum Asphalt Pavement Structure

MATERIAL	THICKNESS (mm)
Asphaltic Concrete	85
19-mm minus crushed sand and gravel Base course	100
Engineered Fill (as described above) Sub-base course	As Required for Grade Restoration Fill

The stripped subgrade should be reviewed by PECI prior to placement of the sub-base layer to confirm the removal of unsuitable material. Laboratory Gradation and Modified Proctor tests should be carried out on the base and sub-base course materials, as instructed by PECI at the time of fill selection.

4.11. Construction Review

Per the District of North Vancouver's Letters of Assurance, subsurface conditions will require verification during construction to confirm that soil conditions are consistent with those described in this document. In accordance with the District's Letters of Assurance, the Geotechnical Engineer-of-Record ("G.E.R.") shall be contacted to carry out field reviews for the following items:

- temporary excavation stability,
- foundation and retaining wall subgrades,
- stability of permanent slopes,
- excavation shoring (as required),
- foundation wall backfill (material selection and placement),
- floor slab subgrades, prior to and after placement of drainage layer,
- Engineered Fill selection and placement, and
- pavement subgrades prior to and after placement of sub-base and base layers (if required).

5.0 CLOSURE

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We are pleased to be of assistance to you on this project and we trust that this information meets with your approval. Please feel free to contact us, if you have any questions or need further clarification.

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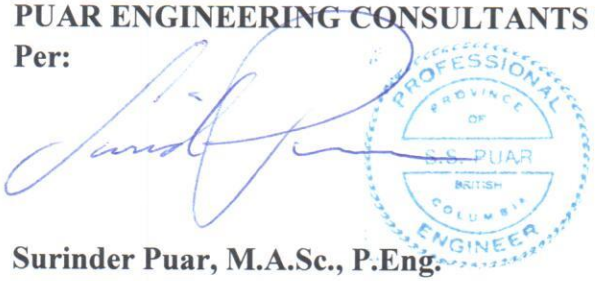

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