# Agenda and Reports

<p>| | |</p>
<table>
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| 1) | Public Hearing Agenda  
Will be published November 9, 2021 |
| 2) | **Staff Report** - September 14, 2021  
This report provides an overview of the project and the land use issues related to the review of this Rezoning Bylaw. |
| 3) | **Bylaw 8524**, which rezones the subject site from Single Family Residential One Acre Zone (RS1) to Single Family Residential Zone (RS3) and to establish specific lot size requirements to enable the development of a two-lot subdivision. |

## Additional Information

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<td>4)</td>
<td>Notice</td>
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<td>5)</td>
<td><strong>Minutes</strong> – Regular Meeting of Council held October 4, 2021</td>
</tr>
</tbody>
</table>

### Land Use

- **OCP Excerpts**  
  - Section 7.1 - housing diversity  
  - Section 12.5 - consolidated list of land use designations  
- **North Lonsdale-Delbrook Plan reference policy document**  
  - Repealed with the adoption of the OCP but remains as a reference document

### Design

- Proposed Plan of Subdivision/Site Plan  
- Tree Replacement Plan  
- Topographic Survey  
- Key Civil Plan

### Arborist Report and Tree Management Plan

- Prepared by Diamond Head Consulting Ltd. speaking to tree removals and recommendations on site

### Preliminary Wildfire Hazard Assessment Report

- Prepared by Diamond Head Consulting Ltd. speaking to the wildfire hazard conditions and recommendations on site

### Geotechnical Investigation Report

- Prepared by Terran Geotechnical Group and speaking to the soil and groundwater conditions on site

## Public Input

<p>| | |</p>
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<tr>
<td>12)</td>
<td><strong>Public Input</strong> – Correspondence / submissions from the public since 1st Reading given October 4, 2021</td>
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</table>
AGENDA

PUBLIC HEARING

Tuesday, November 16, 2021
7:00 p.m.
Council Chamber, Municipal Hall
355 West Queens Road
North Vancouver, BC
Watch at https://dnvorg.zoom.us/j/65345321120

Council Members:
Mayor Mike Little
Councillor Jordan Back
Councillor Mathew Bond
Councillor Megan Curren
Councillor Betty Forbes
Councillor Jim Hanson
Councillor Lisa Muri

www.dnv.org
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PUBLIC HEARING

7:00 p.m.
Tuesday, November 16, 2021
Council Chamber, Municipal Hall,
355 West Queens Road, North Vancouver
Watch at https://dnvorg.zoom.us/j/65345321120

AGENDA

4320 Prospect Road
Zoning Bylaw Amendments

1. OPENING BY THE MAYOR

2. INTRODUCTION OF BYLAW BY CLERK

District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)

Purpose of Bylaw:
Bylaw 8524 proposes to amend the District's Zoning Bylaw by rezoning the subject site from Single Family Residential One Acre Zone (RS1) to Single Family Residential 7200 Zone (RS3) to establish specific lot size requirements for a proposed two-lot subdivision.

3. PRESENTATION BY STAFF

Presentation: Holly Adams, Planning Assistant

4. PRESENTATION BY APPLICANT

Presentation: James Stobie, Director, Design and Operations, Synthesis Design

5. REPRESENTATIONS FROM THE PUBLIC

6. QUESTIONS FROM COUNCIL

7. COUNCIL RESOLUTION

Recommendation:
THAT the November 16, 2021 Public Hearing be closed;

AND THAT “District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)” be returned to Council for further consideration.

8. CLOSING
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The Corporation of the District of North Vancouver

Bylaw 8524

A bylaw to amend District of North Vancouver Zoning Bylaw 3210, 1965

The Council for The Corporation of the District of North Vancouver enacts as follows:

1. Citation

   This bylaw may be cited as “District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)”.

2. Amendments

   2.1 District of North Vancouver Zoning Bylaw 3210, 1965 is amended as follows:

   a) The Zoning Map is amended in the case of the lands illustrated on the attached map (Schedule A) by rezoning the land from Single Family Residential One Acre Zone (RS1) to Single Family Residential 7200 Zone (RS3).

   b) Part 3A Subdivision regulations is amended by adding a new row at the end of the table in Section 310 Special Minimum Lot Sizes as follows:

   | (ac) Amended Lot A (Reference Plan 37777), Lot 17, Block 1, District Lot 785, Plan 4730 | 4320 Prospect Road | 660 m² | 15.8 m | 45.7 m |

READ a first time October 4th, 2021

PUBLIC HEARING held

READ a second time

READ a third time

ADOPTED

Mayor

Municipal Clerk
Certified a true copy

Municipal Clerk
Schedule A to Bylaw 8524

BYLAW 8524
District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)

SINGLE-FAMILY RESIDENTIAL ONE ACRE ZONE (RS1) TO SINGLE-FAMILY RESIDENTIAL 7200 ZONE (RS3)
The District of North Vancouver
REPORT TO COUNCIL

September 14, 2021
Case: 08.3060.20/007.19
File: 08.3060.20/007.19

AUTHOR: Holly Adams, Planning Assistant

SUBJECT: Rezoning Bylaw 1411 (Bylaw 8524) – Rezoning for Two Lot Subdivision at 4320 Prospect Road

RECOMMENDATION:

THAT “District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)” to amend the District of North Vancouver Zoning Bylaw be given FIRST reading;

AND THAT “District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)” is referred to a Public Hearing.

REASON FOR REPORT:

Mr. James Stobie of Synthesis Design has applied on behalf of the owners of 4320 Prospect Road. The proposed subdivision requires an amendment to the Zoning Bylaw to change the zoning of the property and to establish specific lot size regulations for the proposed lots.

SUMMARY:

The applicant is proposing to subdivide the property at 4320 Prospect Road into two single family lots, each approximately 15.84 m (51.9 ft.) in width. As the proposed lots do not meet minimum area and width requirements of the site’s Single Family Residential One Acre zone (RS1), a rezoning and special minimum lot width is required.
EXISTING POLICY:

Official Community Plan:
The subject property is designated as “RES Level 2: Detached Residential” (0.55 FSR) in the Official Community Plan (OCP). The proposed rezoning complies with the land use designation in the OCP.

North Lonsdale-Delbrook Plan:
The subject property is designated as “Low Density” in the North Lonsdale-Delbrook Plan reference policy document. The North Lonsdale-Delbrook Plan provides for consideration of rezoning and subdivision in this area with the following implementation statement:

"the large private lots in the 4200 and 4300 blocks Prospect Road may be considered a potential rezoning (to RS2 and RS3) and subdivision area subject to private owners’ initiatives”.

The rezoning and subdivision proposal would create lots which are configured similarly to the properties to the south. The RS3 lots to the south at 4250 and 4260 Prospect Road were created through a rezoning in 2005. The subsequent subdivision resulted in three lots: one in a panhandle configuration to the rear and two smaller lots fronting Prospect Road (see image above showing subject property and the lots to the south). If the subject property is rezoned and subdivided into two lots, it will achieve a similar layout as that to the south.

The proposed lot areas comply with the RS3 zone minimum area requirements and generally comply with the subdivision provisions of the North Lonsdale-Delbrook Plan reference policy document.

Zoning:
The property is currently zoned RS1 (“Single Family Residential One Acre Zone”). The below table compares the two proposed lots to the current RS1 and proposed RS3 subdivision requirements:

<table>
<thead>
<tr>
<th></th>
<th>Lot Width</th>
<th>Lot Depth</th>
<th>Lot Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RS1 Zone Regulations</strong></td>
<td>30 m (98.43 ft.)</td>
<td>34 m (111.55 ft.)</td>
<td>4,000 m² (43,055.6 sq. ft.)</td>
</tr>
<tr>
<td><strong>RS3 Zone Regulations</strong></td>
<td>18 m (59 ft.)</td>
<td>34 m (111.55 ft.)</td>
<td>660 m² (7,104.2 sq. ft.)</td>
</tr>
<tr>
<td><strong>Proposed RS3 Lots</strong></td>
<td>15.84 m (51.97 ft.)</td>
<td>45.72 m (150 ft.)</td>
<td>724 m² (7,793.1 sq. ft.)</td>
</tr>
</tbody>
</table>
SUBJECT: Rezoning Bylaw 1411 (Bylaw 8524) – Rezoning for Two Lot Subdivision at 4320 Prospect Road

September 14, 2021

The proposed subdivision requires an amendment to the Zoning Bylaw to rezone the property from RS1 to RS3 as the proposed lots do not comply with the RS1 minimum lot area requirements.

Bylaw 8524 also includes an amendment to Section 310 (Special Minimum Lot Size Regulations) of the Zoning Bylaw to establish specific minimum lot size regulations for the proposed lots. The proposed lots are 15.84 m (51.97 ft.) in width and do not meet the RS3 width requirement of 18 m (59 ft.)

Rezoning Bylaw 1206 (Bylaw 7524), which rezoned the lots to the south in 2005, permitted two lots of approximately 16.4 m wide which are also narrower than the RS3 zone requirements. At the time, the Approving Officer had discretion to allow a reduction in lot width of up to 10%. That discretion no longer exists and the proposed amendment to the Zoning Bylaw’s Special Minimum Lot Size Table will permit a reduction in lot width for the subject lots to allow for a minimum lot width requirement of 15.84 m (51.97 ft.)

ANALYSIS:

Site and Surrounding Area:
The subject lot is 31.7 m (104 ft.) wide, 1,448 m² (15,586 sq. ft.) in area and is occupied by a single family dwelling.

The surrounding area is characterized by single-family development with a mix of RS1, RS2, and RS3-zoned properties.

The subject lot is within the Development Permit Area for Protection of Development from Hazardous Conditions (Wildfire Hazard). The new construction must meet the requirements of this Development Permit Area.

Subdivision Proposal:
This application proposes to subdivide the existing lot into two lots. The site plan illustrating the proposed subdivision is shown on the next page. Access to the proposed lots will be from Prospect Road and it is anticipated that the two lots will share one driveway. A reciprocal access easement would be required to be registered on title to allow access over the shared portion the driveway.
The applicant is proposing secondary suites for each new home and as such will need to provide a total of three off-street parking spaces for each lot.

Approving Officer’s Best Practices:

The proposed subdivision creates two RS3-sized lots generally in compliance with the provisions of the North Lonsdale-Delbrook Plan and would continue the lot pattern found to the south. The remainder of the lots on the block are zoned RS1, RS2 and RS3, with the lot adjacent to the north being RS1 and having potential for future rezoning and subdivision under the provisions of the North Lonsdale-Delbrook Plan.

Should Council approve the rezoning and the Approving Officer grant subdivision approval, a covenant will be required ensuring the proposed new houses have unique designs.

The applicant is proposing basements and secondary suites in each of the houses and to accommodate this, a groundwater monitoring study will be required as part of the subdivision process.
Environment:

Development Permit Area:
The site is located within the Development Permit Area for Protection of Development from Hazardous Conditions (Wildfire Hazard). The applicant has provided a preliminary Wildfire Hazard Assessment Report and new construction must meet the requirements of this Development Permit Area. A Development Permit for Wildfire Hazard will be required at the Building Permit stage to ensure compliance.

Trees
The applicant has submitted a tree survey and Arborist Report. A total of 17 on-site trees/hedges are proposed to be removed from the site (the submitted Arborist Report includes trees and hedges in the assessment). Eight trees/hedges are in conflict with the development, one tree is in conflict but also in poor health, and the remainder are recommended to be removed due to poor health, to meet Wildfire Hazard requirements, or as they will not have viable longevity due to removal of other trees.

Of the 17 trees/hedges proposed for removal, there are two trees shared with the District which will require a minimum of four replacement trees on the boulevard area. Six large diameter trees on private property are proposed for removal. The applicant has provided a tree replacement plan and a total of 18 replacement trees will be required.

There are off-site trees and hedges on neighbouring property which were surveyed and included in the submitted Arborist Report. The applicant has designed the site plan to ensure retention of these trees and hedges.
The applicant will need to continue working with the Environment Department and the project consultants through the subdivision approval and Building Permit processes to ensure all tree replacement plans and Wildfire Hazard requirements are fulfilled.

PUBLIC INPUT:

A notification letter was sent to owners and occupants within a 75 m radius in accordance with the District’s public notification policy.

A total of 5 neighbours responded. The nature of neighbour comments include:
- concern with an increase in residential density in the area;
- negative impacts to current residents who purchased in the area for space, privacy, and access to nature;
- a desire to see retention of existing trees and shrubs;
- potential visibility of cars parked on the subject property; and
- potential impacts to views as a result of new houses and trees on the subject property.

Neighbour comments have been included with this report as Attachment 2 (note some neighbours have commented a second time or have provided comments via both a telephone call and emails). Staff have responded to neighbours to answer questions about the process and have provided the applicant with redacted neighbour comments for their consideration.

To address neighbour concerns regarding privacy, visibility of cars parked on-site, and tree retention, the applicant is required to re-plant a minimum of 18 trees including four on the District’s boulevard and has modified the design of their retaining wall to reduce potential impacts on trees located on neighbouring properties.

The species of trees to be re-planted will be guided by the requirements of the Wildfire Hazard Development Permit Area and must be of an approved native species.

The applicant has stated that the proposed shared driveway will aid in allowing the homes to be located closer to Prospect Road which should help reduce impacts on views for neighbouring lots, and house siting / shared access will be secured by a covenant should the subdivision application advance. The height of future houses on the site would be regulated by the proposed RS3 zoning.

The Delbrook Community Association was notified and did not comment on the proposal.

Further public notification will be undertaken should the proposal proceed to the required public hearing.
CONCURRENCE:

The application has been reviewed by the Development Engineering, Environment, Construction Traffic Management, and Building Departments.

The Development Engineering Department is continuing to work with the applicant on revisions to the servicing plan. Acceptance of revised engineering drawings will be a condition of final subdivision approval.

CONCLUSION:

The lots in the 4200 and 4300 blocks of Prospect Road may be considered for potential rezoning to RS2 or RS3 zones under the provisions of the North Lonsdale-Delbrook Plan reference policy document. The proposed lots comply with the RS3 zone minimum area requirements and generally comply with the subdivision provisions of the North Lonsdale-Delbrook Plan reference policy document. The proposal incorporates the Approving Officer’s enhanced best practices for infill subdivisions. Rezoning Bylaw 1411 (Bylaw 8524) (Attachment 1) is ready to be considered for First Reading and referral to Public Hearing.

OPTIONS:

The following options are available for Council’s consideration:

1. THAT “District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)” to amend the District of North Vancouver Zoning Bylaw be given FIRST reading

   AND THAT “District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)” is referred to a Public Hearing (staff recommendation); or

2. THAT “District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)” not be given First Reading and thereby defeat the subdivision proposal.

Respectfully submitted,

[Signature]

Holly Adams

Attachments:

1. District of North Vancouver Rezoning Bylaw 8524
2. Record of Public Input (Redacted)
<table>
<thead>
<tr>
<th>REVIEWED WITH:</th>
<th>External Agencies:</th>
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<tbody>
<tr>
<td>Community Planning</td>
<td>Library Board</td>
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<td>Development Planning</td>
<td>NS Health</td>
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<td>Development Engineering</td>
<td>RCMP</td>
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<td>NVRC</td>
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<td>Engineering Operations</td>
<td>Museum &amp; Arch.</td>
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<td>Parks</td>
<td>Other:</td>
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<td>Environment</td>
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<td>Human Resources</td>
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<td>Review and Compliance</td>
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The Corporation of the District of North Vancouver

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b) Part 3A Subdivision regulations is amended by adding a new row at the end of the table in Section 310 Special Minimum Lot Sizes as follows:

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<th>15.8 m</th>
<th>45.7 m</th>
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</table>

READ a first time

PUBLIC HEARING held

READ a second time

READ a third time

ADOPTED

Mayor

Municipal Clerk
Certified a true copy

Municipal Clerk
Schedule A to Bylaw 8524

BYLAW 8524
District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)

SINGLE-FAMILY RESIDENTIAL ONE ACRE ZONE (RS1) TO
SINGLE-FAMILY RESIDENTIAL 7200 ZONE (RS3)
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June 21st, 2021

Dear Ms. Adams,

File: 08.3060.20/007.19
Case: PLN2019-00007

Thank you for forwarding the subdivision proposal application dated June 1, 2021 regarding 4320 Prospect Road.

As [redacted] both [redacted] and myself strongly object to any rezoning changes from RS1 to RS3 in this neighbourhood - which do not meet minimum requirements. [redacted] which underwent stringent consultation to maintain the integrity and harmony of the environment and the neighbourhood in this new subdivision. This undertaking took a number of years in pre-development, but the acre lot division into three new homes achieved a positive result. We feel very lucky to live in nature and respect the old growth of forests and shrubs, particularly because we are situated on a mountain and are within the Wildfire Hazard and Flooding Development.

As such, we do not think rezoning should be permitted given its impact: where the lot is located, where the lot size of 4320 Prospect (15,600 square feet) is considerably smaller than the two adjacent lots (4250 and 4260 combined at 18,360 square feet) and where an easement exists for the 4302 neighbour behind. If zoning requirements are amended and change the Residential Zoning standards of this entire neighbourhood, we feel this disenfranchises many recent and long-standing owners who purchased specifically for space, privacy and nature - within current zoning minimum lot requirements.

The recent demand for larger, single family homes adhering to the standard building and zoning codes will always make this area popular for homeowners. With older homes now being renovated or demolished for newer, greener family structures, prospective subdivision that meets the current minimum lot requirements should be welcomed. In addition, respect and protection/retention for any original planting of trees and shrubbery. Any subdivision that changes the composition of a neighbourhood should not be considered in this neighbourhood. Particularly, where profit could impact the neighbourhood’s environmentalism and community now and in the future.

Of Note:
This is the second application for this property (previously 2016, I believe). Any changes and/or amendments which occur now for one homeowner affect all current homeowners and future homeowners in this hot real estate market. A number of ‘plums’ are still awaiting development since the old Monteray school was demolished years
ago, and many older homes are currently on the market. ReZoning at this time would reverberate through this entire area, for all property owners and residents.

After COVID and its many waves, now is the time for neighbourliness - not unrest, discord and disruption.

Thank you for the opportunity to voice our concerns.

Sincerely,
Hi Holly:

I am responding to your request for comments regarding the proposed subdivision at 4320 Prospect Road. We have no issue with the subdivision and rezoning for those finalized lots. Our only request is that consideration be made when re-planting trees such that, whether deciduous or coniferous, they not be species that grow to enormous heights. This would help in the preservation of important and valued viewscapes.

Thank you,
Hi Holly, here are the drawings we were presented by the realtor. We of course would support such a development but worry that what is presented to us and what could actually be built within guide lines could be completely different. Could you tell us what heights we could expect under your guidelines and where these heights would be taken from.

We are also surprised that the architectural drawings had not been presented to you, as I thought they would represent the proposed development that the board of variance would look at.

Both [REDACTED] and I are very concerned about our views and would not support any development that would compromise that.

Thank you
Dear Holly

I am the [Redacted]. As I mentioned in the original proposal my view is of great importance to me. The realtor representing the owner has forwarded an architectural drawing that shows in a cross-section the proposed heights of the new structures, one being at 961.6 the other at 958.7. Can these heights be used as a mandated height for future structures or will the future owners of the properties be able to build to the maximum allowable height? If the structures are as proposed by Synthesis design dated January 24, 2018 I am for a subdivision, but if the future owners can build as they wish, I see the massing of two structures rather than one a greater threat to my view.

Kindly
You should also know that [redacted] when I re-sent your notice to a few of the neighbours. I repeated my concerns to [redacted] and told [redacted] that I am not against the re-development, something that, perhaps, [redacted] assumed was the case. [redacted] told me that [redacted] has been working with the [redacted] on the re-development and was also in communication with the architect.

Hi [redacted]

Thank-you, your comments have been recorded and will be provided to the applicant in a redacted format.

Regards,

Holly Adams  MCIP, RPP
Planning Assistant

355 West Queens Road
North Vancouver, BC V7N 4N5

adamsH@dnv.org
604-990-3733

Get the latest information on the District’s response to COVID-19 at DNV.org/COVID-19 or visit our social media channels by clicking the icons above.
From: [Redacted]
Sent: June 29, 2021 3:29 PM
To: Holly Adams <AdamsH@dnv.org>
Subject: Re: 4320 Prospect Rd- public mail-out

**CAUTION:** This email originated from outside of the DNV. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Holly: Thanks for re-sending me the letter/plan. My biggest concern was that there would be two driveways which appears not to be the case. It would be more appealing if we couldn't see the parked cars in front of the house, therefore, I would hope that vegetation was re-planted so as to hide the cars/pavement in front of the homes.

---

From: Holly Adams <AdamsH@dnv.org>
Sent: June 22, 2021 3:36 PM
To: [Redacted]
Subject: 4320 Prospect Rd- public mail-out

Hi [Redacted],

Thank-you for the phone call today. I want to accurately summarize your concerns- if you don't mind putting an email together with your concerns once you've had a chance to use the mapping tool and re-read the notice that will allow me to have a clear, written submission from you.

I have attached the neighbour notification which was sent out to neighbours within a 75m radius as per District policy. Note there will be another opportunity to comment come the public hearing (should the application proceeds to public hearing). The point of this notification is to get a sense of public/neighbour concern and allow the applicant to make any changes they want to prior to Council considering the application.

Here is the link to our mapping tool: [http://geoweb.dnv.org/properties/](http://geoweb.dnv.org/properties/)

You can type the address of the property you wish to look up into the box near the bottom of the screen. Let me know if you need any help with it.

Thanks,

**Holly Adams** MCIP, RPP
*Planning Assistant*
355 West Queens Road
North Vancouver, BC V7N 4N5

adamsh@dnv.org
604-990-3733

Get the latest information on the District's response to COVID-19 at DNV.org/COVID-19 or visit our social media channels by clicking the icons above.
Neighbour input - summary of telephone call

June 25, 2021
4320 Prospect Rd.
PLN2019-00007

[Redacted] of application [Redacted] called to ask questions about the application and to express concern.

Summary of concern:

- Concerned about views being negatively impacted. In particular whether new planted trees would grow very tall and impact views. Second, whether the future home could be built to a height which impacts views.
- Prefers to not have additional density.
- Concerned that future homes will differ from proposed architectural plans.
Hello Holly,

I live at [redacted] and in late June or early July we talked about the proposed subdivision of 4320 Prospect Rd. In early July we met with the architect who has been designing the proposed plan. [redacted] and I expressed our concern that if a developer buys the lot they are not restricted to the proposed height. We expressed our concerns that any increase in height would profoundly affect our views and quality of life. We asked [redacted] to ask [redacted] if [redacted] would put a height covenant on the property to restrict houses to the proposed height. I have not had a response from [redacted].

We would like to go on record that if the height covenant is not in place we will not approve of the subdivision. There are two main reasons for our objections. First, in principal we are not in favour of the increased density, and secondly in that there has been no response from [redacted] we can only assume [redacted] has not agreed to our proposal. I have spoken with [redacted] and I am in agreement with my opinions. I also would appreciate notice of when the proposal goes to district council to discuss the proposed plan.

Thank you

[redacted]
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## Public Hearings

**When:** Tuesday, November 16, 2021 at 7pm  
**Where:** 355 West Queens Road, North Vancouver, BC  
**How:** The Public Hearing will be held in a hybrid format with a combination of in-person and electronic participation by some or all members of council, staff and the public. The public are invited to attend at the Council Chamber where they will be able to see and hear the entire proceedings. Due to a public health order, face masks are required to be worn at all times by all persons attending the meeting and attendance will be limited to a total of 65 persons in the Council Chamber. Registered in-person speakers will have a reserved seat while observers beyond the maximum capacity will be directed to observe the meeting online. Those wishing to view or to participate in the meeting electronically may do so at https://dnvorg.zoom.us/j/65345321120 or by phone by dialing 1-778-907-2071 and entering Meeting ID: 653 4532 1120

Two public hearings will occur consecutively in the order noted below.

### 4320 Prospect Road

**What?** A Public Hearing for Bylaw 8524, proposed amendments to the Zoning Bylaw, to allow the creation of a two-lot subdivision.

**What changes?** Bylaw 8524 proposes to amend the District’s Zoning Bylaw by rezoning the subject site from Single Family Residential One Acre Zone (RS1) to Single Family Residential 7200 Zone (RS3) and to establish specific lot size requirements for a proposed two-lot subdivision.

*Provided by applicant for illustrative purposes only. The actual development, if approved, may differ.

### 1210 – 1260 West 16th Street

**What?** A Public Hearing for Bylaw 8459, proposed amendments to the Zoning Bylaw, to permit the creation of a 62-unit residential strata and rental development at 1210 – 1260 West 16th Street.

**What changes?** Bylaw 8459 proposes to amend the District’s Zoning Bylaw by rezoning the subject site from Single-Family Residential 6000 Zone (RS4) to a new Comprehensive Development Zone 131 (CD131). The CD131 Zone addresses permitted and accessory uses and zoning provisions such as density, amenities, setbacks, height, building and site coverage, landscaping, storm water management, and parking requirements.

*Provided by applicant for illustrative purposes only. The actual development, if approved, may differ.

### When and How can I provide input?

We welcome your input on November 16, 2021 at 7pm. You may sign up in advance to speak at the hearing by contacting the Municipal Clerk at signup@dnv.org prior to 3pm, Tuesday, November 16, 2021. You may also provide a written submission at any time prior to the close of the public hearing by sending it to the Municipal Clerk at input@dnv.org or by mail to Municipal Clerk, District of North Vancouver, 355 West Queens Road, North Vancouver, BC, V7N 4N5. After the speakers list has been exhausted, there will be an opportunity for additional speakers who had not signed up in advance to make submissions. Please note that Council may not receive further submissions from the public concerning these applications after the conclusion of the public hearings.

### Need more info?

Relevant background material and copies of the bylaws are available for review online at DNV.org/public-hearing.

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**Questions about Prospect Road?**  
Holly Adams, Planning Assistant  
604-990-3733 or adamsh@dnv.org

**Questions about West 16th?**  
Andrew Norton, Development Planner  
604-990-3717 or nortonA@dnv.org
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REPORT TO COUNCIL

September 14, 2021
Case: 08.3060.20/007.19
File: 08.3060.20/007.19

AUTHOR: Holly Adams, Planning Assistant

SUBJECT: Rezoning Bylaw 1411 (Bylaw 8524) – Rezoning for Two Lot Subdivision at 4320 Prospect Road

RECOMMENDATION:

THAT “District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)” to amend the District of North Vancouver Zoning Bylaw be given FIRST reading;

AND THAT “District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)” is referred to a Public Hearing.

REASON FOR REPORT:

Mr. James Stobie of Synthesis Design has applied on behalf of the owners of 4320 Prospect Road. The proposed subdivision requires an amendment to the Zoning Bylaw to change the zoning of the property and to establish specific lot size regulations for the proposed lots.

SUMMARY:

The applicant is proposing to subdivide the property at 4320 Prospect Road into two single family lots, each approximately 15.84 m (51.9 ft.) in width. As the proposed lots do not meet minimum area and width requirements of the site’s Single Family Residential One Acre zone (RS1), a rezoning and special minimum lot width is required.
EXISTING POLICY:

Official Community Plan:
The subject property is designated as “RES Level 2: Detached Residential” (0.55 FSR) in the Official Community Plan (OCP). The proposed rezoning complies with the land use designation in the OCP.

North Lonsdale-Delbrook Plan:
The subject property is designated as “Low Density” in the North Lonsdale-Delbrook Plan reference policy document. The North Lonsdale-Delbrook Plan provides for consideration of rezoning and subdivision in this area with the following implementation statement:

"the large private lots in the 4200 and 4300 blocks Prospect Road may be considered a potential rezoning (to RS2 and RS3) and subdivision area subject to private owners’ initiatives”.

The rezoning and subdivision proposal would create lots which are configured similarly to the properties to the south. The RS3 lots to the south at 4250 and 4260 Prospect Road were created through a rezoning in 2005. The subsequent subdivision resulted in three lots: one in a panhandle configuration to the rear and two smaller lots fronting Prospect Road (see image above showing subject property and the lots to the south). If the subject property is rezoned and subdivided into two lots, it will achieve a similar layout as that to the south.

The proposed lot areas comply with the RS3 zone minimum area requirements and generally comply with the subdivision provisions of the North Lonsdale-Delbrook Plan reference policy document.

Zoning:
The property is currently zoned RS1 (“Single Family Residential One Acre Zone”). The below table compares the two proposed lots to the current RS1 and proposed RS3 subdivision requirements:

<table>
<thead>
<tr>
<th></th>
<th>Lot Width</th>
<th>Lot Depth</th>
<th>Lot Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS1 Zone Regulations</td>
<td>30 m (98.43 ft.)</td>
<td>34 m (111.55 ft.)</td>
<td>4,000 m² (43,055.6 sq. ft.)</td>
</tr>
<tr>
<td>RS3 Zone Regulations</td>
<td>18 m (59 ft.)</td>
<td>34 m (111.55 ft.)</td>
<td>660 m² (7,104.2 sq. ft.)</td>
</tr>
<tr>
<td>Proposed RS3 Lots</td>
<td>15.84 m (51.97 ft.)</td>
<td>45.72 m (150 ft.)</td>
<td>724 m² (7,793.1 sq. ft.)</td>
</tr>
</tbody>
</table>
The proposed subdivision requires an amendment to the Zoning Bylaw to rezone the property from RS1 to RS3 as the proposed lots do not comply with the RS1 minimum lot area requirements.

Bylaw 8524 also includes an amendment to Section 310 (Special Minimum Lot Size Regulations) of the Zoning Bylaw to establish specific minimum lot size regulations for the proposed lots. The proposed lots are 15.84 m (51.97 ft.) in width and do not meet the RS3 width requirement of 18 m (59 ft.)

Rezoning Bylaw 1206 (Bylaw 7524), which rezoned the lots to the south in 2005, permitted two lots of approximately 16.4 m wide which are also narrower than the RS3 zone requirements. At the time, the Approving Officer had discretion to allow a reduction in lot width of up to 10%. That discretion no longer exists and the proposed amendment to the Zoning Bylaw’s Special Minimum Lot Size Table will permit a reduction in lot width for the subject lots to allow for a minimum lot width requirement of 15.84 m (51.97 ft.)

ANALYSIS:

Site and Surrounding Area:
The subject lot is 31.7 m (104 ft.) wide, 1,448 m² (15,586 sq. ft.) in area and is occupied by a single family dwelling.

The surrounding area is characterized by single-family development with a mix of RS1, RS2, and RS3-zoned properties.

The subject lot is within the Development Permit Area for Protection of Development from Hazardous Conditions (Wildfire Hazard). The new construction must meet the requirements of this Development Permit Area.

Subdivision Proposal:
This application proposes to subdivide the existing lot into two lots. The site plan illustrating the proposed subdivision is shown on the next page. Access to the proposed lots will be from Prospect Road and it is anticipated that the two lots will share one driveway. A reciprocal access easement would be required to be registered on title to allow access over the shared portion the driveway.
The applicant is proposing secondary suites for each new home and as such will need to provide a total of three off-street parking spaces for each lot.

Approving Officer’s Best Practices:

The proposed subdivision creates two RS3-sized lots generally in compliance with the provisions of the North Lonsdale-Delbrook Plan and would continue the lot pattern found to the south. The remainder of the lots on the block are zoned RS1, RS2 and RS3, with the lot adjacent to the north being RS1 and having potential for future rezoning and subdivision under the provisions of the North Lonsdale-Delbrook Plan.

Should Council approve the rezoning and the Approving Officer grant subdivision approval, a covenant will be required ensuring the proposed new houses have unique designs.

The applicant is proposing basements and secondary suites in each of the houses and to accommodate this, a groundwater monitoring study will be required as part of the subdivision process.
Environment:

Development Permit Area:
The site is located within the Development Permit Area for Protection of Development from Hazardous Conditions (Wildfire Hazard). The applicant has provided a preliminary Wildfire Hazard Assessment Report and new construction must meet the requirements of this Development Permit Area. A Development Permit for Wildfire Hazard will be required at the Building Permit stage to ensure compliance.

Trees
The applicant has submitted a tree survey and Arborist Report. A total of 17 on-site trees/hedges are proposed to be removed from the site (the submitted Arborist Report includes trees and hedges in the assessment). Eight trees/hedges are in conflict with the development, one tree is in conflict but also in poor health, and the remainder are recommended to be removed due to poor health, to meet Wildfire Hazard requirements, or as they will not have viable longevity due to removal of other trees.

Of the 17 trees/hedges proposed for removal, there are two trees shared with the District which will require a minimum of four replacement trees on the boulevard area. Six large diameter trees on private property are proposed for removal. The applicant has provided a tree replacement plan and a total of 18 replacement trees will be required.

There are off-site trees and hedges on neighbouring property which were surveyed and included in the submitted Arborist Report. The applicant has designed the site plan to ensure retention of these trees and hedges.
The applicant will need to continue working with the Environment Department and the project consultants through the subdivision approval and Building Permit processes to ensure all tree replacement plans and Wildfire Hazard requirements are fulfilled.

PUBLIC INPUT:

A notification letter was sent to owners and occupants within a 75 m radius in accordance with the District’s public notification policy.

A total of 5 neighbours responded. The nature of neighbour comments include:

- concern with an increase in residential density in the area;
- negative impacts to current residents who purchased in the area for space, privacy, and access to nature;
- a desire to see retention of existing trees and shrubs;
- potential visibility of cars parked on the subject property; and
- potential impacts to views as a result of new houses and trees on the subject property.

Neighbour comments have been included with this report as Attachment 2 (note some neighbours have commented a second time or have provided comments via both a telephone call and emails). Staff have responded to neighbours to answer questions about the process and have provided the applicant with redacted neighbour comments for their consideration.

To address neighbour concerns regarding privacy, visibility of cars parked on-site, and tree retention, the applicant is required to re-plant a minimum of 18 trees including four on the District’s boulevard and has modified the design of their retaining wall to reduce potential impacts on trees located on neighbouring properties.

The species of trees to be re-planted will be guided by the requirements of the Wildfire Hazard Development Permit Area and must be of an approved native species.

The applicant has stated that the proposed shared driveway will aid in allowing the homes to be located closer to Prospect Road which should help reduce impacts on views for neighbouring lots, and house siting / shared access will be secured by a covenant should the subdivision application advance. The height of future houses on the site would be regulated by the proposed RS3 zoning.

The Delbrook Community Association was notified and did not comment on the proposal.

Further public notification will be undertaken should the proposal proceed to the required public hearing.
CONCURRENCE:

The application has been reviewed by the Development Engineering, Environment, Construction Traffic Management, and Building Departments.

The Development Engineering Department is continuing to work with the applicant on revisions to the servicing plan. Acceptance of revised engineering drawings will be a condition of final subdivision approval.

CONCLUSION:

The lots in the 4200 and 4300 blocks of Prospect Road may be considered for potential rezoning to RS2 or RS3 zones under the provisions of the North Lonsdale-Delbrook Plan reference policy document. The proposed lots comply with the RS3 zone minimum area requirements and generally comply with the subdivision provisions of the North Lonsdale-Delbrook Plan reference policy document. The proposal incorporates the Approving Officer’s enhanced best practices for infill subdivisions. Rezoning Bylaw 1411 (Bylaw 8524) (Attachment 1) is ready to be considered for First Reading and referral to Public Hearing.

OPTIONS:

The following options are available for Council’s consideration:

1. THAT “District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)” to amend the District of North Vancouver Zoning Bylaw be given FIRST reading

   AND THAT “District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)” is referred to a Public Hearing (staff recommendation); or

2. THAT “District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)” not be given First Reading and thereby defeat the subdivision proposal.

Respectfully submitted,

Holly Adams

Attachments:

1. District of North Vancouver Rezoning Bylaw 8524
2. Record of Public Input (Redacted)
SUBJECT: Rezoning Bylaw 1411 (Bylaw 8524) – Rezoning for Two Lot Subdivision at 4320 Prospect Road
September 14, 2021

<table>
<thead>
<tr>
<th>REVIEWED WITH:</th>
<th>External Agencies:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Planning</td>
<td>Library Board</td>
</tr>
<tr>
<td>Development Planning</td>
<td>NS Health</td>
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<tr>
<td>Development Engineering</td>
<td>RCMP</td>
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<td>Utilities</td>
<td>NVRC</td>
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<tr>
<td>Engineering Operations</td>
<td>Museum &amp; Arch.</td>
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<tr>
<td>Parks</td>
<td>Other:</td>
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<tr>
<td>Environment</td>
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<td>Facilities</td>
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<td>Human Resources</td>
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<tr>
<td>Review and Compliance</td>
<td></td>
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</tbody>
</table>

Library Board
NS Health
RCMP
NVRC
Museum & Arch.
Other:

Planning
The Corporation of the District of North Vancouver

Bylaw 8524

A bylaw to amend District of North Vancouver Zoning Bylaw 3210, 1965

The Council for The Corporation of the District of North Vancouver enacts as follows:

1. Citation

This bylaw may be cited as "District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)."

2. Amendments

2.1 District of North Vancouver Zoning Bylaw 3210, 1965 is amended as follows:

a) The Zoning Map is amended in the case of the lands illustrated on the attached map (Schedule A) by rezoning the land from Single Family Residential One Acre Zone (RS1) to Single Family Residential 7200 Zone (RS3).

b) Part 3A Subdivision regulations is amended by adding a new row at the end of the table in Section 310 Special Minimum Lot Sizes as follows:

| (ac) Amended Lot A (Reference Plan 37777), Lot 17, Block 1, District Lot 785, Plan 4730 | 4320 Prospect Road | 660 m² | 15.8 m | 45.7 m |

READ a first time

PUBLIC HEARING held

READ a second time

READ a third time

ADOPTED

Mayor

Municipal Clerk
Certified a true copy

Municipal Clerk
Schedule A to Bylaw 8524

BYLAW 8524
District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)

SINGLE-FAMILY RESIDENTIAL ONE ACRE ZONE (RS1) TO SINGLE-FAMILY RESIDENTIAL 7200 ZONE (RS3)
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The Corporation of the District of North Vancouver

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| (ac) Amended Lot A (Reference Plan 37777), Lot 17, Block 1, District Lot 785, Plan 4730 | 4320 Prospect Road | 660 m² | 15.8 m | 45.7 m |

READ a first time October 4th, 2021

PUBLIC HEARING held

READ a second time

READ a third time

ADOPTED

_________________________________________  ______________________________
Mayor                                           Municipal Clerk
Certified a true copy

Municipal Clerk
Schedule A to Bylaw 8524

BYLAW 8524
District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)

SINGLE-FAMILY RESIDENTIAL ONE ACRE ZONE (RS1) TO SINGLE-FAMILY RESIDENTIAL 7200 ZONE (RS3)
**Public Hearings**

**ZONING BYLAW AMENDMENTS**

**When:** Tuesday, November 16, 2021 at 7pm

**Where:** 355 West Queens Road, North Vancouver, BC

**How:** The Public Hearing will be held in a hybrid format with a combination of in-person and electronic participation by some or all members of council, staff and the public. The public are invited to attend at the Council Chamber where they will be able to see and hear the entire proceedings. Due to a public health order, face masks are required to be worn at all times by all persons attending the meeting and attendance will be limited to a total of 65 persons in the Council Chamber. Registered in-person speakers will have a reserved seat while observers beyond the maximum capacity will be directed to observe the meeting online. Those wishing to view or to participate in the meeting electronically may do so at https://dnworg.zoom.us/j/65345321120 or by phone by dialing 1-778-907-2071 and entering Meeting ID: 653 4532 1120

**Two public hearings will occur consecutively in the order noted below.**

<table>
<thead>
<tr>
<th>4320 Prospect Road</th>
<th>1210 – 1260 West 16th Street</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What?</strong> A Public Hearing for Bylaw 8524 proposes amendments to the Zoning Bylaw, to allow the creation of a two-lot subdivision.</td>
<td><strong>What?</strong> A Public Hearing for Bylaw 8459 proposes amendments to the Zoning Bylaw, to permit the creation of a 62-unit residential strata and rental development at 1210 – 1260 West 16th Street.</td>
</tr>
<tr>
<td><strong>What changes?</strong> Bylaw 8524 proposes to amend the District's Zoning Bylaw by rezoning the subject site from Single Family Residential One Acre Zone (RS1) to Single Family Residential 7200 Zone (RS3) and to establish specific lot size requirements for a proposed two-lot subdivision.</td>
<td><strong>What changes?</strong> Bylaw 8459 proposes to amend the District’s Zoning Bylaw by rezoning the subject site from Single-Family Residential 6000 Zone (RS4) to a new Comprehensive Development Zone 131 (CD131). The CD131 Zone addresses permitted and accessory uses and zoning provisions such as density, amenities, setbacks, height, building and site coverage, landscaping, storm water management, and parking requirements.</td>
</tr>
</tbody>
</table>

*Provided by applicant for illustrative purposes only. The actual development, if approved, may differ.

**When and How can I provide input?**

We welcome your input on November 16, 2021 at 7pm. You may sign up in advance to speak at the hearing by contacting the Municipal Clerk at signup@dnv.org prior to 3pm, Tuesday, November 16, 2021. You may also provide a written submission at any time prior to the close of the public hearing by sending it to the Municipal Clerk at input@dnv.org or by mail to Municipal Clerk, District of North Vancouver, 355 West Queens Road, North Vancouver, BC, V7N 4N5. After the speakers list has been exhausted, there will be an opportunity for additional speakers who had not signed up in advance to make submissions. Please note that Council may not receive further submissions from the public concerning these applications after the conclusion of the public hearings.

**Need more info?**

Relevant background material and copies of the bylaws are available for review online at DNV.org/public-hearing.

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**Questions about Prospect Road?**
Holly Adams, Planning Assistant 604-990-3733 or adamsh@dnv.org

**Questions about West 16th?**
Andrew Norton, Development Planner 604-990-3717 or norton@dnv.org
Minutes of the Regular Meeting of Council for the District of North Vancouver held at 7:01 p.m. on Monday, October 4, 2021 in the Council Chamber of the District Hall, 355 West Queens Road, North Vancouver, British Columbia.

Present: Mayor M. Little
Councillor J. Back
Councillor M. Bond (7:05 p.m.)
Councillor M. Curren
Councillor B. Forbes (via Zoom)
Councillor J. Hanson

Absent: Councillor L. Muri

Staff: Mr. D. Stuart, Chief Administrative Officer
Mr. D. Milburn, General Manager – Planning, Properties & Permits
Ms. S. Walker, General Manager – Corporate Services
Mr. A. Wardell, General Manager – Finance and Chief Financial Officer
Ms. J. Paton, Assistant General Manager – Planning
Ms. T. Atva, Manager – Community Planning
Mr. J. Gordon, Manager – Administrative Services
Mr. M. Hartford, Manager – Development Planning
Mr. E. Iorio, Manager – Financial Services
Ms. C. Jackson, Manager – Climate Action, Natural Systems & Biodiversity
Ms. G. Lanz, Deputy Municipal Clerk
Ms. C. Archer, Confidential Council Clerk
Ms. K. Hebron, Committee Clerk
Mr. S. Neumann, User Support Specialist
Ms. A. Reiher, Council Liaison / Support Officer
Mr. D. Veres, Development Planner

1. ADOPTION OF THE AGENDA

1.1. October 4, 2021 Regular Meeting Agenda

MOVED by Councillor FORBES
SECONDED by Councillor CURREN
THAT the agenda for the October 4, 2021 Regular Meeting of Council for the District of North Vancouver is adopted as circulated, including the addition of any items listed in the agenda addendum.

CARRIED
Absent for Vote: Councillor BOND

2. PUBLIC INPUT

2.1. Mr. Paul Dean:
• Spoke in support of item 8.8 on behalf of CEFA Early Learning; and,
• Commented on the child care and learning space in the proposed development.
Councillor BOND arrived at this point in the proceedings.

2.2. Ms. Joy Hayden:
- Spoke in support of item 8.8 on behalf of Hollyburn Family Services Society;
- Commented on the shortage of affordable rental housing in the region;
- Commented on the housing types in the proposed development; and,
- Noted the local amenities in the neighbourhood.

2.3. Mr. Peter Teevan:
- Recommended limiting the number of new items on Council agendas;
- Commented on item 8.8;
- Queried if the subject site had been evaluated for its suitability for housing based on air quality;
- Commented on the District's progress to date building units to meet the housing goals in the Official Community Plan; and,
- Commented on the District's Residential Tenant Relocation Assistance Policy.

2.4. Mr. Juan Palacio:
- Spoke regarding improving civic engagement with youth and younger adults;
- Recommended a wider age range be included in the proposed advisory committee;
- Opined that younger people may not be interested in serving on the committee or have time to participate; and,
- Commented on the appeal of local government.

2.5. Ms. Estha Parg Murenbeeld:
- Thanked Council and staff for the new pickleball courts planned for Little Cates Park; and,
- Commented on the mental and physical health benefits of the sport.

2.6. Mr. Rene Gourley:
- Spoke on behalf of the Delbrook Community Association regarding vehicle speeds on Delbrook Avenue;
- Thanked staff for installing flashing lights on Delbrook Avenue at crosswalks; and,
- Requested bumpouts at Evergreen Place.

2.7. Ms. Shirley Friessen:
- Spoke regarding a dog attack in August 2021;
- Commented on bylaw enforcement regarding dangerous dogs; and,
- Commented on activities on a property in Edgemont Village.

3. RECOGNITIONS

3.1. Centennial Bursary Awards
- Brianna Bisaillon
- Jack Burnett
- Kobe Conrad
- Max Cunningham

Regular Minutes – October 4, 2021
Councillor FORBES left the meeting at 7:13 p.m. and returned at 7:15 p.m.

4. **DELEGATIONS**

   Nil

5. **ADOPTION OF MINUTES**

   Nil

6. **RELEASE OF CLOSED MEETING DECISIONS**

   Nil

7. **COUNCIL WORKSHOP REPORT**

   Nil

8. **REPORTS FROM COUNCIL OR STAFF**

   8.1. **2021 Community Heritage Advisory Committee Update**

   File No. 01.0360.02/001.000

   Ms. Jennifer Clay, Community Heritage Advisory Committee, provided an update on the committee’s activities, highlighting steps in the implementation of the Heritage Strategic Plan as well as the outcomes of various heritage properties in the District. Ms. Clay provided the committee’s feedback on the Heritage Revitalization Agreement process and the ongoing issue of “demolition by neglect” as well as recommendations to address these issues.

   **MOVED by Mayor LITTLE**
   **SECONDED by Councillor BACK**
   THAT the report of the Community Heritage Advisory Committee is received for information.

   **CARRIED**
MOVED by Councillor BOND  
SECONDED by Mayor LITTLE  
That staff report back to Council on the recommendations in the 2021 Community Heritage Advisory Committee Update.  

CARRIED

8.2. Development Permit 21.20 with Variances - 1755 Lions Gate Lane, 2020-2042 Curling Road, and 1865-1883 Fullerton Avenue  
File No. 08.3060.20/021.20  

MOVED by Mayor LITTLE  
SECONDED by Councillor BACK  
THAT Development Permit 21.20 with variances, to allow for site signage at 1755 Lions Gate Lane, 2020 - 2042 Curling Road, and 1865 - 1883 Fullerton Avenue, is ISSUED.  

CARRIED

8.3. Bylaw 8510: Multi-Family Rental Housing Demolition Notice Bylaw 7406, 2003 Repeal Bylaw  
File No. 09.3900.20/000.000  

MOVED by Mayor LITTLE  
SECONDED by Councillor BOND  
THAT “Multi-Family Rental Housing Demolition Notice Bylaw 7406, 2003 Repeal Bylaw 8510, 2021” is ADOPTED.  

CARRIED

8.4. Bylaw 8522 – 2020-2023 Taxation Exemptions by Council Bylaw 8379, 2019 Amendment Bylaw 8522, 2021 (Amendment 2)  
File No. 05.1940  

MOVED by Councillor FORBES  
SECONDED by Councillor HANSON  
THAT “2020-2023 Taxation Exemptions by Council Bylaw 8379, 2019 Amendment Bylaw 8522, 2021 (Amendment 2)” is given FIRST, SECOND and THIRD Readings;  
AND THAT prior to considering adoption of the Bylaw, public notice is given in accordance with Section 227 of the Community Charter.  

CARRIED

8.5. Extension of Temporary Outdoor Business Areas to October 2022 – Covid 19 Recovery  
File No. 08.3170.20/513.000
MOVED by Mayor LITTLE
SECONDED by Councillor BACK
THAT “Fees and Charges Bylaw 6481, 1992 Amendment Bylaw 8532, 2021 (Amendment 76)” is given FIRST, SECOND and THIRD Readings.

CARRIED

8.6. Amendments to the Council Procedure Bylaw
File No. 01.0115.30/002.000

MOVED by Mayor LITTLE
SECONDED by Councillor HANSON

CARRIED
Opposed: Councillor FORBES

8.7. Rezoning Bylaw 1411 (Bylaw 8524) – Rezoning for Two Lot Subdivision at 4320 Prospect Road
File No. 08.3060.20/007.19

Public Input:
Mr. James Stobie, Synthesis Design:
• Advised that he is the applicant for the project;
• Noted that the proposed two-lot subdivision would be consistent with the size of other properties in the neighbourhood; and,
• Provided information on the design of the proposed new homes, tree removal and replacement, and stormwater management.

MOVED by Councillor BOND
SECONDED by Councillor CURREN
THAT “District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)” is given FIRST Reading;
AND THAT “District of North Vancouver Rezoning Bylaw 1411 (Bylaw 8524)” is referred to a Public Hearing.

CARRIED

8.8. Bylaws 8505, 8506, 8507, 8508 - Rezoning, Housing Agreement and Development Cost Charge Waiver Bylaws for a Mixed-use Development at 1510 – 1530 Crown Street and 420 - 460 Mountain Highway
File No. 08.3060.20/040.18

Ms. Vicki Chou, Fairborne Homes:
• Provided an overview of the proposal;
• Noted the proposal includes a Locals First policy, various Community Amenity Contributions and space for a childcare facility; and,
• Advised she is available to answer questions.
Mayor LITTLE left the meeting at 9:05 p.m.

Councillor BOND assumed the chair.

Mayor LITTLE returned to the meeting at 9:07 p.m.

MOVED by Councillor BACK
SECONDED by Councillor BOND
THAT “District of North Vancouver Rezoning Bylaw 1409 (Bylaw 8505)” is given FIRST Reading;

AND THAT “Housing Agreement Bylaw 8506, 2021 (1510 Crown Street - No Rental Restrictions Except Short-Term Rental)” is given FIRST Reading;

AND THAT “Housing Agreement Bylaw 8506, 2021 (1510 Crown Street - Market and Affordable Rental Housing)” is given FIRST Reading;

AND THAT “Crown Street Development Cost Charges Waiver Bylaw 8508, 2021” is given FIRST, SECOND and THIRD Reading;

AND THAT “District of North Vancouver Rezoning Bylaw 1409 (Bylaw 8505)” is referred to a Public Hearing.

CARRIED
Opposed: Councillor HANSON

8.9. Bylaw 8509, 2021 District of North Vancouver Lands Dedication Bylaw 1107 Amendment
File No. 02.0930.20/509.000

MOVED by Councillor BOND
SECONDED by Councillor BACK
THAT “District of North Vancouver Lands Dedication Bylaw 1107 Amendment Bylaw (Bylaw 8509), 2021” is given FIRST Reading;

AND THAT staff is authorized to publish notification for two consecutive weeks as per the provisions in the Community Charter.

CARRIED

9. REPORTS

9.1. Mayor

Mayor Little reported on his attendance at the following:
• 50th anniversary of the Ecology Centre on October 2, 2021;
• 50th anniversary of the Baden Powell Trail on October 2, 2021; and,
• Observance of the National Day for Truth and Reconciliation on September 30, 2021. This included participating in the pilgrimage walk from the Tsleil-Waututh Nation Administration Building to the site of the former St. Paul’s Residential School, and attending ceremonies at the RCMP detachment in the City of North
that included stories and music performed by members of the Squamish Nation.

9.2. Chief Administrative Officer

Mr. David Stuart provided an update on the following:
• The work stoppage at the North Shore Waste Water Treatment Plant; and,
• A ribbon-cutting ceremony to be held October 5, 2021 at the site of the future Maplewood Fire Services Centre.

9.3. Councillors

9.3.1. Councillor Curren reported on the following:
• October 4, 2021 is the Day of Action on Missing and Murdered Indigenous Women and Girls;
• Her attendance at a disability justice workshop on October 3, 2021; and,
• Her participation in the pilgrimage walk from the Tsleil-Waututh Nation Administration Building to the site of the former St. Paul’s Residential School to observe the National Day for Truth and Reconciliation.

9.4. Metro Vancouver Committee Appointees

9.4.1. Housing Committee – Councillor Bond
Nil

9.4.2. Indigenous Relations Committee – Councillor Hanson
Nil

9.4.3. Board – Councillor Muri
Nil

9.4.4. Regional Culture Committee – Councillor Muri
Nil

9.4.5. Regional Parks Committee – Councillor Muri
Nil

9.4.6. Regional Planning Committee – Councillor Muri
Nil

9.4.7. Liquid Waste Committee – Mayor Little
Nil
9.4.8. COVID-19 Response & Recovery Task Force – Mayor Little
Nil

9.4.9. Mayors Committee – Mayor Little
Nil

9.4.10. Mayors Council – Translink – Mayor Little
Nil

9.4.11. Zero Waste Committee – Mayor Little
Nil

10. ADJOURNMENT

MOVED by Councillor BOND
SECONDED by Mayor LITTLE
THAT the October 4, 2021 Regular Meeting of Council for the District of North Vancouver is adjourned.

CARRIED
(9:46 p.m.)
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 limited office, 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.
NORTH LONSDALE - DELBROOK OFFICIAL COMMUNITY PLAN

SCHEDULE A TO BYLAW 6750

The North Lonsdale-Delbrook Official Community Plan, Bylaw 6750, adopted June 5, 1995, and
Bylaw 6775, adopted September 25, 1995

The Corporation of the District of North Vancouver
355 West Queens Road
North Vancouver, British Columbia
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1.0 INTRODUCTION

1.1 LEGAL BASIS FOR THE PLAN

The North Lonsdale-Delbrook Official Community Plan was prepared under the authority of Section 944 of the Municipal Act and is adopted by bylaw according to Section 947 of the Municipal Act. The content of the plan complies with Section 945 of the Municipal Act. As an official community plan is an expression of Council land use policy, Council may not take any actions contrary to this Plan. However, the plan does not commit Council to undertake any project included in the Plan.

In preparing the Plan consideration was given to adopted Council policy, previous related studies and public opinion. The Plan preparation process included workshops, open houses and meetings with the residents' associations, area interest groups and individual residents as well as consultation with other affected jurisdictions such as School District #44 and the City of North Vancouver. The Plan complements the policies and objectives contained in the District Official Community Plan (1990). Parks and recreation related recommendations are based on the draft Parks and Recreation Master Plan (1991). Relevant background studies include the Transportation Analysis of the Proposed Montroyal Extension and the Proposed Braemar-Dempsey Link (1984), the North Lonsdale Plan Traffic Study (1986), the North Lonsdale Plan (1988), the Heritage Inventory (1988) and the 1992 update, the Childcare Needs report (1990), the North Lonsdale Historic District Guidelines (1992), the Montroyal Connector Update Study (1995) and several landscape reconnaissance reports.

The Plan consolidates the former Queensdale Official Community Plan and the North Lonsdale Plan into one document, and supersedes both plans.

During the plan preparation process several recommended actions were undertaken or commenced and these are footnoted in the relevant sections in the text.

The Plan will be reviewed in five to ten years, or earlier if changing conditions warrant it, to ensure that its objectives and implementation strategies continue to serve the community.

1.2 PLAN BOUNDARIES
The North Lonsdale-Delbrook planning area (Map 1) is defined by:

- the municipal boundary between the City and District of North Vancouver on the south;
- Mosquito Creek on the west;
- the Alpine OCP boundary to the north along the upper edge of the B.C. Hydro right-of-way west of St. Georges Avenue, and the upper edge of D.L.s 700, 802 and 2004 to the east of St. Georges Avenue; and
- Duchess Avenue, Kilmer Creek and the lots fronting Dempsey Road as far as the disused quarry on the east.

There are five distinct residential neighbourhoods (Map 2) within the North Lonsdale-Delbrook community: Delbrook, Norwood/Queens, Upper Delbrook, Carisbrooke and Braemar. Bridging the Carisbrooke and Norwood/Queens neighbourhood is Queensdale, a mixed commercial and multi-family district centred on Lonsdale Avenue.

1.3 RESPONSIBILITY

Known potentially hazardous areas are indicated on Development Permit Area Map 1 in the District Official Community Plan. However responsibility for the safety of any development and liability arising from that development continues to rest exclusively with the owner. Persons using any area within the plan boundaries do so at their own risk.
2.0 SCOPE OF THE PLAN

The North Lonsdale-Delbrook Official Community Plan has been prepared to provide guidance for decisions affecting the future development of the community. The goal of the plan is to retain and enhance the attractive residential character of the community and to intensify use of parcels in the Queensdale commercial centre, creating a more functional and attractive entrance to North Lonsdale-Delbrook. The plan also contains broad objectives, policies and implementation strategies for the different types of land use and servicing elsewhere in the plan area.
3.0 THE NATURAL ENVIRONMENT

The North Lonsdale-Delbrook community extends north from the urban environment of the City of North Vancouver to the sub-alpine forest environment of Mount Fromme. The complex topography ranges from gentle to very steep gradients and makes development and circulation within the community difficult while creating an area which has exceptional views of the Vancouver harbour, Georgia Strait and the mountains. As the elevation increases, rain and snowfall levels increase and temperature drops, rock outcrops are more common, and the average slopes become steeper. These factors are major deterrents to further urban development because of the resulting higher servicing and maintenance costs. The risks of increasing the rate of runoff by removal of forest vegetation and the potential for downstream flooding are high. A history of problems associated with early development of steep hillsides and proximity to creeks plus recent heightened environmental awareness among the general public demands close attention to identifying potential impacts of new developments. This Plan accordingly recognizes that the approximate 320m limit currently imposed by the water distribution system is the practical limit for urban development. The Plan requires environmental guidelines to be followed to encourage sensitive development and prevent outcomes such as floods, loss of significant tree stands, or inappropriate hillside development.

Few areas of first growth vegetation remain. Undeveloped parts of North Lonsdale-Delbrook have second growth immature trees because of early logging and a major forest fire. Private landscaping throughout the rest of the community creates an overall impression of lush greenery with homes subordinate to their setting.

The proximity of North Lonsdale-Delbrook to the sub-alpine areas forms an interface between wildlife and urban development, giving the potential of conflicts although there have been no major problems to date. It presents opportunities for viewing wildlife and contributes to the very special natural environment and character of the upper edges of the community.
OBJECTIVE 3.1

Direct urban development to environmentally suitable sites respecting constraints such as steep slopes and water courses.

POLICY 3.1.1

Creek ravines, and steep slopes shall be retained in their forested state wherever possible to maintain the same runoff interval and limit flood potential.

IMPLEMENTATION

3.1.1.1 A review of existing Council policy on steep slope development should be undertaken to ensure that steep slopes are developed and/or protected appropriately.

3.1.1.2 Lands subject to hazardous conditions and critical natural environment are designated as Development Permit Areas in the District Official Community Plan (see Schedule B Sections 2.0 and 3.0). These lands include the Mosquito, MacKay and other sensitive creek ravines, the prime stand of trees located on the grounds of the East Queens Road apartment complex and the northern fringe area.

3.1.1.3 All watercourses shall be protected from development through the Environmental Protection and Preservation Bylaw and, where designated as Development Permit Areas for protection of the natural environment in the District Official Community Plan, by development permit guidelines.

3.1.1.4 Tree retention on steep slopes to reduce downstream flooding, erosion and landslides, and the protection of heritage and significant trees are regulated by the Environmental Protection and Preservation Bylaw.
POLICY 3.1.2

The present restriction on development above the limit of the water distribution system (approximately 320m) shall be continued.

IMPLEMENTATION

3.1.2.1 Designate lands above the 320m elevation as Parks, Recreation and Wilderness except those parcels referenced in Sections 4.2.1.3 and 4.2.1.5 of this plan.

3.1.2.2 Above the 320m contour, lands designated as Parks, Recreation and Wilderness are categorized either as "natural areas" where they are owned by public agencies or as "private natural areas" where they are private landholdings. "Private natural areas" are not areas for public recreation. Ultimately all categories designated Parks, Recreation and Wilderness will be rezoned to Parks, Recreation and Open Space.

OBJECTIVE 3.2

Maximize opportunities for enjoyment of the community's natural attributes, including views from public property.

POLICY 3.2.1

Retention of major public view corridors shall be an important component of all development proposals.

IMPLEMENTATION

3.2.1.1 An investigation should be undertaken to identify sites for public viewpoints including views from parks, community buildings and grounds, commercial centres and roads. Views to be identified include views of English Bay, the harbour and downtown Vancouver, and views of the North Shore mountains.

3.2.1.2 All developments for commercial and multi-family residential uses will be designated as Development Permit Areas and will have protection of public views included in their design guidelines through appropriate siting, height and landscaping requirements.
4.0 RESIDENTIAL - GENERAL

North Lonsdale-Delbrook’s historical development, varied terrain, and superb views establish the community’s overall character. Distinctive attributes of each of its neighbourhoods are primarily set by the age of development and subdivision pattern. Within the older neighbourhoods, further variation occurs because of average lot size, topography and landscaping, age and design of homes, and street pattern.

Most of the development took place in the 1950’s and 1960’s. As a result of this period of rapid growth, substantial road and servicing improvements were undertaken in the late 1960’s. This established the basic development pattern of today with the only notable exception being the recent Braemar-Dempsey connection and the development of the new Braemar neighbourhood. Today only the more difficult sites located in the north part of the community remain undeveloped where the key concern is whether any further housing can be accommodated without environmental deterioration.

Although most neighbourhoods in North Lonsdale-Delbrook (Map 2) have been fully built up with a cohesive and stable community character, a continual process of renovation and maintenance of properties is occurring. This process can be expected to continue due to high land values relative to the improvement values in the older areas. However most of the areas have relatively uniform subdivision patterns and are not subject to redevelopment pressures. In particular, Delbrook and most of the Upper Delbrook neighbourhoods are fully developed with larger 10-35 year old homes in good condition.

Norwood/Queens has a more varied character catering to a wider range of households. Carisbrooke has a broad range of development patterns: in the north and east are areas of newer homes; in the south-east and north-west there is a wider variation in lot sizes and age of housing; and the central section has a predominance of spacious lots with many older homes noted for their heritage qualities.

Within the established areas, incorporating any potential subdivision or rebuilding in a complementary rather than conflicting manner are key concerns. The plan acknowledges a property owner’s rights to redevelop a lot while accommodating the community’s needs to integrate new development and minimize loss of views. This issue is being addressed through the Council sponsored public meetings where citizens, Council representatives, architects, builders and staff are attempting to identify workable solutions on a neighbourhood basis.
Table 1 shows the population and housing growth in the community over the last 20 years. The lifecycle of this community is a fairly typical profile of an older suburb with an aging population and declining household size as the children of the original residents leave home. In the last five years younger families have begun to replace the retired residents who are leaving the community due to no longer requiring a single family house and a lack of alternative accommodation within the community. The household size appears to have stabilized.

The predominant type of housing has always been single family with only three areas of multi-family housing: Lonsdale Avenue between 29th Street and West Windsor, West Queens at Westview, and in the Delbrook Centre. In addition the Carisbrooke and Norwood/Queens neighbourhoods have most of the community’s registered secondary suites in single family houses. The current housing mix is approximately 90% single family, 5% townhouses and 5% apartments. The impact of this lack of housing diversity on housing choices for older residents is discussed in Section 5.0.

Approximately 40% of the growth in dwelling units noted by the 1991 census is not accounted for by building permits which indicates that they are secondary suites in existing dwellings.
OBJECTIVE 4.1

To maintain the existing character of predominantly low-density residential neighbourhoods.

POLICY 4.1.1

Except as specified in this plan, no changes in uses, densities and zoning in established residential areas are permitted.

IMPLEMENTATION

4.1.1.1 Small lots may be re-created subject to the small lot infill policy in the following Small Lot Infill Areas (S.L.I.A.), as designated on the Plan Map, i.e.

S.L.I.A. 5 - 600 block Queens and West 29th Street excluding north side West Queens.
S.L.I.A. 6 - Mahon Avenue (east side) between Windsor/Evergreen.
S.L.I.A. 10 - 100 block West Windsor. The two lots with the address 114 West Windsor are classified as a primary heritage site on the Heritage Inventory.
S.L.I.A. 11 - 3400 Blocks St. Georges and 200 block E. Osborne (north side).

In these areas, lots which were originally developed as a pair of 33 feet wide lots and subsequently consolidated may be re-created where the predominant development pattern is based on a 33 feet lot width. However, minimal subdivision potential exists in these areas.

4.1.1.2 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.

4.1.1.3 Consolidation of lots with road allowances or portions thereof for the purposes of subdivision will not be permitted.

4.1.1.4 Portions of the 4100-4200 blocks of St. Pauls and 4200 block St. Georges now zoned RS1 (one acre minimum lot size) will be rezoned to correct the existing anomaly and recognize the existing character
of development. As this is a 15m (50 ft.) wide lot module, the most appropriate zone is RS4, Single Family Residential 6000 Zone.

4.1.1.5 Applications for any rezoning in the existing RS2 area in the Carisbrooke neighbourhood to a higher density single family zone to permit subdivision will not be supported.

POLICY 4.1.2

To maintain the existing neighbourhood character by encouraging the construction of `infill housing' in sizes and styles similar to those in their vicinity.

IMPLEMENTATION

4.1.2.1 Owners of small lots are encouraged to follow the "Design Principles for Small Lot Developments" (Appendix B to the Small Lot Infill Report) in their developments. These provide guidance in the massing, height, window locations and facades for new dwellings.

4.1.2.2 In processing the applications for subdivision in existing neighbourhoods the existing practices of requiring the submission, public review and the registration of house plans against title (Land Title Act, Section 215) will be continued.

4.1.2.3 House sizes will be regulated as part of the new neighbourhood zoning initiative whereby new floor space ratios, heights and site coverages will vary in accordance with the established practice in particular character areas.

4.1.2.4 The Marlborough Heights Character Area as designated on the Plan Map is a high priority for neighbourhood zoning due to its historical significance as one of the District's earliest comprehensively planned subdivisions combining street layout, view orientation and house design where the character was enforced by covenant. To maintain the existing character, Zoning Bylaw zones will be created to increase front yard setbacks to maintain spacious front yards and decrease allowable heights to maintain typical existing heights. ¹

OBJECTIVE 4.2

¹ On March 27, 1995 a new Zoning Bylaw zone for the Marlborough Heights Character Area was adopted. A zoning bylaw for the Delbrook neighbourhood is in the process of preparation.
Extend the urban area to the north where appropriate.

**POLICY 4.2.1**

Development of the northern urban fringe will be established by neighbourhood design plans based upon detailed site analysis of topography, hydrology, vegetation and servicing ability.

**IMPLEMENTATION**

4.2.1.1 The design and development of new areas should follow environmental design criteria including the following:

a. recognition of restrictions imposed by topography, surficial geology, and hydrology of the site;

b. the siting of dwelling units to take advantage of any view potential and to protect any existing public views; and

c. retention of the windfirm tree cover where appropriate.

4.2.1.2 The large private lots in the 4200 and 4300 blocks Prospect Road may be considered a potential rezoning (to RS2 or RS3) and subdivision area subject to private owners' initiative.

4.2.1.3 The northern limit to development is imposed by the ability to provide water service which is approximately the 320m contour. Lots may straddle the 320m contour and may extend into the area designated as Parks, Recreation and Wilderness provided house construction is limited to the area designated "Residential". The boundary between the "PRW" and the "R" designations shown on the Plan Map may be interpreted as the upper limit to water servicing based on detailed survey and design information at the time of the application.

4.2.1.4 Where traditional development of separate lots would be detrimental to the natural environment, cluster housing or other innovative design
solutions are encouraged but the average density of the development parcel may not be increased.

4.2.1.5 Privately owned lands above or abutting the 320m contour and which are:

- currently designated as `Residential' in the District Official Community Plan and
- currently serviced, or maybe serviceable subject to survey, or
- may be able to obtain private servicing and access,

are designated `Rural Residential'. The lands designated Rural Residential are to be reviewed further to determine their subdivision potential in conjunction with their ability to be serviced by water.

POLICY 4.2.2

The new neighbourhood of Braemar is to be implemented in accordance with the 1988 plan concept as adopted by Council. (Map 3)

IMPLEMENTATION

4.2.2.1 Implementation of the Braemar neighbourhood will be in accordance with the zoning adopted on January 9, 1989.

4.2.2.2 Minor revisions to the zoning are permitted following detailed survey and subdivision design.

4.2.2.3 The area within which new housing is subject to the Braemar Design Guidelines is designated on the Plan Map.

See also the following sections for objectives, policies and implementation strategies for the following residential issues:

Redevelopment for housing for older adults - Section 5.
Residential units within commercial areas - Section 7.
5.0 RESIDENTIAL - REDEVELOPMENT

Currently there is a limited range of housing forms available in the community. There are few opportunities available for anything other than single family detached homes yet the statistics indicate a substantial demand in the near future for seniors' and empty nesters' units for those who wish to remain in the community without the responsibility of maintaining a detached house. "Empty nesters" are older residents, not yet seniors, whose children are no longer living in the family home. The percentage of area residents aged 55 plus more than doubled between 1971 - 91 (Table 2), as did their numbers (from 1030 in 1971 to 2185 in 1991).

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<th>Age (years)</th>
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<tr>
<td>0-19</td>
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<tr>
<td>20-54</td>
<td>47.1</td>
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<tr>
<td>55+</td>
<td>10.6</td>
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<tr>
<td>Total</td>
<td>100</td>
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Source: Statistics Canada, Census of 1971 - 91

Providing more seniors' housing in the North Lonsdale community requires that suitable sites be located and encouraged to redevelop. Such sites need to be relatively close to bus routes and commercial services and have reasonable accessibility to community services. Locations with these attributes in North Lonsdale are generally limited to the vicinities of W. Queens Road/Delbrook and Queens Road/Lonsdale Avenue. The addition of residential units on existing commercial sites is discussed in Section 7.0 Commercial.
OBJECTIVE 5.1

Recognize and accommodate requirements for housing oriented to the needs of "empty nesters" and seniors.

POLICY 5.1.1

Provide suitable locations for redevelopment for multi-family housing for seniors and empty nesters.

IMPLEMENTATION

5.1.1.1 Designate the north side 600 block W. Queens Road between the creek and the Delbrook Rec Centre parking lot for seniors and "empty nesters" housing at a maximum density of 36.3 u/ac (90 u/ha.) on one consolidated site.

5.1.1.2 Designate the western portion of the 100 block E. 29th Street for seniors and "empty nesters" housing at a maximum density of 36.3 u/ac (90 u/ha) on one consolidated site.

5.1.1.3 Designate the 100 blocks West Queens Road (south side) and West 29th Street (north side) for seniors and "empty nesters" housing at a maximum average density of 36.3 u/ac (90 u/ha) on one to four consolidated sites. See also subsection 5.1.3.3. (Bylaw 7454).

(a) An increased density to a maximum of 42.5 u/ac (105 u/ha) is permitted for Lots 8, 9, 10 and 11, all of Lot B, Blocks 4 to 13, District Lot 2026, Plan 3544C, and Lots C, D, and E, all of Block 2, District Lot 801, Plan 9372 and a portion of the Municipal Lane. (Bylaw 7507)

5.1.1.4 Consider higher densities for the sites designated above when applications include seniors' assisted (non-market) housing, seniors' rental housing and/or seniors' congregate care since these units tend to be smaller in size and generate less parking demand. Maximum gross floor area permitted is equivalent to that which would be permitted in the Low Rise Residential Zone 1 (RL1). (Bylaw 7454)
5.1.1.5 Consider applications for seniors’ housing on any other site in North Lonsdale-Delbrook only where the basic criteria of proximity to bus route(s) and commercial services are met and only when substantial redevelopment of the sites listed in Sections 5.1.1.1 to 5.1.1.3 has occurred. Such services should be within 250 - 400 metres (approx. - ¼ mile) depending on topography.

5.1.1.6 Sites specified in Sections 5.1.1.1 to 5.1.1.3 and 5.1.1.5 are, as a condition of rezoning, designated as:

- A site for special needs housing, pursuant to the Local Government Act Section 904 (3); and

- The occupancy of dwellings is restricted to households in which at least one household head is 55 years of age or older. This restriction is to be registered on title either by a covenant registered under Section 219 of the Land Titles Act in favour of the District of North Vancouver, or by a housing agreement with the District of North Vancouver pursuant to Section 905 (1-8) of the Local Government Act. (Bylaw 7454)

**POLICY 5.1.2**

To encourage mixed commercial-residential developments where presently permitted in Queensdale to meet changing residential requirements.

**IMPLEMENTATION**

5.1.2.1. Review the existing zoning provisions permitting residential units above commercial uses in commercial zones so as to encourage redevelopment and expand the residential base.
POLICY 5.1.3

The scale and design of all commercial and multi-family buildings shall be in keeping with the character of the North Lonsdale community with regard to the provision of high standards of services and landscaping, external appearance and the maintenance of existing view corridors.

IMPLEMENTATION

5.1.3.1. All multi-family areas are designated as Development Permit Areas and all applications for a development permit are regulated in accordance with the District OCP Schedule B Section 4.0. This will ensure that redevelopment will minimize impacts on adjacent lower density residences, such as overviewing and traffic flow, and from adjacent commercial sites, such as noise, lighting, and parking.

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

5.1.3.3. Development guidelines for the 100 Blocks W. Queens (south side) & W. 29th St. (north side) are:

I) VIEW PRESERVATION & SITE DEVELOPMENT

(a) Existing healthy trees should be preserved, where practical, particularly along the frontage of West Queens Road.

(b) Retention of some existing view corridors from north of the block to the south east/south/south-west between existing tree stands is desirable.

(c) A view analysis is required as a condition of development applications and used as a consideration in reviewing building massing.

(d) Sloped roofs or articulated roof forms are encouraged to reduce building scale and visual impact. Use of dormers and partial stories should be considered as a means to reduce overall height and bulk.

(e) The external appearance of buildings in this block should avoid a monolithic appearance, but should instead:

   (i) be, or appear to be, several buildings;
(ii) Incorporate a high quality of design, variation in facades, roof styles, and finishing materials, while ensuring compatibility and continuity between adjacent new projects;

(iii) Present a unified landscaping theme on all frontages;

(iv) Reflect neighbourhood architectural features in project designs, in particular features from the heritage houses on the north side of the 100 block West Queens.

(f) Sidewalks are to be provided along all street frontages.

(g) Pedestrian access from each development parcel is to be provided on all frontages, for convenient access to commercial services and transit stops.

(h) Development should harmonize with the neighbourhood – fences/gates should be used only to separate private and public spaces, not to create the appearance of a “gated community.”

(i) Underground power and communication is to be installed, preferably with power pole removal.

(j) All above ground utilities, garbage and recycling areas are to be screened.

(k) Rooftop mechanical equipment shall be hidden in the roof space, or screened from view.

(l) Off street parking should include employee parking spaces where applicable.
II) GRADATION OF DENSITIES AND HEIGHTS FROM EAST TO WEST

(a) Project appearance toward the west end of the block should step down to a two storey mass relative to the finished grade at Chesterfield Ave., to avoid a dramatic contrast between single family and multi-family uses across Chesterfield Ave.

(b) Building forms should take advantage of the natural south and west slope to reduce the apparent mass of the building.

(c) Unit design and suite orientation in the east portion of the block should recognise both existing commercial development, and the potential for future mixed commercial / residential redevelopment on Lonsdale Ave adjacent to this block.

III) LIMIT VEHICLE ACCESS / EGRESS TO WEST QUEENS ROAD

(a) Site consolidation should address where possible consolidated parking and driveway arrangements, common pedestrian and emergency vehicle access and preserve existing on-street parking on both W. Queens Rd. and W. 29th St.

(b) For all consolidated sites with frontage on West 29th St., vehicle access to parking garages, on-site driveways and drop-off/pick-up areas should be directed to W. 29th St., which has lower vehicle volume and more capacity than W. Queens Rd., and an existing traffic signal and turn lane at Lonsdale Ave.

IV) SITE CONSOLIDATION WITH EXISTING EAST / WEST LANE

The existing east/west lane shall be incorporated into the sites for:

(a) Improved north / south orientation of buildings to achieve view corridors.

(b) Direct access to W. 29th street.

(c) Improved opportunities for more shared on-site open space.
V) MINIMUM SITE SIZE FOR CONSOLIDATION

To ensure that these objectives can be realised, ideally the entire block would be consolidated and developed. Given the difficulties in achieving consolidation, the acceptable number of development sites is four. The following standards apply:

(a) Sites must provide a minimum parcel size of 10,000 sq. ft. to permit future redevelopment for multi-family purposes (consistent with the District’s low rise multi-family residential zones).

(b) Small sites may not be able to achieve the 36.3 u/ac density due to:
   • Limitations in providing required parking,
   • The configuration of the site,
   • The intent to reduce building heights on the Chesterfield frontage to a two storey mass.

(c) Access opportunities to remainder sites must be retained, both for existing single family uses, and for future multi-family development purposes.

(d) Remaining sites may be required to pay latecomer charges for infrastructure improvements upon development.

(Bylaw 7454)
OBJECTIVE 5.2

Recognize the changing housing requirements of the community, and accommodate a variety of housing types to meet these needs.

POLICY 5.2.1

Provide suitable locations for development of multi-family housing to meet the needs of a range of age groups, including families and seniors.

IMPLEMENTATION

5.2.1.1 Consider rezoning for multi-family housing on a site specific basis, where the site meets the criteria of proximity to bus routes and commercial/community services, and where the proposed development minimizes impacts on existing adjacent residences as outlined in Implementation sections 5.1.3.1 and 5.1.3.2;

5.2.1.2 Designate the 200 block of East 29th Street (north side) for medium density residential use at a maximum average density of 12.4 units/acre (30.6 units/ha.).

(Bylaw 7416)
6.0 RESIDENTIAL - HERITAGE

Section 6.0 Residential Heritage was deleted at third reading of the bylaw.
7.0 COMMERCIAL

The two commercial areas established in North Lonsdale are Delbrook Plaza, at Evergreen Place and Delbrook Avenue, and Queensdale at Lonsdale Avenue and Queens Road. These are neighbourhood-level shopping centres catering primarily to residents’ day-to-day needs. Nearby, Lynn Valley Centre, Central Lonsdale, Westview Centre, and Edgemont Village also provide for much of the residents' regular retail requirements. The Plan retains the neighbourhood orientation of the commercial sites and does not envision the expansion of the commercially zoned areas.

The Delbrook commercial centre has had a recent upgrading and a residential component was added. The potential for both upgrading and the addition of residential units still exists in the Queensdale area. Such redevelopment will be encouraged in Queensdale to upgrade the appearance in keeping with its role as a major entrance to the District from the Upper Levels highway and the City of North Vancouver. The addition of apartments suitable for older residents above commercial uses would serve to add to the customer base as well as providing a needed housing type.
OBJECTIVE 7.1

Maintain provision of commercial services within the community from designated sites.

POLICY 7.1.1

Retain the small scale orientation of both the Queensdale and Delbrook commercial centres.

IMPLEMENTATION

7.1.1.1 No additional land shall be designated or zoned for commercial purposes.

7.1.1.2 Retain zoning for commercial purposes in the Queensdale and Delbrook areas.

POLICY 7.1.2

Support the inclusion of residential uses in the commercial areas when compatible with the commercial use. Residential uses are not considered to be compatible on commercial sites used for gas stations and neighbourhood public houses.

IMPLEMENTATION

7.1.2.1 As previously stated in Section 5.1.2.1: - review the existing zoning provisions permitting residential units above commercial uses in commercial zones with a view to encouraging redevelopment and expanding the residential base.

OBJECTIVE 7.2

Enhance Queensdale's position as a major entrance to the District and the North Lonsdale community.

POLICY 7.2.1

Upgrade the Queensdale area and draw upon the natural amenities (gateway location, historic origins, view potential and backdrop of coniferous trees) in order to provide an attractive and functional commercial centre for the surrounding community.
IMPLEMENTATION

7.2.1.1 All commercial and mixed residential-commercial sites are designated development permit areas to ensure a complementary form and character of development, the overall objectives and guidelines of which are contained in the District OCP Schedule B, Section 4.0.

7.2.1.2 Programs for upgrading the pedestrian system\(^2\) and street tree planting\(^3\) shall be developed.

7.2.1.3 Applications for private redevelopments will be expected to include some public amenities such as seating, drinking fountains and public art.

7.2.1.4 The exterior appearance of new buildings and redevelopment projects in the Queensdale area should appear Edwardian rather than modern in order to maintain the historic appearance of the community.

\(^2\) A sidewalk was installed on the north side of West Queens Road in 1995.

\(^3\) The District has been awarded funding for street tree planting in 1994-96 from the federal government's Green Streets Canada Partners in Planting program.
8.0 COMMUNITY 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.

Community concerns regarding the provision of community services focus on responding to the changing demographic structure of the community. North Lonsdale has a reasonable amount and variety of community services. However, some additional provision is required for the future. As the population grows, total demand for services grows while at the same time an increasing percentage of older residents requires that a greater variety of services be provided. During the years of low school enrolments the vacant schools provided considerable space for other purposes. This space is now being reduced as enrolments increase. The plan suggests some additional ways to meet the space needs for community services.

PLACES OF WORSHIP

The four churches provide a religious and social focus within the older, central part of the community. A wide range of activities is associated with the facilities, augmenting those provided by the municipality. No major changes are expected for the existing churches. However space in the Lonsdale area is frequently requested by religious denominations not currently represented in the North Lonsdale area.

SCHOOLS

The schools within North Lonsdale play an important role as neighbourhood centres because they provide both indoor and outdoor space for local activities in addition to their educational purposes, particularly North Star and Carisbrooke schools. Also school playgrounds alleviate the community's shortage of usable open space.

After considerable declines in school enrolment in the late 1970s - mid 80s and closures of two schools, the numbers of school children stabilized in the late `80s and are now on the increase (Table 3). This growth coupled with reduced class sizes means that the surplus space used for other community services, e.g. daycare and preschool, is gradually being reduced.
In particular North Star school which closed as a neighbourhood public school in 1982 has re-opened to accommodate the North Shore-wide Programme Cadre (Ecole Andre Piolat). The remainder of its buildings are fully utilized for public purposes by health, educational and daycare groups. Some uses have had to relocate as Programme Cadre has grown and further reductions in the space available for non-school uses may occur if Ecole Andre Piolat continues its growth.

<table>
<thead>
<tr>
<th>TABLE 3</th>
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<tr>
<td>ENROLMENTS IN NORTH LONSDALE SCHOOLS 1977-1994</td>
</tr>
<tr>
<td>(Selected Years)</td>
</tr>
<tr>
<td>Braemar (a)</td>
</tr>
<tr>
<td>Braemar (b)</td>
</tr>
<tr>
<td>Carisbrooke (a)</td>
</tr>
<tr>
<td>Monteray (a)</td>
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<tr>
<td>North Star (a)</td>
</tr>
<tr>
<td>Andre Piolat (c)</td>
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<tr>
<td>Total Elementary</td>
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<tr>
<td>Balmoral (a)</td>
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<td>Balmoral (b)</td>
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<td>Balmoral (c)</td>
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<td>Total Secondary</td>
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<td>Notes:</td>
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| Source: | School District #44 enrolment records for September of each school year.

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purposes by health, educational and daycare groups. Some uses have had to relocate as Programme Cadre has grown and further reductions in the space available for non-school uses may occur if Ecole Andre Piolet continues its growth.

COMMUNITY BUILDINGS

The Delbrook and William Griffin Recreation Centres provide space for a variety of community groups and organizations, as well as providing recreational programming. While these types of multi-purpose buildings suit many activities and age groups, teen activities often require a single purpose space. The Municipal Hall has recently been expanded and has acquired 267 West Queens Road for eventual use for municipal purposes while retaining the heritage house. Additional lots may be considered for future expansion for civic purposes in the 200 block of West Queens Road (south side) and West 29th Street.

CHILD CARE

Childcare provisions in the community are limited, in particular the availability of care for under 3 year olds. A heavy reliance is placed on one location for childcare - the old North Star School. Preschools place a heavy reliance on local churches as well as North Star School and commercial space. Noting the resurgence of school enrolment and the possibility of reduced school space for daycare/pre-school, additional childcare sites are to be sought on other public lands in the community.
OBJECTIVE 8.1

Provide more opportunities for residents’ social and recreational needs.

POLICY 8.1.1

Existing institutional land uses, including schools, churches, and community centres, should be retained.

IMPLEMENTATION

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

POLICY 8.1.2

Whenever possible, greater public use of existing schools and their grounds should be encouraged particularly for childcare and related activities.

IMPLEMENTATION

8.1.2.1 Develop a Joint Use Agreement between the District of North Vancouver and School District 44 to allow for the greater use of school facilities by the community, especially after school hours.\(^4\)

8.1.2.2 In conjunction with School District No. 44, and the users of North Star school, the municipality should investigate the feasibility of further development of the North Star School grounds for recreation and local park purposes.

8.1.2.3 Negotiation with School District No. 44 should be undertaken to develop community space at Carisbrooke School.

\(^4\) As of March 1995, a Joint Use Agreement has been drafted but has not yet been adopted.
8.1.2.4 Discussion with School District No. 44 should be initiated to investigate how school grounds could be improved to better meet the recreation needs of the broader neighbourhood (e.g. inclusion of pre-school age play equipment at Braemar School).

8.1.2.5 Review with School District No. 44 whether school grounds could accommodate licensed pre-school and after school care.

POLICY 8.1.3

Provision should be made for childcare in new or renovated public buildings, or in close proximity to them to serve the local community and those employed locally.

IMPLEMENTATION

8.1.3.1 Review the zoning bylaw regulations for public assembly uses to ensure that site coverage and other restrictions do not discourage the provision of childcare.

8.1.3.2 Retain the child care/preschool functions at the Delbrook RecCentre in any redevelopment at that facility.

POLICY 8.1.4

Make additional provisions for specialized needs such as the teens and seniors age groups, and community based sports groups as well as for increased meeting spaces for small groups.

IMPLEMENTATION

8.1.4.1 Build a sports administration centre at the Delbrook recCentre as part of the implementation of the Parks and Recreation Master Plan.

8.1.4.2 Open the renovated Municipal Hall meeting and cafeteria areas to the community after office hours.

8.1.4.3 Support the inclusion of any community space proposed in any commercial redevelopment at Queensdale.
8.1.4.4 Require any new multi-family development to include amenities such as a multi-purpose meeting room.

8.1.4.5 The designated heritage house at 267 West Queens Road has been purchased by the District of North Vancouver for future rehabilitation and eventual use for municipal purposes. It is also designated as “Institutional” on the Plan Map.

**OBJECTIVE 8.2**

Ensure that any new or redeveloped community buildings respect the character of the surrounding community.

**POLICY 8.2.1**

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

**IMPLEMENTATION**

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

8.2.1.2 Provide 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.
9.0 PARKS AND RECREATION

North Lonsdale residents enjoy the advantages of living close to large areas of natural open space and parkland, including Mount Fromme, Princess Park and creek systems. Opportunities for use of developed parks are, however, limited due to topographical constraints and the fact that minimal lands were set aside for park purposes in the early development of the area. As a result there is, by current standards, a shortage of usable park in the central and upper areas. District parks, primarily Delbrook, William Griffin, and Carisbrooke, are augmented by school sites which provide neighbourhoods with needed sports fields and play facilities. Since some of the more difficult terrain remains in public ownership there are fairly substantial natural areas; however, usable flat lands for active play are in short supply. The opportunities for public enjoyment of views are also restricted.

The Plan incorporates the recommendations of the 1991 draft Parks and Recreation Master Plan. That Plan recognizes North Lonsdale's deficiency in neighbourhood parks and suggests that it is a priority candidate for funds from the Neighbourhood Park Equity Fund for development of existing park and open spaces as well as for other funding to permit small scale land acquisition for tot lot(s) where no other options exist as, for example, the recent Montroyal School playground upgrade. The Plan complements these recommendations by considering the requirements of future residential areas. It directs attention to the need for development of a system of pathways along unopened street allowances, sidewalks and trails which will inter-connect with the Sea to Sky trail and the Baden-Powell trail.

North Lonsdale residents have good access to indoor recreation facilities including the William Griffin, Delbrook, Karen Magnussen, and Lonsdale Recreation Centres.
OBJECTIVE 9.1

To meet, more closely, the current District standards for parks and recreation provision.

POLICY 9.1.1

Additional usable park space shall be provided for in the design of new subdivisions and within existing neighbourhoods wherever possible.

IMPLEMENTATION

9.1.1.1 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.

9.1.1.2 Funding should be set aside in a future Capital Budget for any necessary improvements to St. Alban's Park to enable the public enjoyment of views, appreciation of the natural features of the park, and incorporate active uses such as play equipment.5

9.1.1.3 Designate as Natural Area and rezone all publicly owned lands above the 320m contour to PRO.

9.1.1.4 Braemar Park will provide neighbourhood park facilities to the Braemar neighbourhood and surrounding residents. Its design will emphasize informal play opportunities in a natural setting. A small playfield, but not a full size playing field, will be included. Include funding for the development of Braemar Park as a high priority in forthcoming Capital budgets in order that the facility is in place concurrent with the sale and development of adjacent District lands for housing.

9.1.1.5 Development of usable park space in the Norwood/Queens neighbourhood could be pursued by including the

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5 St. Alban's park was dedicated as Parkland in 1993.
establishment of a small park adjacent to the District Municipal Hall and the reconstruction of North Star school grounds for recreation purposes.

9.1.1.6 Investigate the possibility of creating a tot lot in the Central Delbrook area on public and/or private property with funding from the Neighbourhood Park Equity Fund.

POLICY 9.1.2

Provision shall be made to create interconnecting footpaths through parks, natural areas, and unopened road allowances to form part of the District's overall trail system. The full width of an unopened road allowance shall be preserved where it forms part of an existing or potential trail system.

IMPLEMENTATION

9.1.2.1 Trails along creeks and through open space corridors, including the B.C. Hydro transmission line, should be established wherever feasible to create connecting pedestrian routes (see Plan Map). Trail improvements for equestrian users should also be considered where appropriate.

9.1.2.2 Entrances to trails should be identified by signs.

9.1.2.3 Pathways on unopened portions of the St. Kilda Road allowance and various rights-of-way should be cleared and maintained.

9.1.2.4 Add signage to link the Carisbrooke (St. Mary's), St. George's and the Baden-Powell trails.

9.1.2.5 Develop a trail connecting Princess and Braemar Parks along the BC Hydro right-of-way, municipal land (Lot 8) and the lane north from Regal Crescent.

9.1.2.6 Acquire and improve the trail from the top of St. Georges to the BC Hydro right-of-way through Lot A.

9.1.2.7 Existing pathways are to be retained and may not be consolidated with adjacent private lots. Rezoning to "Parks, Recreation and Open Space" (PRO) may be considered for
those pathways which may be developed for pedestrian access in the future.

See also section 10.1.5 for further details on the pedestrian system.

OBJECTIVE 9.2

To improve the usability of the existing parks and recreation facilities.

POLICY 9.2.1

Carisbrooke Park shall be maintained as a District level formal 'showpiece' park providing an opportunity to enjoy the magnificent views from a very beautiful setting as well as enhancing the entrance to the Historic District.

IMPLEMENTATION

9.2.1.1 Within Carisbrooke Park the watercourse, path and steps should be restored as soon as possible.

9.2.1.2 Develop a long term restoration/redevelopment plan for Carisbrooke Park with a formal heritage theme and emphasizing the view potential from the park.

POLICY 9.2.2

Princess Park shall continue to be used principally as a forested park offering varied recreation opportunities emphasizing its natural features, especially Hastings Creek.

IMPLEMENTATION

9.2.2.1 The Development Plan for Princess Park (1986) should be used as the basis for increasing utilization of the park and providing water-related activities.

9.2.2.2 Renovated bridges and play equipment in Princess Park should be provided for in the Capital Budget within the next two years\(^6\).

\(^6\) New play equipment was installed in the spring of 1995.
POLICY 9.2.3

Delbrook Park's role as an active sports park and William Griffin Park's role as a multi-use park shall continue.

IMPLEMENTATION

9.2.3.1 Explore joint funding opportunities with other groups to renovate the fieldhouse at Delbrook Park to better meet the needs of the field users.

9.2.3.2 Improve the lighting and trails in William Griffin Park7.

POLICY 9.2.4

Mosquito Creek and smaller water courses shall be treated as recreation amenities as well as environment preserves and used as public park wherever feasible.

IMPLEMENTATION

9.2.4.1 Develop a major Sea to Sky trail corridor along Mosquito Creek by funding improvements between Del Rio Drive and Palisade Drive.

9.2.4.2 Investigate the possibility of acquiring rights of way along the original watercourse of Mosquito Creek between Del Rio Drive and Fairmont Road, north of West Queens Road to re-establish a continuous Mosquito Creek trail.

9.2.4.3 Add signage in the vicinity of Del Rio Drive to indicate present access routes to Mosquito Creek between the ends of the public trail system in William Griffin Park and Del Rio Drive.

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7 Partially installed in 1994.
10.0 TRANSPORTATION & UTILITIES

ROAD NETWORK

Lonsdale Avenue is the central north-south link to the North Lonsdale community while Queens Road is the principal east-west link from Queensdale to Delbrook, Capilano Highlands and Edgemont Village. 29th Street is the major east-west link to Tempe Heights and Lynn Valley Centre with an additional higher level route along Braemar-Dempsey. The historic development of North Lonsdale's road grid with its predominance of north-south routes and poorly developed east-west links has raised District wide concerns for the provision of logical, safe and efficient movement of traffic through the District. At the same time there are local concerns that future road construction could disrupt neighbourhoods.

The Plan recognizes that a good street system entails a balance of needs/demands, convenience of routings, logical routings and protection of neighbourhood areas from through traffic.

The Plan adopts the position that both District-wide and local concerns must be taken into account. It accordingly makes recommendations which aim to provide for overall system requirements yet which would minimize impacts on local areas. The major considerations in these recommendations are the requirements for emergency and public vehicles. The Fire Department's emergency response time is a critical factor due to the location of the Capilano station on Montroyal Boulevard. Provision for bus services is another important consideration.

Traffic studies indicate that Lonsdale Avenue can handle any increases in traffic which are created by new neighbourhood developments above Queensdale. Where new residential development may occur such as the Queensdale Shopping Centre site and on multi-family redevelopment sites, the traffic impact will be evaluated and existing traffic controls may require modification.

The overall efficiency and safety of the road system is under regular review. Roads within the community are generally in good condition and in accordance with accepted standards. There are a number of proposed projects to upgrade those roads which do not meet District standards for drainage, curbs, and paving. Future maintenance work will be identified by the District's Pavement Management System.
PEDESTRIAN SYSTEM

Pedestrian traffic is heaviest close to the apartment and townhouse areas, schools and other community buildings, commercial centres, and active parks and along bus routes. In these areas there are needs for sidewalks on both sides of surrounding streets. There are also needs for sidewalks on the steeper streets where winter conditions can create hazards for pedestrians. The pedestrian system also includes paved and unpaved pathway and trails which are included in Section 9.1.2.

TRANSIT SYSTEM

Public transit was an integral part of the early North Lonsdale development with the initiation of street car service on Lonsdale Avenue in 1906. Bus operations began in 1946. Today, transit service is provided along the major traffic routes with four all day and three rush hour, late night and/or seasonal bus routes providing services to downtown Vancouver, Lynn Valley, Lonsdale Quay, Phibbs Exchange, Edgemont Village and UBC. Four of these routes have wheelchair accessible buses with a minimum of 25% of the bus stops accessible. Some residents are supportive of increased transit services while others are concerned with the negative impacts of bus routes.

UTILITIES

Infrastructure (sanitary, sewers, hydro, telephone, gas systems) is considered adequate for the community and future development areas, as well as for any redevelopment in the Queensdale area to medium densities. There are no plans for expansion of any of these services in the near future. New policies are included for a street tree program to enhance the appearance of major streets. Water supply is adequate throughout most of the area. However residents of the upper limits of water servicing may experience reduced water flow in times of peak demand.
OBJECTIVE 10.1

Establish safe, orderly and efficient circulation systems for the movement of people and vehicles.

POLICY 10.1.1

To ensure a safe and efficient circulation system for vehicular and pedestrian traffic including the needs of the community for through vehicular traffic in both north-south and east-west directions.

IMPLEMENTATION

10.1.1.1 A review of the District's Open Roads and Street Classification Map (Map 4) designations should be undertaken following substantial completion of the Braemar neighbourhood to ensure that roads carry appropriate designations.

10.1.1.2 Delbrook and Lonsdale Avenues shall continue to serve as the major north-south linkages.

10.1.1.3 The major east-west intermunicipal route shall continue to be the Trans-Canada Highway, complemented by 29th Street/Queens as the major link between the District's northern communities, and the Braemar-Dempsey Road as a minor link.

10.1.1.4 Retain all unopened road allowances for possible future pedestrian and/or vehicular connections.

POLICY 10.1.2

The amount of through traffic on local roads should be minimized by the provision of through routes (arterial and collector roads) built for that purpose.

IMPLEMENTATION

10.1.2.1 Construction of the Montroyal-Lonsdale connector should be included in the 1996-2000 Five Year Capital Budget (Bylaw 6775).

10.1.2.2 The Norwood/Madeley road barrier will be reviewed in consultation with local residents following construction of the Montroyal-Lonsdale link to determine if it is still necessary (Bylaw 6775).
The "under review" designation is retained for that section of Princess Avenue south of Osborne Road. Following completion of the Braemar neighbourhood a traffic analysis will be undertaken to determine whether there is a need to open this portion of Princess Avenue. If the road is not required for vehicular circulation the road allowance will be improved for pedestrian access.

**POLICY 10.1.3**

The design of roads shall be appropriate to their designation on the Open Roads and Street Classification Map.

**IMPLEMENTATION**

10.1.3.1 In the design of arterial and collector roads which will link established residential areas, detailed consideration should be given to:

a. discouragement of excessive vehicle speeds;
b. intersections with good visibility;
c. location of street lights;
d. bus stop locations and design;
e. access to the street from adjacent residences, and
f. street trees.

10.1.3.2 Any upgrading of local roads should be appropriate to the character of the street and geographical constraints.

10.1.3.3 The impact of traffic will be included in the analysis of any redevelopment proposal.

**POLICY 10.1.4**

Increase accessibility to public transit.

**IMPLEMENTATION**

10.1.4.1 Convenient and safe access to bus services should be an integral aspect of street design.
10.1.4.2 B.C. Transit is requested to extend the Braemar bus route to Lynn Valley, initially as a rush hour service, as part of the 1995-96 Annual Service Plan.

10.1.4.3 Bus stops along the 230, 229, 232 and 246 routes will be reconstructed as requested with appropriate ramps and sidewalk heights to enable the transfer to wheelchair lift buses.

POLICY 10.1.5

Provide an improved pedestrian circulation system.

IMPLEMENTATION

10.1.5.1 A detailed review of pedestrian requirements should be undertaken to ensure safe circulation and enhance the trail system.

10.1.5.2 Any new multi-family, commercial and public assembly development will be required to provide a sidewalk on all abutting public roads.

10.1.5.3 Designs for street improvements in the Queensdale area will include improved pedestrian access such as the provision of sidewalks on both sides of Queens Road.8

10.1.5.4 Road allowances not required at this time for vehicular circulation will be opened for pedestrian paths where appropriate. These include the St. Kilda unopened road allowance (see Section 9.1.2.3).

POLICY 10.1.6

Encourage the usage of bicycles for recreation and travel to work/school.

IMPLEMENTATION

10.1.6.1 Implement the recommendations as specified in the Bicycle Master Plan as applicable to North Lonsdale-Delbrook.

---

8 A sidewalk was installed on the north side of West Queens Road between Lonsdale-Delbrook in 1995.
OBJECTIVE 10.2

Provide an efficient system of utilities without environmental degradation or detracting from the streetscape.

POLICY 10.2.1

Extend services to new development as appropriately and unobtrusively as possible.

IMPLEMENTATION

10.2.1.1 Water servicing is provided to lots abutting the 320m elevation. Maximum design elevation is site specific. Further details on water servicing policy are shown in Sections 3.1.2 and 4.2.1.3.

10.2.1.2 Services to new subdivisions and redevelopment areas should be placed underground.

10.2.1.3 All electrical transformers, connection boxes, gas meters and all similar items of utilities infrastructure should be located and screened to minimize their visibility.

10.2.1.4 Relocating hydro lines underground should be considered prior to any installation of new sidewalks.

POLICY 10.2.2

Utilize street tree planting programs to enhance the landscaped character of the North Lonsdale community.

IMPLEMENTATION

10.2.2.1 Encourage street tree planting programs as a community initiative and utilize the forthcoming District Street Tree Master Plan as a guideline for those planting programs.

10.2.2.2 Trees used in a street tree planting program shall be chosen to reflect the character of the street and minimize any impact on views from private property.
11.0 SCHEDULE OF LAND USE CATEGORIES

This schedule of Land Use Categories should be used in conjunction with both the Plan Map and the relevant section(s) of the bylaw text to give details of the relative location, size and definition of the major land uses. Further delineation of the boundaries for each land use and definition of permitted land uses will be implemented through the District's Zoning Bylaw and Subdivision Control Bylaw.

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

- Low Density: Areas providing for detached units on separate lots, detached units on strata lots, or attached units on strata lots at densities of up to 18 units per hectare (7 u/ac.).

- Medium Density: Areas providing for attached housing units and apartments at densities between 15 to 135 units per hectare (6 - 54 u/ac);
  - existing multiple family
  - proposed redevelopment - see text sections 5.1.1.1-5.1.1.3

- Rural Residential: Areas providing for detached housing on existing privately owned large lots above the water service limit. - Under Review.

- Designated Heritage Site: Designated municipal heritage site pursuant to the Heritage Conservation Act.

COMMERCIAL: Existing sites developed for commercial or mixed commercial/residential uses:

- Commercial: Existing sites suitable for a range of local and community retail, office and service uses only.

- Commercial with residential: Existing sites suitable for local and community retail office and service uses as well as residential apartments.

INSTITUTIONAL: Existing sites for schools, places of worship, recreation centres and public buildings.
PARKS, RECREATION AND WILDERNESS: Areas designated principally for the preservation and enjoyment of the natural environment and outdoor recreational use:

- Public Parks: Public lands improved and maintained for active parks.
- Natural Area: Public lands (DNV and BC Hydro) remaining largely in a natural state except for pathways, rights-of-way clearances and other minimal improvements. Also included are private lands to be acquired for park purposes - see text Section 9.1.2.6.
- Private Natural Area: Private landholdings in natural areas.
4320 Prospect Road

Construction Traffic Management Plan

File No. 18160
September 2018
Revision 2
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1. PROJECT DETAILS

1.1. INTRODUCTION AND BACKGROUND

The owner of 4320 Prospect Road in the District of North Vancouver is proposing to subdivide the current lot into two lots of equal size. The property is currently occupied by single-family residence. The current total site area is approximately 1448m², the new lots will be 724m² each.

Creus Engineering Ltd. has been retained by the property owner to prepare a construction & traffic management plan that addresses the offsite civil construction and onsite civil construction. The management plan will cover:

- Construction Overview: scope of construction, phasing
- Schedule: start of works and construction schedule
- Mobility Impact: impacts to road users including pedestrians, cyclists, transit and general traffic. Truck volumes and routing.
- Community Impact: impacts to area parking, construction parking.
- Work Zone Traffic Control: specific details of traffic control devices and plans.
- Communication Plan: how information is distributed to the general public, area residents, businesses and neighbors who are directly affected by construction activity.

The Traffic Management Plan covers the complete onsite and offsite civil construction.

1.2. CONSTRUCTION OVERVIEW

Construction activity at 4320 Prospect Road is comprised of multiple different aspects. The scope of work includes onsite construction, servicing installation, and offsite roadworks. For more details see Appendix A for Schedule A.

2. SCHEDULE

2.1. CONSTRUCTION SCHEDULE

A brief construction schedule is shown in the table below. The project is scheduled to begin Fall 2018 and be completed by Fall 2019, taking a total of 12 months. For more details see Appendix A for Schedule A.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demolition</td>
<td>1 week</td>
</tr>
<tr>
<td>Excavation</td>
<td>1 week</td>
</tr>
<tr>
<td>Foundation</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Framing</td>
<td>3 months</td>
</tr>
<tr>
<td>Finishes</td>
<td>1 month</td>
</tr>
<tr>
<td>Landscaping</td>
<td>1 week</td>
</tr>
<tr>
<td>Off-site Civil</td>
<td>2 weeks</td>
</tr>
</tbody>
</table>

*Table 1: Construction Timeline*
2.2. HOURS OF WORK

The District of North Vancouver Noise Bylaw 7188 prohibits any noise or sound which disturbs or tends to disturb the quiet, peace, rest, enjoyment, comfort, or convenience of the neighborhood or of the persons in the vicinity; or exceeds the sound levels prescribed in the bylaw. For construction activity, the maximum Sound Level is 80dB or the maximum Daytime Average Sound Level is 65dB (at the point of reception). Hours of work are:

- Monday to Friday: 07:00 to 20:00
- Saturday: 09:00 to 17:00
- Sunday & Statuary Holidays: No work allowed

Night work is only possible with specific resolution of District of North Vancouver council. If night work is required, a written request to staff is required minimum 1 month in advance of the required night work. No night work is anticipated.

3. MOBILITY IMPACT

This section is intended to describe how the project will impact road users including pedestrians, cyclists, transit service, emergency vehicles, heavy vehicles (trucks) and general road traffic.

The immediate area surrounding the site is residential. Access to the site will be from Prospect Road. Traffic to and from the site is intended to have a minimal effect on existing traffic volumes. Prospect Road has a sidewalk on the opposite side of the site and does not contain bike lanes or transit routes.

Construction of the new services, curbs, and asphalt restoration along Prospect Road will require the periodic closure of the northbound lane. During these works single-lane alternating traffic will be utilized during work hours. Both lanes are to remain open outside working hours.

Access to be maintained at all times to 4302 Prospect Rd. Construction access to take place via the boulevard fronting site.

3.1. TRUCK ROUTES

Access to 4320 Prospect Road is off a local road. All traffic to and from the site will use the following route:

- To get to the site, take Highway 1 Exit 18 and head north along Lonsdale Avenue, at the end of Lonsdale Avenue turn left onto W Rockland Road, turn right onto Prospect Road, and a right turn into the site (TCP controlled).
- From the site, a left turn onto Prospect Road (TCP controlled), turn left onto W Rockland Road, continue right onto Lonsdale Avenue, and a left onto the Highway 1 on-ramp.

The proposed truck route is shown in Appendix B.

A highway use permit is to be obtained by the developer and is to be maintained for the duration of the works.
3.2. MITIGATION MEASURES

The proposed works have the potential to impact Prospect Road including pedestrians, cyclists, transit service, emergency vehicles, heavy vehicles (trucks), and general road traffic. The proposed construction activities have been reviewed against existing road users. In general, the following mitigation measures should be implemented to mitigate the potential impacts:

- The general public is to be protected from construction activities at all times by appropriate fencing, hoarding and communication.
- Existing pedestrian routes (sidewalks, trails) to remain clear and open at all times unless specifically noted in the TMP.
- Bike routes to remain clear and open at all times unless specifically noted in the TMP.
- There are to be no restrictions to emergency vehicles at any time. Emergency vehicles to be given priority access at all times. Emergency services (police, fire, ambulance) to be notified in advance of any construction activities with the potential to cause delays or detours (i.e. road paving).
- Truck marshaling is only available on site. No marshaling on District of North Vancouver roads.
- A copy of the TMP including enter / exit procedures and truck routes is to be sent to the trucking contractor prior to starting construction.
- All heavy vehicle drivers will be given a copy of the site construction traffic procedures and truck routes. The flag person should have additional copies available on the site.
- Heavy vehicles are to be equipped with radios so that trucks can be delayed, diverted or cancelled as required by current site conditions. The general contractor will be responsible for communicating with the heavy vehicles.
- An important part of heavy vehicle management is the mitigation of silt, mud, dust, debris, and litter.
  - All trucks are to be covered while in transit.
  - The trucking contractor will ensure that adjacent streets, truck routes and properties are kept clean and free of dust and debris on a daily basis.
  - The general contractor is also responsible for installing and maintaining a site sediment & erosion control system including mud and dust control and a wheel wash during trucking (if required). An erosion and sediment control plan is to be developed at detailed design phase based on final development proposals.
- Provide enough on-site queue space to hold at least ½ an hour of truck traffic (for both inbound and outbound trucks).
- Construction traffic exiting the site (left turn) is to be operated by certified flag persons from 07:00 to 18:00.
4. PARKING IMPACT

This section is intended to describe how construction activities will impact parking and includes existing parking availability, estimated construction parking requirements and estimated construction parking availability.

4.1. EXISTING PARKING

The existing site consists of one residential building with a garage and driveway. Prospect Road has street parking along both sides of the road. Construction will remove the current on-site parking.

4.2. CONSTRUCTION PARKING

Estimated construction parking requirements have been reviewed by Creus Engineering. 6 onsite parking spots are to be provided at the rear of the lot. Carpooling is to be encouraged to ensure the onsite parking spots are not exceeded. No off-site parking spots are to be expected during construction. Any off-site parking required is to be secured by the developer prior to construction.

5. WORK ZONE TRAFFIC CONTROL DEVICES

This section is intended to describe the specific traffic control devices and plans required and include pavement markings, signage, delineation devices, traffic control persons, building zones, and site access points. All traffic control devices are to be installed and used in accordance with the BC Workers Compensation Board Section 18, the BC MOT Traffic Control Manual for Work on Roadways and the TAC Canadian Manual of Uniform Traffic Control Devices. All construction signage to be in place prior to any closures and removed or covered when lanes are re-opened. Contractor to plan for daily management of all traffic control devices including signs.

5.1. TRAFFIC CONTROL PLANS

Separate drawings have been prepared for each phase of the work. The plans are included in Appendix C. Full size copies of the plans are available upon request from Creus Engineering.

5.2. MONITORING STRATEGY

Traffic conditions and noise levels will be monitored by the project traffic consultant to confirm satisfactory performance and what modifications may be required. Once the traffic management plans have been implemented, periodic site inspections will be performed to confirm performance. Refer to the CTMP and the District of North Vancouver Noise Regulation Bylaw (No. 7188) for details. If deemed necessary by the District of North Vancouver, PTZ (Pan-Tilt-Zoom) cameras may be required.

The developer will be responsible for monitoring the implemented traffic management plans. All construction related detour and information signs and traffic control devices are to be checked every three days. There shall also be an inspection every time there is a change to the signage and devices posted.
6. COMMUNICATIONS PLAN

A number of residents, businesses and through traffic (commuters) have the potential to be impacted by the proposed construction activities. The following Communications Plan has been prepared to provide notifications and updates to all affected parties as well as the general public. It also provides contacts for unforeseen issues, complaints, coordination and emergencies.

6.1. PUBLIC NOTIFICATION

For neighbors with the potential to be directly affected by the proposed construction, written notifications are to be delivered prior to the commencement of general construction and before certain specific works. Included in Appendix D is a map identifying all the neighboring residents and business to be notified of construction activities and a sample notification letter. Copies of all notifications will be cc’d to the District of North Vancouver.
6.2. CONTACT INFORMATION

Project Contacts

Main Contact Number:
James Stobie
(604)-980-2087

General Contractor/Site Contact:
TBD

Coast Mountain Bus Company:
Harjit Sidhu-Kambo, Transit Engineering Manager
(604)-953-3051

District of North Vancouver:
Kayzad Nadirshaw, Engineering Services
(604) 990-2282

North Shore Chamber of Commerce
102 – 124 West 1st St, North Vancouver, BC
604-987-4488

Police (RCMP):
147 East 14th St, North Vancouver, BC
604-985-1311

District of North Vancouver Fire Services:
1110 Lynn Valley Rd, North Vancouver, BC
604-980-7575

District Operations Centre:
1370 Crown St, North Vancouver, BC
604-990-3831

CREUS Engineering:
Fred Ciambrelli, Senior Project Engineer
604-987-9070

Emergency Contacts

RCMP: 911
Fire Department: 911
BC Ambulance: 911
7. REPORT SUBMISSION

Yours Sincerely,

CREUS Engineering Ltd

Cameron Stel, EIT

Reviewed By: Dan Casey, P.Eng.
APPENDIX A: SCHEDULE A
Schedule A

Project Summary Sheet:

<table>
<thead>
<tr>
<th>Building site address</th>
<th>4320 Prospect Ave, North Vancouver</th>
</tr>
</thead>
<tbody>
<tr>
<td># of storeys below grade</td>
<td>1</td>
</tr>
<tr>
<td># of storeys above grade</td>
<td>2</td>
</tr>
<tr>
<td>Type of construction (i.e. concrete/woodframe)</td>
<td>Woodframe</td>
</tr>
<tr>
<td>Total number of months to complete</td>
<td>9 -12 months</td>
</tr>
<tr>
<td>Contractor</td>
<td>TBD</td>
</tr>
<tr>
<td>Project Manager</td>
<td>Name</td>
</tr>
<tr>
<td></td>
<td>E-mail</td>
</tr>
<tr>
<td></td>
<td>Phone</td>
</tr>
<tr>
<td>On-site contact</td>
<td>Name:</td>
</tr>
<tr>
<td></td>
<td>Cell</td>
</tr>
<tr>
<td></td>
<td>E-mail</td>
</tr>
</tbody>
</table>

Site Generated Traffic

<table>
<thead>
<tr>
<th>Phase</th>
<th>Dates/ Duration in months</th>
<th># of Trucks/ day</th>
<th># of Workers</th>
<th># of off-street parking stalls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demolition</td>
<td>1 week</td>
<td>2</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Excavation</td>
<td>1 week</td>
<td>m³ removed: 300</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Foundation/Parkade</td>
<td>2 weeks</td>
<td>m³ concrete: 40</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Above Grade</td>
<td>3 months</td>
<td>m³ concrete: -</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Finishes</td>
<td>1 month</td>
<td>2</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Landscape</td>
<td>1 week</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Off-site Civil</td>
<td>2 weeks</td>
<td>2</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>
APPENDIX B: TRUCK ROUTES
APPENDIX C: CTMP PLANS
APPENDIX D: NOTIFICATIONS
SAMPLE NOTICE TO RESIDENTS AND BUSINESS OPERATORS

Temporary Street Closure/Building Zone
Location
Time and Dates

Date

Dear Residents and Business Operators:

We are writing to notify you that …

This is necessary to install/repair the <underground utilities, road, sidewalk, landscaping, lighting etc.> adjacent to the <Address>.

The closure will be required during week day business hours from <> to <>.

During construction there will be traffic diversions, parking restrictions and lane closures. The actual work site will be kept as compact and tidy as reasonably possible. The workers will cooperate with the businesses to try and minimize the impact the work will have on day-to-day business operations.

We apologize for any inconvenience the work may cause and thank you for your understanding and cooperation. Please contact the undersigned at <> or by e-mail at <> if you would like to discuss this matter in further detail.

Please also refer to project web site at <> for on-going construction updates.

Yours truly,

<Applicant>

cc: North Shore Chamber of Commerce
    RCMP
    District of North Vancouver Fire Services
    District Operations Centre
    District Hall – Transportation Department
    Coast Mountain Bus Company
1. The location of un-surveyed trees on this plan is approximate. Their location and ownership cannot be confirmed without being surveyed by a Registered BC Land Surveyor.

2. All tree protection fencing must be built to the relevant municipal bylaw specifications. The dimensions shown are from the outer edge of the stem of the tree.

3. The tree protection zone shown is a graphical representation of the critical root zone, measured from the outer edge of the stem of the tree. The tree’s diameter was added to the graphical tree protection circles to accommodate the survey point being in the center of the tree.

4. Any construction activities or grade changes within the Root Protection Zone must be approved by the project arborist.

5. This plan is based on a topographic and tree location survey provided by the owners’ Registered British Columbia Land Surveyor (BCLS) and layout drawings provided by the owners’ Engineer (P. Eng).

6. This plan is provided for context only, and is not certified as to the accuracy of the location of features or dimensions that are shown on this plan. Please refer to the original survey plan and engineering plans.
Underground power cable proposed within easement. Not shown on plan.

Recently constructed lock-block wall on offsite side.

Proposed rain garden requires excavation in critical root zones.

Tree protection fencing not practical due to access requirements. Maintain existing grades of gravel driveway.

Retention requires that raised bed be maintained. Link new wall to existing without excavating within raised bed.

594 and 593 mark ends of small hedge

Notes:
1. The location of un-surveyed trees on this plan is approximate. Their location and ownership cannot be confirmed without being surveyed by a Registered BC Land Surveyor.
2. All tree protection fencing must be built to the relevant municipal bylaw specifications. The dimensions shown are from the outer edge of the stem of the tree.
3. The tree protection zone shown is a graphical representation of the critical root zone, measured from the outer edge of the stem of the tree (1/2 the trees diameter was added to the graphical tree protection circles to accommodate the survey point being in the center of the tree).
4. Any construction activities or grade changes within the Root Protection Zone must be approved by the project arborist.
5. This plan is based on a topographic and tree location survey provided by the owners’ Registered British Columbia Land Surveyor (BCLS) and layout drawings provide by the owners’ Engineer (P Eng).
6. This plan is provided for context only, and is not certified as to the accuracy of the location of features or dimensions that are shown on this plan. Please refer to the original survey plan and engineering plans.

Reference drawings:
1. Base Survey by:
Arboricultural Inventory and Report

For:  
Bob Karchut  
c/o Synthesis Designs

Site Location:  
4320 Prospect Road  
North Vancouver, BC

To be submitted with Tree Retention and Removal Plan dated August 8, 2019

Submitted to:  
Kevin Li  
Synthesis Designs  
258 E 1st Street, North Vancouver BC  
V5L 1B3  
Email: kevin@synthesisdesign.ca

Date: August 15, 2019  
Updated November 27, 2020

Submitted by:

DIAMOND HEAD  
3559 Commercial Street  
Vancouver, BC 604.733.4886
The following Diamond Head Consulting staff conducted the on-site tree inventory and prepared or reviewed the report.

All general and professional liability insurance and staff accreditations are provided below for reference.

**Project Staff:**

Michael Harrhy, B.Sc., MSFM  
ISA Certified Arborist (PN-8025A)  
ISA Tree Risk Assessment Qualified (TRAQ)  
BC Wildlife and Danger Tree Assessor  
Registered Professional Forester  
Biologist in Training

Please contact us if there are any questions or concerns about the contents of this report.

**Contact Information:**

Phone: 604-733-4886  
Fax: 604-733-4879  
Email: mikeharrhy@diamondheadconsulting.com  
Website: www.diamondheadconsulting.com

**Insurance Information:**

WCB: # 657906 AQ (003)  
General Liability: Northbridge General Insurance Corporation - Policy #CBC1935506, $10,000,000  
Errors and Omissions: Lloyds Underwriters – Policy #1010615D, $1,000,000
Scope of Assignment:

Diamond Head Consulting Ltd. (DHC) was retained to complete an arboricultural assessment to supplement the proposed development application for 4320 Prospect Road. This report contains an inventory of protected on and off-site trees and summarizes management recommendations with respect to future development plans and construction activities. Off-site trees are included because pursuant to municipal bylaws, site owners must include the management of off-site trees that are within the scope of the development. This report is produced with the following primary limitations, detailed limitations specified in Appendix 7:

1) Our investigation is based solely on visual inspection of the trees during our last site visit. This inspection is conducted from ground level. We do not conduct aerial inspections, soil tests or below grade root examinations to assess the condition of tree root systems unless specifically contracted to do so.

2) Unless otherwise stated, tree risk assessments in this report are limited to trees with a high or extreme risk rating in their current condition, and in context of their surrounding land use at the time of assessment.

3) The scope of work is primarily determined by site boundaries and local tree-related bylaws. Only trees specified in the scope of work were assessed.

4) Beyond six months from the date of this report, the client must contact DHC to confirm its validity because site base plans and tree conditions may change beyond the original report’s scope. Additional site visits and report revisions may be required after this point to ensure report accuracy for the municipality’s development permit application process. Site visits and reporting required after the first submission are not included within the original proposal fee and will be charged to the client at an additional cost.
The client is responsible for:

- Reviewing this report to understand and implement all tree risk, removal and protection requirements related to the project.
- Understanding that we did not assess trees off the subject property and therefore cannot be held liable for actions you or your contractors may undertake in developing this property which may affect the trees on neighboring properties.
- Obtaining a tree removal permit from the relevant municipal authority prior to any tree cutting.
- Obtaining relevant permission from adjacent property owners before removing off-site trees and vegetation.
- Obtaining a timber mark if logs are being transported offsite.
- Ensuring the project is compliant with the tree permit conditions.
- Constructing and maintaining tree protection fencing.
- Ensuring an arborist is present onsite to supervise any works in or near tree protection zones.
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1.0 Introduction

1.1 Site Overview

The subject site currently has a single residence accessed from a shared driveway on Prospect Road. There is a single residence and a landscaped yard. The site has a moderate slope with a western aspect. Trees on the site are mostly mature native conifers: Douglas fir, western redcedar, and western hemlock. The large-diameter, dominant trees are significant and open grown, although several have been topped historically. Western hemlock on the site are typically smaller and suppressed by the larger fir and cedar; they appear to be chronically stressed with low vigor.

Recent building and excavations at 4336 Prospect Road (offsite to the north) may have impacted some onsite trees’ critical root zones at the northern property line. Excavations within the tree’s critical root zone are likely to have impacted roots, but the extent and severity of any damage is unclear. (refer to photo 6).

Note that this property is in a Wildfire Development Permit Area, and that Diamond Head Consulting has also prepared a Wildfire Hazard Assessment for the property which should be reviewed concurrently with this arborist report.

1.2 Proposed Land Use Changes

The proposed development consists of demolishing the existing residence and constructing two new dwellings with a shared driveway access. Rain gardens and drainage infrastructure will require grading at the rear of the property.

1.3 Report Objective

This report has been prepared to ensure the proposed development is compliant with the District of North Vancouver Tree Protection Bylaw 7671 and the Development Servicing Bylaw 8145. Refer to Bylaw 7671 for the complete definition of protected trees, summarized below as:

- Large diameter trees greater than 75 cm DBH (measured at 1.3 m above grade) measured for a single stem or, calculated based on the sum of the DBH of the largest stem + (60% x DBH) of each additional stem;
- District tree of any size;
- Tree of any size in a protected area (defined buffer adjacent to a stream) or on wetland (and within 30 m of wetland) or waterfront (and 30 m inland) or sloping terrain (>30%);
- A replacement tree or tree retained as part of a past tree permit;
- A heritage tree identified in Schedule A of the bylaw;
- A wildlife tree;
- A tree of any size that is an arbutus, Garry oak, Oregon ash, Pacific yew, western white pine or yellow-cedar;
Bylaw 8145 requires that arborist reports for development assess the health of all existing on-site and boulevard trees, interpreted as an inventory of on-site trees greater than or equal to 10 cm DBH and a count of any trees under that size.

Additionally, neighbouring trees with a tree protection zone that extends into the subject site have been captured in the arborist report.

This report outlines the existing condition of all trees on and adjacent to the property required to be protected or assessed under Bylaws 7671 and Bylaw 8145, summarizes the proposed tree retention and removal, and suggests guidelines for protecting retained trees during the construction process.

Figure 1. 4320 Prospect Road in context of the surrounding landscape and infrastructure.
2.0 Process and Methods

Michael Harrhy of DHC visited the site on August 1st, 2019. The following methods and standards are used throughout this report.

2.1 Tree Inventory

Trees on site and trees shared with adjacent properties were marked with a numbered tag and assessed for attributes including: species; height measured to the nearest meter; and, diameter at breast height (DBH) measured to the nearest centimeter at 1.4 m above grade. Off-site trees were inventoried, but not tagged. The general health and structural integrity of each tree was assessed visually and assigned to one of five categories: excellent; good; moderate; poor; or dying/dead. Descriptions of the health and structure rating criteria are given in Appendix 3.

Tree retention value, categorized as high, medium, low, or nil, was assigned to each tree or group of trees based on their health and structure rating, and potential longevity in a developed environment. Descriptions of the retention value ratings are given in Appendix 4. Recommendations for tree retention or removal were determined by taking into account a tree’s retention value rating, its location in relation to proposed building envelopes and development infrastructure.

2.2 Tree Risk Assessment

Tree risk assessments were completed following methods of the ISA Tree Risk Assessment Manual\(^1\) published in 2013 by the International Society of Arboriculture, which is the current industry standard for assessing tree risk. This methodology assigns risk based on the likelihood of failure, the likelihood of impact and the severity of consequence if a failure occurs. Only on-site hazard trees that had high or extreme risk ratings in their current condition and in context of their surrounding land use were identified and reported in section 3.2. Appendix 5 gives the likelihood and risk rating matrices used to categorize tree risk. DHC recommends that on-site trees be re-assessed for risk after the site conditions change (e.g. after damaging weather events, site disturbance from construction, creation of new targets during construction or in the final developed landscape).

2.3 Tree Protection and Replacement

Tree protection zones were calculated for each tree according to Bylaw 7671 requirements for barriers to extend to the dripline or 5 metres from the stem of the outermost tree, whichever is greater, but may be modified based on professional judgement of the project arborist to accommodate species specific tolerances and site specific growing conditions.

The number of replacement trees has been calculated based on the number of protected trees >75 cm DBH removed and the residual canopy cover according to the specifications in Bylaw 7671.

3.0 Findings: Tree Inventory and Risk Assessment

3.1 Tree Inventory

The complete tree inventory is given in Appendix 1.

Trees On-site
There were 6 protected, large diameter trees on the site. Of those, 4 have a medium retention value and 2 have a high retention value and potential longevity in a suburban landscape. All protected trees require removal to accommodate this development proposal (see Appendix 1 for individual tree inventory information).

11 trees <75cm DBH were also identified in the tree inventory that are also recommended for removal due to their condition or conflict with the proposed development plans.

Trees on Adjacent Properties
There were 7 privately owned off-site trees and hedges with tree protection zones extending into the subject site. One offsite hedge is recommended for removal due to grading and wildfire risk reduction. All other offsite trees can be retained through the proposed development.

3.2 Tree Risk Assessment

There were no trees on this site that posed a high or extreme risk at the time of assessment.
4.0 Tree Replacement

Replacement trees for the removal of large diameter trees (over 75cm) are required if the subject lot will have less than 20% canopy cover remaining after the removal of the large diameter tree. If the canopy cover is over 20% after the removal, no replacement tree is required.

- If the subject lot is less than 420 square meters in area, one replacement tree for every large-diameter tree must be planted.
- If the subject lot is over 420 square meters in area, three replacement trees for every large-diameter tree must be planted.

The subject lot is 1419m² in total. Following tree removal, there will be no tree canopy on the site. 18 trees are required to replace the 6 large diameter trees to be removed. We recommend that all replacement trees be deciduous to meet the requirements of the Wildfire DPA and Firesmart recommendations.

In addition to the large-diameter tree replacements, the District may require replacement trees or new tree planting. The District will determine the quantity of trees required and the project arborist or landscape architect can then prepare a landscape plan showing the location and species.
5.0  Discussion and Summary

5.1  Trees On-site

The larger mature trees on the subject site are in generally good condition. However, the proposed development’s proposed building envelopes and grading requires the removal of all large diameter trees. The remaining trees that do not directly conflict with the proposed development are all suppressed or stressed and are not suitable for retention based on their limited life expectancies and intolerance to increased wind forces.

5.2  Trees on Adjacent Properties

Four offsite trees and one hedge can be protected and retained through the proposed development. A short offsite hedgerow marked as 594 and 593 on the tree plan has been marked for retention. Removal of the row of trees was originally recommended because of their condition and FireSmart recommendations. We understand that the trees’ owner has not provided permission for their removal. Grading and retaining walls have been planned to maintain the integrity of offsite trees; conflict is not expected.

Os Hedge 1 can be retained through the development. Standard tree protection barriers are not practical in this situation because the root zone is used as a driveway to access a neighbouring property.
**Appendix 1  Complete Tree Inventory Table**

The complete tree inventory below contains information on tree attributes and recommendations for removal or retention. Tree ownership in this inventory table is not definitive, its determination here is based on information available from the legal site survey, GPS locations, and field assessment during site visits. Tree Protection Zones are measured from the outer edge of a tree’s stem. If using these measurements for mapping the tree protection zone, ½ the tree’s diameter must be added to the distance to accommodate a survey point at the tree’s center. Where tree protection fencing is proposed to vary from the minimum municipal TPZ, comments will be included in the Retention/TPZ comments and shown on the Tree Retention and Removal Plan.

*TPZ is the tree protection zone size required by the relevant municipal bylaw or, if not defined, the project arborist.

<table>
<thead>
<tr>
<th>Tag #</th>
<th>Location</th>
<th>Species Common Name</th>
<th>Botanical Name</th>
<th>DBH (cm)</th>
<th>Height (m)</th>
<th>Health and Structure Rating</th>
<th>Comments</th>
<th>Retention Value Rating</th>
<th>Retain/ Remove</th>
<th>Retention/TPZ Comments</th>
<th>*TPZ (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>585</td>
<td>On-Site</td>
<td>Douglas-Fir</td>
<td>Pseudotsuga menziesii</td>
<td>107</td>
<td>25</td>
<td>Moderate</td>
<td>A very large open grown tree. 9m dripline. Good taper. Previously topped, new growth is approximately 5m tall. Good conical form overall.</td>
<td>Medium</td>
<td>Remove</td>
<td>In conflict with shared driveway</td>
<td>8.56</td>
</tr>
<tr>
<td>586</td>
<td>On-Site</td>
<td>Western Hemlock</td>
<td>Tsuga heterophylla</td>
<td>53</td>
<td>25</td>
<td>Poor</td>
<td>stressed, thin crown. Twin stems with acute union from 5m.</td>
<td>Low</td>
<td>Remove</td>
<td>In conflict with shared driveway</td>
<td>4.24</td>
</tr>
<tr>
<td>Tag #</td>
<td>Location</td>
<td>Species Common Name</td>
<td>Botanical Name</td>
<td>DBH (cm)</td>
<td>Height (m)</td>
<td>Health and Structure Rating</td>
<td>Comments</td>
<td>Retention Value Rating</td>
<td>Retain/Remove</td>
<td>Retention/TPZ Comments</td>
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<tr>
<td>587</td>
<td>On-Site</td>
<td>Western Hemlock</td>
<td>Tsuga heterophylla</td>
<td>56</td>
<td>25</td>
<td>Moderate</td>
<td>An average codominant in the stand. Inclusion 5m from the top. Not recommended for retention without the cover of other trees to the south.</td>
<td>Low</td>
<td>Remove</td>
<td>In conflict with driveway and rain garden. This tree is intolerant of disturbance.</td>
<td>4.48</td>
</tr>
<tr>
<td>588</td>
<td>On-Site</td>
<td>Douglas-Fir</td>
<td>Pseudotsuga menziesii</td>
<td>106</td>
<td>30</td>
<td>Moderate</td>
<td>A very large open grown tree. 9m dripline. Good taper. Previously topped, new growth is approximately 5m tall.</td>
<td>Medium</td>
<td>Remove</td>
<td>Within proposed building envelope</td>
<td>8.48</td>
</tr>
<tr>
<td>589</td>
<td>On-Site</td>
<td>Western Red Cedar</td>
<td>Thuja plicata</td>
<td>101</td>
<td>28</td>
<td>Moderate</td>
<td>A very large open grown tree. Deep crown with good taper. Previously topped, new growth is approximately 5m tall, forming a candelabra top.</td>
<td>Medium</td>
<td>Remove</td>
<td>Within proposed building envelope</td>
<td>8.08</td>
</tr>
<tr>
<td>Tag #</td>
<td>Location</td>
<td>Species</td>
<td>Botanical Name</td>
<td>DBH (cm)</td>
<td>Height (m)</td>
<td>Health and Structure Rating</td>
<td>Comments</td>
<td>Retention Value Rating</td>
<td>Retain/Remove</td>
<td>Retention/TPZ Comments</td>
<td>Retention/TPZ (m)</td>
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</tr>
<tr>
<td>590</td>
<td>On-Site</td>
<td>Western Hemlock</td>
<td>Tsuga heterophylla</td>
<td>43</td>
<td>3</td>
<td>Poor</td>
<td>repeated topped and maintained as a hedge. Removal would aid in achieving wildfire prevention objectives.</td>
<td>Low</td>
<td>Remove</td>
<td>This group of trees is unsuitable for retention as they will not tolerate grading or changes to the rock walls which contain their root zone. Removal is also consistent with the recommendations of the wildfire hazard report.</td>
<td>3.44</td>
</tr>
<tr>
<td>591</td>
<td>On-Site</td>
<td>Western Hemlock</td>
<td>Tsuga heterophylla</td>
<td>24</td>
<td>3</td>
<td>Poor</td>
<td>repeated topped and maintained as a hedge. Removal would aid in achieving wildfire prevention objectives.</td>
<td>Low</td>
<td>Remove</td>
<td>This group of trees is unsuitable for retention as they will not tolerate grading or changes to the rock walls which contain their root zone. Removal is also consistent with the recommendations of the wildfire hazard report.</td>
<td>2</td>
</tr>
<tr>
<td>Tag #</td>
<td>Location</td>
<td>Species Common Name</td>
<td>Botanical Name</td>
<td>DBH (cm)</td>
<td>Height (m)</td>
<td>Health and Structure Rating</td>
<td>Comments</td>
<td>Retention Value Rating</td>
<td>Retain/Remove</td>
<td>Retention/TPZ Comments</td>
<td>*TPZ (m)</td>
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<tr>
<td>592</td>
<td>On-Site</td>
<td>Western Hemlock</td>
<td>Tsuga heterophylla</td>
<td>22</td>
<td>3</td>
<td>Poor</td>
<td>repeated topped and maintained as a hedge. Removal would aid in achieving wildfire prevention objectives.</td>
<td>Low</td>
<td>Remove</td>
<td>This group of trees is unsuitable for retention as they will not tolerate grading or changes to the rock walls which contain their root zone. Removal is also consistent with the recommendations of the wildfire hazard report.</td>
<td>2</td>
</tr>
<tr>
<td>593</td>
<td>Off-Site</td>
<td>Douglas-Fir</td>
<td>Pseudotsuga menziesii</td>
<td>28</td>
<td>3</td>
<td>Poor</td>
<td>Marks the south side of a short hedge. Repeatedly topped and maintained as a hedge. Removal would aid in achieving wildfire prevention objectives.</td>
<td>Low</td>
<td>Retain</td>
<td>Retaining this group of trees requires that the grades of the raised bed be maintained. The proposed retaining wall has been designed to accommodate the trees and will link into the existing edge.</td>
<td>2.24</td>
</tr>
<tr>
<td>Tag #</td>
<td>Location</td>
<td>Species Common Name</td>
<td>Botanical Name</td>
<td>DBH (cm)</td>
<td>Height (m)</td>
<td>Health and Structure Rating</td>
<td>Comments</td>
<td>Retention Value Rating</td>
<td>Retain/ Remove</td>
<td>Retention/TPZ Comments</td>
<td>*TPZ (m)</td>
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</tr>
<tr>
<td>594</td>
<td>Off-Site</td>
<td>Douglas-Fir</td>
<td>Pseudotsuga menziesii</td>
<td>22</td>
<td>3</td>
<td>Poor</td>
<td>Marks the north side of a short hedge. Repeatedly topped and maintained as a hedge. Removal would aid in achieving wildfire prevention objectives.</td>
<td>Low</td>
<td>Retain</td>
<td>Retaining this group of trees requires that the grades of the raised bed be maintained. The proposed retaining wall has been designed to accommodate the trees and will link into the existing edge.</td>
<td>2</td>
</tr>
<tr>
<td>595</td>
<td>On-Site</td>
<td>Western Red Cedar</td>
<td>Thuja plicata</td>
<td>83</td>
<td>30</td>
<td>Good</td>
<td>a natural edge tree with good taper and a deep crown. Existing retaining wall at margin of root zone below. Moderate to significant impacts due to recent construction of lock block retaining wall 3m away on lot to the north. Irrigation system recommended if retaining to mitigate root loss.</td>
<td>Medium</td>
<td>Remove</td>
<td>In conflict with the proposed rain garden and underground power cable to the north.</td>
<td>6.64</td>
</tr>
<tr>
<td>Tag #</td>
<td>Location</td>
<td>Species Common Name</td>
<td>Botanical Name</td>
<td>DBH (cm)</td>
<td>Height (m)</td>
<td>Health and Structure Rating</td>
<td>Comments</td>
<td>Retention Value Rating</td>
<td>Retain/Remove</td>
<td>Retention/TPZ Comments</td>
<td>*TPZ (m)</td>
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<tr>
<td>596</td>
<td>On-Site</td>
<td>Western Hemlock</td>
<td>Tsuga heterophylla</td>
<td>34</td>
<td>20</td>
<td>Poor</td>
<td>Declining, thin crown. Not recommended for retention without the cover of the larger cedar adjacent.</td>
<td>Low</td>
<td>Remove</td>
<td>This tree does not conflict with the proposed design but will not tolerate being exposed or isolated. Not windfirm.</td>
<td>2.72</td>
</tr>
<tr>
<td>597</td>
<td>On-Site</td>
<td>Douglas-Fir</td>
<td>Pseudotsuga menziesii</td>
<td>85</td>
<td>35</td>
<td>Good</td>
<td>dominant and growing as a pair with 598. Both tress have high crowns and good taper. Note uncertain impact from recent grade changes and construction work on the lot to the north.</td>
<td>High</td>
<td>Remove</td>
<td>In conflict with proposed rain garden and grading downslope, and with the proposed underground electrical utility to the north.</td>
<td>6.8</td>
</tr>
<tr>
<td>598</td>
<td>On-Site</td>
<td>Douglas-Fir</td>
<td>Pseudotsuga menziesii</td>
<td>81</td>
<td>35</td>
<td>Good</td>
<td>dominant and growing as a pair with 587. North tress have high crowns and good taper.</td>
<td>High</td>
<td>Remove</td>
<td>In conflict with proposed rain garden and grading downslope, and to a lesser degree with the proposed underground electrical utility to the north.</td>
<td>6.48</td>
</tr>
<tr>
<td>Tag #</td>
<td>Location</td>
<td>Species Common Name</td>
<td>Botanical Name</td>
<td>DBH (cm)</td>
<td>Height (m)</td>
<td>Health and Structure Rating</td>
<td>Comments</td>
<td>Retention Value Rating</td>
<td>Retain/Remove</td>
<td>Retention/TPZ Comments</td>
<td>*TPZ (m)</td>
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<tr>
<td>599</td>
<td>On-Site</td>
<td>Western Hemlock</td>
<td>Tsuga heterophylla</td>
<td>31</td>
<td>25</td>
<td>Poor</td>
<td>Intermediate tree with high height to diameter ratio. Very asymmetrical crown south. Low vigour.</td>
<td>Low</td>
<td>Remove</td>
<td>This tree does not conflict with the proposed design but will not tolerate being exposed or isolated. Not windfirm.</td>
<td>2.48</td>
</tr>
<tr>
<td>693</td>
<td>On-Site</td>
<td>Big-Leaf Maple</td>
<td>Acer macrophyllum</td>
<td>59</td>
<td>15</td>
<td>Moderate</td>
<td>Three stems. Very asymmetrical crown. Acceptable in current state but marginal if exposed.</td>
<td>Low</td>
<td>Remove</td>
<td>Not suitable to be retained as an individual. Relies on surrounding trees for stability.</td>
<td>3.54</td>
</tr>
<tr>
<td>694</td>
<td>On-Site</td>
<td>Western Hemlock</td>
<td>Tsuga heterophylla</td>
<td>72</td>
<td>20</td>
<td>Poor</td>
<td>previously topped and shaded by larger firs above, this tree has a very wide dripline and stout branching. Limited growth above topping wound. Heavy stress crop of cones. Removal would aid in achieving wildfire prevention objectives.</td>
<td>Low</td>
<td>Remove</td>
<td>This tree is in decline and unlikely to adapt to an exposed condition. Long-term viability of the tree is limited by decay at topping wound, poor structure, and low vigour. Removal is consistent with Wildfire hazard reduction strategy.</td>
<td>5.76</td>
</tr>
<tr>
<td>Tag #</td>
<td>Location</td>
<td>Species Common Name</td>
<td>Botanical Name</td>
<td>DBH (cm)</td>
<td>Height (m)</td>
<td>Health and Structure Rating</td>
<td>Comments</td>
<td>Retention Value Rating</td>
<td>Retain/Remove</td>
<td>Retention/TPZ Comments</td>
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<tr>
<td>695</td>
<td>On-Site</td>
<td>Western Hemlock</td>
<td>Tsuga heterophylla</td>
<td>56</td>
<td>30</td>
<td>Dying</td>
<td>this tree has a very thin patchy crown and appears acutely drought stressed. Removal would aid in achieving wildfire prevention objectives.</td>
<td>Low</td>
<td>Remove</td>
<td>This tree is in decline and unlikely to adapt to an exposed condition. Long-term viability of the tree is limited by decay at topping wound, poor structure, and low vigour. Removal is consistent with Wildfire hazard reduction strategy.</td>
<td>4.48</td>
</tr>
<tr>
<td>Os01</td>
<td>Off-Site</td>
<td>Douglas-Fir</td>
<td>Pseudotsuga menziesii</td>
<td>90</td>
<td>35</td>
<td>NA</td>
<td>Large dominant tree. Recent construction within root zone to north.</td>
<td>NA</td>
<td>Retain</td>
<td>Protect with tree protection fencing as per attached tree management plan. Review protection requirements if proposed underground utilities to be extended east of the subject property.</td>
<td>5.4</td>
</tr>
<tr>
<td>Os02</td>
<td>Off-Site</td>
<td>Douglas-Fir</td>
<td>Pseudotsuga menziesii</td>
<td>24</td>
<td>10</td>
<td>NA</td>
<td>small intermediate at fence line.</td>
<td>NA</td>
<td>Retain</td>
<td>Protect with tree protection fencing as per attached tree management plan.</td>
<td>2</td>
</tr>
<tr>
<td>Tag #</td>
<td>Location</td>
<td>Species Common Name</td>
<td>Botanical Name</td>
<td>DBH (cm)</td>
<td>Height (m)</td>
<td>Health and Structure Rating</td>
<td>Comments</td>
<td>Retention Value Rating</td>
<td>Retain/Remove</td>
<td>Retention/TPZ Comments</td>
<td>*TPZ (m)</td>
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</tr>
<tr>
<td>os03</td>
<td>Off-Site</td>
<td>Douglas-Fir</td>
<td>Pseudotsuga menziesii</td>
<td>36</td>
<td>15</td>
<td>NA</td>
<td>previously topped. Average taper. Average vigour.</td>
<td>NA</td>
<td>Retain</td>
<td>Protect with tree protection fencing as per attached tree management plan.</td>
<td>2.16</td>
</tr>
<tr>
<td>os04</td>
<td>Off-Site</td>
<td>Western White Pine</td>
<td>Pinus monticola</td>
<td>30</td>
<td>15</td>
<td>NA</td>
<td>multistemmed, candelabra top from previous topping.</td>
<td>NA</td>
<td>Retain</td>
<td>Protect with tree protection fencing as per attached tree management plan.</td>
<td>2</td>
</tr>
<tr>
<td>OsHedge1</td>
<td>Off-Site</td>
<td>Cherry Laurel</td>
<td>Prunus laurocerasus</td>
<td>25</td>
<td>3</td>
<td>NA</td>
<td>Average mature laurel hedge.</td>
<td>NA</td>
<td>Retain</td>
<td>Tree protection barrier not practical due to driveway and access requirements. Maintaining grades on gravel driveway required for successful retention.</td>
<td>2</td>
</tr>
</tbody>
</table>
Appendix 2  Site Photographs

Photo 1. Trees 587, 586, 585, as viewed at the lot frontage from across Prospect Road.

Photo 2. Tree 585, a large diameter fir that has been topped but otherwise has good structure.
Photo 3. Canopies of trees in backyard, as viewed from the southwest.

Photo 4. Tree 693, Is a maple with several stems and a very poor structure.
Photo 5. 585, 588, and 589 as viewed from the back yard, over the roof of the existing building.

Photo 6. Excavation along north property line.
Appendix 3  Tree Health and Structure Rating Criteria

The tree health and structure ratings used by Diamond Head Consulting summarize each tree based on both positive and negative attributes using five stratified categories. These ratings indicate health and structural conditions that influence a tree’s ability to withstand local site disturbance during the construction process (assuming appropriate tree protection) and benefit a future urban landscape.

**Excellent:** Tree of possible specimen quality, unique species or size with no discernible defects.

**Good:** Tree has no significant structural defects or health concerns, considering its growing environment and species.

**Moderate:** Tree has noted health and/or minor to moderate structural defects. This tree can be retained, but may need mitigation (e.g., pruning or bracing) and monitoring post-development. A moderate tree may be suitable for retention within a stand or group, but not suitable on its own.

**Poor:** Tree is in serious decline from previous growth habit or stature, has multiple defined health or structural weaknesses. It is unlikely to acclimate to future site use change. This tree is not suitable for retention within striking distance of most targets.

**Dying/Dead:** Tree is in severe decline, has severe defects or was found to be dead.
Appendix 4  Tree Retention Value Rating Criteria

The tree retention value ratings used by Diamond Head Consulting provide guidance for tree retention planning. Each tree in an inventory is assigned to one of four stratified categories that reflect its value as a future amenity and environmental asset in a developed landscape. Tree retention value ratings take into account the health and structure rating, species profile*, growing conditions and potential longevity assuming a tree’s growing environment is not compromised from its current state.

High: Tree suitable for retention. Has a good or excellent health and structure rating. Tree is open grown, an anchor tree on the edge of a stand or dominant within a stand or group. Species of *Populus*, *Alnus* and *Betula* are excluded from this category.

Medium: Tree suitable for retention with some caveats or suitable within a group**. Tree has moderate health and structure rating, but is likely to require remedial work to mitigate minor health or structural defects. Includes trees that are recently exposed, but wind firm, and trees grown on sites with poor rooting environments that may be ameliorated.

Low: Tree has marginal suitability for retention. Health and structure rating is moderate or poor; remedial work is unlikely to be viable. Trees within striking distance of a future site developments should be removed.

Nil: Tree is unsuitable for retention. It has a dying/dead or poor health and structure rating. It is likely that the tree will not survive, or it poses an unacceptable hazard in the context of future site developments.

* The species profile is based upon mature age and height/spread of the species, adaptability to land use changes and tree species susceptibility to diseases, pathogen and insect infestation.

** Trees that are ‘suitable as a group’ have grown in groups or stands that have a single, closed canopy. They have not developed the necessary trunk taper, branch and root structure that would allow them to be retained individually. These trees should only be retained in groups.
Trees with a *probable* or *imminent* likelihood of failure, a *medium or high* likelihood of impacting a specified target, and a *significant or severe* consequence of failure have been assessed for risk and included in this report (Section 3.2). These two risk rating matrices showing the categories used to assign risk are taken without modification to their content from the International Society of Arboriculture Tree Risk Assessment Qualification Manual.

**Matrix 1: Likelihood**

<table>
<thead>
<tr>
<th>Likelihood of Failure</th>
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<tr>
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**Matrix 2: Risk Rating**

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<td>Negligible</td>
</tr>
<tr>
<td>Very Likely</td>
<td>Low</td>
</tr>
<tr>
<td>Likely</td>
<td>Low</td>
</tr>
<tr>
<td>Somewhat Likely</td>
<td>Low</td>
</tr>
<tr>
<td>Unlikely</td>
<td>Low</td>
</tr>
</tbody>
</table>
Appendix 6    Construction Guidelines

Tree management recommendations in this report are made under the expectation that the following guidelines for risk mitigation and proper tree protection will be adhered to during construction.

Respecting these guidelines will prevent changes to the soil and rooting conditions, contamination due to spills and waste, or physical wounding of the trees. Any plans for construction work and activities that deviate from or contradict these guidelines should be discussed with the project arborist so that mitigation measures can be implemented.

Tree Protection Zones
A Tree protection zone (TPZ) is determined using either dripline or a DBH multiplier to define a radius measured in all directions from the outside of a tree’s trunk. It is typically determined according to local municipal bylaw specifications and may be modified based on professional judgement of the project arborist to accommodate species specific tolerances and site specific growing conditions. For retained trees, the TPZ and fencing indicated in this report are proposed as suitable in relation to the level of disturbance proposed on the site plan provided to the project arborist. Arborist consultation is required if any additional work beyond the scope of the plans provided is proposed near the tree. Work done in addition to the proposed impacts discussed in this report may cause the tree to decline and die.

Tree Protection Fencing: Tree protection zones (TPZs) will be protected by Tree Protection Fencing except where site features constrict roots (e.g., retaining walls or roads), where continual access is required (e.g., sidewalks), or when an acceptable encroachment into the TPZ is proposed, in which case the fencing will be modified. Tree Protection Fencing is shown on the Tree Protection Plan and, where it varies from the TPZ, the rationale is described in the inventory table in Section 3.1.

Within a TPZ, no construction activity, including materials storage, grading or landscaping, may occur without project arborist approval. Within the TPZ, the following are tree preservation guidelines based on industry standards for best practice and local municipal requirements:

- No soil disturbance or stripping.
- Maintain the natural grade.
- No storage, dumping of materials, parking, underground utilities or fires within TPZs or tree driplines.
- Any planned construction and landscaping activities affecting trees should be reviewed and approved by a consulting arborist.
- Install specially designed foundations and paving when these structures are required within TPZs.
- Route utilities around TPZs.
- Excavation within the TPZs should be supervised by a consultant arborist.
- Surface drainage should not be altered in such a way that water is directed in or out of the TPZ.
• Site drainage improvements should be designed to maintain the natural water table levels within the TPZ.

Prior to any construction activity, Tree Protection Fencing must be constructed as shown on the Tree Protection Plan. The protection barrier or temporary fencing must be at least 1.2 m in height and constructed of 2” by 4” lumber with orange plastic mesh screening. Tree Protection Fencing must be constructed prior to tree removal, excavation or construction and remain intact for the entire duration of construction.

Tree Crown Protection and Pruning
All heavy machinery (excavators, cranes, dump trucks, etc.) working within five meters of a tree’s crown should be made aware of their proximity to the tree. If there is to be a sustained period of machinery working within five meters of a tree’s crown, a line of colored flags should be suspended at eye-level of the machinery operator for the length of the protected tree area. Any concerns regarding the clearance required for machinery and workers within or immediately outside tree protection zones should be referred to the project arborist so that a zone surrounding the crowns can be established or pruning measures undertaken. Any wounds incurred to protected trees during construction should be reported to the project arborist immediately.

Unsurveyed Trees
Unsurveyed trees identified by DHC in the Tree Retention Plan have been hand plotted for approximate location only using GPS coordinates and field observations. The location and ownership of unsurveyed trees cannot be confirmed without a legal survey. The property owner or project developer must ensure that all relevant on- and off-site trees are surveyed by a legally registered surveyor, whether they are identified by DHC or not.

Removal of logs from sites
Private timber marks are required to transport logs from privately-owned land in BC. It is property owner’s responsibility to apply for a timber mark prior to removing any merchantable timber from the site. Additional information can be found at: [http://www.for.gov.bc.ca/hth/private-timber-marks.htm](http://www.for.gov.bc.ca/hth/private-timber-marks.htm)

Regulation of Soil Moisture and Drainage
Excavation and construction activities adjacent to TPZs can influence the availability of moisture to protected trees. This is due to a reduction in the total root mass, changes in local drainage conditions, and changes in exposure including reflected heat from adjacent hard surfaces. To mitigate these concerns the following guidelines should be followed:

• Soil moisture conditions within the tree tree protection zones should be monitored during hot and dry weather. When soil moisture is inadequate, supplemental irrigation should be provided that penetrates soil to the depth of the root system or a minimum of 30 cm.
• Any planned changes to surface grades within the TPZs, including the placement of mulch, should be designed so that any water will flow away from tree trunks.
Excavations adjacent to trees can alter local soil hydrology by draining water more rapidly from TPZs more rapidly than it would prior to site changes. It is recommended that when excavating within 6 m of any tree, the site be irrigated more frequently to account for this.

**Root Zone Enhancements and Fertilization**

Root zone enhancements such as mulch, and fertilizer treatments may be recommended by the project arborist during any phase of the project if they deem it necessary to maintain tree health and future survival.

**Paving Within and Adjacent to TPZs**

If development plans propose the construction of paved areas and/or retaining walls close to TPZs, measures should be taken to minimize impacts. Construction of these features would raise concerns for proper soil aeration, drainage, irrigation and the available soil volume for adequate root growth. The following design and construction guidelines for paving and retaining walls are recommended to minimize the long-term impacts of construction on protected trees:

- Any excavation activities near or within the TPZ should be monitored by a certified arborist. Structures should be designed, and excavation activities undertaken to remove and disturb as little of the rooting zone as possible. All roots greater than 2 cm in diameter should be hand pruned by a Certified Arborist.
- The natural grade of a TPZ should be maintained. Any retaining walls should be designed at heights that maintain the existing grade within 20 cm of its current level. If the grade is altered, it should be raised not reduced in height.
- Compaction of sub grade materials can cause trees to develop shallow rooting systems. This can contribute to long-term pavement damage as roots grow. Minimizing the compaction of subgrade materials by using structural soils or other engineered solutions and increasing the strength of the pavement reduces reliance on the sub-grade for strength.
- If it is not possible to minimize the compaction of sub-grade materials, subsurface barriers should be considered to help direct roots downward into the soil and prevent them from growing directly under the paved surfaces.

**Plantings within TPZs**

Any plans to landscape the ground within the TPZ should implement measures to minimize negative impacts on the above or below ground parts of a tree. Existing grass layer in TPZs should not be stripped because this will damage surface tree roots. Grass layer should be covered with mulch at the start of the project, which will gradually kill the grass while moderating soil moisture and temperatures. Topsoil should be mixed with the mulch prior to planting of shrubs, but new topsoil layer should not be greater than 20 cm deep on top of the original grade. Planting should take place within the newly placed topsoil mixture and should not disturb the original rooting zone of the trees. A two-meter radius around the base of each tree should be left unplanted and covered in mulch; a tree’s root collar should remain free from any amendments that raise the surface grade.
**Monitoring during construction**

Ongoing monitoring by a consultant arborist should occur for the duration of a development project. Site visits should be more frequent during activities that are higher risk, including the first stages of construction when excavation occurs adjacent to the trees. Site visits will ensure contractors are respecting the recommended tree protection measures and will allow the arborist to identify any new concerns that may arise.

During each site visit the following measures will be assessed and reported on by a consulting arborist:

- Health and condition of protected trees, including damage to branches, trunks and roots that may have resulted from construction activities, as will the health of. Recommendations for remediation will follow.
- Integrity of the TPZ and fencing.
- Changes to TPZ conditions including overall maintenance, parking on roots, and storing or dumping of materials within TPZ. If failures to maintain and respect the TPZ are observed, suggestions will be made to ensure tree protection measures are remediated and upheld.
- Review and confirmation of recommended tree maintenance including root pruning, irrigation, mulching and branch pruning.
- Changes to soil moisture levels and drainage patterns; and
- Factors that may be detrimentally impact the trees.
Appendix 7 Report Assumptions and Limiting Conditions

1) Unless expressly set out in this report or these Assumptions and Limiting Conditions, Diamond Head Consulting Ltd. (“Diamond Head”) makes no guarantee, representation or warranty (express or implied) regarding this report, its findings, conclusions or recommendations contained herein, or the work referred to herein.

2) The work undertaken in connection with this report and preparation of this report have been conducted by Diamond Head for the “Client” as stated in the report above. It is intended for the sole and exclusive use by the Client for the purpose(s) set out in this report. Any use of, reliance on or decisions made based on this report by any person other than the Client, or by the Client for any purpose other than the purpose(s) set out in this report, is the sole responsibility of, and at the sole risk of, such other person or the Client, as the case may be. Diamond Head accepts no liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm (including without limitation financial or consequential effects on transactions or property values, and economic loss) that may be suffered or incurred by any person as a result of the use of or reliance on this report or the work referred to herein. The copying, distribution or publication of this report (except for the internal use of the Client) without the express written permission of Diamond Head (which consent may be withheld in Diamond Head’s sole discretion) is prohibited. Diamond Head retains ownership of this report and all documents related thereto both generally and as instruments of professional service.

3) The findings, conclusions and recommendations made in this report reflect Diamond Head’s best professional judgment given the information available at the time of preparation. This report has been prepared in a manner consistent with the level of care and skill normally exercised by arborists currently practicing under similar conditions in a similar geographic area and for specific application to the trees subject to this report on the date of this report. Except as expressly stated in this report, the findings, conclusions and recommendations it sets out are valid for the day on which the assessment leading to such findings, conclusions and recommendations was conducted. If generally accepted assessment techniques or prevailing professional standards and best practices change at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary. Diamond Head expressly excludes any duty to provide any such modification if generally accepted assessment techniques and prevailing professional standards and best practices change.

4) Conditions affecting the trees subject to this report (the “Conditions”, include without limitation, structural defects, scars, decay, fungal fruiting bodies, evidence of insect attack, discolored foliage, condition of root structures, the degree and direction of lean, the general condition of the tree(s) and the surrounding site, and the proximity of property and people) other than those expressly addressed in this report may exist. Unless otherwise stated information contained in this report covers only those Conditions and trees at the time of inspection. The inspection is limited to visual examination of such Conditions and trees without dissection, excavation, probing or coring. While
every effort has been made to ensure that any trees recommended for retention are both healthy and safe, no guarantees, representations or warranties are made (express or implied) that those trees will not be subject to structural failure or decline. The Client acknowledges that it is both professionally and practically impossible to predict with absolute certainty the behavior of any single tree, or groups of trees, in all given circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential for failure and this risk can only be eliminated if the risk is removed. If Conditions change or if additional information becomes available at a future date, modifications to the findings, conclusions, and recommendations in this report may be necessary. Diamond Head expressly excludes any duty to provide any such modification of Conditions change or additional information becomes available.

5) Nothing in this report is intended to constitute or provide a legal opinion and Diamond Head expressly disclaims any responsibility for matters legal in nature (including, without limitation, matters relating to title and ownership of real or personal property and matters relating to cultural and heritage values). Diamond Head makes no guarantee, representation or warranty (express or implied) as to the requirements of or compliance with applicable laws, rules, regulations, or policies established by federal, provincial, local government or First Nations bodies (collectively, “Government Bodies”) or as to the availability of licenses, permits or authorizations of any Government Body. Revisions to any regulatory standards (including bylaws, policies, guidelines an any similar directions of a Government Bodies in effect from time to time) referred to in this report may be expected over time. As a result, modifications to the findings, conclusions and recommendations in this report may be necessary. Diamond Head expressly excludes any duty to provide any such modification if any such regulatory standard is revised.

6) Diamond Head shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.

7) In preparing this report, Diamond Head has relied in good faith on information provided by certain persons, Government Bodies, government registries and agents and representatives of each of the foregoing, and Diamond Head assumes that such information is true, correct and accurate in all material respects. Diamond Head accepts no responsibility for any deficiency, misinterpretations or fraudulent acts of or information provided by such persons, bodies, registries, agents and representatives.

8) Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.

9) Loss or alteration of any part of this report invalidates the entire report.
Wildfire Hazard DP Area Assessment Report

4320 Prospect Road
North Vancouver, BC

- Original - February 15, 2018
- Minor revisions for clarity May 7, 2019
- Harmonized with DHC arborist report August 15, 2019
- Revised November 27, 2020

Submitted to:

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1.0 Introduction

Diamond Head Consulting Ltd. (DHC) was retained to prepare an assessment of wildfire interface risks and mitigation measures for the following proposed development.

<table>
<thead>
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<th>Civic address:</th>
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<td>Client name:</td>
<td>Synthesis design</td>
</tr>
<tr>
<td>Date of site visit:</td>
<td>February 9, 2018</td>
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This project includes one residential lot located within the District of North (DNV) Vancouver Wildfire Hazard Development Permit Area. The overall objective of this report is to assess the potential wildfire threat and provide recommendations and tools to reduce this threat to the development site. This detailed assessment report is meant to be submitted as a part of the Wildfire Development Permit application. It must be prepared and signed by a qualified professional and recommend whether a more detailed assessment is required. Specific goals for this assessment are:

- To assess interface fuels, determine the extent, location and presence of wildfire hazard;
- To recommend site-specific fuel treatments for adjacent high fuel hazards that will reduce the risk to structures, human lives, and critical natural features;
- To make recommendations for improving suppression capabilities in and around the proposed development, and;
- To make recommendations for access, building and landscape materials that will minimize wildfire threat.

1.1 Site Planning Documents Reviewed

Diamond Head Consulting was provided with the following documentation from the client that provides the basis for all comments and recommendations:

1. Site Analysis – 4320 Prospect Road – Job 18002 – Synthesis Design
2. Arborist Report- 4320 Prospect Road – November 27, 2020 – Diamond Head Consulting
3. 4320 Prospect Road – 2019-11-20 – Civil Base plan Creus Engineering.

Any changes to these site plans should be provided to Diamond Head Consulting so that this wildfire report can be updated accordingly.
1.2 Policy Considerations for Wildfire Threat Mitigation
The Districts Wildfire Hazard Report Master Requirement SPE 115 was developed based on the recommendations of the Community Wildfire Protection Plan. The guidelines were developed with the intent of using precautionary measures to protect property in areas that are at risk from potential wildfire. Standards to achieve these objectives are identified, and reference NFPA-1144 (Standard for Reducing Structure Ignition Hazards from Wildland Fire). In some cases, these standards can be difficult to achieve for developments, and can result in more stringent restrictions than intended.

This assessment report considers both NFPA standards and Canadian FireSmart standards to assess hazard and guide recommendations for the design and construction of buildings and structures located within the boundaries of the Wildfire Development Permit Area.

Figure 1. Location of the subject site- 4230 Prospect Road
2.0 Common Deficiencies

There are many requirements specified within this report for this development to comply with the Development Permit. The following are deficiencies commonly encountered during post construction inspections.

- No conifers or long grasses should be included in the landscaping within 10m of any buildings. This includes hedges of cedar, cypress or yew species, and grasses such as bamboo.

- Fencing within 10m of any structures must be made of ignition resistant materials.

Exterior walls must be made of non-combustible materials that meet the acceptance criteria of NFPA 1144 standards. Paint on fire resistant treatments of wood is not acceptable.

3.0 Methodology

This project falls within the DNV Wildfire Hazard Development Permit Wildfire Risk and Interface Area. One nearby stand of trees to the east of the site was identified as a potential risk in the Community Wildfire Protection Plan (CWPP, 2007). This stand was classified into fuel types. There are no fuel classifications specific to the coastal region in the Canadian Fire Behaviour Prediction System; instead, the site has been classified as the fuel type that best represents the fire behavior potential of the forest types most accurately. Fuel type interpretations can be
reviewed in Appendix 2. Figure 4 is an aerial image with the fuel types located in relation to the project site.

Detailed fuel hazard assessments were completed within 500m of the lot using the provincial assessment system, “Rating Interface Wildfire Threats in BC” (Morrow, Johnson, Davies, 2008). These plots are shown on Figure 4. Data collected at each fuel plot included:

- Soil and humus characteristics;
- Slope, aspect and terrain classification;
- Forest stand composition by layer (species, density, age, diameter, height, etc.);
- Vertical and horizontal stand structure;
- Quantity and distribution of ladder fuels;
- Composition and coverage of understory brush, herbs and grasses; and
- Quantity and distribution of ground fuels by size class.

### 4.0 Project Overview

This property is a single residential lot located in the Delbrooke neighbourhood of North Vancouver at 4320 Prospect Rd. There is currently a single dwelling on the property. The site is partially forested, and hosts several large Douglas-firs, and western redcedar. Smaller, suppressed western hemlocks appear to be chronically stressed and in decline. The proposed development includes demolishing the existing house and subdividing the property into two parcels, each with a new single family dwelling.
Figure 3. Development Concept plan for the site
5.0 Fuel Descriptions and Wildfire Threat Assessment

5.1 Summary of Fuel Types
Forested areas nearby the proposed development site were classified into the fuel types mapped in Figure 4. The fuels have been divided into classifications based on the sixteen national benchmark fuel types that are used by the Canadian Fire Behaviour Prediction System (Appendix 3). Two fuel types, M2 and C5, were identified. Detailed descriptions of these forest areas are provided in Appendix 2.

Figure 4. Location of the fuel types relative to project site
5.2 Summary of Wildfire Threats
Each fuel type and distinct stand was assessed for wildfire threat using the Wildfire Urban Interface worksheet. Figure 5 outlines the wildfire threat and plot locations. The Wildfire Urban Interface (WUI) ratings and plot characteristics are summarized in Appendix 1. The subject site was assessed to have an overall moderate risk from wildfire.

The greatest risk of wildfire to this site comes from the mature coniferous forest which is contiguous with the subject site. The stand edge is feathered and interrupted by maintained yards and driveways. There are also coniferous hedges and small trees around the perimeter of the site, within the 10m “Zone 1” buffer. Some of the large conifers on the site have deep crowns that almost reach the ground. These on site conifer trees and hedges are a threat to the property from direct flame contact and radiant heat at the building face.
Photo 1: View of “Os Hedge 1”, found just offsite.

Photo 2: View of existing house at 4320 Prospect Road and large conifers found behind (east)
Photo 5: The mixed deciduous stand near plot #226

Photo 5: The closed coniferous stand near plot 227
6.0 Wildfire Threat Mitigation Recommendations

The following are recommendations to mitigate risk to the development. Community and design recommendations focus on siting of structures, construction materials, access, water sources and utilities. These are factors that provide long term mitigation against a wildfire event. Vegetation fuels on and adjacent to the development will change over time and require maintenance. Recommendations are made for on-site landscaping as well as treatments and required maintenance for forest areas adjacent to the property.

At the time this assessment was completed, architectural plans were in draft form. Diamond Heac Consulting has prepared a tree replacement plan that follows FireSmart guidelines. It is the responsibility of the owner and their project team to understand and comply with the following requirements and restrictions.

6.1 Buildings setback from hazardous fuels

Firesmart recommends that a 10m fuel free zone be established and maintained between structures and hazardous fuels. The proposed building will be approximately 16m from the nearest intact forest edge. Trees within the forest generally have high crowns and no mitigation work is required. All trees on the subject site have been recommended for removal in the most recent arborist report prepared by Diamond Head Consulting.

6.2 Buildings and Construction

Generally, during a wildfire, homes are ignited as a result of embers landing and accumulating on vulnerable surfaces such as roofs, verandas, eaves and openings. Embers can also land on or in nearby flammable materials such as bushes, trees or woodpiles and, if the resulting fire is near the home, it could create enough radiant heat to ignite the walls of the home. Small fires in the yard can also spread towards the structures, beneath porches or under homes. Therefore, the building material and construction techniques are a paramount concern for homes in the interface.

Construction standards and requirements for roofs, chimneys, balconies, decks and porches apply to all new houses that are built within the wildfire DP area. These are outlined in Schedule B of the District of North Vancouver’s Official Community Plan, which can be found at the District website (www.dnv.org/sites/default/files/edocs/wildfire-hazard-DPA-details-schedule-B-OCP.pdf). The DNV building standards along with additional recommendations are summarized in Table 1.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Requirements for building materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roofing</td>
<td>• Class A or B rated roofing material* should be used, and asphalt or metal roofing should be given preference.</td>
</tr>
<tr>
<td></td>
<td>• Any spaces between roof decking and covering should be blocked.</td>
</tr>
<tr>
<td></td>
<td>• Screen or enclose rain gutters to prevent accumulation of plant debris.</td>
</tr>
<tr>
<td>Siding</td>
<td>• Exterior vertical walls should be sheathed with non-combustible materials*. Preference should be given to stucco, metal, brick and concrete cladding.</td>
</tr>
<tr>
<td></td>
<td>• Ensure that fire resistant materials extend from the foundation to the roof.</td>
</tr>
<tr>
<td>Vents, openings, eaves, attics</td>
<td>• Vents should be screened using 3mm, non-combustible wire mesh, and vent assemblies should use fire shutters or baffles.</td>
</tr>
</tbody>
</table>
### Overhanging Projections, Soffits
- Eaves, soffits, attics, overhanging projections and underfloor openings should be protected with non-combustible covers.

### Exterior Windows and Doors
- All windows should be multi-paned, or of glass block. Radiant faces exposed to the forest edge should be multi-paned with one pane glazed with annealed or tempered insulating glass.
- Limit the size and number of windows that face large areas of vegetation.
- Window screens should be non-combustible.
- Exterior doors on radiant faces exposed to the forest edge should be of fire resistant materials.

### Decks, Porches, Balconies
- Decks, porches and balconies should be sheathed with fire-resistant or non-combustible materials.
- Slotted deck surface allows needle litter to accumulate beneath the deck. Provide access to this space to allow for removal of this debris.
- Any covers should be built of the same ignition-resistant materials as a roof.

### Chimney
- All chimneys and wood-burning appliances should have approved spark arrestors (securely attached and made of 12-gauge welded or woven wire mesh screen with mesh opening of less than 12 mm);

### Exterior Sprinklers
- While exterior wall or roof sprinklers were considered, they are not presently recommended because of the lack of accepted standards for design and installation, and the uncertainty regarding maintenance and triggering of sprinklers during a wildfire event when homes are evacuated.
- Irrigation sprinklers should be installed on private property and in landscaped parks to keep plants healthy and fire-resistant. The switch for these should be made accessible to turn on in the case of a wildfire.

### Fences
- Where fencing is within 10 m of the building or accessory buildings, use fire-resistant or non-combustible materials.

### Feature Recommendations during construction

<table>
<thead>
<tr>
<th>Feature</th>
<th>Recommendations during construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combustible materials</td>
<td>During construction of houses, all waste construction materials including brush and land clearing debris; needs to be cleaned up on a regular basis, to minimize the potential risk. No combustible materials should be left at the completion of construction.</td>
</tr>
<tr>
<td>Hydrants</td>
<td>Prior to construction of any wood frame buildings, there must be fire hydrants within operating range.</td>
</tr>
<tr>
<td>Fire Suppression</td>
<td>The contractor should be familiar with the BC Wildfire Act and the current provincial standards for wildfire suppression and have the appropriate tools on-site for the duration of the project.</td>
</tr>
</tbody>
</table>

*Non-combustible materials:* means that a material meets the acceptance criteria of CAN/ULC S114, (Standard Method of test for determination of non-combustibility in Building Materials)

*Fire-resistant materials:* means that a material meets the acceptance criteria of CAN/ULC-S101, (Fire Endurance Tests of Building Construction and Materials)

*Rated roofing materials:* Class A, B or C is a measure of the external spread of flame on a roof surface. Tests are conducted using CAN/ULC S107M methods of fire tests of roof coverings, or equivalent. The best rating achieved is Class A, which may be described as effective against severe fire exposure.

The following specification are very important to comply with. Roofing must be fire retardant. These have a Class A flame spread rating defined as “Class A roof coverings are not readily flammable, are effective against severe fire exposures, and do not carry or communicate (i.e., spread) fire”. ANSI/UL 790, “Tests for Fire Re sistance of Roof Covering Materials,” and ASTM E 108, "Standard Test Methods for Fire Tests of Roof Coverings," are the fire-resistance capacity tests used to determine a product's or roof assembly's classification. Any products that are certificated as Class A with an "Assembly" requirement must have a project engineer or architect provide signed proof that the product has been installed as per the specifications of the manufacturer.
Exterior siding must be fire resistant. (Stucco, brick, fibre cement boards/panels and poured concrete). Untreated wood products do not meet this standard. Flame resistant coatings that require ongoing maintenance or reapplication are not acceptable. Exterior wall assemblies that have exterior wood that is untreated and rely on the interior wall for fire resistance are not acceptable. Wood products that have permanent treatments or are naturally fire resistant can be accepted as long as product specifications and certified testing is provided.

It is critical that the structure be designed and built to these standards. The District will require that the final structure be inspected to confirm it is compliant and in order to obtain permit for occupancy and bonding.

6.3 Firesmart Landscaping and Fuel Mitigation
Landscaping and maintenance for the site should follow FireSmart principals (Ministry of Forests Wildfire Management Branch, Firesmart Program. For single residential lots the entire lot is generally within 10m of the structure and will be landscaped. Planning and maintenance of this area should follow the requirements of priority zone 1 (<10m from structures) outlines in the Firesmart program. The goal in this zone is to remove hazardous fuels and convert vegetation to fire resistance species to produce an environment that does not support combustion. These recommendations include strategic selection of fire resistant replacement trees as well as landscaping and maintenance standards are summarised in Table 2.

Diamond Head Consulting has prepared a tree replacement plan for the project that includes only fire-resistant deciduous species. Refer to Table 2 for addition detail if the landscape plans are expected to change.
Table 2. Requirements for Landscaping

<table>
<thead>
<tr>
<th>Feature</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| **Planting** | • Remove all highly flammable vegetation and other combustibles from around the building.  
• No conifer trees should be planted within 10m of any buildings. (DHC replacement plan is all deciduous species)  
• Landscaping should incorporate species that are fire resistant. These types of plants tend to have moist, supple leaves with low amounts of sap or resin. They also have a tendency not to accumulate dead material. A list of fire resistant plants and trees can be found at the Firesmart Canada website. A list of suitable species has also be provided in Appendix 6.  
• Ensure that vegetation will not grow to touch or overhang buildings.  
• No vegetation should be placed within 10 m of glazed openings unless there are solid shutters to cover the glazing.  
• Irrigation sprinklers should be installed in landscaping. |
| **Maintenance** | • Annual grasses within 10 meters of buildings should be kept mowed to 10 centimeters or less and watered regularly during the summer months;  
• Ground litter and downed trees should be removed regularly and prior to the fire season. |

6.4 Recommendations for Onsite and Neighboring Trees

Existing hedges and trees located within 10m of the proposed structure pose the greatest risk of spreading a wildfire. All trees on the subject site have been recommended for removal the most recent arborist report prepared by Diamond Head Consulting. Should tree retention and removal plans change DHC should be advised so that this report can be amended.

There is a mature mixed species hedge along the south property line. This hedge can be retained if it is properly irrigated and debris regularly cleaned out from under the hedge.

Three conifer trees east of the subject site are located approximately 20m from the rear of the proposed building. They can be retained if all on-site trees are removed. Crown raising is not feasible given the relatively short stature of the trees and suppressed form. If the arborist report changes and the large on-site conifers are retained, DHC should be consulted to revise this report.

Table 3 outlines tree attributes and recommendations for individual trees to reduce the risk from wildfire.
Table 3. Tree Inventory of on site and neighboring trees to be treated for wildfire mitigation

<table>
<thead>
<tr>
<th>Tag #</th>
<th>Common Name</th>
<th>DBH (cm)</th>
<th>Ht (m)</th>
<th>Overall Condition</th>
<th>Comments</th>
<th>Retain/Remove</th>
<th>Tree Retention Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Os Hedge 1</td>
<td>Western hemlock/ Western Cedar/ Laurel</td>
<td>5-15</td>
<td>3</td>
<td>Moderate</td>
<td>Growing south of the property line, opposite the driveway easement. This hedge is mature and dense. It could propagate a fire and be difficult to extinguish. Found within 10m of the proposed structure.</td>
<td>Retain</td>
<td>Regular maintenance and irrigation are the best mitigation options in lieu of removal.</td>
</tr>
<tr>
<td>590-592</td>
<td>Western hemlock</td>
<td>15</td>
<td>3</td>
<td>Poor</td>
<td>these hemlocks have been topped repeatedly and have limited retention value. They have low crowns and form a dense mat of coniferous foliage within 10m of the proposed home.</td>
<td>Remove</td>
<td>Trees 590, 591, and 592 to be removed for wildfire risk reduction and conflict with retaining wall. Note offsite trees to be retained as small hedge. ~15m from building.</td>
</tr>
<tr>
<td>Os-02</td>
<td>Douglas fir</td>
<td>24</td>
<td>5</td>
<td>Moderate</td>
<td>Small intermediate off-site tree</td>
<td>Retain</td>
<td></td>
</tr>
<tr>
<td>Os-03</td>
<td>Douglas fir</td>
<td>36</td>
<td>6</td>
<td>Poor</td>
<td>Has been topped multiple times, making crown raising more difficult</td>
<td>Retain</td>
<td></td>
</tr>
<tr>
<td>Os-04</td>
<td>Western white pine</td>
<td>25</td>
<td>6</td>
<td>Poor</td>
<td>Has been topped multiple times, making crown raising more difficult</td>
<td>Retain</td>
<td></td>
</tr>
</tbody>
</table>
Figure 6. Tree Retention and Removal Map
6.5 Ongoing Maintenance

To ensure that FireSmart standards are maintained on the property, periodic re-treatment or maintenance is recommended in Table 4 Requirements for ongoing maintenance.

Table 4. Requirements for ongoing maintenance

<table>
<thead>
<tr>
<th>Owner</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Regularly remove debris from roofs, gutters and beneath overhanging projections.</td>
</tr>
<tr>
<td></td>
<td>• Grass and landscaping should be kept mowed to 10 cm or less and watered regularly during the summer months.</td>
</tr>
<tr>
<td></td>
<td>• Landscape sprinkler systems should be installed and maintained by the homeowner.</td>
</tr>
<tr>
<td></td>
<td>• Remove any local accumulations of woody or combustible material (e.g., no woodpile or yard waste accumulations).</td>
</tr>
<tr>
<td></td>
<td>• Remove any over mature, dead or dying shrubs and trees.</td>
</tr>
<tr>
<td></td>
<td>• Plant only fire resistant trees and shrubs. A list of fire resistant plants and trees can be found at the fire smart canada website (<a href="https://www.firesmartcanada.ca/images/uploads/resources/FireSmart-Guide-to-Lanscaping.pdf">https://www.firesmartcanada.ca/images/uploads/resources/FireSmart-Guide-to-Lanscaping.pdf</a>). A list of suitable species is also provided in Appendix 6.</td>
</tr>
</tbody>
</table>
### 7.0 Future Condition FireSmart Structure and Hazard Assessment

The table below provides an assessment of the proposed development using the FireSmart Structure and Hazard Assessment form. Assessment ratings are made assuming that the recommendations outlined in this report are adhered to.

**Table 5. FireSmart Structure and Hazard Assessment**

<table>
<thead>
<tr>
<th>HOME/10 m</th>
<th>Criteria</th>
<th>Rating Options</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>What type of roofing material do you have?</td>
<td>Metal, clay tile, asphalt shingle or ULC rated shakes (may be affected by the condition of your roof)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Unrated Wood Shakes</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>How clean is your roof?</td>
<td>No needles, leaves or other combustible materials</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>A scattering of needles and leaves</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clogged gutters and extensive leaves</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>What is the exterior of your home built of?</td>
<td>Non-combustible material, stucco, metal siding or brick</td>
<td>0</td>
<td>0/NA*</td>
</tr>
<tr>
<td></td>
<td>Logs of heavy timbers</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wood, vinyl siding or wood shakes</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>How fire-resistant are your windows and doors?</td>
<td>Tempered glass in all doors/windows</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Double-pane glass - small/medium (smaller than 1 metre x 1 metre)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Double-pane glass - large (greater than 1 metre x 1 metre)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Single-pane glass - small/medium (smaller than 1 metre x 1 metre)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Single-pane glass - large (greater than 1 metre x 1 metre)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Are your eaves closed up and your vents screened?</td>
<td>Closed eaves, vents screened with 3-millimetre wire mesh</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Closed eaves, vents without mesh</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Open eaves, vents not screened</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Have you sheathed-in the underside of your balcony, deck, porch or open foundation?</td>
<td>Sheathed with fire-resistant materials</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Sheathed with combustible materials</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not sheathed</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Is your home set back from the edge of a slope?</td>
<td>Building is located on the bottom or lower portion of a hill</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Building is located on the mid to upper portion of a hill or the crest of a hill</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

**ZONE 1 HOME SCORE**

2
<table>
<thead>
<tr>
<th>Zone 1</th>
<th>Yard/within 10 m</th>
<th>Criteria</th>
<th>Rating Options</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where are your outbuildings (or adjacent buildings) located?</td>
<td>More than 10 metres from home</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Less than 10 metres from home</td>
<td>6</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Where is your woodpile located?</td>
<td>More than 10 metres from any building</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Less than 10 metres away from any building</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What type of forest grows within 10 metres of your home?</td>
<td>Deciduous trees</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mixed wood trees (deciduous and conifer)</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conifer trees</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What kind of surface vegetation and combustible materials are within 10 metres of your home and outbuildings?</td>
<td>Well-drained lawn or non-combustible landscaping material</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uncut grass or shrubs</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Twigs, branches and tree needles on the ground</td>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL ZONE 1 YARD SCORE**

2

<table>
<thead>
<tr>
<th>Zone 2</th>
<th>Yard/10 – 30 m</th>
<th>Criteria</th>
<th>Rating Options</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>What type of forest surrounds your home?</td>
<td>Deciduous trees</td>
<td>0</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mixed wood trees (deciduous and conifer)</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conifer trees separated</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conifer trees continuous</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What kind of surface vegetation grows within 10-30 metres of your home and around your buildings?</td>
<td>Well-drained lawn or non-combustible landscaping material</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uncut grass or shrubs</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scattered twigs, branches and tree needles on the ground</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abundant twigs, branches and tree needles on the ground</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there shrubs and low branches (within 2 metres of the ground) in the surrounding forest?</td>
<td>None within 10-30 metres</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scattered within 10-30 metres of buildings</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abundant within 10-30 metres of buildings</td>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL ZONE 2 YARD SCORE**

20

**TOTAL SCORE**

<table>
<thead>
<tr>
<th>Zone 1/ Home and Yard</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td>2</td>
</tr>
<tr>
<td>10 metres from home</td>
<td>0</td>
</tr>
<tr>
<td>ZONE 2 / Yard</td>
<td>20</td>
</tr>
<tr>
<td>TOTAL</td>
<td>22 - Moderate</td>
</tr>
</tbody>
</table>

HAZARD SCORE: Low: <21 Moderate: 21-29 High: 30 – 35 Extreme: >35

**Following the recommendations in this report will achieve a FireSmart hazard score of Moderate**
8.0 Final Remarks

The District of North Vancouver requires that the proposed development is consistent with the Wildfire Development Permit Guidelines. Planners, engineers, and landscape architects should refer to this report and the FireSmart manual during the design phase of this development. All construction operations should be conducted according to the Wildfire Act and the regulations. Following these regulations will help reduce liability and protect the development.

The District will require that an inspection be done following construction to ensure that the structure and landscaping meet these requirements.

If the recommendations made within this report and the requirements outlined by the District of North Vancouver are complied with, wildfire risk to life and property will be substantially mitigated and the development will meet FireSmart standards to a reasonable extent within the limitations of zoning and ownership.

If there are any questions or concerns as to the contents of this report, please contact us at any time.

Sincerely,

Supervisor:

Mike Coulthard, R.P.Bio., R.P.F.
Senior Forester, Biologist
Certified Tree Risk Assessor (46)

Michael Harrhy, B.Sc., MSFM
ISA Certified Arborist (PN-8025A)
ISA Tree Risk Assessment Qualified (TRAQ)
Registered Professional Forester
Biologist in Training
## Appendix 1  Wildland Urban Interface Plots

<table>
<thead>
<tr>
<th>Plot</th>
<th>226</th>
<th>227</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fuel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duff depth and moisture regime</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Surface Fuels Continuity</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Vegetation Fuel Composition</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Fine Woody Debris Continuity (&lt;7cm)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Large Woody Debris Continuity (&gt;7cm)</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Conifer Crown Closures</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Deciduous Crown Closure</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Conifer Crown Base Height (m)</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Suppressed Understory Conifers (Stems/ha)</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Coniferous Forest Health</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Continuous Forest (ha)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Fuel Assessment sub-score (−/155)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proceed if &gt;29</td>
<td>28</td>
<td>38</td>
</tr>
<tr>
<td><strong>Weather</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BEC Zone</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>History</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td><strong>Weather sub-score (−/30)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proceed if &gt;95</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td><strong>Topography</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspects</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Slope</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Terrain</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Landscape/topo limitations to wildfire spread</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td><strong>Topography sub-score (−/55)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proceed if &gt;95</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td><strong>Wildfire Behaviour Threat Score (−/240)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proceed if &gt;95</td>
<td>52</td>
<td>68</td>
</tr>
<tr>
<td>Wildfire Behaviour Threat Class</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Structural</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position of Structure</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Type of Development</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Position of Assessment Area relative to values</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Structural sub-score (−/55)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td><strong>Wildland Urban Interface Wildfire Threat Score (−/295)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td><strong>Wildfire Behaviour Threat Class</strong></td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Figure 7. Plot locations
Appendix 2  
Description of Forest Fuel Types

Fuel Type C5 – Coniferous dominated stand

Portions of the MacKay Creek park forest have been classified as coniferous including the area immediately to the east of the subject site. The C5 fuel type consists of a mature second growth canopy of even aged, moderately stocked (500 – 800 stems per hectare) conifers. The stand is dominated by Douglas-fir (Pseudotsuga menziesii), Western Hemlock (Tsuga heterophylla), and Western Redcedar (Thuja plicata). This fuel type potentially poses a moderate wildfire threat. It takes a large amount of energy to create a crown fire in this fuel type. In order for a crown fire to generate it would likely require extreme fire weather conditions brought on by higher degrees Celsius than relative humidity (Rh) described as “crossover” in fire weather. Table 6 outlines the general stand characteristics of a C5 stand.

Table 6. Stand characteristics for fuel type C5

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Risk Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface fuel continuity (% cover)</td>
<td>Low</td>
<td>20-40 % cover</td>
</tr>
<tr>
<td>Vegetation fuel composition</td>
<td>Low</td>
<td>Herbs and deciduous shrubs</td>
</tr>
<tr>
<td>Fine woody debris continuity (&lt;=7cm) (% cover)</td>
<td>Med</td>
<td>10-25% coverage</td>
</tr>
<tr>
<td>Large woody debris Continuity (&gt;=7cm) (% cover)</td>
<td>Low</td>
<td>&lt;10% coverage</td>
</tr>
<tr>
<td>Live conifer canopy closure (%)</td>
<td>Med</td>
<td>41-60% crown closure</td>
</tr>
<tr>
<td>Live deciduous canopy closure (%)</td>
<td>High</td>
<td>&lt;20% crown closure</td>
</tr>
<tr>
<td>Live and dead conifer crown height (m)</td>
<td>Low</td>
<td>3-5m</td>
</tr>
<tr>
<td>Live and dead suppressed and understory conifer (stems/ha)</td>
<td>Low</td>
<td>&lt;500 stems/ha</td>
</tr>
</tbody>
</table>

Fuel Type M2 – Mixed conifer and deciduous stand

There are large portions of the MacKay Creek Park forest within 500m of the subject site that have been classified as mixed. These areas consist mostly of Red alder, Western redcedar and Western hemlock. Stand density is variable ranging from 600 to more than 1,000 stems per hectare. The fire behavior potential in these stands varies depending on the percentage content of coniferous species. Most of the stands adjacent to the site have a coniferous component of approximately 50% and pose a moderate risk to the site. There are isolated groups of conifers that pose a moderate risk. The M2 stand poses a moderate wildfire risk to the subject site, but if a surface fire did start it would be unlikely to become a crown fire. Table 7 outlines general stand characteristics.
Table 7. Stand characteristics for fuel type M2

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Risk Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface fuel continuity (% cover)</td>
<td>Low</td>
<td>20-40 % cover</td>
</tr>
<tr>
<td>Vegetation fuel composition</td>
<td>Low</td>
<td>Herbs and deciduous shrubs</td>
</tr>
<tr>
<td>Fine woody debris continuity (&lt;=7cm) (% cover)</td>
<td>Low</td>
<td>Scattered, &lt;10% coverage</td>
</tr>
<tr>
<td>Large woody debris Continuity (&gt;=7cm) (% cover)</td>
<td>Low-Med</td>
<td>10-25% coverage</td>
</tr>
<tr>
<td>Live conifer canopy closure (%)</td>
<td>Low-Med</td>
<td>20-40% crown closure</td>
</tr>
<tr>
<td>Live deciduous closure (%)</td>
<td>Med</td>
<td>20-40% crown closure</td>
</tr>
<tr>
<td>Live and dead conifer crown height (m)</td>
<td>Med</td>
<td>2-&lt;3 m</td>
</tr>
<tr>
<td>Live and dead suppressed and understory conifer</td>
<td>Very Low</td>
<td>0-500 stems/ha</td>
</tr>
<tr>
<td>(stems/ha)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fuel Type D1 – Deciduous dominated stand

There are several deciduous stands within 500m of the subject site. These are typically young stands that have resulted from land clearing. D1 fuel types typically have less than 20% coniferous component and are dominated by even aged native deciduous trees such as Red Alder (Alnus rubra), Bigleaf Maple (Acer macrophyllum), and/or Black Cottonwood (Populus balsamifera ssp. Balsamifera). D1 fuel types have a low flammability and would not support a fast spreading, high intensity wildfire. D1 stands pose a low wildfire risk and are expected to act as fuel breaks decreasing the overall wildfire threat to the site. Table 8 outlines general characteristics of D1.

Table 8. D1 general stand characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Risk Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface fuel continuity (% cover):</td>
<td>Low</td>
<td>20-40 % cover</td>
</tr>
<tr>
<td>Vegetation fuel composition</td>
<td>Low</td>
<td>Herbs and deciduous shrubs</td>
</tr>
<tr>
<td>Fine woody debris continuity (&lt;=7cm) (% cover)</td>
<td>Low</td>
<td>Scattered, &lt;10% coverage</td>
</tr>
<tr>
<td>Large woody debris Continuity (&gt;=7cm) (% cover)</td>
<td>Low-Med</td>
<td>10-25% coverage</td>
</tr>
<tr>
<td>Live conifer canopy closure (%)</td>
<td>Very low</td>
<td>&lt; 20% crown closure</td>
</tr>
<tr>
<td>Live deciduous canopy closure (%)</td>
<td>Very low</td>
<td>&gt;80% crown closure</td>
</tr>
<tr>
<td>Live and dead conifer crown height (m)</td>
<td>Very low</td>
<td>5m+ or &lt;20% conifer crown closure</td>
</tr>
<tr>
<td>Live and dead suppressed and understory conifer</td>
<td>Very Low</td>
<td>0-500 stems/ha</td>
</tr>
<tr>
<td>(stems/ha)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 3  Generic Description of Coastal Fuel Types

The current Canadian Forest Fire Behavior Prediction (FBP) System does not include coastal forests in their fuel type descriptions. These fuel types reflect stand conditions that were modeled to predict fire behavior potential. On the coast the fuel type that most closely represents forest stand structure and conditions has been used. The following fuel types are the most common interpretations used on the coast.

C5 – Uniform Second Growth Conifer Stand – Moderate Risk

This fuel type is characterized by mature second growth stands dominated by Western Red Cedar (Thuja plicata) and Western Hemlock (Tsuga heterophylla). There can be small component of dominant Douglas-fir (Pseudotsuga menziesii) in the overstory. This fuel type is moderately dense (500-1000 stems per ha) and has a high crown base height of 10 to 15m. The understory is of moderate density, usually consisting of Western Redcedar and Western Hemlock regeneration. The ground fuel component consists of moderately dense fine fuel layer (>7cm) and a low percent cover of large woody debris (>7cm). It takes a large amount of energy to create a crown fire.

C5 Fuel Type

C3 – Multistoried Second Growth Conifer Stand – High Risk

This fuel type is characterized by a uniform mature second growth conifer dominated stand. This stand consists of mature Western Red Cedar (Thuja plicata) and Western Hemlock (Tsuga heterophylla). There is also a minor component of dominant Douglas-fir (Pseudotsuga menziesii) in the stand. Compared to a C5 stand, a C3 stand is more densely stocked (1000-2000 stems per ha) and there is a lower crown base height (usually 4-8 m). The understory is more densely stocked with Western Redcedar and Western Hemlock. The ground fuel component consists of moderately dense fine fuel layer (>7cm) and a low percent cover of large woody debris (>7cm). A crown fire in a C3 stand takes less energy to create than a C5 stand.
C3 Fuel Type

M2 - Mature Stands Consisting of a mix of Conifer and Deciduous Trees – Low to Moderate Risk

This fuel type consists of a mixed conifer and deciduous tree type. This stand is not uniform in structure and is composed of a wide variety of species. These may include and not limited to: Western Red Cedar (Thuja plicata), Western Hemlock (Tsuga heterophylla), Douglas-fir (Pseudotsuga menziesii), Red Alder (Alnus rubra), Bigleaf Maple (Acer macrophyllum), and Paper Birch (Betula papyrifera). These stands usually consist of less than a 70% of conifer trees, reducing the wildfire risk. There is usually a low crown height (5m) and a high percentage of ladder fuels. There is a high percent cover of suppressed trees, but they are usually composed of deciduous species.

M2 Fuel Type

D1 - Deciduous Dominated Stands – Low Risk

This fuel type is dominated by deciduous trees consisting mostly of Red Alder (Alnus rubra), Bigleaf Maple (Acer macrophyllum), and Paper Birch (Betula papyrifera). D1 stand structure is not uniform with a wide variety of tree ages. There is a well-developed shrub layer, but is mostly composed of low-flammable species. Crown fires are not expected because of the deciduous fuel type. D1 stands on the coast can be used as fuel buffers as they present a low wildfire risk.
C4 - Uniform Densely Stocked Conifer Stand

This fuel type is rare within the lower mainland as it is mostly defined by densely stocked Lodgepole pine (Pinus contorta). This fuel type can be found more towards Squamish and Pemberton. Some small densely stocked Western Red Cedar (Thuja plicata), Western Hemlock (Tsuga heterophylla), and Sitka Spruce (Picea sitchensis) can be found in the Lower Mainland, but these stands are often isolated and small. Stands are densely stocked, (approximately 10,000-30,000 stems/ha) with a large quantity of fine and large woody debris. These stands are characterized as having vertical and horizontal fuel continuity. The shrub community in this stand is of very low density.
Appendix 4  Resources and Links


### Appendix 5  Description of Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-dominant Trees</td>
<td>Defines trees with crowns forming the general level of the main canopy in even-aged groups of trees, receiving full light from above and partial light from the sides.</td>
</tr>
<tr>
<td>Coarse fuels (coarse woody debris)</td>
<td>Combustible material over 7cm in diameter</td>
</tr>
<tr>
<td>Crown base height</td>
<td>The height, above ground, where the live crown of coniferous trees begins. Measured in meters (m).</td>
</tr>
<tr>
<td>Crown Closure</td>
<td>An assessment of the degree to which the crowns of trees are nearing general contact with one another. The percentage of the ground surface that would be considered by a downward vertical projection of foliage in the crowns of trees.</td>
</tr>
<tr>
<td>Diameter at Breast Height</td>
<td>The diameter of a tree measured at 1.3m above the point of germination.</td>
</tr>
<tr>
<td>Dominant Trees</td>
<td>Defines trees with crowns extending above the general level of the main canopy of even-aged groups of trees, receiving full light from above and comparatively little from the sides.</td>
</tr>
<tr>
<td>Fire-resistant materials</td>
<td>These meet the acceptance criteria of CAN/ULC-S101, (Fire Endurance Tests of Building Construction and Materials)</td>
</tr>
<tr>
<td>Fuel Break</td>
<td>An area of non-combustible materials that inhibits the continuous burning of fuels.</td>
</tr>
<tr>
<td>Fuel Load</td>
<td>The mass of combustible materials expressed as a weight of fuel per unit area.</td>
</tr>
<tr>
<td>Fuel Moisture</td>
<td>Percent water content of vegetation. This is an important factor in rate of spread.</td>
</tr>
<tr>
<td>Fuel Types</td>
<td>Classification of forested stands as described by Canadian Forest Fire Behavior Prediction (FBP) System. There are currently no fuel type classifications specific to coastal fuels.</td>
</tr>
<tr>
<td>Fine fuels (fine woody debris)</td>
<td>Combustible woody debris under 7cm in diameter.</td>
</tr>
<tr>
<td>Fire Behaviour</td>
<td>The manner in which a fire reacts to the influences of fuel, weather, and topography.</td>
</tr>
<tr>
<td>Intermediate Trees</td>
<td>Defines trees with crowns extending into the lower portion of the main canopy of even-aged groups of trees, but shorter in height than the co-dominants. These receive little direct light from above and none from the sides, and usually have small crowns that are crowded on the sides.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Ladder Fuels</td>
<td>Live or dead vegetation that allows a fire to burn into the canopy (crown) of a forested stand.</td>
</tr>
<tr>
<td>Lift Pruned</td>
<td>The removal of ladder fuels to increase the crown base height.</td>
</tr>
<tr>
<td>Litter Layer</td>
<td>Surface buildup of leaves and woody material.</td>
</tr>
<tr>
<td>Live Crown Ratio</td>
<td>Is the percentage of the total stem length covered with living branches. It provides a rough but convenient index of the ability of a tree’s crown to nourish the remaining part of the tree. Trees with less than 30 percent live crown ratio are typically weak, lack vigor, and have low diameter growth, although this depends very much on the tree’s age and species.</td>
</tr>
<tr>
<td>Non-combustible materials</td>
<td>Means that a material meets the acceptance criteria of CAN/ULC S114, (Standard Method of test for determination of non-combustibility in Building Materials)</td>
</tr>
<tr>
<td>Open Grown</td>
<td>Defines trees with crowns receiving full light from all sides due to the openness of the canopy.</td>
</tr>
<tr>
<td>Rated roofing materials</td>
<td>Class A, B or C is a measure of the external spread of flame on a roof surface. Tests are conducted using CAN/ULC S107M methods of fire tests of roof coverings, or equivalent. The best rating achieved is Class A, which may be described as effective against severe fire exposure.</td>
</tr>
<tr>
<td>Spotting</td>
<td>Fire producing sparks or embers that are carried by the wind and start new fires.</td>
</tr>
<tr>
<td>Stems Per Hectare</td>
<td>The number or size of a population (trees) in relation to some unit of space (one hectare). It is measured as the amount of tree biomass per unit area of land.</td>
</tr>
<tr>
<td>Suppressed Trees</td>
<td>Defines trees with entirely below the general level of the canopy of even-aged groups of trees, receiving no direct light either from above or from the sides.</td>
</tr>
<tr>
<td>Wildfire</td>
<td>An unplanned, unwanted wildland fire, including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, lightning strikes, downed power lines, and all other wildland fires where the objective is to put the fire out.</td>
</tr>
</tbody>
</table>
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8. Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.

9. Loss or alteration of any part of this report invalidates the entire report.
1.0 INTRODUCTION

In accordance with your formal Authorization to Proceed provided on February 2nd 2018, we have carried out a geotechnical investigation at the above noted site. The purpose of the investigation is to characterize the site from a geotechnical viewpoint; and to provide pertinent geotechnical recommendations for site development and construction of the proposed new residential development.

2.0 SITE DESCRIPTION and PROPOSED DEVELOPMENT

The site is composed of a residential property in North Vancouver. The site is rectangular in shape with an area of 1,419 m². It is bound by residential properties on the north and east sides, a driveway on the south, and Prospect Road on the west. The site contains one residential home, small retaining structures, small shrubs, trees and grasses. The site decreases in elevation from 293 metres (assumed Geodetic Datum) on the northeast corner area to 285 metres on the south-western property line, though the site is essentially flat, with a sloping portion at the north-east corner area.

The available geologic and surficial geology maps published by the Geologic Survey of Canada indicate that the expected subsurface soil materials in this area generally consist of a Till. Till is a heterogeneous glacial deposit consisting of clay, silt, and stones ranging from pebble to boulder size. Some Tills are very dense and concrete-like, whereas others are sandy and loose. Till commonly has a high bearing capacity and thus, is an excellent foundation material.

It is our understanding that the site is to be subdivided into two residential properties.
3.1 SUBSURFACE CONDITIONS

3.1 Soil Conditions

A subsurface investigation was completed on April 12th, 2018, which consisted of excavating three testpits (TP-01 to TP-03) to depths of 1.68 m. The testpits were completed using a Kubota 75 rubber tracked excavator contracted from King Kubota Excavation Services out of North Vancouver.

Two testpits (TP-01 and TP-03) were completed to a depth of 0.76 m and TP-02 was completed to a depth of 1.68 metres. TP-01 consisted of a topsoil material from 0 m to 0.3 m, from 0.3 m to 0.6 m a light brown to rust brown silty sand was found. This silty sand was lightly ‘cemented’ and some cobbles and boulders were found at 0.6 m. From 0.6 m to 0.76 m consisted of a light grey, very dense ‘Till like’ material. The testpit was terminated due to very dense material and a large boulder at the base of the testpit. The soil profile found at TP-02 consisted of a sod from 0 m to 0.075 m. From 0.075 m to 0.91 m consisted of a light to dark brown silty sand material with intermixed organics and roots. Some cobbles and boulders were found at a depth of 0.91 m. From 0.91 m to the end of the testpit 1.68, consists of a very dense, light grey ‘Till like’ material. At TP-03 sod was found from 0 m to 0.075 m. From 0.075 m to 0.046 m consisted of a very dense, light brown, ‘cemented’ silty sand to sandy silt. This testpit was terminated as it was very difficult to dig.

Detailed soil logs and testpit location plan is attached following the text of this report.

3.2 Groundwater Conditions

During the site investigation, perched groundwater was encountered in TP-01. The groundwater discharge entered the testpit at a moderate flow. The groundwater was perched on top of till material at a depth of 0.61 metres. A more conventional ‘groundwater table’ was not found in any of the testpit locations.

4.0 RECOMMENDATIONS

4.1 General

From a geotechnical viewpoint, the subgrade material typically encountered within the area of the subject site is considered to be well suited to support the proposed development, provided that the following recommendations are incorporated into the design and construction. The following recommendations provided are based on the design drawings and our previous experience on other similar developments.

4.2 Site Preparation

The building footprint, any retaining walls and any other settlement sensitive structures should be suitably stripped and cleared of existing fill soils, topsoil and organic material, disturbed, softened, loosened, abandoned
services or footings and any other otherwise deleterious materials, as required, in order to expose the natural undisturbed inorganic subgrade soil.

Within the context of this report, Engineered Fill is defined as load bearing fill placed under settlement sensitive structures, such as building foundations and floor slabs-on-grades or road structures and retaining walls. The Engineered Fill should extend beyond the edges of the footings, a distance at least equal to the thickness of the fill placed.

Engineered Fill should consist of clean, well graded, coarse grained materials with all particles passing the 75mm sieve size designation. Within the context of this report, “clean” is defined as materials having “fines” content less than 10% of all materials that pass the maximum sand size sieve test designation. This definition of Engineered Fill is comparatively broad and is intended to allow for many different sourced materials to be used. Appropriate compaction levels will depend on the intended use.

4.3 Foundation Design

It is expected that the subgrade exposed at the footing elevations will be a very dense, silty sand glacial till. These subgrades may be designed for a design bearing pressure of 300 kPa under serviceability limit state (SLS) and 600 kPa under ultimate limit state (ULS) design methodologies.

Conventional shallow strip and rectangular (pad) footings should have minimum dimensions as specified in Section 9.15 Division B Part 9 of the B.C. Building code. Foundations should step at no more than 1.0 vertical to 2.0 horizontal. Foundation subgrades should be protected from freezing. All footings should be covered with a minimum of 450 mm of soil for frost protection. In addition, groundwater and rainwater runoff should be directed to temporary sumps, and footing subgrades should be kept free of standing water. Footing concrete should not be poured on frozen ground.

The total settlement of footings, under serviceability loading conditions, designed in accordance with the above recommendation should be less than 25mm. Differential settlement would be expected to be less than 19mm over a span of 9m (3/4 of an inch over a span of 30 feet) or 0.002 radians angular distortion. This corresponds to a deflection ratio of 1 in 500.

The Geotechnical Engineer of Record should be provided with an opportunity to review the exposed, natural undisturbed subgrade prior to pouring concrete for the foundations.

This site is classified as Site Class C for seismic design purposes. The 2015 Edition of the National Building Code (NBC) Seismic Hazard Calculation values have been provided in the table below. From the calculations for the site coordinates, a 2% probability of exceedance in 50 years, the Peak Ground Acceleration and the Spectral Acceleration Response Values have been provided in the table below.

<table>
<thead>
<tr>
<th>Sa(0.05)</th>
<th>Sa(0.1)</th>
<th>Sa(0.2)</th>
<th>Sa(0.3)</th>
<th>Sa(0.5)</th>
<th>Sa(1.0)</th>
<th>Sa(2.0)</th>
<th>Sa(5.0)</th>
<th>PGA(g)</th>
<th>PGV(m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.408</td>
<td>0.622</td>
<td>0.770</td>
<td>0.768</td>
<td>0.678</td>
<td>0.387</td>
<td>0.238</td>
<td>0.077</td>
<td>0.335</td>
<td>0.503</td>
</tr>
</tbody>
</table>
4.4 Slab-on-Grade

All slabs-on-grade should be founded on a minimum of 150 mm of clean, free draining, 19 mm clear crush gravel. It should be compacted to at least 93% of the Modified Proctor Maximum Dry Density (ASTM D-1557). Interior slabs should be underlain with a minimum 6-mil polyethylene vapour barrier.

4.5 Basement Foundation Walls & Retaining Walls

Foundation and retaining walls supporting backfill material on only one side should be designed to support the backfill. To resist lateral earth pressures, it is recommended that these walls be designed to support a uniform pressure distribution of $6 \times H$ kPa (where “$H$” is the backfill height in metres) to account for static, seismic and compaction pressures. This earth pressure assumes the wall is fully drained.

One-third of the vertical component of any surcharge stresses, within a distance equal to the height of the below grade portion of the wall, should be added to the design lateral earth pressure.

4.6 Patio, Sidewalk & Driveway Slabs

Concrete patio, sidewalk and driveway slabs should be supported on clean, well compacted, granular fill, or crushed rock at least 150 mm thick. The granular fill should be placed on a subgrade approved by the geotechnical engineer. Patio, sidewalk or driveway slabs supported on random composition backfill and/or on poorly compacted backfill will likely experience settlement and cracking in the long term.

4.7 Site and Foundation Drainage Systems

The District of North Vancouver is finding that the local streams experience peak flows soon after storm events and low flows in the periods of low precipitation. This is partly a result of the stormwater drainage systems conveying rainfall events to the streams much faster than the natural process of entering the ground and flowing through the subsurface. We suggest placing any materials that are found to contain a high proportion of silt at the ground surface, about 300mm thick, above the perimeter drain detail recommended below. The silty capping material could be placed for a distance of at least 1.5 metres wide and graded such that any surficial water would flow away from the residence into yard or landscape areas.

For this project, below the above mentioned capping soil, we suggest placing a “conventional” site and perimeter drainage system consisting of suitably filtered 100 mm diameter perforated PVC pipes. The “suitably filtered” terminology is intended to represent a medium strength filter fabric geotextile that surrounds coarse drainrock that is too large to enter the pipe perforations. The professionals responsible for the design and performance of the system should carry out field reviews in this regard.
5.0 CLOSURE

We should be provided with the opportunity to review all subgrades, deep foundation components, and the fill placement and compaction procedures. Any compaction test results carried out for the backfill should be provided to Terran Group for review in a timely manner.

This report has been prepared for the sole use of the owners and other design consultants for this project, as described. Any use or reproduction of this report for other than the stated intended purpose is prohibited without our written permission.

We are pleased to be of assistance to you on this project and we trust that our comments and recommendations are both helpful and sufficient for your current purposes. If you would like further details or require clarification of the above, please do not hesitate to call.

For
Terran Engineering Group Ltd.

Leah MacGillivray, EIT
Project Engineer

J. Troy Issigonis, M.Eng, P.Eng
Principal

Attachments
Testpit Location Plan – 1 page
Soil Logs – 3 pages
Testpit Location Plan

4320 Prospect Rd
North Vancouver

6146 - TEG

Scale: N/A
Date: April 17, 2018

Drawn: LM
Checked: TI

Design: Issued

Reference Drawing:
District of North Vancouver - GIS Website
GEOweb Property Viewer
http://www.geoweb.dnv.org/properties/P?topid=011-364-271&dlink=1-4730-A&address=4320%2BPROSPECT%2BROAD

Approximate Location of Testpits
<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Sample</th>
<th>Classification</th>
<th>Lithology</th>
<th>Notes</th>
<th>Moisture Content (%)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td></td>
<td></td>
<td>Topsoil, heavily organic, rooty material, black, loose, wet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td></td>
<td></td>
<td>Silty SAND, light brown to rust brown, cobbles, dense</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td></td>
<td></td>
<td>Silty SAND to sandy SILT, light grey to light brown with rust seams,</td>
<td>End of test pit, difficult to dig due to large boulder</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>dense to very dense</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Perched groundwater, moderate flow
Appeared 'lightly cemented'
<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>Topsoil, heavily organic, rooty material, black, loose, wet</td>
</tr>
<tr>
<td></td>
<td>Silty SAND, intermixed organics, light to dark brown, rooty material, dry, loose</td>
</tr>
<tr>
<td>0.5</td>
<td>Silty SAND, some rooty material, dark brown to black, some cobbles, some boulders, dense</td>
</tr>
<tr>
<td>1.0</td>
<td>Silty SAND to sandy SILT, rust brown, very dense, dry</td>
</tr>
<tr>
<td>1.5</td>
<td>Silty SAND to sandy SILT, some cobbles, light grey, dense to very dense</td>
</tr>
<tr>
<td>2.0</td>
<td>End of testpit, difficult to dig</td>
</tr>
</tbody>
</table>
Topsoil, heavily organic, rooty material, black, loose, wet

Silty SAND, some cobbles, light brown to rust brown, dense, dry

Silty SAND, some gravel, some cobbles, light brown to light grey, very dense, dry

End of test pit, difficult to dig due to large boulder

"Appeared 'lightly cemented'"