



**DEVELOPMENT PERMIT NO. DP001239**

**CASA REALTY INVESTMENTS INC.**  
Name of Owner(s) of Land (Permittee)

**5661 CHRISTINA CRES.**  
Civic Address

1. This development permit is issued subject to compliance with all of the bylaws of the municipality applicable thereto, except as specifically varied or supplemented by this permit.
2. This development permit applies to and only to those lands within the municipality described below, and any and all building structures and other developments thereon:

Legal Description:

**LOT 1, DISTRICT LOT 24G (FORMERLY DISTRICT LOT 24), WELLINGTON DISTRICT, PLAN VIP60991**

**PID No. 023-104-511**

3. The land described herein shall be developed strictly in accordance with the following terms and conditions and provisions of this permit and any plans and specifications hereto which shall form a part thereof.

**Schedule A Location Plan**  
**Schedule B Survey of Proposed Subdivision**  
**Schedule C Landscape Plan and Tree Management Plan**  
**Schedule D Berm and Noise Fence Concept Plan**  
**Schedule E Landscape Maintenance Plan**

4. If the applicant does not substantially commence the development permitted by this permit within two years of the date of this permit, the permit shall lapse.
5. This permit is not a building permit nor does it constitute approval of any signage. Separate applications must be made for a building permit and sign permit.

**CONDITIONS OF PERMIT**

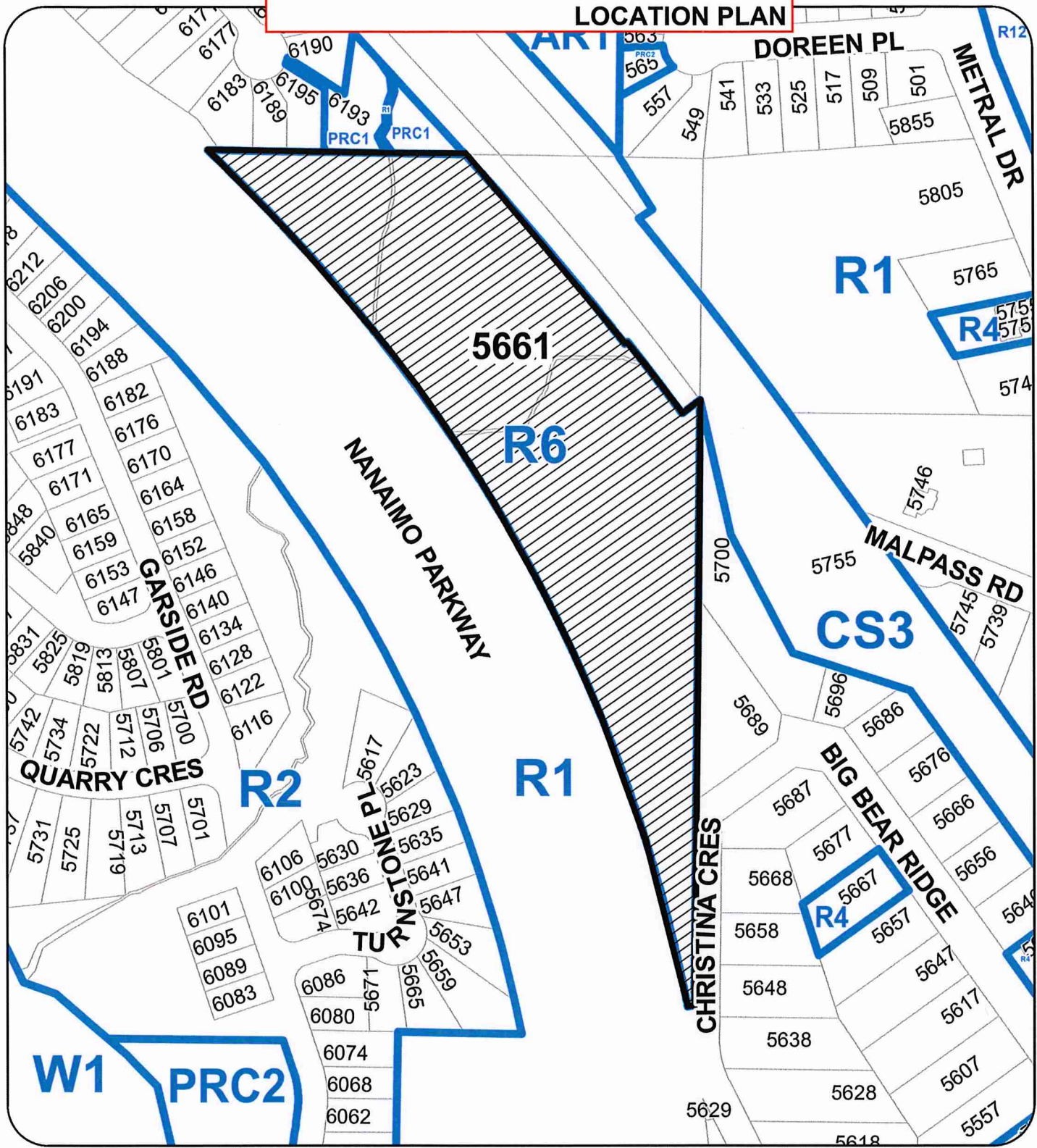
1. The subject property is developed in substantial compliance with the Survey of Proposed Subdivision prepared by Terra Pacific Land Surveying Ltd., received 2021-JUN-28 as shown on Schedule B.
2. The subject property is developed in substantial compliance with the Landscape Plan and Tree Management Plan prepared by Kinship Design Art Ecology., dated 2021-JUN-18 as shown on Schedule C.
3. The subject property is developed in substantial compliance with the Berm and Noise Fence Concept Plan prepared by Cascara Consulting Engineers Limited, dated 2021-JUN-18 as shown on Schedule D.
4. The subject property is developed and maintained in substantial compliance with the Landscape Maintenance Plan prepared by Kinship Design Art Ecology, dated 2022-JAN-21 as shown on Schedule E.
5. The subject property is developed in compliance with the Environmental Assessment Report (and Environmental Protection Plan in Section 8.0 of the report), prepared by Aquaparian Environmental Consulting Ltd., dated 2021-JUN-18. An environmental monitor is required to ensure that environmental protection measures are being followed during site disturbance and construction.
6. Security is to be submitted prior to development permit issuance and held for three years from the date of completion, to ensure the property is developed and maintained in accordance with the Landscape Plan, Landscape Maintenance Plan, and Environmental Assessment Report (with Environmental Protection Plan).
7. Prior to issuance of a building permit, a statutory Right-of-Way for a public walkway from Christina Crescent to Dennie Park shall replace CA3733458 on the property title and the location of the walkway shall be identified in a survey plan.
8. A Provincial Water Sustainability Act Section 11 notification or approval will be required prior to installing a culvert crossing within the stream for the access road.

REVIEWED AND APPROVED ON

2022 - MAR - 11  
Date

D. Lindsay  
D. Lindsay, General Manager of Development Services  
**Development Services**  
Pursuant to Section 154 (1)(b) of the Community Charter

**LOCATION PLAN**

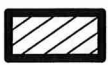


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**REZONING APPLICATION NO. DP001239**

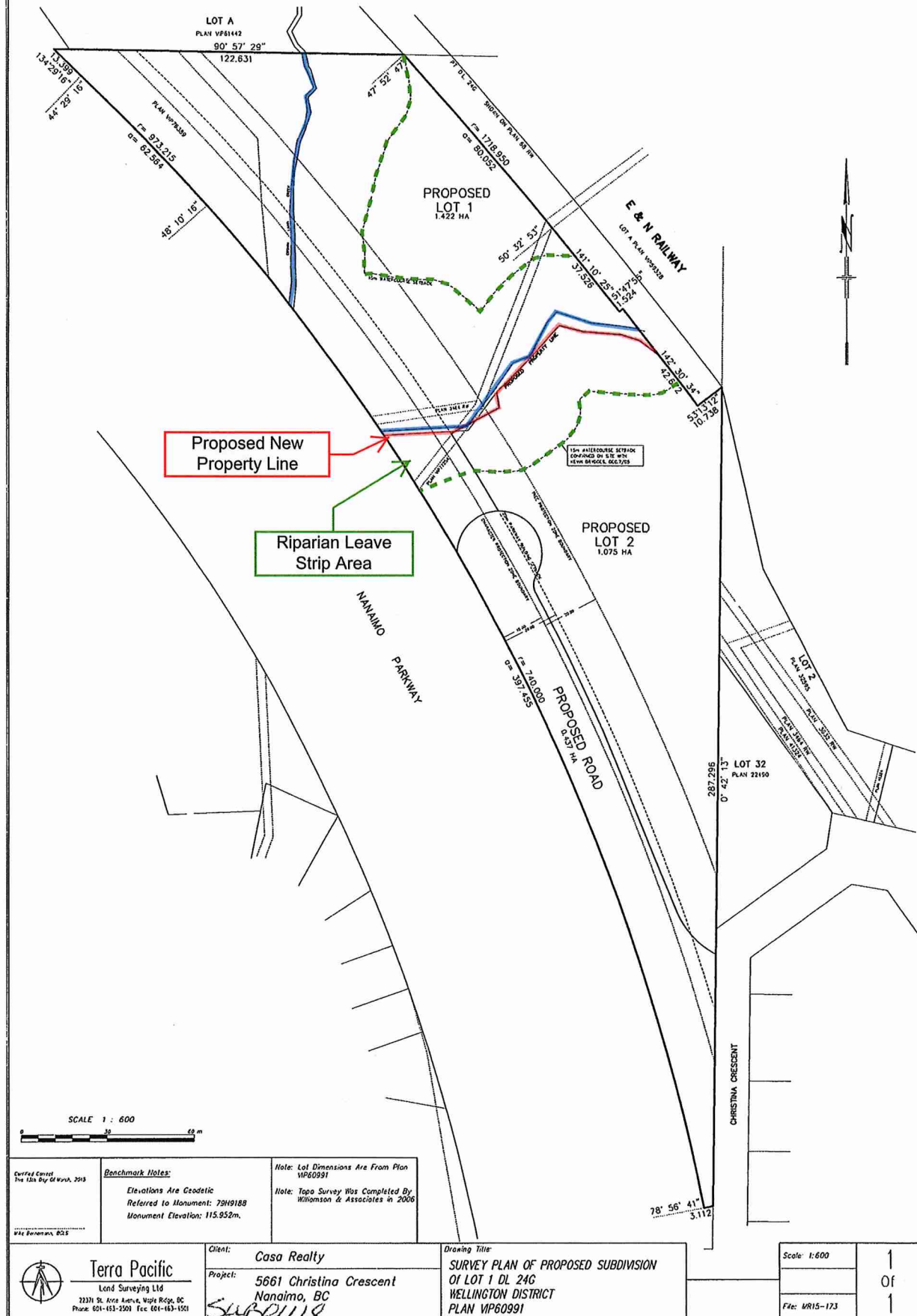
**LOCATION PLAN**



SUBJECT PROPERTY

Civic: 5661 CHRISTINA CRESCENT  
Legal: LT 1, DL 24G, PL VIP60991, LD 58

**SURVEY OF PROPOSED SUBDIVISION**



**Certified Correct**  
For Use By Of Work, 2018

**Benchmark Notes:**  
Elevations Are Geodetic  
Referred to Monument: 79H9188  
Monument Elevation: 115.952m.

Note: Lot Dimensions Are From Plan VP60991  
Note: Topo Survey Was Completed By Williamson & Associates in 2006

**Terra Pacific**  
Land Surveying Ltd  
22371 St. Arca Avenue, Maple Ridge, BC  
Phone: 604-453-2500 Fax: 604-463-1551

Client: Casa Realty  
Project: 5661 Christina Crescent  
Nanaimo, BC  
SUB0118

Drawing Title:  
SURVEY PLAN OF PROPOSED SUBDIVISION  
OF LOT 1 DL 246  
WELLINGTON DISTRICT  
PLAN VP60991

Scale: 1:600  
1 Of 1  
File: WRI5-173

# LANDSCAPE PLAN AND TREE MANAGEMENT PLAN

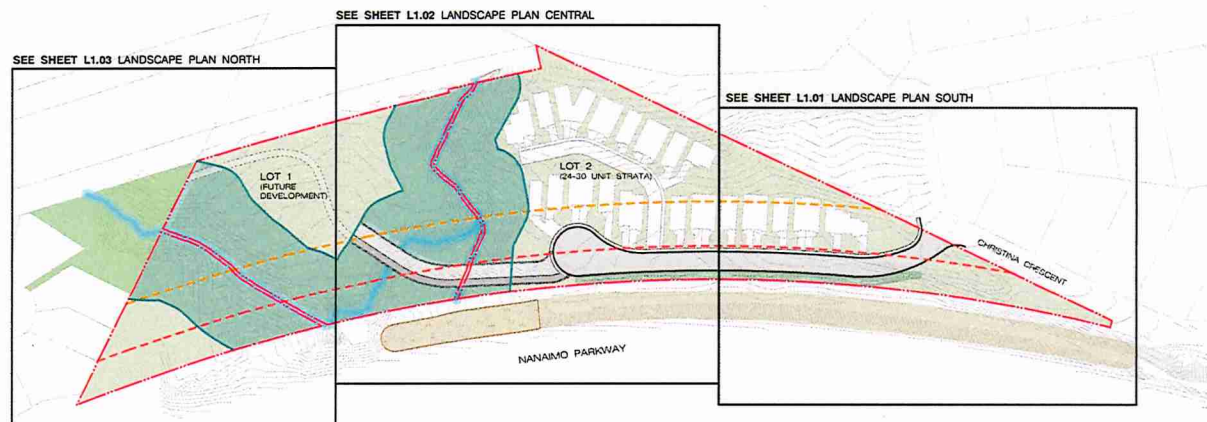
## MULTI-FAMILY DEVELOPMENT 2 LOT SUBDIVISION

5661 Christina Crescent  
Nanaimo, BC

LANDSCAPE ARCHITECTURAL DRAWINGS  
Issued for Development Permit

### LANDSCAPE SHEETS

- L0.00 Cover
- L1.01 Landscape Plan South  
(Tree Legend, Landscape Legend)
- L1.02 Landscape Plan Central
- L1.03 Landscape Plan North  
(Planting List & Planting Notes)
- L2.01 Tree Management Plan  
(Tree Inventory, Tree Replacements, Tree Protection Fencing)



KEY PLAN  
SCALE NTS



**kinship**  
design • art • ecology

1070 Nelson Street, Nanaimo BC, V9S 2K2  
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ksp@kinshipdesign.ca  
chris.midy@kinshipdesign.ca

### CLIENT

**Casa Realty Investments**  
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779-846-3301

### PROJECT

**Multi-Family Development  
2 Lot Subdivision**

5661 Christina Crescent  
Nanaimo, BC

### COVER

NO.	DATE	ISSUE/REVISION
1	6/10/2021	Development Permit

### SEAL

NO. 21000 IS SPECIFIED BY THE LOCAL BYLAWS OF THE MUNICIPAL DISTRICT OF NANAIMO. IT IS THE RESPONSIBILITY OF THE APPLICANT TO OBTAIN A SEAL AS REQUIRED BY THE APPLICABLE LOCAL BYLAWS.

PROJECT	21000	CB	KS
DB	CM		
SCALE	AS NOTED		
DATE	6/10/2021		

RECEIVED  
DP1239  
2021-JUN-18  
Current Planning

**L0.00**



**kinship**  
design-art.ecology

1070 Nelson Street, Nanaimo BC, V9S 2K2  
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christa.mcgley@kinshipdesign.ca

**CLIENT**

**Casa Realty Investments**  
587 Willard Street, Coquitlam BC, V3J 6N7  
778-846-8331

**PROJECT**

**Multi-Family Development  
2 Lot Subdivision**  
5661 Christina Crescent  
Nanaimo, BC

**LANDSCAPE PLAN  
SOUTH**

NO.	DATE	ISSUE/REVISION
1	6/01/2021	Development Permit

**SEAL**

<b>PROJECT</b>	21002	<b>CB</b>	<b>KS</b>
<b>DB</b>	CM		
<b>SCALE</b>	1:250		
<b>DATE</b>	6/01/2021		

**L1.01**

Refer to Sheet L1.03 Landscape Plan North for Planting List & Notes.  
Refer to Sheet L2.01 Tree Management Plan for Tree Inventory list, Tree Replacement list, and Tree Protection Fence location.

**TREE LEGEND**

**CONIFEROUS TREES**

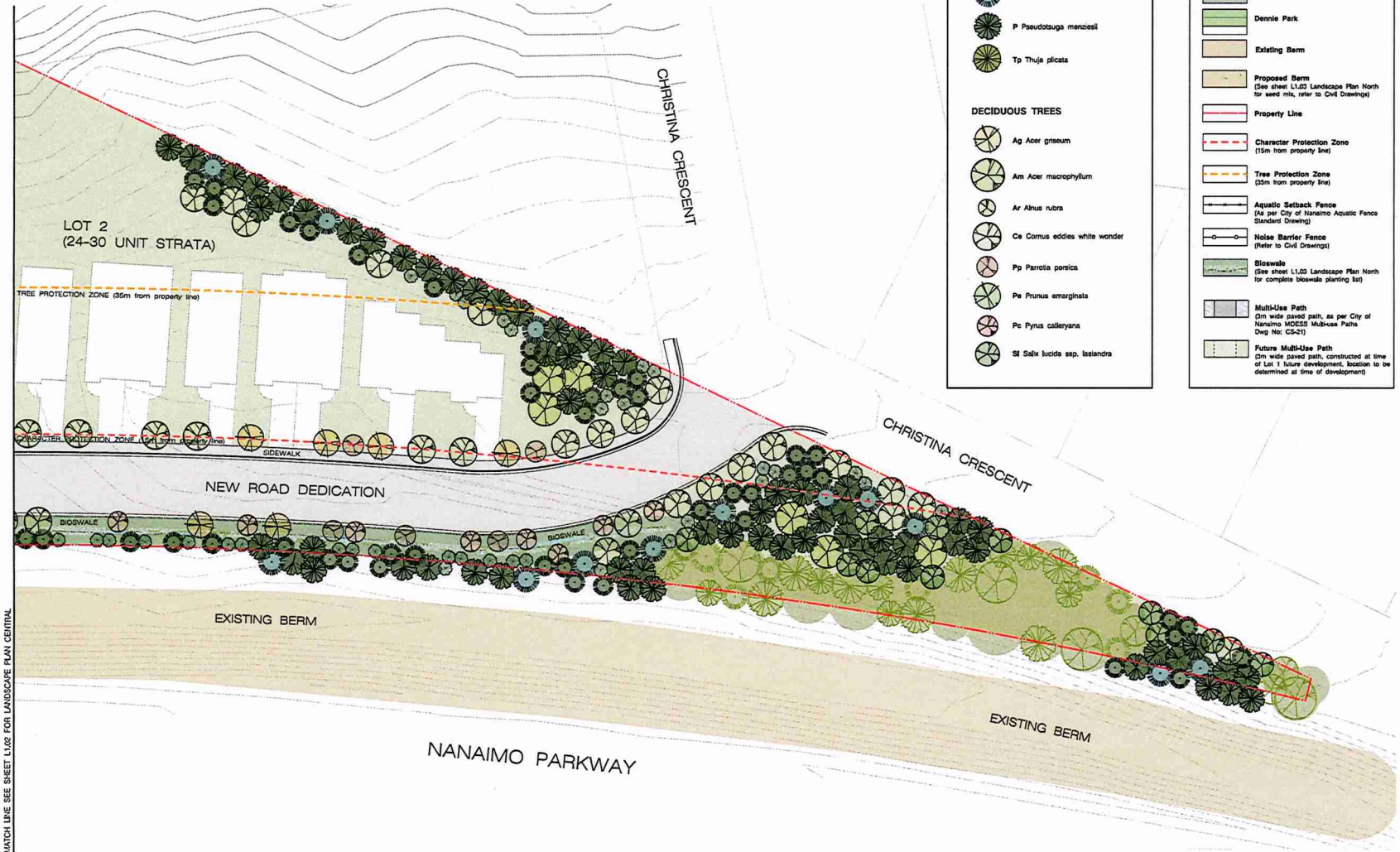
- Po Picea Omorika Bruns
- Pc Pinus contorta
- Pm Pinus monticola
- P Pseudotsuga menziesii
- Tp Thuja plicata

**DECIDUOUS TREES**

- Ag Acer griseum
- Am Acer macrophyllum
- Ar Alnus rubra
- Ce Cornus edulis white wonder
- Pp Parrotia persica
- Pe Prunus emarginata
- Pc Pycnos calleryana
- Sl Salix lucida ssp. lasandra

**LANDSCAPE LEGEND**

- Trees to be Retained (See Sheet L2.01 Tree Management Plan)
- Upper Millstone (Long Creek)
- Watercourse Setback (15m from top of bank)
- Denise Park
- Existing Berm
- Proposed Berm (See sheet L1.02 Landscape Plan North for seed mix, refer to Civil Drawings)
- Property Line
- Character Protection Zone (15m from property line)
- Tree Protection Zone (30m from property line)
- Aquatic Setback Fence (As per City of Nanaimo Aquatic Fence Standard Drawing)
- Noise Barrier Fence (Refer to Civil Drawings)
- Bioswale (See sheet L1.02 Landscape Plan North for complete bioswale planting list)
- Multi-Use Path (3m wide paved path, as per City of Nanaimo MOSES Multi-Use Paths Dwg No: CS-21)
- Future Multi-Use Path (3m wide paved path, constructed at time of Lot 1 future development, location to be determined at time of development)



MATCH LINE SEE SHEET L1.02 FOR LANDSCAPE PLAN CENTRAL

RECEIVED  
591233  
2021-JUN-18  
Current Planning





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chris.mccleary@kinshipdesign.ca

**CLIENT**

**Casa Realty Investments**  
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778-846-8391

**PROJECT**

**Multi-Family Development  
2 Lot Subdivision**

5661 Christina Crescent  
Nanaimo, BC

**LANDSCAPE PLAN  
NORTH**

NO.	DATE	ISSUE/REVISION
1	6/16/2021	Development Permit

**SEAL**

All drawings, text, specifications, etc. are the property of the landscape architect. No reproduction or disclosure in whole or in part is permitted without the landscape architect's written consent.

<b>PROJECT</b>	21002
<b>DB</b>	CM
<b>SCALE</b>	1:250
<b>DATE</b>	6/01/2021

**L1.03**



MATCH LINE SEE SHEET L1.02 FOR LANDSCAPE PLAN CENTRAL

PLANTING LIST		
<b>Deciduous Trees</b>		
Ag 18	Acer gresum	Paper Bark Maple
Am 27	Acer macrophyllum	Big Leaf Maple
Ar 28	Abies rubra	Red Alder
Ce 42	Cornus edulis white wonder	Edible White Wonder
Pp 7	Paniclea persica 'Vanessa'	Panicle Ironwood
Pe 33	Prunus emarginata	Bitter Cherry
Pe 11	Prunus californica	Californian Pear
Sl 32	Salix lucida ssp. lasandra	Pacific Willow
<b>Coniferous Trees</b>		
Pe 56	Pinus Omoika Stone	Omoika Spruce
Pcc 128	Pinus contorta var. contorta	Shore Pine
Pm 33	Pinus monticola	Western White Pine
P 241	Pseudotsuga menziesii	Douglas Fir
Tp 10	Thuja plicata	Western Redcedar
<b>Evergreen Shrubs</b>		
Cs	TBD Gaultheria shallon	Salat
Mn	TBD Mahonia nervosa	Dull Oregon Grape
Ve	TBD Vaccinium ovalum	Evergreen Huckleberry
<b>Deciduous Shrubs</b>		
Cs	TBD Cornus sericea	Red Twig Dogwood
Hd	TBD Hiodicoccus discolor	Ocean Sorey
Ri	TBD Ribes sanguineum	Red Flowering Currant
Rn	TBD Rosa Nutkana	Nutkana Rose
Rp	TBD Rubus speciosus	Salmonberry
Rt	TBD Rubus parviflorus	Thimbleberry
Sa	TBD Symphoricarpos albus	Snowberry
<b>Groundcovers, Perennials, Ferns</b>		
Ac	TBD Achlys trichocarpa	Vanilla Leaf
Au	TBD Anemone pulsatilla	Kimballcuck
Fc	TBD Fragaria chiloensis	Coastal Strawberry
Fv	TBD Fragaria vesca	Woodland Strawberry
Pm	TBD Polystichum munitum	Sword Fern
Pe	TBD Phlox subulata	Brakes Fern
Tg	TBD Thalictrum grandiflorum	Fragaria
Tl	TBD Trientalis latifolia	Western Starflower
To	TBD Trollium ovatum	Western Trollium
<b>Biowalls</b>		
Cs	TBD Carex obovata	Slough Sedge
Ie	TBD Iva ensata	Japanese Iris
Je	TBD Juncus effusus	Common Rush
Gm	TBD Glycerhiza microcarpa	Small Flowered Bulrush
<b>Seeds</b>		
Bern	PK Seed Cherry Oak Upland Mix or equivalent	85% Redwood Fascia or equivalent
Geering		11% California Gaitgrass

- PLANTING NOTES**
- Prior to starting work the westcourse setback boundary to be fenced with orange construction fencing (refer to Landscape Maintenance Plan).
  - Prior to starting work tree protection fencing to be installed as indicated on the Tree Management Plan, Sheet L2.01.
  - Prior to starting work refer to the Landscape Maintenance Plan.
  - All landscape construction to be in accordance with the City of Nanaimo Engineering Standards & Specifications.
  - All landscape construction to meet the current edition of the Canadian Landscape Standards as a minimal acceptable standard.

Refer to Sheet L1.01 Landscape Plan South for Tree Legend and Landscape Legend.

Refer to Sheet L2.01 Tree Management Plan for Tree Inventory list, Tree Replacement list, and Tree Protection Fence location.

Alignment of Public Path to be Determined

NANAIMO PARKWAY

RECEIVED  
2021-JUN-16  
Current Planning



**kinship**  
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chris.midgley@kinshipdesign.ca

**CLIENT**

**Casa Realty Investments**  
587 Hillcrest Street, Coquitlam BC, V3J 6N7  
778-846-8391

**PROJECT**

**Multi-Family Development  
2 Lot Subdivision**

5661 Christina Crescent  
Nanaimo, BC

**TREE  
MANAGEMENT  
PLAN**

NO.	DATE	ISSUE/REVISION
1	6/16/2021	Development Permit

**SEAL**

I hereby certify that I am a duly licensed professional member of the Institute of Professional Foresters of British Columbia and that I am duly registered in the Province of British Columbia.

**PROJECT** 21002  
**DB** CM      **CB** KS  
**SCALE** AS NOTED  
**DATE** 6/01/2021

RECEIVED  
06/23/21  
2021-JUN-18  
Current Planning

**L2.01**



**TREE MANAGEMENT PLAN LEGEND**

- Significant Trees**  
(Refer to Environmental Assessment Report - 5661 Christina Crescent, Table 1: Significant Trees for species and size)
- Tree Retention Area**
- Tree Removal Area**
- Tree Polygons**  
(Refer to Environmental Assessment Report - 5661 Christina Crescent, Figure 3: Tree Polygon Map, and Appendix B: Tree Inventory for tree quantities, size and species in each polygon)
- Tree Protection Fencing**  
(See sheet L2.01, detail 1)
- Property Line**
- Character Protection Zone**  
(15m from property line)
- Tree Protection Zone**  
(35m from property line)

**TREE INVENTORY**

**SIGNIFICANT (LANDMARK) TREES TO BE REMOVED**

KEY CITY	BOTANICAL NAME	COMMON NAME	DBH
(1)	<i>Pinus monticola</i>	Western white pine	0.3
(1)	<i>Pseudotsuga menziesii</i>	Douglas fir	0.8
(1)	<i>Alnus rubra</i>	Red alder	0.4

**TREES TO BE REMOVED**

KEY CITY	BOTANICAL NAME	COMMON NAME	DBH
(13)	<i>Pseudotsuga menziesii</i>	Douglas fir	36.61
(18)	<i>Pseudotsuga menziesii</i>	Douglas fir	0.5
(53)	<i>Pseudotsuga menziesii</i>	Douglas fir	0.4
(72)	<i>Pseudotsuga menziesii</i>	Douglas fir	0.25
(43)	<i>Pseudotsuga menziesii</i>	Douglas fir	0.13
(2)	<i>Thuja plicata</i>	Western redcedar	0.4
(1)	<i>Acer macrophyllum</i>	Bigleaf maple	0.5
(1)	<i>Acer macrophyllum</i>	Bigleaf maple	0.4
(9)	<i>Acer macrophyllum</i>	Bigleaf maple	0.25
(6)	<i>Acer macrophyllum</i>	Bigleaf maple	0.13
(3)	<i>Prunus emarginata</i>	Bitter cherry	0.25
(3)	<i>Prunus emarginata</i>	Bitter cherry	0.13
(2)	<i>Salix lucida</i> spp. <i>Lasioandra</i>	Pacific willow	0.13
(1)	<i>Corylus</i> sp.	Hazelnut	0.25
(1)	<i>Corylus</i> sp.	Hazelnut	0.13
(2)	<i>Robinia</i> sp.	Locust	0.4
(5)	<i>Robinia</i> sp.	Locust	0.25
(1)	<i>Robinia</i> sp.	Locust	0.13
(2)	<i>Prunus</i> sp.	Ornamental cherry	0.13
(1)	<i>Malus domestica</i>	Apple	0.4

TOTAL NUMBER OF TREES TO BE REMOVED: 246  
TOTAL REPLACEMENT TREES: 668

TREES TO BE RETAINED - SEE APPENDIX 2 Environmental Assessment

**TREE REPLACEMENTS**

**REPLACEMENT TREES TO BE PLANTED ON SITE**

**DECIDUOUS TREES (30% of Replacement Trees)**

KEY CITY	BOTANICAL NAME	COMMON NAME	MIN HT. (m)
Ag (18)	<i>Acer griseum</i>	Paper bark maple	2.0
Ap (6)	<i>Acer macrophyllum</i>	Big leaf maple	2.0
Ap (23)	<i>Acer macrophyllum</i>	Big leaf maple	1.5
Ar (28)	<i>Alnus rubra</i>	Red alder	1.5
Ce (42)	<i>Cornus edulis</i> white wonder	Eddies white wonder	2.0
Pp (7)	<i>Parrotia persica</i>	Persian ironwood	1.5
Pe (33)	<i>Prunus emarginata</i>	Bitter cherry	1.5
Pc (11)	<i>Pyrus calleryana</i>	Calleryana pear	1.5
Sl (32)	<i>Salix lucida</i> spp. <i>Lasioandra</i>	Pacific willow	1.5

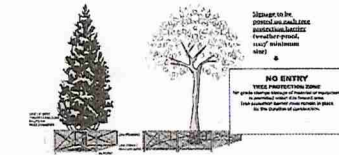
**CONIFEROUS TREES (70% of Replacement Trees)**

KEY CITY	BOTANICAL NAME	COMMON NAME	MIN HT. (m)
Tp (56)	<i>Picea Oromorpha</i> Britton	Sitka spruce	1.5
Plc (128)	<i>Pinus contorta</i> var. <i>contorta</i>	Shore Pine	1.5
Pm (33)	<i>Pinus monticola</i>	Western white pine	2.0
P (137)	<i>Pseudotsuga menziesii</i>	Douglas fir	2.0
P (104)	<i>Pseudotsuga menziesii</i>	Douglas fir	1.5
Tp (10)	<i>Thuja plicata</i>	Western redcedar	2.0

**NOTES:**

CITY OF NANAIMO BYLAW NO. 7126 (2013) REQUIRES 90% REPLACEMENT TREES FOR THE 246 TREES TO BE REMOVED. IF PNWDC CITY STAFF RECOMMENDATION THAT 100 TREES PER HECTARE IS APPROPRIATE TO DETERMINE TOTAL REPLACEMENT TREES REQUIRED, THEN AT 2.9 HECTARES, THE PROJECT REQUIRES 290 REPLACEMENT TREES. 668 REPLACEMENT TREES ARE PROPOSED.

Refer to Landscape Plan Sheet L1.01 L1.02 L1.03 for tree replacement species and locations.



01 Tree Protection Fence  
L2.01 NTS Section

**TREE PROTECTION FENCE**

Prior to construction taking place on site a tree protection fence (see detail 01, sheet L2. 1) shall be installed on site according to the layout as indicated on the Tree Management Plan, the fence is to follow the existing grade.

Prior to the installation of this fence the layout should be reviewed by the City of Nanaimo Urban Forestry Coordinator.

The Project Manager will instruct all trades on the importance of following these tree protection measures. All trades will be required to sign off on their concurrence of this plan.

The fence is to remain in place for the duration of construction.

**NOTES:**

- Height of fence to be 1.2m (4').
- 2"x4" to be used for vertical posts, top and bottom rails and cross bracing (in 60° round un-treated vertical posts may be used with a minimum diameter of 9 cm.
- Spacing between vertical posts to be no further apart than 3.7m (12') on centres.
- Structure must be sturdy with vertical posts driven firmly into ground.
- Continuous plastic mesh screening (e.g. orange snow fencing).
- Signs entitled "Tree Protection Area" to be posted on fence every 15m.
- Location of fence as shown on plan.



# LANDSCAPE MAINTENANCE PLAN

**Development Permit Application**

**5661 Christina Crescent**

**JUNE 17, 2021**

*(revised January 21, 2022)*

RECEIVED  
**DP1239**  
2022-JAN-24  
Current Planning

**Prepared For:**

**Casa Realty Investment Inc.  
587 Hillcrest Street  
Coquitlam, BC, V3J 6N7**

**Prepared By:**

**Chris Midgley, MES, MLA, Eco. Rest.  
KINSHIP DESIGN ART ECOLOGY  
T: 250-853-8093**

**CONTENTS**

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<b>1.0</b>	<b>Introduction</b>	<b>1</b>
<b>2.0</b>	<b>Landscape Management Plan</b>	<b>1</b>
<b>3.0</b>	<b>Restoration Objectives and Activities</b>	<b>3</b>
<b>4.0</b>	<b>Invasive Plant Removal</b>	<b>9</b>
<b>5.0</b>	<b>Three-Year Monitoring and Maintenance plan</b>	<b>13</b>

## 1.0 INTRODUCTION

This Landscape Maintenance Plan is provided as part of the Development Permit Application package submitted in support of the subdivision of Lot 1, District Lot 24G (Formerly District Lot 24), Wellington, Plan VIP60991 (**5661 Christina Crescent**, or “the site”) in Nanaimo BC. It provides direction on the protection, restoration, installation, and maintenance of vegetation required as part of the project, including:

- Replacement trees required pursuant to the City of Nanaimo “Management and Protection of Trees Bylaw 2013 No. 7126” (“Bylaw 7126”); and
- Restoration plantings intended to enhance local ecosystem function and reinforce the rural, wooded character of the site, in accordance with City of Nanaimo Development Permit Area requirements and other regulations.

This Plan incorporates relevant information and recommendations from the *Environmental Assessment – 5661 Christina Crescent, Nanaimo BC* completed by Aquaparian Environmental Consulting Ltd., dated June 3, 2021 (“Environmental Assessment report”), and is to be read in conjunction with the following drawings:

L1.01	Landscape Plan (South)
L1.02	Landscape Plan (Central)
L1.03	Landscape Plan (North)
L2.01	Tree Management Plan

This Landscape Maintenance Plan is focused on objectives and activities in three zones (see L1.01):

Zone 1	<b>Riparian Protection Area:</b> That portion of the site located within the City of Nanaimo DPA 1: Aquatic Development Permit Area, and defined by a Watercourse Setback Boundary;
Zone 2	<b>Nanaimo Parkway:</b> That portion of the parcel located within the City of Nanaimo DPA 4: Parkway Design Development Permit Area; and
Zone 3	<b>Restoration Areas:</b> Those portions of the parcel targeted for tree retention, restoration plantings and replacement trees outside City of Nanaimo Development Permit Areas.

## 2.0 LANDSCAPE MANAGEMENT PLAN

### 2.1 Site Overview

For a detailed site description, see the Environmental Assessment report. Existing plant communities on the parcel are representative of a second-growth, moist marine forest characteristic of the Coastal Douglas Fir biogeoclimatic zone. The site has been partially cleared. Remaining trees are predominantly Douglas fir with bigleaf maple, red alder, western redcedar and bitter cherry also present.

A detailed *Tree Inventory Table* is provided as Appendix 2 of the Environmental Assessment report and indigenous and invasive understorey species are described in detail in *Section 4.0 Site Description*. Overall, the understorey has been significantly affected by invasive species. Himalayan blackberry and

Scotch broom are prevalent, with Daphne/ spurge laurel, English holly, English ivy and several other common invasive species observed on site.

**2.2 Approach**

The approach to this Landscape Management Plan is to employ a landscape restoration strategy for the site. This includes establishing a reference ecosystem from within Coastal Douglas Fir biogeoclimatic zone to guide revegetation; identifying complimentary plant species that contribute to restoration objectives; and employing measures to address the anticipated impacts of development.

**2.3 Reference Ecosystem and Target Species**

The reference ecosystem for the site is the Douglas Fir – Salal site association of the Coastal Douglas Fir biogeoclimatic zone. This ecosystem is characterized by a diverse plant community that includes the following target species for the site:

Tree Layer	Shrub Layer	Herb Layer
Douglas-fir	Dull Oregon-grape	Sword fern
Western redcedar	Salal	Braken fern
Red alder	Oceanspray	Salmonberry
Western flowering dogwood	Baldhip rose	Vanilla leaf
Bigleaf maple	Snowberry	Trailing blackberry
Bitter cherry		

**2.4 Complimentary Plant Species**

Complimentary species include any indigenous species already noted on the site (see the Environmental Assessment report), any non-indigenous tree recommended as a replacement tree in Bylaw 7126, and indigenous species found more generally across the Coastal Douglas Fir biogeoclimatic zone that are known to be particularly resilient, are widely available, or contribute specifically to habitat value including kinnikinnick (*Arcostaphylos uva-ursi*), evergreen huckleberry (*Vaccinium ovatum*), Nootka rose (*Rosa nutkana*) and shore pine (*Pinus contorta*).

When planting, replacement trees are to be spaced at 2.0m on centre where possible. Within the Riparian Protection Area, minimum size and spacing is to be as follows:

Vegetation Type	Minimum Size	Spacing
Native trees	2-gallon or 4cm caliper	1 plant/ 3.0 m o.c.
Native willows	whips	1 plant/ 1.5 m <sup>2</sup>
Shrubs	1-gallon	1 plant/ 0.75 – 0.5 m <sup>2</sup>
Small Shrubs and Groundcovers	1-gallon	1 plant/ 0.5 m <sup>2</sup>
Perennials	4" pots	1 plant/ 0.5 m <sup>2</sup>

L1.01-L1.03 identifies plant species, locations and quantities proposed for the site.

### 3.0 RESTORATION OBJECTIVES AND ACTIVITIES

To implement this strategy, the parcel is divided into three zones each with distinct restoration objectives and activities:

Zone 1	Riparian Protection Area
Zone 2	Nanaimo Parkway (Character Protection and Tree Protection Zones)
Zone 3	Landscape Restoration Areas

Within Zone 1: Riparian Protection Area, landscape restoration objectives are:

1. **Protect the Riparian Protection Area from disturbance.**
2. **Remove Invasive Species.**
3. **Create conditions to promote natural revegetation of indigenous species.**
4. **Revegetate with target and complimentary species, including replacement trees to enhance riparian ecosystem function.**
5. **Incorporate long term protective measures into the Landscape Plan**
6. **Monitor Restoration and Maintain Landscape.**

Within Zone 2: Nanaimo Parkway, landscape restoration objectives are:

1. **Protect retained trees from disturbance.**
2. **Remove Invasive Species.**
3. **Minimize the impact of road development and promote natural revegetation of indigenous species.**
4. **Revegetate with target and complementary species including replacement trees to reinforce the rural-wooded character of the Nanaimo Parkway.**
5. **Monitor Restoration and Maintain Landscape.**

Within Zone 3: Landscape Restoration Areas, landscape objectives are:

1. **Protect healthy indigenous species from disturbance.**
2. **Remove Invasive Species.**
3. **Create conditions to promote natural revegetation of indigenous species.**
4. **Strengthen stands of retained trees and replacement trees with restoration plantings using target and complimentary species.**
5. **Monitor Restoration and Maintain Landscape.**

### 3.1 Zone 1: Riparian Protection Area

The Riparian Protection Area is defined by the Watercourse Setback Area, as shown on L1.01.

#### 3.1.1 Riparian Protection Area – Anticipated Impacts of Development

A segment of road will pass through the Riparian Protection Area and cross an existing watercourse, impacting approximately 440m<sup>2</sup> of the Riparian Protection Area (see the Environmental Assessment report). All other development is to remain outside the Riparian Protection Area. Except where directly necessary to construct road works, machinery is to avoid encroaching into the Riparian Protection Area. Any compaction arising from encroachment that may occur is to be decompacted, covered with a minimum of 5mm (2") of mulch, and replanted with indigenous species.

The natural gradient of the site causes runoff to flow southwest, toward Brennan Lake. Requirements for sedimentation and erosion control measures are described in the Environmental Assessment report.

Restoration activities designed to mitigate the impact of a new road crossing, and re-establish and protect the Douglas Fir – Salal site association are the primary activities proposed for the Riparian Protection Area. This will cause some tree removal and short-term soil disturbance to construct the road, and from the removal of invasive species. For protection over the long term, permanent measures are incorporated into the overall site design to discourage disturbance of the Riparian Protection Area.

#### 3.1.2 Riparian Protection Area – Landscape Restoration Objectives and Activities:

##### Objective 1. Protect Riparian Area from Disturbance

- Activity 1. Erect orange construction fencing along the watercourse setback boundary, or outside the dripline of the trees that define the watercourse setback boundary in order to protect the riparian area during.
- Activity 2. Incorporate permanent fencing along the watercourse setback boundary to discourage intrusion into Riparian Protection Area (refer to L2.01, Tree Management Plan)).

##### Objective 2. Remove Invasive Species

- Activity 1. Employ appropriate removal methods, as described in section 4.0 Invasive Species Removal for invasive species found within the Riparian Protection Area.
- Activity 2. Apply 50mm (2") of organic mulch to gaps in understorey arising from the removal of invasive species.

##### Objective 3. Create conditions to promote natural revegetation of indigenous species.

- Activity 1. Eliminate any compaction within the Riparian Protection Area by making disturbed soil rough and loose.
- Activity 2. Use logs and woody debris from trees felled on site to minimize soil erosion due to rainfall, emulate natural conditions and create microhabitats for local biodiversity.

##### Objective 4. Revegetate with Target and Complimentary Species

- Activity 1. Plant gaps in understory arising from invasive plant removal with drifts of target and complimentary species with spacing and size minimums indicated in Section 2.4.
- Activity 2. Implement L2.01 Tree Management Plan. Within the Riparian Protection Area, plant 456 of the 668 required replacement trees (see the Environmental Assessment

report for locations of significant trees, tree retention areas, and trees to be removed, refer to L2.01 for replacement tree species, locations and quantities).

**Objective 5. Monitor Restoration and Maintain Landscape**

Activity 1. Implement Three-Year Monitoring and Maintenance Plan provided in **section 5.0 Three Year Monitoring and Maintenance Plan** below to control invasive species while indigenous species planted in the Riparian Protection Area are re-establishing.

**3.2 Zone 2: Nanaimo Parkway**

The Nanaimo Parkway Zone coincides with Nanaimo Parkway Design Development Permit Area, as shown on L1.01, L1.02 and L1.03. As per the Nanaimo Parkway Development Permit Area Design Guidelines, the Nanaimo Parkway Zone is divided into three subzones:

Subzone 1.	Character Protection Zone
Subzone 2.	Tree Protection Zone
Subzone 3.	Earth berm and Acoustic Fencing

**Subzone 1: Character Protection Zone**

The Character Protection Zone is a 15m zone parallel to the Nanaimo Parkway. Vegetation in the Character Protection is selected and designed to enhance the rural, woody character of the Parkway.

**Subzone 2: Tree Protection Zone**

The Tree Protection Zone is an additional 20m strip contiguous with the Character Protection Zone, widening the Nanaimo Parkway Zone to a total of 35m. The purpose of the Tree Protection Zone is to reinforce Character Protection Zone.

**Subzone 3: Earth Berm and Acoustic Fencing**

The Earth Berm and Acoustic Fencing is an extension of an existing berm and fence designed to mitigate impacts of noise from the Highway on the proposed development. The earth berm is to be 3m in height, with additional noise abatement fencing to be provided. Details and diagrams of the earth berm and noise abatement fencing are provided in drawings submitted by the civil engineer. Once constructed, the berm will be seeded with an upland Garry oak meadow mix comprised of Roemer's fescue and California oatgrass to tolerate drier, sunny conditions, and maintained to inhibit the emergence of invasive species.



Figure 1: View of the Site from Parkway, northbound



**Figure 2:** View of the Site from Parkway, southbound.

### 3.2.1 Nanaimo Parkway Zone – Anticipated Impacts of Development

A significant portion of the proposed new road dedication is located within the Character Protection Zone at the south and central portions of the parcel; and some future residential development served by that road is located within the larger Tree Protection Zone (see L1.01 – L1.03). For the north portion of the site, no development is planned for the Nanaimo Parkway Zone.

Landscape strategies to minimize the ecological impact of the road within the Character Protection Zone, to strengthen the visual character of the Parkway and mitigate highway noise are the primary activities for the Nanaimo Parkway Zone.

### 3.2.2 Nanaimo Parkway Landscape Restoration Objectives and Activities

#### **Objective 1. Protect retained trees from disturbance.**

Activity 1. Install tree protection fencing around retained significant trees (see L2.01).

#### **Objective 2. Remove Invasive Species**

Activity 1. Employ appropriate removal methods, as described in **Section 4.0 Invasive Species Removal**, for invasive species found within the Nanaimo Parkway Zone.

Activity 2. Apply 50mm (2") of organic mulch to gaps in understorey arising from the removal of invasive species.

#### **Objective 3. Minimize the impact of road development and promote natural revegetation of indigenous species.**

Activity 1. Eliminate any compaction in the Nanaimo Parkway Zone by making the soil surface rough and loose.

Activity 2. Layer plantings of indigenous shrubs, grasses and herbaceous perennials into a bioswale engineered to accommodate rainwater runoff.

#### **Objective 4. Mitigate highway noise with a revegetated earth berm.**

Activity 1. Include adequate soil on proposed 3.0 m earth berm to support upland Garry oak meadow planning

Activity 2. Seed earth berm with drought tolerant, indigenous grass species.

**Objective 5. Revegetate with target and complementary species, including replacement trees, to reinforce the rural-wooded character of the Nanaimo Parkway.**

- Activity 1. Plant gaps in understory arising from invasive plant removal with drifts of species typical to the Douglas-fir-Salal site association and complementary plant species.
- Activity 2. Implement L2.01, Tree Management Plan. Within the Nanaimo Parkway Zone, plant 182 of the 668 replacement trees between the proposed road and the parcel line in order to create the visual impression of a forest along the parcel edge.
- Activity 3. Target a mix of 75% coniferous and 25% deciduous trees for the Nanaimo Parkway Zone for diversity and visual character.
- Activity 4. Seed entire earth berm with a mix of Roemer's fescue and California oatgrass to replicate an upland Garry oak meadow.

**Objective 6. Monitor Restoration and Maintain Landscape**

- Activity 1. Implement section 5.0 Three-Year Monitoring and Maintenance Plan below to control invasive species while indigenous species and replacement trees are establishing.

### 3.3 Zone 3: Landscape Restoration Areas

Landscape Restoration Areas are areas that are outside development permit areas that define Zones 1 and 2, but represent opportunities to retain and restore stands of existing trees or other vegetation, further enhancing the ecological function and forested character of the project (see L1.01-L1.03).

#### 3.3.1 Anticipated Impacts of Development in Landscape Restoration Areas

Impacts on Landscape Restoration Areas from development include altered hydrology and surface flows due to increased impervious surfacing and altered surface temperatures arising from the urban heat island effect. Landscape strategies to mitigate these effects in the Landscape Restoration Areas include expanding remnant stands of existing trees and areas of healthy indigenous understorey vegetation with additional replacement trees and complimentary understorey species.

#### 3.3.2 Landscape Restoration Areas Restoration Objectives and Activities

**Objective 1. Protect healthy indigenous species from disturbance.**

- Activity 1. All existing and new plants including retained areas and replacement trees shall be protected against damage during construction with Construction Fencing.
- Activity 2. Take appropriate measures to ensure that no spillage of fuels, fertilizers, toxic construction materials, or other toxic wastes occurs, and where use of such materials is necessary, to ensure that adequate containment facilities and clean-up equipment are used.
- Activity 3. All toxic wastes and other material shall be disposed of in a manner acceptable to the owner and in accordance with municipal, provincial and federal regulations.

**Objective 2. Remove Invasive Species**

- Activity 1. Employ appropriate removal methods, as described in section 4.0 Invasive Species Removal, below.

Activity 2. Apply a minimum of 50mm (2") of organic mulch to exposed soils to absorb water and ensure successful establishment of indigenous and ornamental plantings.

**Objective 3. Create conditions to promote natural revegetation of indigenous species.**

Activity 1. Eliminate compaction caused by construction within Landscape Restoration Areas by making compacted soils rough and loose.

Activity 2. Use logs and woody debris from trees felled on site to minimize soil erosion due to rainfall, emulate natural conditions and create microhabitats for local biodiversity.

**Objective 4. Strengthen stands of retained trees and replacement trees with restoration plantings using target and complimentary species.**

Activity 1. Target species typical to the Douglas-fir-Salal site association as well as complementary plant species (listed above) for revegetation in Landscape Restoration Areas.

Activity 2. Incorporate replacement trees adjacent to existing tree stands to expand Landscape Restoration Areas where possible.

Activity 3. Implement L2.03, Tree Management Plan. Within the Landscape Restoration Areas, plant 30 replacement trees.

**Objective 5. Monitor Restoration and Maintain Landscape**

Activity 1. Implement section **5.0 Three-Year Monitoring and Maintenance Plan** below to control invasive species while indigenous species and replacement trees are establishing.

**4.0 Invasive Plant Removal**

The understorey species on the site are predominantly non-indigenous invasive species. The foundation for the landscape restoration strategy for the site is to remove invasive species and prevent their re-establishment. This is necessary in order for the target indigenous species to establish, thrive and eventually self-propagate.

Section 4 of the Environmental Assessment report provides an inventory of invasive plants observed on site. Dominant invasive species include Himalayan blackberry, Scotch Broom, reed canary grass, Daphne – Spurge laurel, English holly and English Ivy. It is the responsibility of the owner or contractor to identify and remove invasive plant species that may be on the site in the future.

**4.1 REMOVAL METHODS**

**4.1.1 Himalayan Blackberry (*Rubus discolor*)**

Condition	Removal Method	Timing	Other considerations
Any size patch	Manual control using loppers, hand clippers or brush saw.	Aug. to Oct. (before roots form from draping shoots.)	<ul style="list-style-type: none"> <li>Remove cut canes to expose root crown or burl.</li> <li>Remove root crowns and burls using a pick axe or Pulaski.</li> <li>Take care to remove plant debris from site as root fragments can regrow.</li> <li>Avoid damaging indigenous plants.</li> </ul>
Large, thick patches outside Riparian Protection Area	Remove biomass with backhoe and scrape down to soil	Any time.	<ul style="list-style-type: none"> <li>Repair compaction from machinery by scraping soil surface to make it rough and loose.</li> <li>Avoid damaging indigenous plants.</li> <li>Do not encroach into sensitive or protected areas.</li> </ul>
Draping Tips Beginning to Root	Hand extraction with paring knife	As soon as tips root (Oct. – Nov.)	<ul style="list-style-type: none"> <li>Pulling alone is insufficient for removing roots.</li> </ul>
New Growth from Root Fragments or Root Crown	Manual Control using loppers or hand clippers.	2-3 times per year, for at least three years.	<ul style="list-style-type: none"> <li>Eradication may take up to 5-years.</li> </ul>

**4.1.2 Scotch Broom (*Cytisus scoparius*)**

Condition	Removal Method	Timing	Other considerations
Small seedlings (less than 1cm diameter at base)	Hand-pull when soil is moist.	Anytime	<ul style="list-style-type: none"> <li>Take care to remove plant debris from site and minimize soil disturbance.</li> <li>Avoid damaging indigenous plants.</li> </ul>
Larger plants and, thick patches	Cut plants at base, or just below ground height.	While in bloom, prior to seed formation (March to June).	<ul style="list-style-type: none"> <li>Remove cut plant material from site as debris releases toxins that inhibit establishment of other plants</li> <li>Promptly establish competitive shrubbery (snowberry, salmonberry, thimbleberry, Oregon grape, red alder) for shading and competition for nitrogen.</li> <li>Seeds can remain dormant in soil for 30-years.</li> </ul>

**4.1.3 Daphne (*Daphne laureola*)**

**Caution:** *Daphne* contains naturally occurring toxins that can cause skin and respiratory irritation. Always wear protective clothing including eye protection and a breathing mask when working with *Daphne*. Never transport cuttings in an enclosed vehicle.

Condition	Removal Method	Timing	Other considerations
Mature Plants and Young Shrubs	Hand Removal: Cut stem below the soil line. Push or kick bypass loppers into the ground at the base of the plant. Close them to cut the stem below ground.	Summer	<ul style="list-style-type: none"> <li>Avoid direct skin contact with the plant.</li> <li>Cut the bottom of the stem where there is an obvious colour change between stem and root.</li> <li>Inspect stem for a diagonal cut that bisects the area of colour change.</li> <li>Minimize soil disturbance.</li> <li>Seed or plant with indigenous species following removal</li> </ul>

Large patches of seedlings	Mechanical Removal Cutting with weed eater.	Summer. For 3- years following removal of mature plants.	<ul style="list-style-type: none"> <li>• <b>Caution:</b> This method releases vapours that can cause respiratory irritation. Wear protective gear. Ensure others are not in vicinity.</li> <li>• Avoid damaging nearby plants.</li> <li>• Plant with target indigenous species after treatment.</li> </ul>
Smaller patches of seedlings	Cutting with hand tool.	Summer. For 3- years following removal of mature plants.	<ul style="list-style-type: none"> <li>• Labour intensive.</li> <li>• Produces less toxic vapour than a weed eater.</li> <li>• Cut below lowest point where leaves occur.</li> <li>• Wear protective clothing and avoid direct skin contact with the plant.</li> <li>• Plant with target indigenous species after treatment.</li> </ul>

**4.1.4 English Ivy (*Hedera helix*)**

Condition	Removal Method	Timing	Other considerations
Mature plants climbing trees	Use saw, clippers, loppers or similar to physically remove 1m tall band of ivy at waist to breast height around circumference of affected tree.	Fall	<ul style="list-style-type: none"> <li>• Ivy above band removed may be left in place to die on the tree.</li> <li>• Ensure band is kept clear of new growth as dead ivy may function as a ladder for new growth.</li> <li>• Ensure all contact between roots and upper parts of ivy plants are severed.</li> </ul>
Lower portion of mature plants on tree trunk after climbing portions are severed	Pry roots from base of trunk and soil using grub hoe, cable winch or come-along.	Late Fall (Nov.)	<ul style="list-style-type: none"> <li>• Roots may be over 3m (10 feet) long.</li> </ul>
Juvenile mats spreading horizontally on ground	Dig out roots using paring knife, weed wrench or similar and roll into 2-person manageable piles.	Late Fall (Nov.)	<ul style="list-style-type: none"> <li>• Lift gently or roots will break and resprout</li> <li>• In protected areas, minimize soil compaction by laying planks to work from</li> <li>• Be cautious of juvenile and emerging indigenous plants</li> </ul>

**4.1.5 English Holly (*Ilex aquifolium*)**

Condition	Removal Method	Timing	Other considerations
Seedling	Hand-pull from ground.	Anytime	<ul style="list-style-type: none"> <li>Minimize soil disturbance.</li> <li>Do not confuse with juvenile or emerging Oregon grape specimens.</li> </ul>
Small shrub	Cut off at ground level	Summer to Fall	<ul style="list-style-type: none"> <li>Avoid dispersing berries if present. If present, use tarp for removal.</li> <li>Wear pants, long sleeves, gloves and eye protection to avoid scratches.</li> <li>Monitor for sprouts and remove using clippers.</li> </ul>
Large Shrub or Tree	Cut off at ground level. Remove roots if possible or damage stump with axe.	Spring to Summer (before seed formation)	<ul style="list-style-type: none"> <li>Avoid scattering seeds</li> <li>If seeds have formed, remove debris using a tarp or garbage bags</li> <li>Wear pants, long sleeves, gloves and eye protection to avoid scratches.</li> <li>Stump is likely to resprout for several growing seasons. Monitor for sprouts and remove using clippers.</li> </ul>

For other invasive species, remove entire plant including roots. Take care during removal and clean-up to avoid disturbance to indigenous plants and retained trees and ensure debris from all invasive species removal is promptly removed from the site. Refer to the Environmental Management report for an inventory of invasive species on site, and additional direction on removal of invasive species and post-removal replanting techniques.

## 5.0 THREE YEAR MONITORING AND MAINTENANCE PLAN

### 5.1 General:

Monitoring and maintenance will take place for three years from the time of acceptance of Substantial Completion of the project.

### 5.2 Monitoring

Monitoring will include inspection, documentation and reporting of the health of retained trees and planted specimens; natural regeneration and invasive species removal.

### 5.3 Maintenance Strategies:

- Hand removal of invasive plants in Riparian Protection Zone.
- Indigenous plants shall be allowed to regenerate naturally.
- Replacement planting as required to compensate for invasive plant and hazard tree removal and die-off of any planted specimens. Cover with 50mm of organic mulch following planting.
- Leave fallen leaves, woody debris and other natural litter in place.

### 5.4 Maintenance Procedures and Frequencies for all Zones

Procedure	M	A	M	J	J	A	S	O	Frequency
Inspection		X		X		X		X	4 times per year
Reporting		X		X		X		X	4 times per year
Litter Removal									As required for safety. Otherwise, litter to remain in place.
Weeding		X		X		X		X	4 times per year minimum.
Invasive Removal		X		X		X			3 times per year
Mulching		X		X		X			Following invasive removal.
Replacement Planting	X						X	X	Compensation for invasive or hazard tree removal, or die-off.
Repair									As required.
Tree Hazard Assessment									As required.
Pruning									Undertaken to remove broken or dying branches for safety.
Fire Management		X	X	X	X	X	X	X	As required to reduce the risk of ignition and spread of fire.

### 5.5 Maintenance Operations

Landscape maintenance operations shall include the removal of all invasive plants, and careful removal of all other weeds, taking care to retain all indigenous plants that are naturally regenerating.

The area is intended to reinforce a rural, wooded character and maintain ecological functioning, so an informal appearance is desirable with weeds kept to a minimum. Plants should be kept healthy with

regular watering as required, until establishment (minimum 3-years). Plants should not be trimmed or pruned except for safety and to reduce fire risk.

The maintenance period shall be from the time of planting until three years from the date of Substantial Completion of the landscape works. After the first year, the owner or contractor will contact the Landscape Architect for inspection.

Maintenance operations for the planted shrubs and ground covers shall include:

- Watering and weeding, being careful not to remove naturally regenerating indigenous plants. Weeding should occur at least four times per year. Watering should be at least 3-times per week during the dry summer drought period.
- Weeding must be done when isolated weedy patches have a width of 20cm. Weeding shall remove 80% of weeds. "Isolated" means a weed distribution of no greater than four patches per 5m<sup>2</sup>.
- Invasive plant removal should occur as necessary throughout the growing season. Maintenance operations should, where possible, follow ecologically sound practices such as:
  - Integrated Pest Management (IPM)
  - Plant Health Care (PHC)
  - Composting
  - Application of Organic Mulches

## 5.6 Plan Review

As part of the monitoring process, an adaptive management approach will be applied to this Vegetation Management Plan. As inspections take place, overall plant health will be determined and changes made if necessary, to ensure the success of the planting.