CITY OF COLWOOD

3300 Wishart Road | Colwood | BC V9C 1R1 | 250 478 5999
planning@colwood.ca | www.colwood.ca

File: DP-22-017

DEVELOPMENT PERMIT DP-22-017

THIS PERMIT, issued **October** 10th**, 2023** is,

ISSUED BY: **CITY OF COLWOOD**, a municipality incorporated under the *Local Government Act*, 3300 Wishart Road, Victoria, BC, V9C 1R1

(the "City")

PURSUANT TO: Section 490 of the *Local Government Act*, RSBC 2015, Chapter 1

ISSUED TO: **ROSS CASEY**
783 Cuaulta Cres
Victoria, BC V9C 3H2

(the "Permittee")

---

1. This Natural Hazards (Steeply Sloped) and Environmental (Hillside) Permit applies to those lands within the City of Colwood described below, and any and all buildings, structures, and other development thereon:

   LOT 3 PLAN VIP42613 SECTION 78 ESQUIMALT
   783 Cuaulta Cres

   (the "Lands");

2. This Development Permit regulates the development and alterations of the Land to enable site preparation for a 4-lot subdivision and associated site improvements which are consistent with the Natural Hazard and Environmental guidelines for areas designated as "Steeply Sloped" and "Hillside" in the City of Colwood Official Community Plan (Bylaw No. 1700).

3. This Development Permit is **NOT** a Building Permit or a subdivision approval.

4. This Development Permit is issued subject to compliance with all of the bylaws of the City of Colwood that apply to the development of the Lands, except as specifically varied by Council or supplemented by this Permit.

5. The Director of Development Services or their delegate may approve minor variations to the plans and specifications attached to and forming part of this Development Permit, provided that such minor variations are consistent with the overall intent of the original plans and do not alter the

environmental conditions of the development authorized by those plans.

6. If the Permittee does not substantially start the construction permitted by this Permit within 24 months of the date of this Permit, the Permit shall lapse.

7. The development is to be constructed in accordance with the following plans and specifications, which are attached to and form as part of this permit:

Schedule 1	Arborist Report prepared by SouthShore Forest Consultants revised September 9, 2023.
Schedule 2	Environmental Impact Assessment prepared by Corvidae Environmental Consulting Inc dated May 2023.
Schedule 3	Geotechnical Report prepared by Ryzuk Geotechnical dated April 5, 2023.
Schedule 4	Grading Plan prepared by Westbrook Consulting Ltd dated July 2022.
Schedule 5	Proposed Subdivision Plan prepared by Summit Land Surveying dated June 20, 2022.

8. This Development Permit enables land alterations and site preparation to enable a 4-lot subdivision along with any and all associated onsite works and improvements. The Land shall not be altered, nor any buildings or structures constructed, except in accordance with the following conditions:

NATURAL HAZARD CONDITIONS

Geotechnical, Grading and Blasting

8.1. All blasting and geotechnical earth works shall be completed in accordance with the plans and recommendations contained in the Geotechnical Report by Ryzuk Geotechnical (Schedule 3).

8.2. All proposed grading works must be in substantial compliance with the Grading Plan (Schedule 4) and be completed under the guidance and approval of the Project Geotechnical Engineer.

8.3. Any recommended pre-blast surveys or additional geotechnical reporting included in or responding to the assessment recommendations in the Geotechnical Report (Schedule 3), shall be submitted to the City, to the satisfaction of the Director of Development Services.

8.4. Dismantling of the existing boulder stack wall off the driveway entrance to the east leg of Cuaulta Crescent for work proposed on Lot C will need to be undertaken by the Project Geotechnical Engineer to ensure rockfall material is not dislodged to runout uncontrolled downslope per the recommendations in Schedule 3.

8.5. A geotechnical covenant must be registered on Proposed Lot C (Schedule 5) to ensure that the free-standing boulder stack wall is removed prior to Building Permit issuance to the satisfaction of the City's Approving Officer.

8.6. All fill and septic field systems must be removed and the Project Geotechnical Engineer is to review the native soils prior to Building Permit issuance to the satisfaction of the Director of Development Services.

ENVIRONMENTAL CONDITIONS

Tree Management and Compensation

8.7. All recommendations from the Arborist report must be followed as outlined by SouthShore Forest Consultants (Schedule 1) including but not limited to the Project Arborist observing any excavation and grading activities within the Critical Root Zone and utilization of wood chip debris around the outside of the tree protection area, and must only varied with written consent from the Director of Development Services.

8.8. Tree Protection Fencing must be installed along the perimeter of all trees identified for preservation and must be inspected by the Project Arborist and installation photos submitted to the City for approval prior to land alterations, to the satisfaction of the Director of Development Services.

8.9. Active bird nests are protected under the BC Wildlife Act. Active nests may not be removed, injured, molested, or destroyed. The nests of some species, including bald eagles, peregrine falcons, osprey, and heron, are protected year-round, whether active or not. The nests and eggs of some species are also protected under the federal Migratory Birds Convention Act and/or the Species at Risk Act.

8.10. A cash-in-lieu payment of $13,500 has been accepted for the removal of 27 protected trees at a ratio of 2:1 as per the requirements of the Urban Forest Bylaw No. 1735 through an issued Tree Management Permit, TMP00004.

Environmental Protection and Restoration

8.11. All recommendations from the Environmental Impact Assessment must be followed as outlined by Corvidae Environmental Consulting (Schedule 2), including but not limited to invasive species removal with replacement of native species and plantings and placement of additional logs for resident reptile habitat enhancement.

8.12. Fencing must be installed to protect retained rock outcrops and must be inspected by the Project Biologist and installation photos submitted to the City for approval prior to land alterations to the satisfaction of the Director of Development Services.

8.13. Vegetation clearing must be completed outside of the migratory bird window (prior to March 15 or after August 31). If vegetation clearing is scheduled within the sensitive time period, a qualified professional must be contacted to conduct nest search surveys a maximum of 2-3 days before the start of activities.

8.14. A raptor next survey must be completed by a qualified professional prior to clearing if scheduled between January 1 and August 15 as required by the Environmental Impact Assessment (Schedule 2).

8.14.1. If any eagle or osprey nests are observed in trees to be removed, note that a separate permit is required.

8.15. As a condition of site adaptive principles, the building outlines as shown in Schedule 5 must be in substantial compliance when submitting for Building Permit issuance to the satisfaction of the Director of Development Services.

Erosion and Sediment Control

8.16. The following erosion and sediment control measures shall be adhered to per the recommendations of the Environmental Impact Assessment (Schedule 2):

8.16.1. No soil shall be left exposed for more than one growing season.

8.16.2. If erosion is detected during site preparation, silt fencing or straw wattles shall be installed to direct sediment to a holding area.

8.16.3. A large, labelled, mobile spill kit must be kept on-site during construction works and all construction equipment is kept in good working order without leaks.

ISSUED ON THIS 10th DAY OF OCTOBER, 2023

Yazmin Hernandez B.

YAZMIN HERNANDEZ, MCIP RPP
DIRECTOR OF DEVELOPMENT SERVICES

Schedule 2



ENVIRONMENTAL IMPACT ASSESSMENT

FOR 783 CUAULTA CRESENT COLWOOD, BC

PREPARED FOR:
ROSS CASEY
HYBRID 1 DEVELOPMENTS LTD
VICTORIA, BC, V8Z 7G4

AND

CITY OF COLWOOD
3300 WISHART ROAD
COLWOOD, BC, V9C 1R1

CORVIDAE PROJECT #2023-045

CORVIDAE
ENVIRONMENTAL CONSULTING INC
6526 WATER STREET, SOOKE, BC

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOS

CAVEAT

This Environmental Impact Assessment (EIA) has been prepared with the best information available at the time of writing, including the City of Colwood Official Community Plan, communications with the client, a site visit, review of site plans and design drawings and other documentation relevant to the project. This EA has been developed to assist the project in remaining in compliance with relevant environmental regulations, acts and laws pertaining to the project and to identify and mitigate the expected impacts of the project.

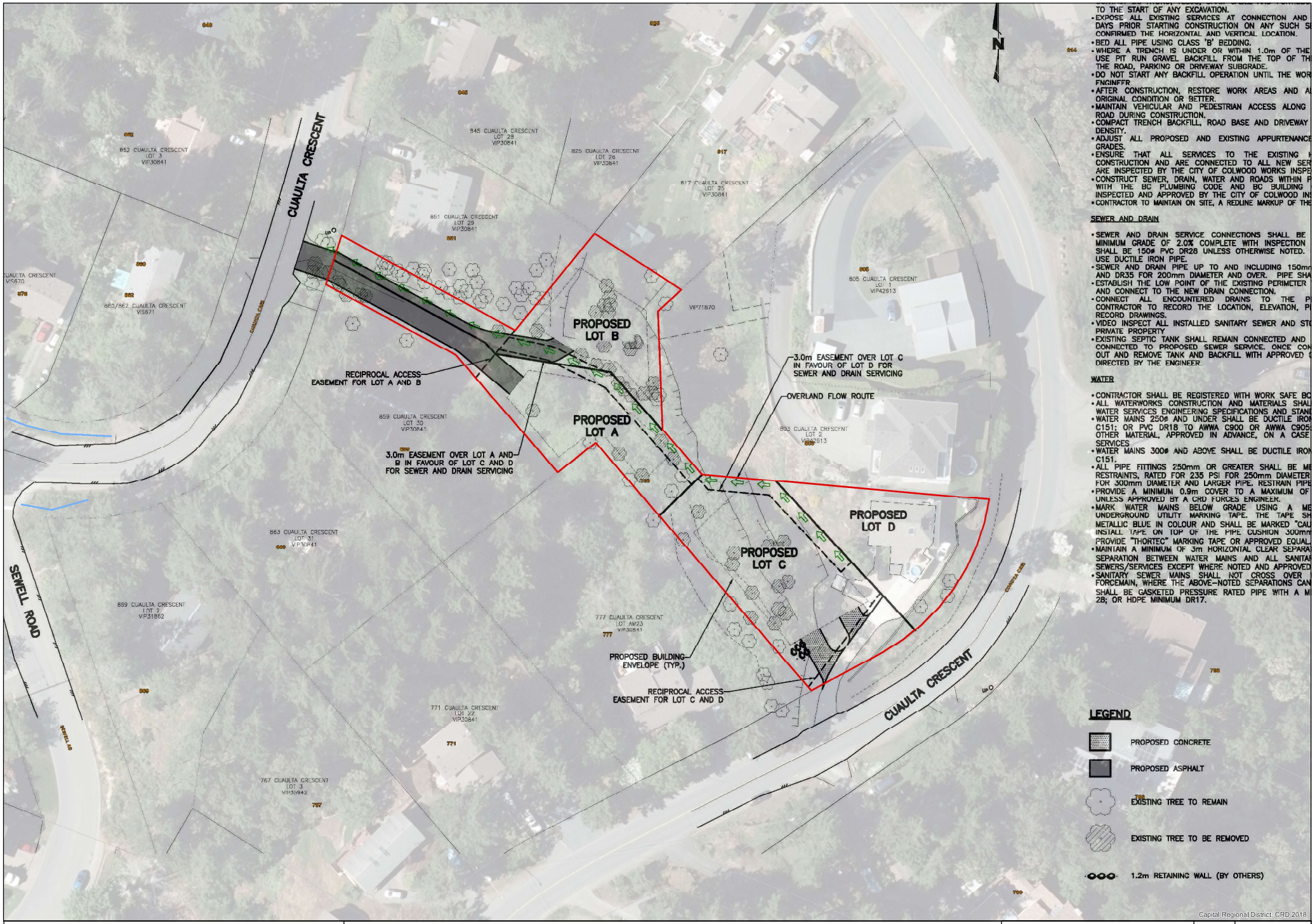
1 INTRODUCTION

Corvidae Environmental Consulting Inc. (Corvidae) is pleased to provide this Environmental Impact Assessment (EIA) for a proposed 4-lot residential subdivision at 783 Cuaulta Crescent in Colwood, BC (the Site) (PID: 001-893-092; Lot 3, Plan 42613).

The Site occurs within the Natural Hazards Development Permit Area (DPA) and the Hillsides Environmental Protection DPA and is currently zoned as Residential 1 (R1). Noteworthy environmental features include steep rocky outcrops predominantly along the northern Site boundary and intermittent mature trees within young, mixed forest. These features have been historically impacted by residential development in the areas surrounding the Site. No surface water features and species or ecological communities at risk were detected during the assessment.

The Site boundaries and proposed subdivision plan are shown in Figure 1, designated by the red polygon. Specific future development details have not been proposed at this time; however, site preparation activities following subdivision approval may include (but are not limited to) the following: vegetation removal, rock excavation (blasting), grading, and the installation of utility alignments and retaining structures. It is recommended that future development on the Site is designed to work with the existing topography and minimizes disruption of rocky outcrops. Retention of mature trees is also recommended where feasible. Invasive species should be removed whenever encountered and disturbed areas enhanced/restored with native seed and plantings suitable for the area.

This document addresses the requirements outlined in Part D of the City of Colwood Bylaw No. 1700, provides a detailed assessment on the environmental conditions on the Site and recommendations for the protection of environmentally sensitive features and methods to minimize impacts of future development activities.



- TO THE START OF ANY EXCAVATION.
- EXPOSE ALL EXISTING SERVICES AT CONNECTION AND DAYS PRIOR STARTING CONSTRUCTION ON ANY SUCH S CONFIRMED THE HORIZONTAL AND VERTICAL LOCATION.
- BED ALL PIPE USING CLASS 'B' BEDDING.
- WHERE A TRENCH IS UNDER OR WITHIN 1.0m OF THE USE PIT RUN GRAVEL BACKFILL FROM THE TOP OF TH THE ROAD, PARKING OR DRIVEWAY SUBGRADE.
- DO NOT START ANY BACKFILL OPERATION UNTIL THE WOR ENGINEER
- AFTER CONSTRUCTION, RESTORE WORK AREAS AND A ORIGINAL CONDITION OR BETTER.
- MAINTAIN VEHICULAR AND PEDESTRIAN ACCESS ALONG ROAD DURING CONSTRUCTION.
- COMPACT TRENCH BACKFILL, ROAD BASE AND DRIVEWAY DENSITY.
- ADJUST ALL PROPOSED AND EXISTING APPURTENANCE GRADES.
- ENSURE THAT ALL SERVICES TO THE EXISTING CONSTRUCTION AND ARE CONNECTED TO ALL NEW SER ARE INSPECTED BY THE CITY OF COLWOOD WORKS INSPE
- CONSTRUCT SEWER, DRAIN, WATER AND ROADS WITHIN WITH THE BC PLUMBING CODE AND BC BUILDING INSPECTED AND APPROVED BY THE CITY OF COLWOOD IN
- CONTRACTOR TO MAINTAIN ON SITE, A REDLINE MARKUP OF THE

SEWER AND DRAIN

- SEWER AND DRAIN SERVICE CONNECTIONS SHALL BE MINIMUM GRADE OF 2.0% COMPLETE WITH INSPECTION SHALL BE 150ø PVC DR28 UNLESS OTHERWISE NOTED. USE DUCTILE IRON PIPE.
- SEWER AND DRAIN PIPE UP TO AND INCLUDING 150mm AND DR35 FOR 200mm DIAMETER AND OVER. PIPE SHA
- ESTABLISH THE LOW POINT OF THE EXISTING PERIMETER AND CONNECT TO THE NEW DRAIN CONNECTION.
- CONNECT ALL ENCOUNTERED DRAINS TO THE P CONTRACTOR TO RECORD THE LOCATION, ELEVATION, P RECORD DRAWINGS.
- VIDEO INSPECT ALL INSTALLED SANITARY SEWER AND ST PRIVATE PROPERTY
- EXISTING SEPTIC TANK SHALL REMAIN CONNECTED AND CONNECTED TO PROPOSED SEWER SERVICE. ONCE CO OUT AND REMOVE TANK AND BACKFILL WITH APPROVED DIRECTED BY THE ENGINEER.

WATER

- CONTRACTOR SHALL BE REGISTERED WITH WORK SAFE BC
- ALL WATERWORKS CONSTRUCTION AND MATERIALS SHAL WATER SERVICES ENGINEERING SPECIFICATIONS AND STAN
- WATER MAINS 250ø AND UNDER SHALL BE DUCTILE IRO C151; OR PVC DR18 TO AWWA C900 OR AWWA C905 OTHER MATERIAL, APPROVED IN ADVANCE, ON A CASE SERVICES
- WATER MAINS 300ø AND ABOVE SHALL BE DUCTILE IRO C151.
- ALL PIPE FITTINGS 250mm OR GREATER SHALL BE M RESTRAINTS, RATED FOR 235 PSI FOR 250mm DIAMETER FOR 300mm DIAMETER AND LARGER PIPE. RESTRAIN PIPE
- PROVIDE A MINIMUM 0.9m COVER TO A MAXIMUM OF UNLESS APPROVED BY A CRD FORCES ENGINEER.
- MARK WATER MAINS BELOW GRADE USING A M UNDERGROUND UTILITY MARKING TAPE. THE TAPE SH METALLIC BLUE IN COLOUR AND SHALL BE MARKED "CAU INSTALL TAPE ON TOP OF THE PIPE CUSHION 300mm PROVIDE "THORTEC" MARKING TAPE OR APPROVED EQUAL
- MAINTAIN A MINIMUM OF 3m HORIZONTAL CLEAR SEPARA SEPARATION BETWEEN WATER MAINS AND ALL SANITA SEWERS/SERVICES EXCEPT WHERE NOTED AND APPROVED
- SANITARY SEWER MAINS SHALL NOT CROSS OVER FORCEMAIN, WHERE THE ABOVE-NOTED SEPARATIONS CAN SHALL BE GASKETED PRESSURE RATED PIPE WITH A M 28; OR HDPE MINIMUM DR17.

LEGEND

- PROPOSED CONCRETE
- PROPOSED ASPHALT
- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED
- 1.2m RETAINING WALL (BY OTHERS)

Capital Regional District, CRD 2018

Site Plan

N

0 10 20 40 Meters

Sources: DataBC, Capital Regional District

Stream or Ditch

Property Boundary

CORVIDAE ENVIRONMENTAL CONSULTING INC

Corvidae Project No.
COR-2023-045

Rev. #	Date
0	April 26, 2023

Figure 1

1.1 OBJECTIVES

The purpose of this EIA is to assess the terrestrial and riparian environments onsite, identifying terrestrial and aquatic habitat, sensitive ecosystems, and wildlife habitat, including wildlife trees, nests, and any other wildlife features. This EIA also identifies the presence of threatened or endangered species on or around the Site, which includes a 2-kilometre (km) buffer around the Site boundaries. As part of the EIA, Corvidae completed a detailed field assessment to document biophysical features, habitat and verify available ecosystem inventory data.

From this information, potential impacts of the subdivision and future potential development of the lots created have been assessed and mitigation measures recommended to minimize residual impacts of the project and to protect the natural environment, its ecosystems and associated biological diversity. This report meets the environmental requirements in the City of Colwood Official Community Plan, zoning by-laws and addresses provincial and federal laws.

1.2 REGULATORY FRAMEWORK

This EIA is designed to comply with the provisions set out in the City of Colwood Official Community Plan (OCP) for development permit areas and for compliance with the provisions for environmental protection contained in the following relevant legislation:

Municipal

City of Colwood OCP, Bylaw No. 1700 (City of Colwood 2018)

Natural Hazards DPA

Objectives

- Protect lives and property from hazardous conditions such as landslides and erosion by avoiding development on unstable or hazardous areas.
- Protect people and development from flooding and erosional processes associated with extreme weather events and potential sea level rise in ways that do not lead to hardening of shorelines and loss of environmental and recreational values.
- Protect lives and property from interface wildfire.

Steeply Sloped Areas (OCP Section 23.1)

- Development on lands with slopes greater than 30% must be avoided. Development may be considered on slopes greater than 30% only where it can be demonstrated that the proposed development will not create geotechnical, ecological, or visual impacts, can be sensitively integrated with terrain, and presents no hazards to people or property.
- Grading or alteration of key topographic features such as knolls, ridgelines, rocky outcrops, cliffs, and ravines must be avoided.

Environmental Protection DPA

Objectives

- Protect wildlife habitat and corridors, and environmentally sensitive areas on hillsides.
- Identify significant features prior to development, and protect hillside character and natural features.
- Conserve unique natural features such as landforms, rock outcrops, mature trees and vegetation, hilltops, and ridge lines.
- Minimize blasting and re-contouring of hillsides.

Hillsides (OCP Section 22.1)

- Take advantage of topography and minimize disruption of rock outcroppings, sensitive ecosystems, mature trees, and culturally significant features.
- Open space and corridors between development areas or lots should be retained to provide continuous habitat linkages within the site and surrounding area. Significant features such as rock outcrops, streams, cliffs, and stands of trees should be incorporated into the open space and corridors as much as possible.

The guiding principle for the use of Development Permits is found within the *Local Government Act*. Development Permit Areas can be designated for purposes such as, but not limited to: protecting, enhancing and restoring the biodiversity and ecological values and functions of environmentally sensitive areas; fostering compatibility between development, existing land uses and environmentally sensitive areas; maintaining connectivity between sensitive ecosystems; and protecting water quality and quantity.

Provincial

- Wildlife Act (1996)
- Invasive Species Council of BC
- *Weed Control Act* (1996, current as of October 2016)

Federal

- Migratory Birds Convention Act (1994)

  Species at Risk Act (SARA) (2002)

1.3 DEVELOPMENT PERMIT AREAS

As per Figures 18 and 19 of the City of Colwood OCP, the Site occurs within the Natural Hazards Development Permit Area (DPA) and the Hillsides Environmental Protection DPA. The DPAs overlap the entirety of the property and are shown in Figure 2.

Commentary regarding development requirements to ensure human safety and slope stability within the Natural Hazards DPA on the property will not be included in this report. A geotechnical evaluation has been prepared and submitted separately by a registered geotechnical professional to certify that the site is safe for its intended use.

Development Permit Areas

N

0 0.03 0.1 km

1: 1,348

Sources: DataBC, Capital Regional District

Natural Hazards DPA -Steeply Sloped Areas (>30%)

Environmental DPA -Hillside

Property boundary

CORVIDAE ENVIRONMENTAL CONSULTING INC

Rev. #	Date
0	May 10, 2023

Corvidae Project No.
COR-2023-045

Figure 2

2 SCOPE OF WORK

Corvidae completed an environmental assessment for the Site and documented the ecological features. Background information was reviewed, including applicable databases. The following features were documented and provided in this report:

- Areas of habitat and biodiversity values, including rocky outcrops.
- Plant communities and plant species on site.
- Potential wildlife presence and wildlife habitat.
- Soil types and terrain.
- Surface water flow patterns.

Mitigation recommendations to minimize the environmental impacts associated with future, potential development on the Site have been provided in Section 6.

3 METHODS

3.1 DESKTOP REVIEW

Baseline biophysical conditions were compiled by reviewing the best available data and information including existing reports for the area and conducting searches of online provincial and federal databases:

- BC Conservation Data Centre (BC CDC 2023a and 2023b).
- BC HabitatWizard (Province of BC 2023).
- Aerial photographs of the Site (Google Earth 2023).
- CRD mapping system and database (CRD 2023).
- City of Colwood GIS Mapping (City of Colwood n.d.)
- Colwood Official Community Plan Bylaw No. 1700 (City of Colwood 2018).

3.2 FIELD ASSESSMENT

A field assessment of the Site was completed by a Qualified Environmental Professional (QEP) from Corvidae. The assessment included characterization of vegetation and habitat types, wildlife sign and species observations, wildlife habitat, surface water flow patterns, and assessed the current conditions of the Site.

4 ENVIRONMENTAL SITE ASSESSMENT

Corvidae completed a site visit on April 27, 2023. Site photographs are included as Appendix A.

4.1 LAND USE

Proposed Lot D currently includes one primary residence that is situated at the peak of a rock outcrop. This lot has been historically modified to include areas of hard and soft landscaping. Proposed Lots A, B, and C occur topographically lower than proposed Lot D, as the contours of the adjacent land have created a steep, ravine-like descent down to the proposed lots. These proposed lots are in a currently undeveloped area, characterized by rocky outcrops and vegetated areas (e.g., trees and shrubs). Land use adjacent to the proposed lots is primarily residential. There are two proposed access points for the Site which are both located off Cuaulta Crescent, to the west and to the east.

4.2 CLIMATE AND BIOGEOCLIMATIC ZONE

The Site is located within the Coastal Douglas-fir (CDF) biogeoclimatic zone, specifically in the Moist Maritime Coastal Douglas-fir Subzone (CDFmm) (BC CDC 2023b). The CDFmm occurs at low elevations (<150 m) along southeast Vancouver Island, the southern Gulf Islands, and part of the Sunshine Coast. The CDFmm has the mildest climate in Canada. This subzone has a long growing season with warm, dry summers and mild, wet winters.

4.3 TERRAIN AND SOILS

Soils in the CDF biogeoclimatic zone are generally derived from morainal, colluvial, and marine deposits, and are typically Brunisols, grading with increased precipitation to Humo-Ferric Podzols (Nuszdorfer et al. 1991). Soils on the Site are described as rapidly drained, Ragbark (60%) underlain by undifferentiated Bedrock (20%) and well-drained Somenos (20%) (SIFT 2018).

The Site is irregularly shaped, with proposed Lot D occurring at the peak of a rock outcrop that slopes steeply down to proposed Lots A, B, and C.

4.4 SURFACE WATER

No surface water features (e.g., watercourses, wetlands, etc.) were detected during the field assessment. A small, grassed swale fronts the Site along Cuaulta Crescent (east), and a roadside ditch occurs along Cuaulta Crescent at the western extent. Flows from this ditch are conveyed south and join up with other roadside ditches in the area. The roadside ditch does not directly drain into a fish-bearing stream and thus does meet the definition of a stream under the Riparian Areas Protection Regulation. A Storm Water Management Plan (SWMP) has been prepared and will be submitted separately to address stormwater aspects as they relate to the proposed subdivision.

4.5 VEGETATION

Vegetation in proposed Lot D consists mostly of open grass/lawn areas and ornamental shrubs due to historic disturbance associated with the existing residence and hardscaped areas. Remaining natural features include moss-covered rocky outcrops and young, mixed forest with mature trees interspersed. Tree cover is most prevalent in proposed Lot B and portions of proposed Lot C and is a mixed canopy of predominantly Douglas-fir, bigleaf maple, and arbutus.

Five invasive plant species were observed on the Site: Himalayan blackberry, English ivy, purple deadnettle, scotch broom, and spurge-laurel. All of those species, with the exception of purple deadnettle, are listed as "Control" species as per the Coastal Invasive Species Committee (2023). It is recommended that efforts to control these species are focused within high value conservation areas and that the use of Biological Control, if available, is utilized on a landscape scale. Measures to remove and prevent invasive species are discussed in Section 6 of this report. All vegetation species noted during the April 27, 2023, field visit are included below in Table 1.

Table 1. Plant species observed on site during the April 27, 2023 field visit.

Common Name	Scientific Name	BC Provincial Status[1]	*SARA* Schedule 1 Status[2]
Anise	*Myrrhis odorata*	Exotic	--
Arbutus	*Arbutus menziesii*	Yellow	--
Baldhip rose	*Rosa gymnocarpa*	Yellow	--
Barberry sp.	*Berberis* sp.	Exotic	--
Bigleaf maple	*Acer macrophyllum*	Yellow	--
Butter-and-eggs	*Linaria vulgaris*	Exotic	--
Broad-leaved stonecrop	*Sedum spathulifolium*	Yellow	-
Camas sp.	*Camassia* sp.	Yellow	--
Chickweed monkey-flower	*Erythranthe alsinoides*	Yellow	--
Cleavers	*Galium aparine*	Yellow	--
Daffodil	*Narcissus* sp.	Exotic	--
Douglas-fir	*Pseudotsuga menziesii*	Yellow	--
Dull Oregon-grape	*Mahonia nervosa*	Yellow	--
English Ivy	*Hedera helix*	**Invasive**; Exotic	--
Garry oak	*Quercus garryana*	Yellow	--
Grand fir	*Abies grandis*	Yellow	--
Grass species	*Poa* sp.	--	--
Himalayan blackberry	*Rubus armeniacus*	**Invasive**; Exotic	--
Juniper haircap	*Polytrichum juniperinum*	Yellow	--
Maiden blue-eyed mary	*Collinsia parviflora*	Yellow	--
Miner's lettuce	*Claytonia perfoliata ssp. perfoliata*	Yellow	--
Nootka rose	*Rosa nutkana*	Yellow	--
Oregon beaked moss	*Kindbergia oregana*	Yellow	--
Oceanspray	*Holodiscus discolor*	Yellow	--
Plum	*Prunus* sp.	Exotic	--
Pretty shooting star	*Dodecatheon pulchellum*	Yellow	--
Purple deadnettle	*Lamium purpureum*	**Invasive**; Exotic	
Red alder	*Alnus rubra*	Yellow	--
Salal	*Gaultheria shallon*	Yellow	--
Salmonberry	*Rubus spectabilis*	Yellow	--
Schreber's big red stem moss	*Pleurozium schreberi*	Yellow	--
Scotch broom	*Cytisus scoparius*	**Invasive**; Exotic	--
Shortspur seablush	*Plectritis brachystemon*	Yellow	--
Slough sedge	*Carex obnupta*	Yellow	--
Small-flowered nemophila	*Nemophila parviflora*	Yellow	--
Spurge-laurel	*Daphne laureola*	**Invasive**; Exotic	--

Common Name	Scientific Name	BC Provincial Status[1]	*SARA* Schedule 1 Status[2]
St. John's Wort	*Hypericum* sp.	--	--
Sword fern	*Polystichum munitum*	Yellow	--
Tall Oregon grape	*Mahonia aquifolium*	Yellow	--
Trailing blackberry	*Rubus ursinus*	Yellow	--
Western redcedar	*Thuja plicata*	Yellow	--
White fawn lily	*Erythronium oregonium*	Yellow	--

[1] BC CDC 2023a
[2] Government of Canada 2023

4.6 WILDLIFE

Existing trees on the Site may provide nesting and roosting habitat for birds, including migratory songbirds, year-round resident species, raptors, and owls. One inactive nest was observed within a conifer at the western extent of the Site. The Site may be utilized as a movement corridor for large mammals, including cougars, and deer. No wildlife dens or burrows were detected during the field assessment.

The rocky outcrops that occur on the Site may provide suitable habitat for reptiles, including garter snakes, as well as other vertebrate (e.g., mammals and birds) and invertebrate species. A Eurasian wall lizard was seen near the driveway along Cuaulta Crescent. Potential for sharp-tailed snake to occupy the rocky outcrops on the Site is considered low due to a lack of 3-dimensional features composed of rock (e.g., talus slopes or patches, or fissures in rock outcrops) and coarse woody debris (including large decaying logs or stumps with sloughing bark). In addition, fragmentation and historical disturbance from surrounding residential development have likely negatively impacted the potential for this species to occur. During the site assessment, the species in Table 2 were observed on or near the Site.

Table 2. Wildlife Species observed on site during the April 27, 2023 field visit.

Common Name	Scientific Name	BC Provincial Status[1]	*SARA* Schedule 1 Status[2]
California quail	*Callipepla californica*	Yellow	--
Anna's hummingbird	*Calypte anna*	Yellow	--
House finch	*Haemorhous mexicanus*	Yellow	--
Chipping sparrow	*Spizella passerina*	Yellow	--
Northern flicker	*Colaptes auratus*	Yellow	--
Downy woodpecker	*Picoides pubescens*	Yellow	--
Common raven (flying overhead)	*Corvus corax*	Yellow	--
Dark-eyed Junco	*Junco hyemalis*	Yellow	--
Brown-headed cowbird	*Molothrus aster*	Yellow	--
American robin	*Turdus migratorius*	Yellow	--
Brown creeper	*Certhia americana*	Yellow	--
Orange-crowned warbler	*Leiothlypis celata*	Yellow	--
Violet-green swallow	*Tachycineta thalassina*	Yellow	--
Spotted towhee	*Pipilo maculatus*	Yellow	--
Chestnut-backed chickadee	*Poecile rufescens*	Yellow	--
Pacific-slope flycatcher	*Empidonax difficilis*	Yellow	--

Red-breasted nuthatch	*Sitta canadensis*	Yellow	--

[1] BC CDC 2023a
[2] Government of Canada 2023

4.7 SPECIES AT RISK

A query of the BC CDC iMap tool yielded occurrences of 7 species and 3 ecosystems at risk within a two-kilometer radius of the Site, as well as one masked occurrence (BC CDC 2023b) (Table 3). No at-risk species or ecosystem occurrences are mapped on the Site. The location of these occurrences in relation to the Site is provided in Figure 3. None of the species or ecosystems listed in Table 3 were detected during the site assessment, nor was suitable habitat identified on the Site for the species mentioned.

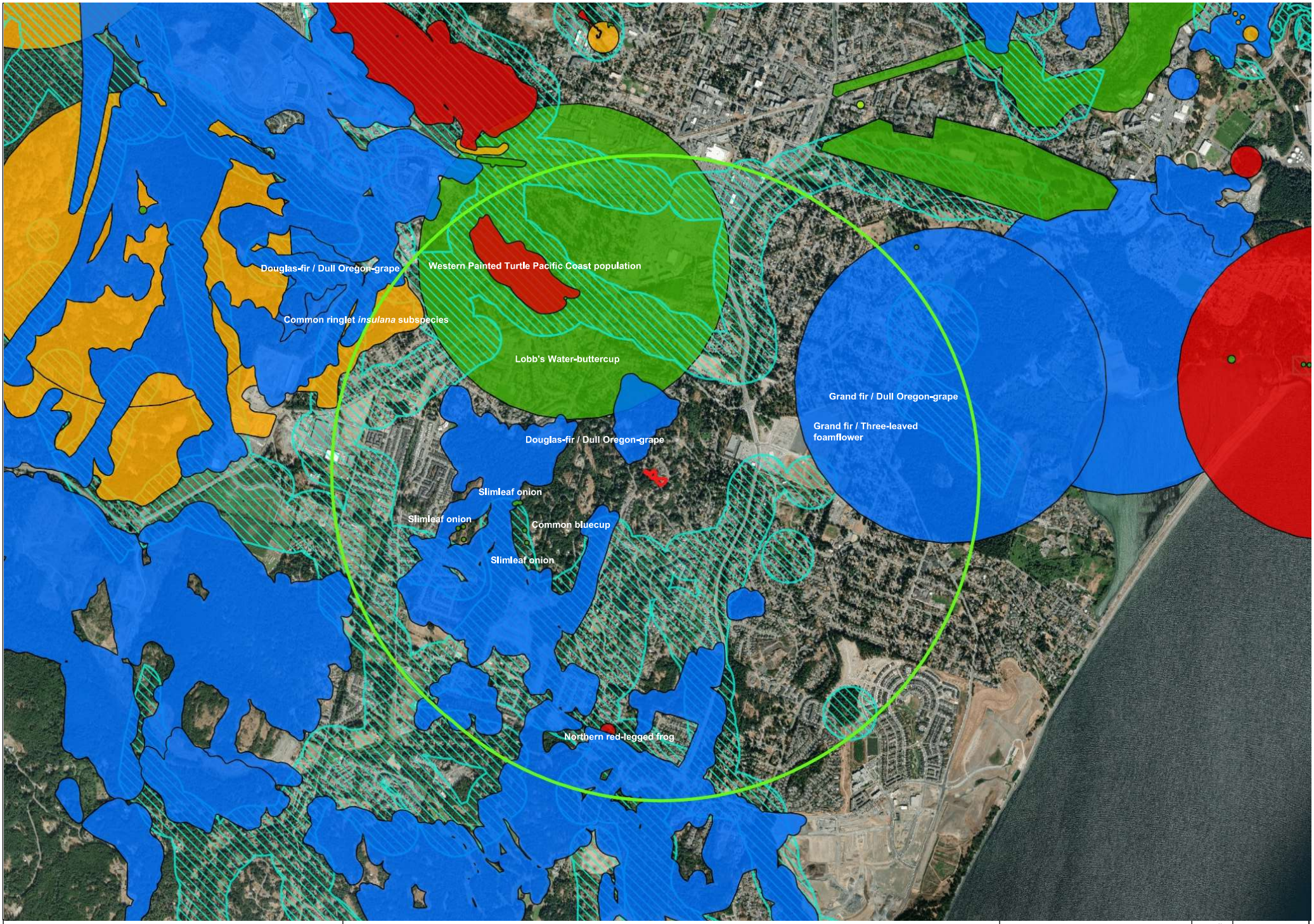
Table 3. Species at risk that may occur in the vicinity of 508 Windthrop Road, Colwood, BC.

Common Name	Scientific Name	BC Provincial Status[1]	*SARA* Schedule 1 Status[2]
Species			
Common Bluecup	*Githopsis specularioides*	Blue	n/a
Common Ringlet, *insulana* subspecies	*Coenonympha california insulana*	Red	n/a
Northern Red-legged Frog	*Rana aurora*	Blue	Special Concern
Painted Turtle - Pacific Coast Population	*Chrysemys picta pop. 1*	Red	Threatened
Phantom Orchid	*Cephalanthera austiniae*	Red	Endangered
Slimleaf Onion	*Allium amplectens*	Blue	n/a
Vancouver Island Beggarticks	*Bidens amplissima*	Blue	Special Concern
Ecosystems			
Douglas-fir / dull Oregon-grape	*Pseudotsuga menziesii / Mahonia nervosa*	Red	n/a
Grand fir / three-leaved foamflower	*Abies grandis / Tiarella trifoliata*	Red	n/a
Grand fir / dull Oregon-grape	*Abies grandis / Mahonia nervosa*	Red	n/a

[1] BC CDC 2023a
[2] Government of Canada 2023

CRITICAL HABITAT

There are no mapped critical habitat polygons on the Site, however, two polygons occur approximately 500 m to the north and 430 m to the south that reflect critical habitat for Western Painted Turtle (Pacific Coast population) (*Chrysemys picta bellii*). Western Painted Turtles are a provincially red listed (critically imperiled) species and are listed as endangered under the federal *Species at Risk Act*. This species is highly aquatic but does require terrestrial habitat for nesting, basking, and movement (Environment and Climate Change Canada 2018). Nesting habitats are on land adjacent to aquatic foraging habitat, usually within 200 m of the water body, typically on gentle south-facing slopes. There are no aquatic features on the property that would support the life history functions of this species and no nesting habitat was identified during the site assessment; therefore, the probability of Western Painted Turtle occurring on the Site is considered low.



Species at Risk and Critical Habitat within 2 km

N

0 0.73 1.5 km

1: 36,112

Sources: DataBC, Capital Regional District

Critical Habitat

- Property Boundary
- 2 km area around property boundary
- Western Painted Turtle Pacific Coast population

Species at Risk

- Ecological Community
- Invertebrate
- Vascular Plant
- Vertebrate

CORVIDAE ENVIRONMENTAL CONSULTING INC

Rev. #	Date
0	May 10, 2023

Corvidae Project No.
COR-2023-045

Figure 3

5 POTENTIAL ENVIRONMENTAL EFFECTS

The potential impacts of future development of the Site on the environment are:

- Impacts on areas with potential habitat and biodiversity values (e.g., rocky outcrops)
- Loss of native vegetation and spread of invasive plant species.
- Change in wildlife habitat availability and wildlife mortality risk.
- Sediment movement in the project area.

The residual environmental impacts of the activities on the Site will be reduced by the implementation of the mitigation and restoration measures recommended in Section 6 of this report.

AREAS WITH POTENTIAL HABITAT & BIODIVERSITY VALUES (ROCKY OUTCROPS)

Rocky outcrops occur along the northern Site boundary. Some rock excavation (blasting) is anticipated to accommodate future development, as per the geotechnical report. Blasting would cause fragmentation of this natural feature, wildlife disturbance, loss of wildlife habitat, and reduced bryoid diversity on the Site.

VEGETATION

The effects of tree and vegetation removal may include loss of biodiversity of plant species and increased susceptibility to invasive plants not only on the Site but also in adjacent plant communities. Vegetation and plant communities immediately adjacent to cleared areas may experience changes due to windthrow and changes in microclimate (increased light and moisture penetration).

INVASIVE SPECIES

Invasive plants are particularly adept at colonizing degraded plant communities and disturbed soils. Invasive plants establish readily in disturbed areas as they have a wide ecological tolerance and grow and propagate quickly. The effects of invasive plant establishment may be the reduction or displacement native species by capturing resources and occupying habitats.

WILDLIFE AND WILDLIFE HABITAT

Loss and alteration of trees and vegetation can result in the loss of habitat for wildlife species. Noise from site preparation and construction may temporarily disturb and displace wildlife residing or passing through the Site.

EROSION AND SEDIMENT

Removal of vegetation during site preparation and construction exposes soils to erosion and can result in the movement of sediment on the Site. Damage or degradation of soil surfaces during site preparation and construction can include loss of soil structure, increased erosion, and soil compaction.

6 RECOMMENDED ENVIRONMENTAL PROTECTION MEASURES

The mitigation measures provided in this report are designed to protect sensitive ecosystems and were developed in accordance with:

- The City of Colwood OCP (City of Colwood 2018),
- Procedures for Mitigating Impacts on Environmental Values (Environmental Mitigation Procedures) (BC Ministry of Environment [MOE] 2014a),
- Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia (Government of BC 2014), and
- Environmental Best Management Practices for Urban and Rural Land Development in British Columbia (BC Ministry of Water, Land and Air Protection 2004).

The mitigation measures identified below are expected to reduce potential environmental impacts when applied during subdivision site preparation and future development and building activities on the proposed lots. Alteration of rocky outcrops and tree removal (if completed) will result in permanent habitat loss that cannot be completely avoided or alleviated with mitigation.

VEGETATION

Tree retention is recommended wherever feasible on the Site. Tree protection fencing should be installed to protect the drip and root zones of retained trees near active construction areas. Fencing should also be installed to protect retained rock outcrop areas both on-site and adjacent where applicable.

It is recommended that areas disturbed by site preparation and project construction activities that are not part of a permanent road or residential footprint be replanted with native vegetation. Enhancement of the proposed lots is also recommended through the removal of invasive species (where encountered) and subsequent application of a native seed mix and installation of native plants. Table 4 details native plant species that are suitable for the area. Recommended plant density following invasive removal is 1 to 2 m^2 for shrubs and 3 m^2 for trees.

The following are recommended species to include in a native seed mix blend for application within disturbed and landscaped areas: *Festuca occidentalis* (western fescue), *Melica subulata* (Alaska oniongrass) *Elymus glaucus* (blue wildrye), *Bromus carinatus* (California brome), *Bromus vulgaris* (Columbia brome), *Festuca occidentalis* (western fescue) and *Sanicula crassicaulis* (pacific sanicle).

The purpose of using native species is to reduce irrigation maintenance in the future. The optimal time for revegetation is in the fall, prior to the wet winter season. However, planting at any time of the year (with irrigation as needed) is acceptable to prevent invasive species. A replacement ratio of 2:1 is recommended for all trees greater than 50 cm DBH (diameter breast height) on the Site that will need to be removed as part of future development proposals.

Table 4. Recommended native vegetation species for future enhancement.

Common Name	Species
Douglas-fir	*Pseudotsuga menziesii*
Arbutus	*Arbutus menziesii*
Oceanspray	*Holodiscus discolor*
Rose species	*Rosa nutkana / gymnocarpa*
Salal	*Gaultheria shallon*
Dull Oregon-grape	*Mahonia nervosa*
Great camas	*Camassia leichtlinii*

INVASIVE SPECIES

Any invasive species encountered on the Site will require removal. Invasive species should be removed using the most appropriate methods, at the correct time of year, and plant material must be disposed of correctly to avoid re-establishment or spread. Following removal, re-seed bare soil with desirable, competing vegetation. Details of removal methods for the invasive species onsite are provided below in Table 5.

Table 5. Removal and disposal methods for invasive species

Species	Removal Method	Removal Timing	Plant Disposal
English ivy	Can be removed by hand pulling and cutting of vines. Roots should be pulled so no rooted portions re-grow.	Removal should occur in the fall, when plants are easier to remove due to moist soil conditions.	Burned or bagged and disposed of properly in a landfill. Do not compost.
Himalayan blackberry	Can be removed by pulling or cutting the canes from the ground. If possible, dig out the roots, paying careful attention not to damage nearby vegetation.	Removal should occur in the spring and early summer before they produce berries as canes that are cut as the plant is producing flowers are least likely to re-sprout.	Burned or bagged and disposed of properly in a landfill. Do not compost.
Scotch broom	Avoid disturbing the soil which can stimulate dormant broom seeds to sprout. Small broom plants can be pulled easily from the ground by hand without disturbing the soil. Larger plants should be cut below the root crown using loppers or a pruning saw.	Scotch broom removal should occur mid-April through early June, when in flower and before its seed pods begin to open.	Bagged and disposed of properly in a landfill or burning. Do not 'recycle' garden debris or compost.

Species	Removal Method	Removal Timing	Plant Disposal
Spurge-laurel	Spurge-laurel can be removed by pulling small plants or cutting larger plants just below the soil. Spurge laurel stems may re-sprout after cutting and numerous seedlings may germinate so repeated site visits are necessary. Always wear gloves when handling spurge laurel because it produces a noxious substance which can cause severe eye and skin irritation. Avoid spreading berries during removal.	Can be removed year-round.	Removed plants should be bagged and disposed of properly in a landfill. Do no transport inside an enclosed vehicle as the plants can cause respiratory irritation.

Mitigation measures to control and minimize the spread of invasive weeds on the site include:

- Clean all machinery before arrival onto the site to ensure that more weed seeds and other propagules (e.g., pieces of root) are not brought into the project area.
- If fill or topsoil is imported from external areas, ensure that it is from a weed-free source.

Any soil should not be left exposed until landscaping. Disturbed areas should be seeded with fast growing vegetation such as a mix with a native clover or seed mix to compete with weed species, fix nitrogen and provide soil stabilization right after clearing.

WILDLIFE AND WILDLIFE HABITAT

Mitigation measures to minimize impacts of the proposed subdivision and subsequent residential development on wildlife and wildlife habitat include:

- Vegetation clearing should be completed outside of the migratory bird window (prior to March 15th or after August 31st; Government of Canada 2021). If vegetation clearing is scheduled within the sensitive time period for breeding birds, a QEP should conduct nest search surveys a maximum of 2-3 days prior to the start of activities. If an active nest is discovered during nest searches or clearing activities, the nest will be subject to site-specific mitigation measures (e.g., protective buffer around the nest or unobtrusive monitoring) until the young have naturally fledged/left the area. Multiple nest sweeps may be required. Nest search areas include both vegetation and any onsite, man-made structures that are scheduled for removal.
- A raptor nest survey should be completed by a QEP prior to clearing. If clearing is scheduled between January 1 and August 15, occupied or active nests would be subject to the actions described above. If any eagle or osprey nests are observed in trees to be removed, note that a permit is required to remove an eagle or osprey nest regardless of occupancy.
- Avoid additional removal of established trees or shrubs, where practical, except for identified danger trees that cannot be avoided.

- Minimize impacts to rocky outcrop areas (e.g., blasting) by designing development to align with the existing contours of the land to maintain bryoid diversity and wildlife habitat.
- Maintain natural areas where possible to promote reptile habitat by leaving natural cover like leaf litter, fallen logs, bark, and rocks. Placement of additional rocks or logs in sunny areas of the rocky outcrops is also recommended for resident reptiles, and to add habitat complexity.

EROSION AND SEDIMENT CONTROL

The primary focus of erosion and sediment control planning is erosion control; if there is no erosion then there is no sediment. Erosion control is far more cost effective to implement and manage than sediment control.

Mitigation options to minimize the potential effects of erosion and sediment movement on the natural environment include:

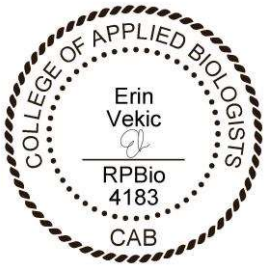
- No soil should be left exposed for more than one growing season. Disturbed areas should be seeded with fast growing vegetation such as a mix with a native clover or seed mix to compete with weed species, fix nitrogen and provide soil stabilization right after vegetation removal.
- If erosion or sediment movement is observed during site preparation activities, silt fencing or straw wattles should be installed to direct sediment to a holding area or vegetated area to settle.
- Heed weather advisories and scheduling initial clearing work to avoid excessively rainy periods (>10 cm in 24 hours) that may result in high flow volumes and/ or increase erosion and sedimentation.
- Regularly inspect and maintain Erosion and Sediment Control measures for the duration of the project.

Measures must also be taken to prevent the risk of hazardous materials and contaminant spills, including oil, gas, and hydraulic fluid during construction. It is recommended that a large, labeled, mobile spill kit is kept onsite during construction works and that all construction equipment is kept in good working order without leaks.

7 CONCLUSION

Corvidae has completed this environmental impact assessment for the proposed subdivision of 783 Cuaulta Crescent. No at-risk or aquatic ecosystems were observed on the Site; however mature trees and rocky outcrops provide habitat for a number of wildlife species. Application of the mitigation measures recommended in this report will minimize the residual impacts of the development and aim to preserve natural features on the Site.

Report Prepared By:



Erin Vekic, R.P.Bio, M.Sc.
Corvidae Environmental Consulting Inc.
604-617-5024

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APPENDIX A – SITE PHOTOGRAPHS

Photo 1. Northwest view of existing residence within proposed Lot D to remain. April 27, 2023.

Photo 2. Cuaulta Crescent roadside (east) looking southwest toward driveway. April 27, 2023

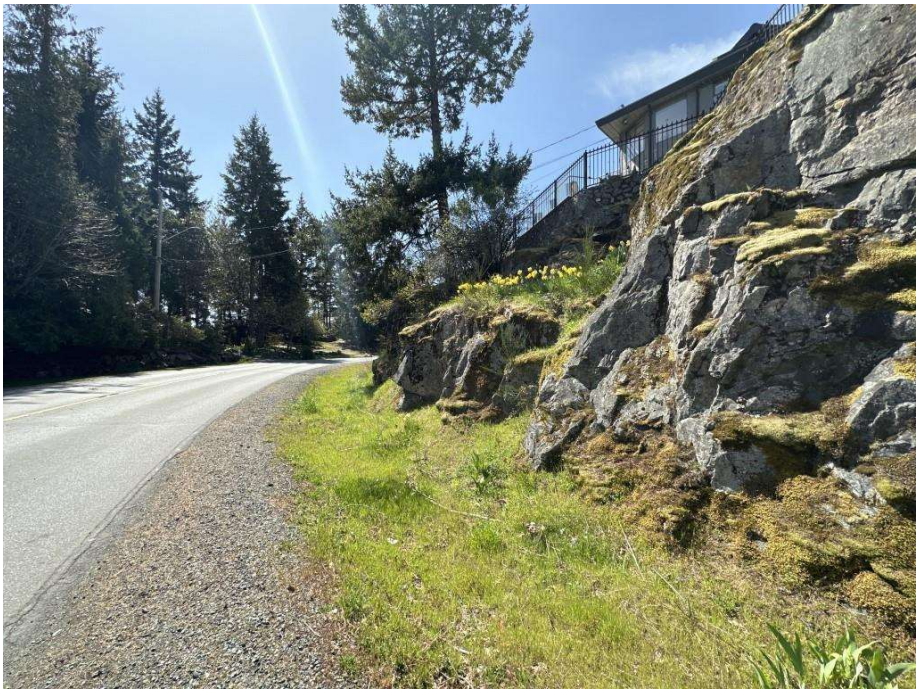


Photo 3. South view from proposed Lot D looking downslope to proposed Lot C. April 27, 2023.

Photo 4.Southeast view of topography and vegetation assemblage in proposed Lot C. April 27, 2023.

Photo 5. Treed areas in proposed Lot B, looking north/northeast. April 27, 2023

Photo 6. Southeast view of rocky outcrop upslope of property. April 27, 2023.

Photo 7. Northwest view of property from proposed Lot B. April 27, 2023.

Photo 8. Disturbed areas in the southern extent of proposed Lot A. April 27, 2023.

Photo 9. Roadside ditch along Cuaulta Crescent (west site access). April 27, 2023.

Photo 10. Southeast view of driveway at west site access off Cuaulta Crescent. April 27, 2023.

Photo 11. North view from proposed Lot B. April 27, 2023.

Schedule 1

SouthShore Forest Consultants

Arborist Report

For

783 CUAULTA CRESCENT
Hybrid 1 Development s Limited
Ross Casey

City of Colwood, B.C.

Proposed Subdivision Plan of Lot 3
Section 78 Esquimalt District, Plan 42613

October 15, 2022 – Revised Sept 9, 2023

Prepared for:
Ross Casey – Project Manager

Prepared by:

SouthShore Forest Consultants

SouthShore Forest Consultants
PO Box 2203, Sidney BC V8L-3S8
Phone: (250) 893-9056, email: butcherlodi@aol.com
GST # 777095324 RC001
Work Safe BC # 968408
Insurance/ Seafirst Brentwood (CFC Underwriting – 5 Million Dollar Liability- Policy PSG03515712)
Incorporation # BC1069996 Ltd.

RE: Arborist Assessment & Tree Protection Plan (TPP)

Background/Scope of Work

SouthShore Forest Consultants was contacted by Ross Casey (client), a residential property developer in regards to a proposed residential development at 783 Cuaulta Crescent in the City of Colwood BC. The client is requesting that SouthShore Forest Consultants provide Arborist consultation in regards to a Tree Management Plan for the site. Under the existing proposal we have identified approximately fifty (50) trees which will require removal during the Development & Building Permit phase of the project. Our assessment of the site has identified approximately fifty-four (54) trees which can be retained under the existing proposal. Several of the trees are positioned on private property within 2-5m of Lots A-C.

Several trees have been assessed to be in poor condition with structural and/or health issues. Direct impacts associated to the proposed building footprints, utility installation and grade requirements will require approximately half of the trees to be removed under the existing proposal. **Approximately twenty-six (26) Bylaw Protected size trees have been proposed for removal within the site.**

Ross Casey has requested that SouthShore Forest Consultants provide a Basic Visual Tree Assessment (BVTA) and Tree Management Plan (TMP) for the site located at 783 Cuaulta Crescent in the City of Colwood.

SouthShore Forest Consultants agreed to accept the Arborist Services and provide the findings in an Arborist Report form. The Tree Management Plan will identify tree preservation/removal and remedial plans for the trees positioned within and near the site.

Methodology

In October, 2022 the property was entered and assessed by SouthShore Forest Consultants. Michael Butcher a Consulting Arborist provided the inspection and visual tree assessment for the site. The weather that day was warm and clear. A slight wind was detected and the temperature averaged 20 +/- degrees Celsius. Dry weather conditions prevailed that morning.

The property was assessed from grade. No form of diagnostic tools or invasive techniques were used during the assessment. A "Basic Visual Tree Assessment" (BVTA) was performed while on site. All tree measurements were made with the use of a standard metal forestry tape and Clinometer (height measurements). Measurements and observations were recorded with the intent to provide a static representation of the area. A "Tree Inventory" is provided within the report and will be referred to as Appendix "B". Photographs of the site were taken during the assessment and these are included as Appendix "A" of this report.

During the assessment we observed, assessed and inventoried at total of thirty-two (32) trees positioned with in development zone. Trees have been tagged with yellow plastic tree tags. Tag numbers range from #101 to #245 & (3 x NT); 148 trees have been inventoried & assessed within and along the edges of the site. Please refer to the Tree Inventory section of the report.

Observations/Discussion

During our site assessment we observed a large well-established parcel of land approximately 3,000 metres square in size. Scheduled for a subdivision, the client has proposed to create four (4) lots. Lots A, B & C are unestablished in a forested and sloped landscape terrain. Lot D is an established residential lot which fronts Cuaulta Crescent.

The site was observed to have several large Bylaw Protected size trees positioned throughout it. In this case our observations indicate that the development/building process phase will significantly affect tree retention within the site. We observed native tree's; Douglas-fir (*Pseudotsuga menziesii*), Pacific madrone (*Arbutus menziesii*), Garry oak (*Quercus garryana*), big leaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*) and poplar (*Populus sp*.) trees within the site. Most of the trees within the site were assessed to be in fair to fair/poor condition.

The development area of the site was observed to be somewhat flat with rising edges along each side of the site. Rock outcropping and steep edging was observed during our assessment. Our assessment of the site has determined that rock blasting will more than likely be required.

During our assessment we observed several declining, partially failed and root damaged trees within the site. Several of the trees appeared to have large decay columns, voids and or infected (decayed) lower stem and root crown formations.

Tree Dynamics

Bylaw Protected Trees & Site Impacts

- **Approximately twenty-six (26) Bylaw Protected trees have been identified for removal under the existing proposal. Each positioned in direct conflict with development services and proposed building envelopes within Lots A-C.**
- **Approximately sixty-nine (69) trees could be retained in and around the site, Lots A-C.**
- Development activity including excavation/grading/blasting & utility alignments will significantly impact tree retention within this site.
- The client will be responsible for the positioning of Tree Protection Fencing (TPF) prior to the start of the development phase of the project. The TPF must be erected upon the completing of the tree removal stage during the demolition stage.
- The client will be responsible for the retention and preservation of trees positioned on private property. In this case, several private trees align the edge of the site's property lines.

Excavation Activity and Grading/Blasting – Interior of Site

- Provide Project Arborist to observe and assess excavation and grading activities within the PRZ of trees identified for retention during the Development Permit Stage of the project.
- Have Project Arborist monitor the demolition of the sites existing dwellings which are near the protected root zones of Bylaw Protected Trees.

All of the TPF must be erected and installed in the proper locations. SSFC staff must provide inspection and verification of fencing detail for municipal approval upon the completion of the tree removal stage.

Each tree protection zone must be vacated of all construction materials and/or equipment. At no time can the fence be taken down unless the Project Arborist is contacted and approval is given. In such cases the Project Arborist must assess and assist fence removal and combined impacts which are require for construction completion. Michael Butcher 250.893.9056 – 72 hours notice required.

Landing/Storage Area

- Materials storage will be confined to the proposed new road dedication and open areas of the site. See Figure #1 & #2 – Site Map

Compaction Reduction

- Utilize "hog-fuel" / wood mulch in and around the outside of tree protection areas. (May be required in this case). This will reduce the impacts to the tree Critical Root Zone (CRZ). Project Arborist to assess and provide further recommendations. Client to provide wood mulch on site for use (Utilize wood chip debris from proposed tree removal).

Root Assessment and Observation

- Provide Project Arborist for excavation observation and assessment when working within the Protected Root Zones of any Bylaw Protected Trees identified for retention. In this case we expect most interior trees to be removed due to building envelope positioning, hardscape & utility requirements.

Tree Pruning – Elevation

- Ensure that any pruning requirements are performed to meet Tree Care Industry Standards. The ANSI A300 pruning guidelines shall be utilized for all tree and shrub pruning.

Although the site has been assessed, trees in the landscape are dynamic and changes could occur. This report is a static representation of the site during our assessment.

Recommendations

- Provide tree protection fencing and Arborist Services to ensure the protection of trees identified for retention. Ensure that the fencing is erected and positioned in the identified location within the site. See figure #1 & #2.
- Provide a signage on the TPF to indicate a Tree Protection and/or environmental requirements.
- Provide Project Arborist for all excavation and soil grading activity within the PRZ of Bylaw Protected Trees. This will include the demolition phase of the project and blasting requirements within the site.
- Provide the permitting for the removal of approximately thirty-five (35) Bylaw Protected Trees within the site.
- Provide tree replacement and mitigation within the site and/or at a suitable location permitted by the City of Colwood. Under the existing tree mitigation requirements, the client could be responsible for the replacement of approximately 35 trees.
- Twelve (12) trees were removed prior to the arborist report. Trees #101- #104 & #106 - #113.

Michael Butcher
SouthShore Forest Consultants
BSc Forestry
ISA-ON-0583A
TRAQ# 1401

ATTACHMENTS

- Appendix A – Tree Inventory
- Appendix B – Site Photos

Arborist Disclosure Statement:

Arborist are tree specialists who use their education, training and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risks.
Arborist cannot detect every condition that could possibly lead to structural failure of a tree. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below the ground.
Arborist cannot guarantee that the tree will be healthy and safe under all circumstances, or for a specific period of time. Trees are dynamic specimens, not static. Changes in conditions including the environment are unknown.
Remedial treatments cannot be guaranteed.
Trees can be managed, but they cannot be controlled. The only way to eliminate all risk is to eliminate all trees.

Tree Assessment Condition Rating

Good - A tree specimen which is exempt defects, branch dieback, moderate insect and fungal identification. This tree has evenly distributed branching, trunk development and flare. The root zone is undisturbed, leaf, bud and flower production and elongation are normal for its distribution.

Fair - A tree specimen which has minor defects, branch dieback, previous limb failure, identification of cavities and insect, or fungal identification. This tree has multiple (2-3) primary stem attachments; previous utility pruning, callus growth and poor wound wood development. Minor root girdling, soil heave and identifiable mechanical damage to the root flare or root zone.

Poor- A tree specimen where 30-40% of the canopy is identifiably dead, large dead primary branching, limited leaf production, bud development and stem elongation. Limb loss or failure, and heavy storm damage leading to uneven weight distribution. Large pockets of decay, multiple cavities, heavy insect and fungal infection. Root crown damage or mechanical severing of roots. Root plate shifting, heavy lean and movement of soil.

Dead- Tree has been observed to be dead with no leaf, foliar and bud development. No stump sprouts and root suckers are present.

Excavation Process and Recommendation for Tree Root Zones

1. Provide and schedule Project Arborist to assess site prior to construction.
2. Inventory and identify trees and hazards which could complicate excavation process.
3. Utilize hand tools and cutting equipment when large tree roots are anticipated.
4. Provide small rubberized track excavation equipment which will reduce soil compaction.
5. Excavator operator must be well informed about dig site and goal to complete project.
6. Use shallow excavation sweeps across the site to establish a depth which roots can be easily identified. (3cm to 5cm in depth of soil for each sweep across the soil face)
7. Roots greater than 6cm in diameter should be preserved and inspected by the Project Arborist. The project arborist will determine if roots should be pruned or cut.
8. All roots greater than 6cm in diameter should be identified and documented for project records.
9. Photos are highly recommended for documentation purposes.

Assessment of the site may expose further tree issues or conditions. If this occurs the project arborist will contact City of Colwood Staff for further recommendations.

Tree Protection Plan – General Notes

i. **Provide a detailed sign specifying that tree protection measures are in place and will be followed during the project. Fines will be posted for malicious acts and can be placed on individuals who disregard the tree protection plan and its guidelines. Signs will be placed at each entrance of the project detailing what is expected when working in potentially high impact tree protection zones.**

ii. **Provide tree protection fencing for all trees identified with protection requirement in this report. This fencing shall be four (4ft) feet in height and made of orange plastic. If required, header and footer boards will be used to secure the protective fencing. Use the City of Colwood tree protection specifications.**

iii. **Tree protection and root protection signs will be placed on the fencing. No entry will be allowed, unless specified by the project arborist and in their presents while on site.**

iv. **Restrict vehicle traffic to designated access routes and travel lanes to avoid soil compaction and vegetation disturbances.**

v. **Make all necessary precautions to prevent the storage of material, equipment, stockpiling of aggregate or excavated soils within tree protection areas. No dumping of fuels, oils or washing of concrete fluids will be allowed in tree protection zones.**

vi. **Provide an onsite arborist when a risk of root damage, root cutting or limb removal is required within the tree protection zone.**

vii. **Avoid alterations to existing hydrological patterns to minimize vegetation impacts to the site.**

viii. **The use of a project arborist is required to provide layout of tree protection zones. The project arborist(s) will provide pre-construction information to all parties involved with the project. The arborist must be notified 72hrs prior to construction activities in sensitive areas. The project arborist should be used to provide root and branch pruning when diameters are greater than 6cm.**

ix. **At no time will tree protection zones be removed from the project unless approved by the project arborist.**

Figure #1 – Tree Inventory

Southshore Forest Consultants

APPENDIX A - TREE INVENTORY/HAZARD RATINGS SUMMARY

Location: 783 Cuaulta Crescent - Colwood B. C. - 3 lot development Date: Sept 9, 2023 Page #: 1

Conditions: Development Subdivision- treed lot - anticipated high tree impacts within the site.

TAG #	Spec.	DBH (cm)	Ht (m)	PRZ (m)	Cond. G,F,P	Impact L,M,H	Bylaw Protected	Retain	Remove	Comments/Recommendations
101	Cedar	20	4	3	F/P	H	No		X	Tree removed as of 20221014 Utility Services requirements
102	Alder	36	9	5	F/P	H	No		X	Tree removed as of 20221014 Utility Services requirements
103	Alder	30	4	5	Dead	H	No		X	Tree removed as of 20221014 Utility Services requirements
104	Alder	28	4	3	Dead	H	No		X	Tree removed as of 20221014 Utility Services requirements
105	Alder	23	5	4	F/P	M/H	No	X		Private tree- next lot - Tree has bene retained 20221014
106	Maple	34	19	6	F/F	M/H	Yes		X	Tree removed as of 20221014 Utility Services requirements
107	Arbutus	8	5	2	F/P	H	Yes		X	Tree removed as of 20221014 Utility Services requirements
108	Maple	22	7	4	F/P	H	No		X	Tree removed as of 20221014 Utility Services requirements
109	D Fir	46	27	8	F/F	H	Yes		X	Tree removed as of 20221014 Utility Services requirements
110	Cedar	24	6	4	Dead	H	No		X	Tree removed as of 20221014 Utility Services requirements
111	Arbutus	20	6	4	F/F	H	Yes		X	Tree removed as of 20221014 Utility Services requirements
112	Maple	33	19	6	F/F	H	Yes		X	Tree removed as of 20221014 Utility Services requirements
113	Maple	28	12	5	F/P	H	No		X	Tree removed as of 20221014 Utility Services requirements
114	D Fir	50	27	9	F/F	H	Yes	X		Footprint driveway - Retained at this time - Potential retention
115	D Fir	46	26	9	F/F	H	Yes	X		Footprint driveway - Retained at this time - Potential retention
116	D Fir	32	23	6	F/F	H	Yes	X		Footprint driveway - Retained at this time - Potential retention
117	D Fir	31	22	6	F/F	H	Yes	X		Footprint driveway - Retained at this time - Potential retention
118	Cedar	21	7	4	F/P	H	No	X		Footprint driveway - Retained at this time - Potential retention
119	D Fir	44	24	8	F/F	H	Yes	X		Footprint driveway - Retained at this time - Potential retention
120	D Fir	9	9	2	F/P	H	No	X		Private tree- next lot - Tree has been retained 20230906
121	Cedar	52	23	10	F/F	H	Yes	X		Private tree- next lot - Tree has been retained 20230906
122	Cedar	49	23	9	F/F	H	Yes	X		Private tree- next lot - Tree has been retained 20230906
123	Cedar	69	26	12	F/F	H	Yes	X		Private tree- next lot - Tree has been retained 20230906
124	D Fir	45	25	9	Dead	H	Yes	X		Private tree- next lot - Tree has been retained 20230906 - Failed top
125	D Fir	93	30	17	F/F/P	L/M	YES	X		Tree postioned on P/P - Protect & preserve
126	D Fir	32	26	6	F/F	L/M	YES	X		Tree postioned on P/P - Protect & preserve
127	D Fir	23	22	4	F/F	L/M	NO	X		Tree postioned on P/P - Protect & preserve
128	D Fir	28	22	5	F/F	L/M	NO	X		Tree postioned on P/P - Protect & preserve
129	D Fir	48	24	8	F/F	L/M	YES	X		Tree postioned on P/P - Protect & preserve
130	D Fir	47	24	8	F/F	M	NO	X		Tree postioned on P/P - Protect & preserve
131	G-fir	22	11	4	F/F	M	NO	X		Tree postioned on P/L tree - Protect & preserve
132	D Fir	50	27	10	F/F	L/M	YES	X		Tree postioned on P/P - Protect & preserve
133	D Fir	53	27	40	F/F	L/M	YES	X		Tree postioned on P/P - Protect & preserve
134	D Fir	10	6	2	F/P	H	NO	X		Private tree - retain - 20230906
135	Willow	23	5	4	P/P	H	NO		X	Tree removed - failed and leaning 20221014
136	D Fir	26	19	5	F/P	M	NO	X		On P/P - Protect and retain
137	Arbutus	31	6	6	F/P	M	YES	X		On P/P - Protect and retain
138	Arbutus	28	12	5	F/F	L/M	YES	X		On P/P - Protect and retain
139	Arbutus	31	12	6	F/F	L/M	YES	X		On P/P - Protect and retain
140	D Fir	50	26	10	F/F	L/M	YES	X		On P/P - Protect and retain
141	Arbutus	9	8	2	F/P	L	YES	X		On P/P - Protect and retain

Figure #1 – Tree Inventory

TAG #	Spec.	DBH (cm)	Ht (m)	PRZ (m)	Cond. G,F,P	Impact L,M,H	Bylaw Protected	Retain	Remove	Comments/Recommendations
142	D Fir	27	16	5	F/P	M/H	NO	X		Possible retention - Non Bylaw Protected - Retain at this time
143	Arbutus	28	17	5	F/P	L/M	YES	X		On P/P - Protect and retain
144	Arbutus	89	19	16	F/P	L/M	YES	X		On P/P - Protect and retain - 2 x stem
145	Maple	46	13	8	F/P	H	YES		X	Foot print tree - remove - declining health - Lot B
146	D Fir	62	22	12	F/P	H	YES		X	Basal cavity - Exposed root plate - remove - Lot B
147	D Fir	63	19	12	F/P	H	YES		X	Failed stem, 3 x stems - resting on grade - remove Lot B
148	Arbutus	7	5	2	F/P	M/H	YES	X		Retain and protect - Preserve at this time
149	D-fir	62	30	11	F/F	H	Yes	X		Retain and protect - Preserve at this time
150	D-fir	28	18	5	F/F	H	No		X	Non Bylaw Protected - remove Lot B
151	D-fir	56	24	10	F/P	H	Yes		X	Shallow root plate - exposed roots - remove - Lot B
152	G-oak	14	6	3	F/P	H	Yes		X	Shallow root plate - exposed roots - remove - Lot B
153	D-fir	24	20	5	F/P	H	No		X	Non Bylaw Protected - remove Lot B
154	D-fir	53	24	9	F/F	H	Yes		X	Foot print tree - grade cut & fill impacts - remove - Lot B
155	D-fir	34	21	6	F/F	H	Yes		X	Foot print tree - grade cut & fill impacts - remove - Lot B
156	D-fir	37	37	6	F/P	H	Yes		X	Foot print tree - grade cut & fill impacts - remove - Lot B
157	D-fir	79	79	14	F/F	M/H	Yes		X	Edge of building envelope - Removal recommended - Lot B
158	arbutus	61	61	11	F/F	M/H	Yes	X		Possible retention - large specimen - development dependent
159	D-fir	60	60	11	F/F	M/H	Yes	X		Possible retention - large specimen - development dependent
160	D-fir	59	59	10	F/F	H	Yes		X	Shallow rooted - exposed roots - Lot B
161	D-fir	33	33	5	F/P	H	Yes		X	Failed tree leaning on grade/rock - Lot B
162	D-fir	27	16	5	F/P	H	No		X	Non Bylaw Protected - remove - Lot B
163	D-fir	45	22	8	F-F/P	M/H	Yes	X		J- root stem formation - retain at DP - Lot B
164	D-fir	39	27	6	F/F	M/H	Yes	X		Possible retention - development dependent - Lot B
165	D-fir	70	35	12	F/P	M/H	Yes	X		Possible retention - large specimen - development dependent - Lot B
166	arbutus	69	25	12	F-F/P	M/H	Yes	X		Possible retention - large specimen - development dependent - Lot B
167	D-fir	41	26	7	F/F	M/H	Yes	X		Retain at DP- Lot B
168	arbutus	70	21	12	F/P	M/H	Yes	X		3 x stem, decay columns in base of tree - Lot B
169	D-fir	28	16	5	F/P	M/H	No	X		Non Bylaw Protected - retain at DP - Lot B
170	D-fir	27	16	5	F/P	M/H	No	X		Non Bylaw Protected - retain at DP - Lot A
171	D-fir	57	19	10	F/P	M/H	Yes	X		Failed stem, heavy lean- retain at DP - Lot A
172	Maple	28	17	5	F/P	M/H	No	X		Non Bylaw Protected - retain at DP - 4 stems - Lot A
173	Maple	26	16	5	F/F	M/H	No	X		Non Bylaw Protected - retain at DP - Lot A
174	D-fir	26	15	5	F/P	M/H	No	X		Non Bylaw Protected - retain at DP - Lot A
175	Alder	27	16	5	F/P	M/H	No	X		Non Bylaw Protected - retain at DP - Lot A
176	Maple	100 +	27	18	F/P	M/H	Yes	X		Unique basal area at grade in rock - footprint & stability issue - Lot C
177	D-fir	18	14	3	F/F	M/H	No	X		P/P - to be retained & protected
178	Alder	21	19	4	F/P	M/H	No	X		Non Bylaw Protected - storm damage - recent top failure - Lot C
179	Arbutus	49	17	8	F/P	M/H	Yes		X	Foot print tree - cut & fill requirements due to grade - Lot C
180	D-fir	53	28	10	F/F	M/H	Yes		X	Foot print tree - cut & fill requirements due to grade - Lot C
181	D-fir	87	36	15	F/F	M/H	Yes		X	Foot print tree - cut & fill requirements due to grade - Lot C
182	Arbutus	100	25	18	F/P	M/H	Yes		X	Foot print tree - cut & fill requirements due to grade - Lot C
183	D-fir	34	19	6	F/F	M/H	Yes		X	Foot print tree - cut & fill requirements due to grade - Lot C
184	D-fir	28	17	5	F/P	M/H	No		X	Non Bylaw Protected - Lot C
185	D-fir	34	18	6	F/P	M/H	Yes		X	Exposed root plate - remove - Lot C
186	D-fir	36	19	6	F/F	M/H	Yes		X	Footprint tree - pending development - Lot C
187	Arbutus	28	8	5	F/P	M/H	Yes		X	Footprint tree - pending development - Lot C

TAG #	Spec.	DBH (cm)	Ht (m)	PRZ (m)	Cond. G,F,P	Impact L,M,H	Bylaw Protected	Retain	Remove	Comments/Recommendations
188	D-fir	28	16	5	F/F	M/H	No	X		Non Bylaw Protected - Lot C
189	D-fir	63	30	11	F/F	M/H	Yes	X		Outside footprint - retain - Lot C
190	Maple	23	17	4	F/P	M/H	No	X		P/P - to be retained and protected - Lot C
191	Maple	24	17	4	F/F	M/H	No	X		P/P - to be retained and protected - Lot C
192	Maple	50	20	9	F/P	M/H	Yes	X		P/P - to be retained and protected - Lot C
193	Maple	50	21	9	F/P	M/H	Yes	X		P/P - to be retained and protected - Lot C
194	D-fir	27	18	5	F/F	M/H	No	X		Non Bylaw Protected - Lot C
195	Maple	27	19	5	F/F	M/H	No	X		P/P - to be retained and protected - Lot C
196	**Maple**	**42**	**20**	**8**	**F/P**	**H**	**Yes**		**X**	**2 x stem - Low attachment at grade - footprint - Lot A**
197	Maple	48	21	8	F/P	M/H	Yes	X		2 x stem low attachment at grade - footprint - remove - Lot A
198	**Alder**	**27**	**16**	**5**	**Dead**	**H**	**No**		**X**	**Non Bylaw Protected - Lot A - dead standing tree 20230906**
199	Alder	40	20	7	F/P	H	No	X		Non Bylaw Protected - 3 trees - Lot A
200	**Alder**	**40**	**20**	**7**	**F/P**	**H**	**No**		**X**	**Non Bylaw Protected - 4 trees - Lot A - (1) dead standing**
NT	D-fir	49	25	8	F/F	L/M	Yes	X		At neighbours retaining wall - edge of exisiting driveway - P/P- Protect
NT	Cedar	87	27	16	F/F	L/M	Yes	X		At neighbours retaining wall - edge of exisiting driveway - P/P- Protect
240	Plum	43	7	8	F/P	L/M	No	X		Public or private tree - Pending verification
241	Plum	23	5	4	F/P	M/H	No	X		P/P - pending verification
242	D-fir	71	26	13	F/P	L/M	Yes	X		P/P - tree positioned on neighbouring lot - Lot C
243	D-fir	35	25	6	F/F	M	Yes	X		P/P - tree positioned on neighbouring lot - Lot C
244	Maple	32	22	6	F/F	M	Yes	X		P/P - tree positioned on neighbouring lot - Lot C
245	**Arbutus**	**47**	**8**	**8**	**F/P**	**H**	**Yes**		**X**	**Remove - Driveway approch - Lot C**
NT	G oak	5	4	1	F/F	L/M	Yes	X		Pending footprint - possible to transplant?

Terms & Meanings

DBH – Diameter Breast Height, tree stem measured at approximately 1.4m above grade.

PRZ – Protected Root Zone, (10cm of trunk diameter = to 1.8m of protection distance) - out from the tree stem.

Tree Condition - (G, F, P), G = Good, F = Fair, P = Poor (Condition is a combination of health + structure).

Impact - (L, M, H), expected development interaction required within tree root, branch and stem zones.

Bylaw Protected - in the City of Colwood all Native Tree Species tree species and trees greater than that 60cm in diameter are protected.

CRZ – Critical Root Zone, a zone below grade which usually contains the large structural roots formations.

Appendix "A"

Figure #1 – Site Map – Proposed Lot A & B – Staging & Tree Protection Fencing

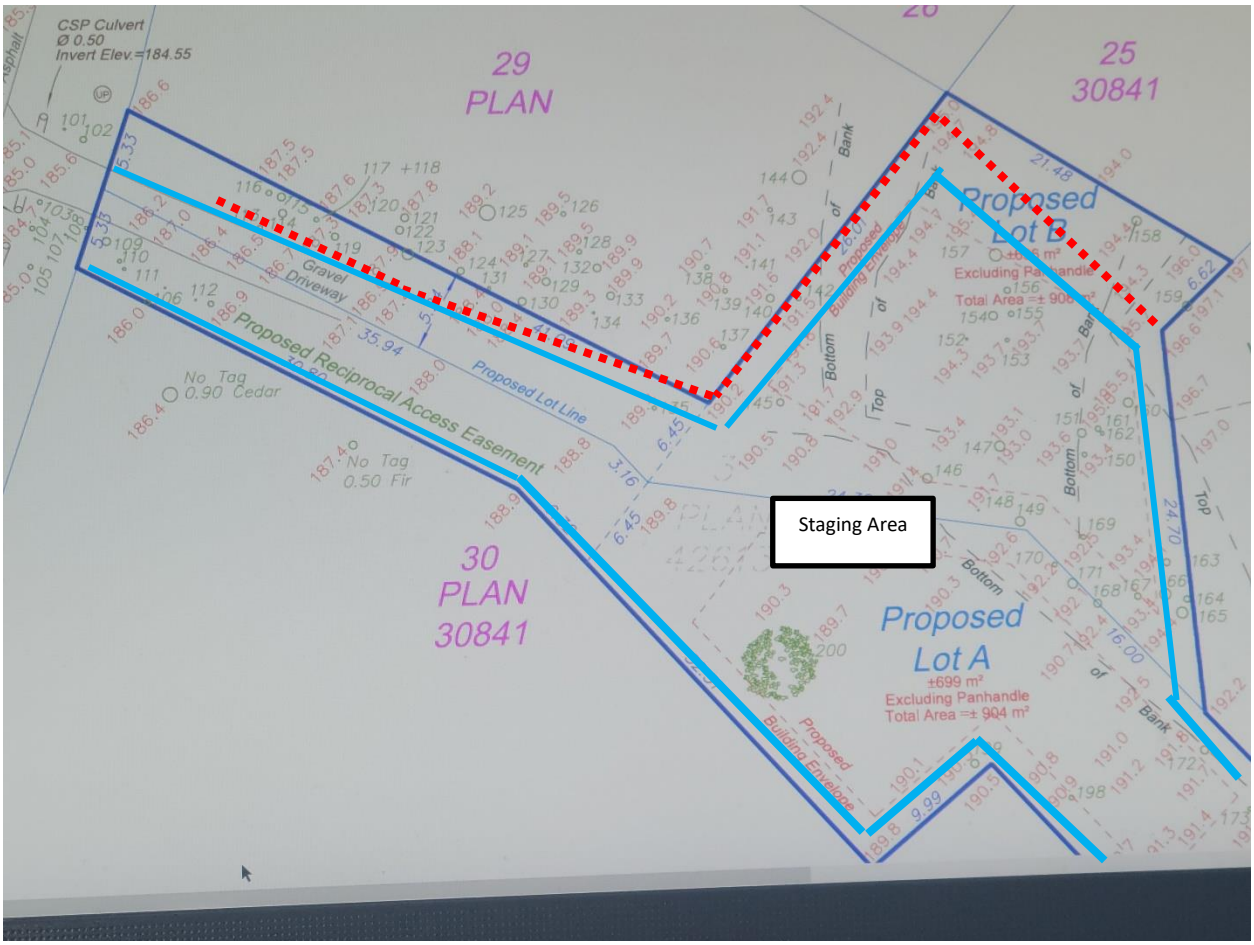


Photo #1 – Figure #2 – Site Map – Proposed Lot C & D – Staging & Tree Protection Fencing

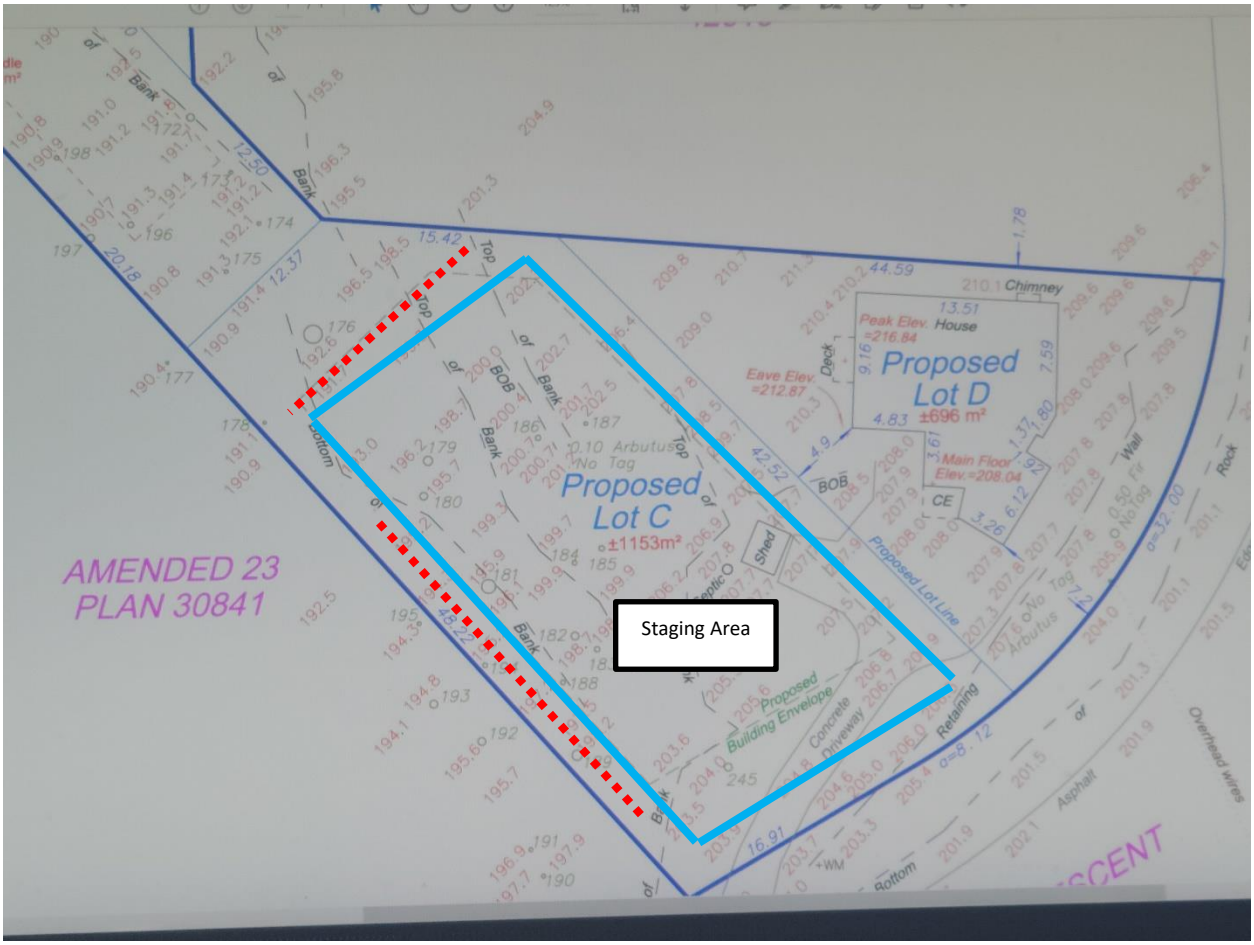


Figure #3 – Proposed Servicing Alignment

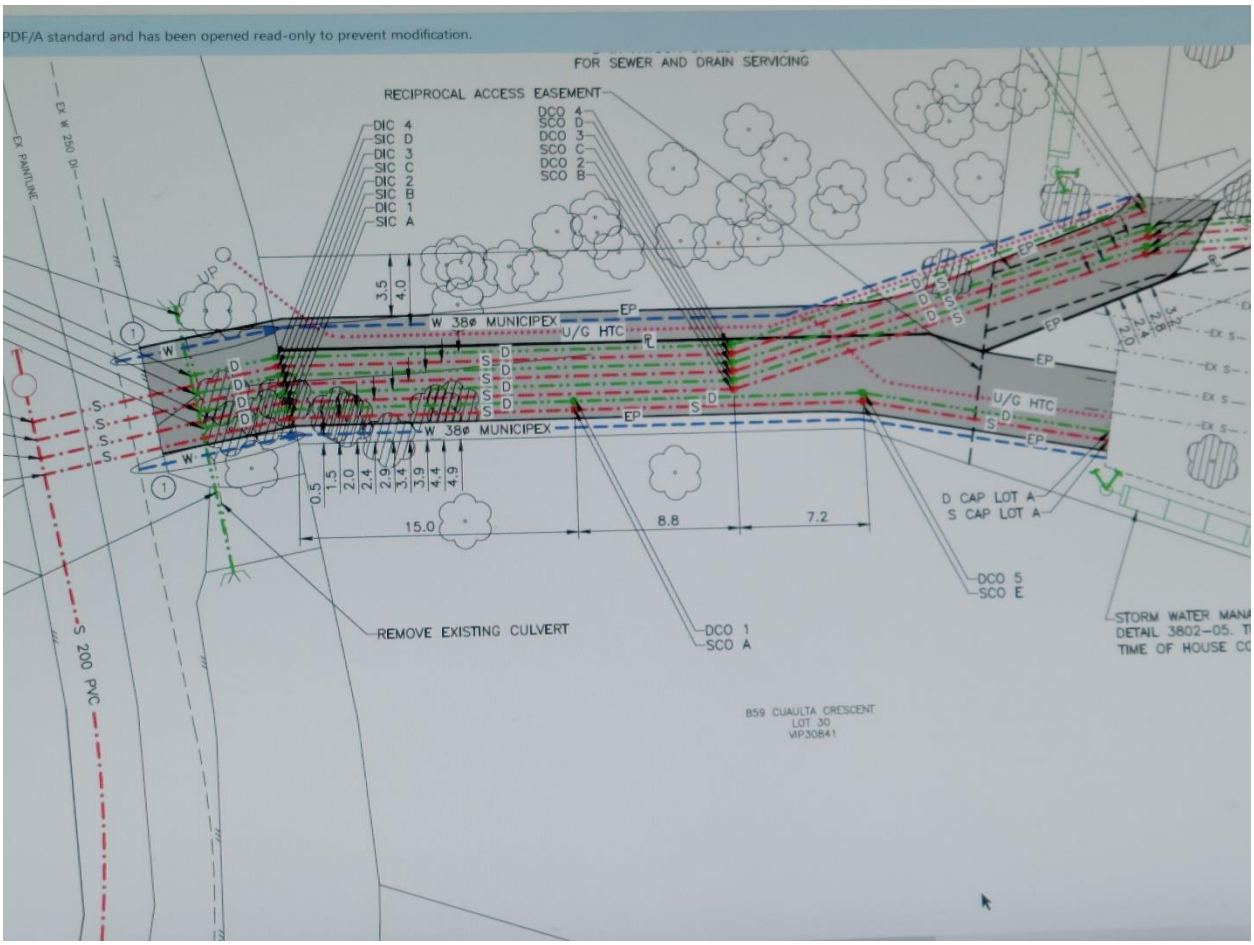
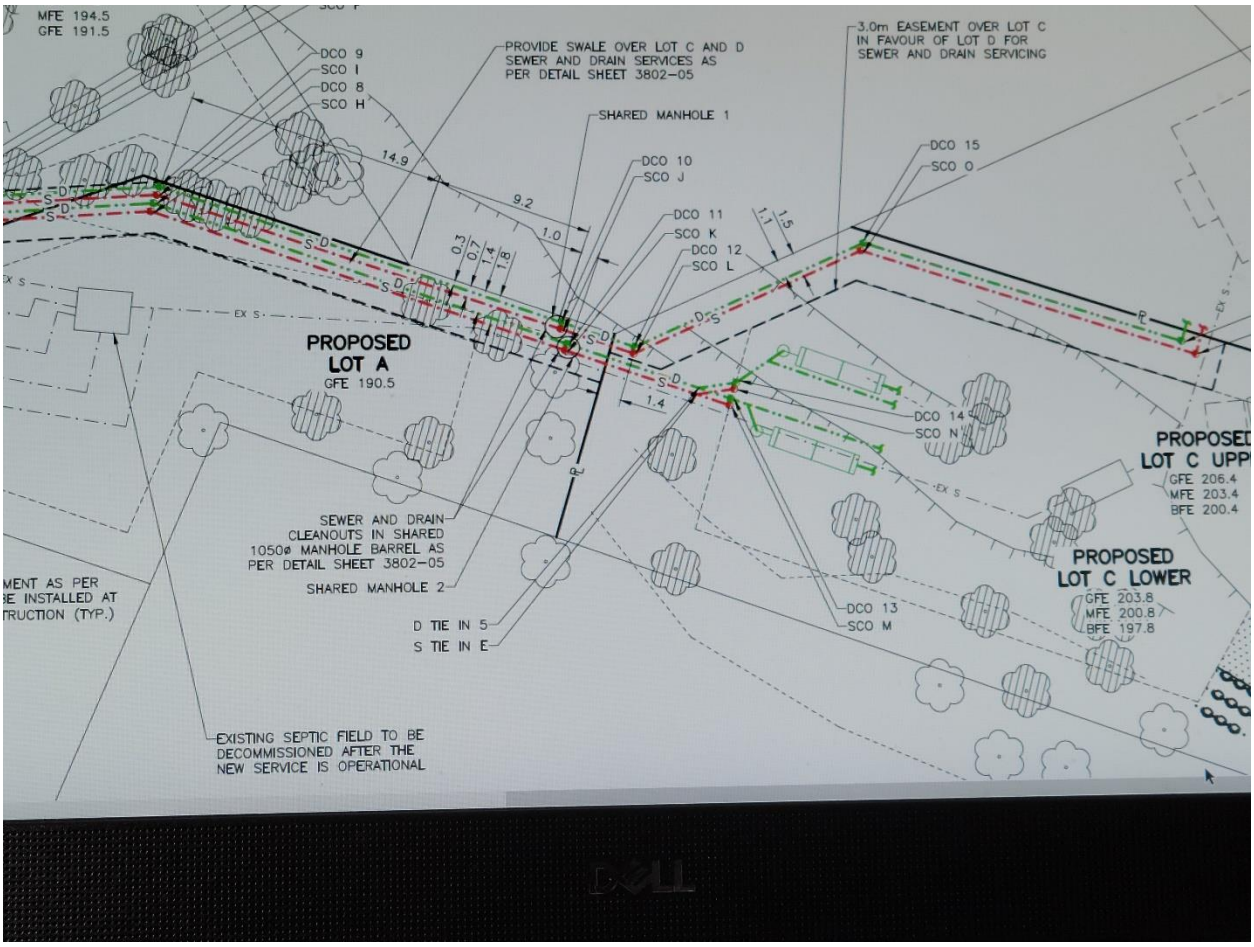


Figure #4 – Proposed Servicing Alignment



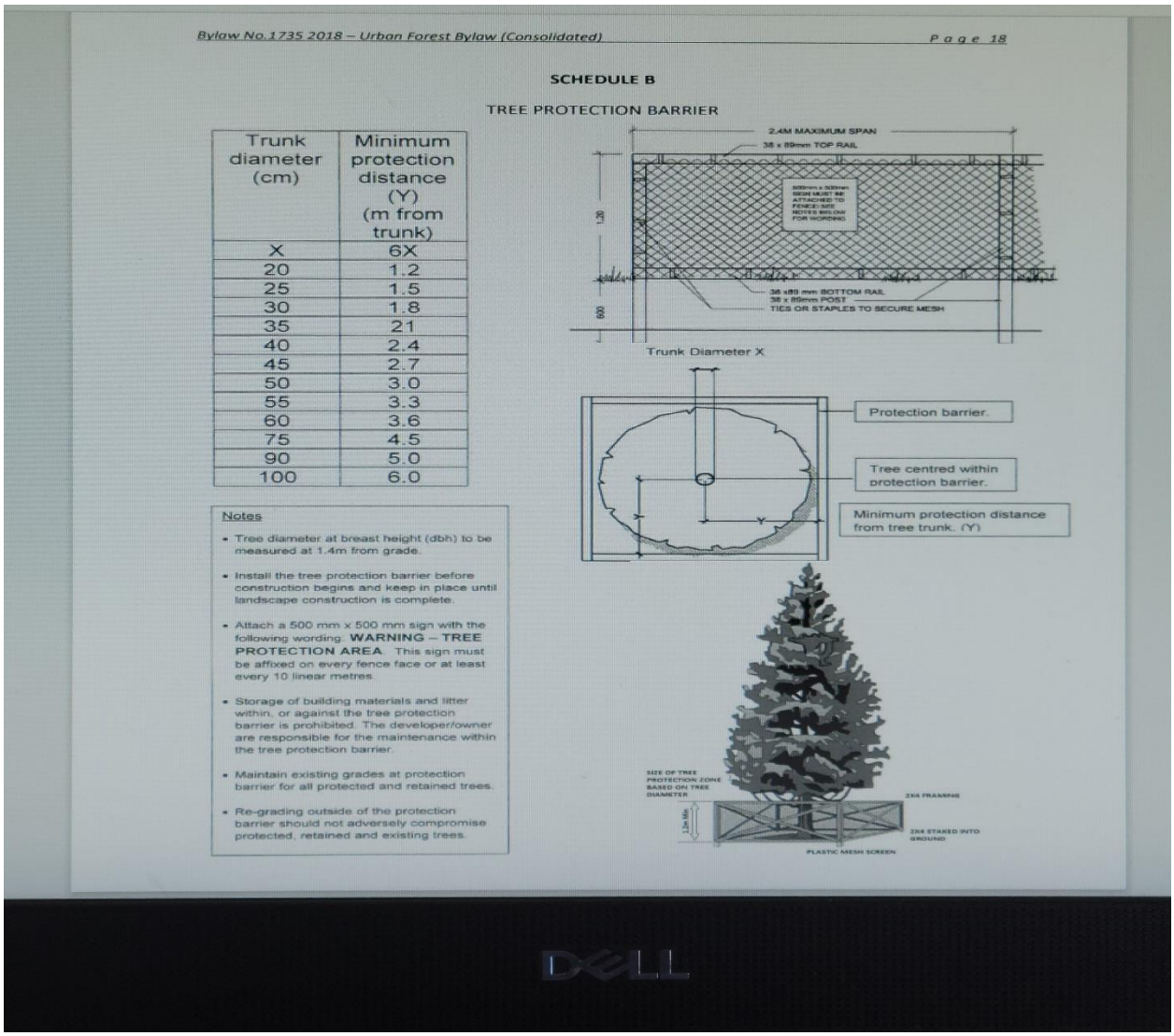
Project Arborist to assess and monitor the excavation and utility alignment requirements when working within tree protected root zones.

Photo #4 – Tree Protection Fencing

In this photo you can see an example of an acceptable tree protection fencing barrier. The Municipal Boulevard must be protected to reduce soil and root compaction. The TPF fence shall have a posted sign reading “Tree Protection Area – No Admittance”.

Photo #5 – Tree Protection Signage

Figure #3 – Tree Protection Guidelines – City of Colwood



Bylaw No.1735 2018 – Urban Forest Bylaw (Consolidated) *Page 18*

SCHEDULE B

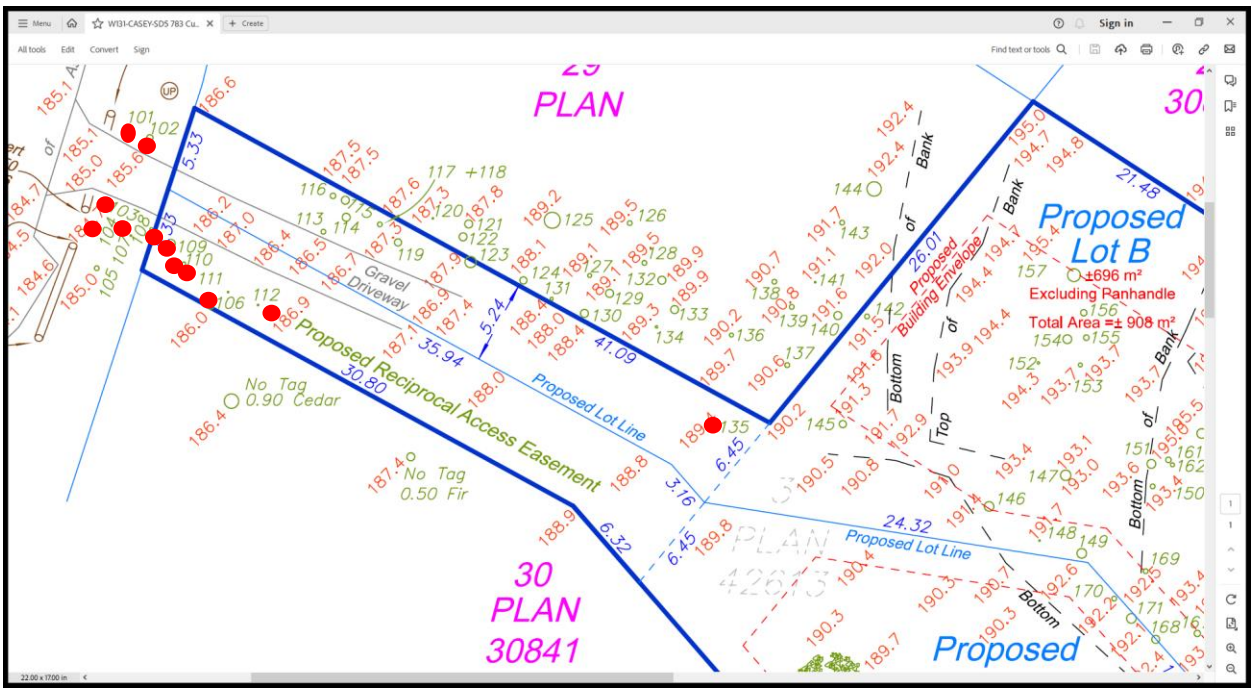
TREE PROTECTION BARRIER

Trunk diameter (cm)	Minimum protection distance (Y) (m from trunk)
X	6X
20	1.2
25	1.5
30	1.8
35	21
40	2.4
45	2.7
50	3.0
55	3.3
60	3.6
75	4.5
90	5.0
100	6.0

Notes

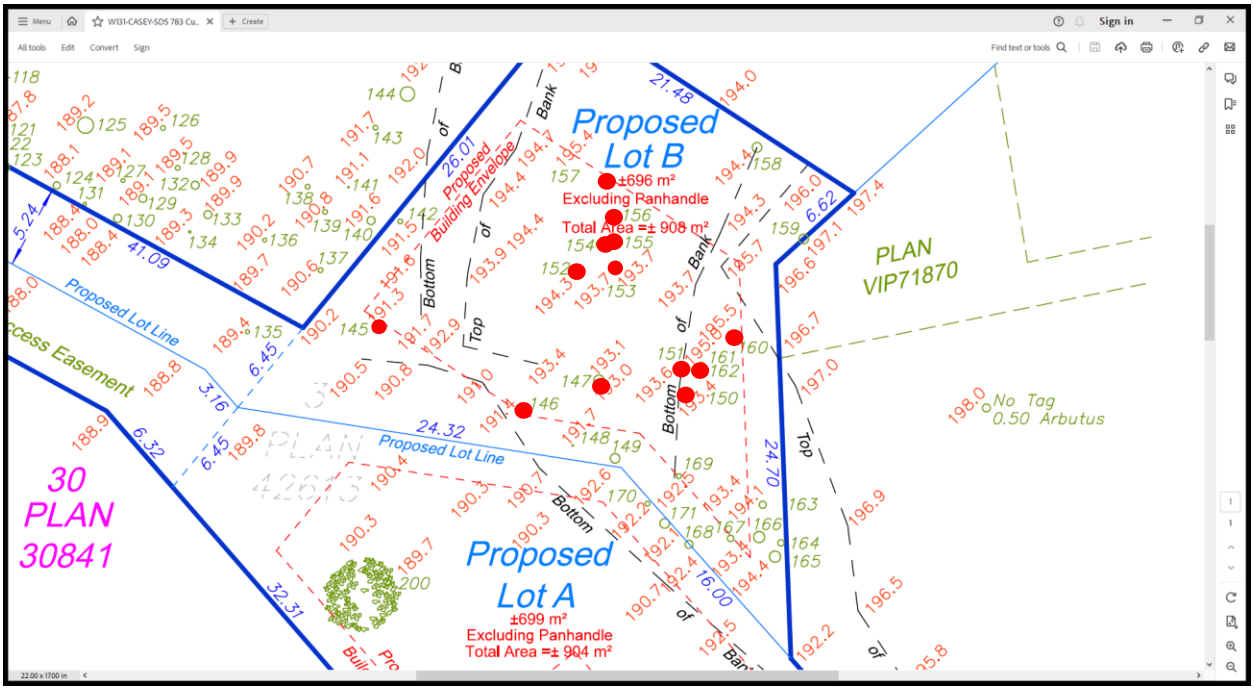
- Tree diameter at breast height (dbh) to be measured at 1.4m from grade.
- Install the tree protection barrier before construction begins and keep in place until landscape construction is complete.
- Attach a 500 mm x 500 mm sign with the following wording: **WARNING – TREE PROTECTION AREA**. This sign must be affixed on every fence face or at least every 10 linear metres.
- Storage of building materials and litter within, or against the tree protection barrier is prohibited. The developer/owner are responsible for the maintenance within the tree protection barrier.
- Maintain existing grades at protection barrier for all protected and retained trees.
- Re-grading outside of the protection barrier should not adversely compromise protected, retained and existing trees.

Figure #4 – Previous Tree Removals – Access Lane



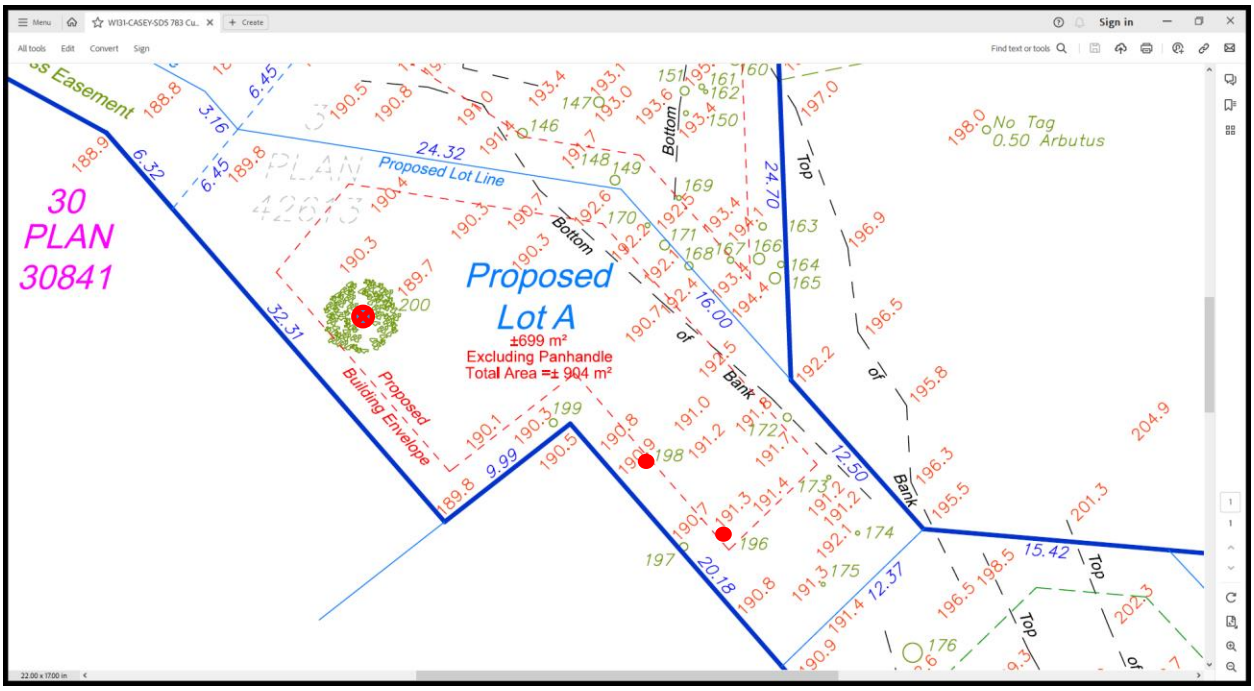
Trees #103, #104 & #110 were assessed to be dead prior to removal.
Tree #135 willow was a failed and leaning tree – Observed to have been removed on 20230906.

Figure #5 – Lot B – Proposed Tree Removal



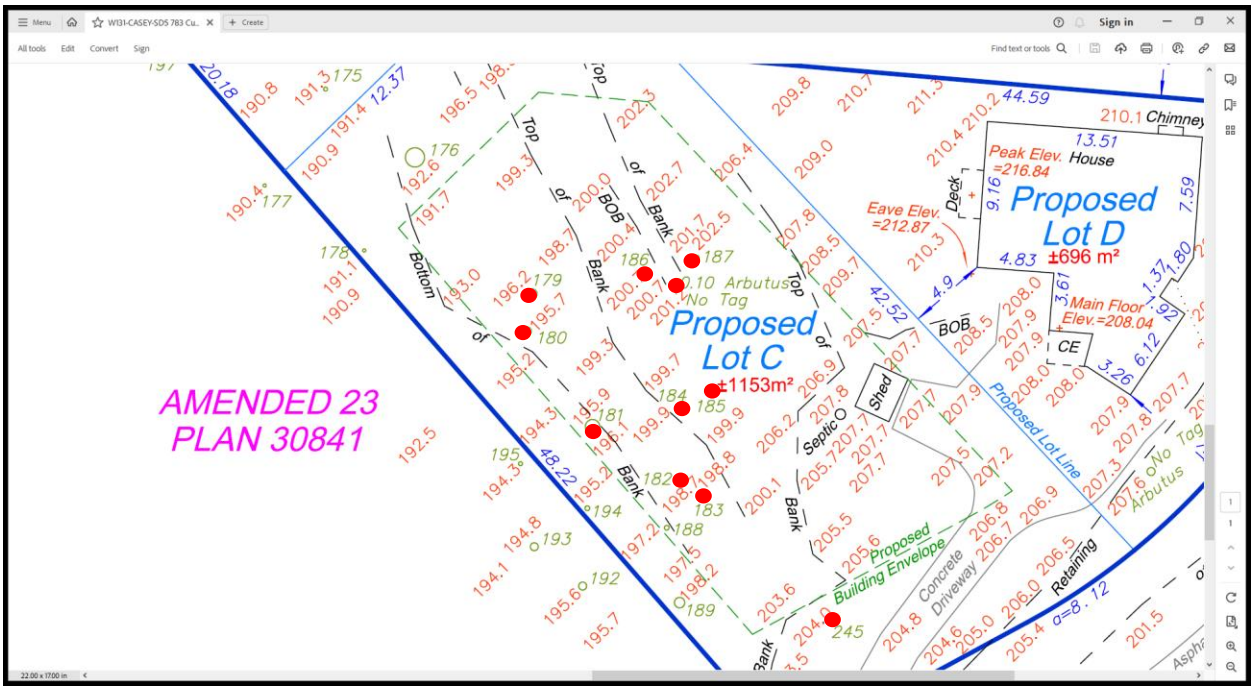
Tree #161, #146 & #147 were assessed & observed to be a failed tree resting on grade.

Figure #6 – Lot A – Proposed Tree Removal



Tree #198 was assessed and observed to be dead – 20230906

Figure #7 – Lot C – Proposed Tree Removal



Tree Removal Summery – Sept 9, 2023 – Revised Sept 27, 2023

	Trees Removed	Proposed Tree removal	Bylaw Protected	Dead & Damaged Trees	Tree replacement	
Access Lane	12 trees	0	5	3	5	
Lot A	0	6	1	2	1	
Lot B	0	13	12	3	12	
Lot C	0	11	9	0	9	
Totals	12	30	27	8 = N/A	27	Tree replacement count
Less 10 trees – 2022 & 2023 tree removal allotment				Not Applicable	27	27 trees to be replaced at 1:1

Schedule 3

RYZUK GEOTECHNICAL
Engineering & Materials Testing
6-40 Cadillac Ave, Victoria, BC, V8Z 1T2 Tel: 250-475-3131 E-mail: mail@ryzuk.com www.ryzuk.com

April 5, 2023
File No: 11177-1

Hybrid 1 Developments Ltd.
4479 Abraham Court
Victoria BC
V8Z 7G4

Attn: Ross Casey by email at rossrealty@shaw.ca

Re: 4 Lot Subdivision
783 Cuaulta Cres - Colwood BC

INTRODUCTION

As requested, we have completed an assessment of the geotechnical conditions at the above referenced site, as such relate to the proposed subdivision. We have previously submitted a report for this proposed subdivision (dated July 20, 2022), however, due to Lot reconfiguration and changes to the design plans for the location of proposed infrastructure this revision has been issued. As such, we provide this updated report to address these revisions and requests.

BACKGROUND & SITE DESCRIPTION

We understand the existing Lot will be subdivided into four new Lots (Proposed Lot's A, B, C, D), with Lot D containing the existing residence. The site is located within the "City of Colwood - Official Community Plan - Steep Slopes Development Permit Area (DPA)" and as such requires geotechnical evaluation of potential hazards. Our work has been carried out in accordance with Engineers and Geoscientists BC (EGBC) "Professional Practice Guidelines – Landslide Assessments in British Columbia", with the associated Landslide Assessment Assurance Statement affixed to this report.

The site is a 0.366 ha lot that is irregular in shape and bounded by single family residential lots to the north and south and separate sections of Cuaulta Crescent to the west and east. The topography of the site is ravine-like, and descends from the eastern portion of Cuaulta Crescent to the western portion with a vertical relief of about 20 m across a horizontal distance of about 145 m.

GEOTECHNICAL INVESTIGATION

Our geotechnical investigation consisted of an office-based review of available geotechnical information, including the proposed subdivision plan prepared by Summit Land Surveying, dated June 20, 2022 (attached), satellite imagery, BC Government Open Source LiDAR digital elevation model (DEM) and surficial and bedrock geology mapping. Our review of available geology mapping for the site indicates

that the parcel is underlain by shallow bedrock with potential for a veneer of undifferentiated soil cover. The bedrock mapped at the site is comprised of volcanic rocks of the Metchosin Igneous Complex.

SURFACE CONDITIONS & OBSERVATIONS

Our field investigation included conducting site reconnaissance and visually assessing the terrain, including steep slopes and other potential hazards across the parcel on June 3, 2022.

The topography of the parcel is generally bedrock controlled with a sparse cover of mature Douglas Fir and Arbutus tree species and a shrubby understory including grass and moss-covered bedrock. Bedrock slopes on the east side of proposed Lot C are roughly 10 to 12 m in total height with 2 to 3 m high vertical portions separated by flat benched areas between 3 to 4 m width, and general slope inclinations in the order of 30 to 45 degrees from horizontal. The bedrock outcrops mostly weather to a rounded, hummocky geomorphology and forms an undulating surface. The open bedrock slopes display a prominent northwest-southeast orientation with an orthogonal fracture set developed within, which generally trends east-west. The bedrock orientation and benched nature was observed on the LiDAR DEM with no large faults or structural discontinuities within the rock mass noted within the parcel or developed locally.

Bedrock slopes down to meet an approximately 5 to 8 m wide valley floor which parallels the western property line and continues in a northwest – southeast direction through the proposed Lot A and towards the western extension of Cuaulta Crescent. The valley floor widens to roughly 15 m at the west end of Lot A and is gently sloped toward the northwest with black silty organic rich soil overlying native dense gravelly silt. Within the central portion of Lot A up to 1 m of fill material was observed atop the native soils, which we understand was introduced as part of the septic field for the residence on Lot D. Along the boundary between Lot's A and B, near vertical bedrock slopes that are 3 to 4 m in height are present which trend northwest-southeast. Beyond this boundary, Lot B generally contains shallowly sloped, grass covered bedrock benches up to 1.5 m in height, with flatter areas separating the benches.

Off the Cuaulta Crescent eastern road edge, adjacent to the entrance driveway on Lot D, there is a boulder stack retaining wall roughly 6 m in height that supports a gravel surfaced parking area and septic tank. The wall is approximately 5 to 7 m in length and back filled with granular material. Boulders within the wall were interlocked, mostly angular and up to 1.5 m in diameter. Sections of HDPE drainpipe were observed on the retaining wall conveying wastewater downslope.

In general, although difficult to ascertain under moss and grass cover, there were no apparent large-scale discontinuities or zones of structural weakness observed in any of the exposed bedrock. However, during our site reconnaissance we observed some loose rock and free-standing boulders on the benched bedrock areas on the east side of Lot C that could potentially pose a rockfall hazard to structures downslope. These boulders appear to consist of weathered bedrock when compared to lithology of the intact bedrock slopes present on the parcel.

During our traverse we did not observe any standing or flowing water on the parcel, however, we consider that stormwater from the bedrock slopes along the east property line will be conveyed downslope to the valley floor paralleling the west property line.

DISCUSSION AND RECOMMENDATIONS

Based on the above, we did not observe any evidence of large-scale slope instability that would preclude safe subdivision of the parcel, provided such is undertaken in accordance with the recommendations presented below.

We consider that the loose, free-standing boulders on the bedrock slopes within Lot C are a geohazard that could become mobilized during seismic ground motions. We recommend that during earthworks construction any loose bedrock material which may be considered a rockfall hazard be cleared.

We understand that the existing boulder stack wall off the driveway entrance to the east leg of Cuaulta Crescent will be removed prior to construction work commencing on Lot C. Dismantling of such will need to be undertaken with care to ensure rockfall material is not dislodged to runout uncontrolled downslope. The existing shed on site will be removed and an access driveway to the future residence on Lot C will occupy this space. We have not seen design drawings for the proposed residences on Lot C, but based on discussions on site we understand that the buildings will incorporate tall cast-in-place concrete foundation walls founded on bedrock subgrade. We consider the bedrock subgrade suitable for placement of foundation elements for the future proposed residential buildings. We recommend that foundations be pinned to bedrock where the slope of the bedrock surface exceeds 10 degrees from horizontal and is not naturally well-keyed. Alternatively, such may be chipped to create a level surface. Footing locations on bedrock should be reviewed by a geotechnical professional to confirm the stability of each location once cleaned of organics and loose rock material.

Based on the conditions observed on site, we expect that some rock excavation (blasting) of the bedrock slopes on Lots B and C will be required prior to construction. We recommend all permanent cutslopes into bedrock should be excavated between 0.25H and 0.5H:1V. Rock cuts require care during excavation as blasting often creates irregularities and accentuates pre-existing weaknesses which may require stabilization. We anticipate that rock scaling and/or construction of rockfall protection measures may be required during excavation and blasting. Rock slopes should be further assessed by a geotechnical professional, during construction. According to WorkSafeBC guidelines, excavations deeper than 1.2 m must be inspected and approved by a qualified geotechnical professional prior to worker entry.

Blasting will create associated ground vibration that could be experienced on adjacent properties. Pre-blast surveys on adjacent properties are recommended prior to commencement of any blasting operations. Peak particle velocities must be kept within industry standard acceptable limits to avoid damage to adjacent structures.

We have reviewed the draft civil drawings prepared by Westbrook Consulting Ltd. Dated July 2022, for the proposed subdivision. Based on our review of the plans we consider such generally geotechnically feasible.

We expect that the downslope portion of the proposed driveway for Lower Lot C will require a cast-in-place concrete wall for support of engineered fill at this location. Current plans show several 1.2 m high retaining walls which could be added as landscaping detail but would not be relied on for support of the driveway. We expect that other than engineered fill required for the driveways to access Lot C Upper and Lower, as well as in areas for levelling the grade on proposed Lot A, there will be no areas that require engineered fill for building support.

We have reviewed the stormwater management plan for the proposed subdivision which includes Stormtech detention chambers tying into municipal drain servicing for Lot C, and standalone infiltration chambers for proposed Lot's A and B. We consider the native soils on site to have moderate infiltration capacity and suitable for support of Stormtech chambers. We recommend hydraulic conductivity testing should be completed for design of stormwater management systems relying on in-ground disposal of stormwater. The chambers for proposed Lot C should be located sufficiently downslope so that they do not reside atop sloping bedrock but are founded upon dense native soils on site. We recommend appropriate perimeter drainage be provided to structures, such as, but not limited to conventional perimeter foundation drainage, to prevent buildup of hydrostatic pressure upon foundation walls.

We recommend that all non-select fills and organics should be removed, and the proposed foundations be extended to bear atop native undisturbed mineral soils, intact/fractured in-place bedrock, or approved engineered fill placed atop such. We can provide additional geotechnical design recommendations associated with the proposed construction prior to building permit approval.

While we consider development on Lots A and B to be feasible we recommend that a geotechnical covenant be registered on Lot C to ensure that the free standing boulder stack wall is removed prior to development occurring on this proposed Lot. Once the hazard associated with this boulder wall is removed, we consider development on Lot C to be geotechnically feasible, provided our recommendations above are implemented.

CLOSING

In summary, we consider that the proposed development would be feasible from a geotechnical perspective. We acknowledge that the City of Colwood planning staff and building inspectors may rely upon this report when making a decision on applications for the subdivision or development of the land. Provided the finished development is conformant with professional design recommendations above, we consider that the land may be used safely for the use intended, pursuant to the DPA guidelines and Section 86 of the Land Title Act and the B.C. Building Code. Our assessment has taken into consideration a design seismic event with a 2% probability of exceedance in 50 years, pursuant to the Guidelines for Legislated Landslide Assessments for Proposed Residential Developments in BC.

We trust the preceding is suitable for your purposes at present. Please do not hesitate to contact our office if we can be of further assistance.

Regards,
Ryzuk Geotechnical (PTPN: 1002996)

Kevin G. Golding, P.Eng.
Intermediate Geotechnical Engineer

Christian J. Flanagan, P.Eng.
Lead Geotechnical Engineer
Operations Manager

Attachments:

- Table 1: Current Conditions of Proposed Lots A, B and C – photos taken June 3rd, 2022
- Proposed Subdivision Plan, Summit Land Surveying, June 20, 2022.
- EGBC Legislated Landslide Assurance Statement (Appendix D)

Table 1 – Current Conditions of Each Proposed Lot

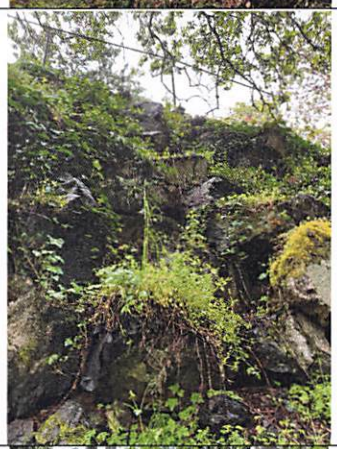
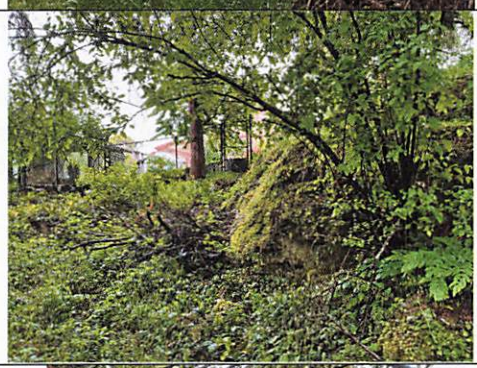
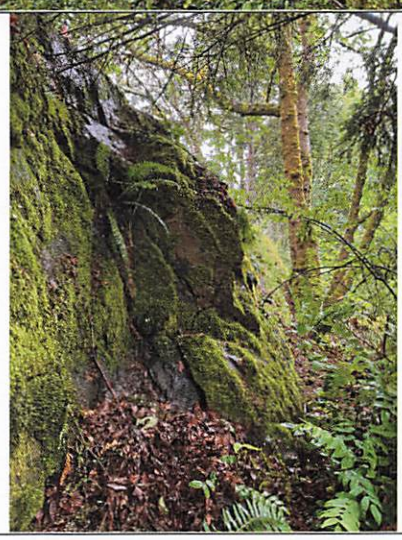
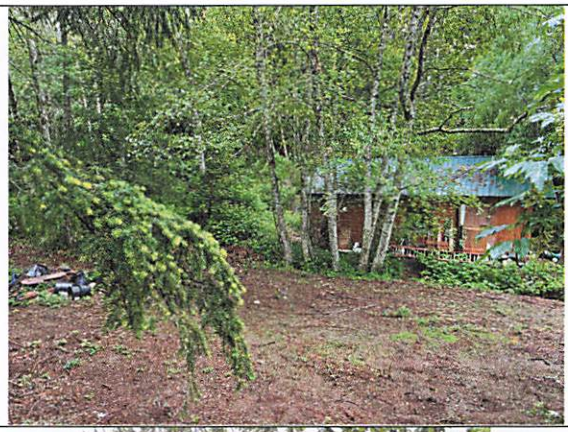
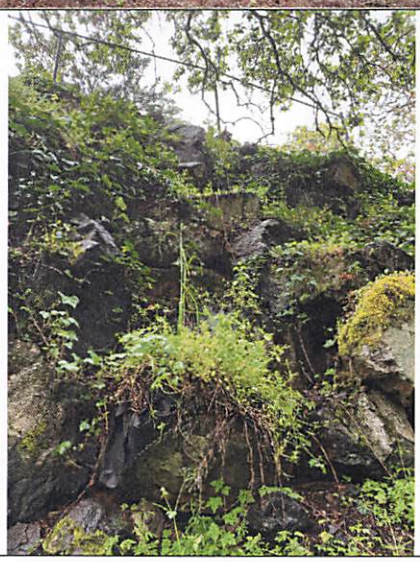
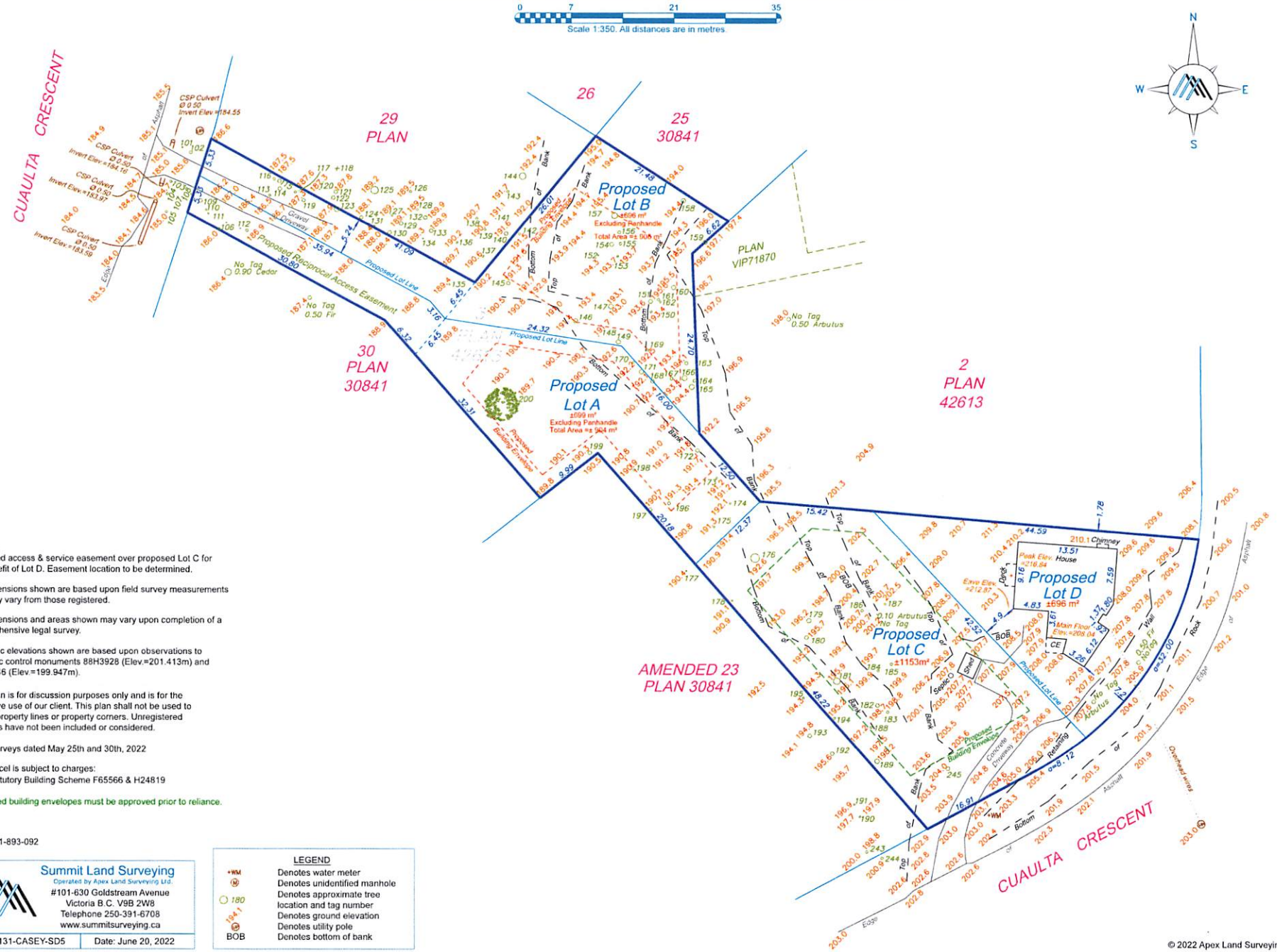
LOT	PHOTO	COMMENTS
C		Proposed Lot C looking northwest. Benched bedrock slopes with a cover of grass and moss.
C		Existing boulder stack wall supporting a gravel surfaced parking pad above. We understand this wall will be removed prior to development on Lot C. A covenant has been placed on the subdivision to ensure removal of this wall prior to construction on proposed Lot C
C		Looking southeast upslope toward Proposed Lot C. Generally, bedrock covered with vegetation and some trees. Note loose boulder material on the slope which will need to be removed prior to construction activities.

Table 1 (continued) – Current or Recent Condition of Each Lot

LOT	PHOTO	*COMMENTS*
B		Looking from Proposed Lot B toward Proposed Lot C. Generally less steep bedrock exposures on Lot B
B		Proposed Lot B contains generally flat topography with some low bedrock benches covered in moss and grass.
A/B		Proposed Lot A exposed bedrock slopes downslope of Lot B at the approximate boundary between Lots A and B

LOT	PHOTO	COMMENTS
A		Proposed Lot A looking southwest from Proposed Lot B. Area currently occupied by septic field. All fill and septic field elements will require removal and inspection of native soils by a geotechnical professional to occur prior to foundation placement.
A		Existing boulder stack wall supporting a gravel surfaced parking pad above. We understand this wall will be removed prior to development on Lot C

PROPOSED SUBDIVISION PLAN OF LOT 3, SECTION 78, ESQUIMALT DISTRICT, PLAN 42613.



NOTE:

Proposed access & service easement over proposed Lot C for the benefit of Lot D. Easement location to be determined.

Lot dimensions shown are based upon field survey measurements and may vary from those registered.

Lot dimensions and areas shown may vary upon completion of a comprehensive legal survey.

Geodetic elevations shown are based upon observations to geodetic control monuments 88H3928 (Elev.=201.413m) and 88H3946 (Elev.=199.947m).

This plan is for discussion purposes only and is for the exclusive use of our client. This plan shall not be used to define property lines or property corners. Unregistered interests have not been included or considered.

Field surveys dated May 25th and 30th, 2022

The parcel is subject to charges:
- Statutory Building Scheme F65566 & H24819

Proposed building envelopes must be approved prior to reliance.

PID: 001-893-092

Summit Land Surveying
Operated by Apex Land Surveying Ltd.
#101-630 Goldstream Avenue
Victoria B.C. V9B 2W8
Telephone 250-391-6708
www.summitsurveying.ca

W131-CASEY-SD5 | Date: June 20, 2022

LEGEND

WM	Denotes water meter
	Denotes unidentified manhole
180	Denotes approximate tree location and tag number
194.1	Denotes ground elevation
	Denotes utility pole
BOB	Denotes bottom of bank

© 2022 Apex Land Surveying Ltd.

APPENDIX D: *LANDSLIDE ASSESSMENT ASSURANCE STATEMENT*

Note: This Statement is to be read and completed in conjunction with the "*APEGBC Guidelines for Legislated Landslide Assessments for Proposed Residential Development in British Columbia*", March 2006/Revised September 2008 ("*APEGBC* Guidelines") and the "2006 BC Building Code (BCBC 2006)" and is to be provided for *landslide assessments* (not floods or flood controls) for the purposes of the Land Title Act, Community Charter or the Local Government Act. Italicized words are defined in the *APEGBC* Guidelines.

To: The *Approving Authority*
Development Services, City of Colwood
3300 Wishart Road, Victoria, BC V9C 1R1
Jurisdiction and address

Date: April 5, 2023

With reference to (check one):

- ☑ Land Title Act (Section 86) – Subdivision Approval
- ☐ Local Government Act (Sections 919.1 and 920) – Development Permit
- ☐ Community Charter (Section 56) – Building Permit
- ☐ Local Government Act (Section 910) – Flood Plain Bylaw Variance
- ☐ Local Government Act (Section 910) – Flood Plain Bylaw Exemption
- ☐ British Columbia Building Code 2006 sentences 4.1.8.16 (8) and 9.4 4.4.(2) (Refer to BC Building and Safety Policy Branch Information Bulletin B10-01 issued January 18, 2010)

For the Property: 783 Cuaulta Crescent, Colwood, BC
Legal description and civic address of the Property

The undersigned hereby gives assurance that he/she is a *Qualified Professional* and is a *Professional Engineer* or *Professional Geoscientist.*

I have signed, sealed and dated, and thereby certified, the attached *landslide assessment* report on the Property in accordance with the *APEGBC Guidelines.* That report must be read in conjunction with this Statement. In preparing that report I have:

Check to the left of applicable items

☑ 1. Collected and reviewed appropriate background information
☐ 2. Reviewed the proposed *residential development* on the Property
☑ 3. Conducted field work on and, if required, beyond the Property
☑ 4. Reported on the results of the field work on and, if required, beyond the Property
☑ 5. Considered any changed conditions on and, if required, beyond the Property
6. For a *landslide hazard analysis* or *landslide risk analysis* I have:
   ☑ 6.1 reviewed and characterized, if appropriate, any *landslide* that may affect the Property
   ☑ 6.2 estimated the *landslide hazard*
   ☑ 6.3 identified existing and anticipated future *elements at risk* on and, if required, beyond the Property
   ☑ 6.4 estimated the potential *consequences* to those *elements at risk*
7. Where the *Approving Authority* has adopted a *level of landslide safety* I have:
   ___ 7.1 compared the *level of landslide safety* adopted by the *Approving Authority* with the findings of my investigation
   ___ 7.2 made a finding on the *level of landslide safety* on the Property based on the comparison
   ___ 7.3 made recommendations to reduce *landslide hazards* and/or *landslide risks*
8. Where the *Approving Authority* has **not** adopted a *level of landslide safety* I have:

☑ 8.1 described the method of *landslide hazard analysis* or *landslide risk analysis* used

☑ 8.2 referred to an appropriate and identified provincial, national or international guideline for *level of landslide safety*

☑ 8.3 compared this guideline with the findings of my investigation

☑ 8.4 made a finding on the *level of landslide safety* on the Property based on the comparison

☐ 8.5 made recommendations to reduce *landslide hazards* and/or *landslide risks*

☐ 9. Reported on the requirements for future inspections of the Property and recommended who should conduct those inspections.

Based on my comparison between

Check one

☐ the findings from the investigation and the adopted *level of landslide safety* (item 7.2 above)

☑ the appropriate and identified provincial, national or international guideline for *level of landslide safety* (item 8.4 above)

I hereby give my assurance that, based on the conditions[1] contained in the attached *landslide assessment* report,

Check one

☑ for subdivision approval, as required by the Land Title Act (Section 86), "that the land may be used safely for the use intended"

Check one

☑ with one or more recommended registered covenants.

☐ without any registered covenant.

☐ for a development permit, as required by the Local Government Act (Sections 919.1 and 920), my report will "assist the local government in determining what conditions or requirements under [Section 920] subsection (7.1) it will impose in the permit".

☐ for a building permit, as required by the Community Charter (Section 56), "the land may be used safely for the use intended"

Check one

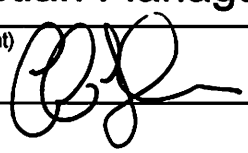
☐ with one or more recommended registered covenants.

☐ without any registered covenant.

☐ for flood plain bylaw variance, as required by the "Flood Hazard Area Land Use Management Guidelines" associated with the Local Government Act (Section 910), "the development may occur safely".

☐ for flood plain bylaw exemption, as required by the Local Government Act (Section 910), "the land may be used safely for the use intended".

Christian Flanagan, P.Eng.
Name (print)


Signature

April 5, 2023
Date

[1] When seismic slope stability assessments are involved, *level of landslide safety* is considered to be a "life safety" criteria as described in the National Building Code of Canada (NBCC 2005), Commentary on Design for Seismic Effects in the User's Guide, Structural Commentaries, Part 4 of Division B. This states:

"The primary objective of seismic design is to provide an acceptable level of safety for building occupants and the general public as the building responds to strong ground motion; in other words, to minimize loss of life. This implies that, although there will likely be extensive structural and non-structural damage, during the DGM (design ground motion), there is a reasonable degree of confidence that the building will not collapse nor will its attachments break off and fall on people near the building. This performance level is termed 'extensive damage' because, although the structure may be heavily damaged and may have lost a substantial amount of its initial strength and stiffness, it retains some margin of resistance against collapse".

28 Crease Avenue - Victoria, BC
Address

V8Z 1S3

250-475-3131
Telephone

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
C. J. FLANAGAN
45682
APR 5, 2023

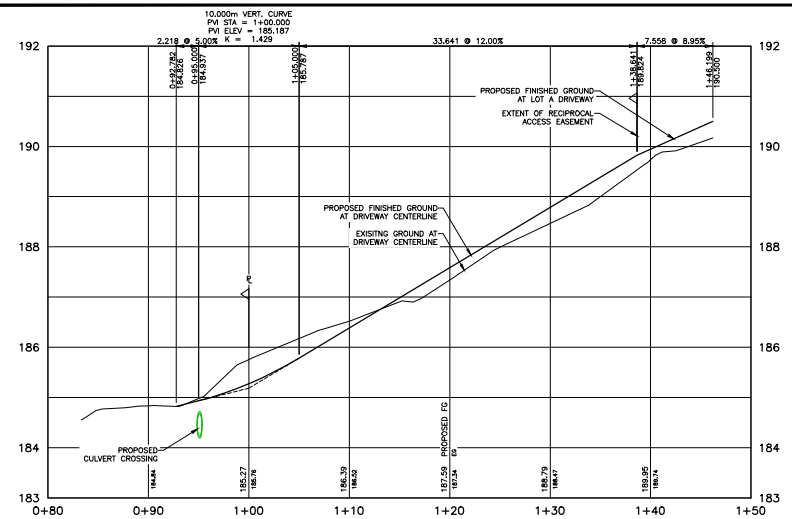
PN: 1002996

(Affix Professional seal here)

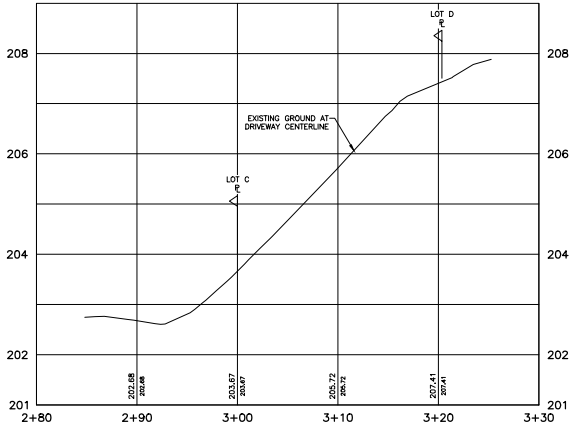
If the *Qualified Professional* is a member of a firm, complete the following.

I am a member of the firm Ryzuk Geotechnical
and I sign this letter on behalf of the firm. (Print name of firm)

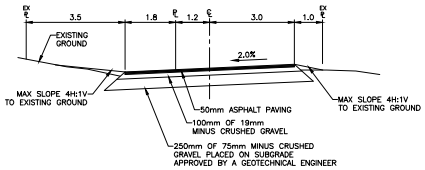
Schedule 4



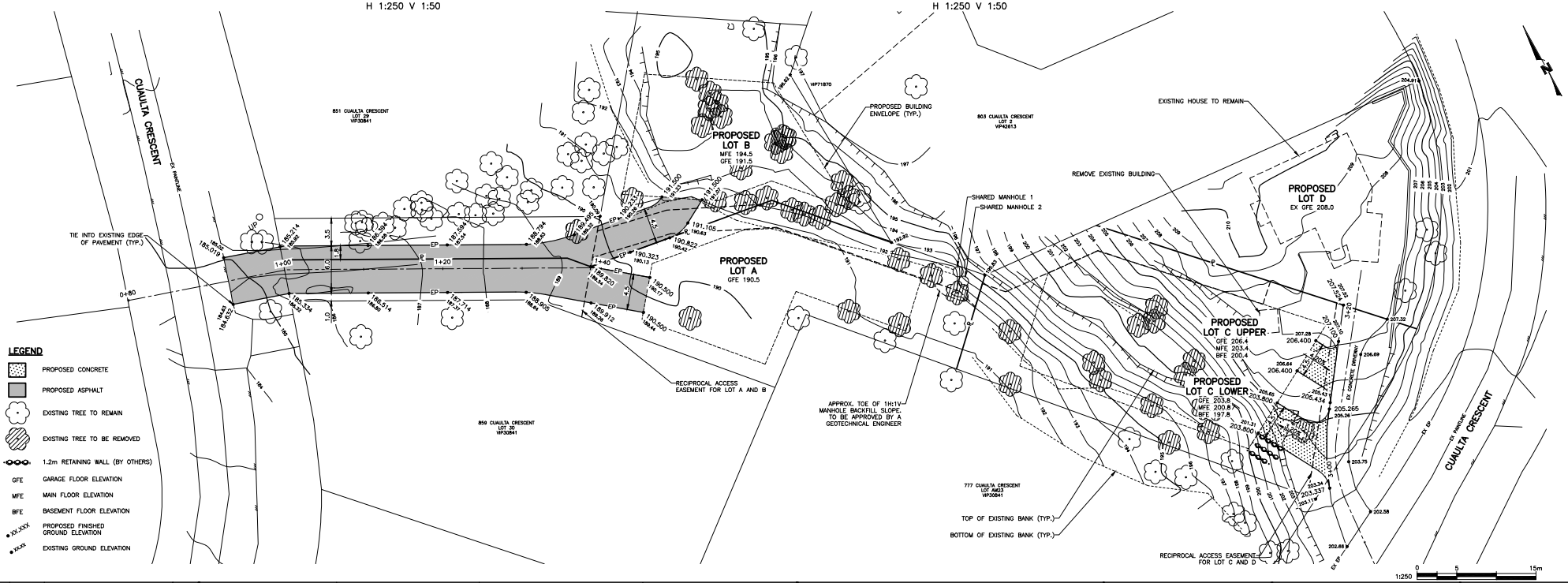
LOT A AND B COMMON DRIVEWAY PROFILE
H 1:250 V 1:50



LOT C AND D COMMON DRIVEWAY PROFILE
H 1:250 V 1:50



LOT A/B COMMON DRIVEWAY TYPICAL SECTION
NTS



LEGEND

- PROPOSED CONCRETE
- PROPOSED ASPHALT
- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED
- 1.2m RETAINING WALL (BY OTHERS)
- GFE — GARAGE FLOOR ELEVATION
- MFE — MAIN FLOOR ELEVATION
- BFE — BASEMENT FLOOR ELEVATION
- PROPOSED FINISHED GROUND ELEVATION
- EXISTING GROUND ELEVATION

No.	DATE	REVISION	ENGR
1	23.03.02	REVISED AS PER COLWOOD COMMENTS	MW

EXISTING	PROPOSED
MANHOLE	
CLEANOUT	
LIFT STATION	
INSPECTION CHAMBER	
CATCH BASIN	
SILT TRAP	
SEEPAGE PIT	
CULVERT	
DITCH	
HYDRANT	
WATER VALVE	
FLUSH VALVE	

EXISTING	PROPOSED
AIR VALVE	
WATER METER	
IRRIGATION VALVE	
UTILITY MANHOLE *	
SERVICE BOX *	
LPT	
UTILITY POLE *	
POLE–MOUNT LS	
ORNAMENTAL LUMINAIRE	
TRAFFIC SIGNAL	

*SUBSTITUTE I,C,T AS REQUIRED

EXISTING	PROPOSED
SANITARY	S
SANITARY FORCEMAIN	FM
STORM DRAIN	D
WATER	W
GAS	G
ELECTRICAL	
ROAD CURB	NWC
EDGE OF PAVEMENT	
DRIVEWAY	
SIDEWALK	
PROPERTY LINE	
EASEMENT	

EXISTING	PROPOSED
	FENCE
	SLOPE – TOP
	SLOPE – BOTTOM
	CONTOUR – MAJOR
	CONTOUR – MINOR
	BOUNDARY
N/A	BUILDING ENVELOPE
	VEGETATION LINE

BENCHMARK: 88H3931
ELEVATION: 177.765

WESTBROOK Consulting Ltd.
#115 - 866 Goldstream Ave,, Victoria, BC V9B 0J3
Telephone: 250-391-8592 Facsimile: 250-391-8593

Colwood

DESIGN	IK
DRAWN	JR
CHECKED	
ENGINEER	MW

SEAL

PROJECT: **783 CUALTA CRESCENT**
HYBRID 1 DEVELOPMENTS LTD

TITLE: **GRADING PLAN**
DRIVEWAY PLANS & PROFILES

DATE: JULY 2022

DRAWING NO. 3802–03

COLWOOD FILE NO. 3320–20–SUB–22–011

COLWOOD CONTRACT NO.

SCALE: H 1:250 V 1:50

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SHEET: 3 OF 5

REV: 1

DATE LAST PRINTED:

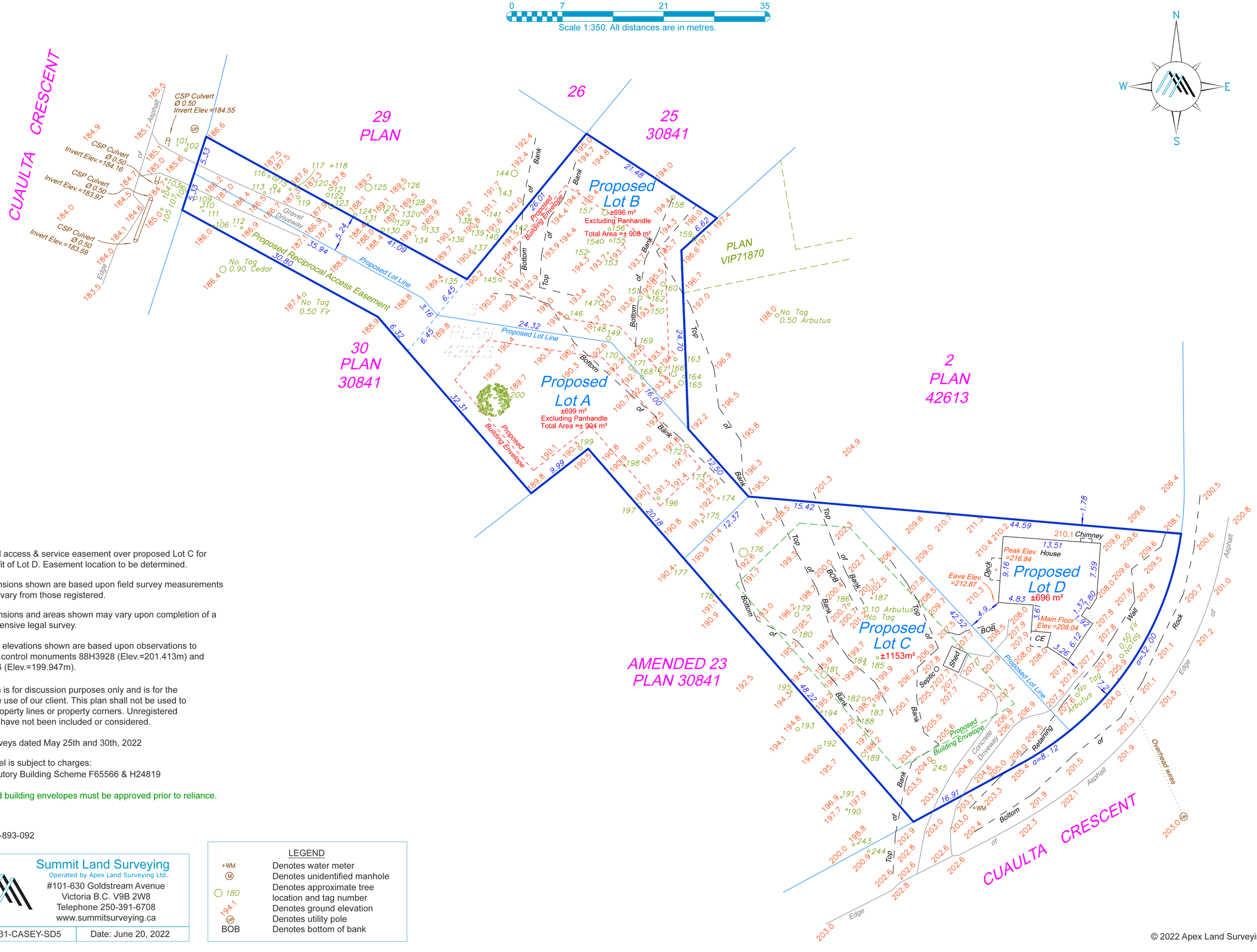
WESTBROOK CONSULTING LTD. - 2023-06-02 11:47AM - M:\PROJECTS\3802 783 Cualta Cr\04 Drawings\3802-03.dwg
M:\engineering\drawings\

PROPOSED SUBDIVISION PLAN OF LOT 3, SECTION 78, ESQUIMALT DISTRICT, PLAN 42613.

Schedule 5

0 7 21 35

Scale 1:350. All distances are in metres.



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Telephone 250-391-6708
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W131-CASEY-SD5 | Date: June 20, 2022

LEGEND

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