TOPOGRAPHIC SURVEY PLAN OF LOT 'A', BLOCK 13, DISTRICT LOT 582, PLAN 10954

P.I.D. 003-532-526

SCALE 1 INCH = 8 FEET

REMAINDER
8

'B'

'A'

PLAN 10954

TOTAL AREA = 22811 sq.ft.
(2119.2 m²)

PROPOSED LOT 1

TOTAL AREA = 11398 sq.ft.
(1058.9 m²)

PROPOSED LOT 2

TOTAL AREA = 11413 sq.ft.
(1060.3 m²)

CYPRESS CREEK

RIPARIAN AREA TO 5m SETBACK
AREA = 1651 sq.ft.
(153.4 m²)

RIPARIAN AREA TO 5m SETBACK
AREA = 1901 sq.ft.
(176.6 m²)

DWELLING HOUSE
No.4363
(ALL OFFSETS AND DIMENSIONS TO STUCCO)

MORGAN CRESCENT

ELEVATIONS

ELEVATIONS ARE TO DISTRICT OF WEST VANCOUVER GEODETIC DATUM.

BENCH MARK USED: INVERT OF SANITARY MANHOLE LOCATED ON MORGAN CRESCENT OPPOSITE DWELLING HOUSE No.4363
INVERT ELEVATION 55.82 FEET

BENCH MARK SET: TOP OF ARROW HEAD NUT ON FIRE HYDRANT LOCATED ON MORGAN CRESCENT OPPOSITE DWELLING HOUSE No.4363
ELEVATION 59.24 FEET

REVISIONS

REVISED PROPERTY LINES AND ADDED POSTING JUNE 8, 2016. FB: 2565 p.21 - 23
REINSPECTED AND ADDED COVERED PATIO AND STORAGE APRIL 9, 2021. FB: 2604 p.143
REINSPECTED AND ADDED PROPOSED SUBDIVISION JUNE 29, 2022. FB: 2774 p.68
ADDED RIPARIAN AREA TO 5m SETBACK FROM TOP OF BANK (HATCHED AREA) JULY 13, 2022.
ADDED CONCRETE POND JULY 15, 2022. FB: 2774 p.69

BENCH MARK
TOP OF ARROW HEAD NUT ON FIRE HYDRANT
ELEVATION 59.24 FEET

FIRE HYDRANT

CERTIFIED CORRECT THIS 14TH DAY OF MARCH, 2016

B.C.L.S.

BUILDING ENVELOPE INFORMATION
ADDED THIS 21ST DAY OF OCTOBER, 2022.

AEH B.C.L.S.

SANITARY MANHOLE

HOBBS, WINTER & MacDONALD,
B.C. LAND SURVEYORS,
113-828 HARBOURSIDE DRIVE,
NORTH VANCOUVER, B.C., V7P 3R9,
TEL 604-986-1371 FAX 604-986-5204
EMAIL: admin@hwmsurveys.com

No.4363 MORGAN CRESCENT
FB.2565 p.3-15 M 3244-10-'G' WV

Environmental Development Permit Application

December 22, 2022

Stephanie Louie
Environmental Protection Officer
District of West Vancouver
750 – 17th St.
West Vancouver, B.C.
V7V 3T3

Re: Proposed Subdivision (two lots) at 4363 Morgan Crescent, West Vancouver

INTRODUCTION

Sartori Environmental Inc. (SEI) has been retained by the owners of 4363 Morgan Crescent, West Vancouver (the Subject Property) to assess the environmental implications of subdividing a single family residential property situated within the environmental setbacks of Cypress Creek. This report and attached drawings form part of the District of West Vancouver's (DWV) Environmental Development Permit (EDP) application, which is required for development within 15 m of a watercourse according to DWV *Watercourse Protection (2015)* guidelines. The DWV *Watercourse Protection (2015)* guidelines restrict development between 0 m and 5 m, and 5 m and 15 m from Top of Bank (ToB) of a watercourse; herein called the 5-m and 15-m Setbacks, respectively.

EXISTING CONDITIONS

Subject Property

SEI visited the Subject Property on December 5, 2022. The Subject Property is 2,118 m^2 in size and currently contains one single-family dwelling, with attached patio and storage shed (no foundation), and periphery structures including a concrete water feature, rock walls, and a wooden platform. The dwelling is located near the center of the property and is connected to Morgan Crescent to the south via gravel driveway. Bordering the property to the east, west, and north are other single family residence and to the south is a school. Cypress Creek is located along the north property line, overlapping the Subject Property, and flowing in a general southwest direction. Located within the 15-m Setback of Cypress Creek is the patio and storage shed, attached to the dwelling, and within the 5-m Setback are three rock walls and a wooden platform. As the wooden platform and two of the smaller rock walls are not surveyed, SEI estimates their footprint and position in **Figure 1**.

Aquatic/Instream Conditions

Cypress Creek (Watershed Code: 900-073500) flows as an open channel near the Subject Property, passing through only one culvert under Marine Drive before its confluence with Burrard Inlet, approximately 500 m downstream of the Subject Property. This section of Cypress Creek is characterized by boulder, cobble and gravel substrate, with an average bankfull width of approximately 10 m and an approximate channel gradient of 3%. Large woody debris is deposited in a large bunch on the edge of the property along the bank. Cypress Creek has been channelized in this area evidenced by the straight nature of the Top of Bank, which consists of a line of large boulders transitioning into flat lawn surface. Cypress Creek has a total stream length of 9.0 km, a stream order of three, and a stream magnitude of six. A review of the Fish Inventory Data Queries and Habitat Wizard databases[1] for Cypress Creek was conducted and confirms fish presence, the results of which are in Table 1 below.

Table 1: BC Ministry of Environment *Fish Inventory Data Queries* database results of recorded species observations in Cypress Creek (information retrieved on 14-Dec-2022).

Common Name	Scientific Name	Observation Date
Cutthroat Trout	*Oncorhynchus clarkii*	Jul 30, 2015
Chinook Salmon	*Oncorhynchus tshawytscha*	Jul 30, 2015
Rainbow Trout	*Oncorhynchus mykiss*	Jul 30, 2015
Coho Salmon	*Oncorhynchus kisutch*	Jul 30, 2015
Coastrange Sculpin	*Cottus aleuticus*	Jul 30, 2015
Prickly Sculpin	*Cottus asper*	Jul 30, 2015

A review of DWV Westmap was conducted in the area near the Subject Property and does not identify any other sensitive environmental features.

Riparian Conditions

Riparian vegetation above the Top of Bank mostly contains lawn, with sporadic native shrubs and native trees, and a few non-native and/or invasive plants. Below the Top of Bank and near the east property line, SEI identified sword fern (*Polystichum munitum*), deer fern (*Struthiopteris spicant*) and salmonberry (*Rubus spectabilis*). Native trees within the 15-m Setback include western redcedar (*Thuja plicata*), Douglas fir (*Pseudotsuga meniziesii*), red alder (*Alnus rubra*) and bigleaf maple (*Acer macrophyllum*). Invasive species present include English ivy (*Hedera helix*), mainly growing along trees, and cherry laurel (*Prunus laurocerasus*) along the west property line.

[1] http://maps.gov.bc.ca/ess/hm/habwiz/ (accessed: December 14, 2022)

PROPOSED DEVELOPMENT

This report contemplates a proposed subdivision of the Subject Property into two lots. The conceptual layout for the subdivision is provided in **Figure 1**. The layout splits the Subject Property approximately in half, east and west, providing access for both lots off Morgan Crescent. Building envelopes proposed for each lot have a northern limit of the 15-m Setback. As part of this application, demolition of the existing dwelling and periphery structures are proposed. The only structure proposed to remain is the surveyed rock wall, adjacent to the Top of Bank, as its demolition may impact the stability of the Top of Bank. The rock wall does not interfere with riparian processes (i.e. hydrologic).

A Riparian Restoration Plan (**Figure 2**) and Invasive Species Management Plan (**Figure 3**) are outlined for future construction, however, implementation is not proposed until the construction of the new dwellings is taking place.

No trees within the 15-m Setback are proposed for removal as part of this EDP. Future construction taking place within the building envelope should be able to be completed without impacting trees within the 15-m Setback (assuming proper mitigation measures) as there is only minor overlap of the building envelope with any critical root zones (CRZ; assuming a 6x DBH zone around trees). Tree #10 as identified by the Arborist Report (Talus, December 19, 2022) would have a 5 m radius CRZ and is located 3.5 m from the building envelope of the eastern lot. This is the only tree with an overlapping CRZ of the building envelope within the 15-m Setback. This report does not contemplate the possible removal of trees outside the 15-m Setback.

HABITAT BALANCE

Habitat gains and impacts between Cypress Creek and the 15-m Setback resulting from proposed demolition were calculated using AutoCAD and are presented in Table 2 below and in Figure 1: Habitat Balance & Site Plan.

Table 2: Habitat Balance calculation.

Habitat Impacts:	
ToB ➔15-m Setback:	
Building envelopes entirely outside the setbacks	0 m^2
Habitat Gains:	
ToB ➔ 5-m Setback:	
Wooden platform removal	+ 19 m^2
5-m ➔ 15-m Setback:	
Patio and storage shed removal	+ 22 m^2
Net Habitat Gain:	+ 41 m^2

RIPARIAN RESTORATION

Riparian restoration is prescribed within the 5-m Setback of both new lots, beginning from the large boulders and rocks of the Top of Bank and rock wall and extending to the 5-m Setback as outlined in **Figure 2**. Suitable native riparian plant species will be planted for a minimum total Riparian Restoration Area of 120 m^2. A total of three conifers and twelve deciduous trees are proposed to be planted within this area, with the rest of the area to be densely planted with shrubs. The replanted vegetative buffer will help increase delineation of the riparian area, help prevent encroachment, provide additional habitat for local flora and fauna, and provide higher quality food and nutrients to downstream reaches.

Invasive species identified within the Invasive Species Management Areas (see **Figure 3**), including English ivy and cherry laurel are proposed to be removed and disposed of according to best management practices prior to riparian planting. Material import and export activities to and from the Subject Property will implement invasive species best management practices to prevent the spread and proliferation of invasive species. Invasive species must be controlled and managed to ensure success of the Riparian Restoration Plan.

Additionally, all area between the 5-m Setback and 15-m Setback is identified as Riparian Landscape Area and should be maintained as vegetated area. During the construction phase of the new lots, a landscape plan should be prepared and approved of by the District for all area within the 15-m Setback. Any non-native vegetation and hard surfaces proposed within the Riparian Landscape Area is subject to approval by the District. SEI recommends that each lot may have up to 20 m^2 of hard surface in the Riparian Landscape Area, which would maintain an overall positive net habitat balance and SEI recommends that new hard surfaces should remain at least 10 m away from Top of Bank (existing structures to be removed are located at 2 m and 7.5 m at their closest point). Both recommendations are subject to the approval of the District.

CONSTRUCTION ENVIRONEMNTAL MITIGATION MEASURES

Tree Protection

As per DWV Tree Bylaw No. 4892, 2016, tree protection fencing, and signage must be installed as specified below and maintained to prevent damage to trees or their root systems during construction activities. Fencing should be constructed around any trees that are to be retained, and if practicable located beyond the Critical Root Zones (CRZs) of trees. CRZs, or Protection Zones as per Schedule A – Tree Protection Specifications of DWV's Tree Bylaw, indicates a minimum fence distance from the tree of six times DBH.

As access to the dwelling for demolition is likely to cross CRZs, alterations from required tree protection measures must be completed under the direction of a certified Arborist, and tree protection measures should be inspected and approved prior to the commencement of development works. No ground disturbance (e.g. excavation, backfilling, compaction, etc.) or changes in grade from existing in the CRZs should occur unless previously assessed by a certified Arborist.

General Environmental Mitigation Measures

An Erosion and Sediment Control (ESC) Plan has been prepared and attached as **Figure 4.** An appropriately qualified ESC Supervisor must be engaged prior to demolition to monitor compliance with the approved ESC Plan and the DWV Watercourse Protection Bylaw 4364, 2005. As a DWV requirement, ESC inspections are required, as per the following schedule:

- Biweekly inspections 1 June – 30 September (dry season);
- Weekly inspections 1 October – 31 May (wet season); and
- As required during or immediately following precipitation events exceeding 20 mm within 24 hours.

It is the responsibility of the owner and/or developer to contact their ESC Supervisor prior to commencing ground disturbance activities. It is recommended that a pre-construction meeting be held to ensure that contractors are aware of the ESC requirements.

The following general environmental mitigation measures shall be implemented during demolition and construction:

- stockpiles of excavated material will be consolidated, bucket-packed, and covered with polyethylene sheeting ("poly") to minimize erosion;
- machinery access and truck loading will be limited to the rock/gravel or paved access only (existing driveway);
- street cleaning will be conducted if any sediment is tracked out on to paved surfaces;
- catch basin protection (e.g., filter socks) will be installed on adjacent catch basins and maintained regularly;
- all imported material will be clean and/or free of contamination;
- a spill kit will be kept on site throughout the duration of the works;
- equipment containing petroleum products will be inspected daily to identify any leaks and wearing parts before they fail;
- leaking equipment or wearing parts will be repaired/replaced before continuing service;
- refuelling of equipment and storage of petroleum products will occur as far away from catch basins and watercourses, as practical; and
- perimeter control along the bank of Cypress Creek should be installed as per Figure 4

CONCLUSIONS

In the opinion of SEI, the proposed subdivsion of the Subject Property addresses the following DWV *Watercourse Protection* (2015) guidelines, as follows:

- *Locate development on portions of the site that are least environmentally sensitive*

  The proposed subdivision commits building envelopes to not encroach the 15-m Setback.

- *Avoid net loss of riparian habitat within 15 m of the top of the watercourse bank or edge of the wetland*

  The habitat balance for the proposed subdivision demonstrates a balance of 41 m². Future landscape plans should not be approved if they incorporate more than 20 m² of hard surfaces within the 15-m Setback.

- *Within 15 m of the top of the watercourse bank or edge of wetland, locate new buildings, structures and impervious/semi-impervious surfaces at least as far from the watercourse or wetland as any existing development*

  Subdivision allows for all new structures to be located outside of the 15-m Setback.

- *Keep free of new buildings, structures, and impervious/semi-impervious surfaces the area within 5 m of the top of the watercourse bank or edge of the wetland*

  No structures will be located within the 5-m Setback aside from an existing rock wall.

- *Enhance, and where feasible, restore watercourses in already developed areas to improve watercourse quality from uplands to inlets*

  The implementation of the Riparian Planting Plan and Invasive Species Management Plan will serve to increase the buffering capacity between the Subject Property and Cypress Creek, provide additional habitat for local flora and fauna suited to native riparian conditions, and provide higher quality food and nutrients to downstream reaches.

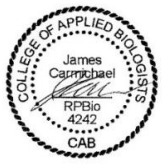
Please contact the undersigned if you require any additional information or clarification of the above.

ENDORSEMENT

Sartori Environmental Inc.

Authored and Endorsed by:

The undersigned certifies the work described herein fulfills standards acceptable of a Professional Biologist.



[Digital Copy, Original Signed]

James Carmichael, RPBio

Attachments:

- **Figure 1: Habitat Balance (2022-12-22; Rev00)**
- **Figure 2: Riparian Restoration Plan (2022-12-22; Rev00)**
- **Figure 3: Invasive Species Management & Riparian Planting Details (2022-12-22; Rev00)**
- **Figure 4: Erosion and Sediment Control Plan (2022-12-22; Rev00)**

PHOTOGRAPHIC DOCUMENTATION

Photo 1. South view of dwelling from Top of Bank; wooden platform in foreground.

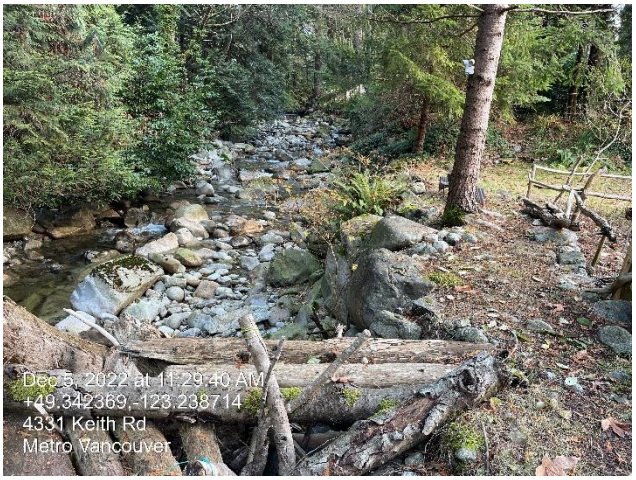


Photo 2. East view of Cypress Creek; retained rock wall pictured right.

Photo 3. West view along Top of bank; rock wall pictured bottom left corner running toward toward top right.

Photo 4. South view of wooden platform and rock wall in foreground.

Photo 5. North view of back yard with patio pictured.

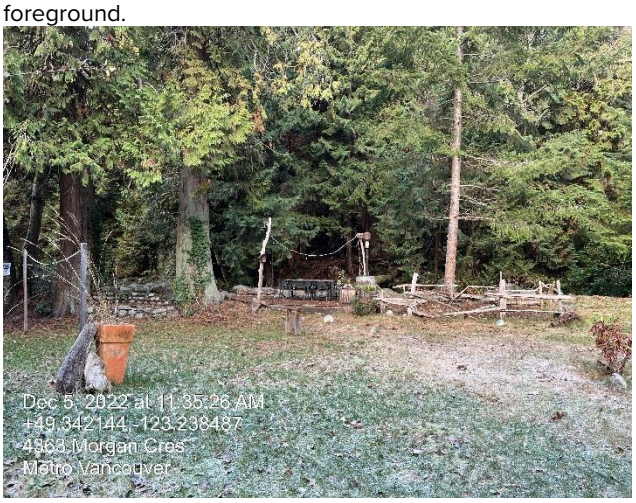
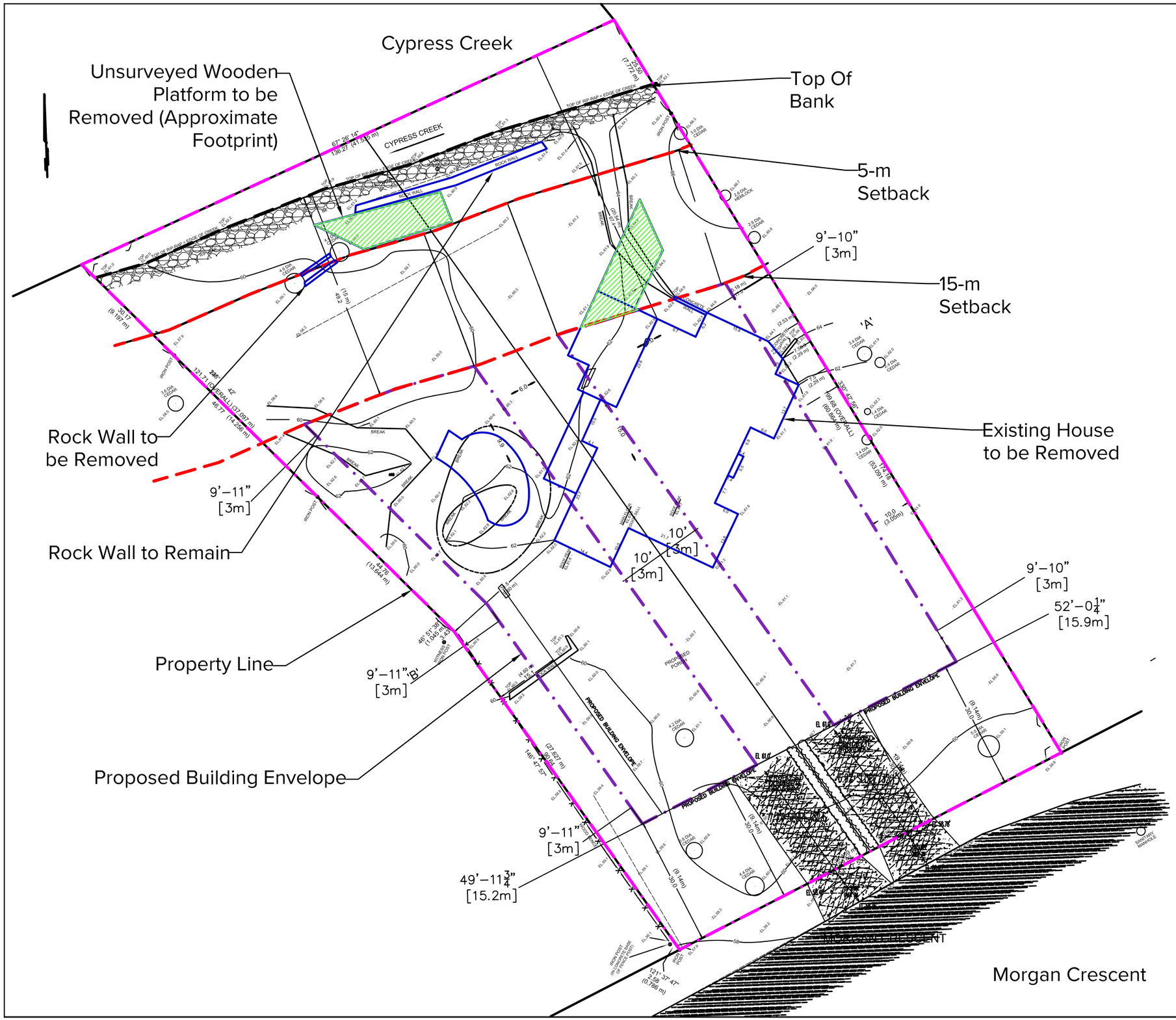


Photo 6. Unsurveyed rock walls between cedars pictured left; wooden platform area pictured on right.



Habitat Balance Within 15 m Top of Bank

Habitat Gains:
0 → 5-m Setback:
Removal of existing wooden platform **+ 19 m²**

Habitat Gains:
5 → 15-m Setback:
Removal of existing dwelling **+ 22 m²**

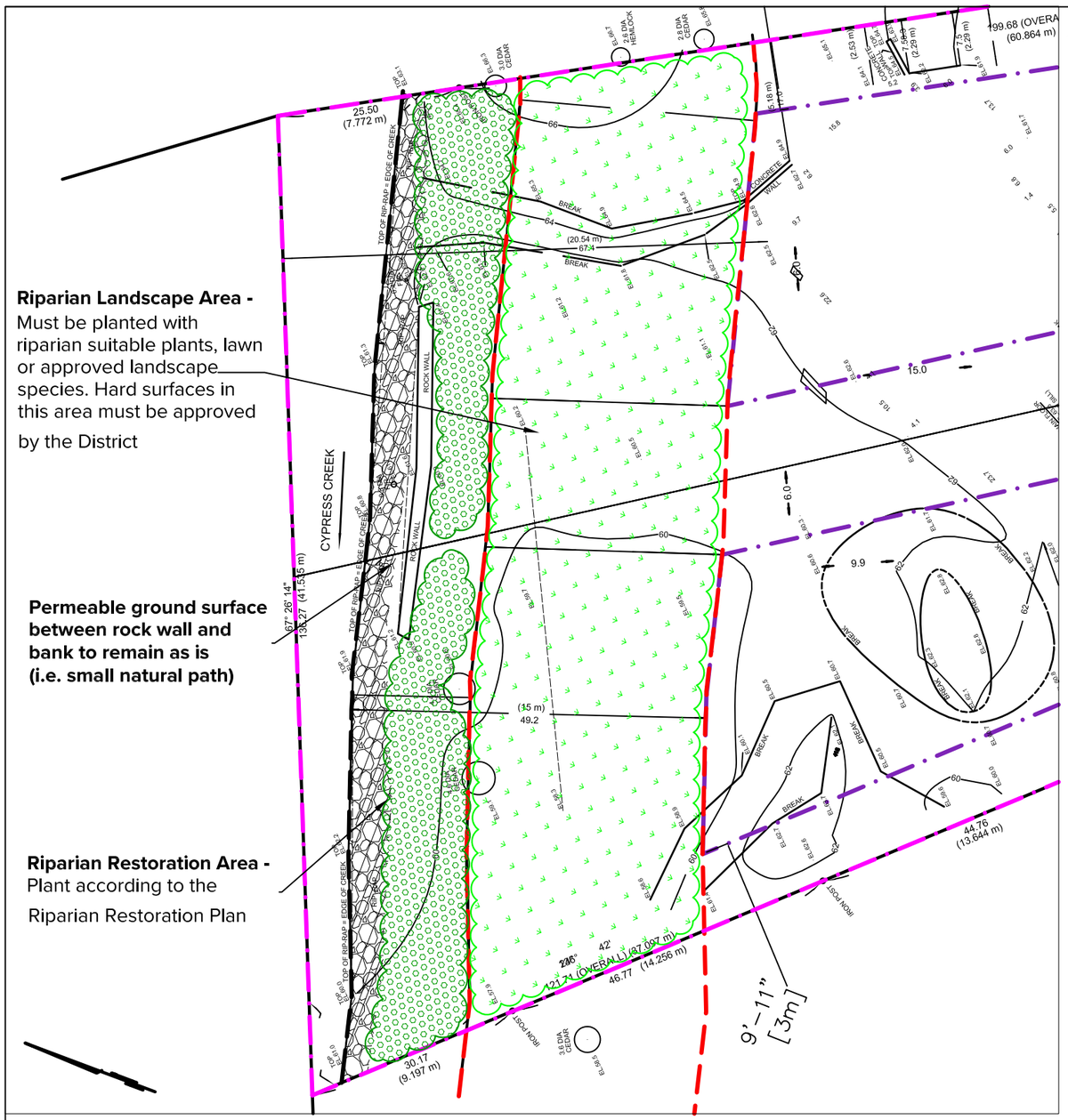
Net Habitat Gain **+ 41 m²**

- Property Line
- Proposed Bulding Envelopes
- Existing Structures
- Top of Bank (ToB)
- DWV Setbacks
- Habitat Gains
- Habitat Impacts

sartori
ASSESSMENT | PLANNING | COMPLIANCE

4363 Morgan Crescent
DWV Environmental Development Permit Figures

Date: 2022/12/22	**Figure 1: Habitat Balance**	REV 00
DRAWN BY J.C.	SCALE 1:275	



Riparian Landscape Area - Must be planted with riparian suitable plants, lawn or approved landscape species. Hard surfaces in this area must be approved by the District

Permeable ground surface between rock wall and bank to remain as is (i.e. small natural path)

Riparian Restoration Area - Plant according to the Riparian Restoration Plan

365 m^2

120 m^2

Riparian Landscape Area - Must be planted with riparian suitable plants, lawn or approved landscape species. May integrate up to 20 m^2 of hard surfaces per lot at the District's approval.

Riparian Restoration Area - All invasive and non-native plants within the polygon must be removed prior to planting

Riparian Restoration Plan

Approximately 120 m^2 of riparian planting should be integrated into a future landscaping plan, planted at an average density of 1 plant per 1.5 m^2 within the identified Riparian Restoration Area (5-m Setback) to increase the overall biological productivity of the watercourses riparian zone. All invasive and non-native plants within the Riparian Restoration Area must be removed prior to planting. Plant species should be selected with consideration to plant community, competitive nature, shade tolerance, growth rates and rate of spread. No more than 25% of one species may be selected from the plant list. Efforts will be taken to retain existing native vegetation in place or may be carefully removed, stored and transplanted to another area on the Subject Property. Existing riparian suitable plants that are retained in the Riparian Restoration Area may count toward the total number of plants needed to satisfy the total numbers listed below. The following planting list is recommended; if plant species substitutions are desired due to reasons of aesthetics or plant stock availability, Sartori Environmental Inc should be contacted at 604.987.5588 to review and comment.

Coniferous Trees

(3.0 - 5.0 m Spacing from other coniferous trees, and purchased at a minimum height of 2.0 m, unless otherwise specified)

Western red cedar (*Thuja plicata*)
Doulgas fir (*Pseudotsuga menziesii*)
Western Hemlock (*Tsuga heterophylla*)

TOTAL - 3*

** coniferous trees must be purchased at a height of at least 2.0 m*

Deciduous Trees

(1.5 - 3.0 m spacing from other deciduous and coniferous trees, and purchased at a minimum height of 1.2 m, unless otherwise specified)

Red alder (*Alnus rubra*)
Pacific willow (*Salix lucidia ssp. lasiandra*)
Bitter cherry (*Prunus emarginata*)
Vine maple (*Acer circinatum*)
Cascara (*Rhamnus purshiana*)
Mountain Ash (*Sorbus scopulina*)
Pacific dogwood (*Cornus nuttallii*)

TOTAL - 12*
*** deciduous trees must be purchased at a height of at least 1.2 m.*

Shrubs

(0.25 - 1.0 m spacing from other vegetation and purchased in minimum #1 or one gallon containers)

Salmonberry (*Rubus spectabilis*)
Western swordfern (*Polystichum munitum*)
Deer fern (*Blechnum spicant*)
Salal (*Gaultheria shallon*)
Oregon grape (*Mahonia aquifolium*)
Red huckleberry (*Vaccinium parviflolium*)
Red-osier dogwood (*Cornus stolonifera*)
Nootka rose (*Rosa nutkana*)
Pacific ninebark (*Physocarpus capitatus*)
Elderberry (*Sambucus racemosa*)

TOTAL - 65*
****No more than 25% of one species may be selected from the plant list.*

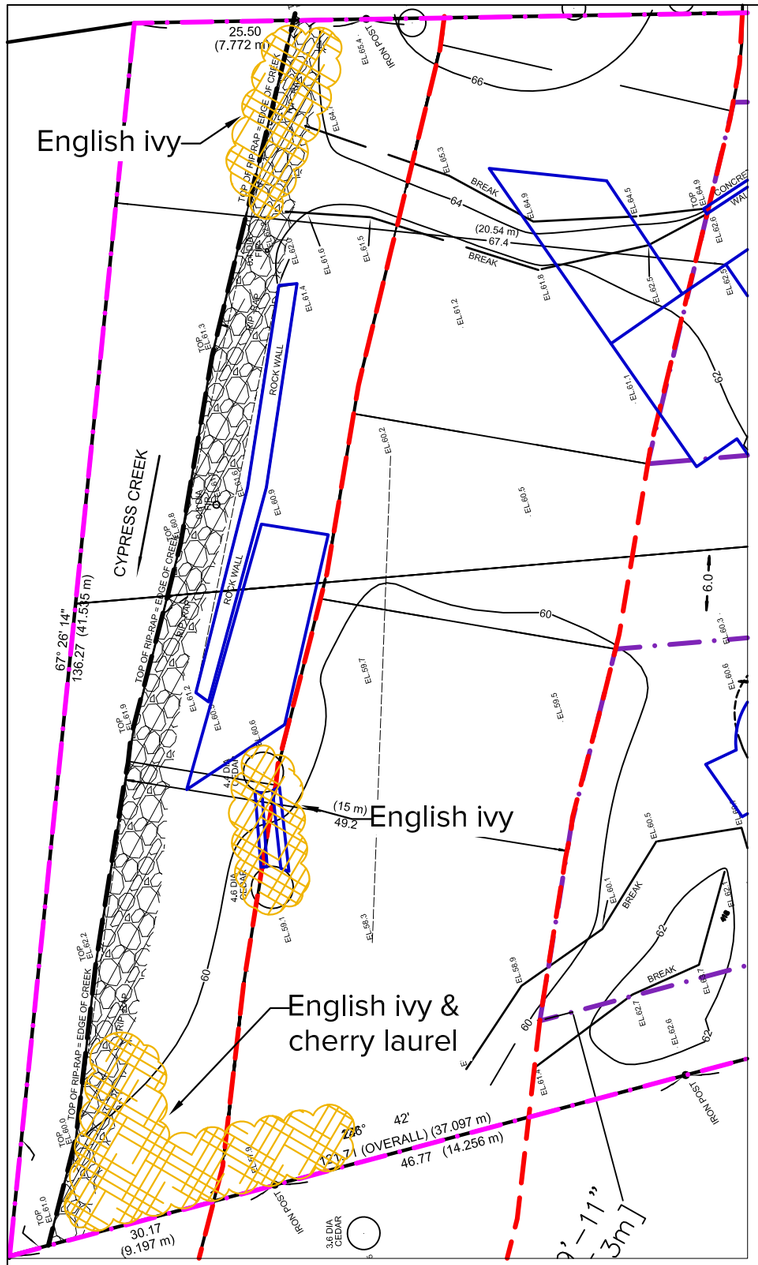
Landscape Riparian Planting Checklist

- ☐ Ensure the entire area is planted in the location identified in the adjacent figure depicting the Riparian Restoration Area
- ☐ Ensure a planting density of 1 plant per 1.5 m^2 (80 plants minimum in 120 m^2)
- ☐ Ensure the Riparian Restoration Area contains the minimum number of plants of each type as shown in the list provided
- ☐ Ensure species planted are from the list provided or have been approved by Sartori or DNV
- ☐ Ensure all invasive and non-native plants are removed from the Riparian Restoration Area
- ☐ Ensure riparian suitable plants, lawn, or approved landscape species are planted within the Riparian Area
- ☐ Ensure no new hard surface are present within either the Riparian Restoration Area or the Riparian Landscape Area unless approved by the District

sartori
ASSESSMENT | PLANNING | COMPLIANCE

4363 Morgan Crescent
DWV Environmental Development
Permit Figures

Date: 2022/12/22	**Figure 2: Riparian Restoration Plan**	REV 00
DRAWN BY J.C.	SCALE 1: 225	



Invasive Species Management

All invasive plant species should be removed (with their root structures) within from the Invasive Species Management Area polygon delineated in the adjacent figure (60 m^2). Invasive plant species within the polygon located along fence lines, stairs, retaining walls, deck edges or steep slopes where machine access is restricted, or where vegetation may be integral to existing structural components or slope stability, should be removed by hand. Invasive species located in riparian areas where machine access is available may be managed through other mechanical means (e.g., use of a small-rubber tracked machine). Extensive species-specific best management practices information exists regarding the removal and control of invasive species, and if requested, Sartori Environmental Inc. can provide further direction during the landscaping/vegetation maintenance phase of the proposed works to ensure adequate removal and disposal. All root structures and topsoil should be disposed of in an appropriate manner.

During the site assessment, the following occurrences of invasive species were observed within or adjacent to the 15-m riparian setback:

Cherry laurel (*Prunus laurocerasus*)

English ivy (*Hedera helix)*

Purchasing, Site Preparation and Planting

Botanical names should be referenced when purchasing to ensure accuracy and all specimens should be of guaranteed nursery stock. Purchased stock should be tagged with species name, and tags should be left on after planting for the purpose of planting confirmation. Nursery stock should be a minimum of two years old at purchase to ensure developed root systems and increase the likelihood of survival. Once plant stock is received onsite, specimens should be stored in a cool, shady location and watered regularly. Planting should be undertaken during the fall (Sep - Oct) or spring (Mar - Apr) for maximized probability of survival. Prior to planting, it should be ensured that adequate soil structure and nutrient content exist through appropriate storage of existing onsite material or import of organic growing medium. If growing medium is to be retained from onsite, consideration should be given to organic stockpile depth (no greater than 1.0m) and length of storage time (ideally less than 1 month) to maintain nutrient cycling, microbial activity and viability of native seed stock. Once placed, factors affecting soil compaction (i.e. traffic, machine movement, material storage) should also be considered. If material import is required for growing medium, it should be inert and certified free of invasive or noxious weed species. Holes should be dug 2-3 times larger than the size of the roots and soil should be non-compacted. Root ball untangling, pruning, splitting and burlap sack removal should be done in a means suitable to allowing the newly planted roots to spread and avoid root girdling. If in doubt, supplier planting prescriptions should be consulted. Regular watering and/or fertilizer application may also be required to ensure adequate recruitment.

The following plant spacings are included as a guideline, and clustering of plants around preferred microsites (e.g., woody debris, large trees, wetted depressions on dry sites, drier mounds on wet sites, etc.) is preferred to a standard grid formation. Course woody debris (CWD), if locally available, should be placed within the panting area to promote nutrient cycling and wildlife habitat, and to serve as native seedbanks. Coniferous Trees should be 2.0 m (Min) height and planted 3.0 - 5.0 m away from other coniferous trees. Deciduous Trees should be 1.2 m (Min) height and planted 1.5 - 2.0 m away from other coniferous and deciduous trees, unless planted in a cluster. Shrubs should be purchased in minimum 1 gallon pots and planted 0.25 - 1.0 m away from other vegetation. Plant species locations should be selected in consultation with an experienced landscaper to determine shade and growing tolerances.

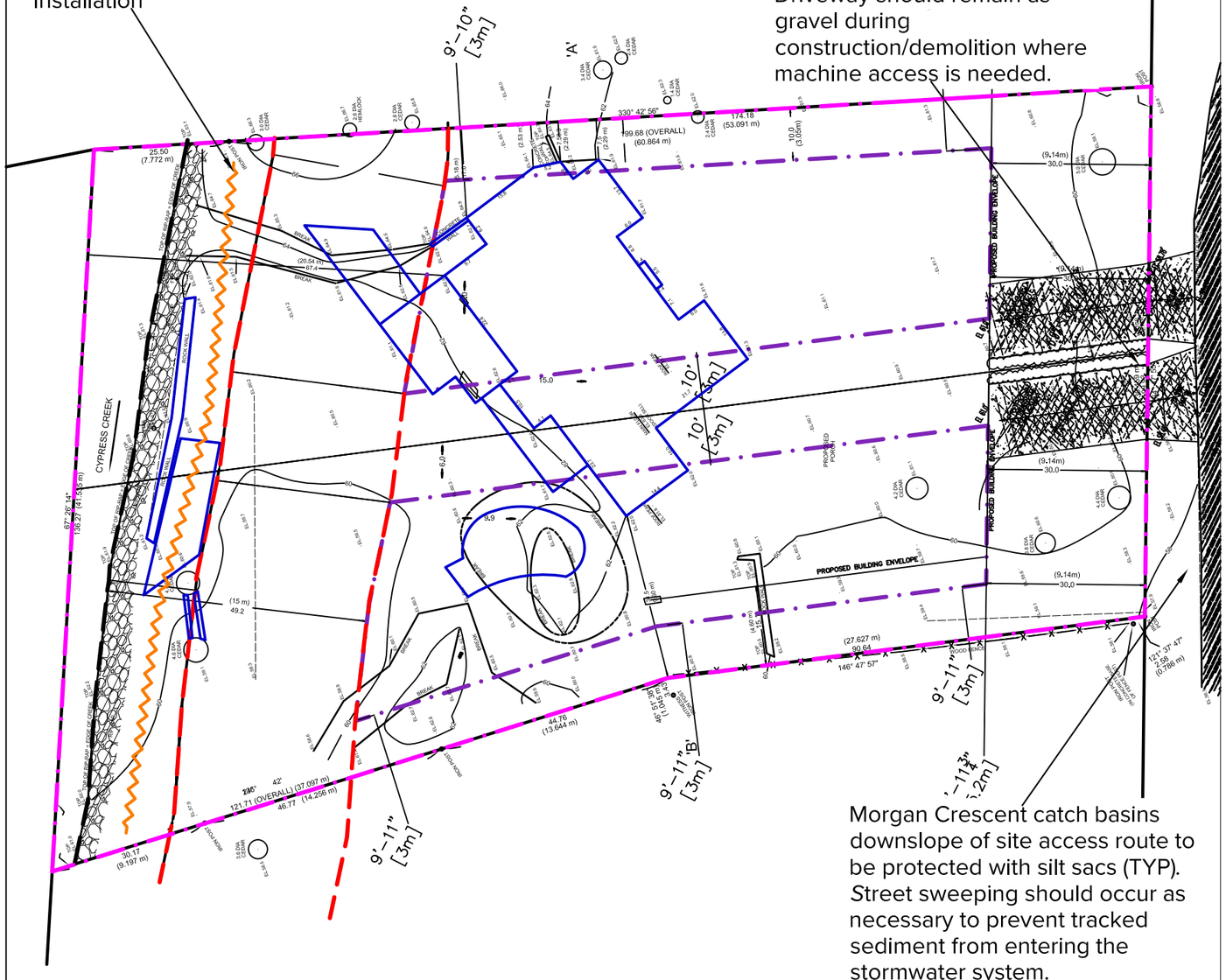
All acquired plant materials shall be healthy, with well developed root systems and top growth, and shall be free of disease, insect infestation and the following defects at all times: broken tops, torn roots and abrasions of bark on trunk and branches; dried out root systems; prematurely opened or damaged buds; dry, loose or broken ball of earth; evidence of heating, moulding, or freezing damage; thin, poor root or top systems, and abnormal leaf colour.

NOTE TO CLIENT: It is integral that prescriptions provided within this Riparian Restoration Plan (the "Plan") are adhered to, and if questions or concerns arise during Plan implementation, Sartori Environmental Inc. or the District of West Vancouver (DWV) should be contacted to resolve potential issues with compliance. As release of municipal environmental security deposits are subject to DWV inspections, facilitating easy auditing by DWV is likely to save time and money, and result in full deposit return. Therefore, Sartori recommends the owner should:
(1) retain a reputable landscape company to implement the Plan and provide "as-planted" figures,
(2) consolidate and retain all documentation including plant purchase, landscaping and invasive plant removal receipts, and
(3) ensure all planted specimens are flagged (with species), or nursery tagged, and those tags remain in place until all conditions of the Environmental Development Permit are satisfied.

sartori ASSESSMENT | PLANNING | COMPLIANCE	**4363 Morgan Crescent** **DWV Environmental Development Permit Figures**	
Date: 2022/12/22	**Figure 3: Invasive Species Management and Planting Details**	REV 00
DRAWN BY J.C.	SCALE 1:200	

Silt Fence or Compostable Sock Installation

Access/egress route will be the existing driveway. Driveway should remain as gravel during construction/demolition where machine access is needed.



Morgan Crescent catch basins downslope of site access route to be protected with silt sacs (TYP). Street sweeping should occur as necessary to prevent tracked sediment from entering the stormwater system.

EEROSION & SEDIMENT CONTROL NOTES

1. THIS EROSION & SEDIMENT CONTROL (ESC) PLAN HAS BEEN PREPARED FOR 4363 MORGAN CRESCENT, **WEST VANCOUVER**.
2. UNDER THIS ESC PLAN, IT IS THE RESPONSIBILITY OF THE OWNER, CONTRACTOR OR DEVELOPER TO ENSURE THAT ALL OF THE EROSION AND SEDIMENT CONTROL FACILITIES DESCRIBED UNDER THIS ESC PLAN ARE CONSTRUCTED, IMPLEMENTED, INSTALLED AND MAINTAINED FOR THE DURATION OF DEMOLITION, AND UNTIL REMOVAL/DECOMISSIONING IS RECOMMENDED BY THE ESC SUPERVISOR (SEE ESC MONITORING SECTION BELOW).
3. THE CONSTRUCTION CONTRACTOR, AND ALL OTHER SUB-CONTRACTORS OR PERSONS INVOLVED WITH SITE DEMOLITION SHALL COMPLY WITH FEDERAL, PROVINCIAL AND MUNICIPAL LEGISLATION AND REGULATIONS PERTAINING TO THE PROTECTION OF FISH AND AQUATIC HABITAT AND EROSION AND SEDIMENT CONTROL, AND THE DISTRICT OF WEST VANCOUVER'S WATERCOURSE PROTECTION BYLAW NO. 4364, 2005 SCHEDULE A.
4. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND ANY SUB-CONTRACTORS TO ENSURE THAT WATER DISCHARGING FROM THE SITE SHALL NOT EXCEED THE WATER QUALITY STANDARD OF 75 MG/L FOR TOTAL SUSPENDED SOLIDS (TSS) FOLLOWING A SIGNIFICANT RAINFALL EVENT AND 25 MG/L DURING NORMAL WEATHER CONDITIONS. A SIGNIFICANT RAINFALL EVENT IS DEFINED AS A PRECIPITATION EVENT THAT MEETS OR EXCEEDS THE INTENSITY OF **20 MM OF TOTAL RAINFALL OVER A 24 HOUR PERIOD**.
5. DEPENDENT ON SITE CONDITIONS, WEATHER CONDITIONS, OR UNFORESEEN OBSTACLES DURING CONSTRUCTION ACTIVITIES, THE ESC MONITOR OR PROJECT MANAGER, AT THEIR DISCRETION, MAY RECOMMEND THAT ESC FACILITIES AND MITIGATION MEASURES BE ADDED TO THE SITE, OR RECOMMENDED ESC FACILITIES BE MODIFIED AS REQUIRED TO COMPLY WITH BYLAW NO. 4364. THE CONTRACTOR SHALL COMPLY WITH THE DIRECTIONS OF THE ESC MONITOR AND THE PROJECT MANAGER, AND SHALL ENSURE THAT ESC FACILITIES ARE CONSTRUCTED, IMPROVED, REPAIRED AND MAINTAINED AS A PRIORITY AHEAD OF ALL OTHER SITE CONSTRUCTION ACTIVITIES.
6. ADDITIONAL ESC RESOURCES ARE AVAILABLE IN SECTION 3.7.3 EROSION AND SEDIMENT CONTROL WITHIN DEVELOP WITH CARE (2014), SECTION 3 - SITE DEVELOPMENT AND MANAGEMENT (http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/DWC-Section-3.pdf).

EARTHWORKS & DEMOLITION

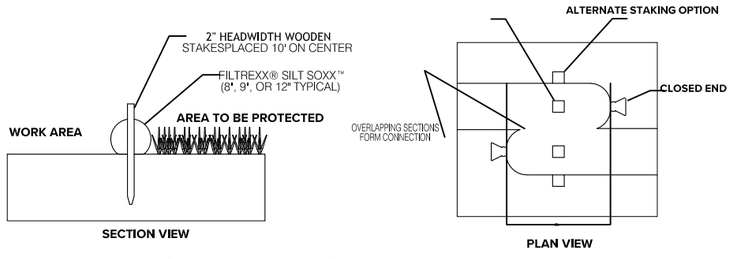
7. REFER TO THE ADJACENT SITE PLAN AND ATTACHED DETAILS FOR RECOMMENDED SITE-SPECIFIC ESC MEASURES. ALTERATIONS TO THE PLAN SHOULD BE IN CONSULTATION WITH THE APPROVED ESC SUPERVISOR.
8. COMPOSTABLE SOCKS SHOULD BE PLACED ON THE WEST PERIMETER OF THE PROPERTY TO MINIMIZE OFF SITE MIGRATION OF RUNOFF.
9. GROUND DISTURBANCE WORKS (I.E. USE OF AN EXCAVATOR) ARE TO BE CONDUCTED DURING FAVORABLE WEATHER TO MINIMIZE EROSION AND GENERATION OF SEDIMENT-LADEN DRAINAGE.
10. TRUCK AND VEHICLE ACCESS TO THE WORKS AREA IS TO BE CONFINED TO DRIVEWAY ACCESS FROM MORGAN CRESCENT TO PREVENT SEDIMENT TRACKING TO PUBLIC ROADS. THE EXISTING DRIVEWAY SHOULD REMAIN AS GRAVEL FOR THE DURATION OF DEMOLITION.
11. THE CONSTRUCTION CONTRACTOR WILL BE RESPONSIBLE FOR MAINTAINING SEDIMENT FREE PUBLIC ROADS ADJACENT TO THE SITE THROUGH PERIODIC SWEEPING AND SCRAPING, AS REQUIRED.
12. ALL CATCH BASINS ADJACENT TO ACTIVE WORKS AND CONSTRUCTION ACCESS ROUTES ARE TO BE PROTECTED, AS REQUIRED, WITH CATCH BASIN PROTECTION DEVICES IF SEDIMENT DEPOSITION IS OBSERVED (DETAIL SHOWN).
13. NO SITE DRAINAGE IS TO FLOW DIRECTLY TO THE MUNICIPAL STORM SYSTEM OR CYPRESS CREEK, WITHOUT PRIOR TREATMENT (e.g. SEDIMENT CONTROL POND), AS NEEDED.
14. EXPOSED CUT AND/OR FILL SLOPES ARE TO BE COVERED WITH DENSE APPLICATION STRAW, COMPOSTABLE MATTING, STAKED-IN POLYETHYLENE SHEETING, OR EQUIVALENT TO PREVENT EROSION DURING POOR WEATHER.
15. STOCKPILES OF ERODABLE MATERIALS (e.g. EXCAVATION SPOIL, CLAYS, PIT RUN, TOPSOIL, etc.) WILL BE COVERED WITH STAKED-IN POLYETHYLENE SHEETING OR EQUIVALENT WHEN NOT IN USE AND ALWAYS PRIOR TO AND DURING FORECASTED PRECIPITATION. NON-ERODABLE MATERIALS WILL BE STOCKPILED ON PAVED SURFACES.

ESC MONITORING PROGRAM

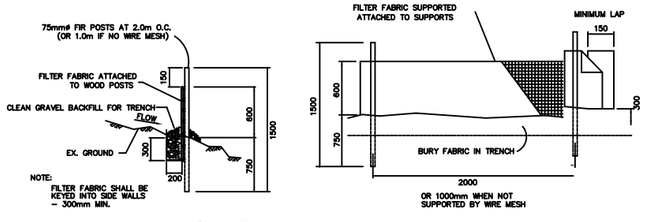
16. AN ESC SUPERVISOR WILL BE CONFIRMED PRIOR TO ISSUANCE OF THE ESC PERMIT THROUGH A CONFIRMATION OF COMMITMENT BY ESC SUPERVISOR. THE ESC MONITOR WILL IMPLEMENT THE FOLLOWING MONITORING SCHEDULE:
    a. ***JUNE 1 UNTIL SEPTEMBER 30 - BIWEEKLY OR AS REQUIRED IF PRECIPITATION EXCEEDS 20MM IN 24HRS.***
    b. ***OCTOBER 1 UNTIL MAY 31 - WEEKLY OR AS REQUIRED IF PRECIPITATION EXCEEDS 20MM IN 24 HRS.***
16. THE OWNER/DEVELOPER IS REQUIRED TO CONTACT THE CONFIRMED ESC SUPERVISOR BY EMAIL AT MINIMUM 72 HRS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES TO SET-UP A SITE KICK-OFF MEETING TO ENSURE AN UNDERSTANDING OF ESC PLAN REQUIREMENTS.
17. THE ESC MONITORING WILL CONTINUE UNTIL ALL SITE SURFACES ARE AT FINAL GRADE, STRUCTURES ARE DEMOLISHED/CONSTRUCTED, AND DISTURBED SURFACES ARE VEGETATED OR TO SUCH A TIME THAT THE ESC SUPERVISOR DETERMINES THAT FURTHER MONITORING IS NO LONGER REQUIRED AS CONSTRUCTION PROGRESS HAS REACHED FINAL STAGES AND THE RISK TO THE SURROUNDING ENVIRONMENT IS NEGLIGIBLE. THE ESC SUPERVISOR WILL PROVIDE THE DISTRICT OF WEST VANCOUVER'S ENVIRONMENTAL STAFF WITH CONFIRMATION VIA EMAIL THAT THE MONITORING PROGRAM HAS CEASED.
18. THE ESC SUPERVISOR WILL INSPECT AND MONITOR THE SITE TO ENSURE SEDIMENT AND SEDIMENT-LADEN WATER DOES NOT REACH THE MUNICIPAL DRAINAGE SYSTEM OR CYPRESS CREEK AND THAT THE ESC PLAN IS BEING IMPLEMENTED AS DESIGNED AND OPERATING EFFECTIVELY. IF ANY REPAIR OR MAINTENANCE OF ESC MATERIALS IS RECOMMENDED, THE CONTRACTOR IS RESPONSIBLE FOR COMPLETION OF THE MAINTENANCE/REPAIR IN A TIMELY MANNER.
19. THE ESC SUPERVISOR MAY MODIFY OR ADJUST THE ESC PLAN, AS REQUIRED, IN ORDER TO ENSURE COMPLIANCE WITH THE MUNICIPAL BYLAW.
20. AT THE DISCRETION OF THE ESC SUPERVISOR, TURBIDITY SAMPLING, MAY BE CONDUCTED DURING EACH SITE VISIT. IF ELEVATED TURBIDITY IS OBSERVED, A TSS WATER SAMPLE MAY BE COLLECTED AND SUBMITTED TO THE LABORATORY FOR ANALYSIS. LABORATORY ANALYSIS WILL BE MADE AVAILABLE UPON REQUEST.

TREE PROTECTION

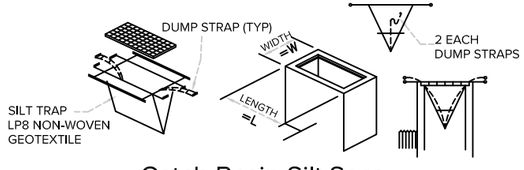
21. NATIVE TREES TO BE RETAINED THROUGH DEVELOPMENT SHOULD BE ADEQUATELY PROTECTED DURING CONSTRUCTION PHASES TO SATISFY REQUIREMENTS OF DISTRICT OF WEST VANCOUVER TREE BYLAW, NO. 4892, 2016. TREES MUST BE PROTECTED DURING ACTIVITIES (*I.E.*, EXCAVATION, DEMOLITION, ETC.) THAT HAVE THE POTENTIAL TO IMPACT THE ABOVE GROUND OR ROOT STRUCTURE OF THE TREE. THE CRITICAL ROOT ZONE (CRZ) OF ANY TREE MAY EXTEND BEYOND THE VISUAL DRIP LINE, THEREFORE, TREE PROTECTION BARRIERS MUST BE INSTALLED IN ACCORDANCE WITH THE DISTRICT OF WEST VANCOUVER TREE BYLAW, NO. 4892, 2016.
22. PRIOR TO GROUND DISTURBANCE WORKS WITHIN A CRZ, INCLUDING EXCAVATOR MOVEMENT, AN ARBORIST SHOULD BE ENGAGED TO RECOMMEND PROPER MITIGATION OR AVOIDANCE MEASURES TO PREVENT DAMAGE TO CRITICAL ROOTS.
23. WORK REQUIRED WITHIN THE CRZ OF A TREE SHOULD BE COMPLETED BY HAND WHERE POSSIBLE, AND UNDER THE DIRECTION OF A CERTIFIED ARBORIST OR APPROPRIATELY QUALIFIED ENVIRONMENTAL PROFESSIONAL (QEP).
24. TREE PROTECTION FENCING SPECIFICATIONS MUST BE IN ACCORDANCE WITH DWV TREE PROTECTION SPECIFICATION **(https://westvancouver.ca/sites/default/files/dwv/assets/home-building-property/permits-and-licences/construction/TreeProtection.pdf)**
25. IF OBSTACLES EXIST TO TREE BARRIER PLACEMENT, ALTERNATIVE PROTECTION FENCING ALIGNMENT AND PLACEMENT, OR ALTERNATIVES TO PROTECTION METHODOLOGY MUST BE APPROVED BY A QEP OR CERTIFIED ARBORIST PRIOR TO IMPLEMENTATION.



Compostable Sock Installation



Silt Fencing Installation



Catch Basin Silt Sacs

sartori
ASSESSMENT | PLANNING | COMPLIANCE

4363 Morgan Crescent
DWV Environmental Development Permit Figures

Figure 4: Erosion and Sediment Control Plan		REV 00
DATE 2022-12-21	DRAWN BY J.C.	SCALE 1:300