PROJECT FAQs AND UPDATES

FREQUENTLY ASKED QUESTIONS

What is the rationale for this development?

The property owner and applicant submitted a Development Permit (DP) application to the District for approval of a new seawall and the DP was issued by staff on July 21, 2021.

As part of the applicant's submission the applicant provided professional reports from a certified biologist and geotechnical engineer as is required by District's requirements. The professional reports provide evidence that erosion is occurring to the waterfront portion of the property. The professional reports supplied have also indicated that the intention of this project is to prevent further erosion of the property and prevent the existing overhanging mature trees from being undermined by the erosion.

Why was this application approved by staff and not Council?

This was an application for a Development Permit (DP). As per the statutes of the *Local Government Act 490-491*, a DP does not require a public hearing or for the application to be presented to Council, given that there are no variances to the District's zoning bylaw #1255. Council is not involved in the processing of DPs without variances since Council has delegated the Approval of DPs without variances to the Director of Planning and Community Services in accordance with the District's Development Applications Procedure Bylaw No 1519.

Doesn't the OCP prevent developments like this?

While the OCP has general policies regarding the marine foreshore in section 4.0 that appear to restrict such developments and structures these are all within the general policy portions of the Official Community Plan. The issuance of a development permit must be exercised only in accordance with the applicable guidelines specified under section 488 of the *Local Government Act* and in an official community plan, in the District's case these guidelines are found in section 14 of the OCP which are the DP Guidelines relating to DPA-1. The other policy statements guide the District in its adoption of land use and other bylaws. Therefore, for development permit applications, the Director of Planning is required to only apply those guidelines that have been specified under section 488 of the *Local Government Act* as applicable to that development permit area i.e., those found in section 14.3 of the OCP. Therefore, should the application meet the DPA guidelines found on pg.43,44 of the current OCP then the DP must be approved.

The District's OCP is now 14 years old and the DP guidelines found in section 14 are outdated and don't reflect best practice in environmental protection or addressing issues such as sea level rise.

Why are no variances required for such a structure?

The clearer authority for preventing or controlling seawalls from being constructed on beaches is through setbacks imposed by the zoning bylaw. The District's zoning bylaw exempts retaining walls from the natural boundary setback (and does not regulate the siting of retaining walls under 1 metre). Section 110.3 of the zoning bylaw states the following:

> *110.3 Despite any other provision or exception in this Bylaw, no building or structure other than staircases, walkways, and retaining walls may be within 15 metres (49.2 ft.) of the natural boundary of the marine shoreline, except in the Marine (M) Zones.*

Therefore, no variance is needed to be obtained from Council for this seawall/retaining wall in this 15m natural boundary setback, whereas a deck/patio would.

Is the District planning on updating its Development Permit guidelines?

The District is currently reviewing its Official Community Plan which includes a review and update to the District's development Permit Areas and Guidelines. Please sign up for updates, so that when we have new draft development permit guidelines you will be able to review them and provide comments on them. Updates and more information: www.connectnorthsaanich.ca/ocp

Are staff monitoring the project?

Staff are being kept informed on progress of the project by the applicants Qualified Environmental Professional (QEP) and undertaken site visits to monitor progress.

QUALIFIED ENVIRONMENTAL PROFESSIONAL UPDATES

The Qualified Environmental Professional (QEP) for the project has been providing regular updates to the District as follows:

QEP Update No. 4 October 1, 2022

Approved with DFO : *1-2 weeks beyond the October 1 Least Risk Timing Window for the protection of fish and fish habitat for Area 19, Victoria (Summer Window: July 1 – October 1) for project 21-HPAC-00629, Seawall Installation, Saanich Inlet, Brentwood Bay (10664 Madrona Drive, North Saanich, BC). The extension is requested because of general construction supply delays in getting concrete for lock blocks and other materials.*

Prior to October 1*, the project status would be:*

- *Continuing Environmental Monitoring: periodic site visits and daily photos from contractor and/or owner.*
- *Site Exclusion from forage fish with sediment fence and site elevation above current tide line.*
- *Majority of Walls complete with topsoil placement at top of wall for landscaping with native plants (top lock blocks have a recessed portion with outer sill for soil retention).*
- *Last delivery of lock blocks to beach.*
- *Native beach material raked for splintered wood from cribbing used for beach protection.*
- *Native beach material backfilled against walls and pre-existing LWD and boulders restored (except immediately in front of ramp)*

After October 1*, the remaining works include:*

- *Continuing Environmental Monitoring: periodic site visits and daily photos from contractor and/or owner.*
- *Site Exclusion from forage fish with site elevation above current tide line.*
- *Completion of ramp, removal of sediment fence, and native beach material backfilled against wall/ramp and pre-existing LWD and boulders restored.*
- *By hand - Minor beach regrading/backfilling of beach materials against walls.*

- *All excavator work from beach completed and excavator removed from beach Further excavator work to restore upper back slope and landscaping to be completed from back slope (est. Oct. 7/14).*

The contractor expects to be finish by Friday, October 7, with a request for contingencies to Oct 14, 2022.

QEP Update No. 3 September 26, 2022

One of the drivers for the project has been to protect the many mature trees at the top of the bank across the property from loss due to bank failure. No lock blocks are being planned for the point/corner under the Juniper, as the root structure is too close to the exposed soil edge.

After the completion of the wall, replacing the beach logs and boulders, installation of native plantings (at the base and the top of the wall), and a winter tidal cycle to re-sort the beach materials, we expect to see beach profile as close to the original condition as possible.

QEP Update No. 2 September 21, 2022

Following up on the concerns about excavation beyond the Present Natural Boundary (PNB): over excavation beyond the PNB is part of the design and permitted activities in order to construct the wall at/behind the PNB.

- *During this work there is a temporary disturbance area that must be excavated to constructed the base for the wall.*
- *Once the lock blocks are placed at/behind the PNB, the wall is back filled and the beach substrate reinstated up to the wall, including the large wood and additional plantings of native marine-tolerant vegetation.*

This design and construction process was included in the Development Permit application to North Saanich, the DFO Project Review and the notification to Crown Lands.

Swell have been monitoring the project, including conducting surveys for Forage Fish eggs in beach substrate within the project footprint and will continue until it is complete.

QEP Update No. 1 August 2, 2022

- *Series of pre-construction meetings with the general contractor and excavator operator*
- *Sara Stallard conducted a Forage Fish Spawning Survey on the beach (no forage fish eggs were found) prior to temporary beach substrate stockpiling (to protect the beach material from being mixed with slope/clay material)*
- *Rocky Point Bird Observatory conducted a pre-clearing nest survey (no nests were found)*
- *QEP is monitoring the site via regular site visits (every 1-2 days, depending on site activities during this stage of the project start up), as well as photos from the owner and contractor to observe progress and determine when we need to be on site.*
- *Don Skinner, RPBio, ISA Certified Arborist from Concrete Jungle Forestry is working with the contractor to protect the roots of the trees during construction, and hand pruning and clearing of the invasive species on the bank around the roots and limbs of native tree species (especially the two Maritime Junipers) to protect them during the vegetation clearing portion of the work on the lower bank.*
    - *A small limb of the Juniper tree was removed, to allow the machine to access under the tree to prevent damage to it during construction.*
- *Salvage of native plants for transplanting at the base of the wall upon completion.*
- *Beach substrate has been moved away from the future excavation zone and stockpiled to prevent mixing with slope soils to be excavated (to be replaced after completion of the work).*
- *Beach logs have been moved out of the area of the work (to be replaced after completion of the work).*
- *The access ramp to the beach has been located to intersect the beach at the highest elevation of the shore and reduce the mixing with beach substrate.*

- *The beach materials adjacent to the bottom of the ramp have been covered with geotextile and cribbing placed on top to prevent mixing of ramp material with the beach stockpile. This protective 'apron' is being expanded as needed.*

There have been concerns reported by the public about the perceived placement of non-native material on the beach, and preservation of the beach sediments. We wanted to clarify that no material has been imported onto the beach, and that the preservation of the beach sediments (along with protection and preservation of the native trees) has been the focus of our planning and Environmental Protection Measures. In consultation with us, the contractor has pulled back and stockpiled the beach substrate (gravels and shell hash) away from the bank along the length of the beach landward of the high tide line. This area is being used to keep the beach substrate from mixing with the excavated slope materials and as a buffer between the high water and the excavated slope (and soon-to-be seawall trench). The excavator/bobcat are using this higher level berm to prevent tracking of the bank materials (soil and clay) along the top of the beach. The lock blocks are temporarily located along the landward edge of the high tide line, resting on wooden cribbing and the beach logs that are shoring up the stockpiled beach materials. The intent here is to ensure that no lock blocks (or other materials) are being placed in potential forage fish spawning habitat without surveys for eggs. The logs and cribbing were placed in tandem with the stockpiled beach materials within the recommended 7-day window post forage fish survey and will remain in place, with lock blocks being added and removed as work progresses. And while not the original intent, the lock blocks have the added benefit of keeping the beach logs in one place during the work window.

The other concern that has been raised for the site is for Erosion and Sediment Control.
We have been implementing the measures identified in the Letter of Advice and our Environmental Protection Plan. A questions was raised about installation of a sediment fence, and at this point we have not installed one because:

- *The high tide is below the top of the stockpiled beach sediments and is not entering the work site at the toe of the bank.*
- *No observed sedimentation has occurred from the stockpiled material into the marine environment (see attached high tide photos, 2022-07-28).*
- *We have forecasted extreme dry weather.*

At this time, we have not seen that there will be a benefit for environmental protection achieved with installation of a sediment fence along the whole site, and we have observed on other sites that these fences can be a fish trap if they are over-topped at high tide. Given the minimal benefit (beyond perceived protection by the public) and the potential for fish trapping risk, we have decided not to install a sediment fence along the whole site at this time.

On Tuesday, the contractor will be installing a short section of sediment fence and sand bags at the south end of the project (near the beach access stairs), prior to excavation for the start of the lock block wall. In this lower elevation location underlain with bedrock, there was much less granular beach material and the tidal water can come into the work area. Here we will install barriers to prevent sediment from migrating outside the work site, we will ensure that the fence is tall enough that it won't be over-topped, and that fish will not be able to go around the fence to be trapped in the worksite on a falling tide.

We will continue to monitor the site and have the contractor install sediment fences where we observe a risk of sedimentation to the marine environment that will be remedied by a sediment fence.

Other Erosion and Sediment Control measures that are on site and ready for use are:

- *Wooden cribbing, logs and geotextile to prevent slope sediments from mixing with the stockpiled beach substrate*
    - *Additional plywood is stockpiled and available, if needed, to cover the beach substrate for the smaller excavator to move along the beach*
- *Polysheeting to cover exposed soils in the event of forecasted rainfall*
- *Sediment fences*

We are minimizing vegetation clearing and conducting work during dry weather and in the reduced risk fisheries window.
The contractor understands that the methods for protecting the beach substrate and the marine environment from sedimentation are proactive and are being adapted based on site observations.

Development Application

District of North Saanich
Planning & Community Services
1620 Mills Road, North Saanich BC V8L 5S9
Phone: 250-655-5470 Fax: 250-656-0782
www.northsaanich.ca

Part 1

An application is submitted for one or more of the following:

- ☐ **Rezoning/Bylaw Text Amendment**
- ☐ **OCP Amendment**
- ☑ **Development Permit**
- ☐ **Development Variance Permit**
- ☐ **Board of Variance**
- ☐ **Temporary Use Permit**
- ☐ DP 2021-11

Description of Property

Civic Address 10664 Madrona Drive PID 025-468-014

Legal Lot A Block 21 Section 17 Range 3 West Plan VIP 74147

Contacts

Please print clearly.

Applicant

Name	Company
Peter Kerr	
Address	**City**
10664 Madrona Drive	North Saanich
Email [redacted]	**Postal Code** V8L 5L8
Phone [redacted]	**Cell** [redacted] **Fax**

The undersigned owner/authorized agent of the owner makes an application as specified herein, and declares that the information submitted in support of the application is true and correct in all respects.

Applicant's Signature (required)	Date
[signature]	May 26, 2021

Owner

If the applicant is NOT the owner, complete "Owner's Authorization" form.

Name	Company
Lilian Kerr	
Address	**City**
10664 Madrona Drive	North Saanich
E [redacted]	**Postal Code** V8L 5L8
Phone [redacted]	**Cell** [redacted] **Fax**

Any personal information provided in this application is collected for the purpose of administering the Local Government Act, and the bylaws of the municipality under the Local Government Act, and under the authority of those enactments. Questions about the collection of the information may be directed to the Freedom of Information Officer.

Office Use Only

Reviewed By	Date	File No.
Received	Received By	Folio No.
Required Documents		
Required Plans	Receipt No.	Fees $

Forms of payment accepted: CASH CHEQUE INTERAC

Owner's Authorization

District of North Saanich
Planning & Community Services
1620 Mills Road, North Saanich BC V8L 5S9
tel 250-655-5470 fax 250-656-0782
www.northsaanich.ca

This form may be used in conjunction with Development Applications where the owner is authorizing an agent to submit an application and liaison with the municipality on his/her behalf.

Description of Property

Civic Address 10664 Madrona Drive, North Saanich

Legal Lot A Block 21 Section 17 Range 3 West Plan VIP 74147

Authorization

Authorization *The owner(s) of the above property, hereby authorize and appoint* Peter Kerr
Print Name
as our agent for the purposes of the submitted application. Permit No. _____
All communication and correspondence regarding this application shall be directed to the applicant.

Owner(s)

Please print clearly.

Owner Name (or Company Representative with Signing Authority)	Company	
Lilian Kerr		
Address 10664 Madrona Drive	**City** North Saanich	
Phone [redacted]	**Fax**	**Postal Code** V8L 5L8
Registered Owner Signature (or Company Representative with Signing Authority) Lilian Kerr	**Date** May 26/2	

Owner Name (or Company Representative with Signing Authority)	Company	
Address	**City**	
Phone	**Fax**	**Postal Code**
Registered Owner Signature (or Company Representative with Signing Authority)	**Date**	

Owner Name (or Company Representative with Signing Authority)	Company	
Address	**City**	
Phone	**Fax**	**Postal Code**
Registered Owner Signature (or Company Representative with Signing Authority)	**Date**	

Any personal information provided above is collected for the purpose of administering the Local Government Act, the bylaws of the municipality under the Local Government Act, and under the authority of those enactments. Questions about the collection of the information may be directed to the Freedom of Information Officer.

Appendix 3. North Saanich MUFDPA Development Permit Checklist

This document is linked to the Development Permit section of the Development Applications Guide

DP

Development Permit Area No. 1: Marine Uplands and Foreshore

Development Permit Application Guideline Review Table

OCP Section	Guideline	Proposal Details (describe how your proposal achieves the DP Guideline)
14.3.1	No site alterations shall be permitted in a foreshore area, as designated in section 14.3 above, except those allowed in a development permit or subject to the general exemptions outlined in section 14.2.	The proposal is for a lockblock seawall within the MUFDPA for slope stabilization, required due to excessive erosion as per geotechnical assessment.
14.3.2	Existing trees and vegetation on the upland area and adjacent to the foreshore must be retained in order to maintain the existing habitat and to control erosion.	Existing large trees and vegetation will be retained, where possible and appropriate native vegetation will be planted in exposed soil areas as per RPBio recommendations and landscape plan.
14.3.3	No habitable buildings or other structures requiring foundations will be constructed and no sewage disposal system will be installed in these Development Permit Areas except those allowed in a development permit or subject to the general exemptions outlined in section 14.2.	The proposal is for a lockblock seawall within the MUFDPA for slope stabilization, required due to excessive erosion as per geotechnical assessment.
14.3.4	Modification of channels, banks or shores which could result in environmental harm or significantly alter local hydrological conditions will not be permitted.	The proposal is for a lockblock seawall within the MUFDPA for slope stabilization, required due to excessive erosion as per geotechnical assessment.
14.3.5	Development must be designed so as to maintain the quality of any storm water flowing toward or into the ocean and to prevent any increase in volume and peak flow of runoff.	No change in quantity or quality of runoff is expected due to the project and drainage has been incorporated into the design by the structural engineer.
14.3.6	Proposed development must be designed to avoid any increase in runoff and to prevent any effluent or storm water discharge that could have a detrimental effect on the environment.	No change in quantity or quality of runoff is expected due to the project and drainage has been incorporated into the design by the structural engineer.
14.3.7	Controls are required on surface-water drainage to prevent pollutants from entering water features.	No change in quantity or quality of runoff is expected due to the project and drainage has been incorporated into the design by the structural engineer. Erosion and sediment control measures will be implemented during construction as per RPBio recommendations.
14.3.8	Intensively landscaped areas and other related activities should be sited so as to prevent nutrient-rich water from entering natural water features.	No change in quantity or quality of runoff is expected and native plants along the shoreline will be retained and additional native plants will be planted in exposed soil areas with no nutrient rich runoff expected from the work.

DEVELOPMENT PERMIT

DNS File No:	DP 2021-11
DPA(s):	1 & 4
Registered Owner:	Lilian Kerr
Subject Property:	10664 Madrona Drive
Description of Land:	
Parcel Identifier:	025-468-014
Legal Description:	Lot A, Section 17, Range 3 West, North Saanich District, Plan VIP 74147
Proposal:	**Sea Wall Construction within Marine Foreshore**

Conditions of Permit:

1. Development of the site must be completed in substantial compliance with the attached drawings and documents:

Schedule A	Site Survey (Wey Mayenburg Land Surveying Inc, July 9, 2021)
Schedule B	Site Plan and Construction Drawings (Westmar Advisors, May 20, 2021)
Schedule C	Biologist Report (Swell Environmental Consulting, May 20, 2021)
Schedule D	Geotechnical Report (Ryzuk Geotechnical, March 4, 2021)

2. As provided for under section 491 of the *Local Government Act*, the following conditions must be adhered to:
    a. All works will be monitored by the designated Qualified Environmental Professional during construction to ensure that the designs and plans detailed in Schedules A through D are adhered to:
        i. All collected storm water must be suitably discharged in a manner that does not destabilize vegetation or soils;
        ii. All necessary silt abatement measures must be undertaken including runoff control and silt fences;
        iii. Within the Development Permit area, no vegetation (excluding invasive species) will be removed other than vegetation removal associated with construction of the sea wall as specified in Schedule C; and
        iv. Any trees removed from the Development Permit Area for safety reasons, as determined by a certified arborist, will be replaced in the same area at a 1:1 ratio as specified by the QEP in Schedule C;

b. All construction activity must be done in accordance with the Best Management Practice published by the Department of Fisheries and Oceans.

c. Pursuant to Section 502 of *the Local Government Act*, prior to the issuance of a Building Permit, the applicant shall deposit security in an amount equal to 125% of the estimated landscaping costs, based on written cost estimates.

3. Notice of this Permit shall be filed in the Land Title Office at Victoria under S. 503 of the *Local Government Act,* and upon such filing, the terms of this Permit (DP 2020-13) or any amendment hereto shall be binding upon all persons who acquire an interest in the land affected by this Permit.

4. There may be some potential for the subject property to contain archaeological sites protected by the Heritage Conservation Act. Section 12.1(2) of the Heritage Conservation Act protects heritage (archaeological) sites and heritage objects. This Development Permit does not authorize alteration of any such site or object. The property owner is responsible for ensuring compliance with the Heritage Conservation Act including taking any required steps to determine whether or not the subject property contains a heritage (archaeological) site or heritage object. Under section 36 of the Heritage Conservation Act it is an offence to alter a heritage (archaeological) site or heritage object without first obtaining a permit to do so from the Province of British Columbia.

5. Pursuant to section 504 of the *Local Government Act*, this permit will lapse two years from the date of the Development Permit approval unless construction, in accordance with the terms and conditions of this permit, has substantially started.

6. Further to condition #4, construction is considered to be substantially started when a valid building permit for the development has been issued and shall not have lapsed; and excavation or construction works associated with the development hereby approved must have commenced to the satisfaction of the Director of Community Services. Demolition does not constitute construction.

7. The plans and specifications attached to this Permit are an integral part of this Permit.

8. This permit is issued subject to compliance with all relevant District of North Saanich bylaws, and given that the proposed development is supplemented by this Permit.

Despite issuance of this permit, construction may not start without a Building Permit, Tree Cutting Permit or other necessary permits including obtaining a license of occupation for the Crown foreshore lands from the Department of Forests, Lands, Natural Resource Operations and Rural Development. It is the owner's responsibility to determine whether such permits are required.

Approved by the Director of Planning & Community Services as authorized under Bylaw No. 1324:

Brian Green

Date: JULY 21, **2021**

Schedule A

Site Plan Of:
Lot A, Section 17, Range 3 West, North Saanich District, Plan VIP74147.
P.I.D. 025-468-014

5 4 3 2 1 0 5 10 15

Scale = 1:300

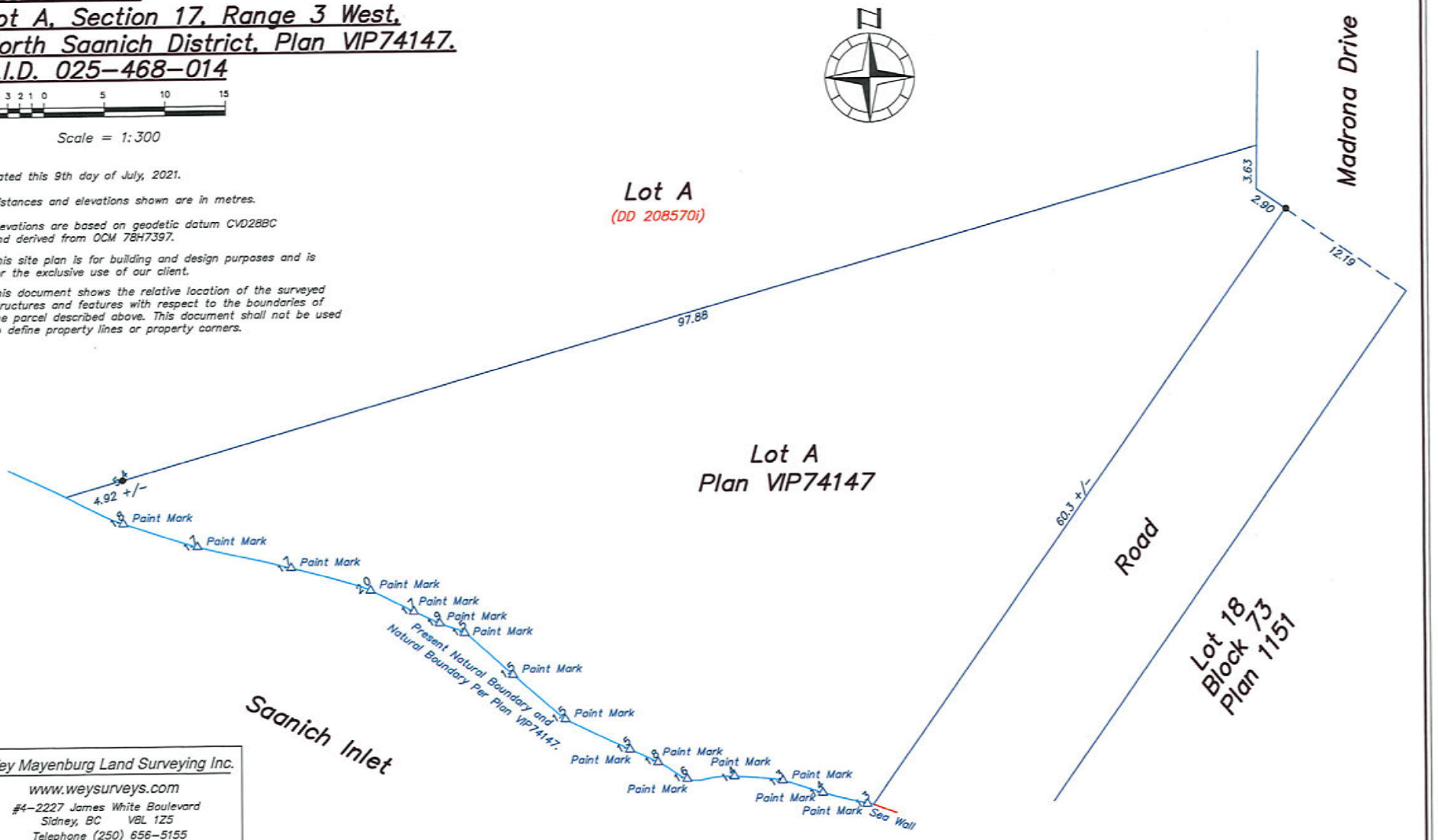
Dated this 9th day of July, 2021.

Distances and elevations shown are in metres.

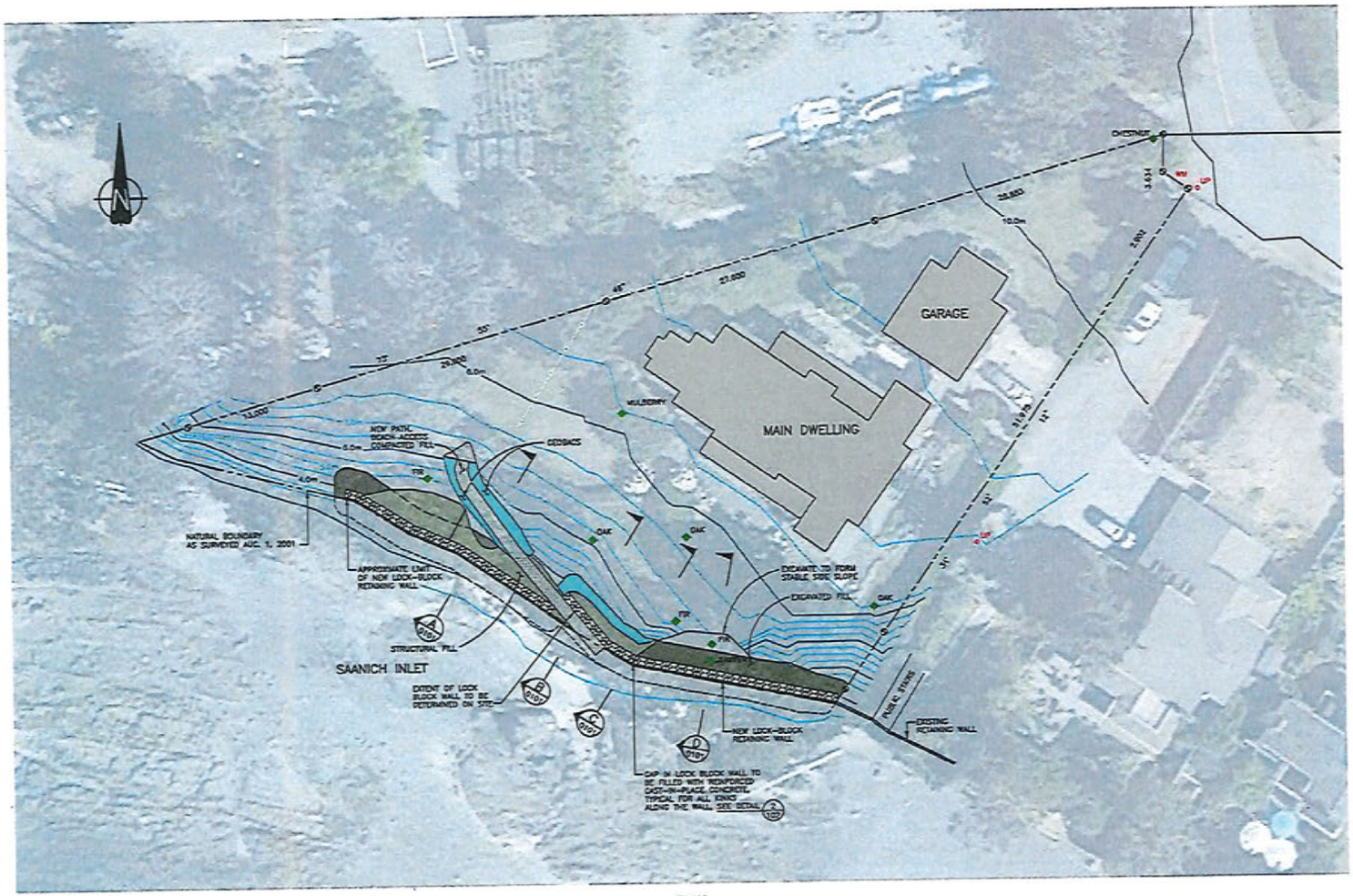
Elevations are based on geodetic datum CVD28BC and derived from OCM 78H7397.

This site plan is for building and design purposes and is for the exclusive use of our client.

This document shows the relative location of the surveyed structures and features with respect to the boundaries of the parcel described above. This document shall not be used to define property lines or property corners.



Wey Mayenburg Land Surveying Inc.
www.weysurveys.com
#4-2227 James White Boulevard
Sidney, BC V8L 1Z5
Telephone (250) 656-5155
File: 210246\SIT\LE



PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: May. 20/21 10:01am

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LEGEND:

- LOCK-BLOCK RETAINING WALL (39.71m²)
- GEOSACS (38.53m²)
- COMPACTED FILL (31.22m²)
- EXCAVATED FILL (56.36m²)
- STRUCTURAL FILL (54.01m²)

NOTES:

1. BASE PLAN DERIVED FROM BRAD CUNNIN LAND SURVEYOR, DRAWING 8CE5PG4, DATED 2018-03-05.
2. ELEVATIONS ARE IN METRES AND REFERENCED TO GEODETIC DATUM.

No.	DATE	DESCRIPTION	DRAWN	CHK'D	DESIGN	CHK'D	APP'D
E	MAY20/21	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR
D	APR26/21	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR
C	APR16/21	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR
B	DEC04/20	ISSUED FOR CLIENT REVIEW	ML	–	KKR	VR	VR
A	NOV19/20	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR

ISSUE / REVISIONS

MDR

CLIENT: 10664 MADRONA DRIVE

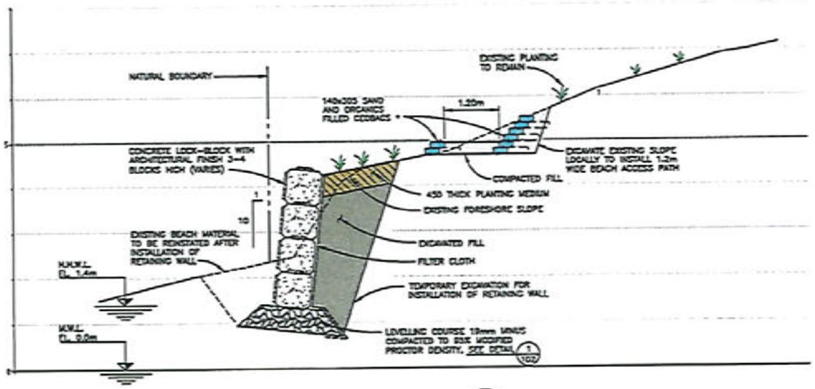
PROJECT: FORESHORE SLOPE STABILIZATION

WESTMAR ADVISORS

TITLE: RETAINING WALL GENERAL ARRANGEMENT

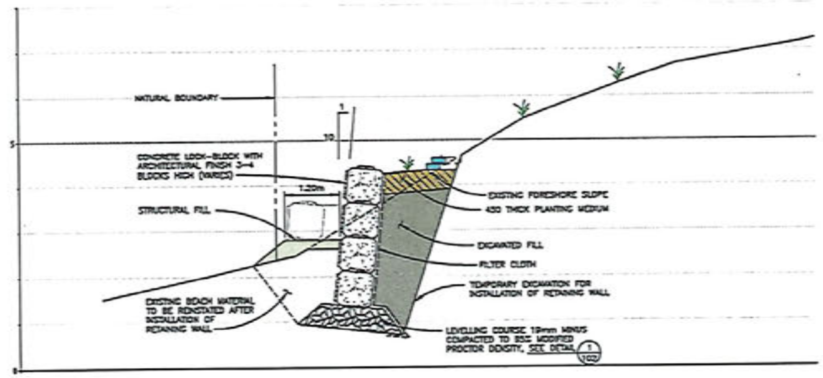
DRAWING SCALE	PROJECT NUMBER	DRAWING NUMBER	REV.
NONE	1200092	00-0100	E

Schedule B

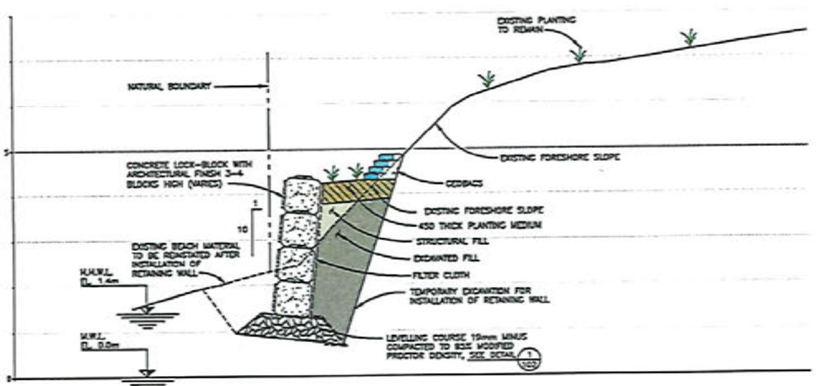

NATURAL BOUNDARY
EXISTING PLANTING TO REMAIN
140x305 SAND AND ORGANICS FILLED GEOBAGS *
1.20m
CONCRETE LOCK-BLOCK WITH ARCHITECTURAL FINISH 3-4 BLOCKS HIGH (VARIES)
EXCAVATE EXISTING SLOPE LOCALLY TO INSTALL 1.2m WIDE BEACH ACCESS PATH
COMPACTED FILL
450 THICK PLANTING MEDIUM
EXISTING FORESHORE SLOPE
EXISTING BEACH MATERIAL TO BE REINSTATED AFTER INSTALLATION OF RETAINING WALL
EXCAVATED FILL
FILTER CLOTH
H.H.W.L. EL. 1.4m
TEMPORARY EXCAVATION FOR INSTALLATION OF RETAINING WALL
M.W.L. EL. 0.0m
LEVELLING COURSE 19mm MINUS COMPACTED TO 95% MODIFIED PROCTOR DENSITY, SEE DETAIL 1/102

SECTION A
1:50 0100

* UPTO SEVEN GEOBAGS MAYBE REQUIRED TO RETAIN FILL AT TOP OF BEACH ACCESS PATH. THREE SHOWN IN THIS SECTION.


NATURAL BOUNDARY
CONCRETE LOCK-BLOCK WITH ARCHITECTURAL FINISH 3-4 BLOCKS HIGH (VARIES)
1.20m
STRUCTURAL FILL
EXISTING FORESHORE SLOPE
450 THICK PLANTING MEDIUM
EXCAVATED FILL
FILTER CLOTH
TEMPORARY EXCAVATION FOR INSTALLATION OF RETAINING WALL
EXISTING BEACH MATERIAL TO BE REINSTATED AFTER INSTALLATION OF RETAINING WALL
LEVELLING COURSE 19mm MINUS COMPACTED TO 95% MODIFIED PROCTOR DENSITY, SEE DETAIL 1/102

SECTION B
1:50 0100


EXISTING PLANTING TO REMAIN
NATURAL BOUNDARY
EXISTING FORESHORE SLOPE
CONCRETE LOCK-BLOCK WITH ARCHITECTURAL FINISH 3-4 BLOCKS HIGH (VARIES)
GEOBAGS
EXISTING FORESHORE SLOPE
450 THICK PLANTING MEDIUM
STRUCTURAL FILL
EXISTING BEACH MATERIAL TO BE REINSTATED AFTER INSTALLATION OF RETAINING WALL
EXCAVATED FILL
H.H.W.L. EL. 1.4m
FILTER CLOTH
TEMPORARY EXCAVATION FOR INSTALLATION OF RETAINING WALL
M.W.L. EL. 0.0m
LEVELLING COURSE 19mm MINUS COMPACTED TO 95% MODIFIED PROCTOR DENSITY, SEE DETAIL 1/102

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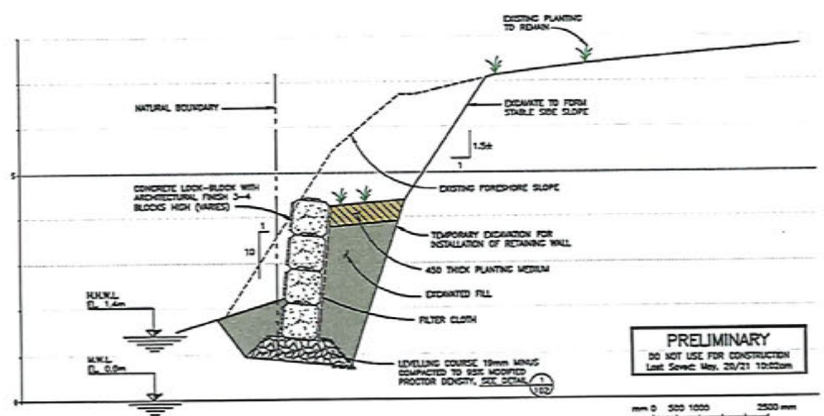
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NATURAL BOUNDARY
EXCAVATE TO FORM STABLE SIDE SLOPE
EXISTING FORESHORE SLOPE
CONCRETE LOCK-BLOCK WITH ARCHITECTURAL FINISH 3-4 BLOCKS HIGH (VARIES)
TEMPORARY EXCAVATION FOR INSTALLATION OF RETAINING WALL
450 THICK PLANTING MEDIUM
H.H.W.L. EL. 1.4m
EXCAVATED FILL
FILTER CLOTH
M.W.L. EL. 0.0m
LEVELLING COURSE 19mm MINUS COMPACTED TO 95% MODIFIED PROCTOR DENSITY, SEE DETAIL 1/102

SECTION D
1:50 0100

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: May. 20/21 10:02am

mm 0 500 1000 2500 mm
1:50

NOTES:

1. ELEVATIONS ARE IN METRES AND REFERENCED TO GEODETIC DATUM.

No.	DATE	DESCRIPTION	DRAWN	CHK'D	DESIGN	CHK'D	APP'D
E	MAY20/21	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR
D	APR26/21	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR
C	APR16/21	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR
B	DEC04/20	ISSUED FOR CLIENT REVIEW	HL	–	KKR	VR	VR
A	NOV19/20	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR

ISSUE / REVISIONS

CLIENT: 10664 MADRONA DRIVE

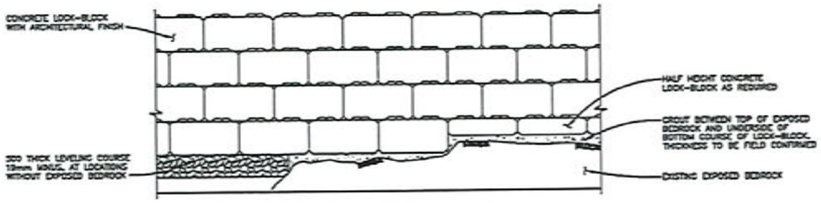
PROJECT: FORESHORE SLOPE STABILIZATION

WESTMAR ADVISORS

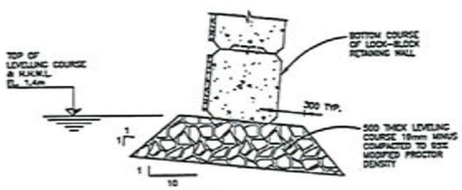
TITLE: RETAINING WALL SECTIONS

DRAWING SCALE	PROJECT NUMBER	DRAWING NUMBER	REV.
NONE	1200092	00-0101	E

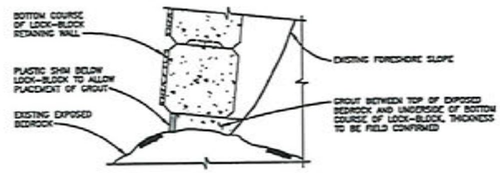
Filename: C:\Users\rmal\OneDrive\Westmar\2020\Site Coords\1200092-00-0100-0102.dwg – 101
Last Saved: May. 20/21 10:02am Plotted: May. 20/21


CONCRETE LOCK-BLOCK WITH ARCHITECTURAL FINISH
HALF HEIGHT CONCRETE LOCK-BLOCK AS REQUIRED
GROUT BETWEEN TOP OF EXPOSED BEDROCK AND UNDERSIDE OF BOTTOM COURSE OF LOCK-BLOCK. THICKNESS TO BE FIELD CONFIRMED
500 THICK LEVELING COURSE 19mm MINUS AT LOCATIONS WITHOUT EXPOSED BEDROCK
EXISTING EXPOSED BEDROCK

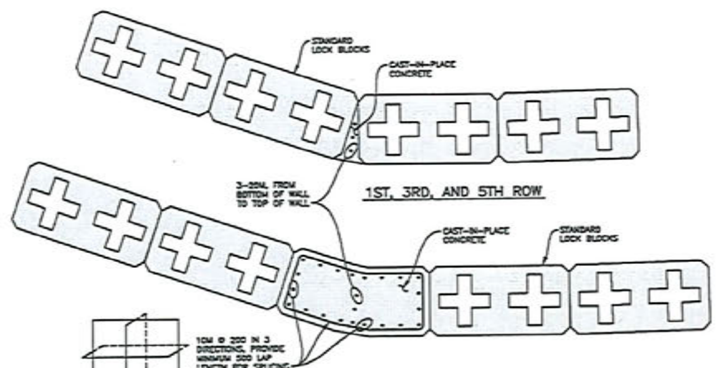
ELEVATION – RETAINING WALL
1:50



DETAIL (1 / 101) LEVELLING COURSE
1:25


BOTTOM COURSE OF LOCK-BLOCK RETAINING WALL
PLASTIC SHIM BELOW LOCK-BLOCK TO ALLOW PLACEMENT OF GROUT
EXISTING EXPOSED BEDROCK
EXISTING FORESHORE SLOPE
GROUT BETWEEN TOP OF EXPOSED BEDROCK AND UNDERSIDE OF BOTTOM COURSE OF LOCK-BLOCK. THICKNESS TO BE FIELD CONFIRMED

ALTERNATE DETAIL AT LOCATIONS WITH EXPOSED BEDROCK



DETAIL (2 / 101) LOCK BLOCK WALL AT KINK
1:25

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Apr. 26/21 1:08pm

mm 0 500 1000 2500 mm
1:50

NOTES:

1. ELEVATIONS ARE IN METRES AND REFERENCED TO GEODETIC DATUM.

No.	DATE	DESCRIPTION	DRAWN	CHK'D	DESIGN	CHK'D	APP'D
D	APR26/21	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR
C	APR16/21	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR
B	DEC04/20	ISSUED FOR CLIENT REVIEW	HL	–	KKR	VR	VR
A	NOV19/20	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR

ISSUE / REVISIONS

No.	DATE	DESCRIPTION	DRAWN	CHK'D	DESIGN	CHK'D	APP'D

ISSUE / REVISIONS

MCR

CLIENT: 10664 MADRONA DRIVE

PROJECT: FORESHORE SLOPE STABILIZATION

WESTMAR ADVISORS

TITLE: RETAINING WALL ELEVATION AND DETAILS

DRAWING SCALE	PROJECT NUMBER	DRAWING NUMBER	REV.
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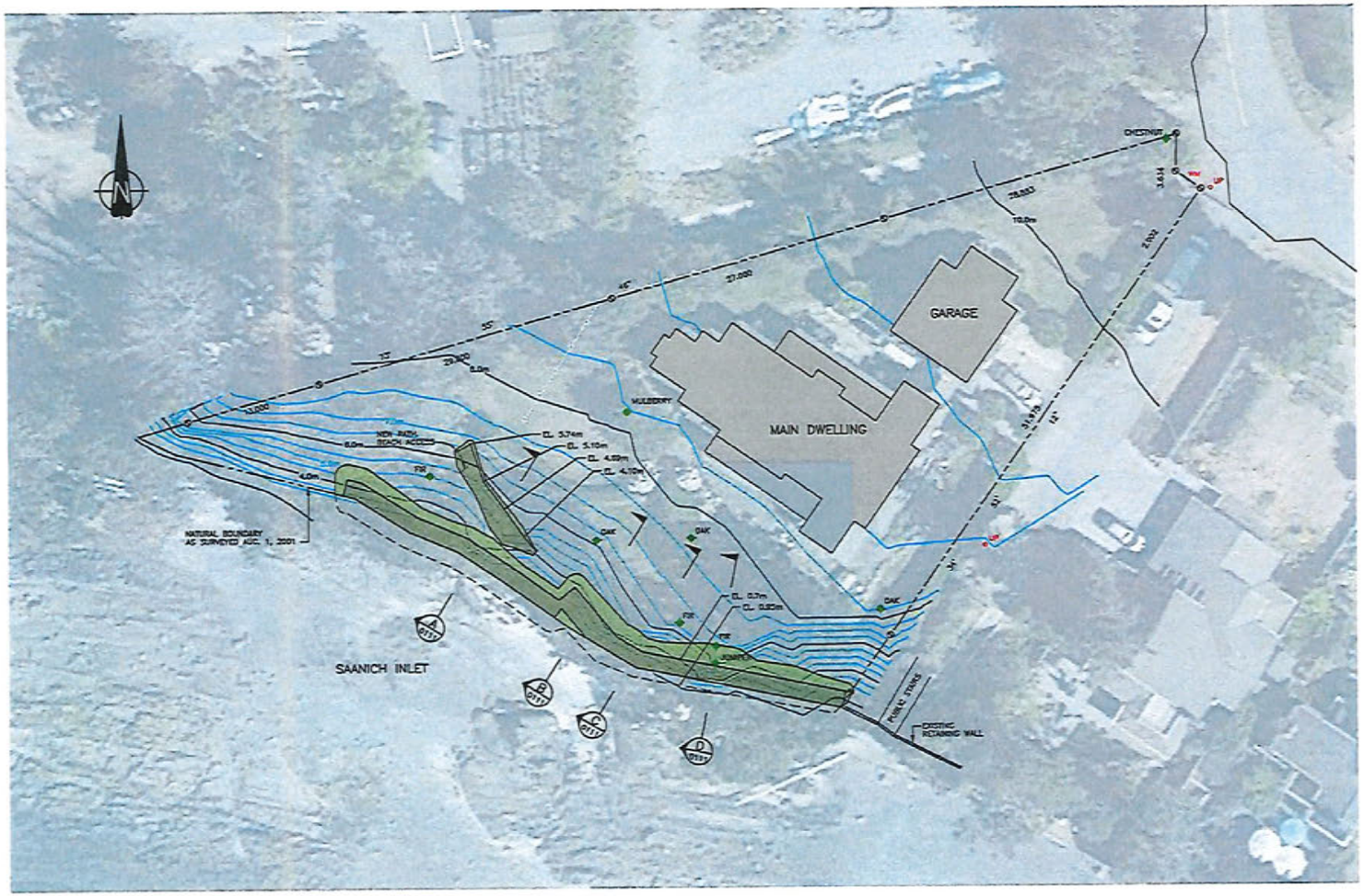
Filename: C:\Users\...\1200092-00-0100-0102.dwg – 102
Last Saved: Apr. 26/21 1:08pm Plotted: Apr. 26/21



PLAN
1:200

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Apr. 26/21 1:07pm

m 0 5 10 m
1:200

LEGEND:

EXCAVATED BASIN (108.78m²)

EXCAVATED SIDE SLOPE (79.0m²)

NOTES:

1. BASE PLAN DERIVED FROM BRAD CUNNIN LAND SURVEYOR, DRAWING 8062SP04, DATED 2018-03-05.
2. ELEVATIONS ARE IN METRES AND REFERENCED TO GEODETIC DATUM.

No.	DATE	DESCRIPTION	DRAWN	CHK'D	DESIGN	CHK'D	APP'D
B	APR26/21	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR
A	APR16/21	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR

ISSUE / REVISIONS

MCR

CLIENT: 10664 MADRONA DRIVE

PROJECT: FORESHORE SLOPE STABILIZATION

WESTMAR ADVISORS

TITLE: EXCAVATION PLAN

DRAWING SCALE	PROJECT NUMBER	DRAWING NUMBER	REV.
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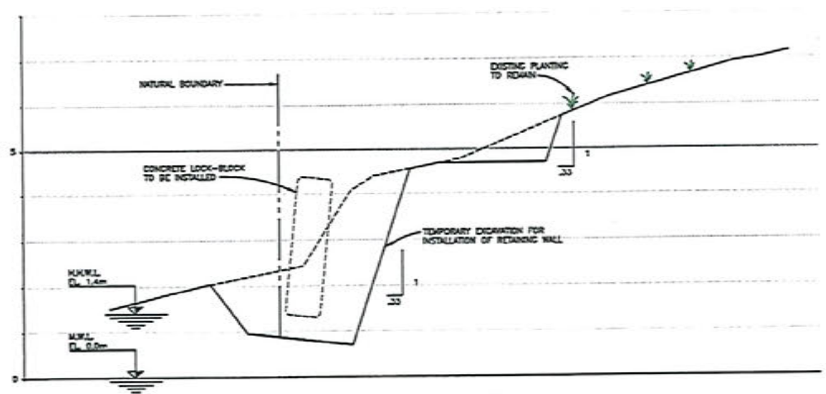
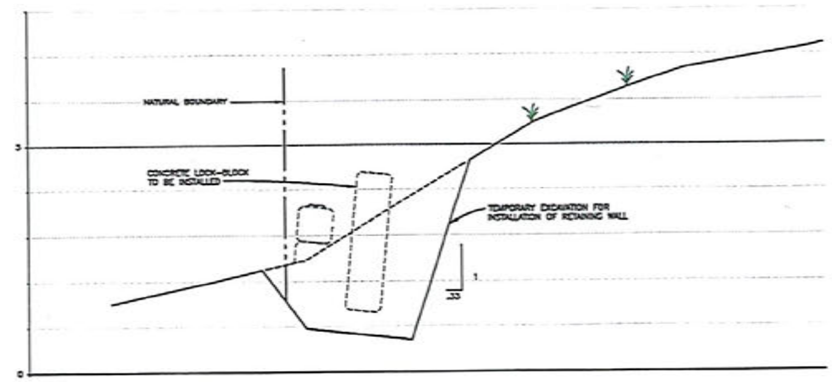


SECTION A
1:50 0110



SECTION B
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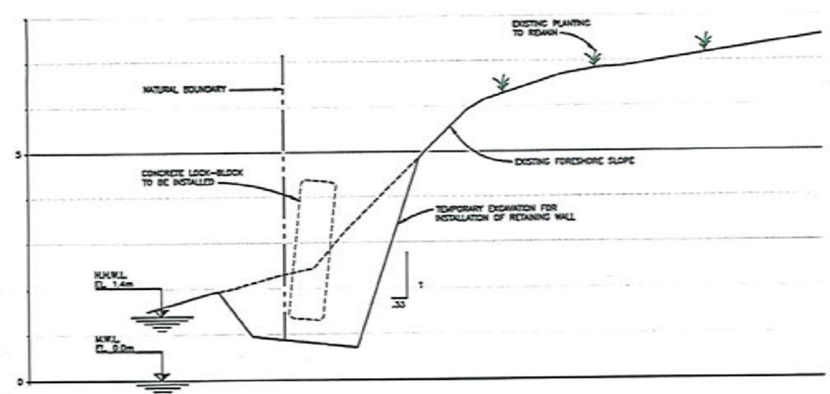
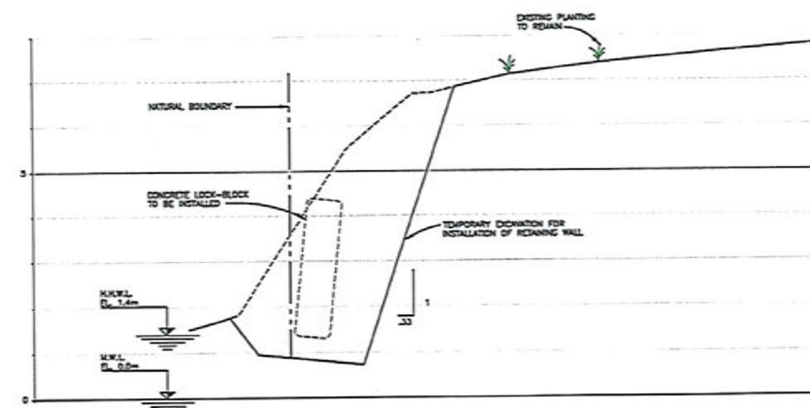


SECTION C
1:50 0110



SECTION D
1:50 0110

mm 0 500 1000 2500 mm
1:50

NOTES:
1. ELEVATIONS ARE IN METRES AND REFERENCED TO GEODETIC DATUM.

No.	DATE	DESCRIPTION	DRAWN	CHK'D	DESIGN	CHK'D	APP'D
B	APR26/21	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR
A	APR16/21	ISSUED FOR CLIENT REVIEW	RM	–	KKR	VR	VR

ISSUE / REVISIONS

No.	DATE	DESCRIPTION	DRAWN	CHK'D	DESIGN	CHK'D	APP'D

ISSUE / REVISIONS

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
Last Saved: Apr. 26/21 1:07pm

MGR

CLIENT: 10664 MADRONA DRIVE

PROJECT: FORESHORE SLOPE STABILIZATION

WESTMAR ADVISORS

TITLE: EXCAVATION SECTIONS

DRAWING SCALE	PROJECT NUMBER	DRAWING NUMBER	REV.
NONE	1200092	00-0111	B

Filename: C:\Users\...\OneDrive\Engineering\Westmar\2020\Site Cost...\1200092-00-0110-0111.dwg – 0111
Last Saved: Apr. 26/21 1:07pm Plotted: Apr. 28/21

Schedule C

swell ENVIRONMENTAL CONSULTING

Peter Kerr
10664 Madrona Drive
North Saanich, BC V8L 5L8

May 20, 2021

RE: Environmental Review for Shoreline Stabilization in the Marine Uplands and Foreshore Development Permit Area for 10664 Madrona Drive, North Saanich, BC.

On March 11, 2020, I visited 10664 Madrona Drive (Figures 1 and 2) to meet with the owner, and review the condition of the Marine Uplands and Foreshore Development Permit Area (MUFDPA), (which is 15m from the natural boundary of the sea), to assess the MUFDPA with regard to erosion that is occurring along the shoreline within the MUFDPA.

The MUFDPA has the stated objective (North Saanich Official Community Plan (2007) page 42):

> To regulate development along the shoreline, foreshore and uplands to provide long- term protection for the ecological values of these areas and guard against their deterioration and contamination.

Existing Condition

The property has a single family house and associated landscaping and generally low slope from the road to the southwest, until there is a steep slope along the southern edge of the property to the shoreline, and historic wooden slope stabilization revetments and beach access. The MUFDPA was observed to have experienced excessive erosion at the base of the slope at the shoreline, as described by Laura Lessingham, PEng, Ryzuk Geotechnical (Appendix 1). In particular, there are the following concerns (Photos 5-17):

- erosion along and above the upper tidal limit, with a near vertical scarp along the base that is locally undercut
- tree roots exposed in some locations
- evidence of past failure in several areas of the slope including in the location of the previous boat ramp

The slope in the MUFDPA down to the shoreline from the house has mature trees on the slope: Douglas-fir (*Pseudotsuga menziesii*), Garry oak (*Quercus garryana*), arbutus (Arbutus menziesii), juniper (*Juniperus* sp.), with younger bigleaf maple (*Acer marcophyllum*), and non-native, invasive, English hawthorn (*Crataegus monogyna*). The understory been historically cleared, and currently consists of ornamental landscaping and lawn at the top of the slope, while the steep slope to the shoreline is composed primarily of non-native invasive species: English ivy (*Hedra helix*), Scotch broom (*Cytisus scoparius*), gorse (*Ulex europaeus*), Himalayan blackberry (*Rubus armeniacus*), golden chain tree (*Laburnum* sp.), spurge laurel (*Daphne laureola*). The steep slope also has periodic occurrences of the native species common snowberry (*Symphoricarpos albus*), Nootka rose (*Rosa nutkana*), tall Oregon grape (*Mahonia aquifolium*), trumpet honeysuckle (*Lonicera ciliosa*), and yerba buena (*Clinopodium douglasii*) (Photos 1-17).

The beach consists of bedrock outcroppings with a mix of cobble, gravel and sand with drift wood, and a salt marsh at the western end of the proposed work. The beach has appropriate substrate and profile for forage fish spawning habitat and recent local surveys in Patricia Bay have been positive for both surf smelt and sand lance (Photos 18 and 19).

"Forage fish, such as Pacific sand lance (*Ammodytes hexapterus*) and surf smelt (*Hypomesus pretiosus*), are small schooling fish that play an integral role in marine food webs, directly and indirectly feeding a diverse selection of birds, fish (including Chinook salmon), and whales. Their role as food, or 'forage' for other animals underpins the health of the Salish Sea, providing a link between lower and higher trophic levels. Surf smelt grow to be 20-25cm long and spawn year-round on gravel and sand beaches near the high tide line. These fish depend on shading from overhanging vegetation to protect their eggs from summer sun. Pacific sand lance are up to 20cm long and spawn on sandy intertidal beaches. They are one of Chinook salmon's primary food sources. These important fish face threats from a variety of sources, most notably from fisheries and the destruction of spawning habitats through shoreline modification. This includes armoring (i.e. seawalls, rip rap), dredging, vegetation removal, and pollution from storm water or other sources. These modifications result in alterations of the supply and movement of beach sediments, reduced shading of beach area, and increased pollution, therefore making the beaches unsuitable for surf smelt and sand lance" (background summary courtesy of Peninsula Streams).

Proposed Work in the MUFDPA

The proposed work in the MUFDPA is to construct a lockblock seawall along eastern 51.5m of the length of the property (above the Present Natural Boundary), as recommended by Laura Lessingham, PEng, Ryzuk Geotechnical (Appendix 1). Additionally, a new ramp to the beach will be installed to provide temporary construction access and long-term beach access for the property (replacing the existing one which is in an area of the failed slopes) (Figures 2-5). MSE Geo Bags will be used to create small retaining walls on the slope to create the ramp and another area for mid-slope stabilization, and these will be planted with native species (Figure 6). The structure is engineered and designed by Vignesh Ramadhas, P.Eng. at Westmar Advisors Inc. (Figure 3, Appendix 2). Sarah Carver, Haven Garden Design, has developed a landscape plan for the areas that will be disturbed by the seawall construction, incorporating the Swell recommendations for site restoration (Figure 6). The construction is proposed to occur in the summer of 2021 (within the DFO reduced risk fisheries window - July 1 to October 1).

The erosion on the site threatens the bank and trees on the slope, as described in the report by Ryzuk Geotechical (Appendix 1). According to Ryzuk, softer approaches, such as bioengineering will not be sufficient to provide the shoreline protection and bank stability required.

A lockblock seawall has been specified, even though these are not typically recommended for new seawalls, because the site access does not allow space around the house to bring large rock to the shoreline, and the shoreline is too rocky for access by barge to bring large rock to the shoreline to build a more typical stacked boulder wall.

The construction technique proposed for the site is to:

- Trim understory vegetation on the slope so the slope is visible.
- Create an access to the beach around the north side of the house and down the slope (approximately in the location of the previous boat ramp) for an excavator to access the beach
- The excavator will work along the top of the beach to excavate the trench for the base of the wall and to place the lockblocks on the landward side of the Present Natural Boundary (PNB)
    - Beach materials (e.g. drift wood) will be placed to the side and replaced following the work
    - Excavated slope material (soil) will be kept separate from the beach substrate (sand/gravel/shell hash) and will be removed from the beach prior to tidal inundation.
- Concrete grout may be used at the base where lockblocks are placed over bedrock (Appendix 2)
- MSE Geo Bags will be installed by hand
- A medium sized Bobcat will be used to bring road base and drain rock from the road to the top of the bank to backfill behind the wall
- Construction is expected to take approximately 6 weeks
- Native species plantings will be installed in the fall of 2021

The proposed wall is 2-3m high (varies), approx. 2m wide at the base, and 51.5m long with a total construction footprint of 188m^2 (Figures 4 and 5).
No large trees are proposed for removal for the work. Three small trees on the lower slope (bigleaf maple, Garry oak, and the invasive, non-native English hawthorn) may require removal: if they are removed, they will be replaced at 1:1 with native species (Figures 2, 3, and 6, and Photo 15).

Native vegetation will be replanted (replacing primarily invasive, non-native species) in the area that will be disturbed by construction and the area of the backfill behind the wall, and any other exposed soil areas that are observed following construction. The estimated planting area is approximately 188m^2 (Figure 4). The number of plants required for the restoration will be determined following construction, once the exact area of disturbance is known, and the restoration plantings will be installed at the densities shown on the plan (Figure 6).

The lock block wall is proposed above the Present Natural Boundary (PNB) of the sea, however, the excavator will temporarily work below the PNB to install the wall, and a Project Review will be submitted to Fisheries and Oceans Canada for their advice on the environmental protection measures proposed for the project.

Recommendations for Environmental Protection

Environmental Protection Measures must be implemented during the work to protect the marine shoreline environment during construction. The following measures are recommended:

Forage Fish Spawning Survey and Monitoring

Between the two species of forage fish possible at the site, the spawning seasons have a potential year-round coverage. Under the federal *Fisheries Act*, it is illegal to cause 'serious harm' to fisheries fish. Serious harm is defined as "the death of fish or any permanent alteration to, or destruction of, fish habitat". To ensure protection of potential forage fish spawn on the beach, the guidelines currently being used on the peninsula recommend that "potential" spawning habitat be surveyed within 7 days of works during summer months (14 days in winter) and then "every 7 days during the duration of the works", if no eggs or embryos are found.

Sara Stallard, BSc, AScT from Swell Environmental Consulting Ltd. will conduct the forage fish surveys. The following monitoring protocol will be implemented:

- Initial Forage Fish Spawning Survey
- Follow Up Forage Fish Spawning Surveys- must be completed every 7 days while activity is occurring below the Present Natural Boundary (estimate 6 weeks of construction time)
- If forage fish eggs are found, the eggs will be aged to determine when they will hatch and leave the beach. Work on the beach cannot proceed until there are no eggs present.
- Completion report for municipality for Development Permit and data entry for DFO

Pre-Clearing Nesting Bird Survey

- Section 34 of the BC *Wildlife Act* protects birds and their eggs from possession, molestation or destruction. The nests of eagles, peregrine falcons, gyrfalcons, ospreys, herons, and burrowing owls are protected at all times of the year. The nests of all other species are protected when the birds or their eggs are in the nest.
- Pre-clearing nesting bird surveys should be conducted if tree or vegetation removal will occur during breeding season. While the period between August 15 and March 15 has been identified by Environment Canada and the BC Ministry of Environment as the general period least likely to involve active bird nesting, this time period does not coincide with the breeding and nesting habits of eagles, many owls species, or herons (Grant Bracher, FLNR and Ann Nightingale, VNHS pers. comm. 2018), therefore we recommend a nesting bird survey be conducted if tree and vegetation clearing will occur between February 1 and August 15. The survey should be conducted by an appropriately qualified professional between 1-3 days prior to the work, depending on the timing during the nesting season.

Protecting ecological features

- An ISA Certified Arborist will be consulted prior to construction to recommend tree protection measures for trees to be retained
- Schedule excavation and construction activities during dry weather and low tides. Heavy equipment will be removed from the beach each day.
- Excavator activity on the beach should be limited to the top of the beach, as close to the slope as possible, minimizing heavy equipment activity on the beach
    - If possible, install a barrier between the excavator and beach materials (e.g. blasting mats)
- Do not disturb the salt marsh at the west end of the project site.
- Schedule trench excavation and lock block installation activities during the DFO reduced risk fisheries window (July 1 to October 1), during forecasted dry weather, if possible, and when tides are suitable to ensure the trench or wet concrete are not inundated by sea water
- Remove all wastes associated with construction
- Measures to Protect Fish and Fish Habitat identified by DFO at https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html will be implemented during the project, including:
    - No working in the water to prevent the death of fish
        - The excavator will be located above the water level at all times
    - Maintain riparian vegetation
        - Shoreline vegetation (primarily invasive, non-native species) that will be removed during constructed will be replanted with native vegetation
    - Carry out works, undertakings and activities on land (above the Present Natural Boundary)
        - Permanent structures will be placed above the PNB
        - Temporary disturbance will occur during construction below the PNB
    - Ensure Proper Sediment Control (see Erosion & Sediment Control section)
    - Prevent entry of deleterious substances into water (see Spill Prevention & Response section)

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480 Beach Drive, Victoria, BC V8M 2S5 lehna@swell.ca 250.217.9190

Erosion & Sediment Control

- Minimize vegetation removal
- Conduct excavation during forecasted dry weather, if possible
- If tidal water or waves can reach the area to be temporarily disturbed on the beach, install a sediment fence or sediment curtain around the perimeter of the work on the beach to prevent mobilized sediments from migrating into the marine environment
- Cover exposed soils on the slope if heavy rain is forecast, (e.g. poly, tarps)
- Excavated slope material (soil) will be kept separate from the beach substrate (sand/gravel/shell hash) and will be removed from the beach prior to tidal inundation.
- Do not leave exposed soils or soil stockpiles on the beach to be subjected to tides or waves
- Ensure soil and debris stockpiles are placed away from the shoreline and sediment-laden water cannot flow into the marine environment
- Ensure no tracking of sediments on to roadways from truck traffic (road sweeping and installing rock/hog fuel at entrance to minimize tracking)
- Do not direct water runoff from the site directly into waterbodies
- Install compostable erosion control mats after construction if needed to stabilize soil on the slopes
- Contact Environmental Monitors immediately with any concerns.

Spill Prevention and Response

- Concrete wash-water and wet concrete is highly alkaline and toxic to fish and other aquatic organisms. All concrete wash-water from equipment, trucks and/or hand tools needs to be directed to a settling area away from runoff paths to the waterbodies. Freshly poured concrete needs to be covered when rain is forecasted and must be isolated from waterbodies during the curing process.
- Ensure concrete wastes are contained: wet concrete is not deposited into surrounding water, remove excess concrete, and do not allow water from equipment and tool cleaning to enter the environment.
- Equipment is inspected for leaks prior to beginning work.
- Wrap hydraulic line joints with adsorbent spill pads and zip ties or use environmentally friendly hydraulic fluid.
- Spill response kits (capable of addressing the volume of fuel/oils/chemicals on site) are on site when any fueled machinery is working, and operators are trained in their use.
- Equipment refueling is at a designated location and >30 m from aquatic ecosystems.
- Fuel generators must be placed in a spill-proof container (e.g. plastic bin, or other impermeable containment area such as poly-lined bermed depression).
- Store all fuel cans in spill-proof containers (e.g. as above).
- In case of spills, the following general steps are recommended:
    1. Stop source of spill/prevent further spillage (turn off valves, right overturned containers)
    2. Block spill from reaching aquatic (marine or freshwater) environment or pathways to waterbodies
    3. Block spill from spreading
    4. Call Environmental Monitor

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Site Restoration

Following completion of construction, re-vegetate the disturbed construction areas by November 1, 2021.

- Native vegetation will be replanted (replacing primarily invasive, non-native species) in the area that will be disturbed by construction and the area of the backfill behind the wall, and any other exposed soil areas that are observed following construction.
- The estimated planting area is approximately 188m^2 (Figure 6).
- The number of plants required for the restoration will be determined following construction, once the exact area of disturbance is known.
- Trees will be replaced 1:1 with suitable native species, if any of the 3 small trees identified must be removed during construction.
- The restoration plantings will be installed at the densities shown on the plan (Figure 6).
- Install compostable erosion control mats after construction if needed to stabilize soil on the slopes
- The planted area should be mulched with 10cm composted mulch.
- Irrigation
    - Years 1 and 2 - watering 1/week deeply during the growing season (e.g. May 1-Sep 30, weather dependent), 2/week when temperatures are over 28 °C or plants are wilting.
    - Year 3 and onwards - Water as needed to establish and wean plants off irrigation.
- Invasive species removal a minimum of 4 times/growing season for a minimum of 3 growing seasons to control invasive species in the MUFDPA and to prevent planted areas from becoming re-invaded by non-native, invasive species (e.g. English ivy, Scotch broom, gorse, Himalayan blackberry)

Environmental Monitoring

The following environmental monitoring protocol is recommended to ensure that environmental protection measures are properly implemented and maintained, and to meet regulatory reporting requirements:

- Owner must notify the QEP, Lehna Malmkvist, a minimum of 2 weeks prior to the initiation of the works.
- Forage Fish Survey and Monitoring, as described previously
- Preconstruction meeting with contractor to review Environmental Protection Measures and Permit Requirements
- Site visits during key phases
    - Lay out of the seawall
    - During excavation and ramp construction
    - During installation of the lock blocks
    - During backfilling
    - During planting
    - Heavy rainfall (>10mm/24 hours) until the QEP is satisfied that erosion and sediment control measures are preventing sediment laden water from entering the marine environment
    - Emergencies, such as spills
    - To assess completion of the project
- By December 31, 2021, final inspection of the project and preparation of a completion report to be provided to the municipality to ensure all DP requirements are completed.

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Summary

The works within the MUFDPA have been designed to address the erosion issues identified by Ryzuk Geotechnical on the site (Appendix 1) and designed by Westmar Advisors Inc. (Appendix 2) to provide shoreline stabilization at the toe of the steep slope at 10664 Madrona Drive, above the Present Natural Boundary.

The recommendations for Environmental Protection are expected to minimize the impact of the proposed activities during construction on the current ecosystems of the 15-m DPA setback or the marine environment. However, the seawall may reduce natural sediment replenishment in this area and wave action on the seawall may reduce the beach profile over time, potentially impacting possible forage fish habitat.

Following construction, planting native species above the seawall is proposed to replace the primarily invasive species that that will be disturbed through the construction process. Appendix 3 contains the North Saanich MUFDPA Guidelines Checklist.

Please do not hesitate to contact me with any questions you may have.

Sincerely,

L. Malmkvist

Lehna Malmkvist, MSc, RPBio (#1613)

Swell Environmental Consulting Ltd
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Figure 1. Location of 10664 Madrona Drive, North Saanich.

Figure 2. Location of proposed works at 10664 Madrona Drive.

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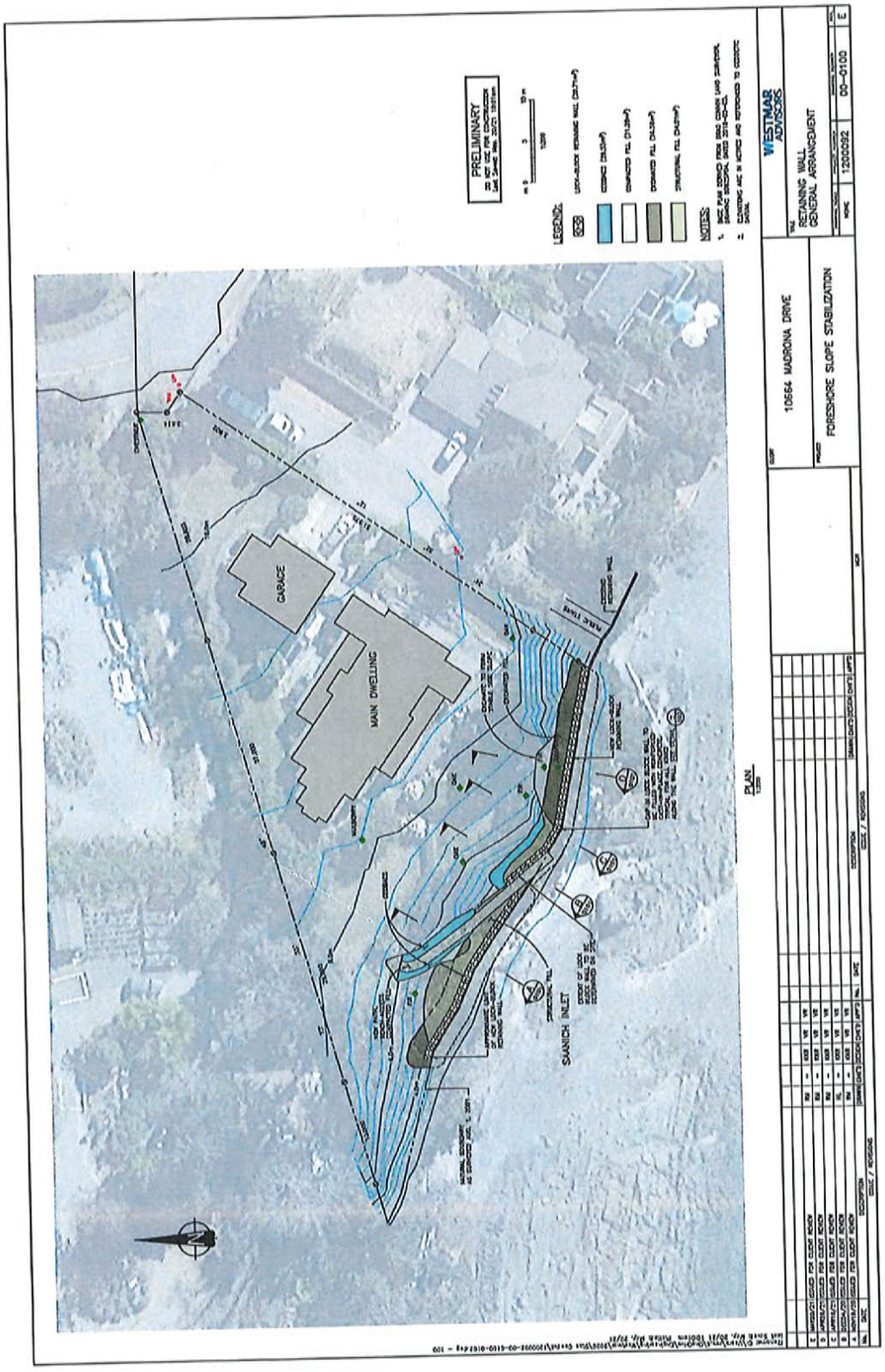

Figure 3. Site Plan with location of proposed works.

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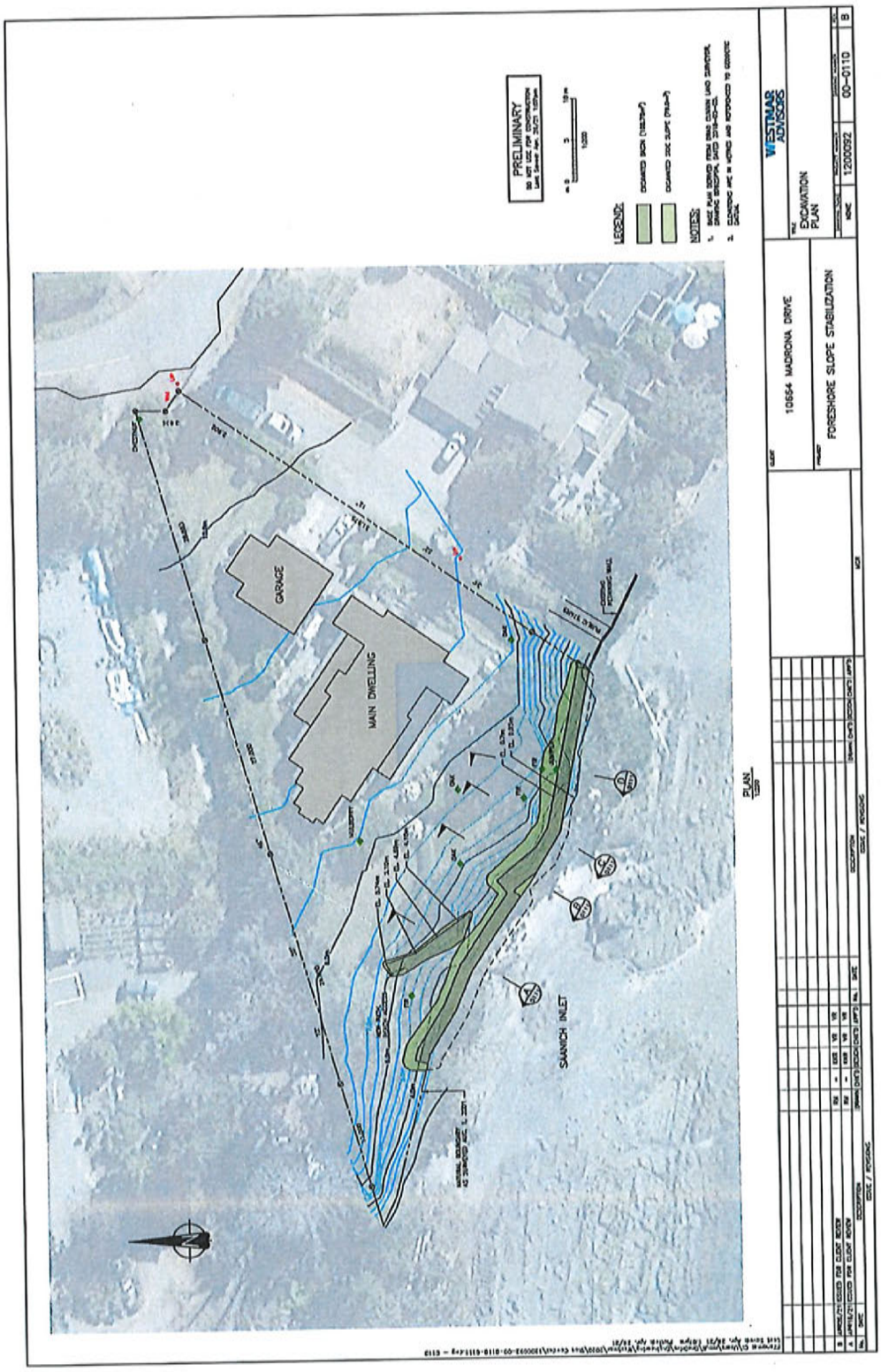

Figure 4. Site Plan with proposed construction footprint.

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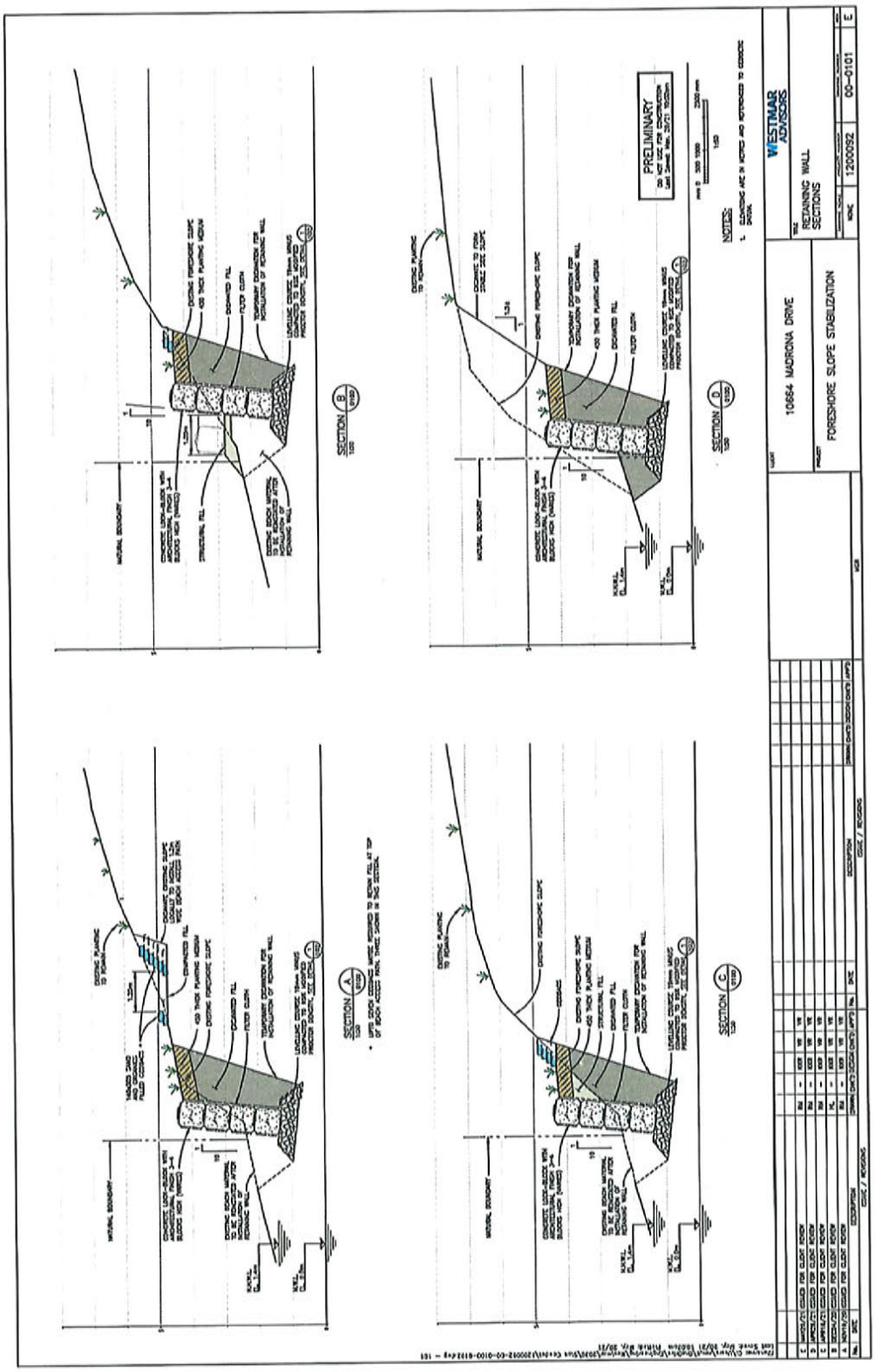

Figure 5. Cross sections of the proposed work.

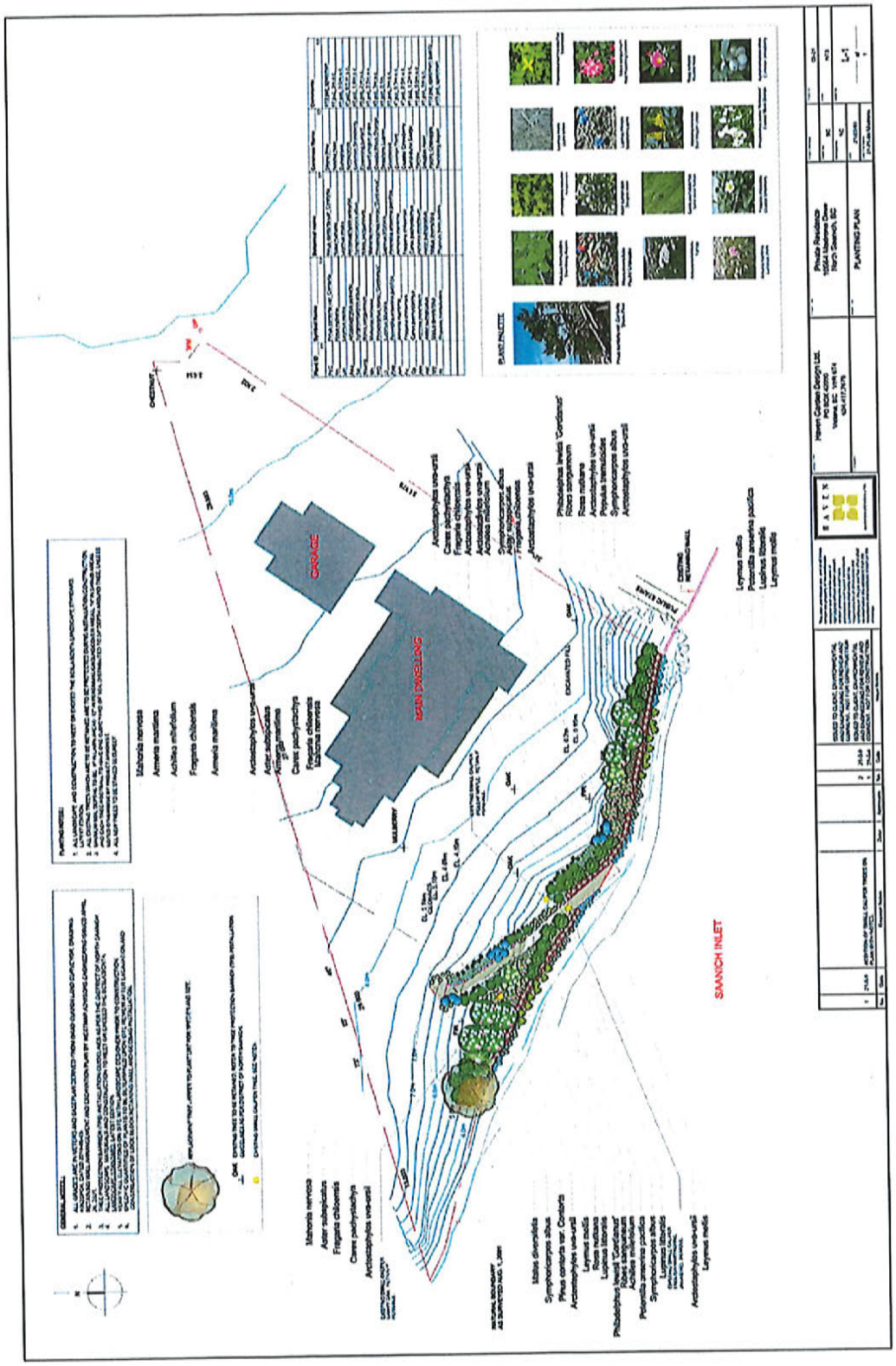

Figure 6. Proposed native species restoration plantings.

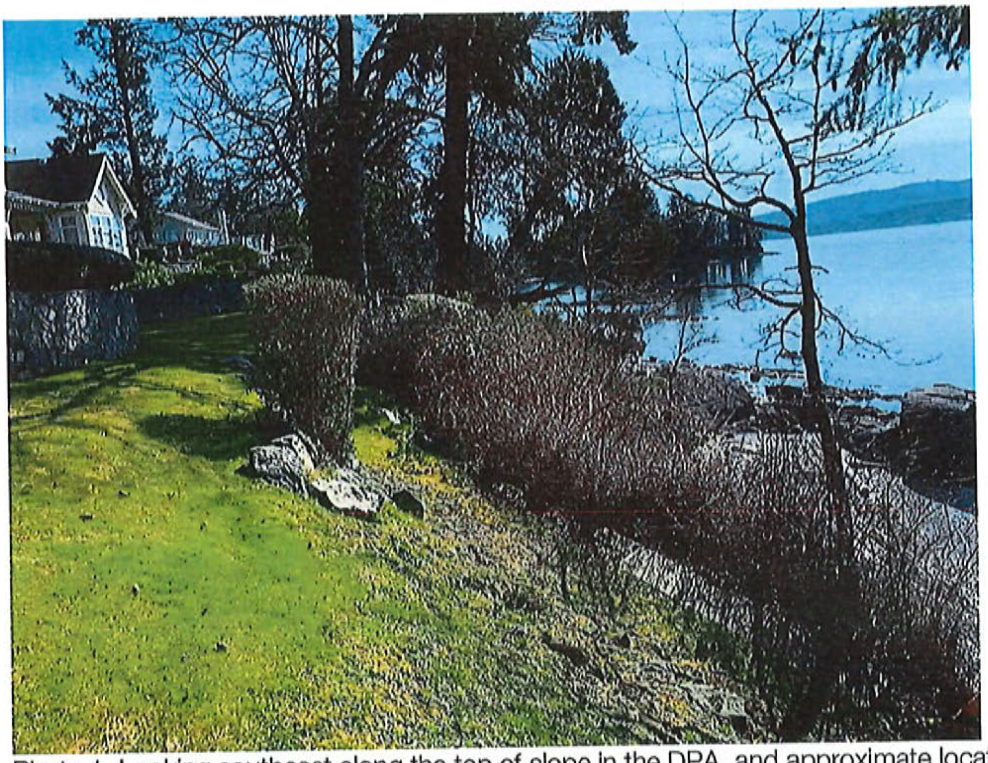

Photo 1. Looking southeast along the top of slope in the DPA, and approximate location of start of proposed ramp to the beach. Ornamental landscaping, lawn, trees, and invasive species on the bank.

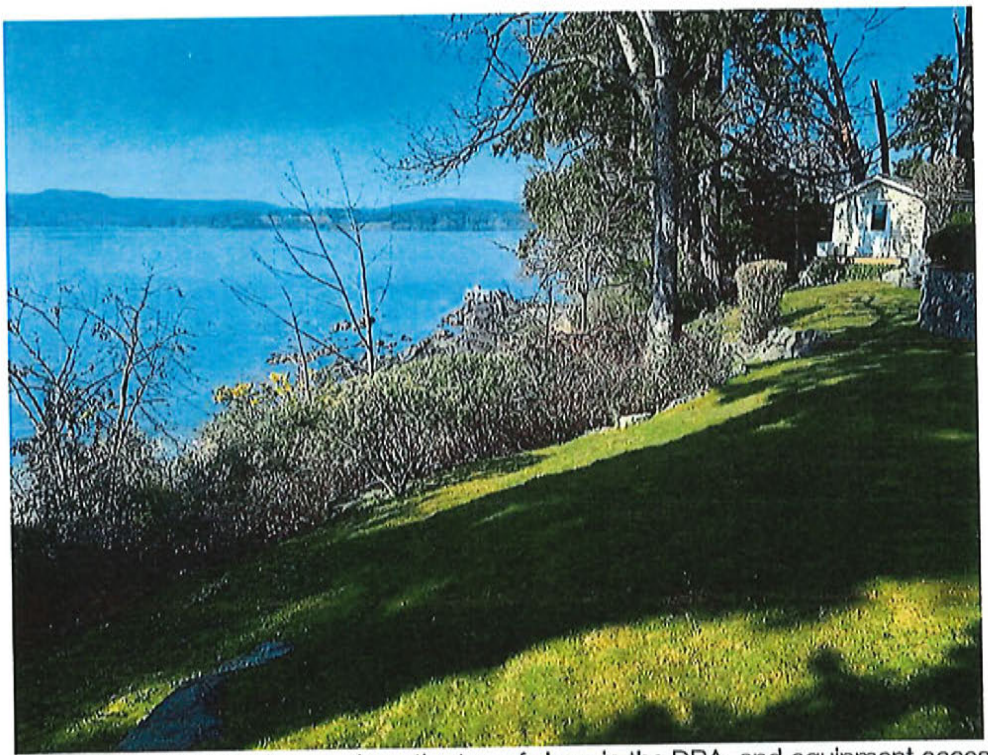

Photo 2. Looking northwest along the top of slope in the DPA, and equipment access to the beach. Ornamental landscaping, lawn, trees, and invasive species on the bank.

Photo 3. Looking east along north property boundary and equipment access to the beach.

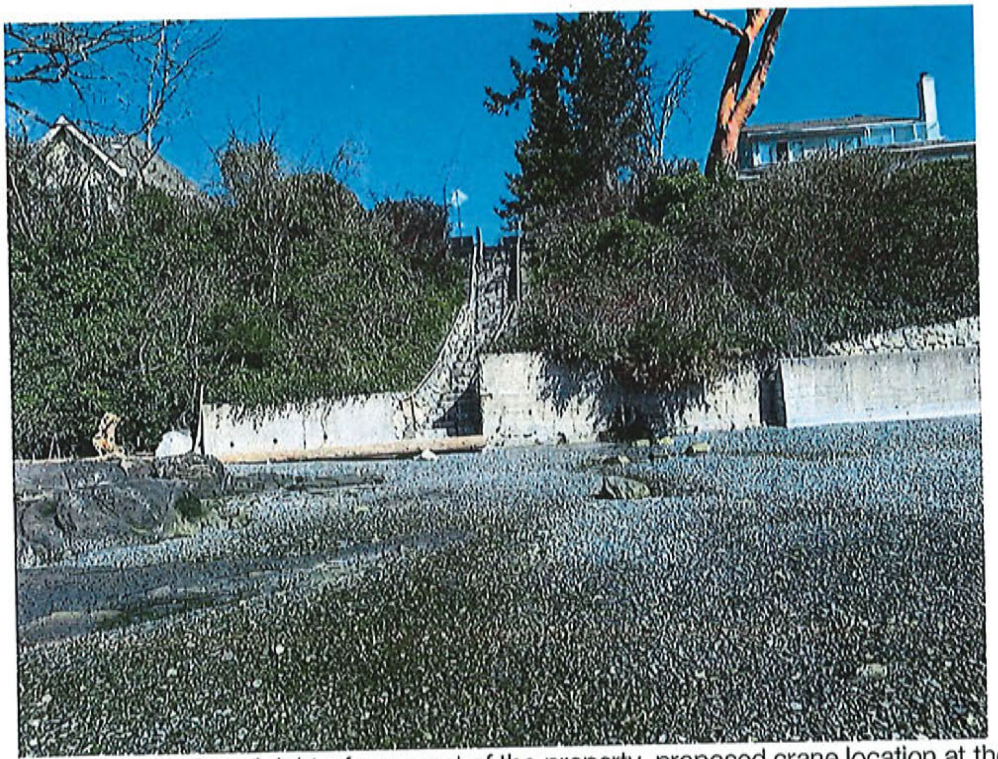

Photo 4. End of road right-of-way east of the property, proposed crane location at the top of the slope to move lockblocks to the beach.

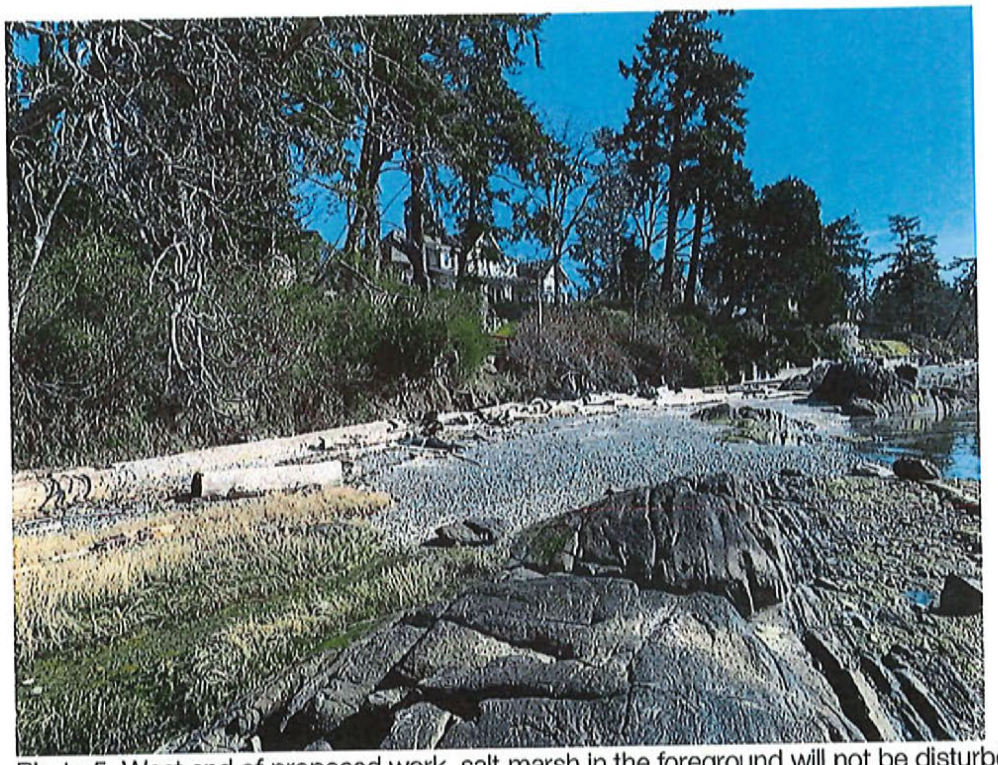

Photo 5. West end of proposed work, salt marsh in the foreground will not be disturbed.

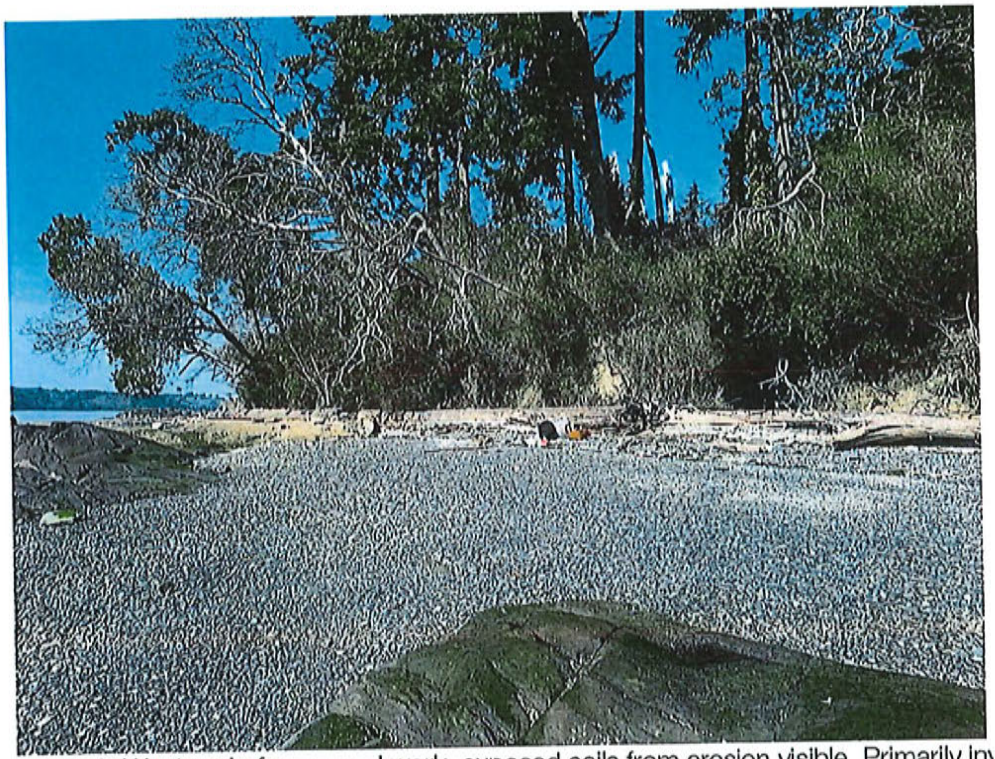

Photo 6. West end of proposed work, exposed soils from erosion visible. Primarily invasive non-native species and mature trees on the slope.

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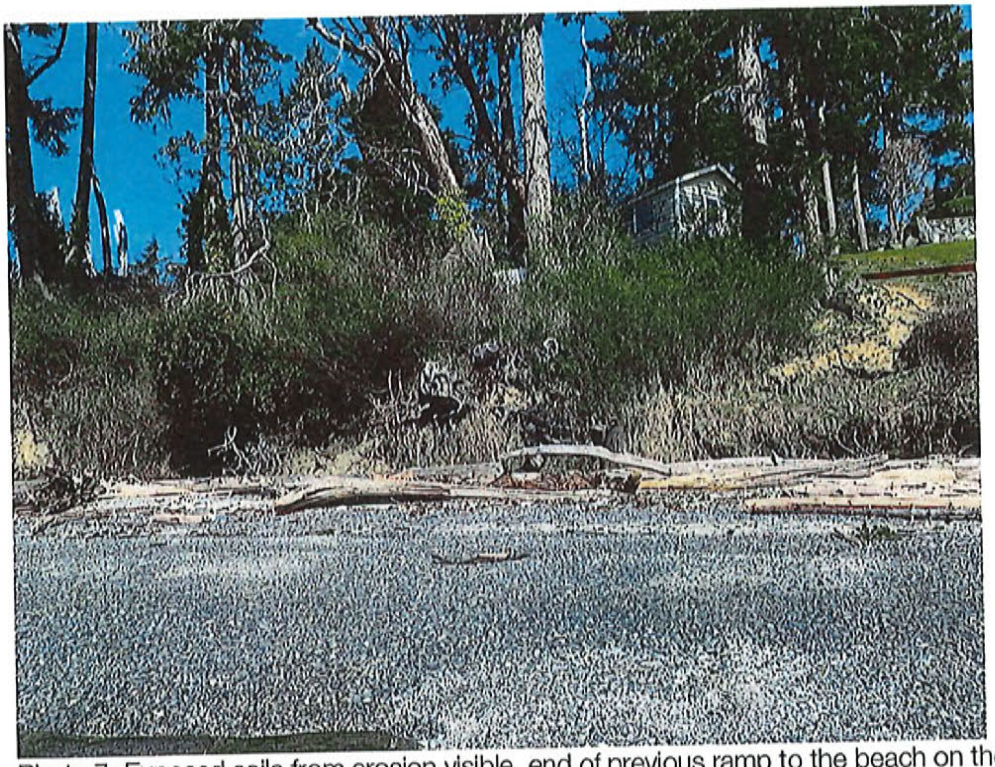

Photo 7. Exposed soils from erosion visible, end of previous ramp to the beach on the right side of the photo.

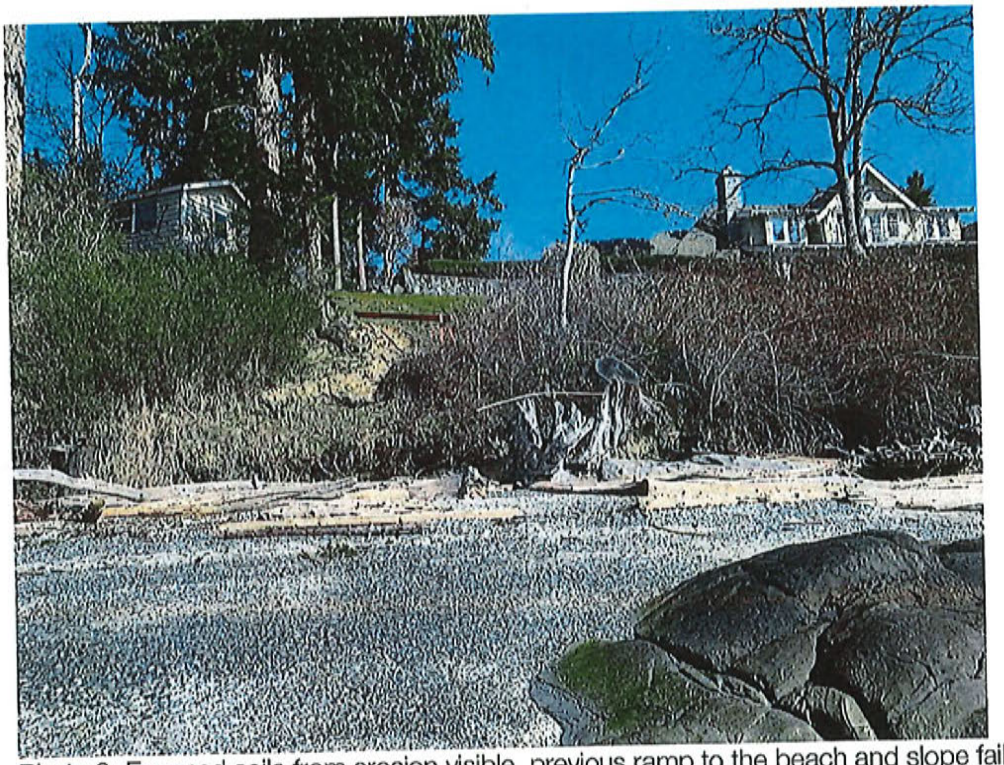

Photo 8. Exposed soils from erosion visible, previous ramp to the beach and slope failure.

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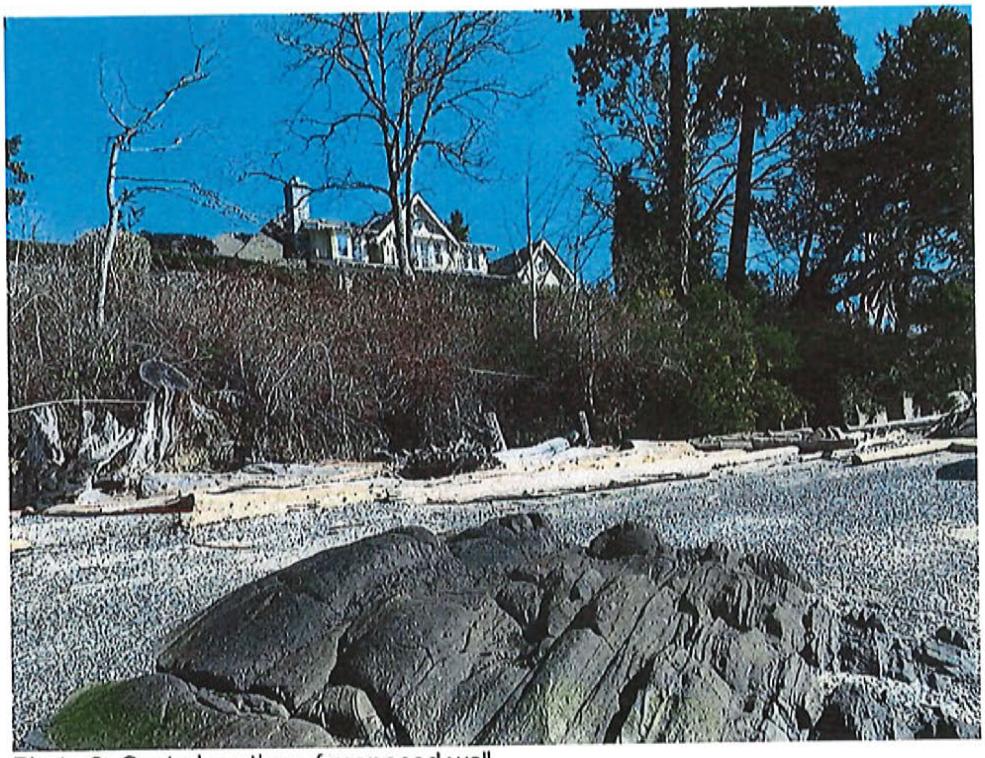

Photo 9. Central section of proposed wall.

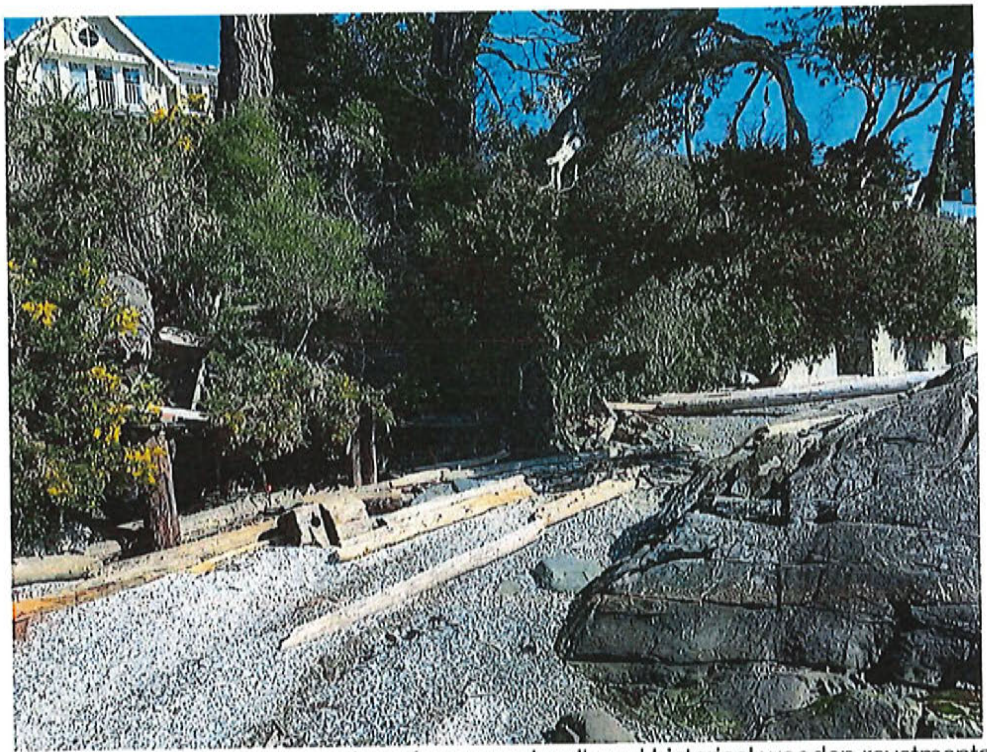

Photo 10. South eastern section of proposed wall, and historical wooden revetments visible.

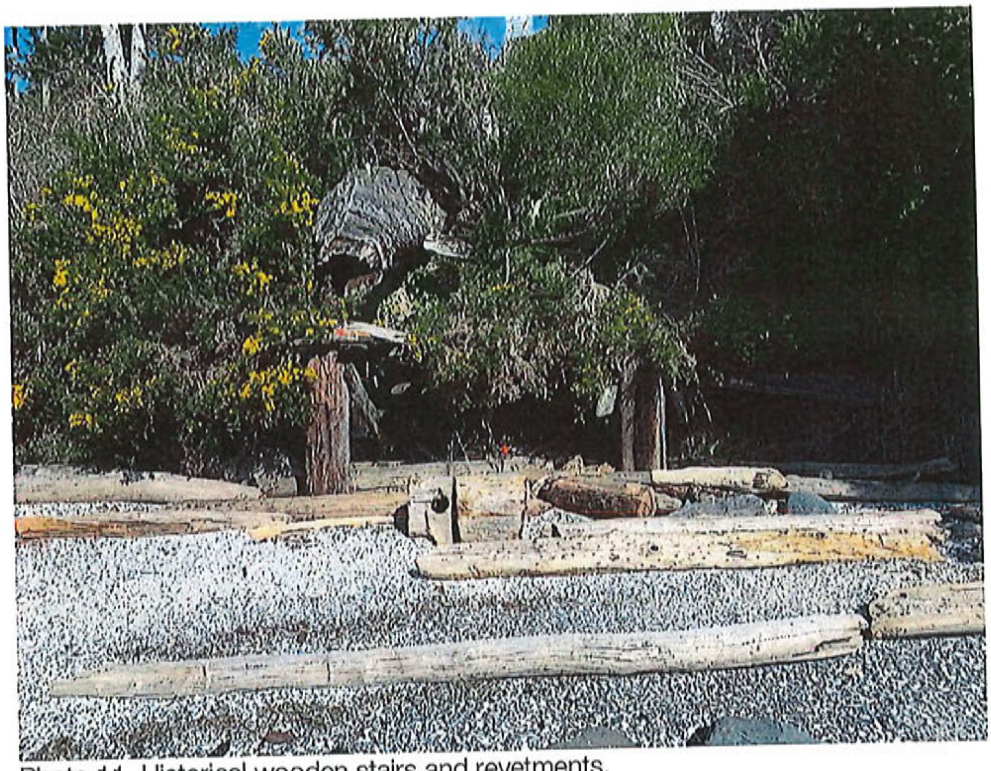

Photo 11. Historical wooden stairs and revetments.

Photo 12. South eastern section of proposed wall.

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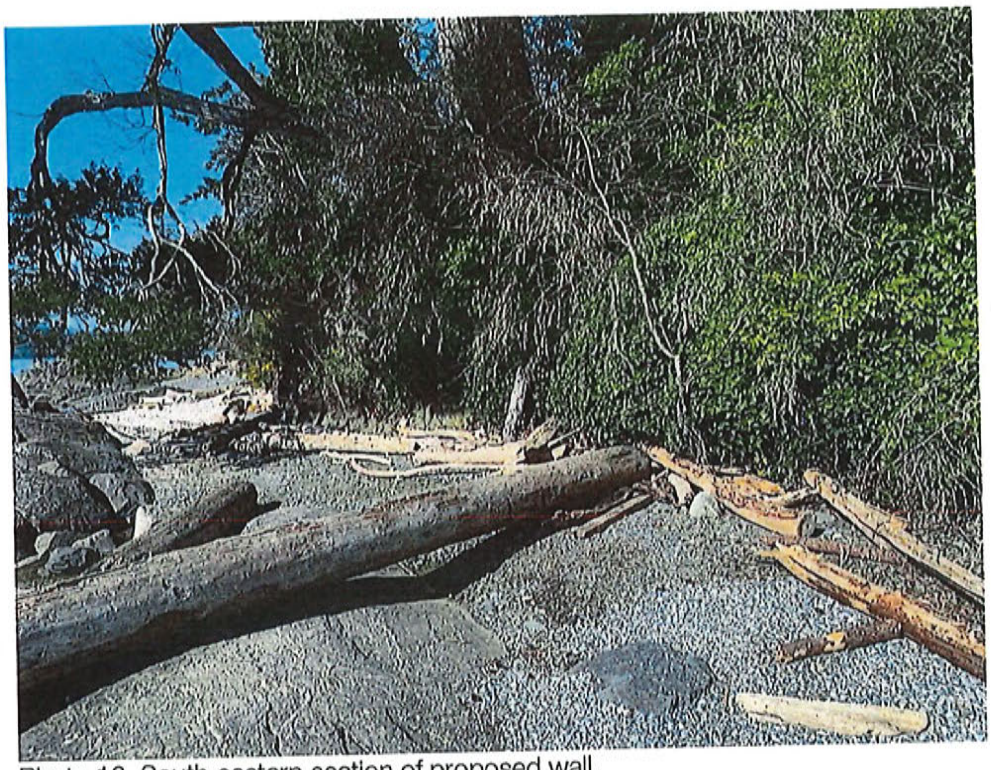

Photo 13. South eastern section of proposed wall.

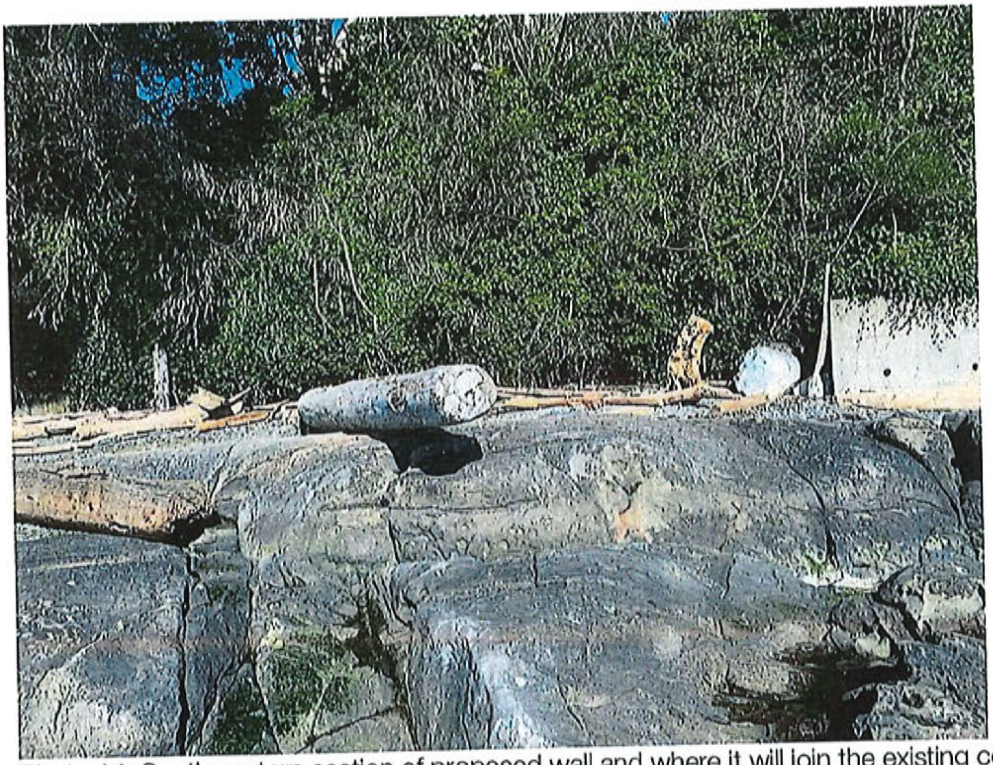

Photo 14. South eastern section of proposed wall and where it will join the existing concrete wall at the end of the road right-of-way.

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Photo 15. Three small trees that may require removal.

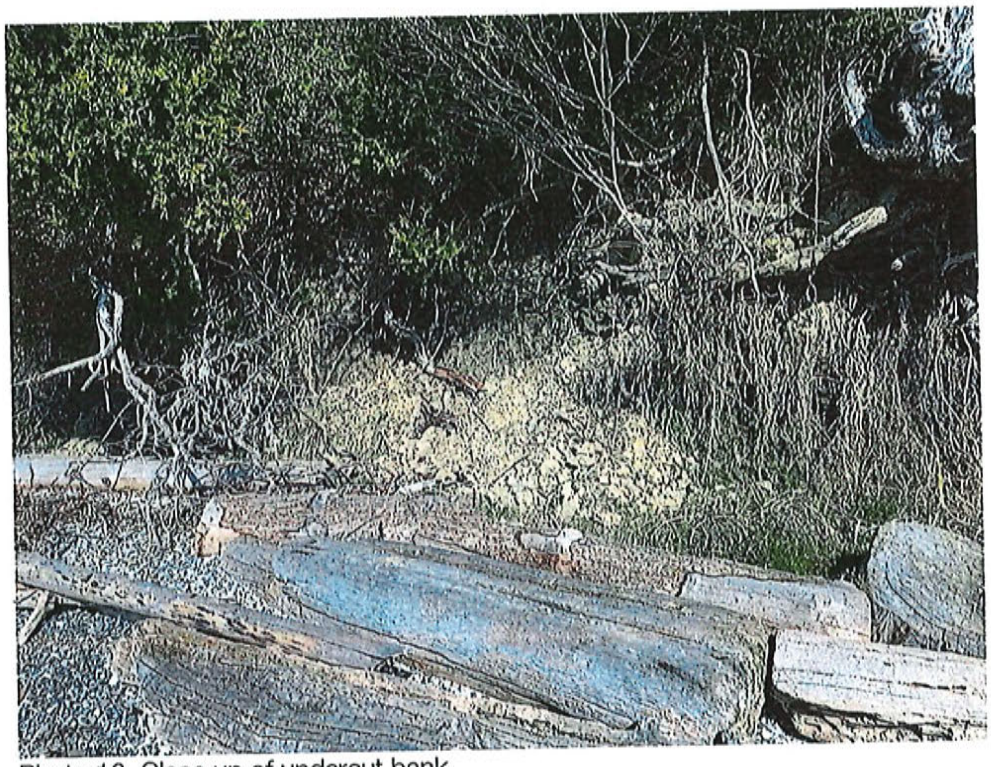

Photo 16. Close up of undercut bank.

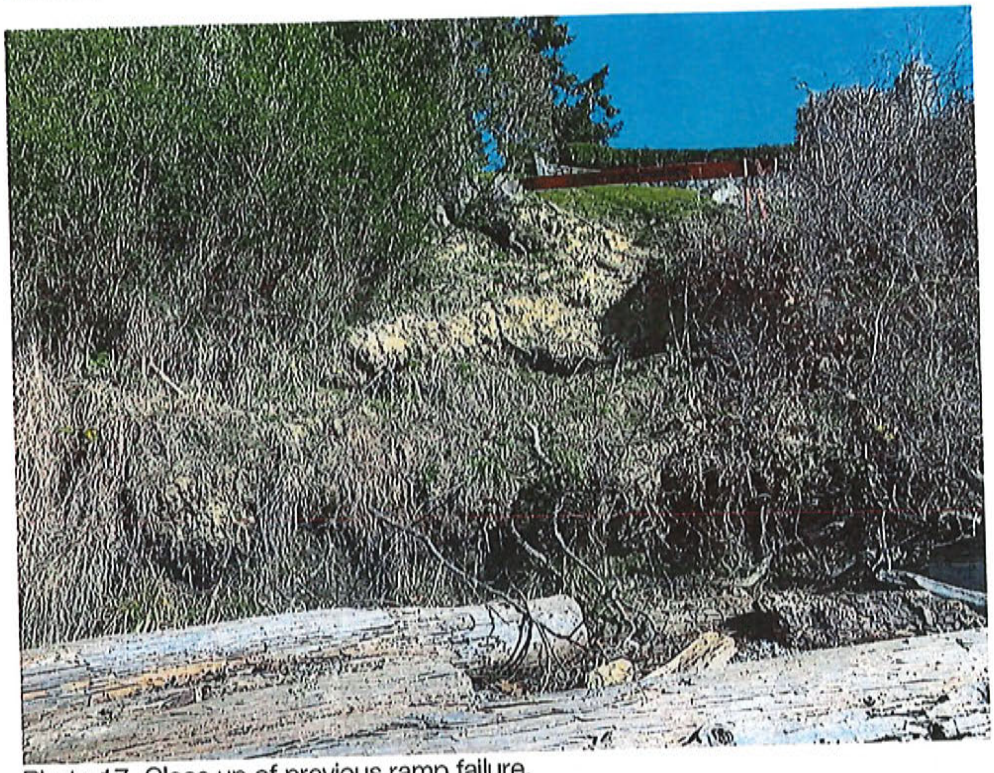

Photo 17. Close up of previous ramp failure.

Photo 18. Beach substrate, suitable for forage fish spawning.

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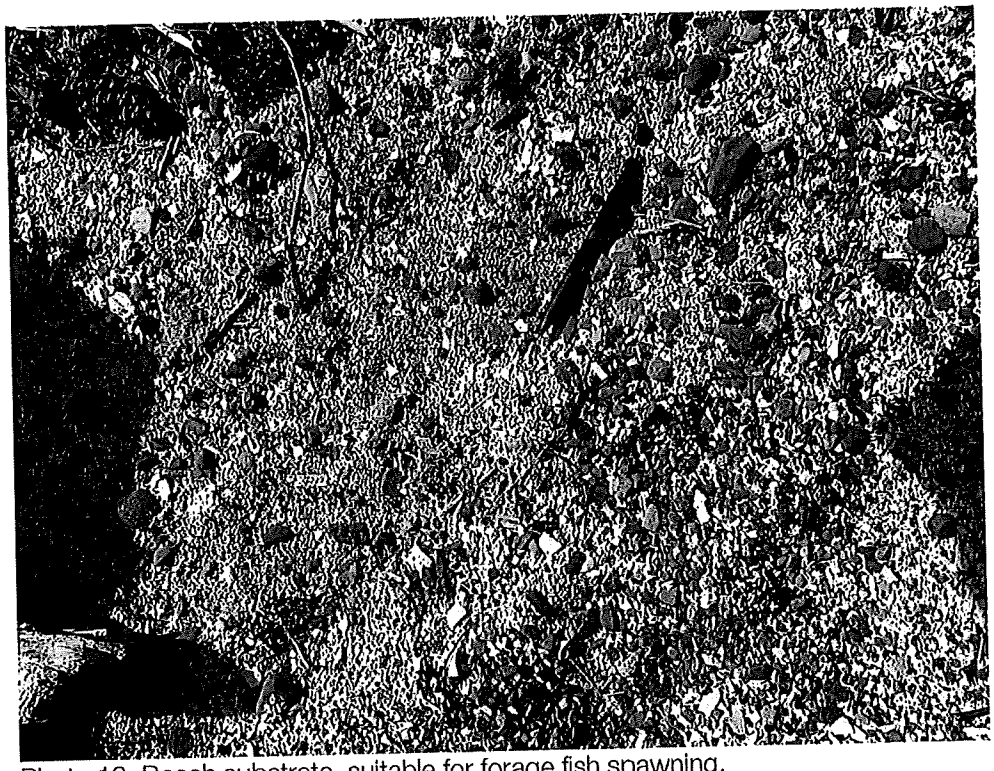

Photo 19. Beach substrate, suitable for forage fish spawning.

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Appendix 1. Ryzuk Geotechnical Report

Schedule D

RYZUK GEOTECHNICAL
Engineering & Materials Testing
28 Crease Avenue, Victoria, BC, V8Z 1S3 Tel: 250-475-3131 Fax: 250-475-3611 www.ryzuk.com

March 4, 2021
File No: 4274-1

Peter Kerr
10664 Madrona Drive
North Saanich, BC
V8L 5L8
By E-mail: [redacted]

Re: Foreshore Revetment Structure
10664 Madrona Drive – North Saanich, BC

As requested, we attended the referenced site on February 11, 2021, to meet with you and carry out a visual geotechnical assessment of the slope above the foreshore as such relates to ongoing erosion and proposed construction of a revetment. The property is located within Development Permit Area (DPA) 1: Marine Uplands and 4: Steep Slopes within the North Saanich Official Community Plan Bylaw No. 1130. Work within these DPAs is subject to the guidelines of a Development Permit approved and issued by the District. Our associated observations and recommendations relating to the geotechnical aspects of the DPAs are contained herein. Our work has been carried out in accordance with, and is subject to, our previously accepted Terms of Engagement.

We have previously completed a geotechnical assessment of the slope in 2005 and provided our associated report and design at that time, however the project did not proceed to construction. Our current assessment has involved reviewing our previous work and providing an updated letter to accompany the proposed Development Permit Application.

The property is located on the south side of a localized point of land between Towner Bay and Deep Cove on the west side of the Saanich Peninsula. It is bounded to the northeast by Madrona Drive, to the north/northwest by a neighbouring residential property, to the east by a road right of way/beach access, and to the south/southwest by the foreshore of Saanich Inlet. The property is occupied by a single family residence and associated landscaping. The upland area of the property is generally level to gently sloping down from the road, transitioning to a steep slope in the order of 4 to 6 m (vertical measure) down to the present natural boundary. Several mature trees, as well as stumps and shrub vegetation are present on the slope. A number of the trees are leaning toward the slope, and in some areas root systems are exposed within the slope face. The slope soils, where exposed, consist of native sandy clay with gravel (inferred glacial till) in the lower portions, with a varying thickness of silty clay and a minor amount of fill near the crest. At least one drainage pipe leading from the upland area currently discharges approximately mid-slope. We observed that erosion of the slope has occurred along and above the upper tidal limit, resulting in a near vertical scarp along the base of the slope that is locally undercut. There is also evidence of some past failures in several areas on the slope, including at the location of the previous boat ramp in the western portion of the shoreline

where slumping has occurred over a length of approximately 3 to 5 m of shoreline and a scarp is present mid-slope as well as localized soil exposure near the crest. Root systems of existing vegetation, some trees, and remaining stumps have been locally undermined. The intertidal area is characterized by irregularly outcropping bedrock, with a boulder/cobble beach with some sand in the upper portion. Terrestrial vegetation was noted locally along the upper limits of the natural boundary.

From our site observations, together with our local experience, we consider that the shoreline slope is relatively stable and not subject to deep seated rotational failure. That being said, the slope does experience long term creep and episodic shallow instability and regressive failure toward the crest due to the oversteepened inclination and ongoing erosion. Processes contributing to this ongoing erosion include wave attack, to which the foreshore is moderately exposed to during major storm events, particularly during those occurring in conjunction with high tide. Groundwater seepage and uncontrolled surface water flow can also contribute to erosion. The result is that the slope face, and crest, migrate landward in the long term. Based on our observations, we expect that ongoing erosion can be expected and that there is the potential for future instability if the erosion is not mitigated.

Accordingly, we recommend installation of a revetment to mitigate concerns for ongoing foreshore erosion, to improve the overall slope stability and to reduce the potential for further loss of natural vegetation. We also recommend that existing drainage pipes be extended so that such do not discharge on the slope soils but instead upon a non-erodible surface (ie. splash pad or bedrock) at beach level. We have viewed the lock block wall design/drawings prepared by Westmar Advisors (Issued for Client Review dated December 4, 2020) and understand that the revetment would consist of a 3 to 4 block (2.25 to 3 m) high wall constructed behind the present natural boundary. A new path for beach access would also be constructed on the slope. We consider the proposed concept to be suitable to protect the slope from coastal erosion and understand that the design will be prepared by Westmar.

We understand that equipment access to the site is available along the north of the property and that a ramp would be built upon the slope to allow access to the beach for construction of the revetment. Work should be undertaken in conformance with DFO's standards and codes of practice for projects near water, which are available online. These guidelines must be followed when working in and around the intertidal area and include (but are not limited to): avoiding unnecessary disturbance to the beach area, use of adequate silt abatement protection, tightly sealed engine and hydraulic systems (vegetable oil or equivalent preferred), on-site spill kit, and refueling away from the intertidal area. Beach access should also be avoided during periods of high tide or heavy rain/storm events. The work should be carried out during a window of least risk to fish/fish habitat, which include either July 1 to October 1 (summer window) or December 1 to February 15 (winter window).

Given that the right of way to the south is protected with a vertical concrete seawall and the neighbouring property to the north is relatively well protected by outcropping bedrock, we do not anticipate any significant negative impacts to adjacent properties due to the proposed works. We understand the revetment may not extend to the northern limit of the property and note that there is a minor possibility of a transition in sediment regime with localized beach scour adjacent to the proposed structure, however we do not consider that there is significant longshore current along the shoreline of the bay. We expect that once the proposed works are constructed, the upper tidal area

will adjust accordingly with possible minor changes in foreshore conditions along the natural intertidal beach. In addition, we expect that the effect of any short term site disturbance during construction can be mitigated and we do not anticipate any major risk of slope instability and/or erosion as a result of the works.

In summary, the proposed revetment is intended to mitigate the extent of foreshore erosion and improve existing slope stability. However, slow, surficial creep of fills and/or native soils on the slope above may be expected in the long term, and localized raveling/sloughing of the slope above may be expected to occur even after construction as the slope reaches its natural angle of repose. We recommend against depositing fill materials on the slope or at the crest of the slope such as yard waste or any other uncontrolled fill materials. Existing drainage systems should be checked to ensure such are in working order to avoid introducing further water to the slope.

We trust the preceding is suitable for your purposes at present. If you have any questions, or require anything further, please do not hesitate to contact us.

Yours very truly,
Ryzuk Geotechnical

Laura Lessingham, P.Geo.
Intermediate Geoscientist

Scott Currie, P.Eng.
Review Engineer