STAFF REPORT

File No.: PL-DVP-2024-0299 (Apps)

DATE OF MEETING:	April 17, 2025
TO:	Gabriola Island Local Trust Committee
FROM:	Stephen Baugh, Island Planner Northern Team
COPY:	Renée Jamurat, Regional Planning Manager
SUBJECT:	Development Variance Permit – PL-DVP-2024-0299 (Apps) Applicant: Michael Apps Location: 1140 The Strand, Gabriola Island

RECOMMENDATION

1. **That the Gabriola Island Local Trust Committee deny Development Variance Permit application PL-DVP-2024-0299 (Apps).**

REPORT SUMMARY

The purpose of this report is to introduce a development variance permit to reduce the setback to the natural boundary of the sea to facilitate the construction of a shoreline erosion protection structure. The Gabriola Island Land Use Bylaw has a 15 metre setback from the natural boundary of the sea for buildings and structures and a 1.5 metre setback from interior lot lines. The applicant is proposing a shoreline erosion protection structure within 0 metres of the natural boundary of the sea and within 0 metres of an interior side lot line.

Staff are recommending that the Local Trust Committee (LTC) deny the application.

BACKGROUND

The applicant has submitted this application to reduce the setback to the natural boundary of the sea for a revetment structure in response to shoreline erosion that has occurred at this location. The objective is to construct a rock revetment that would tie in to the existing revetment at the neighbouring properties. In order to connect to the neighbouring rock revetement (which is currently under consideration by the LTC through DVP applications GB-DVP2022.3 and GB-DVP-2022.4), the interior side lot line setback is also proposed to be varied through this DVP application. A site visit was completed on January 20, 2025.

Although the natural boundary of the sea forms the property boundary, including where there is erosion or accretion which shift the location of the natural boundary, in instances where the boundary shifts abruptly (avulsion) the legal boundary of the lot does not change which is stated to be the case at the subject property.

The applicant has submitted a Geotechnical Report (Attachment 3) and Environmental Impact Assessment (Attachment 4).

RATIONALE FOR VARIANCE

The applicant has provided a rationale for their application (Attachment 5). The following points are included in the applicant rationale:

- Some of the damage to the waterfront has been caused by an avulsion event in 2021/2022;
- The shoreline of the property continues to erode;
- The neighbours have constructed a rock revetment in response to similar issues occurring on their waterfront;
- Several large trees on the property may be undercut if action is not taken to armour the shoreline;
- They have received advice that the only way to protect against ongoing damage is through hard armouring; and
- the revetment is designed to adhere to the intent of the guiding principles of Greenshore Design.

ANALYSIS

Official Community Plan:

The subject property is not located within a development permit area. The following OCP policies are relevant to this DVP application:

- **6.1(e)** To protect against hazardous conditions and to protect environmentally sensitive areas a setback shall apply from the high water mark of the sea. In the case where a bluff or large land ridge is the prominent upland feature adjacent the sea, a setback from the upper edge of the bluff or ridge shall be applicable.
- **6.1(f)** The sandstone and conglomerate banks along Gabriola's shoreline shall be protected against the accelerated effects of erosion resulting from human activity by requiring the setback of buildings or structures and control of storm water runoff.
- **6.2(k)** Natural coastal processes shall be left undisturbed to the maximum extent possible and there shall be no deposition of material below the natural boundary of the sea unless a permit is issued by Ministry of Environment and DFO authorizing a breakwater or a seawall to be constructed.

The rock revetment structure is proposed to be located within an environmentally sensitive area within the setback to the natural boundary of the sea, it is unknown if the proposed structure would accelerate effects of erosion by creating an eddying effect. Although the structure is not proposed to be located below the natural boundary of the sea, replacing an eroding shoreline with an armoured shoreline can have impacts on natural coastal processes. OCP policies provide caution with regards to structures in the setback to the natural boundary of the sea, in particular with regards to erosion caused by human activity, protecting development from hazardous conditions, and minimizing disturbance to natural coastal processes

<u>Revetment Design and Environmental Impact Assessment</u>
The rock revetment is intended to protect the property from further erosion in the least invasive and inexpensive means possible. It is proposed to be sloped at a ratio of 2H:1V and composed of large rocks in a tight two-layer matrix and infilled with smaller rocks to fill gaps. Plantings of native vegetation are also included in the design and would be located above the natural boundary. These plantings can maintain or enhance the habitat diversity and function in the areas along the shoreline.

Although both the Environmental Impact Assessment (EIA) and Geotechnical Report state that the proposed revetment preserves coastal processes when compared to more intrusive structures, such as a seawall, other alternatives to protect from erosion are not considered in the reports.

The application was sent to Islands Trust professional biologist for comment. Her comments state that from an environmental perspective the information provided does not appear to provide justification for the proposed development. The application does not state the potential threats and impacts to the surrounding area, or include any mitigation measures to reduce risks. Specifically, the EIA report does not:

- acknowledge the presence of a red-listed Douglas-fir/dull Oregon grape ecosystem;
- provide an analysis of sediment transport and natural shoreline processes such as the movement of water and sediment essential for maintaining a healthy foreshore;
- assess the cumulative effects of shoreline armouring across the bay, including potential impacts on eelgrass beds and broader coastal habitat changes;
- acknowledge known potential harms from armouring shorelines;
- provide mitigation strategies for potential harms; or
- include rationale for why this design was chosen over a softer approach.

Green Shores for Homes

The applicant and Geotechnical Report indicate that the rock revetement is designed to adhere to the intent of the guiding principals of Green Shores for Homes.

The application does not provide an analysis of the project with regards to the Green Shores for Homes Credits and Ratings Guide to show how the guidelines are achieved with this project. In particular, a high number of base points are available to projects that do not include shoreline protection structures or that remove hard armouring such as the rock revetement proposed with this application.

Intent of Regulations being Varied

The intent of setbacks to the natural boundary of the sea are to ensure that buildings and structures are located outside of environmentally sensitive areas, and are located a sufficient distance from the water to avoid impacts from changing shoreline and marine conditions.

Interior side lot line setbacks promote a level of privacy between neighbouring properties and ensure a degree of separation between buildings on neighbouring properties.

Potential Impacts of Granting the Variance

Granting the variance to allow the shoreline armouring at this location does present risk to the natural environment. Rock revetments can impact the sediment migration along the shoreline, may result in scouring and increased erosion where the armouring transitions to the natural shoreline, and may result in other beach morphology impacts such as steepening of the beach.

Other impacts that form the basis of this proposal are protecting the existing vegetation along the shoreline, protecting existing structures from being subject to the impacts of the shoreline erosion, and providing opportunity to revegetate the eroded shoreline.

Circulation

DVP Notices were circulated to surrounding property owners and residents within 100 metres (Attachment 6). The notification period ends at 4:30 p.m. on April 16, 2025.

To date, no correspondence had been received and any submissions received following the preparation of this staff report will be forwarded to the LTC and reported at the meeting.

First Nations

The Gabriola OCP contains the following policies related to archeological sites on Gabriola Island:

6.3(a) The Snuneymuxw First Nation and the Archaeology Branch should be consulted prior to the initiation of any future development which may impact on a known archaeological site on Gabriola, or an area exhibiting potential for the presence of unrecorded archaeological sites.

6.3(f) Development proponents are encouraged to consider archaeological resources during all phases of project planning, design and implementation.

The applicant has submitted a referral to Snuneymuxw First Nation, to date a response has not been received. Staff have informed Snuneymuxw First Nation staff that the application is on the LTC agenda today and Snuneymuxw First Nation staff have indicated that they will make efforts to send a response prior to April 17.

Rationale for Recommendation

Staff are recommending the LTC deny the development variance permit for the following reasons:

- The dwelling unit is setback over 15 metres from the natural boundary of the sea;
- There are risks to the environment associated with the installation of the shoreline armouring and other alternatives have not been considered; and
- The visual impact of the rock revetment.

ALTERNATIVES

The LTC may consider the following alternatives to the staff recommendation:

1. **Request further information**

   The LTC may request further information prior to making a decision. If selecting this alternative, the LTC should describe the specific information needed and the rationale for this request. Recommended wording for the resolution is as follows:

   That the Gabriola Island Local Trust Committee request that the applicant submit to the Islands Trust [describe information].

2. **Approve the application**

   The LTC may approve the application to facilitate the construction of the rock revetment. Staff advise that the implications of this alternative are that impacts from the proposed development and the Snuneymuxw First Nations interests related to this application are not known. Recommended wording for the resolution is as follows:

   That the Gabriola Island Local Trust Committee approve issuance of Development Variance Permit PL-DVP-2024-0299 (Apps).

3. **Hold the application in abeyance**

   The LTC may choose to hold the application in abeyance.

NEXT STEPS

If the Staff recommendation is selected the applicant will be informed and the file will be closed.

Submitted By:	Stephen Baugh, Island Planner	April 2, 2025
Concurrence:	Robert Kojima, Regional Planning Manager	April 2, 2025

ATTACHMENTS

1. Site Context
2. Maps, Plans, Photographs
3. Geotechnical Report
4. Environmental Impact Assessment
5. Applicant Rationale
6. Notice
7. Development Variance Permit

ATTACHMENT 1 – SITE CONTEXT

LOCATION

Legal Description	LOT 6, SECTION 18, GABRIOLA ISLAND, NANAIMO DISTRICT, PLAN 45781
PID	008-828-075
Civic Address	1140 The Strand, Gabriola Island
Lot Size	0.62 ha

LAND USE

Current Land Use	Residential
Surrounding Land Use	Waterfront (North), Sandwell Park (West), Residential (East and South)

HISTORICAL ACTIVITY

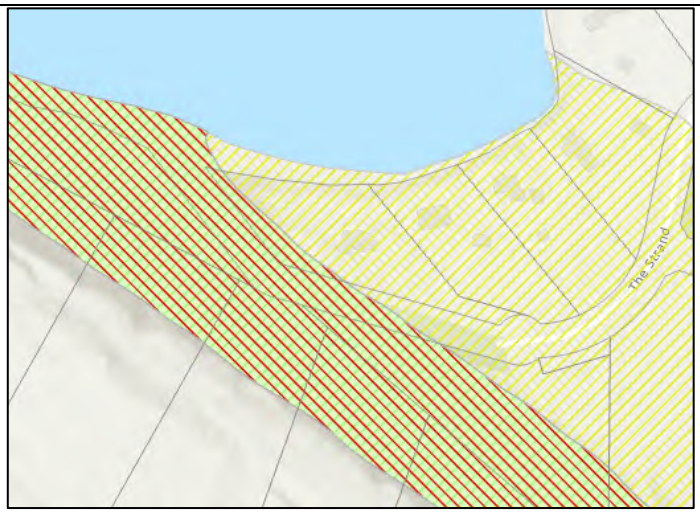
File No.	**Purpose**
GB-BOV-1993.2	Board of Variance order to reduce the lot line setback for a proposed garage.

POLICY/REGULATORY

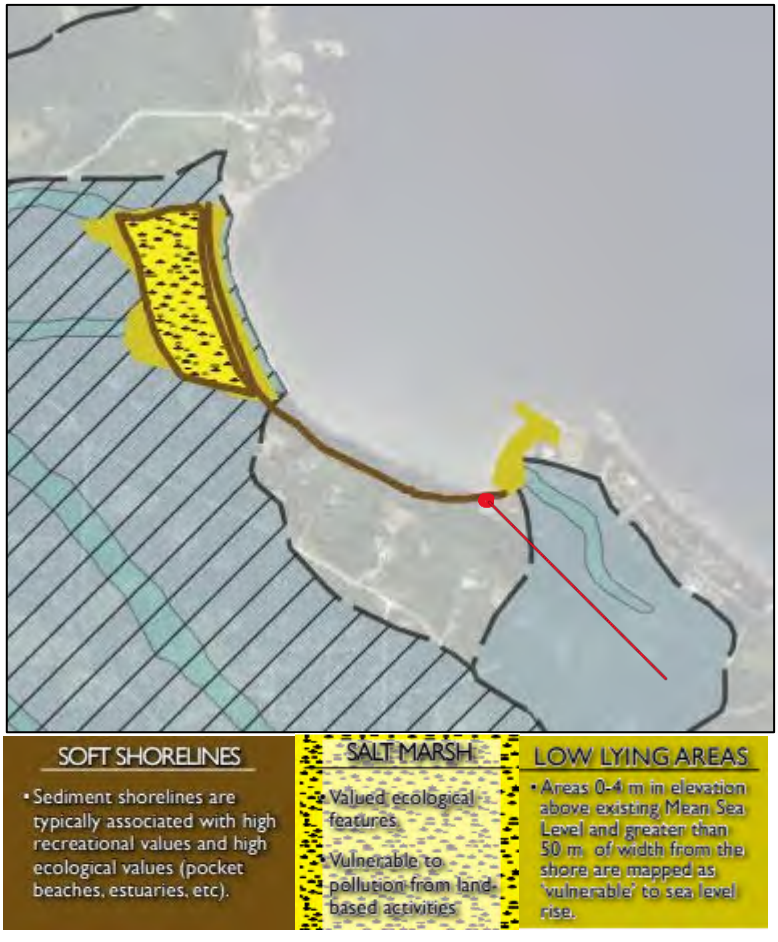
Official Community Plan Designations	**Small Rural Residential (SRR)**
Land Use Bylaw	**Small Rural Residential (SRR)**
Other Regulations	
Covenants	None
Bylaw Enforcement	GB-BE-2015.19

SITE INFLUENCES

Islands Trust Conservancy	There are no ITC covenants or properties in the direct area. Referral to ITC is not required.
Regional Conservation Strategy	The Regional Conservation Plan 2018-2027 estimated importance of habitat composition in the area of the subject property is Medium. This application does not appear to be inconsistent or contrary to the goals and objectives set out in the ITC Regional Conservation Plan.
Species at Risk	None Mapped
Sensitive Ecosystems	**SEM Secondary Class:** Wetland (Yellow) **SEM Primary Class:** Mature Forest (Red) **SEM Tertiary Class:** Cliff (Green)

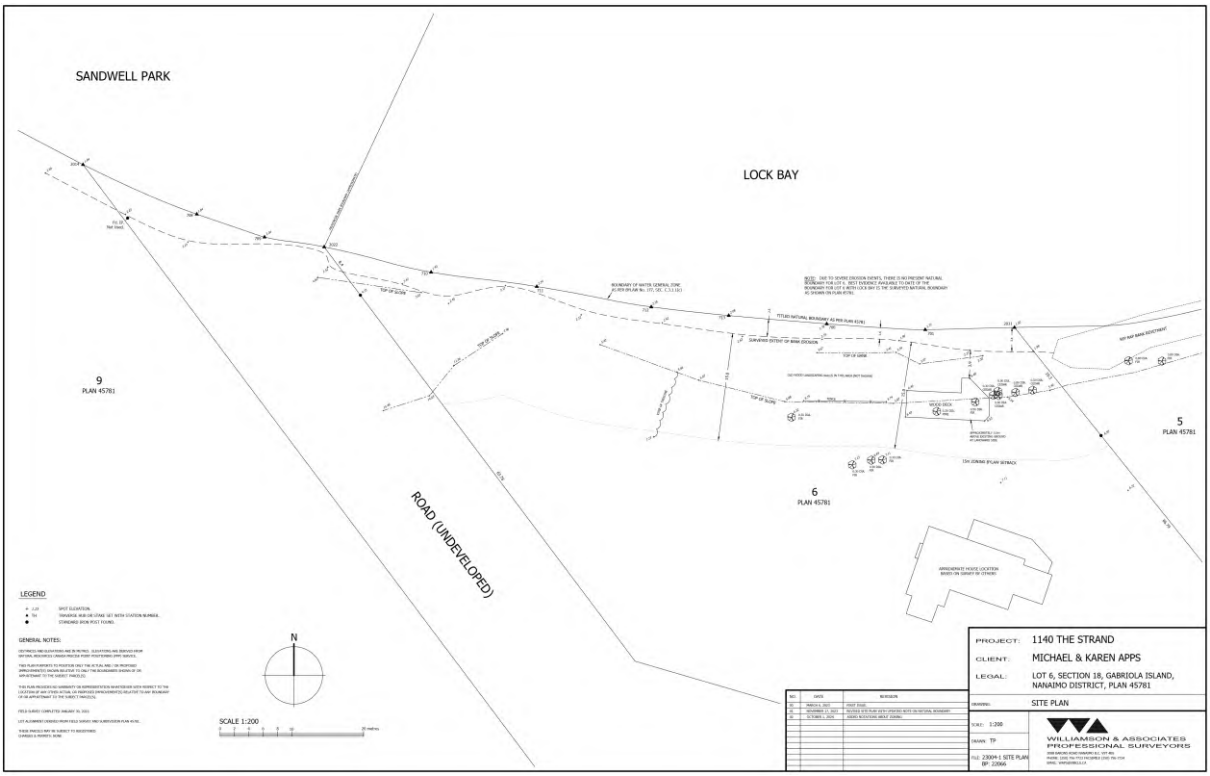
	
Hazard Areas	Areas of Low and Moderate risk steep slopes mapped within the subject property.
Archaeological Sites	Mapping indicates areas of high archaeological potential on the subject property and known archaeological sites within 100m of the subject property. Notwithstanding the foregoing, and by copy of this report, the owners and applicant should be aware that there is a chance that the lot may contain previously unrecorded archaeological material that is protected under the *Heritage Conservation Act*. If such material is encountered during development, all work should cease and Archaeology Branch should be contacted immediately as a *Heritage Conservation Act* permit may be needed before further development is undertaken. This may involve the need to hire a qualified archaeologist to monitor the work.
Climate Change Adaptation and Mitigation	In consideration of the existing development's proximity to the natural boundary of the sea, there may be potential for future impacts by sea level rise or other climate change induced hazards. Natural wave action has impacted and eroded parts of the shoreline in the past, and may continue to erode the bank in the future.
Shoreline Classification	Sediment Shoreline - Pebble/Sand
Shoreline Data in TAPIS	*Eelgrass meadow mapped approximately 120 metres from property boundary.*


Watershed Sediment Inputs to Shoreline System
Localized Sediment Movement Direction (Small Scale)

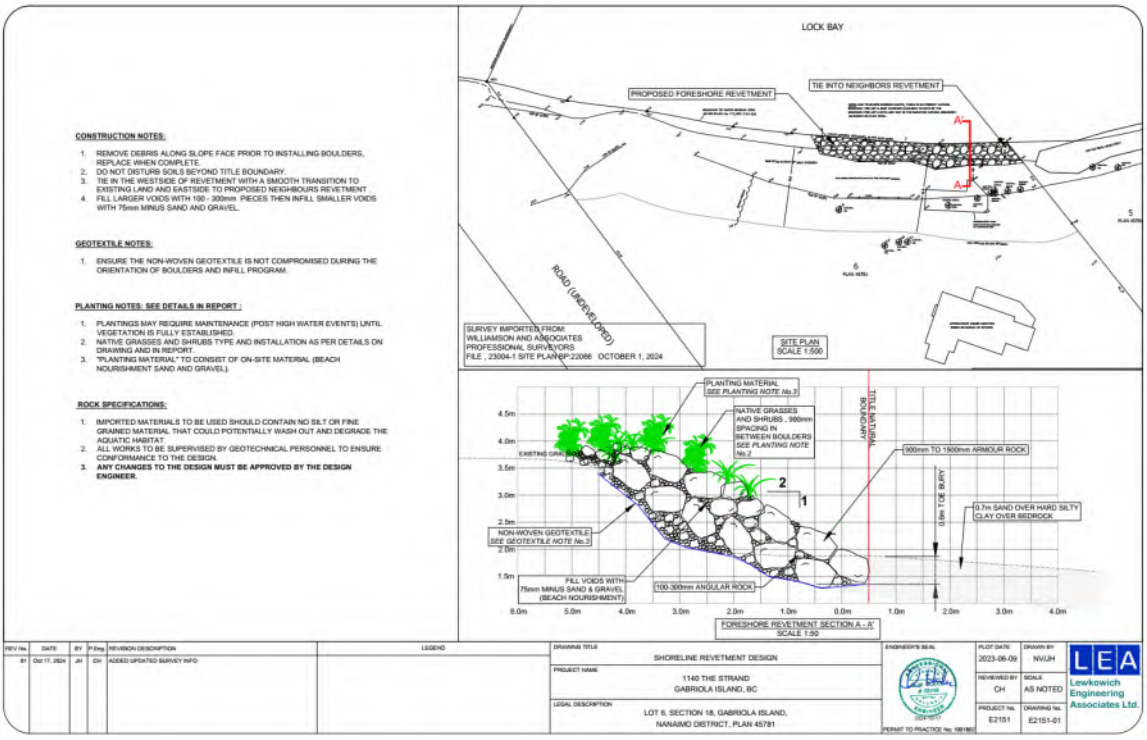

SOFT SHORELINES
• Sediment shorelines are typically associated with high recreational values and high ecological values (pocket beaches, estuaries, etc).
SALT MARSH
• Valued ecological features
• Vulnerable to pollution from land-based activities
LOW LYING AREAS
• Areas 0-4 m in elevation above existing Mean Sea Level and greater than 50 m of width from the shore are mapped as 'vulnerable' to sea level rise.

ATTACHMENT 2 – MAPS, PLANS, PHOTOS

2.1 SITE SURVEY



2.3 ROCK WALL REVETMENT PLAN



2.4 SITE VISIT PHOTOS

GEOTECHNICAL REPORT

Mike Apps
1140 The Strand
Gabriola Island, BC
V0R 1X3

File: E2151.01Rev 2
Revision: 02
Date: October 17, 2024

ATTENTION: **Mike Apps**

PROJECT: **FORESHORE REVETMENT**
1140 THE STRAND, GABRIOLA ISLAND, BC
LOT 6, PLAN VIP45781, SECTION 18, NANAIMO DISTRICT, GABRIOLA ISLAND, PID 008-828-075

SUBJECT: **FORESHORE REVETMENT ASSESSMENT AND DESIGN**

1.0 INTRODUCTION

a. The owner of the property, located at 1140 the Strand, Gabriola Island, BC has requested Lewkowich Engineering Associates Lt. (LEA) to assess the damage to this property's foreshore by recent erosion events and to proposes non-structural measures to rehabilitate and protect the property from further degradation.

b. This letter summarizes the results of our assessment, observations and design and provides our comments, recommendations, and conclusions regarding the proposed construction of a foreshore revetment. LEA will be working in concert with a qualified BC Land Surveyor for the legal boundary component of the work.

2.0 OBJECTIVES

a. The objectives of this report are to provide recommendations and designs regarding foreshore protection while adhering to Coastal Slope guidelines and the intent of the Green Shores for Homes Guiding Principles (GSH)[1]. These "Guiding Principles" consist of the following:

   i. Preserve or restore physical processes to maintain healthy shorelines.

   ii. Maintain or enhance habitat function and diversity along the shoreline.

   iii. Prevent or reduce pollutants from entering the aquatic environment.

   iv. Avoid or reduce cumulative impacts on the shoreline environments.

3.0 SITE CONDITIONS

a. The property is currently developed with an existing single-family residence, existing carriage house, and established landscaping/lawn areas. The subject site is located along the northern shore of Gabriola Island.

Figure 3.1– Location Plan of Subject Property[2]

b. In general, the foreshore can be characterized as a low-bank shoreline with a gently sloping intertidal zone facing the open waters of the Strait of Georgia / Salish Sea to the north. The total height of the shoreline bank ranged from approximately 2.4m to 5.9m at the time of our assessment. The crest is defined by the rear yard extent of lawn and organic soil cap with a detached wooden deck and fencing which transitions to a naturally forested area further to the west along the foreshore. Widely spaced coniferous trees exist at or near the slope crest. The present natural boundary is defined by an approximately 1.5m tall, near-vertical soil exposure located at the toe of the foreshore slope. See photos below.

Photo 1: Western foreshore conditions where they meet neighboring revetment.

Photo 2: Conditions at the central foreshore area.

c. There is considerable length of inter-tidal zone along this section of shoreline. The very gently sloping sea floor extends into the Strait of Georgia. This very gently sloping beach is covered by sand to cobbles and small boulder sized material.

d. The property owner is looking to remediate foreshore areas impacted by erosion and to protect the foreshore from future erosion in the least invasive and inexpensive means possible. A revetment to the title natural boundary is proposed. This filling (revetment) is justified as it will help ensure the protection of the mature trees and provide the necessary safe distance to buildings from storm events. These recent storms have a much greater intensity with varying wave directions. The frequency and intensity of such storm events is partly due to impacts of climate change, causing severe erosion of this area (any many others) over the last few years. Erosion has destroyed the shoreline habitat and reduced the set back to buildings and mature trees, which had remained intact for decades. As the trend of severe weather events with increasing frequency and intensity is expected to continue, remediating and mitigating the foreshore erosion is the recommended approach.

e. A similar shoreline revetment has been completed for the two neighbouring properties to the east of the subject property and it is our intent to install this revetment to be coincident with the neighbours' installations, providing a smooth shoreline alignment without any abrupt protrusions.

f. Survey data for the present natural boundary was provided by the attached survey from Williamson and Associates Professional Surveyors.

4.0 FORESHORE REVETMENT DESIGN

a. The wave climate at the site is influenced by several factors including bathymetry, tidal level, storm surge, wind speed and direction, as well as future sea level rise. A foreshore revetment following the GSH and Coastal Slopes principles was considered the most suitable design for this site. To conform to the design criteria, the following design principles shall be included:

   i. The finished gravel slope shall not exceed 2H:1V (Horizontal, Vertical). The revetment shall be constructed by utilizing a minimum two layers of large angular 900mm to 1500mm boulders, smaller 100mm to 300mm fractured rock infill with smaller voids filled completely with on-site well graded sand and gravel. The smaller materials are considered vital for the root zone of plantings and are part of the beach nourishment component of the design.

   ii. This will provide a gentle transition from the shoreline to the subject property rear yard level and suitable growth medium for native shoreline species which will aid in reducing erosion of the finer

soils. See Following Table 4.0 for typical gradation of revetment materials.

Revetment Materials	
Material Type	**Diameter (mm)**
Sand	**0.125 to 4.75**
Gravel	**4.76 to 75**
Cobble	**76 to 256**

Table 4.0 – Foreshore Revetment Materials

iii. The proposed revetment should be keyed into the natural substrate material a minimum of 1.0m depth. Prior to the placement of the underlying rock structure, a layer of geotextile (Armtec Type 250 non-woven geotextile or equivalent) is required to provide a barrier to the migration of fine-grained material from wave and tidal action.

iv. The planting plan should include plug planting at 900mm spacing in the sandy infill soils between the large boulders. Plantings should be located at and above the NB elevation. These plantings should consist of pre-existing native vegetation (as found in other areas of the property foreshore) and other native species which may include:

i. Dune and Oak Grasses
ii. Nootka or Baldhip Roses
iii. Ocean Spray
iv. Oregon grape
v. Evergreen huckleberry, snow berry, kinnikinnick, salal

These plantings should be installed in the spring / summer and watered periodically to establish root mats into the interstitial spaces between boulders.

v. See attached LEA Drawing E2151-01 - Foreshore Revetment Design, for further details.

5.0 CONSTRUCTION RECOMMENDATIONS

a. A trench should be excavated along the Title Natural Boundary, which will provide the position of the foreshore revetment area and for the underlying rock structure to be keyed into the foreshore floor. This trench should be 1.2m in width and minimum 0.6m in depth.

b. A layer of non-woven geotextile filter fabric (Armtec-250 or equivalent) should be placed on the prepared

base and extend to the top of the revetment against the slope facing.

c. The 900mm to 1500mm underlying rock structure should then be installed by placing them in a "tight" two-layer matrix, beginning with the largest rocks placed in the toe trench, then continuing to construct the revetment in a bottom-up sequence (i.e. from toe to crest), while being mindful of the maximum 2H:1V slope requirement.

d. Smaller sized rocks (100mm to 300mm) shall be used to infill any larger gaps within the rock structure and the onsite sand and gravel should be used to infill smaller gaps throughout construction.

e. The overall slope of the revetment shall not exceed 2H:1V.

f. The revetment at the east end should smoothly transition to neighboring (1160 The Strand) revetment already installed. Abrupt protrusions should be avoided to prevent the effects of eddying during hightide/storm events.

6.0 CONCLUSIONS AND RECOMMENDATIONS

a. Based on our foreshore assessment and recommendations outlined below, we conclude the designed foreshore revetment will help protect the foreshore from marine erosion by dissipating wave energy and providing stability to the foreshore bank.

b. The proposed gently sloping (2H:1V) revetment should effectively dissipate wave energy without significant effect on the neighbouring properties. The gentle transition to the foreshore revetment at the neighbouring property should reduce eddying effects from the revetment installation.

c. The effects of sea level rise could reduce the effectiveness of the revetment in the long term. The design has incorporated a stable matrix of boulders that will provide a stable base for the future expansion of the revetment both in height and depth if warranted to protect habitat, life, and property.

d. The benefits of the design principles from the perspective of the Regional District of Nanaimo and GSH are:

   i. The proposed revetment preserves the physical processes required to maintain healthy shorelines, compared to more obtrusive concrete structures (i.e., concrete walls).

   ii. The proposed design will maintain or enhance habitat diversity and function in areas along the shoreline.

   iii. The proposed revetment will prevent and/or reduce pollutants entering the aquatic environment.

   iv. The design will reduce the cumulative impacts to the costal environment by reducing erosion and by providing a more stable growth medium for native species.

v. We have added beach nourishment sand and gravel to ensure there is a suitable growth medium for the native vegetation planting plan. This component of work may require maintenance to ensure this medium is re-established if damaged by storm events until the vegetation has taken hold. See Toth and Associates report[4] for details on plantings and beach nourishment maintenance.

7.0 CLOSURE

a. Lewkowich Engineering Associates Ltd. appreciates the opportunity to be of service on this project. If you have any comments, or if we can be of further service, please contact us at your convenience.

Respectfully Submitted,
Lewkowich Engineering Associates Ltd.

Tennes Hamre, P.Geo
Geoscientist

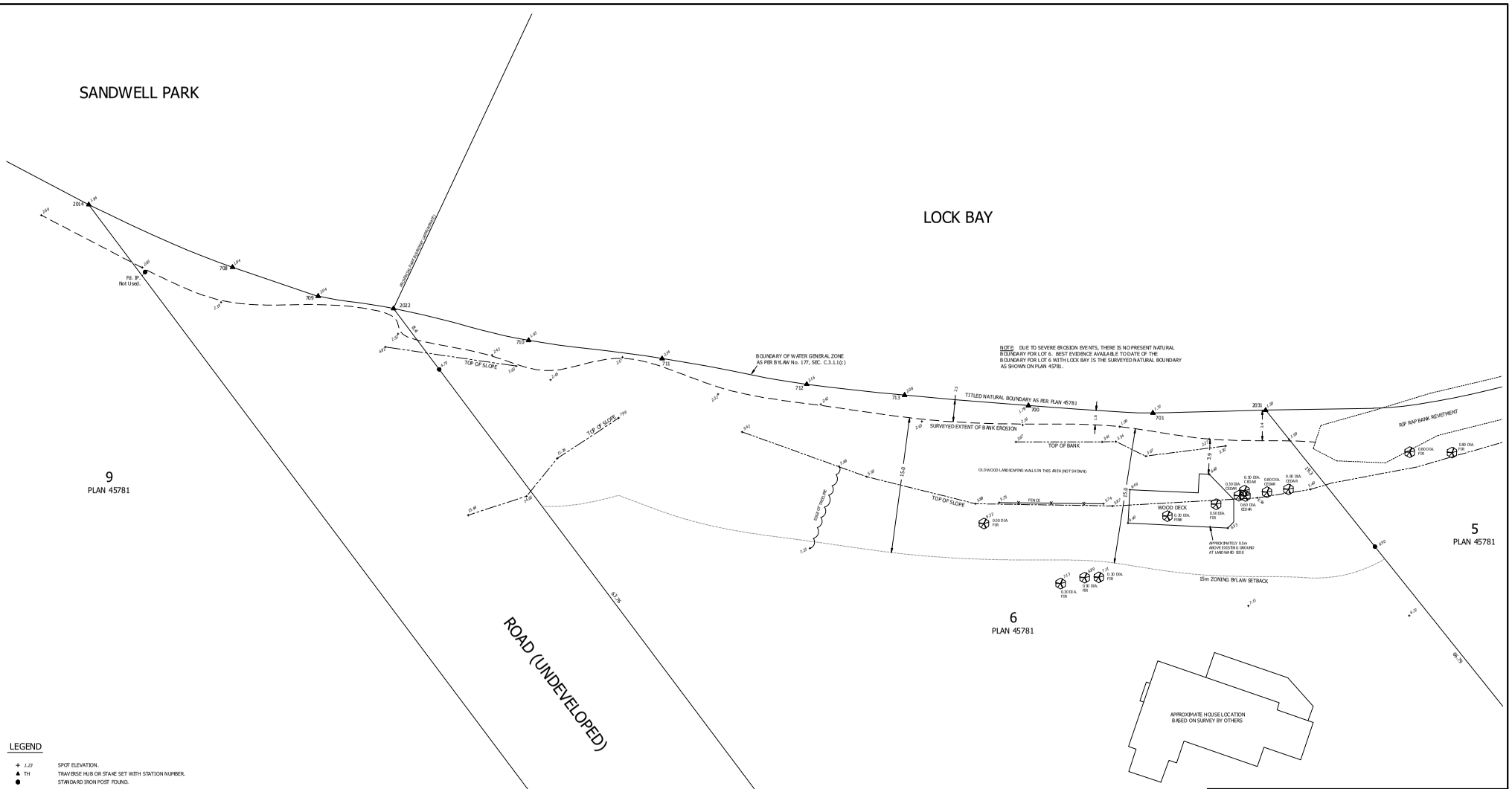
Chris Hudec, M.A.Sc., P.Eng.
Senior Project Engineer

8.0 ATTACHMENTS

1. Williamson and Associates Professional Surveyors, British Columbia Land Surveyor, File: 23004-1 SITE PLAN, dated October 1, 2024
2. LEA Drawing No. E2151-01Rev 1 – Foreshore Revetment Design.

9.0 REFERENCE:

1. Green Shores for Homes. December 2015.
2. Regional District of Nanaimo – RNDMAP, Online GIS Database, accessed June, 2023.
3. Islands Trust – Gabriola Island Official Community Plan, Bylaw No. 166, 167, dates September 2, 2019.
4. Gabriola Land and Trails Trust, Native plants and shoreline erosion, published February 5, 2023. https://galtt.ca/native-plants-and-shoreline-erosion/.



LEGEND

+ 1.23	SPOT ELEVATION.
▲ TH	TRAVERSE HUB OR STAKE SET WITH STATION NUMBER.
●	STANDARD IRON POST FOUND.

GENERAL NOTES:

DISTANCES AND ELEVATIONS ARE IN METRES. ELEVATIONS ARE DERIVED FROM NATURAL RESOURCES CANADA PRECISE POINT POSITIONING (PPP) SERVICE.

THIS PLAN PURPORTS TO POSITION ONLY THE ACTUAL AND / OR PROPOSED IMPROVEMENT(S) SHOWN RELATIVE TO ONLY THE BOUNDARIES SHOWN FOR APPURTENANT TO THE SUBJECT PARCEL(S).

THIS PLAN PROVIDES NO WARRANTY OR REPRESENTATION WHATSOEVER WITH RESPECT TO THE LOCATION OF ANY OTHER ACTUAL OR PROPOSED IMPROVEMENT(S) RELATIVE TO ANY BOUNDARY OF OR APPURTENANT TO THE SUBJECT PARCEL(S).

FIELD SURVEY COMPLETED JANUARY 30, 2023.

LOT ALIGNMENT DERIVED FROM FIELD SURVEY AND SUBDIVISION PLAN 45781.

THESE PARCELS MAY BE SUBJECT TO REGISTERED CHARGES & PERMITS: NONE

N

SCALE 1:200

0 2 4 6 8 10 20 metres

NO.	DATE	REVISION
00	MARCH 6, 2023	FIRST ISSUE.
01	NOVEMBER 17, 2023	REVISED SITE PLAN WITH UPDATED NOTE ON NATURAL BOUNDARY
02	OCTOBER 1, 2024	ADDED NOTATIONS ABOUT ZONING

PROJECT:	1140 THE STRAND
CLIENT:	MICHAEL & KAREN APPS
LEGAL:	LOT 6, SECTION 18, GABRIOLA ISLAND, NANAIMO DISTRICT, PLAN 45781
DRAWING:	SITE PLAN
SCALE: 1:200	
DRAWN: TP	
FILE: 23004-1 SITE PLAN BP: 22066	

WILLIAMSON & ASSOCIATES
PROFESSIONAL SURVEYORS
3088 BARONS ROAD NANAIMO B.C. V9T 4R5
PHONE: (250) 756-7723 FACSIMILE (250) 756-7724
EMAIL: WAPS@VIBO.S.CA

CONSTRUCTION NOTES:

1. REMOVE DEBRIS ALONG SLOPE FACE PRIOR TO INSTALLING BOULDERS, REPLACE WHEN COMPLETE.
2. DO NOT DISTURB SOILS BEYOND TITLE BOUNDARY.
3. TIE IN THE WESTSIDE OF REVETMENT WITH A SMOOTH TRANSITION TO EXISTING LAND AND EASTSIDE TO PROPOSED NEIGHBOURS REVETMENT .
4. FILL LARGER VOIDS WITH 100 - 300mm PIECES THEN INFILL SMALLER VOIDS WITH 75mm MINUS SAND AND GRAVEL.

GEOTEXTILE NOTES:

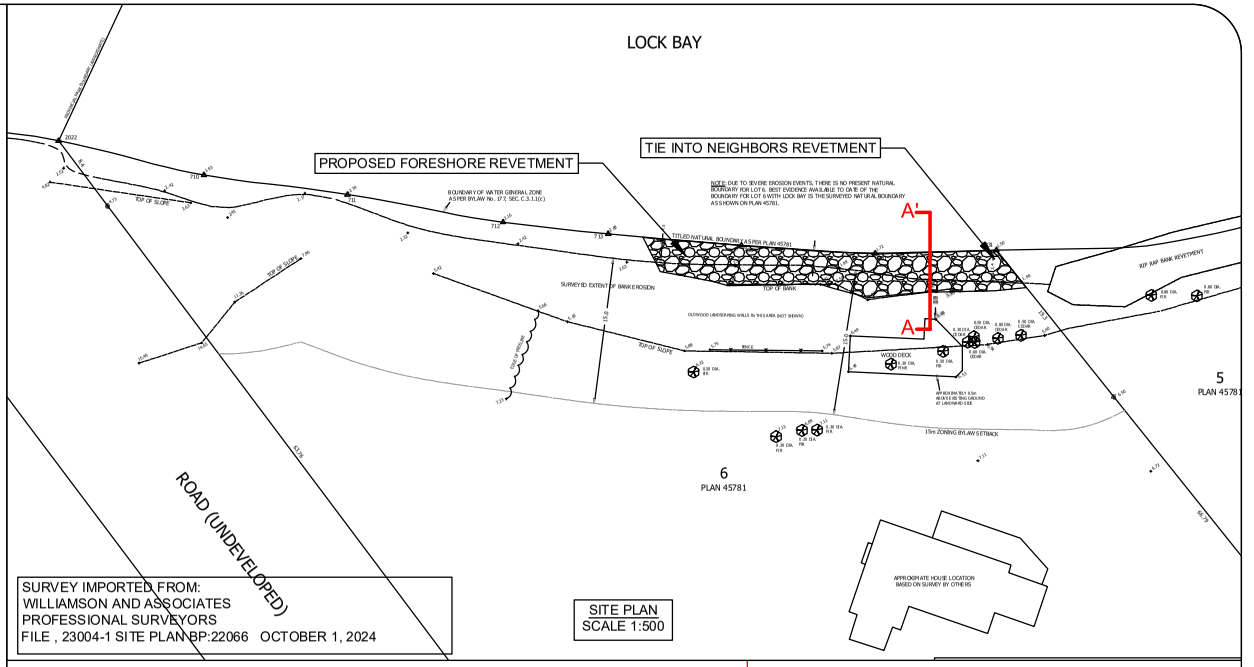
1. ENSURE THE NON-WOVEN GEOTEXTILE IS NOT COMPROMISED DURING THE ORIENTATION OF BOULDERS AND INFILL PROGRAM.

PLANTING NOTES: SEE DETAILS IN REPORT :

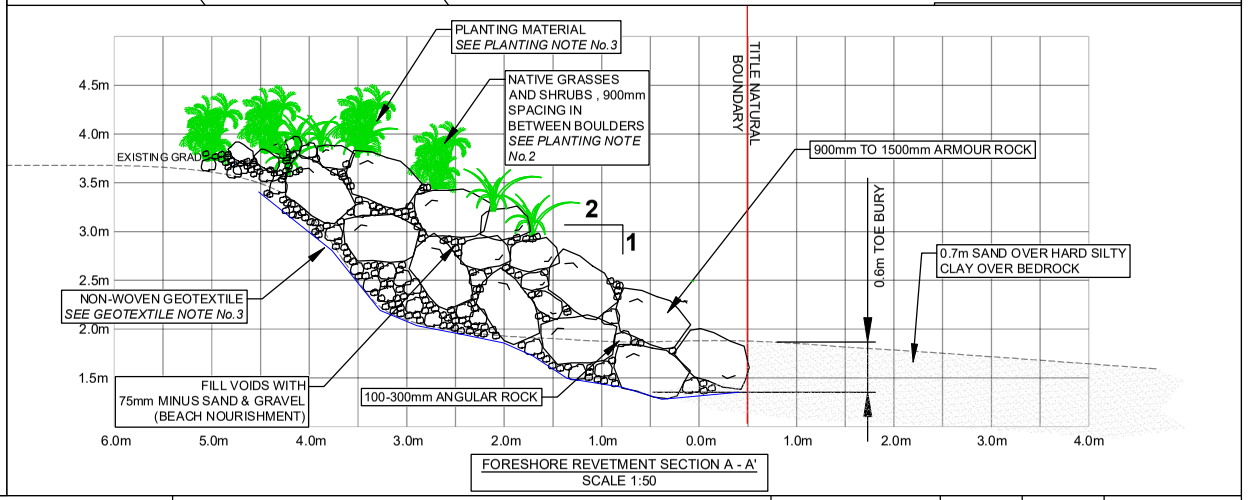
1. PLANTINGS MAY REQUIRE MAINTENANCE (POST HIGH WATER EVENTS) UNTIL VEGETATION IS FULLY ESTABLISHED.
2. NATIVE GRASSES AND SHRUBS TYPE AND INSTALLATION AS PER DETAILS ON DRAWING AND IN REPORT.
3. "PLANTING MATERIAL" TO CONSIST OF ON-SITE MATERIAL (BEACH NOURISHMENT SAND AND GRAVEL).

ROCK SPECIFICATIONS:

1. IMPORTED MATERIALS TO BE USED SHOULD CONTAIN NO SILT OR FINE GRAINED MATERIAL THAT COULD POTENTIALLY WASH OUT AND DEGRADE THE AQUATIC HABITAT.
2. ALL WORKS TO BE SUPERVISED BY GEOTECHNICAL PERSONNEL TO ENSURE CONFORMANCE TO THE DESIGN.
3. **ANY CHANGES TO THE DESIGN MUST BE APPROVED BY THE DESIGN ENGINEER.**



SITE PLAN
SCALE 1:500



FORESHORE REVETMENT SECTION A - A'
SCALE 1:50

REV No.	DATE	BY	P.Eng.	REVISION DESCRIPTION
01	Oct 17, 2024	JH	CH	ADDED UPDATED SURVEY INFO

LEGEND

DRAWING TITLE
SHORELINE REVETMENT DESIGN

PROJECT NAME
1140 THE STRAND
GABRIOLA ISLAND, BC

LEGAL DESCRIPTION
LOT 6, SECTION 18, GABRIOLA ISLAND,
NANAIMO DISTRICT, PLAN 45781

ENGINEER'S SEAL
PROFESSIONAL ENGINEER # 29249 BRITISH COLUMBIA
2024-10-17
PERMIT TO PRACTICE No: 1001802

PLOT DATE	DRAWN BY
2023-06-09	NV/JH
REVIEWED BY	SCALE
CH	AS NOTED
PROJECT No.	DRAWING No.
E2151	E2151-01

Lewkowich Engineering Associates Ltd.

Environmental Impact Assessment,
1140 The Strand
Gabriola Island, BC

By

D. R. Clough Consulting
Fisheries Resource Consultants
6966 Leland Road Lantzville B.C. V0R 2H0
Ph/fax: 1-250-390-2901, email: drclough@shaw.ca

1.0) General Project Description

The purpose of this report is to review the environmental aspects of a foreshore property that experiences reoccurring erosion events. A record high tide and storm event in spring 2022 resulted in the initial avulsion of the properties foreshore slope. The impact assessment includes recommendations to improve natural function with plantings.

Location: The property is located at 1140 The Strand on in the eastern corner of Lock Bay Gabriola Island (Fig.1) The adjoining properties to the east each have a residential dwelling with revetments previously constructed. The western property is parkland. The property encompasses approximately 95m of lineal foreshore.

2.0) Project Objectives

The purpose of this environmental assessment is to determine the environmental impacts associated with mitigating damages and protecting the property from further degradation by;

1. Assessing the aquatic and terrestrial resources within the property area;
2. Determine the potential impacts of the proposed structures;
3. Discuss potential mitigative measures to avoid causing negative impacts caused from the proposed work.

3.0) Methods

The methodology for this assessment included;

1. An assessment of potential environmental impacts
2. Preparation of a mitigation plan (if required);
3. An assessment of cumulative effects and future requirements;

The method and presentation of this assessment follows the Environmental Impact Assessment Act (IAA) guidelines that allow a complete coverage of all potential environmental attributes. This assessment focused primarily on the aquatic resources of the foreshore directly in the vicinity of the proposed work area as these resources are the potential for most impacted.

3.1) Background Review

The report was prepared using the following references to describe the environmental resources and to identify any potential environmental issues within the work area.

1. ImapBC (http://maps.gov.bc.ca/ess/sv/imapbc/)
2. Community Mapping Network B.C. (http://cmnmaps.ca/EELGRASS/)
3. Committee on the Status of Endangered Wildlife in Canada (Cosewic) database reports. (www.cosewic.gc.ca)
4. Aquatic Species at Risk Mapping (https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html)

Figure 1.) Site Location

3.2) Survey Information

Land survey information was provided by Williamson and Associates Professional Surveyors (Appendix 1).

3.3) Terrestrial Habitats

The foreshore riparian and surrounding areas were captured within the inventory. The assessment identifies vegetation types, depth, and topographical characteristics. It also identifies features such as bedrock or alterations such as riprap. The terrestrial habitat was identified using methodologies within "A Field Manual for Describing Terrestrial Habitats (MOE 1998)".

3.4) Aquatic Habitats

The aquatic habitat assessment includes a detailed inspection of:

1. Substrates
2. Functional LWD
3. Alterations
4. Bank Erosion
5. Vegetation Depth and type
6. Riparian Slopes and Bank Stability

3.5) Rare and Endangered Species

The province of B.C. and the federal government use separate systems to classify rare or endangered species. Background information was collected prior to the habitat inventory and was used to compile a list of potential species, which may inhabit the site (Appendix 2). The work site was assessed for potential rare species by determining the available habitat based on the individual species requirements.

4.0) Environmental Impact Assessment

The quantity and quality of potential habitats (terrestrial and aquatic) in relation to the magnitude of the proposed project, was assessed to determine the potential impacts associated works. The assessment

included the current site condition and anticipation effects of proposed work and associated mitigation. The anticipated effects were assessed based on the length of exposure, quality of habitat and features such as large woody debris or significant trees. The anticipated impacts were scored on the following:

1. Negligible: no expected disturbance or impact
2. Low: minimal or short length disturbance to important habitat
3. Medium: moderate or potentially long-term alteration or important habitat used by a species of management concern (ie Red Listed)
4. High: Significant, permanent alteration of habitat

4.1) Mitigation and Residual Effects

The mitigative actions are advised to reduce, offset, or avoid the projects related negative effects. Mitigation strategies which limit additional negative effects are advised. This advice is based on accepted practices from both Federal and Provincial Authorities.

4.2) Cumulative Effects

Cumulative effects are changes to the environment that are caused by an action in combination with other past, present, and future human actions. The methodology for assessing the potential cumulative effects is the same as the residual effects.

5.0) Results - Environmental Setting

5.1) Ecological Area

The subject property is located in the southeast corner of Lock Bay which has significant southeast exposure to wind and as well as wave/log action during winter storm events (Figure 1).

5.2) Vegetation

5.2.1) Vegetation Communities

Vegetation communities within the proposed work site were grouped into one of the two types:

1. Marine foreshore
2. Coastal Forest

Marine Foreshore

The property is located on the shoreline of the Lock Bay with the closest freshwater drainage over 600m away to the west. The site is in a residential setting with single family residences on each lot. The property has approximately 95m of shore frontage.

There are marine grasses in the area but not near the structure. Eel grass is located approximately 170-220m offshore from the subject properties in the lower intertidal area (Figure 2). The beach slope is gentle with the steepest portion at the wrack line where it drops away for 5-10 m (0.5m) and then to a relativity flat to the sub-tidal areas approximately 200m away. The upper beach area has a cobble/gravel substrate with small sand deposits that tend to move around with seasonal weather patterns. The lower beach is mostly gravel with sand flats at the outer tide line set on sandstone base. The eel-grass bed is extensive following the foreshore in a broad band (as recorded by CMNBC.ca). It is located approximately 200m from the foreshore and continuing into the deeper waters.

Figure 2: Eel Grass mapping in relation to subject property

The foreshore also supports the common species of invertebrates (i.e. Littleneck, Manila Clams, Mussels, Oysters) as well as potential spawning habitat for shoreline forage fish such as Surf Smelt and Sandlance. The offshore eel grass offers herring spawning habitat. The shoreline offers tidal feeding opportunities preferred by salmonids such as Chinook, Coho, Chum Salmon, and Sea Run Cutthroat Trout.

Coastal Forest

The Coastal Douglas-fir (CDF) is the dry, well-drained south aspect areas and rain shadow zones primarily of southeastern Vancouver Island and the Gulf Islands. This coastal forest community is one of the most imperilled due to historic logging and human development. Few old-growth stands remain throughout the community's distribution and existing patches are highly fragmented with less. This ecological community, where it does persist supports a diverse range of at-risk flora and fauna, including Northern Goshawk, Marbled Murrelet, Garry Oak as well as species such as Salal, Dull Oregon Grape and Ocean Spray, Oregon Beaked Moss and electrified cats-tail moss. The significant trees on the subject properties are shown on Table 1 as well as the site plan.

Table 1: Significant Trees along foreshore

Species	Tree Diameter (m)
Shore Pine *Pinus contorta*	0.3
Douglas Fir *Pseudotsuga menziesii*	0.5/0.5/0.3/0.3/0.3
Western Red Cedar *Thuja plicata*	0.5/0.6/0.3/0.8/0.5

5.3) Wildlife

Common terrestrial wildlife of the ecological zone such as Black Bear, Black Tail Deer, Mountain Lion and Roosevelt Elk are not likely to be found in the disturbed area. Marine mammals are very common due to the productivity of Herring and Salmon in the area and the following have been routinely

observed: California Sea Lion, Harbour Seal, River Otter and Mink. According to the aquatic species at risk map (Appendix 2) there are 14 Species at Risk that have the potential to use Lock Bay. No species habitats were changed in relation to this site.

5.3.1) Birds

Migrating waterfowl and other associated birds are likely to use the foreshore for foraging and rest. There are numerous common wildlife species found in the area with migratory bird species such as Black Brandt a vulnerable species known for reliance on eelgrass beaches. There are Bald Eagles and Blue herons observed routinely in the area. Bald eagles routinely perch on the large fir trees along the foreshore on the property. No nests were observed on the subject property (there was a documented Bald Eagle nest (BAEA-101-016) that is no longer functional located approximately 150m to the south (CMNBC.ca/WiTS).

5.4) Aquatic Resources

There are no freshwater features on or within 30m of the subject property. The marine foreshore is located primarily within the supra-littoral and intertidal zones, which due to wave action are extremely unstable limiting biological production.

6.0) Environmental Effects

6.1) Wildlife

Revetment is not expected to result in any habitat lost to wildlife, some will be gained by stabilizing the uppermost intertidal zone, removing the rock off the beach and increasing the repose of the rock and installing the plants in the interstices.
The expected habitat impacts of development on wildlife are summarized below:

1. Temporary habitat avoidance by wildlife can be expected during the work period due to increased noise and other building activities.

Table 2) Anticipated impacts on local wildlife and habitat

	Habitat Effects	Anticipated Environment Effects		
	Mammalian habitat	Reptile and amphibian habitat	Bird Habitat	Species at Risk
Habitat Risk	Low	Low	low	Low

The impacts on potential wildlife habitat and populations are expected to have minimal effects on any protected wildlife.

6.2) Vegetation

There will be no removal of any native plants as most was lost during the avulsion. Inspection of the beach line for transport of materials found no plants in the route. The remaining trees are identified on the site plan.

Table 3) Anticipated impacts on local vegetation

	Marine Foreshore	Coastal Rain Forest	Rare Plant Species at Risk	Rare or endangered ecosystems
Habitat Risk	Low	Nil	Nil	Nil

Planting Plan: The proposed revetment will be constructed at approximately 2:1 sloping rock creating a 2-3m wide face across the 45m width. The rock diameter will be 900 to 1500mm with 100-300mm fractured rock to infill smaller voids filled completely with on-site (or imported) well graded sand and gravel. Sea Grass plugs and other native plants sourced from local nurseries will then be planted in the gravel voids at approximately 900mm spacing (Appendix 5). This will result in approximately 100m^2 of planted shoreline above 3m elevation. This will help to restore habitats on the foreshore which serves a vital function as a primary nutrient producer to marine invertebrates as well as cover habitat for shorebirds and reptiles.

6.3) Aquatic Resources

The proposed construction site is located at the high watermark of the foreshore. There is no eel grass nearby (170m away). Experience using a similar construction method on similar properties indicates there is little impact (i.e. none/little compression, rutting, movement of substrates, logs or grasses). The expected habitat impacts are summarized below:

Table 4) Anticipated impacts on aquatic resources

	Habitat Effects	Anticipated Environment Effects			
	Marine Aquatic Invertebrates	Marine Pelagic Fishes	Saltwater Salmonid Rearing	Fresh Water Salmonid rearing	Fresh Water Salmonid migration
Habitat Risk	Low	Low	Low	Na	Na

7.0) Applicable Legislation

7.1) Provincial Legislation

Wildlife Act: The Wildlife Act protects all wildlife and endangered species from human related disturbance. The Act covers amphibians, birds, mammals, reptiles including nesting habitat. The act also identifies the seasonal window in which certain vegetation can be removed (i.e. Mar 15- Aug 15) to protect surrounding bird nests.

Water Act: Section 11 of the Water Sustainability Act covers work around water in non-tidal environments. The project is in a marine tidal area and not covered under the Water Act.

7.2) Federal Legislation

Fisheries Act: The fisheries act protects all fisheries resources in Canada including fish habitat and migration. In a current review using the DFO self assessment tool (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) we find the design, protective measures and marine timing window (Area 17 Summer; June 1-September 1, Winter; Dec. 1- Feb. 15)) will result in no harm to fish habitat.
A DFO Avoid and Mitigate Letter is included in Appendix 6.

Migratory Bird Convention Act:
The Migratory Bird Convention Act protects all migratory bird nesting habitat from disturbance. The act also identifies the window which certain vegetation can be removed (Mar 15- August 15) to protect surrounding bird nests.

8.) Residual Effects

Residual impacts refer to those environmental effects predicted to remain after the application of mitigation outlined in this assessment. After review of the site and accompanying professional report/letters it is anticipated that the long-term impacts of this project will have no net loss of habitat with respect to the function of the foreshore. The valued components of the foreshore habitats will be

protected or enhanced by stabilizing the failed bank and revegetating it. The most sensitive habitats water course and eel grass beds are located over 170m away from the project and will show no anticipated impact. There is expected to be a reduction of sediment from the lot onto the foreshore no impact to public spaces. The Residual Effects are, therefore, not significant.

9.) Cumulative Effects

Cumulative effects are changes to the environment that are caused by an action in combination with other past, present, and future human actions. Upon a review of the BC Environmental Assessment Office registry there are no active projects within 1km of the proposed site. This site will have a net improvement as designed as it is being moved off the beach and will also receive a shore grass planting treatment which is expected to result in net positive cumulative effect.

It is known that the adjoining properties 1160 & 1170 of The Strand have a similar revetment which will allow for a uniform shoreline. Based on preliminary observations a large proportion of the other properties in the bay have previously altered the foreshore ranging from rip rap to a vertical concrete wall. In comparison to the vertical concrete wall this 2:1 style revetment is the preferred biological option.

10.) Conclusions

Based on this assessment and the recommendations of other professionals including the land surveyor, engineer, and biologist, are confident the proposed structure will be structurally and environmentally conforming with more benefit than the previous bank.

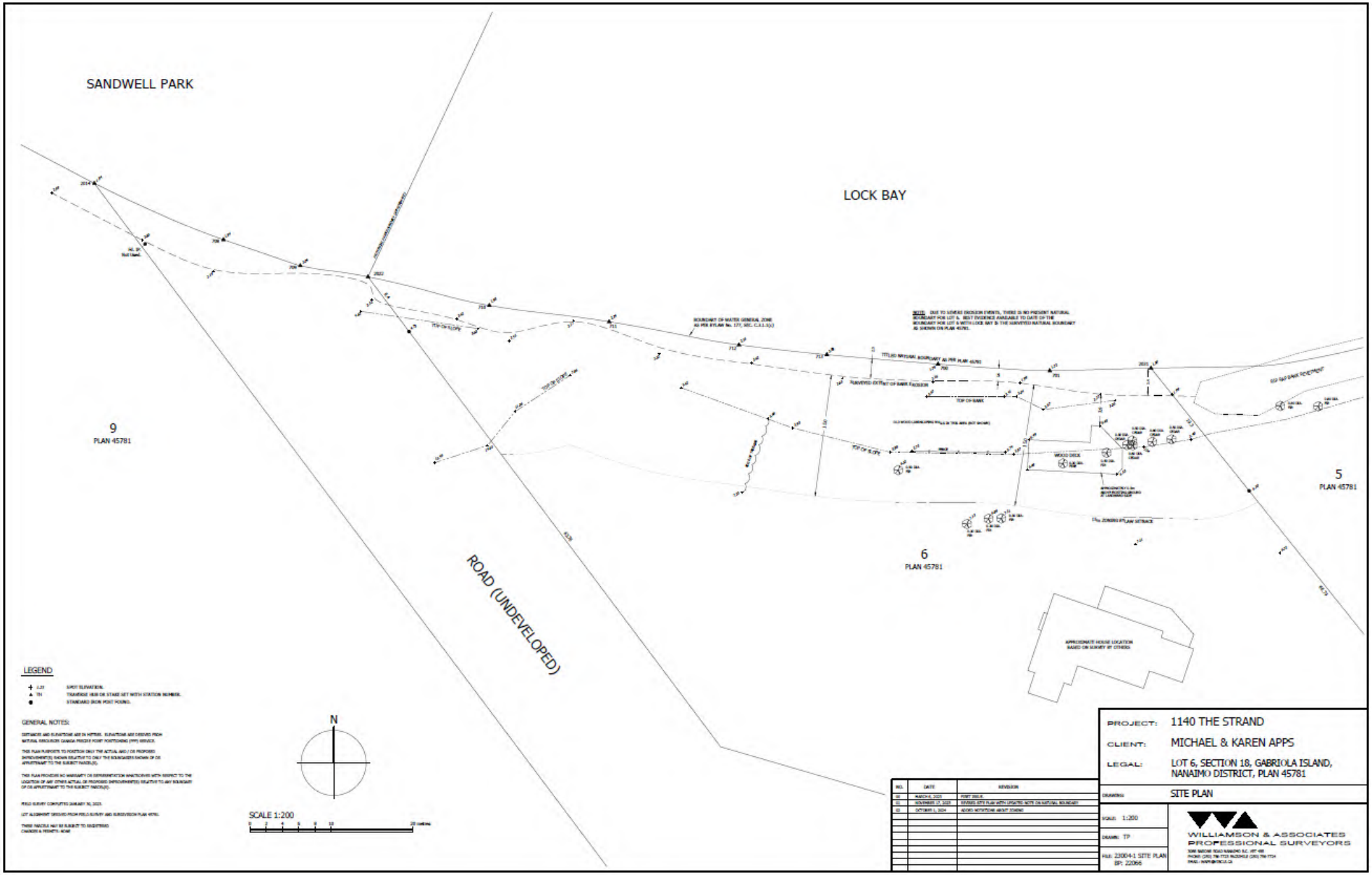
11.) Closure

This document was written by Brad Remillard, RPBio of D.R. Clough Consulting. It is for the sole use of the owner of 1140 The Strand.

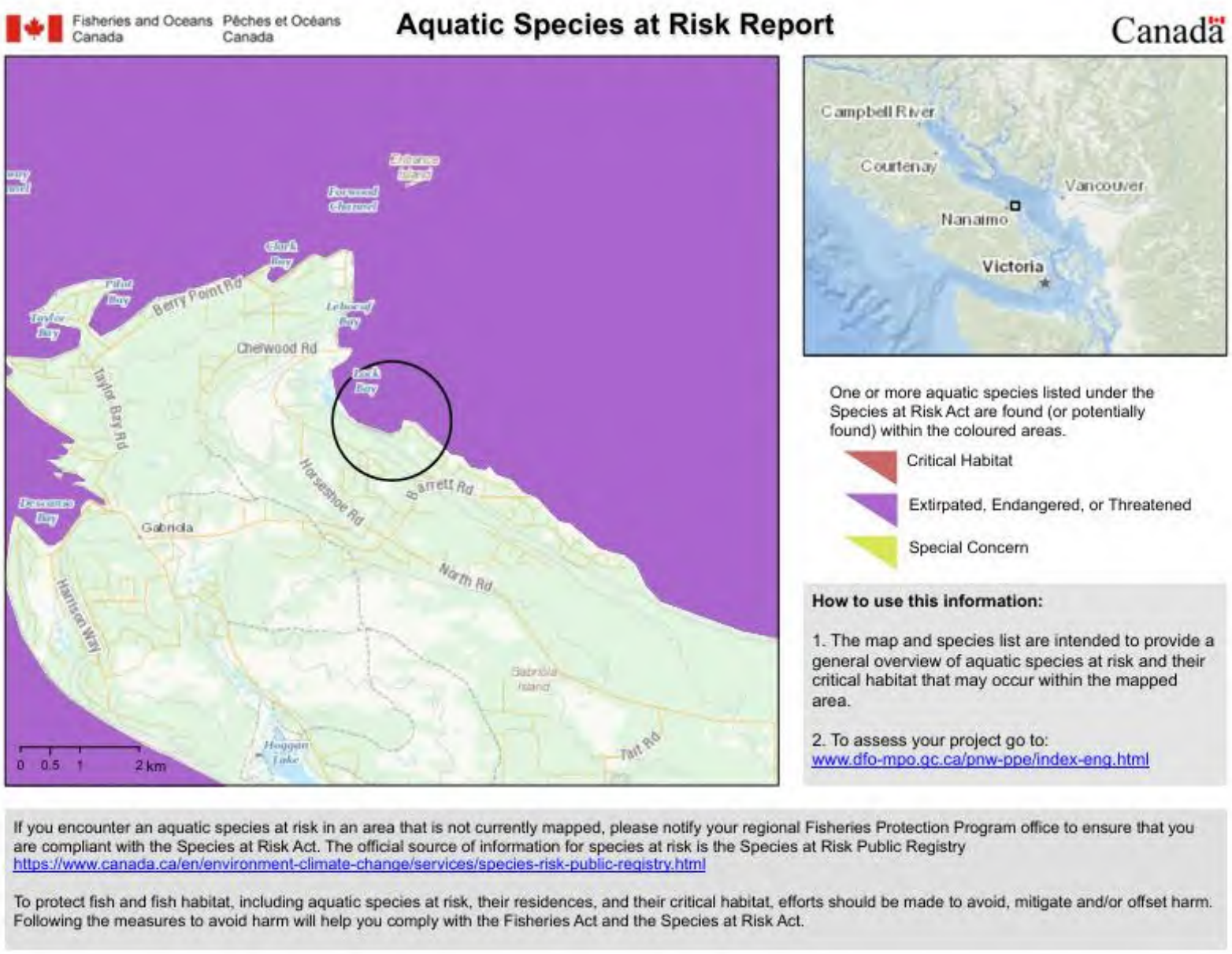
Report prepared by:

Brad Remillard, RPBio

Appendix 1 - Property Land Survey



Appendix 2: Aquatic Species at Risk Map



Critical habitat for these species is found within the outlined area

Critical habitat is identified in recovery strategies or action plans for species listed under Schedule 1 of the Species at Risk Act as extirpated, endangered or threatened.

Name	Where Found	Species Status
	No critical habitat	

Species found (or potentially found) within the outlined area

Name	Where Found	Species Status
Basking Shark - Pacific	Pacific Ocean/Océan Pacifique	Endangered
Bluntnose Sixgill Shark	Pacific Ocean/Océan Pacifique	Special Concern
Green Sturgeon	Pacific Ocean/Océan Pacifique	Special Concern
Grey Whale - Eastern North Pacific	Pacific Ocean/Océan Pacifique	Special Concern
Harbour Porpoise - Pacific Ocean	Pacific Ocean/Océan Pacifique	Special Concern
Humpback Whale - North Pacific	Pacific Ocean/Océan Pacifique	Special Concern
Killer Whale - Northeast Pacific Offshore	Pacific Ocean/Océan Pacifique	Threatened
Killer Whale - Northeast Pacific Southern Resident	Pacific Ocean/Océan Pacifique	Endangered
Killer Whale - Northeast Pacific Transient	Pacific Ocean/Océan Pacifique	Threatened
Leatherback Sea Turtle - Pacific	Pacific Ocean/Océan Pacifique	Endangered
Longspine Thornyhead	Pacific Ocean/Océan Pacifique	Special Concern

Northern Abalone	Pacific Ocean/Océan Pacifique	Endangered
Rougheye Rockfish type I	Pacific Ocean/Océan Pacifique	Special Concern
Rougheye Rockfish type II	Pacific Ocean/Océan Pacifique	Special Concern
Steller Sea Lion	Pacific Ocean/Océan Pacifique	Special Concern
Tope	Pacific Ocean/Océan Pacifique	Special Concern
Yelloweye Rockfish - Pacific Ocean Inside Waters	Pacific Ocean/Océan Pacifique	Special Concern
Yelloweye Rockfish - Pacific Ocean Outside Waters	Pacific Ocean/Océan Pacifique	Special Concern

Appendix 3-Revetment Design (LEA Ltd)

CONSTRUCTION NOTES:

1. REMOVE DEBRIS ALONG SLOPE FACE PRIOR TO INSTALLING BOULDERS, REPLACE WHEN COMPLETE.
2. DO NOT DISTURB SOILS BEYOND TITLE BOUNDARY.
3. TIE IN THE WESTSIDE OF REVETMENT WITH A SMOOTH TRANSITION TO EXISTING LAND AND EASTSIDE TO PROPOSED NEIGHBOURS REVETMENT .
4. FILL LARGER VOIDS WITH 100 - 300mm PIECES THEN INFILL SMALLER VOIDS WITH 75mm MINUS SAND AND GRAVEL.

GEOTEXTILE NOTES:

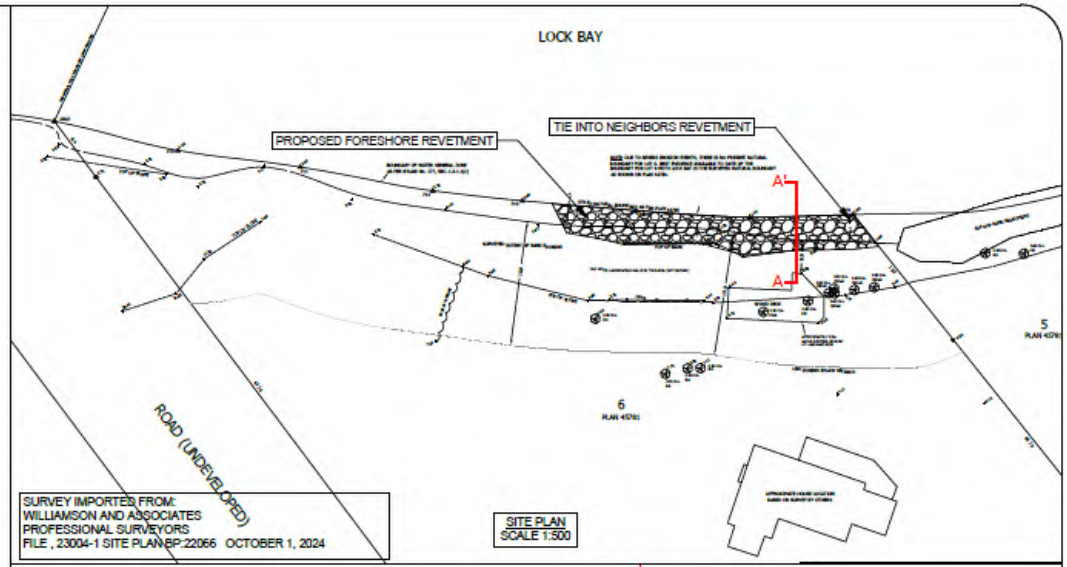
1. ENSURE THE NON-WOVEN GEOTEXTILE IS NOT COMPROMISED DURING THE ORIENTATION OF BOULDERS AND INFILL PROGRAM.

PLANTING NOTES: SEE DETAILS IN REPORT :

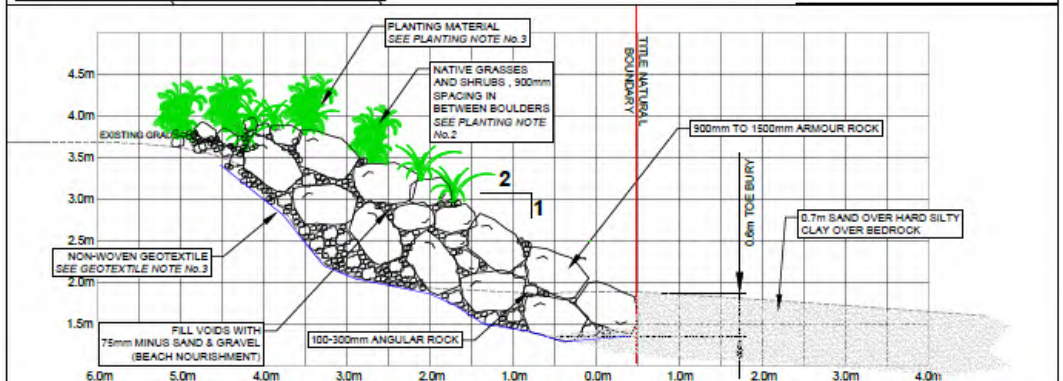
1. PLANTINGS MAY REQUIRE MAINTENANCE (POST HIGH WATER EVENTS) UNTIL VEGETATION IS FULLY ESTABLISHED.
2. NATIVE GRASSES AND SHRUBS TYPE AND INSTALLATION AS PER DETAILS ON DRAWING AND IN REPORT.
3. "PLANTING MATERIAL" TO CONSIST OF ON-SITE MATERIAL (BEACH NOURISHMENT SAND AND GRAVEL).

ROCK SPECIFICATIONS:

1. IMPORTED MATERIALS TO BE USED SHOULD CONTAIN NO SILT OR FINE GRAINED MATERIAL THAT COULD POTENTIALLY WASH OUT AND DEGRADE THE AQUATIC HABITAT.
2. ALL WORKS TO BE SUPERVISED BY GEOTECHNICAL PERSONNEL TO ENSURE CONFORMANCE TO THE DESIGN.
3. **ANY CHANGES TO THE DESIGN MUST BE APPROVED BY THE DESIGN ENGINEER.**



SITE PLAN
SCALE 1:500



FORESHORE REVETMENT SECTION A - A'
SCALE 1:50

REV No.	DATE	BY	P.Eng.	REVISION DESCRIPTION
01	Oct 17, 2024	JH	CH	ADDED UPDATED SURVEY INFO

LEGEND

DRAWING TITLE: SHORELINE REVETMENT DESIGN

PROJECT NAME: 1140 THE STRAND
GABRIOLA ISLAND, BC

LEGAL DESCRIPTION: LOT 6, SECTION 18, GABRIOLA ISLAND, NANAIMO DISTRICT, PLAN 45781

ENGINEER'S SEAL

PERMIT TO PRACTICE No. 1001803

PLOT DATE	DRAWN BY
2023-06-09	NV/JH
REVIEWED BY	SCALE
CH	AS NOTED
PROJECT No.	DRAWING No.
E2151	E2151-01

Lewkowich Engineering Associates Ltd.

Appendix 4-Site Photos

1.) Shore looking east along property line

2.) Looking west from NE corner at eroding bank

3.) Looking north toward the Salish Sea at beach characteristics

4.) Looking south toward subject property

Appendix 5-Revegetation Plan

Estimated Landscaping Fees

Item	Cost	# items	Total
Dune Grass 10cm -plug	**$4.00**	**60**	**$240.00**
Nootka Rose	**$9.00**	**5**	**$45.00**
Ocean Spray	**$9.00**	**5**	**$45.00**
Evergreen Huckleberry	**$9.00**	**5**	**$45.00**
Snowberry	**$9.00**	**5**	**$45.00**
Kinnicinick	**$9.00**	**5**	**$45.00**
Salal	**$9.00**	**5**	**$45.00**
Feature trees (7 gal confiner)	**$60.00**	**2**	**$120.00**
Planting Medium with delivery	**$100**	**2**	**$200.00**
Landscape Labour – planting and irrigation		**Lump sum**	**$480.00**
Contingency	**10%**		**$131.00**
Total			**$1441.00**

Appendix 6-DFO Avoid and Mitigate Letter

Fisheries and Oceans Canada
Pêches et Océans Canada

Pacific Region
Ecosystem Management Branch
417 2nd Avenue W
Prince Rupert, BC
V8J 1G8

Région du Pacifique
Direction de la gestion des écosystèmes
417, 2e Avenue Ouest
Prince Rupert, (C.-B.)
V8J 1G8

August 28, 2024

Our file *Notre référence*
23-HPAC-00980

Michael & Karen Apps
1140 The Strand
Gabriola, BC
V0R 1X3

Via email: mjapps2@gmail.com

Dear Michael & Karen Apps:

Subject: Foreshore Revetment, Lock Bay, Gabriola – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on September 28, 2023. We understand that you propose to:

- Construct a riprap revetment along the eastern portion of the marine shoreline along your property to prevent further erosion. The revetment will extend (seaward) approximately 3 m beyond the high water mark. It will be constructed using machinery operating from above the high water mark.

Our review considered the following information:

- *Request for Review* form submitted by email on September 28, 2023;
- *Foreshore Revetment Assessment and Design* report prepared by Lewkowich Engineering Associates Ltd., submitted by email on September 28, 2023;
- Information provided through email and telephone communication between Michael Apps and Mike Gillespie (the Program) from November 2023 to August 2024; and
- Site visits completed by the Program in November 2023 and March 2024.

Your proposal has been reviewed to determine whether it is likely to result in:

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*; and
- effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*.

Canada

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The aforementioned outcomes are prohibited unless authorized under their respective legislation and regulations. As of the date of this letter, aquatic species listed under the *Species at Risk Act* may be found in the greater vicinity of your proposal but are unlikely to be affected by the project activities.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), and in addition to what you have proposed, we recommend you implement the additional measures as listed below:

- Retain a Qualified Environmental Professional (QEP) to conduct environmental monitoring during all project activities that may result in potential negative effects to fish and fish habitat.
  - Survey work zone areas for the presence of forage fish spawning prior to construction. Use accepted methods for surveying for intertidal spawning forage fish. If evidence of forage fish spawning is detected, temporarily suspend work until a subsequent survey indicates that no incubating embryos are present.
- Limit the footprint of the works, undertakings and activities below the high water mark to the extent possible.
- Limit the duration of the works, undertakings and activities.
- Complete works in the dry and during falling or low tide conditions.
- Schedule work to avoid wet, windy and rainy periods (and heed weather advisories) that may result in high runoff volumes and increased erosion and sedimentation. Implement shut down procedures as required.
- Construction is not to result in the trapping or stranding of fish.
- Operate machinery from land in stable dry areas.
- Develop, implement, monitor, and maintain an effective Erosion and Sediment Control plan to avoid the introduction of sediment into nearby aquatic habitat during all phases of the work, undertaking or activity.
- Adhere to BC water quality guidelines at all times.
- All rock used for the project is to be non-acid generating, clean and free of debris.
- Limit impacts to native riparian vegetation to the extent possible.
- Re-vegetate disturbed areas with native species suitable for the site.
- Develop and implement an emergency spill response plan as required. Ensure sufficient spill response supplies are on-site and readily available.
- Machinery is to be in good working condition and free of leaks or debris. It should be inspected before initiating works, and regularly throughout construction.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal is not likely to result in the contravention of the above mentioned prohibitions and requirements.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if

further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act* and the *Species at Risk Act*.

It is also your Duty to Notify DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to the DFO-Pacific Observe, Record and Report phone line at 1-800-465-4336 or by email at DFO.ORR-ONS.MPO@dfo-mpo.gc.ca.

Please notify the Program by email at Michael.Gillespie@dfo-mpo.gc.ca at least 10 days before starting your project, ensuring your file number and appropriate on-site contact information is included. We recommend that a copy of this letter be kept on site while the work is in progress.

It remains your responsibility to meet all other federal, provincial and municipal requirements that apply to your proposal, including possible Crown Land tenure considerations.

Please note that the advice provided in this letter will remain valid for a period of one year from the date of issuance. If you plan to execute your proposal after the expiry of this letter, we recommend that you contact the Program to ensure that the advice remains up-to-date and accurate. Furthermore, the validity of the advice is also subject to there being no change in the relevant aquatic environment, including any legal protection orders or designations, during the one year period.

If you have any questions with the content of this letter, please contact Mike Gillespie at 236-464-7819 or by email. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Bergsma, Ian Digitally signed by Bergsma, Ian
Date: 2024.08.28 11:40:35 -07'00'

Ian Bergsma
Senior Biologist, Coastal Watershed Regulatory Operations
Fish and Fish Habitat Protection Program

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Project Narrative

We purchased the property at 1140 the Strand in 2011 in large part because we loved the scenic beauty of Loch Bay and the waterfront we were entranced by the water front. At that time there was easy access to the beach down a series of stone steps and past a rich border of native vegetation, including black berries and a few small conifer saplings. This access was separated from the public beach by a wire deer fence set about 12 feet from the high water mark at our titled property boundary.

The property is our home and we live in it full time. Most of the property is landscaped with lawn, ornamental shrubs (mostly native to Gabriola) and vegetables. As shown on the site plan, there is both a main house (our residence) and a separate building we refer to as the CoachHouse as well as several small utility sheds (<8'x12'). The CoachHouse was originally a single story garage, but converted to a one bedroom studio by a previous owner who had the main house constructed (Mrs. Litherland). The year after we purchased the property we had the architects who built the house (Margot Kimble, Architrave) design and build a second floor for the CoachHouse in order to provide a workshop and recreation room (Architrave ensured that this was all approved by RDN). These modifications to the CoachHouse, other than ongoing maintenance, are the extent of structural construction on the property since we took possession.

The proposed revetment is NOT further development of the property to increase its value or to improve its functionality. It is entirely a rehabilitation and mitigative project. (The damages and threats caused by Climate Change are described in the Project Description Comments.) The purpose of the project are to

1. Return the foreshore to its original state (pre-2022) as close as possible, using locally sourced rock & materials and native, pre-existing vegetation.
2. To protect the foreshore against future avulsion events and consequent erosion to the extent possible.

The Engineering consultant (John Hessels, LEA), asked to provide a design that fulfilled these objectives, used his extensive experience on coastline stabilization and followed Coastal Slope Guidelines and The Green Shores Guiding Principles:

- Preserve or restore physical processes to maintain healthy shorelines.
- Maintain or enhance habitat function and diversity along the shoreline.
- Prevent or reduce pollutants from entering the aquatic environment.
- Avoid or reduce cumulative impacts on the shoreline environments.

It is to be noted that the revetment will be entirely comprised of natural & native resources using pre-existing material & vegetation where possible. No concrete, steel or other bulk construction materials will be used. (A geotextile barrier will be placed below the revetment to prevent migration of fine-grained particulates from run-off and wave and tidal action.)

Project Description Comments:

During the winter of 2021/22 a series of unprecedented storms and record high tides severely damaged the properties facing Loch Bay. This damage was significantly magnified by the very large number of unsalvaged logs (a change in provincial regulations appears to have greatly reduced salvage logging) which then acted as multi-ton battering rams.

THIS WAS NOT NORMAL EROSION. The damage was due to sudden Avulsion events driven by human causes (climate change, logging and change in salvage practices) during which a portion of the land is torn off and washed away.

Three years ago, our neighbours (1160 and 1170 the Strand) faced immediate threats to property and humans from the undercutting of very large tree roots on their embankments. A year later one these trees at 1160 the Strand indeed fell, causing significant property damage, narrowly missing the hot tub at 1170 the Strand – a potentially fatal outcome avoided by mere good luck. These owners took emergency remedial action - a rock revetment to stabilize their foreshore.

Islands Trust did not accept their claim of the emergency provisions of Section C 3.1.1. and charged them with a bylaw infraction, and required they apply for a DVP. The fine was paid and a DVP application submitted.

Our property (1140 the Strand) was also damaged by these 2021/22 avulsion events, but thinking this was a once-in-a-lifetime event, we opted not to join the neighbours' remedial action. Bad mistake: in 2022/23 a second set of avulsion events occurred, and our waterfront was severely damaged and nearly 10' of embankment was torn off and washed away. Beach access was completely destroyed and most of the native vegetation cover (including several small trees) were killed. It was obvious that in a very few years, several large trees on our property would be undercut, presenting significant danger to us, passersby and to our property. Meanwhile, the neighbours were completely protected from these 2022/23 events.

I approached Islands Trust in February of 2023 for assistance with this climate related threat. I was complimented for NOT following the neighbours' lead, but told I must make an application for a DVP. This has been an extremely lengthy, frustrating and expensive process requiring multiple (expensive and lengthy) professional consultations. Although the reviews carried out by the neighbours and all the online guidelines from DFO (Department of Fisheries and Oceans) and BCAB (BC Archaeological Branch) indicated there would be no issues of concern, we were instructed that we would still need separate letters from both DFO and BCAB. This triggered lengthy and expensive (to the taxpayer) reviews by these agencies.

Meanwhile, the hearing of the DVP application for 1160 and 1170 the Strand (submitted in Feb 2023) was repeatedly postponed and has still not been resolved. I remain concerned that until their DVP (and legal conflict) is settled, our own application will similarly linger on. In the meantime, another winter and potential storms approaches.

The Engineering consultant (John Hessels, LEA) has many years of experience on stabilizing foreshores along BC's coast line. He told us emphatically that the ONLY WAY TO PROTECT AGAINST ONGOING DAMAGE IS THROUGH HARD ARMORING of some form. His revetment was designed to adhere to the Coastal Slope guidelines and the intent of the Guiding Principles of the Greenshore Design.

The situation is becoming dire: after the protective embankment and vegetation cover was torn away by the Avulsion events of 2021/22/23, even minor storms at high tides continue to erode the embankment. Failure to put this revetment in place in the coming year may result in the root destabilization of the existing old growth trees on our embankment, posing a significant danger to life, as well as other massive damage to our property.