STAFF REPORT

File No.: GB-DVP-2022.4 (Woodside)
X.ref: GB-BE-2022.10

DATE OF MEETING:	April 17, 2025
TO:	Gabriola Island Local Trust Committee
FROM:	Margot Thomaidis, Planner 2 Northern Team
COPY:	Renée Jamurat, Regional Planning Manager
SUBJECT:	Development Variance Permit – PL-GB-DVP-2022.4 (Woodside) Applicant: Mark Woodside (Owner) Location: 1170 The Strand, Gabriola Island

RECOMMENDATION

1. **That the Gabriola Island Local Trust Committee deny Development Variance Permit application GB-DVP-2022.4 (Woodside).**

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 permit a previously constructed shoreline erosion protection revetment structure along the natural boundary. 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 to permit the 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 based on the rationale provided in the following report.

BACKGROUND

The subject property is located at 1170 The Strand, Gabriola Island, and is approximately 0.5 hectare (1.25 acres) in area (Figure 1). The subject property contains a single-family dwelling and an accessory garage.

Bylaw enforcement file GB-BE-2022.10 was opened in May 2022, due to the unlawful construction of a shoreline structure built without permits. The existing rock revetment is part of an approximately 100 metre long, two-to-three-metre-wide revetment that spans the length of the shoreline along the two properties at 1160 and 1170 The Strand. It is also located partly beyond the legal boundary of the original subdivision plan from 1987.

The objective of this application includes the following:

- to permit the existing revetment to remain in place while being upgraded to meet the recommended design standards according to the geotechnical engineering consultant's assessment, including expanding part of the existing structure at the east end with additional rip rap (see **Attachment 6**);

- to revegetate the upper portion of the revetment per the Environmental Impact Assessment's Revegetation Plan (**Attachment 7**); and
- to remove any parts of the rock revetment that are trespassing on Crown land.

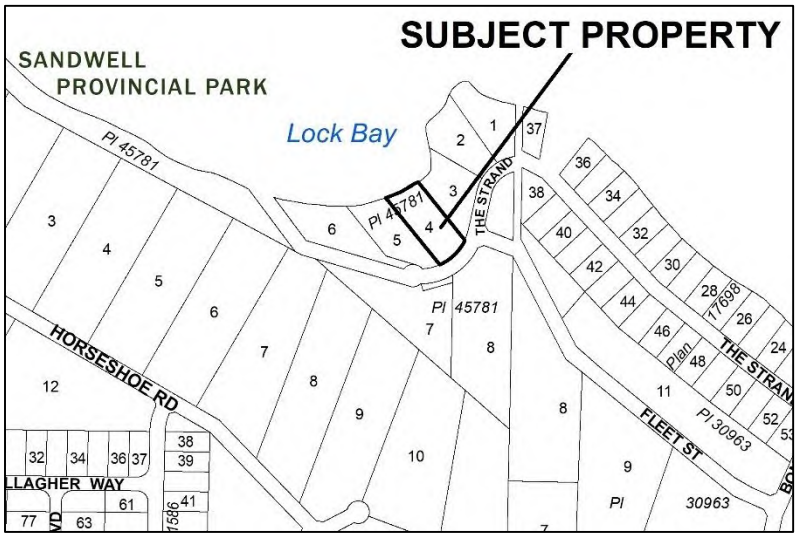
In order to permit this proposal and the existing rock revetement, the setback to the natural boundary of the sea as well as the interior side lot line setbacks would need to be varied through this DVP application.

The applicant has submitted the following materials in support of their application:

- A letter and a final survey plan prepared by a B.C. Land Surveyor. (September 7, 2022 and May 29, 2023) (**Attachment 5**);
- A Foreshore Revetment Assessment and Design Report prepared by Lewkowich Engineering Associates Ltd. submitted April 10, 2023 (Geotechnical Report – **Attachment 6**); and
- An Environmental Impact Assessment report prepared by a Registered Professional Biologist at D.R. Clough Consulting (November 23, 2023) (**Attachment 7**).

A site context, a collection of plans and photos, and an OCP policy review prepared by staff are found in **Attachments 1-3**.

Figure 1 – Subject Property Map



APPLICANT/OWNER RATIONALE FOR REQUESTED VARIANCES

The applicant/Owner's rationale for the variances is found in their letter submitted to Islands Trust in **Attachment 4** and summarized as follows:

The Owners installed the revetment without permits because they felt they must act very quickly to protect their property and the general public from falling trees, soil slippage, and other erosion events. They believe that they acted in good faith by installing the revetment for emergency mitigation action.

Erosion of their property accelerated dramatically in 2021/2022 due to:

- intense and frequent storms combined with king tides;
- high wave energy in and around Lock Bay;
- hundreds of large beach logs from log booms battering the soft foreshore and soil bank; and

- abrupt erosion (avulsion) events in 2021 and 2022.

This has led to:

- undermining of the clay and soil bank, rendering their previously 45-degree sloped bank close to vertical;
- the loss of trees along their shoreline;
- a sudden reduction of the setback to buildings and structures, which had previously remained intact for decades.

The Owners have also noted the following in support of their application:

- They have received advice from qualified professionals that the only way to protect their bank from further erosion is through maintaining the existing hard armouring approach.
- The existing structure has ceased most of the erosion issues on the property and provided stability to the existing trees along the slope crest.
- They want to do everything in the best way possible to protect their property from further erosion and damage.

ANALYSIS

The existing shoreline erosion protection works are inconsistent with the policy and regulatory framework, as follows.

Official Community Plan:

The subject property is not located within a development permit area. The Gabriola Island Official Community Plan (OCP) policies applicable to this DVP application are reviewed in **Attachment 3**.

The 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 environmentally sensitive coastal ecosystems.

Land Use Bylaw:

The revetment is not in compliance with the following regulations in the Gabriola Island Land Use Bylaw (LUB), therefore a variance is sought:

- **Article B.2.1.1 Setbacks and Elevations from Watercourses and the Sea, Clause (a), which states:**

  "…retaining walls… must be sited a minimum of 7.5 metres (24.6 feet) from and 1.5 metres (4.9 feet) above the natural boundary of the sea."

- **Article D.1.1.3, Clause (a) Buildings and Structures Siting Requirements, Item (i), which states:**

  "On lots less than 1.0 hectares (2.47 acres), except for a sign, fence, or pump/utility house, the minimum setback of buildings or structures is: …1.5 metres (4.9 feet) from any interior lot line."

The existing dwelling is in compliance with the following regulation in the LUB:

- **Article B.2.1.1 Setbacks and Elevations from Watercourses and the Sea, Clause (a), which states:**

  "*…Where the frontage on the sea is not adequately protected from erosion by natural bedrock or works as certified by a professional engineer, buildings and structures must be sited a minimum of 15 metres (49.2 feet) from and 1.5 metres (4.9 feet) above the natural boundary of the sea."*

The 90 m^2 deck attached to the dwelling is sited 11 metres from the legal boundary according to the Geotechnical Report, not in compliance with the required 15-metre setback. The dwelling is approximately 15.5 metres away from the legal boundary, exceeding the setback requirement.

Revetment Design and Environmental Impact Assessment

The rock revetment is intended to protect the property from further erosion in the least invasive and inexpensive means possible. It is sloped at a ratio of 2H:1V and composed of large rock rip rap in a tight two-layer matrix and planned to be infilled with smaller rocks and 'beach nourishment' to fill voids above 3.0 metres elevation. Plantings of native vegetation are also included in the design and would be located above the natural boundary. These plantings are intended to 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 revetment preserves coastal processes when compared to more intrusive structures, such as a cement seawall, other alternatives to protect from erosion are not substantially considered in the report. Staff spoke with the engineering consultant for the Geotechnical Report who confirmed that a softer, nature-based approach would not effectively withstand against wave action to protect the property from erosion.

The Geotechnical Report acknowledges that the effects of sea level rise could reduce the effectiveness of the revetment in the long term, noting that 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*." (pg. 7)

The application as well as consultant reports were sent to the Islands Trust professional biologist for comment. Her comments state that from an environmental perspective the information does not appear to provide justification for the revetment. The application does not state the potential threats and impacts of the revetment on the surrounding area, or include mitigation measures to reduce risks. Specifically, the EIA report does not:

- 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;
- assess how the revetment and the proposed revegetation plan provide more benefit than the natural bank;
- acknowledge known potential harms from armouring shorelines; and
- provide mitigation strategies for potential harms.

Both the National Oceanic and Atmospheric Administration (NOAA – USA) and Fisheries and Oceans Canada have stated there are detrimental effects of shoreline armouring on the natural movement of sediments. Islands Trust's mapping of shoreline types, energy and sediment movement, and shoreline values and vulnerability (**Attachment 8**) show the shoreline near the subject property has potential watershed sediment inputs into the shoreline system, and localized sediment movement towards the western portion of Lock Bay where eelgrass meadows are mapped. The subject property is indicated as a low-lying area adjacent to a soft shoreline, typically associated with high recreational and ecological values.

Although these shoreline maps and diagrams are helpful, the Islands Trust Shoreline Mapping Project Methodology (2011) report states that they do not have a level of accuracy or representational detail sufficient for analysis of shoreline conditions at the scale of individual properties, and the maps should not be used for detailed analysis without input from qualified building or environmental professionals. They should not be considered a

comprehensive inventory of risk factors at the site level, and that detail should be determined by the EIA and Geotechnical reports.

Green Shores for Homes

The applicant and Geotechnical Report indicate that the rock revetement is designed to adhere to the intent of the guiding principles 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 in this application.

Staff consulted with the Green Shores for Homes program staff and determined that the site topography and wave energy is such that it is not considered a candidate for Green Shores for Homes nature-based shoreline protection. The Geotechnical Report confirms that the shoreline requires a robust hard armouring approach to withstand the wave energy and logs in Lock Bay.

Legal Boundary

With respect to the location of the legal boundary of the subject property at the natural boundary of the sea, the natural boundary is normally considered to be the location of property boundaries along the shoreline. This includes instances where there is erosion or accretion which shift the location of the natural boundary. However, in instances where the boundary abruptly erodes (avulsion), then the legal boundary of the lot does not change. The surveyor hired by the Owners has made the determination that due to sudden erosion/avulsion, the title boundary is the legal boundary.

Intent of Regulations being Varied

The intent of setbacks to the natural boundary of the sea are:

- To protect properties against the accelerated effects of erosion resulting from human activity;
- To ensure that buildings and structures are located outside of environmentally sensitive areas;
- To protect against hazardous conditions and ensure that developments are located a sufficient distance from the water so as not to be impacted by changing shoreline and marine conditions; and
- To protect the visual appearance of the shoreline as seen from the sea and other properties.

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

Potential Impacts of Granting the Variance

Granting the variance to allow the shoreline armouring at this location to continue would effectively protect the property from further erosion and prevent the mature trees along the top of the bank from being further undermined for now. It may also present risk to the natural coastal environment. Rock revetments impact the sediment migration along the shoreline, may result in scouring and increased erosion where the armouring transitions to the natural shoreline near adjacent properties, and may result in other beach morphology impacts such as steepening of the beach over time. The Owners would be required to return to the LTC to request an additional variance permit in the future when upgrades or a replacement are required.

Potential Impacts of Denying the Variance

Denying the variance would mean that bylaw enforcement action would continue and the Owners would be required to remove the revetment structure to reach compliance with the LUB. Removal may present risk to the

natural coastal environment, continued erosion of the property, and potential damage to unrecorded archaeological materials if certain practices are not followed. However, it is not possible for Islands Trust to place conditions on how the removal process must be carried out, unless there is at some point in the future a court-ordered removal. Removal must comply with all other provincial and federal requirements, such as the *Heritage Conservation Act, Wildlife Act, Fisheries Act,* and the *Species at Risk Act*. The Owners may also apply to the Board of Variance if denied by the LTC.

Circulation

DVP Notices were circulated to surrounding property owners and residents within 100 metres (**Attachment 9**). The notification period ends at 4:30 p.m. on April 16, 2025.

To date, four letters from the public have been received in support of this application, from neighbouring property owners (**Attachment 11**). Any submissions received following the preparation of this staff report will be forwarded to the LTC and reported at the meeting.

First Nations

The following two OCP policies apply regarding First Nations archaeological heritage:

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

At the time of bylaw enforcement inspection, Remote Access to Archaeological Data (RAAD) mapping showed a known archaeological site on the subject property, near the area where the seawall was installed. A Natural Resource Officer (NRO) investigated the alleged contravention of Section 12.1(2) of the *Heritage Conservation Act*. The NRO and an archaeological specialist determined that the archaeological site had either completely eroded away or that the position of the site had not been accurately catalogued originally. They determined that the seawall had not been built in an archaeological site.

The Owners submitted a referral to Snuneymuxw First Nation in early 2024 and a response has not been received. Staff have informed Snuneymuxw First Nation staff that the application is on the LTC agenda today. Any responses received from Snuneymuxw following the preparation of this staff report will be forwarded to the LTC and reported at the meeting.

Department of Fisheries and Oceans

Staff have confirmed with staff from the Department of Fisheries and Oceans Canada (DFO) that if the Owners are proposing to do any work in and around the foreshore, including removal of the revetment, they are separately required to submit a Request for Project Review. DFO staff have confirmed that the Owners should contact Fish and Fish Habitat Protection Program staff for advice and to answer any questions prior to any work or undertaking near the water. The Owners were provided with information on HADD (harmful alteration, disruption or destruction of fish habitat).

Rationale for Recommendation

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

- The dwelling complies with the legal boundary setback regulation;

- There are potential risks to the marine and shoreline environment and adjacent properties associated with shoreline armouring; and
- The structure alters the visual appearance of the shoreline as seen from the sea and other properties.

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. Staff advise that the implications of this alternative are additional staff time and resources. 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 for GB-DVP-2022.4 (Woodside) submit to the Islands Trust [describe information].

2. **Approve the application**

   The LTC may approve the application to facilitate the rock revetment. Staff advise that the implications of this alternative are that at this time Snuneymuxw First Nations interests related to this application are not fully known. Recommended wording for the resolution is as follows:

   That the Gabriola Island Local Trust Committee approve issuance of Development Variance Permit GB-DVP-2022.4 (Woodside).

3. **Hold the application in abeyance**

   The LTC may choose to hold the application in abeyance pending a response from the Snuneymuxw First Nation, or the completion of a significant study or OCP process, etc.

NEXT STEPS

If the staff recommendation is selected the applicant will be informed and the DVP file will be closed. Bylaw enforcement action will continue and the Owners will be required to remove the structure to reach compliance.

Submitted By:	Margot Thomaidis, Planner 2	April 8, 2025
Concurrence:	Renée Jamurat RPP MCIP, Regional Planning Manager	April 9, 2025

ATTACHMENTS

1. Site Context
2. Maps, Plans, and Photographs
3. OCP Policy Review
4. Applicant Letter dated June 17, 2022.
5. Surveyor's Letter and Final Survey Plan – Williamson & Associates Professional Surveyors, September 7, 2022 and May 29, 2023.
6. Geotechnical Report – Lewkowich Engineering Associates Ltd. dated April 10, 2023.

7. Environmental Impact Assessment Report – D.R. Clough Consulting, dated November 23, 2023.
8. Gabriola Island Marine Shorelines Mapping, 2011
9. Notice
10. Draft Development Variance Permit
11. Public Correspondence

ATTACHMENT 1– SITE CONTEXT – GB-DVP-2022.4 (WOODSIDE)

LOCATION

Legal Description	LOT 4, SECTION 18, GABRIOLA ISLAND, NANAIMO DISTRICT, PLAN 45781
PID	008-828-059
Civic Address	1170 THE STRAND GABRIOLA BC V0R 1X3
Lot Size	0.51 ha / 1.25 acres

LAND USE

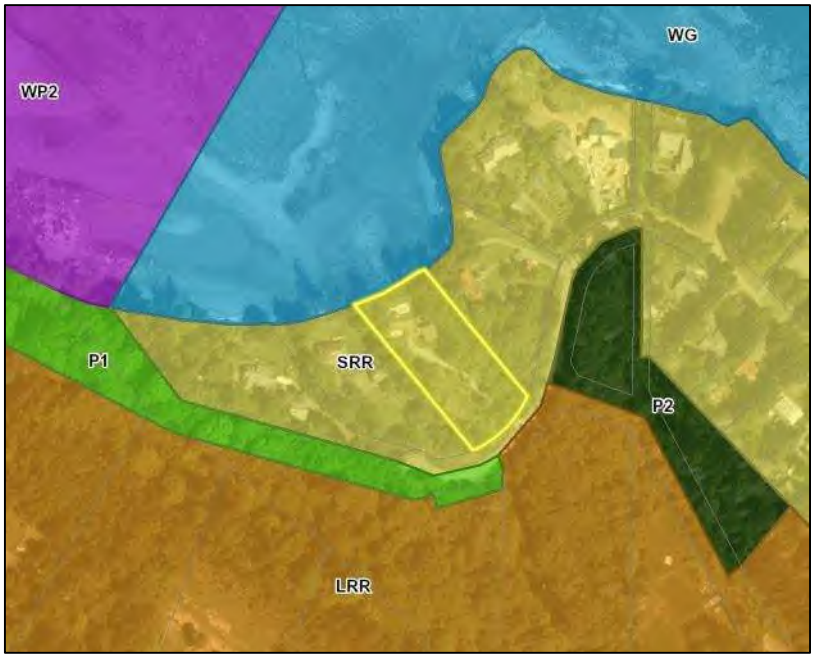
Current Land Use	Residential
Surrounding Land Use	Residential to East and West, Provincial Park and Residential to the South, Lock Bay to the North. 

HISTORICAL ACTIVITY

File No.	Purpose
	N/A

POLICY/REGULATORY

Gabriola Island Official Community Plan (OCP)	Small Rural Residential (SRR) Marine (M) Not in a Development Permit Area

No. 166, 1997	
Gabriola Island Land Use Bylaw (LUB) No. 177, 1999	Small Rural Residential (SRR) Water General (WG)  **B.2.1.1 Setbacks and Elevations from Watercourses and the Sea** a. Despite all other siting references in this Bylaw excepting B.2.1.4c, third party signs, fences, pump/utility houses, retaining walls, ground level decks, structures and buildings, excepting boathouses, must be sited a minimum of 7.5 metres (24.6 feet) from and 1.5 metres (4.9 feet) above the natural boundary of the sea and a minimum of 15 metres (49.2 feet) from and 1.5 metres (4.9 feet) above the natural boundary of any lake, stream, or wetland. Where the frontage on the sea is not adequately protected from erosion by natural bedrock or works as certified by a professional engineer, buildings and structures must be sited a minimum of 15 metres (49.2 feet) from and 1.5 metres (4.9 feet) above the natural boundary of the sea. **C.3.1.1 Determination of Zone Boundaries** **c.** where a land based zone and a water based zone boundary coincide, the boundaries must be the surveyed high water mark as shown on a plan registered in the Land Title Office; and where there is no registered survey plan, the natural boundary of the sea is the boundary. **D.1.1.3 Regulations** The general regulations in Part B, plus the following regulations apply in the Small Rural Residential (SRR) zone: **a. Buildings and Structures Siting Requirements** i On lots less than 1.0 hectares (2.47 acres), except for a sign, fence, or pump/utility house, the minimum setback of buildings or structures is: • 6.0 metres (19.7 feet) from the front lot line; • 4.5 metres (14.8) from any exterior side lot line; and

	• 1.5 metres (4.9 feet) from any interior lot line.
Other Regulations	Land Act **Section 60(e):** **Offences** A person commits an offence if the person does any of the following: …(e) constructs on Crown land a building, structure, enclosure or other works, or does or performs any dredging, excavation or filling, without the authorization of the minister;… The existing development involved the installation of parts of a rock revetment on Crown land below the legal boundary.
Covenants	M76301 - Undersurface Rights
Bylaw Enforcement	**GB-BE-2022.10: Open** Non-permitted sea wall along the frontage of two properties (1160 and 1170 The Strand). DVP application submitted to address Bylaw non-compliance.

SITE INFLUENCES

Islands Trust Conservancy	There are no ITC covenants or properties in the direct area. Referral to ITC is not required.
Regional Conservation Plan	The Regional Conservation Plan 2018-2027 estimated importance of habitat composition in the area of the subject property is Medium- High. This application may be inconsistent or contrary to the goals and objectives set out in the ITC Regional Conservation Plan, as it proposes approval of a natural system modification identified as a common ecosystem threat, which may change natural erosion and sedimentation processes. See ITC Conservation Planning. The Environmental Impact Assessment report suggests that there is no threat to natural erosion and sedimentation processes, however, Islands Trust Biologist staff suggest that the report is missing key analysis.
Species at Risk	**Ecosystems at Risk:** Douglas-fir / dull Oregon-grape mapped (public) ecological community in proximity to the subject property. Wetland Sensitive Ecosystem Inventory mapped in proximity to the subject property. 

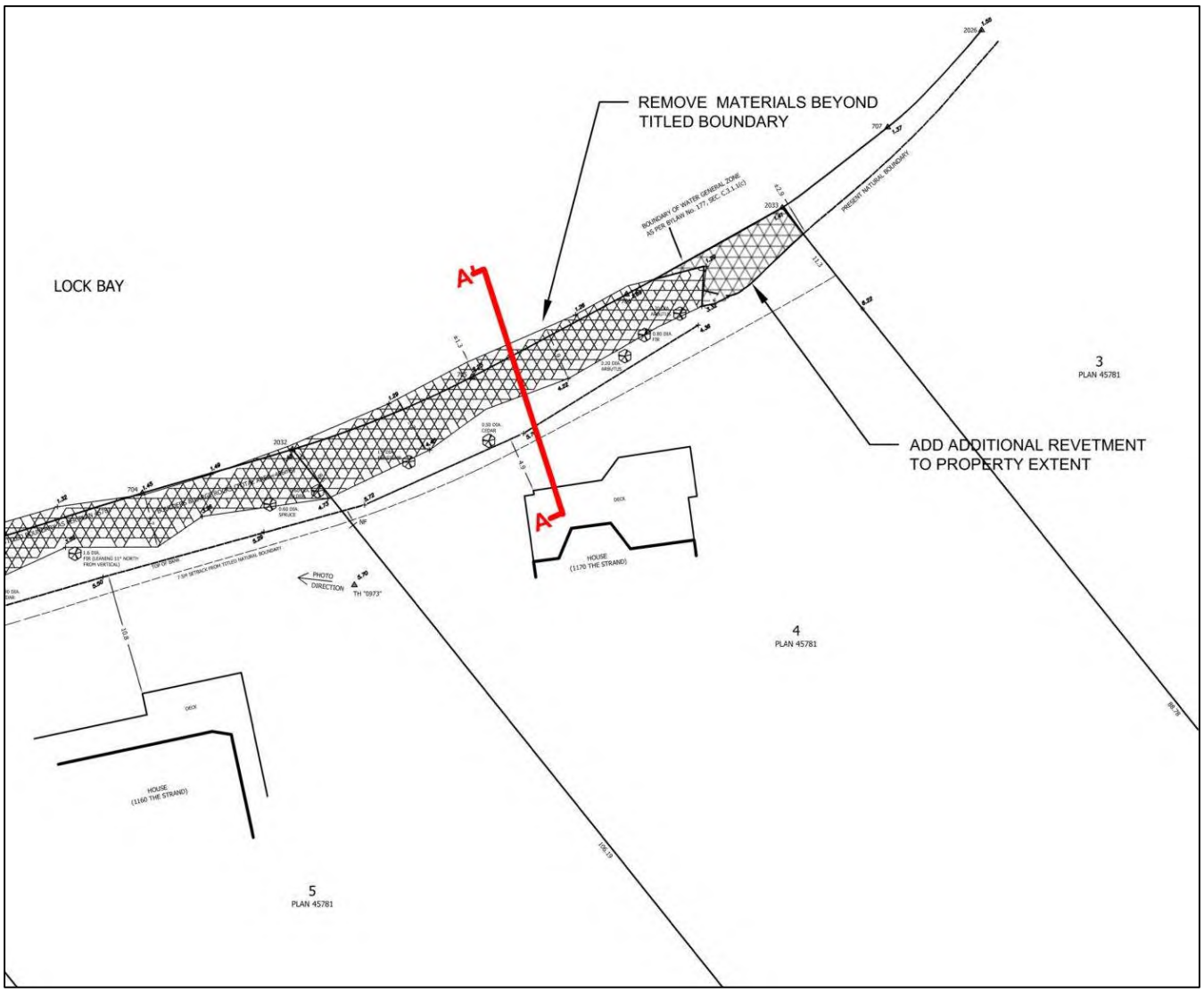
Sensitive Ecosystems	**SEM Secondary Class:** Wetland/ Swamp. **SEM Primary Class:** Mature Forest – Douglas Fir-salal. **SEM Tertiary Class:** Coastal Cliff.  **Terrestrial Species:** Mapped eagle's nest within 100 m of property.
Hazard Areas	Areas of Low and Moderate risk steep slopes mapped within the subject property: 
Archaeological Sites	Mapping indicates areas of high archaeological potential and a known archaeological site within proximity of the subject property. A Natural Resource Officer and an Arch Specialist visited the site in June 2022 and determined that the seawall had not been built in an archaeological site. They did not find strata or objects to suggest an archaeological site. 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	Current BC Provincial Government guidelines suggest up to 1 metre of sea level rise by 2100. Sea level rise may cause increased shoreline vulnerability to land-based activities by causing such effects as increased flooding in low lying areas or softening of sediment shorelines and increased shoreline erosion on the subject property. These effects could be further exacerbated by storm surges and changing climatic conditions. The subject property ranges in elevation from approximately 0.0 to 10.0 metres.
Shoreline Classification	Two Shoreline types: Western: Sediment Shoreline - Pebble/Sand Eastern: Rock Shoreline - Low Rock/Boulder 
Shoreline Data in TAPIS	Moderate and sparse Eelgrass Meadows mapped in Lock Bay adjacent to the property. 

ATTACHMENT 2 – MAPS, PLANS, & PHOTOGRAPHS – GB-DVP-2022.4 (WOODSIDE)

1. Aerial Photo (2020)

2. Site Plan Survey Excerpt (Extracted from Lewkowich Engineering Associates Ltd. Geotechnical Report)



3. SITE VISIT PHOTOS – OCTOBER 2022 AND JANUARY 2025

Top of bank and revetment at 1170 The Strand, facing west

Revetment and foreshore at 1170 The Strand, facing west

Shoreline adjacent (east) of 1170 The Strand

1170 The Strand revetment eastern portion as viewed from the beach

Eastern edge of revetment at 1170 The Strand

Top of bank at 1160 The Strand facing east

ATTACHMENT 3 – GB-DVP-2022.4 (WOODSIDE) – OCP ANALYSIS

GABRIOLA ISLAND OFFICIAL COMMUNITY PLAN BYLAW NO. 166

OCP Objective/Policy	Planner Comments	Complies?
6.1 Environmentally Sensitive Areas Policies		
Policy 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.*	The rock revetment is unlawfully located in an environmentally sensitive area in the setback to the natural boundary of the sea. It is protecting private property and mature trees from erosion due to high wave energy and severe storms. The 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 environmentally sensitive coastal ecosystems.	Not definitive
Policy 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 Marine Resource Policies		
Policy 6.2.a) *Except as specifically provided for, the surface of the water in the Gabriola Planning Area shall be zoned Water General wherein the permitted uses shall include boat moorage and boat launching facilities (where suitable), associated with single-dwelling residential uses located on the adjacent upland, public parks, ecological reserves, marine navigational aids and publicly funded and operated boat launching facilities.*	Currently, a portion of the revetment is located beyond the legal boundary in the water area. The water area adjacent to the subject property does not permit revetment structures. **This application proposes to remove that portion of the structure.** The Geotechnical Report prepared by LEA Ltd. states the following "*at this site, which is subjected to frequent drifting logs, a robust design that can protect against the impacts of these logs is required. A foreshore revetment following the intent of the GSH and Coastal Slopes principles was considered the most suitable design for this site.*" The rock revetment, although not as harmful as a cement seawall structure, may still disturb the natural coastal processes. However, according to the engineer, the rock revetment is the most suitable option that disturbs those processes to the least extent possible while still effectively protecting the properties from erosion.	Yes
Policy 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.*		

June 17,2022

ATTACHMENT 4

To : Islands Trust Gabriola

Re: Bank erosion at 1170 The Strand, Gabriola

To whom it may concern,

After many years of enjoying several of the Gulf Islands we have now been the owners of 1170 The Strand for the past 3 years having moved into our new home on June 28,2019 (***See Picture 1 taken July 19,2019***).

For the next 1 ½ years everything was great but things changed rapidly on January 15,2021.

Clearly the natural softscape was no match to protect our home and property with the rapidly changing weather conditions. On Jan 15,2021 we noticed that a lovely tree in our front yard was sinking lower. Upon examination it was now falling off our property and down to the beach taking a large portion of our property behind it. Luckily nobody was on the beach below it at the time it fell.

We definitely saw a huge and drastic erosion to our property not only due to storms that winter and the next, which we are all aware have been pretty severe this last couple of years, but also an increase in large logs impacting our foreshore accelerating what should have taken decades into in our case significant erosion in just 1 year. Our neighbours who have owned their property next door for over 30 years were also shocked at their damage and said they have also experienced more damage in the last couple of years than in the previous 30 years.

I have included a picture (***Picture 2***) of the tree as we first noticed it sinking on Jan. 15,2021 and the damage it was doing pulling away our bank over the next 2 days (***Pictures 3 & 4***).

We had hoped that it would end there and settle down but over the next year it got worse. By early 2022, just one year later, in our opinion we absolutely felt we were in an emergency situation and had to do something immediately or our property could face irreparable damage.

Our solution was to place landscape rocks (rip rap) on our bank to protect not only from storm wave action but also importantly from the number of large logs impacting our property. These rocks were all placed within our property boundary as per the property survey Registered with Land Titles (***See copies A & B included***).

Islands Trust LUB C.3.1.1c states:

c. where a land based zone and a water based zone boundary coincide, the boundaries must be the surveyed high water mark as shown on a plan registered in the Land Title Office; and where there is no registered survey plan, the natural boundary of the sea is the boundary;

We suffered even more significant erosion damage in just the following one year. You can clearly see the additional erosion damage and property loss shown in ***Picture 5*** taken in April 2022 which is prior to us

placing the landscape rocks to protect our property and also to do everything we could to prevent further erosion around our large Fir tree that was now seriously eroded from underneath.

We did have tree specialists look at it and they felt it was still okay but would not be if the erosion was allowed to continue so this was also the best way to protect that tree and other at-risk trees also from the potential harm if it fell on the beach when anyone was there.

I am sure you can clearly see why we felt we needed to do this emergency mitigation. You can absolutely see the significant damage over the course of one (1) year to our property as shown in Picture 5 and we really had no choice but to instigate emergency mitigation to protect our property and home from further significant erosion. Planting another softscape was clearly not sufficient as that was what was so quickly destroyed.

You can also see in ***Picture 5*** the large rocks by the stone steps on the one side of our property and they are also within the property boundary as currently registered with Land Titles. All the landscape rocks we placed were within that boundary (***Picture 6***). It should also be noted that this is all the rocks we intended to place and our next step is we want to create a natural softscape over top to make it as green and natural as possible.

We also believe all we have done also falls under the Islands Trust LUB in the following section:

Page 86, F.3.3 Exemptions: The following activities are exempt from any requirement for a development permit. Despite these exemption provisions, owners must satisfy THEMSELVES that they meet any other applicable local, provincial or federal requirements."

k. emergency procedures to prevent, control or reduce immediate threats to life or property including: emergency actions for flood protection and erosion protection.

Even though we believe since we were working within our registered property boundaries and placing landscape rocks to prevent further erosion we were told that we now need to apply for a Permit Variance by the Islands Trust Bylaws Officer Warren Dingman which is the reason for this application even though I do believe we acted in good faith with our emergency mitigation actions.

The situation is we did all this within our currently registered property boundary but are now being told to do a new survey based on the new existing eroded conditions, which we have now arranged.

We do want to do everything right in the best way possible to protect our property from further erosion and property damage. We are in the process of doing a new survey as requested. The earliest we could get a new survey was in early July and that is in progress so I trust you will find that satisfactory.

I appreciate all you do, and I hope you can understand the situation we were in and that we believed we were not out of bounds on anything based on our registered property survey but if getting a variance is what you deem necessary based on a new survey of the eroded property then I hope you can help us make this right with an approved variance at your earliest convenience.

I also understand that you will want to contact any neighbours in close proximity and the only ones that are close to us are at 1140 The Strand and 1178 The Strand. I hope this helps. I am also including a brief letter from the neighbour at 1140 The Strand.

To be clear we want to work with you in the best way possible for the best possible outcome.

Thank you for your understanding.

Regards,

Mark Woodside

PICTURE 1

DATE: JULY 19, 2019

PICTURE 2

DATE: JAN. 15, 2021

PICTURE 3

DATE: JAN. 15, 2021

PICTURE 4

DATE: JAN. 15, 2021

Picture 5

Date: April 2022

Note: Large Rocks on the one side of our Property by the "Stone Steps" were already there and within the Property Boundary as per the Property Survey Registered with Land Titles.

PICTURE 6

TAKEN BY NATURAL RESOURCES OFFICER
ANTHONY KENNEDY JUNE 16, 2022.

ALL LANDSCAPE ROCKS PLACED WITHIN
OUR CURRENT PROPERTY BOUNDARY SURVEY
AS REGISTERED WITH LAND TITLES.

PICTURE 6.

ATTACHMENT 5

WILLIAMSON & ASSOCIATES
PROFESSIONAL SURVEYORS
3088 BARONS ROAD, NANAIMO B.C. V9T 4B5
PHONE: (250) 756-7723 email: waps@vibcls.ca

September 7, 2022

Our File No.: 22066
Your File: _____

Gabriola Local Trust Area
Planning Department (North Team)
700 North Road
Gabriola Island BC V0R 1X3

Attention: Planning Department

RE: 1160 The Strand & 1170 The Strand
Lot 4 (#1170) and Lot 5 (#1160), Gabriola Island, Nanaimo District, Plan 45781

For your review with respect to the above-mentioned properties, I have been retained by the landowners (Tom and Jeff Pink – owners of Lot 5, and Mark and Gail Woodside – owners of Lot 4). The survey plan prepared and enclosed is of a field survey to conducted determine the boundaries of the parcels, and to complete a topographic survey along the natural boundary. This also included surveying the location of rocks placed to prevent further erosion along the natural boundary. The survey is in response to the land owners each receiving a letter from the Island Trust notifying them that they both were in violation of 4 sections of the Land Use Bylaw No. 177. It is our understanding that these violations are all with respect to these rocks that were placed.

Our survey crew and I attended the site on July 5th, 2022 and completed the legal field survey. The survey included:

- finding survey monuments defining the parcel boundaries,
- GNSS (Global Navigation Satellite System) observations to determine geodetic elevations with respect to mean sea level,
- retracing the titled natural boundary for the parcels as shown on Subdivision Plan 45781,
- surveying the location of the present natural boundary, if possible, as defined in the Land Act,
- surveying visible features such as houses & decks, trees along the bank, and topographic top of bank, and
- surveying the extent of the rocks which are the focus of the Island Trust letter.

Accompanying this letter, I have included the following:

1. A copy of the digitally signed Site Plan,
2. Copies of the Certificates of Title for Lot 4 and Lot 5,
3. Photo taken from Survey Station #2031 looking east along titled natural boundary, and
4. Photo taken close to Station "0973" looking westerly at the 1.6m diameter Fir Tree indicating a 11 degree lean toward the water.

For clarity, I have marked on the photo (Item #3) a blue line connecting the wood stakes that we set which approximately corresponds to the titled natural boundary as shown on Plan 45781. This titled natural boundary is the zone boundary between the SRR (Small Rural Residential) zone and the WG (Water General) zone as per Section C.3.1.1(c) of the Land Use Bylaw.

During our research for this project, we have reviewed the following parts of the Land Use Bylaw that appear to be relevant to your review:

1. Definition of "Structure": This definition is for anything "constructed or erected".

2. Definition of "Landscaped Area": This definition includes rocks and boulders and landscaping materials

3. Section F.3.3(k)(i): This section allows for exemption to a development permit for "emergency procedures to prevent, control or reduce immediate threats to life or property including emergency actions for flood-protection and erosion protection".

4. Section C.3.1.1(c): This section defines the boundary between the residential zone and the water zone.

Site Plan and Field Survey

The first conclusion that I make from this survey is that the majority of the rocks placed along the natural boundary is upland from the 1987 titled natural boundary as shown on Plan 45781. There are two areas where some rocks are waterward of this boundary by approximately 1.3 metres or less. The retracement of the titled natural boundary is based on the dimensions shown on the plan and the hand drawn graphical illustration of the natural boundary drawn on the plan. The approximate accuracy of this retracement is +/- 1.0 metres.

Erosion of the Bank

It was relayed to me by the owners of Lot 4 that they hired contractors to place landscaping filter cloth along the near vertical bank to prevent leaching of the soil behind it, and then placed rock to protect the bank and the filter cloth from further wave action and erosion. I was advised that the owners of Lot 5 placed all of the filter cloth and some rock themselves, and then hired the same contractor to place the majority remaining rock along their portion of the bank. It is their opinion that the bank was suffering significant erosion from wave action during intense storms mostly during the winter season in the past couple of years.

They reported trees falling and leaning due to the erosion undercutting the supporting soil. I was advised that the major erosion event that triggered their emergency protection measures happened in the Spring of 2022 when Lot 5 lost two matures trees that slid down the bank due to dramatic recent erosion, and Lot 4 lost 2 trees and a significant section of the bank gave way and slid down to the beach. At that point, it is the landowner's belief that there was a significant risk to losing more trees and more bank collapse, as well as a potential safety risk to the public should the remaining trees fall onto the beach. This was evident during our field survey where a substantial fir tree is

currently leaning 11 degrees from vertical toward the water. In response to witnessing this erosion, the land owners took immediate steps to prevent further erosion.

Legal Extent of the Titles for Lots 4 and 5

With respect to the movement of a natural boundary, the common law principle that applies is that the natural boundary moves lawfully, either by erosion or accretion or other natural methods, if the change is slow and imperceptible. If this is not the case, then the natural boundary remains in the last location before an abrupt change. In Canadian common law, this is most common with flood events and river bends and oxbows. It is my professional belief based on the information provided by the land owners (anecdotally and photographic) that the natural boundary has moved suddenly and perceptibly in the last few years, and therefore, at this time, the best evidence of the extent of the title of Lots 4 and 5 that I have is the titled natural boundary as shown on Plan 45781. The Site Plan provided with this letter shows the legal boundary of Lot 4 and Lot 5 as per Plan 45781. This has not been verified or confirmed by a formal application to the Surveyor General's office at this time.

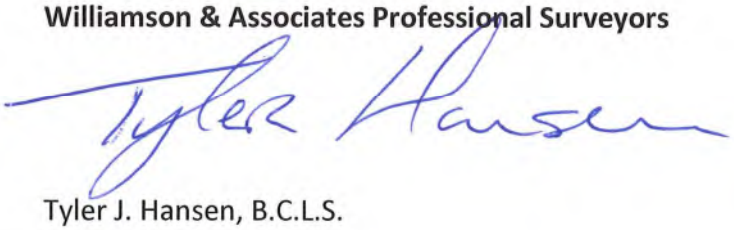
Professional Opinion

It is my professional opinion that there are rocks beyond the titled natural boundary, but in my opinion, the rocks piled up along the natural boundary do not form a structure. The landowners had these rocks dumped within the setback to the natural boundary, and partially beyond the natural boundary, but none are affixed, secured or stacked into a retaining wall. Furthermore, the work the landowners had completed was for the sole purpose of emergency prevention of further loss and damage of property, and protection of the public using the beach.

Based on the information provided above, I do not believe that the landowners are in violation of the Land Use Bylaw as set out in the Island Trust letter. If I have missed any relevant information within the Land Use Bylaw, or if you have other relevant information regarding these properties, my professional opinion can be revisited and revised.

We trust you will find the preceding and enclosed to be in order and the information you require for your review. If you have additional questions regarding this survey plan, or should you require any information that we have not supplied to you here, please contact me.

Yours truly,
Williamson & Associates Professional Surveyors



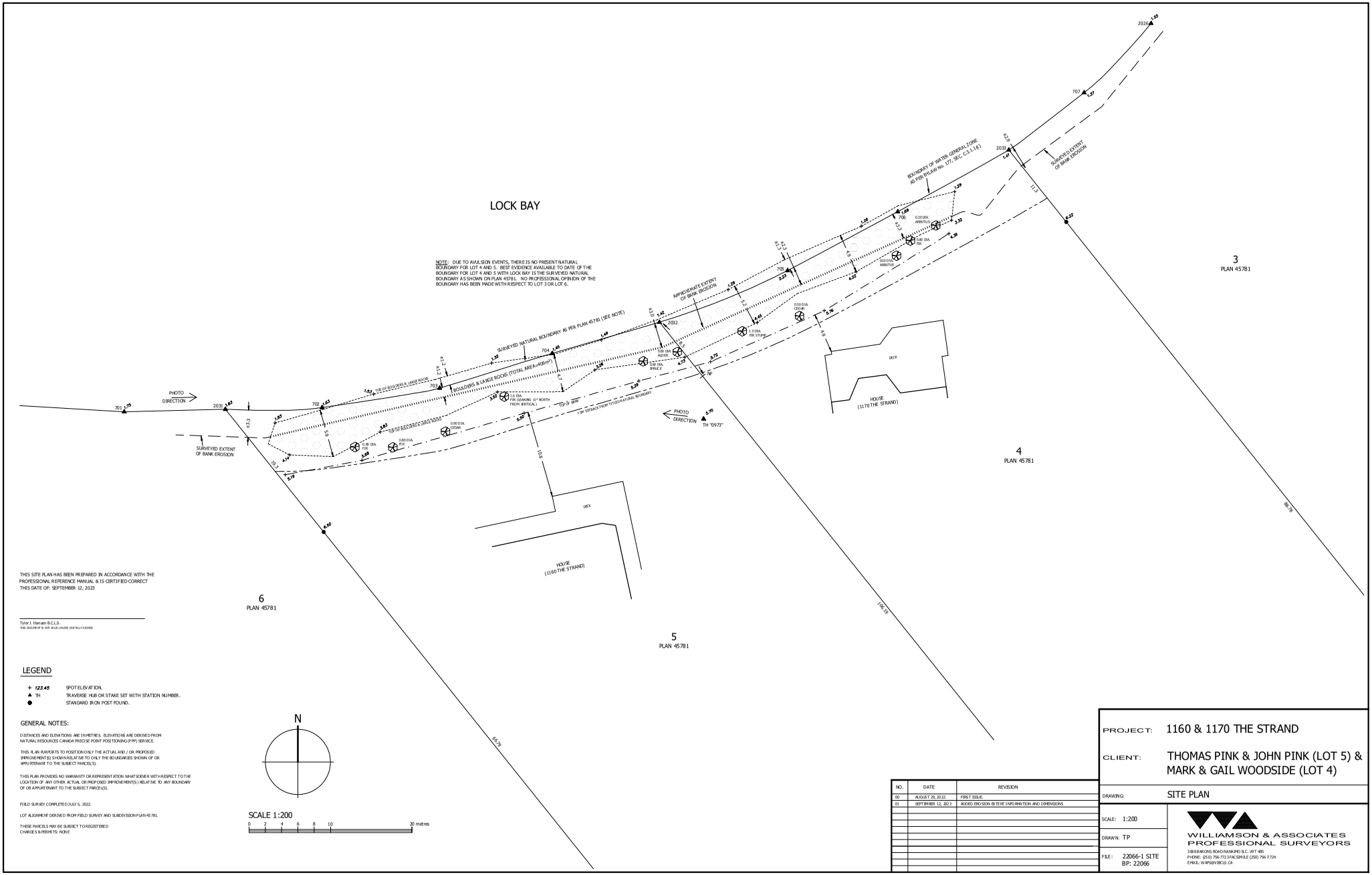
Tyler J. Hansen, B.C.L.S.

Enclosures

ec: Tom and Jeff Pink (1160 The Strand, Gabriola Island)
Mark and Gail Woodside (1170 The Strand, Gabriola Island)


POINT 2031


Local Time: Jul. 5, 2022 11:11:18 a.m.
Lat, Lon: 49.184334, -123.812077
Alt: -39m MSL WGS84
CEP: 5m
Azimuth and Bearing
254° S73W
+15°
11.3°
+10°
-15°
-.3°
0°
+15°
SW
W



THIS SITE PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROFESSIONAL REFERENCE MANUAL & IS CERTIFIED CORRECT
THIS DATE OF: SEPTEMBER 12, 2023

Tyler J. Hansen B.C.L.S.
THIS DOCUMENT IS NOT VALID UNLESS DIGITALLY SIGNED

LEGEND

+ 123.45	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 OF OR 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 JULY 5, 2022.

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 30 metres

NO.	DATE	REVISION
00	AUGUST 29, 2022	FIRST ISSUE.
01	SEPTEMBER 12, 2023	ADDED EROSION EXTENT INFORMATION AND DIMENSIONS

PROJECT:	1160 & 1170 THE STRAND
CLIENT:	THOMAS PINK & JOHN PINK (LOT 5) & MARK & GAIL WOODSIDE (LOT 4)
DRAWING:	SITE PLAN
SCALE:	1:200
DRAWN:	TP
FILE:	22066-1 SITE BP: 22066

WILLIAMSON & ASSOCIATES
PROFESSIONAL SURVEYORS
310 BARONS ROAD NANAIMO B.C. V9T 4B5
PHONE: (250) 756-7723 FACSIMILE (250) 756-7724
E-MAIL: WAPS@TELUS.NET

Lewkowich Engineering Associates Ltd.
geotechnical • environmental, health & safety • materials testing

GEOTECHNICAL REPORT

Mark and Gail Woodside
1170 The Strand
Gabriola Island, BC
V0R 1X3

File: E1939.01
Date: April 10, 2023

ATTENTION: **Mr. Mark Woodside**

PROJECT: **SHORELINE EROSION PROTECTION**
1170 THE STRAND, GABRIOLA ISLAND, BC
LOT 4, SECTION 18, GABRIOLA ISLAND, NANAIMO DISTRICT, PLAN 45781, PID 008-828-059

SUBJECT: **FORESHORE REVETMENT ASSESSMENT AND DESIGN**

1.0 INTRODUCTION

a. As requested, Lewkowich Engineering Associates Ltd. (LEA) has conducted an assessment regarding the re-design and upgrading of an existing foreshore revetment for the property located at 1170 The Strand, Gabriola Island, B.C. We understand that a Development Variance permit is required to allow for the shoreline protection (GB-DVP-2022-3).

b. This letter summarizes the results of our assessment, observations and design and provides our comments, recommendations, and conclusions regarding the proposed re-construction of a foreshore revetment. LEA will be working in concert with BC Land Surveyorl[3] 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 Slopes guidelines and the intent of the Green Shores for Homes Guiding Principles (GSH). 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 out buildings, and established landscaping/lawn areas. The subject site is located in the north east quadrant of Gabriola Island See Figure 3.1 Below for location.

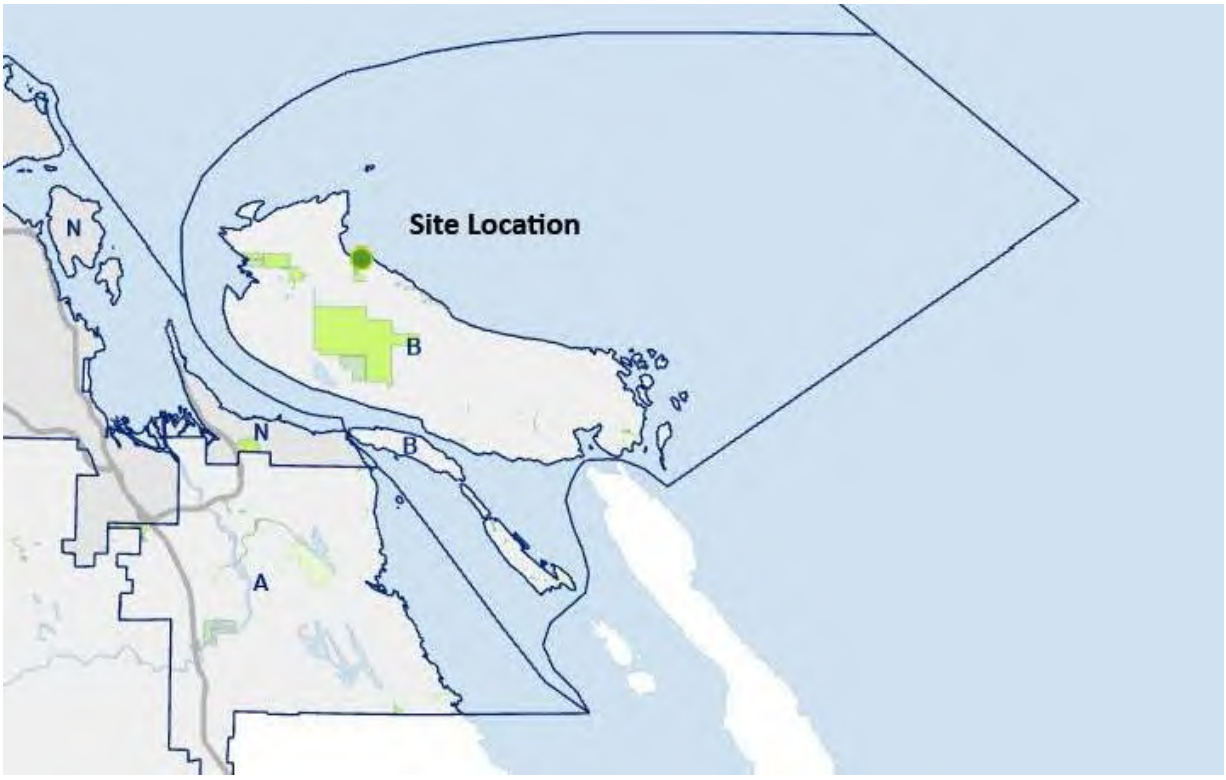


Figure 3.1 Site location

b. In general, the foreshore can be characterized as a low-bank shoreline with a gently sloping, smooth shallow intertidal zone facing the open waters of the Strait of Georgia / Salish Sea to the north. The total height of the shoreline bank was approximately 4.36m to 5.72m at the time of our assessment. The crest is defined by the rear yard extent of lawn and organic soil cap. Several mature evergreen trees are located at or just below the slope crest. There is no vegetation below the tree extents to the beach below. This area is comprised of a revetment installation consisting of a collection of 500mm to 1000mm sized boulders deposited on a geotextile base that was installed as an emergency measure to protect the property against the significant erosion caused by waves and drifting logs from winter storm activity. Since that time the installation has ceased most of the erosion issues and provided stability to the existing mature trees along the slope crest. See Figures 3.1, 3.2 and 3.3 below.

Figure 3.1 Typical Steep Eroded Bank

Figure 3.2 Current Shoreline Condition

Figure 3.3 Heavy flotsam (Logs) along shoreline

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 and transitions to bedrock near the east extent (no revetment).

d. The property owner is looking to have the revetment installation approved by the local authorities and requires a letter and revetment re-design in accordance with the Green Shores initiative supported by the Islands Trust and Regional District of Nanaimo. With this design it is the goal to improve the installation with respect to the long term erosion protection for the property as well as adding a growth medium of soils and plantings thereby softening the hard armouring with a vegetated surface. 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 and come from different directions, all of which are part 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.

e. A shoreline revetment upgrade is also proposed for the neighbour at 1160 The Strand and it is the intent to enhance this revetment in concert with the neighbours' installation, providing a smooth shoreline

alignment without any abrupt protrusions.

f. Survey data for the natural boundary was provided by the attached survey from Williamson and Associates, British Columbia Land Surveyor, File: 22066-1 Site , Dated August 29, 2022.

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. In addition, at this site, which is subjected to frequent drifting logs, a robust design that can protect against the impacts of these logs is required. 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 best practices 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 500mm to 1000mm boulders, smaller 100mm to 300mm fractured rock infill and 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 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 0.6m depth. The existing layer of non-woven geotextile should be retained as it is required to provide a barrier to the migration of fine-grained material from wave and tidal action. Where toe boulders are founded on bedrock they should be retained by a series of epoxy coated rebar pins embedded 200mm into the bedrock at the direction of the Geotechnical Engineer.

iv. The planting plan should include plug planting at 900mm spacing in the sandy infill soils between the large boulders no lower than 3.0m geodetic to help protect against winter wave activity. These

plantings should consist of 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 E1939-01 - Foreshore Revetment Design, for further details.

5.0 CONSTRUCTION RECOMMENDATIONS

a. A trench should be excavated along the 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. The layer of non-woven geotextile filter fabric should be peeled back at the toe excavation then placed on the prepared base prior to the addition of toe boulders.
c. The 500mm to 1000mm boulders should then be re-installed by placing them in a “tight” two-layer matrix, beginning with the largest rocks placed in the toe trench, then continuing to reconstruct 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. The overall slope of the revetment shall not exceed 2H:1V.
e. The revetment at the east end should smoothly transition to the neighboring properties revetment (1160 The Strand). The revetment at the west end should culminate in a smooth transition to the neighbouring property line. 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 reconstructed moderately 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 properties 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 RDN 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 the habitat diversity and function in areas along the shoreline.

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

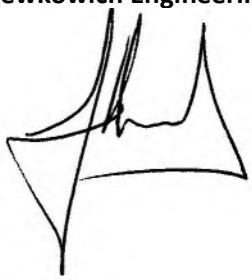
   iv. The design will reduce the cumulative impacts to the costal environment by reducing erosion and by providing a more stable growth medium for native species.

   v. We have added beach nourishment sand and gravel to ensure there is a suitable growth medium for the 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.

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.



John Hessels, AScT
Project Manager - Geotechnical

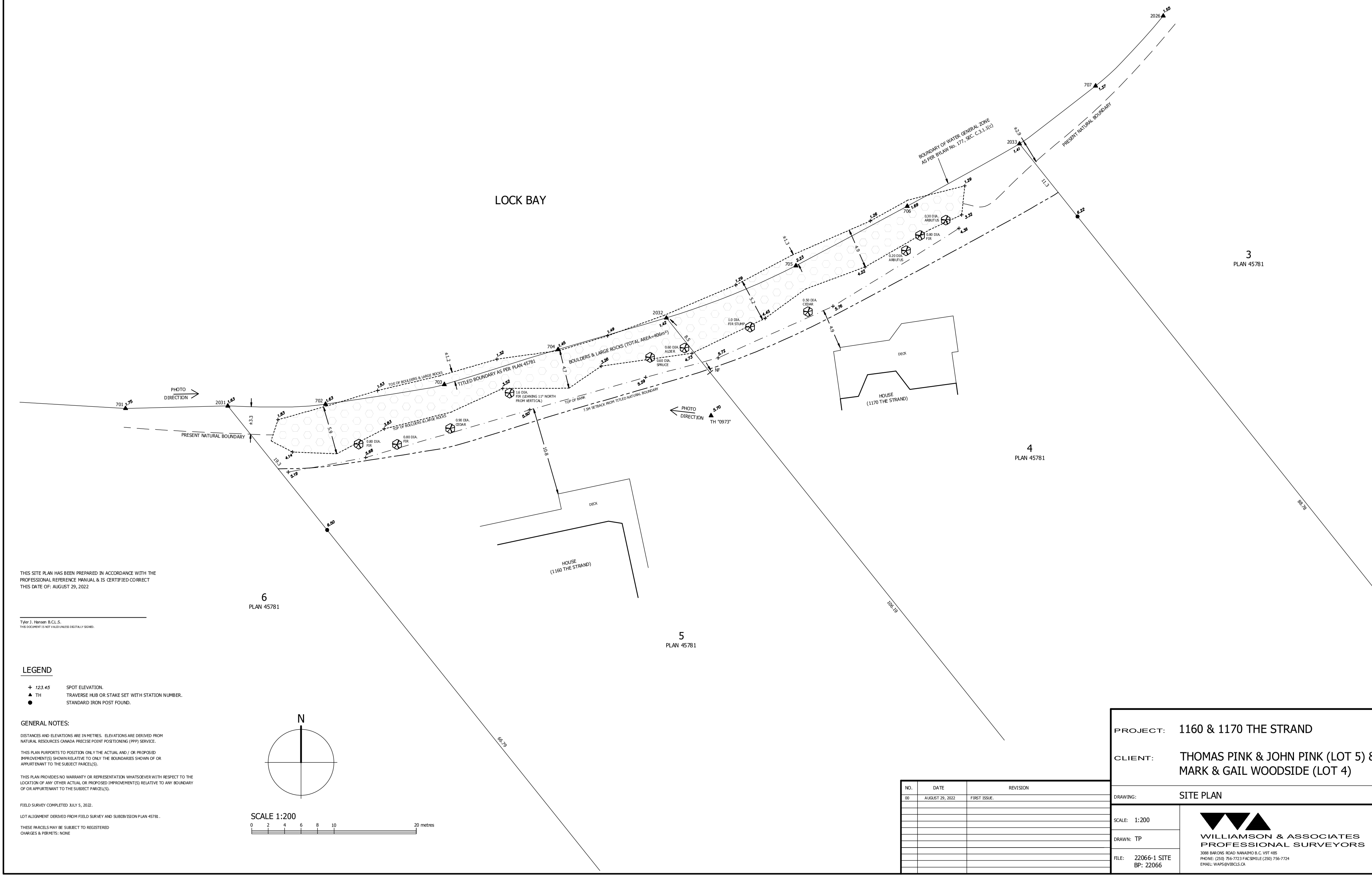
Chris Hudec, M.A.Sc., P.Eng.
Senior Project Engineer

8.0 ATTACHMENTS

1. Williams and Associates , Site Plan, No 22066-1, Dated August 29, 2022
2. LEA Drawing No. E1939-01 – Foreshore Revetment Design.

9.0 REFERENCE:

1. Green Shores for Homes. December 2015.
2. Islands Trust, Gabriola OCP
3. Gabriola Land and Trails Trust, Native plants and shoreline erosion.



THIS SITE PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROFESSIONAL REFERENCE MANUAL & IS CERTIFIED CORRECT THIS DATE OF: AUGUST 29, 2022

Tyler J. Hansen B.C.L.S.
THIS DOCUMENT IS NOT VALID UNLESS DIGITALLY SIGNED.

LEGEND

+ 123.45	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.

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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 JULY 5, 2022.

LOT ALIGNMENT DERIVED FROM FIELD SURVEY AND SUBDIVISION PLAN 45781.

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

NO.	DATE	REVISION
00	AUGUST 29, 2022	FIRST ISSUE.

PROJECT: 1160 & 1170 THE STRAND

CLIENT: THOMAS PINK & JOHN PINK (LOT 5) & MARK & GAIL WOODSIDE (LOT 4)

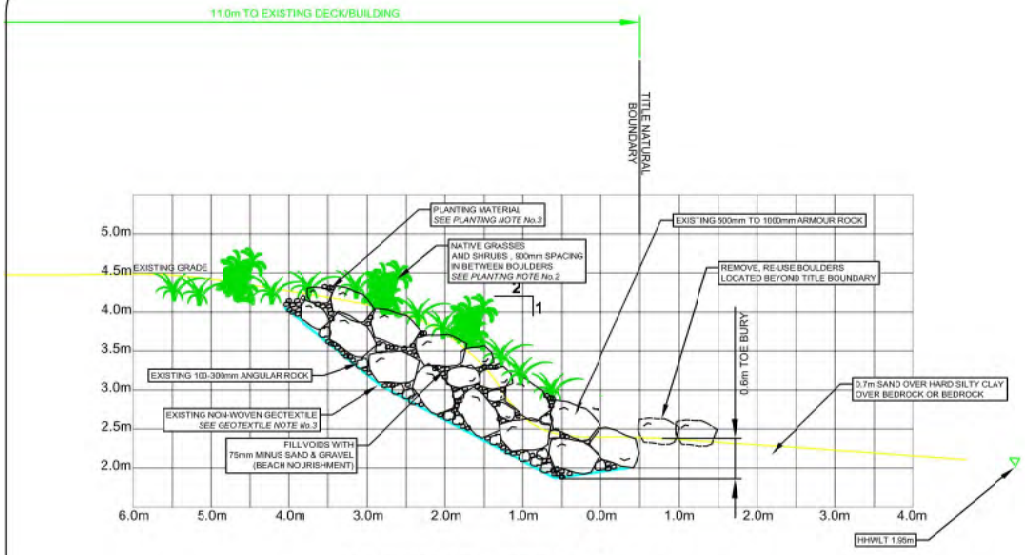
DRAWING: SITE PLAN

SCALE: 1:200

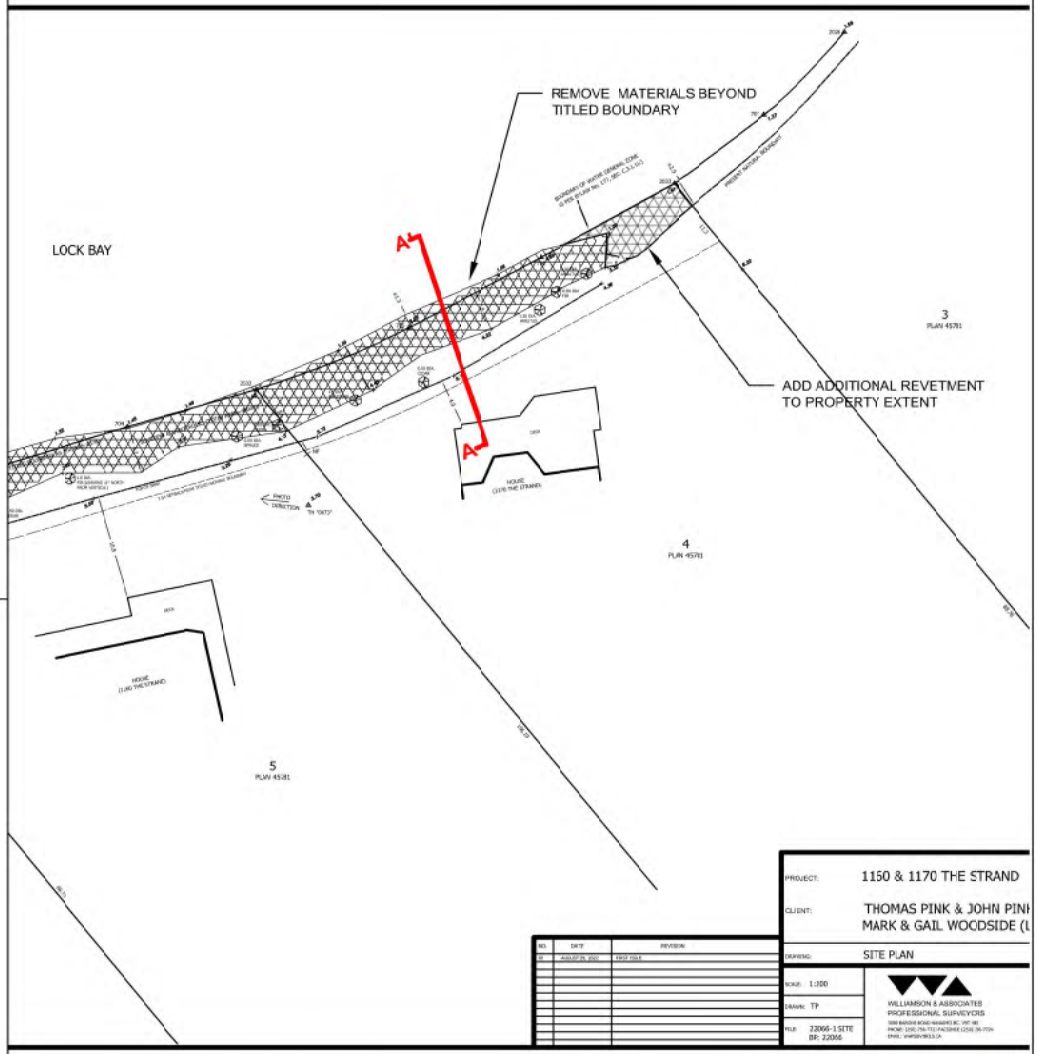
DRAWN: TP

FILE: 22066-1 SITE
BP: 22066

WILLIAMSON & ASSOCIATES
PROFESSIONAL SURVEYORS
3088 BARONS ROAD NANAIMO B.C. V9T 4B5
PHONE: (250) 756-7723 FACSIMILE (250) 756-7724
EMAIL: WAPS@VIBCLS.CA



FORESHORE REVETMENT SECTION A - A



CONSTRUCTION NOTES:

1. REMOVE DEBRIS ALONG SLOPE FACE PRIOR TO REORIENTATING BOULDERS, REPLACE WHEN COMPLETE.
2. ADD EPOXY COATED 20M REBAR PINS ALONG TOE (200mm EMBEDMENT) FOR AREAS BEARING ON BEDROCK.
3. DO NOT DISTURB SOILS BEYOND TITLE BOUNDARY.
4. TIE IN THE WESTSIDE OF REVETMENT WITH A SMOOTH TRANSITION TO EXISTING LAND AND EASTSIDE TO PROPOSED NEIGHBOURS REVETMENT (1170 THE STRAND).
5. FILL LARGER VOIDS WITH 100 - 200mm PIECES THEN INFILL SMALLER VOIDS WITH 75mm MINUS SAND AND GRAVEL.

GEOTEXTILE NOTES:

1. ENSURE THE EXISTING NON-WOVEN GEOTEXTILE IS NOT COMPROMISED DURING THE REINORIENTATION 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. EXISTING ROCK IS CONSIDERED SUITABLE FOR THE EROSION CONTROL REVETMENT DESIGN.LARGEST PIECES SHOULD BE ON THE LOWER REACHES.
2. IMPORTED MATERIALS TO BE USED SHOULD CONTAIN NO SILT OR FINE GRAINED MATERIAL THAT COULD POTENTIALLY WASH OUT AND DEGRADE THE AQUATIC HABITAT.
3. ALL WORKS TO BE SUPERVISED BY GEOTECHNICAL PERSONNEL TO ENSURE CONFORMANCE TO THE DESIGN.
4. **ANY CHANGES TO THE DESIGN MUST BE APPROVED BY THE DESIGN ENGINEER.**

NO.	DATE	REVISION
0	AUGUST 25, 2022	FIRST ISSUE

PROJECT: 1150 & 1170 THE STRAND
CLIENT: THOMAS PINK & JOHN PINK
MARK & GAIL WOODSIDE (L
DRAWING: SITE PLAN
SCALE: 1:200
DRAWN: TP
FILE: 22066-1 SITE
BP: 22066
WILLIAMSON & ASSOCIATES
PROFESSIONAL SURVEYORS

REV No.	DATE	BY	P.Eng.	REVISION DESCRIPTION	LEGEND

DRAWING TITLE: SHORELINE REVETMENT DESIGN
PROJECT NAME: 1170 THE STRAND, GABRIOLA ISLAND, BC
LEGAL DESCRIPTION:
ENGINEER'S SEAL: PROFESSIONAL ENGINEER, # 20249, PROVINCE OF BRITISH COLUMBIA, 2023-04-10

PLOT DATE	DRAWN BY
APRIL 10-22	JH
REVIEWED BY	SCALE
CH	AS NOTED
PROJECT No.	DRAWING No.
E1939	E1939-C1

LEA Lewkowich Engineering Associates Ltd.

ATTACHMENT 7

Environmental Impact Assessment, 1160&1170 The Strand Gabriola Island.

By

D. R. Clough Consulting
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1.0) General Project Description

The purpose of this report is to review the environmental aspects of a previously constructed emergency shoreline revetment. The works were undertaken to stabilize the foreshore of the subject properties. A record high tide and storm event in spring 2022 resulted in the loss of the property. The owners made repairs to the exposed property in early summer of 2022. These repairs were inspected by Islands Trust who determined them to be a nonconforming structure to the Gabriola Island Land Use Bylaw 177,1999 natural setback bylaw. The intention of this report is to aid the Islands Trust in review of a variance application for the structure. The impact assessment includes recommendations to improve natural function with plantings and to remove the loosened armour rocks now on crown land.

Location: The properties are located at 1160 &1170, The Strand on in the eastern corner of Lock Bay Gabriola Island (Fig.1) The adjoining properties each have a residential dwelling. Combined the properties encompass approximately 100m of lineal foreshore.

2.0) Project Objectives

The purpose of this environmental assessment is to determine compliance of the revetment within the Islands Trust OCP by reporting on the following:

1. Assess 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. Islands Trust Gabriola Island Land Use Bylaw Bylaw No. 177, 1999 (http://www.rdn.bc.ca/pqb-wildlife-management-area)
2. ImapBC (http://maps.gov.bc.ca/ess/sv/imapbc/)
3. Community Mapping Network B.C. (http://cmnmaps.ca/EELGRASS/)
4. Committee on the Status of Endangered Wildlife in Canada (Cosewic) database reports. (www.cosewic.gc.ca)
5. 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 Surveys, which included the revetment work (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 with 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 properties are 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 shared properties have approximately 100m of shore frontage. The existing repair structure is a rock revetment with large rock (1000mm diameter) placed approximately 2:1 vertical to a height of approximately 2.5 m. The revetment was reviewed by Lewkowich Engineering Associates (Appendix 3) and deemed stable. There are no native shoreline plants on the new rock wall. Inland of the structure are number of significant trees identified on the site plan (Appendix 1) and measurements shown on Table 1 below.

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 properties

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)
Arbutus *Arbutus menziesii*	0.2/0.3
Douglas Fir *Pseudotsuga menziesii*	0.8/0.8/0.8/1.6
Western Red Cedar *Thuja plicata*	0.5/0.9

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. Since installation of the revetment the property owners have observed an increase in wildlife usage when comparing it to the previous eroding bank. 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 with 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 each 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 properties. 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

The existing non-conforming 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.

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 rock slope is constructed at approximately 2:1 sloping rock revetment creating a 2-3m wide face across the 100m width. The rock diameter of 700 to 1000mm has resulted in large voids. These voids are recommended to be filled with smaller rock 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 200m^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). Past experience using a similar construction method on similar properties indicate 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	Salt Water 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 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.

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 reduction from the lots onto the foreshore and once the rocks are removed from crown land there is 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 our understanding that the adjoining property 1140 The Strand has applied for 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 existing structure can be modified to become structurally and environmentally conforming with more benefit than the previous bank. We recommend that the existing revetment remain in place but be upgraded to meet the recommended design standards, the rocks trespassing on crown land be removed, and the upper portion of the revetment be planted as per the attached design (Appendix 5).

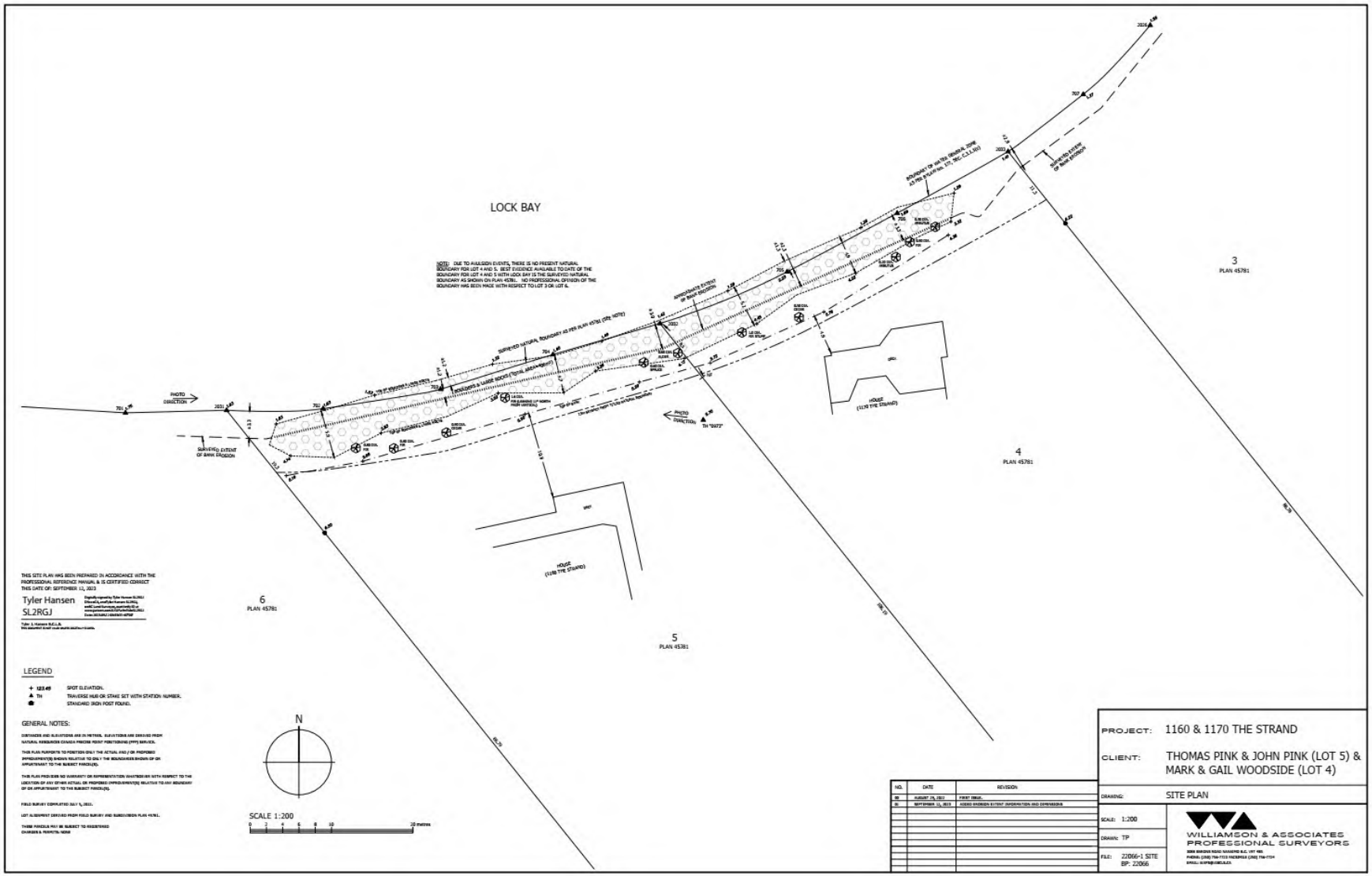
11.) Closure

This document was written by Brad Remillard, RPBio of D.R. Clough Consulting. It is for the sole use of the owners of 1160 & 1170 The Strand.

Report prepared by:

Brad Remillard, RPBio

Appendix 1 - Property Land Survey



Appendix 2: Aquatic Species at Risk Map

Fisheries and Oceans Canada | Pêches et Océans Canada

Aquatic Species at Risk Report

Canada

One or more aquatic species listed under the Species at Risk Act are found (or potentially found) within the coloured areas.

- Critical Habitat
- Extirpated, Endangered, or Threatened
- Special Concern

How to use this information:

1. The map and species list are intended to provide a general overview of aquatic species at risk and their critical habitat that may occur within the mapped area.

2. To assess your project go to: www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html

If you encounter an aquatic species at risk in an area that is not currently mapped, please notify your regional Fisheries Protection Program office to ensure that you are compliant with the Species at Risk Act.
The official source of information for species at risk is the Species at Risk Public Registry www.sararegistry.gc.ca

To protect fish and fish habitat, including aquatic species at risk, their residences, and their critical habitat, efforts should be made to avoid, mitigate and/or offset harm. Following the measures to avoid harm will help you comply with the Fisheries Act and the Species at Risk Act.

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.

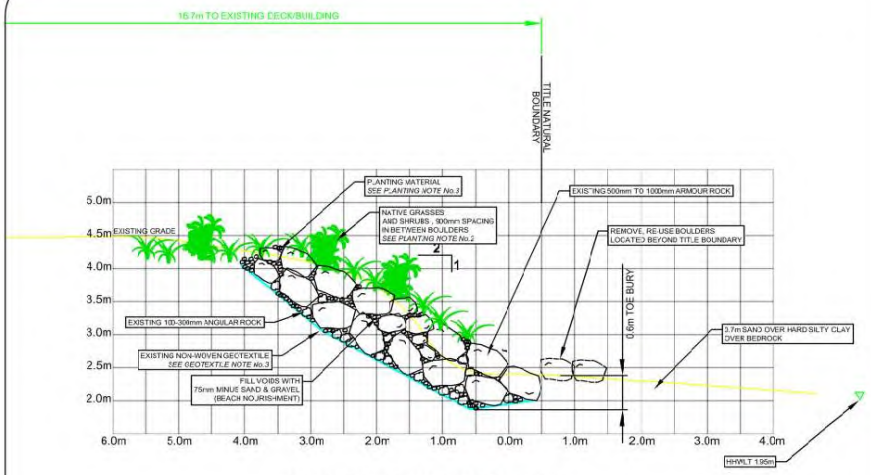
Name	Where Found	Species Status
	No critical habitat	

Species found (or potentially found) within the outlined area

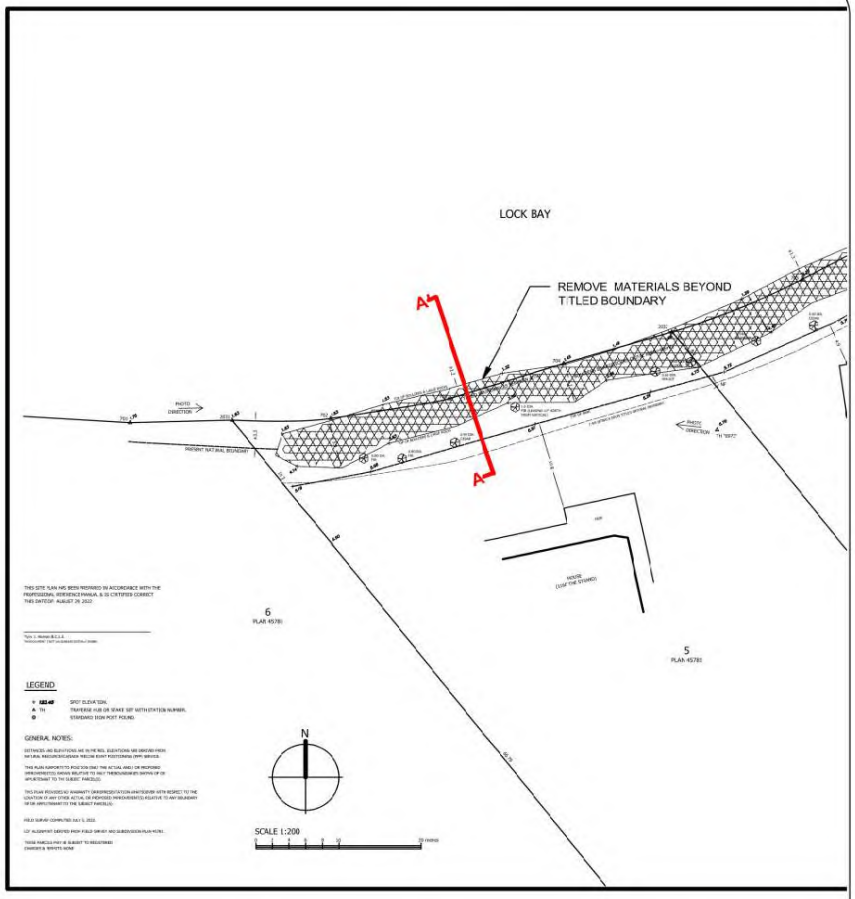
Name	Where Found	Species Status
Basking Shark - Pacific	Pacific Ocean/Océan Pacifique	Endangered
Bluntnose Sixgill Shark	Pacific Ocean/Océan Pacifique	Special Concern
Green Sturgeon	Pacific Ocean/Océan Pacifique	Special Concern
Grey Whale - Eastern North Pacific	Pacific Ocean/Océan Pacifique	Special 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)



FORESHORE REVETMENT SECTION A - A



CONSTRUCTION NOTES:

1. REMOVE DEBRIS ALONG SLOPE FACE PRIOR TO REORIENTATING 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 (1170 THE STRAND).
4. FILL LARGER VOIDS WITH 100 - 200mm PIECES THEN INFILL SMALLER VOIDS WITH 75mm MINUS SAND AND GRAVEL.

GEOTEXTILE NOTES:

1. ENSURE THE EXISTING NON-WOVEN GEOTEXTILE IS NOT COMPROMISED DURING THE REINORIENTATION 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. EXISTING ROCK IS CONSIDERED SUITABLE FOR THE EROSION CONTROL REVETMENT DESIGN.LARGEST PIECES SHOULD BE ON THE LOWER REACHES.
2. IMPORTED MATERIALS TO BE USED SHOULD CONTAIN NO SILT OR FINE GRAINED MATERIAL THAT COULD POTENTIALLY WASH OUT AND DEGRADE THE AQUATIC HABITAT.
3. ALL WORKS TO BE SUPERVISED BY GEOTECHNICAL PERSONNEL TO ENSURE CONFORMANCE TO THE DESIGN.
4. **ANY CHANGES TO THE DESIGN MUST BE APPROVED BY THE DESIGN ENGINEER.**

REV No.	DATE	BY	P.Eng.	REVISION DESCRIPTION	LEGEND

DRAWING TITLE: SHORELINE REVETMENT DESIGN
PROJECT NAME: 1160 THE STRAND, GABRIOLA ISLAND, BC
LEGAL DESCRIPTION:
ENGINEER'S SEAL
P2P#: 1001802

PLOT DATE	DRAWN BY
FEB-22	JH
REVIEWED BY	SCALE
CH	AS NOTED
PROJECT No.	DRAWING No.
E1636	E1636-01

LEA Lewkowich Engineering Associates Ltd.

Appendix 4-Site Photos

1.) Looking upland from sub-title across subject properties area.

2.) Looking west across subject properties.

3.) Looking west across subject properties

4.) Looking west across subject properties

Appendix 5-Revegetation Plan

Estimated Landscaping Fees

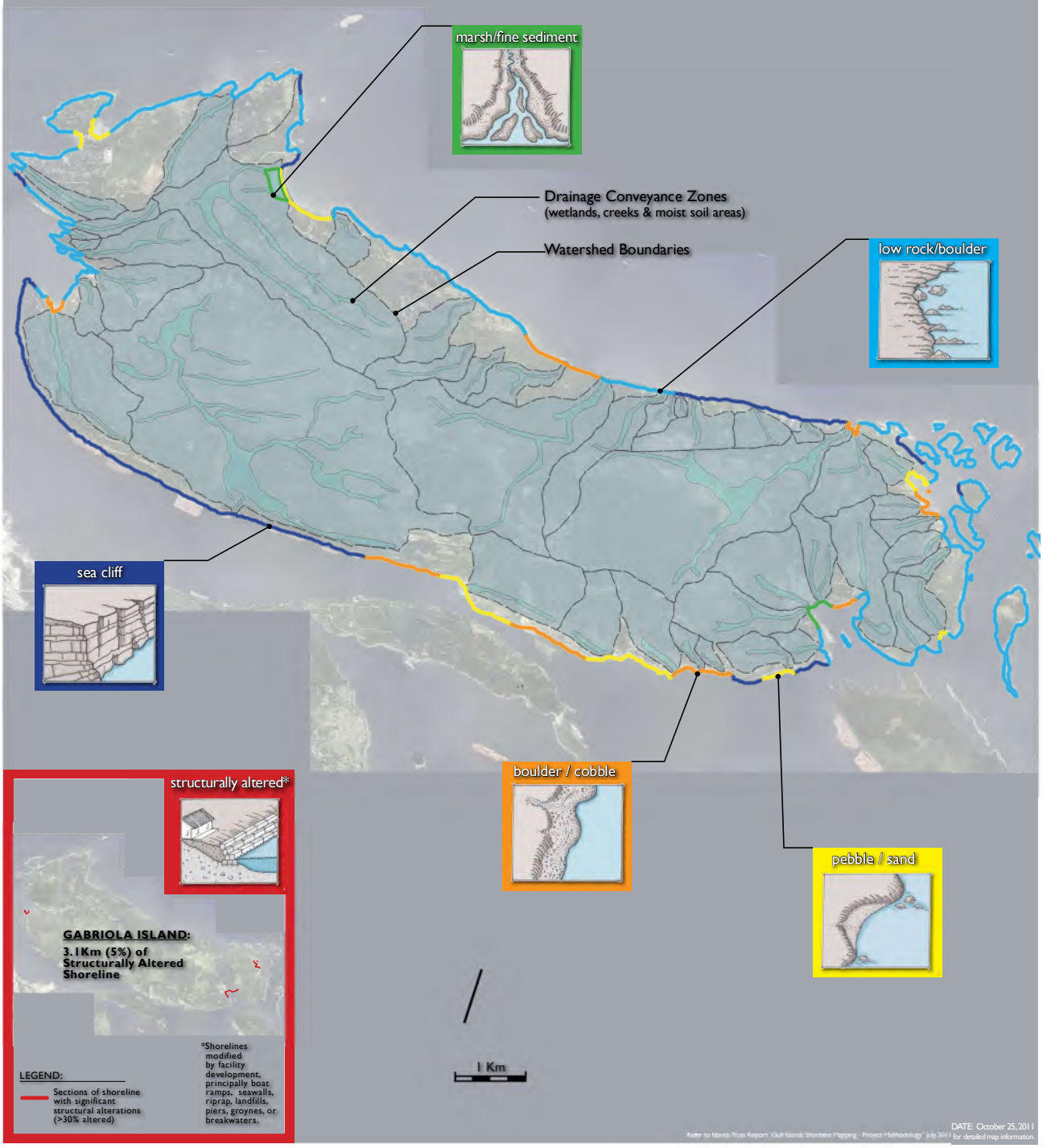
Item	Cost	# items	Total
Dune Grass 10cm -plug	**$3.00**	**200**	**$600.00**
Nootka Rose	**$8.00**	**16**	**$128.00**
Ocean Spray	**$8.00**	**10**	**$80.00**
Evergreen Huckleberry	**$8.00**	**6**	**$ 48.00**
Snowberry	**$8.00**	**18**	**$144.00**
Kinnininick	**$8.00**	**12**	**$96.00**
Salal	**$8.00**	**6**	**$48.00**
Feature trees	**$30.00**	**4**	**$120.00**
Planting Medium with delivery	**$100**	**2**	**$200.00**
Landscape Labour – planting and irrigation		**Lump sum**	**$480.00**
Contingency	**10%**		**$195.00**
Total			**$2139.00**

GABRIOLA Is.

MAP 1 of 3: Distribution of Shoreline Types

ATTACHMENT 8

The Gabriola Island shoreline is largely bedrock and resistant to erosion. There are several sand and shell pocket beaches which are very important recreationally, including Taylor, Pilot and Lock Bays as well as Percy Anchorage. The north end of Gabriola Island is exposed to northwesterly wind and waves and the northeast side of Gabriola Island is exposed to southeasterly storm winds and waves. The south side of Gabriola Island is protected by Valdes Island to the southeast, and partially protected by Mudge Island and the De Courcy group to the south, and by Vancouver Island to the west. Gabriola Island's only areas of mudflat, which are sensitive to human disturbance, are located in Degnen Bay on the southeast end, and to a lesser extent, in Silva Bay. There is a very protected saltmarsh area in Lock Bay, just to the east on the north tip of Gabriola Island, completely bounded on the east by a soft sediment (pebble/sand) spit.



SEA CLIFF	LOW ROCK/BOULDER	BLUFF	BOULDER/COBBLE	PEBBLE/SAND	MARSH/FINE SEDIMENT
• rocky shore with steep slopes • 19% of shoreline (12 Km)	• rocky shore with low slopes • 59% of shoreline (39 Km)	• moderate to high slopes of sediment (often eroding) • Saturna Island has no bluff shores	• boulder - cobble cover on beach (often indicates eroding shoreline) • 10% of shoreline (6.5 km)	• stable or accreting pebble-sand (or shell) beaches (may be eroding where sediment supply is interrupted). • 9% of shoreline (6 Km)	• low energy shorelines with sediment inputs from watersheds nearby • 3% of shoreline (2 Km)
Rock (Hard) Shorelines		Sediment (Soft) Shorelines			

Islands Trust
Preserving island communities, culture and environment

PROJECT FUNDING GENEROUSLY PROVIDED BY: GREEN SHORES, STEWARDSHIP CENTRE FOR BRITISH COLUMBIA, PACIFIC CLIMATE IMPACTS CONSORTIUM, real estate foundation BRITISH COLUMBIA

MAPPING PRODUCTS PRODUCED BY: Murdoch de Greeff Inc. (Project Lead) | Coastal and Ocean Resources Inc. | Archipelago Marine Research Ltd. | Land & Water Inc. IN PARTNERSHIP WITH: UBC School of Architecture and Landscape Architecture and the Islands Trust.

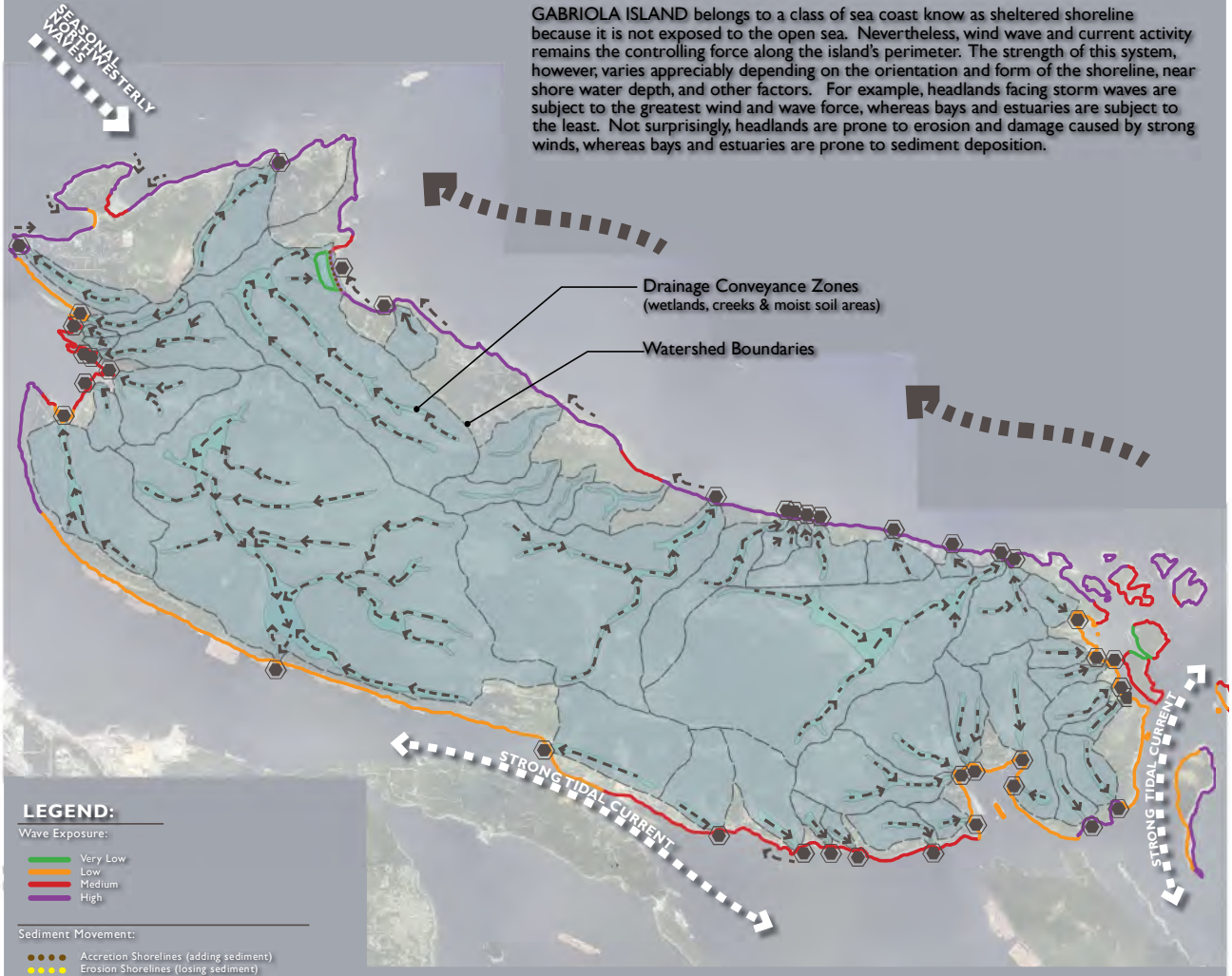
GABRIOLA Is.

MAP 2 of 3: Energy & Sediment Movement

ISLAND ENVIRONMENTS are shaped by two primary or formative systems:
1) watershed systems; and
2) longshore systems.

Watersheds are driven by runoff, and longshore systems are driven by waves and ocean currents. Any attempt to understand the islands, including discussions about land use planning, must be framed by these systems. Within this framework all other systems (natural systems like forests, wetlands, eelgrass beds etc, and human systems like roads, buildings, etc) are organized and structured.

GABRIOLA ISLAND belongs to a class of sea coast know as sheltered shoreline because it is not exposed to the open sea. Nevertheless, wind wave and current activity remains the controlling force along the island's perimeter. The strength of this system, however, varies appreciably depending on the orientation and form of the shoreline, near shore water depth, and other factors. For example, headlands facing storm waves are subject to the greatest wind and wave force, whereas bays and estuaries are subject to the least. Not surprisingly, headlands are prone to erosion and damage caused by strong winds, whereas bays and estuaries are prone to sediment deposition.



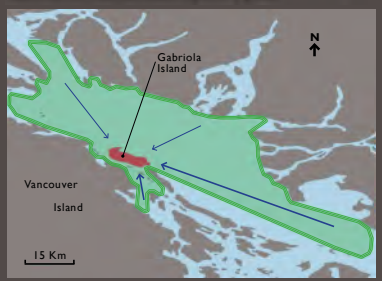
Making Sense of the Energy Systems:

The coloured shorelines on this map indicate that for Gabriola Island, the highest wave exposures occur on the north side of the island. Yet, the arrows indicate that the predominant energy system flow direction is from south to north.

This seemingly conflicting information can be explained by examining the difference between wave exposure and prevailing storms. Wave exposure is a function of wave fetch (as described in more detail in the inset to the right) and wind strength from a given direction. Indeed the Gabriola Island shoreline facing north has a long fetch, and our region does receive periodic cold spells where strong outflow winds blow from the north - this combination of factors results in north facing beaches having a high wave exposure rating relative to other Gabriola shorelines. However, over the course of a storm season, the majority of strong winds and energy comes from the southeast. For Gabriola Island, this means that although north-facing shorelines have high exposures, the dominant sediment movement (relatively little sediment exists on the Gabriola shoreline because it is predominantly rocky) direction is driven by the southeasterly storms towards the north.

Wave Fetch & Energy:

Waves are generated by wind. Wave fetch is the distance over which wind can push water to generate waves - generally, the longer the fetch, the larger the waves. In the diagram below, the wave fetch for Gabriola Island is shown in green.



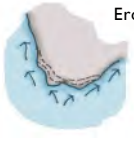
DATE: October 25, 2011

Refer to Islands Trust Report "Gulf Islands Shoreline Mapping - Project Methodology" July, 2011 for detailed map information.

Accretion Shorelines:

Sediment accumulation (accretion) is typically associated with lower energy environment along the shorelines.

Accretion features include sandy beaches, beach berms, pocket beaches or storm berms, and are often high value recreation features or wildlife habitats.



Erosion Shorelines:

Eroding shorelines are typically associated with higher energy environment along the shorelines, like headlands, high exposure sediment shorelines or points of land.

Eroding shorelines feed the sediment transport system and halting erosion can have severe impacts on the shoreline sediment movement system and 'downstream' beaches. Adequate setbacks for buildings and facilities are critical.

Wave Exposure & the Sediment System

Trees and vegetation damaged or shaped by the wind along shorelines are good indicators of high wind exposure.

Caution should be exercised when siting buildings and facilities in these locations to ensure they are adequately set back from the shoreline.

Wind Exposure & Buildings

Islands Trust
Preserving island communities, culture and environment

PROJECT FUNDING GENEROUSLY PROVIDED BY: GREEN SHORES, STEWARDSHIP CENTRE FOR BRITISH COLUMBIA, PACIFIC CLIMATE IMPACTS CONSORTIUM, real estate foundation BRITISH COLUMBIA

MAPPING PRODUCTS PRODUCED BY: **Murdoch de Greeff Inc.** (Project Lead) | **Coastal and Ocean Resources Inc.** | **Archipelago Marine Research Ltd.** | **Land & Water Inc.** IN PARTNERSHIP WITH: **UBC School of Architecture and Landscape Architecture** and the **Islands Trust.**

GABRIOLA Is.

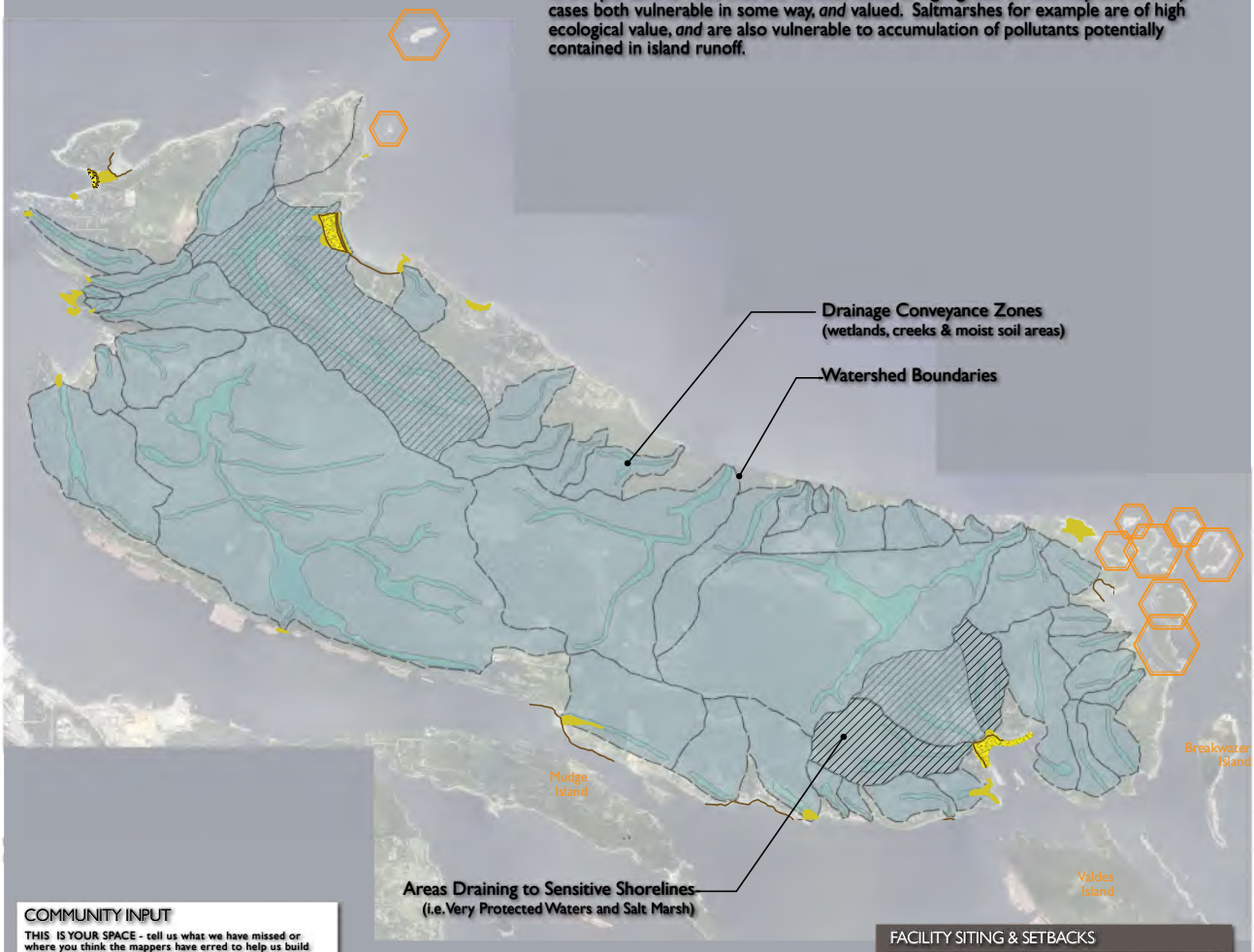
MAP 3 of 3: Shoreline Values & Vulnerability

This map is intended to give a general impression of areas along the Gabriola Island shoreline that are considered valued and/or vulnerable to change.

Value refers to areas or features of high ecological or recreational significance.

Vulnerability refers to:
1) Natural areas or features vulnerable to human disturbance; or
2) Buildings or facilities, vulnerable to disturbance from natural or human-altered system processes.

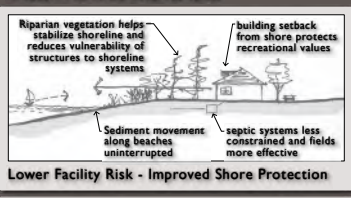
It is important to note that the various features highlighted on this map are in many cases both vulnerable in some way, *and* valued. Saltmarshes for example are of high ecological value, *and* are also vulnerable to accumulation of pollutants potentially contained in island runoff.



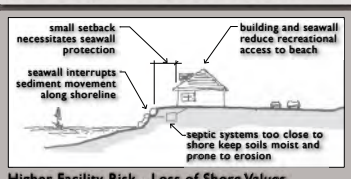
COMMUNITY INPUT

THIS IS YOUR SPACE - tell us what we have missed or where you think the mappers have erred to help us build a more comprehensive values and vulnerability resource! Feel free to make notes right on the map also.

FACILITY SITING & SETBACKS



Lower Facility Risk - Improved Shore Protection



Higher Facility Risk - Loss of Shore Values

DATE: October 25, 2011

Refer to Islands Trust Report "Gulf Islands Shoreline Mapping - Project Methodology" July 2011 for detailed map information.

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.

Current BC Provincial Government guidelines suggest up to 1 metre of sea level rise over the next 100 years (www.env.gov.bc.ca). Sea level rise may cause increased shoreline vulnerability to land-based activities by causing such effects as increased flooding in low lying areas or softening of sediment shorelines and increased shoreline erosion. These effects could be further exacerbated by storm surges and changing climatic conditions.

SOFT SHORELINES

- Sediment shorelines are typically associated with high recreational values and high ecological values (pocket beaches, estuaries, etc).

VERY PROTECTED WATERS

- Shorelines highly protected from wave exposure
- Poor water circulation increases vulnerability to water pollution

SALT MARSH

- Valued ecological features
- Vulnerable to pollution from land-based activities

ISLETS

- Often important ecologically, islets can be vulnerable to disturbance from recreational users

Islands Trust
Preserving island communities, culture and environment

PROJECT FUNDING GENEROUSLY PROVIDED BY: GREEN SHORES, STEWARDSHIP CENTRE FOR BRITISH COLUMBIA, PACIFIC CLIMATE IMPACTS CONSORTIUM, real estate foundation BRITISH COLUMBIA

MAPPING PRODUCTS PRODUCED BY: Murdoch de Greeff Inc. (Project Lead) | Coastal and Ocean Resources Inc. | Archipelago Marine Research Ltd. | Land & Water Inc. IN PARTNERSHIP WITH: UBC School of Architecture and Landscape Architecture and the Islands Trust.

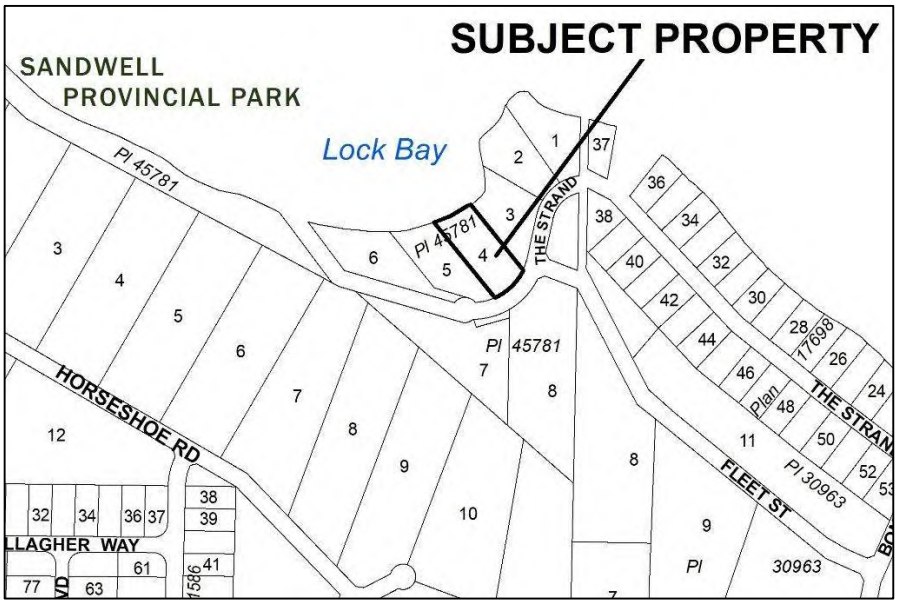
NOTICE
GB-DVP-2022.4
GABRIOLA ISLAND LOCAL TRUST COMMITTEE

ATTACHMENT 9

NOTICE is hereby given pursuant to Section 499 of the *Local Government Act* that the Gabriola Island Local Trust Committee will be considering a resolution allowing for the issuance of a Development Variance Permit, the proposed permit would vary the Gabriola Island Land Use Bylaw, 1999 by **permitting the siting of an existing rock wall revetment structure and the placement of additional rock wall materials within 0 metres of the interior side lot line setback and 0 metres from the setback to the natural boundary of the sea**.

The property is located at **1170 The Strand** and is legally described as LOT 4, SECTION 18, GABRIOLA ISLAND, NANAIMO DISTRICT, PLAN 45781 (PID: 008-828-059).

The general location of the subject property is shown on the following sketch:



A copy of the proposed permit may be inspected at the Islands Trust Office, 700 North Road, Gabriola Island, BC V0R between the hours of 8:30 a.m. to 4:30 p.m. Monday to Friday inclusive, excluding statutory holidays, commencing **April 3, 2025** and continuing up to and including **April 16, 2025.**

For the convenience of the public only, and not to satisfy Section 499 (2) (c) of the *Local Government Act*, additional copies of the Proposed Permit may be inspected at the Notice Board on Gabriola Island.

Enquiries or comments should be directed to Margot Thomaidis, Planner 2, at (250) 247-2204, for Toll Free Access, request a transfer via Enquiry BC: In Vancouver 660-2421 and elsewhere in BC 1-800-663-7867; or by fax (250) 405-5155; or by email to: northinfo@islandstrust.bc.ca **before 4:30 pm, April 16, 2025**.

The Gabriola Island Local Trust Committee may consider a resolution allowing for the issuance of the permit during the regular business meeting starting at **10:30 a.m. on April 17, 2025 at Gabriola Arts & Heritage Centre, 476 South Road, Gabriola, BC**.

All applications are available for review by the public with prior appointment. Written comments made in response to this notice will also be available for public review.

Nadine Mourao, Deputy Secretary

PROPOSED

ATTACHMENT 10

GABRIOLA LOCAL TRUST COMMITTEE
DEVELOPMENT VARIANCE PERMIT
GB-DVP-2022.4

To: Mark and Gail Woodside

1. This Development Variance Permit applies to the land described below:

   LOT 4, SECTION 18, GABRIOLA ISLAND, NANAIMO DISTRICT, PLAN 45781
   (PID: 008-828-059)

2. Gabriola Island Land Use Bylaw, 1999 is varied as follows:

   a) Article **B.2.1.1 *Setbacks* and Elevations from *Watercourses* and the Sea** which states: "...retaining walls, ground level decks, *structures* and *buildings*, excepting *boathouses*, must be sited a minimum of 7.5 metres (24.6 feet) from and 1.5 metres (4.9 feet) above the *natural boundary* of the sea" is varied to permit a rock wall revetment within 0 metres of the natural boundary of the sea.

   b) Article **D.1.1.3 Regulations**, Clause **(a) *Buildings* and *Structures* Siting Requirements**, Item (i) which states: "On *lot*s less than 1.0 hectares (2.47 acres), except for a sign, *fence*, or *pump/utility house*, the minimum *setback* of *buildings* or *structures* is: ...1.5 metres (4.9 feet) from any *interior lot line*." is varied to permit a rock wall revetment within 0 metres of the interior side lot line.

   The development shall be consistent with Schedule 'A' Site Plan and Schedule 'B' Shoreline Revetment Design which are attached to and form part of this permit.

3. This permit is not a building permit and does not remove any obligation on the part of the permittee to comply with all other requirements of "Gabriola Island Land Use Bylaw, 1999" and to obtain other approvals necessary for completion of the proposed development, including approval of the Nanaimo Regional District and Ministry of Transportation and Infrastructure.

AUTHORIZING RESOLUTION PASSED BY THE GABRIOLA LOCAL TRUST COMMITTEE THIS ##th DAY OF [MONTH], 202X.

_____
Deputy Secretary, Islands Trust

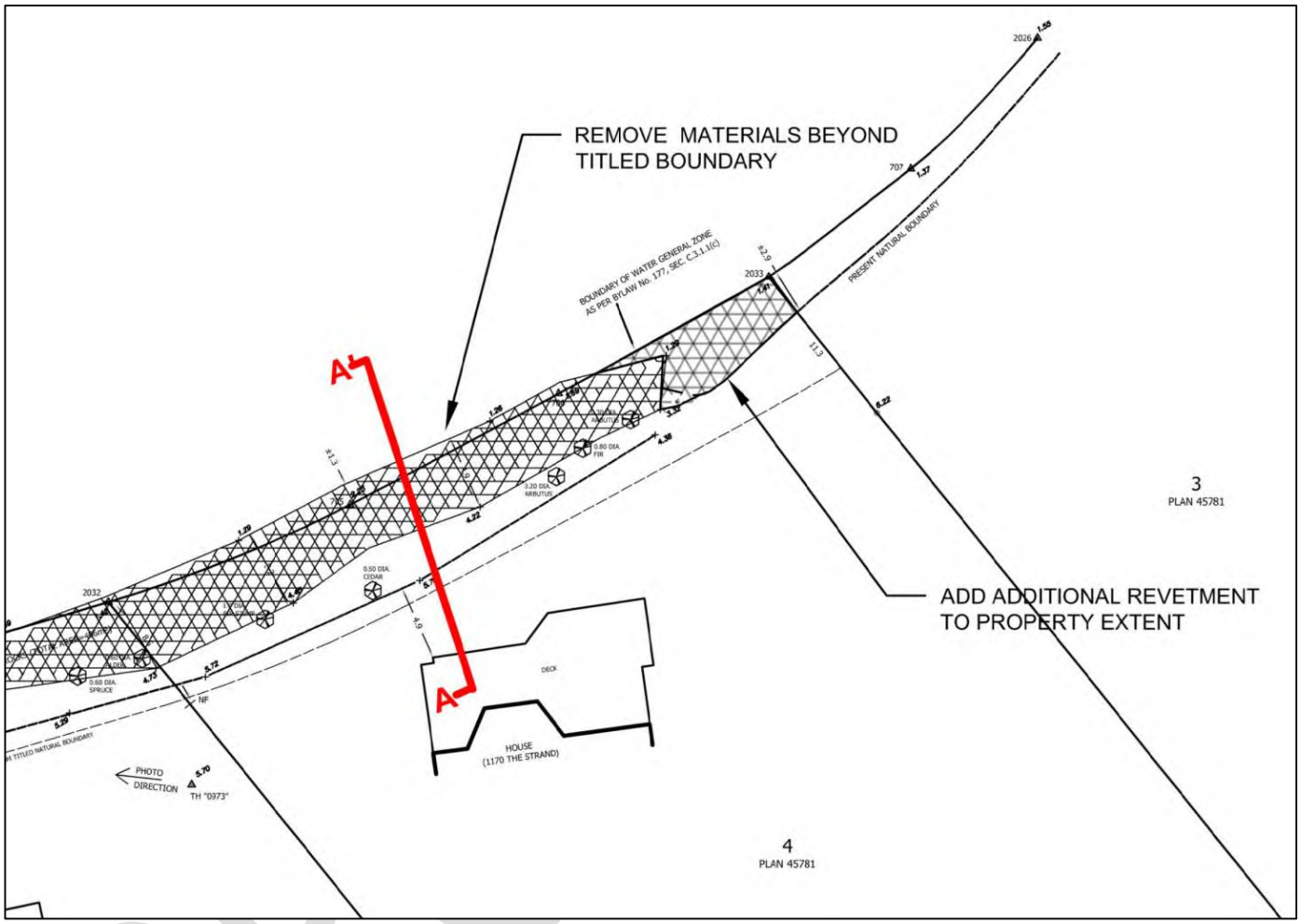
_____
Date of Issuance

IF THE DEVELOPMENT DESCRIBED HEREIN IS NOT COMMENCED BY THE ##th DAY OF [MONTH], 202X (2 YEARS FROM DATE OF ISSUANCE)] THIS PERMIT AUTOMATICALLY LAPSES.

PROPOSED

GABRIOLA ISLAND LOCAL TRUST COMMITTEE
GB-DVP-2022.4
SCHEDULE 'A'

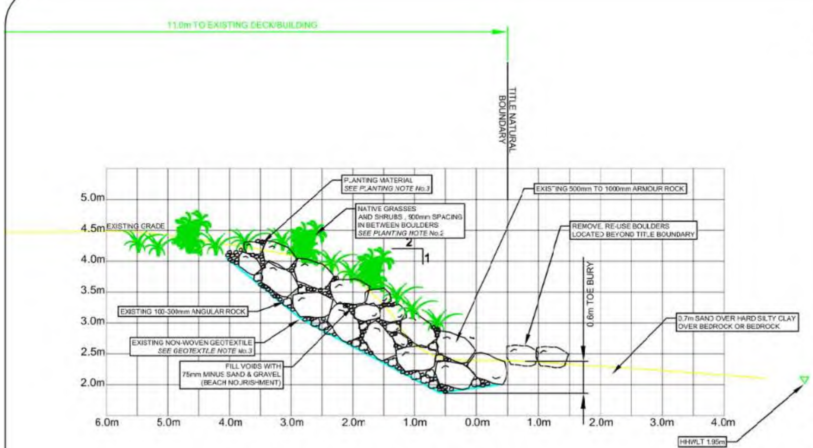
Site Plan



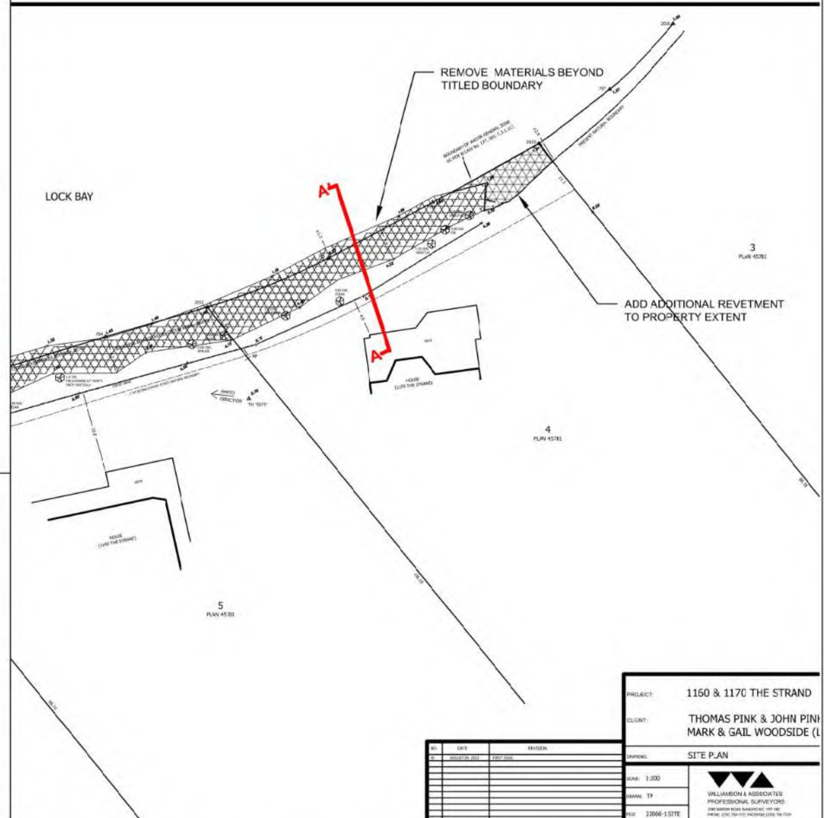
PROPOSED

GABRIOLA ISLAND LOCAL TRUST COMMITTEE
GB-DVP-2022.4
SCHEDULE 'B'

Shoreline Revetment Design



FORESHORE REVETMENT SECTION A - A



CONSTRUCTION NOTES:

1. REMOVE DEBRIS ALONG SLOPE FACE PRIOR TO REORIENTATING BOULDERS, REPLACE WHEN COMPLETE.
2. ADD EPOXY COATED 20M REBAR PINS ALONG TOE (200mm EMBEDMENT) FOR AREAS BEARING ON BEDROCK.
3. DO NOT DISTURB SOILS BEYOND TITLE BOUNDARY
4. TIE IN THE WESTSIDE OF REVETMENT WITH A SMOOTH TRANSITION TO EXISTING LAND AND EASTSIDE TO PROPOSED NEIGHBOURS REVETMENT (1170 THE STRAND).
5. FILL LARGER VOIDS WITH 100 - 200mm PIECES THEN INFILL SMALLER VOIDS WITH 75mm MINUS SAND AND GRAVEL.

GEOTEXTILE NOTES:

1. ENSURE THE EXISTING NON-WOVEN GEOTEXTILE IS NOT COMPROMISED DURING THE REINORIENTATION 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. EXISTING ROCK IS CONSIDERED SUITABLE FOR THE EROSION CONTROL REVETMENT DESIGN.LARGEST PIECES SHOULD BE ON THE LOWER REACHES.
2. IMPORTED MATERIALS TO BE USED SHOULD CONTAIN NO SILT OR FINE GRAINED MATERIAL THAT COULD POTENTIALLY WASH OUT AND DEGRADE THE AQUATIC HABITAT.
3. ALL WORKS TO BE SUPERVISED BY GEOTECHNICAL PERSONNEL TO ENSURE CONFORMANCE TO THE DESIGN.
4. **ANY CHANGES TO THE DESIGN MUST BE APPROVED BY THE DESIGN ENGINEER.**

PROJECT	1150 & 1170 THE STRAND
CLIENT	THOMAS PINK & JOHN PINK / MARK & GAIL WOODSIDE
DRAWING	SITE PLAN

REV No.	DATE	BY	P.Eng	REVISION DESCRIPTION	LEGEND

DRAWING TITLE	SHORELINE REVETMENT DESIGN
PROJECT NAME	1170 THE STRAND GABRIOLA ISLAND, BC
LEGAL DESCRIPTION	

ENGINEER'S SEAL

PLOT DATE	DRAWN BY
APRIL 10-22	JH
REVIEWED BY	SCALE
CH	AS NOTED
PROJECT No.	DRAWING No.
E1939	E1939-01

LEA Lewkowich Engineering Associates Ltd.

ATTACHMENT 11

[redacted]
Gabriola, Island
[redacted]
3 June 2022

To: Islands Trust G:\My Documents_1\HOuse Stuff\IslandsTrust_Erosion.docx

Re: Bank Erosion in Lock Bay, Gabriola

To whom it may concern

I am writing to express my support for the erosion protection efforts undertaken by my neighbours on the Strand, Gabriola Island (addresses 1160 and 1170 the Strand). Over the past several years the banks at both these properties (and on my own) have eroded significantly from wave action.

I recall seeing a Report several years ago indicating that this area of Lock Bay was expected to suffer significant erosion in the coming years. This report may have been commissioned by Island Trust or some other provincial agency - I don't recall for sure. The expected erosion has taken place and indeed, I would estimate that my own property has lost several feet to the ocean over the last year.

The loss of land (on which we still pay taxes, I note) is not as concerning as the undercutting of the bank and the weakening of tree roots and other infrastructure such as paths to the beach. This is particularly true for my neighbours. Several old heritage trees have been lost along the waterfront due to the collapse of the bank. I applaud my neighbours for undertaking mitigative of measures.

I know that as the founding chairperson of the Island Trust, my aunt Hilary Newitt Brown would also have approved these measures. I strongly urge you to approve them as well.

Yours sincerely,

[redacted]

Michael J Apps, PhD

Glenn & Marg Munro

[redacted]

Gabriola, BC, V0R 1X3

April 21, 2023

Islands Trust
700 North Road
Gabriola Island B.C. VOR 1X3

Attn: Margot Thomaidis

Dear Sirs:

Re; 1160 & 1170 The Strand

This letter is to voice our support for the bank restoration plan submitted by our neighbours living at the above noted addresses. We understand they have a hearing with the Development Variance Board in May or early June for the purpose of considering their plan.

Like many homeowners with land fronting on the ocean where the foreshore is composed of softer organic material, significant erosion has and continues to occur. This would appear to be the result of various forces including king tides, more severe winter storms and rising sea levels resulting from climate change. There also seem to be larger numbers of stray logs floating about because, it appears, these are no longer being collected by log salvagers. These seem to act as battering rams and do enormous damage to the shoreline during a heavy storm.

Our own lot sits adjacent to Bell's Landing. I noticed this spring, for the first time, that the bank at the foot of the beach access road from the public parking lot has been gouged out during the winter. We are fortunate in that a significant portion of our own foreshore consists of rock but it would appear that it is only a matter of time before undercutting of the bank on these public lands at Bell's Landing will begin to affect public accessibility and may also threaten erosion of our property.

Given the situation we and our neighbours face, we have no hesitation in supporting our neighbour's application to the Development Variance Board to have their bank restoration plan approved.

Yours truly,

[redacted]

Glenn Munro

[redacted]

Marg Munro

May 26, 2023

Margot Thomaidis
Islands Trust

Re: Erosion Event Gabriola Island

Dear Margot,

We are writing to support our neighbours' request for approval of the variance they have applied for in connection with their emergency mitigation landscaping. This landscaping was required because of a severe erosion event to their properties at 1160 and 1170 The Strand, Gabriola Island.

The landscaping rocks they have put in place have been very well done. We think it looks excellent from the beach and is providing them with the protection they need to preserve their properties. The fact that this was done under urgent circumstances doesn't take away from the care and thoughtfulness that they put into making the landscaping aesthetic and consistent with the natural environment of the surrounding area.

Please feel free to contact us any time on this matter at

Sincerely,

Jim Logan and Bev Park
Gabriola, BC

From: k mitchell
Sent: Tuesday, May 30, 2023 2:39 PM
To: Margot Thomaidis
Cc:
Subject: 1160 & 1170 The Strand, Gabriola

Follow Up Flag: Follow up
Flag Status: Completed

Dear Margot Thomaidis:
Jeff & Tom Pink supplied me with your name in respect to the work that was being done on their property last summer that was intended to help prevent further erosion of their property due to wave action.

We own the property across the road at

They inform me that they have to appear before the Island Trust in early June to obtain permission to keep the work done to date which will hopefully prevent further erosion of their bank.

As both neighbour and home owner I fully support the work that has been undertaken to prevent further erosion of both their property at 1160 The Strand and at 1170 The Strand.

Regards
Ken & Kathleen Mitchell

Sent from Mail for Windows