



# DEVELOPMENT PERMIT

NO. DP- 2020-20  
DP- 2020-21

TO: **Lincoln Construction Ltd**

ADDRESS: **1459 Davidson Road**  
**Gibsons, B.C. V0N 1V6**  
(Permittee)

- 1) This Development Permit is issued subject to compliance with all of the Bylaws of the Town of Gibsons applicable thereto, except those specifically varied or supplemented by this Permit.
- 2) The Development Permit applies Land within the Town of Gibsons described below:

**Parcel Identifier: 010-897-321**

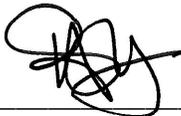
**Legal Description: Lot 1 Block J District lot 686 Plan 6401**

**Civic Address: 466 Marine Drive**

(the "Lands")
- 3) The Lands are within Development Permit Areas identified in the Town of Gibsons Official Community Plan, Bylaw 985, 2005. This permit applies to:
  - Development Permit Area No. 1 (Geotechnical Hazard Area) for the purpose of protection of development from hazardous conditions; and
  - Development Permit Area No. 2 (Environmentally Sensitive Areas) for the purpose of protection of the natural environment.
- 4) The Land shall be developed only in strict accordance with the terms and conditions and provisions of this Permit, including without limitation to the specifications in the following reports, which are attached to and form part of this Permit:
  - a) Geotechnical Assessment Report for Proposed Landscape Retaining Walls, Stamped by Patrick Sails of Ground Up Geotechnical Ltd. Dated September 29, 2020
  - b) Marine Foreshore Environmental Assessment, stamped by Cam Forrester, R.P.F, of Cam Forrester & Associates Ltd., dated October 3, 2020
- 5) All recommendations of the report(s) are to be followed including without limitation: On site monitoring by the Qualified Professionals during excavation/ construction; provision of Schedule B (at time of Building Permit); and provision of Schedule C-B (after completion) as required under the BC Building Code.

- 6) All buildings and structures, including retaining walls, shall be located within the property lines of the lands.
- 7) Minor changes to the aforesaid drawings that do not affect the intent of this Development Permit are permitted only with the approval of the Director of Planning.
- 8) If the Permittee does not commence the development permitted by this Permit within twenty-four months of the date of this Permit, this Permit shall lapse.
- 9) Upon completion of the works, a letter from a qualified professional is required to confirm all conditions of this permit were met.
- 10) This Permit is NOT a Building Permit.

ISSUED THIS 23<sup>RD</sup> DAY OF OCTOBER, 2020.



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Lesley-Anne Staats, MCIP, RPP  
Director of Planning

Copy of permit to the Geotechnical Engineer and the Qualified Environmental Professional



## GROUND UP GEOTECHNICAL

SOIL | FOUNDATIONS | ROCK | WATER

Call: 778.678.7654 Email: [info@groundupgeo.ca](mailto:info@groundupgeo.ca) Visit: [www.groundupgeotechnical.ca](http://www.groundupgeotechnical.ca)  
Box 151 Garibaldi Highlands, Squamish BC V0N 1T0

September 29, 2020  
Project #: GUG 20-216-1

Lincoln Construction Ltd.  
BY EMAIL: [info@buildwithlincoln.ca](mailto:info@buildwithlincoln.ca)

### **Attention: Mr. Erik Lincoln**

Re: Geotechnical Assessment Report for Proposed Landscape Retaining Walls  
Location: 466 Marine Drive, Gibsons BC  
Legal: Lot 1, Block J, DL 686, Plan 6401  
PID: 010-897-321

### 1.0 INTRODUCTION

As requested, we have completed our geotechnical assessment in support of the proposed construction of landscape retaining walls on the rear slope of the subject property. We understand the property owners desire to improve the usability of the steep slope as part of other renovations underway on the home structure. The objective of our geotechnical assessment was to determine the geotechnical suitability of the proposed construction of retaining walls on the rear slope at the property. The subject property is situated within the Town of Gibsons' "*Geotechnical Development Permit Area No. 1*" as defined within the Official Community Plan (OCP), and thus, geotechnical assessment of the land and a report is required to support construction of the retaining walls.

Accordingly, we attended the subject property on July 29, 2020 to meet with Margo & Mike Karda (property owners), Erik Lincoln of Lincoln Construction Ltd. and Jonny Bacon of Tall Timber Excavating Ltd. (wall builders) and complete our visual geotechnical assessment of the slope and proposed retaining wall locations. This report summarizes our observations, assessment, conclusions, development conditions and preliminary design associated with the proposed retaining walls. Our work has not included any assessment of the existing home or any other existing structures on the property. Our services and this report have been provided in accordance with, and are subject to, the attached Terms of Engagement.

Based on our discussions with the property owners and wall builders, we understand the desired plan is to construct three retaining walls upon the slope as shown on the attached 'Site Photos & Preliminary retaining Wall Sketches'. We understand the property owners and builders would prefer to utilize stacked boulder retaining walls due to esthetics and cost. We don't expect the proposed landscape walls will require excavations or ground disturbance below a depth of 1.5m.

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## 2.0 SITE CHARACTERISTICS & OBSERVATIONS

As shown on the attached 'Site Plan' prepared by Strait Land Surveying Inc., the subject property lies along the marine shoreline Shoal Channel, immediately north of Gibsons Landing. The property is situated upon a steep slope stretching from Marine Drive down to a wide waterfront pathway and the marine shoreline of Shoal Channel. This same slope stretches across neighboring properties to the north and south, many of which also have tiered retaining walls. Upon the subject property, the slope is broken into two main segments with a bench in between where an existing home is situated. A detached garage was also present, built into the slope at the northernmost corner of the lot. Total vertical relief between Marine Drive and the waterfront pathway (bottom of slope) is approximately 11m.

The focus of our assessment was the lower segment of slope, extending up from the waterfront pathway to the existing home. This slope is approximately 6m high and has an angle of between 30 and 40 degrees (see Figures 1, 2 & 3 on the attached 'Site Photos & Preliminary Retaining Wall Sketches'). The slope has several rows of rudimentary stacked rock walls which appear to be slumping down the slope. The slope is mostly bare of vegetation except for several small shrubs and a severely leaning and heavily pruned deciduous tree situated right on the northern property line near the toe of the slope. Areas with black landscape fabric were also visible across much of the slope. No signs of instability were observed on or around the slope. No groundwater seepage, or vegetation indicating recurring groundwater seepage (wet soil indicator plant species), were observed on or around the slope. No subsurface investigation was completed as part of our assessment.

The subject property's eastern property boundary extends across the very bottom of the slope, elevated just above the slope toe (approximately 0.5m above). The property boundary is setback approximately 7.5m from the marine shoreline, or Present Natural Boundary (PNB), of Shoal Channel. According to the Site Plan, the small fenced yard at the base of the slope is not part of the subject property and is actually Unsurveyed Crown Land (labelled UCL on the Site Plan). Beyond the fenced yard, a wide flat gravel waterfront pathway is present just behind the marine shoreline. We suspect the waterfront pathway was likely created by landfill. The marine shoreline (PNB) is lined with large angular boulder rip rap. The toe of the slope is at an approximate elevation of 2.66m geodetic.

According to the Town of Gibsons' 'Schedule C – Geotechnical Hazards Development Permit Area No. 1' (from the Official Community Plan), the subject property is classified as "Low Geotech Hazard", which we suspect is due to the steep slope discussed above and the ocean front nature of the property.

## 3.0 GEOTECHNICAL ASSESSMENT & CONCLUSIONS

Based on our observations, we believe the slope could accommodate the proposed construction of three tiers of professionally designed and constructed stacked boulder retaining walls. Geosynthetic reinforcement of the proposed wall's backfill zones will certainly be required, and such may increase the stability of the existing slope.



The toe of the slope is at an elevation of around 2.66m geodetic and we believe it may be at risk of erosion during extreme oceanic storm events, especially when considering the predicted climate change driven sea level rise.

Based on our geotechnical assessment, it is our opinion that installation of professionally designed and constructed retaining walls:

1. Would not diminish the stability conditions of the existing slope.
2. Would not create a hazard to neighboring lands or land users.
3. Can be done so in a safe and practical manner which would not risk existing structures or uses on the property.
4. Would protect the slope toe from erosion during extreme oceanic storm events.

Based on our assessment, we believe it is geotechnically feasible to construct the proposed retaining walls on the rear slope at the subject property without adversely affecting the existing stability conditions of the slope. As required for development proposals within "*Geotechnical Development Permit Area No. 1*" as defined within the '*The Town of Gibsons OCP*', it is our professional opinion that the land described above as the proposed retaining wall locations, and shown as such on the attached Preliminary Retaining Wall Sketches, may be used safely for the use intended, provided adherence to our development conditions contained herein. Our definition of 'used safely' in the context of this report means that construction of the proposed retaining walls will not adversely impact the existing stability conditions upon the rear yard slope, and will not introduce any additional geohazard risk to inhabitants of the property or neighboring properties.

Our assessment has not included a detailed slope stability analysis nor assessment of the existing home or garage.

#### 4.0 DEVELOPMENT CONDITIONS

The proposed retaining walls are to be constructed on a steep soil slope adjacent the marine shoreline. To avoid creating a slope hazard, the following must be incorporated into design and construction of the proposed walls:

1. Soil conditions below the proposed retaining walls must be assessed by Ground Up Geotechnical at the start of excavation.
2. Proposed retaining walls must be designed and field reviewed by Ground Up Geotechnical or another qualified professional engineer.
3. Existing and future foundations for the home structure and deck must not be supported by the retaining walls.
4. The proposed retaining walls would not be designed to support excess surface loading caused by items such as pools and hot tubs etc. and such items must remain off the terraces above and below the retaining walls.
5. Rainwater from the home's roof and deck shall be collected and piped to the base of the slope within non-perforated UV resistant pipe, where it may be discharged onto a non-erodible surface such as a pile of boulders.



6. While not a geotechnical item, we recommend the property owners consider either installing a handrail or rope or landscaping along the crests of the walls in a manner which prevents accidental falls by inhabitants and guests of the property.

#### 5.0 CLOSURE

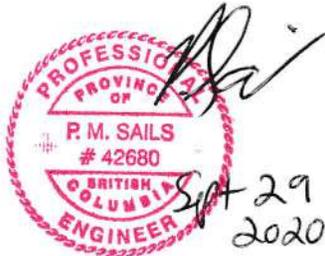
The conclusions in this report are provided based upon the assumption that either Ground Up Geotechnical Ltd. or another qualified Geotechnical Engineer will provide the detailed design & construction field reviews of the site preparation and proposed retaining walls.

This report has been prepared exclusively for our client, their agents, and their design and construction team, yet remains the property of Ground Up Geotechnical Ltd. Margo & Mike Karda (property owners) as well as the Town of Gibsons are also considered authorized users of this report.

Any use of this report by third parties, or any reliance on or decisions made based on it, are the responsibility of such third parties. Ground Up Geotechnical Ltd. does not accept responsibility for damages suffered, if any, by a third party as a result of their use of or reliance on this report.

We trust that this report provides you with the information you require at this time, please do not hesitate to contact us if you have any questions or require anything further.

Sincerely,  
Ground Up Geotechnical Ltd.



Patrick Sails, P.Eng.  
Geotechnical Engineer

Attachments – Terms of Engagement  
SCRD Property Report  
Site Plan - Strait Land Surveying Inc. August 28, 2020  
Site Photos & Preliminary Retaining Wall Sketches  
Ground Up Geotechnical Ltd. Certificate of Insurance



## TERMS OF ENGAGEMENT

### GENERAL

Ground Up Geotechnical Ltd. (the Consultant) shall render the Services, as specified in the agreed Scope of Services, to the Client for this Project in accordance with the following terms of engagement. The Services, and any other associated documents, records or data, shall be carried out and/or prepared in accordance with generally accepted engineering practices in the location where the Services were performed. No other warranty, expressed or implied is made. The Consultant may, at its discretion and at any stage, engage sub-consultants to perform all or any part of the Services.

### COMPENSATION

Charges for the Services rendered by the Consultant will be made in accordance with the Consultants Fee Estimate and/or Schedule of Fees if such was provided. All charges will be payable in Canadian Dollars. Invoices will be due and payable by the Client within 30 days of receipt of the invoice without hold back. Interest on overdue accounts is 24% per annum.

### REPRESENTATIVES

Each party shall designate a representative who is authorized to act on behalf of that party and receive notices under this Agreement.

### TERMINATION

Either party may terminate this engagement without cause upon thirty (30) days' notice in writing. On termination by either party under this paragraph, the Client shall forthwith pay to the Consultant its Charges for the Services performed, including all expenses and other charges incurred by the Consultant for this Project.

If either party breaches this engagement, the non-defaulting party may terminate this engagement after giving seven (7) days' notice to remedy the breach. On termination by the Consultant under this paragraph, the Client shall forthwith pay to the Consultant its Charges for the Services performed to the date of termination, including all fees and charges for this Project.

### ENVIRONMENTAL

The Consultant's field investigation, laboratory testing and engineering recommendations will not address or evaluate pollution of soil or pollution of groundwater.

### PROFESSIONAL RESPONSIBILITY

In performing the Services, the Consultant will provide and exercise the standard of care, skill and diligence required by customarily accepted professional practices and procedures normally provided in the performance of the Services contemplated in this engagement at the time when and the location in which the Services were performed.

### INSURANCE

Ground Up Geotechnical Ltd. is covered by Professional Indemnity Insurance as well as Commercial General Liability Insurance.

### LIMITATION OF LIABILITY

The Consultant shall not be responsible for:

1. the failure of a contractor, retained by the Client, to perform the work required for the Project in accordance with the applicable contract documents;
2. the design of or defects in equipment supplied or provided by the Client for incorporation into the Project;
3. any cross-contamination resulting from subsurface investigations;
4. any Project decisions made by the Client if the decisions were made without the advice of the Consultant or contrary to or inconsistent with the Consultant's advice;
5. any consequential loss, injury or damages suffered by the Client, including but not limited to loss of use, earnings and business interruption;
6. the unauthorized distribution of any confidential document or report prepared by or on behalf of the Consultant for the exclusive use of the Client;
7. Any damage to subsurface structures and utilities;

The Consultant will make all reasonable efforts prior to and during subsurface site investigations to minimize the risk of damaging any subsurface utilities/mains. If, in the unlikely event that damage is incurred where utilities were unmarked and/or undetected, the

Consultant will not be held responsible for damages to the site or surrounding areas, utilities/mains or drilling equipment or the cost of any repairs.

The total amount of all claims the Client may have against the Consultant or any present or former partner, executive officer, director, stockholder or employee thereof under this engagement, including but not limited to claims for negligence, negligent misrepresentation and breach of contract, shall be strictly limited to the amount of any professional liability insurance the Consultant may have available for such claims.

No claim may be brought against the Consultant in contract or tort more than two (2) years after the date of discovery of such defect.

#### DOCUMENTS AND REPORTING

All of the documents prepared by the Consultant or on behalf of the Consultant in connection with the Project are instruments of service for the execution of the Project. The Consultant retains the property and copyright in these documents, whether the Project is executed or not. These documents may not be used on any other project without the prior written agreement of the Consultant.

The documents have been prepared specifically for the Project, and are applicable only in the case where there has been no physical alteration to, or deviation from any of the information provided to the Consultant by the Client or agents of the Client. The Client may, in light of such alterations or deviations, request that the Consultant review and revise these documents.

The identification and classification as to the extent, properties or type of soils or other materials at the Project site has been based upon investigation and interpretation consistent with the accepted standard of care in the engineering consulting practice in the location where the Services were performed. Due to the nature of geotechnical engineering, there is an inherent risk that some conditions will not be detected at the Project site, and that actual subsurface conditions may vary considerably from investigation points. The Client must be aware of, and accept this risk, as must any other party making use of any documents prepared by the Consultant regarding the Project.

Any conclusions and recommendations provided within any document prepared by the Consultant for the Client has been based on the investigative information undertaken by the Consultant, and any additional information provided to the Consultant by the Client or agents of the Client. The Consultant accepts no responsibility for any associated deficiency or inaccuracy as the result of a miss-statement or receipt of fraudulent information.

#### JOBSITE SAFETY AND CONTROL

The Client acknowledges that control of the jobsite lies solely with the Client, his agents or contractors. The presence of the Consultant's personnel on the site does not relieve the Client, his agents or contractors from their responsibilities for site safety. Accordingly, the Client must endeavor to inform the Consultant of all hazardous or otherwise dangerous conditions at the Project site of which the Client is aware.

The client must acknowledge that during the course of a geotechnical investigation, it is possible that a previously unknown hazard may be discovered. In this event, the Client recognizes that such a hazard may result in the necessity to undertake procedures which ensure the safety and protection of personnel and/or the environment. The Client shall be responsible for payment of any additional expenses incurred as a result of such discoveries, and recognizes that under certain circumstances, discovery of hazardous conditions or elements requires that regulatory agencies must be informed. The Client shall not bring about any action or dispute against the Consultant as a result of such notification.

#### FIELD SERVICES

Where applicable, field services recommended for the Project are the minimum necessary, in the sole discretion of the Consultant, to observe whether the work of the Client, or a contractor retained by the Client, is being carried out in general conformity with the intent of the Services. Any reduction from the level of services recommended will result in the Consultant providing qualified certifications for the work.

#### DISPUTE RESOLUTION

If requested in writing by either the Client or the Consultant, the Client and the Consultant shall attempt to resolve any dispute between them arising out of or in connection with this Agreement by entering into structured non-binding negotiations with the assistance of a mediator on a without prejudice basis. The mediator shall be appointed by agreement of the parties. If a dispute cannot be settled within a period of thirty (30) calendar days with the mediator, the dispute shall be referred to and finally resolved by arbitration under the rules of the arbitrator appointed by agreement of the parties or by reference to a Judge of the British Columbia Court.



# SCRD Maps

## Property Report

### 466 MARINE DR

9/17/2020

Folio: 524.00697.000

PID: 010-897-321

Address: 466 MARINE DR

Jurisdiction: Gibsons

Lot: 1

Block: J

Plan: VAP6401

District Lot: 686

2020 Assessed Value: 1144000

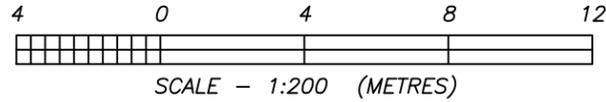
Land Value: 984000

Improvement Value: 160000

Approximate Lot Size (BC Assessment): 5742 SQUARE FEET



**SITE PLAN OF PART OF LOT 1 BLOCK J DISTRICT LOT 686  
PLAN 6401**



**NOTE:**

- DENOTES A STANDARD IRON POST FOUND.
- 100.00 STAKE DENOTES 1X2 WOODEN STAKE SET.
- + 100.00 DENOTES GROUND ELEVATION.
- △ DENOTES AN ALUMINUM RIVET SET.
- UCL DENOTES UNSURVEYED CROWN LAND.
- Wt. DENOTES WITNESS.

ALL DISTANCES ARE IN METRES.

DIMENSIONS OF THE LOT ARE FROM FIELD TIES TO SURVEY MONUMENTS AND FROM REGISTERED LTO PLANS.

DIMENSIONS ARE TO EXTERIOR MAIN WALL.

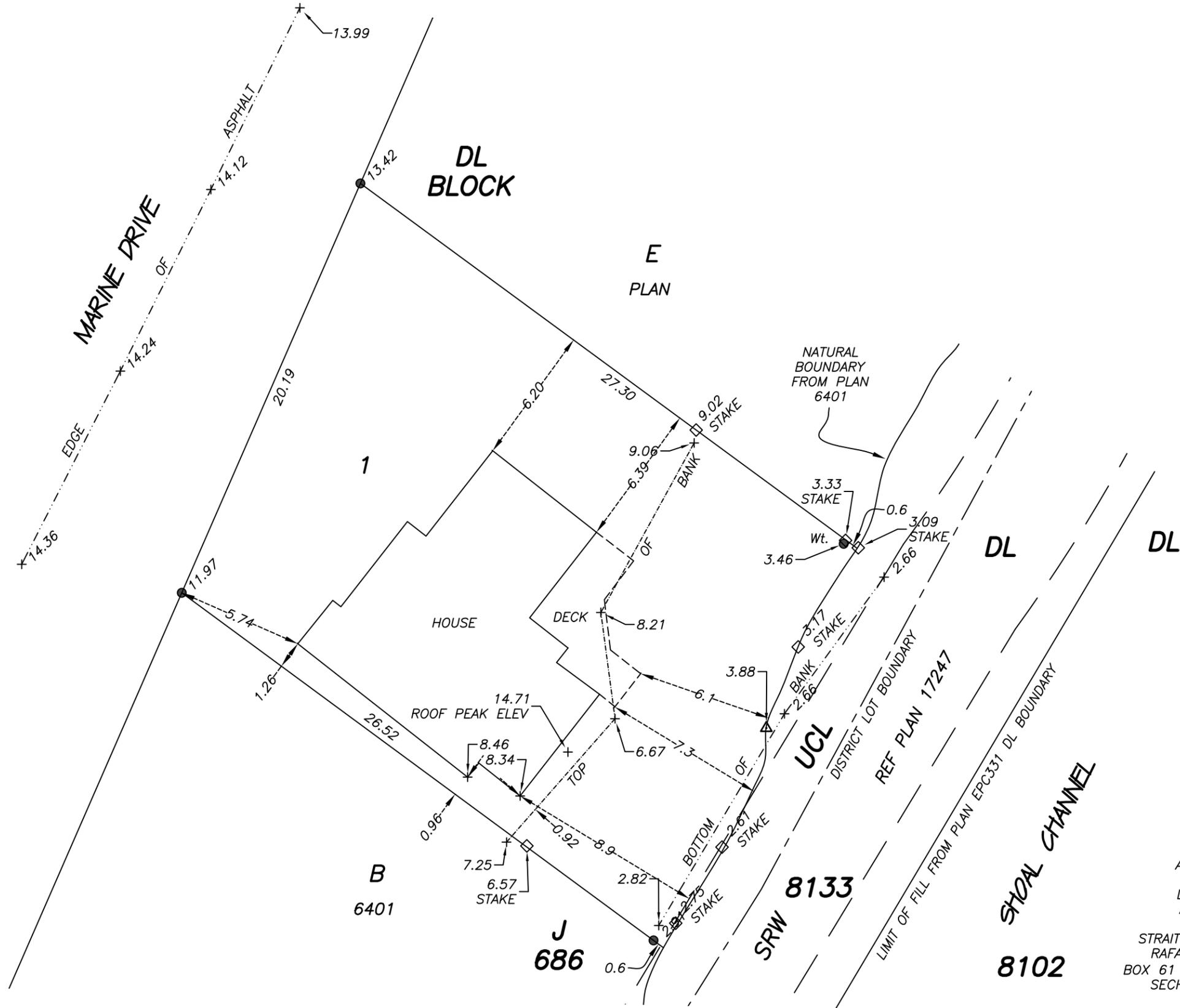
GEODETIC ELEVATIONS ARE IN METRES AND ARE REFERENCED TO THE CVD28BC VERTICAL DATUM DERIVED BY CONVENTIONAL SURVEY OBSERVATIONS TO GCM 94H1234.

LOCATION: 466 MARINE DRIVE, GIBSONS, BC  
PID: 010-897-321

THIS PLAN WAS PREPARED FOR  
LINCOLN CONSTRUCTION LTD.

THE REGISTERED OWNER OF LOT 1 ARE MICHAEL  
KARDA AND MARGARET KARDA.

COPYRIGHT 2020.



REVISED:  
AUGUST 28, 2020  
  
DATE OF SURVEY:  
AUGUST 6, 2020

STRAIT LAND SURVEYING INC.  
RAFAEL REBOLONE, BCLS  
BOX 61 (5689 DOLPHIN STREET)  
SECHLT, BC VON 3A0  
T. 604.885.3237

20147-1504

## Site Photos & Preliminary Retaining Wall Sketches



Figure 1: Current state of rear yard slope, looking west from waterfront path. Wood stakes with orange flagging delineate property boundary.



Figure 2: Looking south across neighbors' property towards subject slope. Note neighbor's tiered retaining walls.

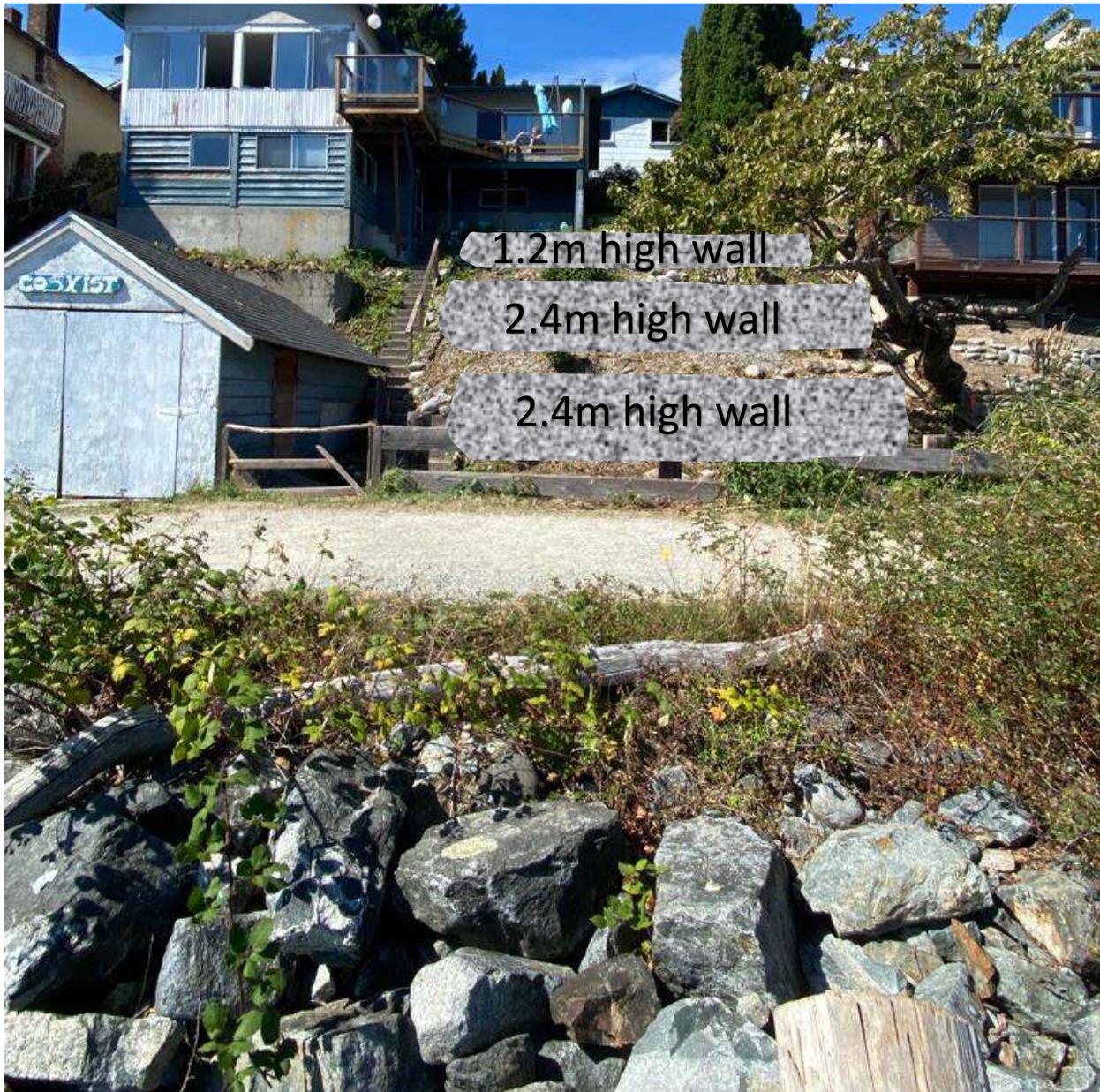


Figure 3: Rear yard slope and proposed retaining walls (looking west from marine shoreline)





Figures 6 & 7: Example of 2.5m high stacked boulder retaining wall recently built in Squamish BC

CSIO

# CERTIFICATE OF INSURANCE

 DATE (YY/MM/DD)  
 20/05/05
**BROKER**
 FX INSURANCE BROKERS LTD.  
 SUITE 114, 3218 JACKLIN ROAD  
 VICTORIA, BC V9B 0J5

**This certificate is issued as a matter of information only and confers no rights upon the certificate holder. This certificate does not amend, extend or alter the coverage afforded by the policies below**

 BROKER'S CLIENT ID: **GROUU-1** CERTIFICATE NUMBER: **2020-01 (REV)**
**COMPANIES AFFORDING COVERAGE****INSURED'S FULL NAME & MAILING ADDRESS**
 Ground Up Geotechnical Ltd.  
 PO Box 151  
 Garibaldi Highlands, BC

VON 1T0

|           |   |
|-----------|---|
| COMPANY A | Wawanesa Insurance Company                |
| COMPANY B | HDI Global Specialty SE - Canadian Branch |
| COMPANY C |   |
| COMPANY D |   |

**COVERAGES**

This is to certify that the policies of insurance listed below have been issued to the insured named above for the policy period indicated, notwithstanding any requirement, term or condition of any contract or other document with respect to which this Certificate may be issued or may pertain. The insurance afforded by the policies described herein is subject to all the terms, exclusions and conditions of such policies.

**LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.**

| TYPE OF INSURANCE   | CO LTR | POLICY NUMBER | POLICY EFFECTIVE DATE (YY/MM/DD) | POLICY EXPIRATION DATE (YY/MM/DD) | LIMITS OF LIABILITY<br>(Canadian dollars unless indicated otherwise) |             |
|---|--------|---------------|----------------------------------|-----------------------------------|--|-------------|
|   |        |               |                                  |                                   |  |             |
| <b>COMMERCIAL GENERAL LIABILITY</b><br><input checked="" type="checkbox"/> CLAIMS MADE OR <input type="checkbox"/> OCCURRENCE<br><input checked="" type="checkbox"/> PRODUCTS AND/OR COMPLETED OPERATIONS<br><input checked="" type="checkbox"/> EMPLOYERS' LIABILITY<br><input checked="" type="checkbox"/> CROSS LIABILITY<br><br><input checked="" type="checkbox"/> TENANT'S LEGAL LIABILITY<br><input checked="" type="checkbox"/> NON-OWNED AUTOMOBILE<br><input checked="" type="checkbox"/> HIRED AUTOMOBILES<br><input type="checkbox"/> POLLUTION LIABILITY EXTENSION | A      | M1118008      | 20/02/26                         | 21/02/26                          | EACH OCCURRENCE  | \$2,000,000 |
|   |        |               |                                  |                                   | GENERAL AGGREGATE  | \$5,000,000 |
|   |        |               |                                  |                                   | PRODUCTS-COMP/OP AGG   | \$2,000,000 |
|   |        |               |                                  |                                   | PERSONAL INJURY  | \$2,000,000 |
|   |        |               |                                  |                                   | TENANTS LEGAL LIABILITY  | \$2,000,000 |
|   |        |               |                                  |                                   | MED EXP (Any one person)   | \$10,000    |
|   |        |               |                                  |                                   | NON-OWNED AUTO   | \$2,000,000 |
|   |        |               |                                  |                                   | OPTIONAL POLLUTION LIABILITY EXTENSION                               | \$--        |
|   |        |               |                                  |                                   | (Per Occurrence)   | \$--        |
|   |        |               |                                  |                                   | (Aggregate)  | \$--        |
| <b>AUTOMOBILE LIABILITY</b><br><input type="checkbox"/> DESCRIBED AUTOMOBILES<br><input type="checkbox"/> ALL OWNED AUTOS<br><input type="checkbox"/> LEASED AUTOMOBILES<br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br>**ALL AUTOMOBILES LEASED IN EXCESS OF 30 DAYS WHERE THE INSURED IS REQUIRED TO PROVIDE INSURANCE  |        |               |                                  |                                   | BODILY INJURY AND PROPERTY DAMAGE COMBINED                           | \$--        |
|   |        |               |                                  |                                   | BODILY INJURY (Per Person)   | \$--        |
|   |        |               |                                  |                                   | BODILY INJURY (Per accident)   | \$--        |
|   |        |               |                                  |                                   | PROPERTY DAMAGE  | \$--        |
|   |        |               |                                  |                                   |  |             |
|   |        |               |                                  |                                   |  |             |
| <b>EXCESS LIABILITY</b><br><input type="checkbox"/> UMBRELLA FORM<br><input type="checkbox"/> OTHER THAN UMBRELLA FORM (Specify)  |        |               |                                  |                                   | EACH OCCURRENCE  | \$--        |
|   |        |               |                                  |                                   | AGGREGATE  | \$--        |
| <b>OTHER LIABILITY (SPECIFY)</b><br><input checked="" type="checkbox"/> ERRORS & OMISSIONS (Claims Made)  | B      | CC0060020000  | 20/02/26                         | 21/02/26                          | EACH OCCURRENCE  | \$1,000,000 |
|   |        |               |                                  |                                   | AGGREGATE  | \$1,000,000 |

**ADDITIONAL INSURED, but only with respect to liability arising out of the operations of the Named Insured.**

N/A

**DESCRIPTION OF OPERATIONS/LOCATIONS/AUTOMOBILES/SPECIAL ITEMS**

Engineering and Consulting

**CERTIFICATE HOLDER**

To Whom it may concern.

**CANCELLATION**
 Should any of the above described policies be cancelled before the expiration date thereof, the issuing company will endeavor to mail n/a days written notice to the certificate holder named to the left, but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or representatives

SIGNATURE OF AUTHORIZED REPRESENTATIVE

FX INSURANCE BROKERS LTD.

Per:



PRINT NAME INCLUDING POSITION HELD

 Doug Roddick, CAIB  
 Senior Account Executive  
 DIRECT 250.217.7097

FAX NUMBER

866.828.7679

EMAIL ADDRESS

droddick@fxinsurance.ca

COMPANY

FX INSURANCE BROKERS LTD.

DATE

20/05/05

CSIO CERT (6/00)

OP ID AH

CSR AJH

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# **Marine Foreshore Environmental Assessment**

**Lot 1, Block J, DL 686, Plan 6401**

**466 Marine Dr**

**Gibsons, BC**

October 3, 2020

Cam Forrester & Associates Ltd., 6231 Sunshine Coast Highway, Sechelt, BC, V0N 3A7

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## **1. Introduction**

Lincoln Construction, on behalf of the owners of 466 Marine Dr, has engaged Cam Forrester & Associates to conduct an Environmental Assessment that addresses the environmental requirements of the Gibsons Official Community Plan, Marine, Foreshore and Shoreline Areas Development Permit Area 2 (DPA2). The objective of DPA2 is to: “protect environmentally sensitive areas from development”. As it applies to this lot, the main areas of concern are “environmentally sensitive marine shore areas and proximate eelgrass beds”.

Cam Forrester is a Qualified Professional with expertise in habitat conservation, ecosystem classification and environmental services, who has assessed the foreshore habitat values, development risks and has proposed appropriate practical mitigation measures.

In addition, Geotechnical Hazards Development Permit Area (DPA1) requires that a development permit be obtained to ensure that property development will not damage the shoreline and marine environments with respect to slope regression and foreshore and shoreline processes. Patrick Sails, P. Eng, has provided a draft Geotechnical assessment for DPA 1 (Geotechnical Hazards) certifying the safe use of the land including recommendations and mitigation measures. That assessment is concerned with the setback from the marine shore top of bank, contrasting with DPA 2, which is the zone extending to 15m from the natural boundary. Based on the recommendations in that DPA1 report, there is a low likelihood of construction impacts from proposed developments on the adjacent marine environment. slope regression and any design requirements with respect to the foreshore and shoreline processes.

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## **2. Assessment Area**

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The property boundary is setback approximately 7.5m from the marine shoreline, or Present Natural Boundary (PNB), of Shoal Channel. According to the Site Plan, the small fenced yard at the base of the slope is not part of the subject property and is actually Unsurveyed Crown Land (labelled UCL on the Site Plan – Attachment 1). Below the fenced yard, there is a gravel waterfront pathway, which is immediately above the marine shoreline. The pathway was likely constructed with imported fill material. At the toe of slope, the marine shoreline (PNB) is lined with large angular boulder rip rap.

The environmental assessment area is the waterfront zone of Lot 1, comprised of the intertidal zone combined with the 15m parcel boundary setback (upland from the natural boundary), as defined by the DPA 2.

Two obvious strata were identified and assessed; A), - terrestrial (from the natural boundary to 15m inland), which aligns with the distance from the High Tide Line By-law setback zone boundary; and B), - the marine foreshore intertidal zone from the High Tide Line to the Low Tide Line, along Shoal Channel, northeast of Gibsons Landing. Relevant information was also collected from inventory resources on the general offshore marine environment affecting the property.

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## **3. Methods**

The survey was conducted during a site visit in Sept 27, 2020 by Cam Forrester, R.P.F and Eugenie Jacobsen, BSc. The terrestrial ecology was assessed and classified in accordance with the British Columbia Biogeoclimatic Ecosystem Classification System. The physical and biological character of the adjacent marine foreshore is classified according to the Physical Shore-Zone Mapping System for British Columbia, the British Columbia Biological Shore-Zone Mapping System and the British Columbia Marine Ecological Classification system.

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## **4. Background**

- There are two high-value marine habitat elements to take into account during this build; - A) the rocky intertidal zone along the subject property foreshore; - and B) - the sub-tidal eelgrass bed located directly offshore;

- The town of Gibsons and West Howe Sound shorelines contain significant eelgrass habitat compared to the rest of Howe Sound/Atl'ka7tsem's mainland coast<sup>1</sup>; and,
  - There are no watercourses affected by the build.
- 

## **5. Description of Resource**

### **Rocky Intertidal Zone**

**Foreshore:** Cobble & gravel beach.

The waterfront lot boundary is an exposed high energy beach, which is characterized as having a permeable sediment mixture of boulders, cobbles, pebbles and sand (>10% sand content and > 10% gravel content). The boulder/cobble material in the lower and middle intertidal zone occurs as armor over a sand gravel mixture. The cobble beach occurs in the lower, middle to upper and intertidal zone, and is also characterized by biological diversity in the form of fish access during high tides and heavy juvenile crustacean (crabs) use in the lower to middle intertidal zones. Storm deposits of logs and woody debris are characteristic of the supra-tidal zone.

The beach slope is in the range of 2° to 5° with a manmade rip rap shoreline protection structure at the high tide line.

Marine shoreline habitats contribute significant ecosystem functions, providing rich habitat for many species of fish, invertebrates, microorganisms, and shorebirds. In addition to filtering pollutants, shoreline habitats also provide structural integrity to the water's edge by protecting it from erosion. At Lot 1, the shoreline acts a buffer from the strong wave and wind action of Howe Sound/ Atl'ka7tsem.

### ***Ecosystems Services & Mitigation***

Algae - Macroalgae are important in both a biochemical sense as well as a physical sense. Macroalgae found in the Lot 1 foreshore include many of the beneficial macroalgae which removes excess nutrients and pollutants from sea water (Photo 1). *Fucus gardneri*, or more commonly known as rockweed, is the dominant species found on site. *F. gardneri* consists of multiple branches each with an air bulb at their tip. The bulbs allow the plant to stay orientated towards the sunlight when the tide rises. When the tide is high, rockweed provide shelter from sunlight and predators for juvenile fish and shoreline crabs (*Hemigrapsus oregonensis*). At

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<sup>1</sup> Gibsons Harbour Eelgrass Survey, Howe Sound Reference Guide 2019, Fiona Beaty & Dianne Sanford

low tide, rockweed also provides shelter for small crabs, fish, and invertebrates by acting as temperature regulator and physical barrier from predators.

Mitigation – Although rockweed is a common species found along the coastline of BC, the importance of macroalgae cannot be overlooked. Because they are anchored to the rocky shore, rockweed can continue to provide these valuable ecosystems services even during strong wave action. However, the most sensitive aspect of rockweed is their ability to photosynthesize. If the plant is smothered by sediment or pollutants, they will not be able to reach the sunlight. Therefore, the biggest threats to rockweed are sediment run-off and pollutants from upland construction sites, thermal discharges, oil discharges, and stormwater run-off. Practices should be put into place to prevent the smothering and destruction of this macroalgae.

Filter feeders – Similar to the algal species that inhabit the rocky intertidal zone, filter feeders like oysters and mussels help in maintaining water quality. They remove phytoplankton from sea water and help to reduce the impact of harmful algae blooms (HAB's). Two species of interest found at Lot 1 include *Crassostrea gigas*, or the pacific oyster, as well as *Mytilus edulis*, or the Salish mussel (Photo 2).

Mitigation - Given the increase in urbanization and habitat destruction of littoral areas, mussel and oyster populations are in slow decline. During the Lot 1 assessment, only a few oysters were found which suggests that the area has already experienced habitat loss. To help prevent further habitat impacts, the constructor will implement practices to prevent pollutant run off, erosion of sediments, and physical disturbances on the intertidal zone during construction.

Shorebirds – Shorebirds contribute to a healthy ecosystem and help to keep populations of fish, crabs, aquatic insects, and other small mammals in check. They feed primarily during low tide is low or in shallow waters when the tide is less than 50 cm (20 in) deep. A healthy shoreline is often defined by the presence of shoreline birds – especially by the presence of *Ardea Herodias fannini*, or the Great Blue Heron, which was observed foraging during the assessment. (The Great Blue Heron is an iconic symbol of wetland conservation and environmental quality.) (Photo 3).

Mitigation – Under both the Species at Risk Act (SARA) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the great blue heron has been granted 'Special Concern' status. Small nesting colonies are common on the Sunshine Coast with nests located at 4-70 m above ground and consist of large stick platforms under one meter in diameter. They are typically constructed on the horizontal branches of mature, Black Cottonwood, Bigleaf, Maple, or conifers. Taking note of the lack of trees in Lot 1, there are neither heron nests or perching habitat. However, the foreshore feeding grounds are significant. Construction

practices will address the need to reduce habitat loss of eelgrass beds and impacts to the rocky intertidal zone.

### **Eelgrass Beds**

Seagrasses are marine plants found globally and contribute to a vast number of ecosystem services. The eelgrass species that is native to the Pacific Northwest is known as *Zostera marina*. Their growth form results in dense underwater meadows. Eelgrass beds are highly productive in terms of photosynthesis and contribute significantly to the primary biomass production of inshore waters. This inherent productivity and complex physical structure support critical habitats for various economic and culturally important species like juvenile salmon, Pacific herring, Dungeness crabs, and many more. Eelgrass beds also provide dense canopies to filter wave energy, while their roots help to stabilize sediment and prevent particulate resuspension. The collective socio-economic and biological functions of eelgrass beds in the Salish Sea are estimated to be worth \$87,000 per hectare per year<sup>2</sup>.

Mitigation - Eelgrass beds are relatively rare in Howe Sound and tend to grow in narrow fringes rather than larger flat beds as seen in other locations in the Salish Sea. At the Lot 1 location, we can see evidence of one of these sensitive fringing eelgrass beds located just offshore (Photo 4). Considering that Howe Sound is a fjord with steep slopes and little intertidal zonation, there are not many places where these sensitive nursery habitats can survive. Unlike the rest of the Sound, Gibsons Harbour and its counterparts foster dense and relatively healthy beds. Eelgrass in the Town's recreational water lease is in a stable but declining state of health relative to previous surveys in 2013 and 2004.

To avoid further destruction to this highly valuable habitat, many of the same principles for the rocky intertidal zone apply. The most significant threats to seagrass growth and distribution have been identified as; water column light conditions affected by nutrient loading and siltation, dead oxygen zones caused by eutrophication (run-off of fertilizers), and physical disturbances caused by coastal development (see Table 1 for a summary).

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<sup>2</sup> 2015, Molnar, M. Measuring the return on Howe Sound's ecosystem assets, Sound investment: Measuring the return on Howe Sound's ecosystem assets. The David Suzuki Foundation.

**TABLE 1: Species Impact Summary**

| <b>SUMMARY</b>          |  |  |
|-------------------------|--|--|
| <b>Rocky Intertidal</b> | <ul style="list-style-type: none"> <li>- Pacific oyster</li> <li>- Common acorn barnacle</li> <li>- Green shore crabs</li> <li>- Ribbed limpet</li> <li>- Checkered periwinkle</li> <li>- Tidepool sculpin</li> <li>- Eelgrass beds</li> </ul>   | Highly sensitive<br>High concern   |
| <b>Marine Mammals</b>   | <ul style="list-style-type: none"> <li>- Harbour porpoises</li> <li>- Sea lions (occasional)</li> <li>- Harbour seals</li> <li>- Pacific white-sided dolphin</li> <li>- Grey whale</li> <li>- Killer Whale</li> <li>- Humpback whales</li> </ul> | Moderate sensitivity<br>Low concern (little influence by Lot 1 construction) |
| <b>Shorebirds</b>       | <ul style="list-style-type: none"> <li>- Bald eagles</li> <li>- Oyster catchers</li> <li>- Herons</li> <li>- Cormorant</li> <li>- Dabbling</li> <li>- Geese</li> <li>- Gulls</li> <li>- Loons</li> </ul>   | Moderate Sensitivity<br>Moderate concern                                     |

Comment: Not all species living in the Sound will be affected by construction at Lot 1. This table provides a brief indication of the species that are sensitive as well as levels of concern caused by the construction impacts. The most sensitive areas are the rocky shores (including seagrass beds), as well the shorebird habitats.

### **Aquaculture Capability**

Not assessed. - (Salmon, Japanese scallops, Manilla clams, Pacific Oyster)

### **Biological Resources – Bird presence**

(Alcids (auks, murrelets etc.), Bald eagles, Oyster catchers, Herons, Cormorants, Dabbling & Diving ducks, Geese, swans & gulls, Loons & grebes).

### **Biological Resources – Mammal presence**

- Harbour porpoises
- Sea lions (occasional presence)
- Harbour seals
- Pacific white-sided dolphin
- Grey whale, Orca, Humpback whale, - occasional recent sightings
- (Absent are: Sea otter)

### **Biological Resources – Significant plant communities**

No at risk ecosystems or vascular plants were observed.

### **Biological Resources – Fisheries**

Commercial (crab, salmon troll).

Recreation (crab, finfish, diving).

### **Physical Classification of marine shoreline environment**

| Element                | Values                             |
|------------------------|------------------------------------|
| Marine ecosection      | Strait of Georgia                  |
| Benthic ecosection     | -                                  |
| Pelagic                | Polyhaline (18-28ppt) - Stratified |
| Current                | Low (<3 knots)                     |
| Depth                  | Photic (0-20m) to Shallow (<20m)   |
| Exposure               | Low-medium                         |
| Slope                  | 5-20%                              |
| Roughness / relief     | Medium                             |
| Repetitive shore types | 5 – rock, sand, gravel             |
| Tides                  | Moderate-Low                       |

## **Terrestrial environment description**

The slope directly above the pathway and overlapping the DPA 2 setback is characterized by a shallow soil veneer, with extensive areas of bare exposed soil, with sparse vegetation other than exotics and domestic volunteers. Also, beyond the setback zone and overlapping into the setback is a pre-existing rustic concrete pathway and remnant gardens. Soils are characterized by a disturbed organic layer over a 30-100 cm mesic, gravelly Bf horizon

The Biogeoclimatic classification for the site is CWH xm1. The original native forest on the site would have been a stand of exposed dry site arbutus, Douglas-fir, western hemlock, western red-cedar. Productivity ranges from  $SI_{50} = 27-33$

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## **6. Development Plans**

A series of three engineered rock stack walls are proposed for the northern two thirds of the lot. (See Attachment 1)

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## **7. Shoreline Processes**

This DPA 2 environmental report relied on the comments and recommendations of a Geotechnical assessment<sup>3</sup>. The proposed construction is to build the rock retaining walls inside of both the DPA 1 & DPA 2 setback. However, the foreshore will not be affected by this development and the report concludes that the retaining walls 'will protect the slope from erosion during extreme oceanic storm events. There are no further geotechnical setback or design recommendations for weathering and slope regression or for protecting infrastructure from shoreline processes.

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## **8. Recommendations**

As noted above, the ground condition of the lot is that it has previously been developed into gardens that more recently appear to have been prepared for the rock wall construction. Further clearing, construction, and disturbance within the DPA 2 15m planning zone will not affect the natural functions and processes that support habitat and shoreline protection. Disturbance is limited to pre-existing rustic pathways and the landscaped slope. With due care and attention to construction environmental best management practices, the construction will not

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<sup>3</sup> Sales, Patrick, P.Eng., Geotechnical Assessment Report for Proposed Landscape Retaining Walls, Sept 23, 2020. Ground Up Geotechnical.

result in any additional impact to the general marine environment or fish habitat along the marine foreshore.

## **Construction best practices and mitigation measures:**

### **Clearing, & Excavation**

Site preparation for the new construction, including, demolition, clearing and excavation will be located inside of the DPA 2 15m setback. The highest risk element during construction is sediment delivery to the marine foreshore zone.

- The flat section of ground adjacent to the pathway will serve to capture any sediment and run-off, which can be supplemented with sediment fence, straw wattles, or straw mulch;
- If soil piles are left exposed for more than 24 hours, they should be covered with tarps or similar material; and,
- Shut down operations during extreme weather events.

### **Encroachment & Protection of Trees**

The pre-existing condition of the lot will not be materially changed with the construction of rock walls. The builder and owner will avoid unplanned trails, refuse dumping, soil disturbance, machine tracking, vegetation conversion or tree clearing in the setback zone. Paths should be constructed with granite or other natural steppingstone-style material placed in a fashion that directs traffic to decrease disturbance to erodible soils.

There is only one domestic tree at the edge of the property just outside the northern boundary. Normal tree protection recommendations do not apply.

### **Stormwater Management - Sediment and Erosion Control**

Management of sediment and erosion within the assessment area and setback zone shall be considered part of construction and can be implemented with a minimum of effort and costs given the scale of development. Consider the following procedures:

- Minimize soil disturbance by timing, clearing as close to construction as possible to avoid long periods of bare soils being exposed to rain and run-off erosion;
- Install sediment fences at the slope break;
- Mulch or consider plastic covers for exposed soils; and,

- Re-vegetate disturbed areas post-construction.

The objective of sediment and erosion control is to avoid contaminated (sediments) run-off towards the foreshore during construction.

### **Pollution Prevention**

Machinery and equipment should arrive at site mechanically sound, clean and free of dirt, invasive plants, grease buildup, hydrocarbon leaks, hanging drips and worn or frayed hoses;

Machinery should be parked as far from the ocean as possible;

A large format barrel-sized spill kit should be staged with the equipment and every machine should have a spill kit; and,

Emergency spill response contact numbers should be part of the site safety plan.

### **Environmental Monitoring**

An environmental monitoring program is recommended during the rock wall construction phase to ensure that the setback zone is understood and protected.

This will consist of:

- crew education and standard environmental operating procedures for construction;
- pre-work meeting, pre-work plan and crew signoffs;
- on-site monitoring as required to ensure setback zone integrity through following the pre-work plan;
- the ability for the qualified monitor to direct and advise works related to protection of the setback zone, especially on the implementation of erosion and sediment controls;
- the ability to issue stop work orders in the case of practices that are illegal or damaging the setback zone;
- the ability to report environmental infractions related to habitat protection regulations;
- Photographs and notes should be taken to document the various phases of construction, any observed environmental events and their resolution.

A Post-development Report is to be completed and kept as a record of the practices and procedures followed during construction.

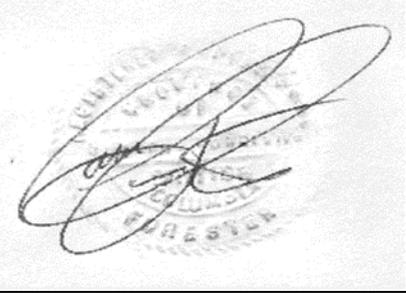
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## 9. Professional Opinion

The proposed construction of a rock wall structure will not result in material alteration of natural marine foreshore or offshore features or habitat.

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### Certification

| QEP SIGNATURE and SEAL  | QEP PRINTED NAME                        |
|---|---|
|  | <p>Cam Forrester, R.P.F.<br/># 2118</p> |
|   | <p>Date signed: October 3rd, 2020</p>   |

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## Photos



**Photo 1 – Rockweed, *Fucus gardneri*, dominating in the intertidal zone.**



**Photo 2 – Salish mussel, *Mytilus edulis*, and Pacific oysters, *Crassostrea gigas*, are present.**



**Photo 3 – Great blue heron, *Ardea Herodias fannini*.**



**Photo 4: Foreshore riprap stabilization. Viewing northeast from below Lot 1 at the water.**



**Photo 5: Upland southeast portion of Lot 1, site of proposed tiered rock wall construction. Waterfront gravel pathway also visible in foreground.**



**Photo 6: Upland southeast portion of Lot 1, site of proposed tiered rock wall construction. Pre-existing rustic landscaping within DPA 2, lack of native vegetation, disturbed ground.**



**Photo 7: Upland southwest portion of Lot 1.**

# Site Plan / Map

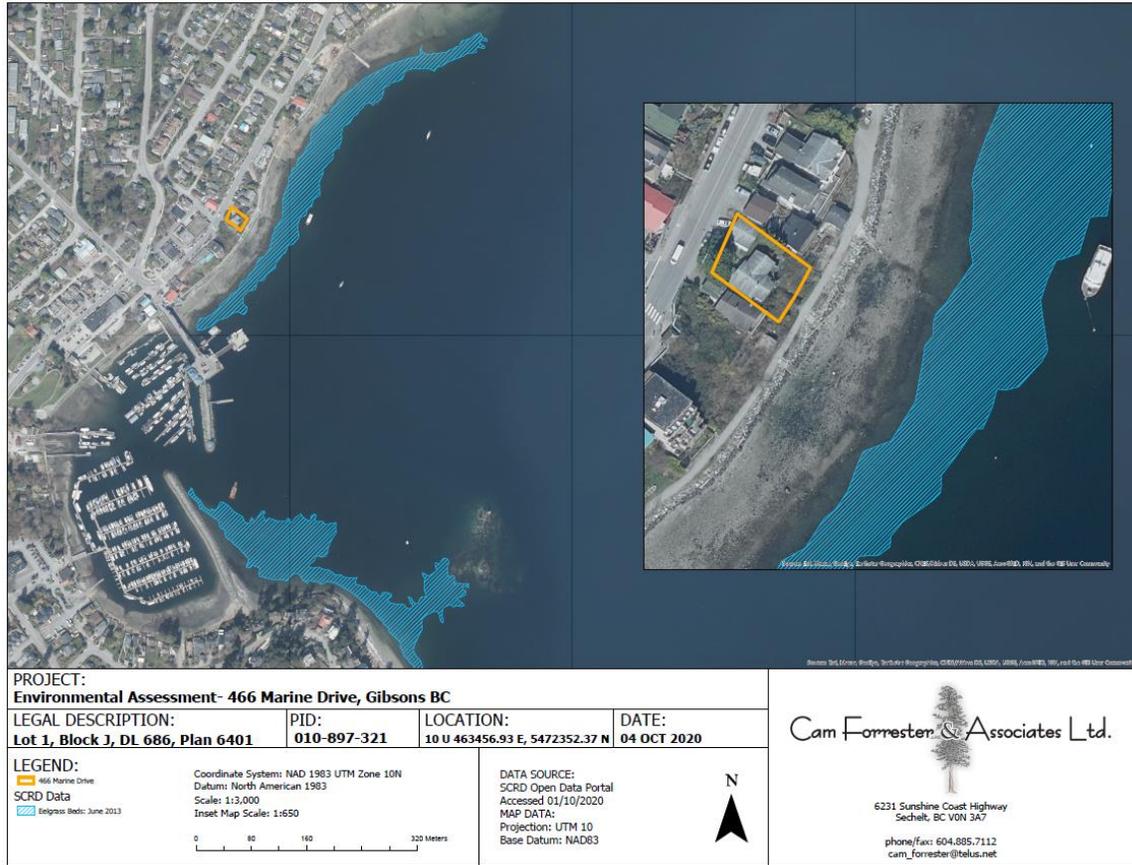
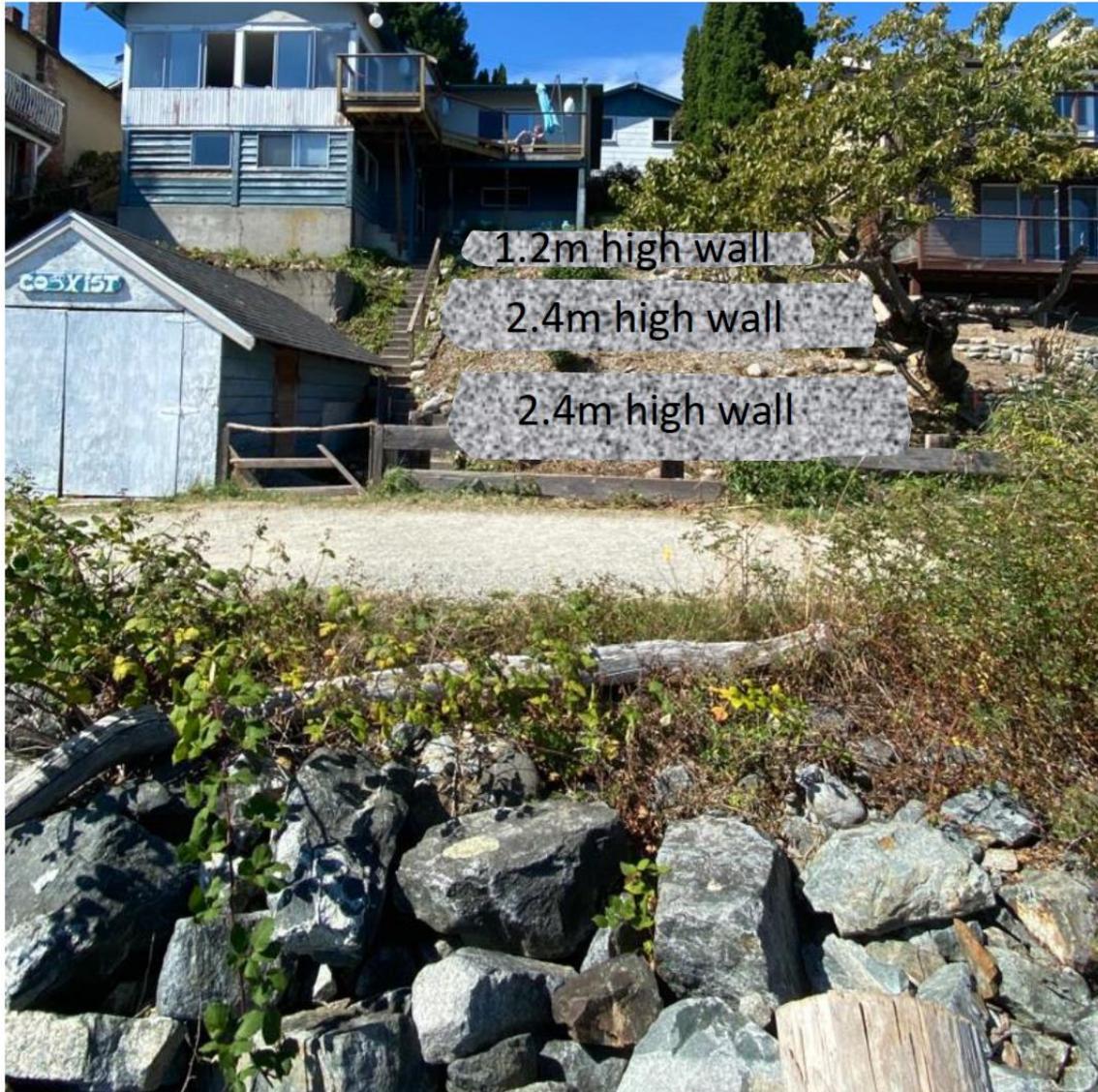


Figure 1 DPA 2 setback, and assessment area relative to construction.

## ATTACHMENT – Preliminary Retaining Wall Sketches<sup>4</sup>



Proposed retaining wall location & configuration.

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<sup>4</sup> Site Photos & Preliminary Retaining Wall Sketches, 2020. Lincoln Construction Ltd.

