January 22, 2025 (Version 1)
Project No.: **K-180314-00**

Bowen Island Properties
PO Box 228
Bowen Island, BC
V0N 1G0

Attention: Daron Jennings
djennings@bowenislandproperties.ca

RE: Geotechnical Review for Rezoning
Seymour Landing at Cowan Point, 802, 806, 807, 810 McIntosh Lane and 826 Seymour Bay Road, Bowen Island, BC

Dear Daron Jennings,

1.0 INTRODUCTION

In accordance with your recent request, Kontur Geotechnical Consultants Inc. ("Kontur") has completed this *Geotechnical Review* for the above-referenced project. The purposes of this study are to characterize the site from a geotechnical point-of-view and to provide geotechnical engineering comments and recommendations with respect to the feasibility of constructing single family and multi-family residential buildings.

This letter which summarizes the findings of the *Geotechnical Review*, has been prepared in accordance with standard and widely accepted geotechnical engineering principles and practices for similar projects in this region. This report does not address any archaeological, environmental, or other engineering considerations related to the project.

Review and use of this letter should be completed in accordance with the attached *Interpretation and Use of Study and Report* document. It is included as an integral part of this report and should be read in conjunction with all parts of this report.

2.0 PROJECT DESCRIPTION

Based on review of provided proposed concept development site plan and information regarding number of units the project generally consists of the following:

- 802, 806, 807 and 810 McIntosh will have a total of between 28 and 54 residential units;
- 826 Seymour Bay Road will have a total of between 5 and 7 residential units;
- Seymour Landing at Cowan Point will consist of:
    - "Seniors Campus" comprising between 49 and 85 residential units including 9 units in a "Larger Building";
    - "Cottage Hill" comprising between 15 and 26 units; and,
    - "Mini-Plaza" comprising between 18 and 21 residential units.

3.0 METHODOLOGY

The following sources of information were reviewed and are referenced as part of this study:

- Geotechnical assessment report titled "*Geotechnical Assessment Rockfall and Steep Slope Areas Proposed Subdivision Phase 1A and B Cowan/ Point Seymour Bay Landing Development Bowen Island, B.C.*" prepared by Trow dated June 27, 2006;
- Relevant information obtained from the Bowen Island Municipality (BIM) online web-mapping application;
- Topographic plan with conceptual development overlay prepared by Think Modus; and,
- Site reconnaissance conducted by senior Kontur personnel to observe, record and photograph features of geotechnical significance.

The location and conceptual site layout are attached to this report.

4.0 SITE DESCRIPTION

4.1 General

The subject properties are located on the southeastern portion of Bown Island near Seymour Bay, about 4.4km south of Snug Cove. The subject properties include:

- 810 McIntosh Lane located at the northeast corner of the intersection of McIntosh Lane and Seymour Bay Road;
- 806 and 807 McIntosh Lane accessed from a hairpin corner of the roadway about 100m from the intersection of Seymour Bay Road and McIntosh Lane;
- 802 McIntosh Lane accessed by means of a shared driveway (with 807 McIntosh Lane) for the hairpin corner;
- 826 Seymour Bay Road located on the north side of Seymour Bay Road about 130m west of the intersection of Seymour Bay Road and McIntosh Lane; and,
- The subject portions of Seymour Landing at Cowan Point comprised an area south of Seymour Bay Road from about 270m to about 450m east of the intersection of Cowan Point Road and Seymour Bay Road.

4.2 Surface Conditions

The subject properties are located in an area where topography generally consists of southeast facing slopes.

The properties accessed from McIntosh Lane (810, 806, 802and 807) have slope inclinations ranging from about 1.5H :1V (Horizontal: Vertical) to 4H: 1V with localized steeper areas and near vertical bedrock bluffs up to about 5m height. A gravel access road about 5m wide had been constructed across the northern portion of 807 McIntosh Lane. The near vertical bedrock bluffs are generally located on the north side of the access road.

Topography within 826 Seymour Bay Road generally consisted of southeast facing slopes with an overall inclination of about 3H: 1V with the lower portion (south) having inclinations of about 4H: 1V, steepening

to the north with very steep bedrock slopes (1H: 2V) located in the northwest corner of the property. Localized bedrock bluffs up to about 3m high were noted within the property and along the northern property boundary bedrock bluffs up to about 15m height were noted. The area below the toe of the higher bedrock bluffs in the northern portion of the property is generally flat lying with a bench width of about 20m.

Topography within Seymour Landing at Cowan Point generally consisted of gently inclined southeast facing slopes (about 7H: 1V) with localized areas of flat lying ground surface and steeper bedrock slopes/bluffs. Bedrock bluffs were up to about 3m in height and generally associated with cut slopes to accommodate the construction of a gravel access road originating on Seymour Bay Road and traversing to the southwest (Seymour Landing Lane). A gully is located in the eastern portion of the property, which had largely been infilled previously with blast rock.

A small gully (500mm deep and 7m wide) is located with a southwest flow direction through 807 and 802 McIntosh Lane, across Seymour Bay Drive and into the eastern portion of Seymour Landing at Cowan Point. The gully appears to have experienced periodic water flow but was dry at the time of site reconnaissance. A watercourse is also located east of McIntosh Lane crossing Seymour Bay Drive in an 800mm culvert and flowing parallel to Seymour Landing Lane. The gully containing the watercourse is about 4m wide and 2m deep.

4.3 Subsurface Conditions

Interpretation of subsurface soil and groundwater conditions at the site are based on Kontur's nearby and relevant experience and the geotechnical site reconnaissance completed as part of this study.

During site reconnaissance exposed bedrock (strong dioritic rock) was noted throughout the subject properties. Thin overburden soils (generally less than 1m thick) generally consist of compact sand with some gravel and trace to some silt based on visual observation of existing soil exposures.

Localized ponding was noted in some areas within the subject properties. The ponded water is considered representative of localized perched water on underlying bedrock. Fluctuations in groundwater conditions should be anticipated at this site which may be influenced by seasonal precipitation and/or nearby land uses.

4.4 Subsurface Variability

It is important to note that the subsurface conditions described above and observed at the various soil and bedrock exposures are considered representative of the specific conditions in the immediate vicinity of each exposure. Extrapolation and interpretation of the subsurface profile is formulated based on an assumed horizontal continuity of subsurface conditions across the site. Therefore, the conditions or units described above are generalized and based on the observed exposures information only. Variation in stratigraphic conditions should always be expected.

5.0 GEOTECHNICAL ENGINEERING COMMENTS AND RECOMMENDATIONS

5.1 General

Based on Kontur's understanding of the project, information, and findings described above, the following geotechnical engineering comments and recommendations are provided with respect to proposed development of the subject properties.

It is Kontur's opinion that the significant geotechnical considerations for the project may be related to rockfall and flooding.

The subject properties were generally sloped with moderate to gently inclinations. However, localized bedrock bluffs could be a source of rockfall. The noted watercourse has been provided with a channel and a culvert designed for anticipated flows by others.

5.2 Rockfall

Rockfall can originate from steeply inclined (near vertical) bedrock bluffs.

In the case of the bedrock bluffs located above the access road at 807 McIntosh Lane, the bluffs were estimated to have a height of about 5m. A rockfall catchment ditch with dimensions of 2m wide and 1m deep would provide adequate rockfall protection for residential development below the access road.

Rockfall originating from the bedrock bluffs located north of 826 Seymour Bay Drive are considered to have a runout distance from the bedrock bluff defined by a line inclined at about 28^{o} from horizontal originating at the rockfall source. Hence, the project runout from these bluffs (heights of about 15m) would likely be in the order of about 28m. This distance could be significantly reduced with the use of berms. The design and requirement of such berms would be determined as locations of proposed residential building is further developed.

Kontur considers that rockfall hazards within the subject properties can be suitably mitigated with proper analysis and design.

5.3 Flooding

The main watercourse noted within the subject study area is currently flowing through a culvert and channel designed by others for anticipated flows.

It is understood that the gully within 807 McIntosh Lane was constructed to provide drainage for this portion of the proposed subdivision; however, the drainage system was redesigned to direct water to the main watercourse discussed above. As such, it is assumed flooding potential has been mitigated as a result of the drainage re-design developed by others.

6.0 CLOSURE

Kontur has conducted a review of the proposed residential development as described above with respect to feasibility from a geotechnical point-of-view. It is confided that identified naturally occurring geologic hazards (Rockfall, flooding) could feasibly be mitigated to provide areas which are safe for intended use

(construction of residential buildings). The subsurface conditions (bedrock overlain with a thin layer of granular overburden soils) would provide adequate support for proposed buildings within typical tolerable settlement for such buildings. Global stability of the bedrock slope is considered adequate for static and seismic conditions.

The comments and recommendations presented in this letter are based on the referenced information and Kontur's understanding of the project as described herein. If site conditions or project parameters differ from those described in this report, Kontur should be notified promptly to review geotechnical aspects of the project and provide additional or modified comments and recommendations, as deemed appropriate. Contractors should make their own assessments of subsurface conditions at this site and select the construction means and methods that are most appropriate for encountered site conditions.

This letter has been prepared for the exclusive use of Bowen Island Properties ltd. and/or their designated agents or consultants for the intended purpose described herein. The Bowen Island Municipality may use the information for development and/or building permit purposes. Any use of the information contained in this report for other than its intended purpose or by any other party must first be verified in writing by Kontur. Kontur does not accept any responsibility or damages because of any other party relying on or using the information, interpretations, opinions, comments, and/or recommendations that are contained in this report.

Kontur trusts that the information described above meets your current requirements. If you should have any concerns or questions, please do not hesitate to contact the undersigned.

Sincerely,

Kontur Geotechnical Consultants Inc.
EGBC Permit to Practice #1000925

Per:

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
E. SYKES
23025

2025-01-22
Evan Sykes, P.Eng.
Principal | Geotechnical Engineer

Reviewed by:

2025-01-22
Brian L.J. Mylleville, Ph.D., P.Eng.
Senior Geotechnical Engineer

Attachments: Interpretation and Use of Study and Report
Photos
Figure 1 –Site Plan

INTERPRETATION AND USE OF STUDY AND REPORT DOCUMENT

1.0 STANDARD OF CARE

This study and Report have been prepared in accordance with generally accepted engineering consulting practices in this area. No other warranty, expressed or implied, is made. Engineering studies and reports do not include environmental engineering or consulting.

2.0 COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report which is of a summary nature and is not intended to stand alone without reference to the instructions given to us by the Client, communications between us and the Client, and to any other reports, writings, proposals or documents prepared by us for the Client relative to the specific site described herein, all of which constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. WE CANNOT BE RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3.0 BASIS OF THE REPORT

The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose that were described to us by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document are only valid to the extent that there has been no material alteration to or variation from any of the said descriptions provided to us unless we are specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4.0 USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT OUR WRITTEN CONSENT. WE WILL CONSENT TO ANY REASONABLE REQUEST BY THE CLIENT TO APPROVE THE USE OF THIS REPORT BY OTHER PARTIES AS "APPROVED USERS". The contents of the Report remain our copyright property and we authorise only the Client and Approved Users to make copies of the Report only in such quantities as are reasonably necessary for the use of the Report by those parties. The Client and Approved Users may not give, lend, sell or otherwise make the Report, or any portion thereof, available to any party without our written permission. Any use which a third party makes of the Report, or any portion of the Report, are the sole responsibility of such third parties. We accept no responsibility for damages suffered by any third party resulting from unauthorised use of the Report.

5.0 INTERPRETATION OF THE REPORT

Nature and Exactness of Descriptions: Classification and identification of soils, rocks, geological units, contaminant materials, building envelopment assessments, and engineering estimates have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature and even comprehensive sampling and testing programs, implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations, or building envelope descriptions, utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarising such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and all persons making use of such documents or records should be aware of, and accept, this risk. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

Reliance on Provided information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in the report as a result of misstatements, omissions, misrepresentations or fraudulent acts of persons providing information.

To avoid misunderstandings, KONTUR should be retained to work with the other design professionals to explain relevant engineering findings and to review their plans, drawings, and specifications relative to engineering issues pertaining to consulting services provided by KONTUR. Further, KONTUR should be retained to provide field reviews during the construction, consistent with building codes guidelines and generally accepted practices. Where applicable, the field services recommended for the project are the minimum necessary to ascertain that the Contractor's work is being carried out in general conformity with KONTUR's recommendations. Any reduction from the level of services normally recommended will result in KONTUR providing qualified opinions regarding adequacy of the work.

6.0 ALTERNATE REPORT FORMAT

When KONTUR submits both electronic file and hard copies of reports, drawings and other documents and deliverables (KONTUR's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by KONTUR shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancy, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by KONTUR shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of KONTUR's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except KONTUR. The Client warrants that KONTUR's instruments of professional service will be used only and exactly as submitted by KONTUR.

The Client recognizes and agrees that electronic files submitted by KONTUR have been prepared and submitted using specific software and hardware systems. KONTUR makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

Photograph 1 – Bedrock Bluff 807McItnosh Lane

Photograph 2 – Gully 807 McIntosh Lane

Photograph 3 – Bedrock Bluffs Adjacent to Access Road

Photograph 4 – Bedrock controlled slopes (McIntosh Lans Properties)

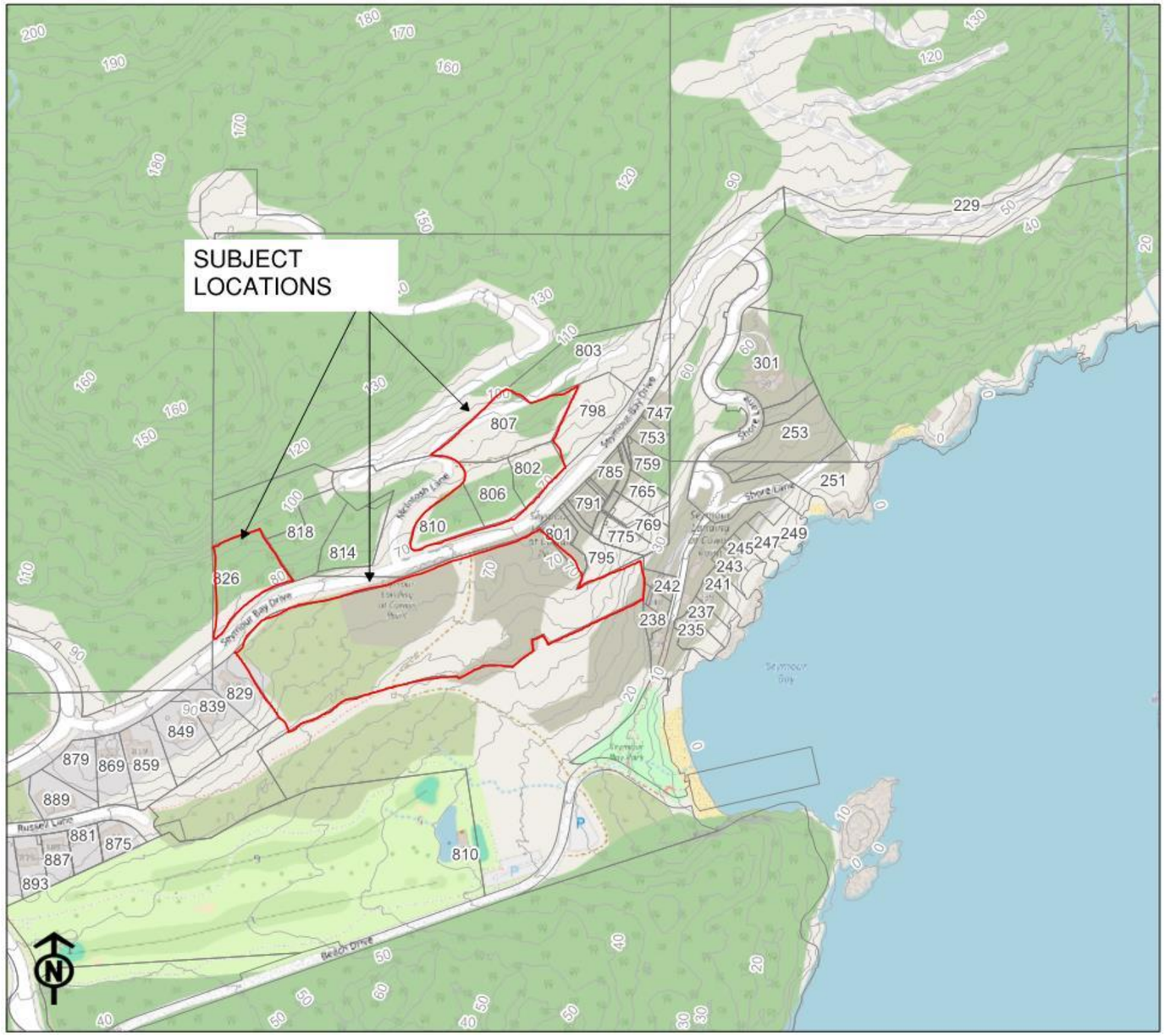
Photograph 5 – Bedrock Bluffs 826 Seymour Bay Drive

Photograph 6 – Topography Seymour Landing at Cowan Point

Photograph 7 – Watercourse Seymour Landing at Cowan Point

Photograph 8 – Seymour Landing Lane

Photograph 9 – Infilled Gully – Seymour Landing at Cowan Point



September 16, 2020 3:47:05 PM

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SEAL

VERSIONS

NO	DESCRIPTION	DATE
0	Intended for Review	2024-12-02

TITLE: SITE PLAN

CLIENT: BOWEN ISLAND PROPERTIES LTD.

PROJECT LOCATION: SEYMOUR BAY ROAD, BOWEN ISLAND, BC

PROJECT NO.: K-180314-00

DATE:	SCALE:	DWG NO.:
2024-12-02	NTS	FIG 1

DRAFT:	DESIGN:	CHECK:
EGS	EGS	BLJM