

MATERIALS TESTING • SOILS CONCRETE • ASPHALT • CORING GEOTECHNICAL ENGINEERING

#1 – 1965 MOSS COURT KELOWNA, B.C. V1Y 9L3 250-860-6540 INFO@INTERIORTESTING.COM

Ms. Elizabeth Kutschera 5705 Upper Booth Road Kelowna, B.C. V1X 7V7 October 26, 2022 Job 97107

Dear Madam:

Re:

Geotechnical Considerations Proposed 2 Lot Subdivision 5705 Upper Booth Road Kelowna, B.C.

As requested, Interior Testing Services Ltd. (ITSL) has reviewed the above noted lot with respect to the proposed residential subdivision. We attach a site survey plan with 2 pages of cross sections prepared by Advanced Surveying Ltd., a 4 page, redacted report previously prepared by ITSL for the overall 7 Lot Subdivision dated July 24, 1997, and an Appendix D: Landslide Assessment Assurance Statement from EGBC. Also attached is a copy of our standard, two-page "Terms of Engagement", which governs our work and has been previously signed and accepted. Our general comments are as follows.

We understand that this report may form part of your subdivision approval permit process. We identify the Regional District of Central Okanagan (RDCO) as authorized users of this report, also subject to our attached "Terms of Engagement."

We have reviewed our report dated July 24, 1997. At that time, given that there was an existing house on the current Lot 1, and no additional construction was anticipated, the portion west of Upper Booth Road was indicated as a "conditional" building area, or alternatively, a "no-build" area as that area was bisected by a creek.

We now understand that you desire to further subdivide the existing Lot 1, to create a new lot west of Upper Booth Road. We understand that the proposed building footprint is to be set within the upper, northeast corner of the proposed lot, within the existing relatively flat

area. Although this remains outside of our geotechnical scope and we understand this is being addressed by others, there is an existing creek, and we understand that the proposed building footprint will be set outside of any current environmental covenant areas.

A site visit was carried out on October 3, 2022. The overall site slopes moderately down towards the southwest, but no evidence of previous geotechnical hazards was observed. Based on the topographic information provided, the overall slopes exist at flatter than 2 Horizontal to 1 Vertical (2H:1V) with some localized areas slightly steeper.

Based on our surface observations, bedrock was often exposed at the sloping grades or is expected to be shallow below the ground surface. The overlying surface soils are expected to consist of silty SAND and GRAVEL.

Based on our understanding that the proposed building footprint will be within the upper, northeast corner of the proposed lot, the proposed house foundations are expected to be set below and behind a conventional 2H:1V plane projected up from the toe of the existing moderate slopes. Further geotechnical guidance to this respect can be provided at the time of construction by ITSL.

Based on our review and experience in the area, there do not appear to be any significant geotechnical hazards related to the proposed residential subdivision. The natural soils appear to consist of competent granular soils and/or bedrock. Disturbed soil slopes should be finished at no steeper than 2H:1V and vegetated with hydro-seeding, landscaping, or similar, to reduce the potential for surface erosion.

Disposal of site generated storm water (including foundation perimeter and roof drainage) can be contemplated below the proposed building footprint, and further guidance to this respect can be provided at the time of construction.

Based on our site review of the existing conditions and review of the rationale behind initially designating this portion of Lot 1 as either a "no build" area or a "conditional" area, subdivision of Lot 1 to allow for construction of a proposed residence appears feasible for this site, and no net decrease in overall slope stability would result from the proposed development.

To that end, it appears reasonable, in our opinion, to conclude that the property may be safely used for the residential use intended. We define "safe" based on the levels of safety

understood to be adopted by the RDCO and Ministry of Transportation and Infrastructure, including a 10% probability of failure occurring in a 50 year period (1 in 475) for geotechnical hazards of a foreseeable nature.

In accordance with the EGBC Guidelines for Legislated Landslide Assessments for Residential Developments, we have included an Appendix D: Landslide Assessment Assurance Statement.

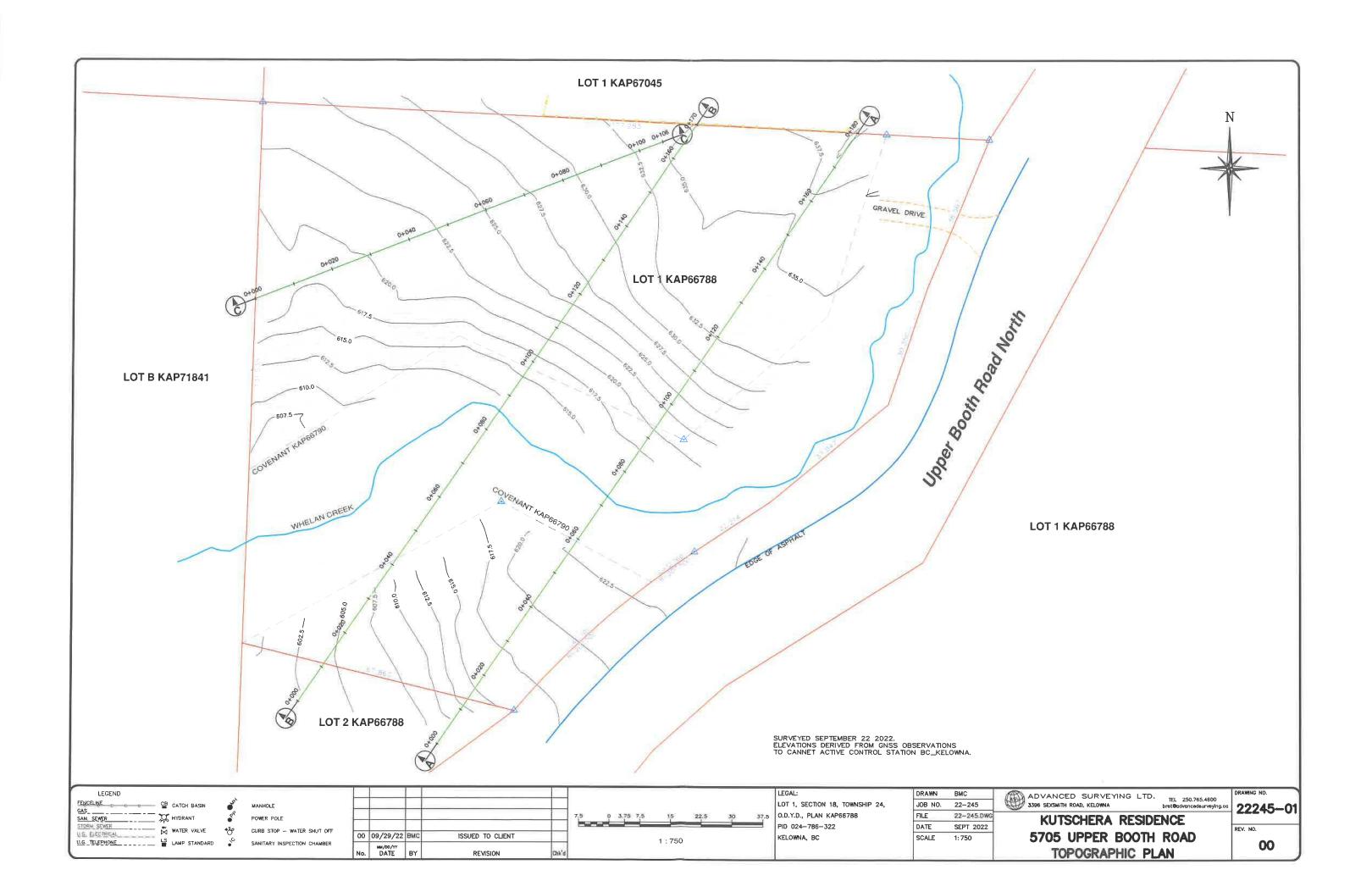
It is anticipated that additional site visits will be required during construction of this project. Please call as required when ready.

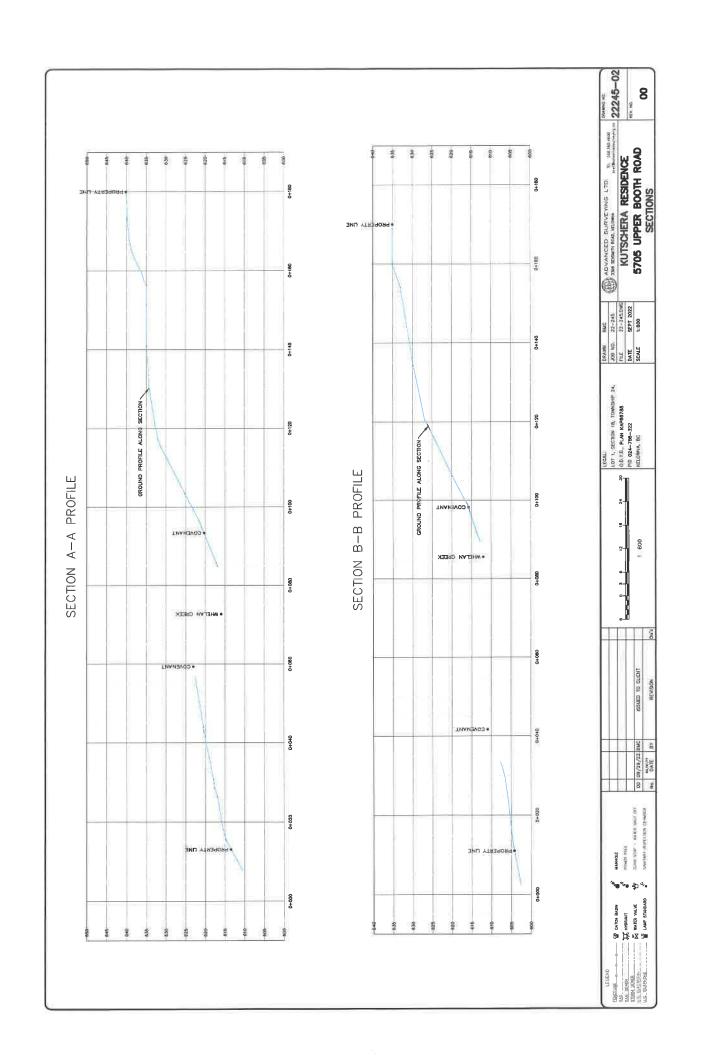
We trust this will assist you. Please call if you have any questions.

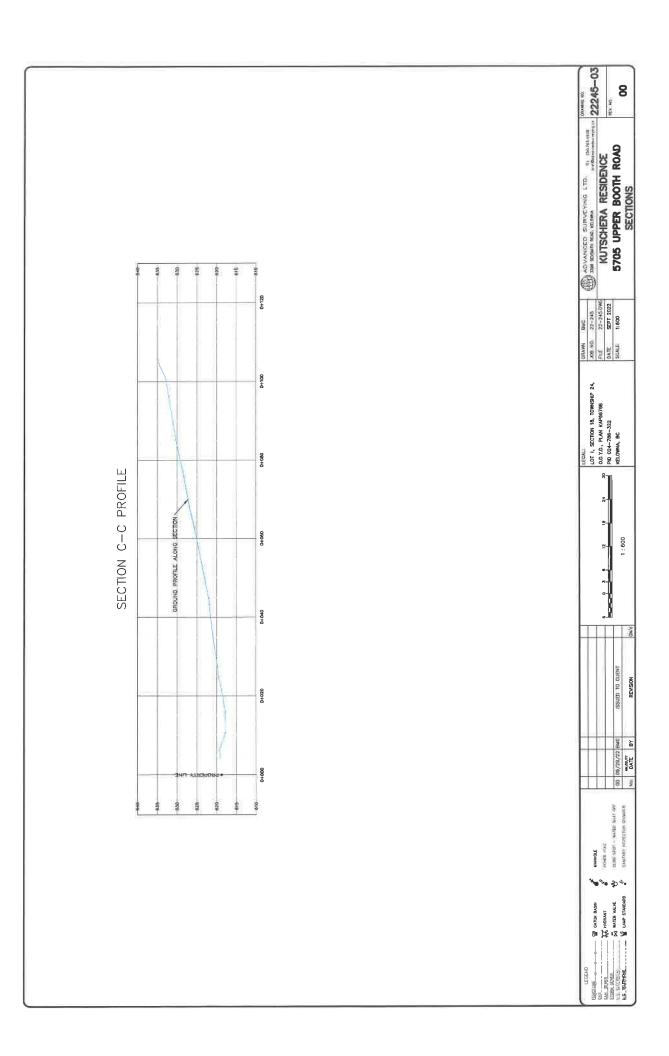
Yours truly, Interior Testing Services Ltd. Permit to Practice No. 1001971

OCT 26 2022

Peter Hanenburg, P.Eng.









MATERIALS TESTING • SOILS CONCRETE • ASPHALT • CORING GEOTECHNICAL ENGINEERING

> 1 - 1925 KIRSCHNER ROAD KELOWNA, B.C. V1Y 4N7 PHONE: 860-6540 FAX: 860-5027

July 24, 1997 Job 97107



Dear Sir:

RE: Proposed 7 Lot Subdivision, S 1/2 of SE 1/4, Sec. 18., TP 24, ODYD, Booth Road, Kelowna, B.C.

As requested, Interior Testing Services Ltd. has carried out a geotechnical review of the above site with respect to natural hazards evaluation. Such a report has been required as a part of your application to subdivide the above property.

A plan showing the new lots to be created is attached to this letter report, which is intended to form part of your application to subdivide. A copy of our standard "Terms of Engagement" is also attached.

INTRODUCTION

The property to be subdivided lies uphill of Booth Road off Anderson Road, just outside the municipal limits of Kelowna, B.C. At present there is one existing house on the site, as indicated on the plan.

The property is presently accessed by a gravelled road, extending approximately 1 to 1.5 kilometers from the intersection of Booth Road and Anderson Road. At present, both the access road, and an access road within the property are under construction.

SITE REVIEW

A site reconnaissance was carried out on July 15, 1997, at which time site features were reviewed and assessed.

In general, the site is moderately sloping, typically at roughly an estimated 20 to 30% grade. There is a creek crossing the northwest corner of the property. Vegetation on the site varies from dense brush in the creek area, to well-treed or brush area at higher elevations, and open range or grassland on the lower elevations. Frequent BEDROCK exposures are apparent throughout the site.

With respect to the potential for natural hazards on each of the lots, our comments are as follows.

(a) LOT 1

Some restrictions would be necessary if the existing house on Lot 1 were removed, and a new house was to be constructed near the creek area. Accordingly, we have marked the part of Lot 1 west of the proposed road as a "conditional" building area, or alternatively, a "no-build" area. We understand there are also other restrictions on encroachment into the creek area as well.

No other hazards were noted in this area.

(b) LOTS 2, 3, and 4

No potential hazards were noted on these proposed lots. It appears the natural moderately sloping topography is typically underlain by BEDROCK.

(c) LOT 5

No significant potential hazards were noted on this lot. However, the new roadway access will create a significant cut zone, and a steeper grade, at the west end of the lot.

Accordingly, we recommend the first 50 meters of the lot adjacent to the road be considered a "no-build", or a "conditional" building zone.

Building could typically be permitted within this area, but only if further reviewed by a geotechnical engineer, and some significant cost premiums might be required.

(d) LOTS 6 and 7

There are two noticeable features on lots 6 and 7 that could impact construction on the site.

The first is a relatively steeper BEDROCK and soil slope within approximately the west 100 meters of the two lots. This area will also contain a significant roadway cut when the road construction is complete. Therefore, we recommend a 100 meter "no-build" zone within the west end of these lots adjacent to the new roadway. Construction within selected areas might be feasible with further review by a geotechnical engineer, but most of the area is likely to remain undeveloped as relatively steeper topography.

The remainder of the sites appear moderately sloping, and feasible for construction, with the exception of an obvious FILL area. This FILL area lies approximately at the center of lots 6 and 7, crossing from north to south. At this location, an access road or trail appears to have been created with FILLS. The FILL zone, from crest to toe, is less than roughly 30 meters wide, and should not be difficult to avoid with new construction. The area above and to the east shows evidence of periodic trenching down to BEDROCK; to the west, there is the natural forest cover.

CONCLUSIONS AND RECOMMENDATIONS

- 1. In our opinion, there are no natural hazards present on lots 2, 3, and 4. No restrictions on construction (beyond good building practice) appears necessary on those sites.
- Some "conditional-build" or "no-build" zones appear suitable for parts of lots 1, 5, 6, and 7.

Specifically, these are suggested as follows:

- (a) Lot 1 exclude portion west of road as it is bisected by the creek.
- (b) Lot 5 exclude west 50 meters of lot adjacent to roadway unless reviewed by geotechnical engineer.
- (c) Lot 6, 7 = exclude west 100 meters of lots 6 and 7 adjacent to roadway unless reviewed.
 - avoid existing filled slope as indicated on the drawing with construction. This feature should be relatively obvious, and may not require any special restrictions such as a covenant zone.

These areas have been indicated on the attached plan, in at least an approximate manner.

3. If there is any doubt regarding the intent of this report, or the suitability of building sites at the time of construction, it is recommended that the geotechnical engineer review the proposed building locations.

I trust this will assist you. If you have any questions, please call.

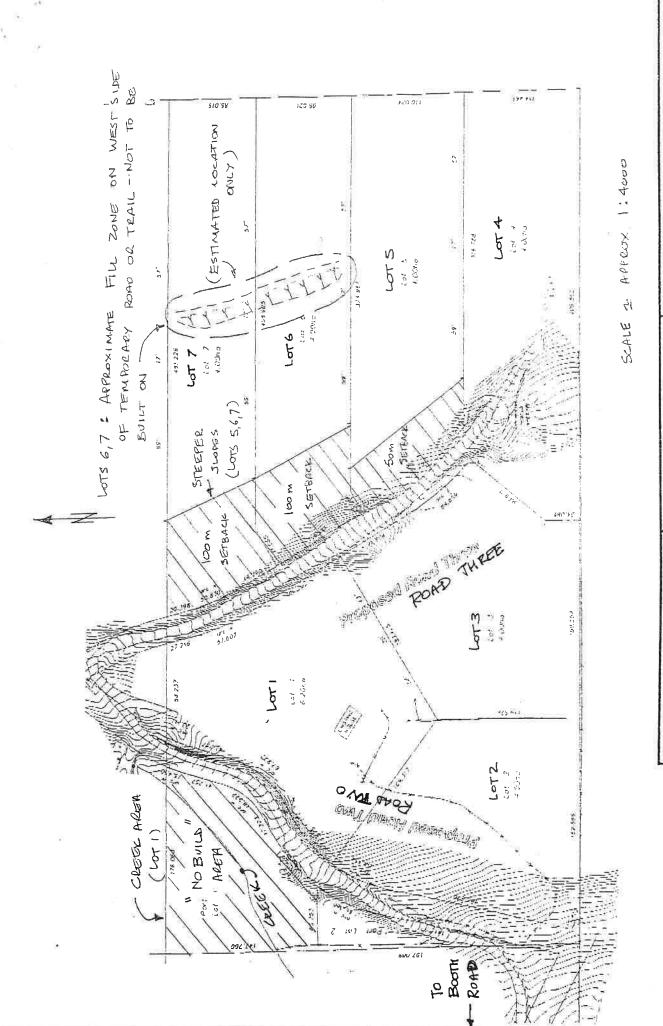
Yours truly,

INTERIOR TESTING SERVICES LTD.

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Norman K. Williams, P. Eng.

NKW/dh



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WEST THE THEFT IS	MEF. PLAN.: COPY OF SITE PLAN PROPOSED 7 LOT SUBDIVISION	WEST OF BOOTH ROAD,	KELOWNA, B.C.
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SERVICES LTD.	JOB NO.: 97107	DWG. NO.: 97107-1
INTERIOR TESTING SERVICES LTD. Soils - concrete - Asphalt - Field Supervision	DATE DRILLING:	DATE REPORT: JULY 1997 DWG. NO.: 97107-1
	LOCATION PLAN	

LANDSLIDE ASSESSMENT ASSURANCE STATEMENT

Notes: This statement is to be read and completed in conjunction with the Engineers and Geoscientists BC *Professional Practice Guidelines – Landslide Assessments in British Columbia* ("the guidelines") and the current *BC Building Code* (*BCBC*), and is to be provided for Landslide Assessments (not floods or flood controls), particularly those produced for the purposes of the *Land Title Act*, *Community Charter*, or *Local Government Act*. Some jurisdictions (e.g., the Fraser Valley Regional District or the Cowichan Valley Regional District) have developed more comprehensive assurance statements in collaboration with Engineers and Geoscientists BC. Where those exist, the Qualified Professional is to fill out the local version only. Defined terms are capitalized; see the Defined Terms section of the guidelines for definitions.

o: The Approving Authority (or Client)	Date: OCT 26, 1022
REGIONAL DISTRUCT OF CENTR	AL
	•
Jurisdiction/name and address	
Julisulation marine and addition	
Nith reference to (CHECK ONE):	
A. Land Title Act (Section 86) – Subdivision Appro-	
□ B. Local Government Act (Sections 919.1 and 920	
☐ C. Community Charter (Section 56) – Building Peri	nit
□ D. Non-legislated assessment	
For the following property (the "Property"):	
5705 UPPER BOOTH R	DAD KELDWANA B.C.
Civic address of the Property	
The undersigned hereby gives assurance that they are a Qual	fied Professional and a professional engineer or professional
geoscientist who fulfils the education, training, and experience	
	the attached Landslide Assessment Report on the Property in
accordance with the guidelines. That report must be read in co	njunction this statement.
In preparing that report I have:	
CHECK TO THE LEFT OF APPLICABLE ITEMS]	
 Collected and reviewed appropriate background info 	rmation
	other development on the Property
 Conducted field work on and, if required, beyond the 	
 Reported on the results of the field work on and, if re 	
5. Considered any changed conditions on and, if required	
6. For a Landslide Hazard analysis or Landslide Risk a	
 6.1 reviewed and characterized, if appropriate, a 6.2 estimated the Landslide Hazard 	ny Landslide that may affect the Property
	nents at Risk on and, if required, beyond the Property
6.4 estimated the potential Consequences to the	
7. Where the Approving Authority has adopted a Level	of Landslide Safety, I have:
	pted by the Approving Authority with the findings of my
investigation	for the Property based on the appropriate
7.2 made a finding on the Level of Landslide Sa 7.3 made recommendations to reduce Landslide	fety on the Property based on the comparison
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PROFESSIONAL PRACTICE GUIDELINES
LANDSLIDE ASSESSMENTS IN BRITISH COLUMBIA

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VERSION 4.0

LANDSLIDE ASSESSMENT ASSURANCE STATEMENT

	8.	Where the Approving Authority has not adopted a Level of Landslide Safety, or where the Landslide Assessment is not produced in response to a legislated requirement, I have:
		8.1 described the method of Landslide Hazard analysis or Landslide Risk analysis used
		8.2 referred to an appropriate and identified provincial, national, or international guideline for Level of Landslide Safety
		8.3 compared those guidelines (per item 8.2) with the findings of my investigation
		8.4 made a finding on the Level of Landslide Safety on the Property based on the comparison
		8.5 made recommendations to reduce Landslide Hazards and/or Landslide Risks
_	9.	Reported on the requirements for future inspections of the Property and recommended who should conduct those inspections
Bas	ed or	n my comparison between:
[CHE	CK O	NE]
		findings from the investigation and the adopted Level of Landslide Safety (item 7.2 above) appropriate and identified provincial, national, or international guideline for Level of Landslide Safety (item 8.4 above)
		ne Landslide Assessment is not produced in response to a legislated requirement, I hereby give my assurance that, in the conditions¹ contained in the attached Landslide Assessment Report:
Α	SUE	BDIVISION APPROVAL
M		subdivision approval, as required by the Land Title Act (Section 86), "the land may be used safely for the use intended" ECK ONE]
		with one or more recommended additional registered Covenants without an additional registered Covenant(s)
В.	DE\	VELOPMENT PERMIT
	gov	a <u>development permit</u> , as required by the <i>Local Government Act</i> (Sections 488 and 491), my report will "assist the local ernment in determining what conditions or requirements it will impose under subsection (2) of [Section 491]" ECK ONE]
		with one or more recommended additional registered Covenants without an additional registered Covenant(s)
C.	BUI	LDING PERMIT
	inte	a <u>building permit</u> , as required by the <i>Community Charter</i> (Section 56), "the land may be used safely for the use nded"
	-	ECK ONE]
		with one or more recommended additional registered Covenants without any additional registered Covenant(s)

PROFESSIONAL PRACTICE GUIDELINES
LANDSLIDE ASSESSMENTS IN BRITISH COLUMBIA

VERSION 4.0 100

When seismic slope stability assessments are involved, Level of Landslide Safety is considered to be a "life safety" criteria, as described in Commentary JJJ of the *National Building Code of Canada (NBC) 2015*, Structural Commentaries (User's Guide – NBC 2015: part 4 of division B). This states:

[&]quot;The primary objective of seismic design is to provide an acceptable level of safety for building occupants and the general public as the building responds to strong ground motion; in other words, to minimize loss of life. This implies that, although there will likely be extensive structural and non-structural damage, during the DGM (design ground motion), there is a reasonable degree of confidence that the building will not collapse, nor will its attachments break off and fall on people near the building. This performance level is termed 'extensive damage' because, although the structure may be heavily damaged and may have lost a substantial amount of its initial strength and stiffness, it retains some margin of resistance against collapse."

LANDSLIDE ASSESSMENT ASSURANCE STATEMENT

PETEL HANENBURG P.ENG. Name (print)	Oct 26, 2022 Date
#1 -1965 moss Coult Address	Novince Se
250 860-6540	28282 OCTO 200 22
Telephone	Market
peter Cinteriortesting.com	(Affix PROFESSIONAL SEAL and signature here)
The Qualified Professional, as a registrant on the roster of a registr	ant firm, must complete the following:
The Qualified Froicestonal, as a registration the restor of a registr	
I am a member of the firm	
with Permit to Practice Number (Print permit to p	ractice number)

PROFESSIONAL PRACTICE GUIDELINES LANDSLIDE ASSESSMENTS IN BRITISH COLUMBIA

and I sign this letter on behalf of the firm.

TERMS OF ENGAGEMENT

GENERAL

Interior Testing Services Ltd. (ITSL) shall render the Services performed for the Client on this Project in accordance with the following Terms of Engagement. ITSL may, at its discretion and at any stage, engage subconsultants to perform all or any part of the Services. Unless specifically agreed in writing, these Terms of Engagement shall constitute the entire Contract between ITSL and the Client.

COMPENSATION

Charges for the Services rendered will be made in accordance with ITSL's Schedule of Fees and Disbursements in effect from time to time as the Services are rendered. All Charges will be payable in Canadian Dollars. Invoices will be due and payable by the Client within thirty (30) days of the date of the invoice without hold back. Interest on overdue accounts is 18% per annum, compounded monthly (19.6%)

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 ITSL its Charges for the Services performed, including all expenses and other charges incurred by ITSL 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 ITSL under this paragraph, the Client shall forthwith pay to ITSL its Charges for the Services performed to the date of termination, including all fees and charges for this Project.

ENVIRONMENTAL

ITSL's field investigation, laboratory testing and engineering recommendations will not address or evaluate pollution of soil or pollution of groundwater. ITSL will co-operate with the Client's environmental consultant during the field work phase of the investigation.

PROFESSIONAL RESPONSIBILITY

In performing the Services, ITSL 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. ITSL makes no warranty, representation or guarantee, either express or implied as to the professional services rendered under this agreement.

LIMITATION OF LIABILITY

ITSL shall not be responsible for:

- (a) the failure of a contractor, retained by the Client, to perform the work required in the Project in accordance with the applicable contract documents:
- (b) the design of or defects in equipment supplied or provided by the Client for incorporation into the Project;
- (c) any cross-contamination resulting from subsurface investigations;
- (d) any damage to subsurface structures and utilities;
- (e) any Project decisions made by the Client if the decisions were made without the advice of ITSL or contrary to or inconsistent with ITSL's advice:
- (f) any consequential loss, injury or damages suffered by the Client, including but not limited to loss of use, earnings and business interruption;
- (g) the unauthorized distribution of any confidential document or report prepared by or on behalf of ITSL for the exclusive use of the Client.

The total amount of all claims the Client may have against ITSL under this engagement, including but not limited to claims for negligence, negligent misrepresentation and breach of contract, shall be strictly limited to the lesser of our fees or \$50,000.00.

No claim may be brought against ITSL in contract or tort more than two (2) years after the Services were completed or terminated under this engagement.

PERSONAL LIABILITY

For the purposes of the limitation of liability provisions contained in the Agreement of the parties herein, the Client expressly agrees that it has entered into this Agreement with ITSL, both on its own behalf and as agent on behalf of its employees and principals.

The Client expressly agrees that ITSL's employees and principals shall have no personal liability to the Client in respect of a claim, whether in contract, tort and/or any other cause of action in law. Accordingly, the Client expressly agrees that it will bring no proceedings and take no action in any court of law against any of ITSL's employees or principals in their personal capacity.

THIRD PARTY LIABILITY

This report was prepared by ITSL for the account of the Client. The material in it reflects the judgement and opinion of ITSL in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. ITSL accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This report may not be used or relied upon by any other person unless that person is specifically named by us as a beneficiary of the Report. The Client agrees to maintain the confidentiality of the Report and reasonably protect the report from distribution to any other person.

INDEMNITY

The client shall indemnify and hold harmless ITSL from and against any costs, damages, expenses, legal fees and disbursements, expert and investigation costs, claims, liabilities, actions, causes of action and any taxes thereon arising from or related to any claim or threatened claim by any party arising from or related to the performance of the Services.

DOCUMENTS

All of the documents prepared by ITSL or on behalf of ITSL in connection with the Project are instruments of service for the execution of the Project. ITSL 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 ITSL.

FIELD SERVICES

Where applicable, field services recommended for the Project are the minimum necessary, in the sole discretion of ITSL, to observe whether the work of a contractor retained by the Client is being carried out in general conformity with the intent of the Services.

DISPUTE RESOLUTION

If requested in writing by either the Client or ITSL, the Client and ITSL 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 an arbitrator appointed by agreement of the parties.

CONFIRMATION OF PROFESSIONAL LIABILITY INSURANCE

As required by by-laws of Engineers & Geoscientists British Columbia (EGBC), it is required that our firm advises whether or not Professional Liability Insurance is held. It is also required that a space for you to acknowledge this information be provided.

Our professional liability insurance is not project specific for the project and should not be regarded as such. If you require insurance for your project you should purchase a project specific insurance policy directly.

Accordingly, this notice serves to advise you that ITS	L carries professional liability insurance.	Please sign and return
a copy of this form as an indication of acceptance an	d agreement to the contractual force of th	nese Terms of
Engagement.		

PRINT NAME:	DATE:
ACKNOWLEDGEMENT:	