
December 5, 2023

GFX-1010

To: Drs. Shammi & Geetika Saini
drshammi14@gmail.com
geetika14saini@gmail.com

cc: Level 2 Developments
Colleen Moore
colleen@level2developments.com

Geotechnical and Geohazard Assessment for Proposed Swimming Pool - **AMENDED**
2204 Forsyth Drive, Penticton, BC

SUMMARY

Drs. Shammi and Geetika Saini, the owners of the property at 2204 Forsyth Drive, Penticton are planning to construct a new house and swimming pool on the property. Ground FX Geotechnical Inc. (GFX) was contacted by the project general contractor, Colleen Moore of Level 2 Developments, and retained by Drs. Shammi and Geetika Saini to assess site conditions with respect to potential geotechnical and geohazard impacts of the proposed swimming pool construction to adjacent and downslope properties.

Geotechnical/geohazard engineering investigations were completed to assess site conditions and slope stability related to the potential impacts from the construction of the proposed new swimming pool.

The Roc-Science program SLIDE was used to calculate safety factors for possible landslides under three scenarios: current (dry); wet (30% saturated); and seismic (earthquake) conditions on a section below the planned swimming pool.

From the results of landslide analyses, it is concluded that there is a low potential for a landslide that would affect the planned swimming pool on the property. Factors of Safety for slope stability are adequate for the section analysed.

Based upon a review of available information, previous reports and mapping, a visual site inspection and test pit investigations, it is concluded that the planned swimming pool on the property at 2204 Forsyth Drive will not adversely impact the subject property or neighbouring properties, provided the recommendations presented in this report are implemented.

GFX to be called at the time of construction to provide geotechnical review of the pool construction.

Amber LeComte, P. Eng. has signed, sealed and dated, and thereby certified the Appendix D – Landslide Assessment Assurance Statement included in this report in accordance with EGBC guidelines. This report must be read in conjunction with the attached Appendix D – Landslide Assessment Assurance Statement.

As stated in the attached Landslide Assessment Assurance Statement, the proposed new lots “*may be used safely for the residential housing use intended*” as required by the BC Land Title Act (Section 86).

GFX certifies that the construction of the planned swimming pool will not negatively impact the subject property or properties below provided that the recommendations in this report are followed.

1.0 INTRODUCTION AND BACKGROUND

Drs. Shammi and Geetika Saini plan to construct a new swimming pool at 2204 Forsyth Drive in the West Bench area of Penticton (See *Figure 1 – Location Plan*). In accordance with *Regional District of Okanagan Similkameen (RDOS) Policy No. P3740-00.02*, Ground FX Geotechnical Inc. (GFX) was requested by the project general contractor, Colleen Moore of Level 2 Developments as well as the property owners, Drs. Shammi and Geetika Saini to review site conditions with respect to potential geotechnical/geohazard impacts of the proposed swimming pool construction to adjacent and downslope properties.

In order to fulfil the requirements of *RDOS Policy No. P3740-00.02*, GFX reviewed the *Klohn Leonoff Report* findings and recommendations, the *Greater West Bench Geotechnical Review* completed by Clarke Geoscience (December 22, 2021), and made a site reconnaissance visit to assess local site conditions. This report documents the results of a geohazard assessment for the planned swimming pool construction at 2204 Forsyth Drive, Penticton.

2.0 WORK COMPLETED

GFX completed the following tasks for this assessment:

- Discussed planned swimming pool with owners and contractor.
- Reviewed the *RDOS Policy No. P3740-00.02*.
- Reviewed the *Klohn Leonoff Report* findings and recommendations.
- Reviewed the *Greater West Bench Geotechnical Review*.
- Reviewed RDOS aerial and topographic mapping.
- Reviewed Mandeville Land Surveying Inc. topographic survey.
- Reviewed RDOS bylaw No. 2974 (March 2, 2023) – a bylaw to regulate the removal and deposit of soils on lands within Electoral Area “F”.
- Reviewed Hillside Development Permit Application Requirements.
- Completed a site reconnaissance visit of the property.
- Completed investigative test pits on the property.
- Assessed site conditions and prepared a report documenting the findings of the geotechnical/geohazard assessment with respect to the impacts of the proposed swimming pool construction to adjacent and downslope lots.

3.0 SITE CONDITIONS

The property at 2204 Forsyth Drive is located in the West Bench area of Penticton. Amber LeComte, P.Eng. of GFX has completed numerous projects in the West Bench area including projects on Lambert Drive, Sandstone Crescent, West Bench Drive, Jonathan Drive, Solana Crescent and Sage Mesa Drive.

The property is surrounded by residential lots with access along a driveway from Forsyth Drive. The subject property slopes down to the south with the planned swimming pool located as shown on the attached *Figure 2 – Site Plan with Test Pit locations*.

GFX excavated two test pits in the planned swimming pool location, as shown on the attached *Figure 2– Site Plan with Test Pit Locations*. Photo Nos. 5 and 6 show excavated test pits Nos. 1 and 2. Test pit logs are also attached to this report. Based on these test pits, it is anticipated that granular SAND and GRAVEL soils underlie the site. This will be confirmed at the time of construction.

Groundwater levels are greater than 5 m below ground.

4.0 GEOHAZARD CONSIDERATIONS

GFX has assessed geohazard conditions as they relate to potential impacts of the planned swimming pool construction. The findings and recommendations of the *Klohn Leonoff Report*, as well as the *Greater West Bench Review* were taken into consideration as part of this assessment.

The *Klohn Leonoff Report* has mapped the property at 2204 Forsyth Drive as “Gravel or Bedrock Outside Study Area.” These areas have a low to moderate hazard classification. The *Greater West Bench Review* shows the subject property is within an area mapped as Glaciofluvial Sediments, indicating low to moderate landslide hazard, low sinkhole hazard and low compressible soil hazard classifications.

GFX excavated two test pits on the property and confirmed that the site soils were primarily the SAND, GRAVEL and COBBLE materials as indicated in the *Klohn Leonoff Report*. These predominantly granular soils are well drained and generally acceptable as foundation soils.

The planned swimming pool construction will result in an increase in the impermeable area on the property; however, this surface area can be drained to a rock pit situated a minimum of 5 m from any structure foundations, including the planned swimming pool foundations. An appropriate drainage disposal design will be determined by GFX at the time of construction.

Any drainage from the swimming pool must be carefully controlled and not allowed to discharge a concentrated flow that could cause soil erosion. In this regard, properly designed rock pits/drywells can be designed to accommodate the planned swimming pool drainage.

5.0 GEOHAZARD LANDSLIDE ASSESSMENT

The subject property is not located within the “Red Zone” hazard area as defined by the RDOS mapping. A landslide assessment was completed including an analysis of landslide hazards and potential consequences. The assessment analysed the potential for a landslide event to be “a source of potential harm, or a situation with a potential for causing harm, in terms of human injury; damage to health, property, the environment, and other things of value; or some combination of these.” (CSA 1997). It coupled the potential for damage and harm with an assessment of the consequences of these events. SLIDE analyses were completed on Sections A-A’ and B-B’ using Mandeville Land Surveying plans and are shown on the attached *Figure 3 – Topographic Site Plan Showing Cross-Section Locations*. Section B-B’ runs through the steep slope on the north portion of the property, while Section A-A’ runs through the planned new swimming pool location.

GFX used the District of North Vancouver (DNV) 2009 *Natural Hazards Risk Tolerance Criteria* to assess the landslide risk as well as reviewed the and assessed slopes on the property and compared the results to the “Landslide Hazard Criteria for Areas Outside the Silt Bluffs” (Section 6.5 of *The Greater West Bench Geotechnical Review*).

The DNV slope stability criteria state that for static conditions, a factor of safety of 1.5 or above is acceptable and for non-static conditions, a factor of safety of 1.0 or above is acceptable. While attached SLIDE results of Section A-A' do not display factors of safety meeting the DNV criteria, it should be noted that the low factor of safety numbers refer to localized (surficial) areas. Globally, there is a low likelihood of slope failure. Using a factor of safety approach, the slope south of (below) the planned swimming pool location meets the risk tolerance criteria developed by the DNV.

From the results of landslide analyses, including SLIDE analyses of Sections A-A' and B-B' as well as reviewing the DNV 2009 Natural Hazards Risk Tolerance Criteria and "Landslide Hazard Criteria for Areas Outside the Silt Bluffs" of the *Greater West Bench Geotechnical Review*, it is concluded that there is a high potential for a landslide on the north slope (Section B-B') and a low potential for landslide on the slope south of the planned swimming pool (Section A-A'). In this regard, for any construction below the north slope, landslide/rockfall mitigation measures should be implemented. As the swimming pool is not adjacent to the north slope, this report does not comment on landslide/rockfall mitigation measures required. The planned swimming pool siting is okay based on the DNV's and the *Greater West Bench Geotechnical Review's* slope stability criteria.

After review the slope stability results from the SLIDE analysis, it was determined that, the north slope (Section B-B') has a high likelihood of slope failure both globally and locally. The south slope below the planned swimming pool location (Section A-A') has a low likelihood of global failure and a moderate likelihood of local (more surficial) slope failures.

In this regard, it is recommended that the foundations for the planned swimming pool are founded below the fill material that was encountered in the planned swimming pool location with a minimum depth of 5 feet below the existing grade. This will ensure that the swimming pool will not affect the stability of the slope south of the planned new swimming pool location (Section A-A').

Slope stability results of Section B-B' through the north slope, show that landslide protection measures should be implemented for any structures constructed below this slope; however, the planned swimming pool construction will not impact stability of the north slope.

A *Landslide Assessment Assurance Statement* (Appendix D) is attached to this report.

6.0 GEOTECHNICAL AND GEOHAZARD RECOMMENDATIONS AND CONCLUSIONS

The following points summarize the findings and conclusions of this geohazard assessment:

- This assessment identified only limited geohazards on the subject property. The primary geohazard of note is the slope located in the northern portion of the property shown in Photo No. 3; the swimming pool will be located at least 20 m away from the base of the slope. In this regard, proper water management on the property is required to maintain soil stability.
- The northern slope on the property is currently marginally stable with factors of safety around (or less than) 1. In this regard, any structures situated near the north slope should have mitigative measures to protect against surficial raveling and potential landslides.
- The slope below the planned swimming pool location is presently stable with surficial raveling being the primary concern. In this regard, the swimming pool will be sited well above the expected failure surface of the slope below (See attached SLIDE figures for approximate location of planned swimming pool).
- The planned deck elevation of the swimming pool will be similar to the existing grade on the property. The pre and post development finished grades will be similar.

- GFX recommends that the foundations for the swimming pool be founded on a minimum of 150 mm (6") of compacted 50 mm (2") minus crushed gravel structural fill over the natural SAND and GRAVEL soils.
- Local SAND, GRAVEL and COBBLE soils have moderate values of hydraulic conductivity (K), in the range of 10^{-4} m/s to 10^{-2} m/s.
- The planned swimming pool will be located approximately 100 m from the nearest downstream house. In the event of a swimming pool leak, the granular site soils in this area would infiltrate any swimming pool leakage before it could negatively affect the downstream houses (Photo No. 2 shows a view of the large open field area below the planned swimming pool location).
- In addition, Forsyth Drive is located below the swimming pool site. Photo No. 1 shows a view of Forsyth Drive below and the curbing in place which would direct any overland flow (from a potential swimming pool leak) away from the developed area below toward the open field (Photo No. 2).
- Significant amounts (approximately 4 to 5 feet) of uncontrolled fill have been placed on the property to level the building site. Any uncontrolled fill material will have to be removed and replaced with structural fill at the time of construction. This applies to both the planned swimming pool and the planned house.
- The granular SAND, GRAVEL and COBBLE soils underlying the property at 2204 Forsyth Drive are suitable for the planned construction of a new swimming pool. With properly designed and constructed foundations, site soils can support the new swimming pool. A minimum of 150 mm (6") of 50 mm (2") minus crushed gravel structural fill is recommended under swimming pool foundations.
- Stormwater, including site, roof and pool deck drainage, can be managed on the property in properly designed rock pits situated a minimum of 5 m from any structure foundations, including the planned swimming pool foundations.
- A GFX professional engineer shall be contacted to review geotechnical aspects of swimming pool construction including foundation preparation and drainage works installations.

7.0 CLOSURE AND LIMITATIONS

This report was prepared for Drs. Shammi & Geetika Saini at the request of their project general contractor, Colleen Moore of Level 2 Developments with respect to the construction of the planned new swimming pool at 2204 Forsyth Drive, Penticton, BC.

The work was completed in accordance with generally accepted geotechnical engineering practice. No other warranty, expressed or implied, is intended.

This geotechnical assessment was completed on the basis of information available from the *Klohn Leonoff Report* (August 10, 1992) as well as the *Greater West Bench Geotechnical Review* (December 22, 2021), test pits completed on the property, a review of information and mapping from Okanagan Geology South (Norman Williams, P. Eng.) as well as other geotechnical investigations performed by Ms. LeComte in the West Bench area. GFX also completed a site reconnaissance visit to assess the possible consequences of the planned new swimming pool construction.

This assessment has concluded that, provided the recommendations presented in this report are implemented, the planned swimming pool on the property at 2204 Forsyth Drive will not adversely impact the subject property or neighbouring properties. In the context of geohazard concerns, it is

our judgement that the subject property *may be safely used for the construction of a new swimming pool without increasing the geohazard concerns on the subject property, or on adjacent and downstream lands.*

We trust that the contents of this report are appropriate for our requirements. If you have any questions, please don't hesitate to contact our office.

Regards,

Amber LeComte, P. Eng
Ground FX Geotechnical Inc.
EGBC Permit No. 1004765

- Attachments:
- 1) Google Earth Street View of Forsyth Drive
 - 2) Site Photos
 - 3) Figure 1 - Location Plan
 - 4) Figure 2 - Site Plan Showing Test Pit Locations
 - 5) Figure 3 - Topographic Site Plan Showing Cross Section Locations
(Mandeville Land Surveying)
 - 6) Test Pit Logs
 - 7) SLIDE Sections
 - 8) Appendix D: Landslide Assessment Assurance Statement

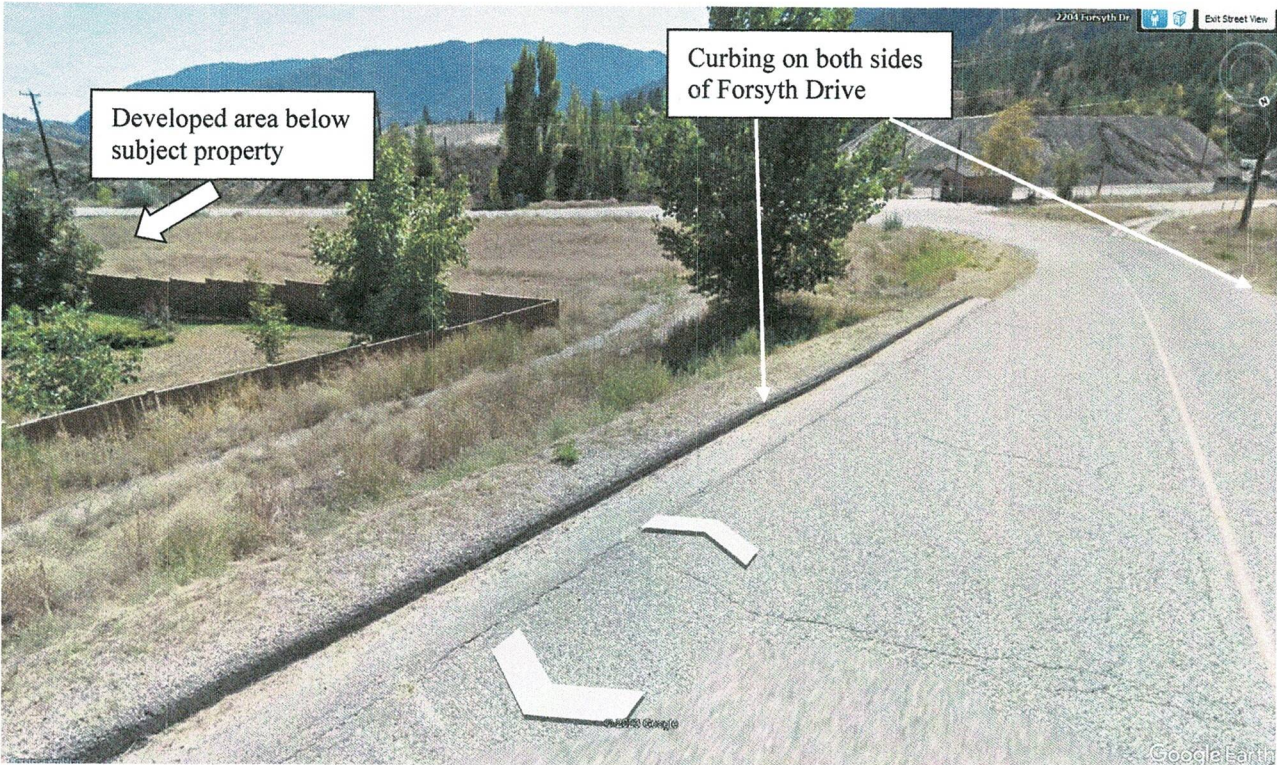


Photo No. 1 (Google Earth): Street view looking southwest down Forsyth Drive
 Note curbing on both side of roadway directing any incidental water away from developed area below.

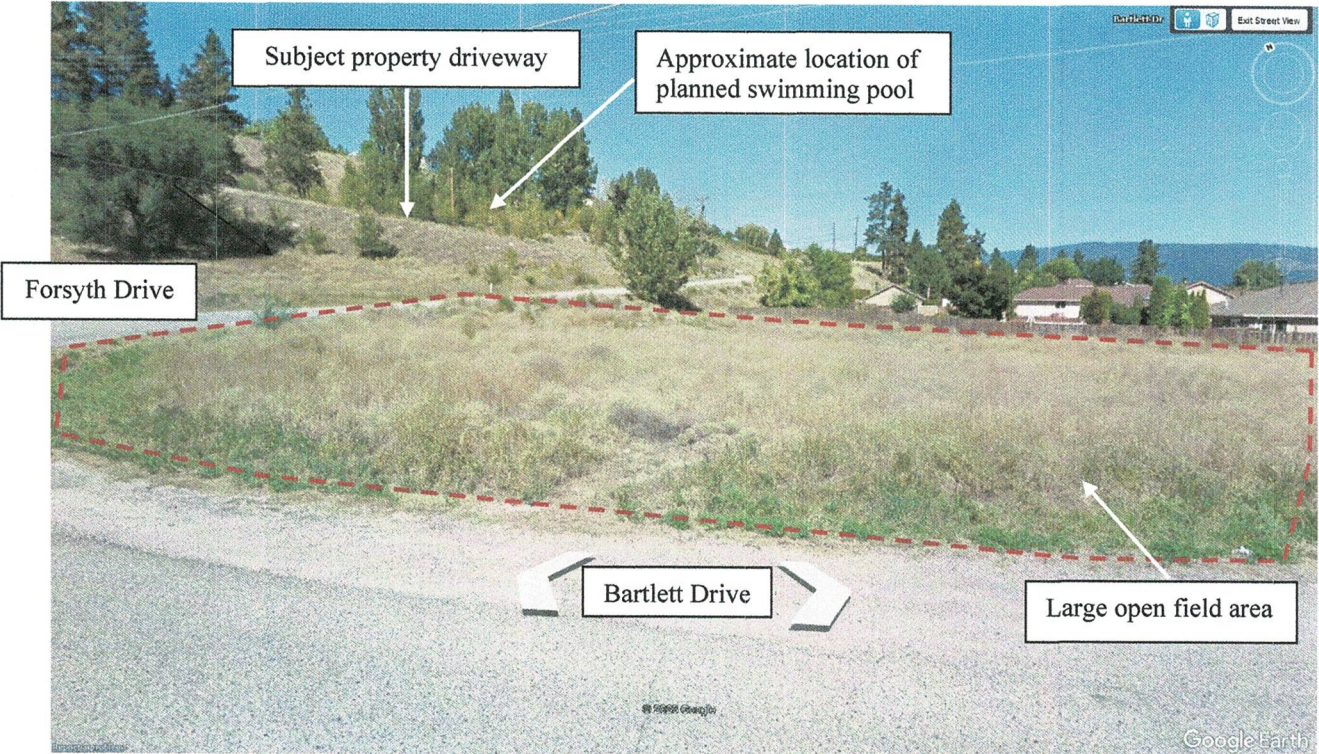


Photo No. 2 (Google Earth): Streetv view looking northeast from Bartlett Drive up Forsyth Drive.
 Note large area of bare land where, in the event of a swimming pool leak/failure, the water from the swimming pool leakage would flow down the subject property driveway, then down Forsyth drive and into the large open field area. This area is expected to be granular SAND and GRAVEL and able to infiltrate swimming pool leakage



Photo No. 3: View looking north from approximate location of planned swimming pool toward the north slope (2023 03 24)



Photo No. 4: View looking east through approximate location of planned swimming pool. (2023 03 24)



Photo No. 5: Test Pit No. 1 (2023 04 05)



Photo No. 6: Test Pit No. 2 (2023 04 05)



PO Box 22042
RPO Pentiction Plaza
Pentiction, BC V2A 8L1

Project No.:
GFX-1010

Address:
2204 Forsyth Drive, Pentiction

Date:
March 24, 2023

Design		
Drawn	KT	2023 03 24
Check	AL	2023 12 05

Revisions:

EGBC Permit No. 1004765



Approximate Location of Planned Swimming Pool (size not exact)

Test Pit #2

Test Pit #1

2204

Subject Property: 2204 Forsyth Drive

FORSYTH DRIVE



PO Box 22042
RPO Pentiction Plaza
Pentiction, BC V2A 8L1

Project No.:
GFX-1010

Address:
2204 Forsyth Drive, Pentiction

Date:
March 24, 2023

Design		
Drawn	KT	2023 03 24
Check	A	2023/12/05

Revisions:

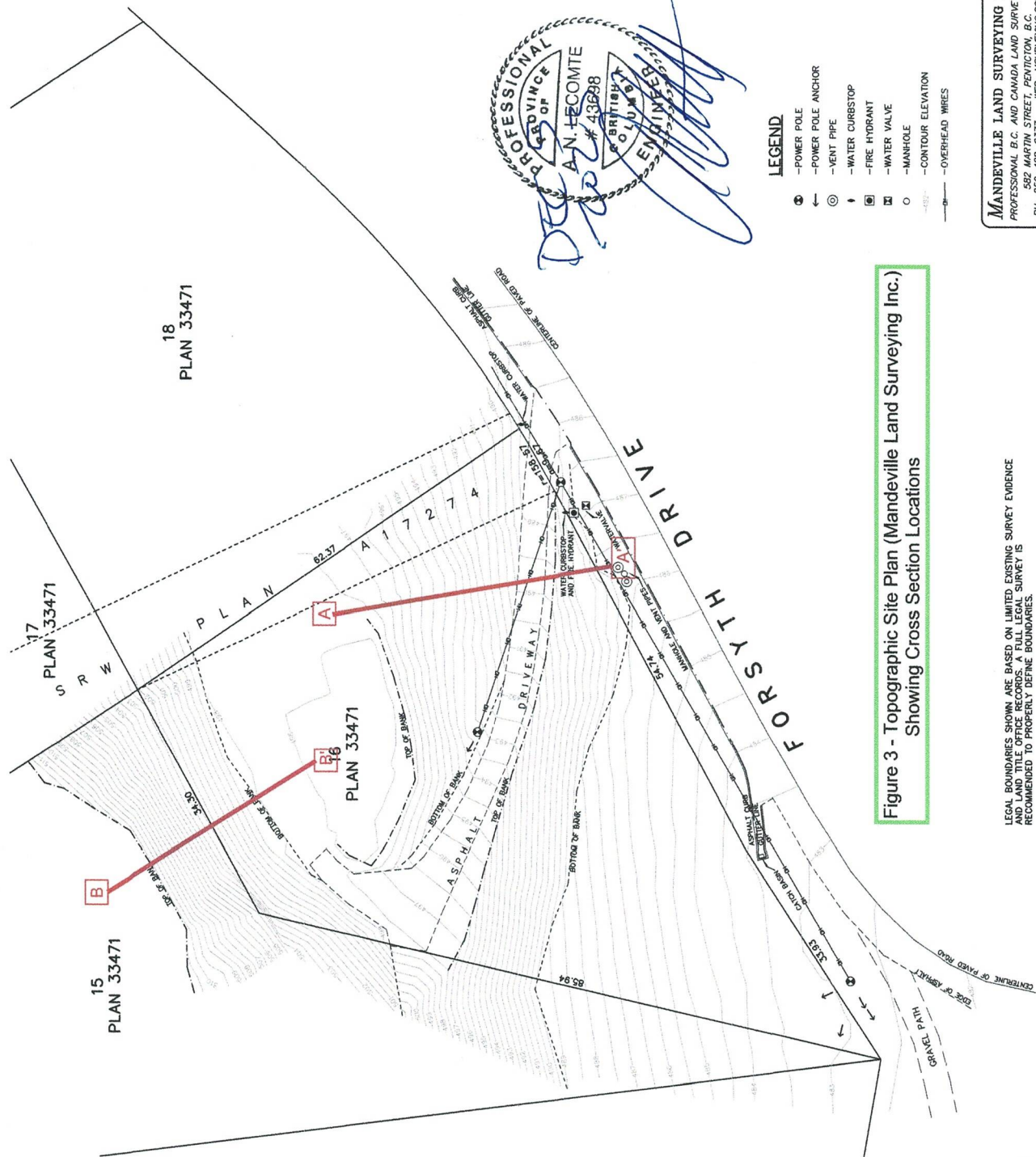


EGBC Permit No. 1004765

Figure 2 - Site Plan with Test Pit Locations

SITE PLAN SHOWING CERTAIN TOPOGRAPHIC FEATURES ON LOT 16, DL 4947, ODYD, PLAN 33471

CIVIC ADDRESS: 2204 FORSYTH DRIVE, PENTICTON, B.C.
 PID: 003-181-154
 SCALE 1:400



PROFESSIONAL SURVEYOR
AN. RECOMITE # 43888
BRITISH COLUMBIA ENGINEERS

[Signature]

- LEGEND**
- ⊕ - POWER POLE
 - ⊖ - POWER POLE ANCHOR
 - ⊙ - VENT PIPE
 - ⊥ - WATER CURBSTOP
 - ⊕ - FIRE HYDRANT
 - ⊖ - WATER VALVE
 - - MANHOLE
 - - - - - CONTOUR ELEVATION
 - — — — — OVERHEAD WIRES

**Figure 3 - Topographic Site Plan (Mandeville Land Surveying Inc.)
 Showing Cross Section Locations**

NOTE: SUBJECT TO THE NON-FUNCTIONAL CHANGES AND INTERESTS WHICH MAY BE SHOWN ON THE TITLE AND RELATED SET DOCUMENTS FOR COMPARISON.

THIS PLAN IS BASED ON LAND TITLE AND UNREGISTERED INTERESTS HAVE NOT BEEN CONSIDERED.

LAND SURVEYING COMPANY AND SURVEYOR ACCEPT NO RESPONSIBILITY FOR THE ACCURACY OF THE INFORMATION CONTAINED HEREIN, INCLUDING, BUT NOT LIMITED TO, DIRECT, INDIRECT, SPECIAL AND CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH ANY DIRECT OR INDIRECT USE OF THIS PLAN.

THIS PLAN IS PREPARED SOLELY FOR A LIMITED CONTRACTUAL USE BETWEEN MANDEVILLE LAND SURVEYING INC. AND THE CLIENT. IT IS NOT TO BE USED FOR ANY OTHER PURPOSES, AND THE SURVEYOR ACCEPTS NO RESPONSIBILITY FOR ANY UNAUTHORIZED USE.

FIELD SURVEY COMPLETED THIS 7th DAY OF JUNE, 2022.

ELEVATIONS ARE GEODETIC (ORTHOMETRIC HTG(O)) DERIVED FROM GNSS OBSERVATION AND REAL TIME NETWORK STATION PENTICTON LEICA SMARTNET.

ALL DIMENSIONS ARE IN METRES AND DECIMALS THEREOF UNLESS OTHERWISE NOTED.

LEGAL BOUNDARIES SHOWN ARE BASED ON LIMITED EXISTING SURVEY EVIDENCE AND LAND TITLE OFFICE RECORDS. A FULL LEGAL SURVEY IS RECOMMENDED TO PROPERLY DEFINE BOUNDARIES.

MANDEVILLE LAND SURVEYING INC.
 PROFESSIONAL B.C. AND CANADA LAND SURVEYORS
 582 MARTIN STREET, PENTICTON, B.C.
 PH: 250-488-6377 WEB: MDSURVEYING.COM
 FILE: 22-156 DWS: 22-156

File No: GFX-1010

Location: 2204 Forsyth Drive, Penticton

SUBSURFACE PROFILE		SAMPLE		FIELD TEST										
Depth (metres)	Soil Description	Depth (feet)	Sample Number	Sample Type	Pocket Penetration Test (tsf)				Water Content (%)					
					1	2	3	4	10	20	30	40		
1	FILL – topsoil, roots, sand, gravel, silt, dry, loose.	1												
2	SAND & GRAVEL – compact, dry.	2												
3	Base of Excavation – 2.1 m Dry at completion.	3												

Investigation Date: April 5, 2023

Equipment: 125 Excavator

Logged By: Amber LeComte, P. Eng.



PROFESSIONAL ENGINEER
 PROVINCE OF BRITISH COLUMBIA
 A. N. LECOMTE
 # 43698
 DEC 5 2023

File No: GFX-1010

Location: 2204 Forsyth Drive, Penticton

SUBSURFACE PROFILE		SAMPLE		FIELD TEST				Water Content (%)					
Depth (metres)	Soil Description	Depth (feet)	Sample Number	Sample Type	Pocket Penetration Test (tsf)				Water Content (%)				
					1	2	3	4	10	20	30	40	
0 - 1	TOPSOIL – organics, black/brown	0 - 1											
1 - 2	SAND, GRAVEL & COBBLE – compact, dry	2											
2 - 3		3											
3 - 4	Base of Excavation – 1.8 m Dry at Completion	4											
4 - 5		5											
5 - 6		6											
6 - 7		7											
7 - 8		8											
8 - 9		9											
9 - 10		10											

Investigation Date: April 5, 2023

Equipment: Excavator

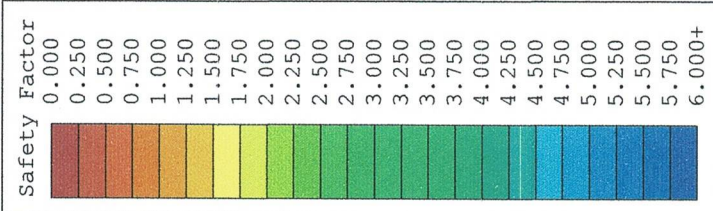
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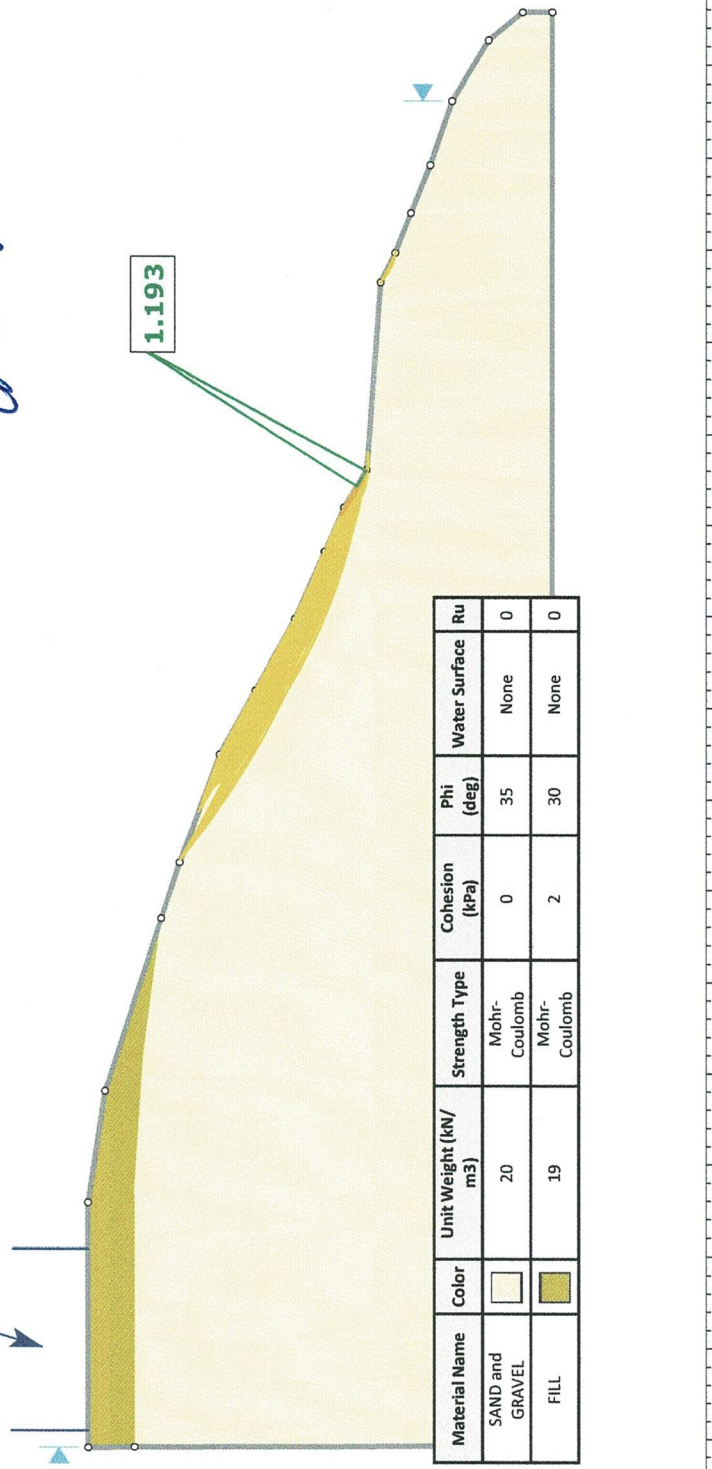
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. N. LECOMTE
49698

DEC 5 2023

PROFESSIONAL ENGINEER
 PROVINCE OF QUEBEC
 A. N. LECOMTE
 # 43698
 2023



Approximate Location of Planned Swimming Pool



1.193

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
SAND and GRAVEL		20	Mohr-Coulomb	0	35	None	0
FILL		19	Mohr-Coulomb	2	30	None	0

Project

2204 Forsythe Drive, Penticton

rocscience

Group 1

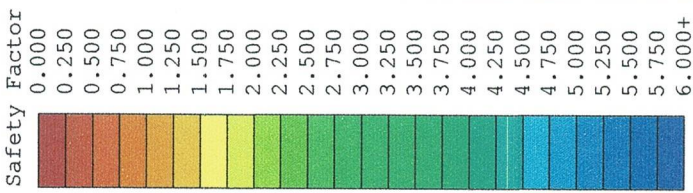
Master Scenario

Drawn By
 Amber LeComte, P.Eng.

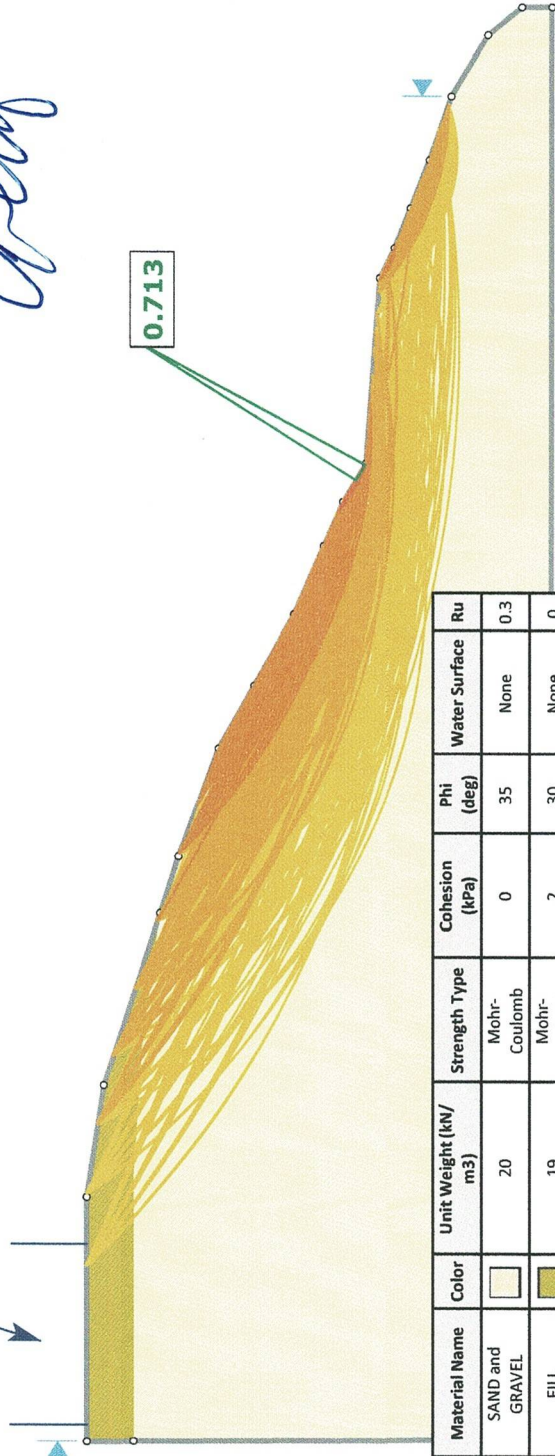
Company
 Ground FX Geotechnical Inc.

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Approximate Location of Planned Swimming Pool



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
SAND and GRAVEL		20	Mohr-Coulomb	0	35	None	0.3
FILL		19	Mohr-Coulomb	2	30	None	0

PROFES
OF
A. N. LECOMTE
43698
CAPITOL
ENGINEER

DEC 5 2023

Project: 2204 Forsythe Drive, Penticton

Group: Group 1

Scenario: Master Scenario

Drawn By: Amber LeComte, P.Eng.

Company: Ground FX Geotechnical Inc.

Date: 2023-04-24, 1:56:15 PM

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rocscience

SLIDEINTERPRET 9.027

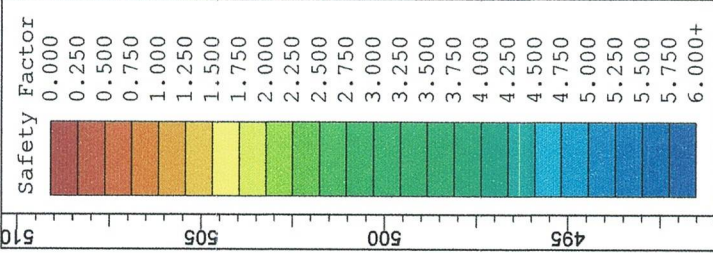


PROFESSIONAL ENGINEER
 PROVINCE OF ONTARIO
 A. N. LECOMTE
 # 43698
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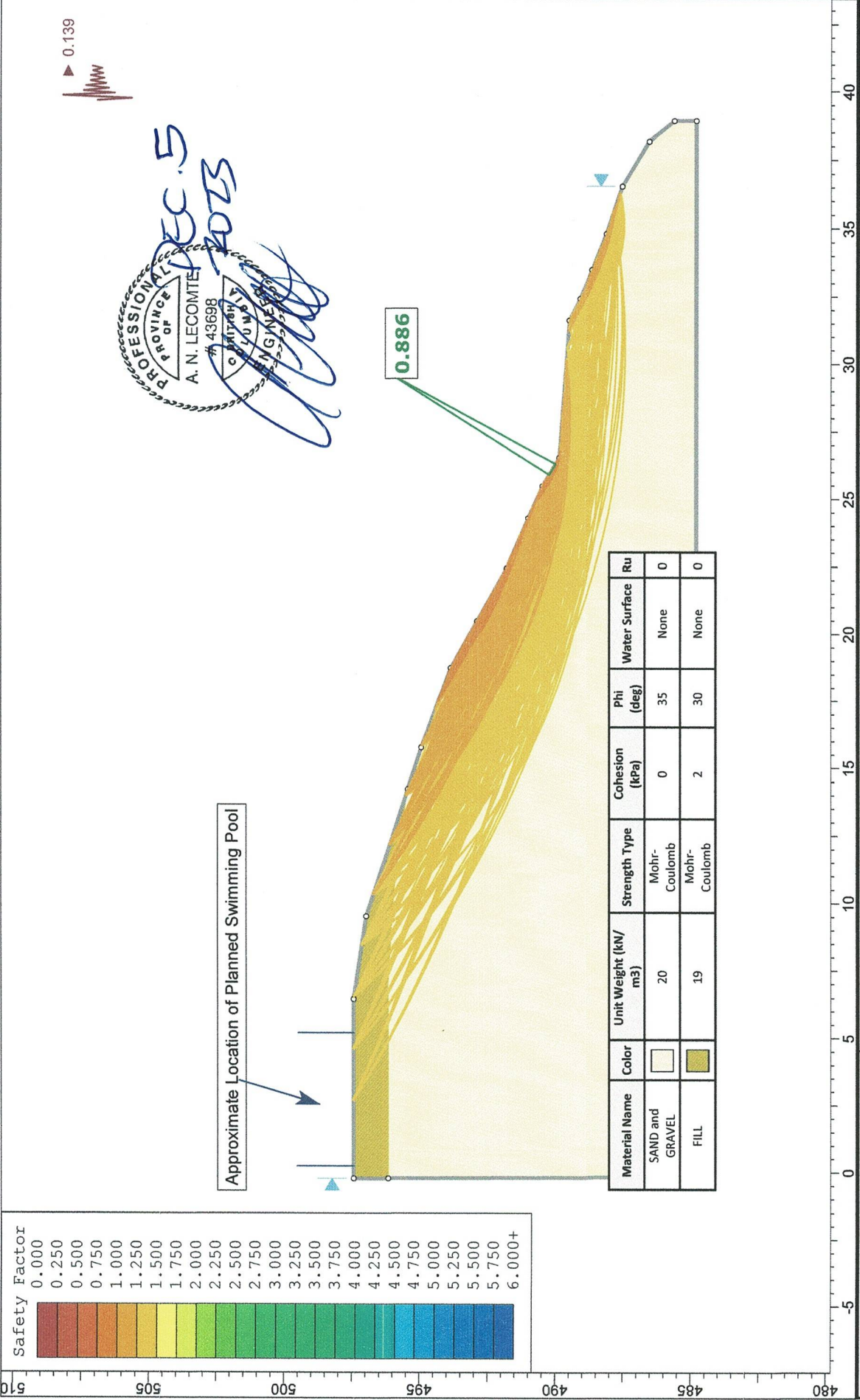
DEC 5 2023

Approximate Location of Planned Swimming Pool

0.886

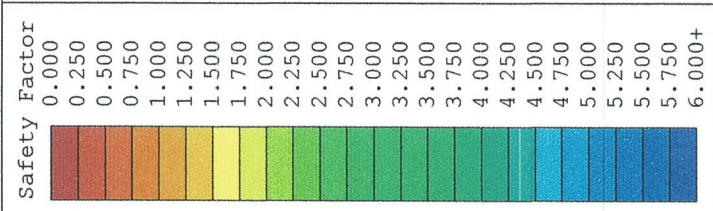


Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
SAND and GRAVEL		20	Mohr-Coulomb	0	35	None	0
FILL		19	Mohr-Coulomb	2	30	None	0



2204 Forsythe Drive, Penticton

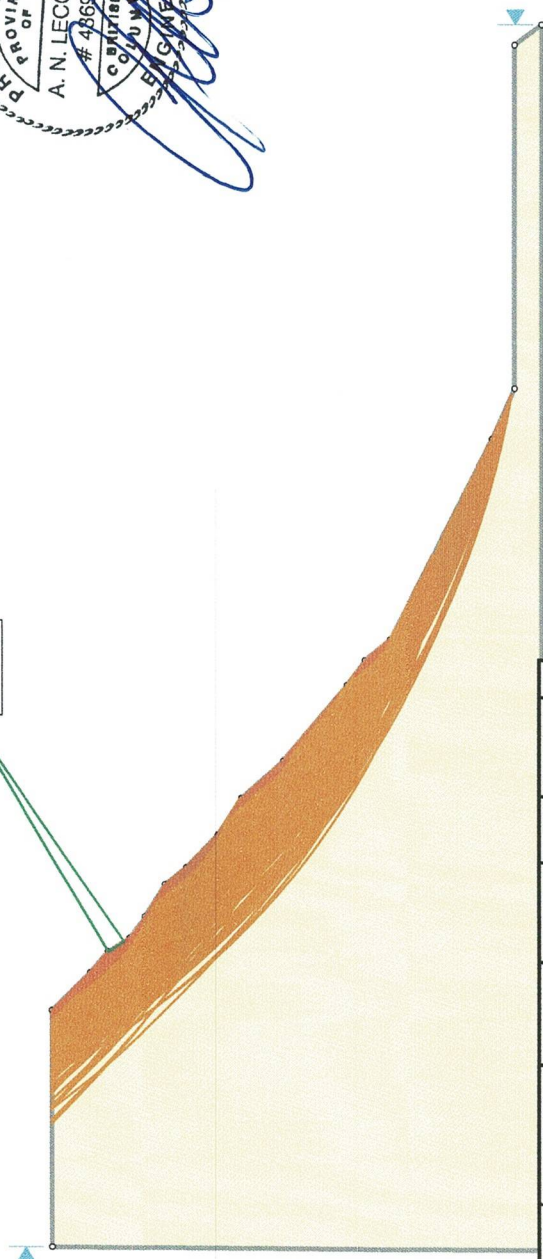
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PROFESSIONAL
 PROVINCE OF
 A. N. LECOMTE
 # 48698
 COLLEGE OF ENGINEERS
 BELGIUM

DEC 5 2023

0.447

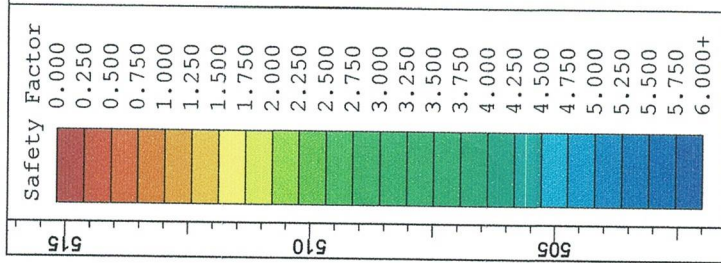


Material Name	SAND and GRAVEL	Color		Unit Weight (kN/m ³)	20	Strength Type	Mohr-Coulomb	Cohesion (kPa)	0	Phi (deg)	35	Water Surface	None	Ru	0
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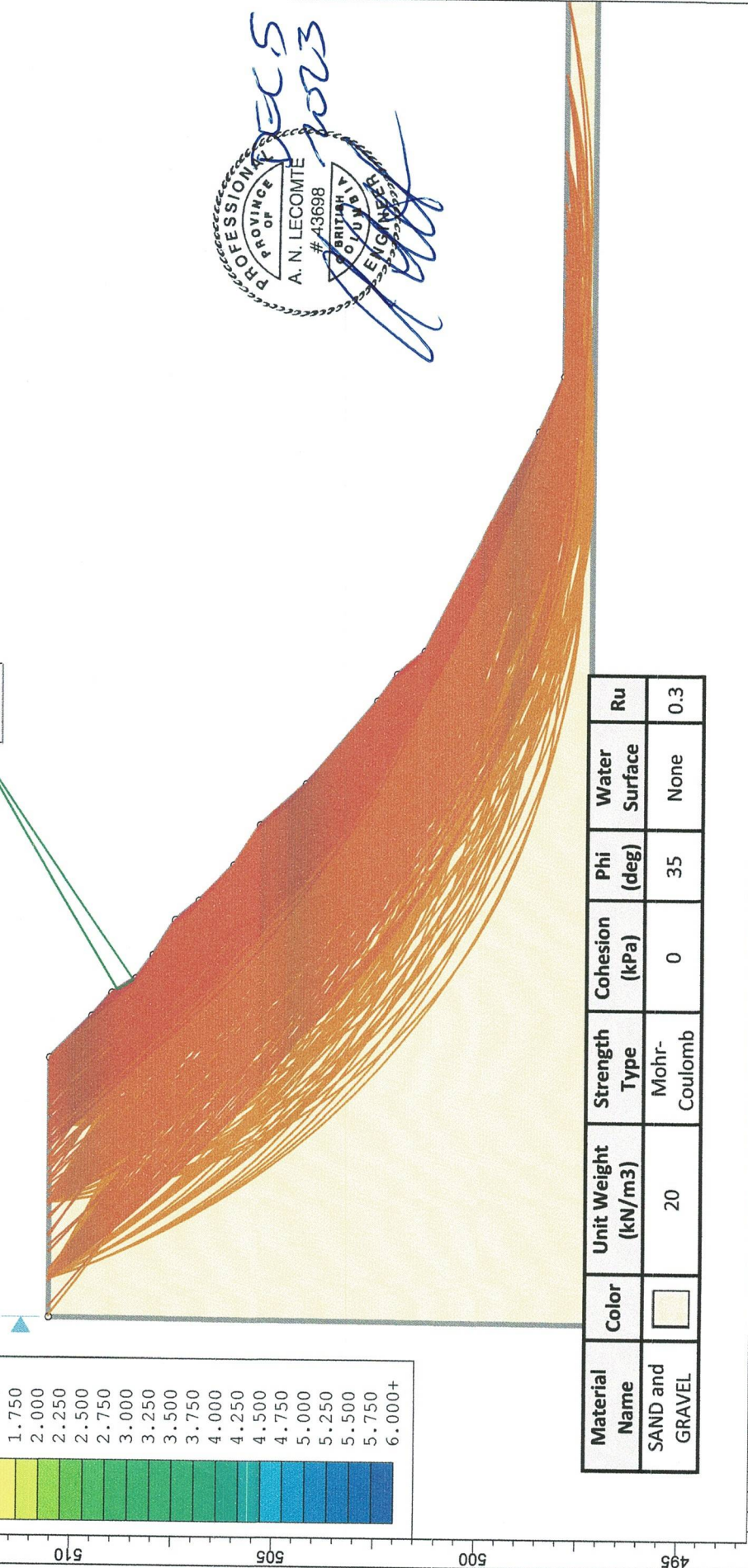
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2204 Forsythe Drive, Penticton

rocscience		Project	
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PROFESSIONAL ENGINEER
 PROVINCE OF BRITISH COLUMBIA
 A. N. LECOMTE #43698
 2023

Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
SAND and GRAVEL		20	Mohr-Coulomb	0	35	None	0.3

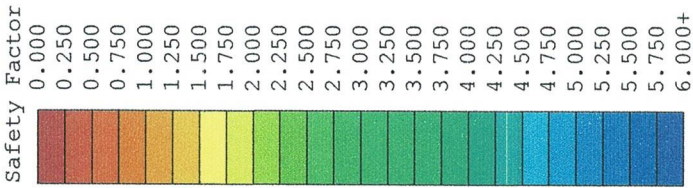
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0.139



0.330

PROFESSIONAL
OF
A. N. LECOMTE
48698
BRITISH
COLUMBIA
ENGINEER



Material Name	Color	Unit Weight (kN/m ³)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
SAND and GRAVEL		20	Mohr-Coulomb	0	35	None	0



2204 Forsythe Drive, Penticton

		Project	
		Group	Scenario
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		Drawn By	Company
SLIDEINTERPRET 9.027		Amber LeComte, P.Eng.	Ground FX Geotechnical Inc.
		Date	File Name
			Slide Section B-B' SEISMIC.slm

APPENDIX D: LANDSLIDE ASSESSMENT ASSURANCE STATEMENT

Note: This Statement is to be read and completed in conjunction with the "APEGBC Guidelines for Legislated Landslide Assessments for Proposed Residential Development in British Columbia", March 2006/Revised September 2008 ("APEGBC Guidelines") and the "2006 BC Building Code (BCBC 2006)" and is to be provided for *landslide assessments* (not floods or flood controls) for the purposes of the Land Title Act, Community Charter or the Local Government Act. Italicized words are defined in the APEGBC Guidelines.

To: The Approving Authority Date: Dec. 4, 2023
REGIONAL DISTRICT OF OKANAGAN SIMILKAMEEN
101 MARTIN ST. PENTICTON, BC. V2A 8T9
Jurisdiction and address

With reference to (check one):

- Land Title Act (Section 86) – Subdivision Approval
- Local Government Act (Sections 919.1 and 920) – Development Permit
- Community Charter (Section 56) – Building Permit
- Local Government Act (Section 910) – Flood Plain Bylaw Variance
- Local Government Act (Section 910) – Flood Plain Bylaw Exemption
- British Columbia Building Code 2006 sentences 4.1.8.16 (8) and 9.4 4.4.(2) (Refer to BC Building and Safety Policy Branch Information Bulletin B10-01 issued January 18, 2010)

For the Property: LOT 16, PLAN KAP 33471, DL 4947, ODD.
Legal description and civic address of the Property

The undersigned hereby gives assurance that he/she is a *Qualified Professional* and is a *Professional Engineer* or *Professional Geoscientist*.

I have signed, sealed and dated, and thereby certified, the attached *landslide assessment* report on the Property in accordance with the *APEGBC Guidelines*. That report must be read in conjunction with this Statement. In preparing that report I have:

Check to the left of applicable items

- 1. Collected and reviewed appropriate background information
- 2. Reviewed the proposed *residential development* on the Property
- 3. Conducted field work on and, if required, beyond the Property
- 4. Reported on the results of the field work on and, if required, beyond the Property
- 5. Considered any changed conditions on and, if required, beyond the Property
- 6. For a *landslide hazard analysis* or *landslide risk analysis* I have:
 - 6.1 reviewed and characterized, if appropriate, any *landslide* that may affect the Property
 - 6.2 estimated the *landslide hazard*
 - 6.3 identified existing and anticipated future *elements at risk* on and, if required, beyond the Property
 - 6.4 estimated the potential *consequences* to those *elements at risk*
- 7. Where the *Approving Authority* has adopted a *level of landslide safety* I have:
 - 7.1 compared the *level of landslide safety* adopted by the *Approving Authority* with the findings of my investigation
 - 7.2 made a finding on the *level of landslide safety* on the Property based on the comparison
 - 7.3 made recommendations to reduce *landslide hazards* and/or *landslide risks*
- 8. Where the *Approving Authority* has not adopted a *level of landslide safety* 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 this guideline 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.

Based on my comparison between

Check one

- the findings from the investigation and the adopted *level of landslide safety* (item 7.2 above)
- the appropriate and identified provincial, national or international guideline for *level of landslide safety* (item 8.4 above)

I hereby give my assurance that, based on the conditions^[1] contained in the attached *landslide assessment* report,

Check one

- for subdivision approval, as required by the Land Title Act (Section 86), "that the land may be used safely for the use intended"

Check one

- with one or more recommended registered covenants.
- without any registered covenant.

- for a development permit, as required by the Local Government Act (Sections 919.1 and 920), my report will "assist the local government in determining what conditions or requirements under [Section 920] subsection (7.1) it will impose in the permit".

- for a building permit, as required by the Community Charter (Section 56), "the land may be used safely for the use intended"

Check one

- with one or more recommended registered covenants.
- without any registered covenant.

- for flood plain bylaw variance, as required by the "Flood Hazard Area Land Use Management Guidelines" associated with the Local Government Act (Section 910), "the development may occur safely".

- for flood plain bylaw exemption, as required by the Local Government Act (Section 910), "the land may be used safely for the use intended".

AMBER LECOMTE, P.ENG.

DEC. 4, 2023.

Name (print)

Date

Signature

[1] When seismic slope stability assessments are involved, *level of landslide safety* is considered to be a "life safety" criteria as described in the National Building Code of Canada (NBCC 2005), Commentary on Design for Seismic Effects in the User's Guide, Structural Commentaries, Part 4 of Division B. This states:

"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".

Box 22042, RPO

Address

PENTICTON PLAZA, PENTICTON

(250) 274 9500

Telephone

BC



If the *Qualified Professional* is a member of a firm, complete the following.

I am a member of the firm GROUND FX GEOTECHNICAL INC.
and I sign this letter on behalf of the firm. (Print name of firm)