- INTERIOR -
TESTING SERVICES
- LTD. -

MATERIALS TESTING • SOILS
CONCRETE • ASPHALT • CORING
GEOTECHNICAL ENGINEERING

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

Rob & Donalyn Hirtz
1701 Shaleridge Pl
West Kelowna, BC V1Z 3E4

February 27, 2023
Job 23.024

Attention: Mr. Rob Hirtz

Re: **Preliminary Geotechnical Hazard Assessment**
Proposed House
4545 Mill Road
Naramata, BC

As requested, and further to our email proposal of January 30, 2023, Interior Testing Services Ltd. (ITSL) has completed a desktop review, field visits, and a preliminary slope stability analysis for the proposed home. Please find attached to this letter report the following documents:

- Site Plan (others): Drawing 23.024-1
- Cross-Sections (others): Drawing 23.024-2
- Preliminary Slope Stability Results: Drawings 23.024-3 to 23.024-8
- *Appendix D: Landslide Assessment Assurance Statement*

Attached at the end of this letter report is a copy of our two page *Terms of Engagement* which forms the basis on which we undertake this work, that has been previously signed and accepted.

ITSL understands that this report will be used as part of the Permit Application with the Regional District of the Okanagan-Similkameen (RDOS). ITSL acknowledges the RDOS as authorized users of this report, subject to the attached *Terms of Engagement.*

1.0 INTRODUCTION

ITSL understands that a single-family dwelling is proposed for the subject property. From the attached site plan (Drawing 23.024-1) a driveway and septic infrastructure will also be constructed.

Our scope of work included a desktop review of relevant information onsite or nearby, as well as a field visit to evaluate the potential for existing or possible geotechnical hazards, and our work included preliminary slope stability analyses.

The following report outlines our methodology, the findings of our field visit, the results of our preliminary slope stability analyses, our geotechnical hazard assessment, and preliminary geotechnical recommendations for site development.

2.0 SITE DESCRIPTION

The subject property is located at 4545 Mill Road in Naramata, BC. The property is generally rectangular in shape and is approximately 0.03 hectares (0.075 acres) in plan area. The property is relatively flat, and currently contains small structures as well as some landscaping infrastructure (ie; small walls, steps, fences, etc.). The property is bordered by a residential properties to the east and west, Mill Road to the north, and Okanagan Lake to the south.

2.0 PRELIMINARY GEOTECHNICAL INVESTIGATION

2.1 Desktop Review

As reported in *Late Glacial History and Surficial Deposits of the Okanagan Valley British Columbia* (Naismith, 1962), the materials on the property consist of glacial lake sediments (glaciolacustrine deposits). These are further described by Naismith as thick layers of "silt, sand and clay".

ITSL reviewed our project database for existing soil information from nearby projects. Based on this review, the soil types for nearby projects are typically comprised of natural, silt and sand.

The geology map titled *OK Geology (Open File 6839)* provided by the Geologic Survey of Canada was also reviewed. Within the subject property, this map indicates the bedrock materials consist of granitic gneiss. Although no reasonably proximate groundwater wells were discovered in our research of the publicly available information from iMapBC, based on our experience, ITSL anticipates that bedrock will be very deep.

Our desktop review also included examination of the available information from the RDOS online mapping resource to aid in the identification of potential geotechnical hazards and areas requiring additional review. The RDOS has identified the subject property with an area described as within the geologic hazard area identified as "GG Runka Soil Stability Ratings" (ITSL could not locate the reference material), and further as an area of "hazard or land receiving slope or slump material from above".

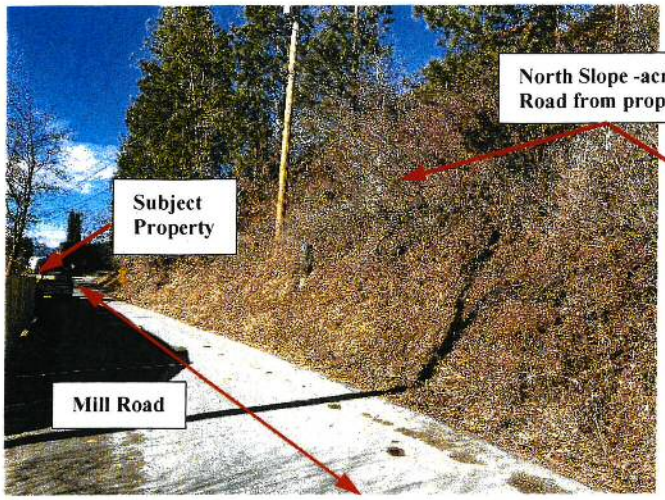
2.2 Field Visit and Site Conditions

ITSL carried out a field visit on February 8, 2023. During our field visit, the property was toured to view the existing surface conditions, to check for bedrock outcrops, to observe the general drainage conditions and identify potential hazard areas in relation to the proposed dwelling. No intrusive investigations were carried out during our field visits.

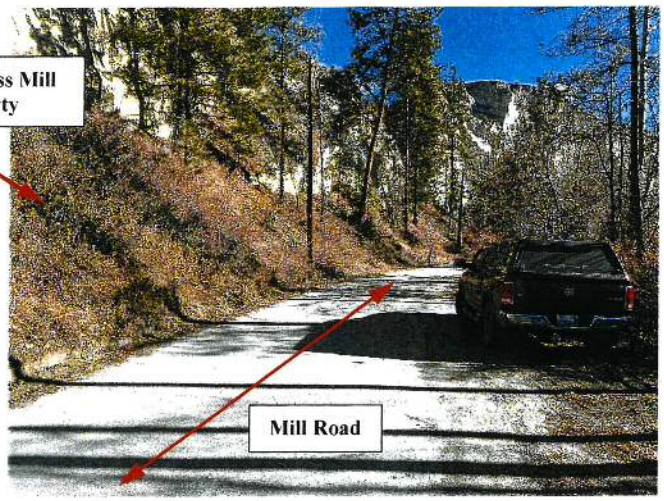
The property is located south of Mill Road along Okanagan Lake. On the north side of Mill Road, the terrain slopes up at approximately 42 degrees, and the slope is roughly 15 to 17 m in height. The slope appears to be well-vegetated and there was no obvious, visual evidence of significant slope instability.

2.3 Select Site Photographs

Below we include a series of select site photographs taken during our field visits.



Site Photo 1: February 8, 2023



Site Photo 2: February 8, 2023

3.0 GEOTECHNICAL HAZARD ASSESSMENT

3.1 Design Criteria

With respect to design criteria, to the best of our knowledge at the time of this report, the RDOS has not adopted level of safety for slope stability. The *Canadian Foundation Engineering Manual* (CFEM, 4th Edition) recommends factors of safety (FS) between 1.3 and 2.0 for earthworks, retaining walls and temporary excavations. The *Geotechnical Design Specifications for Subdivisions* prepared by the British Columbia Ministry of Transportation and Infrastructure (MoTI) suggests a FS range between 1.45 to 1.85 where there is a "low degree of understanding", for a range of consequence factors from "low" to "high". Where a "typical degree of understanding" is considered, the FS range is 1.34 to 1.71, again for "low" to "high" consequence factors. From the Professional Practice Guideline, *Landslide Assessments in British Columbia* (Engineers and Geoscientists BC, V4.0), a minimum FS of 1.5 is recommended for the long-term, static condition. The guideline also recommends that where a FS of 1.0 is calculated for the seismic condition, no further analyses are required.

Furthermore, with respect to probabilistic based approaches, it is our understanding that MoTI often uses the threshold of 1 in 475 years for geotechnical hazards. Comparing factors of safety to annual probability is challenging. However, information prepared by the *Pipeline Research Council* (PRC, 2009) indicates that a factor of safety of 1.3 has a probability equivalent of landslide occurrence of 1 in 1000. Furthermore, PRC suggests that a factory of safety of 1.4 or greater has a probability equivalent of 1 in 10 000.

3.2 Preliminary Slope Stability Analyses – Limit Equilibrium Method

Using the cross-sections prepared by JFI Drafting and Design (Drawing 23.024-2) ITSL has completed preliminary slope stability analysis for the sections described as A-A, B-B and C-C. To evaluate the stability of the slopes to the immediate north of the building area, ITSL completed both the static and seismic analyses using the commercially available software, Slide2 (by Rocscience).

The glaciolacustrine deposits common in the area of the subject property typically derive their shear strength or resistance to instability from cohesion. Conversely, granular materials (ie, sand and gravel) derive their strength from friction. Cohesion is independent of interparticle friction forces. From our project database, cohesion of the natural materials encountered in this area is normally on the order of 30 kPa. Previous publications (Iravani, 1999 and Ecora, 2021) have noted that cohesion can be as high as 60 kPa. ITSL has assumed a cohesion value of 32 kPa for the preliminary analyses, which appears to be reasonably conservative in our opinion.

With respect to soil unit weight of the glaciolacustrine deposits, ITSL used 17 kN / m^3, which appears to be reasonable in our opinion for preliminary purposes. For all three sections, ITSL modeled a thin, surface layer of topsoil-like materials, with a unit weight of 16 kN / m^3 and 5 kPa of cohesion. In Section A-A, a loading condition of 10 kN/m^2 was also applied where an existing structure is located north of the slope.

The material types and model properties are show below in Table 1.

Material	Unit Weight (kN/m^3)	Cohesion (kPa)	Friction Angle (degree)
Topsoil-like (silt / sand)	16	5	20
SILT / SAND	17	32	24

Table 1 – Slope Stability Soil Properties

The results of the preliminary slope stability analyses are shown below in Table 2, and graphical results are shown attached to this report.

Section	Min. Static FS	Min. Seismic FS
A-A	1.8	1.6
B-B	1.8	1.6
C-C	1.7	1.6

Table 2 – Slope Stability Results

From Table 2 above, the results of A-A, B-B, and C-C achieve the design criteria discussed above and have a minimum static FS of 1.7, and a minimum seismic FS of 1.6.

3.3 Additional Geotechnical Comments

Geotechnical concerns such as landslide and rockfall have been considered as potential hazards on the site with respect to a safe building site. Other hazards as identified in the *Local Government Act {RSBC} Chapter 1* are flooding, mud flows, torrents of debris, subsidence, tsunami, avalanche or wildfire.

As ITSL does not have any experience with flooding, tsunami, avalanche or wildfire hazards, we did not include those in our hazard analysis.

Landslide and rockfall were assessed in the field based on visible soil conditions, topography, historical slope erosion and instabilities in areas with similar soil types, surface drainage patterns, slope characteristics and proximity to watercourses. Besides localized, near surface erosion, evidence of previous significant geotechnical hazards such as slope instability or rock fall were not observed on the site, nor on the slopes to the immediate north of the property.

In addition, as part of our hazard assessment, ITSL referred to *Hazard Acceptability Thresholds for Development Approvals by Local Government*, an approval document prepared by Dr Peter Cave (Cave, 1993). The paper by Cave identifies a total of seven types of development based on intensity of land use, ranging from minor repair to community planning. The paper by Cave also provides hazard related responses ranging from "1 – Approval with conditions relating to hazards", to "5 – Not approvable".

ITSL provides the following estimated frequency of the geohazards presented by Cave.

Geohazard	Estimated Frequency
Small-scale Landslides	<1:475
Small-scale Rock Fall	<1:10 000
Large-scale Landslides / Rockfalls	<1:10 000

Table 3 – Hazard Frequency Estimates (based on Cave 1993)

The geohazard frequencies provided in the above table are estimated based on our engineering judgement, the proposed development as known to ITSL, site conditions observed during our field visits, results of previous statistical analyses and our limit equilibrium analyses of slope stability.

It appears reasonable in our opinion to conclude that rock fall and large-scale landslide will not impact the subject property. These frequencies are subject to change, particularly where uphill changes occur. The proposed site is not expected to be affected by small scale landslides due to natural forces. However, human activities, such as site grading, logging or other landscape altering activities uphill of the subject property may potentially result in negative impacts.

As discussed above, the RDOS has not provided a design level of safety for consideration, and to the best of our knowledge there is no generally accepted level of landslide safety in British Columbia. However, it is also our understanding that the BC MoTI commonly accepts an assessment of probability of landslide occurrence less than 10% in 50 years (1 in 475), in reference to a landslide that can cause injury to persons or severe damage to the home.

On the assumption that the MoTI level of safety is acceptable, the site appears suitable for the proposed residential development and adequate for the intended purpose. In reference to Section 86 of the Land Title Act, in our opinion, the land may be used safely for the use intended, subject to our recommendations provided within this report.

In accordance with the EGBC Professional Practice Guideline *Landslide Assessments in British Columbia* for *Legislated Landslide Assessments for Residential Developments*, we have attached a *Landslide Assessment Assurance Statement* to this letter report.

4.0 PRELMINARY GEOTECHNICAL RECOMMENDATIONS

Our preliminary recommendations for site preparation, foundation design, and building drainage are provided below.

4.1 Site Preparation

Prior to placement of engineered FILL materials or concrete foundations, ITSL recommends that the site be cleared of existing vegetation, TOPSOIL, old FILL materials, any buried structures and / or any other

deleterious materials. We recommend that ITSL review the subgrade soils after site clearing work is completed, prior to placing engineered FILL materials or concrete foundations, to confirm that conditions are satisfactory or to provide additional geotechnical guidance as needed.

4.2 Engineered Fill

ITSL recommends that where the site grades need to be raised, that engineered FILL be placed and compacted above suitable subgrade. ITSL recommends that engineered FILL material consist of clean sands and gravels with no more than 8% passing the 0.075 mm sieve (ie MMCD Pit-Run or similar). In addition, prior to placement of the engineered FILL, we recommend that ITSL review the proposed FILL material to confirm suitability.

ITSL recommends that the engineered FILL be placed in controlled lifts not exceeding 300 mm thickness and that each lift be compacted to at least 95% of Modified Proctor Density (MPD) and moisture conditioned to within 2% of the optimum moisture content. ITSL recommends that field density testing be carried out on at least every second lift (every 600 mm) to confirm compaction is adequate.

Depending on the elevation of groundwater relative to the actual foundations and slabs, engineered FILL may need to consist of clear, crushed rock. Further guidance can be provided at the time of construction.

4.3 Foundation Preparation

ITSL recommends that the foundation bearing materials consist of suitable natural soil or engineered FILL. ITSL recommends that we review the foundation subgrade materials to confirm conditions are satisfactory.

4.4 Foundation Design

For footings set on suitable natural soil or engineered FILL, a preliminary allowable bearing pressure of 100 kPa (2000 psf) may be assumed for foundation design purposes.

The allowable bearing pressure is subject to the following considerations.

a) Bearing surfaces to be clean, dry, free of any TOPSOIL and in a well compacted condition.
b) Minimum footing width to be 400 mm (16 inches).
c) Minimum depth of footing to be 600 mm (24 inches) below final adjacent grade, or as per local by-law, for frost protection purposes.

The above allowable bearing pressure can also be taken as the Service Limit State (SLS) resistance. For the factored geotechnical resistance at the Ultimate Limit State (ULS) for soil bearing, a resistance of 150 kPa (3000 psf) can be assumed for foundation design purposes.

The above ULS comments are based on a resistance factor of 0.5 as recommended in the CFEM.

4.5 Building Drainage and Final Site Grading

The 2018 British Columbia Building Code specifies that the base of every exterior foundation wall shall be drained by tile, pipe or rock, laid around the exterior of the foundation, unless it can be shown to be unnecessary.

Where interior slabs are below exterior grades (ie crawl spaces or basements), typical foundation drainage is to be provided and directed to a suitable disposal location. The drainage system and disposal location are to be designed by others.

ITSL recommends that the roof drainage be directed to splash pads or similar above ground collection systems, set well away from the foundations to limit potential water infiltration into the foundation backfill zone.

5.0 CONCLUSION

As requested, ITSL has prepared a geotechnical report discussing the findings of our desktop review, field visit, preliminary slope stability analyses and our hazard assessment. In addition, ITSL has provided preliminary geotechnical recommendations for the development of the site, including preliminary foundation preparation and design recommendations.

Subject to the recommendations in this report and to confirmation that the referenced level of safety is satisfactory, it appears reasonable in our opinion to conclude that the land may be safely used for the intended use, which is support of a single-family residence.

At the time construction, ITSL recommends that we carry out field reviews as discussed in the recommendations, or as required by the RDOS.

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

Sincerely,
Interior Testing Services Ltd
Permit to Practice Number: 1001971

Prepared By:

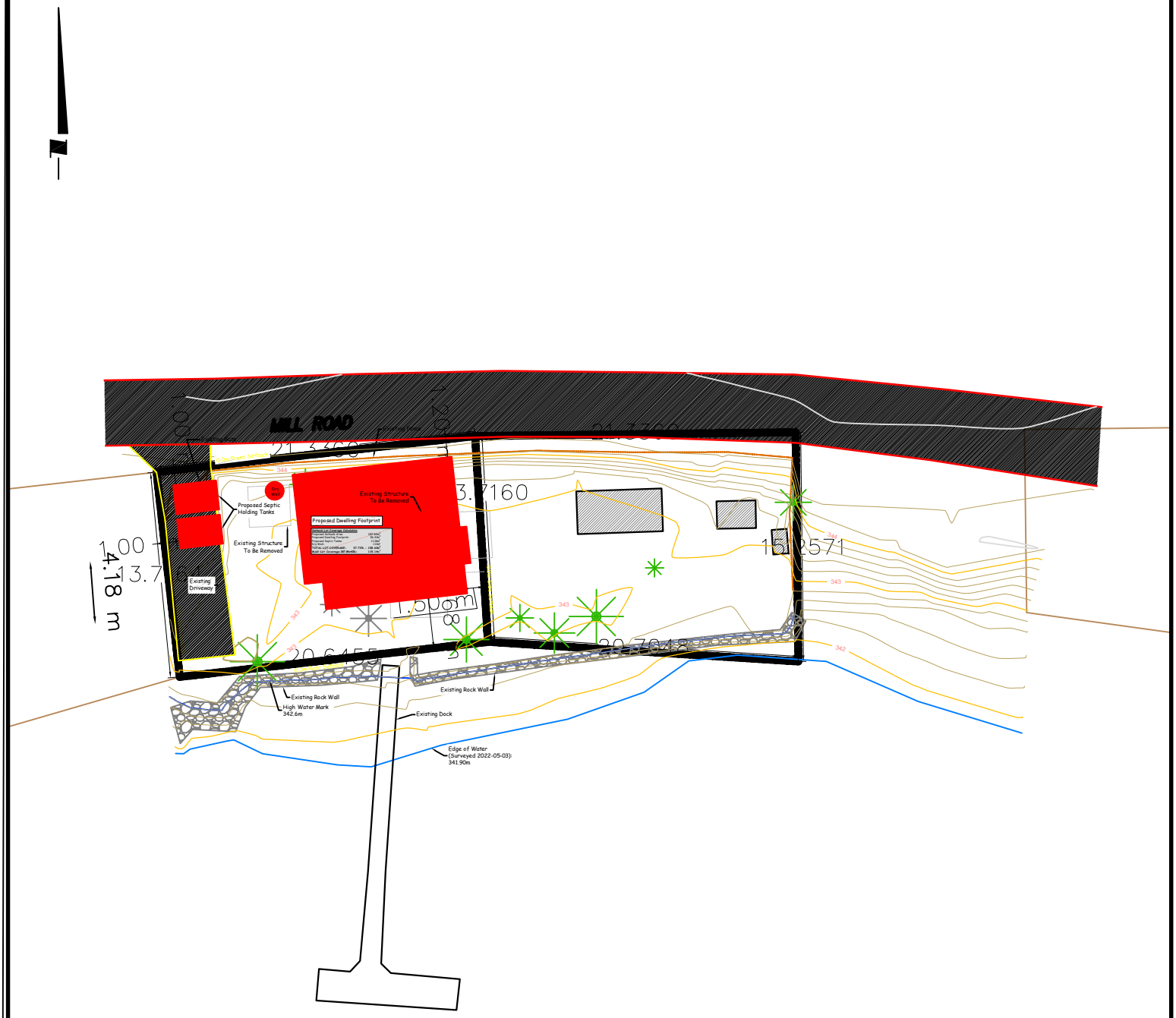
Eli Schock, EIT
Junior Geotechnical Engineer

Reviewed By:

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
J. BLOCK
39007
FEB 27 2023

Jeremy Block, P Eng
Senior Geotechnical Engineer

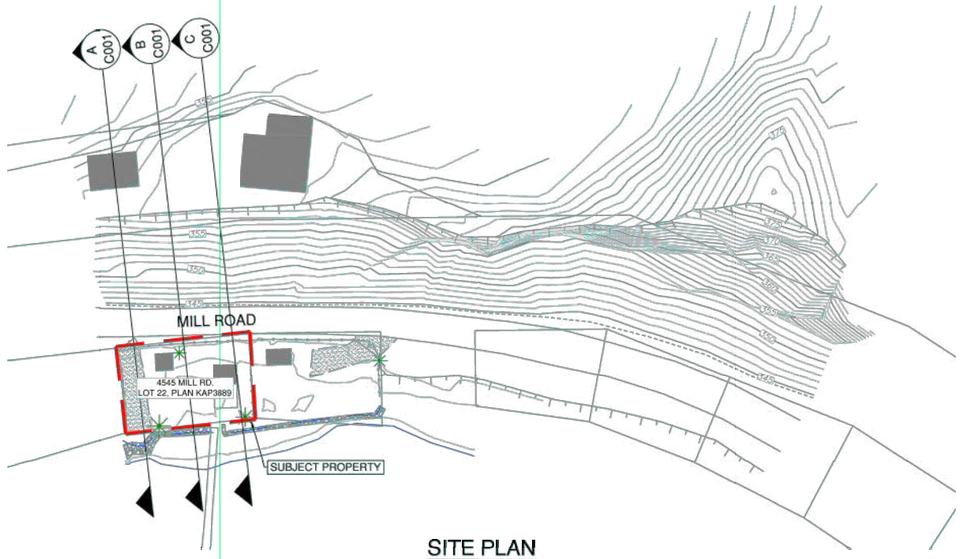
Revision No.	Date	Comments
0.0	February 27, 2023	Issued for use



NOTES

1. REFERENCE PLAN SUPPLIED BY OKANAGAN DEVELOPMENT CONSULTANTS INC (NTS).

MR. ROB HIRTZ	*SITE PLAN*	*INTERIOR TESTING SERVICES LTD* *1-1965 MOSS COURT, KELOWNA, BC V1Y 9L3* *PH: 250-860-6540 EM: info@interiortesting.com*
PROPOSED HOUSE *4545 MILL ROAD* *NARAMATA, BC*		*DATE OF INVESTIGATION: FEBRUARY 8, 2023* *JOB NUMBER: 23.024* — *DRAWING NUMBER: 23.024-1*



SITE PLAN

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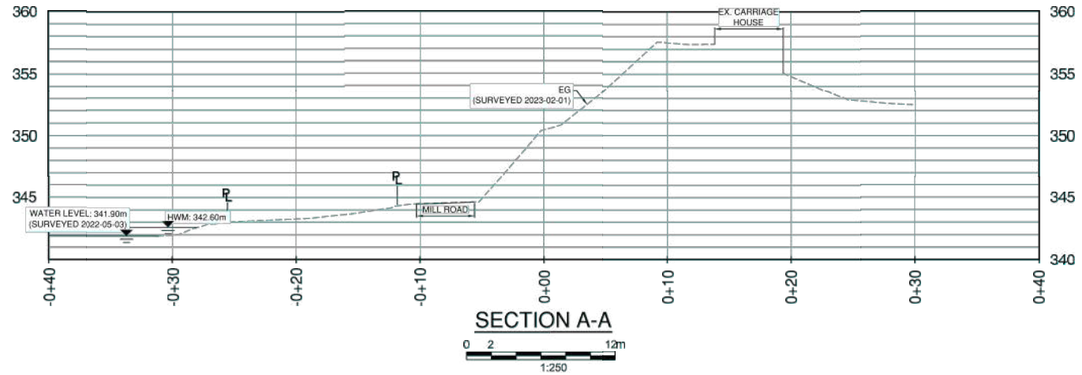

SECTION A-A

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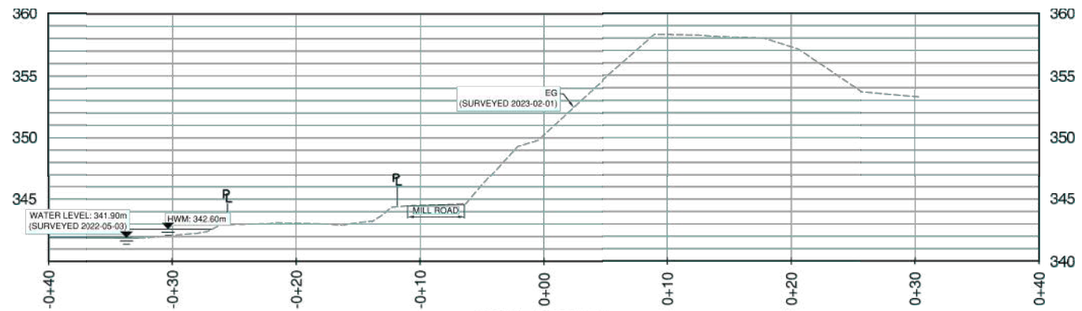

SECTION B-B

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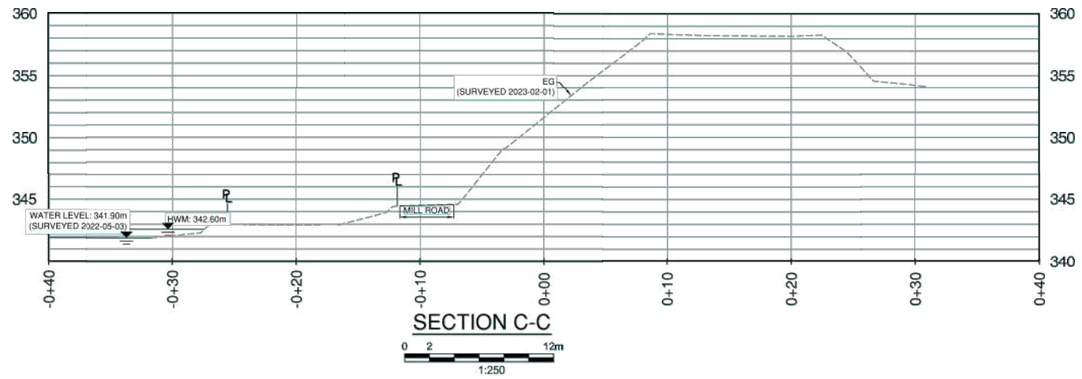

SECTION C-C

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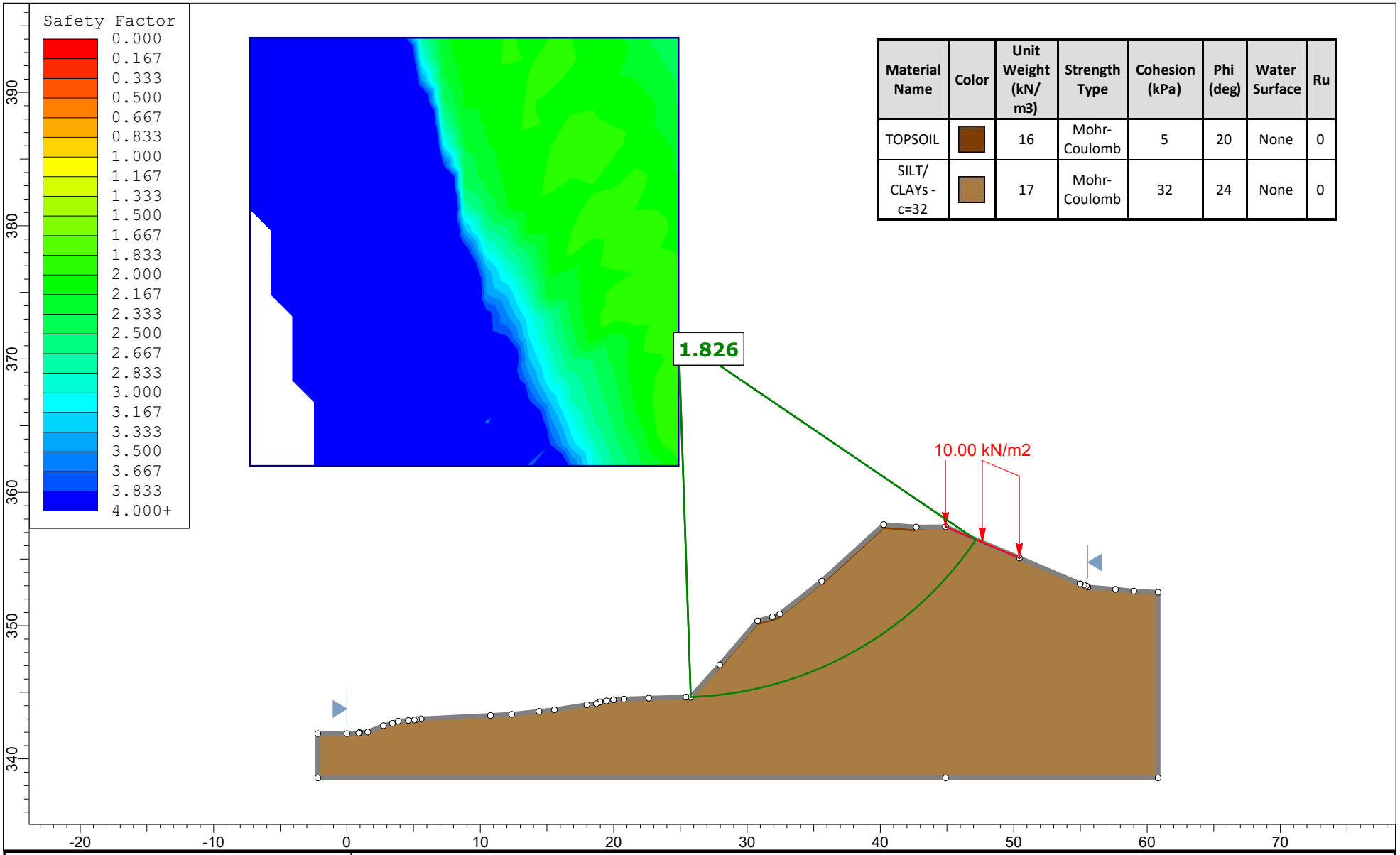
1:250

NOTES

1. REFERENCE PLAN SUPPLIED BY JFI DRAFTING AND DESIGN (NTS).

MR. ROB HIRTZ	SITE PLAN	INTERIOR TESTING SERVICES LTD 1-1965 MOSS COURT, KELOWNA, BC V1Y 9L3 PH: 250-860-6540 EM: info@interiortesting.com
PROPOSED HOUSE 4545 MILL ROAD NARAMATA, BC		DATE OF INVESTIGATION: FEBRUARY 8, 2023 JOB NUMBER: 23.024 | DRAWING NUMBER: 23.024-2



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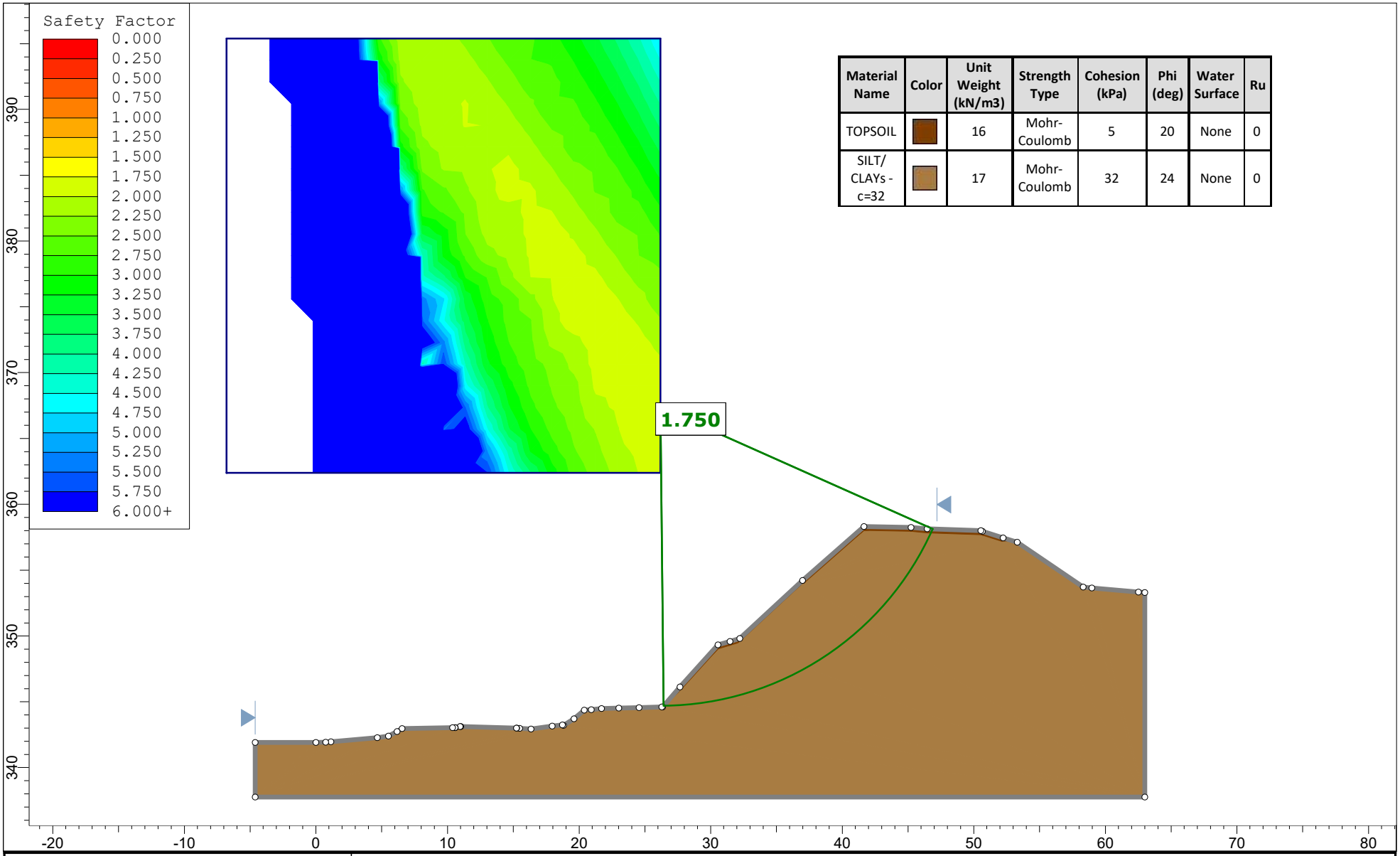
TOPSOIL		16	Mohr-Coulomb	5	20	None	0
SILT/ CLAYs - c=32		17	Mohr-Coulomb	32	24	None	0

- INTERIOR - TESTING SERVICES - LTD. -

SLIDEINTERPRET 9.017

Project	23.024 - Slope Stability		
Group	23.024-3	*Scenario*	Section A - Static Condition
Drawn By		*Company*	Interior Testing Services Ltd.
Date	2022-04-05, 8:09:33 AM	*File Name*	23.024 - Slope Stability.slmd



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SILT/ CLAYs - c=32		17	Mohr-Coulomb	32	24	None	0

- INTERIOR - TESTING SERVICES - LTD. -

SLIDEINTERPRET 9.017

Project	23.024 - Slope Stability		
Group	23.024-4	*Scenario*	Section B - Static Condition
Drawn By		*Company*	Interior Testing Services Ltd.
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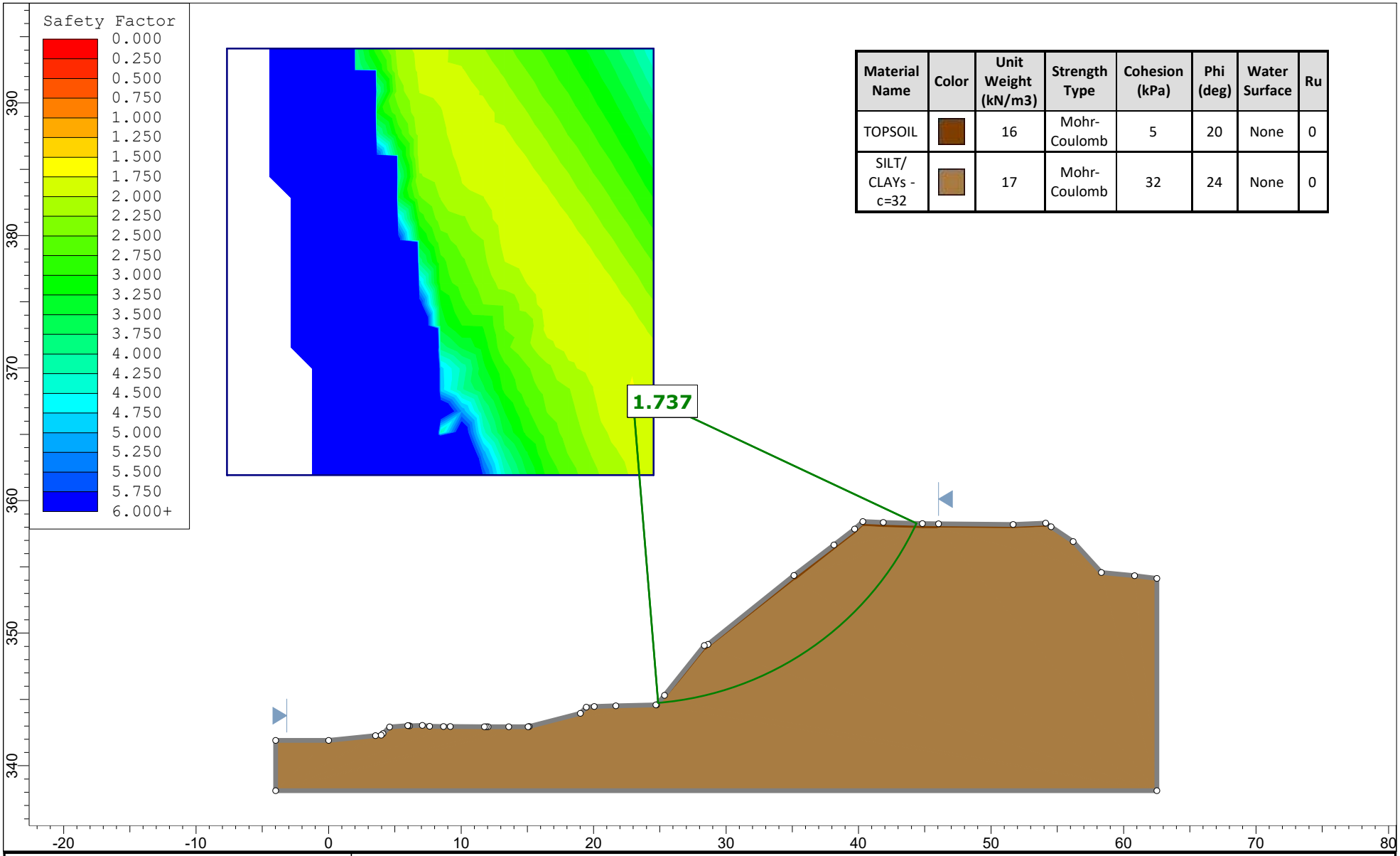

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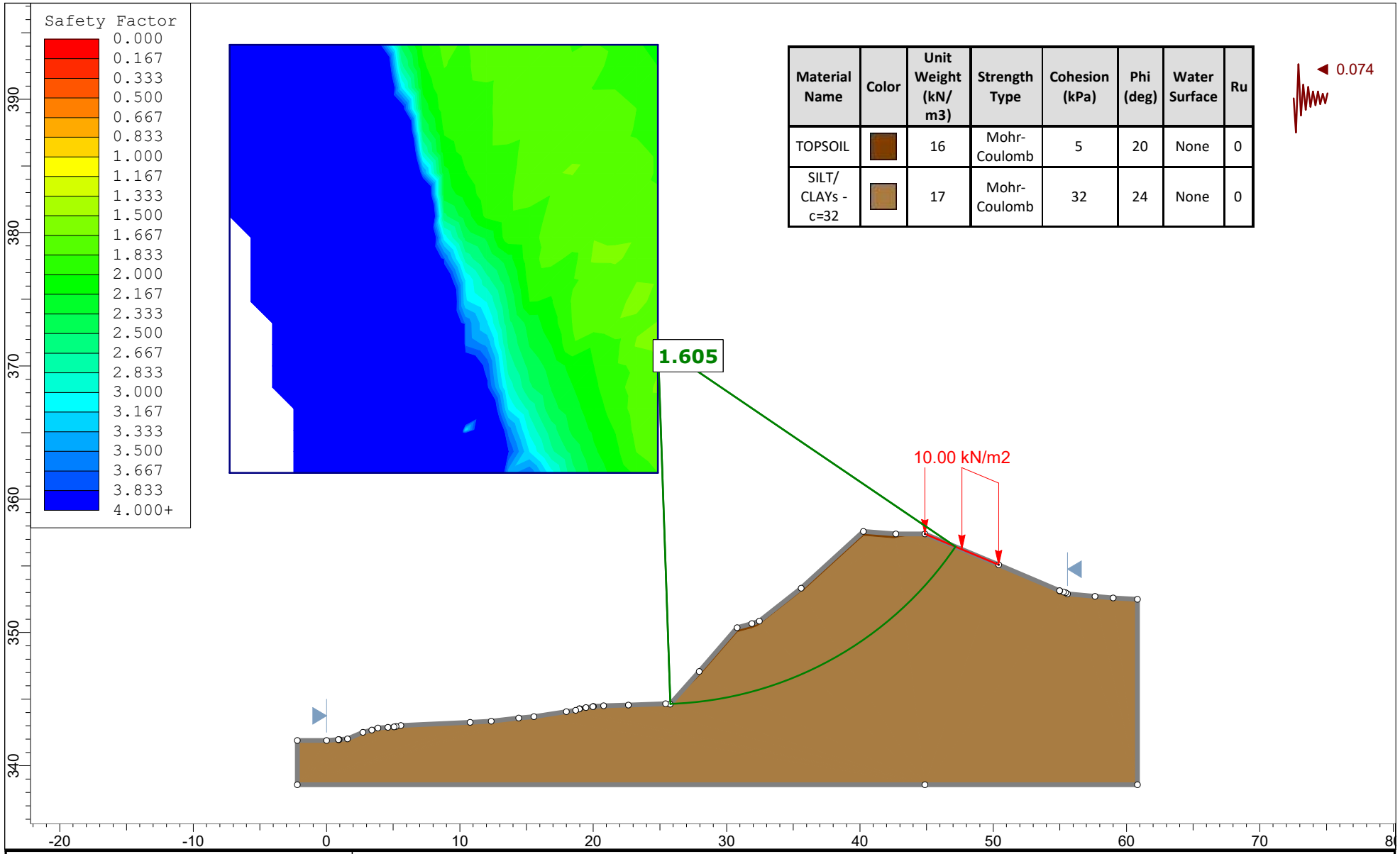
TOPSOIL		16	Mohr-Coulomb	5	20	None	0
SILT/ CLAYs - c=32		17	Mohr-Coulomb	32	24	None	0

- INTERIOR - TESTING SERVICES - LTD. -

SLIDEINTERPRET 9.017

Project	23.024 - Slope Stability		
Group	23.024-5	Scenario	Section C - Static Condition
Drawn By		Company	Interior Testing Services Ltd.
Date	2022-04-05, 8:09:33 AM	File Name	23.024 - Slope Stability.slmd



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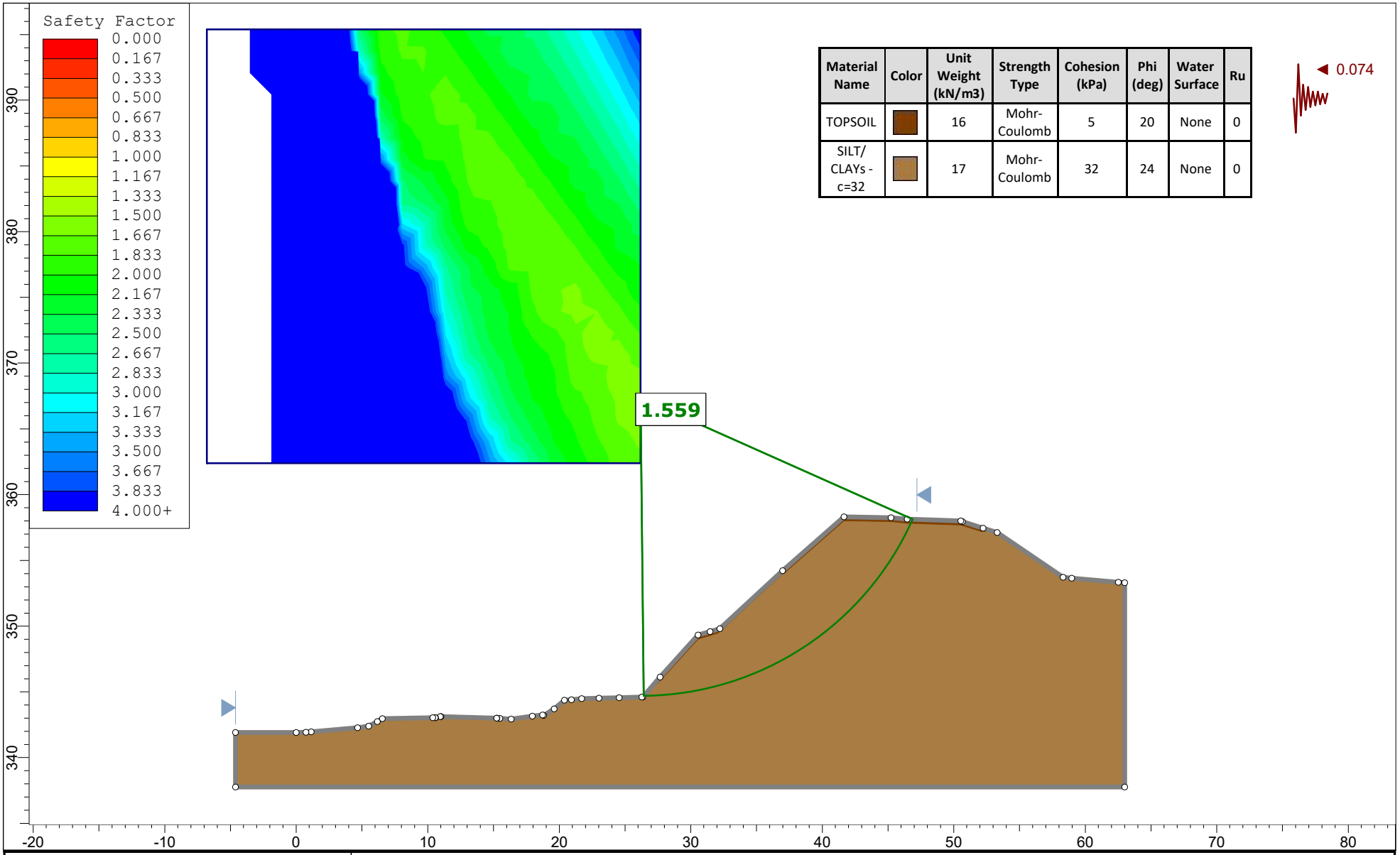
TOPSOIL		16	Mohr-Coulomb	5	20	None	0
SILT/ CLAYs - c=32		17	Mohr-Coulomb	32	24	None	0

- INTERIOR - TESTING SERVICES - LTD. -

SLIDEINTERPRET 9.017

Project	23.024 - Slope Stability		
Group	23.024-6	*Scenario*	Section A - Seismic Condition
Drawn By		*Company*	Interior Testing Services Ltd.
Date	2022-04-05, 8:09:33 AM	*File Name*	23.024 - Slope Stability.slmd



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SILT/ CLAYs - c=32		17	Mohr-Coulomb	32	24	None	0

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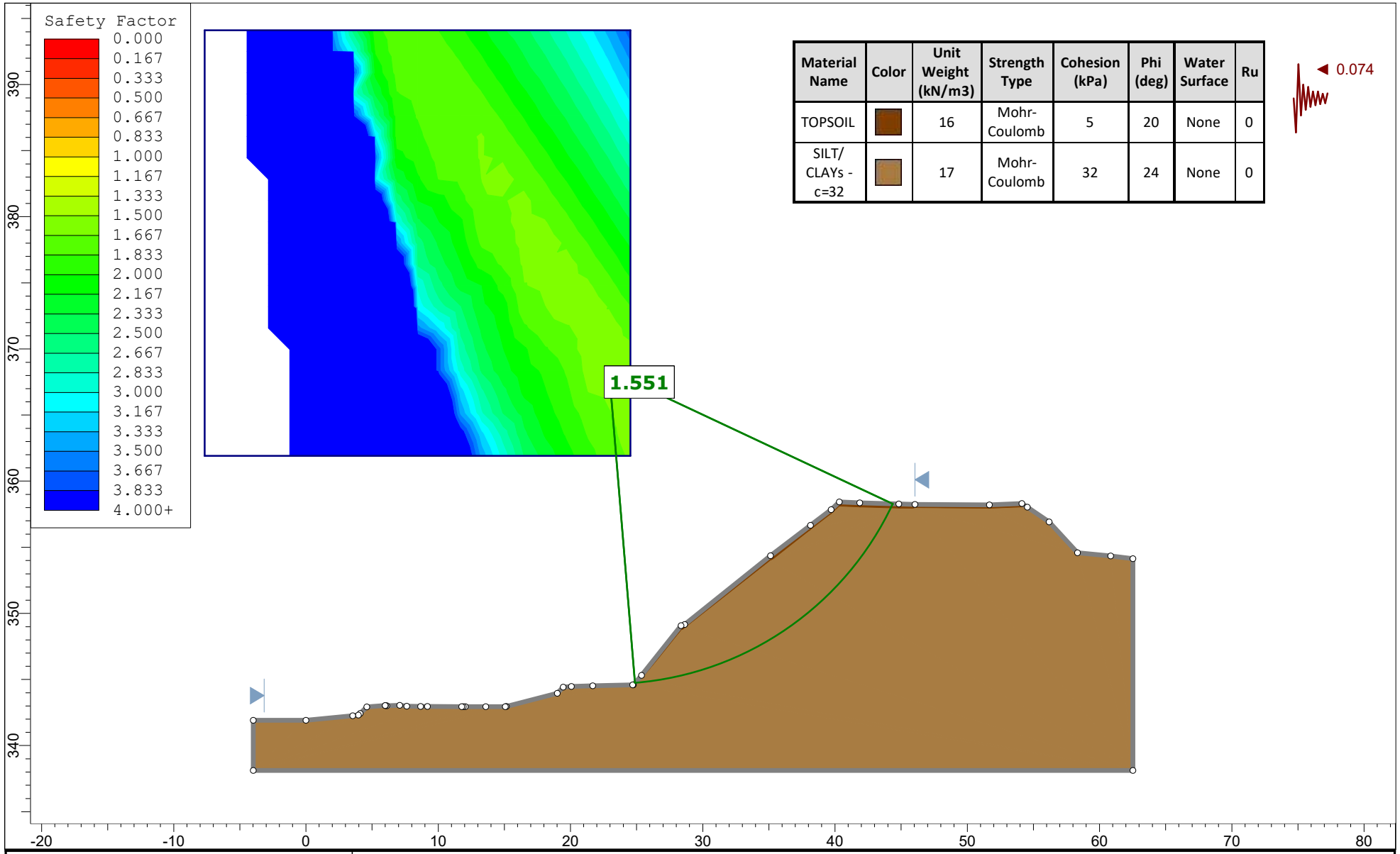
SLIDEINTERPRET 9.017

Project	23.024 - Slope Stability		
Group	23.024-7	*Scenario*	Section B - Seismic Condition
Drawn By		*Company*	Interior Testing Services Ltd.
Date	2022-04-05, 8:09:33 AM	*File Name*	23.024 - Slope Stability.slmd



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SILT/ CLAYs - c=32		17	Mohr-Coulomb	32	24	None	0

- INTERIOR - TESTING SERVICES - LTD. -

SLIDEINTERPRET 9.017

Project	23.024 - Slope Stability		
Group	23.024-8	*Scenario*	Section C - Seismic Condition
Drawn By		*Company*	Interior Testing Services Ltd.
Date	2022-04-05, 8:09:33 AM	*File Name*	23.024 - Slope Stability.slmd

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.

To: The Approving Authority (or Client) Date: February 27, 2023

Regional District of Okanagan-Similkameen

c/o Mr Rob Hirtz

Jurisdiction/name and address

With reference to (CHECK ONE):

- ☐ A. *Land Title Act* (Section 86) – Subdivision Approval
- ☒ B. *Local Government Act* (Sections 919.1 and 920) – Development Permit
- ☐ C. Community Charter (Section 56) – Building Permit
- ☐ D. Non-legislated assessment

For the following property (the "Property"):

4545 Mill Road, Naramata, BC

Civic address of the Property

The undersigned hereby gives assurance that they are a Qualified Professional and a professional engineer or professional geoscientist who fulfils the education, training, and experience requirements as outlined in the guidelines.

I have signed, authenticated, and dated, and thereby certified, the attached Landslide Assessment Report on the Property in accordance with the guidelines. That report must be read in conjunction this statement.

In preparing that report I have:

[CHECK TO THE LEFT OF APPLICABLE ITEMS]

X 1. Collected and reviewed appropriate background information

X 2. Reviewed the proposed Residential Development or other development on the Property

X 3. Conducted field work on and, if required, beyond the Property

X 4. Reported on the results of the field work on and, if required, beyond the Property

X 5. Considered any changed conditions on and, if required, beyond the Property

6. For a Landslide Hazard analysis or Landslide Risk analysis, I have:

X 6.1 reviewed and characterized, if appropriate, any Landslide that may affect the Property

X 6.2 estimated the Landslide Hazard

X 6.3 identified existing and anticipated future Elements at Risk on and, if required, beyond the Property

X 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, or where the Landslide Assessment is not produced in response to a legislated requirement, I have:

X 8.1 described the method of Landslide Hazard analysis or Landslide Risk analysis used

X 8.2 referred to an appropriate and identified provincial, national, or international guideline for Level of Landslide Safety

X 8.3 compared those guidelines (per item 8.2) with the findings of my investigation

X 8.4 made a finding on the Level of Landslide Safety on the Property based on the comparison

X 8.5 made recommendations to reduce Landslide Hazards and/or Landslide Risks

X 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)

Where the Landslide Assessment is not produced in response to a legislated requirement, I hereby give my assurance that, based on the conditions[1] contained in the attached Landslide Assessment Report:

A. SUBDIVISION APPROVAL

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

[CHECK ONE]

☐ with one or more recommended additional registered Covenants

☐ without an additional registered Covenant(s)

B. DEVELOPMENT PERMIT

☒ For a development permit, as required by the *Local Government Act* (Sections 488 and 491), my report will "assist the local government in determining what conditions or requirements it will impose under subsection (2) of [Section 491]"

[CHECK ONE]

☐ with one or more recommended additional registered Covenants

☒ without an additional registered Covenant(s)

C. BUILDING 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 additional registered Covenants

☐ without any additional registered Covenant(s)

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[1] 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:

"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

Jeremy Block, P Eng
Name (print)

February 27, 2023
Date

Interior Testing Services Ltd
Address

1 - 1965 Moss Court, Kelowna, BC V1Y 9L3

(250) 860-6540
Telephone

info@interiortesting.com
Email

(Affix PROFESSIONAL SEAL and signature here)

The Qualified Professional, as a registrant on the roster of a registrant firm, must complete the following:

I am a member of the firm Interior Testing Services Ltd
(Print name of firm)

with Permit to Practice Number 1001971
(Print permit to practice number)

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. Increased liability limits may be negotiated upon the Client's request in consideration of an additional fee.

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 ITSL carries professional liability insurance. Please sign and return a copy of this form as an indication of acceptance and agreement to the contractual force of these Terms of Engagement.

PRINT NAME:_____DATE:_____

ACKNOWLEDGEMENT:_____