
Steve Kingsnorth
Civil-X Contracting Ltd.
2483 Rhinestone Road
West Kelowna, BC

April 15, 2021

Re: Slope Excavation - 4995 Trepanier Road
Peachland, BC

At your request, SNT Geotechnical Ltd. (SNTG) performed a site review and assessed the slope excavation plans and the drainage for the proposed land development at 4995 Trepanier Road in Peachland, BC.

A site review of the area outlined in Figure 1 was performed by Mr. Mike Walsh, P.Eng. of SNTG on April 1, 2021 to examine the soil and drainage conditions and review the proposed slope development. The following is a summary of our observations and conclusions.

Site Observations

The property is predominated by a relatively flat area along the southern 2/3 of the property. The northern portion of the property is comprised of a mostly treed natural slope inclined upward to the north between 30 and 35 degrees.

Some slope excavation has recently been performed on the northwestern portion of the slope; exposing a relatively consistent sand and gravel soil with cobbles to 450mm in size.

Groundwater or seepage was not observed along any of the slope or within the flat area of the property.

Conclusions

Slope Stability

It is understood the proposed development will comprise of the removal of the existing vegetation and topsoil and the excavation and/or filling along the present slope to develop a proposed 2H:1V (26.5 degree) angle. The existing access road presently running along the slope will be placed along the top of the proposed excavation.

The exposed slope material and geomorphic location would tend to indicate the terrain is comprised of glaciofluvial sediments developed through successive outwash events experienced from the Trepanier Creek drainage to the northwest. Furthermore, these soils are indicative of the higher energy depositional environment implying a relatively consistent composition of coarse sediments. These soils are considered relatively strong and generally suitable for the proposed development slope. In addition, as the proposed development of the slope will mostly involve a reduction in gradient, overall slope stability will be improved.

In the area of the present slope where excavation has been performed, some filling may be required to develop a consistent 2H:1V slope along the face. In these instances, it is recommended that the coarse granular material sourced elsewhere on the slope be used as fill. The material should be compacted in place using shallow (<300mm) lifts and be free of any organic material.

Based on our understanding of the proposed development and the soils observed at the site, it is our opinion that the slopes will be stable under the proposed configuration.

Site Drainage

It is understood the site is proposed to be used mainly for agricultural purposes. Typical with this type of usage, various forms of controlled intermittent irrigation are utilized to water crops and facilitate growth. The soil observed on the site is typical of its geomorphic setting; comprising of a variable mixture of coarse grained materials to a considerable depth. This type of soil is considered to be high permeable and will provide significant surficial drainage capability and will have sufficient capacity to locally absorb drainage from typical irrigation practices.

Based on our understanding of the proposed development, the soils observed at the site and the typical irrigation practices expected, it is our opinion that the site drainage will be suitable for its intended use. In addition, we do not believe the additional drainage imposed by the development will cause any adverse impact to properties downslope.

Closure – Report Use and Limitations

This report is prepared for the exclusive use of Civil-X Contracting Ltd. and its designated consultants and may not be used by other parties without the written permission of SNT Geotechnical Ltd.

It should be noted that the comments and conclusions provided in this letter are based on a limited field investigation. Subsurface conditions at other locations could vary and the required slope treatment may vary from those recommended.

The use of this report is subject to the conditions on the Report Interpretation and Limitations sheet which is included with this report. The reader's attention is drawn specifically to those conditions, as it is considered essential that they be followed for proper use and interpretation of this report.

Where conditions encountered at the site differ significantly from those anticipated in this report, it is a condition of this report that SNTG be notified of any changes and be provided with an opportunity to review and revise the recommendations/conclusions within this report.

The material in this report reflects SNTG's best judgment and professional opinion 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 decision to be made based on it are the responsibility of such third parties. SNTG accepts no responsibility for damages, if any, suffered by any third party as a result of decision made or action based, or lack thereof, on this report. No other warranty is made, either expressed or implied.

Soil and groundwater conditions described in this report are the observed conditions at the time of their determination or measurement. Unless otherwise noted, those conditions form the basis of the recommendations/conclusions in the report. Groundwater conditions may vary between and beyond reported locations and can be affected by annual, seasonal, and meteorological conditions.

The report and assessment have been carried out in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering profession currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. The discussion and recommendations presented above are based on limited field investigation, boreholes, and inferences from surficial features. Inherent variability in surface and subsurface conditions may create unforeseen situations.

Prepared by:



Mike Walsh, P.Eng.
Geotechnical Engineer
SNT Geotechnical Ltd.

Reviewed by:



A handwritten signature in black ink, appearing to read "Michael Burnett".

Michael Burnett, P.Eng.
Geotechnical Engineer
SNT Geotechnical Ltd.



References

Imagery - Google Earth

Nasmith, H. (1962): Late glacial history and surficial deposits of the Okanagan Valley, British Columbia; BC Ministry of Energy, Mines and Petroleum Resources, British Columbia Geological Survey, Bulletin 46, scale 1:100 000

Okulitch, A. V. (2013). Geology, Okanagan Watershed, British Columbia. Geological Survey of Canada, Open File 6839, 2013

Tannant, D. D. (2011). Geohazards in the South Okanagan [R].
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Photos



Along slope looking west



Along slope looking east

REPORT INTERPRETATION AND LIMITATIONS

1. STANDARD OF CARE

SNT Geotechnical Ltd. (SNTG) has prepared this report in a manner consistent with generally accepted engineering consulting practices in this area, subject to the time and physical constraints applicable. No other warranty, expressed or implied, is made.

2. COMPLETENESS OF THIS REPORT

This Report represents a summary of paper, electronic and other documents, records, data and files and is not intended to stand alone without reference to the instructions given to SNTG by the Client, communications between SNTG and the Client, and/or to any other reports, writings, proposals or documents prepared by SNTG for the Client relating to the specific site described herein.

This report is intended to be used and quoted in its entirety. Any references to this report must include the whole of the report and any appendices or supporting material. SNTG cannot be responsible for use by any party of portions of this report without reference to the entire report.

3. BASIS OF THIS REPORT

This report has been prepared for the specific site, development, design objective, and purpose described to SNTG by the Client or the Client's Representatives or Consultants. The applicability and reliability of any of the factual data, findings, recommendations or opinions expressed in this document pertain to a specific project as described in this report and are not applicable to any other project or site, and are valid only to the extent that there has been no material alteration to or variation from any of the descriptions provided to SNTG. SNTG cannot be responsible for use of this report, or portions thereof, unless we were specifically requested by the Client to review and revise the Report in light of any alterations or variations to the project description provided by the Client.

If the project does not commence within 18 months of the report date, the report may become invalid and further review may be required.

The recommendations of this report should only be used for design. The extent of exploration including number of test pits or test holes necessary to thoroughly investigate the site for conditions that may affect

Construction costs will generally be greater than that required for design purposes. Contractors should rely upon their own explorations and interpretation of the factual data provided for costing purposes, equipment requirements, construction techniques, or to establish project schedule.

The information provided in this report is based on limited exploration, for a specific project scope. SNTG cannot accept responsibility for independent conclusions, interpretations, interpolations or decisions by the Client or others based on information contained in this Report. This restriction of liability includes decisions made to purchase or sell land.

4. USE OF THIS REPORT

The contents of this report, including plans, data, drawings and all other documents including electronic and hard copies remain the copyright property of SNTG. However, we will consider any reasonable request by the Client to approve the use of this report by other parties as "Approved Users."

With regard to the duplication and distribution of this Report or its contents, we authorize only the Client and Approved Users to make copies of the Report only in such quantities as are reasonably necessary for the use of this Report by those parties. The Client and "Approved Users" may not give, lend, sell or otherwise make this Report or any portion thereof available to any other party without express written permission from SNTG. Any use which a third party makes of this Report – in its entirety or portions thereof – is the sole responsibility of such third parties. SNT GEOTECHNICAL LTD. ACCEPTS NO RESPONSIBILITY FOR DAMAGES SUFFERED BY ANY PARTY RESULTING FROM THE UNAUTHORIZED USE OF THIS REPORT.

Electronic media is susceptible to unauthorized modification or unintended alteration, and the Client should not rely on electronic versions of reports or other documents. All documents should be obtained directly from SNTG.

5. INTERPRETATION OF THIS REPORT

Classification and identification of soils and rock and other geological units, including groundwater conditions have been based on exploration(s) performed in accordance with the standards set out in Paragraph 1.

These tasks are judgmental in nature; despite comprehensive sampling and testing programs properly performed by experienced personnel with the appropriate equipment, some conditions may elude detection.

As such, all explorations involve an inherent risk that some conditions will not be detected.

Further, all documents or records summarizing such exploration will be based on assumptions of what exists between the actual points sampled at the time of the site exploration. Actual conditions may vary significantly between the points investigated and all persons making use of such documents or records should be aware of and accept this risk.

The Client and “Approved Users” accept that subsurface conditions may change with time and this report only represents the soil conditions encountered at the time of exploration and/or review. Soil and ground water conditions may change due to construction activity on the site or on adjacent sites, and also from other causes, including climactic conditions.

The exploration and review provided in this report were for geotechnical purposes only. Environmental aspects of soil and groundwater have not been included in the exploration or review or addressed in any other way.

The exploration and Report is based on information provided by the Client or the Client’s Consultants, and conditions observed at the time of our site reconnaissance or exploration. SNTG has relied in good faith upon all information provided. Accordingly, SNTG cannot accept responsibility for inaccuracies, misstatements, omissions, or deficiencies in this Report resulting from misstatements, omissions, misrepresentations or fraudulent acts of persons or sources providing this information.

6. DESIGN AND CONSTRUCTION REVIEW

This report assumes that SNTG will be retained to work and coordinate design and construction with other Design Professionals and the Contractor. Further, it is assumed that SNTG will be retained to provide field reviews during construction to confirm adherence to building code guidelines and generally accepted engineering practices, and the recommendations provided in this report. Field services recommended for the project represent the minimum necessary to confirm that the work is being carried out in general conformance with SNTG’s recommendations and generally accepted engineering standards. It is the Client’s or the Client’s Contractor’s responsibility to provide timely notice to SNTG to carry out site reviews.

The Client acknowledges that unsatisfactory or unsafe conditions may be missed by intermittent site reviews by SNTG. Accordingly, it is the Client’s or Client’s Contractor’s responsibility to inform SNTG of any such conditions.

Work that is covered prior to review by SNTG may have to be re-exposed at considerable cost to the Client. Review of all Geotechnical aspects of the project are required for submittal of unconditional Letters of Assurance to regulatory authorities. The site reviews are not carried out for the benefit of the Contractor(s) and therefore do not in any way effect the Contractor(s) obligations to perform under the terms of his/her Contract.

7. SAMPLE DISPOSAL

SNTG will dispose of all samples 3 months after issuance of this report, or after a longer period of time at the Client’s expense if requested by the Client. All contaminated samples remain the property of the Client and it will be the Client’s responsibility to dispose of them properly.

8. SUBCONSULTANTS AND CONTRACTORS

Engineering studies frequently requires hiring the services of individuals and companies with special expertise and/or services which SNT Geotechnical Ltd. does not provide. These services are arranged as a convenience to our Clients, for the Client’s benefit. Accordingly, the Client agrees to hold the Company harmless and to indemnify and defend SNT Geotechnical Ltd. from and against all claims arising through such Sub consultants or Contractors as though the Client had retained those services directly. This includes responsibility for payment of services rendered and the pursuit of damages for errors, omissions or negligence by those parties in carrying out their work. These conditions apply to specialized sub consultants and the use of drilling, excavation and laboratory testing services, and any other Sub consultant or Contractor.

9. SITE SAFETY

SNT Geotechnical Ltd. assumes responsibility for site safety solely for the activities of our employees on the jobsite. The Client or any Contractors on the site will be responsible for their own personnel. The Client or his representatives, Contractors or others retain control of the site. It is the Client’s or the Client’s Contractors responsibility to inform SNTG of conditions pertaining to the safety and security of the site – hazardous or otherwise – of which the Client or Contractor is aware.

Exploration or construction activities could uncover previously unknown hazardous conditions, materials, or substances that may result in the necessity to undertake emergency procedures to protect workers, the public or the environment. Additional work may be required that is outside of any previously established budget(s). The Client agrees to reimburse SNTG for fees and expenses resulting from such discoveries. The Client acknowledges that some discoveries require that certain regulatory bodies be informed. The Client agrees that notification to such bodies by SNTG Geotechnical Ltd. will not be a cause for either action or dispute.