ENVISION
CONSULTANTS LTD

6415 NORTHWEST DRIVE
UNITS 37-40
MISSISSAUGA, ON L4V 1X1

ENVISIONCONSULTANTS.CA

May 28, 2024

Project #: 24-0695

Green Cottage
Maynooth, Ontario

Attention: Mike Green

Sent via email: Mike Green@rbsomerville.com

SUBJECT: REPORT ON GEOTECHNICAL SLOPE STABILITY AND FOUNDATION ASSESSMENT FOR A PROPOSED GARAGE STRUCTURE, 1995 MINK LAKE ROAD, MAYNOOTH, ONTARIO.

1 INTRODUCTION

EnVision Consultants Ltd. (EnVision) is pleased to present the following letter report documenting the findings of a geotechnical assessment, along with associated geotechnical recommendations for the design of a replacement garage structure at the subject site. located at 1995 Mink Lake Road, Maynooth, Ontario.

This report is provided on the assumption that the design will be in accordance with the applicable codes and standards. If there are any changes in the design features relevant to the geotechnical analyses, or if any questions arise concerning the geotechnical aspects of the codes and standards, EnVision should be contacted to review the design. It may then be necessary to carry out additional assessment and reporting before the recommendations of this office can be relied upon.

2 BACKGROUND

EnVision is of the understanding that Mr. Green proposes to replace the existing 22X36 foot garage with a new 28x40 foot garage. The existing garage will be removed following construction of the new structure.

3 INVESTIGATION METHODOLOGY

As agreed with the Client, two (2) geotechnical testpits (denoted as TP1/TP2) were advanced at the Site at the approximate locations indicated on Figure 1.

Stability of the embankment to the west of the proposed garage building site was also evaluated as this is the closest slope to the proposed undertaking. Utilizing a level, rod and tape measurements, offsets from building edge to observed top of bank and to toe of bank were measured.

General site characterization observations to assess slope, setbacks, properties of native soil, and slope vegetation observations were also conducted to assess stability.

The testpits were advanced on May 17, 2024 with a local backhoe operator.

Technical supervision of the field work was carried out by EnVision's engineering staff – D.Lewis, Geotechnical Engineer. Testpits were examined in the field to assess type of soil and sampled and probed to determine density and soil composition. Testpits were backfilled on completion.

4 SUBSURFACE CONDITIONS

4.1 SOIL STRATIGRAPHY

The approximate testpit locations are shown in Figure No. 1. The subsurface conditions are also presented in Figure 1 and are summarized in the following paragraphs.

The subsurface conditions encountered within Testpits TP1 And TP2 are as follows:

The area designated for the New Garage Structure is currently a large relatively flat gravel parking area with a sand and gravel base. Visual inspection and testpits revealed an upper sand and gravel fill across the entire area in question. Fill depth ranged from 0.3m to 0.8m (east to west) across the proposed building envelope.

The fill layer was found to be underlain by potential glacial deposit of silty sand with some gravel, extending to testpit termination at approximately 1.4mbelow grade. Based on probing observations, these deposits are considered to be in a compact to dense state. Water contents in the silty sand and gravel is expected to be moist, in the range of 6 to 9%.

4.2 GROUNDWATER

Groundwater was not observed in the testpits and is expected to be similar to the observed Mink Lake levels, approximately 8m4.5mbelow the building grade level.

4.3 SLOPE STABILITY ASSESSMENT

Slope stability was assessed with consideration of X-section and setbacks from the field survey. The closest distance from the building to the observed top of bank is 9m followed then by an embankment with a 4.5m drop to the gravel access road below. This survey also made note of the vegetated slope with deep rooted trees and brush which provides for a generally stable bank in the area to the west and south of the existing parking area where the garage is proposed.

The evaluation of soil types, with particular interest of the native founding dense glacial silty sand and gravel till allows for a confident estimation of the zone of influence that the structure will have within the bearing soils below and laterally from the structure foundations (see Figure 1). With consideration of the native soil material, a 1:1 slope down and laterally from the foundation would best define the structures zone of influence loading and this loading would not have an impact adjacent slope stability.

5 GEOTECHNICAL RECOMMENDATIONS

5.1 DESIGN FROST PENETRATION DEPTH

Structure foundations and heave-sensitive utilities must be provided with at least 1.2 m of earth cover for frost protection purposes.

Garage foundations must be founded in the native, dense silty sand and gravel material found at a depth that ranged from 0.3 to 0.8m below existing parking lot grade.

All excavations must be carried out in accordance with the most recent Occupational Health and Safety Act (OHSA). In accordance with OHSA, the existing fill material can be classified as Type 3 Soil. For excavations passing through multiple soil types, the side slope geometry is governed by the highest number Soil Type designation. The OHSA Soil Types indicated herein are broad brush classifications for general planning purposes. In accordance with the OHSA, the Constructor must assign a Competent Person during construction who will be responsible for re-assessing the Soil Type based on visual observations of soil behaviour during construction and on this basis must re-classify the Soil Types accordingly.

5.2 SLOPE STABILITY ASSESSMENT

Based on the assessment of setback distances, slope height, slope vegetation and founding soil materials, the proposed structure will have no impact on the stability to the slopes that are adjacent to the structure. Soil grading around the structure and management of water run-off from roof surfaces and surrounding parking surfaces should be considered in the final design and landscaping to avoid potential erosion from occurring in this general area.

5.3 FOUNDATION DESIGN

The garage strip foundations founded on native soils can be designed for an SLS bearing resistance of 150 kPa and factored ULS resistance of 200 kPa. Total and differential settlement under the design pressures will be less than 25mm and 15mm respectively.

6 LIMITATIONS

This report is intended solely for the Client named. The material in it reflects our best judgment in light of the information available to EnVision at the time of preparation. Unless otherwise agreed in writing by EnVision Consultants Ltd. shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. No portion of this report may be used as a separate entity, it is written to be read in its entirety.

The comments given in this report are based on information determined at the test hole location. The information contained herein in no way reflects on the environment aspects of the project, unless otherwise stated. Subsurface and groundwater conditions between and beyond the test holes will differ from those encountered at the test hole locations, and conditions may become apparent during construction, which could not be detected or anticipated at the time of the site investigation.

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. EnVision Consultants Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

EnVision prepared this report solely for the use of the intended recipient in accordance with the professional services agreement. In the event a contract has not been executed, the parties agree that the EnVision General Terms and Conditions, which were provided prior to the preparation of this report, shall govern their business relationship.

The report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings in the assessment. The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the report are based on the observations and/or information available to EnVision at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by EnVision and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

EnVision disclaims any obligation to update this report if, after the date of this report, any conditions appear to differ significantly from those presented in this report; however, EnVision reserves the right to amend or supplement this report based on additional information, documentation or evidence.

EnVision makes no other representations whatsoever concerning the legal significance of its findings. The intended recipient is solely responsible for the disclosure of any information contained in this report. If a third party makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance or decisions. EnVision does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report.

EnVision has provided services to the intended recipient in accordance with the professional services agreement between the parties and in a manner consistent with that degree of care, skill and diligence normally provided by members of the same profession performing the same or comparable services in respect of projects of a similar nature in similar circumstances. It is understood and agreed by EnVision and the recipient of this report that EnVision provides no warranty, express or implied, of any kind. Without limiting the generality of the foregoing, it is agreed and understood by EnVision and the recipient of this report that EnVision makes no representation or warranty whatsoever as to the sufficiency of its scope of work for the purpose sought by the recipient of this report.

Unless otherwise agreed in writing by EnVision, the Report shall not be used to express or imply warranty as to the suitability of the site for a particular purpose. EnVision disclaims any responsibility for consequential financial effects on transactions or property values, or requirements for follow-up actions /or costs.

This limitations statement is considered an integral part of this report.

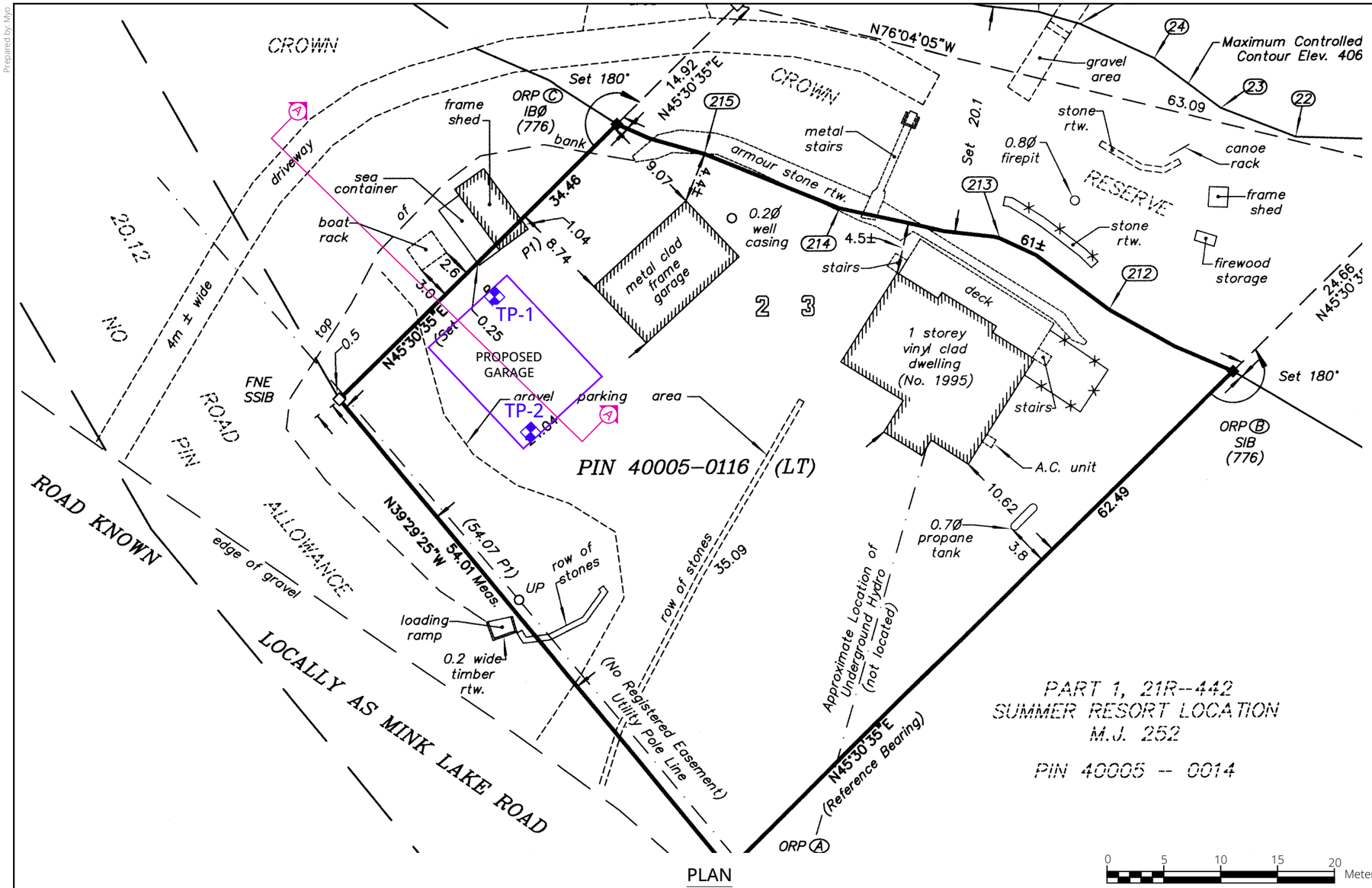
7 CLOSURE

We thank you for the opportunity to be of service on this project. Should you have any questions or wish to review the contents of this letter in more detail, please do not hesitate to contact the undersigned.

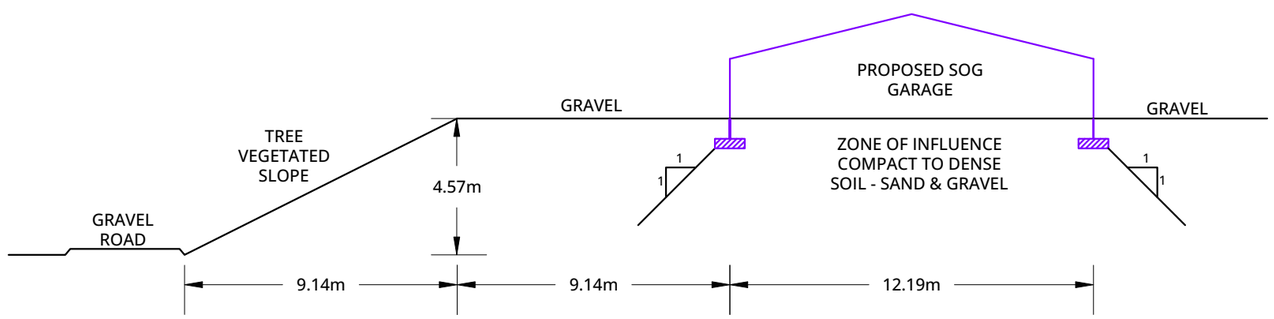
Yours Very Truly

EnVision Consultants Ltd.

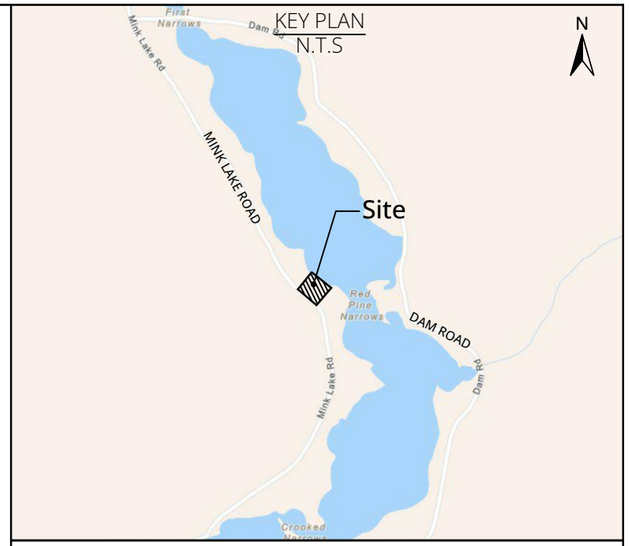
David Lewis, P.Eng.
Senior Geotechnical Engineer
dlewis@envisionconsultants.ca



PLAN



SECTION A-A



LEGEND

- Testpit Location
- Proposed Garage Location

TESTPITS IN AREA OF PROPOSED GARAGE

TEST PIT LOG TP1

0.00 - 0.84 m FILL - BROWN SAND & GRAVEL, MOIST, COMPACT
0.84 - 1.37 m NATIVE - RED BROWN SILTY SAND WITH SOME GRAVEL, MOIST, DENSE

TEST PIT LOG TP2

0.00 - 0.30 m FILL - BROWN SAND & GRAVEL, MOIST, COMPACT
0.30 - 1.37 m NATIVE - BROWN SILTY SAND AND GRAVEL, SOME SILTY SAND SEAMS, MOIST, DENSE

TITLE

Testpit & Proposed Garage Location Plan and Section A-A

PROJECT

1995 Mink Lake Road
Hastings Highlands, ON

CLIENT

Green Cottage

PROJECT NO.	DATE	PREPARED BY	APPROVED BY	FIGURE NO
24-0695	May, 2024	ZMO	DL	1

Prepared by: Myo

C:\Users\Myo\Dev\Desktop\24-0695\24-0695_TP plan-20240528.dwg