MOREY ASSOCIATES LTD.
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March 14, 2025 File: 024634

Lockwood Brothers Construction
2010 Totem Ranch Road East
Oxford Station, Ontario
K0G 1T0

Attention: Michael Barkhouse, Construction Manager

RE: SLOPE STABILITY ASSESSMENT
EXISTING SINGLE FAMILY DWELLING – PROPOSED ADDITION AND SHED
116 CLOTHIER STREET EAST, KEMPTVILLE
MUNICIPALITY OF NORTH GRENVILLE, ONTARIO

Dear Michael:

As requested by Lockwood Brothers Construction (client) this letter provides the results of a slope stability assessment carried out for the existing slope adjacent to the existing dwelling at the above site. The purpose of the slope stability assessment was to observe the condition of the existing subject slope at the site and based on an interpretation of the observations made, in consideration of the proposed dwelling addition and proposed detached shed at the site, and the results of slope stability analyses, to provide a limit of hazards lands if applicable, from a slope stability point of view. In addition to the above, an allowable bearing pressure for the design of spread footing foundations for the proposed dwelling addition was to be provided.

The reader of this letter is referred to the ‘Important Information And Limitations Of This Letter’ which follows the text of this letter and forms an integral part of this letter.

PROJECT DESCRIPTION AND BACKGROUND

For discussion purposes Clothier Street East is considered to exist at the north side of the subject site (see attached Key Plan, Figure 1). The subject slope is located within about the rear half of the east side yard adjacent to the existing dwelling at the site and extends into the rear yard some 4 metres. The subject site is an irregular shaped parcel of land some 0.27 hectares in plan area, with about 16 metres of frontage on Clothier Street East which borders the north side of the site and about 36 metres of frontage on the South Branch of the Rideau River (Kemptville Creek) which borders the south side of the site. It is understood that plans are being prepared to construct a 1-storey addition onto the main level of the existing dwelling (consisting of additional living space and a covered deck), with no basement. The portion of the proposed dwelling addition extending beyond the existing dwelling concrete foundation walls is planned to be supported, in general, by wood posts on isolated concrete pier foundations. The proposed dwelling is located at the rear of the existing dwelling where a wood framed deck currently exists. It is understood that the existing deck is to be removed. Beneath the proposed dwelling addition (and beneath the existing deck) is the existing dwelling “walk out” basement foundation. It is further understood that plans are being prepared to construct a detached, single storey, about 8 feet by 12 feet in plan area, shed, within the above mentioned east side yard at about the south end of the existing driveway at the site. The proposed detached shed is planned to be supported on helical screw piles (see attached Aerial Sketch Plan, Figure 2).

In addition to the above, it is understood that some landscaping works at the site are proposed, which includes, in general, a proposed less than 1 metre high armour stone retaining wall near the toe of the subject slope, and an exterior wood framed staircase, supported by helical screw piles, extending from about the slope crest to the existing dwelling “walk out” basement. It is further understood that no changes to the existing grade/ground surface are planned for the upper portion of the subject slope within the east side yard (beneath the proposed shed).

The field work for this assessment was carried out by members of our technical field staff between November 11 and December 18, 2024. Two test pits, advanced using a track mounted excavator supplied and operated by the client, were put down at the subject slope, within the face of the upper portion of the slope and within the face of the lower portion of the slope to check the soil comprising the subject slope. At the time of the field work, measurements of the height and inclination of the steepest, tallest portion (based on visual observations) of the subject slope were carried out using

Spectra SP60 GNSS surveying equipment. The state of erosion of the subject slope and any evidence of slope instability was visually assessed.

A review of the surficial geology map for the site area indicates that the slope at the site is underlain by sand plains (Chapman & Putnam, 2007, Ontario Geological Survey), see attached Figure 3. The bedrock geology map indicates that the bedrock underlying the site consists of dolostone, minor shale and sandstone of the Oxford Formation (Armstrong & Dodge, 2007, Ontario Geological Survey), see attached Figure 4. Drift thickness mapping published by the Ontario Geological Survey (2006) provides limited data points within relatively close proximity to the subject site. However, the available data points within relatively close proximity to the subject site indicate an overburden thickness between some 4 to 6 metres.

The Ministry of the Environment, Conservation and Parks (MECP) well records for two abandoned dug wells and two drilled wells indicated to be located within relatively close proximity to the subject site were obtained from the Province of Ontario, Map: Well Records website and are attached as Appendix A. The MECP well records indicate that the overburden thickness at the drilled wells is between some 5 to 6 metres and the native overburden material encountered by the well drillers at those wells is indicated to consist of hard pan and clay with stones. The MECP well records for the two abandoned dug wells indicate overburden was encountered up to depths of some 6 to 7 metres and where indicated the overburden was found by the well drillers to consist of sand with silt. The bedrock underlying the overburden material at the drilled wells is indicated by the well drillers to consist of limestone.

OBSERVATIONS

The measurements of the subject slope carried out by a member of our technical field staff indicate that the subject slope at the site is some 3.6 metres high and has an overall inclination of about 14 degrees to the horizontal or about 4 horizontal to 1 vertical. A relatively short, steeper portion of the slope exists at the slope crest (inclined at about 28 degrees to the horizontal), however, that portion of the existing slope is less than 0.3 metres high. A relatively small flat area exists within about the lower portion of the slope face, inclined at about 4 degrees to the horizontal). This relatively flat area for the below mentioned analyzed slope section is about 1 metre in width. The remaining portions of the face of the subject slope are inclined between about 11 to 15 degrees to the horizontal. The tableland north of the slope crest consists of the existing concrete paver surfaced

driveway at the site and is relatively flat with a gentle downward gradient towards Clothier Street East. A relatively flat floodplain exists at the bottom of the subject slope, from about the toe of the slope extending some 69 metres to the edge of the Kemptville Creek.

The ground cover of the subject slope at the time of the field work consists, in general, of some gravel, grass, shrubs and young trees. The ground cover of the above mentioned floodplain at the time of the field work consists, in general, of grass, shrubs and young to mature trees.

No evidence of major slope instability was observed at the time of the field work. No evidence of active or previous erosion at the subject slope toe was observed. The Kemptville Creek was measured to be some 69 metres from the subject slope toe.

A description of the subsurface conditions encountered at the above mentioned test pits is provided in the attached Table I – Record of Test Pits and the approximate locations of the test pits are provided on the attached Aerial Sketch Plan, Figure 2. From the ground surface about a 1.7 to 1.9 metre thickness of fill materials was encountered. The fill materials, in general, consisted of topsoil, sand, silt, clay, cobbles, occasional brick and a trace to some ash. The fill material was underlain by a deposit of red brown to grey brown fine sand, with some silt, and a trace of clay and gravel. The test pits were terminated within the sand material at depths of some 2.0 to 2.3 metres below the existing ground surface. Based on tactile examination and on the difficulty to advance the test pits within the sand material, the sand material encountered at the test pits is considered to be in a loose to compact state of packing. No groundwater was observed in the test pits at the time of the field work.

A sample of the native sand material obtained from one of the test pits was delivered to a soils laboratory for grain size distribution testing. The results of that laboratory testing are provided in Appendix B and indicate that the sand sample tested consists of 62.9 percent sand, 29.9 percent silt, 7.0 percent clay, and 0.2 percent gravel.

A Slope Stability Rating Chart provided as Table 4.2 from Section 4.3.2 of the Ministry of Natural Resources Technical Guide, River & Stream Systems: Erosion Hazard Limit (MNR Technical Guide) was completed for the subject slope (specifically, for the below mentioned analyzed slope section A-A) and is provided in the attached Appendix C.

The completed Slope Stability Rating Chart resulted in rating value of 22. Based on the MNR Technical Guide slope stability rating values of less than 24 are categorized as “Low Potential”.

Photographs taken at the time of the above mentioned field work are provided in the attached Appendix D.

SLOPE STABILITY ANALYSES

Computer slope stability analyses were carried out for what is considered the steepest/highest portion of the subject slope at the site using GeoStudio 2018 Slope/W software package produced by GEO-SLOPE International Ltd., in order to determine a factor of safety of the slope against overall rotational failure (global slope stability analysis). The slope section used in the analyses was chosen by Morey Associates Ltd. based on slope geometry, slope height and the location of the slope section relative to the existing and proposed development at the site. The approximate location of the slope section analyzed (A-A) is shown on the attached Aerial Sketch Plan, Figure 2.

The soil conditions used for the slope stability analyses were based on the above described subsurface information. It is pointed out that the bedrock was considered impenetrable from a critical slip surface point of view.

The slope stability analyses parameters used for the existing fill material are:

Cohesion, c’ = 0.5 kilopascals
Internal Friction Angle, ϕ’ = 30 degrees
Unit Weight, γ = 16.5 kilonewtons per cubic metre

The slope stability analyses parameters used for the native sand, with some silt, and a trace of clay and gravel material are:

Cohesion, c’ = 0.5 kilopascals
Internal Friction Angle, ϕ’ = 32 degrees
Bulk Unit Weight, γ = 18.0 kilonewtons per cubic metre

The slope stability analyses parameters used for the proposed landscape fill material are:

Cohesion, c' = 0 kilopascals
Internal Friction Angle, ϕ' = 30 degrees
Unit Weight, γ = 20 kilonewtons per cubic metre

The above parameters used in the analyses are based on experience with similar soil types in the Ottawa Valley and surrounding area as well as information published by the City of Ottawa and Ministry of Natural Resources (MNR) relating to the subsurface conditions described above.

No groundwater was observed in the above mentioned test pits which were put down at the subject slope to depths of some 2.0 and 2.3 metres below the existing ground surface. However, for a conservative approach, the slope was assumed to be nearly fully saturated with a groundwater level within about 0.2 to 0.6 metres of the existing ground surface.

Based on the above mentioned existing and proposed site development, the following was included in the computer slope stability analyses.

- A 4.8 kilopascals surcharge load was applied at and back of the crest of the slope in consideration of vehicular use of the existing driveway at the site.

- The proposed stone retaining wall and associated landscape grade raise at the lower portion of the slope (near the toe of the slope).

It is pointed out that based on preliminary plans provided to us by the client and on discussion with the client, the above mentioned proposed isolated, pier foundations supporting the proposed dwelling addition will be founded at depths meeting earth frost protection requirements which should result in the founding depths of those piers being about at/or below the level of the toe of the slope. Further, it is understood that the proposed helical screw piles supporting the proposed detached shed and wood framed staircase are to extend below the existing fill materials and well into the underlying native sand material at the site. As such, it is considered that the helical screw piles are likely to be founded at depths being about at/or below the level of the toe of the slope. Based on the above, the proposed pier foundations and helical screw piles are not considered to

have a significant impact on the subject slope and are not included in the computer slope stability analyses.

Slope stability analyses for the subject slope were carried out for both static conditions and pseudo-static (seismic) conditions. Based on the material comprising the slope and the subject site setting it is considered that a pseudo-static analysis is adequate for the purposes of this present slope stability assessment. For a conservative approach a conventional pseudo-static analysis was carried out as opposed to a two stage pseudo-static analysis since typically a two stage pseudo-static analysis will result in a higher factor of safety.

The peak (horizontal) ground acceleration (PGA) for the subject site was obtained from the 2015 National Building Code Seismic Hazard calculation (website), see Appendix E. The PGA for the subject site is indicated to be 0.28 for a 2 percent probability of exceedance in 50 years. A seismic coefficient, k, was used for the above mentioned pseudo-static analysis, where k is equal to 0.5PGA.

For the purposes of this assessment, a factor of safety of 1.5 or greater is considered to indicate long term stability for static conditions and a factor of safety of 1.1 or greater is considered to indicate adequate slope stability for pseudo-static conditions.

The result of the slope stability analysis for the subject slope for static conditions at the slope section analyzed indicates that the slope has a factor of safety against failure of about 1.93, see attached Figure 5. The result of the slope stability analysis for the subject slope for pseudo-static conditions at the slope section analyzed indicates that the slope has a factor of safety against failure of about 1.13, see attached Figure 6.

SLOPE SETBACKS AND LIMIT OF HAZARD LANDS

As per the Ontario Ministry of Natural Resources (MNR), for unstable slopes the “Limit of Hazard Lands” should be determined based on a stable slope allowance, a slope toe erosion allowance, and an erosion access allowance in order to provide a safe setback line for development.

As previously mentioned, the stable slope allowance is the distance from the slope crest to the point at which a factor of safety against failure of 1.5 is calculated for static conditions, or the distance

from the slope crest to the point at which a factor of safety against failure of 1.1 is calculated for pseudo-static conditions, whichever is greater. As the results of the above mentioned slope stability analyses for the subject slope gave values for static conditions and pseudo-static conditions greater than 1.5 and 1.1, respectively, no stable slope allowance for the subject slope is required.

As previously mentioned, the toe of the slope is some 69 metres from the Kemptville Creek. No evidence of active or previous erosion at the subject slope toe was observed at the time of the field work. Based on the observations made at the time of the field work and on the subject site setting it is considered that the subject slope toe is not located in an area prone to toe erosion. Based on the above, it is considered that no significant future erosion should occur at the slope toe of the subject slope. Based on the above no toe erosion allowance for the subject slope is required.

The MNR technical guide includes a 6 metre erosion access allowance beyond the toe erosion allowance to allow for access by equipment to repair a possible failed slope. The access allowance is measured back from (or added to) the stable slope allowance.

The MNR technical guide indicates the three main principles to support the inclusion of an erosion access allowance are:

- *"Providing for emergency access to erosion prone areas;"*
- *"Providing for construction access for regular maintenance and access to the site in the event of an erosion event or failure of a structure; and"*
- *"Providing protection against unforeseen or predicted external conditions which could have an adverse effect on the natural conditions or processes acting on or within an erosion prone area of provincial interest."*

As mentioned above, it is considered that the subject slope toe is not located in an area prone to toe erosion and that no significant future erosion should occur at the slope toe of the subject slope. Based on the above, it is considered that the three main principles to support the inclusion of an erosion access allowance are not applicable to the subject slope/subject site. It is pointed out that the subject site is already developed, and a driveway exists at the site allowing access to the crest of the slope. Based on the above, it is considered that no erosion access allowance is required.

Based on the results of the slope stability analyses and the slope setback requirements mentioned above it is considered that no limit of hazard lands for the subject slope at the site is required.

CONCLUSIONS

Based on the results of this slope stability assessment, the subject slope at the site, with consideration for the above described proposed site development, is adequately stable and no limit of hazard lands for the subject slope at the site is required.

Based on the above calculated factors of safety against slope failure, it is considered that the above described proposed site development, is not in danger of a global slope failure.

Based on the limited observations within the test pits put down for this assessment, the proposed spread footing foundations founded as mentioned above and on the native, undisturbed red brown to grey brown sand, supporting the proposed dwelling addition, should be designed using an allowable bearing pressure of 75 kilopascals SLS and 110 kilopascals for a factored bearing resistance at ultimate limit states, ULS. Spread footing foundations designed using the above allowable bearing pressure/resistance should be a minimum 0.6 metres wide for strip footings, and a minimum 0.8 metres square (0.8 metres by 0.8 metres) for square pad footings, and/or a minimum 0.9 metres diameter for circular pad footings (“Bigfoot System” footing forms).

The helical screw piles should be installed in accordance with the requirements of the helical screw pile qualified designer.

To ensure that the foundations for the proposed dwelling addition are founded on a competent and suitably prepared subgrade, it is considered that prior to foundation formwork placement, a subgrade evaluation should be carried out by qualified geotechnical engineering personnel. A subgrade evaluation is considered a common construction site evaluation.

The existing surficial topsoil and vegetation material on the slope should be maintained, or be suitably reinstated should it be disturbed during construction, in order to mitigate the potential for surficial erosion. No concentrated surface water flow should be directed towards the slope. Surface water drainage directed towards the slope, if needed, should be minimal sheet flow drainage. Should eavestrough drainage for the proposed dwelling addition and proposed detached shed be

directed on/towards the slope, the eavestrough drainage should be directed to “splash pads” that promote sheet flow drainage and protect from surficial erosion. No regrading of the existing subject slope should take place that steepens the current inclination of the subject slope or increases the height of the subject slope (with the exception of the above mentioned proposed armour stone retaining wall).

Should changes to the proposed site development be considered from that described in this present letter, Morey Associates Ltd. should be retained to review the proposed changes to ensure compatibility with any engineering guidelines and conclusions contained in this letter.

We trust the above information is sufficient for your present purposes. If you have any questions concerning this letter, please do not hesitate to contact our office.

Yours truly,
Morey Associates Ltd.

D. G. Morey, P.Eng.
Principal | Consulting Engineer

Attachments: Important Information And Limitations Of This Letter
Figures 1 to 6
Table I – Record of Test Pits
Appendices A to E

File: 024634

IMPORTANT INFORMATION AND LIMITATIONS OF THIS LETTER

This letter provides a summary of work that was carried out with generally accepted professional standards at the time and location in which the services were provided and in a manner consistent with a level of care and skill normally exercised by other professional engineering firms practicing under similar conditions and subject to the time limits and financial and physical constraints applicable to the services. No other warranty, expressed or implied, is made.

This letter was prepared for the exclusive use of Lockwood Brothers Construction. This letter may not be relied upon by any other person or entity without the express written consent of Lockwood Brothers Construction and Morey Associates Ltd. Any party that relies on services and/or work carried out by Morey Associates Ltd. and/or on a letter prepared by Morey Associates Ltd. without Morey Associates Ltd. express written consent, does so at their own risk. Morey Associates Ltd. specifically disclaims any liability and disclaims any responsibility to any such party for any loss, damage, expense, fine, penalty or other such thing which may arise or result from the use of any information, recommendation or other matter arising from the services, work or letters provided by Morey Associates Ltd.

It is understood based on instruction given to Morey Associates Ltd. by the client and/or by other design professionals associated with and retained by the client for this project and/or by municipal/county/provincial/ regulatory approval agency personnel that this letter may be used for guidance of the designers of the project and submitted for a specific site development permit application process. Any other use of this letter by the client and/or by others is prohibited and is without responsibility of Morey Associates Ltd. Further, Morey Associates Ltd. cannot be responsible for use of only portions of this letter by the client and/or by others without reference to the entire letter.

This letter is of a summary nature and is not intended to stand alone without reference to the instructions given to Morey Associates Ltd. by the client and/or by other design professionals associated with and retained by the client for this project and/or by municipal/county/provincial/regulatory approval agency personnel. This letter has been prepared based on our interpretation of the instructions given to Morey Associates Ltd. by the client and/or by other design professionals associated with and retained by the client for this project and/or by municipal/county/provincial/regulatory approval agency personnel only. Regulatory agency requirements may change in real time during a development permit application process and regulatory agency requirements are subject to interpretation and these interpretations may change over time. As such, no warranty, expressed or implied, is made by Morey Associates Ltd. that this letter meets others' interpretations of any regulatory agency requirements.

It is stressed that the information presented in this letter is provided for the guidance of the design professionals associated with and retained by the client for this project and is intended for this project only. The use of this letter as a construction document is neither intended nor authorized by Morey Associates Ltd.

Contractors bidding on or undertaking works related to the proposed project at the subject site should examine the factual results of the assessment, satisfy themselves as to the adequacy of the information for construction, which may require the contractor(s) to carry out additional investigation(s) and reporting, as it affects their construction techniques, schedule, safety and equipment capabilities.

Any letter recommendations/engineering guidelines are applicable only to the project described in the letter. Any changes in the scope of the project will require a review by Morey Associates Ltd. to ensure compatibility with any letter recommendations/engineering guidelines contained in this letter.

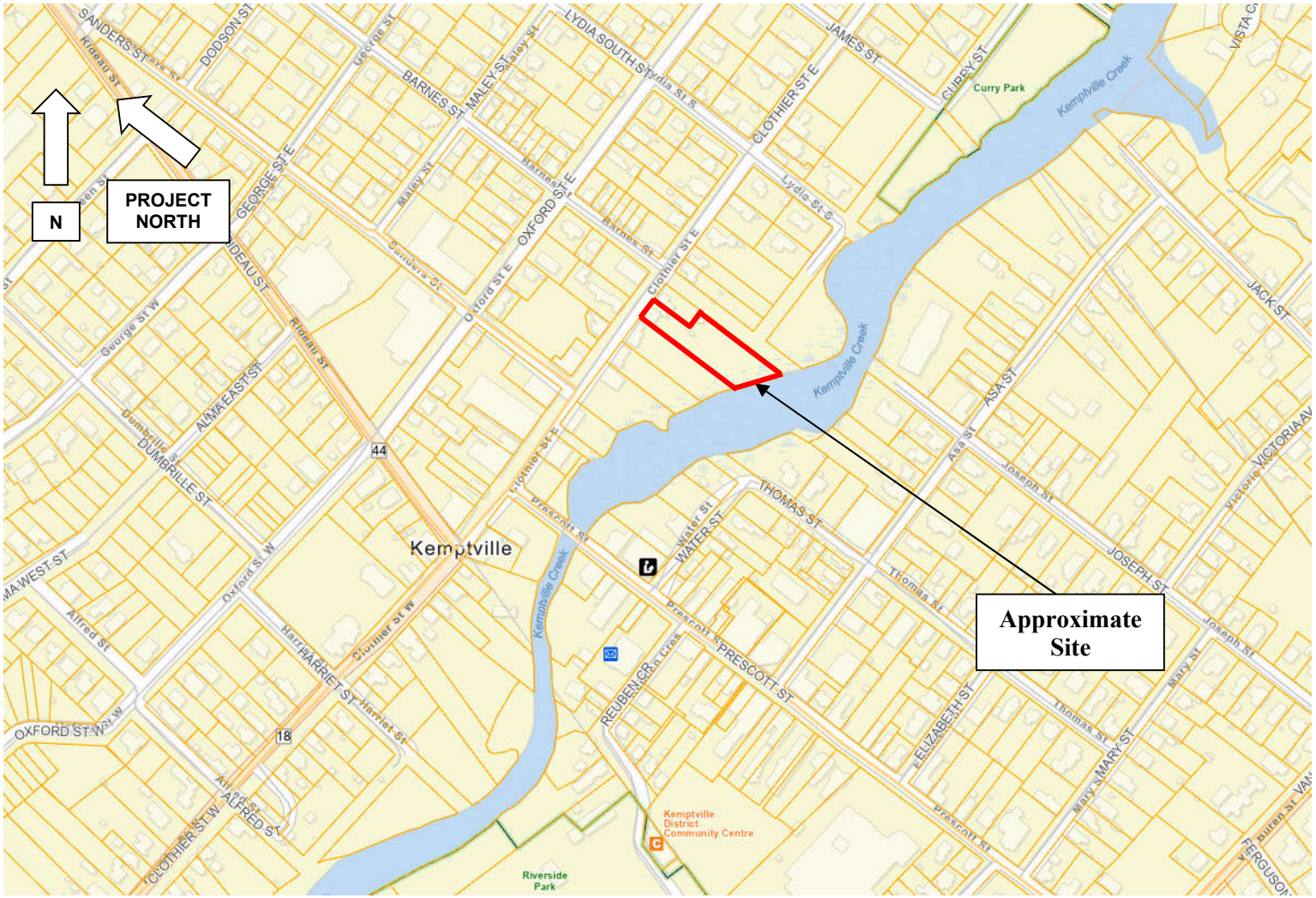
IMPORTANT INFORMATION AND LIMITATIONS OF THIS LETTER (continued)

The professional services for this project include the slope stability aspects of the assessment described above/in the letter only. The presence or implications of possible surface and/or subsurface contamination resulting from previous uses or activities at this site or adjacent properties, and/or resulting from the introduction onto the site of materials from offsite sources are outside the terms of reference for this letter and have not been addressed.

The engineering guidelines provided in this letter are based on subsurface data obtained at the specific test hole locations only. Boundaries between zones on the logs are often not distinct but transitional and were interpreted. A geotechnical (subsurface) assessment is a limited sampling of a site. Experience indicates that the subsurface soil and groundwater conditions can vary significantly between and beyond the test hole locations. Should any conditions at the site be encountered which differ from those at the test hole locations, Morey Associates Ltd. should be notified to carry out a review regarding the encountered conditions as they relate to the engineering guidelines/recommendations contained in this letter.

KEY PLAN

FIGURE 1



Reference: Leeds Grenville Public Map Viewer GIS website

NOT TO SCALE

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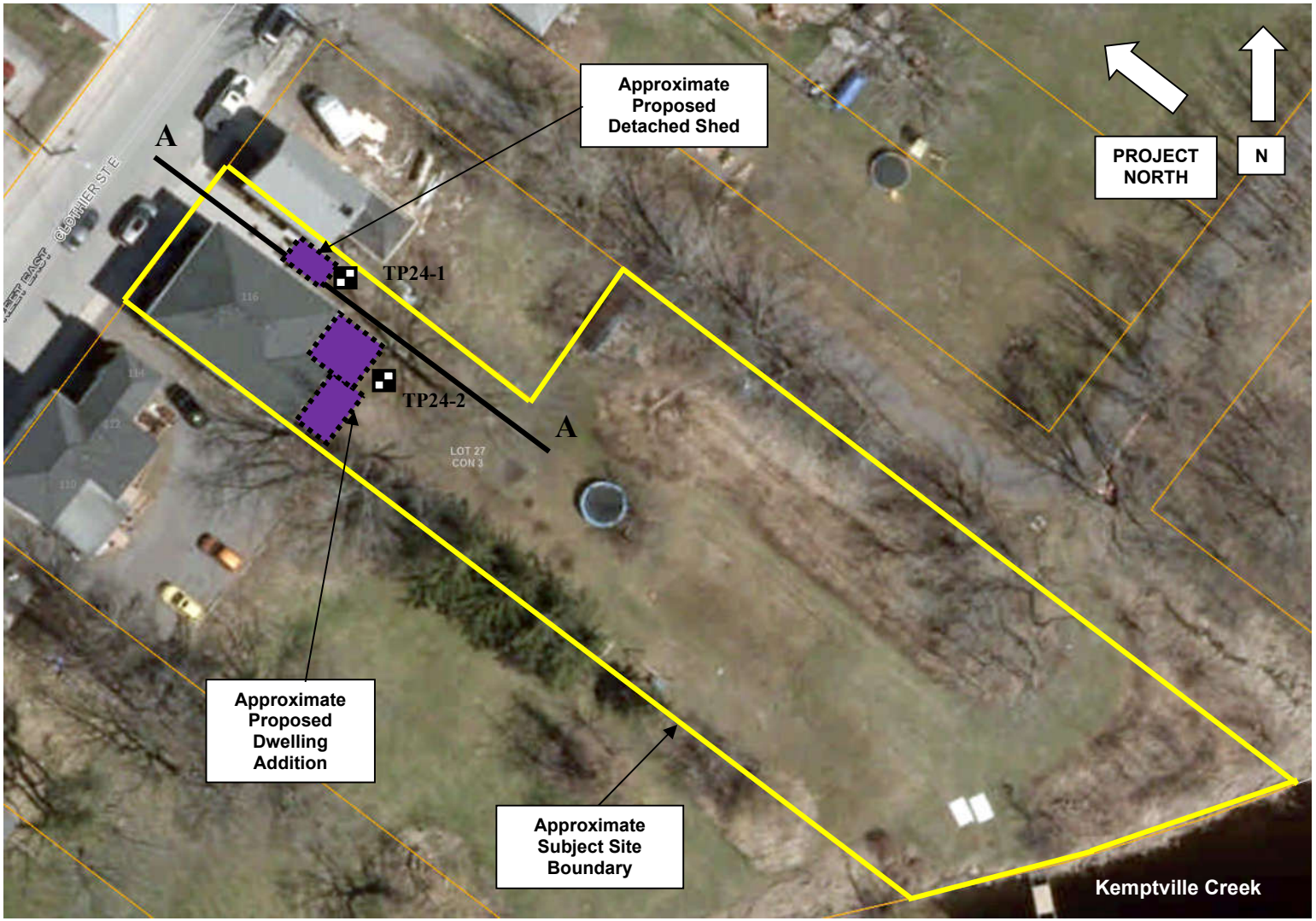
Project No. 024634

Date March 2025

AERIAL SKETCH PLAN

FIGURE 2



Reference: Leeds Grenville Public Map Viewer GIS website

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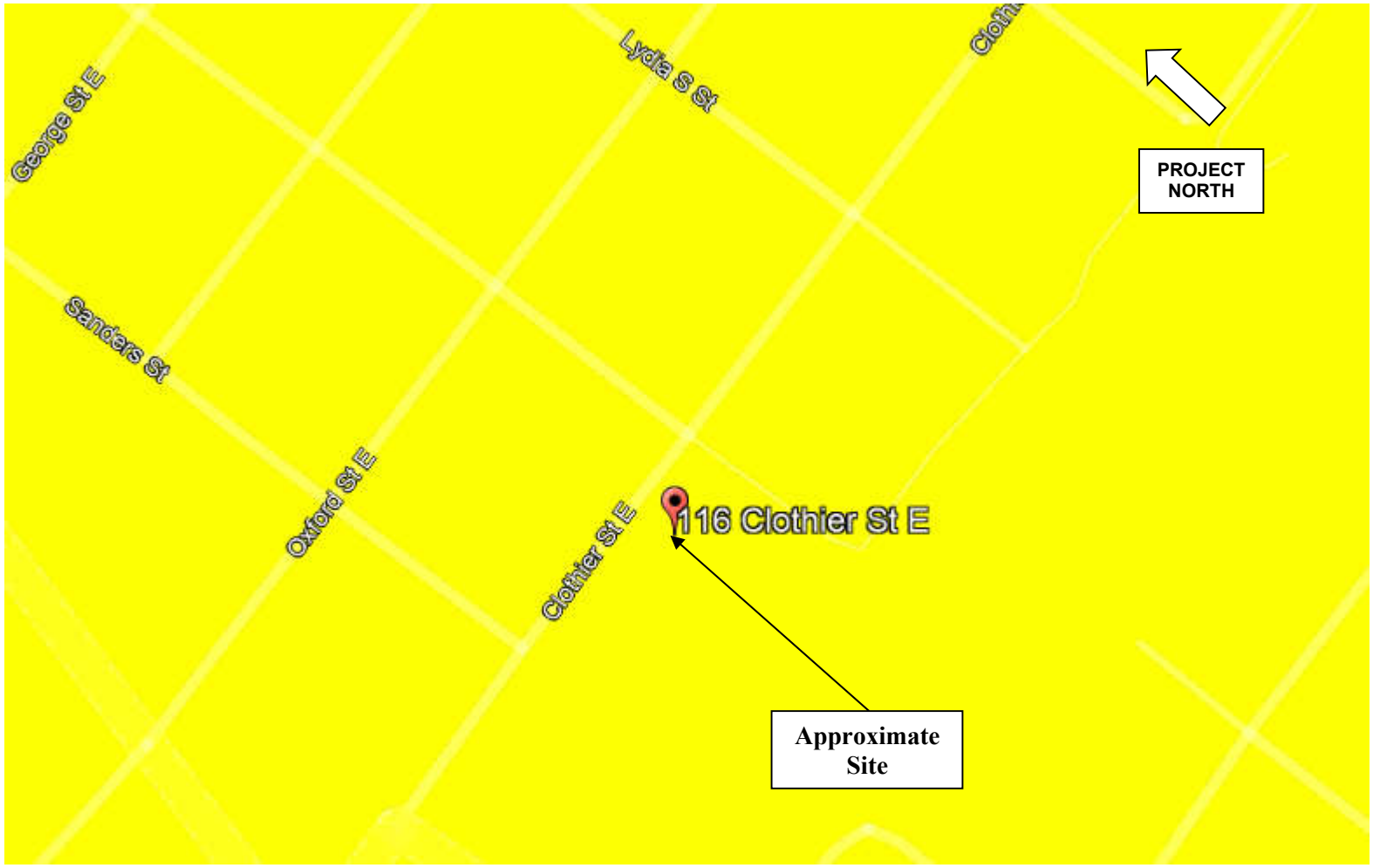
Project No. 024634

Date March 2025

SURFICIAL GEOLOGY MAP

FIGURE 3



Reference: Physiography of South Ontario, OGS, Chapman and Putnam, 2007

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11 Sand Plains

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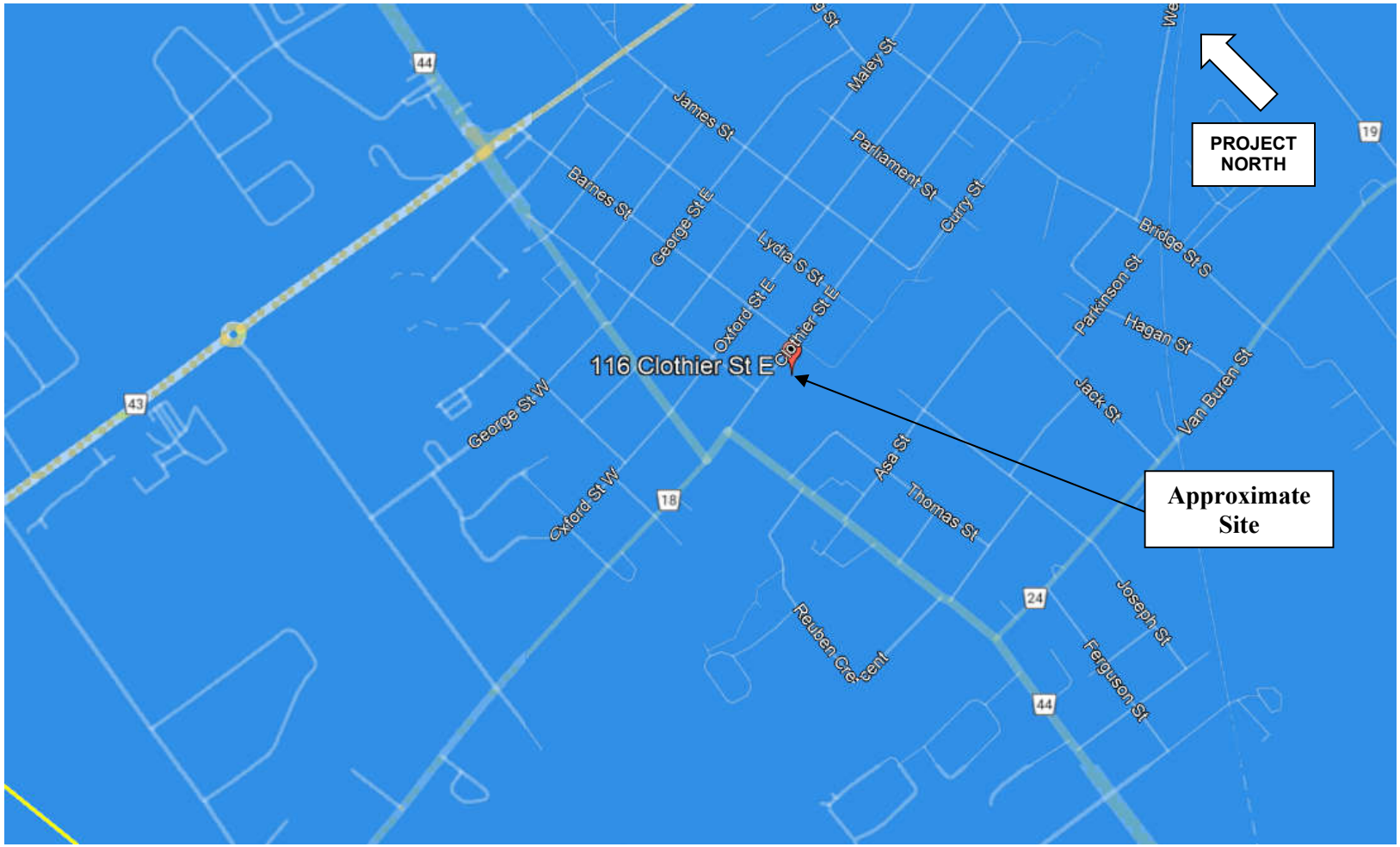
BEDROCK GEOLOGY MAP

FIGURE 4



Reference: Ontario Geological Survey, 2011

NOT TO SCALE

5

Oxford Formation: dolostone, minor shale and sandstone

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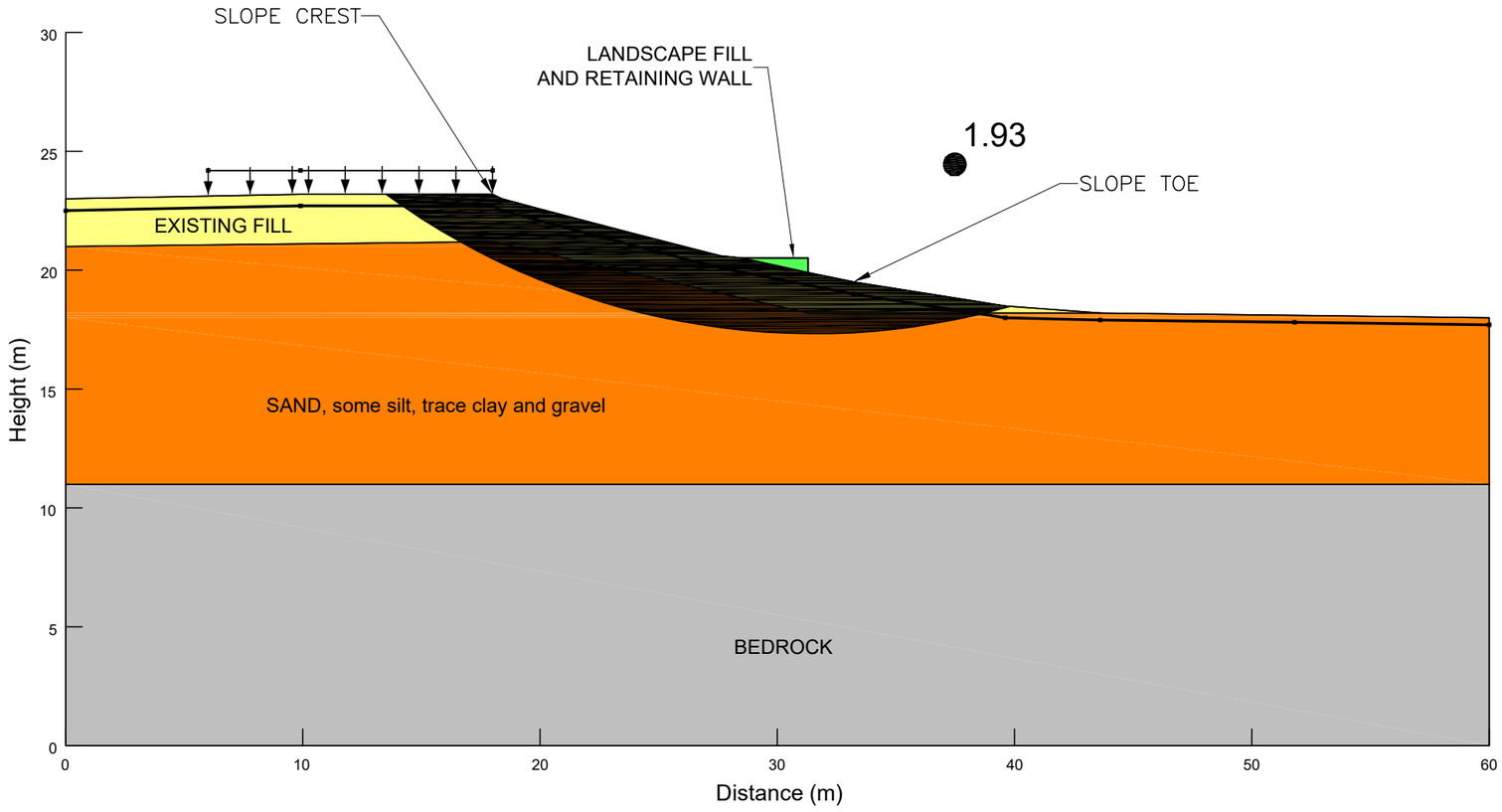
Project No. 024634

Date March 2025



ANALYSIS NAME

STATIC CONDITIONS - SLOPE SECTION A-A
FIGURE 5

LOCATION

116 CLOTHIER STREET EAST
MUNICIPALITY OF NORTH GRENVILLE
ONTARIO

PROJECT

SLOPE STABILITY ASSESSMENT

CLIENT

LOCKWOOD BROTHERS CONSTRUCTION

DATE	DRAWN BY	APPROX.SCALE	FILE NO.
March 2025	DGM	As Shown	024634

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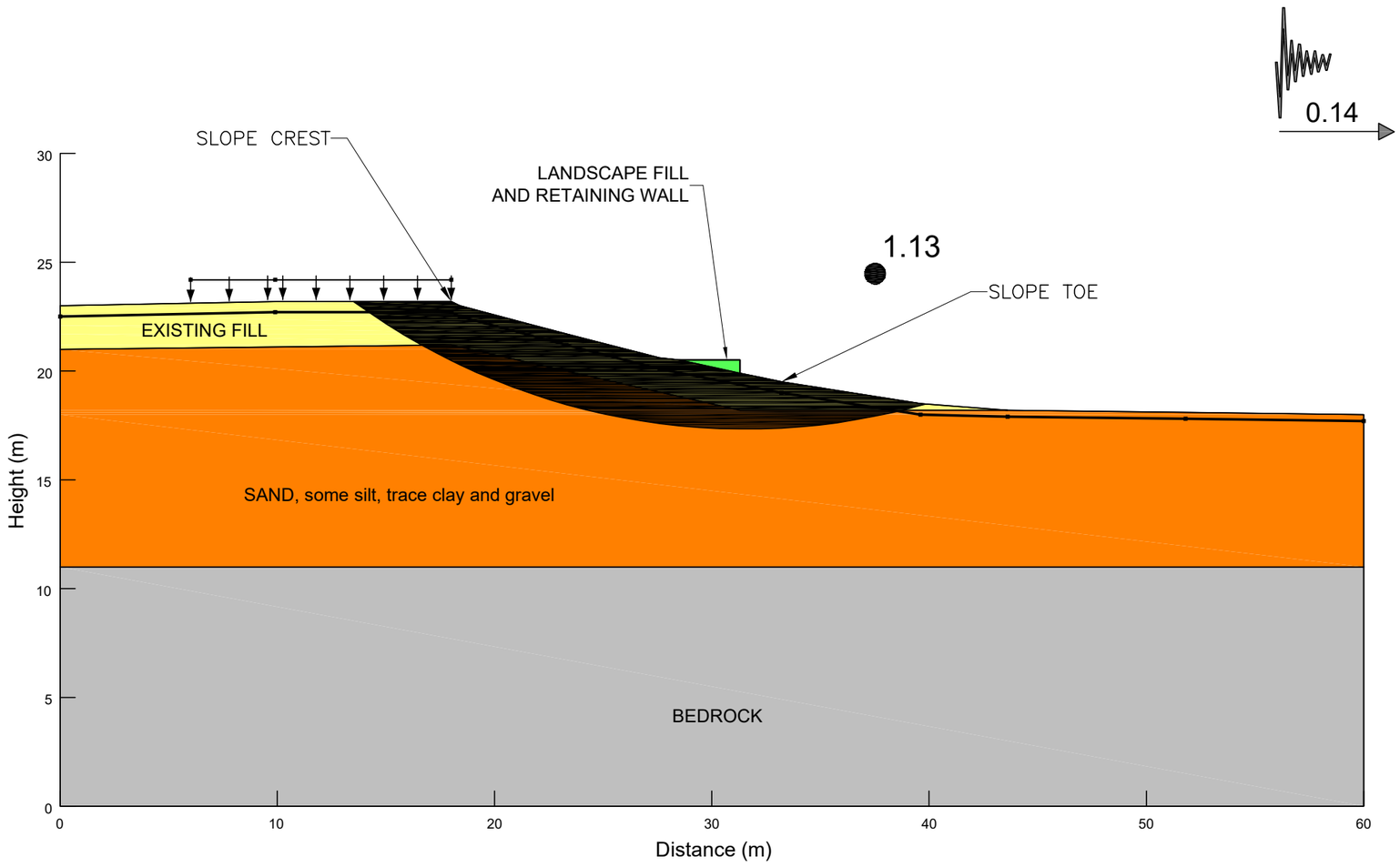

ANALYSIS NAME

PSEUDO-STATIC CONDITIONS - SLOPE SECTION A-A
FIGURE 6

LOCATION

116 CLOTHIER STREET EAST
MUNICIPALITY OF NORTH GRENVILLE
ONTARIO

PROJECT

SLOPE STABILITY ASSESSMENT

CLIENT

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TABLE I
RECORD OF TEST PITS

116 CLOTHIER STREET EAST, KEMPTVILLE
MUNICIPALITY OF NORTH GRENVILLE
ONTARIO

TEST PIT NUMBER [APPROX. ELEV.]	DEPTH (METRES)	DESCRIPTION
TP24-1 [±89.5m]	0.00 – 1.70	Topsoil, sand, silt, clay, occasional brick, trace to some ash (FILL)
	1.70 – 2.00	Red brown to grey brown fine SAND, some silt, trace clay, trace gravel
	2.00	End of test pit

No groundwater seepage observed into test pit at time of field work, December 18, 2024.

TP24-2 [±88.5m]	0.00 – 1.90	Topsoil, sand, silt, clay, cobbles (FILL)
	1.90 – 2.30	Grey brown fine SAND, some silt, trace clay, trace gravel
	2.30	End of test pit

No groundwater seepage observed into test pit at time of field work, December 18, 2024.

APPENDIX A

MECP WELL RECORDS

3 1216 same as 1215

UTM | | Z | | | | | | E
| 9 | R | | | | | | | N
Elev. | 9 | R | 0 | 3 | 0 | 0 |
Basin | 2 | 5 | | | |

24 No 1217

The Well Drillers Act
Department of Mines, Province of Ontario

Water Well Record

[redacted] ... Con. ... Lot ... Rt. Lot ...
... Kemptville Ont. ... Acres ...
Date Completed July 1st - 47 ... Cost of Well (not including pump) ...

Pipe and Casing Record

Casing diameter(s) 6" ...
Length(s) of casing(s) 16'6" ...
Length of screen ...
Type of screen ...
Type of pump ...
Capacity of pump ...
Depth of pump setting ...

Pumping Test

Date no test ...
Developed Capacity ...
Duration of Test ...
Pumping Rate ...
Drawdown ...
Static level of completed well 18' ...
Is well a gravel-wall type? ...

Water Record

Kind (fresh or mineral) Fresh ...
Quality (hard, soft, contains iron, sulphur etc.) Hard ...
Appearance (clear, cloudy, coloured) Clear ...
For what purpose(s) is the water to be used? Domestic ...
How far is well from possible source of contamination? No source ...
What is source of contamination? None ...
Enclose a copy of any mineral analysis that has been made of water ...

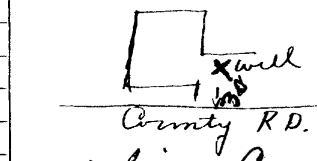
Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
18'	Clear had	28'

Well Log

Drift and Bedrock Record	From	To
16'6" hard pan	0 ft.	ft.
13' Limestone		16'6
	16'6'	29'6"

Location of Well

In diagram below show distances of well from road and lot line



30' from County R.D
South

Situation: Is well on upland, in valley, or on hillside? Hillside ...
Drilling Firm Fred Hillabaugh ...
Address Kemptville Ont. ...
Recorded by ... Address ...
Date July 1st ... Licence Number ... CSS:S8

The Ontario Water Resources Commission Act

WATER WELL RECORD

3164

Water management in Ontario

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 2402321 | MUNICIP. 24602 | CON.

COUNTY OR DISTRICT: Stormont | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Cumberland | CON., BLOCK, TRACT, SURVEY, ETC.: St Saunders | LOT: 44 5

OWNER (SURNAME FIRST): Julia Construction | ADDRESS: Richmond Ont | DATE COMPLETED: DAY 15 MO May YR 72

21 | UTM ZONE 18 | EASTING 448950 | NORTHING 4985000 | RC | ELEVATION 0300 | RC | BASIN CODE 25

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	DEPTH – FEET TO
grey	clay	stones		0	19
grey	limestone			19	63

31 | 0019205718 | 0063215

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
0063	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	DEPTH – FEET TO
05	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	0021 ~~21~~
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☒ OPEN HOLE			0063
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER | PUMPING RATE: 0008 GPM. | DURATION OF PUMPING: 01 HOURS 00 MINS.

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
007 FEET	055 FEET		040 FEET	050 FEET	055 FEET	055 FEET

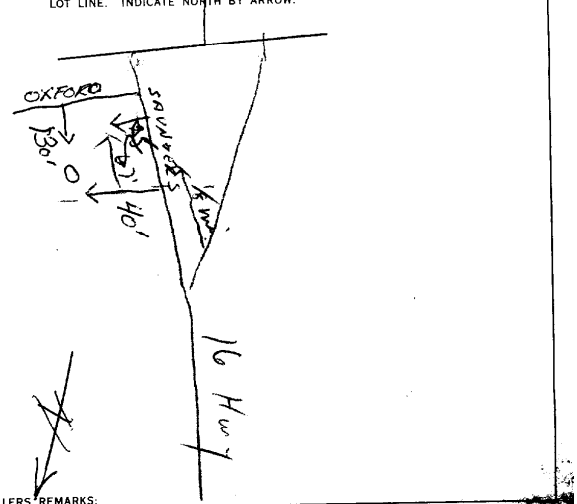
IF FLOWING, GIVE RATE: GPM. | PUMP INTAKE SET AT: FEET | WATER AT END OF TEST: 1 ☐ CLEAR 2 ☒ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING: 055 FEET | RECOMMENDED PUMPING RATE: 005 GPM.

50-53: 000.2 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

FINAL STATUS OF WELL (54)
1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE (55-56) 01
1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING (57)
1 ☒ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Henry Mann Well Drilling | LICENCE NUMBER: 3644
ADDRESS: Box 326, Richmond Ont
NAME OF DRILLER OR BORER: Henry Mann | LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: Henry Mann | SUBMISSION DATE: DAY 16 MO May YR 72

OFFICE USE ONLY

DATA SOURCE 1 | 58 | CONTRACTOR 3644 | 59-62 | DATE RECEIVED 180872 | 63-66 | 80
DATE OF INSPECTION | INSPECTOR K
REMARKS: | P ✗ | WI

OWRC COPY

Ontario — Ministry of the Environment

Well Tag No. *(Place Sticker and/or Print Below)*

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☒ Imperial

Page _____ of _____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	Grenville Lodge #279		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
119 Clouthier Street East	Kemptville	ON	K0G1J0	6139895788

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
119 Clouthier Street East		34	

County/District/Municipality	City/Town/Village	Province	Postal Code
Grenville	Kemptville	Ontario	K0G1J0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	449083	4985189	Plan 11	

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
	Decomission Unused Dug Well				

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
21'	18'	Bentonite Chips	13.80
18'	7'	Clean Sand	108
7'	4'	Bentonite Chips	18.63
4'	ϕ	Clean Sand	81'

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, *specify* _____

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☒ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify* _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☒ Abandoned, other, *specify* unused
☐ Other, *specify*

Water Details

Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, *specify*
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, *specify*
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, *specify*

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)

Results of Well Yield Testing

After test of well yield, water was:
☒ Clear and sand free
☐ Other, *specify* _____

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping _____ hrs + _____ min

Final water level end of pumping *(m/ft)*

If flowing give rate *(l/min / GPM)*

Recommended pump depth *(m/ft)*

Recommended pump rate *(l/min / GPM)*

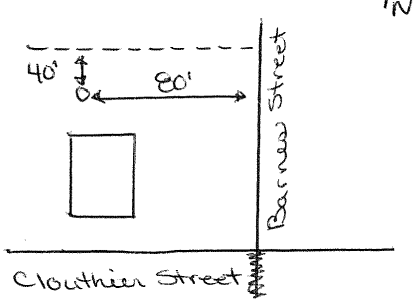
Well production *(l/min / GPM)*

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
1425486 Ontario Ltd o/a Splash Well Drilling	4877

Business Address (Street Number/Name)	Municipality
PO Box 1083	Prescott

Province	Postal Code	Business E-mail Address
ON	K0E1T0	

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
6139254885	Ferguson, Todd

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
T478	Todd	2014/11/26

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	2014/11/19	2014/11/13

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Audit No. Z197246

NOV 28 2014

Ministry's Copy

20-00069-00

Ontario Ministry of the Environment

Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. *(Place Sticker and/or Print Below)* No Tag

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
203 Clothier St. E			

County/District/Municipality	City/Town/Village	Province	Postal Code
North Grenville	Kemptville	Ontario	K0G1J0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	18	449116	4918514		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brn	Sand	Silt	Loose	0'	24'
	Abandoned				

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0'	9'	clean Fill	
9'	12'	Bentonite chips	12 bags
12'	24'	cement	3 m

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☑ Digging
☐ Air percussion
☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify Abandoned

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
24"	stone	10"	0'	24'
	0' to 13' Removed			

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
24"	Stone	Stone		

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☑ Abandoned, other, specify Not in use
☐ Other, specify

Water Details

Water found at Depth (m/ft)	Kind of Water	Other, specify
22'	☐ Fresh ☑ Untested ☐ Gas	
	☐ Fresh ☐ Untested ☐ Gas	
	☐ Fresh ☐ Untested ☐ Gas	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0'	24'	24"

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping _____ hrs + _____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

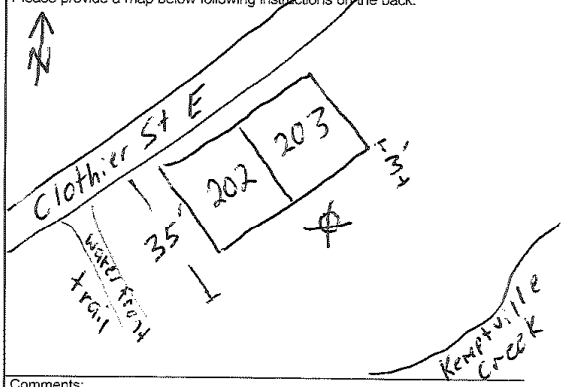
Well production (l/min / GPM)

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Aardvark Drilling Inc	7167 15

Business Address (Street Number/Name)	Municipality
25-C Lewis Rd	Guelph

Province	Postal Code	Business E-mail Address
ON	N1H 1G9	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
5199826913410	Smith, Kyle

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3591		2020 06 22

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No		2020 06 15

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Audit No. Z199747

Received JUL 21 2020

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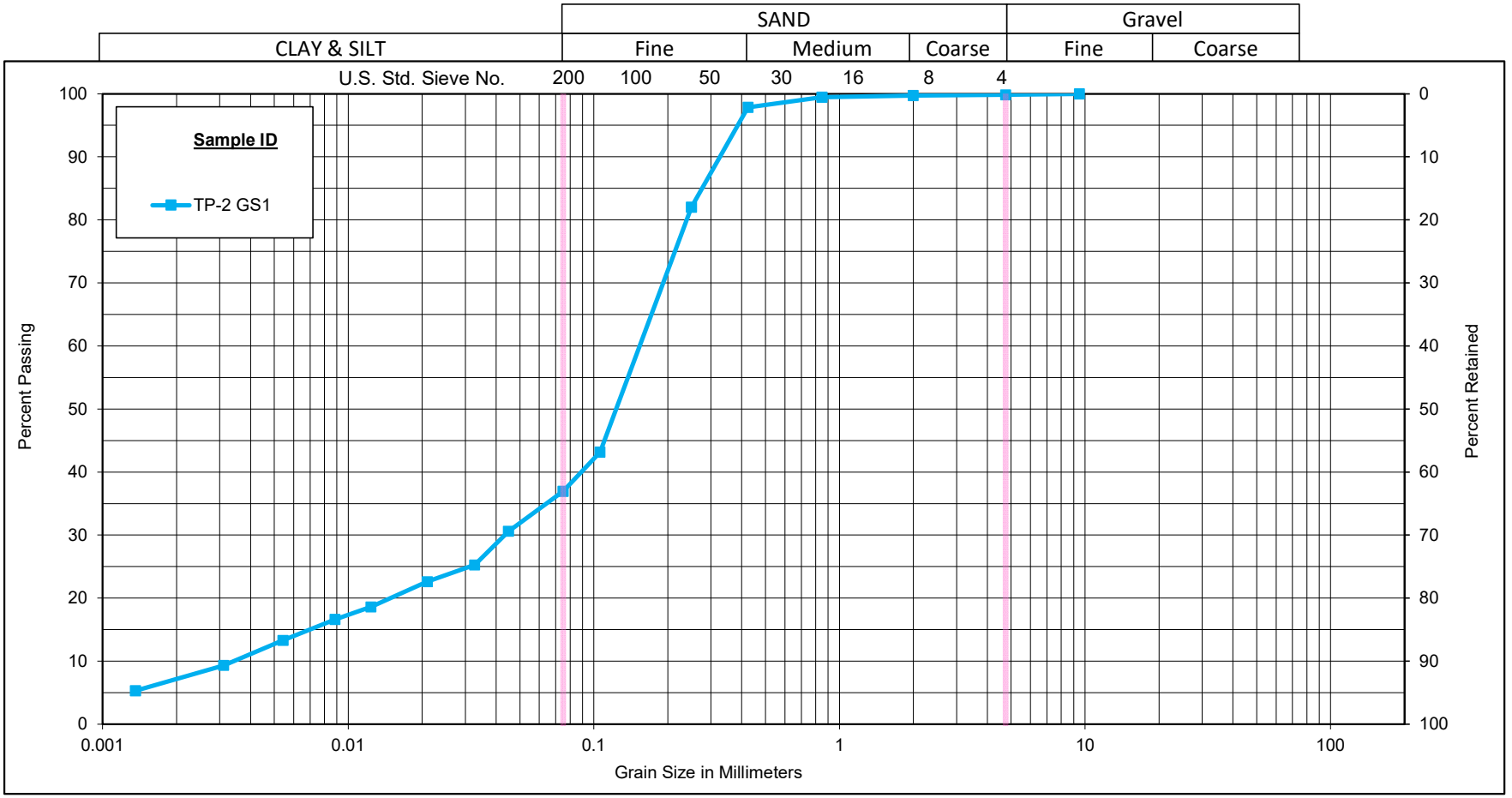
APPENDIX B

LABORATORY GRAIN SIZE DISTRIBUTION TESTING RESULTS

Unified Soil Classification System



Sample ID	Depth	% Gravel	% Sand	% Silt	% Clay
TP-2 GS1	80"-90"	0.2	62.9	29.9	7.0

Stantec

GRAIN SIZE DISTRIBUTION

Morey Associates, File #024634

Materials Testing

Figure No.

Project No. 121625580

Particle-Size Analysis of Soils

LS702

AASHTO T88

PROJECT DETAILS			
Client:	**Morey Associates, File #024634**	Project No.:	**121625580**
Project:	**Materials Testing**	Test Method:	**LS702**
Material Type:	**Soil**	Sampled By:	**Morey Associates**
Source:	**TP-2**	Date Sampled:	**December 18, 2024**
Sample No.:	**GS1**	Tested By:	**Brian Prevost**
Sample Depth	**80"-90"**	Date Tested:	**December 22, 2024**

WASH TEST DATA	
Oven Dry Mass In Hydrometer Analysis (g)	73.38
Sample Weight after Hydrometer and Wash (g)	47.12
Percent Passing No. 200 Sieve (%)	**35.8**
Percent Passing Corrected (%)	**35.69**

PERCENT LOSS IN SIEVE	
Sample Weight Before Sieve (g)	**1075.20**
Sample Weight After Sieve (g)	**1072.40**
Percent Loss in Sieve (%)	**0.26**

SOIL INFORMATION		
Liquid Limit (LL)		
Plasticity Index (PI)		
Soil Classification		
Specific Gravity (G_s)	2.750	
Sg. Correction Factor (α)	0.978	
Mass of Dispersing Agent/Litre	24	g

CALCULATION OF DRY SOIL MASS	
Oven Dried Mass (W_o), (g)	219.31
Air Dried Mass (W_a), (g)	220.30
Hygroscopic Corr. Factor ($F=W_o/W_a$)	0.9955
Air Dried Mass in Analysis (M_a), (g)	73.71
Oven Dried Mass in Analysis (M_o), (g)	73.38
Percent Passing 2.0 mm Sieve (P_{10}), (%)	99.74
Sample Represented (W), (g)	73.57

SIEVE ANALYSIS		
Sieve Size mm	**Cum. Wt. Retained**	**Percent Passing**
75.0		100.0
63.0		100.0
53.0		100.0
37.5		100.0
26.5		100.0
19.0		100.0
13.2		100.0
9.5	0.0	100.0
4.75	1.8	99.8
2.00	2.8	99.7
Total (C + F)[1]	1072.40	
0.850	0.19	99.5
0.425	1.40	97.8
0.250	13.03	82.0
0.106	41.63	43.2
0.075	46.21	36.9
PAN	46.43	

Note 1: (C + F) = Coarse + Fine

HYDROMETER DETAILS	
Volume of Bulb (V_B), (cm^3)	63.3
Length of Bulb (L_2), (cm)	14.2
Length from '0' Reading to Top of Bulb (L_1), (cm)	10.3
Scale Dimension (h_s), (cm/Div)	0.17
Cross-Sectional Area of Cylinder (A), (cm^2)	27.25
Meniscus Correction (H_m), (g/L)	1.0

START TIME 10:32 AM

HYDROMETER ANALYSIS

Date	Time	Elapsed Time T Mins	H_s Divisions g/L	H_c Divisions g/L	Temperature T_c °C	Corrected Reading $R = H_s - H_c$ g/L	Percent Passing P %	L cm	η Poise	K	Diameter D mm
22-Dec-24	10:33 AM	1	27.0	4.0	20.0	23.0	30.59	11.47798	10.09098	0.013286	0.04501
22-Dec-24	10:34 AM	2	23.0	4.0	20.0	19.0	25.27	12.15798	10.09098	0.013286	0.03276
22-Dec-24	10:37 AM	5	21.0	4.0	20.0	17.0	22.61	12.49798	10.09098	0.013286	0.02101
22-Dec-24	10:47 AM	15	18.0	4.0	20.0	14.0	18.62	13.00798	10.09098	0.013286	0.01237
22-Dec-24	11:02 AM	30	16.5	4.0	20.0	12.5	16.62	13.26298	10.09098	0.013286	0.00883
22-Dec-24	11:52 AM	80	14.0	4.0	21.0	10.0	13.30	13.68798	9.84835	0.013126	0.00543
22-Dec-24	2:42 PM	250	11.0	4.0	21.5	7.0	9.31	14.19798	9.73081	0.013047	0.00311
23-Dec-24	10:32 AM	1440	8.0	4.0	19.0	4.0	5.32	14.70798	10.34409	0.013452	0.00136

Remarks:

Reviewed By: Brian Prevost

Date: December 23, 2024

V:\01216\active\laboratory_standing_offers\2024 Laboratory Standing Offers\121625580 Morey Associates\December 18, Hydrometer_TP2_GS1, Morey #024634\Hydrometer-Lab Standing Offers.xlsx

APPENDIX C

COMPLETED TABLE 4.2 SLOPE STABILITY RATING CHART (EXCERPT FROM SECTION 4.3.2 OF THE MNR "TECHNICAL GUIDE - RIVER & STREAM SYSTEMS: EROSION HAZARD LIMIT")

TABLE 4.2 - SLOPE STABILITY RATING CHART

Site Location: *116 Clothier St. E., Kemptville, ON* File No. *024634*

~~Property Owner~~ Client: *Lockwood Brothers Construction* ~~Inspection~~ Site Visit Date: *November 22, 2024*

~~Inspected~~ Site Visit By: *Morey Associates Ltd. technical staff* Weather: *Overcast, ~6 degrees C*

1. SLOPE INCLINATION			
	degrees	**horiz. : vert.**	
a)	18 or less	3 : 1 or flatter	0
b)	18 - 26	2 : 1 to more than 3 : 1	6
c)	more than 26	steeper than 2 : 1	16
2. SOIL STRATIGRAPHY			
a)	Shale, Limestone, Granite (Bedrock)		0
b)	Sand, Gravel		6
c)	Glacial Till		9
d)	Clay, Silt		12
e)	Fill		16
f)	Leda Clay		24
3. SEEPAGE FROM SLOPE FACE			
a)	None or Near bottom only		0
b)	Near mid-slope only		6
c)	Near crest only or, From several levels		12
4. SLOPE HEIGHT			
a)	2 m or less		0
b)	2.1 to 5 m		2
c)	5.1 to 10 m		4
d)	more than 10 m		8
5. VEGETATION COVER ON SLOPE FACE			
a)	Well vegetated; heavy shrubs or forested with mature trees		0
b)	Light vegetation; Mostly grass, weeds, occasional trees, shrubs		4
c)	No vegetation, bare		8
6. TABLE LAND DRAINAGE			
a)	Table land flat, no apparent drainage over slope		0
b)	Minor drainage over slope, no active erosion		2
c)	Drainage over slope, active erosion, gullies		4
7. PROXIMITY OF WATERCOURSE TO SLOPE TOE			
a)	15 metres or more from slope toe		0
b)	Less than 15 metres from slope toe		6
8. PREVIOUS LANDSLIDE ACTIVITY			
a)	No - no evidence of previous slope failures at proposed site development area		0
b)	Yes		6

SLOPE INSTABILITY RATING VALUES INVESTIGATION RATING SUMMARY **TOTAL** *22*

APPENDIX D

SITE PHOTOGRAPHS

Photograph 1: Upper portion of subject slope in background (east side yard), bottom portion of subject slope in foreground (rear yard). [Looking in project north direction]

Photograph 2: Toe of subject slope in foreground, floodplain in background with Kemptville Creek beyond. [Looking in project south direction]

APPENDIX E

2015 NATIONAL BUILDING CODE SEISMIC HAZARD CALCULATION

2015 National Building Code Seismic Hazard Calculation

INFORMATION: Eastern Canada English (613) 995-5548 français (613) 995-0600 Facsimile (613) 992-8836
Western Canada English (250) 363-6500 Facsimile (250) 363-6565

Site: 45.019N 75.645W

2025-03-13 13:25 UT

Probability of exceedance per annum	0.000404	0.001	0.0021	0.01
Probability of exceedance in 50 years	2 %	5 %	10 %	40 %
Sa (0.05)	0.445	0.240	0.140	0.039
Sa (0.1)	0.519	0.291	0.177	0.055
Sa (0.2)	0.432	0.247	0.154	0.051
Sa (0.3)	0.327	0.189	0.119	0.041
Sa (0.5)	0.231	0.134	0.085	0.029
Sa (1.0)	0.114	0.067	0.043	0.015
Sa (2.0)	0.054	0.032	0.020	0.006
Sa (5.0)	0.014	0.008	0.005	0.001
Sa (10.0)	0.005	0.003	0.002	0.001
PGA (g)	0.277	0.158	0.096	0.030
PGV (m/s)	0.191	0.107	0.065	0.020

Notes: Spectral (Sa(T), where T is the period in seconds) and peak ground acceleration (PGA) values are given in units of g (9.81 m/s^2). Peak ground velocity is given in m/s. Values are for "firm ground" (NBCC2015 Site Class C, average shear wave velocity 450 m/s). NBCC2015 and CSAS6-14 values are highlighted in yellow. Three additional periods are provided - their use is discussed in the NBCC2015 Commentary. Only 2 significant figures are to be used. **These values have been interpolated from a 10-km-spaced grid of points. Depending on the gradient of the nearby points, values at this location calculated directly from the hazard program may vary. More than 95 percent of interpolated values are within 2 percent of the directly calculated values.**

References

National Building Code of Canada 2015 NRCC no. 56190; Appendix C: Table C-3, Seismic Design Data for Selected Locations in Canada

Structural Commentaries (User's Guide - NBC 2015: Part 4 of Division B)
Commentary J: Design for Seismic Effects

Geological Survey of Canada Open File 7893 Fifth Generation Seismic Hazard Model for Canada: Grid values of mean hazard to be used with the 2015 National Building Code of Canada

See the websites www.EarthquakesCanada.ca and www.nationalcodes.ca for more information