Memorandum to the Council of

Corporation of the Municipality of Temagami

Subject: Fox Run Road Remediation and Resurfacing Project - Progress Report

Memo No: 2025-M-080

Date: April 10, 2025

Attachment: Appendix A - Englobe Geotechnical Final Report

Prepared By: Laala Jahanshahloo - CAO/Treasurer

Recommendation

BE IT RESOLVED THAT Council receives Memo 2025-M-080 as presented.

Contents

1. Executive Summary

The Municipality of Temagami is moving forward with the rehabilitation of Fox Run Road, Stevens Road, and White Bear Crescent to enhance road conditions, drainage, and long-term resilience. Following Council Resolution #24-539, Tulloch Engineering Inc., with geotechnical support from Englobe Corp., has completed initial investigations and design work.

Geotechnical fieldwork, completed in March 2025, identified two surfacing options: Hot-Mix Asphalt (HMA) and Double Surface Treatment (DST). HMA offers a longer lifespan and better support for future development, while DST provides a more economical short-term solution with higher maintenance needs. The final geotechnical report confirms that both options are structurally viable, with recommended pavement structures, drainage upgrades, and frost protection measures in place. Cost estimates remain pending tender results.

2. Background

Following Council Resolution #24-539, the Municipality of Temagami authorized Tulloch Engineering Inc. to proceed with the design, tendering, and construction administration services for the Fox Run Road Remediation Project. This authorization included subcontracting Englobe Corp. to carry out geotechnical investigations and provide pavement design services.

This report serves as the first progress report for the project, summarizing completed investigations, key findings, and proposed surfacing options based on geotechnical and engineering analysis.

3. Project Overview

The rehabilitation project aims to:

- Improve roadway conditions and resolve drainage issues.
- Apply a durable and context-appropriate surface treatment.
- Strengthen pavement structure to support future residential development.
- Incorporate geotechnical best practices for longevity and resilience.

3. Completed Work

The geotechnical investigation, completed by Englobe on March 27, 2025, was delivered within budget.

- Fieldwork Summary:
  - 31 boreholes (1 fewer than planned due to TCE right-of-way restrictions)
  - Soil samples tested for gradation, moisture, and frost susceptibility
- Key Findings:
  - Granular Base: Sand with gravel, low frost susceptibility
  - Subbase: Natural sand or imported fill
  - Bedrock: Encountered in several locations (auger refusal due to dense materials or boulders)
- Recommendations:
  - Pavement Structure: 60 mm HMA + 150 mm granular base (see Table 4-4)
  - Drainage: Ditch grading, crossfall adjustments, and culvert upgrades per OPSD
- Deliverables Submitted:
  - Final Geotechnical Report (Ref. 02411222) with borehole logs, lab results, and design parameters

4. Geotechnical Status

- Geotechnical Report: Finalized and accepted by project team
- Pavement Design Validation (AASHTO DARWin 3.1):
  - Structural Number (SN): 47 mm
  - Estimated Design Life: 12–13 years (with proper drainage and routine maintenance)
- Limitations & Notes:

- Traffic volumes were assumed (AADT = 250, 5% commercial)
- No groundwater levels observed during winter; monitoring to occur in spring

5. Proposed Surfacing Options

Option 1: Hot-Mix Asphalt (HMA)

- Specifications:
    - Surface: 60 mm Superpave 12.5 (OPSS.MUNI 1151)
    - Base: 150 mm Granular M (retained from 2023/2024 work)
    - Subgrade: Crowned at 3% crossfall
- Performance:
    - Estimated service life: 12–13 years
    - Ideal for anticipated traffic growth (25,298 ESALs)
    - Preferred for its durability and support for development potential

Option 2: Double Surface Treatment (Class II)

- Specifications:
    - Two BST applications (OPSS.MUNI 304)
    - Applied with specified aggregate and binder rates
- Performance:
    - Estimated lifespan: 8–10 years
    - Lower upfront cost but requires more frequent maintenance
    - Suitable for roads with AADT ≤ 1,000 and low commercial traffic

6. Key Design Parameters

- Compaction Requirements:
  - Granular materials compacted to 100% Standard Proctor Density
- Drainage Improvements:
  - Ditches: Minimum 0.5 m below subgrade; cleaned and graded
  - Culverts: Upgraded to HDPE corrugated pipe (per OPSD standards)
- Frost Protection:
  - Frost tapers of 5H:1V at culverts and crossings (OPSD 803.030)
- Traffic Design Basis:
  - AADT: 250 vehicles/day (5% commercial)
  - ESALs: 25,298 over 12 years (validated using AASHTOWare DARWin 3.1)

7. Challenges & Mitigation

- Borehole Reduction: 31 completed (1 fewer than planned)
- Mitigation: Analysis adjusted; no impact on final design
- Winter Fieldwork Limitations: Drainage assessments restricted
- Mitigation: Spring monitoring planned during construction phase
- Traffic Data Assumptions: Historical data unavailable
- Mitigation: Post-construction traffic surveys will refine future performance models

8. Cost Implications

Item	HMA	Double Surface Treatment
Material Costs	Higher (durability)	Lower (short-term solution)
Maintenance Costs	Lower	Higher (more frequent upkeep)
Total Project Cost	TBD (based on tenders)	TBD (based on tenders)

9. Conclusion

Based on the geotechnical analysis and engineering design parameters, both Hot-Mix Asphalt and Double Surface Treatment are viable options for the Fox Run Road Remediation Project. HMA is recommended for its superior durability and alignment with anticipated traffic growth and residential development. However, DST may remain a suitable alternative in lower-traffic segments or budget-limited scenarios. Final decision-making should consider lifecycle costs, funding availability, and long-term municipal infrastructure planning priorities.

Resurfacing of Fox Run Road Temagami, ON

Municipality of Temagami c/o Tulloch

Geotechnical Report | Final
Reference no. 02411222

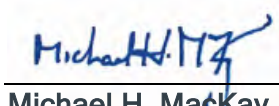
March 27, 2025

ENGLOBE

Prepared by:

Ryan Grasser
Team Lead
Materials (NE/NW Ontario)

Approved by:



Michael H. MacKay, M.Eng., P.Eng.
Vice President - Expertise
Pavement Technology & Geotechnical Engineering

Production team

Client

	Ted Maurer, CET

Englobe Corp.

Project Manager/Pavement Designer	Ryan Grasser
Reviewer	Michael H. MacKay, M.Eng., P.Eng.
Drafting	Duncan Mitchell

Revisions and publications log

REVISION No.	DATE	DESCRIPTION
00	February 8, 2025	Preliminary version published for comments
01	March 27, 2025	Final version submitted

Distribution

1 PDF copy	Ted Maurer, CET

Property and Confidentiality

“This document is intended solely for the purposes stated herein. Any use of the report must take into consideration the purpose and scope of the mandate under which the report was prepared, as well as the limitations and conditions specified therein and the state of scientific knowledge at the time the report is issued. Englobe Corp. does not make any warranties or representations other than those expressly contained in the report.

This document is the work of Englobe Corp. Any reproduction, distribution, or adaptation, in whole or in part, is strictly prohibited without the prior written permission of Englobe and its Client. For greater certainty, the use of report excerpts is strictly prohibited without the written permission of Englobe and its Client, and the report should be read and considered in its entirety.

No information contained in this report may be used by any third party without the written permission of Englobe and its Client. Englobe Corp. disclaims all liability for any unauthorized reproduction, distribution, adaptation, or use of the report.

If tests have been performed, the results of these tests are valid only for the sample described in this report.

Subcontractors of Englobe who may have performed laboratory work are duly evaluated according to the purchasing procedure of our quality system. For further information or details, please contact your project manager.”

Table of Contents

TABLES

1 Introduction

As requested by the Client, TULLOCH on behalf on the Municipality of Temagami (the Municipality), Englobe Corp. (Englobe) has carried out the geotechnical investigation for the proposed rehabilitation of sections of Stevens Road, Fox Run Road and White Bear Crescent located in Temagami, Ontario. The Site Location Plans are shown on Drawing Nos. 1a and 1b, included in Appendix A.

Englobe has completed the field and laboratory testing programs and submit the factual results in this report along with our comments and recommendations.

It is understood that the Municipality previously pulverized the existing surface treatment into the underlying granular on the entire limits of the project. Following a visual assessment by TULLOCH in 2023, 150 mm of Granular M, including liquid calcium, was installed on sections of the roadway surface in both 2023 and 2024, which remains as the current driving surface. The Municipality intends on completing additional remedial work including centreline culvert replacements and the excavation of poorly performing areas which have been identified by municipal staff.

Application of a bituminous surface treatment was being considered for the entire rehabilitation limits; however, consideration is now being given to a hot-mix asphalt surface considering that a number of new high-end homes are expected to be constructed in the near future.

The purpose of the geotechnical investigation was to determine the subsurface and groundwater conditions along the proposed reconstruction to provide geotechnical recommendations for hot-mix asphalt design and construction.

1.1 Site Conditions

Stevens Road, Fox Run Road and White Bear Crescent are currently two-lane gravel surfaced roadways with rural cross section (i.e. open ditching) that provides access to primarily residential and municipal properties along its limits. These routes also provide access to various waterbodies.

The topography at the site is rolling, with exposed bedrock visible throughout the limits.

Due to the timing on Englobe's investigations (winter 2025), observations of the drainage, roadway condition, and overall performance could not be completed. However, a memorandum was prepared

and provided by the Client based on the 2023 site reviews which indicated that the roadway platform widths varied between 8.7 and 11.4 metres. The ditching was described as partial in nature, with irregular depths and configuration. It was estimated that 10% of the roadway did not have any visible ditching. The memorandum indicated that where ditching was observed, it was generally found to be in fair to good condition. The memo also stated that several of the centreline culverts had been replaced with HDPE corrugated culverts.

2 Fieldwork

The fieldwork for this geotechnical investigation was carried out on January 6th and 7th, 2025. The fieldwork consisted of thirty-one (31) sampled boreholes (Boreholes (BH) Nos. 01 to 31). The original scope of work, as outlined in Englobe's proposal dated October 30, 2024, recommended that thirty-two (32) boreholes be advanced for the project. However, permissions would not be granted to advanced boreholes near the Trans-Canada Energy right-of-way, and as such the scope was marginally reduced. The locations of the boreholes are shown on the Borehole Location Plans, Drawing No. 2a and 2b in Appendix A.

The boreholes and auger probes were advanced with a truck mounted CME-45 drill rig operated by Limitless Drilling Ltd. and equipped with continuous solid stem augers. The field work was under the full-time direction of an experienced member of our engineering field staff who was responsible for underground service locates, logging individual borings, retrieving samples, field sample classification, plus overall field supervision. All samples taken during this investigation were stored in labeled airtight containers for transport to our North Bay laboratory for visual examination and select laboratory testing. The routine laboratory testing consisted of natural moisture content determination and particle size analysis on select samples. Samples remaining following testing will be stored for a period of three months following the date of this report and then discarded unless otherwise instructed.

In order to comply with the intent of Ontario Water Resources Act Regulation 903 amended to O. Reg. 128/03, the boreholes were sealed with reverse augering techniques for the full depth and, where appropriate, the surface was sealed with a bentonite plug. Each borehole was capped with asphalt cold patch.

Survey of the individual borehole locations was outside the scope of work of this project. As such, prior to carrying out any design requiring geodetic elevations, they must be confirmed by an qualified Ontario Land Surveyor. All measurements in this report are in Metric units (unless otherwise noted) report.

3 Subsurface Conditions

Soil conditions are confirmed at the boring locations only and may vary between borings. The boundaries between stratums indicated on the borehole logs are inferred from non-continuous sampling, results of in-situ tests, observations during the drilling operations, and/or the response of the drilling equipment. These boundaries are approximations only and should not be regarded as exact planes of geological change as the actual transition may be gradual from one soil type to another. The description of compactness of the granular subsoils, in part, was based on the results of the SPT and/or the response of the drilling equipment. Refusal is defined as the point at which the augers can no longer be practically advanced with the equipment used in this investigation. Refusal to further advance of the augers, where encountered, may have been due to the presence of very dense soils, cobbles/boulders in the underlying soils, or possibly bedrock.

The observed depth of frost at the time of investigations was in the order of 0.4 m measured from existing grade.

Detailed descriptions of the subsurface conditions revealed at the boreholes are shown on the enclosed Record of Borehole Logs in Appendix B. The following is a brief description of revealed subsurface conditions at this site.

3.1 Borehole Subsurface Description Summary

Borehole (BH) Nos. 01 to 31 were advanced on the existing roadway, along the alignment of the proposed rehabilitation. A summary of the borehole locations and advancement depths are provided on Table 3-1 below.

Table 3-1: Borehole Data

Boring ID	Coordinates Northing (UTM Zone 17N)	Coordinates Easting (UTM Zone 17N)	Depth (m)	Refusal Encountered (Y/N)
01	592494	5213262	1.5	N
02	592581	5213367	0.5	Y
03	592785	5213424	1.5	N
04	592996	5213389	1.5	N
05	593180	5213401	1.5	N
06	593379	5213470	1.5	N
07	593583	5213585	0.8	Y
08	593731	5213688	0.9	Y
09	593905	5213786	1.5	N
10	594090	5213833	1.5	N
11	594265	5213750	1.1	Y
12	594457	5213729	0.6	Y
13	594746	5213757	0.6	Y
14	594849	5213667	0.5	Y
15	595022	5213607	0.7	Y
16	595223	5213593	0.6	Y
17	595419	5213592	0.8	Y
18	595642	5213562	0.5	Y
19	595803	5213453	0.5	Y
20	596000	5213462	0.6	Y
21	596225	5213537	0.7	Y
22	596390	5213611	0.8	Y
23	596443	5213808	0.8	Y
24	596453	5214020	0.4	Y
25	596474	5214222	0.9	Y
26	596462	5214420	1.5	N
27	596462	5214608	0.7	Y
28	596524	5213866	0.9	Y
29	596692	5213953	1.5	N
30	596771	5214121	0.4	Y
31	596780	5214188	0.6	Y

3.1.1 Granular Fill (Base)

At the time of the field investigations, approximately 400 mm of the roadway structure was frozen, and ice/snow covered, making any discrete surficial granular layers (i.e. new layer of Granular M) undistinguishable from the underlying supporting layer.

Underlying the assumed layer of Granular M, a layer of granular fill was penetrated. For purposes of pavement design, this layer is considered with the Granular M to comprise the granular base layer. The fills were described as sand, with gravel, trace to some silt. Due to the upper section of the assumed base layer being frozen, the sampling was predominantly taken from the fill material underlying the new Granular M layer. Five (5) samples from the granular fill layer were subject to gradation (sieve) analysis. The results are summarized in Section 3.1.4 below and provided in Appendix C – Laboratory Test Results. Based on the gradation results, the frost susceptibility of this layer is estimated to be low. The granular fill (base) layer was variable in thickness and was encountered to depths ranging between 0.2 and 1.5 m. Auger refusal was encountered at the base of this fill layer at BH Nos. 02, 07, 08, 12 to 16, 18 to 24, 28, 30 and 31. Confirming the nature of the refusal with diamond bit coring operations was outside the scope of work for this project. Refusal may be a result of cobbles/boulders, rock fill or bedrock. It is noted that bedrock outcrops are evident throughout the limits of the project. Sampling was terminated in this granular fill layer at BH Nos. 04, 06 and 09 at depth of 1.5 m.

3.1.2 Sand (Subbase)

Underlying the granular fill (base layer) at BH Nos. 01, 03, 05, 10, 11, 17, 26, 27, and 29, a deposit of sand was encountered. It could not be confirmed if this consisted of natural sand or imported fill placed during previous construction activities. For the purposes of pavement design, this layer is considered to be the granular subbase layer. The layer was generally described as sand, trace to with gravel, trace to with silt. Four (4) samples from the sand stratum were subject to gradation (sieve) analysis. The results are summarized in Section 3.1.4 below and provided in Appendix C – Laboratory Test Results. The granular fill (subbase) layer was variable in thickness and was encountered to depths ranging between 0.7 and 1.5 m. Auger refusal was encountered at the base of this fill layer at BH Nos. 05, 11, 17 and 27. Again, confirming the nature of the refusal with diamond bit coring operations was outside the scope of work for this project. Sampling was terminated within this granular fill layer at BH Nos. 01, 03, 10, 26 and 29.

3.1.3 Silty Sand

At one borehole location (BH No. 05), a layer of silt sand was encountered underlying the sand (subbase) layer. The layer was described as silty sand, some gravel. One (1) sample from the sand stratum was subject to gradation (sieve) analysis. The results are summarized in Section 3.1.4 below and provided in Appendix C – Laboratory Test Results. Based on the results of the gradation analysis, this silty sand material was deemed to have a low susceptibility to frost heaving. The silty sand layer was encountered to a depth of 1.5 m, where sampling was terminated.

3.1.4 Laboratory Test Results

The following summarizes the laboratory data results obtained from relevant samples collected during the geotechnical investigation. Laboratory tests were conducted to determine physical soil characteristics relevant to the geotechnical investigation at select borehole locations:

- Gradation (sieve) – ten (10) tests

The following table summarizes the gradation results (sieve) obtained from conducting laboratory testing on the following samples:

Table 3-2: Gradation Results

Borehole ID	Description	Depth (m)	Gradation		
			Gravel (%)	Sand (%)	Silt & Clay
BH 01, Sa 1	Granular Fill (Base)	0 - 0.2	27	62	10
BH 01, Sa 2	Sand (Subbase)	0.2 - 1.5	8	87	5
BH 03, Sa 1	Granular Fill (Base)	0 - 0.25	22	76	12
BH 05, Sa 1	Silty Sand	1.1 - 1.5	15	49	36
BH 10, Sa 1	Sand (Subbase)	0.3 - 1.5	19	54	27
BH 15, Sa 1	Granular Fill (Base)	0 - 0.7	22	64	14
BH 18, Sa 1	Granular Fill (Base)	0 - 0.5	22	67	11
BH 23, Sa 1	Granular Fill (Base)	0 - 0.8	22	59	19
BH 27, Sa 1	Sand (Subbase)	0.5 - 0.7	11	82	7
BH 29, Sa 1	Sand (Subbase)	0.4 - 1.5	28	61	11

3.1.5 Groundwater Data

Groundwater was not encountered within the boreholes during the investigations. It is noted that there may have been insufficient time for the groundwater levels to stabilize in the boreholes prior to measuring.

Additionally, groundwater levels will fluctuate seasonally and/or yearly. As such, the groundwater level should be established in advance of the construction operations (i.e. at time of tender or following award, prior to starting site work) such that adequate groundwater control plans can be developed, if required.

4 Discussion and Recommendations

It is understood that the Municipality of Temagami proposes to rehabilitate sections of Stevens Road, Fox Run Road and White Bear Crescent located in Temagami, Ontario.

It is further understood that the Municipality previously pulverized the existing surface treatment into the underlying granular on the entire limits of the project. Following a visual assessment by Tulloch in 2023, 150 mm of Granular M, including liquid calcium to aid with compaction, was installed on sections of the roadway surface in both 2023 and 2024, which remains as the current driving surface. The Municipality intends on completing additional remedial work including centreline culvert replacements and the excavation of poorly performing areas which have been identified by municipal staff.

Bituminous surface treatment was being considered for the entire rehabilitation limits; however, consideration is being given to applying a hot-mix asphalt surfacing or a double layered surface treatment coinciding with construction of a number of new high-end homes in the near future.

Although variable in thickness, the current roadway is generally constructed with granular fill materials either supported on natural sand or rock subgrade. The primary subgrade throughout the project limits is assumed by refusal to augers and the local topography and geological features to be bedrock. The groundwater table was not encountered in the investigations, but it is likely to be present in select locations, during seasonally wet period such as post spring thaw.

As confirmed by TULLOCH's 2023 review, much of the existing ditching is considered to be sub standard and warrants improvement.

Overall, the condition of these sections of roadway can be considered to be fair, considering the current function and the types of vehicles using the roadway, warranting resurfacing due to the aforementioned expected development.

4.1 Flexible Pavement Design

4.1.1 General Design Considerations

The current roadway configuration is constructed with a rural-type cross section with drainage by means of open ditching. The open ditching is generally somewhat shallow, and even non-existent in some isolated sections. These sections of roadway are considered Rural Local for the purposes of this design.

It is understood that no substantial changes to the existing horizontal and vertical alignments or to the road platform width are planned.

4.1.2 Design Parameters

Current traffic data (volume and traffic types) is not available for these sections of roadway. **If site specific traffic data becomes available, Englobe must be retained to confirm the viability of the flexible pavement design**. As such, Englobe assumed the following traffic data for purposes of pavement design.

Table 4-1: Assumed Traffic Data

Average Annual Daily Traffic (AADT)	% Commercial
250	5

An AADT growth rate of 1.05% was assumed.

For pavement design on this project, Englobe used the following commercial truck breakdown data:

Table 4-2: Commercial Truck Breakdown

Major Truck Class	FHWA Truck Class	Average Truck %
2 & 3 Axle Trucks	5, 6	87
4 Axle Trucks	7, 8	2
5 Axle Trucks	9, 11	5
6+ Axle Trucks	10, 12, 13	6

The truck breakdown for the project area was derived from Table D-2 from the *Adaptation and Verification of AASHTO Pavement Design Guide for Ontario Conditions Final Report* (MI-183), dated March 2008, using the mid limit values in the range provided for 4 to 6 axle trucks, in consideration of the future construction works, and the associated increase in commercial traffic (i.e. contractors, equipment, material deliveries). Annual truck volume growth rates were assumed at a similar compound AADT growth rate of 1.05%.

Based on the assumed traffic data and the commercial truck breakdown listed above, calculations indicate that approximately 25,298 Equivalent Single Axle Loads (ESALs) can be expected over a 12-year period.

Pavement rehabilitation alternatives were developed and then analysed using AASHTOWare DARWin 3.1 software. The Structural Number (SN) required for future traffic was determined and compared to the estimated SN for the recommended design. Acceptable performance periods were established using this SN comparison, as well as information included in the *MTO Pavement Design and Rehabilitation Manual - Second Edition* (PDRM-SE) and consideration of past pavement performance. The AASHTO 93 Method considers an acceptable performance period as up until the pavement exhibits a minimum of 10% fatigue caused cracking.

An overstressing analysis of this section was undertaken on the AASHTO DARWin Pavement Design and Analysis System. The following parameters were used for the structural evaluation of the reconstruction for this roadway section:

Table 4-3: AASHTO Structural Analysis Parameters

Parameter	Design value
ESALs Over a 12 Year Period	25,298
Initial Serviceability	4.2
Terminal Serviceability	2.0
Reliability Level	85
Overall Standard Deviation	0.49
Estimated Resilient Modulus of Subgrade (kPa)	50,000
Calculated Design Structural Number	**47 mm**

4.1.3 Drainage Considerations

Prior to undertaking any pavement rehabilitation work, the surface drainage and sub-drainage should be carefully assessed, noting that proper drainage is fundamental to the performance of the roadway pavement structure to mitigate frost-related movements and minimize the seasonal loss of subgrade support (subgrade softening in the spring). It would appear from the embankment configuration that the pavement structure is drained by means of open ditching.

It appears that there are some areas where the ditching is relatively shallow or not present. It is recommended that a ditch survey be undertaken prior to construction to address any areas where drainage can be improved. All drainage components should be installed as per the proper corresponding OPSD and properly maintained. In addition, the surface of the completed pavement should also be provided with cross-fall and superelevation constructed to design standards.

Ditches require regular maintenance and cleaning to ensure positive drainage. The ditches must have a positive gradient towards an outlet that will provide continuous drainage.

Site specific drainage recommendations are provided below.

4.1.4 Subgrade Tapers

Although full reconstruction of the existing roadway structure is not expected, proper subgrade tapers between areas where the native subgrade is encountered at different depths below existing grade, where different types of subgrades are encountered, or where service trenches are installed below the pavement structure, to provide a uniform subgrade transition to minimize the risk of differential heaving are always recommended, if possible. Proper frost tapers impart a gradual heave and as such are less noticeable and less detrimental to the pavement structure.

It is unknown whether proper frost tapers were established for culvert and utility crossings on these sections of roadway. As such, it is recommended that tapers be established at new and existing crossings as shown on OPSD 803.030.

Standard frost tapers for roadway construction are established at a minimum of 10H:1V slope for centreline culverts etc.; however, considering the soils encountered in the field investigation and the low-speed limits (40 km/hr) on these roadways, taper constructed with a 5H:1V slope can be considered. Every effort must be made to prevent disturbing the founding subgrade during excavating and construction operations.

4.2 Site Specific Recommendations

Generally, the pavement structure at this site consists of granular fill of variable thickness over sand with variable silt and gravel content. Much of the existing roadway was constructed over assumed bedrock. The subsoils are considered to have a low susceptibility to frost heaving.

Ideally, the subgrade below the pavement structure must have a uniform (i.e. consistent subgrade type, moisture and density conditions, etc.) cross section within the depth of frost penetration to reduce differential heaving and promote subsurface drainage. However, it is understood that the entire roadway is unlikely to be excavated during the upcoming improvements.

If areas are identified for full reconstruction following spring frost heave surveys and review by other, the following subgrade preparation recommendations shall be considered:

Where encountered, all deleterious surficial materials (i.e. fill, organic soil, disturbed soil, etc.) should be stripped from below the area of influence of the pavement structure to allow construction of the pavement structure described below. Some isolated areas may require deeper excavations if areas of weak/poor subgrade become evident during construction.

Where exposed, the surface of the subgrade should be crowned at a minimum centre to edge crossfall of 3% towards a positive drainage system (i.e. ditch). Once the subgrade is approved, engineered fill may be required to raise the site from approved subgrade to underside of the pavement structure. If backfill is required it is recommended that, at a minimum, an imported material meeting OPSS for a well graded SSM be used.

Provided a properly prepared subgrade, we recommend the following pavement structure:

Table 4-4: Recommended Minimum Hot Mix Asphalt Pavement Structure

Pavement Structure	Minimum Thickness (mm)
HMA Surface Course (Superpave 12.5)	60
Existing Granular Base Material	150

The surface of the granular base course must be crowned at a 2% crossfall towards ditches or other drainage facilities. Grading of the existing granular base course prior to paving must be completed in manner to ensure the minimum thickness recommended in Table 4-5 remains. Leaving as much of the Granular M, previously placed in 2023 and 2024, remaining as possible is ideal. As such, crossfall and superelevation correction with the addition of imported granular should be considered.

The surface of the HMA wearing surface must be crowned at a crossfall of 2% towards ditches or other drainage facilities. The importance of draining the pavement structure (granular) below the roadway cannot be stressed enough.

Hot-mix asphalt placed on this project shall be OPSS.MUNI 1151 Superpave (SP) 12.5. Based on the traffic data, 53,072 million ESALS over a 20-year period is projected, which places it within Traffic Category ‘A’ (0 to < 0.3 million Design ESALs). It is however recommended by Englobe that, at minimum, Traffic Category 'B' should be used for the Superpave mix design.

To provide positive drainage of the granular base and subbase material below the paved areas, the invert of the ditches should be placed at a minimum of 0.5 m below the underside of the subbase or, at minimum, 1.0 m. Ditches require regular maintenance and cleaning to ensure positive drainage.

4.2.1 Compaction

Any new base material required to regrade should be compacted to a minimum of 100% Standard Proctor Maximum Dry Density (SPMDD).

4.2.2 Service Life

AASHTO 93 forecasts pavement life in terms of years before the pavement exhibits 10% fatigue cracking, assuming adequate support layers and construction practices, and based on the traffic parameters assumed.

An estimated acceptable performance period of 12 to 13 years was established subjectively in additional consideration of thermal cracking, frost depth and the climate experienced in this region. This represents the number of years to the first rehabilitation, assuming regular maintenance (i.e. route and seal, ditch cleaning, etc.) is carried out.

The finished pavement surface and underlying granular surfaces should be free of depressions and should be sloped to provide effective drainage. Surface water should not be allowed to pond adjacent to the outside edges of pavement areas.

4.2.3 Double Surface Treatment

If a hot mix asphalt surface is not financially feasible, a Class II Double Surface Treatment could be considered on this roadway. As previously stated in Section 4.1.2, estimating the performance is very difficult without accurate traffic data. However, it is noted that the MTO Pavement Design and Rehabilitation Manual indicates that surface treatment is an appropriate surfacing for secondary highways up to 1,000 AADT including up to 10% commercial traffic.

As with any roadway with a hard top (HMA, surface treatment, etc.), drainage of the supporting granular layers is critical. Any weakened granular under saturated condition will likely result in distress at surface. It is also critical to make sure that heavy trucks stay off the roadway under spring thaw conditions and ensure they are using proper pads when using any riggers, in attempt to distribute weight while unloading materials.

Additionally, it is important that the application requirements outlined in OPSS.MUNI 304 are followed for surface treatment. Surface treatment installed in poor weather, or on wet aggregate, or in cold temperatures can result in poor performance. It is much more susceptible to these factors than hot mix asphalt brought in hot from a batch plant.

4.2.4 Distress Area Treatments

Reviews and investigations specifically for localised distress areas or frost heaves, were outside the scope of work for this project. However, it is understood that poorly performing areas will be reviewed by others and addressed during the proposed construction.

Ideally, the natural subgrade depths and distress limits would be established during construction and OPSD 205.060 frost heave treatments would be implemented at each location where frost heaving is observed. The depth of frost penetration for the Temagami area is in the order of 2.1 m (OPSD 3090.101), which can be considered for the depth of treatment below profile grade (k) if subgrade and excavating depths are not established prior to excavation through boreholes advanced at the specific distress locations.

At minimum, the treatments should provide a uniform natural subgrade with drainage as shown on OPSD 200.010 and providing continuous positive drainage. If bedrock is encountered within the depth of excavation, the excavation can be terminated on bedrock barring abrupt rock to earth transitions are not created.

Treatment backfill shall consist of 150 mm of Granular A or M base course over Granular B Type I subbase.

5 Limitations

The design recommendations given in this geotechnical report are applicable only to the project described in the text and only if constructed substantially in accordance with details of alignment and elevations stated in the report. Since all details of the design may not be known, in our analysis certain assumptions had to be made. The actual conditions may however, vary from those assumed, in which case changes and modifications may be required to our geotechnical recommendations. We recommend, therefore, that we be retained and provided the opportunity during the design stage to review the design drawings, site survey information, proposed elevations, etc. to verify that they are consistent with our recommendations or the assumptions made in our analysis. It is further recommended that we be retained to review the final design drawings and specifications relative to the geotechnical recommendations. If, during construction, conditions in the field vary from those assumed at the design stage, an engineer from this Englobe office must be notified immediately.

It should be noted that the soil boundaries indicated on the borehole log are inferred from noncontinuous sampling and observations during drilling and should not be interpreted as exact planes of geological change. These boundaries are intended to reflect approximate transition zones for the purpose of geotechnical design. Also, the subsoil and groundwater conditions have been determined at the borehole locations only.

It is further noted that, depending on the time of year the field work was completed, water levels should be expected to vary, perhaps significantly from those observed at the time of this investigation.

Proper subgrade preparation, groundwater control, compaction, etc. are all critical aspects of the bearing capacity of native soils. It must be noted that different aspects of the geotechnical design are based on the assumption that Englobe will be retained during site preparation and construction of the proposed works to ensure that both the geotechnical site characteristics and the construction operations/techniques are consistent with our recommendations. Should Englobe not be involved during the full construction phase, our liability is strictly limited to the factual information contained herein only.

The comments in this report are intended solely for the guidance of the design team and address the geotechnical conditions only. The number of boreholes required to determine the localized conditions between boreholes directly affecting construction costs, equipment, scheduling, etc. would in fact be greater than what has been carried out for design purposes. Inclusion of the factual information

(Sections 1 to 3 inclusive) in the tender documents is furnished merely for the general information of bidders and is not in any way warranted or guaranteed by or on behalf of the owner or the owner's consultants and its subconsultants or the consultants' or subconsultants' employees, and neither the owner nor its consultants or its employees shall be liable for any representations negligent or otherwise contained in the documents. Therefore, contractors bidding on this project or undertaking this work should make their own interpretations of the factual borehole results and carry out further work as they deem necessary to assess the scope of the project.

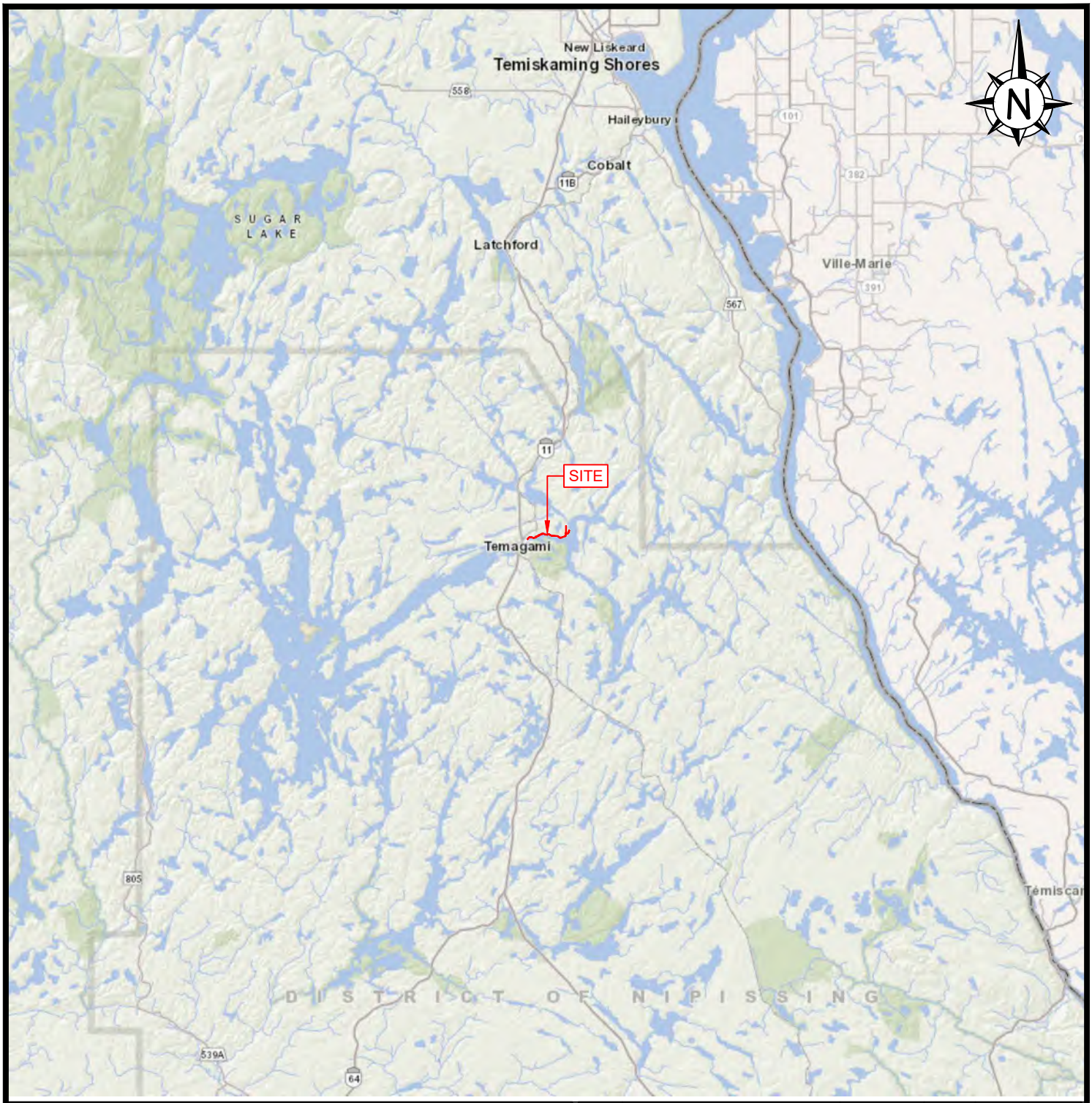
Section 4 of this report is intended solely for the use of the client and the design team. If this section is provided to the Contractor, it is solely to provide an understanding of the geotechnical aspects of the site, and alternatives presented are not to be considered potential substitutes of the final design. If there is a discrepancy between this report and the tender documents and/or construction drawings, the latter shall govern and the discrepancy must be immediately brought to the attention of the design team.

The professional services provided for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise stated specifically in the report. The recommendations and opinions given in this report are based on our professional judgment and are for the guidance of the Client or its Agent in the design of the specific project. No other warranties or guarantees, expressed or implied, are made.

The Englobe recommendations are contingent upon provision of a consistently competent, stable subgrade, which is properly drained and free of soft spots and objectionable materials such as organics.

All construction works should only be completed during periods of favourable weather. The need for continuous construction supervision by a qualified, experienced technician, and quality control testing during construction projects cannot be over-emphasized. All materials and construction services required should be in accordance with Ontario Provincial Standard Specifications.

Appendix A
Drawings



No.	Version	Date	By	Verif	Appr.
00	FINAL	2025/02/07	DM	RG	JRB

Tulloch

Geotechnical Investigation
Proposed Roadway Improvements
Fox Run Road, Temagami, ON

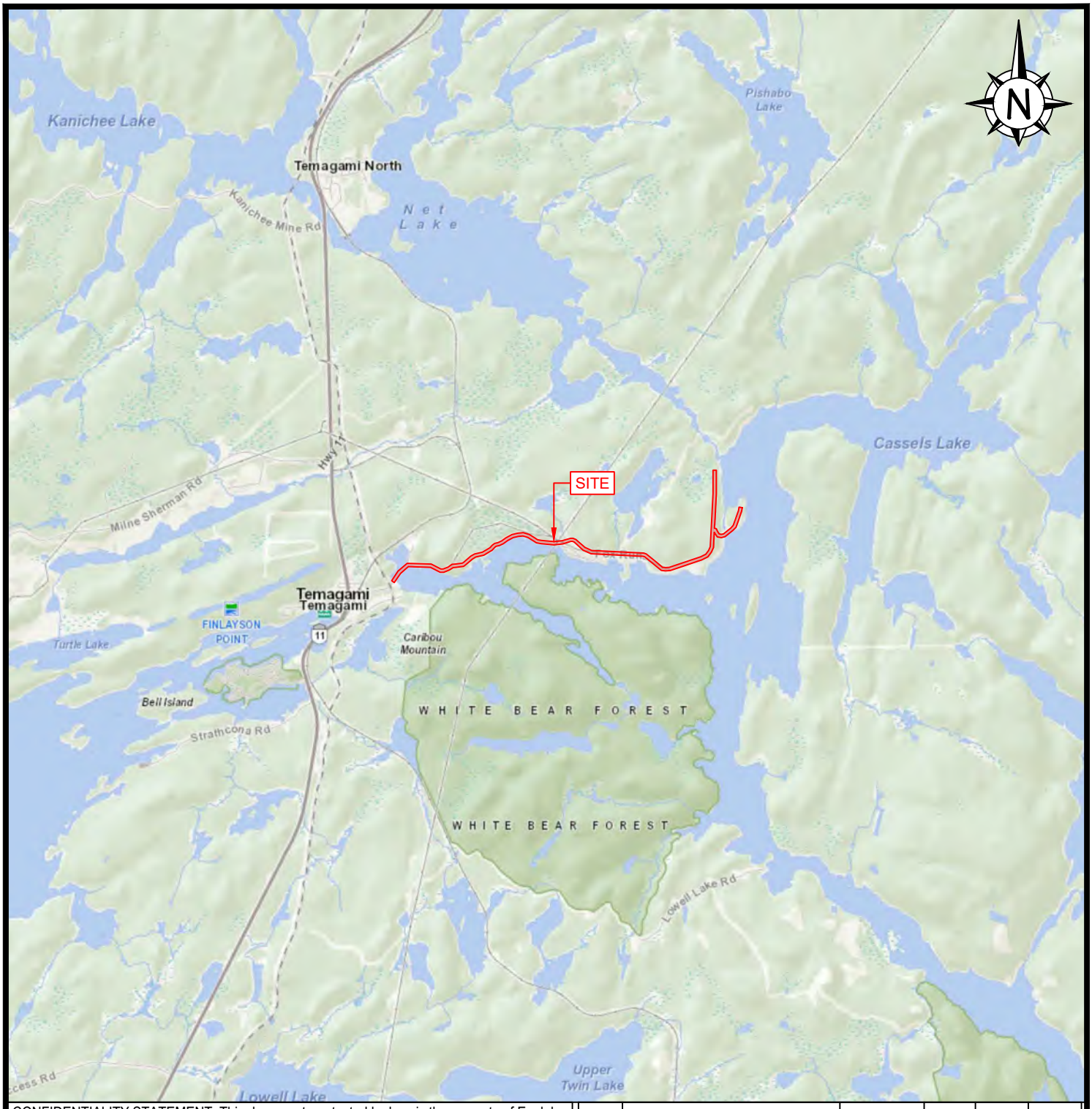
Key Plan (Micro)

eNGLOBe
2–120 Progress Court
North Bay, Ontario, P1A 0C2
705-476-2550

Discipline:	Geotechnical	Prepare by: DM	Verify by: RG
Scale:	Not To Scale	Draw by: DM	Approval by: JRB
Date:	2025/02/07	Drawing no:	1a
Page setup: Key Plan (Macro)	Paper size: 8.50 X 11.00 in.	Register no.:	----------

Man.	Project	Otp	Project	Phase	Electronic ref.	Rev.
JRB	02411222	---	GE	- -- --	----	00

D:\Backup\Transfer\Work\02411222 - Fox Run Road\024011222 - Borehole Location Plan, Fox Run Rd.dwg



No.	Version	Date	By	Verif	Appr.
00	FINAL	2025/02/07	DM	RG	JRB

Tulloch

Geotechnical Investigation
Proposed Roadway Improvements
Fox Run Road, Temagami, ON

Key Plan (Micro)

eNGLOBE
2–120 Progress Court
North Bay, Ontario, P1A 0C2
705-476-2550

Discipline:	Geotechnical	Prepare by: DM	Verify by: RG
Scale:	Not To Scale	Draw by: DM	Approval by: JRB
Date:	2025/02/07	Drawing no:	1b
Page setup: Key Plan (Micro)	Paper size: 8.50 X 11.00 in.	Register no.:	----------

Man.	Project	Otp	Project	Phase	Electronic ref.	Rev.
JRB	02411222	---	GE	- -- --	----	00

D:\Backup\Transfer\Work\02411222 - Fox Run Road\024011222 - Borehole Location Plan, Fox Run Rd.dwg

D:\Backup\Transfer\Work\02411222 - Fox Run Road\02411222 - Borehole Location Plan, Fox Run Rd.dwg

Tulloch

No scale

Seal

Geotechnical Investigation
Proposed Roadway Improvements
Fox Run Road, Temagami, ON

Borehole Location Plan

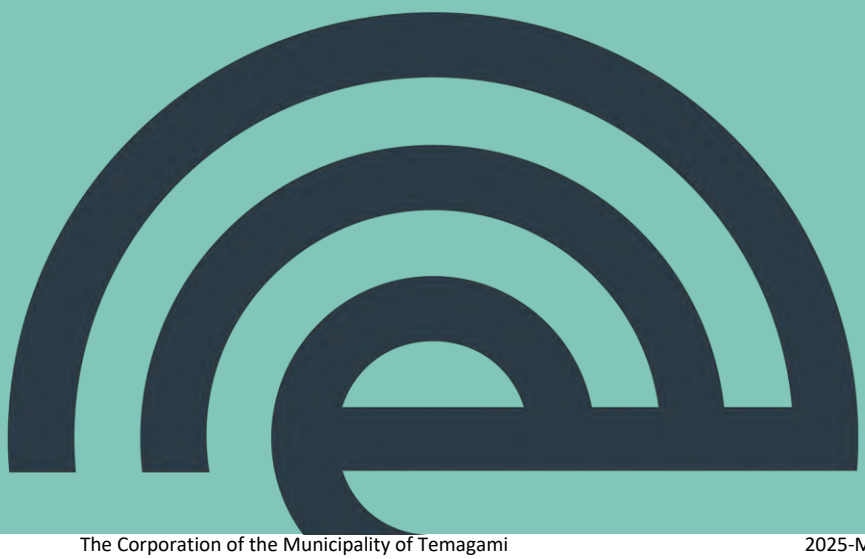
No.	Version	Date	By	Verif	Appr.
00	FINAL	2025-02-07	DM	RG	JRB

Discipline: Geotechnical		Prepare by: DM	Verify by: RG
Scale: Not To Scale		Draw by: DM	Approval by: JRB
Date: 2025/02/07		Drawing no: 2	
Page setup: BH Plan	Paper size: 17.00 X 11.00 in.	Register no.: 024011222	

Man.	Project	Otp	Project	Phase	Electronic ref.	Rev.
JRB	02411222	---	GE	- -- --	----	00

Englobe Corp.
2–120 Progress Court
North Bay, Ontario, P1A 0C2
705-476-2550

Appendix B
Subsurface Data



LIST OF ABBREVIATIONS & DESCRIPTION OF TERMS

The abbreviations and terms, used to describe retrieved samples and commonly employed on the borehole logs, on the figures and in the report are as follows:

1. ABBREVIATIONS

AS Auger Sample
CS Chunk Sample
DS Denison type sample
FS Foil Sample
NFP No Further Progress
PH Sampler advanced by hydraulic pressure
PM Sampler advanced by manual pressure
RC Rock core with size & percentage of recovery
SS Split Spoon
ST Slotted Tube
TO Thin-walled, open
TP Thin-walled, piston
WS Wash Sample

2. PENETRATION RESISTANCE/"N"

Dynamic Cone Penetration Test (DCPT):

A continuous profile showing the number of blows for each 300 mm of penetration of a 50 mm diameter 60° cone attached to AW rod driven by a 63 kg hammer falling 760 mm.

Plotted as —•—•—•—•—

Standard Penetration Test (SPT) or "N" Values

The number of blows of a 63 kg hammer falling 760 mm required to advance a 50 mm O.D. drive open sampler 300 mm.

3. SOIL DESCRIPTION

a) *Cohesionless Soils:*

"N" (blows/0.3 m)	*Compactness Condition*
0 to 4	very loose
4 to 10	loose
10 to 30	compact
30 to 50	dense
over 50	very dense

3. SOIL DESCRIPTION (Cont'd)

b) *Cohesive Soils:*

Undrained Shear Strength (kPa)	*Consistency*
Less than 12	very soft
12 to 25	soft
25 to 50	firm
50 to 100	stiff
100 to 200	very stiff
over 200	hard

c) *Method of Determination of Undrained Shear Strength of Cohesive Soils:*

+ 3.2 - Field Vane test in borehole. The number denotes the sensitivity to remoulding.

D - Laboratory Vane Test

¨ - Compression test in laboratory

For a saturated cohesive soil the undrained shear strength is taken as one-half of the undrained compressive strength.

4. TERMINOLOGY

Terminology used for describing soil strata is based on the proportion of individual particle sizes present in the samples (please note that, with the exception of those samples subject to a grain-size analysis, all samples were classified visually and the accuracy of visual examination is not sufficient to determine exact grain sizing):

Trace, or occasional	Less than 10%
Some	10 to 20%
With	20 to 30%
Adjective (i.e. silty or sandy)	30 to 40%
And (i.e. sand and gravel)	40 to 60%

5. LABORATORY TESTS

P Standard Proctor Test
A Atterberg Limit Test
GS Grain Size Analysis
H Hydrometer Analysis
C Consolidation

SAMPLE DESCRIPTION NOTES:

1. **FILL:** The term fill is used to designate all man-made deposits of natural soil and/or waste materials. The reader is cautioned that fill materials can be very heterogeneous in nature and variable in depth, density and degree of compaction. Fill materials can be expected to contain organics, waste materials, construction materials, shot rock, rip-rap, and/or larger obstructions such as boulders, concrete foundations, slabs, abandoned tanks, etc.; none of which may have been encountered in the borehole. The description of the material penetrated in the borehole therefore may not be applicable as a general description of the fill material on the site as boreholes cannot accurately define the nature of fill material. During the boring and sampling process, retrieved samples may have certain characteristics that identify them as 'fill'. Fill materials (or possible fill materials) will be designated on the Borehole Logs. If fill material is identified on the site, it is highly recommended that testpits be put down to delineate the nature of the fill material. However, even through the use of testpits defining the true nature and composition of the fill material cannot be guaranteed. Fill deposits often contain pockets or seams of organics, organically contaminated soils or other deleterious material that can cause settlement or result in the production of methane gas. It should be noted that the origins and history of fill material is frequently very vague or non-existent. Often fill material may be contaminated beyond environmental guidelines and the material will have to be disposed of at a designated site (i.e. registered landfill). Unless requested or stated otherwise in this report, fill material on this site has not been tested for contaminants however, environmental testing of the fill material can be carried out at your request. Detection of underground storage tanks cannot be determined with conventional geotechnical procedures.

2. **TILL:** The term till indicates a material that is an unstratified, glacial deposit, heterogeneous in nature and, as such, may consist of mixtures and pockets of clay, silt, sand, gravel, cobbles and/or boulders. These heterogeneous deposits originate from a geological process associated with glaciation. It must be noted that due to the highly heterogeneous nature of till deposits, the description of the deposit on the borehole log may only be applicable to a very limited area and therefore, caution must be exercised when dealing with a till deposit. When excavating in till, contractors may encounter cobbles/boulders or possibly bedrock even if they are not indicated on the borehole logs. It must be appreciated that conventional geotechnical sampling equipment does not identify the nature or size of any obstruction.

3. **BEDROCK:** Auger refusal may be due to the presence of bedrock, but possibly could also be due to the presence of very dense underlying deposits, boulders or other large obstructions. Auger refusal is defined as the point at which an auger can no longer be practically advanced. It must be appreciated that conventional geotechnical sampling equipment does not differentiate between nature and size of obstructions that prevent further penetration of the boring below grade. Bedrock indicated on the borehole logs will be labeled 'possibly' or 'probable' etc. based on the response of the boring and sampling equipment, surrounding topography, etc. Bedrock can be proven at individual borehole locations, at your request, by diamond core drilling operations or, possibly, by testpits. It must also be appreciated that bedrock surfaces can be, and most times are, very erratic in nature (i.e. sheer drops, isolated rock knobs, etc.) and caution must be used when interpreting subsurface conditions between boreholes. A bedrock profile can be more accurately estimated, at the clients' request, through a series of closely positioned unsampled auger probes combined with core drilling.

4. **GROUNDWATER:** Although the groundwater table may have been encountered during this investigation and the elevation noted in the report and/or on the record of boreholes, it must be appreciated that the elevation of the groundwater table will fluctuate based upon seasonal conditions, localized changes, erratic changes in the underlying soil profile between boreholes, underlying soil layers with highly variable permeabilities, etc. These conditions may affect the design and type and nature of dewatering procedures. Cave-in levels recorded in borings give a general indication of the groundwater level in cohesionless soils however, it must be noted that cave-in levels may also be due to the relative density of the deposit, drilling operations etc.

ENCLOSURE NO.: 2 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 01

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 592494, 5213262 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt		1	AS							27 63 (10)
-0.2											
0.2	SAND - trace gravel, trace silt (possibly fill)		2	AS							8 87 (5)
							-1				
-1.5											
1.5	End of Sampling End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

+ 3, × 3 : Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 3 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 02

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 592581, 5213367 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m^3	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt										
-0.5											
0.5	Auger Refusal - likely rock fill End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 4 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 03

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 592785, 5213424 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa: ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt		1	AS							
-0.3											
0.3	SAND - trace gravel, trace silt (possibly fill)		2	AS			-1				
-1.5											
1.5	End of Sampling End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

+ 3, × 3 : Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 5 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 04

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 592996, 5213389 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt						-1				
-1.5											
1.5	End of Sampling End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 6 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 05

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 593180, 5213401 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 6, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 6, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt										
-0.4											
0.4	SAND - trace gravel, trace silt (possibly fill)										
	moist						-1				
-1.1											
1.1	SILTY SAND - some gravel		1	AS							15 49 (36)
-1.5											
1.5	End of Sampling End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 7 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 06

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 593379, 5213470 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 6, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 6, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt										
	moist						-1				
-1.5											
1.5	End of Sampling End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 8 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 07

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 593583, 5213585 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 6, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 6, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt										
-0.8											
0.8	Auger Refusal - likely boulder End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 9 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 08

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 593731, 5213688 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 6, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 6, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt										
-0.9											
0.9	Auger Refusal - likely boulder End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 10 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 09

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 593905, 5213786 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 6, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 6, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt						-1				
-1.5											
1.5	End of Sampling End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 11 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 10

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 594090, 5213833 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 6, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 6, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt										
-0.3											
0.3	SAND - some gravel, with silt (possibly fill)		1	AS							19 54 (27)
							-1				
-1.5											
1.5	End of Sampling End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

	Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)		-	-
2)		-	-
3)		-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 12 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 11

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 594265, 5213750 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 6, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 6, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface							20 40 60 80 100	20 40 60		
0.0	FILL - sand with gravel, trace silt										
-0.5											
0.5	SAND - with gravel, trace silt (possibly fill)										
							-1				
-1.1											
1.1	Auger Refusal - likely boulders End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

+ 3, × 3 : Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 13 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 12

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 594457, 5213729 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 6, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 6, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt										
-0.6											
0.6	Auger Refusal - likely rock fill End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 14 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 13

REFERENCE 02411222 DATUM _____ LOCATION 17N 594746, 5213757 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 6, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 6, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt										
-0.6											
0.6	Auger Refusal - likely rock fill End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

+ 3, × 3 : Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 15 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 14

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 594849, 5213667 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 6, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 6, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt										
-0.5											
0.5	Auger Refusal - likely rock fill End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 16 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 15

REFERENCE 02411222 DATUM _____ LOCATION 17N 595022, 5213607 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 6, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 6, 2025

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	NUMBER	TYPE	"N" VALUES						GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, some silt		1	AS							22 64 (14)
-0.7											
0.7	Auger Refusal - likely rock fill End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 17 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 16

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 595223, 5213593 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 6, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 6, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, some silt										
-0.6											
0.6	Auger Refusal - likely rock fill End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 18 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 17

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 595419, 5213592 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt										
-0.4											
0.4	SAND - with gravel, trace silt (possibly fill)										
-0.8											
0.8	Auger Refusal - likely boulders End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

	Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)		-	-
2)		-	-
3)		-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 19 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 18

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 595642, 5213562 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, some silt		1	AS							22 67 (11)
-0.5											
0.5	Auger Refusal - likely bedrock End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 20 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 19

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 595803, 5213453 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, some silt										
-0.5											
0.5	Auger Refusal - likely boulders End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 21 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 20

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 596000, 5213462 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, some silt										
-0.6											
0.6	Auger Refusal - likely boulders End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 22 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 21

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 596225, 5213537 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, some silt										
-0.7											
0.7	Auger Refusal - likely boulders End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 23 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 22

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 596390, 5213611 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, some silt										
-0.8											
0.8	Auger Refusal - likely boulders End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 24 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 23

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 596443, 5213808 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m^3	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, some silt		1	AS							22 59 (19)
-0.8											
0.8	Auger Refusal - likely bedrock End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 25 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 24

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 596453, 5214020 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, some silt										
-0.4											
0.4	Auger Refusal - likely rock fill End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 26 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 25

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 596474, 5214222 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, some silt										
-0.9											
0.9	Auger Refusal - likely bedrock End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 27 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 26

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 596462, 5214420 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt										
-0.4											
0.4	SAND - some gravel, with silt (possibly fill)						-1				
-1.5											
1.5	End of Sampling End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

+ 3, × 3 : Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 28 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 27

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 596462, 5214608 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, trace silt										
-0.5											
0.5	SAND - some gravel, trace silt (possibly fill)		1	AS							11 82 (7)
-0.7											
0.7	Auger Refusal - likely rock fill End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

+ 3, × 3 : Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 29 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 28

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 596524, 5213866 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, some silt										
-0.9											
0.9	Auger Refusal - likely rock fill End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

	Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)		-	-
2)		-	-
3)		-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 30 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 29

REFERENCE 02411222 DATUM _____ LOCATION 17N 596692, 5213953 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, some silt										
-0.4											
0.4	SAND - with gravel, some silt (possibly fill)		1	AS			-1				28 61 (11)
-1.5											
1.5	End of Sampling End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

+ 3, × 3 : Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 31 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 30

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 596771, 5214124 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, some silt										
-0.4											
0.4	Auger Refusal - likely rock fill End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

ENCLOSURE NO.: 32 (Pg. 1 of 1)

METRIC

RECORD OF BOREHOLE NO. 31

eNGLOBe

REFERENCE 02411222 DATUM _____ LOCATION 17N 596780, 5214188 ORIGINATED BY SG

PROJECT Fox Run Road - Temagami, ON BOREHOLE TYPE Truck Mounted CME 45 - Solid Stem Augers COMPILED BY RG

CLIENT Tulloch DATE (Started) January 7, 2025 TIME (Completed) _____ CHECKED BY JRB

DATE (Completed) January 7, 2025

ELEV / DEPTH	DESCRIPTION (see Enclosure No. 1)	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA (SI CL)
0.0	Ground Surface										
0.0	FILL - sand with gravel, some silt										
-0.6											
0.6	Auger Refusal - likely rock fill End of Borehole										

COMMENTS

The stratification lines represent approximate boundaries. The transition may be gradual.

$+^3$, $\times^3$: Numbers on right refer to Sensitivity
Numbers on left refer to values greater than 100 kPa

○ 3% STRAIN AT FAILURE

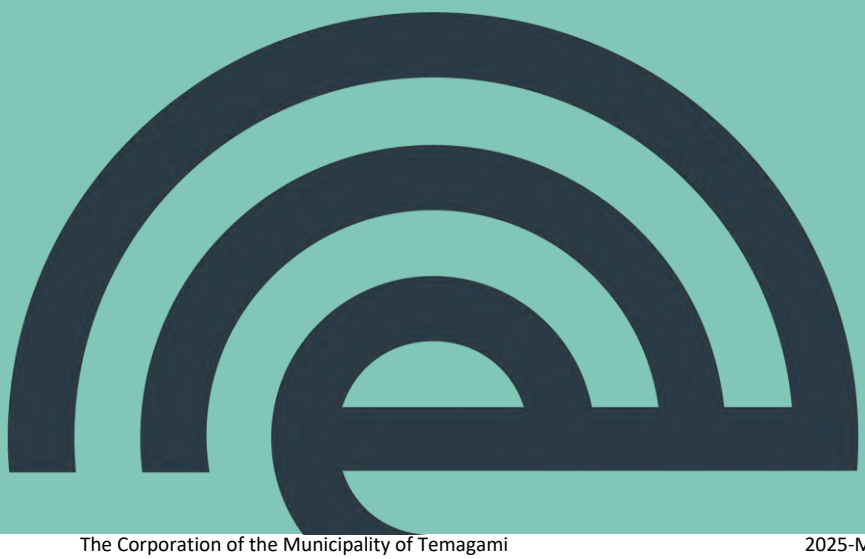
WATER LEVEL RECORDS

Date (dd/mm/yy)/Time	Water Depth (m)	Cave In (m)
1)	-	-
2)	-	-
3)	-	-

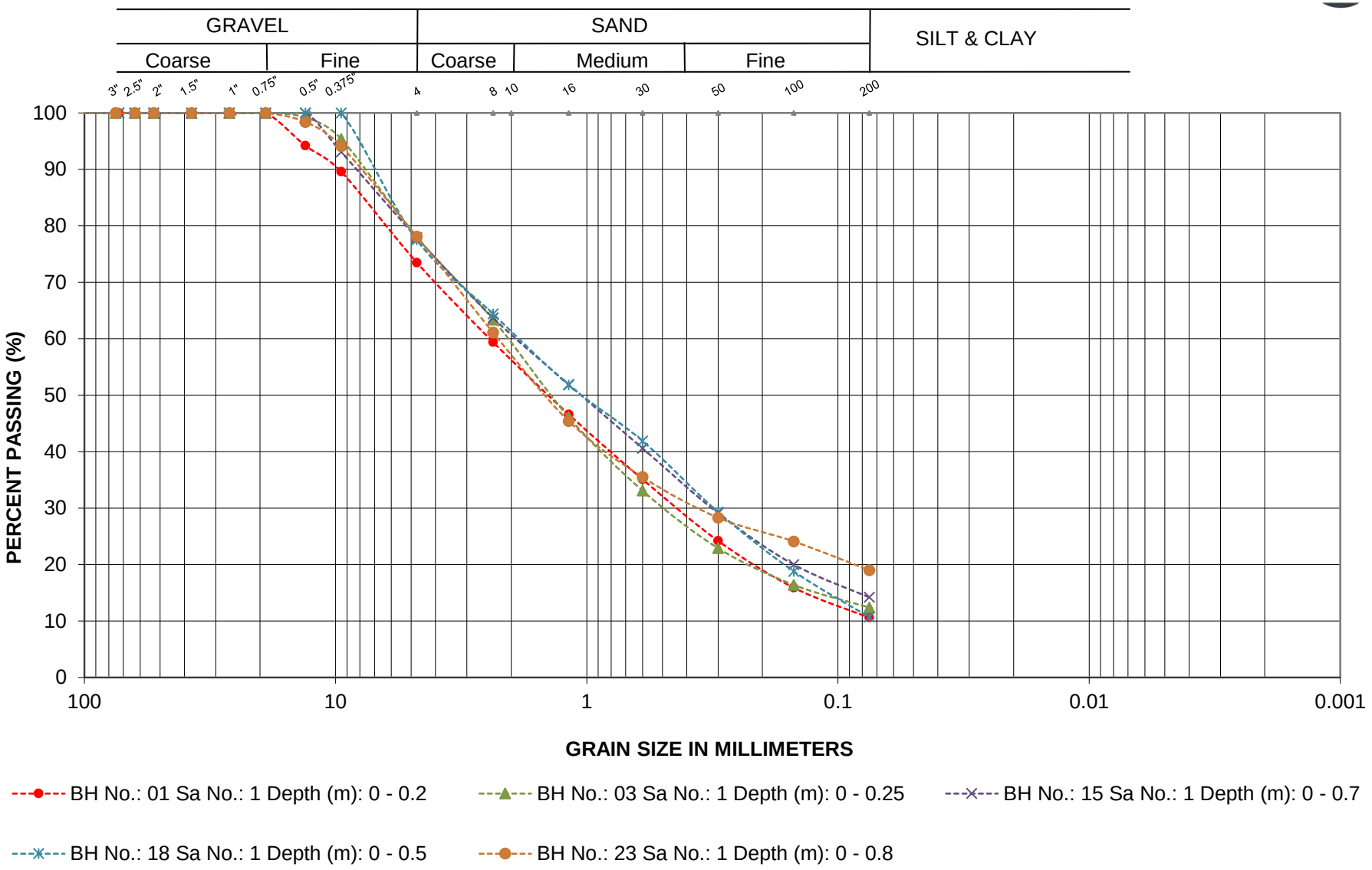
MEL-GEO 02411222 - BOREHOLE LOGS, FOX RUN ROAD.GPJ MEL-GEO.GDT 2/7/25

Englobe Corp.
120 Progress Court, North Bay, On P1A 0C2 Phone: (705)476-2550 Fax: (705)476-8882 Email: northbay@englobecorp.com

Appendix C
Lab Data



GRAIN SIZE ANALYSIS



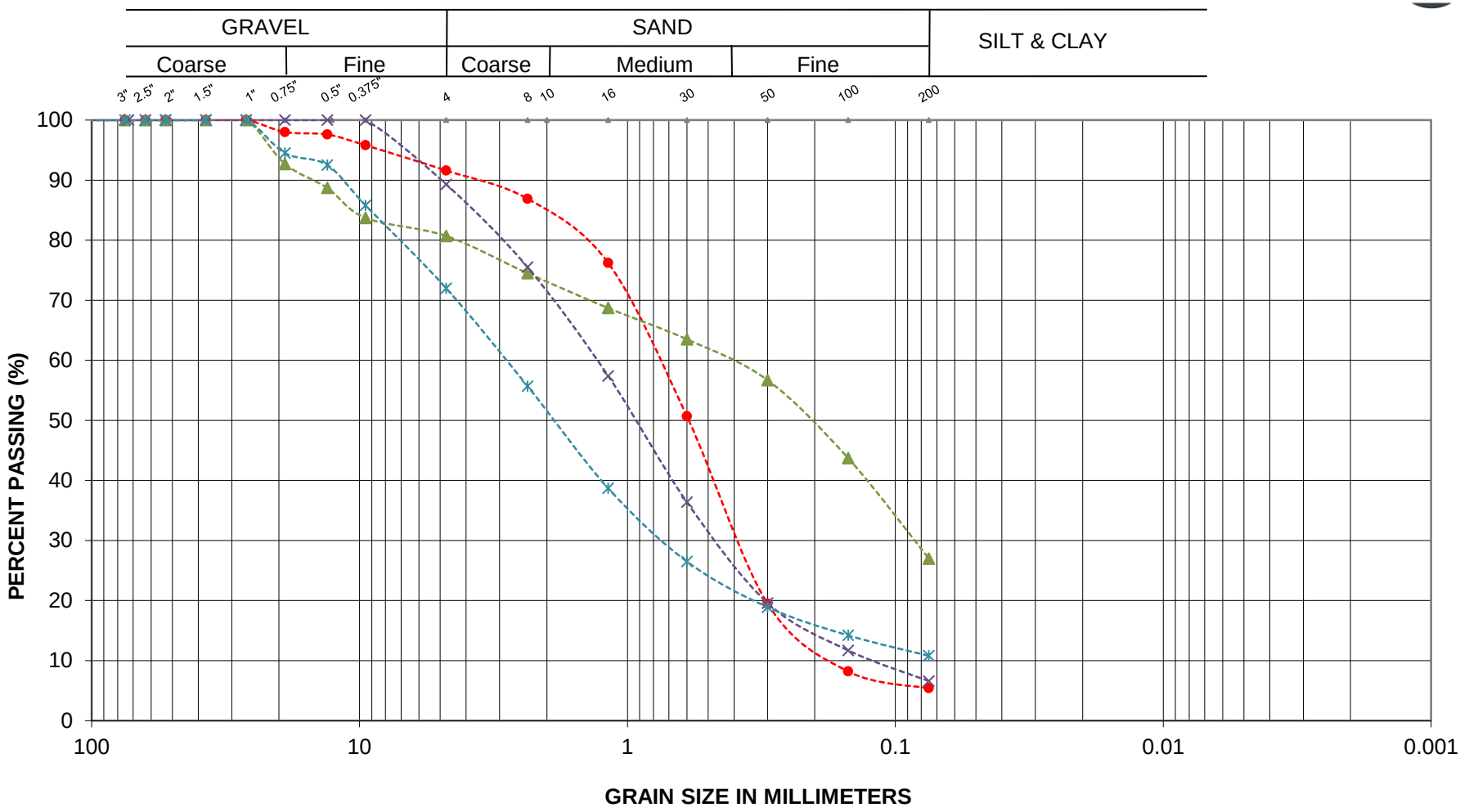
Granular Base

PROJECT: Fox Run Road
LOCATION: Temagami, Ontario

Englobe Corp.

FIGURE L-1

GRAIN SIZE ANALYSIS



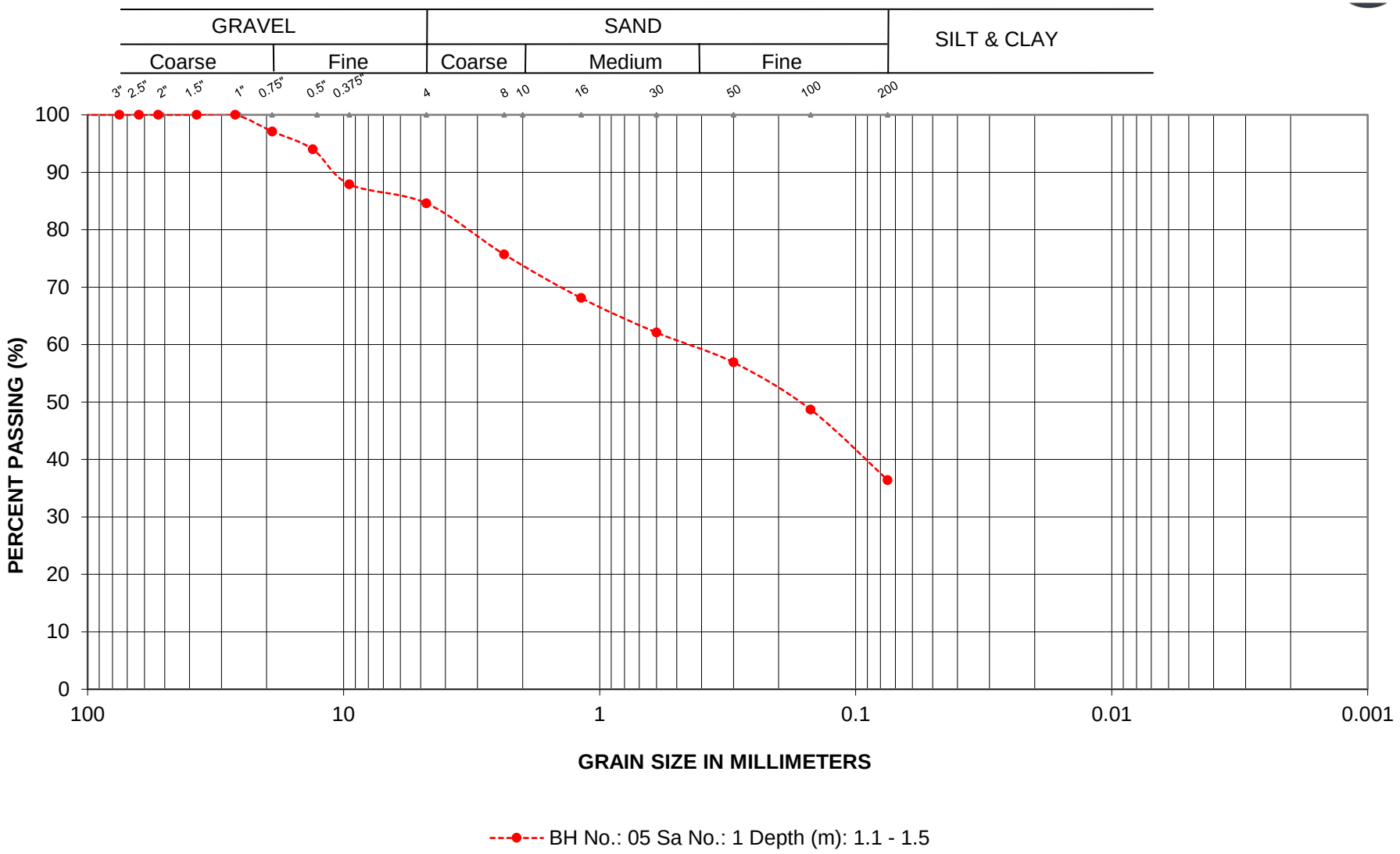
SAND (Subbase)

PROJECT: Fox Run Road
LOCATION: Temagami, Ontario

Englobe Corp.

FIGURE L-2

GRAIN SIZE ANALYSIS



SILTY SAND

PROJECT: Fox Run Road
LOCATION: Temagami, Ontario

Englobe Corp.

FIGURE L-3

Appendix D
Photos

Fox Run Road – Typical Conditions, Near Borehole 03	Photo: 1

Fox Run Road – Typical Roadway Conditions	Photo: 2

Project: 02411222 - GI, Fox Run Road - Temagami ON	Photos By: Englobe Date: January 2025

White Bear Crescent – Typical Conditions, Near Borehole 29	Photo: 3

White Bear Cres – Typical Drilling Operations	Photo: 4

Project: 02411222 - GI, Fox Run Road - Temagami ON	Photos By: Englobe Date: January 2025

Appendix E
Design Data

ENGLOBE

1997 AASHTO Pavement Design

DARWin Pavement Design and Analysis System

A Proprietary AASHTOWare
Computer Software Product
Englobe Corp.

Flexible Structural Design Module

Fox Run Road
Temagami, Ontario

Fox Run
20 Year ESAL

Flexible Structural Design

80-kN ESALs Over Initial Performance Period	53,072
Initial Serviceability	4.2
Terminal Serviceability	2
Reliability Level	85 %
Overall Standard Deviation	0.49
Roadbed Soil Resilient Modulus	50,000 kPa
Stage Construction	1
Calculated Design Structural Number	53 mm

Simple ESAL Calculation

Performance Period (years)	20
Two-Way Traffic (ADT)	250
Number of Lanes in Design Direction	1
Percent of All Trucks in Design Lane	100 %
Percent Trucks in Design Direction	50 %
Percent Heavy Trucks (of ADT) FHWA Class 5 or Greater	- %
Average Initial Truck Factor (ESALs/truck)	-
Annual Truck Factor Growth Rate	- %
Annual Truck Volume Growth Rate	- %
Growth	Simple
Total Calculated Cumulative ESALs	- *

*Note: This value is not represented by the inputs or an error occurred in calculation.

1997 AASHTO Pavement Design

DARWin Pavement Design and Analysis System

A Proprietary AASHTOWare
Computer Software Product
Englobe Corp.

Flexible Structural Design Module

Fox Run Road
Temagami, Ontario

Flexible Structural Design

80-kN ESALs Over Initial Performance Period	25,984
Initial Serviceability	4.2
Terminal Serviceability	2
Reliability Level	85 %
Overall Standard Deviation	0.49
Roadbed Soil Resilient Modulus	50,000 kPa
Stage Construction	1
Calculated Design Structural Number	47 mm

Simple ESAL Calculation

Performance Period (years)	12
Two-Way Traffic (ADT)	250
Number of Lanes in Design Direction	1
Percent of All Trucks in Design Lane	100 %
Percent Trucks in Design Direction	50 %
Percent Heavy Trucks (of ADT) FHWA Class 5 or Greater	- %
Average Initial Truck Factor (ESALs/truck)	-
Annual Truck Factor Growth Rate	- %
Annual Truck Volume Growth Rate	- %
Growth	Simple
Total Calculated Cumulative ESALs	- *

*Note: This value is not represented by the inputs or an error occurred in calculation.

Layered Thickness Design

Thickness precision Actual

Layer	Material Description	Struct Coef. (Ai)	Drain Coef. (Mi)	Spec Thickness (Di)(mm)	Min Thickness (Di)(mm)	Elastic Modulus (kPa)	Width (m)	Calculated Thickness (mm)	Calculated SN (mm)
1	New Hot Mix Asphalt	0.42	1	-	-	2,600,000	-	66	28
2	Existing Base	0.12	0.9	-	-	170,000	-	177	19
3	Existing Subbase	0.06	0.9	-	-	50,000	-	3	0
Total	-	-	-	-	-	-	-	246	47