



Soil Engineers Ltd.

CONSULTING ENGINEERS

GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE

90 WEST BEAVER CREEK ROAD, SUITE 100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

BARRIE
TEL: (705) 721-7863
FAX: (705) 721-7864

MISSISSAUGA
TEL: (905) 542-7605
FAX: (905) 542-2769

OSHAWA
TEL: (905) 440-2040
FAX: (905) 725-1315

NEWMARKET
TEL: (905) 853-0647
FAX: (905) 881-8335

MUSKOKA
TEL: (705) 721-7863
FAX: (705) 721-7864

HAMILTON
TEL: (905) 777-7956
FAX: (905) 542-2769

June 19, 2026

Reference No. 2506-S157

Page 1 of 7

G.N Transport Inc.
25 Newkirk Court, Unit 8
Brampton, Ontario
L6Z 0J8

Attention: Mr. Kirat Hothi

**Re: A Geotechnical Investigation for
Proposed Transportation Terminal
6404 Mayfield Road
Town of Caledon**

Dear Sir:

In accordance with your written authorization dated June 24, 2025, Soil Engineers Ltd. has completed a geotechnical investigation for the captioned project and herein presents the geotechnical findings and recommendations.

SITE AND PROJECT DESCRIPTIONS

The site is located in the Town of Caledon, at the northwest of Mayfield Road and Innis Lake Road, approximately 300 m west of Innis Lake Road. The property consists of an existing building and a garage situated within an unpaved gravel parking area. Based on the topography survey prepared by Mauro Group Inc. (Project No. 25-B8391), dated July 3, 2025, the existing site gradient is generally flat with minimal undulation.

Based on the site plan dated May 1, 2024 by n Architecture Inc (Project No. 25-25, Drawing No. A-1.0), it is understood that the proposed project involves the improvement of the existing unpaved parking area and an infiltration basin at the northwest area of the site.

FIELD WORK

The field work, consisting of four (4) sampled boreholes extending to depths ranging from 1.4 to 2.7 m below the existing grade, was performed on July 8, 2025. Upon completion of drilling and sampling, a total of 3 monitoring wells were installed at selected boreholes to facilitate groundwater monitoring.



All borehole and monitoring well locations are shown on the Borehole and Monitoring Well Location Plan, Drawing No. 1.

The boreholes were advanced at intervals to the sampling depths by a track-mounted machine equipped with solid stem augers and split spoon sampler for soil sampling. Standard Penetration Tests, using the procedures described on the enclosed “List of Abbreviations and Terms,” were performed at the sampling depths. The test results are recorded as the Standard Penetration Resistance (or ‘N’ values) of the subsoil. The compactness of the cohesionless strata and the consistency of the cohesive strata are inferred from the ‘N’ values. Split-spoon samples were recovered for soil classification and laboratory testing. The field work was supervised and the findings were recorded by a Geotechnical Technician.

The geodetic ground elevation at each borehole and monitoring well location was obtained using a hand-held Global Navigation Satellite System (GNSS) equipment and were cross-referenced with the abovementioned topographic survey.

SUBSURFACE CONDITIONS

Detailed descriptions of the encountered subsurface conditions are presented on the Borehole Logs, comprising Figures 1 to 4, inclusive.

All boreholes were carried out on the gravel pavement, where the thickness of the granular fill varies from approximately 300 to 360 mm.

Pavement Structure

The encountered pavement thickness at each borehole location is summarized in the table below:

BH No.	Granular Thickness (mm)	Subgrade Condition
1	360	Sandy Silt Fill
2	360	Sandy Silt Fill
3	300	Sandy Silt Fill and Silty Clay
4	300	Sandy Silt Fill and Silty Clay

Beneath the granular fill, a layer of earth fill, was encountered in all boreholes, extending to a depth of approximately 1.4 m below grade. The fill consists of sandy silt mixed with



gravel, clay, and occasional organics. The recorded 'N' values range from 5 to 32, with a median of 7 blows per 30 cm of penetration, indicating nominal compaction or the fill has been weakened from weathering over time. Higher 'N' value is likely due to the higher concentration of granular fill near the ground surface.

The native silty clay till was contacted beneath the earth fill in all boreholes. The till contains traces of sand and gravel. Shale fragments were observed in the lower zone of the stratigraphy. Grain size analyses were performed on 2 selected samples of the silty clay till; the results are plotted on Figure 5.

In addition to the grain size analyses, Atterberg Limit tests were performed on 2 silty clay till samples. The resulting Liquid Limits are 31% and 32% and the resulting Plastic Limits is 18%, indicating that the clay till has a low plasticity.

The obtained 'N' values range from 12 to over 50, with a median of over 50 blows per 30 cm of penetration, indicating the clay till is stiff to hard, being generally hard in consistency.

Interpretation of Auger Refusal

Auger refusals were encountered in three boreholes at depths ranging from 2.3 to 2.7 m below the prevailing ground surface. According to the publicly available information, outcrop bedrock is noted at the nearby watercourse to the west of the site and that shallow bedrock is also noted in the nearby well records. Based on the bedrock geology in the area, the bedrock may consist of shale with limestone, dolostone and siltstone, from the Georgian Bay Formation.

GROUNDWATER CONDITION

All boreholes remained dry upon completion of field work. Water seepage was not noted in the open boreholes.

SLOPE STABILITY ASSESSMENT

Based on our visual inspection of the subject site, the nearby watercourse and its associated sloping area in the vicinity, the grade difference from the watercourse to the subject site is approximately 1.5 to 2 m over a distance of at least 15 m, resulting in a very gentle ground gradient. Thus, there is no slope stability concern at the subject site.



GEOTECHNICAL ASSESSMENT AND RECOMMENDATIONS

Temporary Truck Parking

It is understood that the proposed truck parking pavement will be gravel paved and will be of temporary use for a duration of approximately 3 years as per the current application. The following recommendations are provided:

Based on the visual observation of the granular fill samples, it is our opinion that the existing granular fill may have been deteriorated or have been mixed with fine particles from outside source or from upfiltration of fine particles over time. Thus, the existing granular fill may not provide sufficient strength to support the heavy-duty truck traffic loading. Excessive deformation or rutting can be expected as time passes. Frequent maintenance such as regrading and top up of granular fill will likely be necessary to maintain smooth driving condition.

Alternatively, an addition of 300 mm thick granular base, consisting of OPSS Granular 'A' or 19-mm Crusher-Run Limestone (CRL), can provide additional support and longevity to the gravel pavement structure over the temporary usage period of 3 years. The granular base must be compacted to 100% Standard Proctor Maximum Dry Density (SPMDD) in lifts no more than 150 mm in compacted thickness in order to provide the necessary stiffness.

Prior to the placement of the granular base, the existing ground surface must be graded and proof-rolled to allow proper drainage, avoiding unnecessary water ponding at the subgrade level. Ponding water will cause saturation of the subgrade over time, weakening of the subgrade strength, resulting in pre-mature failure of the pavement structure.

Permanent/Long-Term Truck Parking

Where the truck parking be serviced for longer than 3 years or becomes part of the permanent plan of the subject site, proper rectification should be considered and the recommendations are as follow:

Subgrade Preparation

As mentioned, excessive fine particles were noted within the existing granular fill, indicating that the granular fill may not meet the requirement of OPSS Granular 'A' or 'B'. Thus, the existing granular fill may not be suitable for reuse as granular base or subbase make up of the new pavement. This material, however, can be used as subgrade



stabilization upon further assessment to ensure the fill is free of organics and/or deleterious material.

After regrading to the required proposed subgrade level, the subgrade must be proof-rolled and inspected for deficiency. Any weak or wet spot as identified should be subexcavated to competent soil and replaced with properly compacted earth fill or salvaged granular fill. The final subgrade should be compacted to at least 98% SPMDD in lifts no more than 20 cm in thickness.

As noted, the subgrade must be properly graded to prevent water ponding. In addition, a subsurface drainage system is recommended at the low-lying areas and discharge to a positive outlet to prolong the service life of the pavement where necessary. The subdrains, consisting of filter-wrapped weepers and backfilled with free-draining granular material, should be installed at least 0.3 m below the granular sub-base and connected to nearby catch basins or positive outlet. Where catch basins are present, they should also be provided with filter-sleeved weeper stubs around the catch basins, extending to 0.6 m away from the catch basins on 4 sides.

Pavement Design

Where gravel pavement is to be considered, the gravel pavement design is presented below:

Course	Thickness (mm)	OPSS Specifications
Granular Base	300	19-mm Crusher-Run Limestone
Granular Sub-Base		50-mm Crusher-Run Limestone
Light Duty	300	
Heavy Duty	450	

Where the parking becomes permanent use, the recommended pavement design is presented below:



Course	Thickness (mm)	OPSS Specifications
Asphalt Surface	40	HL3
Asphalt Binder		HL8
Light Duty	60	
Heavy Duty	90	
Granular Base	150	19-mm Crusher-Run Limestone
Granular Sub-Base		50-mm Crusher-Run Limestone
Light Duty	200	
Heavy Duty	300	

Alternatively, the addition of geogrid can be utilized to reduce pavement thickness while maintaining its structural integrity, or be used to improve service life and performance in conjunction with the above pavement design. This can be further discussed with the geogrid specialist and/or manufacturer for further input as necessary.

The granular base and sub-base must be compacted to 100% SPMDD in layers not exceeding 200 mm thick.

It must be noted that the on-site subgrade is highly frost susceptibility, resulting in heaving of the pavement in severe cold weathered and softening of subgrade in the thawing season. Regular maintenance of the asphalt, including but not limited to sealing of crack or the addition of granular when rutting becomes apparent, will be necessary to ensure proper performance and to extend the life of the pavement structure, or where gravel pavement is considered, regular top up of granular base is recommended.

Infiltration Basin

It is understood that an infiltration basin is proposed at the subject site. Based on the design, the bottom of the basin is expected to be at El. 226.65 m and 226.70 m, where the subsoil consists of silty clay till. For design purpose, the estimated coefficient of permeability and the percolation time of the silty clay till is estimated to be 10^{-7} cm/ sec and over 80 min/cm, respectively.

The infiltration basin is expected to be constructed via excavation into the existing ground. The side slope gradient is designed to be flatter than 3H:1V, and is considered geotechnically suitable.

An outlet structure, is proposed to the southwest of the basin, discharging into the nearby watercourse with a 300-mm diameter PVC pipe. The pipe bedding shall consist of 19-mm CRL, or equivalent, compacted to at least 98% SPMDD. The backfill of the outlet pipe



shall consist of on-site inorganic soil compacted to least 95% SPMDD, in lifts no more than 20 cm thick. Where ground cover is deemed insufficient above the pipe, the pipe must be properly insulated to avoid heaving from frost penetration.

LIMITATIONS OF REPORT

This report was prepared by Soil Engineers Ltd. for the account of G.N Transport Inc., and for review by its designated consultants and government agencies. Use of this report is subject to the conditions and limitations of the contractual agreement.

The material in the report reflects the judgement of Curtis Lee, B.Eng., EIT., and Kin Fung Li, P.Eng., in light of the information available to it at the time of preparation. Any use which a Third Party makes of this report, or any reliance on decisions to be made based on it, is the responsibility of such Third Parties. Soil Engineers Ltd. accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

Yours truly,
SOIL ENGINEERS LTD.

Curtis Lee, B.Eng., EIT.
CL/KL

Kin Fung Li, P.Eng.



ENCLOSURES

Borehole Logs.....	Figures 1 to 4
Grain Size Distribution Graph.....	Figure 5
Borehole Location Plan	Drawing No. 1

LIST OF ABBREVIATIONS AND DESCRIPTION OF TERMS

The abbreviations and terms commonly employed on the borehole logs and figures, and in the text of the report, are as follows:

SAMPLE TYPES

AS	Auger sample
CS	Chunk sample
DO	Drive open (split spoon)
DS	Denison type sample
FS	Foil sample
RC	Rock core (with size and percentage recovery)
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample

PENETRATION RESISTANCE

Standard Penetration Resistance or 'N' Value:

The number of blows of a 63.5 kg hammer falling from a height of 76 cm required to advance a 51 mm outer diameter drive open sampler 30 cm into undisturbed soil, after an initial penetration of 15 cm.

Plotted as '○'

Dynamic Cone Penetration Resistance:

A continuous profile showing the number of blows per each 30 cm of penetration of a 51 mm diameter, 90° point cone driven by a 63.5 kg hammer falling from a height of 76 cm.

Plotted as '—●—'

WH	Sampler advanced by static weight
PH	Sampler advanced by hydraulic pressure
PM	Sampler advanced by manual pressure
NP	No penetration

SOIL DESCRIPTION

Cohesionless Soils:

<u>'N' (blows/30 cm)</u>	<u>Compactness</u>
0 to 4	very loose
4 to 10	loose
10 to 30	compact
30 to 50	dense
> 50	very dense

Cohesive Soils:

<u>Undrained Shear Strength (kPa)</u>	<u>'N' (blows/30 cm)</u>	<u>Consistency</u>
<12	<2	very soft
12 to <25	2 to <4	soft
25 to <50	4 to <8	firm
50 to <100	8 to <15	stiff
100 to 200	15 to 30	very stiff
>200	>30	hard

Method of Determination of Undrained Shear Strength of Cohesive Soils:

x 0.0 Field vane test in borehole; the number denotes the sensitivity to remoulding

△ Laboratory vane test

METRIC CONVERSION FACTORS

1 ft	= 0.3048 m
1 inch	= 25.4 mm
1 lb	= 0.454 kg
1 ksf	= 47.88 kPa

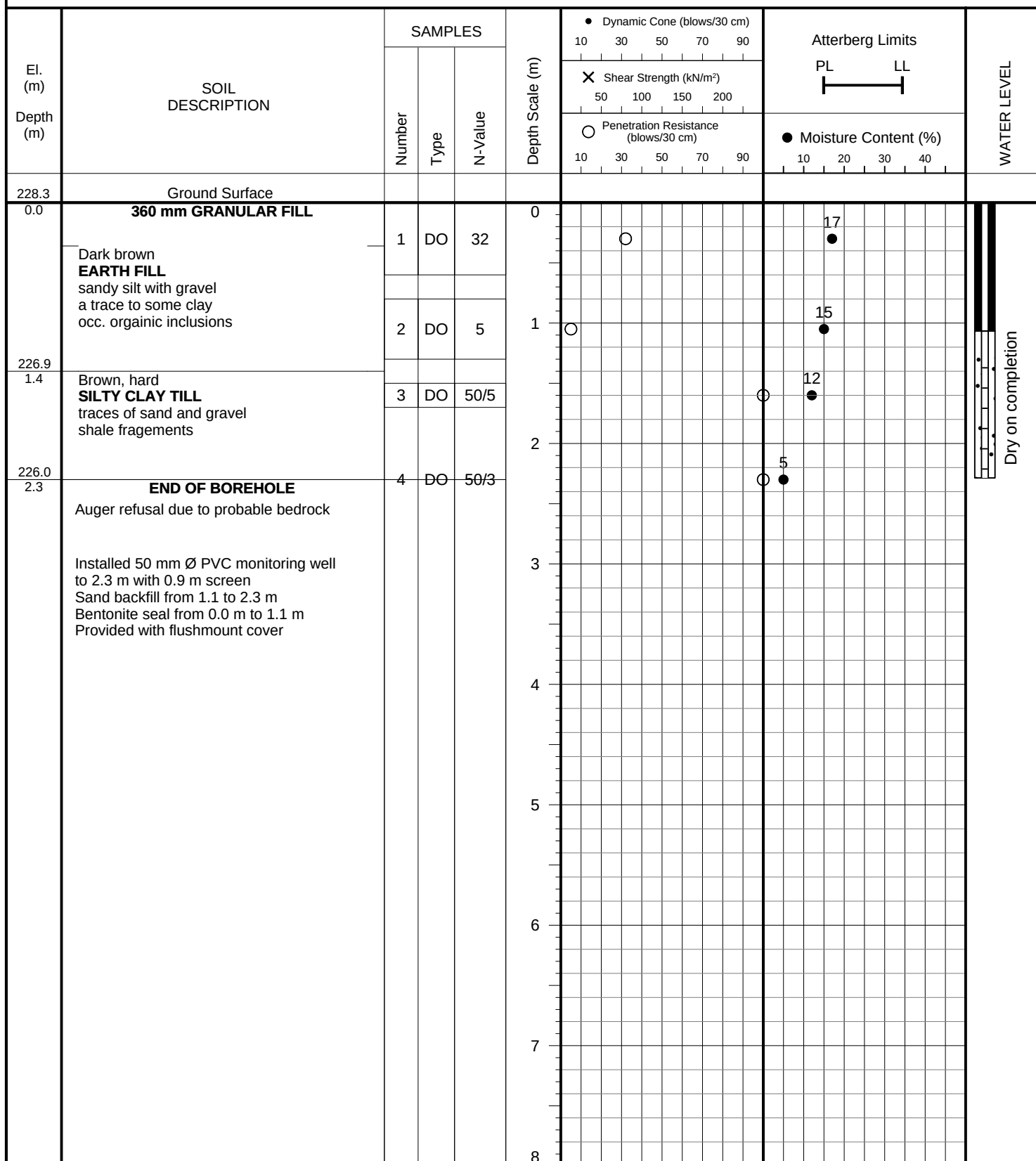


Soil Engineers Ltd.

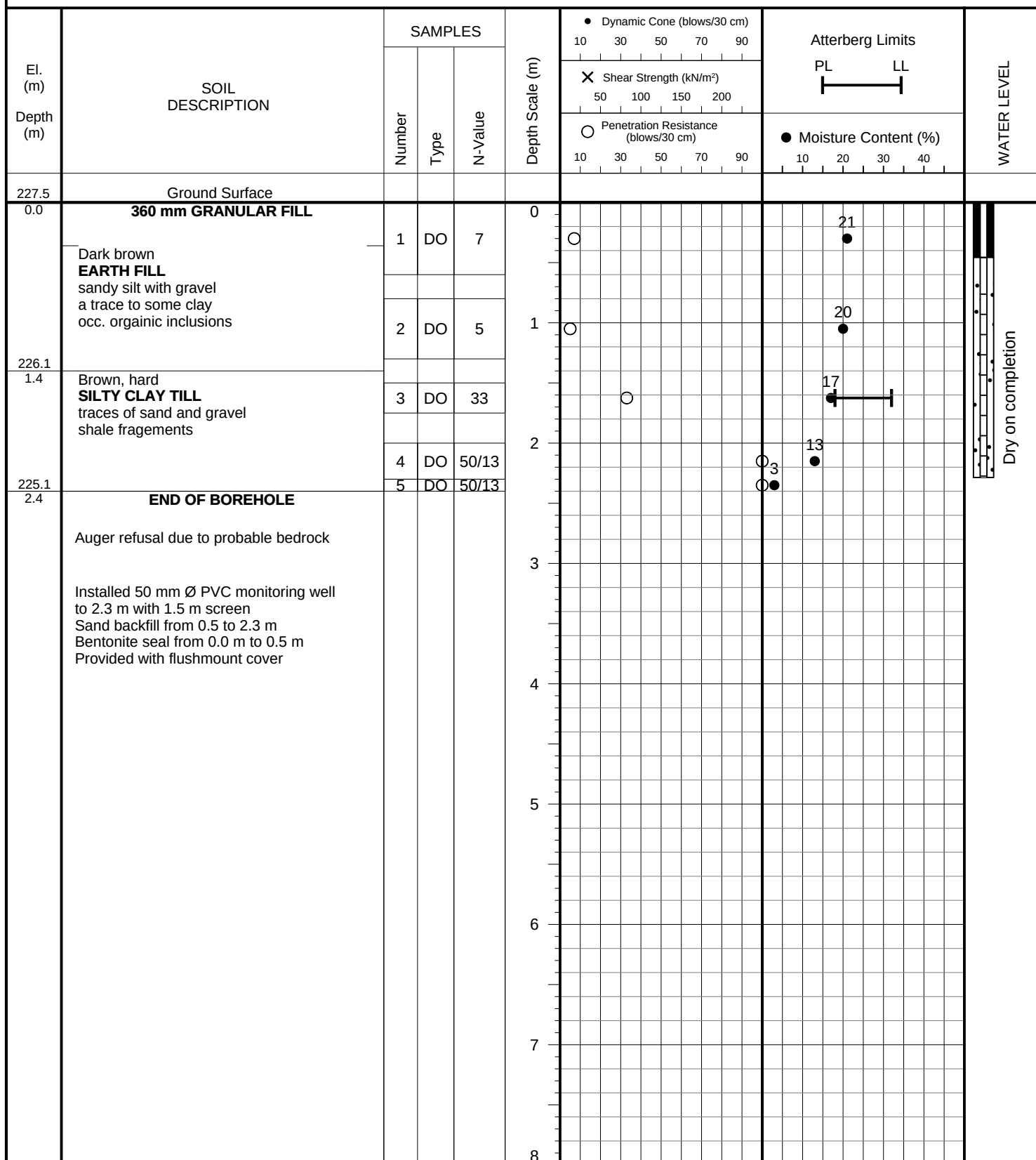
CONSULTING ENGINEERS

GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE

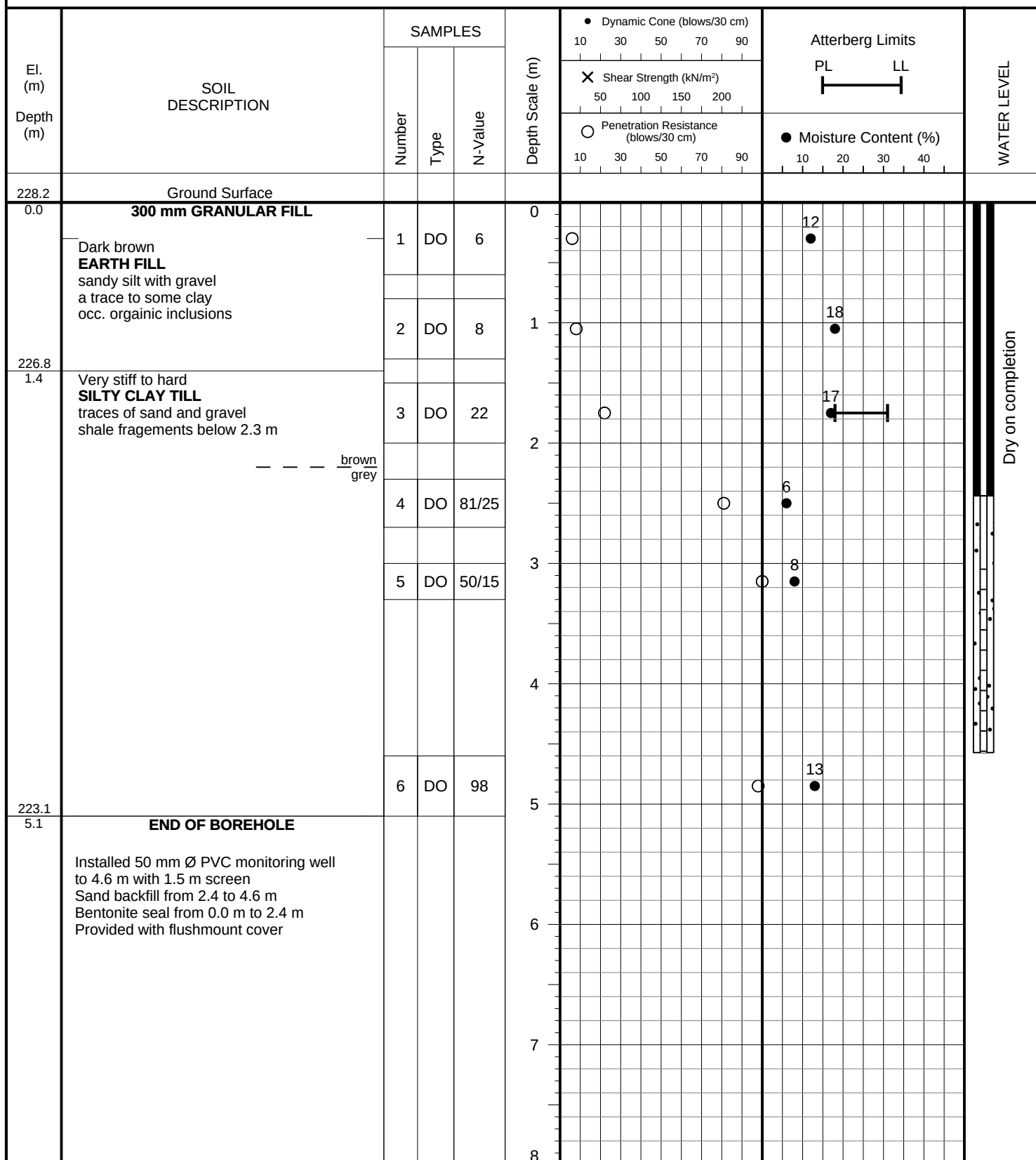
JOB NO.: 2506-S157

LOG OF BOREHOLE:**1****FIGURE NO.: 1****PROJECT DESCRIPTION:** Proposed Transportation Terminal**METHOD OF BORING:** Hollow Stem Augers**PROJECT LOCATION:** 6404 Mayfield Road, Town of Caledon**DRILLING DATE:** July 8, 2025**Soil Engineers Ltd.**

JOB NO.: 2506-S157

LOG OF BOREHOLE:**2****FIGURE NO.: 2****PROJECT DESCRIPTION:** Proposed Transportation Terminal**METHOD OF BORING:** Hollow Stem Augers**PROJECT LOCATION:** 6404 Mayfield Road, Town of Caledon**DRILLING DATE:** July 8, 2025**Soil Engineers Ltd.**

JOB NO.: 2506-S157

LOG OF BOREHOLE:**3****FIGURE NO.: 3****PROJECT DESCRIPTION:** Proposed Transportation Terminal**METHOD OF BORING:** Hollow Stem Augers**PROJECT LOCATION:** 6404 Mayfield Road, Town of Caledon**DRILLING DATE:** July 8, 2025**Soil Engineers Ltd.**

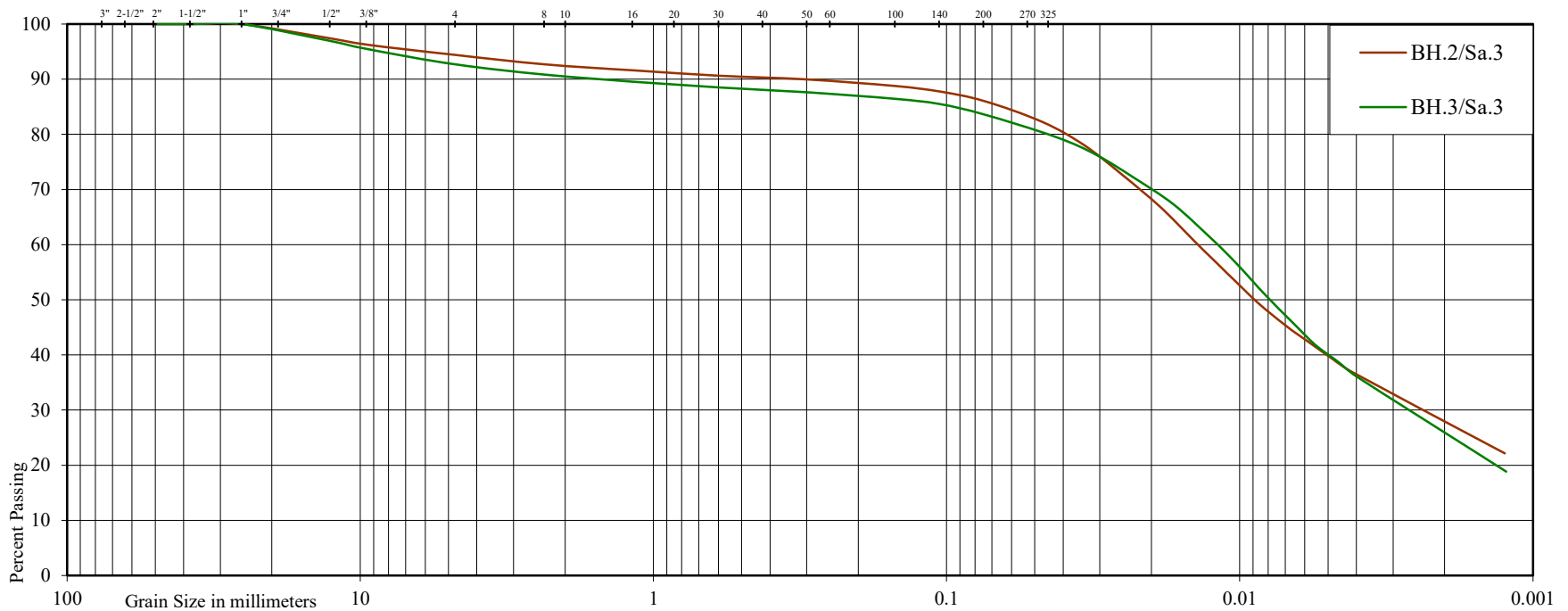


U.S. BUREAU OF SOILS CLASSIFICATION

GRAVEL			SAND				SILT	CLAY
COARSE		FINE	COARSE	MEDIUM	FINE	V. FINE		

UNIFIED SOIL CLASSIFICATION

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



Project: Proposed Transportation Terminal

Location: 6404 Mayfield Road, Town of Caledon

Borehole No: 2 3

Sample No: 3 3

Depth (m): 1.7 1.7

Elevation (m): 225.8 226.5

BH./Sa. 2/3 3/3

Liquid Limit (%) = 32 31

Plastic Limit (%) = 18 18

Plasticity Index (%) = 14 13

Moisture Content (%) = 17 17

Estimated Permeability (cm./sec.) = 10^{-7} 10^{-7}

Classification of Sample [& Group Symbol]: SILTY CLAY TILL
traces of sand and gravel

