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Geotechnical Investigation Report
Commercial Storage and Truck and Trailer Parking
13291 Airport Road
Caledon, Ontario

GEMTEC Project: 103140.008

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Submitted to:

Giampaolo Developments Limited
1 Kenview Boulevard, Suite 301
Brampton, Ontario
L6T 5E6

Geotechnical Investigation Report
Commercial Storage and Truck and Trailer Parking
13291 Airport Road
Caledon, Ontario

April 3, 2025
GEMTEC Project: 103140.008

GEMTEC Consulting Engineers and Scientists Limited
6695 Millcreek Drive, Unit 7,
Mississauga, ON, Canada
L5N 5M4

April 3, 2025 File: 103140.008 – Rev0

Giampaolo Developments Limited
1 Kenview Boulevard, Suite 301
Brampton, Ontario
L6T 5E6

Attention: Todd Kerr, President

Re: Geotechnical Investigation Report
Commercial Storage and Truck and Trailer Parking
13291 Airport Road, Caledon, Ontario

Please find enclosed our Geotechnical Investigation Report for the Proposed Commercial Storage and Truck/Trailer Parking development located at 13291 Airport Road in Caledon, Ontario. The report presented herein is based on the scope of work summarized in our Proposal dated October 1, 2024. This report was prepared by Matthew Kelly, P.Eng. and reviewed by Jeff Tolton, C.E.T.

Matthew Kelly, P.Eng.
Senior Geotechnical Engineer

Jeff Tolton, C.E.T.
Senior Project Manager

MWK/JET/af/sv

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1.0 INTRODUCTION

GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) has been retained by Giampaolo Developments Limited (Giampaolo), to carry out a geotechnical site investigation for the Commercial Storage and Truck and Trailer Parking Lot proposed to be constructed on a portion of the property located at 13291 Airport Road in Caledon, Ontario. This report addresses the geotechnical (physical) aspects of the design and should be read in conjunction with the Environmental and Hydrogeological reports (issued under separate cover).

The purpose of the geotechnical investigation was to identify the general subsurface and groundwater conditions at the site by means of a limited number of boreholes and monitoring wells, and based on the factual data obtained, to provide engineering guidelines on the geotechnical design aspects of the project, including construction considerations that could influence design decisions.

This report is subject to the *Conditions and Limitations of This Repor*t, which is included in Appendix A, and are considered an integral part of the report. The factual data, interpretations and recommendations contained in this report pertain to a specific project as described in the report and are not applicable to any other project or site location. If the project is modified in concept, location or elevation, or if the project is not initiated within eighteen months of the date of the report, GEMTEC should be given an opportunity to confirm that the recommendations in this report are still valid.

2.0 SITE AND PROJECT DESCRIPTIONS

The overall site is currently occupied by a farmer's field that has recently been used for agricultural purposes, with a residential house and driveway leading to Airport Road. We understand that a water course regulated by the TRCA crosses the driveway. The site at the truck/trailer parking area is gently undulating with very little topographic relief and is located within the back field area (see Figure 1).

It is our understanding that the proposed development is to consist of a gravel-paved transport truck and trailer parking area with no concrete curbs or asphalt pavement. Further, we understand that the storm water run-off will be directed to the edges of the new construction and that no storm water management system (i.e., storm water collection or storm water management pond) is proposed. As such, it is our understanding that the topsoil will be removed and bermed on-site, slight regrading of the subgrade soils will be required, and finally gravel will be imported to complete the construction works.

3.0 METHODOLOGY

The fieldwork for this investigation was carried out on November 5 to 27, 2024 during which time six boreholes, designated as Boreholes BH24-1 to BH24-6, were advanced to approximate

depths ranging from about 6.2 to 6.6 m below ground surface (bgs). Groundwater monitoring wells were installed in five of the boreholes to allow for groundwater level monitoring at the site. The approximate locations of the completed boreholes are shown on the Borehole Location Plan, Figure 1, in Appendix B.

Prior to initiating the field work, GEMTEC contacted public utility companies to locate and clear existing underground services. As the boreholes advanced within the existing site were located on private property, GEMTEC also retained a private utility locating contractor to scan the borehole locations for buried services prior to drilling.

The boreholes were advanced with a track mounted drill rig using Hollow stem augers, supplied, and operated by a specialist drilling contractor, subcontracted through GEMTEC.

Standard Penetration Tests (SPT's) were carried out in the boreholes and samples of the soils encountered were recovered using a 50-millimetre (mm) diameter split spoon sampler. The SPT N-values presented on the borehole records were measured directly in the field and are unfactored / uncorrected.

The fieldwork was supervised by a member of our engineering staff who directed the drilling operations and logged the boreholes and collected soil samples. Following completion of the drilling, the soil samples were returned to our laboratory for further examination. Selected soil samples were submitted for water content, Atterberg Limits and grain size distribution testing.

Descriptions of the subsurface conditions observed in the boreholes are provided on the Record of Borehole Sheets in Appendix C. The results of the laboratory tests are provided on the Record of Boreholes (where applicable) and in Appendix D.

4.0 SUBSURFACE AND GROUNDWATER CONDITIONS

As previously indicated, the soil and groundwater conditions observed in the boreholes are presented on the Record of Borehole Sheets in Appendix C. The Record of Boreholes indicate the subsurface conditions at the specific borehole locations only. Boundaries between zones on the Record of Boreholes are often not distinct and can be transitional, and as such have been interpreted. The precision with which subsurface conditions are indicated depends on the method of drilling, the frequency and recovery of samples, the method of sampling, and the uniformity of the subsurface conditions. Subsurface conditions between and beyond the borehole locations may vary from the conditions encountered in the boreholes, both laterally and with depth. In addition to soil variability, fill of variable physical and chemical composition can be present over portions of the site or on adjacent properties.

The soil descriptions in this report are based on commonly accepted methods of classification and identification employed in geotechnical practice. Classification and identification of soil

involves judgement and GEMTEC does not guarantee descriptions as exact but infers accuracy to the extent that is common in current geotechnical practice.

The following presents an overview of the subsurface conditions encountered in the boreholes advanced during this preliminary investigation. In general, the subsurface conditions encountered consist of a surficial layer of topsoil overlying a silty clay till deposit, that contains periodic silty sand seams.

4.1 Topsoil

A layer of topsoil was encountered at the ground surface at all of the borehole locations. The topsoil layer was measured to be between about 150 mm and 250 mm thick at the borehole locations.

Materials identified as topsoil in this report were classified based on visual and textural evidence as no other testing for organic content or other nutrients was carried out. As such, the ability for these materials to support vegetation has not been assessed.

At some borehole locations, the materials encountered directly below the topsoil layer contain trace amounts of organics. These materials are anticipated to be suitable to be left in place and/or re-used as earth fill provided that the organic content remains below about 5 percent. In localized areas, if the organic content is greater than about 5 percent the soil below the topsoil will need to be excavated and replaced with engineered fill.

4.2 Silty Clay (CL) Till

A deposit of silty clay till, trace sand to sandy, trace gravel was encountered underlying the topsoil in all of the boreholes advanced at the site. The cohesive till deposit was encountered between approximate depths of 0.15 m and 0.25 m bgs and extended to the termination depths of all of the boreholes (between 6.2 and 6.6 m bgs). Layers of silty sand and gravelly sand between 0.1 m and 0.7 m thick were encountered within the glacial till deposit at various locations as noted on the borehole records. Cobbles and boulders are also inferred to be present within the glacial till deposit based on griding of the augers at various locations and depths, as noted on the borehole records.

Standard penetration tests carried out in the silty clay till deposit measured SPT N-values between 8 blows per 0.3 m of penetration and 50 blows for 0.05 m, but generally greater than 30 blows per 0.3 m of penetration, suggesting a stiff to hard, but generally hard consistency.

Two grain size distribution tests were carried out on the silty clay till material from Boreholes BH23-1 and BH23-6, and the results are provided in Appendix D and are summarized in Table 4.1.

Table 4.1 – Summary of Grain Size Distribution Test (Silty Clay - Till)

Location	Sample Number	Sample Depth (metres)	Gravel (%)	Sand (%)	Silt / Clay (%)
BH23-1	3	1.5 – 2.0	2.4	17.1	80.5
BH23-6	3	1.5 – 1.8	0.1	13.8	86.0

Atterberg limits tests were carried out on two selected samples from this deposit and measured liquid limits of about 33 percent and 44 percent, plastic limits of about 19 percent and 22 percent, and corresponding plasticity indices of about 14 percent and 22 percent. These results, which are plotted on a plasticity chart in Appendix D, indicate that the glacial till can be classified as silty clay of medium plasticity.

The water contents measured on samples of this cohesive deposit ranged from about 9 percent to 25 percent.

4.3 Groundwater Levels

Groundwater levels were measured in the boreholes and monitoring wells on completion of drilling, and in the monitoring wells on November 27, 2024 and are summarised in the table below.

Table 4.2 – Groundwater Depths

Monitoring Well	Date	Depth Below Ground Surface (m)	Notes
BH24-1	November 5, 2024 November 27, 2024	Dry 1.7	On Completion
BH24-2	November 5, 2024	Dry	On Completion
BH24-3	November 6, 2024 November 27, 2024	Dry 1.5	On Completion
BH24-4	November 5, 2024 November 27, 2024	Dry 3.7	On Completion
BH24-5	November 5, 2024 November 27, 2024	Dry 1.7	On Completion
BH24-6	November 6, 2024 November 27, 2024	5.5 2.6	On Completion

The groundwater conditions described in this report refer only to those measured at the place and time of observation. Seasonal and annual fluctuations should be anticipated. Further details on the groundwater levels at the site will be provided in GEMTEC's hydrogeological report (provided under separate cover).

5.0 RECOMMENDATIONS AND CONSIDERATIONS

This section of the report provides engineering guidance on the geotechnical design aspects of the project based on our interpretation of the boreholes advanced as part of the site investigation. It is stressed that the information in the following sections is provided for the guidance of the designers and is intended for this project only. Contractors bidding on or undertaking the works should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction, and make their own interpretation of the factual data as it affects their construction techniques, schedule, safety and equipment capabilities.

Based on the results of this investigation, the subsurface soil conditions encountered at the site are considered to be generally suitable for the proposed development.

At the time of this report, proposed subgrade and finished pavement design grades were not available for the proposed site development. The following engineering recommendations regarding the geotechnical design aspects of the project should be considered as preliminary only, and should be reviewed and refined as required when the design grades have been finalized.

5.1 Subgrade Preparation

The existing site vegetation, surficial topsoil/organics, and any other near-surface soils containing significant amounts of organic matter or construction debris encountered during stripping are not considered to be suitable for the subgrade support of engineered fill or other settlement sensitive structures. These materials should be completely stripped prior to placing any engineered fill or constructing the pavement structure.

If areas of disturbed/reworked materials containing excessive amounts of organic material or construction debris are encountered during site preparation, these materials should be disposed of following appropriate environmental procedures. Furthermore, excessively-wet soils should be suitably dried before reuse as engineered fill.

Following the stripping of the surficial topsoil and soils containing significant amounts of organics and/or soft/disturbed surficial soils, the exposed subgrade should be heavily proofrolled with suitable equipment, in conjunction with inspection by qualified geotechnical personnel to confirm that the exposed soils are competent and have been adequately stripped of ponded water and all disturbed, loosened, softened, organic and other deleterious material. Remedial work (i.e., further sub-excavation and replacement) should be carried out on poorly performing areas identified during the proofrolling activities, as directed by GEMTEC.

Any filling carried out at the site in conjunction with regrading should be carried out in accordance with engineered fill procedures. Recommendations for the placement of engineered fill are outlined in the following section of this report.

5.2 Engineered Fill Requirements

The anticipated site grading activities may include both cutting and raising (filling) the original grade to meet the final design subgrade levels. At the time of this report, the design cut and fill depths were not available for review. As such, for the purposes of this report, it has been assumed that cuts and grade raises will not exceed about 2 m.

In general, the existing native material and existing fill soils that do not contain significant amounts (i.e., greater than 5 percent) of organics or construction debris, are considered to be acceptable for reuse as engineered fill. Based on the laboratory test results, the water content of the native soils present at the site are considered to be generally near or slightly below their optimum water contents for compaction, and therefore may require minor wetting prior to placement.

It should be noted that the existing fill and native materials at the site are silty/clayey in nature, and as such are susceptible to over-wetting and subsequent freezing during inclement weather. Therefore, it is recommended that site grading activities not be carried out during late fall, winter, early spring seasons or any periods of inclement weather conditions. All oversized cobbles (i.e., greater than 150 mm in size) and boulders, if present, should be removed from excavated material that will be used as engineered fill material.

If imported material is required for the engineered fill process, the material that is proposed for use as engineered fill should be approved by the geotechnical engineer at its source, prior to importing the material to the site. Suitable soils, free of topsoil, organic matter or other deleterious materials can be used as engineered fill provided that the water content of the soil at the time of placement does not vary by more than 2 percent above or below its optimum water content for compaction. Otherwise, the soils may require treatment (i.e., drying or wetting) prior to placement.

Following the inspection and approval of the subgrade as described previously in this report, engineered fill materials should be placed in maximum 300 mm-thick loose lifts and uniformly compacted to 98 percent of the Standard Proctor Maximum Dry Density (SPMDD). Filling should continue until the design elevations are achieved.

Full-time monitoring and in situ density testing should be carried out by GEMTEC during placement of engineered fill.

The final surface of the engineered fill should be protected as necessary from construction traffic and should be sloped to provide positive drainage for surface water during the construction period. If the engineered fill materials will be left exposed (i.e., uncovered) during periods of freezing

weather, additional soil cover should be placed above final subgrade to provide some level of frost protection.

5.3 Pavement Design

Following site grading operations, as noted previously, the proposed pavement subgrade will generally consist of either compacted engineered fill or native silty clay glacial till. These materials are considered to have a low frost susceptible, and as such, the pavement design provided in Table 5.1 below has taken this condition into consideration.

Based on the proposed site usage, (i.e., tractor-trailer parking and storage) frost susceptibility and strength of the subgrade soils, the following pavement components are recommended for the proposed parking area:

Table 5.1 – Pavement Design

Material		Minimum Thickness of Pavement Structure Components (mm)
Granular Materials (OPSS.MUNI 1010)	Granular A Base	300
	Granular B Type II Subbase	400
Total Pavement Structure Thickness (mm)		700
		Prepared and Approved Subgrade

As an alternative to the above noted pavement design, outlined below is an alternative pavement design that is thinner and will require additional ongoing maintenance such as regular grading and the placement of additional granular to fill in potholes/ruts if/when required.

Table 5.2 – Pavement Design

Material		Minimum Thickness of Pavement Structure Components (mm)
Granular Materials (OPSS.MUNI 1010)	Granular A Base	450
	Granular B Type II Subbase	-
Total Pavement Structure Thickness (mm)		450
		Prepared and Approved Subgrade

If the pavement structure provided in Table 5.2 is selected for the site, it should be understood that the maintenance requirements will be greater and more frequent than for the pavement structure provided in Table 5.1. In addition, if the pavement structure provided in Table 5.2 is

selected for the site, consideration should be given to incorporating a woven geotextile fabric (e.g. Terrafix 200W – Woven Geotextile or equivalent) into the design between the subgrade soils and the Granular A base, in particular within the driveway and main drive aisle footprint.

Prior to placing pavement subbase and/or base materials, the exposed soil subgrade should be heavily proofrolled in conjunction with an inspection by GEMTEC. The granular subbase and base materials should be placed in loose layers no thicker than 200 mm and uniformly compacted to 100 percent of their SPMDD.

It should be noted that the gravel surfaced pavement sections will require significantly greater maintenance as compared to asphalt surfaced pavement areas. Furthermore, any asphalt layers immediately adjacent to gravel surfaces will have decreased lateral support and with the passage of traffic across this transition between the asphalt and gravel, the asphalt layers may possibly exhibit premature cracking. It should be anticipated that the gravel driveway will need to be regraded and recompacted every year, and that additional granular material may need to be added to compensate for the material lost from the surface.

6.0 CLOSURE

We trust that this report meets your immediate requirements. If conditions that differ from those assumed in this geotechnical investigation report are encountered during construction, GEMTEC should be given the opportunity to review the recommendations presented herein.

If you have any questions or require additional information, please contact the undersigned.

Regards,

GEMTEC Consulting Engineers and Scientists Limited

Matthew Kelly, P.Eng.
Senior Geotechnical Engineer

Jeff Tolton, C.E.T.
Senior Project Manager

APPENDIX A

Conditions and Limitations of This Report

Conditions and Limitations of This Report

1. **Standard of Care:** GEMTEC has prepared this report in a manner consistent with generally accepted engineering or environmental consulting practice in the jurisdiction in which the services are provided at the time of the report. No other warranty, expressed or implied is made.
2. **Copyright:** The contents of this report are subject to copyright owned by GEMTEC, save to the extent that copyright has been legally assigned by us to another party or is used by GEMTEC under license. To the extent that GEMTEC owns the copyright in this report, it may not be copied without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to the Client in confidence and must not be disclosed or copied to third parties without the prior written agreement of GEMTEC. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests.
3. **Complete Report:** This report is of a summary nature and is not intended to stand alone without reference to the instructions given to GEMTEC by the Client, communications between GEMTEC and the Client and to any other reports prepared by GEMTEC for the Client relative to the specific site described in the report. In order to properly understand the suggestions, recommendations and opinions expressed in this report, reference must be made to the whole of the report. GEMTEC can not be responsible for use of portions of the report without reference to the entire report.
4. **Basis of Report:** This Report has been prepared for the specific site, development, design objectives and purposes that were described to GEMTEC by the Client. The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document, subject to the limitations provided herein, are only valid to the extent that this report expressly addresses the proposed development, design objectives and purposes. Any change of site conditions, purpose or development plans may alter the validity of the report and GEMTEC cannot be responsible for use of this report, or portions thereof, unless GEMTEC is requested to review any changes and, if necessary, revise the report.
5. **Time Dependence:** If the proposed project is not undertaken by the Client within 18 months following the issuance of this report, or within the timeframe understood by GEMTEC to be contemplated by the Client, the guidance and recommendations within the report should not be considered valid unless reviewed and amended or validated by GEMTEC in writing.
6. **Use of This Report:** The information, recommendations and opinions expressed in this report are for the sole benefit of the Client. No other party may use or rely on this report or any portion thereof without GEMTEC's express written consent. If the report was prepared to be included for a specific permit application process, then upon the reasonable request of the client, GEMTEC may authorize in writing the use of this report by the regulatory agency as an Approved User for the specific and identified purpose of the applicable permit review process.

   Contractors bidding on, or undertaking the work, should rely on their own investigations, as well as their own interpretations of the factual data presented in the report, as to how subsurface conditions may affect their work, including but not limited to proposed construction techniques, schedule, safety and equipment capabilities.
7. **No Legal Representations:** GEMTEC makes no representations whatsoever concerning the legal significance of its findings, or as to other legal matters touched on in this report, including but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.

8. **Decrease in property value:** GEMTEC shall not be responsible for any decrease, real or perceived, of the property or site's value or failure to complete a transaction, as a consequence of the information contained in this report.
9. **Reliance on Provided Information:** The evaluation and conclusions contained in this report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations. information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of misstatements, omissions, misrepresentations. or fraudulent acts of the Client or other persons providing information relied on by us. We are entitled to rely on such representations, information and instructions and are not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.
10. **Investigation Limitations:** Site investigation programs are a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions but even a comprehensive investigation, sampling and testing program may fail to detect all or certain subsurface conditions.

    The data derived from the site investigation program and subsequent laboratory testing are interpreted by trained personnel and extrapolated across the site to form an inferred geological representation and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. Conditions between and beyond the borehole/test hole locations may differ from those encountered at the borehole/test hole locations and the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies. Accordingly, GEMTEC does not warrant or guarantee the exactness of of the subsurface descriptions.

    Soil and groundwater conditions shown in the factual data and described in the report are the observed conditions at the time of their determination-or measurement. Unless otherwise noted, those conditions form the basis of the recommendations in the report. Groundwater conditions may vary between and beyond reported locations and can be affected by annual, seasonal and meteorological conditions. The condition of the soil, rock and groundwater may be significantly altered by construction activities (traffic, excavation, groundwater level lowering, pile driving, blasting, etc.) on the site or on adjacent sites. Excavation may expose the soils to changes due to wetting, drying or frost. Unless otherwise indicated the soil must be protected from these changes during construction.

    In addition, fill of variable physical and chemical composition can be present over portions of the site or on adjacent properties. The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in the report. The presence or implication(s) of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this project and have not been investigated or addressed.
11. **Sample Disposal:** GEMTEC will dispose of all uncontaminated soil and/or rock samples 60 days following issue of this report or, upon written request of the Client, will store uncontaminated samples and materials at the Client's expense. In the event that actual contaminated soils, fills or groundwater are encountered or are inferred to be present, all contaminated samples shall remain the property and responsibility of the Client for proper disposal.
12. **Follow-Up and Construction Services:** All details of the design were not known at the time of submission of GEMTEC's report. GEMTEC should be retained to review the final design, project plans and documents prior to construction, to confirm that they are consistent with the intent of GEMTEC's report.

    During construction, GEMTEC should be retained to perform sufficient and timely observations of encountered conditions to confirm and document that the subsurface conditions do not

materially differ from those interpreted conditions considered in the preparation of GEMTEC's report and to confirm and document that construction activities do not adversely affect the suggestions, recommendations and opinions contained in GEMTEC's report. Adequate field review, observation and testing during construction are necessary for GEMTEC to be able to provide letters of assurance, in accordance with the requirements of many regulatory authorities. In cases where this recommendation is not followed, GEMTEC's responsibility is limited to interpreting accurately the information encountered at the borehole locations, at the time of their initial determination or measurement during the preparation of the Report.

13. **Changed Conditions:** Where conditions encountered at the site differ significantly from those anticipated in this report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that GEMTEC be notified of any changes and be provided with an opportunity to review or revise the recommendations within this report. Recognition of changed soil and rock conditions requires experience and it is recommended that GEMTEC be employed to visit the site with sufficient frequency to detect if conditions have changed significantly.
14. **Drainage:** Drainage of subsurface water is commonly required either for temporary or permanent installations for the project. Improper design or construction of drainage or dewatering can have serious consequences. GEMTEC takes no responsibility for the effects of drainage unless specifically involved in the detailed design and construction monitoring of the system.

APPENDIX B

Borehole Location Plan

Legend

BH # BOREHOLE ID

APPROXIMATE BOREHOLE LOCATION

APPROXIMATE MONITORING WELL

GEOTECHNICAL INVESTIGATION

SITE BOUNDARY

NOTES:

1. All locations approximate.
2. Coordinate system: NAD 1983 UTM Zone 17N
3. Geographic dataset source: Ontario GeoHub.
4. Contains information licensed under the Open Government Licence – Ontario.
5. Service Layer Credits: World Imagery: Peel Region, Maxar, Microsoft World_Street Map Background (Community Map of Canada): Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada

Scale:

1:3,000

0 25 50 100 150 200 250 Meters

Drawing: BOREHOLE LOCATION PLAN

Client: GIAMPAOLO DEVELOPMENTS LIMITED

Project: GEOTECHNICAL INVESTIGATION
13291 AIRPORT ROAD,
CALEDON, ONTARIO

Drwn By:	S.J.	Chkd By:	M.W.K.
Project No.	103140.008	Revision No.	0
Date	DECEMBER 2024		**FIGURE 1**

GEMTEC
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Folder: N:\Projects\103100\103140.008\06_Civil Drafting\Design\WaterBalance\103140_008_WaterBalance_AirPortRd_R0_2024_12_10\

APPENDIX C

Record of Borehole Sheets

ABBREVIATIONS AND TERMINOLOGY USED ON RECORDS OF BOREHOLES AND TEST PITS

SAMPLE TYPES	
AS	Auger sample
CA	Casing sample
CS	Chunk sample
BS	Borros piston sample
GS	Grab sample
MS	Manual sample
RC	Rock core
SS	Split spoon sampler
ST	Slotted tube
TO	Thin-walled open shelby tube
TP	Thin-walled piston shelby tube
WS	Wash sample

SOIL TESTS	
w	Water content
PL, w_p	Plastic limit
LL, w_L	Liquid limit
C	Consolidation (oedometer) test
D_R	Relative density
DS	Direct shear test
G_S	Specific gravity
M	Sieve analysis for particle size
MH	Combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	Organic content test
UC	Unconfined compression test
γ	Unit weight

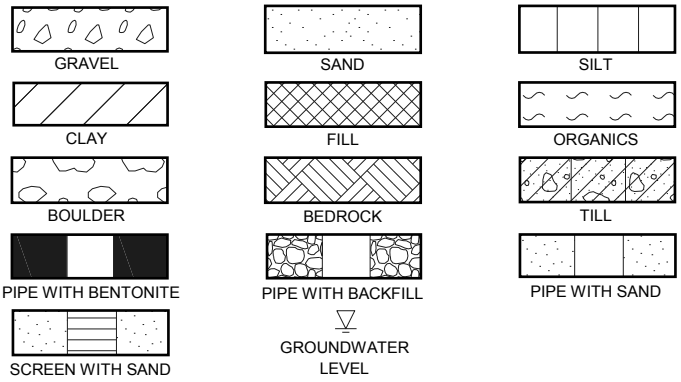
PENETRATION RESISTANCE

Standard Penetration Resistance, N
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 millimetres (30 in.) required to drive a 50 mm split spoon sampler for a distance of 300 mm (12 in.). For split spoon samples where less than 300 mm of penetration was achieved, the number of blows is reported over the sampler penetration in mm.

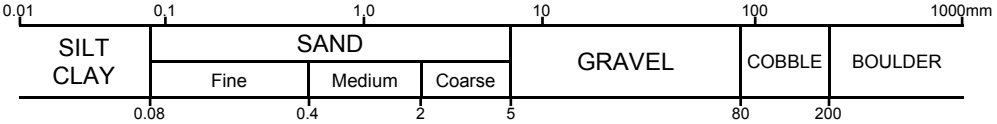
Dynamic Penetration Resistance
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive a 50 mm (2 in.) diameter 60° cone attached to 'A' size drill rods for a distance of 300 mm (12 in.).

WH	Sampler advanced by static weight of hammer and drill rods
WR	Sampler advanced by static weight of drill rods
PH	Sampler advanced by hydraulic pressure from drill rig
PM	Sampler advanced by manual pressure

COHESIONLESS SOIL Compactness		COHESIVE SOIL Consistency	
SPT N-Values	**Description**	**Cu, kPa**	**Description**
0-4	Very Loose	0-12	Very Soft
4-10	Loose	12-25	Soft
10-30	Compact	25-50	Firm
30-50	Dense	50-100	Stiff
>50	Very Dense	100-200	Very Stiff
		>200	Hard

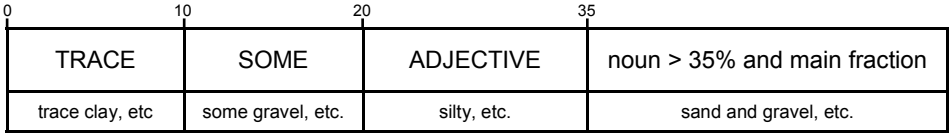


GRAIN SIZE



DESCRIPTIVE TERMINOLOGY

(Based on the CANFEM 4th Edition)



RECORD OF BOREHOLE BH24-1

CLIENT: Giampaolo Developments
PROJECT: Commercial Storage and Truck and Trailer Parking, 13291 Airport Road, Caledon, Ontario
JOB#: 103140.008
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Unknown
BORING DATE: Nov 5 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		Ground Surface								Monument
		TOPSOIL			1A	SS	406	13		
		(CL) Silty Clay, trace to some gravel, some sand; brown (TILL); cohesive, w<PL, very stiff to hard		0.20	1B					
1					2	SS	457	22		Bentonite
					3	SS	457	30	MH	
2					4A	SS	457	92		
					4B					
3	Power Auger / Solid Stem Auger (152mm OD)	- Auger grinding from about 2.9m to 3.0m depth.			5	SS	229	50\0.076m		Filter Sand
		- Auger grinding from about 3.2m to 3.7m depth.								
4										
		- 2m silty sand layer at about 4.6m depth.			6A	SS	457	77		50mm dia. well screen
5					6B					
6					7	SS	457	76		End of Augering
		End of Borehole		6.55						
7		1. Monitoring well installed as shown upon completion of drilling.								
		2. Borehole dry upon completion.								
8										
9										
10										

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/11/27	1.7 ▽	

GEMTEC
Consulting Engineers and Scientists

LOGGED: E.D
CHECKED: M.W.K

GEO - BOREHOLE LOG 103140.008_GINT_GEOTECH_2024-11-08.GPJ GEMTEC 2018.GDT 11/27/24

RECORD OF BOREHOLE BH24-2

CLIENT: Giampaolo Developments
PROJECT: Commercial Storage and Truck and Trailer Parking, 13291 Airport Road, Caledon, Ontario
JOB#: 103140.008
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Unknown
BORING DATE: Nov 5 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA (NATURAL, REMOULDED) / WATER CONTENT, %	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger, Solid Stem Auger (152mm OD)	Ground Surface									
		TOPSOIL			1A	SS	406	10			
		(CL) Silty Clay, trace organics, some sand to sandy; brown (TILL): cohesive, w<PL, hard		0.25	1B						
1					2	SS	457	30			
					3A	SS	279	6			
		(SP-SC) Gravelly SAND with CLAY, trace silt; brown to grey; non-cohesive, moist		1.60	3B						
2		(CL) Silty Clay, some sand, trace gravel; brown (TILL); cohesive, w<PL, hard		2.29	4A	SS	356	48			
					4B						
3					5	SS	457	39			
4											
					6	SS	254	50\0.102m			
5											
6					7A	SS	432	77\0.279m			
		- 0.1m thick silty sand layer at about 6.2m depth.			7B						
		End of Borehole		6.53							
7		1. Borehole dry upon completion.									
8											
9											
10											

GEMTEC
Consulting Engineers and Scientists

LOGGED: E.D
CHECKED: M.W.K

GEO - BOREHOLE LOG 103140.008_GINT_GEOTECH_2024-11-08.GPJ GEMTEC 2018.GDT 11/27/24

RECORD OF BOREHOLE BH24-3

CLIENT: Giampaolo Developments
PROJECT: Commercial Storage and Truck and Trailer Parking, 13291 Airport Road, Caledon, Ontario
JOB#: 103140.008
LOCATION: See Borehole Location Plan

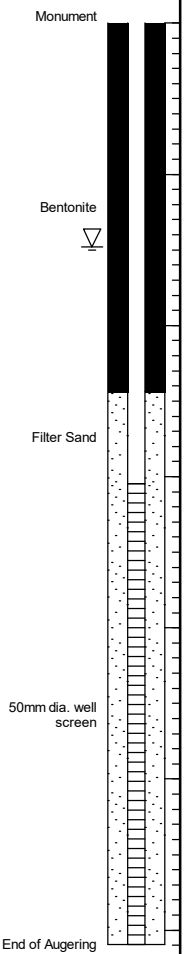
SHEET: 1 OF 1
DATUM: Unknown
BORING DATE: Nov 6 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
0	Power Auger Solid Stem Auger (152mm OD)	Ground Surface						
		TOPSOIL			1A	SS	483	4
		(CL) Sandy SILTY CLAY, trace gravel; brown/grey mottled (TILL); cohesive, w~PL to w<PL, firm to hard		0.18	1B			
1					2	SS	381	8
					3	SS	127	50\0.127m
2					4	SS	127	50\0.127m
3		- Auger grinding between about 3.05m and 4.42m.			5	SS	203	50\0.051m
4		- Auger refusal at 3.81m. Moved hole 3m South along fence line.			6	SS	76	50\0.076m
5								
6					7	SS	51	50\0.051m
		End of Borehole		6.15				
7		1. Monitoring well installed as shown upon completion of drilling.						
		2. Borehole dry upon completion.						
8								
9								
10								

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/11/27	1.5 ▽	

GEMTEC
Consulting Engineers and Scientists

LOGGED: E.D
CHECKED: M.W.K

GEO - BOREHOLE LOG 103140.008_GINT_GEOTECH_2024-11-08.GPJ GEMTEC 2018.GDT 11/27/24

RECORD OF BOREHOLE BH24-4

CLIENT: Giampaolo Developments
PROJECT: Commercial Storage and Truck and Trailer Parking, 13291 Airport Road, Caledon, Ontario
JOB#: 103140.008
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Unknown
BORING DATE: Nov 5 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA (NATURAL, REMOULDED) / WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger Solid Stem Auger (152mm OD)	Ground Surface									
		TOPSOIL			1A	SS	533	9			Monument
		(CL) Sandy SILTY CLAY, trace gravel; brown to grey mottled (TILL); cohesive, w<PL, very stiff to hard		0.18	1B						
1					2	SS	178	24			Bentonite
2					3	SS	457	26			
					4	SS	457	50			Filter Sand
3					5	SS	457	69			
4		- 0.3m thick silty sand layer at about 4.6m depth.			6A	SS	356	89\0.203m			50mm dia. well screen
		(ML) Sandy SILT, some clay, trace gravel; grey; cohesive, w~PL		4.80	6B						
5											
6		- Rock fragment blocking spoon tip in sample 7.			7	SS	102	50\0.102m			End of Augering
		End of Borehole		6.20							
		1. Monitoring well installed as shown upon completion of drilling.									
7		2. Borehole dry upon completion.									
8											
9											
10											

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/11/27	3.7 ▽	

GEMTEC
Consulting Engineers and Scientists

LOGGED: E.D
CHECKED: M.W.K

GEO - BOREHOLE LOG 103140.008_GINT_GEOTECH_2024-11-08.GPJ GEMTEC 2018.GDT 11/27/24

RECORD OF BOREHOLE BH24-5

CLIENT: Giampaolo Developments
PROJECT: Commercial Storage and Truck and Trailer Parking, 13291 Airport Road, Caledon, Ontario
JOB#: 103140.008
LOCATION: See Borehole Location Plan

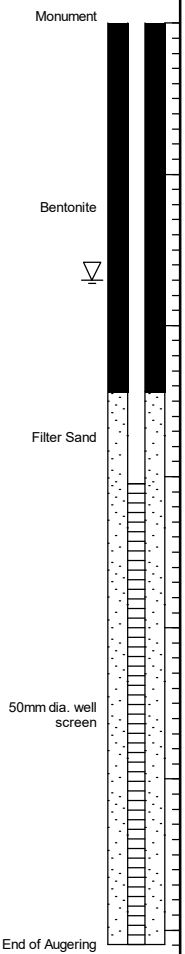
SHEET: 1 OF 1
DATUM: Unknown
BORING DATE: Nov 5 2024

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
0	Power Auger Solid Stem Auger (152mm OD)	Ground Surface						
		TOPSOIL			1A	SS	584	3
		(CL) SILTY CLAY, trace sand, trace gravel; brown to grey mottled (TILL); cohesive, w<PL, stiff to hard		0.15	1B			
1					2	SS	457	13
2					3	SS	457	11
					4	SS	457	13
3					5	SS	457	22
4		- 0.1m thick silty sand layer at about 4.6m depth. - Rock fragment blocking spoon tip in sample 6.			6	SS	203	50\0.051m
5								
6					7	SS	457	94
		End of Borehole 1. Monitoring well installed as shown upon completion of drilling. 2. Borehole dry upon completion.		6.55				
7								
8								
9								
10								

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/11/27	1.7 ▽	

GEMTEC
Consulting Engineers and Scientists

LOGGED: E.D
CHECKED: M.W.K

GEO - BOREHOLE LOG 103140.008_GINT_GEOTECH_2024-11-08.GPJ GEMTEC 2018.GDT 11/27/24

RECORD OF BOREHOLE BH24-6

CLIENT: Giampaolo Developments
PROJECT: Commercial Storage and Truck and Trailer Parking, 13291 Airport Road, Caledon, Ontario
JOB#: 103140.008
LOCATION: See Borehole Location Plan

SHEET: 1 OF 1
DATUM: Unknown
BORING DATE: Nov 6 2024

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m / DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m / SHEAR STRENGTH (Cu), kPA / WATER CONTENT, %	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger Solid Stem Auger (152mm OD)	Ground Surface									Monument
		TOPSOIL			1A	SS	279	50\0.27m			
		(SM) SILTY SAND; brown; non-cohesive, moist		0.18	1B						
1		(CL) SILTY CLAY, some sand, trace gravel; brown to grey (TILL); cohesive, w<PL to w~PL, hard		0.76	2	SS	127	50\0.27m			Bentonite
					3	SS	279	50\0.27m		MH	
2					4	SS	279	50\0.27m			
3					5	SS	279	50\0.27m			Filter Sand
4											
5					6	SS	457	34			50mm dia. well screen
6					7	AS	0	50\0.051m			End of Augering
		End of Borehole 1. Monitoring well installed as shown upon completion of drilling.		6.15							
7											
8											
9											
10											

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA: + NATURAL ⊕ REMOULDED
WATER CONTENT, %: W_P — W — W_L
10 20 30 40 50 60 70 80 90

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
24/11/06	5.5 ▽	
24/11/27	2.5 ▼	

GEMTEC
Consulting Engineers and Scientists

LOGGED: E.D
CHECKED: M.W.K

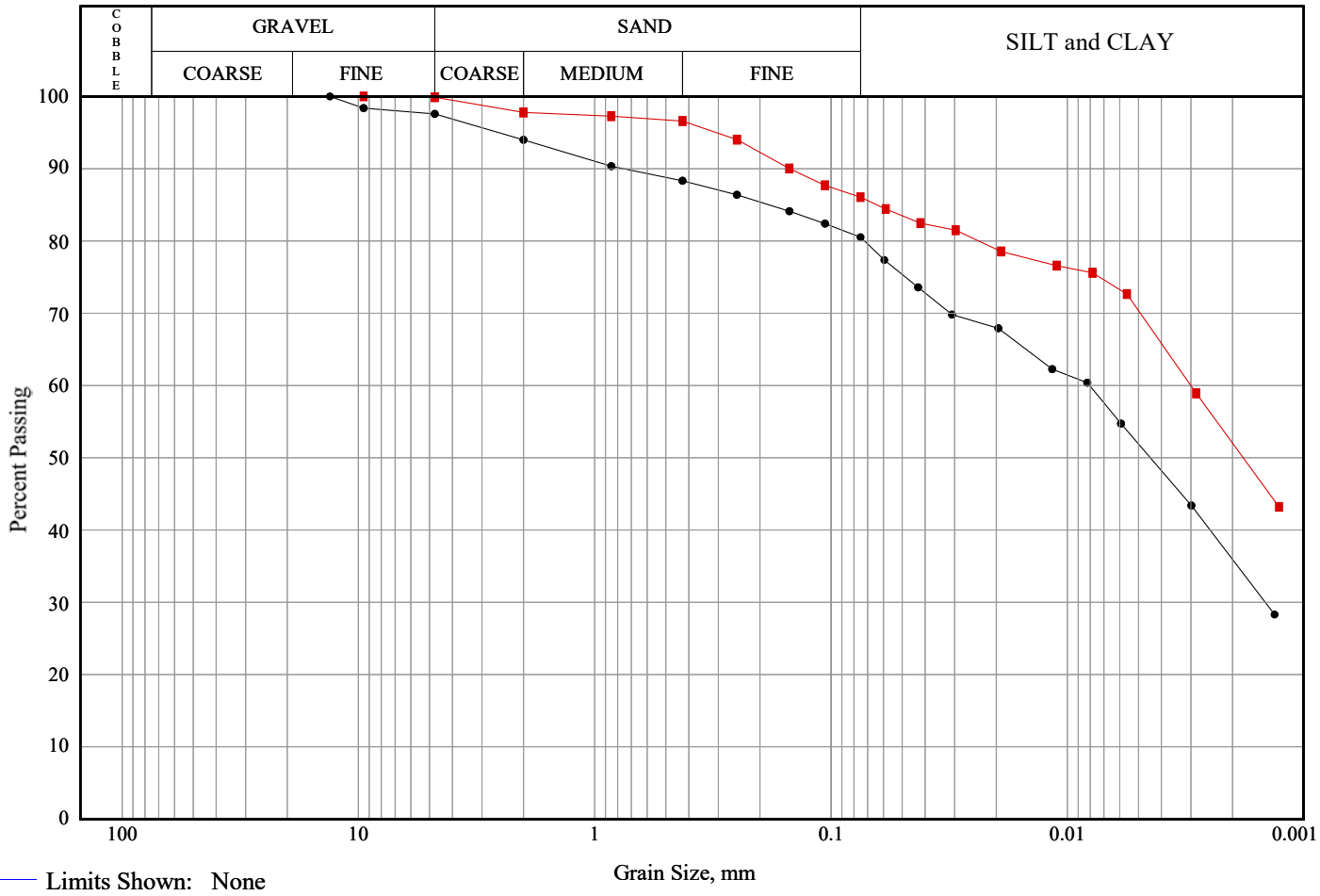
GEO - BOREHOLE LOG 103140.008_GINT_GEOTECH_2024-11-08.GPJ GEMTEC 2018.GDT 11/27/24

APPENDIX D

Laboratory Test Results

GEMTEC Consulting Engineers and Scientists	Client: Giampaolo Developments	Soils Grading LS-702/ASTM D-422
	Project: Commercial Storage and Truck and Trailer Parking, 13291 Airport Road, Caledon, Ontario	
	Project #: 103140008	

Note: More information available upon request

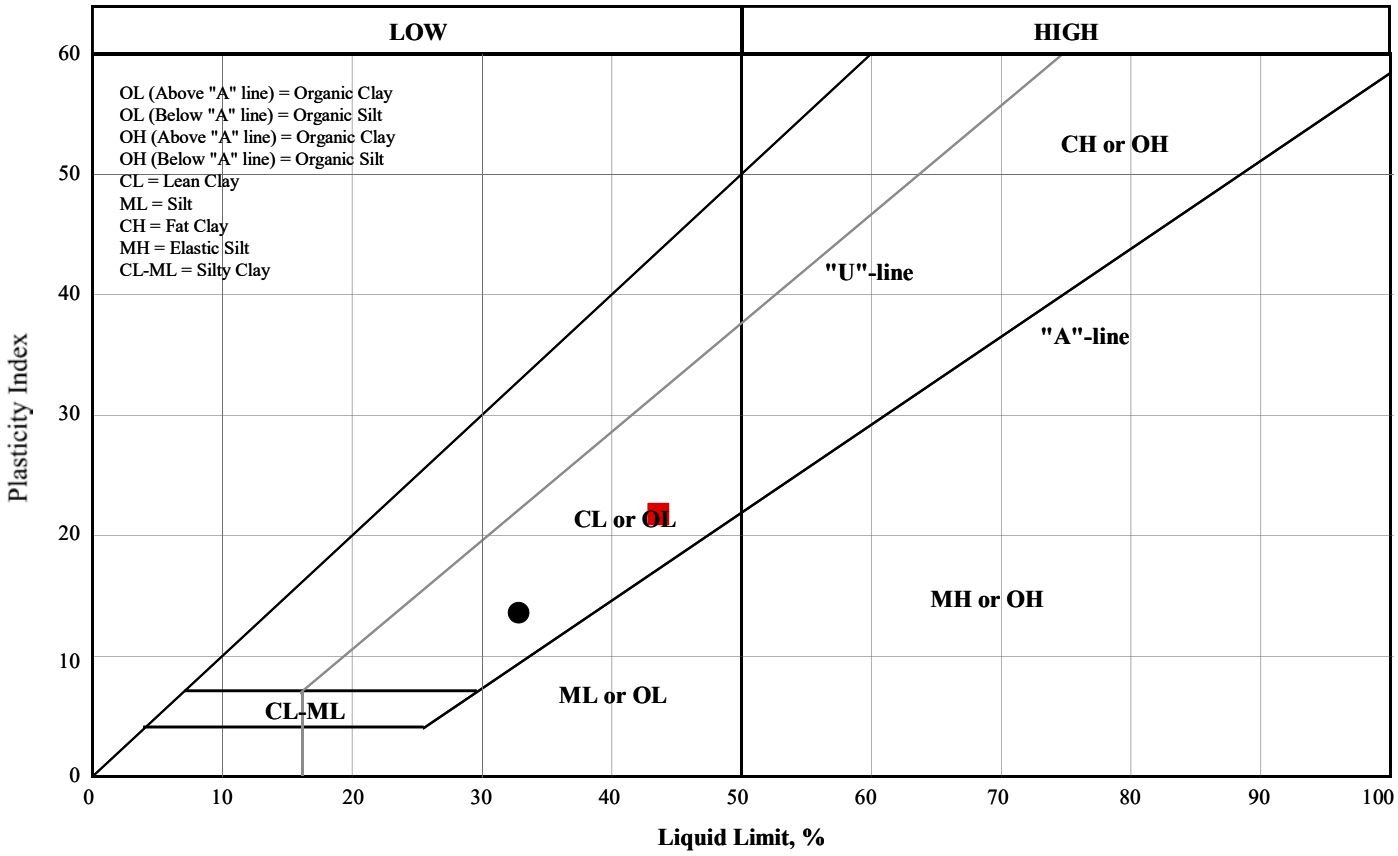


Limits Shown: None

Line Symbol	Sample	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt and Clay
●		BH24-1	SA-3	1.5-2.0	2.4	17.1	80.5
■		BH24-6	SA-3	1.5-1.8	0.1	13.8	86.0

Line Symbol	USCS Classification	USCS Symbol	D_{10}	D_{15}	D_{30}	D_{50}	D_{60}	D_{85}	% 5-75µm
●	Silt and clay , some sand , trace gravel	CL	---	---	0.00	0.00	0.01	0.18	44.6
■	Silty clay , some sand , trace gravel	CL	---	---	---	0.00	0.00	0.06	34.0

GEMTEC Consulting Engineers and Scientists Oshawa, ON	Client: Giampaolo Developments Project: Commercial Storage and Truck and Trailer Parking, 13291 Airport Road, Caledon, Ontario Project #: 103140008	Plasticity Chart (LS-7034/ASTM D4318)



Symbol	Borehole /Test Pit	Sample Number	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Non-Plastic	Moisture Content, %
●	BH24-1	SA-3	1.5-2.0	32.8	19.2	14	N/A	14.9
■	BH24-6	SA-3	1.5-1.8	43.6	21.8	22	N/A	14.5

Note: More information available upon request

experience • knowledge • integrity

civil	civil
geotechnical	géotechnique
environmental	environnement
structural	structures
field services	surveillance de chantier
materials testing	service de laboratoire des matériaux

expérience • connaissance • intégrité