

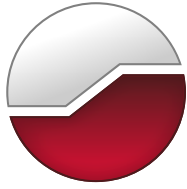


# GEMTEC

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**Geotechnical Investigation  
Proposed Mixed-Use Development  
1052, 1060, and 1064 St. Laurent Boulevard  
Ottawa, Ontario**

GEMTEC Project: 103499.002



# GEMTEC

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Submitted to:

Stan Bernard Automotive Limited  
1469 Youville Drive  
Orelans, Ontario  
K1C 4R1

**Geotechnical Investigation  
Proposed Mixed-Use Development  
1052, 1060, and 1064 St. Laurent Boulevard  
Ottawa, Ontario**

January 7, 2026  
GEMTEC Project: 103499.002

GEMTEC Consulting Engineers and Scientists Limited  
32 Steacie Drive  
Ottawa, ON, Canada  
K2K 2A9

January 7, 2026

File: 103499.002 – R01

Stan Bernard Automotive Limited  
1469 Youville Drive  
Orelans, Ontario  
K1C 4R1

Attention: Mr. John McEwan

**Re: Geotechnical Investigation  
Proposed Mixed-Use Development  
1052, 1060, and 1064 St. Laurent Boulevard  
Ottawa, Ontario**

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Enclosed is GEMTEC Consulting Engineers and Scientists Limited's preliminary geotechnical investigation report for the above-noted project. The geotechnical investigation and report are based on the scope of work presented in our proposal dated May 28, 2025. This report was prepared by Chris Clarkson, P.Eng., and reviewed by Alex Meacoe, P.Eng..

We trust this information is sufficient for your current needs. If you have any questions or require further information, please contact the undersigned.



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Chris Clarkson, P.Eng.



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Alex Meacoe, P.Eng.

## EXECUTIVE SUMMARY

GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) was retained by Stan Bernard Automotive Limited to carry out a preliminary geotechnical investigation for the properties located at 1052, 1060, and 1064 St. Laurent Boulevard in Ottawa, Ontario.

This report presents the findings of a preliminary geotechnical investigation completed by GEMTEC for a proposed 30 storey mixed-use (commercial/residential) tower with a three storey underground parking garage located at 1052, 1060, and 1064 St. Laurent Boulevard in Ottawa, Ontario. The investigation included advancing eight boreholes at the Site, including the installation of groundwater monitoring wells.

The site is presently occupied by low-rise commercial structures. Subsurface conditions were found to be generally consistent across the boreholes. The subsurface conditions generally consist of surficial layers of asphaltic concrete or concrete slab over fill material, sandy silt, and glacial till. The limestone bedrock was encountered at a depth of about 5.9 metres below the existing ground surface.

The site is considered suitable for the proposed development, with a foundation system consisting of either shallow footings on the competent limestone bedrock, or supported on deep foundations, such as piles. Depending on the depth of the underside of footings, the excavations will require groundwater management and possibly shoring.

Only conceptual information about the proposed development was available at the time of the geotechnical investigation. The recommendations provided in this report are preliminary in nature, and, as the design of the development progresses, these plans should be provided to GEMTEC for review.

Further ground investigation works should be completed for the proposed development to identify geohazards and establish appropriate methods and actions to manage these geohazards.

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Appendix C	Chemical Analysis of Soil Samples

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## **1.0 INTRODUCTION**

This report presents the results of a preliminary geotechnical investigation carried out for the proposed mixed-use (commercial/residential) development for the properties located at 1052, 1060, and 1064 St. Laurent Boulevard in Ottawa, Ontario, herein referred to as 'the Site'.

The purpose of the investigation was to identify the general subsurface and groundwater condition, by means of a limited number of boreholes, and based on the factual information obtained, to provide engineering guidelines on the geotechnical design aspects of the project, including construction consideration that could influence design decisions.

This report is subject to the Conditions and Limitations of This Report, which follows the text of the report, and which are considered an integral part of the report.

## **2.0 BACKGROUND**

### **2.1 Project Description**

Plans are being prepared to construct a mixed-use development across the three identified properties. The following is known about the Site and project:

- 1052 St. Laurent Boulevard: currently occupied by a two-storey building with a basement.
- 1060 St. Laurent Boulevard: currently occupied by a one-storey building with a basement.
- 1064 St. Laurent Boulevard: currently occupied by a one-storey building housing.
- The proposed structure will be constructed across the three properties. It is expected to be approximately 30 storeys in height, with the ground level designated for commercial use and the upper levels consisting of residential units. The structure will also include a three-storey underground parking garage.

No other details are known at the time of preparing this report.

### **2.2 Previous Investigation**

No records of previous geotechnical investigations were provided to GEMTEC. (Records of environmental investigations were provided).

### **2.3 Site Geology**

Surficial geology maps indicates that the Site is underlain by deposits of silty clay over bedrock. Bedrock geology maps indicate shale of the Billings formation present below the soil cover at depths ranging from about 3 to 10 metres.

## **3.0 METHODOLOGY**

### **3.1 Geotechnical Investigation**

The fieldwork for this investigation was carried out on October 3, 6, 9, and 10, 2025. On those dates, eight boreholes, identified as 25-01 to 25-08 inclusive, were advanced to depths ranging from about 2.4 to 9.4 metres, at the approximate locations shown on the Site Plan, Figure 1.

It should be noted that boreholes 25-02, 25-03, and 25-04 were advanced inside the existing buildings using portable drilling techniques. Borehole 25-02 was advanced through the basement level of 1052 St. Laurent Blvd, while boreholes 25-03 and 25-04 were advanced through the ground surface level inside 1064 St. Laurent Blvd.

The exterior boreholes were advanced using a track mounted drill rig supplied and operated by Strata Drilling Group of Whitchurch-Stouffville, Ontario. Standard penetration tests were carried out in borehole 25-01 and 25-05 and samples of the soils encountered in these boreholes were recovered using a 50-millimetre diameter split spoon sampler. At other borehole locations sampling by direct push was performed for environmental purposes.

A monitoring well was installed in boreholes 25-02 to 25-06, inclusive, for subsequent measurement of the groundwater level. The groundwater level was measured in the monitoring wells on October 27, 2025. The groundwater level in the other boreholes was measured upon completion, where possible.

The fieldwork was supervised throughout by a member of our engineering staff, who directed the drilling operation, logged the soil samples, and carried out the in-situ testing.

Following completion of the fieldwork, the soil samples were tested for water content and grain size distribution testing. In addition, one of the recovered samples was sent to an accredited analytical laboratory for sulphate and chloride testing to assess the corrosive potential of the soils to exposed concrete and steel.

The investigation points were positioned at the Site by GEMTEC and placed relative to existing features. The locations and ground surface elevations of the boreholes were determined using a precision GPS survey instrument. The coordinates of the boreholes are referenced to NAD83 (CSRS) Epoch 2010, vertical network CGVD28.

It should be noted that the ground surface elevations at boreholes 25-02, 25-03, and 25-04 were measured using laser level surveying equipment from a known elevation. The “ground surface” is referenced to the surface where the boreholes were advanced (i.e., the slab on grade or basement floor slab).

## **4.0 SUBSURFACE CONDITIONS**

### **4.1 General**

Descriptions of the subsurface conditions logged in the boreholes are provided on the Record of Borehole Sheets in Appendix A. The results of the laboratory classification testing are provided on the Record of Borehole Sheets and in Appendix B. The rock core photographs are saved in Appendix C. The results of the chemical analysis on the selected soil samples are provided in Appendix D.

The sections below provide a description of the subsurface conditions encountered in the boreholes advanced as part of this investigation.

### **4.2 Surfacing Layers of Asphalt and Concrete**

Asphaltic concrete and Portland cement concrete are present at ground surface at all borehole locations.

The asphaltic concrete present at boreholes 25-01 and 25-05 to 25-08 has a thickness ranging from about 30 to 130 millimetres. A layer of base/subbase material is present below the asphaltic concrete, with thicknesses ranging from about 70 to 630 millimetres. The base/subbase layers are typically granular in composition. Refer to the borehole logs for detailed description of the material composition at each borehole location.

The concrete surfacing in boreholes 25-02, 25-03, and 25-04 have thicknesses ranging from about 180 to 390 millimetres. A layer of gravel with some sand with a thickness of about 20 millimetres was present within the concrete surfacing at borehole 25-04.

### **4.3 Fill Material**

A layer of fill material is present below the pavement and concrete layers at the boreholes, with the exception of borehole 25-02. The fill material is granular and is described as a sand with varying amounts of non-plastic fines and gravel. The fill material extends to depths ranging from about 1.5 to 3.1 metres.

Two standard penetration tests carried out in the fill material gave N values of 10 and 20 blows per 0.3 metres of penetration, which reflects a loose to compact relative density.

The measured water content on two samples of the fill material are about 20 and 21 percent.

### **4.4 Sandy Silt**

A native deposit of sandy silt is present below the fill material in boreholes 25-01, 25-02, 25-03, 25-06, 26-07 and 25-08. Borehole 25-02 was terminated at a depth of about 2.4 metres without encountering the base of the sandy silt deposit. At the other borehole locations, the sandy silt deposit extends to depths ranging from about 3.1 to 4.1 metres.

The measured water content on one sample of the sandy silt is about 21 percent.

#### 4.5 Glacial Till

A native deposit of glacial till is present below the fill material and sandy silt, where encountered, in the boreholes, with the exception of borehole 25-02.

The glacial till is a heterogeneous mixture of all grain sizes, which at this site, can be described as a silty sand and gravel to a gravelly sandy silt. Although no directly encountered in the boreholes, the glacial till deposit is known to contain cobbles and boulders.

The glacial till deposit extends to a depth of about 5.9 metres below the existing ground surface in borehole 25-05. At the other boreholes, the glacial till was not fully penetrated, but was proven to a depth of up to about 3.8 metres.

Standard penetration tests carried out within the glacial till deposit range from 5 to 17 blows per 0.3 metres of penetration, which reflects a loose to compact relative density.

The results of grain size distribution tests carried out on two samples of glacial till are summarized in Table 4.1. The measured water content of seven samples of the glacial till ranges from about 9 to 15 percent.

**Table 4.1 – Summary of Grain Size Distribution Test, Glacial Till**

Borehole ID	Sample Number	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
25-01	5	17	29	44	10
25-05	7	31	37	23	9

#### 4.6 Casing Refusal

Casing refusal was encountered in boreholes 25-01, 25-03, and 25-04 at depths ranging from about 5.6 to 5.9 metres.

#### 4.7 Limestone Bedrock

Limestone bedrock was encountered in borehole 25-05 at a depth of about 5.9 metres and cored to a depth of about 9.4 metres below the existing ground surface. The recovered core is described as slightly weathered to fresh, thinly bedded limestone with interbedded shale. Total core recovery throughout was 100 percent, solid core recovery ranged from 75 to 100 percent, and rock quality designation (RQD) ranged from 0 to 100 percent. Excluding the initial short core run the RQD is greater than 77 percent.

According to the system provided in the Canadian Foundation Engineering Manual (5<sup>th</sup> Edition) the bedrock at this location can be classified as Good to Excellent quality.

The results of unconfined compressive strength testing carried out on samples of recovered bedrock core from borehole 25-05 and the resulting rock strength classification are presented in Table 4.2. The rock strength classification in the Canadian Foundation Engineering Manual (5<sup>th</sup> Edition) has been applied.

**Table 4.2 – Results of Unconfined Compressive Testing of Rock Cores**

Borehole ID	Depth (metres)	Rock Compressive Strength (megapascals)	Rock Strength Classification
25-05	6.3 to 6.5	71	Strong
25-05	8.8 to 9.1	118	Very Strong

#### 4.8 Groundwater Level

The groundwater level in the monitoring wells in boreholes 25-02, 25-03, 25-04, 25-05, and 25-06, were measured on October 27, 2025, and are presented in Table 4.3. The groundwater levels may be higher during wet periods of the year such as the early spring or following periods of precipitation.

**Table 4.3 – Groundwater Level Depths and Elevations**

Borehole ID	Ground Surface Elevation (metres)	Groundwater Depth (metres)	Groundwater Elevation (metres)	Date of Reading
25-02	67.2	0.4	66.8	October 27, 2025
25-03	70.2	1.8	68.4	October 27, 2025
25-04	70.2	1.7	68.5	October 27, 2025
25-05	70.1	1.7	68.4	October 27, 2025
25-06	69.8	2.1	67.7	October 27, 2025

## 4.9 Chemistry Relating to Corrosion

The results of chemical testing of one soil sample recovered from borehole 25-06 is summarized in Table 4.4.

**Table 4.4 – Soil Chemistry Related to Corrosion**

Parameter	Borehole 25-06 Sample 3
Resistivity (ohm.m)	6.2
pH	7.74
Chloride Content (ug/g)	1,060
Sulphate Content (ug/g)	44

## 5.0 GEOTECHNICAL GUIDELINES AND RECOMMENDATIONS

### 5.1 General

At the time of preparing this report, the final details for the proposed structures were not available to GEMTEC. The recommendations provided in the following sections may require review as the design of the project progresses and further details are made available to GEMTEC. The guidelines and recommendations provided herein are preliminary in nature, further geotechnical investigations should be undertaken as the design progresses.

### 5.2 Site Grade Raise Restriction

Preliminary indications suggest that moderate grade raise filling (in the order of 1 metre) can be carried out at this Site. Further investigation and analysis will be required should additional grade raise filling be proposed for the Site.

### 5.3 Excavation and Groundwater Management

#### 5.3.1 Excavations

The excavations for the proposed structures will be carried out through the fill material, silt deposits, and into glacial till. Some minor bedrock excavation may also be required. Excavation of overburden soils should not present significant constraints in terms of excavation effort, noting that large boulders may be encountered in the glacial till, and that the fractured bedrock may be encountered primarily as boulder sized fragments of rock.

The sides of open excavations should be sloped in accordance with the requirements in Ontario Regulation 213/91 under the Occupational Health and Safety Act. According to the Act, the soils

at the Site above the can be classified as Type 3 and, accordingly, allowance should be made for excavation side slopes of 1 horizontal to 1 vertical, or flatter, excavation slopes for soils above the groundwater level. In the case that excavation is carried out below the groundwater level in the sandy soil, the soils can be classified as Type 4, requiring excavation side slopes of 3 horizontal to 1 vertical. It should be noted that where more than one soil Type is encountered in an excavation, the highest number is applicable to the full excavation. Consideration should be given to utilizing some form of retaining wall and/or shoring system to minimize the dimensions of the excavations, for instance a soldier pile and lagging wall system.

The upper portion of the limestone bedrock can likely be carried out using larger hydraulic excavating equipment and hoe-ramming. Deeper excavations into the higher quality, stronger bedrock will likely require drill and blast techniques to achieve reasonable rates of excavation.

### **5.3.2 Temporary Groundwater Management**

Excavations will likely extend below the groundwater level and therefore some groundwater inflow into the excavations should be anticipated. Accurate estimates of groundwater inflow are not possible at this time.

Perched groundwater levels may be encountered in the uncontrolled fill material. Groundwater inflow from the glacial till unit is not expected to be significant. Increased inflow may occur where granular zones are encountered. Any fractured rock zones may be water bearing and groundwater inflow from this unit could be experienced, particularly following periods of heavy precipitation, although groundwater inflow may diminish overtime. Groundwater inflow from lower more competent limestone bedrock is not likely to be significant and could likely be managed by pumping from within the excavation.

The overall quantity of water to be managed will depend on the overall dimensions of the excavation, which is unknown at this time, and the approach to shoring the excavations (if any is to be used).

## **5.4 Foundation Design**

The proposed structure should be founded on shallow spread footings bearing on limestone bedrock. In the case that bedrock depths are significantly below the anticipated basement level the use of pile foundations could also be considered.

For design purposes, footings bearing on suitably prepared bedrock can be sized for a factored geotechnical resistance at Ultimate Limit State (ULS) of 1,000 kilopascals. The post construction total and differential settlement of the footings on bedrock should be minimal.

## **5.5 Frost Protection of Foundations**

All exterior footings should be provided with at least 1.5 metres of earth cover for frost protection purposes which is likely to be achieved for a structure with two basement levels. Isolated (unheated) footings that are located in areas that are to be cleared of snow should be provided with at least 1.8 metres of earth cover for frost protection purposes. The requirement for minimum depths of soil cover for frost protection of foundations could likely be waived for foundations on or within relatively sound bedrock, or where non-frost susceptible engineered fill material (i.e., Ontario Provincial Standards Specification (OPSS) Granular A or B) is placed over bedrock. An evaluation of the frost susceptibility of the bedrock at subgrade level could be carried out by geotechnical personnel at the time of construction, prior to placement of engineered fill.

## **5.6 Basement Slab Support and Drainage**

The base for the floor slab should consist of at least 300 millimetres of 19 millimetre clear crushed stone. Nominal compaction of the clear stone, with at least 2 passes of a diesel plate compactor, is recommended.

Underfloor drains are not considered essential provided that the clear stone can outlet to a sump and drains are installed to link any hydraulically isolated areas in the basement.

Alternatively, material meeting OPSS Granular A could be for the slab base material. However, in that instance we suggest that drainage be provided by means of plastic perforated pipes spaced at about 5 metres on centre or as required to link any hydraulically isolated areas in the basement. The pipes should discharge to a sump from which the collected water is pumped.

## **5.7 Basement Wall Backfill and Drainage**

Foundation drainage and foundation wall damp proofing should be installed where floor slabs will be constructed below the exterior ground level.

The approach to basement wall backfill and drainage will depend, in part, on the construction methodology used for the basement walls and the level of the foundations and basement walls relative to bedrock, which is unknown at this time. Further commentary can be provided as additional information on the subsurface conditions and structure configuration are known.

## **5.8 Lateral Earth Pressures**

The selection of the appropriate value of lateral earth pressure coefficient (i.e., active, at rest) for design depends on the permissible movement in the foundation wall and the design approach adopted. For instance, relatively large wall movements are typically required to generate “active” earth pressure conditions and, as such, the use of “at rest” earth pressure coefficients are recommended for design purposes unless the structures are specifically designed for such movements to occur. It should be noted that even larger movements are required to generate full “passive” conditions.

Seismic shaking can increase the forces on the retaining wall. The selection of the appropriate value of dynamic earth pressure coefficient (considering full or 50 percent peak ground acceleration (PGA) values) for design depends on the permissible movement in the retaining structures and the design approach adopted. For instance, for non-yielding structures the use of full PGA is recommended, while for yielding structures (i.e., those that permit more movement) a reduced PGA value may be applied.

Further details can be provided as the design progresses and once the applicable seismic Site Class/Site designation value is confirmed.

## **5.9 Seismic Design of Proposed Structures**

The current level of investigation limits the applicable seismic Site Class / Site Designation to C. Provided the structure is founded on bedrock, in our opinion, seismic Site Class / Site Designation B could be justified however, further investigations are required to confirm this.

## **5.10 Site Services**

Commentary on the proposed below ground services can be provided as additional information on the subsurface conditions and structure configuration are known. Refer to Section 5.4 for commentary on trench excavations.

As an alternative to sloping the excavations, the excavations could be carried out within a tightly fitting, braced steel trench support system, which is designed specifically for this purpose and meets the requirements in the Occupational Health and Safety Act. It should be noted that the presence of cobbles and boulders may impede the installation of trench support systems.

## **5.11 Access Roadway/Parking Areas**

Commentary on the proposed access roadways and parking areas can be provided as additional information on the subsurface conditions and structure configuration are known.

## **5.12 Corrosion of Buried Concrete and Steel**

According to Canadian Standards Association (CSA) "Concrete Materials and Methods of Concrete Construction", the concentration of sulphate in the soil samples recovered from borehole 25-06 can be classified as low. For low exposure conditions, any concrete that will be in contact with the native soil or groundwater could be batched with General Use (GU) type cement. The effects of freeze thaw in the presence of de-icing chemical (sodium chloride) near the buildings should be considered in selecting the air entrainment and the concrete mix proportions for any exposed concrete.

Based on the resistivity and pH of the soil samples tested the soil can be generally classified as aggressive to slightly aggressive toward unprotected steel. It is noted that the corrosivity of the soil could vary throughout the year due to the application sodium chloride for de-icing.

## **6.0 ADDITIONAL CONSIDERATIONS**

### **6.1 Supplemental Investigation**

As indicated above, the recommendations provided in this report are based on preliminary design information.

As the design of the development progresses it is recommended that further ground investigation works be completed which should be tailored to the proposed development and the identified geohazards to establish appropriate methods and actions to manage these geohazards. The condition of the bedrock should be evaluated in greater detail across the site as variable conditions may be encountered. Further, an accurate assessment of the seismic Site Class (Site Designation) should be carried out to realise potential benefits. GEMTEC can assist with the development of a ground investigation program to address these considerations.

### **6.2 Effects of Construction Induced Vibration**

Some of the construction operations (such as excavation, hoe ramming/blasting, granular material compaction, etc.) will cause ground vibration on and off site. The vibration effects of hoe ramming are usually minor and localized. The vibrations will attenuate with distance from the source but may be felt at nearby structures.

Assuming that any excavating is carried out in accordance with the guidelines in this report, the magnitude of the vibrations will be much less than that required to cause damage to the nearby structures or services in good condition but may be felt at the nearby structures. We recommend that preconstruction surveys be carried out on any adjacent structures and that vibration monitoring be carried out during bedrock excavation to ensure that vibrations are below typical threshold values and so that any damage claims can be addressed in a fair manner.

Vibration monitoring could be carried out, at least initially, by a specialist consultant who could confirm that vibrations are below acceptable thresholds.

### **6.3 Excess Soil Management Plan**

This report does not constitute an excess soil management plan. The disposal requirements for excess soil from the site have not been assessed.

## 7.0 CLOSURE

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



Chris Clarkson, P.Eng.  
Junior Geotechnical Engineer



Alex Meacoe, P.Eng.  
Senior Geotechnical Engineer



DC/CC/WAM  
Enclosures

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## GEOTECHNICAL REPORT CONDITIONS & LIMITATIONS

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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 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.

**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.

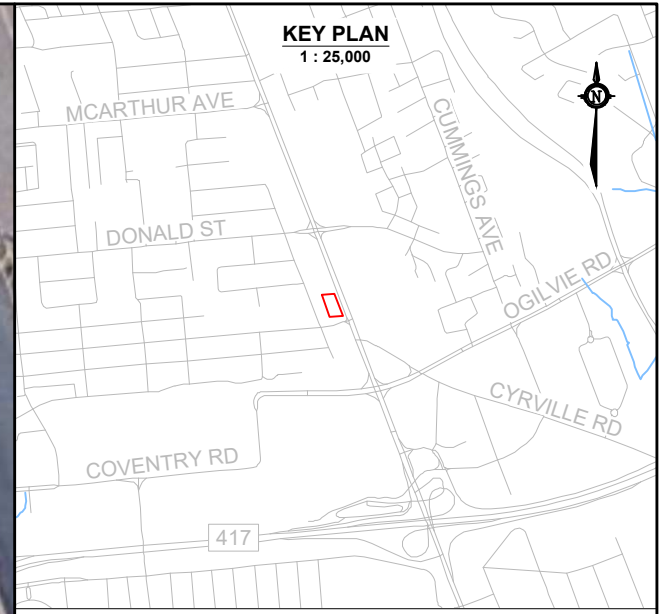
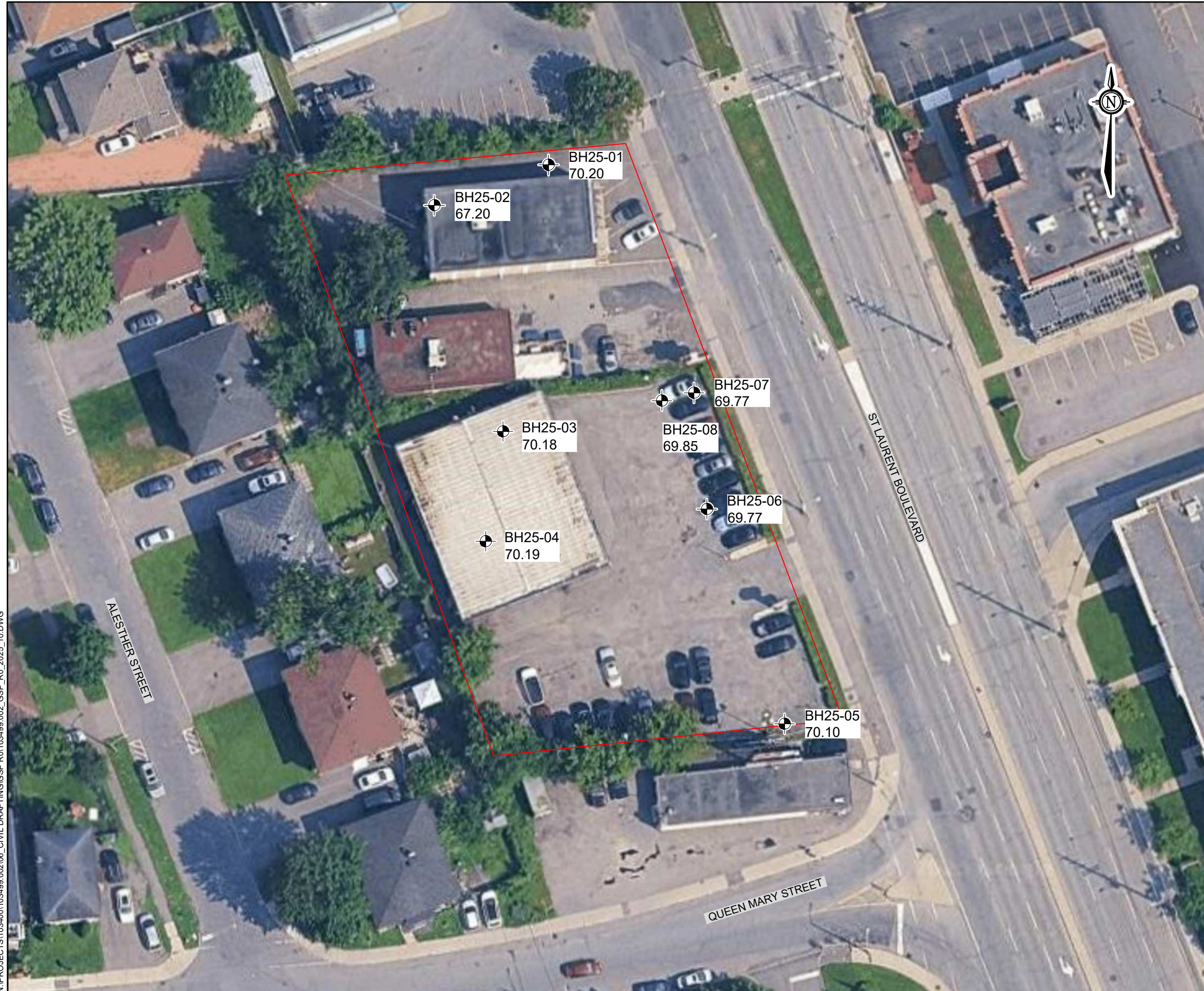
**FOLLOW-UP AND CONSTRUCTION SERVICES:** All details of the design were not known at the time of submission of GEMTEC's report. GEMTEC should be retained to review the final design, project plans and documents prior to construction, to confirm that they are consistent with the intent of GEMTEC's report.

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.

**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.

**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.

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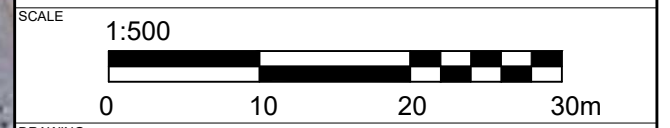


**LEGEND**

- BH # ← BOREHOLE ID
- XX.XX ← GROUND SURFACE ELEVATION, IN METRES  
GEODEIC DATUM
- ⊕ ← BOREHOLE LOCATION  
(current investigation by GEMTEC)
- APPROXIMATE SITE BOUNDARY

**DATA SOURCES AND REFERENCES**

- Coordinate system: CSRS.UTM-18N
- Distances, elevations, and coordinates are shown in metres unless denoted otherwise
- This drawing is a schematic representation and should not be taken as a substitute for a legal survey.
- Image ©2025 Google Maps, CNES / Airbus, First Base Solutions, Maxar Technologies
- Contains information licensed under the Open Government Licence – Ontario
- Geographic dataset source: Ontario GeoHub



DRAWING **SITE PLAN**

CLIENT **STAN BERNARD AUTOMOTIVE LIMITED**

PROJECT **GEOTECHNICAL INVESTIGATION  
PROPOSED MIXED-USE DEVELOPMENT  
1052, 1060, AND 1064 ST. LAURENT BOULEVARD  
OTTAWA, ONTARIO**

DRAWN BY **SL** CHECKED BY **WAM**

PROJECT NO. **103499.002** REVISION NO. **0**

DATE **JANUARY 2026** FIGURE NO. **FIGURE 1**

**GEMTEC**  
CONSULTING ENGINEERS  
AND SCIENTISTS

32 Steacie Drive  
Ottawa, ON, K2K 2A9  
Tel: (613) 836-1422  
www.gemtec.ca  
ottawa@gemtec.ca



## **APPENDIX A**

Record of Borehole Logs  
List of Abbreviations and Symbols  
Boreholes 25-01 to 25-08

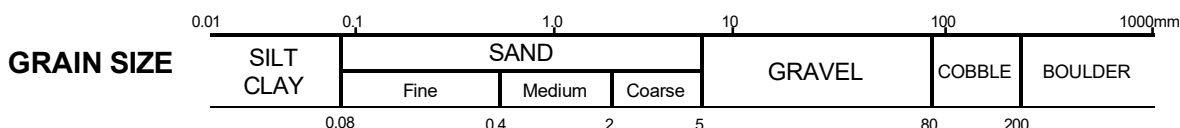
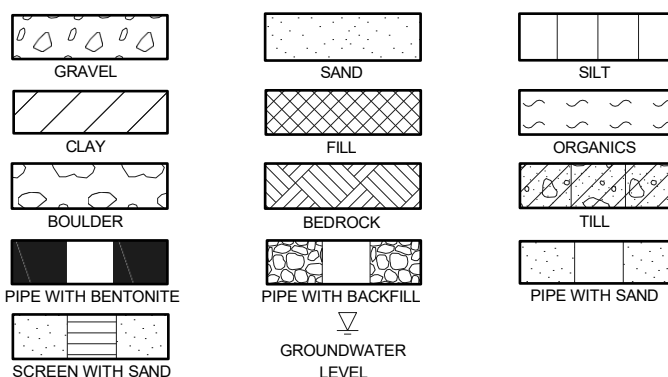
# ABBREVIATIONS AND TERMINOLOGY USED ON RECORDS OF BOREHOLES AND TEST PITS

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 <sub>p</sub>	Plastic limit
LL, w <sub>L</sub>	Liquid limit
C	Consolidation (oedometer) test
D <sub>R</sub>	Relative density
DS	Direct shear test
G <sub>s</sub>	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	
<p><b>Standard Penetration Resistance, N</b>                      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.</p>	
<p><b>Dynamic Penetration Resistance</b>                      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.).</p>	
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



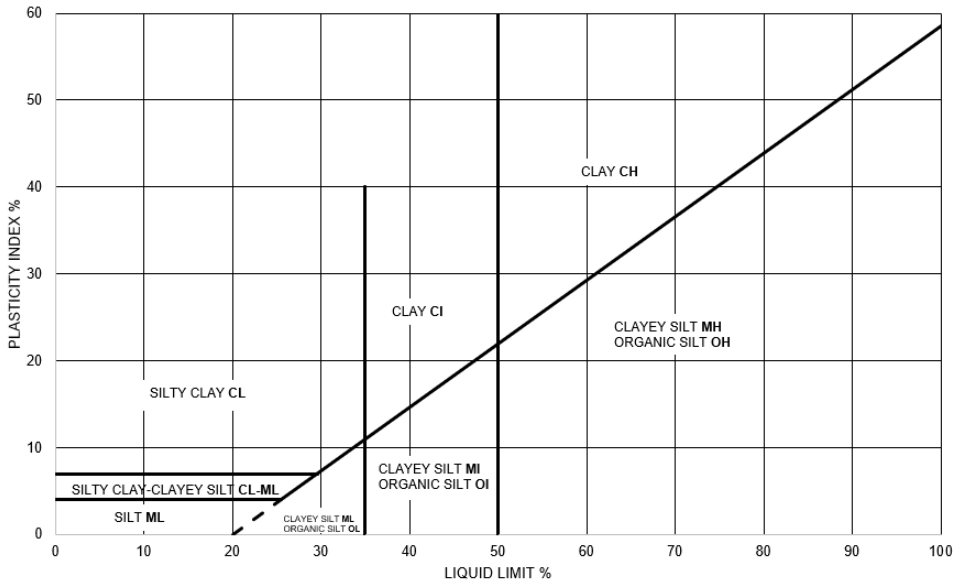
## DESCRIPTIVE TERMINOLOGY

TRACE	SOME	ADJECTIVE	noun > 30% and main fraction
trace clay, etc	some gravel, etc.	silty, etc.	sand and gravel, etc.

## Method of Soil Classification

GEMTEC's Soil Classification is based on the MTC Soil Classification Manual (January 1980)

Organic or Inorganic	Soil Group	Type of Soil		Gradation or Plasticity	$C_u = \frac{D_{60}}{D_{10}}$	$C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$	USCS Group Symbol	Group Name		
Inorganic (Organic Content less than 30%)		Gravel (>50% of coarse fraction is > 4.75 mm)	Gravel with ≤12% fines	Poorly Graded	<4	≤1 or ≥3	GP	Gravel		
				Well Graded	≥4	1 to 3	GW	Gravel		
			Gravel with >12% fines	Below A Line	N/A		GM	Silty Gravel		
				Above A Line	N/A		GC	Clayey Gravel		
		Sand (≥50% coarse fraction is > 4.75 mm)	Sand with ≤12% fines	Poorly Graded	<6	≤1 or ≥3	SP	Sand		
				Well Graded	≥6	1 to 3	SW	Sand		
			Sand with >12% fines	Below A Line	N/A		SM	Silty Sand		
				Above A Line	N/A		SC	Clayey Sand		
			Soil Group	Type of Soil	Liquid Limit	Field Tests			USCS Group Symbol	Group Name
				Fine Grained Soils (≥50% is smaller than 0.075 mm)	Silts (Non-Plastic or PI and LL plot below A-Line)	<50	Rapid	>6 mm	N/A	ML
	Slow	3 to 6 mm					None to low	ML	Clayey Silt	
	Slow to V. Slow	3 to 6 mm					Low	OL	Organic Silt	
	≥50	Slow to V. Slow				3 to 6 mm	Low to Medium	MH	Clayey Silt	
		None				1 to 3 mm	Medium to High	OH	Organic Silt	
		Clays (PI and LL plot above A-Line)				Liquid Limit <35	None	~3 mm	Low to Medium	CL
Liquid Limit 35 to 50	None				1 to 3 mm	Medium	CI	Silty Clay		
Liquid Limit >50	None				<1 mm	High	CH	Clay		
Highly Organic (> 30%)	Peat (Amorphous or Fibrous)						PT	Peat		



**Dual Symbol** – Is used to indicate when soils are transitional. For coarse grained soils, it is used when the soil has between 5 and 12% fines (e.g., SP-SC, Sand to Silty Sand). For fine-grained soils it is used when the plasticity index and liquid limit values plot in the area shown in the plasticity chart on this page.

**Borderline Symbol** – Is used to indicate soils that are not clearly in one soil type but have similar behaviour and properties as similar materials (e.g., CL/CI or GM/SM).

## LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

WEATHERING STATE	
Fresh	No visible sign of rock material weathering
Faintly weathered	Weathering limited to the surface of major discontinuities
Slightly weathered	Penetrative weathering developed on open discontinuity surfaces but only slight weathering of rock material
Moderately weathered	Weathering extends throughout the rock mass but the rock material is not friable
Completely weathered	Rock is wholly decomposed and in a friable condition but the rock and structure are preserved

CORE CONDITION
<p><b>Total Core Recovery (TCR)</b> The percentage of solid drill core recovered regardless of quality or length, measured relative to the length of the total core run</p>
<p><b>Solid Core Recovery (SCR)</b> The percentage of solid drill core, regardless of length, recovered at full diameter, measured relative to the length of the total core run.</p>
<p><b>Rock Quality Designation (RQD)</b> The percentage of solid drill core, greater than 100 mm length, as measured along the centerline axis of the core, relative to the length of the total core run. RQD varies from 0% for completed broken core to 100% for core in solid segments.</p>

BEDDING THICKNESS	
Description	Thickness
Thinly laminated	< 6 mm
Laminated	6 - 20 mm
Very thinly bedded	20 - 60 mm
Thinly bedded	60 - 200 mm
Medium bedded	200 - 600 mm
Thickly bedded	600 - 2000 mm
Very thickly bedded	2000 - 6000 mm

DISCONTINUITY SPACING	
Description	Spacing
Very close	20 - 60 mm
Close	60 - 200 mm
Moderate	200 - 600 mm
Wide	600 - 2000 mm
Very wide	2000 - 6000 mm

ROCK QUALITY	
RQD	Overall Quality
0 - 25	Very poor
25 - 50	Poor
50 - 75	Fair
75 - 90	Good
90 - 100	Excellent

ROCK COMPRESSIVE STRENGTH	
Comp. Strength, MPa	Description
1 - 5	Very weak
5 - 25	Weak
25 - 50	Moderate
50 - 100	Strong
100 - 250	Very strong

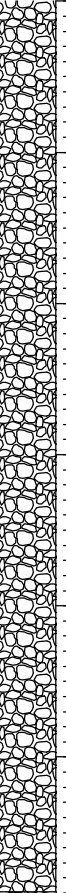
# RECORD OF BOREHOLE 25-01

CLIENT: Stan Bernard Automotive Limited  
 PROJECT: Geotechnical Investigation, Proposed Mixed-Use Development, 1052, 1060, and 1064 St. Laurent Boulevard, Ottawa, Ontario  
 JOB#: 103499.002  
 LOCATION: See Site Plan, Figure 1

SHEET: 1 OF 1  
 DATUM: CGVD28  
 BORING DATE: Oct 9 2025

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	▲ DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	●	⊕ NATURAL	⊖ REMOULDED			
				WATER CONTENT, %											
				10	20	30	40	50	60	70	80	90			
0	Direct Push Casing (57mm OD)	Ground Surface		70.20											
		ASPHALTIC CONCRETE		70.07											
		BASE/SUBBASE - (SM) silty sand, some gravel; dark grey; non-cohesive, moist		0.13	1	GS									
				69.44											
1		FILL - (SM) silty sand, trace gravel; brown; non-cohesive, moist		0.76	2	SS	355	19		●					
2					3	SS	25	13		●					
3		(ML) sandy SILT; grey; non-cohesive; moist		67.15											
				3.05	5	SS	510	8		●	○				
4		(SM-GM) SILTY SAND and GRAVEL; dark brown, with cobbles and boulders (GLACIAL TILL); non-cohesive, wet		66.39											
				3.81	6	SS	455	7		●	○				
5															
5					7	SS	380	73		○		●		MH	
6		End of Borehole Casing Refusal		64.31											
				5.89	8	SS	430	19		○	●				
7															
8															
9															
10															

Auger cuttings



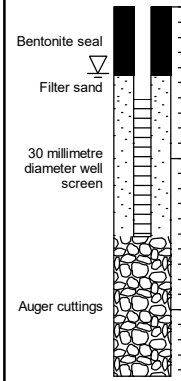
GEO - BOREHOLE LOG, 103499.002, GEO. BH. GINT, 2025, 10.GPJ, GEMTEC, 2018, GDT, 1/6/26

# RECORD OF BOREHOLE 25-02

CLIENT: Stan Bernard Automotive Limited  
 PROJECT: Geotechnical Investigation, Proposed Mixed-Use Development, 1052, 1060, and 1064 St. Laurent Boulevard, Ottawa, Ontario  
 JOB#: 103499.002  
 LOCATION: See Site Plan, Figure 1

SHEET: 1 OF 1  
 DATUM: CGVD28  
 BORING DATE: Oct 10 2025

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		WATER CONTENT, %			
				DEPTH (m)					W <sub>p</sub>	W	W <sub>L</sub>			
0	Direct Push Casing (57mm OD)	Ground Surface		67.20										
		Portland cement CONCRETE		67.12	1	GS								
		FILL - (GP) Gravel, some sand, grey brown; non-cohesive, moist		67.10										
		Portland cement CONCRETE		66.81										
		(ML) Sandy SILT, some gravel, grey brown; non-cohesive, wet		0.39	2	DP	25							
				64.76	3	DP	405							
				2.44										
		End of Borehole												
3														
4														
5														
6														
7														
8														
9														
10														



GROUNDWATER OBSERVATIONS		
DATE	DEPTH (m)	ELEV. (m)
25/10/27	0.44	▽ 66.8

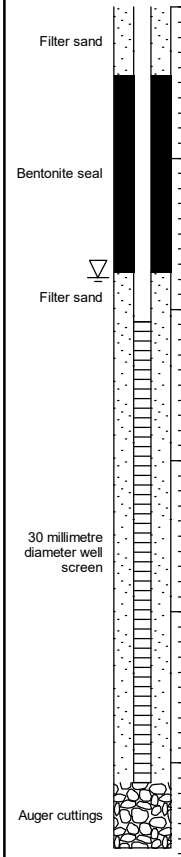
GEO - BOREHOLE LOG 103499.002 GEO\_BH\_GINT\_2025\_10.GPJ GEMTEC 2018.GDT 1/6/26

# RECORD OF BOREHOLE 25-03

CLIENT: Stan Bernard Automotive Limited  
 PROJECT: Geotechnical Investigation, Proposed Mixed-Use Development, 1052, 1060, and 1064 St. Laurent Boulevard, Ottawa, Ontario  
 JOB#: 103499.002  
 LOCATION: See Site Plan, Figure 1

SHEET: 1 OF 1  
 DATUM: CGVD28  
 BORING DATE: Oct 10 2025

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		WATER CONTENT, %			
									10	20	30			40
0	Direct Push Casing (57mm OD)	Ground Surface		70.18										
		Portland cement CONCRETE		69.98										
		FILL - (SP) sand, trace gravel; brown; non-cohesive, moist		0.20										
		FILL - (SM) silty sand, trace gravel; brown; non-cohesive, moist		69.72	1 & 2	DP	710							
				0.46										
1				68.61										
		(ML) sandy SILT, some gravel; grey brow, non-cohesive, moist		1.57	3 & 4	DP	840							
2				66.90										
		(SM-GM) SILTY SAND and GRAVEL; dark brown, with cobbles and boulders (GLACIAL TILL); non-cohesive, wet		3.28	5 & 6	DP	915							
3				64.62										
			5.56	7 & 8	DP	1220								
4														
				9	DP	685								
5														
6		End of Borehole Casing Refusal												
7														
8														
9														
10														



GROUNDWATER OBSERVATIONS		
DATE	DEPTH (m)	ELEV. (m)
25/10/27	1.79	68.4

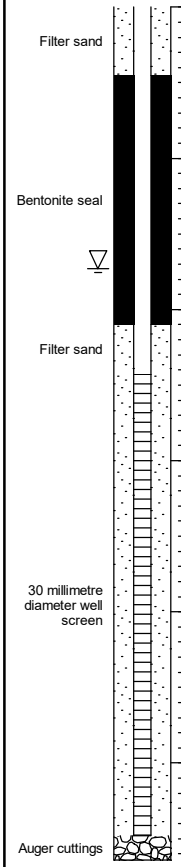
GEO - BOREHOLE LOG 103499.002 GEO\_BH\_GINT\_2025\_10.GPJ GEMTEC 2018.GDT 1/6/26

# RECORD OF BOREHOLE 25-04

CLIENT: Stan Bernard Automotive Limited  
 PROJECT: Geotechnical Investigation, Proposed Mixed-Use Development, 1052, 1060, and 1064 St. Laurent Boulevard, Ottawa, Ontario  
 JOB#: 103499.002  
 LOCATION: See Site Plan, Figure 1

SHEET: 1 OF 1  
 DATUM: CGVD28  
 BORING DATE: Oct 10 2025

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		WATER CONTENT, %			
									10	20	30			40
0	Direct Push Casing (57mm OD)	Ground Surface		70.19										
		Portland cement CONCRETE		70.01										
		FILL - (SP) sand, trace gravel; brown; non-cohesive, moist		0.18										
		FILL - (SP/GP) sand and gravel; dark brown; non-cohesive, dry		69.81	1 & 2	DP	560							
				0.38										
1														
2			(ML) gravelly sandy SILT; dark brown, with cobbles and boulders (GLACIAL TILL); non-cohesive, moist		68.36	3 & 4	DP	685						
				1.83										
3														
4														
5														
6		End of Borehole Casing Refusal		64.55										
				5.64										
7														
8														
9														
10														



GROUNDWATER OBSERVATIONS		
DATE	DEPTH (m)	ELEV. (m)
25/10/27	1.73	68.5

GEO - BOREHOLE LOG 103499.002 GEO\_BH\_GINT\_2025\_10.GPJ GEMTEC 2018.GDT 1/6/26



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 CHECKED: WAM

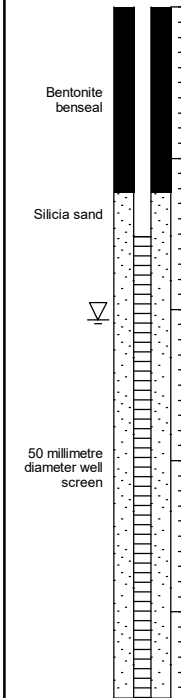


# RECORD OF BOREHOLE 25-06

CLIENT: Stan Bernard Automotive Limited  
 PROJECT: Geotechnical Investigation, Proposed Mixed-Use Development, 1052, 1060, and 1064 St. Laurent Boulevard, Ottawa, Ontario  
 JOB#: 103499.002  
 LOCATION: See Site Plan, Figure 1

SHEET: 1 OF 1  
 DATUM: CGVD28  
 BORING DATE: Oct 3 2025

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		WATER CONTENT, %			
									10	20	30			40
0	Direct Push Casing (57mm OD)	Ground Surface		69.77										
		ASPHALTIC CONCRETE		0.04										
		BASE/SUBBASE - (SP-SM) gravelly sand, some non-plastic fines; grey; non-cohesive, moist		69.47	1	DP	300							
		FILL - (SP-SM) sand, some non-plastic fines; brown; non-cohesive, moist		0.30										
1						2	DP	760						
		(ML) sandy SILT, trace gravel; grey brown; non-cohesive, moist		68.25	3	DP	760							
2														
3														
4														
		(ML) gravelly sandy SILT; dark brown, with cobbles and boulders (GLACIAL TILL); non-cohesive, moist		65.96	6	DP	760							
5		End of Borehole		65.20										
6														
7														
8														
9														
10														



GROUNDWATER OBSERVATIONS		
DATE	DEPTH (m)	ELEV. (m)
25/10/27	2.07	67.7

GEO - BOREHOLE LOG 103499.002 GEO\_BH\_GINT\_2025\_10.GPJ GEMTEC 2018.GDT 1/6/26



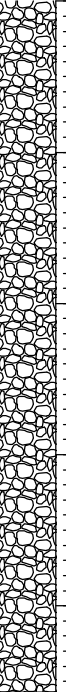
LOGGED: JG  
 CHECKED: WAM

# RECORD OF BOREHOLE 25-07

CLIENT: Stan Bernard Automotive Limited  
 PROJECT: Geotechnical Investigation, Proposed Mixed-Use Development, 1052, 1060, and 1064 St. Laurent Boulevard, Ottawa, Ontario  
 JOB#: 103499.002  
 LOCATION: See Site Plan, Figure 1

SHEET: 1 OF 1  
 DATUM: CGVD28  
 BORING DATE: Oct 3 2025

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		WATER CONTENT, %			
									10	20	30			40
0	Direct Push Casing (57mm OD)	Ground Surface		69.77										
		ASPHALTIC CONCRETE		0.03										
		BASE/SUBBASE - (SP-GP) sand and gravel, some non-plastic fines; dark grey; non-cohesive		69.48	1	DP	290							
1		FILL - (SP) sand, some gravel, some non-plastic fines, brown; non-cohesive, moist		0.29	2	DP	210							
2					3	DP	460							
		(ML) sandy SILT, trace to some gravel; grey brown; non-cohesive, moist		67.48	4	DP	310							
3														
	(ML) gravelly sandy SILT; dark brown, with cobbles and boulders (GLACIAL TILL); non-cohesive, wet		66.72	5	DP	680								
4														
5		End of Borehole		65.20										
				4.57										
6														
7														
8														
9														
10														



Auger cuttings

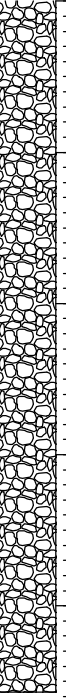
GEO - BOREHOLE LOG, 103499.002, GEO\_BH\_GINT\_2025\_10.GPJ, GEMTEC, 2018, GDT, 1/6/26

# RECORD OF BOREHOLE 25-08

CLIENT: Stan Bernard Automotive Limited  
 PROJECT: Geotechnical Investigation, Proposed Mixed-Use Development, 1052, 1060, and 1064 St. Laurent Boulevard, Ottawa, Ontario  
 JOB#: 103499.002  
 LOCATION: See Site Plan, Figure 1

SHEET: 1 OF 1  
 DATUM: CGVD28  
 BORING DATE: Oct 3 2025

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		WATER CONTENT, %			
									10	20	30			40
0	Direct Push Casing (57mm OD)	Ground Surface		69.85										
		ASPHALTIC CONCRETE		0.05										
		BASE/SUBBASE - (GP/GM) sandy gravel, some non-plastic fines; brown; non-cohesive, moist		0.12	1	DP	120							
1			FILL - (SP-SM) sand, some gravel, some non-plastic fines; grey brown; non-cohesive, moist											
					2	DP	100							
2					3	DP	700							
3		(ML) sandy SILT, trace to some gravel; grey brown; non-cohesive, moist		2.29	4	DP	760							
4					5	DP	760							
4		(ML) gravelly sandy SILT; dark brown, with cobbles and boulders (GLACIAL TILL); non-cohesive, wet		65.76 4.09	6	DP	760							
5		End of Borehole		65.28 4.57										
6														
7														
8														
9														
10														



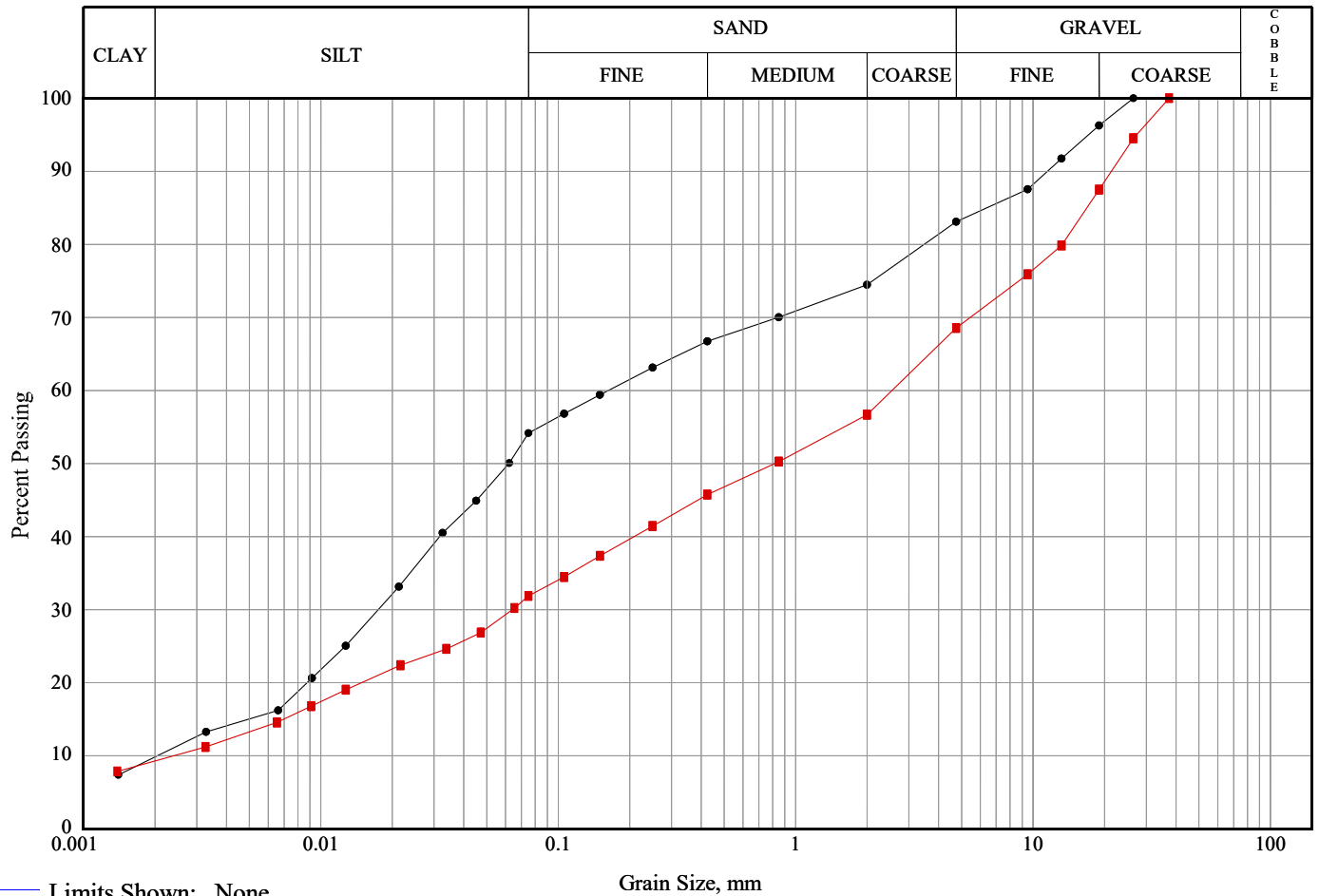
Auger cuttings

GEO - BOREHOLE LOG 103499.002 GEO\_BH\_GINT\_2025\_10.GPJ GEMTEC 2018.GDT 1/6/26



## **APPENDIX B**

Laboratory Testing  
Grain Size Distribution  
Rock Core Compressive Strength



— Limits Shown: None

Line Symbol	Sample	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay
—●—	GLACIAL TILL	25-05	5	3.05-3.66	16.9	28.9	44.3	9.8
—■—	GLACIAL TILL	25-01	7	4.57-5.18	31.5	36.7	22.6	9.3

Line Symbol	USCS Classification	USCS Symbol	D <sub>10</sub>	D <sub>15</sub>	D <sub>30</sub>	D <sub>50</sub>	D <sub>60</sub>	D <sub>85</sub>	% 5-75µm
—●—		N/A	0.002	0.005	0.02	0.06	0.16	6.40	44.3
—■—		N/A	0.002	0.007	0.06	0.82	2.55	16.88	22.6



Client: Mazda of Portcharlotte  
Project: Phase 1 ESA - St. Laurent Properties  
Project #: 103499002

# Rock Core Compressive Strength

Date/Time Sampled: 25/10/20 3:05:00 PM

Date/Time Tested: 25/10/20 3:06:32 PM

BH	Sample No	Depth	Description	Diameter, mm	Area, mm <sup>2</sup>	Length After Capping, mm	L/D	Load, kN	Comp. Str., MPa
25-05	10	6.35-6.55		62.6	3074	123	1.96	219.020	71.1
25-05	11	8.81-9.09		62.8	3099	125	1.98	368.690	118.7



## **APPENDIX C**

Rock Core Photographs  
Figure C1 and C2

**BOREHOLE: BH25-05 (DRY)**  
**BORING DATE: OCTOBER 6, 2025**  
**DEPTH: 5.79 TO 9.35 METRES BELOW GROUND SURFACE**



NOTE: MATERIAL IN CORE BOX FROM 5.79 TO 5.91 METRES DEPTH IS GRAVEL AND COBBLES IN GLACIAL TILL

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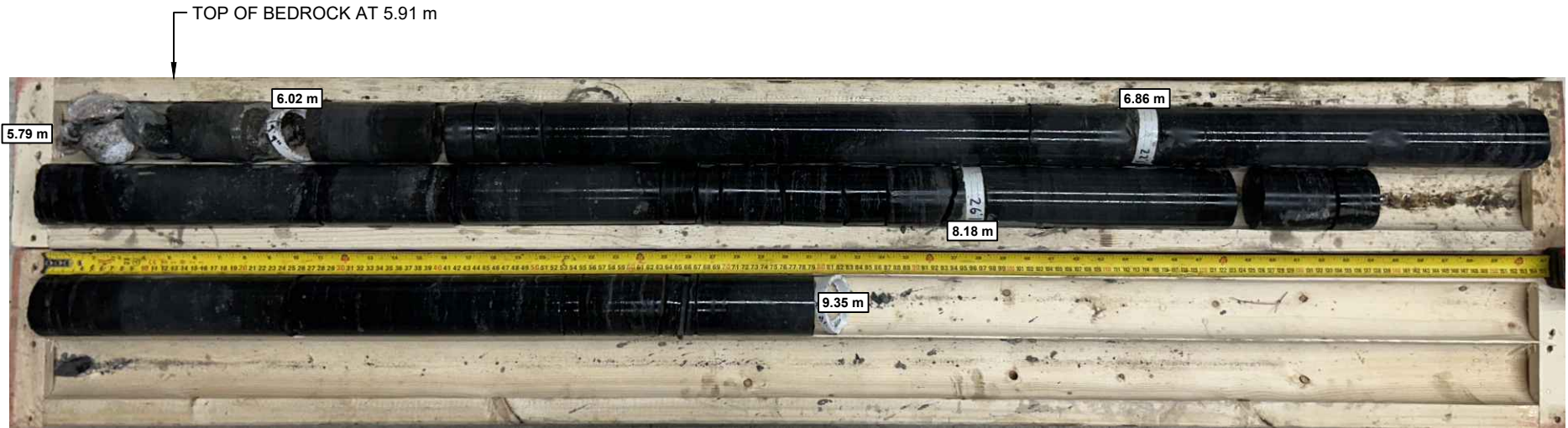
Project  
 GEOTECHNICAL INVESTIGATION  
 PROPOSED MIXED-USE DEVELOPMENT  
 1052, 1060, AND 1064 ST. LAURENT BOULEVARD  
 OTTAWA, ONTARIO

Drawing  
 ROCKCORE PHOTOGRAPH  
 BOREHOLE BH25-05 (DRY)

**FIGURE C1**

Project No. 103499.002	Drwn By SL	Chkd By WAM	Rev No. 0	Date JANUARY 2026
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**BOREHOLE: BH25-05 (WET)**  
**BORING DATE: OCTOBER 6, 2025**  
**DEPTH: 5.79 TO 9.35 METRES BELOW GROUND SURFACE**



NOTE: MATERIAL IN CORE BOX FROM 5.79 TO 5.91 METRES DEPTH IS GRAVEL AND COBBLES IN GLACIAL TILL

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Project  
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 PROPOSED MIXED-USE DEVELOPMENT  
 1052, 1060, AND 1064 ST. LAURENT BOULEVARD  
 OTTAWA, ONTARIO

Drawing  
 ROCKCORE PHOTOGRAPH  
 BOREHOLE BH25-05 (WET)

**FIGURE C2**

Project No. 103499.002	Drwn By SL	Chkd By WAM	Rev No. 0	Date JANUARY 2026
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## **APPENDIX D**

Chemical Analysis of Soil Samples  
Samples Relating to Corrosion  
(Paracel Laboratories Ltd. Order No. 2539487)

Certificate of Analysis

Report Date: 27-Oct-2025

Client: **GEMTEC Consulting Engineers and Scientists Limited**

Order Date: 21-Oct-2025

Client PO:

Project Description: 103499.002

<b>Client ID:</b>	25-06 SA3 5'0"-5'6"	-	-	-	-
<b>Sample Date:</b>	03-Oct-25 10:00	-	-	-	-
<b>Sample ID:</b>	2543212-01	-	-	-	-
<b>Matrix:</b>	Soil	-	-	-	-
<b>MDL/Units</b>					

**Physical Characteristics**

% Solids	0.1 % by Wt.	82.3	-	-	-	-
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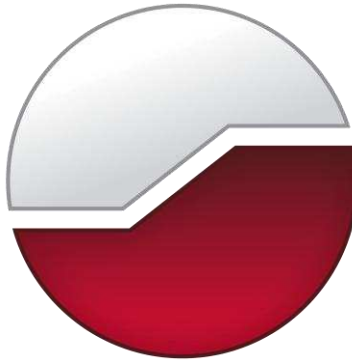
**General Inorganics**

Conductivity	5 uS/cm	1620	-	-	-	-
pH	0.05 pH Units	7.74	-	-	-	-
Resistivity	0.1 Ohm.m	6.2	-	-	-	-

**Anions**

Chloride	10 ug/g	1060	-	-	-	-
Sulphate	10 ug/g	44	-	-	-	-

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

