Geotechnical Investigation Report
Proposed Half Moon Bay Secondary School
3853 Cambrian Road
Ottawa, Ontario

Client:
Mr. David Lacelle
Team Leader, Architectural and Engineering, Design and Construction
Ottawa Carleton District School Board
1224 Stittsville Main Street
Stittsville, Ontario

Type of Document:
Final Report

Project Number:
OTT-23012778-G0

Prepared By:
EXP Services Inc.
100-2650 Queensview Drive
Ottawa, Ontario K2B 8H6
Canada

Date Submitted:
December 22,2025

Table of Contents

List of Tables

List of Figures

List of Appendices

Executive Summary

Introduction

EXP Services Inc. (EXP) is pleased to present the results of the geotechnical investigation completed for the proposed new Half Moon Bay secondary school to be located at 3853 Cambrian Road, Ottawa, Ontario (Figure 1). Terms and conditions of this assignment were outlined in EXP's proposal dated October 9,2024. Authorization to proceed with this work was provided by the Ottawa Carleton District School Board.

Proposed Development

The proposed school building will be two (2)-storeys with no basement. The proposed school development on the site will include outdoor basketball courts, practice football/soccer field and a second football/soccer field with a running track around the field. The development will also include outdoor portables and an outdoor paved parking lot. The proposed school development will be serviced by municipal services. The design elevation of the ground floor of the proposed school building and final grades at the site were not available at the time of this geotechnical investigation.

The due diligence geotechnical desktop review report for the proposed school site dated April 4,2024 and prepared by Paterson Group indicates that from 2007 to 2024 fill has been placed on the site. A comparison of the ground surface elevations of previous boreholes conducted between 2007 and 2012 with the ground surface elevations of the current boreholes indicate that approximately 2.0 m to 4.0 m of fill has been placed on the site over the years from approximately 2007 to 2024.

Fieldwork Program

The fieldwork for this geotechnical investigation was undertaken from October 21 to 25 and on October 31,2024 and consists of twenty-two (22) boreholes (Borehole Nos. 24-01, 24-02, 24-04 to 24-15, 24-17 to 24-19 and 24-21 to 24-25). advanced to termination and cone refusal depths ranging from 3.7 m to 38.7 m below existing grade. Borehole Nos.3, 16 and 20 were not drilled.

Shear wave velocity sounding survey was conducted on the site on December 5,2024 by Geophysics GPR International Inc. (GPR). The purpose of the survey was to determine the site designation and classification for seismic design. The seismic shear wave velocity sounding survey was undertaken using multi-channel analysis of surface waves (MASW), spatial auto correlation (SPAC) and seismic refraction and reflection methods.

Subsurface Conditions

The information from the boreholes indicates the subsurface conditions at the site consist of surficial topsoil underlain by fill that extends to depths of 0.7 to 6.1 m (Elevation 93.7 m to Elevation 90.0 m) further underlain by very loose to compact silty sand to sandy silt, very soft to stiff silty clay to depths ranging from 15.5 m to 27.1 m (Elevation 78.6 m to Elevation 68.2 m), compact glacial till to dolostone bedrock to 32.5 m and 36.0 m (Elevation 61.8 m and Elevation 58.7 m). Based on the November 21,2024 set of measurements, the groundwater level ranges from 1.5 m to 3.1 m depths (Elevation 92.8 m to Elevation 90.4 m).

Geotechnical Engineering Comments and Recommendations

The seismic shear wave velocity sounding survey report is shown in Appendix B. Based on a review of the results of the seismic shear wave velocity sounding survey, the seismic shear wave velocity from existing ground surface to a 30 m depth (Vs_{30}) is 174 m/s. A comparison of the Vs_{30} value with Section 4.1.8.4 of the 2024 Ontario Building Code (OBC) indicates the site designation is X_{174}.

For the case where the bottom of the grade beams will be 2.5 m below existing grade, the Vs_{30} value is 196 m/s. A comparison of the Vs_{30} value with Section 4.1.8.4 of the 2024 Ontario Building Code (OBC) indicates the site designation is X_{196}.

EXP can provide the recommended site designation once the site grade raise and design elevation of the underside of the grade beams are known.

The subsurface soils are not considered to be susceptible to liquefaction during a seismic event.

The geotechnical investigation and the results from the consolidation tests revealed that the deep deposit of marine silty clay at the site is normally consolidated to slightly over-consolidated. In this case, if the silty clay is loaded beyond its pre-consolidation pressure by loads imposed on the silty clay by site grade raise using soil fill, footings, slab-on-grade and/or permanent groundwater lowering, settlements higher than the normally tolerated limits will result. Therefore, the silty clay is prone to large settlements on application of any additional loads and therefore, is considered to have very limited capacity to support additional loads.

Since the silty clay has very limited capacity to support additional loads, two (2) options are available for the proposed school development.

The first option is to support the proposed school building by pile foundation driven to practical refusal into the underlying bedrock and designed in end bearing and design the ground floor of the proposed building as a structural slab that is also supported by the pile foundation. It is recommended that the pile tip elevation should be established from the bedrock depths identified in the boreholes where the bedrock as cored (Borehole Nos. 24-07 and 24-13) and not from the cone refusal depth from the dynamic cone penetration test (DCPT), since cone refusal may have occurred in the glacial till. The services beneath the structural floor slab should be connected or tied to the underside of the structural ground floor slab. With this option, site grade raise beneath the ground floor of the proposed building may be achieved by the placement of approved fill. The site grade raise outside the proposed building and around the proposed building in areas that are settlement sensitive such as at entranceways to the proposed building, sidewalks, loading/unloading areas and the shop loading area as well as outside trenches for underground services that will service the proposed building may be achieved by using light-weight fill (LWF). EXP can provide additional details regarding LWF, if required. Site grade raise beyond the proposed building in the access road, parking lots, portable area and outdoor sports fields may be achieved by using approved soil fill. However, since these areas will undergo settlement over time, periodic maintenance of the access road, parking lots and outdoor sports fields may be required. Similarly, the portables may require periodic re-levelling over time.

The second option is to support the proposed school building by footings or pile foundation driven to practical refusal into the underlying bedrock and designed in end bearing and design the ground floor of the proposed building as a slab-on-grade. This option may be achieved by preloading (with wick drains) the ground floor and footing area of the proposed building and outdoor settlement sensitive areas and outdoor service trenches that will service the building to accelerate the consolidation settlement of the silty clay. However, the feasibility of the pre-loading option for slab-on grade and/or footings will need to be explored further by conducting an additional geotechnical investigation consisting of boreholes, laboratory tests and the determination of the estimated settlement and time to settlement and by consultation with a specialized contractor.

The ground floor of the proposed school building that is designed as a structural slab supported by pile foundation should be placed on a 200 mm thick, 19 mm sized clear stone bed placed on the existing fill. The clear stone will minimize the capillary rise of moisture from the sub-soil to the floor slab. Alternatively, the clear stone layer may be replaced with a 200 mm thick bed of OPSS Granular A overlain by a vapour barrier. Adequate saw cuts should be provided in the floor slabs to control cracking. Underground services beneath the structural floor slab should be connected to or tied to the underside of the floor slab.

The ground floor of the proposed building that is designed as a slab-on-grade following completion of pre-loading may also be set on a 200 mm thick 19 mm sized clear stone layer or on a 200 mm thick OPSS Granular A layer compacted to 98 percent SPMDD that is placed on the engineered fill pad prepared in accordance with Section 9 of the attached geotechnical report.

The proposed school building will require a perimeter drainage system. The need for underfloor drainage system for the proposed building can be determined once the final design elevation of the ground floor is available.

The excavations may be undertaken by conventional heavy equipment capable of removing possible debris within the fill.

All excavations must be undertaken in accordance with the Occupational Health and Safety Act (OHSA), Ontario Reg. 213/91. Based on the definitions provided in OHSA, the subsurface soils on site are considered to be Type 3 and as such must be cut back at 1H:1V from the bottom of the excavation. Excavations within the soft to very soft zone of the silty clay considered to be Type 4 soil will have to be cut back at 3H:1V from the bottom of the excavation. Within zones of seepage, the excavation side slopes are expected to slough and eventually stabilize at 2H:1V to 3H:1V from the bottom of the excavation. For excavations above the groundwater level or properly dewatered (refer to paragraph below), the installation of the municipal underground services may be undertaken within the confines of a prefabricated support system (trench box) designed and installed in accordance with OHSA.

Seepage of the surface and subsurface water into the excavations is anticipated. However, it should be possible remove groundwater entering into excavation by pumping from sumps. In areas of high infiltration or in areas where more permeable soil layers may exist, a higher seepage rate should be anticipated and will require high-capacity pumps to keep the excavation dry (may need to operate 24 hours a day, seven (7) days a week).

Open cut excavations that extend into or terminate within the silty sand to sandy silt below the groundwater level are anticipated to be more problematic and will require the lowering of the groundwater level prior to the start of excavation. It is anticipated that the base of the excavation in the silty sand to sandy silt and below the groundwater level may be susceptible to basal instability or base type failure in the form of piping or heave. To minimize the occurrence of base type failure, it is recommended that the groundwater level should be lowered by at least 1.0 m below the bottom of the excavation prior to the start of excavation. This may be achieved by installing deep sumps and pumping with high-capacity pumps. The dewatering contractor should review the subsurface conditions at the site and select the most appropriate method to lower the groundwater level.

Excavations that terminate at or within the very soft to soft zone of the silty clay are susceptible to base heave failure. Once design elevations of invert levels of underground services and other elements of the proposed school development are available, EXP can provide additional comments and recommendations regarding the potential for base heave and prevention of base heave failure within the very soft to soft zone of the silty clay.

It is anticipated that the majority of the material required for backfilling purposes in the interior and exterior of the proposed buildings and in the underground service trenches will need to be imported and should preferably conform to the material specifications indicated in the attached geotechnical report.

Additional Geotechnical Investigation

The feasibility of the pre-loading option for slab-on grade and/or footings will need to be explored further by conducting an additional geotechnical investigation consisting of boreholes, laboratory tests and the determination of the estimated settlement and time to settlement.

Closure

The above and other related considerations are discussed in greater detail in the main body of the attached geotechnical report.

This executive summary is a brief synopsis of the attached report and should not be read in lieu of reading the attached geotechnical report in its entirety.

1. Introduction

EXP Services Inc. (EXP) is pleased to present the results of the geotechnical investigation completed for the proposed new Half Moon Bay secondary school to be located at 3853 Cambrian Road, Ottawa, Ontario (Figure 1). Terms and conditions of this assignment were outlined in EXP's proposal dated October 9,2024. Authorization to proceed with this work was provided by the Ottawa Carleton District School Board.

The proposed school building will be two (2)-storeys with no basement. The proposed school development on the site will include outdoor basketball courts, practice football/soccer field and a second football/soccer field with a running track around the field. The development will also include outdoor portables and an outdoor paved parking lot. The proposed school development will be serviced by municipal services. The design elevation of the ground floor of the proposed school building and final grades at the site were not available at the time of this geotechnical investigation.

The due diligence geotechnical desktop review report dated April 4,2024 for the proposed school site and prepared by Paterson Group indicates that from 2007 to 2024 fill has been placed on the site. A comparison of the ground surface elevations of previous boreholes conducted between 2007 and 2012 with the ground surface elevations of the current boreholes indicate that approximately 2.0 m to 4.0 m of fill has been placed on the site over the years from approximately 2007 to 2024.

The geotechnical investigation was undertaken to:

a) Establish the subsurface soil and groundwater conditions at twenty-two (22) boreholes located on the site,

b) Provide site designation for seismic design in accordance with the requirements of the 2024 Ontario Building Code (OBC) and assess the potential for liquefaction of the subsurface soils during a seismic event,

c) Comment on grade-raise restrictions and provide site grading requirements,

d) Make recommendations regarding the most suitable type of foundations, founding depth and bearing pressure at serviceability limit state (SLS) and factored geotechnical resistance at ultimate limit state (ULS) of the founding strata and comment on the anticipated total and differential settlements of the recommended foundation type,

e) Provide comment regarding slab-on-grade construction and the requirement for perimeter and underfloor drainage systems,

f) Comment on excavation conditions and de-watering requirements during construction,

g) Provide pipe bedding requirements for underground services,

h) Discuss backfilling requirements and suitability of on-site soils for backfilling purposes,

i) Recommend pavement structure thicknesses for access road and parking lot areas,

j) Comment on the corrosion potential of subsurface soils buried concrete and steel structures/members; and

k) Provide comment on tree planting restrictions.

The comments and recommendations given in this report are based on the assumption that the above-described design concepts will proceed into construction. If changes are made either in the design phase or during construction, this office must be retained to review these modifications. The result of this review may be a modification of our recommendations, or it may require additional field or laboratory work to check whether the changes are acceptable from a geotechnical viewpoint.

2. Site Description

The site for the proposed school development is located in the southeast corner of the Cambrian Road and Elevation Road intersection in Ottawa, Ontario. At the time of this geotechnical investigation, the majority of the site was vacant with a temporary building fronting onto Cambrian Road (Mattamy Half Moon Bay site office) in the northeast corner of the site and a fill stockpile just west of the temporary building close to Cambrian Road and the north property line of the site. The site is covered by high grasses with some open bare areas. The ground surface elevations at the borehole locations range from Elevation 97.65 m to Elevation 92.23 m. The raised or higher areas of the site are approximately in the north (also the location of the fill stockpile) to central east and southeast parts of the site with the lower areas in the west and southwest portions of the site. The site is bordered by Cambrian Road on the north side and by residential development north of Cambrian Road and by Elevation Road to the west with vacant land beyond. Vacant lands exist south and east of the site.

3. Site Geology

3.1 Surficial Geology

The surficial geology was reviewed via the Google Earth application using the map published by the Ontario Ministry of Energy, Northern Development and Mines available via www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearth/surficial-geology and was last modified on May 23, 2017. The map indicates the site is underlain by organic deposits consisting of peat, muck and marl underlain by fine-textured glaciolacustrine deposits consisting of silt and clay with minor sand and gravel and coarse-textured glaciomarine deposits consisting of sand and gravel with minor silt and clay. Glacial fluvial deposits were noted to the south of the site. The surficial deposits are shown in Image 1 below.

Organic Deposits: Peat, muck and marl

Fine-textured glaciolacustrine deposits: silt and clay, minor sand and gravel

Coarse-textured glaciomarine deposits: Sand, gravel, minor silt and clay. Foreshore and basinal deposits

Glaciofluvial deposits: river deposits and delta topset facies

Image 1 – Surficial Geology

3.2 Bedrock Geology

The bedrock geology was reviewed via the Google Earth application using the map published by the Ontario Ministry of Energy, Northern Development and Mines available via http://www.geologyontario.mndm.gov.on.ca/mines/ data/google/MRD219/geology/doc.kml and publish in 2007. The map indicates the site is underlain by dolostone with minor shale and sandstone of the Beekmantown Group, Oxford formation. The bedrock geology is show in Image 2 below.

Dolostone, minor shale and sandstone, Beekmantown Group, Oxford formation

Image 2 – Bedrock Geology

4. Available Information

The following documents were used as reference material in the preparation of this geotechnical report:

- Phase Two Environmental Site Assessment, 3853 Cambrian Road, Ottawa, Ontario prepared by cm3 environmental (cm3) - Soil Quality Site Plan dated November 2024 (Figure 3) and Test Pit Logs for Test Pit Nos. 1 to 9 (cm3 Project No. ER1076).
- Geotechnical Desktop Review – Due Diligence – Proposed Secondary School, 2853 Cambrian Road, Ottawa, Ontario dated April 4,2024 and prepared by Paterson Group (Paterson) – (Paterson Project No. PG7065-1).

The location of the cm3 test pit logs are shown on the Test Hole Location Plan, Figure 2 and the test pit logs are shown in Appendix A.

5. Procedure

5.1 Borehole Fieldwork

The fieldwork for this geotechnical investigation was undertaken from October 21 to 25 and on October 31,2024 and consists of twenty-two (22) boreholes (Borehole Nos. 24-01, 24-02, 24-04 to 24-15, 24-17 to 24-19 and 24-21 to 24-25) advanced to termination and cone refusal depths ranging from 3.7 m to 38.7 m below existing grade. Borehole Nos. 24-03, 24-16 and 24-20 were not drilled. The borehole fieldwork was supervised on a full-time basis by EXP.

The locations and geodetic elevations of the boreholes were established by Farley, Smith and Denis Surveying Ltd. and are shown on the Test Hole Location Plan, Figure 2. The ground surface elevation of Borehole No. 24-15 was estimated from the ground surface elevations of nearby Borehole Nos. 24-16 and 24-19 and therefore, should be considered approximate.

The boreholes were drilled using a CME-55 track-mounted drill rig equipped with continuous flight hollow-stem auger equipment and rock coring capabilities. Some boreholes were advanced through the soils by casing and wash-boring technique. Standard penetration tests (SPTs) were performed in all the boreholes at 0.75 m to 3.8 m depth intervals and the soil samples retrieved by the split-spoon sampler. Dynamic cone penetration test (DCPT) was conducted in selected boreholes. The undrained shear strength of the clayey soil was measured at selected depths by conducting in-situ vane tests. Relatively undisturbed thin-walled tube samples (Shelby tubes) of the silty clay were collected a selected depths in some of the boreholes. The bedrock was cored in two (2) boreholes using the N-size core barrel and conventional rock coring techniques. A field record of wash water return, colour of wash water and any sudden drops of the core barrel were kept during rock coring operations.

The subsurface soil conditions in each borehole were logged with each soil sample placed in labelled plastic bags. Similarly, the rock cores were visually examined, placed in core boxes, identified, and logged.

Nineteen (19 mm) diameter standpipes were installed in selected boreholes for long-term monitoring of the groundwater table. The standpipes were installed in accordance with EXP standard practice, and the installation configuration is documented on the respective borehole log. The boreholes were backfilled upon completion of drilling and installation of the standpipes and monitoring wells.

On completion of the borehole fieldwork, the soil samples and rock cores were transported to the EXP laboratory in Ottawa where they were examined by a geotechnical engineer and borehole logs prepared. The soils are classified by their main constituents in accordance with the Unified Soil Classification System (USCS) using the soil group name and symbol and by the modified Burmister soil classification method for the classification of the minor constituents of the soil using adjectives and modifiers such as trace and some. The rock cores were visually examined by the geotechnical engineer, logged and photographs taken.

5.2 Laboratory Testing

The laboratory testing program for the soil samples and rock core sections is summarized in Table I.

Table I: Summary of Laboratory Testing Program

Type of Test	Number of Tests Completed
Soil Samples	
Moisture Content Determination	146
Grain Size Analysis	7
Atterberg Limit Determination	6
Corrosion Analysis (pH, sulphate, chloride and resistivity)	3

5.3 Shear Wave Velocity Sounding Survey

Shear wave velocity sounding survey was conducted on the site on December 5,2024 by Geophysics GPR International Inc. (GPR). The purpose of the survey was to determine the site designation and classification for seismic design. The shear wave velocity sounding survey was undertaken using multi-channel analysis of surface waves (MASW), spatial auto correlation (SPAC) and seismic refraction and reflection methods. The shear wave velocity sounding survey report is shown in Appendix B.

6. Subsurface Conditions and Groundwater Levels

A detailed description of the subsurface conditions encountered in the boreholes is given on the attached Borehole Logs, Figures 3 to 24. The test pit logs from the cm3 November 2024 Phase Two Environmental Site Assessment (ESA) are shown in Appendix A.

The borehole logs and related information depict subsurface conditions only at the specific locations and at the times indicated. Subsurface conditions and water levels at other locations may differ from conditions at the locations where sampling was conducted. The passage of time also may result in changes in the conditions interpreted to exist at the locations where sampling was conducted.

Boreholes were drilled to provide representation of subsurface conditions as part of a geotechnical exploration program and are not intended to provide evidence of potential environmental conditions. Reference is made to the environmental reports prepared by cm3 regarding the environmental conditions of the site.

It should be noted that the soil boundaries indicated on the borehole logs are inferred from observations during drilling operations. These boundaries are intended to reflect approximate transition zones for the purpose of geotechnical design and should not be interpreted as exact planes of geological change. The “Notes on Sample Descriptions” preceding the borehole logs form an integral part of this report and should be read in conjunction with this report.

A review of the borehole logs indicates the following subsurface soil and bedrock conditions with depth and groundwater level measurements. The results from the cm3 test pit logs are also discussed in this section of the report.

6.1 Topsoil

A 50 mm to 700 mm thick surficial topsoil layer was contacted in Borehole No. 24-6, 24-08 to 24-10, 24-12, 24-18, 24-23 and 24-25. In Borehole No. 24-11, the surficial topsoil layer is 1400 mm thick (1.4 m thick).

6.2 Peat Fill

A surficial peat fill was encountered in Borehole Nos. 24-15 and 24-22 and extends to depths of 2.4 m and 3.1 m (Elevation 94.6 m to Elevation 93.8 m). The peat contains decayed plant matter and debris in the form of wood fragments. The moisture content of the peat ranges from 39 percent to 150 percent.

6.3 Fill

Fill was contacted beneath the surficial topsoil and peat fill in all of the boreholes with the exception of Borehole No. 24-24 and in all of the cm3 test pits. The fill extends to depths of 0.7 m to 6.1 m below existing grade (Elevation 93.7 m to Elevation 90.0 m). The soil matrix of the fill consists of a mixture of varying percentages of gravel, sand, silt and clay. In some boreholes, the fill contains organic soil in the form of topsoil inclusions, pockets, seams and layers. Possible cobbles and boulders are also scattered within the fill in some boreholes. The fill also contains several different types of debris such as asphalt fragments in Borehole No. 24-22, brick, plastic and wood debris in Test Pit No. 1, landscape fabric debris in Test Pit No. 6, wood debris in Test Pit No. 7 and metal and plastic debris in Test Pit Nos. 8 and 9. Based on the standard penetration test (SPT) N-values ranging from 0 to 31, the fill is in a very loose to dense state. The moisture content of the fill ranges from 2 percent to 43 percent.

6.4 Sand and Silt

Beneath the topsoil layer, peat fill and fill, a sand and silt were encountered in all boreholes, except in Borehole Nos. 24-01, 24-07 and 24-08, at 0.7 m to 6.1 m depths (Elevation 93.7 m to Elevation 90.8 m) and extends to depths of 2.8 m to 6.7 m (Elevation 93.0 m to Elevation 90.0 m). The sand and silt range from a silty sand to sandy silt to clayey silt. Based on the SPT N-values of 0 to 12, the silty sand to sandy silt is in a very loose to compact state. Based on undrained shear strength measurements of 38 kPa and 48 kPa, the clayey silt has a firm consistency. Natural moisture contents of the sand and silt range from 16 percent to 35 percent.

Results from the grain size analysis and Atterberg limit determination of two (2) samples of the soil are summarized in Table II. The grain size distribution curves are shown in Figures 25 and 26.

Table II: Summary of Results from Grain-Size Analysis and Atterberg Limit Determination – Sand and Silt

Borehole No. (BH): Sample No. (SS)	Depth (m)	Grain-Size Analysis (%) and Atterberg Limits (%)								
		Gravel	Sand	Silt	Clay	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification
BH24-10: SS4	2.3-2.9	0	57	34	9	22	-	-	-	Silty Sand (SM) – Trace Clay
BH24-19: SS9	6.1-6.7	0	40	45	15	29	-	--	Non-Plastic	Sandy Silt (ML) – Some Clay

Based on a review of the results of the grain-size analysis and Atterberg limits, the soil may be classified as a silty sand (SM) to sandy silt (ML) with trace to some clay.

6.5 Silty Clay

Silty clay was contacted below the fill or sand and silt in all boreholes, except Borehole Nos. 24-15, 24-18, 24-19, 24-21 and 24-22, at 0.7 m to 5.6 m depths (Elevation 93.3 m to Elevation 89.5 m) and extends to approximate depths of 15.5 m to 27.1 m (Elevation 78.6 m to Elevation 68.2 m). The silty clay is grey to dark grey in colour. The upper portion of the silty clay in Borehole No. 24-08 from the contact depth of 2.2 m (Elevation 92.5 m) to 3.6 m depth (Elevation 91.1 m) is brown in colour and considered to be the upper desiccated crust of the silty clay. In Borehole No. 24-25, the silty clay is brown to grey in colour. Portions of the silty clay contain shell fragments. Based on undrained shear strength measurement of 96 kPa, the upper desiccated brown crust of the silt clay in Borehole No. 24-08 has a stiff consistency. The grey to dark grey silty clay has a lower undrained shear strength ranging from 10 kPa to 62 kPa indicating the grey silty clay has a very soft to stiff consistency. The natural moisture content of the brown and grey to dark grey silty clay ranges from 20 percent to 60 percent. In Borehole No. 24-05, an 800 mm thick silty sand to sandy silt layer is present within the silty clay at a 2.7 m depth (Elevation 91.4 m). Based on the SPT N-value of 2, the silty sand layer is in a very loose state. The natural moisture content of the silty sand to sandy silt layer is 32 percent.

Results from the grain-size analysis and Atterberg limit determination conducted on five (5) samples of the upper brown silty clay and the grey to dark grey silty clay are summarized in Table III. The grain-size distribution curves are shown in Figures 27 to 31.

Table III: Summary of Results from Grain-Size Analysis and Atterberg Limit Determination – Brown and Grey Silty Clay

Borehole No. (BH) Sample No. (SS)	Depth (m)	Grain-Size Analysis (%) and Atterberg Limits (%)								
		Gravel	Sand	Silt	Clay	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification
BH24-07: SS10	13.7-14.3	0	5	46	49	60	38	21	17	Silty Clay of Medium Plasticity (CI)-Trace Sand
BH24-08: SS4	2.3-2.9	1	8	47	44	34	45	18	27	Silty Clay of Medium Plasticity (CI) – Trace Gravel and Sand
BH 24-11: SS8	6.1-6.7	0	12	56	32	36	29	16	13	Silty Clay of Low Plasticity (CL) – Some Sand
BH 24-13: SS6	5.3-5.9	0	11	56	33	39	33	18	15	Silty Clay of Medium Plasticity (CI) – Some Sand
BH 24-18: SS6	3.8-4.4	1	12	55	32	22	31	16	15	Silty Clay of Medium Plasticity (CI) – Some Sand, Trace Gravel

Based on a review of the results of the grain-size analysis and Atterberg limits, the soil may be classified as a silty clay of low to medium plasticity (CL-CI) with trace gravel and trace to some sand.

A consolidation test was conducted on three (3) samples of the grey silty clay. The test results and estimated soil parameters derived from the consolidation test results are summarized in Table IV and the consolidation test result report is shown in Appendix C.

Table IV: Consolidation Test Results – Grey Silty Clay

Borehole No. (BH)	Sample No. – Depth (Elevation)	Natural Unit Weight (kN/m³)	σ_p'	σ_{vo}'	C_c	C_r	e_o	OCR
BH 24-07	ST1: 15.2-15.8 (79.5-78.9)	15.7	150	127	0.949	0.074	1.881	1.2
BH 24-12	ST1: 4.6-5.2 (89.6-89.0)	17.0	18	69	0.672	0.037	1.352	0.26
BH 24-13	ST1: 9.1-9.7 (85.2-84.6)	17.0	80	91	0.586	0.038	1.389	0.88~1.0

NOTES:

σ_p'	- Apparent pre-consolidation pressure (kPa)	σ_{vo}'	- Calculated existing vertical effective pressure (kPa)
C_c	- Compression index	C_r	- Recompression index
e_o	- Initial void ratio	**OCR**	- Over consolidation ratio

Based on a review of the consolidation test results, the sample from Borehole No. 24-12 is considered to be disturbed and therefore, not representative of the consolidation properties of the silty clay. As a result, the test results from the sample from Borehole No. 24-12 were not used in the settlement analysis for this project. The consolidation test results from the remaining samples indicate the silty clay is normally consolidated to slightly overconsolidated based on the overconsolidation ratio (OCR) estimated at 1.0 and 1.2.

6.6 Shaley Glacial Till

Glacial till was encountered below the silty clay in Borehole Nos. 24-04, 24-07 and 24-13 at 15.5m to 25.9 m (Elevation 78.8 m to Elevation 68.8 m) and extends to depths of 32.4 m to 36.0 m (Elevation 61.9 m to Elevation 58.7 m). The glacial till consists of a silty sand and gravel with numerous cobbles and boulders. Due to the presence of numerous cobbles and boulders within the glacial till, it was necessary to use conventional rock coring technique to advance the borehole through the glacial till by coring through the cobble and boulders. Based on the SPT N-value of 26, the silty sand and gravel soil matrix of the glacial till is in a compact state with a natural moisture content of 11 percent and 12 percent.

6.7 Inferred and Actual Bedrock

Based on the dynamic cone penetration test (DCPT), cone refusal was met in Borehole Nos. 24-11 and 24-12 at 16.1 m and 32.2 m depths (Elevation 78.1 m and Elevation 63.1 m) on inferred cobbles, boulders or bedrock. Cone refusal depths (elevations) on inferred cobbles, boulders or bedrock are summarized in Table V.

Table V: Summary of Inferred Bedrock Depths (Elevations)

Borehole No. (BH)	Ground Surface Elevation (m)	Cone Refusal Depth (Elevation) on Inferred Cobbles, Boulders or Bedrock (m)
BH 24-11	95.30	32.2 (63.1)
BH 24-12	94.24	16.1 (78.1)

The presence of bedrock was proven by coring the bedrock in Borehole Nos. 24-07 and 24-13 and the bedrock was contacted at 32.5 m and 36.0 m depths (Elevation 61.8 m and Elevation 58.7 m).

A summary of the depths (elevations) of the bedrock is shown in Table VI.

Table VI: Summary of Bedrock Depths (Elevations)		
Borehole No. (BH)	**Ground Surface Elevation (m)**	**Bedrock Depth (Elevation)**
BH 24-07	94.74	36.0 (58.7)
BH 24-13	94.26	32.5 (61.8)

The bedrock consists of dolostone of the Oxford formation.

The results of the coring of the dolostone bedrock indicate a total core recovery (TCR) of 94 percent to 100 percent and a rock quality designation (RQD) of 59 percent to 93 percent. Based on the RQD values, the bedrock has a fair to excellent quality. Photographs of the bedrock cores are shown in Appendix D.

6.8 Groundwater Level Measurements

A summary of the groundwater level measurements taken in the boreholes equipped with standpipes on November 21,2024 is shown in Table VII.

Table VII: Summary of Groundwater Level Measurements			
Borehole No.	Ground Surface Elevation (m)	Date of Measurement (Elapsed Time in Days from Date of Installation)	Groundwater Depth Below Ground Surface (Elevation), m
BH 24-05	94.11	November 21,2024 (31 days)	2.4 (91.7)
BH24-07	94.74	November 21,2024 (28 days)	2.2 (92.5)
BH 24-08	94.70	November 21,2024 (29 days)	3.1 (91.6)
BH24-13	94.26	November 21,2024 (27 days)	1.5 (92.8)
BH 24-17	94.35	November 21,2024 (31 days)	2.0 (92.4)
BH24-23	94.47	November 21,2024 (28 days)	2.3 (92.2)
BH 24-25	92.23	November 21,2024 (28 days)	1.8 (90.4)

Based on the November 21,2024 set of measurements, the groundwater level ranges from 1.5 m to 3.1 m depths (Elevation 92.8 m to Elevation 90.4 m).

The groundwater levels were determined in the boreholes at the time and under the condition stated in this report. Note that fluctuations in the level of groundwater may occur due to a seasonal variation such as precipitation, snowmelt, rainfall activities, and other factors not evident at the time of measurement and therefore may be at a higher level during wet weather periods.

7. Site Designation for Seismic Design and Liquefaction Potential of Soils

The seismic shear wave velocity sounding survey report is shown in Appendix B. Based on a review of the results of the seismic shear wave velocity sounding survey, the seismic shear wave velocity from existing ground surface to a 30 m depth (Vs_{30}) is 174 m/s. A comparison of the Vs_{30} value with Section 4.1.8.4 of the 2024 Ontario Building Code (OBC) indicates the site designation is X_{174}.

For the case where the bottom of the grade beams will be 2.5 m below existing grade, the Vs_{30} value is 196 m/s. A comparison of the Vs_{30} value with Section 4.1.8.4 of the 2024 Ontario Building Code (OBC) indicates the site designation is X_{196}.

EXP can provide the recommended site designation once the site grade raise and design elevation of the underside of the grade beams are known.

The subsurface soils are not considered to be susceptible to liquefaction during a seismic event.

8. Grade Raise Restriction

The geotechnical investigation and the results from the consolidation tests revealed that the deep deposit of silty clay at the site is normally consolidated too slightly over-consolidated. In this case, if the silty clay is loaded beyond its pre-consolidation pressure by loads imposed on the silty clay by site grade raise using soil fill, footings, slab-on-grade and/or permanent groundwater lowering, settlements higher than the normally tolerated limits will result. Therefore, the silty clay is prone to large settlements on application of any additional loads and therefore, is considered to have very limited capacity to support additional loads.

Since the silty clay has very limited capacity to support additional loads, two (2) options are available for the proposed school development.

The first option is to support the proposed school building by pile foundation driven to practical refusal into the underlying dolostone bedrock and designed in end-bearing. The ground floor of the proposed building should be designed as a structural slab that is also supported by the pile foundation. The services beneath the structural floor slab should be connected or tied to the underside of the structural ground floor slab. With this option, site grade raise beneath the ground floor of the proposed building may be achieved by the placement of approved fill. The site grade raise outside the proposed building and around the proposed building in areas that are settlement sensitive such as at entranceways to the proposed building, sidewalks, loading/unloading areas and the shop loading area as well as outside trenches for underground services that will service the proposed building may be achieved by using light-weight fill (LWF). EXP can provide additional details regarding LWF, if required. Site grade raise beyond the proposed building in the access road, parking lots, portable area and outdoor sports fields may be achieved by using approved soil fill. However, since these areas will undergo settlement over time, periodic maintenance of the access road, parking lots and outdoor sports fields may be required. Similarly, the portables may require periodic re-levelling over time.

The second option is to support the proposed school building by footings or pile foundation driven to practical refusal into the dolostone bedrock and designed in end-bearing. The ground floor of the proposed building may be designed as a slab-on-grade supported by soil. This option may be achieved by preloading (with wick drains) the ground floor and footing area of the proposed building and outdoor settlement sensitive areas and outdoor service trenches that will service the building to accelerate the consolidation settlement of the silty clay.

However, the feasibility of the pre-loading option for slab-on grade and/or footings will need to be explored further by conducting an additional geotechnical investigation consisting of boreholes, laboratory tests and the determination of the estimated settlement and time to settlement.

Prior to the start of the preloading program with wick drains, the existing subsurface fill will need to be excavated down to the native silty sand to sandy silt or silty clay, whichever occurs first and backfilled with Ontario Provincial Standard Specification (OPSS) Granular B Type II compacted to 98 percent standard Proctor maximum dry density (SPMDD) beneath the floor slab and to 95 percent SPMDD elsewhere within the preloaded area. Once the existing fill has been removed and replaced with compacted OPSS Granular B Type II as noted above, preparation of the site for the preloading program may begin. Preloading involves the placement of the design site grade raise using approved soil fill and placing an additional or greater height of soil fill on top of the site grade raise fill and leaving the additional soil in place for a specified period of time in order to achieve the expected consolidation settlement more quickly. Once the expected consolidation settlement has been achieved, the additional fill may be removed and construction of the proposed building may proceed. The preloading (with wick drains) area includes the area beneath the slab-on-grade of the proposed building and should extend to settlement sensitive areas outside and around the footprint of the proposed building such as entranceways to the proposed building, sidewalks, loading/unloading areas and the shop loading area as well as outside trenches for underground services that will service the building. With this option, the services beneath the ground floor slab-on-grade may be installed without tying the underground services to the floor slab. Site grade raise beyond the proposed building in the access road, parking lots, portable area and outdoor sports fields may be achieved by using approved soil fill. However, since these areas will undergo settlement over time, periodic maintenance of the access road, parking lots and outdoor sports fields maybe required. Similarly, the portables may require periodic re-levelling over time.

9. Site Grading

At the time of this geotechnical investigation, the site was occupied by stockpiles of soil fill and boulders.

In June 2025, Taggart Construction removed topsoil and boulder stockpiles from the site. EXP visited the site on June 16,2025 to review the removal of the stockpiles and the results of the site review are provided in the site review report (SSR1) shown in Appendix E.

It is recommended that any remaining stockpiles on site be removed and disposed off-site. It is also recommended that the grades at the site be re-surveyed once all stockpiles have been removed and on completion of general re-grading of the site.

For budgeting purposes, the contractor should assume that all existing subsurface fill within the footprints of the proposed portables, outdoor sports field, parking lots and access roads would require removal and replacement with well-compacted fill.

Building Footprint

For the structural slab option, site grading within the proposed building footprint should consist of the removal of all existing surficial and organic stained soils down to the non-organic fill. The existing fill beneath the locations of the grade beams should be proofrolled in the presence of a geotechnician. Any soft or spongy areas identified during proofrolling should be subexcavated and replaced with suitable approved material such as Ontario Provincial Standard Specification (OPSS) Select Subgrade Material (SSM) or Granular B Type II compacted to 95 percent standard Proctor maximum dry density (SPMDD).

For the slab-on-grade option with preload (using wick drains) and prior to the start of preloading (with wick drains), the topsoil and existing fill will have to be excavated and removed down to the native silty clay or silty sand to sandy silt, whichever occurs first within the floor slab area and settlement sensitive areas outside and around the proposed building. The native subgrade should be proofrolled and examined by a geotechnician. Any loose/soft areas identified during proofrolling and subgrade examination should be excavated, removed and replaced with Ontario Provincial Standard Specification (OPSS) Granular B Type II material compacted to 98 percent standard Proctor maximum dry density (SPMDD) beneath the floor slab area and to 95 percent SPMDD elsewhere within the preloading with wick drains area. Once the subgrade has been approved, the grades may be raised to the design underside of floor slab elevation or to subgrade elevation in the settlement sensitive areas around and outside the proposed building by the construction of an engineered fill pad. The engineered fill pad should consist of OPSS Granular B Type II material with each lift compacted to 98 percent SPMDD beneath the floor slab area and to 95 percent SPMDD elsewhere within the preloading (with wick drains) area. The engineered fill should be placed under the full-time supervision of a geotechnician working under the direction of a geotechnical engineer. In-place density tests should be undertaken on each lift of the engineered fill to ensure that it is properly compacted prior to placement of subsequent lifts.

Preload soil material that will be placed on top of the compacted Granular B Type II material and removed on completion of the preload process may consist of approved on-site excavated material (free of organics, debris, cobbles and boulders) compacted to 95 percent SPMDD.

Portable Area

In the portable area, all topsoil and peat fill should be excavated and removed down to the non-organic fill. The fill should be proofrolled in the presence of a geotechnician. Any soft or spongy areas identified during proofrolling should be subexcavated and replaced with suitable approved material such as Ontario Provincial Standard Specification (OPSS) Select Subgrade Material (SSM) or Granular B Type II compacted to 100 percent standard Proctor maximum dry density (SPMDD). Once the fill surface has been approved, the excavation may be backfilled by the construction of an engineered fill pad. The excavation for the removal of topsoil and peat fill should extend a sufficient distance beyond the limits of the proposed potables to accommodate a 1.0 m wide horizontal bench of engineered fill that extends beyond the perimeter of the proposed portables on all sides, which should thereafter

be sloped at an inclination of 1H to 1V down to the approved subgrade. The engineered fill should consist of OPSS Granular B Type II material that is placed in 300 mm thick lifts and each lift compacted to 100 percent SPMDD. The placement and compaction of the engineered fill can in this way be undertaken to the design subgrade of the portables. The engineered fill should be placed under the full-time supervision of a geotechnician working under the direction of a geotechnical engineer. In-place density tests should be undertaken on each lift of the engineered fill to ensure that it is properly compacted prior to placement of subsequent lift.

Since the underlying silty clay is normally consolidated to slightly overconsolidated and the portables will likely be supported by shallow foundations set on the engineered fill pad, the potables will undergo settlement and as results will require re-levelling on a periodic basis over time.

Outdoor Sports Fields, Parking Lot and Access Roads

Site grading within the proposed parking lot and access road should consist of the removal of all topsoil and fill down to the native soil. Site grading within the outdoor sports field areas should consist of the removal of topsoil and peat fill down to the non-organic fill. The exposed soil subgrades should be proofrolled in the presence of a geotechnician. Any loose/soft areas identified during the proofrolling process should be excavated, remove and replaced with Ontario Provincial Standard Specification (OPSS) Granular B Type II or OPSS Select Subgrade Material (SSM) compacted to 95 percent standard Proctor maximum dry density (SPMDD). Once the exposed soil subgrades have been approved, the grades may be raised to the design subgrade level of the sports field, parking lot and access road areas by the placement of OPSS Select Subgrade material (SSM) or approved non-organic on-site material that is free of debris, cobbles and boulders compacted to 95 percent SPMDD. In-place density tests should be undertaken on each lift of the fill material to ensure that it is properly compacted prior to placement of subsequent lifts. Since these areas will undergo settlement over time, periodic maintenance of the access road, parking lots and outdoor sports fields may be required.

10. Foundation Considerations

The geotechnical investigation has revealed that the subsurface conditions at the site consist of fill and native sand and silt underlain by a sensitive, compressible very soft to stiff silty clay deposit, which extends to approximate depths of 15.5 m to 27.1 m below existing grade (Elevation 78.6 m to Elevation 68.2 m). Due to the limited capacity of the silty clay to support additional loads, it is recommended the proposed building be supported by pile foundations driven to practical refusal into the underlying bedrock and designed in end bearing and as an option as previously discussed, the ground floor of the proposed building designed as structural slab that is also supported by the piles or preloading the slab and footing area and designing the floor slab as a slab-on-grade. For the case of the structural slab, underground services beneath the floor slab should be connected or tied to the structural floor slab.

The feasibility of the pre-loading option for slab-on grade and/or footings will need to be explored further by conducting an additional geotechnical investigation consisting of boreholes, laboratory tests and the determination of the estimated settlement and time to settlement and by consultation with a specialized contractor.

Pile foundation is discussed in the following section of this geotechnical report.

10.1 Pile Foundation

Bedrock was contacted at 32.5 m and 36.0 m depths (Elevation 61.8 m and Elevation 58.7 m) in Borehole Nos. 24-07 and 24-13. It is recommended that the pile tip elevation should be established from the bedrock depths identified in the boreholes where the bedrock as cored (Borehole Nos. 24-07 and 24-13) and not from the cone refusal depth from the dynamic cone penetration test (DCPT), since cone refusal may have occurred in the glacial till.

The factored geotechnical resistance at ultimate limit state (ULS) and factored structural capacity for various pile sections are shown in Table VIII. The factored geotechnical resistance and structural capacity for various pile sections are shown in Table VIII. The factored geotechnical capacity of the piles is based on the Hiley dynamic formula and includes a geotechnical resistance factor of 0.4. The factored structural capacity of the piles are based on steel piles with a yield strength of 350 MPa and concrete compressive strength of 35 MPa.

It is noted that the piles will be subjected to down-drag forces (negative skin friction) due to consolidation of the marine clay and will need to be determined to provide the allowable load on the pile for design purposes. The negative skin friction has no effect on the geotechnical resistance of the pile, only on the structural capacity of the pile. The allowable load on a pile that may be used for design is based on comparing the difference between the factored structural capacity of the pile and estimated negative skin friction with the factored geotechnical resistance of the pile. The lower of the two (2) values will govern the design and will be the allowable load carrying capacity of the pile to be used in the pile design. Once design details regarding site grade raise and floor slab elevation are known, EXP can provide the estimated negative skin friction and the allowable load on the pile that may be used for design.

Table VIII: Factored Geotechnical and Structural Capacity of Piles

Pile Section	Description	Factored Geotechnical Resistance at ULS (kN)	Factored Structural Capacity of Piles (kN)
Steel Pipe Section	245 mm O.D. by 10 mm wall thickness	1320	1782
	245 mm O.D. by 12 mm wall thickness	1490	2030
	324 mm O.D. by 12 mm wall thickness	2000	2910
HP Section	HP 310 x 110	2400	2640
	HP 310 x 125	2700	2980

Total and differential settlement of the piles are expected to be less than 10 mm.

The contractor should be made aware that the glacial till contains numerous cobbles and boulders that may make it difficult to drive the piles to bedrock.

To achieve the capacity given previously, the pile-driving hammer must seat the pile in the overburden without overstressing the pile material. For guidance purposes, it is estimated that a hammer with rated energy of 54 kJ to 70 kJ (40,000 to 52,000 ft. lbs.) per blow would be required to drive the piles to practical refusal. Practical refusal is considered to have been achieved at a set of 5 blows for 6 mm or less of pile penetration. However, the driving criteria for a particular hammer-pile system must be established at the beginning of the project using the Pile Driving Analyzer.

The piles should be equipped with a driving shoe as per Ontario Provincial Standard Drawing (OPSD) 3001.100, Type II, Revision No. 2 dated November 2017, to protect them from damage during driving through cobbles and boulders within the glacial till.

A number of test piles (5 percent of the total number of piles) should be monitored with the Pile Driving Analyzer during the initial driving and re-striking at the beginning of the project. This monitoring will allow for the evaluation of transferred energy into the pile from the hammer, determination of driving criteria and an evaluation of the ultimate bearing capacity of the piles. Depending on the results of the pile driving analysis, the pile capacity may have to be proven by at least one pile load test for each pile type before production piling begins. If necessary, the pile load test should be performed in accordance with the American Society for Testing and Materials (ASTM) D 1143.

Closed end pipe piles tend to displace a relatively large volume of soil. When driven in a cluster or group, they may tend to jack up the adjacent piles in the group. Consequently, the elevation and the location of the top of each pile in a group should be monitored immediately after driving and after all the piles in the group have been driven. This is to ensure that the piles are not heaving or being displaced. Any piles found to heave more than 3 mm should be re-tapped.

Piles driven at the site may be subject to relaxation (loss of set with time). It is therefore recommended that all the piles should be re-tapped at least 24 hours after initially driving and at 24-hour intervals thereafter until it can be proven that relaxation is no longer a problem.

The installation of the piles at the site should be monitored on a full-time basis by a geotechnician working under the direction and supervision of a qualified geotechnical engineer to verify that the piles are driven in accordance with the project specifications.

The concrete grade beams and pile caps for heated structures should be protected from frost action by providing the beams and caps with 1.5 m of earth cover. For non-heated structures, the pile caps and beams should be provided with 2.4 m of earth cover in areas where the snow will be removed and 2.1 m of earth cover where the snow will not be removed. Alternatively, frost protection may be provided by rigid insulation or a combination of rigid insulation and earth cover.

A 50 mm thick concrete mud slab is recommended to installed under the grade beams and pile caps immediately upon excavation and approval of the subgrade to protect the surface of the sandy silt to silty sand and silty clay from disturbance from water, the effects from the weather and foot traffic from construction workers.

Temporary granular roads and mats (at least 900 mm thick) will be required to provide access for the pile driving rig. The actual thickness required for the granular roads and mats will have to be established by the piling contractor, based on the type of piling rig that will be used on site and subsurface condition.

The recommended factored geotechnical resistances at ULS have been calculated by EXP from the borehole information for the design stage only. The investigation and comments are necessarily on-going as new information of underground conditions becomes available. For example, more specific information is available with respect to conditions between boreholes, when foundation construction is underway. The interpretation between boreholes and the recommendations of this report must therefore be checked through field monitoring provided by an experienced geotechnical engineer to validate the information for use during the construction stage.

11. Floor Slab and Drainage Requirements

The ground floor of the proposed school building that is designed as a structural slab supported by pile foundation should be placed on a 200 mm thick, 19 mm sized clear stone bed placed on the existing non-organic fill. The clear stone will minimize the capillary rise of moisture from the sub-soil to the floor slab. Alternatively, the clear stone layer may be replaced with a 200 mm thick bed of OPSS Granular A overlain by a vapour barrier.

The ground floor of the proposed building that is designed as a slab-on-grade following the completion of pre-loading may also be set on a 200 mm thick 19 mm sized clear stone layer or on a 200 mm thick OPSS Granular A layer compacted to 98 percent SPMDD that is placed on the engineered fill pad prepared in accordance with Section 9 of this report. Adequate saw cuts should be provided in the floor slabs to control cracking. Underground services beneath the structural floor slab should be connected to or tied to the underside of the floor slab.

The proposed school building will require a perimeter drainage system. The need for underfloor drainage system for the proposed building can be determined once the final design elevation of the ground floor is available.

The floor slab should be set at a minimum of 150 mm higher than the final exterior grade surrounding the buildings.

The final exterior grade surrounding the proposed building should be sloped away from the proposed building to prevent ponding of surface water close to the exterior walls of the proposed building.

12. Excavation and De-Watering Requirements

12.1 Excess Soil Management

Ontario Regulation 406/19 specifies protocols that are required for the management and disposal of excess soils. As set forth in the regulation, specific analytical testing protocols need to be implemented and followed based on the volume of soil to be managed and the requirements of the receiving site. The testing protocols are specific as to whether the soils are stockpiled or in situ. In either scenario, the testing protocols are far more onerous than have been historically carried out as part of standard industry practices. These decisions should be factored in and accounted for prior to the initiation of the project-defined scope of work. EXP would be pleased to assist with the implementation of a soil management and testing program that would satisfy the requirements of Ontario Regulation 406/19.

Reference is made to the environmental reports prepared by cm3 regarding excess soil management.

12.2 Excavation

The construction of the proposed school development including the installation of the underground services are anticipated to extend to a maximum 3.0 m depth below existing grade and are expected to be within the fill, silty sand to sandy silt and silty clay and below the groundwater level.

The excavations may be undertaken by conventional heavy equipment capable of removing possible debris within the fill.

All excavations must be undertaken in accordance with the Occupational Health and Safety Act (OHSA), Ontario Reg. 213/91. Based on the definitions provided in OHSA, the subsurface soils on site are considered to be Type 3 and as such must be cut back at 1H:1V from the bottom of the excavation. Excavations within the soft to very soft zone of the silty clay considered to be Type 4 soil will have to be cut back at 3H:1V from the bottom of the excavation. Within zones of seepage, the excavation side slopes are expected to slough and eventually stabilize at 2H:1V to 3H:1V from the bottom of the excavation. For excavations above the groundwater level or properly dewatered, the installation of the municipal underground services may be undertaken within the confines of a prefabricated support system (trench box) designed and installed in accordance with OHSA.

Open cut excavations that extend into or terminate within the silty sand to sandy silt below the groundwater level are anticipated to be more problematic and will require the lowering of the groundwater level prior to the start of excavation. It is anticipated that the base of the excavation in the silty sand to sandy silt and below the groundwater level may be susceptible to basal instability or base type failure in the form of piping or heave. To minimize the occurrence of base type failure, it is recommended that the groundwater level should be lowered by at least 1.0 m below the bottom of the excavation prior to the start of excavation. This may be achieved by installing deep sumps and pumping with high-capacity pumps. The dewatering contractor should review the subsurface conditions at the site and select the most appropriate method to lower the groundwater level.

Excavations that terminate at or within the very soft to soft zone of the silty clay are susceptible to base heave failure. Once design elevations of invert levels of underground services and other elements of the proposed school development are available, EXP can provide additional comments and recommendations regarding the potential for base heave and prevention of base heave failure within the very soft to soft zone of the silty clay.

Many geologic materials deteriorate rapidly upon exposure to meteorological elements. Unless otherwise specifically indicated in this report, walls and floors of excavations must be protected from moisture, desiccation, and frost action throughout the course of construction.

12.3 De-Watering Requirements

Seepage of the surface and subsurface water into the excavations is anticipated. However, it should be possible remove groundwater entering into excavation by pumping from sumps. In areas of high infiltration or in areas where more permeable soil layers may exist, a higher seepage rate should be anticipated and will require high-capacity pumps to keep the excavation dry (may need to operate 24 hours a day, seven (7) days a week).

As discussed above, to minimize base type failure of excavations that extend below the groundwater level and into the silty sand to sandy silt, it is recommended that the groundwater level should be lowered by at least 1.0 m below the bottom of the excavation for the proposed buildings and underground services prior to the start of excavation. These may be achieved by installing deep sumps and pumping with high-capacity pumps. The dewatering contractor should review the subsurface conditions at the site and select the most appropriate method to lower the groundwater level.

For construction dewatering, an Environmental Activity and Sector Registry (EASR) approval shall be obtained for water takings greater than 50 m3 per day. Since July of 2025, any volume of pumping at greater than 50 m3/day will require to be registered as EASR. A hydrogeological assessment report, water taking and discharge plans are required for EASR registration.

Although this investigation has estimated the groundwater levels at the time of the fieldwork, and commented on dewatering and general construction problems, conditions may be present which are difficult to establish from standard boring and excavating techniques and which may affect the type and nature of dewatering procedures used by the contractor in practice. These conditions include local and seasonal fluctuations in the groundwater table, erratic changes in the soil profile, thin layers of soil with large or small permeabilities compared with the soil mass, etc. Only carefully controlled tests using pumped wells and observation wells will yield the quantitative data on groundwater volumes and pressures that are necessary to adequately engineer construction dewatering systems.

13. Pipe Bedding Requirements

It is anticipated that the subgrade for the proposed underground services will consist of existing fill, silty sand to sandy silt and silty clay.

The pipe bedding including material specifications, thickness of cover material and compaction requirements should conform to City of Ottawa specifications, drawings and special provisions. The bedding and cover material should be compacted to a minimum of 95 percent standard Proctor maximum dry density (SPMDD).

The bedding thickness may be increased in areas where the subgrade is subject to disturbance. If this is the case, trench base stabilization techniques, such as the removal of loose material, placement of sub-bedding, consisting of OPSS Granular B Type II completely wrapped in a non-woven geotextile, may be used.

For paved surfaces that will be located over service trenches, it is recommended that the trench backfill material within the 1.8 m frost zone, should match the existing material exposed along the trench walls to minimize differential frost heaving of the subgrade. The trench backfill should be placed in 300 mm thick lifts and each lift should be compacted to 95 percent SPMDD. Alternatively, frost tapers may be used.

If the backfill for the service trenches will consist of granular fill, clay seals should be installed in the service trenches at select intervals (spacing) as per City of Ottawa Drawing No. S8. The seals should be 1 m wide, extend over the entire trench width and from the bottom of the trench to the underside of the pavement structure. The clay should be compacted to 95 percent SPMDD. The purpose of the clay seals is to prevent the permanent lowering of the groundwater level.

The underground services should be installed in short open trench sections that are excavated and backfilled the same day.

14. Backfilling Requirements and Suitability of On-Site Soils for Backfilling Purposes

The materials to be excavated from the site will comprise of topsoil, fill, peat fill, silty sand to sandy silt and silty clay. From a geotechnical perspective, the topsoil, and peat fill are not considered suitable for reuse as backfill material in the interior or exterior of the buildings and should be discarded. Portions of the non-organic fill (free of organics, debris, cobbles and boulders), silty sand to sandy silt and silty clay above the groundwater level may be re-used as fill in locations away from the proposed building as backfill in service trenches and subgrade fill in paved, outdoor sports field and landscaped areas, subject to further geotechnical examination and testing during construction. These soils are subject to moisture absorption due to precipitation and must be protected at all times from the elements. Subject to additional examination and testing during construction, portions of the non-organic fill (free of organics, debris, cobbles and boulders), silty sand to sandy silt and silty clay below the groundwater level, may be re-used as fill in locations away from the proposed building as backfill in service trenches and subgrade fill in paved and landscaped areas, but will likely require air-drying to reduce the moisture content to compact the materials to the specified degree of compaction. Air-drying may be problematic (difficult) since it is weather dependent, may take time and that the soils are subject to moisture absorption from precipitation and must be protected at all times from the elements.

Therefore, it is anticipated that the majority of the material required for backfilling purposes in the interior and exterior of the proposed building and in the underground service trenches will need to be imported and should preferably conform to the following specifications:

- Engineered fill under slab-on-grade for the proposed building and beneath portables – OPSS Granular B Type II placed in 300 mm thick lifts and each lift compacted to 98 percent SPMDD,
- Backfill material against exterior side of grade beams located outside the proposed building – OPSS Granular B Type II placed in 300 mm thick lifts and each lift compacted to 95 percent SPMDD,
- Trench backfill and subgrade fill for access road, parking lots and outdoor sports fields - OPSS Granular B Type I, Type II or Select Subgrade Material (SSM) or approved on site material (free of organics, debris, cobbles and boulders) placed in 300 mm thick lifts and each lift compacted to 95 percent SPMDD; and
- Landscaped areas - Clean fill that is free of organics and deleterious material, cobbles and boulders and is placed in 300 mm thick lifts with each lift compacted to 92 percent of the SPMDD.

15. Pavement Structures for Access Road and Parking Lots

The subgrade for the pavement structures is anticipated to consist of fill, native silty sand to sandy silt, silty clay, OPSS Granular B Types I or II material or OPSS Select Subgrade Material (SSM). Pavement structure thicknesses required for the access road and parking lots set on the anticipated approved subgrade materials were computed and are shown in Table IX. The pavement structures assume a functional design life of 15 to 20 years. The proposed functional design life represents the number of years to the first rehabilitation, assuming regular maintenance is carried out on a periodic basis over the years.

Table IX: Recommended Pavement Structure Thicknesses

Pavement Layer	Compaction Requirements	Computed Pavement Structure	
		Light Duty Traffic (Cars Only)	Heavy Duty Traffic – Access Road (Emergency Vehicles and Trucks)
Asphaltic Concrete	92 percent-97 percent MRD	65 mm HL3/SP12.5 mm/ Cat. B (PG 58-34)	50 mm HL3/SP12.5 Cat. B (PG 58-34) 60 mm HL8/SP 19 Cat. B (PG 58-34)
OPSS 1010 Granular A Base	100% percent SPMDD	150 mm	150 mm
OPSS 1010 Granular B Type II Sub-base	100% percent SPMDD	450 mm	600 mm

Notes:

1. SPMDD denotes standard Proctor maximum dry density, ASTM, D-698-12e2.
2. MRD denotes Maximum Relative Density, ASTM D2041.
3. The upper 300 mm of the subgrade fill must be compacted to 98 percent SPMDD.
4. The approved subgrade should be covered with a woven geotextile prior to placement of granular sub-base of the pavement structure.

The foregoing design assumes that construction is carried out during dry periods and that the subgrade is stable under the load of construction equipment. If construction is carried out during wet weather and heaving or rolling of the subgrade is experienced, additional thickness of granular material may be required in addition to the woven geotextile indicated in Table IX.

Additional comments for the construction of the access road and parking lots are as follows:

As part of the subgrade preparation, the proposed parking area and access road should be stripped of surficial topsoil and organic stained soil and fill down to the native soil. The subgrade should be properly shaped, crowned, then proofrolled with a heavy vibratory roller in the full-time presence by a geotechnician. Any soft or spongy subgrade areas detected should be sub excavated and properly replaced with suitable approved material or approval OPSS Granular B Type II placed in 300 mm lift and each lift compacted to 95 percent SPMDD (ASTM D698-12e2). Alternatively, crusher-run material (100 mm minus) may be used in the lower level of the subgrade fill for the proposed parking lots and access road for the purposed of stabilizing the clayey subgrade in addition to using a geotextile (separation membrane) over the crusher-run material.

1. The long-term performance of the pavement structure is highly dependent upon the subgrade support conditions. Stringent construction control procedures should be maintained to ensure that uniform subgrade moisture and density conditions are achieved. The need for adequate drainage cannot be over-emphasized. Subdrains should be installed on both sides of the access road. Subdrains must be installed in the proposed parking area and on both sides of the roadway at low points and should be continuous between catchbasins to intercept excess surface and subsurface moisture and to prevent subgrade softening. This will ensure no

water collects in the granular course, which could result in pavement failure during the spring thaw. The location and extent of sub drainage required within the paved areas should be reviewed by this office in conjunction with the proposed site grading.

2. To minimize the problems of differential movement between the pavement and catchbasins/manhole due to frost action, the backfill around the structures should consist of free-draining granular preferably conforming to OPSS Granular B Type II material. Weep holes should be provided in the catchbasins/manholes to facilitate drainage of any water that may accumulate in the granular fill.
3. The most severe loading conditions on light-duty pavement areas and the subgrade may occur during construction. Consequently, special provisions such as restricted lanes, half-loads during paving, temporary construction roadways, etc., may be required, especially if construction is carried out during unfavorable weather.
4. The finished pavement surface should be free of depressions and should be sloped (preferably at a minimum cross fall of 2 percent) to provide effective surface drainage towards catchbasins. Surface water should not be allowed to pond adjacent to the outside edges of paved areas.
5. Relatively weaker subgrade may develop over service trenches at subgrade level. These areas may require the use of thicker/coarser sub-base material and the use of a geotextile at the subgrade level. if this is the case, it is recommended that additional 150 mm of granular sub-base Granular B Type II should be provided in these areas in addition to the use of a geotextile at the subgrade level. The granular materials used for pavement construction should conform to OPSS 1010 for Granular A and Granular B Type II and should be compacted to 100 percent of the SPMDD (ASTM D698). The asphaltic concrete and its placement should meet OPSS requirements. It should be compacted to 92 to 97 percent of the maximum relative density in accordance with ASTM D2041.

The asphaltic concrete used, and its placement should meet OPSS 1150 or 1151 requirements. It should be compacted from 92 percent to 97 percent of the MRD (ASTM D2041). Asphalt placement should be in accordance with OPSS 310 and OPSS 313.

It is recommended that EXP be retained to review the final pavement structure design and drainage plans prior to construction to ensure they are consistent with the recommendations of this report.

16. Subsurface Concrete and Steel Requirements

Chemical tests limited to pH, sulphate, chloride and resistivity were undertaken on three (3) soil samples. A summary of the results is shown in Table X. The laboratory certificate of analysis report is shown in Appendix F.

Table X: Corrosion Test Results on Soil Samples						
Borehole: Sample No.	Depth (m)	Soli Type	pH	Sulphate (%)	Chloride (%)	Resistivity (ohm-cm)
BH 24-02: SS3	1.5-2.1	Grey Clayey Silt	8.21	0.0401	0.0070	1680
BH 24-21: SS4	2.3-2.9	Silty Sand	7.97	0.0377	0.0040	3690
BH 24-24: SS4	2.3-2.9	Grey Silty Clay	8.17	0.0525	0.0010	1500

The results indicate the soils have a negligible sulphate attack on subsurface concrete. The concrete should be designed in accordance with CSA A.23.1:24 and CSA A23.2:24.

The results from the resistivity tests indicate that the grey clayey silt and silty clay are corrosive to moderately corrosive and the silty sand is mildly corrosive to bare steel as per the National Association of Corrosion Engineers (NACE). Appropriate measures should be taken to protect the buried bare steel from corrosion.

17. Tree Planting Restrictions

Based on the results of the Atterberg limits of the clayey soils and comparison of the results with the City of Ottawa 2005 Clay Soils Policy and 2017 Tree Planting in Sensitive Marine Clay Soils Guidelines (2017 Tree Planting Guidelines), the clayey soils at this site are considered to have a low/medium potential for soil volume change. Therefore, the tree planting should be carried out in accordance with the 2017 City of Ottawa Tree Planting Guidelines.

A landscape architect should be consulted to ensure the tree planting restrictions and setbacks for the proposed development are in accordance with the applicable City of Ottawa guidelines.

18. Additional Geotechnical Investigation

The feasibility of the pre-loading option for slab-on grade and/or footings will need to be explored further by conducting an additional geotechnical investigation consisting of boreholes, laboratory tests and the determination of the estimated settlement and time to settlement.

19. General Comments

The comments given in this report are intended only for the guidance of design engineers. The number of boreholes required to determine the localized underground conditions between boreholes affecting construction costs, techniques, sequencing, equipment, scheduling, etc., would be much greater than has been carried out for the design purposes. Contractors bidding on or undertaking the works should, in this light, decide on their own investigations, as well as their own interpretations of the factual borehole results, so that they may draw their own conclusions as to how the subsurface conditions may affect them.

The information contained in this report is not intended to reflect on environmental aspects of the soils and groundwater. Reference is made to the environmental reports prepared by cm3 regarding the environmental aspects of the site.

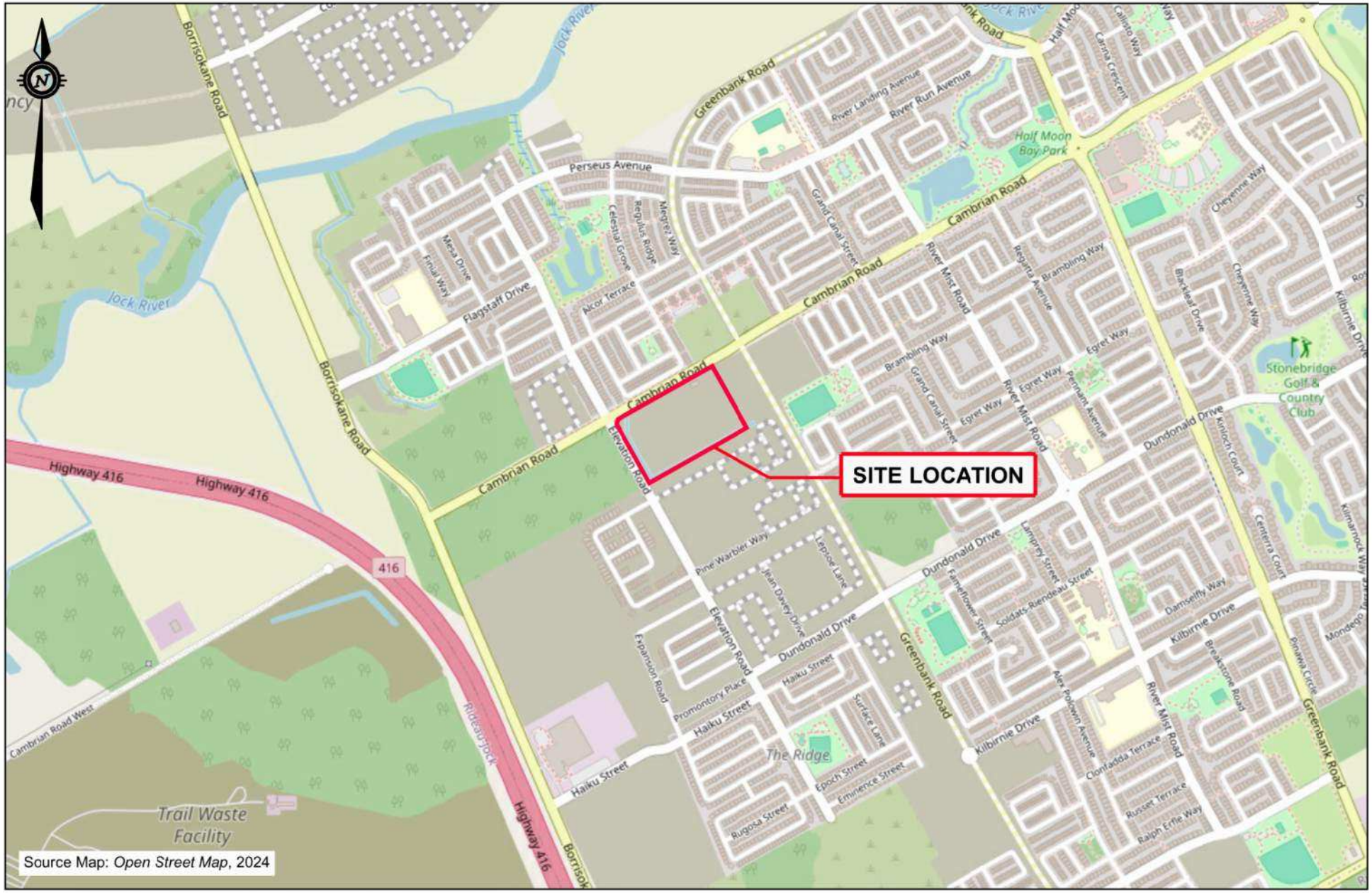
We trust that the information contained in this report will be satisfactory for your purposes. Should you have any questions, please do not hesitate to contact this office.

Sincerely,

Susan M. Potyondy, P.Eng.
Senior Geotechnical Engineer
Earth & Environment
Eastern Region

Ismail M. Taki, M.Eng., P.Eng.
Senior Manager
Earth & Environment
Eastern Region

Figures



ORIGINAL SHEET SIZE = 11" X 8.5"

0 150m 300m 600m

HORIZONTAL 1:15,000

exp Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6
www.exp.com

DESIGN	IT/SP
DRAWN	AS
DATE	NOVEMBER 2024
FILE NO	OTT-23012778-G0

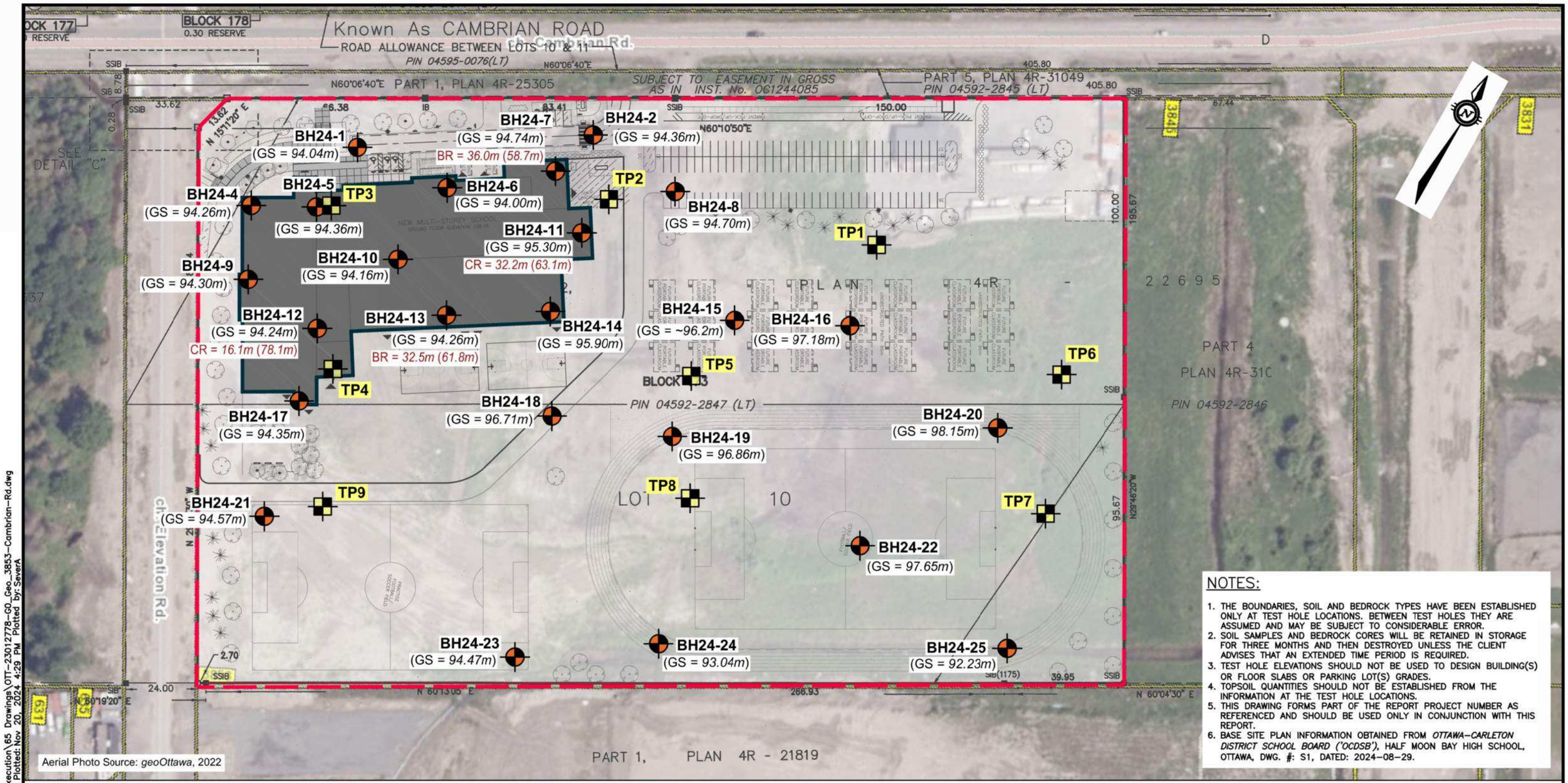
GEOTECHNICAL INVESTIGATION
OCDSB HALF MOON BAY SECONDARY SCHOOL
3853 CAMBRIAN ROAD, OTTAWA, ONTARIO

SITE LOCATION PLAN

SCALE 1:15,000

SKETCH NO FIG 1

Filename: E:\OTT\OTT-23012778-G0\60 Execution\65 Drawings\OTT-23012778-G0_Geo_3853-Cambrian-Rd.dwg
Last Saved: Nov 20, 2024 4:25 PM Last Plotted: Nov 20, 2024 4:25 PM Plotted by: SeverA



NOTES:

1. THE BOUNDARIES, SOIL AND BEDROCK TYPES HAVE BEEN ESTABLISHED ONLY AT TEST HOLE LOCATIONS. BETWEEN TEST HOLES THEY ARE ASSUMED AND MAY BE SUBJECT TO CONSIDERABLE ERROR.
2. SOIL SAMPLES AND BEDROCK CORES WILL BE RETAINED IN STORAGE FOR THREE MONTHS AND THEN DESTROYED UNLESS THE CLIENT ADVISES THAT AN EXTENDED TIME PERIOD IS REQUIRED.
3. TEST HOLE ELEVATIONS SHOULD NOT BE USED TO DESIGN BUILDING(S) OR FLOOR SLABS OR PARKING LOT(S) GRADES.
4. TOPSOIL QUANTITIES SHOULD NOT BE ESTABLISHED FROM THE INFORMATION AT THE TEST HOLE LOCATIONS.
5. THIS DRAWING FORMS PART OF THE REPORT PROJECT NUMBER AS REFERENCED AND SHOULD BE USED ONLY IN CONJUNCTION WITH THIS REPORT.
6. BASE SITE PLAN INFORMATION OBTAINED FROM *OTTAWA–CARLETON DISTRICT SCHOOL BOARD ('OCDSB')*, HALF MOON BAY HIGH SCHOOL, OTTAWA, DWG. #: S1, DATED: 2024–08–29.

LEGEND

PROPERTY LINE

PROPOSED NEW SECONDARY SCHOOL BUILDING

BH24-1 — *EXP* BOREHOLE NO. & LOCATION (2024)

TP1 — *CM3 ENVIRONMENTAL* TEST PIT NO. & LOCATION – PHASE TWO ENVIRONMENTAL SITE ASSESSMENT (NOVEMBER 2024)

(GS = *94.04m*) GROUND SURFACE ELEVATION (m)

BR = *36.0m (58.7m)* BEDROCK DEPTH (ELEVATION) (m)

CR = *32.2m (63.1m)* CONE REFUSAL DEPTH (ELEVATION) (m) FROM DYNAMIC CONE PENETRATION TEST (DCPT) ON INFERRED COBBLES, BOULDERS OR BEDROCK

ORIGINAL SHEET SIZE = 17" X 11"

0 10m 20m 50m

HORIZONTAL 1:1250

exp Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6
www.exp.com

DESIGN	IT/SP
DRAWN	AS
DATE	NOVEMBER 2024
FILE NO	OTT–23012778–G0

GEOTECHNICAL INVESTIGATION
OCDSB HALF MOON BAY SECONDARY SCHOOL
3853 CAMBRIAN ROAD, OTTAWA, ONTARIO

TEST HOLE LOCATION PLAN

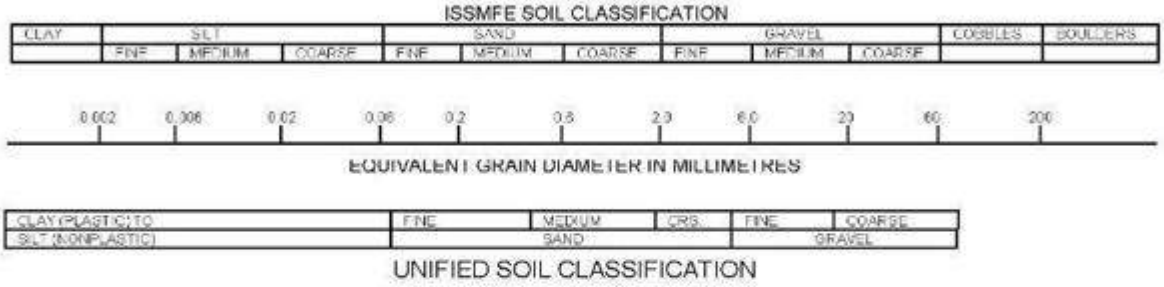
SCALE 1:1,250

SKETCH NO FIG 2

Filename: E:\OTT\OTT-23012778-G0\60 Execution\65 Drawings\OTT-23012778-G0_Geo_3853-Cambrian-Rd.dwg
Last Saved: Nov 20, 2024 4:29 PM Last Plotted: Nov 20, 2024 4:29 PM Plotted by: SeverA

Notes On Sample Descriptions

1. All sample descriptions included in this report follow the Canadian Foundations Engineering Manual soil classification system. This system follows the standard proposed by the International Societv for Soil Mechanics and Foundation Engineering. Laboratory grain size analyses provided by **exp** Services Inc. also follow the same system. Different classification systems may be used by others; one such system is the Unified Soil Classification. Please note that, with the exception of those samples where a grain size analysis has been made, all samples are classified visually. Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems.



2. Fill: Where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc., none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional geotechnical site investigation.

3. Till: The term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (60 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

Log of Borehole BH 24-01

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 3

Page. 1 of 1

Date Drilled: 'October 22, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test ——— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits |—○—| | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		FILL Sandy silt, trace gravel, topsoil inclusions, brown to grey, moist, (compact)	94.04	0	13		SS1	
			93.3					
		SILTY CLAY Trace sand, sand seams, shell fragments, grey to dark grey, wet, (soft to stiff)		1	5		SS2	
				2	1		SS3	
					62 kPa s=3.3			
				3	Hammer Weight		SS4	
					Hammer Weight		SS5	
				5	19 kPa			
		Borehole Terminated at 5.2 m Depth	88.8					

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-02

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 4

Page. 1 of 1

Date Drilled: 'October 22, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits |—○
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		FILL Silty sand with gravel, possible cobbles and boulders, brown, moist, (compact)	94.36	0	31	×	SS1	
		Augers grinding from 0.0m to 0.7 m depth on possible cobbles and boulders.	93.7	1	5	×	SS2	
		CLAYEY SILT Sandy, shell fragments, grey, moist to wet, (firm)		2	2	×	SS3	
					38 kPa s=4.0			
		With 150 mm thick sand layer at 3.2m depth.		3	3	×	SS4	
				4	48 kPa s=10.0			
		SILTY CLAY Dark grey, wet, (very soft)	90.1	5	Hammer Weight	×	SS5	
		Borehole Terminated at 5.2 m Depth	89.2					

NOTES:
1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-04

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 5

Page. 1 of 3

Date Drilled: 'October 24, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test —— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		FILL Silty sand to clayey silt with topsoil inclusions, brown to grey, damp to moist, (loose to compact)	94.26	0	20		SS1	
				1	6		SS2	
				2	4		SS3	
		SILTY SAND TO SANDY SILT Grey, wet, (loose)	91.9	3	6		SS4	
				3	4		SS5	
		SILTY CLAY Dark grey, wet, (soft)	90.6	4	14 kPa			
		Borehole advanced by casing and wash boring technique from 5.2 m to 15.5 m depths.	89.7	5	Hammer Weight		SS6	
				6				
				7				
				8				
				9				
				10				

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	15.5 - 16.2		
2	16.5 - 17.6		
3	17.6 - 18.3		
4	18.6 - 20.6		
5	21.9 - 23.6		
6	23.6 - 25		
7	25 - 28		
8	28 - 29.6		

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-04

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Figure No. 5

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value (20 40 60 80) / Shear Strength kPa (50 100 150 200)	Combustible Vapour Reading (ppm) (250 500 750) / Natural Moisture Content % Atterberg Limits (% Dry Weight) (20 40 60)	SAMPLES	Natural Unit Wt. kN/m³
		Borehole advanced by casing and wash boring technique from 5.2 m to 15.5 m depths. *(continued)*	84.26	10				
				11				
				12				
				13				
				14				
				15				
			78.8					
		GLACIAL TILL Silty sand and gravel, cobbles and boulders, grey Coring through cobbles and boulders within glacial till from 15.5m to 32.4 depths.		16	25, then spoon refusal ○	×	Run 1	
							SS7	
				17			Run 2	
				18	24, then 50 for 75mm ○	×	SS8	
				19			RUN4	
				20				
				21			RUN5	
				22				

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	15.5 - 16.2		
2	16.5 - 17.6		
3	17.6 - 18.3		
4	18.6 - 20.6		
5	21.9 - 23.6		
6	23.6 - 25		
7	25 - 28		
8	28 - 29.6		

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-04

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Figure No. 5

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		GLACIAL TILL Silty sand and gravel, cobbles and boulders, grey Coring through cobbles and boulders within glacial till from 15.5m to 32.4 depths. *(continued)*	72.26	22 23 24 25 26 27 28 29 30 31 32	Standard Penetration Test N Value: 20 40 60 80 Shear Strength kPa: 50 100 150 200 Combustible Vapour Reading (ppm): 250 500 750 Natural Moisture Content % / Atterberg Limits (% Dry Weight): 20 40 60	RUN6 RUN7 RUN8 RUN9 RUN10 RUN11	
		Borehole Terminated at 32.4 m Depth	61.9					

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	15.5 - 16.2		
2	16.5 - 17.6		
3	17.6 - 18.3		
4	18.6 - 20.6		
5	21.9 - 23.6		
6	23.6 - 25		
7	25 - 28		
8	28 - 29.6		

Log of Borehole BH 24-05

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 6

Page. 1 of 1

Date Drilled: 'October 21, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ⊠ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test —— | Shelby Tube ■ | Shear Strength by Vane Test + S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		FILL Sandy silt with gravel, trace clay, topsoil inclusions, dark brown, damp, (compact)	94.11	0	21	×	SS1	
			93.3					
		SILTY CLAY Occasional sand seams, grey, moist, (stiff)		1	9	×	SS2	
				2	3	×	SS3	
▼			91.71		82 kPa s=3.4			
		SILTY SAND TO SANDY SILT Dark grey, wet, (very loose)	91.4	3	2	×	SS4	
		SILTY CLAY Dark grey, wet, (very soft to soft)	90.6	4				
				5	10 kPa	×	SS5	
				6	24 kPa s=5.0			
				7				
			86.2		24 kPa s=10.0			
		Borehole Terminated at 7.9 m Depth						

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
Nov. 21, 2024	2.4	

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH 24-06

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 7

Page. 1 of 1

Date Drilled: 'October 23, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test —— | Shelby Tube ■ | Shear Strength by Vane Test + S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits |—○—| | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~500 mm thick Some silt and gravel, moist, dark brown	94	0	10	×	SS1	
		FILL Sandy silt with some clay, trace gravel, light brown, moist to wet, (loose)	93.5	1	8	×	SS2	
				2	4	×	SS3	
		SILTY SAND TO SANDY SILTY Shell fragments, grey, moist, (loose)	91.8	2	6	×	SS4	
		SILTY CLAY With sand seams, dark grey, wet, (soft to stiff)	91.1	3	58 kPa s=6.0 Hammer Weight	×	SS5	
					Hammer Weight	×	SS6	
				5	24 kPa Hammer Weight	×	SS7	
				6	24 kPa s=2.5			
				7	24 kPa S=10.0			
			86.1					
		Borehole Terminated at 7.9 m Depth						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-07

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 8

Date Drilled: 'October 24, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ⊠
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits |—○—|
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		FILL Silty sand to clayey silt, trace gravel, topsoil inclusions, organic pockets, grey, moist, (loose to compact)	94.74	0	13		SS1	
				1	9		SS2	
				2	5		SS3	
			92.54		4		SS4	
				3	5		SS5	
			91.0					
		SILTY CLAY Medium plasticity, trace sand, dark grey, moist to wet, (soft to firm)		4	4		SS6	
		With sand seams and shell fragments from 3.8 m to 4.2 m depths.			24 kPa s=10.0			
				5	Hammer Weight		SS7	
				6	29 kPa			
				7				
				8	Hammer Weight		SS8	
				9	24 kPa			
				10				

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov. 21, 2024	2.2	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	26.5 - 30.1		
2	30.1 - 32.9		
3	32.9 - 34.1		
4	34.1 - 36		
5	36 - 37.2	98	59
6	37.2 - 38.7	98	93

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-07

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Figure No. 8

SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
SILTY CLAY Medium plasticity, trace sand, dark grey, moist to wet, (soft to firm)	84.74	10	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
With sand seams and shell fragments from 3.8 m to 4.2 m depths. *(continued)*		11	Hammer Weight		SS9	
		12	48 kPa			
		13				
		14	Hammer Weight		SS10	
		15			ST-1	
		16	24 kPa			
Borehole advanced by casing and wash-boring technique from 16.2 m to 25.9 m depths.	78.5	17				
		18				
		19				
		20				
		21				
		22				

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov. 21, 2024	2.2	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	26.5 - 30.1		
2	30.1 - 32.9		
3	32.9 - 34.1		
4	34.1 - 36		
5	36 - 37.2	98	59
6	37.2 - 38.7	98	93

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-07

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Figure No. 8

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value (20 40 60 80) / Shear Strength kPa (50 100 150 200)	Combustible Vapour Reading (ppm) (250 500 750) / Natural Moisture Content % Atterberg Limits (% Dry Weight) (20 40 60)	SAMPLES	Natural Unit Wt. kN/m³
		Borehole advanced by casing and wash-boring technique from 16.2 m to 25.9 m depths. *(continued)*	72.74	22				
				23				
				24				
				25				
			68.8	26	26 ○	×	SS11	
		GLACIAL TILL Silty sand and gravel, cobbles and boulders, grey, (compact) Borehole advanced by coring through cobbles and boulders within glacial till from 25.9 m to 36.0 m depths.		27				
				28			RUN1	
				29				
				30				
				31			RUN2	
				32				
				33			RUN3	
				34				

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov. 21, 2024	2.2	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	26.5 - 30.1		
2	30.1 - 32.9		
3	32.9 - 34.1		
4	34.1 - 36		
5	36 - 37.2	98	59
6	37.2 - 38.7	98	93

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-07

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Figure No. 8

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		GLACIAL TILL Silty sand and gravel, cobbles and boulders, grey, (compact) Borehole advanced by coring through cobbles and boulders within glacial till from 25.9 m to 36.0 m depths. *(continued)*	60.74	34 35	20 40 60 80 50 100 150 200	250 500 750 20 40 60	RUN4	
			58.7	36				
		DOLOSTONE BEDROCK Shale layers, grey		37			RUN5	
				38			RUN6	
			56.0					
		Borehole Terminated at 38.7 m Depth						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov. 21, 2024	2.2	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	26.5 - 30.1		
2	30.1 - 32.9		
3	32.9 - 34.1		
4	34.1 - 36		
5	36 - 37.2	98	59
6	37.2 - 38.7	98	93

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-08

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 9

Page. 1 of 1

Date Drilled: 'October 23, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test ——— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits |—○—| | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~180 mm thick	94.7	0				
		FILL Silty sand and crushed gravel, moist, (dense)	94.5		46	×	SS1	
		FILL Clayey silt, trace sand, grey, moist, (loose)	93.9	1	7	×	SS2	
					4	×	SS3	
		SILTY CLAY Medium plasticity, trace gravel and sand, light brown, moist, (stiff)	92.5	2	5	×	SS4	
			91.6	3	96 kPa, s=5.0			
		SILTY CLAY TO CLAYEY SILT With sand seams and shell fragments, grey to dark grey, moist, (soft)	91.1	4	2	×	SS5	
			89.8		19 kPa			
		Borehole Terminated at 4.9 m Depth						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov. 21, 2024	3.1	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-09

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 10

Page. 1 of 1

Date Drilled: 'October 21, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ⊠ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test — | Shelby Tube ■ | Shear Strength by Vane Test + S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits |—○—| | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~100 mm thick	94.3	0	19		SS1	
		FILL Sandy clayey silt, topsoil inclusions, dark brown, moist, (loose to compact)	94.2					
				1	8		SS2	
			92.9					
		SILTY SAND TO SANDY SILT Silty clay, sand seams, trace clay, grey, moist, (loose)		2	4		SS3	
		Attempted Shelby tube sample from 3.0 m to 3.6 m depths. Sample indicated sandy silt.		3			ST-1	
			90.2	4				
		SILTY CLAY Dark grey, wet, (soft to firm)			19 kPa			
				5	Hammer Weight		SS4	
				6	34 kPa s=7.0			
				7				
			86.4		34 kPa s=5.6			
		Borehole Terminated at 7.9 m Depth						

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH 24-10

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 11

Page. 1 of 1

Date Drilled: 'October 23, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test ——— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~300 mm thick	94.16	0				
		FILL Clayey silt with gravel, sand seams, coarse gravel, shell fragments, topsoil with grass shoots, dark brown, moist, (very loose to loose)	93.9	0	9	×	SS1	
				1	4	×	SS2	
				2	2		SS3	
		SILTY SAND Trace clay, grey, moist, (very loose)	92.0	2				
				3	3	×	SS4	
				3	Hammer Weight	×	SS5	
		SILTY CLAY Dark grey, wet, (soft to firm)	90.5					
					Hammer Weight	×	SS6	
				5	14 kPa			
					Hammer Weight	×	SS7	
				6	29 kPa s=12.0			
				7				
			86.3		29 kPa s=12.0			
		Borehole Terminated at 7.9 m Depth						

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH 24-11

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 12

Page. 1 of 3

Date Drilled: 'October 22, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits |—○
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~1400 mm thick Dark brown, wet	95.3	0	8	×	SS1	
				1	7	×	SS2	
		FILL Sandy silt to silty clay, topsoil inclusions, brown and grey, wet, (very loose to compact)	93.9	2	12	×	SS3	
				3	4	×	SS4	
					Hammer Weight	×	SS5	
				4	3	×	SS6	
		SILTY SAND TO SANDY SILT With clay pockets, grey, moist, (very loose)	90.8	5	2	×	SS7	
		SILTY CLAY Low plasticity, some sand, dark grey, wet, (soft to firm)	90.0		24 kPa			
				6	Hammer Weight		—○×	SS8
				7				
		Dynamic Cone Penetration Test (DCPT) conducted from 7.9 m to cone refusal at 32.2 m depth.	87.4	8	29 kPa s=12.0			
				9				
				10				

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-11

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Figure No. 12

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value (20 40 60 80) / Shear Strength kPa (50 100 150 200)	Combustible Vapour Reading (ppm) (250 500 750) / Natural Moisture Content % Atterberg Limits (% Dry Weight) (20 40 60)	SAMPLES	Natural Unit Wt. kN/m³
		Dynamic Cone Penetration Test (DCPT) conducted from 7.9 m to cone refusal at 32.2 m depth. *(continued)*	85.3	10				
				11				
				12				
				13				
				14				
				15				
				16				
				17				
				18				
				19				
				20				
				21				
				22				

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-11

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Figure No. 12

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		Dynamic Cone Penetration Test (DCPT) conducted from 7.9 m to cone refusal at 32.2 m depth. *(continued)*	73.3	22	20 40 60 80 / 50 100 150 200	250 500 750 / 20 40 60		
				23				
				24				
				25				
				26				
				27				
				28				
				29				
				30				
				31				
			63.1	32				
		Cone Refusal at 32.2 m depth						

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH 24-12

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 13

Page. 1 of 2

Date Drilled: 'October 21, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test —— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits —○— | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL~700mm thick	94.24	0	13	×	SS1	
		FILL Silty sand, topsoil inclusions, brown, moist, (loose)	93.5	1	8		SS2	
		SILTY SAND TO SANDY SILT Trace gravel and clay, light brown, moist, (loose)	92.6	2	5	×	SS3	
		SILTY SAND Grey, wet, (compact)	92.0	2	12	×	SS4	
		SILTY CLAY Dark grey, wet, (soft to stiff)	91.4	3	53 kPa, s=11.0			
		Sandy from 2.8 m to 3.7 m depths.		3	Hammer Weight	×	SS5	
				4	19 kPa			
				5		×	ST-1	
				5	24 kPa			
				6	Hammer Weight	×	SS6	
				7				
				8	29 kPa, s=4.0			
		Dynamic Cone Penetration Test (DCPT) from 8.0 m to cone refusal at 16.1 m depth.	86.2	9				
				10				

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-12

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Figure No. 13

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		Dynamic Cone Penetration Test (DCPT) from 8.0 m to cone refusal at 16.1 m depth. *(continued)*	84.24	10	20 40 60 80 / 50 100 150 200	250 500 750 / 20 40 60		
				11				
				12				
				13				
				14				
				15				
			78.1	16				
		Cone Refusal at 16.1 m depth						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH 24-13

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 14

Page. 1 of 4

Date Drilled: 'October 25, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test ——— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits |—○—| | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		FILL Silty sand to sandy silt, some gravel, topsoil inclusions, brown to grey, moist, (very loose to compact)	94.26	0	13	×	SS1	
				1	6	×	SS2	
			92.76	2	3	×	SS3	
		SILTY SAND TO SANDY SILT With shell fragments, grey, moist, (loose)	92.1	3	8	×	SS4	
		SILTY CLAY Medium plactisity, some sand, grey to dark grey, wet, (very soft to firm)	90.7	4	Hammer Weight	×	SS5	
				5	24 kPa			
				6	Hammer Weight	×	SS6	
		Borehole advanced by casing and wash boring technique from 6.0 m to 10.4 m depths.		7	10 kPa			
				8	Hammer Weight	×	SS7	
				9		×	ST-1	
				10				

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov. 21, 2024	1.5	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	22.3 - 23.7		
2	23.7 - 25.6		
3	25.6 - 28.1		
4	28.1 - 31		
5	31 - 32.5		
6	32.5 - 33.8	94	82
7	33.8 - 35.4	100	90

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-13

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Figure No. 14

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
			84.26	10	29 kPa			
		Borehole advanced by casing and wash-boring technique from 10.4 m to 22.3 m depths.	83.9	11				
				12				
				13				
				14				
				15				
				16				
				17				
				18				
				19				
				20				
				21				
				22				

Standard Penetration Test N Value: 20 40 60 80

Shear Strength kPa: 50 100 150 200

Combustible Vapour Reading (ppm): 250 500 750

Natural Moisture Content % / Atterberg Limits (% Dry Weight): 20 40 60

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov. 21, 2024	1.5	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	22.3 - 23.7		
2	23.7 - 25.6		
3	25.6 - 28.1		
4	28.1 - 31		
5	31 - 32.5		
6	32.5 - 33.8	94	82
7	33.8 - 35.4	100	90

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-13

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Figure No. 14

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
			72.26	22	20 40 60 80 / 50 100 150 200	250 500 750 / 20 40 60		
			72.0					
		GLACIAL TILL Silty sand and gravel,cobbles and boulders, grey Coring through cobbles and boulders within glacial till from 22.3 m to 32.5 m depths.		23			RUN1	
				24				
				25			RUN2	
				26				
				27			RUN3	
				28				
				29				
				30			RUN4	
				31				
				32			RUN5	
			61.8					
		DOLOSTONE BEDROCK Shale layers, grey		33			RUN6	
				34				

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov. 21, 2024	1.5	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	22.3 - 23.7		
2	23.7 - 25.6		
3	25.6 - 28.1		
4	28.1 - 31		
5	31 - 32.5		
6	32.5 - 33.8	94	82
7	33.8 - 35.4	100	90

Log of Borehole BH 24-13

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Figure No. 14

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		DOLOSTONE BEDROCK Shale layers, grey *(continued)*	60.26	34	20 40 60 80 50 100 150 200	250 500 750 20 40 60		
				35			RUN7	
			58.9					
		Borehole Terminated at 35.4 m Depth						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov. 21, 2024	1.5	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	22.3 - 23.7		
2	23.7 - 25.6		
3	25.6 - 28.1		
4	28.1 - 31		
5	31 - 32.5		
6	32.5 - 33.8	94	82
7	33.8 - 35.4	100	90

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-14

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 15

Page. 1 of 1

Date Drilled: 'October 22, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test ——— | Shelby Tube ■ | Shear Strength by Vane Test ┼ S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		FILL Silty sand to silty clay, trace gravel, topsoil inclusion, moist, brown to grey, (very loose to compact)	95.9	0	12		SS1	
		With rootlets and black organic-type stains from 3.0 m to 3.6 m depths.		1	12		SS2	
				2	8		SS3	
				3	4		SS4	
					Hammer Weight		SS5	
		Augers grinding on possible cobbles and boulders from 3.8 m to 4.6 m depths.		4	50 for 75mm		SS6	
			90.9	5	12		SS7	
		SILTY SAND TO SANDY SILT Some clay, grey, wet, (very loose)	90.3		2		SS8	
		SILTY CLAY Some sand, shell fragments, grey to dark grey, moist to wet, (soft)		6	19 kPa ┼ s=8.0			
				7	19 kPa ┼ s=8.0			
			88.0					
		Borehole Terminated at 7.9 m Depth						

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH 24-15

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 16

Page. 1 of 1

Date Drilled: 'October31, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test ——— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		PEAT FILL Decayed plant matter and wood fragments, dark brown, wet	96.2	0	7	81	SS1	
				1	4		SS2	
				2	3	150	SS3	
		FILL Silty sand, some gravel, possible cobbles and boulders, brown, moist, (loose) Augers grinding on possible cobbles and boulders from 3.0 m to 3.8 m depths.	93.8	3	8		SS4	
					9		SS5	
				4	8		SS6	
		SILTY SAND TO SANDY SILT With shell fragments, grey, wet, (very loose to loose)	91.7	5	6		SS7	
					2		SS8	
		Borehole Terminated at 5.8 m Depth	90.4					

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-17

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 17

Page. 1 of 1

Date Drilled: 'October 21, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ⊠ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test —— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits |—○—| | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		FILL Sandy silt to silty clay, trace gravel, sand seams, some clay, light brown to grey, moist to wet, (very loose to compact)	94.35	0	18	×	SS1	
				1	6	×	SS2	
			92.35	2	3	×	SS3	
		SILTY SAND TO SANDY SILT Some clay, grey, wet, (loose)	92.0	3	5	×	SS4	
		SILTY CLAY With sand seams, dark grey, wet, (firm)	91.0		Hammer Weight	×	SS5	
				5	34 kPa			
					Hammer Weight	×	SS6	
				6	29 kPa			
				7				
			86.5		38 kPa s=10.7			
		Borehole Terminated at 7.9 m Depth						

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
Nov. 21, 2024	2.0	

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole BH 24-18

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 18

Page. 1 of 1

Date Drilled: 'October 24, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits |—○
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~ 50 mm thick	96.71	0	18	×	SS1	
		96.7						
		FILL						
		Silty sand, trace gravel, brown, moist, (loose to compact)		1	8	×	SS2	
				2	6	×	SS3	
					4	×	SS4	
			93.7	3				
		SILTY SAND			8	×	SS5	
		Brown, moist, (loose to compact)	93.0					
		SILTY CLAY		4	14	⊣×○	SS6	
		Medium plasticity, trace gravel, some sand, brown, moist, (firm to stiff)						
				5	4	×	SS7	
			91.5					
		Borehole Terminated at 5.2 m Depth						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-19

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 19

Page. 1 of 1

Date Drilled: 'October 23, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test ——— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		FILL Mixture of sandy silt and clayey silt, some gravel, topsoil seams and layers, dark brown, moist, (loose to compact)	96.86	0	12		SS1	
				1	9		SS2	
				2	5		SS3	
				3	7		SS4	
				3	9		SS5	
				4	18		SS6	
				5	8		SS7	
		SILTY SAND TO SANDY SILT Some clay, dark grey, moist to wet, (very loose to loose)	91.4	6	8		SS8	
			90.2		2		SS9	
		Borehole Terminated at 6.7 m Depth						

Standard Penetration Test N Value: 20 40 60 80

Shear Strength kPa: 50 100 150 200

Combustible Vapour Reading (ppm): 250 500 750

Natural Moisture Content % Atterberg Limits (% Dry Weight): 20 40 60

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-21

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 20

Page. 1 of 1

Date Drilled: 'October 24, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test ——— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		FILL Silty sand, some gravel, trace organics, brown, damp, (loose to compact)	94.57	0	18	×	SS1	
				1	18	×	SS2	
					7	×	SS3	
		SILTY SAND Trace gravel, brown to grey, moist to wet, (very loose to loose)	92.4	2	4	×	SS4	
				3	1		SS5	
			90.9					
		Borehole Terminated at 3.7 m Depth						

Standard Penetration Test N Value: 20 40 60 80

Shear Strength kPa: 50 100 150 200

Combustible Vapour Reading (ppm): 250 500 750

Natural Moisture Content % Atterberg Limits (% Dry Weight): 20 40 60

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-22

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 21

Page. 1 of 1

Date Drilled: 'October 23, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test ——— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		PEAT FILL Dark brown, wet	97.65	0	3	81	SS1	
				1	6	125	SS2	
				2	6	110	SS3	
					5	105	SS4	
			94.6	3	8		SS5	
		FILL Silty sand to sandy silt, some gravel, possible cobbles and boulders, topsoil pockets, asphalt fragments, brown to grey, damp to moist, (loose to compact) Augers grinding on possible cobbles and boulders from 5.3 m to 6.1 m depths .		4	4		SS6	
				5	6		SS7	
					16		SS8	
		SANDY SILT TO CLAYEY SILT With sand seams, grey, wet, (loose/ stiff)	91.6	6	9		SS9	
			91.0					
		Borehole Terminated at 6.7 m Depth						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-23

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 22

Page. 1 of 1

Date Drilled: 'October 24, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits |—○
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~50 mm thick	94.47	0				
		FILL	94.4					
		Silty sand, some gravel, brown, moist, (loose)			8	×	SS1	
				1	9	×	SS2	
					5	×	SS3	
▼			92.3	2				
		SILTY SAND	92.17		3	×	SS4	
		With gravel, grey to brown, wet, (very loose)						
			91.5	3	2	×	SS5	
		SILTY CLAY Brown to grey, wet, (very soft)						
			90.8					
		Borehole Terminated at 3.7 m Depth						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
Nov. 21, 2024	2.3	

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-24

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 23

Page. 1 of 1

Date Drilled: 'October 24, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒ | Auger Sample ◧ | SPT (N) Value ○ | Dynamic Cone Test ——— | Shelby Tube ■ | Shear Strength by Vane Test +S

Combustible Vapour Reading □ | Natural Moisture Content × | Atterberg Limits ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		SILTY SAND Brown, moist, (loose) With trace organics from ground surface to 0.3 m depth.	93.04	0	4		SS1	
				1	4		SS2	
		SILTY CLAY Grey, wet, (soft to firm)	91.6	2	2 29 kPa s=12.0 Hammer Weight		SS3 SS4	
				3	19 kPa s=3.2 Hammer Weight		SS5	
		Borehole Terminated at 3.7 m Depth	89.3					

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

Log of Borehole BH 24-25

Project No: OTT-23012778-G0

Project: Proposed Half Moon Bay Secondary School

Location: 3853 Cambrian Road, Ottawa, Ontario

Figure No. 24

Page. 1 of 1

Date Drilled: 'October 24, 2024

Drill Type: CME. 55 Track-Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: S.P.

Split Spoon Sample ☒
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits |—○
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~ 50 mm thick	92.23	0				
		FILL Silty sand and gravel, possible cobbles and boulders, brown, damp, (loose to compact)	92.2		26	×	SS1	
				1	10	×	SS2	
			90.43		6	×	SS3	
		SILTY SAND Brown, moist, (very loose)	90.0	2	3	×	SS4	
		SILTY CLAY Brown to grey, wet, (soft)	89.5	3	19 kPa s=8.0 Hammer Weight	×	SS5	
		Borehole Terminated at 3.7 m Depth	88.5					

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23012778-G0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov. 21, 2024	1.8	

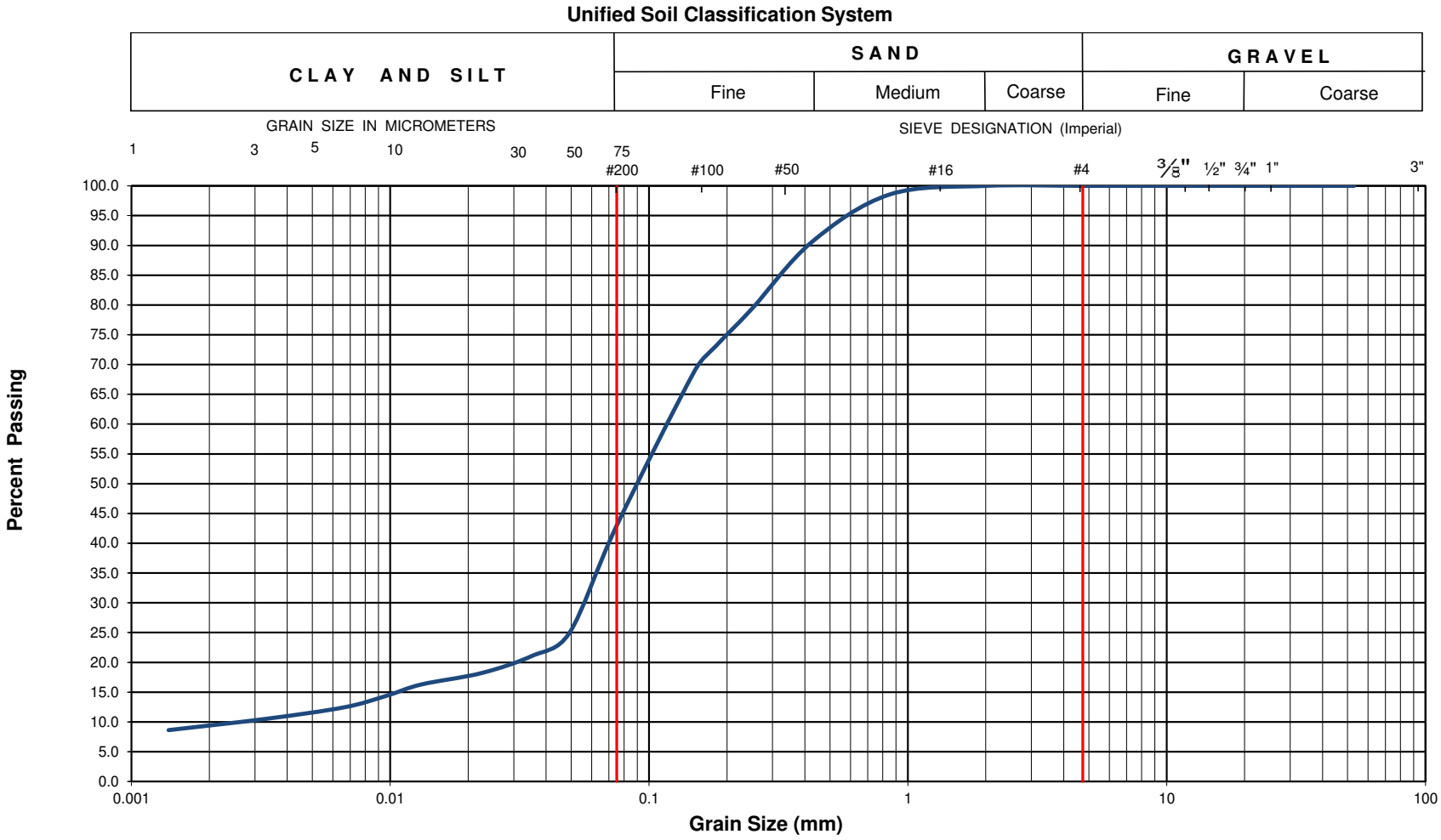
CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE HALF MOON BAY HIGH SCHOOL.GPJ TROW OTTAWA.GDT 12/19/25

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

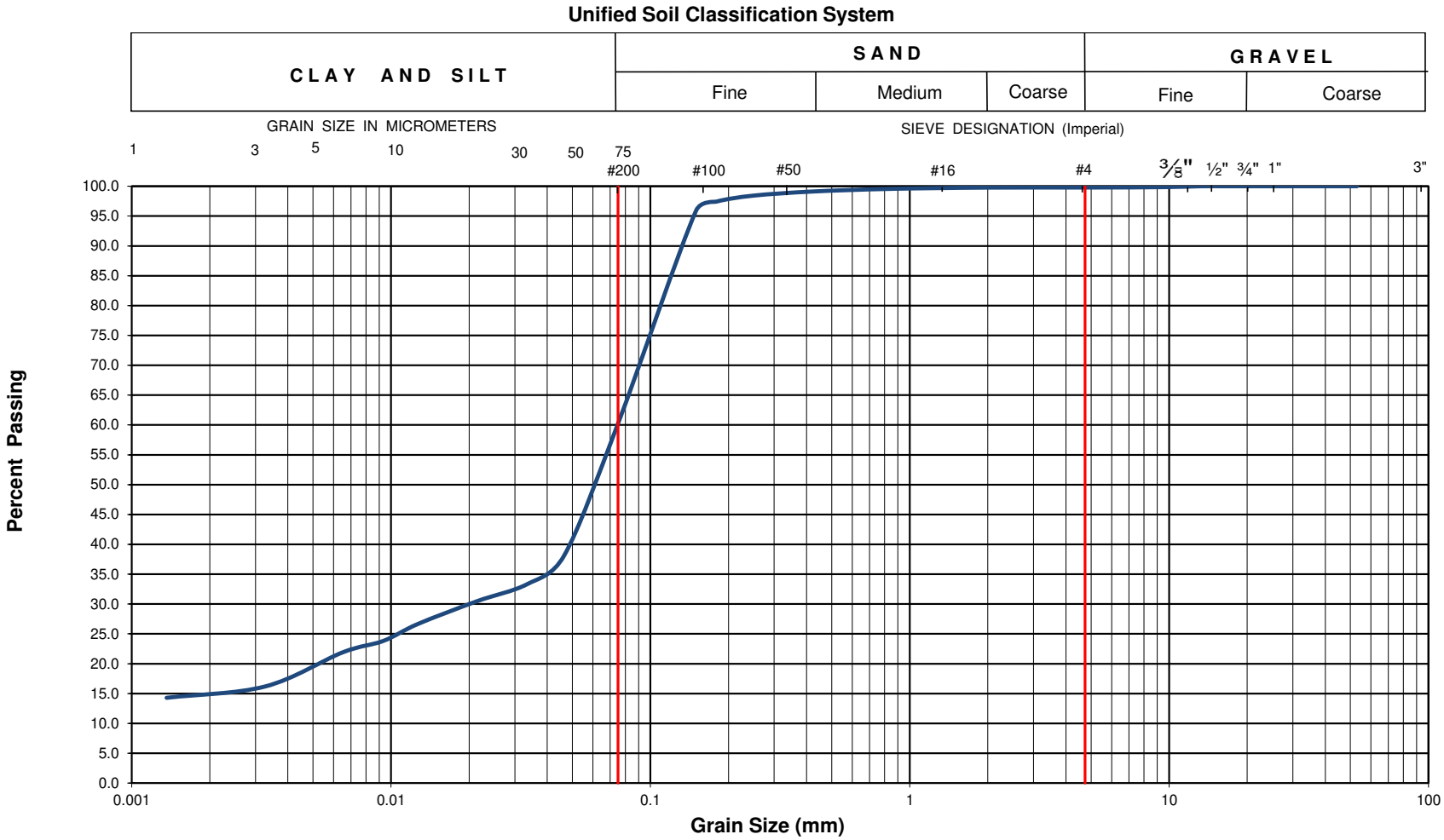
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	**OTT-23012778-G0**	**Project Name :**	**Half Moon Bay Secondary School**						
Client :	**OCDSB**	**Project Location :**	**3853 Cambrian Road, Ottawa, Ontario**						
Date Sampled :	**October 23, 2024**	**Borehole No:**	**BH24-10**	**Sample No.:**	**SS4**	**Depth (m) :**	**2.3-2.9**		
Sample Description :		**% Silt and Clay**	**43**	**% Sand**	**57**	**% Gravel**	**0**	**Figure :**	**25**
Sample Description :		**SILTY SAND (SM) - Trace Clay**							

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

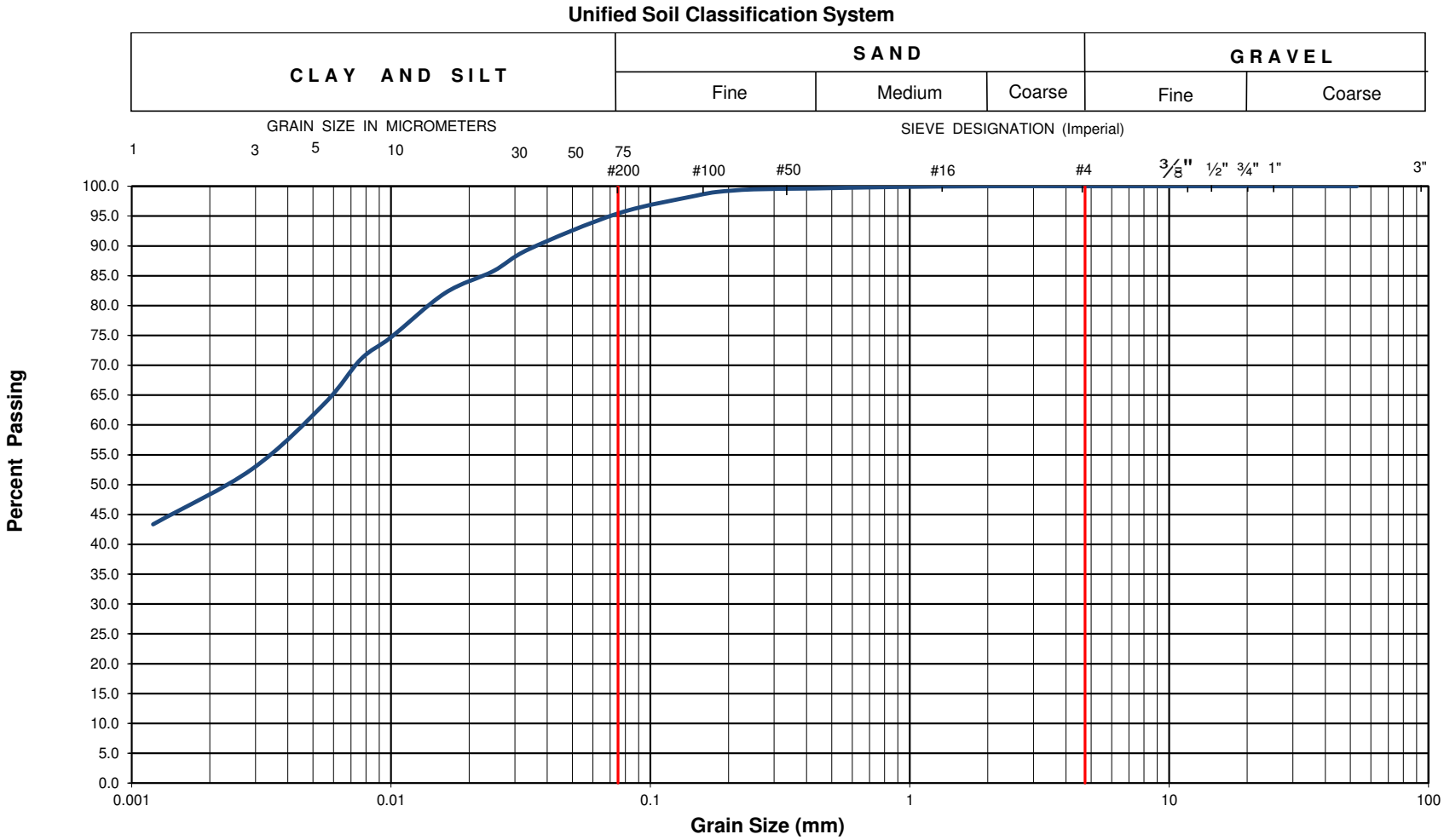
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	**OTT-23012778-G0**	**Project Name :**	**Half Moon Bay Secondary School**						
Client :	**OCDSB**	**Project Location :**	**3853 Cambrian Road, Ottawa, Ontario**						
Date Sampled :	**October 23, 2024**	**Borehole No:**	**BH24-19**	**Sample No.:**	**SS9**	**Depth (m) :**	**6.1-6.7**		
Sample Description :		**% Silt and Clay**	**60**	**% Sand**	**40**	**% Gravel**	**0**	**Figure :**	**26**
Sample Description :		**SANDY SILT (ML) - Some Clay**							

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

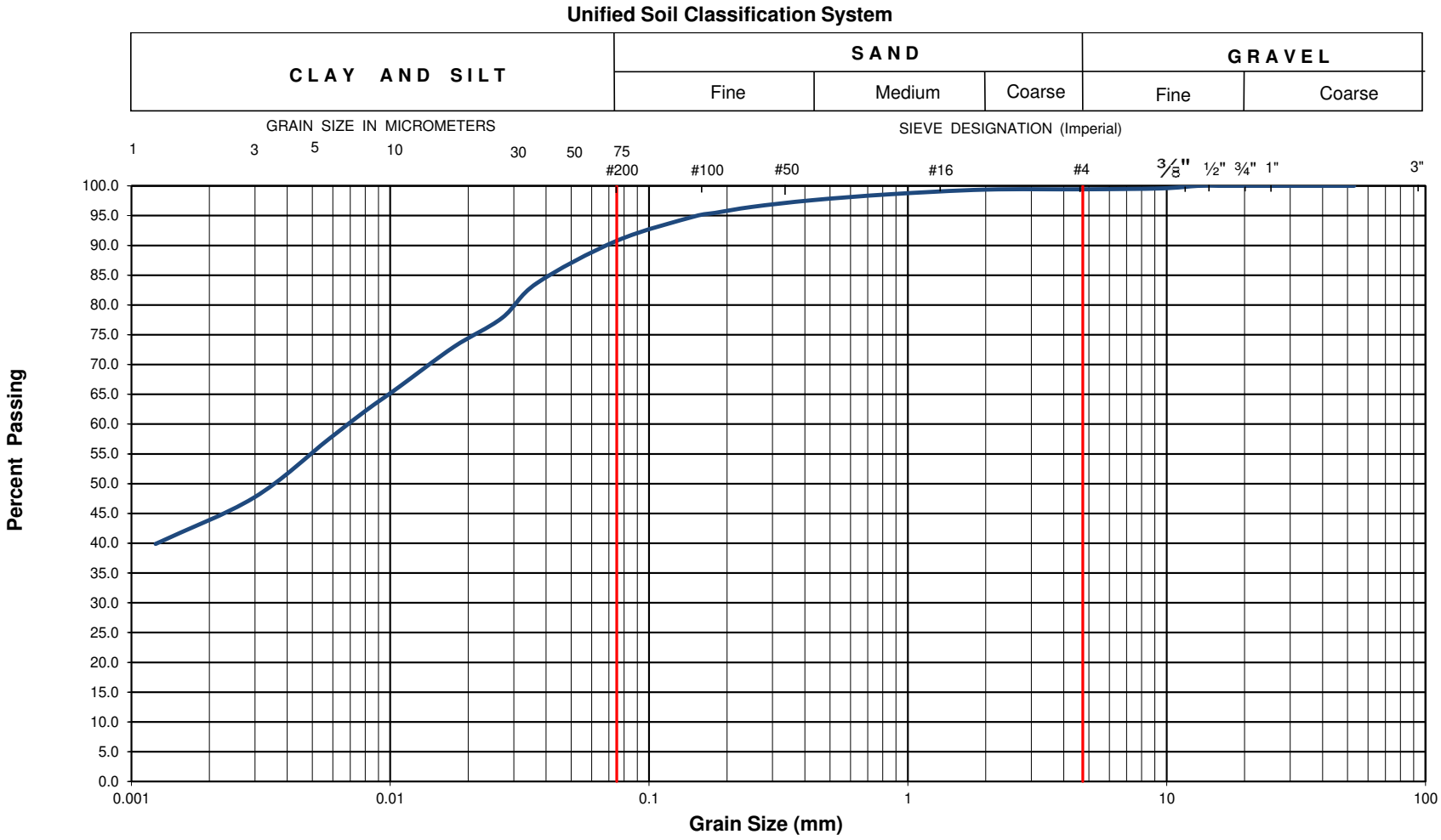
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	**OTT-23012778-G0**	**Project Name :**	**Half Moon Bay Secondary School**						
Client :	**OCDSB**	**Project Location :**	**3853 Cambrian Road, Ottawa, Ontario**						
Date Sampled :	**October 24, 2024**	**Borehole No:**	**BH24-07**	**Sample No.:**	**SS10**	**Depth (m) :**	**13.7-14.3**		
Sample Description :		**% Silt and Clay**	**95**	**% Sand**	**5**	**% Gravel**	**0**	**Figure :**	**27**
Sample Description :		**SILTY CLAY of MEDIUM PLASTICITY (CI) - Trace Sand**							

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

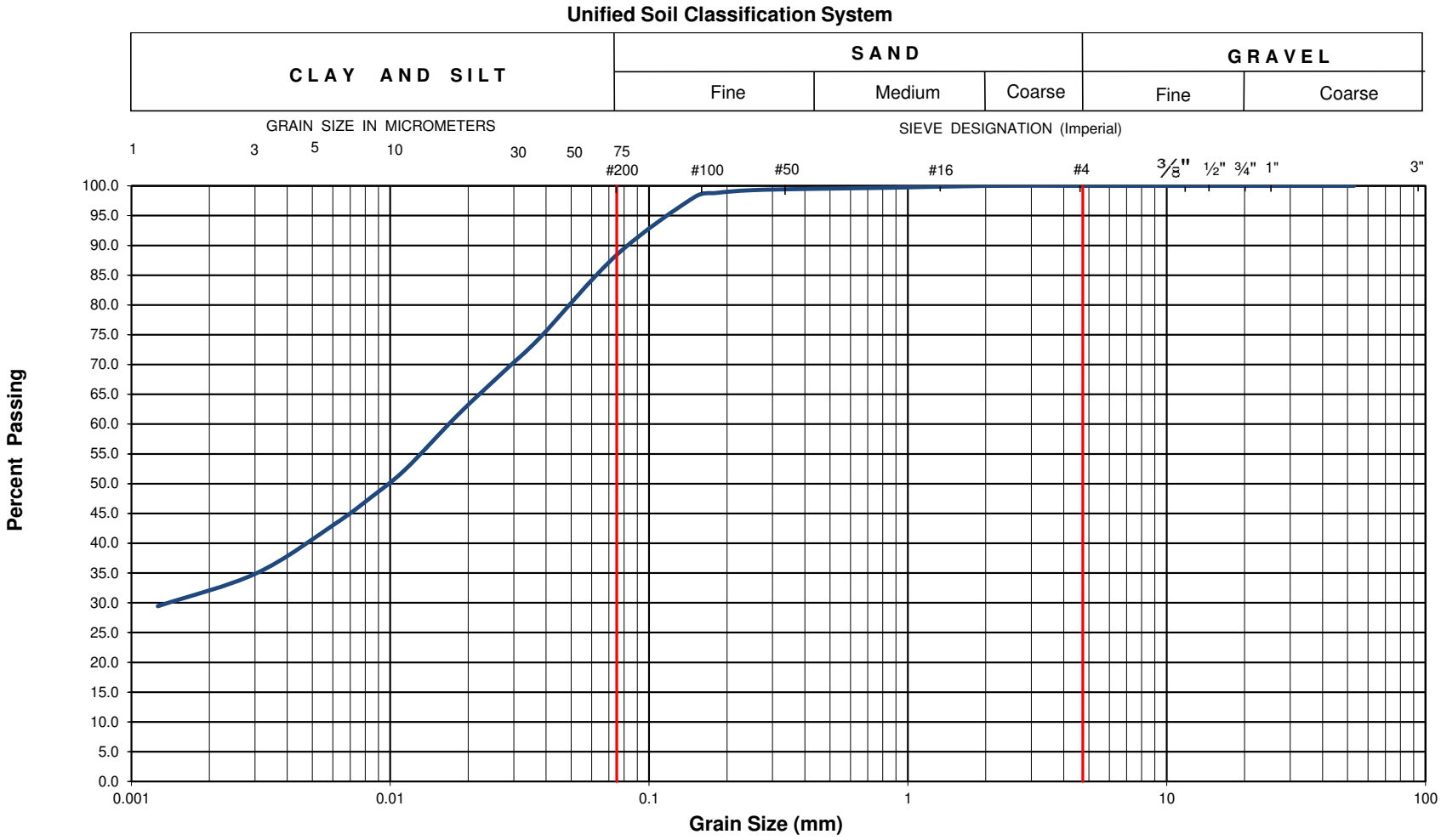
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	**OTT-23012778-G0**	**Project Name :**	**Half Moon Bay Secondary School**						
Client :	**OCDSB**	**Project Location :**	**3853 Cambrian Road, Ottawa, Ontario**						
Date Sampled :	**October 23, 2024**	**Borehole No:**	**BH24-08**	**Sample No.:**	**SS4**	**Depth (m) :**	**2.3-2.9**		
Sample Description :		**% Silt and Clay**	**91**	**% Sand**	**8**	**% Gravel**	**1**	**Figure :**	**28**
Sample Description :	**SILTY CLAY of MEDIUM PLASTICITY (CI) - Trace Gravel and Sand**								

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422

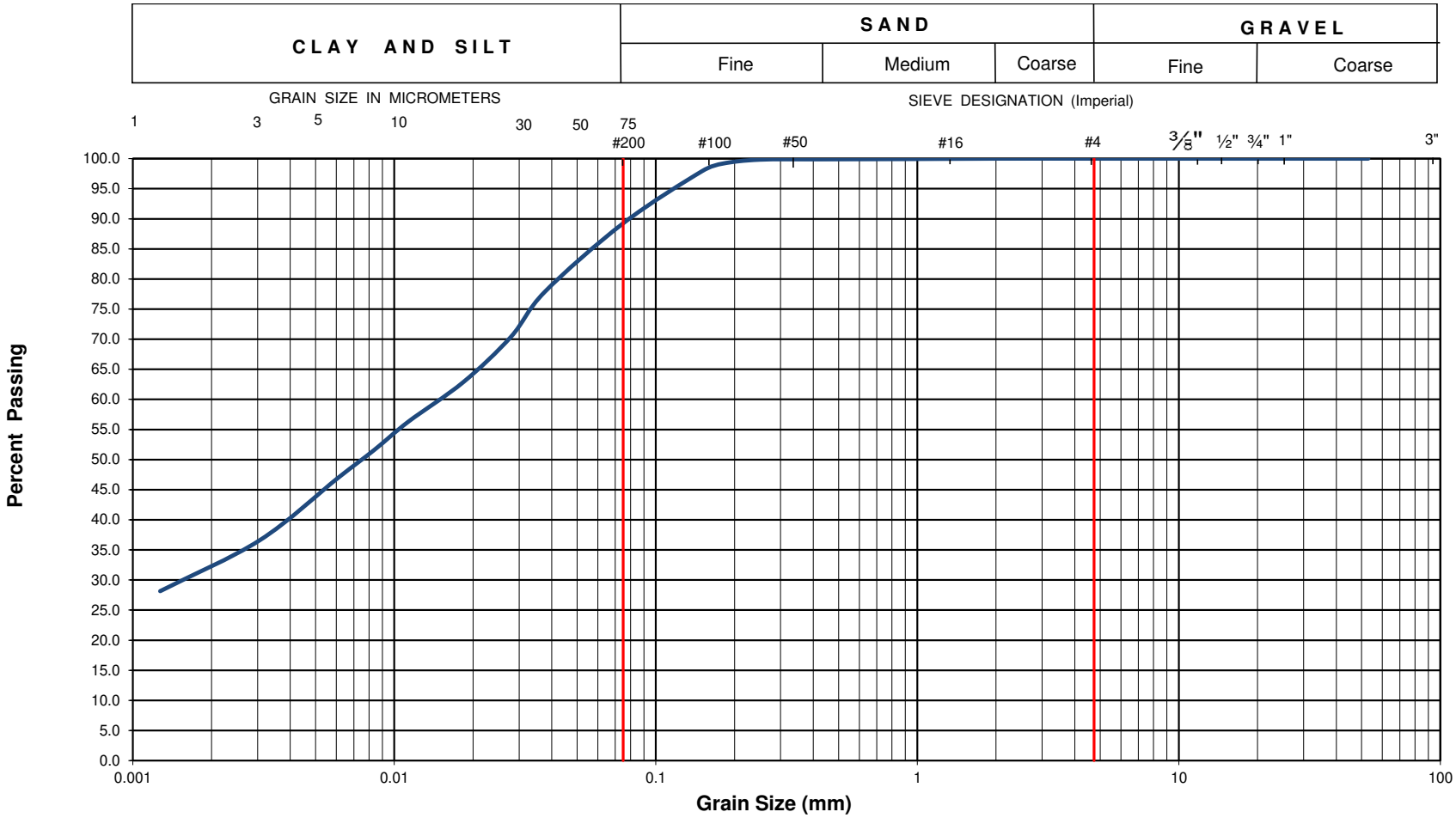


EXP Project No.:	**OTT-23012778-G0**	**Project Name :**	**Half Moon Bay Secondary School**						
Client :	**OCDSB**	**Project Location :**	**3853 Cambrian Road, Ottawa, Ontario**						
Date Sampled :	**October 22, 2024**	**Borehole No:**	**BH24-11**	**Sample No.:**	**SS8**	**Depth (m) :**	**6.1-6.7**		
Sample Description :		**% Silt and Clay**	**88**	**% Sand**	**12**	**% Gravel**	**0**	**Figure :**	**29**
Sample Description :	**SILTY CLAY OF LOW PLASTICITY (CL) - Some Sand**								

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422

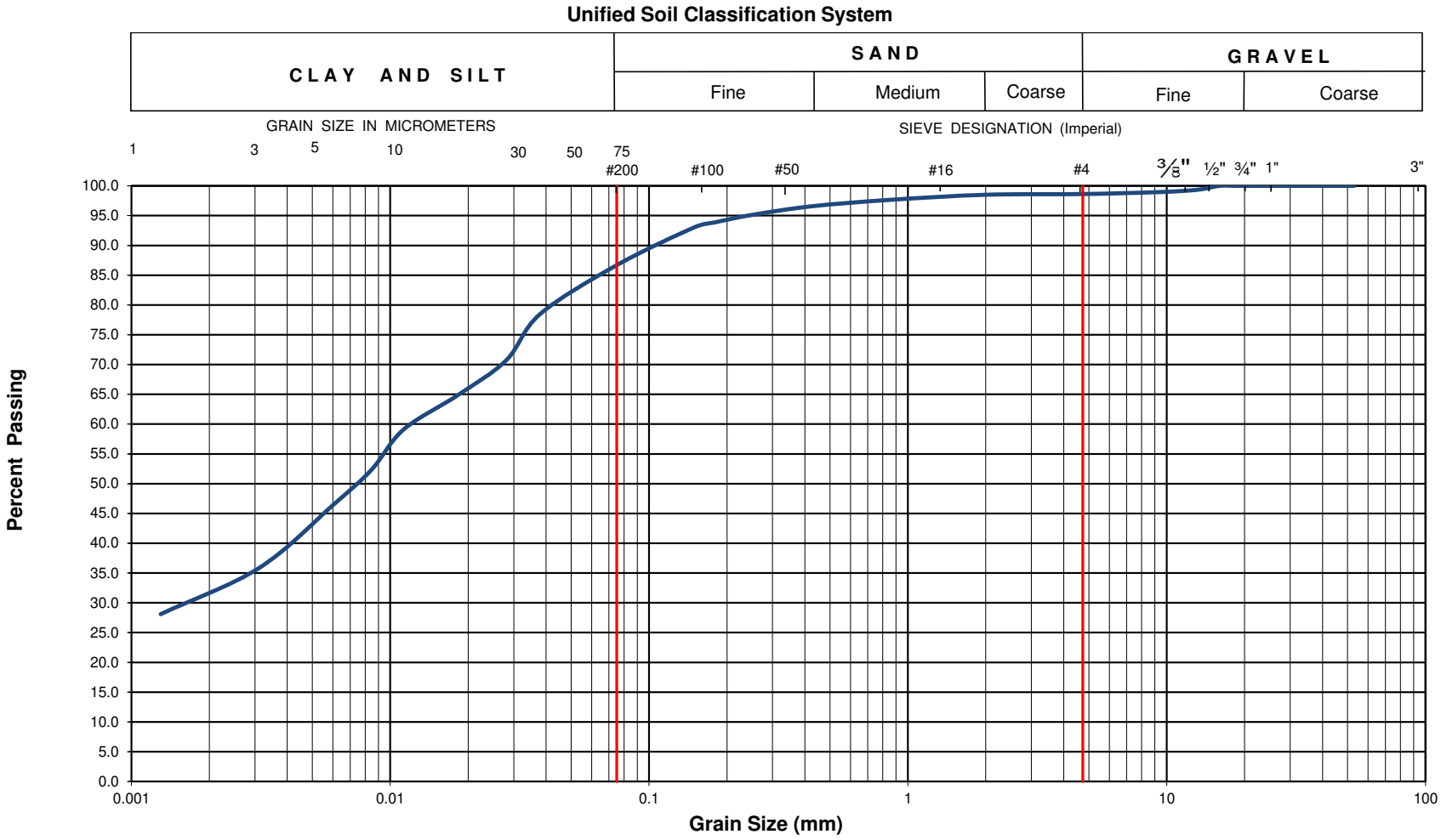
Unified Soil Classification System



EXP Project No.:	**OTT-23012778-G0**	**Project Name :**	**Half Moon Bay Secondary School**						
Client :	**OCDSB**	**Project Location :**	**3853 Cambrian Road, Ottawa, Ontario**						
Date Sampled :	**October 25, 2024**	**Borehole No:**	**BH24-13**	**Sample No.:**	**SS6**	**Depth (m) :**	**5.3-5.9**		
Sample Description :		**% Silt and Clay**	**89**	**% Sand**	**11**	**% Gravel**	**0**	**Figure :**	**30**
Sample Description :		**SILTY CLAY of MEDIUM PLASTICITY (CI) - Some Sand**							

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	**OTT-23012778-G0**	**Project Name :**	**Half Moon Bay Secondary School**						
Client :	**OCDSB**	**Project Location :**	**3853 Cambrian Road, Ottawa, Ontario**						
Date Sampled :	**October 28, 2024**	**Borehole No:**	**BH24-18**	**Sample No.:**	**SS6**	**Depth (m) :**	**3.8-4.4**		
Sample Description :		**% Silt and Clay**	**87**	**% Sand**	**11**	**% Gravel**	**2**	**Figure :**	**31**
Sample Description :		**SILTY CLAY (CI) - Some Sand, Trace Gravel**							

Appendix A – cm3 Test Pit Logs

TESTPIT LOG

CM³ JOB NO: ER1076

CLIENT: **Ottawa-Carleton District School Board**

PROJECT: **3853 Cambrian Road, Ottawa, ON**

TESTPIT NO: TP1

SURFACE ELEVATION:

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv) 1 / 10 / 100	TESTPIT COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	DEPTH (m)
		TP1 S1			**SAND AND GRAVEL** loose, brick, plastic, and wood debris throughout, minor sulphur odour at 1.52 m bg., dark brown, moist	0				
1		TP1 S2				0				1.0
					End of testpit at 1.52 m					

DRILLING METHOD: Yanmar ViO 35

DRILL DATE: 2024 September 4 LOGGED BY: ER

Notes: ■ GRAB SAMPLE

TESTPIT LOG

CLIENT: **Ottawa-Carleton District School Board**

PROJECT: **3853 Cambrian Road, Ottawa, ON**

CM³ JOB NO: ER1076

TESTPIT NO: TP2

SURFACE ELEVATION:

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv) 1 – 10 – 100	TESTPIT COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	DEPTH (m)
		TP2 S1			**GRAVELY SAND** occasional cobbles, loose, dark grey/brown, moist, standing water at 0.61 m bg.	20				
		TP2 S2			**GRAVELY SAND** some silt, loose, dark grey/brown, wet	0				
1										1.0
					End of testpit at 1.22 m					

DRILLING METHOD: Yanmar ViO 35

DRILL DATE: 2024 September 4 LOGGED BY: ER

Notes: ■ GRAB SAMPLE

TESTPIT LOG

CLIENT: **Ottawa-Carleton District School Board**

PROJECT: **3853 Cambrian Road, Ottawa, ON**

CM³ JOB NO: ER1076

TESTPIT NO: TP3

SURFACE ELEVATION:

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv) 1 – 10 – 100	TESTPIT COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	DEPTH (m)
		TP3 S1			**SAND AND ORGANIC SOIL** loose, brown, dry	25				
		TP3 S2			**SAND AND ORGANIC SOIL** some silt, brown/grey, dry	0				
1										1.0
					End of testpit at 1.22 m					

DRILLING METHOD: Yanmar ViO 35

DRILL DATE: 2024 September 4 LOGGED BY: ER

Notes: ■ GRAB SAMPLE

TESTPIT LOG

CLIENT: **Ottawa-Carleton District School Board**

PROJECT: **3853 Cambrian Road, Ottawa, ON**

CM³ JOB NO: ER1076

TESTPIT NO: TP4

SURFACE ELEVATION:

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv) 1 – 10 – 100	TESTPIT COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	DEPTH (m)
		TP4 S1			some organic soil, loose, brown dry	20				
		TP4 S2				0				
1										1.0
					End of testpit at 1.22 m					

DRILLING METHOD: Yanmar ViO 35

DRILL DATE: 2024 September 4 LOGGED BY: ER

Notes: ■ GRAB SAMPLE

TESTPIT LOG

CLIENT: **Ottawa-Carleton District School Board**

PROJECT: **3853 Cambrian Road, Ottawa, ON**

CM³ JOB NO: ER1076

TESTPIT NO: TP5

SURFACE ELEVATION:

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv) 1 10 100	TESTPIT COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	DEPTH (m)
		TP5 S1			**SAND** some organic soil, compact, brown, dry	0				
		TP5 S2			**SAND** some organic soil, trace silt, brown, dry	0				
1										1.0
					End of testpit at 1.22 m					

DRILLING METHOD: Yanmar ViO 35

DRILL DATE: 2024 September 4 LOGGED BY: ER

Notes: ■ GRAB SAMPLE

TESTPIT LOG

CLIENT: **Ottawa-Carleton District School Board**

PROJECT: **3853 Cambrian Road, Ottawa, ON**

CM³ JOB NO: ER1076

TESTPIT NO: TP6

SURFACE ELEVATION:

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv) 1 10 100	TESTPIT COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	DEPTH (m)
		TP6 S1			**SAND** some organic soil, loose, brown, dry, landscape fabric debris around	20				
		TP6 S2				0				
1										1.0
					End of testpit at 1.22 m					

DRILLING METHOD: Yanmar ViO 35

DRILL DATE: 2024 September 4 LOGGED BY: ER

Notes: ■ GRAB SAMPLE

TESTPIT LOG

CLIENT: **Ottawa-Carleton District School Board**

PROJECT: **3853 Cambrian Road, Ottawa, ON**

CM³ JOB NO: ER1076

TESTPIT NO: TP7

SURFACE ELEVATION:

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv) 1 – 10 – 100	TESTPIT COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	DEPTH (m)
		TP7 S1			**SAND** some organic soil, loose, brown, dry	0				
1		TP7 S2			**SILTY SAND** loose, grey, moist, wood debris	20				1.0
					End of testpit at 1.52 m					

DRILLING METHOD: Yanmar ViO 35

DRILL DATE: 2024 September 4 LOGGED BY: ER

Notes: ■ GRAB SAMPLE

TESTPIT LOG

CM³ JOB NO: ER1076

CLIENT: **Ottawa-Carleton District School Board**

PROJECT: **3853 Cambrian Road, Ottawa, ON**

TESTPIT NO: TP8

SURFACE ELEVATION:

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv) 1 10 100	TESTPIT COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	DEPTH (m)
		TP8 S1			**SAND** some gravel,occasional cobbles, loose, dry, brown, metal and plastic debris around 0.90 m bg.	0				
1		TP8 S2				0				1.0
					End of testpit at 1.22 m					

DRILLING METHOD: Yanmar ViO 35

DRILL DATE: 2024 September 4 LOGGED BY: ER

Notes: ■ GRAB SAMPLE

TESTPIT LOG

CLIENT: **Ottawa-Carleton District School Board**

PROJECT: **3853 Cambrian Road, Ottawa, ON**

CM³ JOB NO: ER1076

TESTPIT NO: TP9

SURFACE ELEVATION:

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv) 1 / 10 / 100	TESTPIT COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	DEPTH (m)
		TP9 S1			**SAND** some gravel,occasional cobbles, loose, dry, brown, metal and plastic debris around 0.90 m bg.	0				
1		TP9 S2				0				1.0
					End of testpit at 1.22 m					

DRILLING METHOD: Yanmar ViO 35

DRILL DATE: 2024 September 4 LOGGED BY: ER

Notes: ■ GRAB SAMPLE

Appendix B – Shear Wave Velocity Soundings Survey Report by GPR

GEOPHYSICS GPR INTERNATIONAL INC.

January 24th, 2025

Transmitted by email : ismail.taki@exp.com

Our ref : GPR24-05886-c

Mr. Ismail Taki, M.Eng., P.Eng.
Senior Manager, Earth & Environment, Eastern Region
exp Services inc.
100 - 2650 Queensview Drive
Ottawa ON K2B 8H6

Subject: **Shear Wave Velocity Sounding for the Site Class Determination**
3853 Cambrian Road, Ottawa (ON)

[Project: OTT-23012778-G0]

Dear Mr. Taki,

Geophysics GPR International inc. has been mandated by **exp** Services inc. to carry out seismic surveys at 3853 Cambrian Road, in Ottawa (ON). The geophysical investigation used the Multi-channel Analysis of Surface Waves (MASW) with the Spatial AutoCorrelation (SPAC), and the seismic refraction and reflection methods. From the subsequent results, the seismic shear wave velocity values were calculated for the soils and the rock, to determine the Site Class.

The surveys were conducted on December 5th, 2024, by Mrs. Karyne Faguy, B.Sc. geophysics and Mr. Félix Bergeron, EIT (QC). Figure 1 shows the regional location of the site and Figure 2 illustrates the location of the seismic spread. Both figures are presented in the Appendix.

The following paragraphs briefly describe the survey design, the principles of the testing methods, and the results presented in table and graph.

MASW Principle

The *Multi-channel Analysis of Surface Waves* (MASW) and the *SPatial AutoCorrelation* (SPAC or MAM for *Microtremors Array Method*) are seismic methods used to evaluate the shear wave velocities of subsurface materials through the analysis of the dispersion properties of the Rayleigh surface wave. The MASW is considered an "active" method, as the seismic signal is induced at known location and time in the geophones' spread axis. Conversely, the SPAC is considered a "passive" method, using the low frequency "signals" produced far away. The method can also be used with "active" seismic source records. The SPAC method generally allows deeper V_S soundings. Its dispersion curve can then be merged with the one of higher frequency from the MASW to calculate a more complete inversion. The dispersion properties are expressed as a change of velocities with respect to frequencies. Surface wave energy will decay exponentially with depth. Lower frequency surface waves will travel deeper and thus be more influenced by deeper velocity layering than the shallow higher frequency waves. The inversion of the Rayleigh wave dispersion curve yields a shear wave (V_S) velocity depth profile (sounding).

Figure 3 schematically outlines the basic operating procedure for the MASW method. Figure 4 illustrates an example of one of the MASW/SPAC records, a corresponding spectrogram analysis and resulting 1D V_S model.

INTERPRETATION

The main processing sequence involved data inspection and edition when required; spectral analysis (from MASW and SPAC); picking the fundamental mode; and 1D inversion of the MASW and SPAC shot records using the SeisImagerSW™ software. The data inversions used a nonlinear least squares algorithm.

In theory, all the shot records for a given seismic spread should produce a similar shear-wave velocity profile. In practice, however, differences can arise due to energy dissipation, local surface seismic velocities variations, and/or dipping of overburden layers or rock. In general, the precision of the calculated seismic shear wave velocities (V_S) is around 15% or better.

More detailed descriptions of these methods are presented in *Shear Wave Velocity Measurement Guidelines for Canadian Seismic Site Characterization in Soil and Rock*, Hunter, J.A., Crow, H.L., et al., Geological Surveys of Canada, General Information Product 110, 2015.

SURVEY DESIGN

The seismic spreads were laid out east of the intersection of Cambrian Road and Elevation Road (Figure 2). The geophone spacing was 3.0 metres for the main spread, using 24 geophones. A shorter seismic spread, with geophone spacing of 1.0 metre, was dedicated to the near surface materials. The seismic records were produced with a seismograph Terraloc PRO2 (from ABEM Instrument), and the geophones were 4.5 Hz.

The seismic records counted 4096 data, sampled at 1000 µs for the MASW surveys, and at 50 µs for the seismic refraction. The records included a pre-trigged portion of 10 ms. A 5 kg sledgehammer was used as the energy source, with impacts being recorded off both ends of the seismic spreads. A stacking procedure was also used to improve the Signal / Noise ratio for the seismic records.

The shear wave depth sounding can be considered as the average of the bulk area within the geophone spread, especially for its central half-length.

RESULTS

From seismic resonance a reflector associated to the rock was calculated between 30.5 and 32.5 metres deep. This parameter was used for the initial geophysical models, prior to the modelling and inversion of the MASW results.

The MASW calculated V_S results are illustrated at Figure 5. From the surface to 14 metres deep, very low seismic velocities were calculated.

The $\overline{V}_{S30}$ value results from the harmonic mean of the shear wave velocities, from the surface to 30 metres deep. It is calculated by dividing the total depth of interest (30 metres) by the sum of the time spent in each velocity layer from the surface down to 30 metres, as:

$$\overline{V}_{S30} = \frac{\sum_{i=1}^{N} H_i}{\sum_{i=1}^{N} {H_i}/{V_i}} \quad | \quad \sum_{i=1}^{N} H_i = 30 \text{ m}$$

(N: number of layers; H_i : thickness of layer "*i*" ; V_i : V_S of layer "*i*")

Thus, the $\overline{V}_{S30}$ value represents the seismic shear wave velocity of an equivalent homogeneous single layer response, between the surface and 30 metres deep.

The calculated $\overline{V}_{S30}$ value of the actual site is 174.2 m/s (Table 1), corresponding to the Site Class "E". In the case the bottom of the foundation would be at 2.5 metres deep, the $\overline{V}_{S30}$* value would be 196.3 m/s, corresponding to the Site Class "D".

CONCLUSION

Geophysical surveys were carried out to identify the Site Class at 3853 Cambrian Road, in Ottawa (ON). The seismic surveys used the MASW and the SPAC analysis to calculate the $\overline{V}_{S30}$ value. Its calculation is presented at Table 1.

The $\overline{V}_{S30}$ value of the actual site is 174 m/s, corresponding to the Site Class "E" ($\overline{V}_{S30} \leq 180$ m/s), as determined through the MASW and SPAC methods, Table 4.1.8.4.-A of the NBC (2015), and the Building Code, O. Reg. 332/12.

In the case the bottom of the foundation would be at 2.5 metres deep, the $\overline{V}_{S30}$* value would be 196 m/s, corresponding to the Site Class "D" ($180 < \overline{V}_{S30} \leq 360$ m/s).

It must be noted that very low seismic velocities were calculated from the surface to 14 metres deep. A geotechnical assessment of the corresponding materials could be required for the potential of liquefaction, the clay sensitivity, and other critical parameters.

It must also be noted that other geotechnical information gleaned on site; including the presence of liquefiable soils, very soft clays, high moisture content etc. (cf. Table 4.1.8.4.-A of the NBC 2015) can supersede the Site classification provided in this report based on the $\overline{V}_{S30}$ value.

The V_S values calculated are representative of the in situ materials and are not corrected for the total and effective stresses.

Hoping the whole to your satisfaction, we remain yours truly,

Jean-Luc Arsenault, M.A.Sc., P.Eng.
Senior Project Manager

Figure 1: Regional location of the Site
(Source : OpenStreetMap©)

Figure 2: Location of the seismic spread
(source: *Google Earth™*)

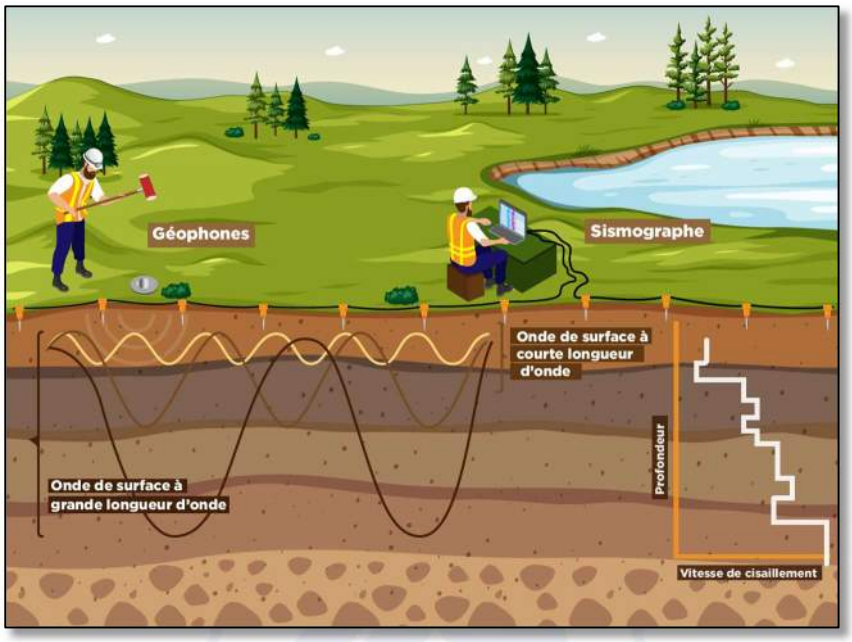


Figure 3: MASW Operating Principle

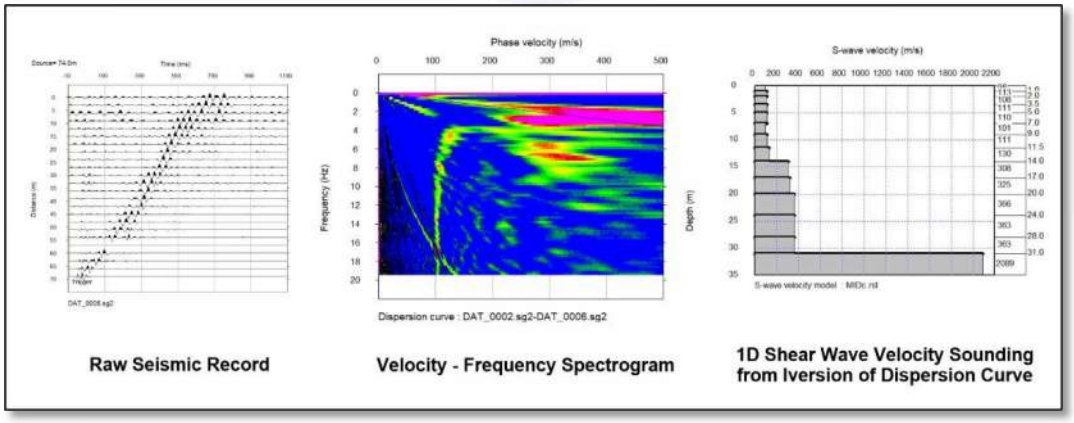


Figure 4: Example of a MASW/SPAC record, Phase Velocity - Frequency curve of the Rayleigh wave and resulting 1D Shear Wave Velocity Model

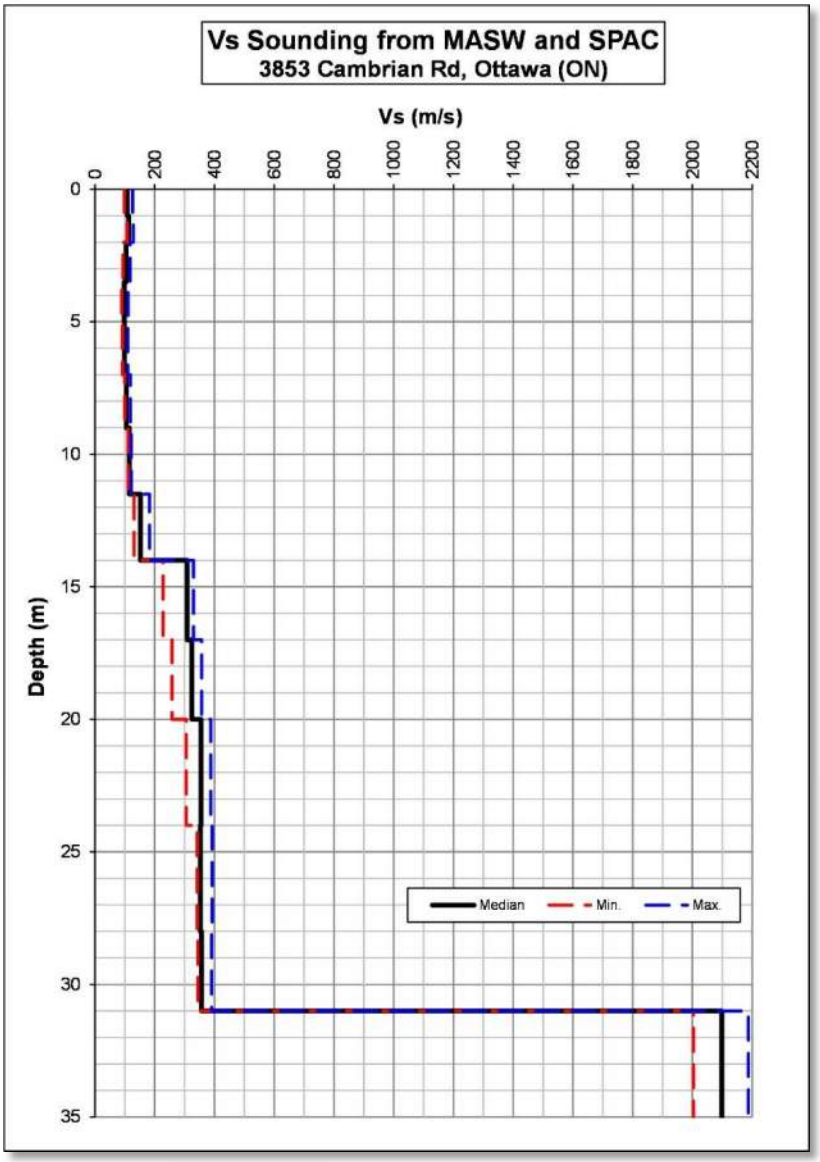


Figure 5: MASW Shear-Wave Velocity Sounding

TABLE 1

$\bar{V}_{S30}$ Calculation for the Site Class (actual site)

Depth	Vs			Thickness	Cumulative Thickness	Delay for med. Vs	Cumulative Delay	Vs at given Depth
	Min.	Median	Max.					
(m)	(m/s)	(m/s)	(m/s)	(m)	(m)	(s)	(s)	(m/s)
0	**98.1**	**108.6**	**126.1**	**Grade Level (December 5th, 2024)**				
1.0	**107.7**	**112.7**	**128.5**	1.00	1.00	0.009205	0.009205	108.6
2.0	**93.7**	**104.2**	**117.3**	1.00	2.00	0.008873	0.018078	110.6
3.5	**89.9**	**98.6**	**111.1**	1.50	3.50	0.014389	0.032468	107.8
5.0	**92.6**	**99.2**	**110.4**	1.50	5.00	0.015211	0.047679	104.9
7.0	**100.0**	**105.3**	**119.0**	2.00	7.00	0.020153	0.067832	103.2
9.0	**111.1**	**114.6**	**121.2**	2.00	9.00	0.018993	0.086825	103.7
11.5	**130.7**	**152.4**	182.8	2.50	11.50	0.021808	0.108633	105.9
14.0	228.0	308.7	330.0	2.50	14.00	0.016403	0.125036	112.0
17.0	258.1	324.4	356.9	3.00	17.00	0.009718	0.134753	126.2
20.0	305.6	355.3	387.9	3.00	20.00	0.009248	0.144001	138.9
24.0	342.3	353.0	392.4	4.00	24.00	0.011258	0.155260	154.6
28.0	344.3	356.6	390.6	4.00	28.00	0.011333	0.166592	168.1
30				2.00	30.00	0.005609	0.172201	174.2

V_{S30} (m/s)	**174.2**
Class	**E (1)**

(1) Some low seismic velocities were calculated from the surface to 14 metres deep. A geotechnical assessment of the corresponding materials could be required.

TABLE 2

$\bar{V}_{S30}$* Calculation for Foundation at 2.5 metres Deep

Depth	Vs			Thickness	Cumulative Thickness	Delay for med. Vs	Cumulative Delay	Vs at given Depth
	Min.	Median	Max.					
(m)	(m/s)	(m/s)	(m/s)	(m)	(m)	(s)	(s)	(m/s)
0	98.1	108.6	126.1	**Considering the foundation at 2.5 metres deep**				
1.0	107.7	112.7	128.5					
2.0	93.7	104.2	117.3					
2.5	93.7	104.2	117.3					
3.5	89.9	98.6	111.1	1.00	1.00	0.009593	0.009593	104.2
5.0	92.6	99.2	110.4	1.50	2.50	0.015211	0.024804	100.8
7.0	100.0	105.3	119.0	2.00	4.50	0.020153	0.044957	100.1
9.0	111.1	114.6	121.2	2.00	6.50	0.018993	0.063950	101.6
11.5	130.7	152.4	182.8	2.50	9.00	0.021808	0.085758	104.9
14.0	228.0	308.7	330.0	2.50	11.50	0.016403	0.102161	112.6
17.0	258.1	324.4	356.9	3.00	14.50	0.009718	0.111879	129.6
20.0	305.6	355.3	387.9	3.00	17.50	0.009248	0.121127	144.5
24.0	342.3	353.0	392.4	4.00	21.50	0.011258	0.132385	162.4
28.0	344.3	356.6	390.6	4.00	25.50	0.011333	0.143718	177.4
31.0	2003.3	2120.0	2186.7	3.00	28.50	0.008413	0.152131	187.3
32.5				1.50	30.00	0.000708	0.152838	196.3

V_{S30}* (m/s)	**196.3**
Class	**D**

Appendix C – Consolidation Test Results

Stantec Consulting Ltd.
300 - 1331 Clyde Avenue, Ottawa ON K2C 3G4

November 22, 2024
File: 121624678

Attention: Ismail Taki, M.Eng., P.Eng.
Exp Services Inc
2650 Queensview Drive
Suite 100
Ottawa, Ontario, Canada, K2B 8H6
Tel: 1-613-853-1350
E-mail: ismail.taki@exp.com

Dear Mr. Taki,

Reference: Consolidation Test Results: Proposed Half Moon Bay School-3853 Cambrian Road, Ottawa, ON. Exp Services Inc., File # OTT-23012778-G0

This letter presents the results of one-dimensional consolidation tests carried out on three shelby tube samples in accordance with ASTM D2435/D2435M – 11(2020). The tests result is provided in the attached tables and figures.

Summary of the tested samples

Sample ID	Depth (ft)	Date sampled
BH24-07, ST1	50-52	October 24, 2024
BH24-12, ST1	15-17	October 21, 2024
BH24-13, ST1	30-32	October 25, 2024

This letter provides test results only and does not constitute any interpretation or engineering recommendations with respect to material suitability or specification compliance.

We trust the information presented herein meets your present requirements. Should you have any questions or require additional information, please do not hesitate to contact us.

Regards,

Stantec Consulting Ltd.

Ramin Ghassemi

Ramin Ghassemi Ph.D., P.Eng.
Geotechnical Engineer
Direct: 613 722-4420
Mobile: 437 775-7625
Ramin.ghassemi@stantec.com

v:\01216\active\1216246xx\121624678-exp\121624678_let_consolidation_bh24-07 12 13 st1.docx

CONSOLIDATION TEST SUMMARY

SAMPLE IDENTIFICATION

Borehole No. :	BH24-07	Sample No. :	ST1
		Sample Depth (ft) :	50-52

TEST CONDITIONS

Test Type :	ASTM D2435/D2435M	Date Started :	31-Oct-24
Load Duration (hr) :	24	Date Completed :	15-Nov-24

SAMPLE DIMENSIONS AND PROPERTIES _ INITIAL

Sample Height (mm) :	20.00	Unit Weight (kN/m^3) :	15.74
Sample Diameter (mm) :	50.00	Dry Unit Weight (kN/m^3) :	9.36
Area (cm^2) :	19.63	Specific Gravity : (Assumed)	2.75
Volume (cm^3) :	39.27	Solid Height (mm) :	6.94
Water Content (%) :	68.14	Volume of Solids (cm^3) :	13.63
Wet Mass (g) :	63.02	Volume of Voids (cm^3) :	25.64
Dry Mass (g) :	37.48	Degree of Saturation (%) :	99.61

TEST COMPUTATIONS

Axial Stress (kPa)	Height (H) (mm)	Corrected Deformation (ΔH) (mm)	Axial Strain (ε_a) (%)	Void Ratio e	t_{90} (sec)	C_v (cm^2/s)	m_v (m^2/kN)	k (m/s)
0	20.0000	0.0000	0.00	1.881				
5	19.7625	0.2375	1.19	1.847	128.08	6.50E-03	2.38E-03	1.51E-08
10	19.6980	0.3020	1.51	1.838	179.02	4.61E-03	6.45E-04	2.92E-09
20	19.5915	0.4085	2.04	1.822	871.59	9.38E-04	5.33E-04	4.90E-10
40	19.4780	0.5220	2.61	1.806	184.68	4.38E-03	2.84E-04	1.22E-09
80	19.2860	0.7140	3.57	1.778	160.05	4.98E-03	2.40E-04	1.17E-09
160	18.3220	1.6780	8.39	1.640	472.88	1.63E-03	6.03E-04	9.62E-10
320	15.6280	4.3720	21.86	1.251	1209.08	5.30E-04	8.42E-04	4.38E-10
480	14.6897	5.3103	26.55	1.116	1064.59	4.71E-04	2.93E-04	1.35E-10
160	14.8362	5.1638	25.82	1.137				
40	15.1362	4.8638	24.32	1.181				
160	14.9507	5.0493	25.25	1.154	175.18	2.74E-03	7.73E-05	2.08E-10
480	14.4840	5.5160	27.58	1.087	171.22	2.70E-03	7.29E-05	1.93E-10
720	13.8944	6.1056	30.53	1.002	405.15	1.08E-03	1.23E-04	1.30E-10
960	13.4281	6.5719	32.86	0.935	783.54	5.15E-04	9.71E-05	4.91E-11
1920	12.3457	7.6543	38.27	0.779	190.26	1.90E-03	5.64E-05	1.05E-10

SAMPLE DIMENSIONS AND PROPERTIES _ FINAL

Sample Height (mm) :	12.35	Unit Weight (kN/m^3) :	20.44
Sample Diameter (mm) :	50.00	Dry Unit Weight (kN/m^3) :	15.16
Area (cm^2) :	19.63	Specific Gravity (Assumed) :	2.75
Volume (cm^3) :	24.24	Solid Height (mm) :	6.94
Water Content (%) :	34.79	Volume of Solids (cm^3) :	13.63
Wet Mass (g) :	50.52	Volume of Voids (cm^3) :	10.61
Dry Mass (g) :	37.48		

Project No. :	121624678	Prepared By :	DB
Date :	22-Nov-24	Checked By :	RG

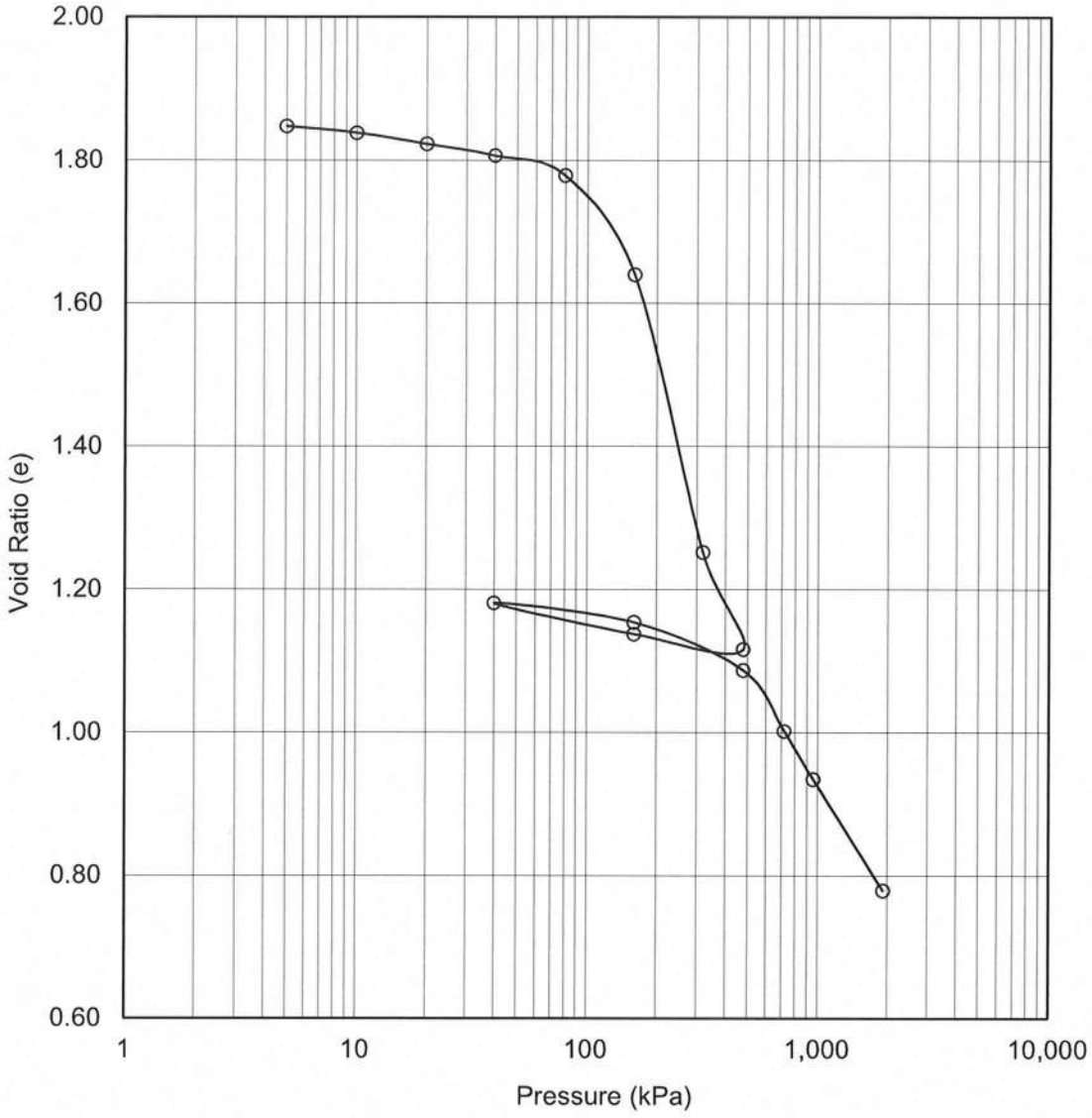
Stantec

CONSOLIDATION TEST	FIGURE 1

Exp File# OTT-23012778-G0

BH24-07, ST1

Void Ratio vs Pressure



Soil Type : *Silty clay, firm to stiff, dark grey, wet*

e_o =	1.881	w_L =	N/A	σ_{v0}' =	kPa
w =	68.1%	w_P =	N/A	σ_P' =	kPa
γ =	15.7 kN/m^3	PI =	N/A		
Gs =	2.75				

Project No. : 121624678
Date : 22-Nov-24

Stantec

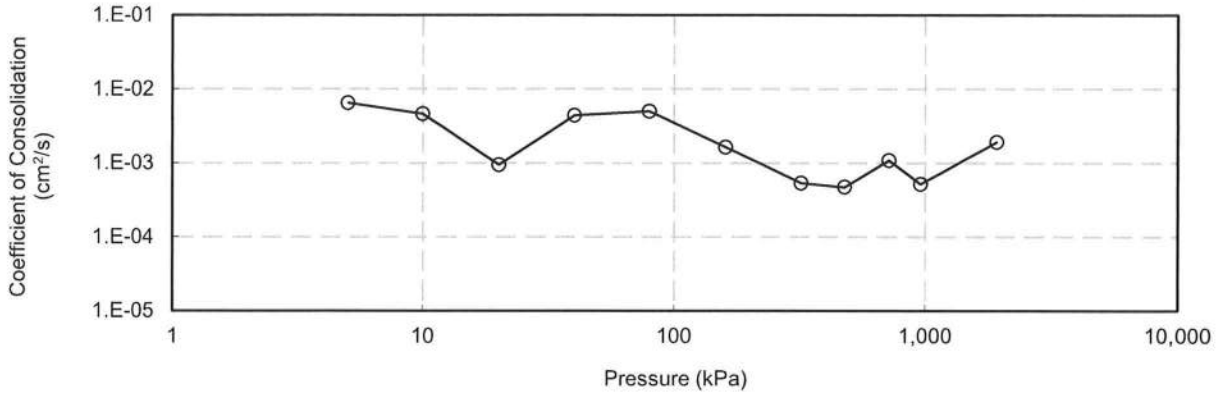
Prepared By : DB
Checked By : RG

CONSOLIDATION TEST	FIGURES 2, 3 & 4

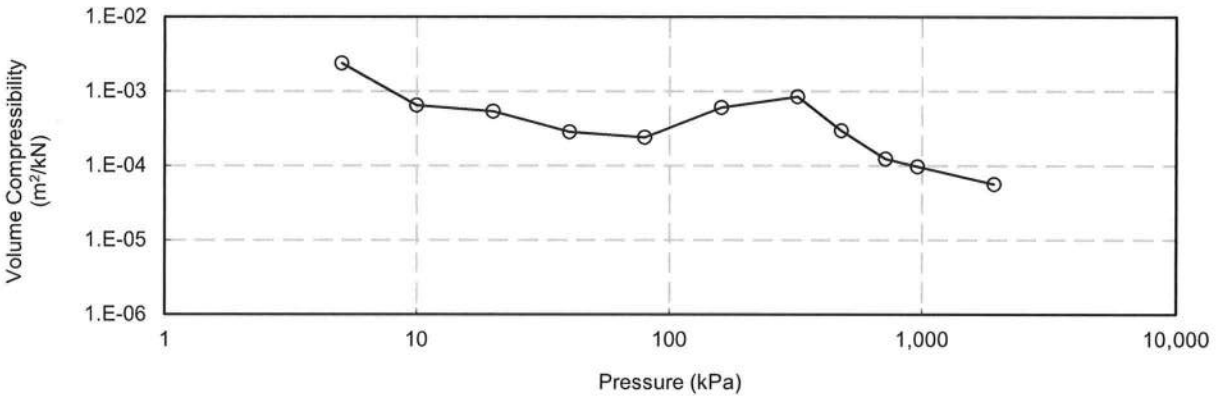
Exp File# OTT-23012778-G0

BH24-07, ST1

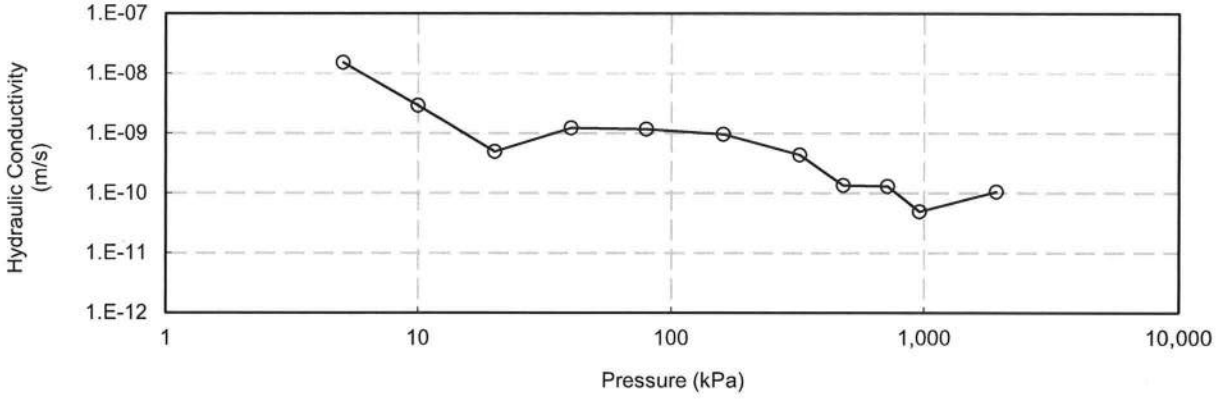
Cv vs Pressure



mv vs Pressure



k vs Pressure

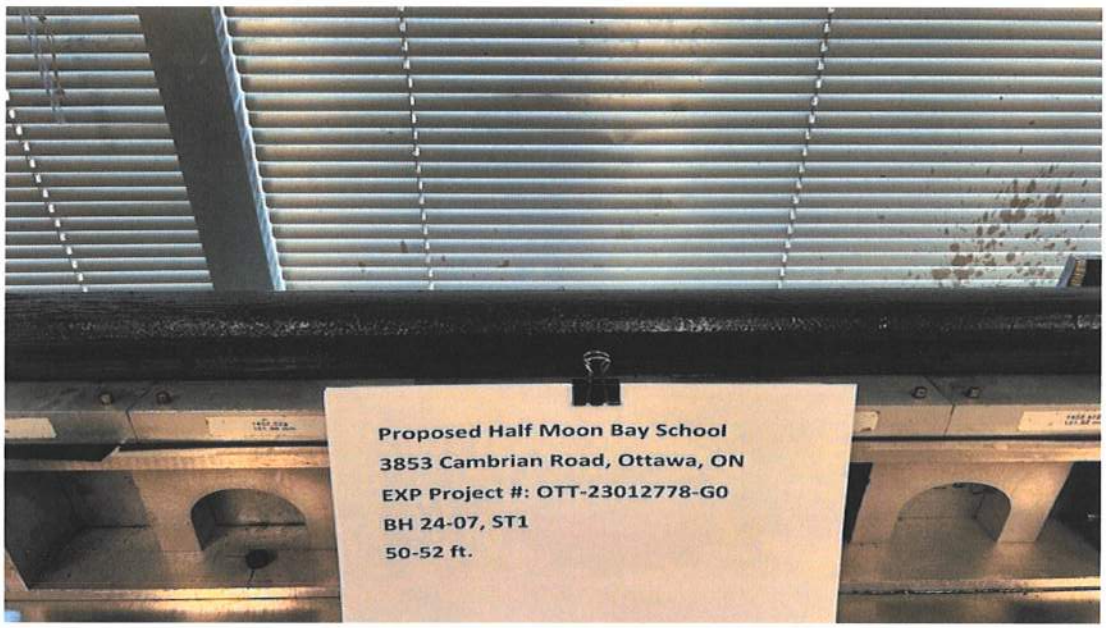


Project No. :	121624678	Stantec	Prepared By : DB
Date :	22-Nov-24		Checked By : RG

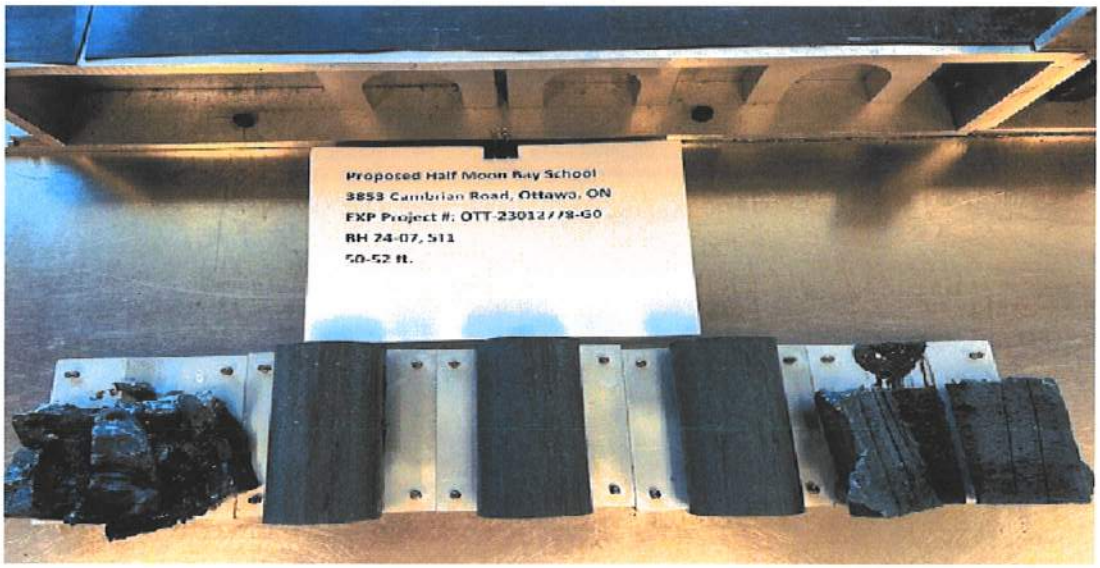
Exp File# OTT-23012778-G0	PHOTOS 1 & 2

Proposed Half Moon Bay School (Site : 3853 Cambrian Road, Ottawa, ON)

Silty clay, firm to stiff, dark grey, wet



BH24-07, ST1



BH24-07, ST1

Project No. : 121624678
Date : 22-Nov-2024

Stantec

Prepared by : DB
Checked by : RG

CONSOLIDATION TEST SUMMARY

SAMPLE IDENTIFICATION

Borehole No. :	BH24-12	Sample No. :	ST1
		Sample Depth (ft) :	15-17

TEST CONDITIONS

Test Type :	ASTM D2435/D2435M	Date Started :	31-Oct-24
Load Duration (hr) :	24	Date Completed :	15-Nov-24

SAMPLE DIMENSIONS AND PROPERTIES _ INITIAL

Sample Height (mm) :	20.00	Unit Weight (kN/m^3) :	17.01
Sample Diameter (mm) :	50.00	Dry Unit Weight (kN/m^3) :	11.47
Area (cm^2) :	19.63	Specific Gravity : (Assumed)	2.75
Volume (cm^3) :	39.27	Solid Height (mm) :	8.50
Water Content (%) :	48.30	Volume of Solids (cm^3) :	16.70
Wet Mass (g) :	68.10	Volume of Voids (cm^3) :	22.57
Dry Mass (g) :	45.92	Degree of Saturation (%) :	98.26

TEST COMPUTATIONS

Axial Stress (kPa)	Height (H) (mm)	Corrected Deformation (ΔH) (mm)	Axial Strain (ε_a) (%)	Void Ratio e	t_{90} (sec)	C_v (cm^2/s)	m_v (m^2/kN)	k (m/s)
0	20.0000	0.0000	0.00	1.352				
5	19.4901	0.5099	3.59	1.267	104.69	7.89E-03	7.19E-03	5.57E-08
10	19.1437	0.8563	5.21	1.229	1013.27	7.71E-04	3.23E-03	2.44E-09
20	18.6642	1.3358	7.61	1.173	1111.19	6.74E-04	2.41E-03	1.59E-09
40	18.0226	1.9774	11.55	1.080	786.31	8.94E-04	1.97E-03	1.73E-09
80	17.1300	2.8700	15.76	0.981	935.35	6.85E-04	1.05E-03	7.08E-10
160	16.1441	3.8559	20.80	0.863	654.30	8.77E-04	6.29E-04	5.41E-10
320	15.1600	4.8400	25.87	0.743	326.39	1.55E-03	3.17E-04	4.82E-10
480	14.5348	5.4652	28.49	0.682	535.18	8.49E-04	1.64E-04	1.37E-10
160			28.20	0.689				
40			27.30	0.710				
160	14.4306	5.5694	27.94	0.695	123.56	3.59E-03	5.27E-05	1.85E-10
480	14.2064	5.7936	29.45	0.659	160.07	2.69E-03	4.73E-05	1.25E-10
720	13.9530	6.0470	31.15	0.619	345.85	1.20E-03	7.08E-05	8.36E-11
960	13.5933	6.4067	32.85	0.579	525.86	7.50E-04	7.07E-05	5.20E-11
1920	12.7793	7.2207	37.18	0.477	161.77	2.21E-03	4.52E-05	9.81E-11

SAMPLE DIMENSIONS AND PROPERTIES _ FINAL

Sample Height (mm) :	12.56	Unit Weight (kN/m^3) :	22.49
Sample Diameter (mm) :	50.00	Dry Unit Weight (kN/m^3) :	18.25
Area (cm^2) :	19.63	Specific Gravity (Assumed) :	2.75
Volume (cm^3) :	24.67	Solid Height (mm) :	8.50
Water Content (%) :	23.21	Volume of Solids (cm^3) :	16.70
Wet Mass (g) :	56.58	Volume of Voids (cm^3) :	7.97
Dry Mass (g) :	45.92		

Project No. :	121624678	Prepared By :	DB
Date :	22-Nov-24	Checked By :	RG

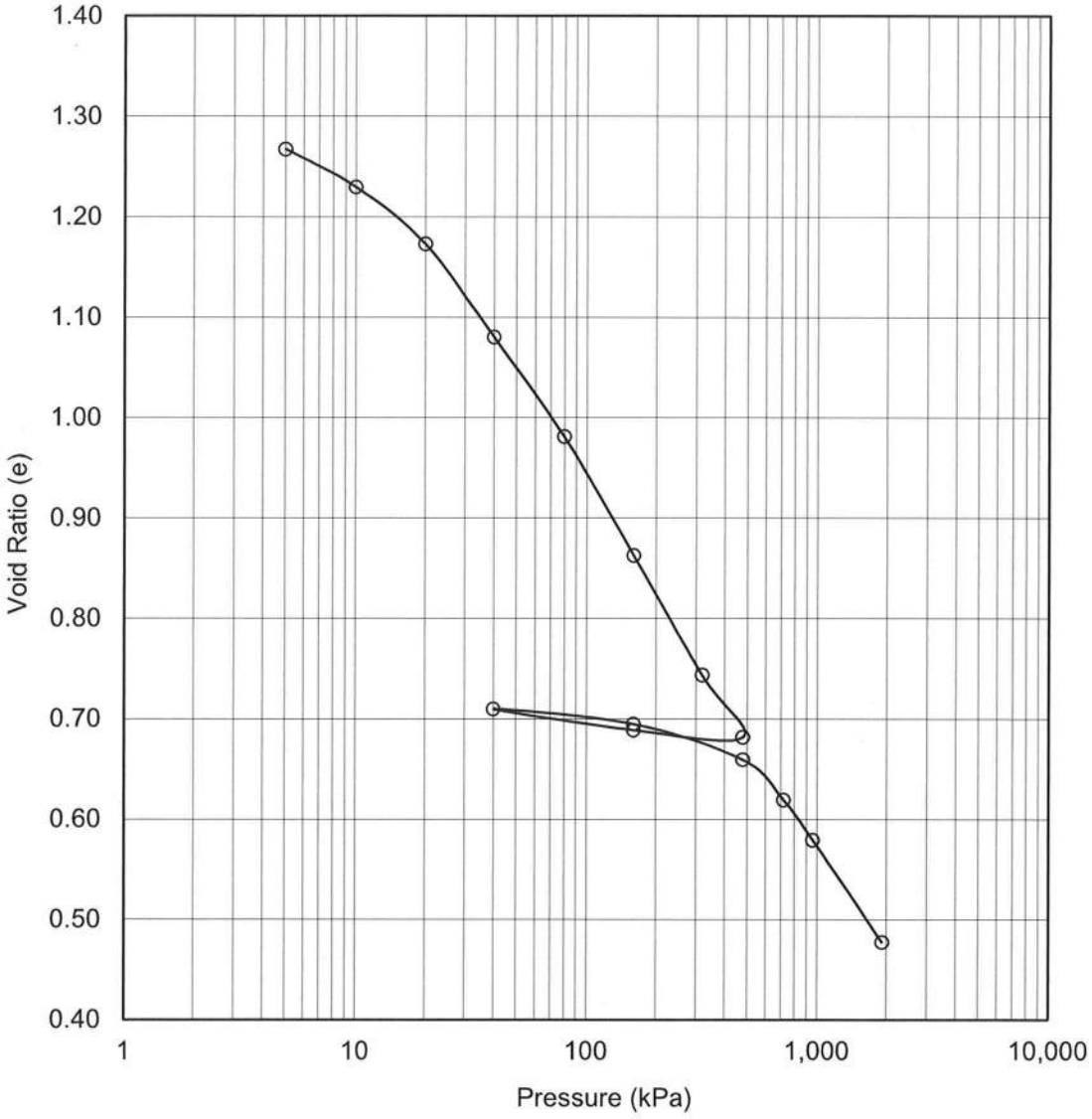
Stantec

CONSOLIDATION TEST	FIGURE 1

Exp File# OTT-23012778-G0

BH24-12, ST1

Void Ratio vs Pressure



Soil Type : *Silty clay, very soft, dark grey, wet*

e_o =	1.352	w_L =	N/A	σ_{v0}' =	kPa
w =	48.3%	w_P =	N/A	σ_P' =	kPa
γ =	17.0 kN/m^3	PI =	N/A		
Gs =	2.75				

Project No. : 121624678
Date : 22-Nov-24

Stantec

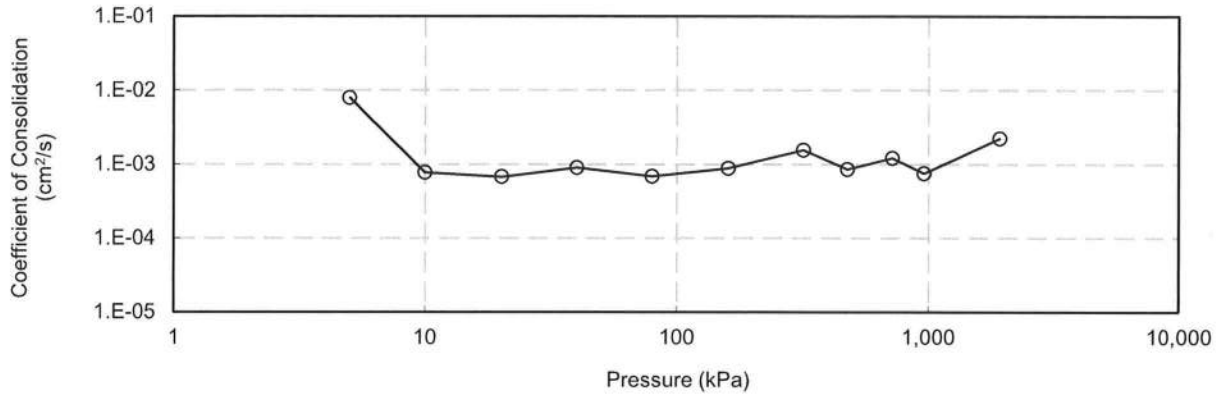
Prepared By : DB
Checked By : RG

CONSOLIDATION TEST	FIGURES 2, 3 & 4

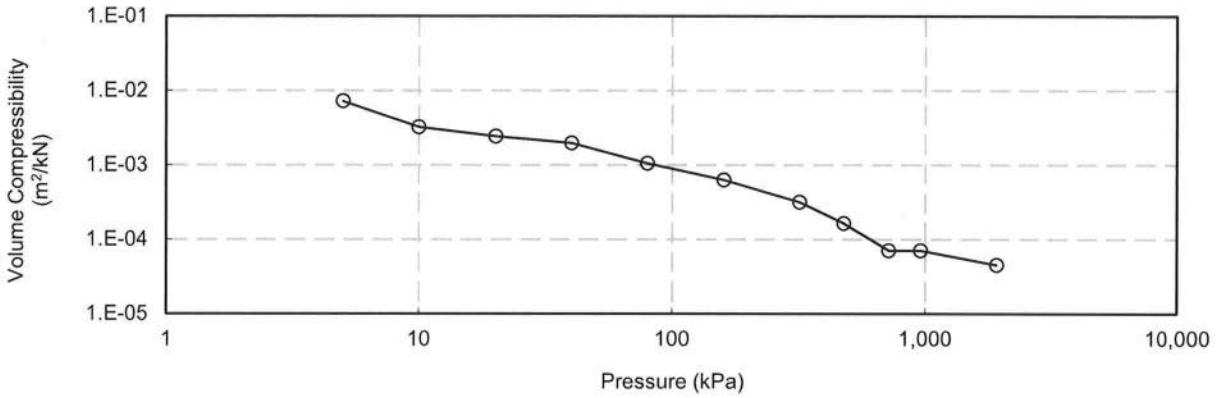
Exp File# OTT-23012778-G0

BH24-12, ST1

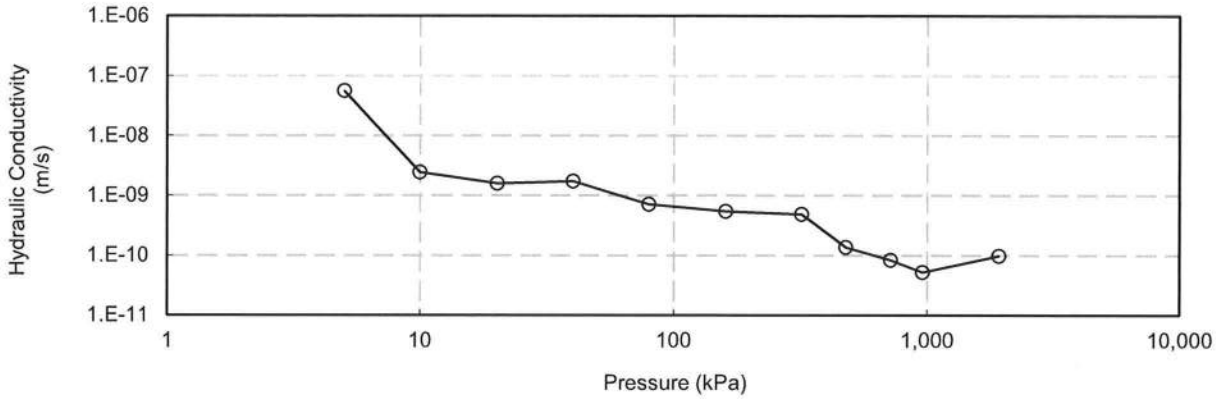
Cv vs Pressure



mv vs Pressure



k vs Pressure



Project No. :	121624678	Prepared By :	DB
Date :	22-Nov-24	Checked By :	RG

Stantec

Exp File# OTT-23012778-G0	**PHOTOS 1 & 2**

Proposed Half Moon Bay School (Site : 3853 Cambrian Road, Ottawa, ON)

Silty clay, very soft, dark grey, wet

BH24-12, ST1

BH24-12, ST1

Project No. : 121624678
Date : 22-Nov-2024

Stantec

Prepared by : DB
Checked by : RG

CONSOLIDATION TEST SUMMARY

SAMPLE IDENTIFICATION

Borehole No. :	BH24-13	Sample No. :	ST1
		Sample Depth (ft) :	30-32

TEST CONDITIONS

Test Type :	ASTM D2435/D2435M	Date Started :	31-Oct-24
Load Duration (hr) :	24	Date Completed :	15-Nov-24

SAMPLE DIMENSIONS AND PROPERTIES _ INITIAL

Sample Height (mm) :	20.00	Unit Weight (kN/m^3) :	16.99
Sample Diameter (mm) :	50.00	Dry Unit Weight (kN/m^3) :	11.29
Area (cm^2) :	19.63	Specific Gravity : (Assumed)	2.75
Volume (cm^3) :	39.27	Solid Height (mm) :	8.37
Water Content (%) :	50.45	Volume of Solids (cm^3) :	16.44
Wet Mass (g) :	68.02	Volume of Voids (cm^3) :	22.83
Dry Mass (g) :	45.21	Degree of Saturation (%) :	99.91

TEST COMPUTATIONS

Axial Stress (kPa)	Height (H) (mm)	Corrected Deformation (ΔH) (mm)	Axial Strain (ε_a) (%)	Void Ratio e	t_{90} (sec)	C_v (cm^2/s)	m_v (m^2/kN)	k (m/s)
0	20.0000	0.0000	0.00	1.389				
5	19.8663	0.1337	0.67	1.373	91.03	9.25E-03	1.34E-03	1.21E-08
10	19.7669	0.2331	1.17	1.361	92.64	8.98E-03	9.94E-04	8.76E-09
20	19.5822	0.4178	2.09	1.339	96.26	8.50E-03	9.24E-04	7.70E-09
40	19.4356	0.5644	2.82	1.321	164.12	4.91E-03	3.66E-04	1.77E-09
80	19.1519	0.8481	4.24	1.287	189.45	4.18E-03	3.55E-04	1.45E-09
160	17.3398	2.6602	13.30	1.071	465.79	1.58E-03	1.13E-03	1.75E-09
320	15.7823	4.2177	21.09	0.885	422.36	1.40E-03	4.87E-04	6.69E-10
480	15.1195	4.8805	24.40	0.806	518.96	9.89E-04	2.07E-04	2.01E-10
160	15.1549	4.8451	24.23	0.810				
40	15.3552	4.6448	23.22	0.834				
160	15.2206	4.7794	23.90	0.818	121.70	4.07E-03	5.61E-05	2.24E-10
480	14.8969	5.1031	25.52	0.779	71.75	6.71E-03	5.06E-05	3.33E-10
720	14.4747	5.5253	27.63	0.729	179.21	2.58E-03	8.80E-05	2.23E-10
960	14.0993	5.9007	29.50	0.684	710.51	6.13E-04	7.82E-05	4.70E-11
1920	13.2365	6.7635	33.82	0.581	107.56	3.72E-03	4.49E-05	1.64E-10

SAMPLE DIMENSIONS AND PROPERTIES _ FINAL

Sample Height (mm) :	13.24	Unit Weight (kN/m^3) :	21.43
Sample Diameter (mm) :	50.00	Dry Unit Weight (kN/m^3) :	17.06
Area (cm^2) :	19.63	Specific Gravity (Assumed) :	2.75
Volume (cm^3) :	25.99	Solid Height (mm) :	8.37
Water Content (%) :	25.64	Volume of Solids (cm^3) :	16.44
Wet Mass (g) :	56.80	Volume of Voids (cm^3) :	9.55
Dry Mass (g) :	45.21		

Project No. :	121624678	Prepared By :	DB
Date :	22-Nov-24	Checked By :	RG

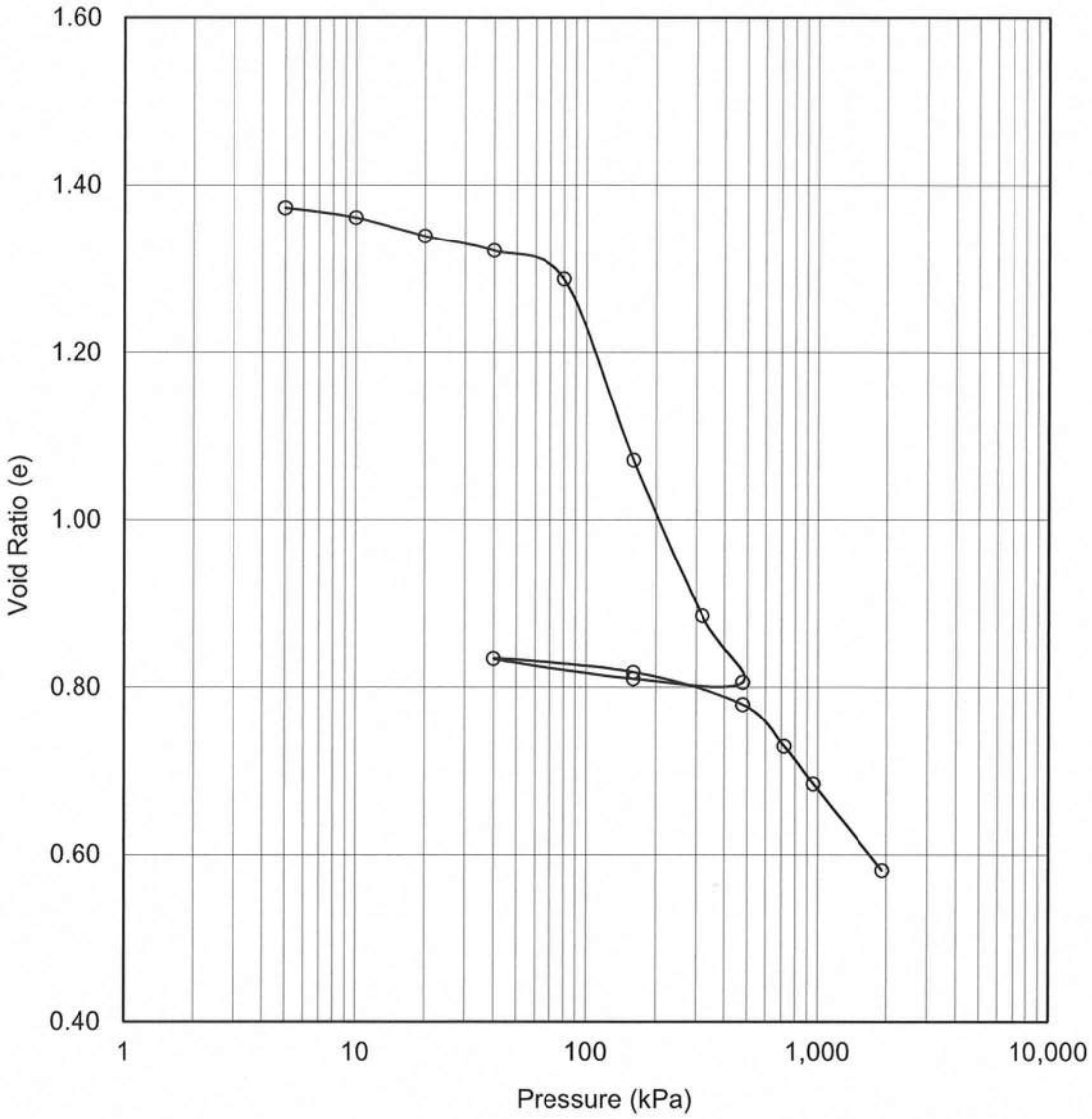
Stantec

CONSOLIDATION TEST	FIGURE 1

Exp File# OTT-23012778-G0

BH24-13, ST1

Void Ratio vs Pressure



Soil Type : *Silty clay, firm, dark grey, wet*

e_o =	1.389	w_L =	N/A	σ_{v0}' =	kPa
w =	50.5%	w_P =	N/A	σ_P' =	kPa
γ =	17.0 kN/m^3	PI =	N/A		
Gs =	2.75				

Project No. : 121624678
Date : 22-Nov-24

Stantec

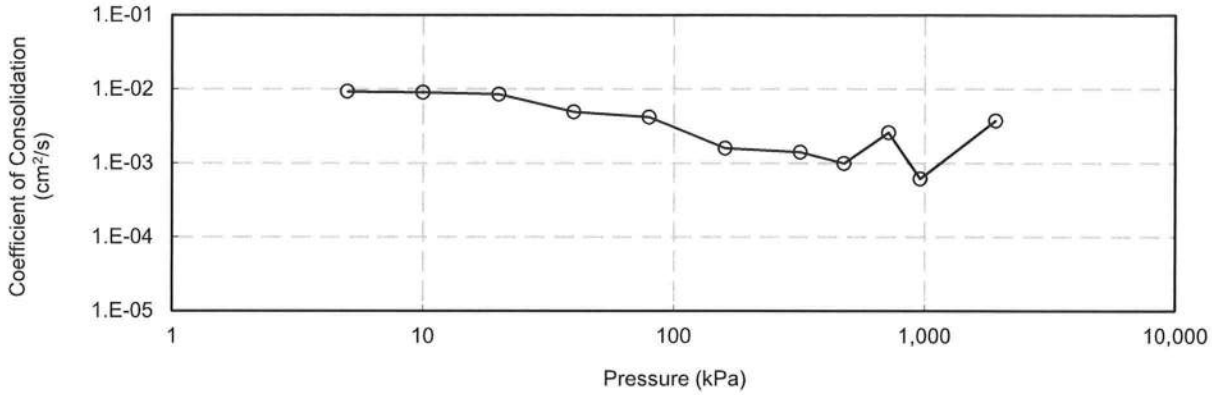
Prepared By : DB
Checked By : RG

CONSOLIDATION TEST	FIGURES 2, 3 & 4

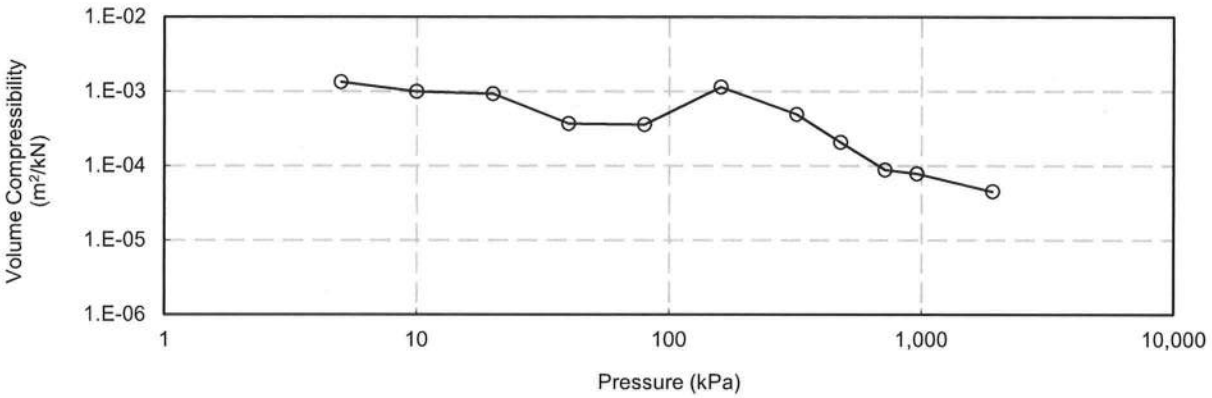
Exp File# OTT-23012778-G0

BH24-13, ST1

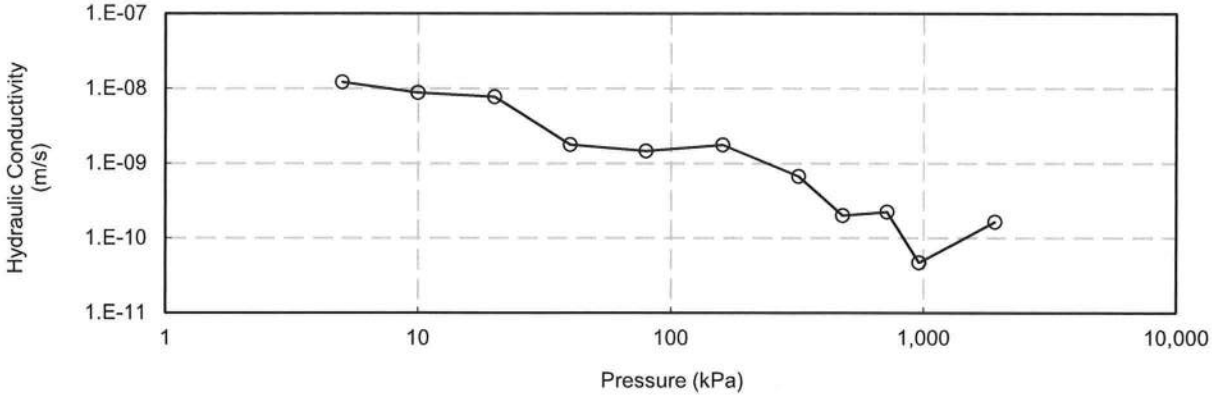
Cv vs Pressure



mv vs Pressure



k vs Pressure



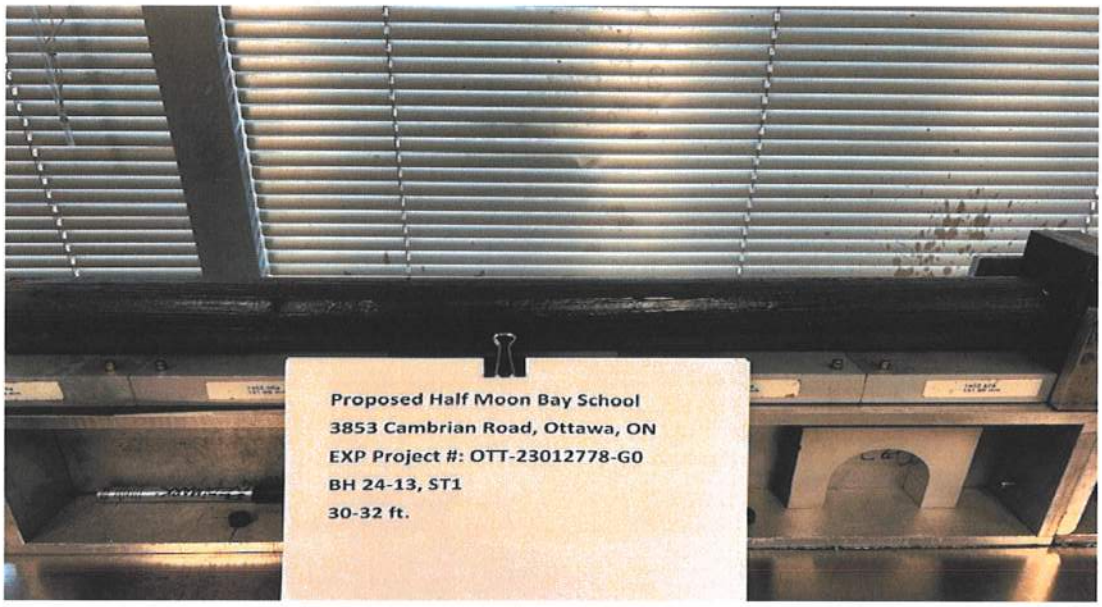
Project No. :	121624678	Prepared By :	DB
Date :	22-Nov-24	Checked By :	RG

Stantec

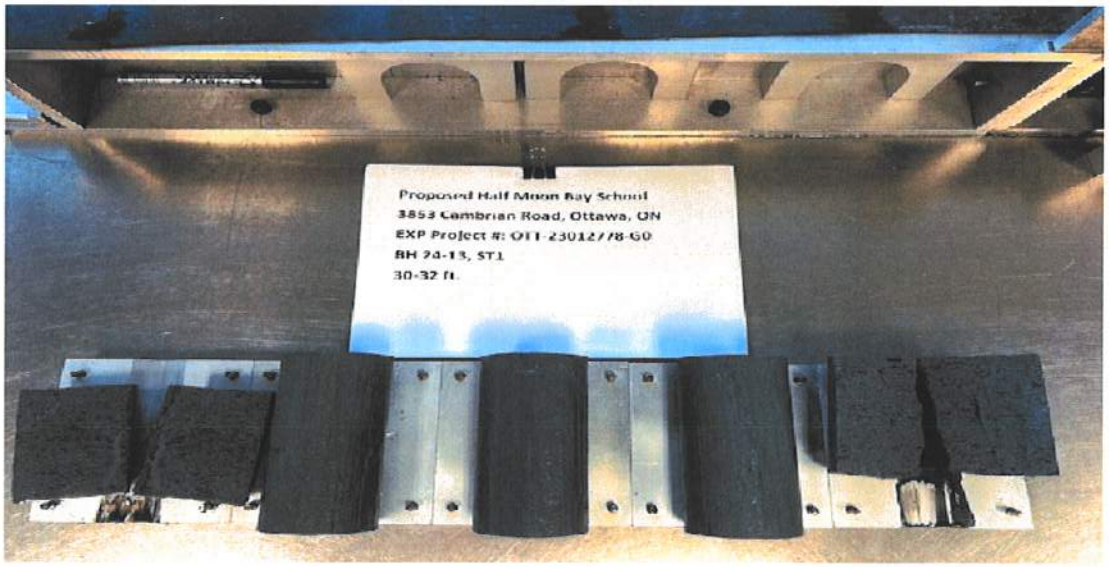
Exp File# OTT-23012778-G0	PHOTOS 1 & 2

Proposed Half Moon Bay School (Site : 3853 Cambrian Road, Ottawa, ON)

Silty clay, firm, dark grey, wet



BH24-13, ST1



BH24-13, ST1

Project No. : 121624678

Date : 22-Nov-2024

Stantec

Prepared by : DB

Checked by : RG

Appendix D – Bedrock Core Photographs

DRY BEDROCK CORES

25.9m

Top of Bedrock

WET BEDROCK CORES

25.9m

exp Services Inc.
t: +1.613.688.1899 | f: +1.613.225.7337
2650 Queensview Drive, Suite 100
Ottawa, ON K2B 8H6
Canada

www.exp.com

borehole no.	core runs	PROJECT	project no.
BH24-7	Run 1: 25.9 - 30.1m Run 2: 30.1 - 32.9m Run 3: 32.9 - 34.1m Run 4: 34.1 - 36.0m Run 5: 36.0 - 37.2m Run 6: 37.2 - 38.7m End of Borehole	Half Moon Bay Secondary School 3853 Cambrian Road, Ottawa, Ontario	OTT-23012778-G0
date cored Oct 25, 2024		ROCK CORE PHOTOGRAPHS	FIG. D-1

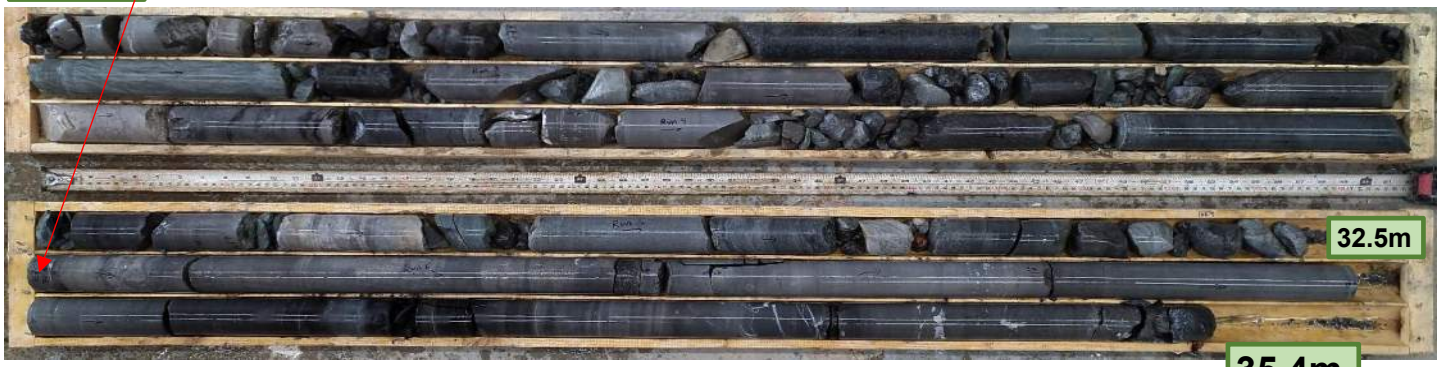
DRY BEDROCK CORES

22.3m

Top of Bedrock at 32.5 m

WET BEDROCK CORES

22.3m



exp Services Inc.
t: +1.613.688.1899 | f: +1.613.225.7337
2650 Queensview Drive, Suite 100
Ottawa, ON K2B 8H6
Canada
www.exp.com

• BUILDINGS • EARTH & ENVIRONMENT • ENERGY •
• INDUSTRIAL • INFRASTRUCTURE • SUSTAINABILITY •

borehole no.	core runs	PROJECT	project no.
BH24-13	Run 1: 22.3 - 23.7m Run 2: 23.7 - 25.6m Run 3: 25.6 - 28.2m Run 4: 28.2 - 31.0m Run 5: 31.0 - 32.5m Run 6: 32.5 - 33.8m Run 7: 33.8 - 35.4m	Half Moon Bay Secondary School 3853 Cambrian Road, Ottawa, Ontario	OTT-23012778-G0
date cored Oct 28, 2024		ROCK CORE PHOTOGRAPHS	FIG. D-2

Appendix E – June 16,2025 Site Review Report by EXP

Site Review Report – SRR1

To:	**OCDSB**	Date:	June 16, 2025
EXP Project No.:	OTT-23012778-G0		
Subject:	Half Moon Bay School – Pre-Grading of Site		
Owner:	Ottawa Carleton District School Board (OCDSB)		
Contractor:	Taggart Construction		
Prepared By	Matthew Zammit, P.Eng.	Reviewed by:	Ismail Taki, P.Eng.

EXP visited the above-noted site as requested on June 16, 2025, at 12:00 noon to review the pre-grading operations being carried out.

At the time of EXP's arrival, the contractor had removed stockpiles and lowered the grades on the east portion of the site (Figure 1). The contractor continued to remove topsoil and peat material during the inspection. No native material was exposed at the time of the site visit. The contractor was not working in the area of the proposed building.

The contractor indicated that they were working for Mattamy Homes. They were instructed to remove the stockpiled topsoil and boulders from the site, and re-grade the site with topsoil-free on-site material to prevent creating areas for water to pond. The contractor indicated that approximately 15ft (4.6 m) depth of material was removed, and the low point would be approximately 3 ft (1 m) below the gravel lot previously used as a Mattamy site office.

The contractor intends to be finished their operations in 1 to 2 weeks' time from this date or June 20th to 27th.

Please see attached figure and photos at the end of this report.

Written By:

Matthew Zammit, M.A.Sc., P.Eng.

Reviewed By:

Ismail Taki, M.Eng., P.Eng.

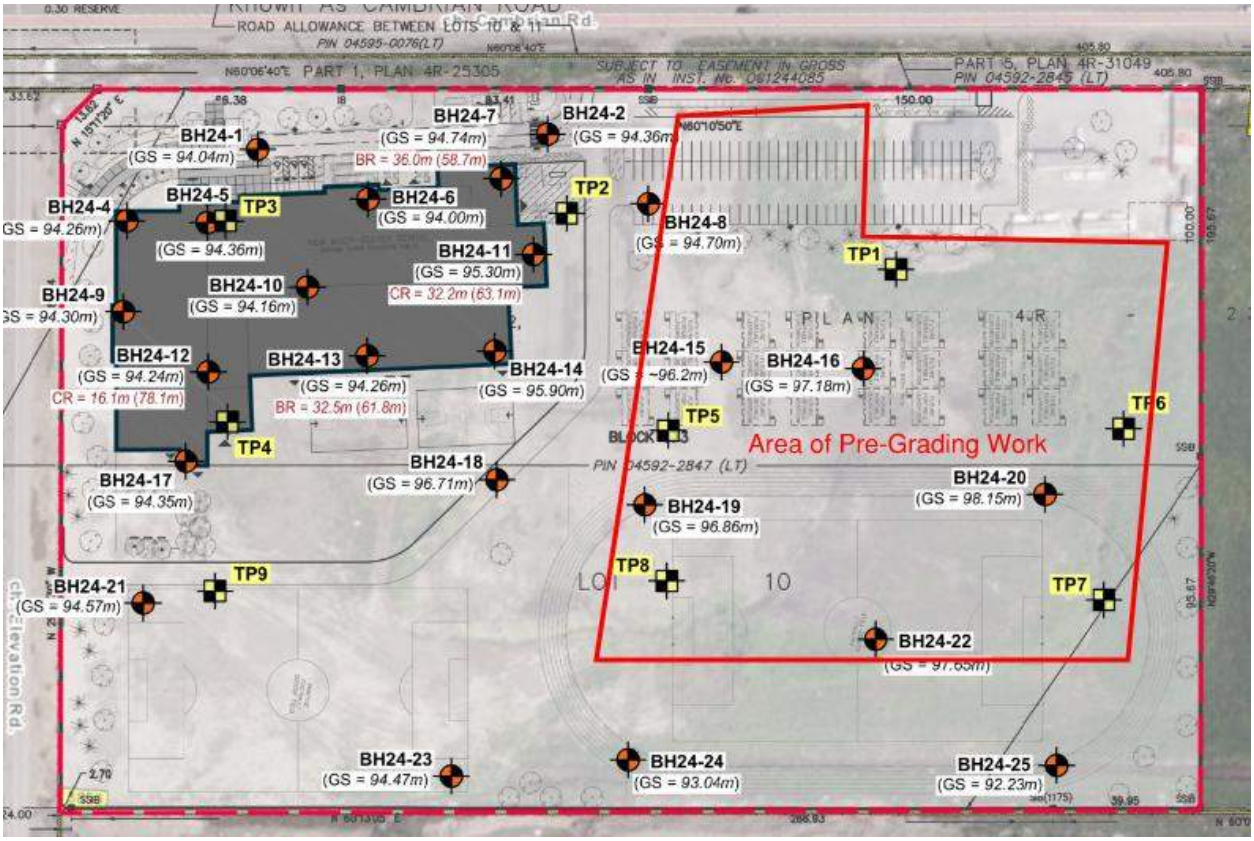


Figure No. 1: Area of Pre-Grading Work

Photograph No. 1: Contractor Loading Topsoil and Removing It Off-Site

Photograph No. 2: Boulders Also to be Removed

Photograph No. 3: Deepest Part of Removals, Facing East Across Site Over Work Area

Photograph No. 4: Facing West Across Site to Proposed Building Location from West Edge of Work Area

Photograph No. 5: Low Point of Removals Facing North – Fill Material Remaining

Photograph No. 6: East Edge of Site Facing South

Photograph No. 7: East Edge of Site Facing West

END OF REPORT

Appendix F – Laboratory Certificate of Analysis Report by AGAT

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: **EXP SERVICES INC**
2650 QUEENSVIEW DRIVE, UNIT 100
OTTAWA, ON K2B8H6
(613) 688-1899

ATTENTION TO: **Susan Potyondy**

PROJECT: **OTT-23012778-G0**

AGAT WORK ORDER: **24Z217260**

SOIL ANALYSIS REVIEWED BY: **Nivine Basily, Inorganic Team Lead**

DATE REPORTED: **Nov 12, 2024**

PAGES (INCLUDING COVER): **5**

VERSION*: **1**

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information is available on request from AGAT Laboratories, in accordance with ISO/IEC 17025:2017, ISO/IEC 17025:2005 (Quebec), DR-12-PALA and/or NELAP Standards.*
- *This document is signed by an authorized signatory who meets the requirements of the MELCCFP, CALA, CCN and NELAP.*
- *For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.*

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 24Z217260

PROJECT: OTT-23012778-G0

CLIENT NAME: EXP SERVICES INC

ATTENTION TO: Susan Potyondy

SAMPLING SITE:3853 Cambrian Road, Ottawa

SAMPLED BY:EXP

(Soil) Inorganic Chemistry

DATE RECEIVED: 2024-11-05 **DATE REPORTED: 2024-11-12**

				BH24-2 SS3	BH24-21 SS4	BH24-24 SS4
		SAMPLE DESCRIPTION:		5'-7'	7.5'-9.5'	7.5'-9.5'
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2024-10-22	2024-10-18	2024-10-18
Parameter	Unit	G / S	RDL	6292872	6292873	6292874
Chloride (2:1)	µg/g		2	70	40	10
Sulphate (2:1)	µg/g		2	401	377	525
pH (2:1)	pH Units		NA	8.21	7.97	8.17
Resistivity (2:1) (Calculated)	ohm.cm		1	1680	3690	1500

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

6292872-6292874 pH, Chloride and Sulphate were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water: 1 part soil). Resistivity is a calculated parameter.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: EXP SERVICES INC

AGAT WORK ORDER: 24Z217260

PROJECT: OTT-23012778-G0

ATTENTION TO: Susan Potyondy

SAMPLING SITE:3853 Cambrian Road, Ottawa

SAMPLED BY:EXP

Soil Analysis

RPT Date: Nov 12, 2024			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
(Soil) Inorganic Chemistry															
Chloride (2:1)	6282183		9	9	NA	< 2	92%	70%	130%	100%	80%	120%	95%	70%	130%
Sulphate (2:1)	6282183		55	55	1.7%	< 2	95%	70%	130%	100%	80%	120%	98%	70%	130%
pH (2:1)	6292872	6292872	8.21	8.38	2.0%	NA	104%	80%	120%						

Comments: NA signifies Not Applicable.
pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Duplicate NA: results are under 5X the RDL and will not be calculated.

Certified By:

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: EXP SERVICES INC

AGAT WORK ORDER: 24Z217260

PROJECT: OTT-23012778-G0

ATTENTION TO: Susan Potyondy

SAMPLING SITE:3853 Cambrian Road, Ottawa

SAMPLED BY:EXP

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Chloride (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
pH (2:1)	INOR 93-6031	modified from EPA 9045D and MCKEAGUE 3.11	PH METER
Resistivity (2:1) (Calculated)	INOR-93-6036	McKeague 4.12, SM 2510 B,SSA #5 Part 3	CALCULATION

AGAT Laboratories

Have feedback? Scan here for a quick survey!

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 24727260

Cooler Quantity: n/a - no ice packs
Arrival Temperatures: 19.3 | 19.6 | 19.9
Depot Temperatures: 3.9 | 4.1 | 4.3
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
Notes: Bagged ice

Report Information:

Company: EXP Services Inc
Contact: Susan Potyondy
Address: 2650 Queensview Drive, Suite 100
Ottawa, Ontario. K2B 8H6
Phone: 613-688-1899 Fax:
Reports to be sent to:
1. Email: Susan.potyondy@exp.com
2. Email: ryan.digiuseppe@exp.com

Regulatory Requirements:

(Please check all applicable boxes)

☐ Regulation 153/04
Table ___ *Indicate One*
☐ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture *(Check One)* ☐ Coarse ☐ Fine

☐ Regulation 406
Table ___ *Indicate One*
☐ Ind/Com ☐ Res/Park ☐ Agriculture
☐ Regulation 558
☐ CCME

☐ Sewer Use ☐ Sanitary ☐ Storm
___ *Region*
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
___ *Indicate One*

Is this submission for a **Record of Site Condition (RSC)**? ☐ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CSR

Project Information:

Project: OTT-23012778-G0
Site Location: 3853 Cambrian Road, Ottawa
Sampled By: EXP
AGAT Quote #: ___ PO: ___
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☑ No ☐

Company:
Contact:
Address:
Email:

Legal Sample ☐

Sample Matrix Legend

GW	Ground Water	**SD**	Sediment
O	Oil	**SW**	Surface Water
P	Paint	**R**	Rock/Shale
S	Soil		

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI, DOC (Y/N)	O. Reg 153: Metals & Inorganics	O. Reg 153: Metals - ☐ CrVI, ☐ Hg, ☐ HWSB	O. Reg 153: BTEX, F1-F4 PHCs	VOC	PAHs	PCBs: Aroclors ☐	O. Reg 406: Regulation 406 Characterization Package pH, Metals, BTEX, F1-F4	O. Reg 406: EC, SAR	O. Reg 406: Regulation 406 SPLP Rainwater Leach mSPLP: ☐ Metals ☐ VOCs ☐ SVOCs ☐ OC	O. Reg 558: Landfill Disposal Characterization TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Corrosivity: ☐ Moisture ☐ Sulphide	pH	Sulphates	Chlorides	Resistivity			Potentially Hazardous or High Concentration (Y/N)
1. BH24-2 SS3 5'-7'	Oct 22	AM PM	1															☑	☑	☑	☑			
2. BH24-21 SS4 7.5'-9.5'	Oct 18	AM PM	1															☑	☑	☑	☑			
3. BH24-24 SS4 7.5'-9.5'	Oct 18	AM PM	1															☑	☑	☑	☑			
4.		AM PM																						
5.		AM PM																						
6.		AM PM																						
7.		AM PM																						
8.		AM PM																						
9.		AM PM																						
10.		AM PM																						
11.		AM PM																						

	Date	Time		Date	Time	
Samples Relinquished By (Print Name and Sign):			Samples Received By (Print Name and Sign):	11/05/24	16h10	
Samples Relinquished By (Print Name and Sign): Cat to Denis	11/05/24	15h00	Samples Received By (Print Name and Sign): HB	6 Nov	9:10	Page ___ of ___
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time	N°:

Pink Copy - Client | Yellow Copy - AGAT | White Copy - AGAT

Legal Notification

This report was prepared by EXP Services for the account of Ottawa Carleton District School Board.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. EXP Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

List of Distribution

Report Distributed To:

Jean Voth; jean.voth@ocdsb.ca

David Lacelle; david.lacelle@ocdsb.ca