



**Geotechnical Investigation Report
Proposed New Catholic High School
5431 Fernbank Road
Ottawa, Ontario**

Client:

Ottawa Catholic School Board
570 West Hunt Club Road
Ottawa, Ontario
K2G 3R4

Type of Document:

Updated Final Report (supersedes September 16,2025 final report)

Project Number:

OTT-23004319-A0

Prepared By:

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

Date Submitted:

December 18,2025

Table of Contents

Executive Summary.....	1
1. Introduction.....	4
2. Site Description.....	5
3. Available Background Information	6
4. Procedure.....	7
4.1 Test Hole Fieldwork	7
4.2 Laboratory Testing Program	8
5. Subsurface Conditions and Groundwater Levels.....	9
5.1 Topsoil.....	9
5.2 Fill.....	9
5.3 Buried Topsoil Layer.....	9
5.4 Sandy Silt to Silt.....	9
5.5 Silty Clay.....	10
5.5.1 Upper Brown Silty Clay Crust	10
5.5.2 Lower Grey Silty Clay	11
5.6 Inferred Glacial Till	12
5.7 Limestone Bedrock	12
5.8 Groundwater Level Measurements	13
6. Site Classification and Designation for Seismic Design and Liquefaction Potential of Soils.....	14
7. Grade Raise Restrictions	15
8. Site Grading.....	16
9. Foundation Considerations.....	17
9.1 Pile Foundation	17
9.1.1 Piles Designed in End-Bearing.....	17
9.1.2 Uplift Resistance of Piles.....	18
9.1.3 Additional Comments for Pile Foundation	19
9.2 Additional Comment for Foundations	20

10. Floor Slab and Drainage Requirements	21
11. Excavation and De-Watering Requirements.....	22
11.1 Excess Soil Management.....	22
11.2 Excavation	22
11.3 De-Watering Requirements	23
12. Impact on Adjacent Existing Structures	24
13. Pipe Bedding Requirements.....	25
14. Backfilling Requirements and Suitability of On-Site Soils for Backfilling Purposes	26
15. Pavement Structure for Parking Lot and Access Roads	27
16. Corrosion Analysis.....	29
17. Tree Planting Restrictions	30
18. Additional Comments	31
19. General Comments	32

List of Tables

Table I: Summary of Laboratory Testing Program	8
Table II: Summary of Grain-Size Analysis and Atterberg Limit Determination –Sandy Silt Samples	10
Table III: Summary of Grain-Size Analysis and Atterberg Limit Determination –Brown Silty Clay Sample	11
Table IV: Summary of Grain-Size Analysis and Atterberg Limit Determination –Grey Silty Clay Samples .	11
Table V: Summary of Bedrock Depths (Elevations)	12
Table VI: Summary of Unconfined Compressive Strength Test Results – Bedrock Cores	12
Table VII: Summary of Groundwater Level Measurements.....	13
Table VIII: Allowable Load Carrying Capacity of Steel Pipe and H-Piles.....	18
Table IX: Factored Uplift Resistance of Piles at ULS.....	18
Table X: Recommended Pavement Structure Thicknesses.....	27
Table XI: Corrosion Test Results on Soil Samples	29

List of Figures

Figure 1	Site Location Plan
Figures 2	Test Hole Location Plan
Figures 3 to 35	Test Hole (Borehole and Test Pit) Logs
Figures A to E	Borehole Logs
Figures 36 to 44	Grain-Size Distribution Curves

List of Appendices

Appendix A – Borehole Logs and Consolidation Test Results for Borehole Nos. 1,9 and 10 – Paterson Group Inc.

Appendix B – Bedrock Core Photographs

Appendix C – Laboratory Certificate of Analysis Report by AGAT

Legal Notification

List of Distribution

Executive Summary

Introduction

EXP Services Inc. (EXP) is pleased to present the results of the geotechnical investigation completed for the proposed new high school to be located at 5431 Fernbank Road, Ottawa, Ontario (Figure 1). Authorization to proceed with this geotechnical investigation was provided by the Ottawa Catholic School Board.

A Phase One Environmental Site Assessment (ESA) of the proposed new high school site was also conducted by EXP in conjunction with this geotechnical investigation. The results of the Phase One ESA are provided in a separate report.

Proposed Development

The proposed new high school development will include a new three (3) storey school building with future addition, two (2) outdoor sports fields with one sports field having a running track and an outdoor paved parking lot and access roads. The school building and future addition will not have a basement. The development will be serviced by municipal services. The site grading plan, Drawing No. C2, dated December 2, 2025 (Revision No. 4) indicates the design elevation of the finished floor is Elevation 99.65 m and the site grade raise is up to 1.5 m.

Test Hole Fieldwork Program

The test hole fieldwork was undertaken from May 5 to 18, 2023 and from October 7 to 10, 2025. The test hole fieldwork consists of thirty-three (38) test holes; twenty (25) boreholes and thirteen (13) test pits. Borehole Nos. 1, 8 and 11 were advanced to cone refusal depths at 30.5 m to 32.6 m. Borehole Nos. 2 to 7, 9, 10, 12 and 13 were advanced to termination depths of 7.9 m to 8.2 m. Borehole Nos. 14 to 20 were advanced to termination depths of 3.4 m to 5.2 m. Borehole Nos. 25-01, 25-02 and 25-04 to 25-06 were advanced to cone refusal and termination depths of 33.1 m to 39.4 m below existing grade. Borehole No. 25-03 was not drilled. The test pits were advanced to termination depths of 1.8 m to 2.2 m. The fieldwork was supervised on a full-time basis by a representative from EXP.

Subsurface Conditions

The subsurface conditions at the site of the proposed new high school consists of surficial and buried topsoil and fill underlain by very loose to compact sandy silt to silt that extends to depths of 1.1 m to 1.8 m (Elevation 97.8 m to Elevation 96.2 m) followed by a deep silty clay deposit having an upper desiccated brown firm to stiff silty clay zone that exhibits good strength properties underlain by a weaker soft to firm grey silty clay zone. Cone refusal was met on inferred cobbles, boulders or bedrock at 30.5 m to 34.0 m depths (Elevation 68.2 m to 64.7 m). Inferred glacial till was encountered at approximate depths of 24.0 m and 24.3 m (Elevation 74.7 m and Elevation 74.2 m). Limestone bedrock (with shaly partings) was contacted in Borehole Nos. 25-01 and 25-04 to 25-06 at 30.4 m to 34.9 m depths (Elevation 68.5 m to Elevation 63.8 m). The groundwater level on the site ranges from 0.8 m to 1.7 m depths (Elevation 99.1 m and Elevation 96.5 m).

Geotechnical Engineering Comments and Recommendations

Based on a comparison of the test hole information with Table 4.1.8.4.-B of the 2024 Ontario Building Code (OBC), the site class is E and the site designation is X_E for seismic design.

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

The site for the proposed new high school is underlain by a sensitive marine clay deposit that is prone to consolidation settlement if overstressed by loads imposed on it by site grade raise, foundations, and by the

permanent lowering of the groundwater level. Overstressing of the clay will result in its consolidation and subsequent settlement of foundations, which may exceed the tolerable limits of the structure resulting in cracking of the structure.

Based on a review of the test hole information, the maximum permissible site grade raise is 1.5 m. A review of the site grading plan, Drawing No. C2, dated December 2, 2025 (Revision No. 4) indicates the site grade raise will be up to 1.5 m which conforms to the maximum permissible site grade raise of 1.5 m.

However, for the site grade raise of up to 1.5 m, it is considered that the underlying silty clay does not have sufficient capacity to support the proposed three-storey building by footings. Therefore, in conjunction with a site grade raise of up to 1.5 m, the proposed building will have to be supported by pile foundations driven to practical refusal into the limestone bedrock and designed in end bearing. The floor slab may be designed as a slab-on-grade.

The proposed new high school building and future building addition may be supported by steel H or concrete filled steel pipe piles designed in end-bearing and driven to practical refusal into the underlying bedrock. The limestone bedrock was contacted at 30.4 m to 34.9 m depths (Elevation 68.5 m to Elevation 63.8 m). It is recommended that the pile tip elevation should be established from the bedrock depth identified in the boreholes where the bedrock was cored (Borehole Nos. 25-01 and 25-04 to 25-06) and not from the cone refusal depth from the dynamic cone penetration test (DCPT), since cone refusal may have occurred in the glacial till. Pile foundation may be used in conjunction with the maximum permissible site grade raise of 1.5 m. The allowable load carrying capacity of the piles is provided in the attached geotechnical report.

The design elevation of the floor slab for the proposed new high school building and future building addition was not known at the time of this geotechnical investigation. The floor slab for the proposed new high school and future addition may be designed and constructed as a slab-on-grade that is placed on a well packed 200 mm thick 19 mm sized clear stone bed set on a minimum 300 mm thick engineered fill pad placed on the proofrolled sandy silt to silt or on the silty clay and compacted to 98 percent SPMDD. The clear stone would minimize the capillary rise of moisture from the sub-soil to the floor slab. As an alternative to the clear stone layer, the floor slab may be cast on a 200 mm thick bed of Ontario Provincial Standard Specification (OPSS) Granular A compacted to 98 percent standard Proctor maximum dry density (SPMDD) and overlain by a vapour barrier. Adequate saw cuts should be provided in the floor slabs to control cracking. It is recommended that a perimeter drainage system should be provided around the proposed new high school building and future building addition. An underfloor perimeter drainage system is not required for the proposed building.

Open cut excavation within the subsurface soils should comply with the most recent Occupational Health and Safety Act (OHSA), Ontario Regulations 213/91 (August 1, 1991). Based on the definitions contained in OHSA, the subsurface soils at the site are classified as Type 3 soil and as such the excavation sidewalls must be cut back at 1H:1V from the bottom of the excavation. Below the groundwater table, the excavation side slopes are expected to slough and will eventually stabilize at a slope of 2H:1V to 3H:1V.

Seepage of the surface and subsurface water into the excavations is anticipated. However, it should be possible to collect any water entering the excavations in perimeter ditches and to remove it by pumping from sumps. In areas of high infiltration, such as within the sandy silt to silt, 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 and minimize basal instability in the form of piping or heave where excavations terminate within the sandy silt to silt.

It is anticipated that the majority of the material required for backfilling purposes, interior and exterior to the proposed new high school building and future addition and for service trench backfill and for subgrade construction would have to be imported and should preferably conform to Ontario Provincial Standard Specification (OPSS) Granular B Type II and Select Subgrade Material (SSM).

Closure

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

The executive summary is a brief synopsis of the attached geotechnical 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 high school to be located at 5431 Fernbank Road, Ottawa, Ontario (Figure 1). Authorization to proceed with this geotechnical investigation was provided by the Ottawa Catholic School Board.

A Phase One Environmental Site Assessment (ESA) of the proposed new high school site was also conducted by EXP in conjunction with this geotechnical investigation. The results of the Phase One ESA are provided in a separate report.

The proposed new high school development will include a new three (3) storey school building with future addition, two (2) outdoor sports fields with one sports field having a running track and an outdoor paved parking lot and access roads. The school building and future addition will not have a basement. The development will be serviced by municipal services. The site grading plan, Drawing No. C2, dated December 2, 2025 (Revision No. 4) indicates the design elevation of the finished floor is Elevation 99.65 m and the site grade raise is up to 1.5 m.

This geotechnical investigation was undertaken to:

- a) Establish the subsurface soil and groundwater conditions at 38 test holes (25 boreholes and 13 test pits) located on the site,
- b) Provide the site classification and site designation for seismic design in accordance with 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 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 for the proposed new high school building and future building addition and comment on the anticipated total and differential settlements of the recommended foundation type,
- e) Provide comments regarding slab-on-grade construction and the requirements for perimeter and underfloor drainage systems,
- f) Comment on excavation conditions and de-watering requirements during construction,
- g) Provide pipe bedding requirements,
- h) Discuss backfilling requirements and suitability of on-site soils for backfilling purposes,
- i) Provide pavement structure for access roads and parking lot,
- j) Comment on the corrosion potential of the subsurface soils to buried concrete and steel; and
- k) Discuss 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

At the time of this geotechnical investigation, the site of the proposed high school was a vacant parcel of land located on the north side of Fernbank Road. The site is bounded to the north by Cope Drive, to the east by Wal-Mart and Terry Fox Drive beyond and to the west by Atlas Terrace. Soil stockpiles were observed on the site.

The topography of the site is relatively flat with ground surface elevations at the test hole locations (boreholes and test pits) ranging from Elevation 100.33 m to Elevation 97.56 m. The ground surface gradually slopes down in an easterly direction.

3. Available Background Information

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

- Geotechnical investigation report for the proposed condominium development located west of the proposed new catholic high school site - *Proposed Residential Development, Blackstone – Phase 5 – Condominium Block, Fernbank Road – Ottawa*, dated February 19,2019 and prepared by Paterson Group Inc. (Paterson) (Report: PG4053-2).
- Geotechnical investigation report (original and revised reports) for the proposed residential development located north and west of the proposed new catholic high school site – *Proposed Residential Development, Blackstone Community – Phases 4 to 8, Terry Fox Drive – Ottawa*, dated February 2,2018 (Revised Report) and May 5,2017 (Original Report) and prepared by Paterson Group Inc. (Report: PG4053-1R (revised report) and PG4053-1 (original report).

A brief summary of the relevant geotechnical information from the two (2) above referenced reports is presented in the following paragraphs.

The boreholes relevant to the proposed new high school development are Borehole Nos. 1, 9 and 10 from the original Paterson 2017 geotechnical report (Project No. PG4053-1). These boreholes were undertaken in 2010 and 2011 and the ground surface elevations at the borehole locations are assumed as indicated in the February 2,2018 revised Paterson report. Borehole Nos. 9 and 10 are located on the proposed new high school site with Borehole No. 9 located in the south portion of the site and Borehole No. 10 located in the northeast portion of the site along the north property line of the school site. Borehole No.1 is located on the proposed condominium development site located west of and next door to the south portion of the proposed school site approximately 10.0 m west of the west property line of the school site. The approximate locations of these boreholes relative to the school property are shown in Figure 2.

The Paterson borehole logs for Borehole Nos. 1, 9 and 10 are shown in Appendix A. The information from the three (3) boreholes indicates the subsurface conditions consist of a 300 mm and 360 mm surficial topsoil underlain by very loose silty sand to 1.5 m and 2.2 m depths (Elevation 97.4 m to Elevation 95.9 m) followed by a deep firm to stiff silty clay and clayey silt deposit. From the dynamic cone penetration test (DCPT) conducted in Borehole No. 1 cone refusal was met on inferred cobbles, boulders or bedrock at 28.50 m depth (Elevation 70.4 m). The groundwater level was measured in Borehole No. 1 only at a 5.1 m depth (Elevation 93.8 m).

Laboratory consolidation tests were undertaken on four (4) samples of the silty clay from Borehole Nos. 1, 9 and 10 and the test results are shown in Appendix A. The laboratory test results indicate the silty clay at 3.3 m to 4.2 m depths (Elevation 95.4 m to Elevation 94.2 m) is over-consolidated by 32 kPa to 38 kPa with an over-consolidation ratio of 1.7 and 2.0 and at an 8.1 m depth (Elevation 90.3 m), the silty clay is over-consolidated by 47 kPa with an over-consolidation ratio of 1.7.

4. Procedure

4.1 Test Hole Fieldwork

The test hole fieldwork was undertaken from May 5 to 18, 2023 and from October 7 to 10, 2025. The test hole fieldwork consists of thirty-three (38) test holes; twenty (25) boreholes and thirteen (13) test pits. Borehole Nos. 1, 8 and 11 were advanced to cone refusal depths at 30.5 m to 32.6 m. Borehole Nos. 2 to 7, 9, 10, 12 and 13 were advanced to termination depths of 7.9 m to 8.2 m. Borehole Nos. 14 to 20 were advanced to termination depths of 3.4 m to 5.2 m. Borehole Nos. 25-01, 25-02 and 25-04 to 25-06 were advanced to cone refusal and termination depths of 33.1 m to 39.4 m below existing grade. Borehole No. 25-03 was not drilled. The test pits were advanced to termination depths of 1.8 m to 2.2 m. The fieldwork was supervised on a full-time basis by a representative from EXP.

The locations and the geodetic elevations of the test holes were established on site by EXP and are shown on the Test Hole Location Plan, Figure 2. The ground surface elevation for Test Pit No. 13 shown on Figure 2 should be considered approximate.

The test holes were cleared of private and public underground services, prior to the start of borehole drilling and test pit excavating operations.

The boreholes were drilled using CME-55 and CME-55LC track-mounted drill rigs equipped with continuous flight hollow stem augers and soil sampling capabilities. The boreholes were advanced by augering, power augering, wash-boring and casing methods. Standard penetration tests (SPTs) were performed in all the boreholes at depth intervals of 0.75 m to 3.1 m with soil samples retrieved by the split-barrel sampler. A relatively undisturbed tube sample (Shelby tube) of the clayey soil was obtained from Borehole Nos. 3 and 12. Dynamic cone penetration tests (DCPT) were conducted in Borehole Nos. 1, 8, 11, 25-02 and 25-04. The undrained shear strength of the clayey cohesive soils was measured by conducting in-situ vane tests. The bedrock was cored in Borehole Nos. 25-01, 25-04 to 25-06 using 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 a labelled plastic bag. Similarly, the bedrock cores were placed in labelled rock core boxes and logged on site.

Nineteen (19) mm diameter standpipes with slotted section were installed in selected boreholes for long-term monitoring of the groundwater levels. 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 the installation of the standpipes.

Test pits were excavated with a CAT 320F track mounted hydraulic excavator. Soil samples (grab samples) of the different soil types exposed in the test pits were retrieved and the soil conditions from the test pits were logged with each soil sample placed in a labeled plastic bag. The test pits were backfilled upon completion of excavating.

On completion of the test hole fieldwork, the soil samples were transported to the EXP laboratory in Ottawa. The soil samples were visually examined in the laboratory by a geotechnical engineer. Soil classification consisted of classifying the main constituents of the soils in accordance with the Unified Soil Classification System (USCS) using the soil group name and symbol and by the modified Burmister Soil to classify the minor constituents of the soil using modifiers and adjectives such as trace and some.

4.2 Laboratory Testing Program

The laboratory testing program for the soil samples and sections of bedrock cores is summarized in Table I.

Table I: Summary of Laboratory Testing Program	
Type of Test	Number of Tests Completed
Soil Samples	
Moisture Content Determination	149
Unit Weight Determination	12
Grain Size Analysis	9
Atterberg Limit Determination	9
Corrosion Analysis (pH, sulphate, chloride and resistivity)	3
Bedrock Core Sections	
Unit Weight and Unconfined Compressive Strength Determination	4

5. Subsurface Conditions and Groundwater Levels

A detailed description of the subsurface conditions and groundwater levels from the test holes (boreholes and test pits) are given on the attached borehole and test pit logs, Figures 3 to 35 and A to E. The test hole logs and related information depict subsurface conditions only at the specific locations and 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.

The test holes were to provide representation of subsurface conditions as part of a geotechnical exploration program and are not intended to provide evidence of potential environmental conditions.

It should be noted that the soil boundaries indicated on the borehole and test pit logs are inferred from non-continuous sampling and observations during drilling and excavating 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 and test pit logs form an integral part of this report and should be read in conjunction with this report.

A review of the borehole and test pit logs indicates the following subsurface conditions with depth and groundwater level measurements.

5.1 Topsoil

A surficial 180 mm to 400 mm thick topsoil layer was contacted in Borehole Nos. 3, 8, 13 to 16, 20 and in Test Pit Nos. 3 to 9 and 12. The surficial topsoil layer in Borehole No. 8 is 1000 mm (1.0 m) thick.

5.2 Fill

Surficial fill was encountered in all boreholes except Borehole Nos. 3, 8, 14 to 16 and in Test Pit Nos. 1, 2, 5, 10, 11 and 13. The fill is present below the surficial topsoil layer in Borehole Nos. 13 and 20 and in Test Pit No. 5. The fill extends to depths of 0.1 m to 0.8 m (Elevation 99.9 m to Elevation 97.0 m). The fill in Borehole No. 19 and in Test Pit Nos. 10, 11 and 13 extends to deeper depths ranging from 1.2 m to 2.6 m (Elevation 98.7 m to Elevation 97.7 m). The composition of the fill is a heterogeneous mixture of gravel, sand, silt and clay. The fill contains topsoil pockets/inclusions and rootlets. Debris in the form of asphalt, brick, concrete, metal, plastic and wood were present in the fill in Borehole No. 18, Test Pit Nos. 2, 11 and 13. Based on the standard penetration test (SPT) N-values ranging from 4 to 46 the fill is in a very loose to dense state. The moisture content of the fill ranges from 4 percent to 29 percent.

5.3 Buried Topsoil Layer

A topsoil layer buried beneath the surficial fill is present in Borehole Nos. 12, 18 and in Test Pit Nos. 1, 10, 11 and 13. The buried topsoil layer in Test Pit No. 1 is beneath a non-woven geotextile that underlies the fill. The buried topsoil layer was contacted at 0.3 m to 1.5 m depths (Elevation 99.9 m to Elevation 98.1 m) and ranges in thickness from 100 mm to 300 mm. The moisture content of the buried topsoil is 30 percent.

5.4 Sandy Silt to Silt

The fill and topsoil (surficial and buried) are underlain by sandy silt to silt in all of the boreholes except Borehole Nos. 18 to 20 and in all of the test pits. The sandy silt in Borehole Nos. 14 and 16 is described as ranging from a sandy silt to silty sand. The sandy silt to silt extends to depths of 1.1 m to 1.8 m (Elevation 97.8 m to Elevation 96.2 m). Test Pit Nos. 1, 2, 5, 10, 11 and 13 terminated within the sandy silt to silt at 1.8 m to 2.2 m depths (Elevation 97.9 m to

Elevation 95.6 m). The SPT N-values of the sandy silt to silt range from 2 to 12 indicating the sandy silt to silt is in a very loose to compact state. The natural moisture content of the sandy silt to silt ranges from 2 percent to 40 percent and the natural unit weight of the sandy silt to silt ranges from 18.8 kN/m³ to 20.9 kN/m³.

The results from the grain-size analysis and Atterberg limits determination of two (2) samples of the sandy silt are summarized in Table II. The grain-size distribution curves are shown in Figures 36 and 37.

Table II: Summary of Grain-Size Analysis and Atterberg Limit Determination –Sandy Silt Samples										
Test Pit No. – Grab Sample No. (GS)	Depth (m)	Grain-Size Analysis (%)				Atterberg Limits (%)				Soil Classification
		Gravel	Sand	Silt	Clay	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	
TP 5-GS2	0.9-1.1	0	15	69	16	34	-	-	Non-Plastic	Silt (ML) - Some Sand and Clay
TP 13-GS3	1.8-2.0	0	23	59	18	20	-	-	Non-Plastic	Sandy Silt (ML) - Some Clay

A review of the test results indicates the soil may be classified as a non-plastic silt (ML) with some sand and clay.

5.5 Silty Clay

A deep silty clay deposit was contacted below the topsoil (surficial and buried), fill and sandy silt to silt in all of the boreholes and in all of the test pits, except Test Pit Nos. 1,2,5,10, 11 and 13 at depths ranging from 0.8 m to 1.8 m (Elevation 99.7 m to Elevation 96.3 m). Locally in Borehole Nos. 8, 11 and 19, the silty clay was contacted at 2.2 m to 2.6 m depths (Elevation 97.7 m to Elevation 96.5 m). The boreholes were sampled and in-situ vane tests conducted in the boreholes to termination depths within the silty clay ranging from 3.4 m to 12.8 m depths (Elevation 95.9 m to Elevation 85.7 m). Test Pit Nos. 3,4,6 to 9 and 12 terminated within the silty clay at 2.0 m to 2.2 m depths (Elevation 96.3 m to Elevation 95.8 m). The sensitive marine clay consists of an upper desiccated brown clay crust that exhibits good strength properties underlain by an un-desiccated weaker grey clay.

5.5.1 Upper Brown Silty Clay Crust

The upper desiccated brown silty clay crust extends to depths of 2.2 m to 4.0 m (Elevation 96.5 m to Elevation 94.8 m). The undrained shear strength of the brown silty clay crust ranges from 27 kPa to 77 kPa indicating the brown silty clay crust has a firm to stiff consistency. The natural moisture content of the brown silty clay crust ranges from 22 percent to 38 percent. The natural unit weight of the upper brown silty clay crust ranges from 18.6 kN/m³ and 20.8 kN/m³.

The results from the grain-size analysis and Atterberg limits determination of one (1) sample of the upper brown silty clay are summarized in Table III. The grain-size distribution curves are shown in Figure 38.

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

Borehole No. (BH) Sample No. (SS)	Depth (m)	Grain-Size Analysis (%)				Atterberg Limits (%)				Soil Classification
		Gravel	Sand	Silt	Clay	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	
BH 8 – SS4	2.3- 2.9	0	12	62	26	32	29	16	13	Silty Clay of Low Plasticity (CL - Some Sand)

A review of the test results indicates the soil may be classified as a silty clay of low plasticity (CL) with some sand.

5.5.2 Lower Grey Silty Clay

The grey silty clay was contacted below the brown silty clay crust and locally below the sandy silt in Borehole No. 1 at 1.5 m to 4.0 m depths (Elevation 99.7m to Elevation 94.8 m). Based on undrained shear strength measurements of 14 kPa to 43 kPa, the grey clay has a soft to firm consistency. The natural moisture content of the grey clay is 23 percent to 45 percent.

The results from the grain-size analysis and Atterberg limits determination of six (6) samples of the grey silty clay are summarized in Table IV. The grain-size distribution curves are shown in Figures 39 to 44.

Table IV: Summary of Grain-Size Analysis and Atterberg Limit Determination –Grey Silty Clay Samples

Borehole No. (BH) – Sample No. (SS)	Depth (m)	Grain-Size Analysis (%)				Atterberg Limits (%)				Soil Classification
		Gravel	Sand	Silt	Clay	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	
BH 2 – SS4	3.0 – 3.6	0	10	65	25	37	22	16	6	Silty Clay-Clayey Silt of Low Plasticity (CL-ML) -Trace to Some Sand
BH 2 – SS6	6.1-6.7	0	1	64	35	45	34	17	17	Silty Clay of Medium Plasticity (CL) - Trace Sand
BH 5- SS3	2.3-2.9	0	15	59	26	34	26	16	10	Silty Clay of Low Plasticity (CL) - Some Sand
BH 10 – SS5	4.6-5.2	0	2	66	32	39	30	18	12	Silty Clay of Low to Medium Plasticity (CL) - Trace Sand
BH 11 – SS4	3.0-3.6	0	4	68	28	36	25	16	9	Silty Clay of Low Plasticity (CL) - Trace Sand
BH 13 -SS5	6.1-6.7	0	1	62	37	43	34	18	16	Silty Clay of Medium Plasticity (CL) - Trace Sand

Based on a review of the laboratory test results, the soil may be classified as ranging from a silty clay-clayey silt of low plasticity (CL-ML) to silty clay of low to medium plasticity (CL) with trace to some sand.

5.6 Inferred Glacial Till

Inferred glacial till was encountered in Borehole Nos. 25-02 and 25-04 at 24.0 m and 24.3 m depths (Elevation 74.7 m and Elevation 74.2 m).

5.7 Limestone Bedrock

Dynamic cone penetration tests (DCPT) were performed in Boreholes Nos 1,8, 11 25-02 and 25-04 to cone refusal at 30.5 m to 34.0 m depths (Elevation 68.2 m to Elevation 64.7 m). Cone refusal may have occurred on inferred cobbles/boulders within a glacial till or on inferred bedrock.

Bedrock was contacted in Borehole Nos. 25-01 and 25-04 to 25-06 at 30.4 m to 34.9 m depths (Elevation 68.5 m to Elevation 63.8 m). The bedrock is limestone bedrock with shaly partings. Photographs of the bedrock cores are shown in Appendix B.

Based on the bedrock geology map tilted, Generalized Bedrock Geology, Ottawa-Hull, Ontario and Quebec, Map 1508A, dated 1979 and prepared by the Geological Survey of Canada, the site is underlain by limestone bedrock (with shaly partings) of the Ottawa formation.

A summary of the depth (elevation) to the bedrock surface is shown in Table V.

Table V: Summary of Bedrock Depths (Elevations)

Borehole (BH) No.	Ground Surface Elevation (m)	Bedrock Depth (Elevation), m
BH 25-01	98.68	33.7 (65.0)
BH 25-04	98.71	34.9 (63.8)
BH 25-05	98.87	30.4 (68.5)
BH 25-06	98.73	32.8 (65.9)

The total core recovery (TCR) ranges from 42 percent to 100 percent and the rock quality designation (RQD) ranges widely from 6 percent to 100 percent, indicating a very poor to excellent quality bedrock based on the 2023 Fifth Edition Canadian Foundation Engineering Manual (2023 CFEM).

A summary of the unit weight and unconfined compressive strength of tested rock cores is shown in Table VI. The classification of the rock with respect to strength is as per the 2023 CFEM (Fifth Edition). Based on the unconfined compressive strength tests, the bedrock may be classified as very strong (R5).

Table VI: Summary of Unconfined Compressive Strength Test Results – Bedrock Cores

Borehole No.: Run No.	Depth (m)	Unit Weight (kN/m ³)	Unconfined Compressive Strength (MPa)	Classification of Rock with respect to Strength (2023 CFEM)
BH 25-01: Run 2	33.7-33.9	27.8	216.5	Very Strong (R5)
BH 25-04: Run 2	35.3-35.4	26.8	158.0	Very Strong (R5)
BH 25-04: Run 3	36.7-36.9	26.5	124.1	Very Strong (R5)
BH 25-06: Run 4	35.7-35.8	26.8	158.9	Very Strong (R5)

5.8 Groundwater Level Measurements

A summary of the groundwater level measurements taken on June 6, 2023 in the boreholes equipped with standpipes is summarized in Table VII.

Table VII: Summary of Groundwater Level Measurements

Borehole No. (BH)	Ground Surface Elevation (m)	Elapsed Time in Days from Date of Installation	Depth Below Ground Surface (Elevation), m
BH-1	98.49	26 days	1.6 (96.9)
BH-2	98.39	22 days	1.2 (97.2)
BH-5	98.51	22 days	1.1 (97.4)
BH-6	98.73	20 days	1.3 (97.4)
BH-11	98.65	21 days	1.3 (97.4)
BH-13	98.41	22 days	0.8 (97.6)
BH-15	97.81	19 days	1.3 (96.5)
BH-18	100.80	19 days	1.7 (99.1)

The groundwater level ranges from 0.8 m to 1.7 m depths (Elevation 99.1 m and Elevation 96.5 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.

6. Site Classification and Designation for Seismic Design and Liquefaction Potential of Soils

Based on a comparison of the test hole information with Table 4.1.8.4.-B of the 2024 Ontario Building Code (OBC), the site classification is E and the site designation is X_E for seismic design.

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

7. Grade Raise Restrictions

The site grading plan, Drawing No. C2, dated December 2, 2025 (Revision No. 4) indicates the design elevation of the finished floor is Elevation 99.65 m and the site grade raise is up to 1.5 m.

The site for the proposed new high school is underlain by a sensitive marine clay deposit that is prone to consolidation settlement if overstressed by loads imposed on it by site grade raise, foundations, and by the permanent lowering of the groundwater level. Overstressing of the clay will result in its consolidation and subsequent settlement of foundations, which may exceed the tolerable limits of the structure resulting in cracking of the structure.

Based on a review of the test hole information, the maximum permissible site grade raise is 1.5 m. A review of the site grading plan, Drawing No. C2, dated December 2, 2025 (Revision No. 4) indicates the site grade raise will be up to 1.5 m which conforms to the maximum permissible site grade raise of 1.5 m.

However, for the site grade raise of up to 1.5 m, it is considered that the underlying silty clay does not have sufficient capacity to support the proposed three-storey building by footings. Therefore, in conjunction with a site grade raise of up to 1.5 m, the proposed building will have to be supported by pile foundations driven to practical refusal into the limestone bedrock and designed in end bearing. The floor slab may be designed as a slab-on-grade.

An allowance for the permanent groundwater lowering is not required, since clay seals will be installed in the service trenches to minimize the permanent lowering of the groundwater level at the site, as recommended in Section 13 of this geotechnical report.

8. Site Grading

For budgeting purposes, the contractor should assume that all existing fill, surficial and buried topsoil (organic) layers, organic stained soils and sandy silt to silt within the footprints of the proposed building and future building addition, sports fields, parking lots and access roads would require removal and replacement with well-compacted fill as indicated below.

As part of the site grading operation, all stockpiles should be removed from the site.

Site grading within the **proposed building and future building addition footprints** should consist of the removal of all existing fill, surficial and buried topsoil (organic) layers and organic stained soils down to the sandy silt to silt. The sandy silt to silt should be proofrolled (vibration mode off), in the presence of a geotechnician, to improve its support capability. Any loose/soft areas identified during the proofrolling operation 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). Should proofrolling the sandy silt to silt prove to be difficult or problematic, the sandy silt to silt should be excavated and removed down to the silty clay. The silty clay subgrade should be examined by a geotechnician. Any loose/soft areas identified during the subgrade examination should be excavated, removed and replaced with OPSS Granular B Type II material compacted to 98 percent SPMDD. Once the subgrade has been approved, the grades below the floor slab of the proposed building and future building addition may be raised to the design subgrade level of the floor slab by the construction of an engineered fill pad consisting of OPSS Granular B Type II material with each lift compacted to 98 percent SPMDD.

Site grading within the **proposed sports fields, parking lot and access road areas** should consist of the removal of all existing fill, surficial and buried topsoil (organic) layers and organic stained soils down to the sandy silt to silt. The sandy silt to silt should be proofrolled (vibration mode off), in the presence of a geotechnician, to improve its support capability. Any loose/soft areas identified during the proofrolling operation should be excavated, removed and replaced with OPSS Granular B Type II or OPSS Select Subgrade Material (SSM) compacted to 95 percent SPMDD. Should proofrolling the sandy silt to silt prove to be difficult or problematic, the sandy silt to silt should be excavated and removed down to the silty clay. The silty clay subgrade should be examined by a geotechnician. Any loose/soft areas identified during examination should be excavated, removed and replaced with OPSS Granular B Type II or OPSS Select Subgrade Material (SSM) compacted to 95 percent SPMDD. Imported crusher-run granular material may be required to stabilize the subgrade prior to placement of the fill. Portions of the excavated on-site non-organic soils above the groundwater level that are free of debris, cobbles, boulders and topsoil (organic soils), may be reused to raise the site grades to the design subgrade level. The suitability of re-using the excavated on-site soils above the groundwater level to raise the grades will have to be further assessed at time of construction by examining and conducting additional tests on the excavated soils.

In place density tests should be performed on each lift of placed material to ensure that it has been compacted to the project specifications.

9. Foundation Considerations

The site grading plan, Drawing No. C2, dated December 2, 2025 (Revision No. 4) indicates the design elevation of the finished floor is Elevation 99.65 m and the site grade raise is up to 1.5 m.

However, for the site grade raise of up to 1.5 m, it is considered that the underlying silty clay does not have sufficient capacity to support the proposed three-storey building by footings. Therefore, in conjunction with a site grade raise of up to 1.5 m, the proposed building will have to be supported by pile foundations driven to practical refusal into the limestone bedrock and designed in end bearing. The floor slab may be designed as a slab-on-grade.

Geotechnical comments and recommendations regarding pile foundation are discussed in the following section of this report.

9.1 Pile Foundation

9.1.1 Piles Designed in End-Bearing

The proposed new high school building and future building addition may be supported by steel H or concrete filled steel pipe piles designed in end-bearing and driven to practical refusal into the underlying limestone bedrock. The bedrock was contacted at 30.4 m to 34.9 m depths (Elevation 68.5 m to Elevation 63.8 m). It is recommended that the pile tip elevation should be established from the bedrock depth identified in the boreholes where the bedrock was cored (Borehole Nos. 25-01 and 25-04 to 25-06) and not from the cone refusal depth from the dynamic cone penetration test (DCPT), since cone refusal may have occurred in the glacial till. Pile foundation may be used in conjunction with the maximum permissible site grade raise of 1.5 m.

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. The negative skin friction that the piles would be subjected to is also listed in Table VIII. The negative skin friction is based on the maximum permissible site grade raise of 1.5 m and a 24.0 m embedment length in the silty clay. 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 as shown in Table VIII.

Table VIII: Allowable Load Carrying Capacity of Steel Pipe and H-Piles

Pile Section	Description	Factored Geotechnical Resistance at ULS (kN)	Factored Structural Capacity of Piles (kN)	Estimated Negative Skin Friction (kN)	Allowable Load Carrying Capacity of Pile (kN)
Steel Pipe Section	245 mm O.D. by 10 mm wall thickness	1320	1782	522	1260
	245 mm O.D. by 12 mm wall thickness	1490	2030	522	1490
	324 mm O.D. by 12 mm wall thickness	2000	2910	690	2000
HP Section	HP 310 x 110	2400	2640	838	1802
	HP 310 x 125	2700	2980	846	2134

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

For load combinations imposed on the piles, the 2023 Canadian Foundation Engineering Manual (CFEM) indicates that drag load (negative skin friction) and transient live load should not be combined and that two (2) separate loading cases should be considered in the design of the piles to determine which loading case will govern the design. The first loading case is to consider is permanent load plus drag load (negative skin friction) but no transient live load. The second loading case to consider is permanent load and transient live load but no drag (negative skin friction) load.

9.1.2 Uplift Resistance of Piles

The computed factored uplift resistance at ULS for the piles is provided in Table IX. The factored uplift resistance at ULS is based on a 33.0 m embedment length of the pile and includes a factored geotechnical resistance of 0.30. The factored geotechnical uplift resistance does not include the weight of the pile.

Table IX: Factored Uplift Resistance of Piles at ULS

Pile Section	Description	Factored Uplift Resistance at ULS (kN)
Steel Pipe Section	245 mm O.D. by 10 mm wall thickness	205
	245 mm O.D. by 12 mm wall thickness	205
	324 mm O.D. by 12 mm wall thickness	269
HP Section	HP 310 x 110	329
	HP 310 x 125	333

If the factored uplift resistance of the piles is not sufficient to resist uplift loads, uplift resistance may be provided by rock anchors installed into the pile and into the underlying sound bedrock or through a separate casing or sleeve located next to the pile with the rock anchor extending into the underlying sound bedrock. The rock anchor will carry the load in bond between the grout and the sound bedrock.

The rock anchor will require casing to the upper level of the sound bedrock to prevent cave-in of material into the rock anchor hole in the sound bedrock. The bond between the casing and soil or bedrock (that is not sound) should be neglected.

The unfactored ultimate load carrying capacity of the rock anchor may be computed from the following expression:

$$P_{ult} = \pi \alpha_1 l_1 d_1$$

Where P_{ult} = Unfactored ultimate load carrying capacity of pile, kN

α_1 = The unfactored bond between the sound bedrock and grout at ultimate limit state (ULS) is 2000 kPa.

l_1 = Length of the uncased portion of the pile socketed into the sound bedrock, m

d_1 = Diameter of drilled hole in sound bedrock, m

The computed ultimate capacity of the rock anchor should be multiplied by a geotechnical resistance factor of 0.30 when computing the factored uplift resistance at ultimate limit state (ULS).

The rock anchor will require casing to the upper level of the sound bedrock to prevent cave-in of material (soil, cobbles, boulders) into the rock anchor hole in the sound bedrock and to reduce the groundwater seepage into the rock anchor holes. It is imperative that the holes in the sound bedrock for the rock anchors are cleaned properly so that the grout is in contact with the clean sound bedrock that is free of any soil smearing. All water should be pumped out from the pile borings prior to the placement of the grout.

It is noted that the inferred glacial till contain numerous boulders and cobbles. The contractor should take into consideration the inferred glacial till when selecting the method of drilling the rock anchors. The limestone bedrock is fractured with an RQD value less than 50 percent in some boreholes. Therefore, the contractor should anticipate the possibility of significant grout takes within fractured zones of the bedrock during grouting operations. Also, water inflow into the drilled pile holes should be expected.

It is recommended that the uplift capacity of the rock anchors pile capacity should be confirmed by conducting pre-production or design performance tests on selected piles and/or proof load test on all piles.

9.1.3 Additional Comments for Pile Foundation

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 site is underlain by possible glacial till with cobbles and boulders in the lower levels. It is therefore recommended that the piles should be equipped with a driving shoe to protect them from damage during driving as per Ontario Provincial Standard Drawing (OPSD) 3001.100, Type II, Revision No. 2 dated November 2017.

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.

For the forming of the grade beams, the grade beams may be placed on a 600 mm thick granular working mat constructed on top of the proofrolled sandy silt to silt or on the silty clay. The granular pad may consist of OPSS Granular B Type II material compacted to 98 percent SPMDD.

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 be installed under the grade beams and pile caps immediately upon excavation and approval of the subgrade to protect the surface of the 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 to 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.

9.2 Additional Comment for Foundations

The recommended bearing pressure at SLS and 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 ongoing 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.

10. Floor Slab and Drainage Requirements

The design elevation of the floor slab for the proposed new high school building and future building addition was not known at the time of this geotechnical investigation. The floor slab for the proposed new high school and future addition may be designed and constructed as a slab-on-grade that is placed on a well packed 200 mm thick 19 mm sized clear stone bed set on a minimum 300 mm thick engineered fill pad placed on the proofrolled sandy silt to silt or on the silty clay and compacted to 98 percent SPMDD. The clear stone would minimize the capillary rise of moisture from the sub-soil to the floor slab. As an alternative to the clear stone layer, the floor slab may be cast on a 200 mm thick bed of OPSS Granular A compacted to 98 percent SPMDD and overlain by a vapour barrier. Adequate saw cuts should be provided in the floor slabs to control cracking.

It is recommended that a perimeter drainage system should be provided around the proposed new high school building and future building addition.

Based on a comparison of the design elevation of the ground floor at Elevation 99.65 m with the groundwater levels in the boreholes located in the building footprint, an underfloor drainage system is not required.

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

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

11. Excavation and De-Watering Requirements

11.1 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.

11.2 Excavation

Excavations for the proposed new high school building and future addition and the installation of underground services are anticipated to extend to a maximum 3.0 m depth below existing grade and terminate within the silty clay. The excavations are anticipated to range from being at or above the groundwater level to below the groundwater level.

Open cut excavation within the subsurface soils should comply with the most recent Occupational Health and Safety Act (OHSA), Ontario Regulations 213/91 (August 1, 1991). Based on the definitions contained in OHSA, the subsurface soils at the site are classified as Type 3 soil and as such the excavation sidewalls must be cut back at 1H:1V from the bottom of the excavation. Below the groundwater table, the excavation side slopes are expected to slough and will eventually stabilize at a slope of 2H:1V to 3H:1V.

If side slopes cannot be achieved due to space restrictions on site such as the proximity of open cut excavations to the property limits, existing infrastructure or to foundations of adjacent existing building(s), the new building construction would have to be undertaken within the confines of an engineered support system (shoring system). The dewatered excavation for 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.

The need for a shoring system, the most appropriate type of shoring system and the design and installation of the shoring system should be determined by the contractors bidding on this project. The design of the shoring system should be undertaken by a professional engineer experienced in shoring design and the installation of the shoring system should be undertaken by a contractor experienced in the installation of shoring systems. The shoring system should be designed and installed in accordance with latest edition of Ontario Regulation 213/91 under the OHSA and the 2023 Fifth Edition of the Canadian Foundation Engineering Manual (CFEM).

Excavations that terminate within the silty clay to a 3.0 m depth below existing grade are not expected to experience base-heave type failure.

A pre-construction condition survey of buildings and infrastructure located within the influence zone of the construction should be undertaken prior to start of construction activities.

During construction activities for the proposed school development, vibration monitoring should be conducted at the site and at adjacent existing buildings and infrastructure located within the influence zone of the construction, to ensure the existing structures and infrastructure are not damaged as a result of the construction activities.

The sandy silt to silt and silty clay are susceptible to disturbance due to movement of construction equipment and personnel on its surface. It is therefore recommended that the excavation at the site should be undertaken by construction equipment that does not travel on the excavated surface, such as a gradall or mechanical shovel.

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.

11.3 De-Watering Requirements

Seepage of the surface and subsurface water into the excavations is anticipated. However, it should be possible to collect any water entering the excavations in perimeter ditches and to remove it by pumping from sumps. In areas of high infiltration, such as within the sandy silt to silt, 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 and minimize basal instability in the form of piping or heave where excavations terminate within the sandy silt to silt.

For construction dewatering, an Environmental Activity and Sector Registry (EASR) approval may be obtained for water takings greater than 50 m³ and less than 400 m³ per day. If more than 400 m³ per day of groundwater are generated for dewatering purposes, then a Category 3 Permit to Take Water (PTTW) must be obtained from the Ministry of the Environment, Conservation and Parks (MECP). A Category 3 PTTW would require a complete hydrogeological assessment and would take at least 90 days for the MECP to process once the application is submitted.

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.

12. Impact on Adjacent Existing Structures

The lowering of the groundwater level over the short-term excavation period for the proposed building and installation of the underground services is not anticipated to negatively impact existing adjacent surrounding structures. Section 13 of this geotechnical report recommends that clay seals be installed in service trenches to prevent the permanent lowering of the groundwater level. Therefore, since long-term lowering of the groundwater level will be prevented by the clay seals, no negative impact to existing adjacent surrounding structures is anticipated due to long-term lowering of the groundwater level.

13. Pipe Bedding Requirements

The depth at which municipal services will be installed is anticipated to be a maximum of 3.0 m depth below existing grade. Based on this, the subgrade for the underground service pipes is expected to be within the sandy silt to silt and silty clay.

The bedding for the underground services including material specifications, thickness of cover material and compaction requirements conform to municipal requirements and/or Ontario Provincial Standard Specification and Drawings (OPSS and OPSD).

It is recommended that the pipe bedding be 300 mm thick and consist of OPSS Granular A. The bedding material should be placed along the sides and on top of the pipe to provide a minimum cover of 300 mm. The bedding should be compacted to at least 98 percent of the SPMDD.

The bedding thickness may be further increased in areas where the subgrade becomes disturbed. Trench base stabilization techniques, such as the removal of loose/soft material, placement of additional sub-bedding, consisting of Ontario Provincial Standard Specification (OPSS) Granular B Type II completely wrapped in a non-woven geotextile, may be used if trench base disturbance becomes a problem in wet or soft/loose areas.

To minimize settlement of the pavement structure over services trenches, the trench backfill material within the frost zone, to 1.8 m depth below final grade, should match the existing material along the trench walls to minimize differential frost heaving of the subgrade soil, provided this material is compactible. Otherwise, frost tapers may be required.

If the backfill in 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 municipal 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 (surficial and buried layers), fill, sandy silt to silt and silty clay. From a geotechnical perspective, the topsoil (surficial and buried layers) is not considered suitable for reuse as backfill material in the interior or exterior of the proposed building and addition and should be discarded. Portions of the non-organic parts of the fill (free of organics, debris, cobbles and boulders), sandy silt to silt and silty clay free of organics, cobbles and boulders, and above the groundwater level may be re-used as fill in locations away from the proposed building and addition 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), sandy silt to silt and silty clay free of organics, cobbles and boulders and below the groundwater level, may be re-used as fill in locations away from the proposed building and addition 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 school building and addition, at locations of the outdoor sports fields, parking lot, access roads 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 school building and addition – OPSS Granular B Type II placed in 300 mm thick lifts and each lift compacted to 98 percent SPMDD beneath the floor slab,
- Backfill material against foundation walls outside the proposed school building and addition – 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 roads, parking lot and outdoor sports fields - OPSS Granular B Type I, Type II or Select Subgrade Material (SSM) or approved on site non-organic 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, debris, cobbles and boulders and is placed in 300 mm thick lifts with each lift compacted to 92 percent of the SPMDD.

15. Pavement Structure for Parking Lot and Access Roads

The subgrade for the pavement structures is anticipated to consist of the sandy silt to silt and silty clay, OPSS Granular B Type II material, OPSS Select Subgrade Material (SSM) and approved on-site non-organic material. Pavement structure thicknesses required for the access roads and parking lot set on the anticipated approved subgrade materials were computed and are shown in Table X. 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.

Table X: Recommended Pavement Structure Thicknesses			
Pavement Layer	Compaction Requirements	Computed Pavement Structure	
		Light Duty Traffic (Cars Only)	Heavy Duty Traffic (Buses and Trucks)
Asphaltic Concrete	92 percent to 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 (crushed limestone)	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
2. MRD denotes Maximum Relative Density
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 X.

Additional comments on the construction of the parking lot and access roads are as follows:

1. As part of the subgrade preparation, the proposed parking area and access roads should be stripped of all existing fill, surficial and buried topsoil (organic) layers, organic stained soils and other obviously unsuitable material. The subgrade should be properly shaped, crowned, then proofrolled with a heavy vibratory roller in the full-time presence of a representative of this office. Any soft or spongy subgrade areas detected should be sub excavated and properly replaced with suitable approved backfill compacted to 95 percent SPMDD (ASTM D698-12e2). Should proofrolling of the sandy silt to silt prove to be difficult or problematic, the sandy silt to silt may require excavation and removal down to the silty clay.
2. 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(s). Subdrains must be installed in the proposed parking area 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 subdrains required within the paved areas should be reviewed by this office in conjunction with the proposed site grading.

3. 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.
4. 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.
5. 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 catch basins. Surface water should not be allowed to pond adjacent to the outside edges of paved areas.
6. 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 thick granular sub-base, OPSS Granular B Type II, should be provided in these areas, in addition to the use of a geotextile at the subgrade level.
7. The granular materials used for pavement construction should conform to Ontario Provincial Standard Specifications (OPSS 1010) for Granular A and Granular B Type II and should be compacted to 100 percent of the SPMDD.

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.

16. Corrosion Analysis

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

Table XI: Corrosion Test Results on Soil Samples

Borehole – Sample No.	Depth (m)	Soil Type	pH	Sulphate (%)	Chloride (%)	Resistivity (ohm-cm)
BH 3 – SS2	0.8 – 1.4	Sandy Silt	8.44	0.0027	0.0008	7870
BH 8 – SS8	10.7-11.3	Grey Silty Clay	9.22	0.0136	0.1590	301
BH 12 – SS5	4.6-5.2	Grey Silty Clay	8.91	0.0378	0.0569	606

The results indicate the soils have a negligible sulphate attack on subsurface concrete. The concrete should be designed in accordance with CSA A.23.1-19.

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

Corrosion protection of the steel piles may be provided by a sacrificial thickness of the pile achieved by increasing the thickness of the pile. The amount of sacrificial thickness for the piles for a 50-year service life is 1.25 mm, for a 75-year service life the sacrificial thickness is 1.875 mm and for a 100-year service life is 2.5 mm.

17. Tree Planting Restrictions

The site of the proposed new high school and future addition is underlain by sensitive marine clay. The laboratory test results of the marine clay were compared with the document titled, “Tree Planting in Sensitive Marine Clay Soils – 2017 City of Ottawa Guidelines (2017 Guidelines)” and indicate the clay has a low/medium potential for soil volume change. For soils that have a low/medium potential for soil volume change, the 2017 Guidelines indicate that the tree to foundation setback distance and tree planting restrictions should be in accordance with the 2017 Guidelines.

In accordance with the City of Ottawa Tree Planting in Sensitive Marine Clay Soils (2017 Guidelines), for soils of a low/medium potential for soil volume change, as is the case for this project, large trees (mature height over 14.0 m) can be planted provided a tree to foundation setback equal to the full mature height of the tree can be provided (e.g. in a park or other green space).

Further, in accordance with the City of Ottawa Tree Planting in Sensitive Marine Clay Soils (2017 Guidelines), for soils of a low/medium potential for soil volume change, as is the case for this project, for street trees in the road right-of-way, the tree to foundation setbacks may be reduced to 4.5 m for small (mature tree height up to 7.5 m) and medium sized trees (mature tree height 7.5 m to 14.0 m) provided all of the following conditions are met:

- The underside of footing (USF) is 2.1 m or greater below the lowest finished grade. Note: This footing level must be satisfied for footings within 10 m of the tree, as measured from centre of tree trunk, and verified by means of the grading plan as indicated in the Procedural Changes in the 2017 Guidelines.
- A small sized tree must be provided with a minimum of 25 cubic metres of available soil volume, as determined by a Landscape Architect. A medium sized tree must be provided with a minimum 30 cubic metres of available soil volume, as determined by the Landscape Architect. The developer will ensure the soil is generally uncompacted when backfilling in street tree planting locations.
- The tree species must be small to medium sized, as confirmed by the Landscape Architect in the Landscape Plan.
- The foundation walls are to be reinforced at least nominally (minimum of two (2) upper and two (2) lower 15 M sized bars in the foundation walls).
- Grading surrounding the tree must promote draining to the tree root zone (in such a manner as not to be detrimental to the tree), as to be noted on the subdivision Grading Plan.

A landscape architect should be consulted to ensure the setbacks and tree planting restrictions are in accordance with the 2017 Guidelines.

18. Additional Comments

All earthwork activities from subgrade preparation to placement and compaction of engineered fill and backfill material should be inspected and tested by qualified geotechnicians to ensure that construction proceeds according to the project specifications.

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.

19. General Comments

The comments given in this report are intended only for the guidance of design engineers. The number of boreholes and test pits required to determine the localized underground conditions between boreholes and test pits 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 and test pit 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. Should specific information be required, including for example, the presence of pollutants, contaminants or other hazards in the soil, additional testing may be required.

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,

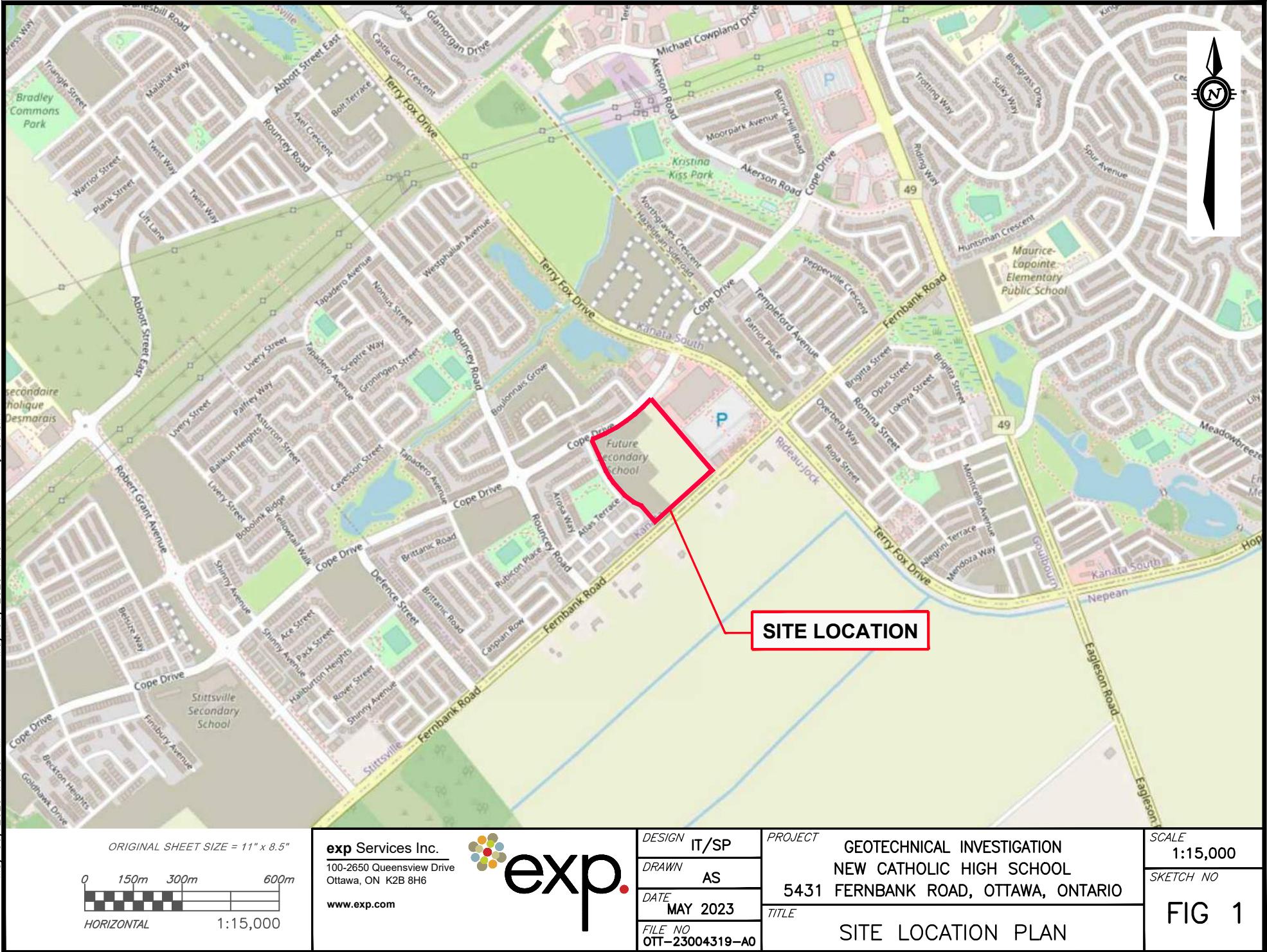


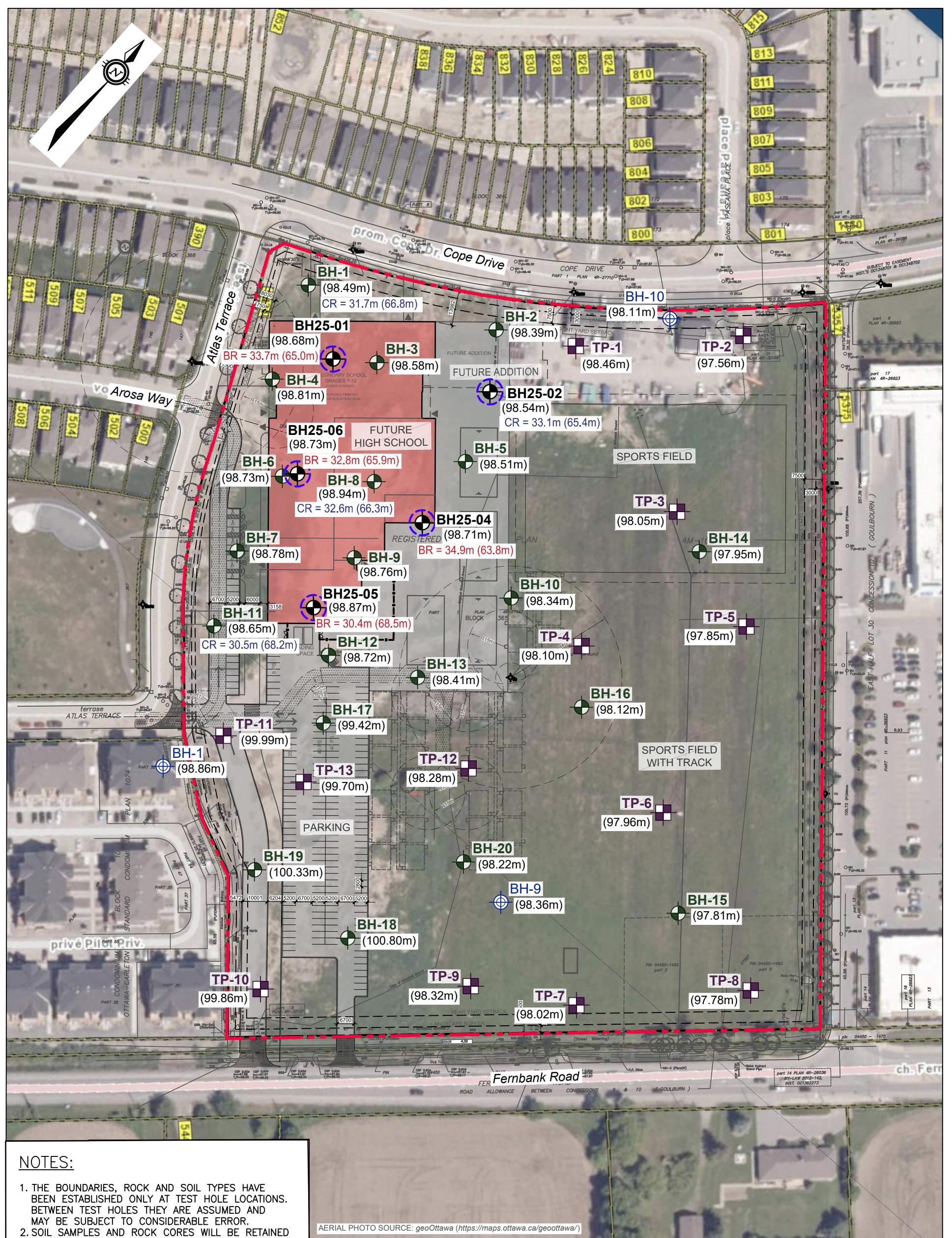
Susan M. Potyondy, P.Eng.
Senior Geotechnical Engineer
Earth & Environment



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

Figures





NOTES:

1. THE BOUNDARIES, ROCK AND SOIL 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 ROCK CORES WILL BE RETAINED IN STORAGE FOR THREE MONTHS AND THEN DESTROYED UNLESS THE CLIENT ADVISES THAT AN EXTENDED TIME PERIOD IS REQUIRED.
3. TOPSOIL QUANTITIES SHOULD NOT BE ESTABLISHED FROM THE INFORMATION PROVIDED AT THE TEST HOLE LOCATIONS.
4. TEST HOLE ELEVATIONS SHOULD NOT BE USED TO DESIGN BUILDING[S] OR FLOOR SLABS OR PARKING LOT[S] GRADES.
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 PRODUCED BY: N45 ARCHITECTURE INC., PROJECT NO.: 24-845, DWG. NO.: A-001, DATED: JUNE 24, 2025

AERIAL PHOTO SOURCE: geoOttawa (<https://maps.ottawa.ca/geoottawa/>)

LEGEND

PROPERTY BOUNDARY

BH-1 (98.49m) BOREHOLE NO. & LOCATION (EXP, 2023)

GROUND SURFACE ELEVATION (m)

BH-1 (98.86m) BOREHOLE NO. & LOCATION AND GROUND SURFACE ELEVATION (m) - PATERSON GROUP INC. GEOTECHNICAL REPORT DATED FEBRUARY 2, 2018 (REPORT: PG4053-IR)

TP-1 (98.46m) TEST PIT NO. & LOCATION (EXP, 2023)
GROUND SURFACE ELEVATION (m)

BH25-01 (98.11m) BOREHOLE NO. & LOCATION (EXP, 2025)

CR = 33.1m (65.4m) CONE REFUSAL ON INFERRED BEDROCK DEPTH (ELEVATION) (m)

BR = 33.7m (65.0m) BEDROCK DEPTH (ELEVATION) (m)

*NOTE: BH25-03 - NOT DRILLED

ORIGINAL SHEET SIZE = 11" x 17"

0 15m 30m 60m
HORIZONTAL 1:1500

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



DESIGN IT/SP
DRAWN AS
DATE DECEMBER 2025
FILE NO OTT-23004319-A0

PROJECT GEOTECHNICAL INVESTIGATION
NEW CATHOLIC HIGH SCHOOL
5431 FERNBANK ROAD, OTTAWA, ONTARIO
TITLE TEST HOLE LOCATION PLAN

SCALE 1:1,500
SKETCH NO

FIG 2

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 Society 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.

ISSMFE SOIL CLASSIFICATION											
CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE		
0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60	200	

EQUIVALENT GRAIN DIAMETER IN MILLIMETRES

CLAY (PLASTIC) TO SILT (NONPLASTIC)	FINE	MEDIUM SAND	CRS.	FINE	COARSE GRAVEL
--	------	----------------	------	------	------------------

UNIFIED SOIL CLASSIFICATION

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-01

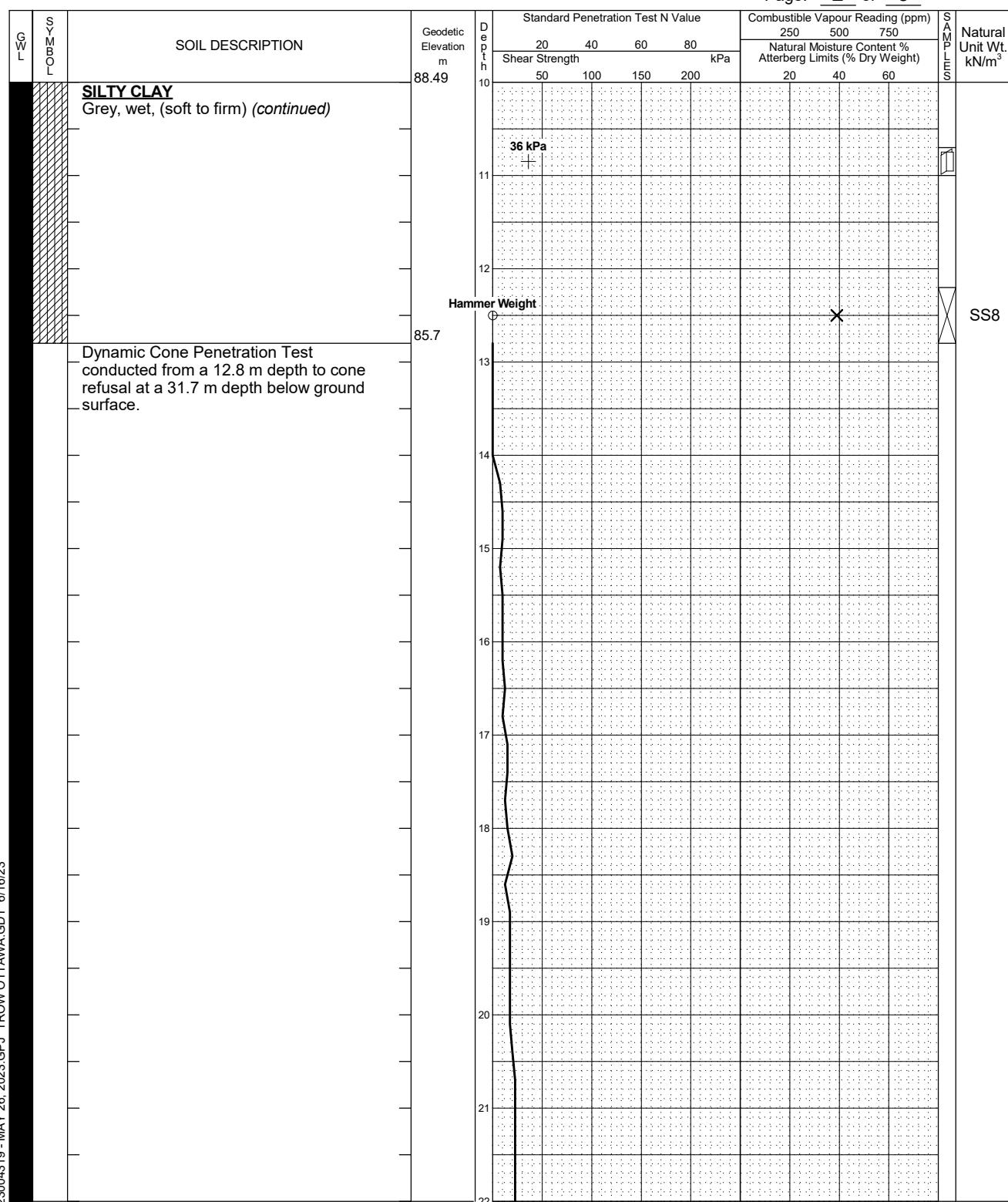


Project No: OTT-23004319-A0

Project: New Catholic High School

Figure No. 3

Page. 2 of 3



Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. 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-23004319-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
June 6, 2023	1.6	

CORE DRILLING RECORD

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

Log of Borehole BH-01

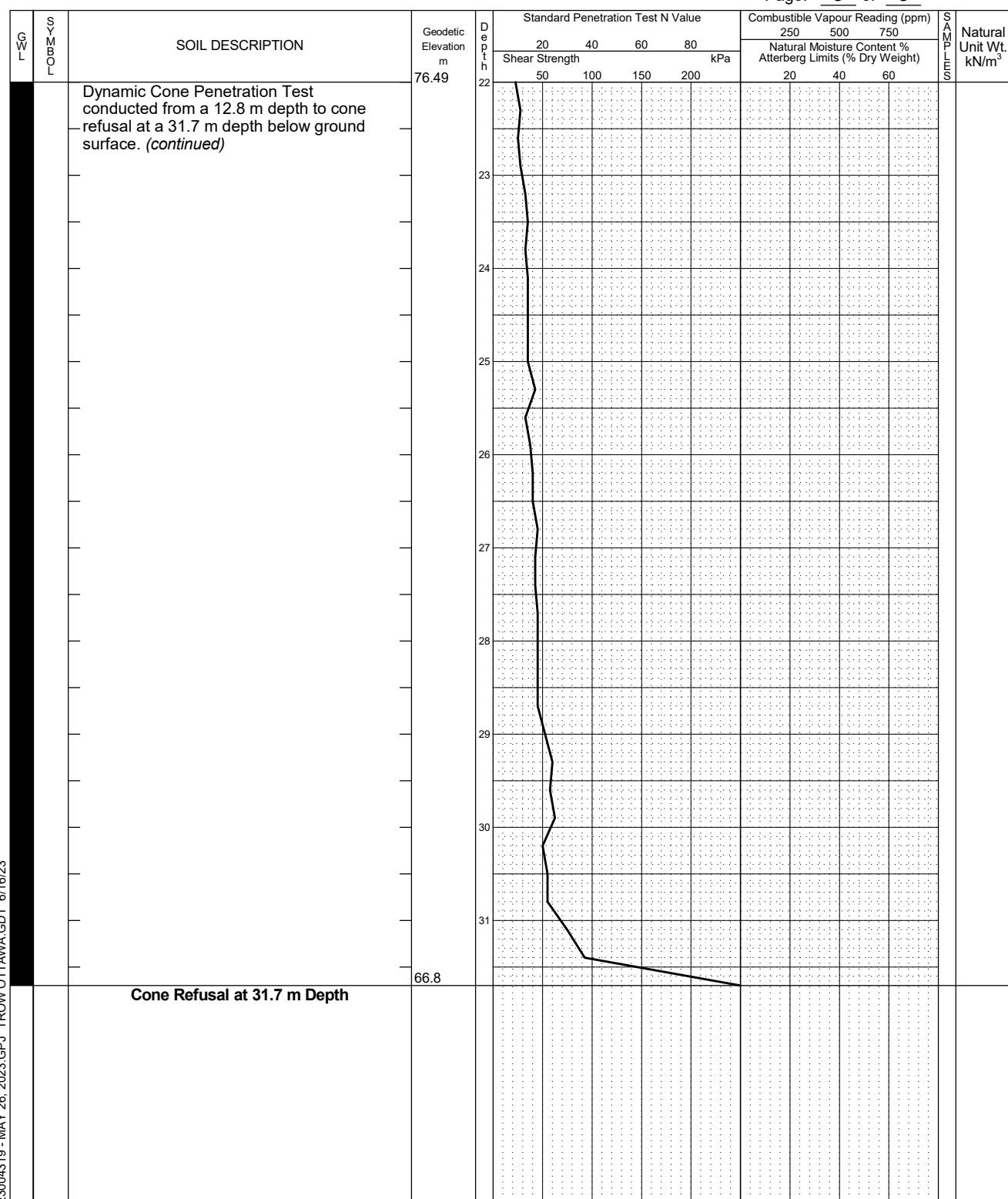


Project No: OTT-23004319-A0

Project: New Catholic High School

Figure No. 3

Page. 3 of 3



LOG OF BOREHOLE BH LOGS - 23004319 - MAY 26, 2023 GFJ TROW OTTAWA GDT 6/16/23

NOTES:

- Borehole data requires interpretation by EXP before use by others
- 19 mm diameter standpipe installed as shown
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
June 6, 2023	1.6	

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

Log of Borehole BH-02



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 4

Page. 1 of 1

Date Drilled: May 15, 2023

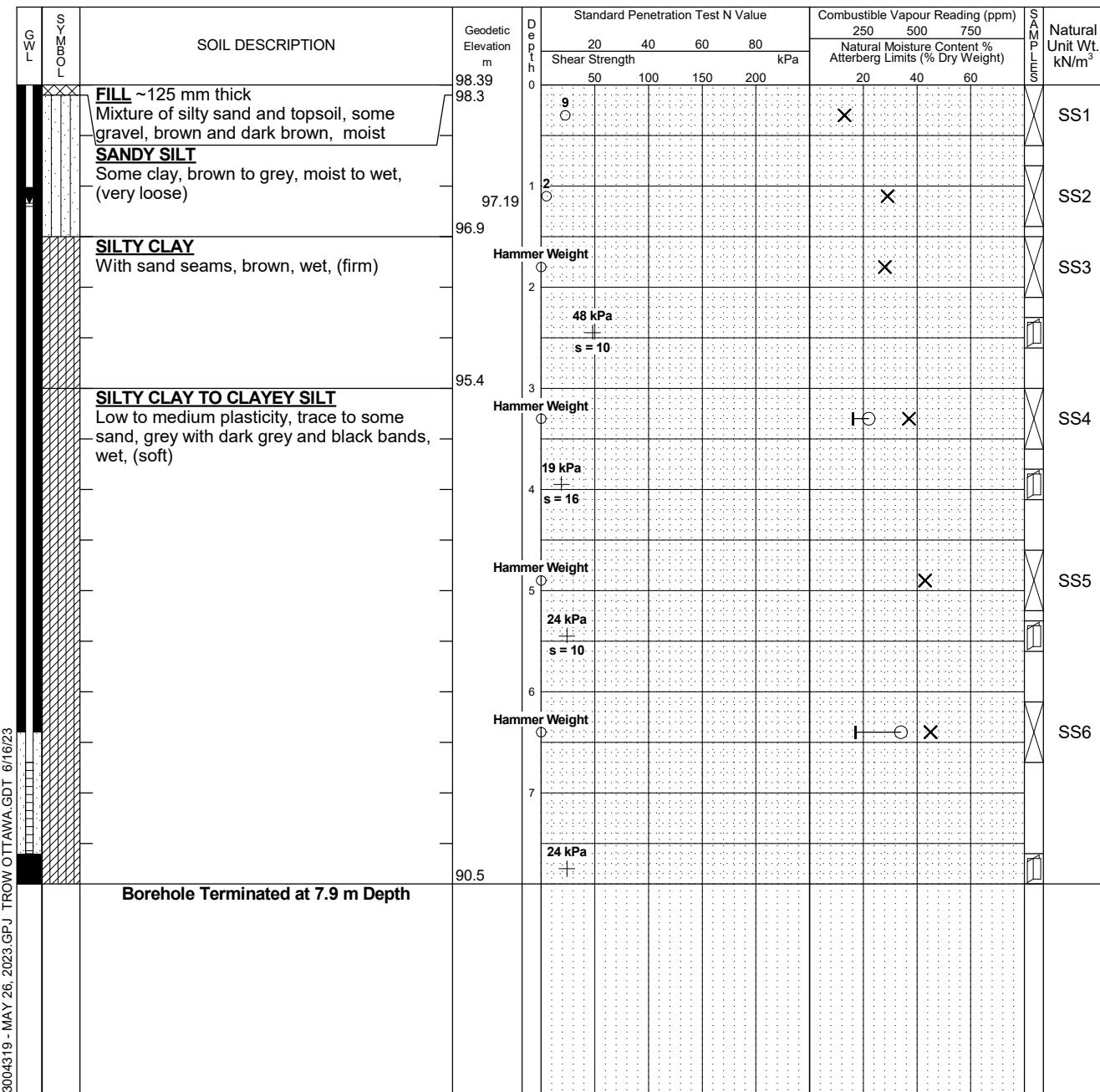
Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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
 ▲



LOG OF BOREHOLE BH LOGS - 23004319 - MAY 26, 2023 GRJ TROW OTTAWA GDT 6/16/23

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. 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-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
June 6, 2023	1.2	

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

Log of Borehole BH-03



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 5

Page. 1 of 1

Date Drilled: May 12, 2023

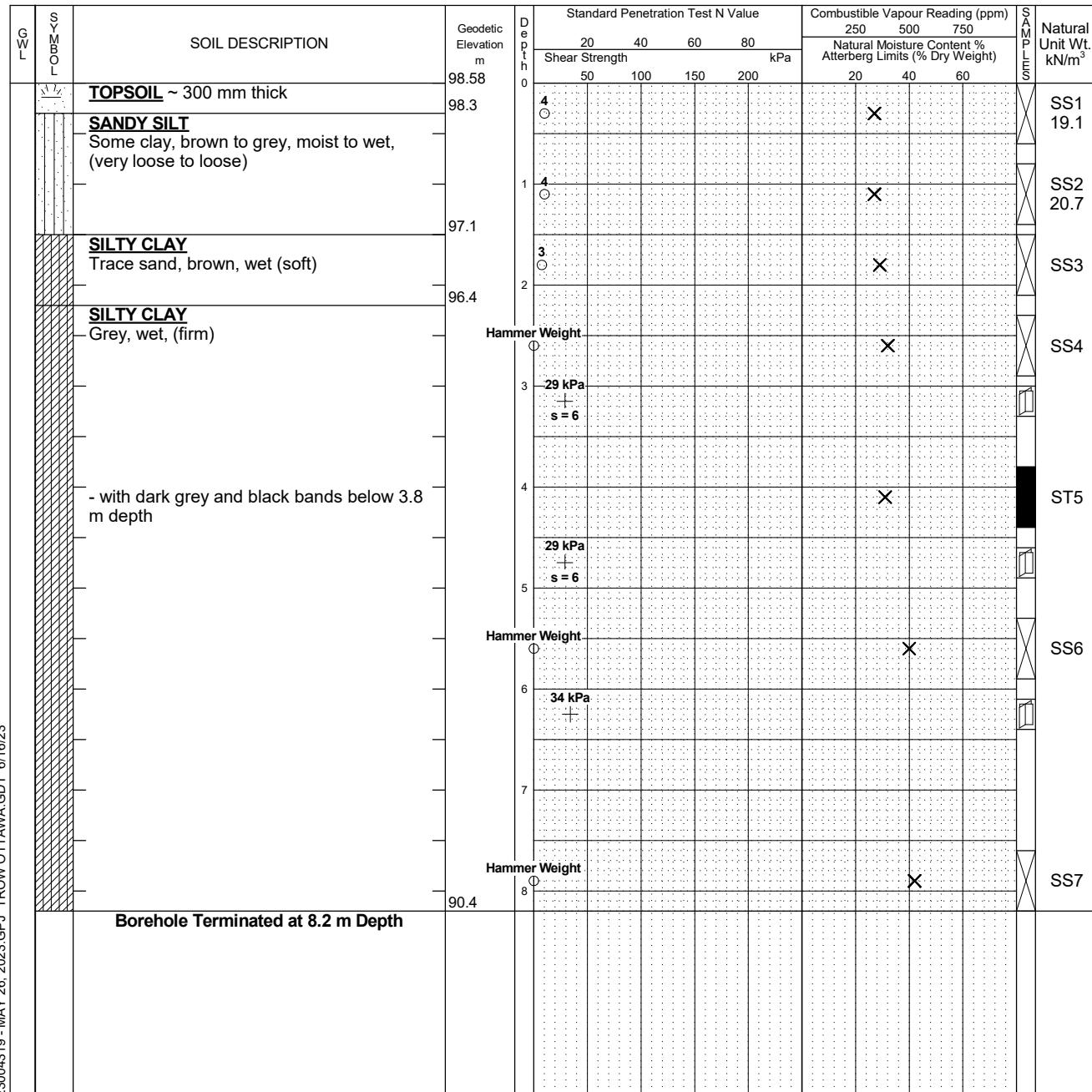
Drill Type: CME-55LC Rubber Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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
 ▲



NOTES:

- Borehole data requires interpretation by EXP before use by others
- Borehole was backfilled upon completion
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Upon Completion	3.7	3.7

CORE DRILLING RECORD

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

Log of Borehole BH-04



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 6

Page. 1 of 1

Date Drilled: May 12, 2023

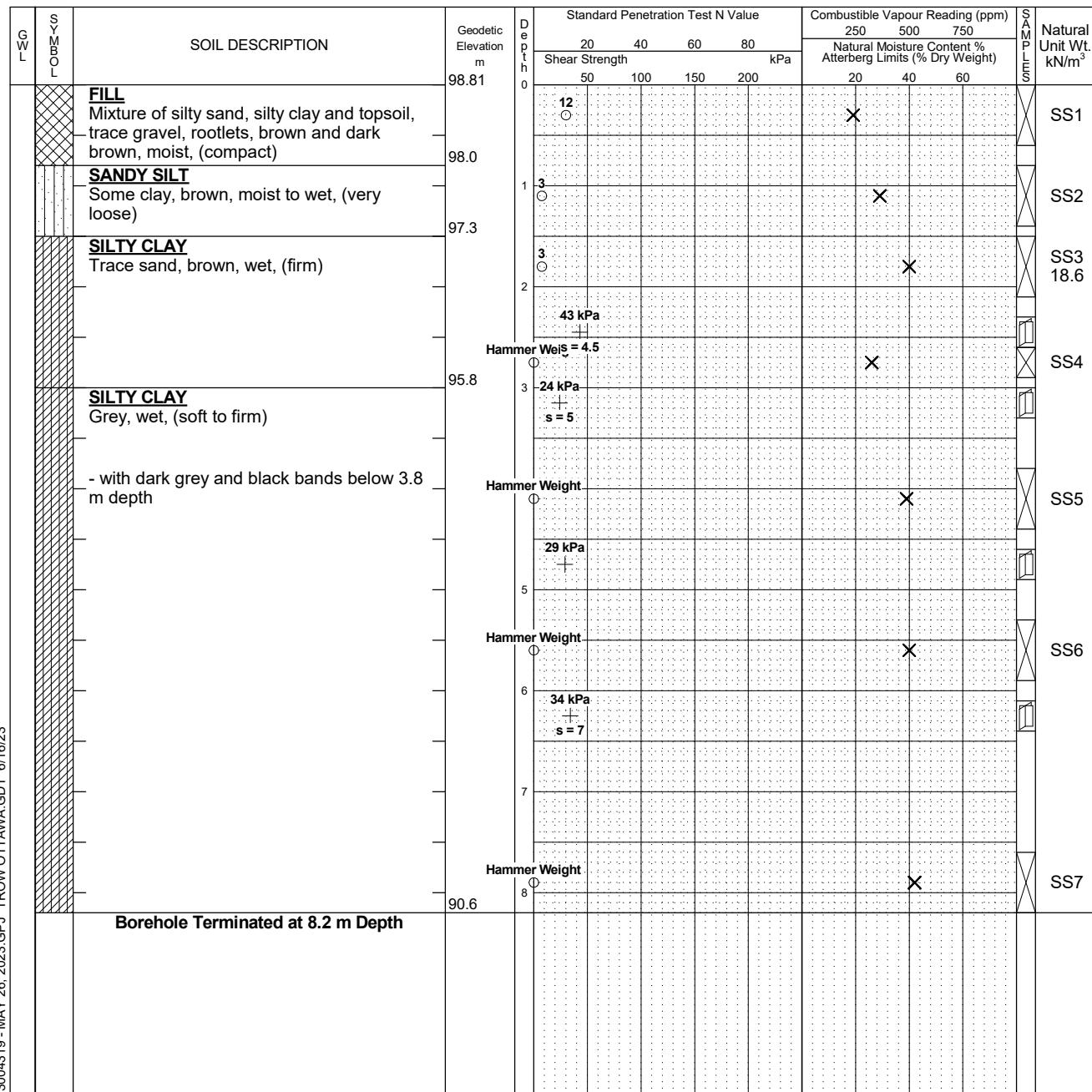
Drill Type: CME-55LC Rubber Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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
 ▲



NOTES:

- Borehole data requires interpretation by EXP before use by others
- Borehole was backfilled upon completion
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Upon Completion	dry	7.6

CORE DRILLING RECORD

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

Log of Borehole BH-05



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 7

Page. 1 of 1

Date Drilled: May 15, 2023

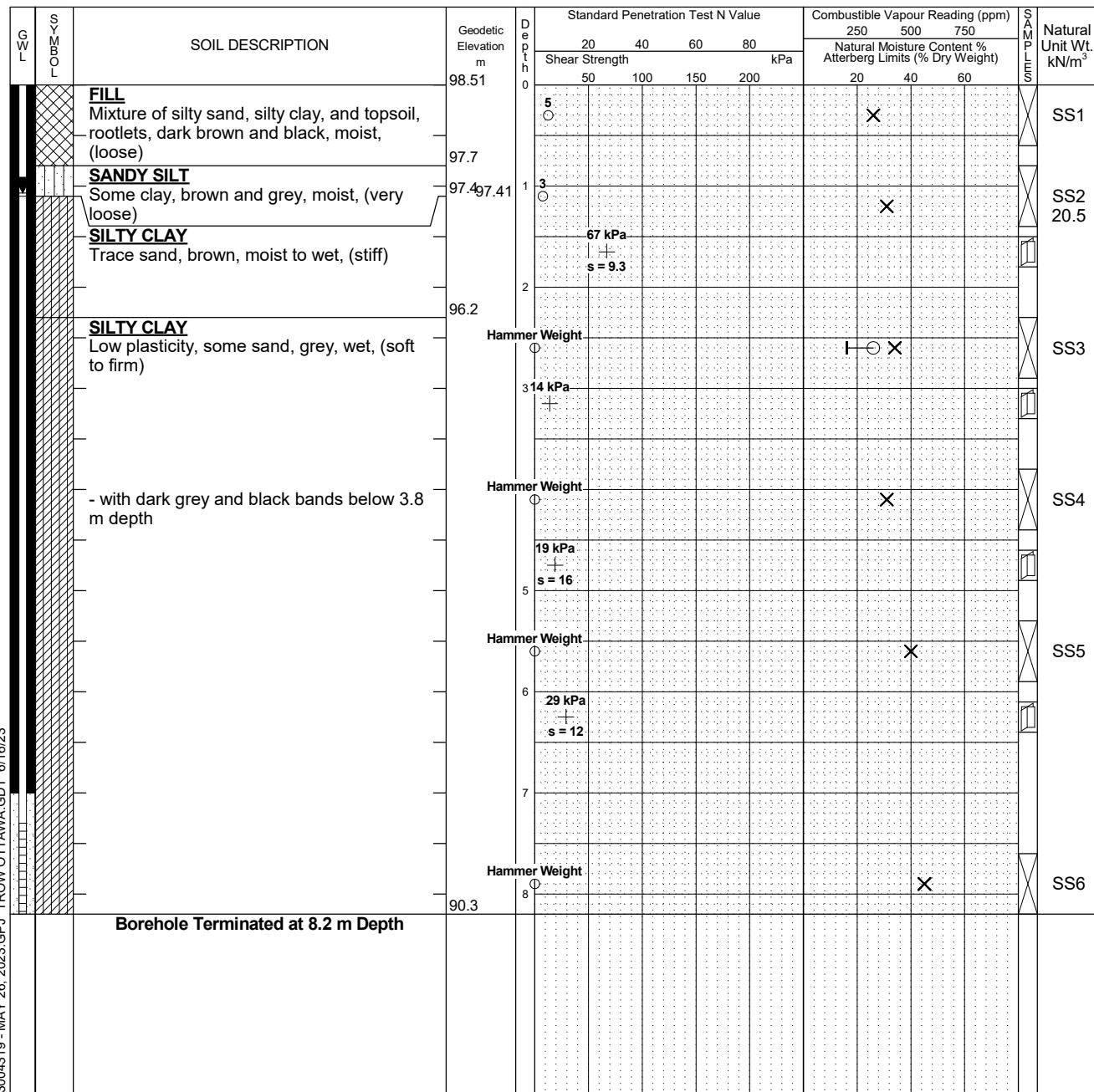
Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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
 ▲



LOG OF BOREHOLE BH LOGS - 23004319 - MAY 26, 2023 GFJ TROW OTTAWA GDT 6/16/23

NOTES:

- Borehole data requires interpretation by EXP before use by others
- 19 mm diameter standpipe installed as shown
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
June 6, 2023	1.1	

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

Log of Borehole BH-07



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 9

Page. 1 of 1

Date Drilled: May 17, 2023

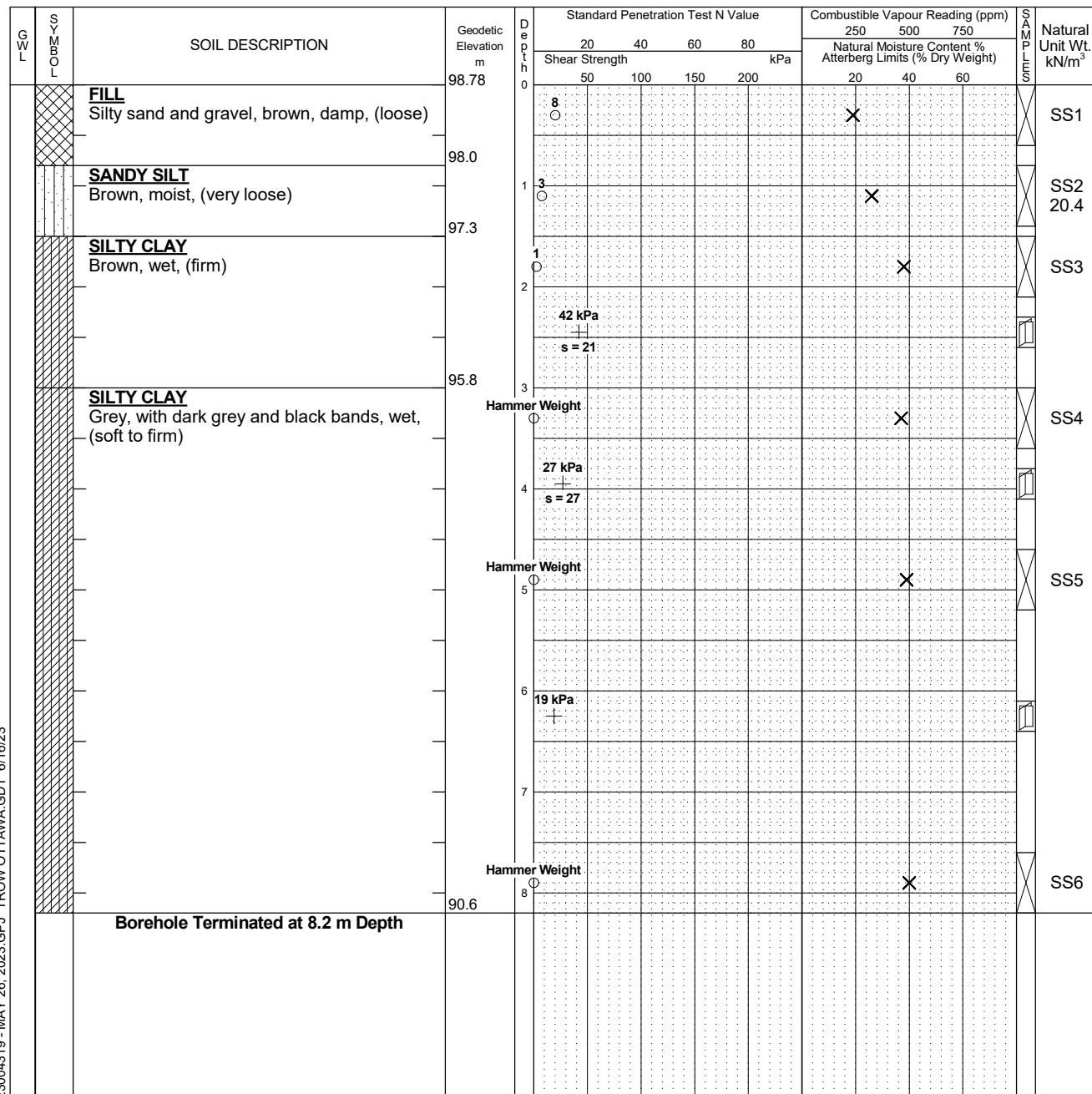
Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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
 ▲



NOTES:

- Borehole data requires interpretation by EXP before use by others
- Borehole was backfilled upon completion
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Upon Completion	dry	8.2

CORE DRILLING RECORD

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

Log of Borehole BH-08

The logo for exp. features a circular arrangement of small, colorful dots in shades of yellow, orange, and brown, followed by the lowercase letters "exp." in a black, sans-serif font.

Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 1

Page. 1 of 3

Date Drilled: 'May 12, 2023

Split Spoon Sample

Combustible Vapour Reading

Drill Type: CME-55LC Rubber Track Mounted Drill Rig

Auger Sample

Natural Moisture Content

Datum: Geodetic Elevation

Dynamic Cone Test

Undrained Triaxial at

Logged by: MZ Checked by: IT

Shear Strength by

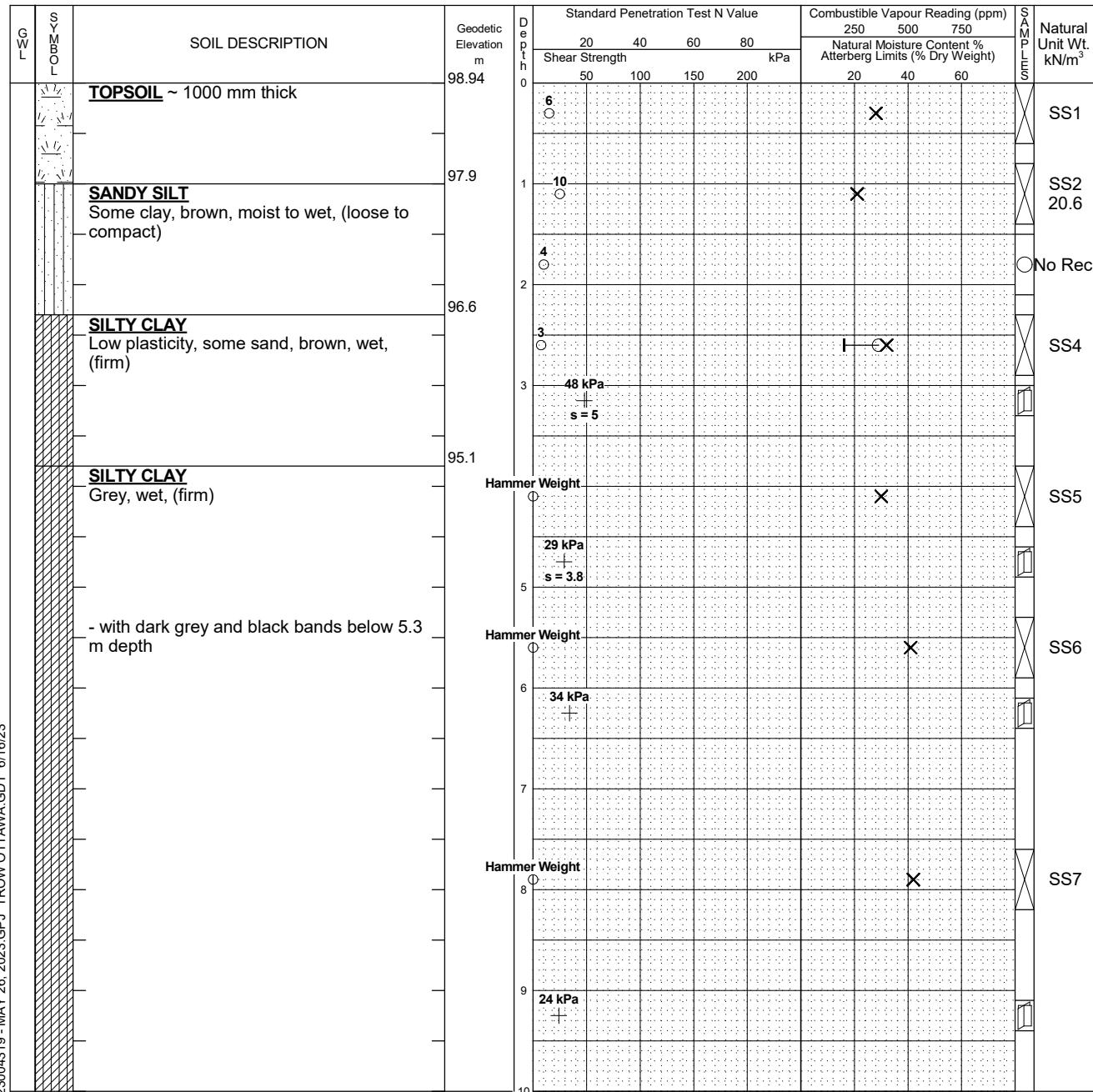
Shear Strength by

Vane Test

G | S Y M | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Standard Penetration Test N Value

Combustible Vapour Reading
250 500 750



Continued Next Page

Continued Next Page						
NOTES:		WATER LEVEL RECORDS		CORE DRILLING RECORD		
Date	Water Level (m)	Hole Open To (m)	Run No.	Depth (m)	% Rec.	RQD %
Upon Completion	dry	11.7				

Log of Borehole BH-08

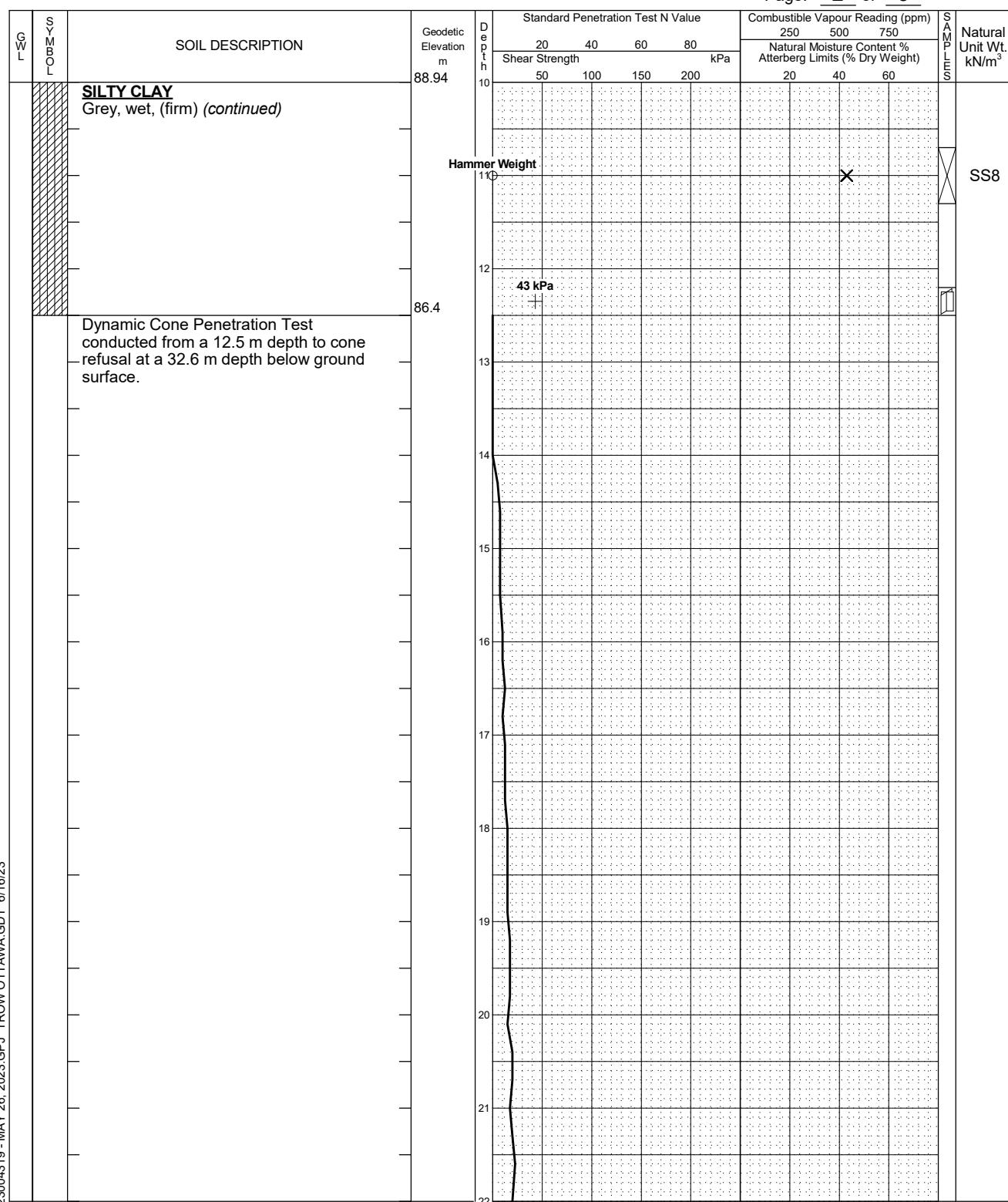


Project No: OTT-23004319-A0

Project: New Catholic High School

Figure No. 10

Page. 2 of 3



LOG OF BOREHOLE BH LOGS - 23004319 - MAY 26, 2023 GFJ TROW OTTAWA GDT 6/16/23

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
Upon Completion	dry	11.7

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

Log of Borehole BH-08

The logo for exp. features a stylized 'e' composed of a cluster of colorful dots in shades of yellow, orange, and brown, followed by the lowercase letters 'xp.' in a black sans-serif font.

Project No: OTT-23004319-A0

Project: New Catholic High School

Figure No. 10

Page. 3 of 3

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
Upon Completion	dry	11.7

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

Log of Borehole BH-09



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 11

Page. 1 of 1

Date Drilled: May 17, 2023

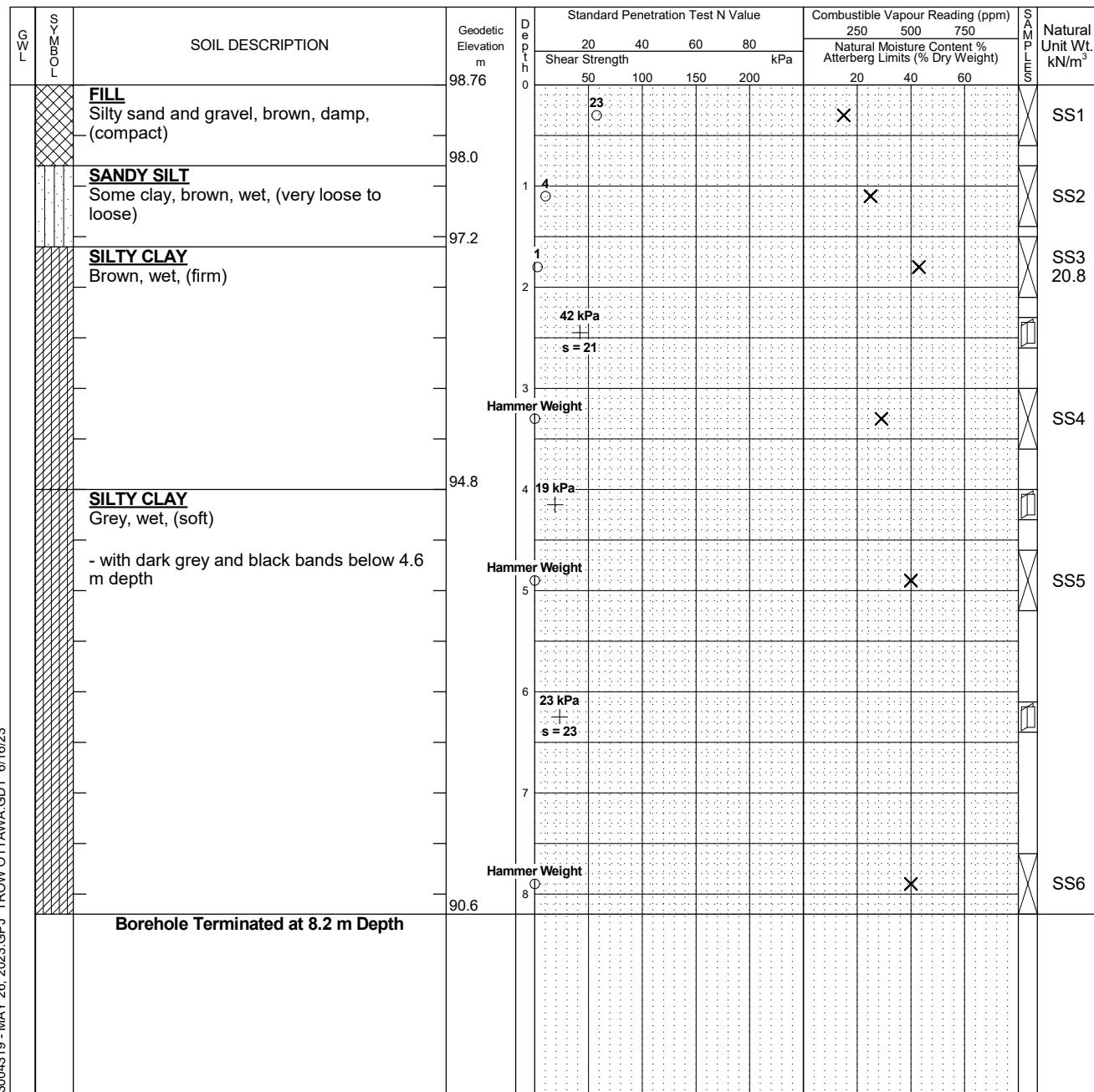
Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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
 ▲



NOTES:

- Borehole data requires interpretation by EXP before use by others
- Borehole was backfilled upon completion
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Upon Completion	dry	8.2

CORE DRILLING RECORD

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

Log of Borehole BH-10



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 12

Page. 1 of 1

Date Drilled: May 15, 2023

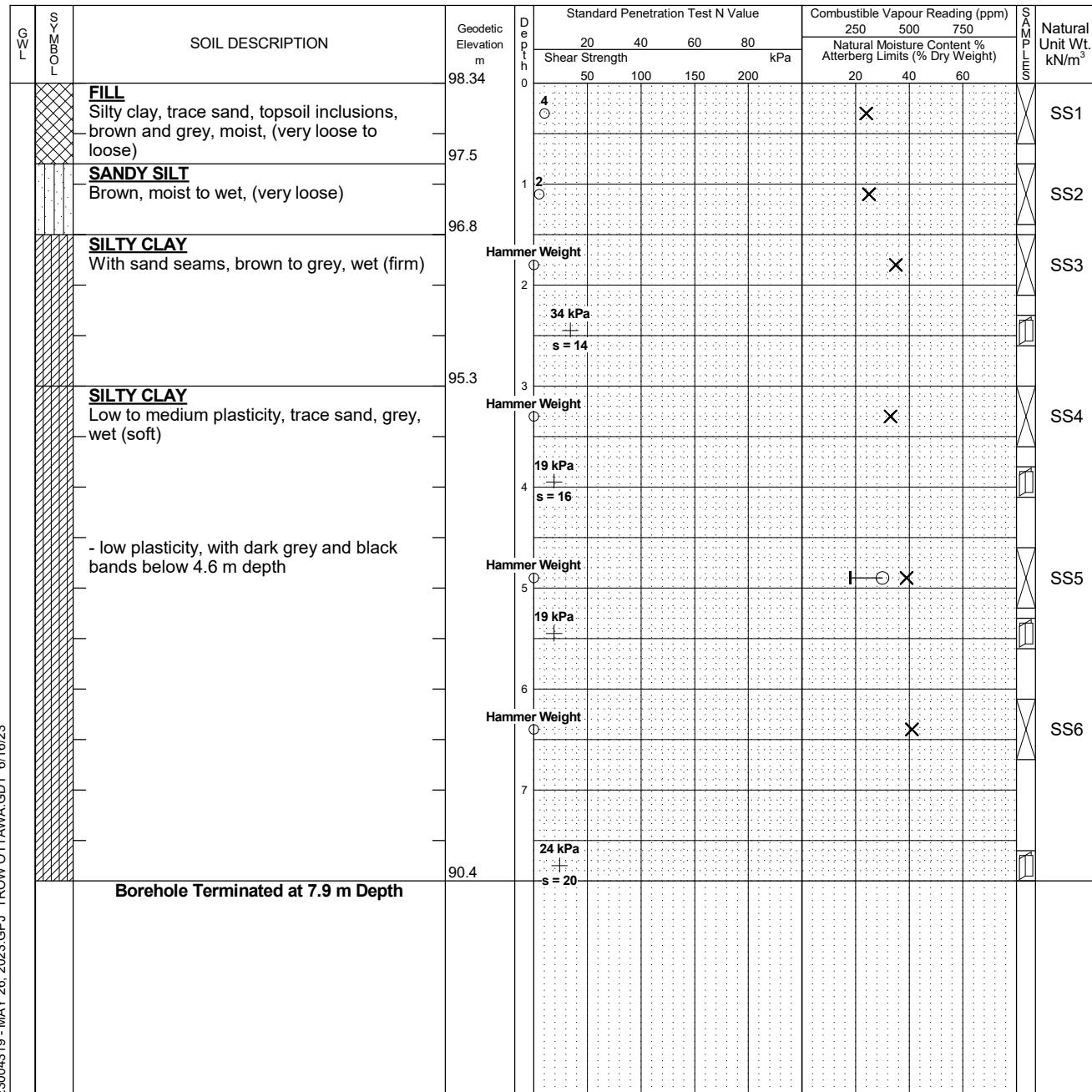
Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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
 ▲



NOTES:

- Borehole data requires interpretation by EXP before use by others
- Borehole was backfilled upon completion
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Upon Completion	4.3	7.4

CORE DRILLING RECORD

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

Log of Borehole BH-11

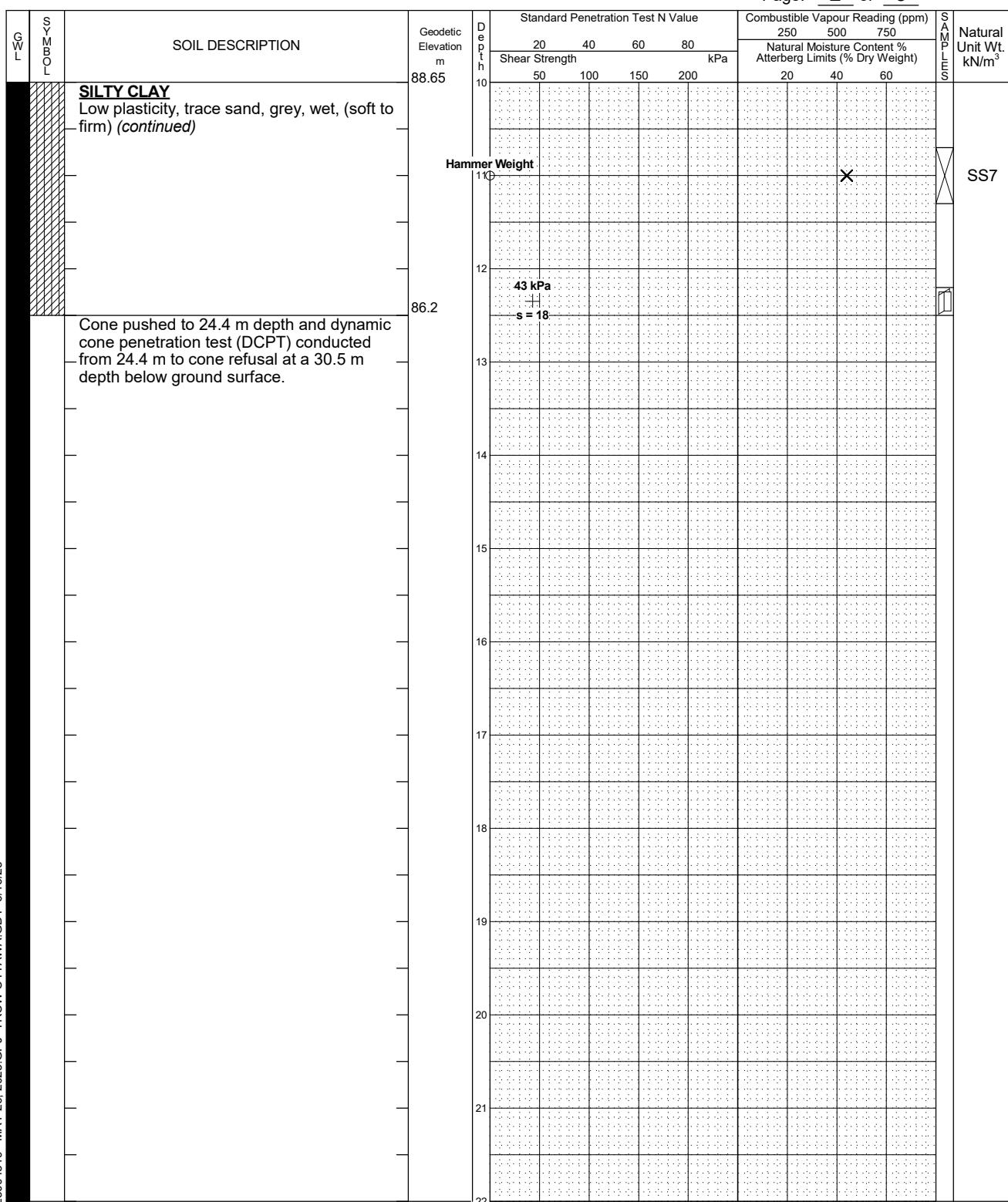


Project No: OTT-23004319-A0

Project: New Catholic High School

Figure No. 13

Page. 2 of 3



Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. 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-23004319-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
June 6, 2023	1.3	

CORE DRILLING RECORD

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

Log of Borehole BH-11

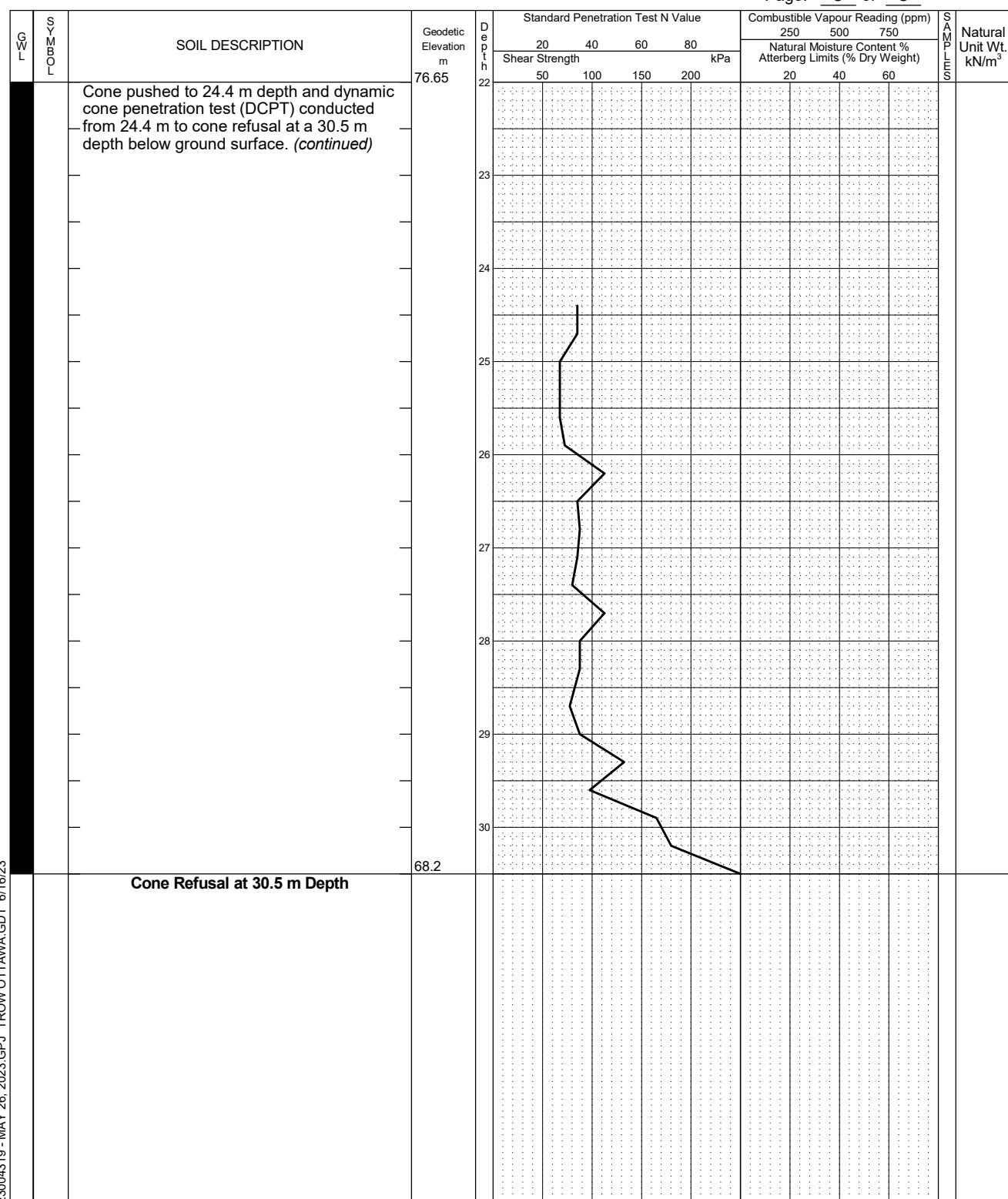


Project No: OTT-23004319-A0

Project: New Catholic High School

Figure No. 13

Page. 3 of 3



LOG OF BOREHOLE BH LOGS - 23004319 - MAY 26, 2023 GFJ TROW OTTAWA GDT 6/16/23

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. 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-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
June 6, 2023	1.3	

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

Log of Borehole BH-12



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 14

Page. 1 of 1

Date Drilled: May 16, 2023

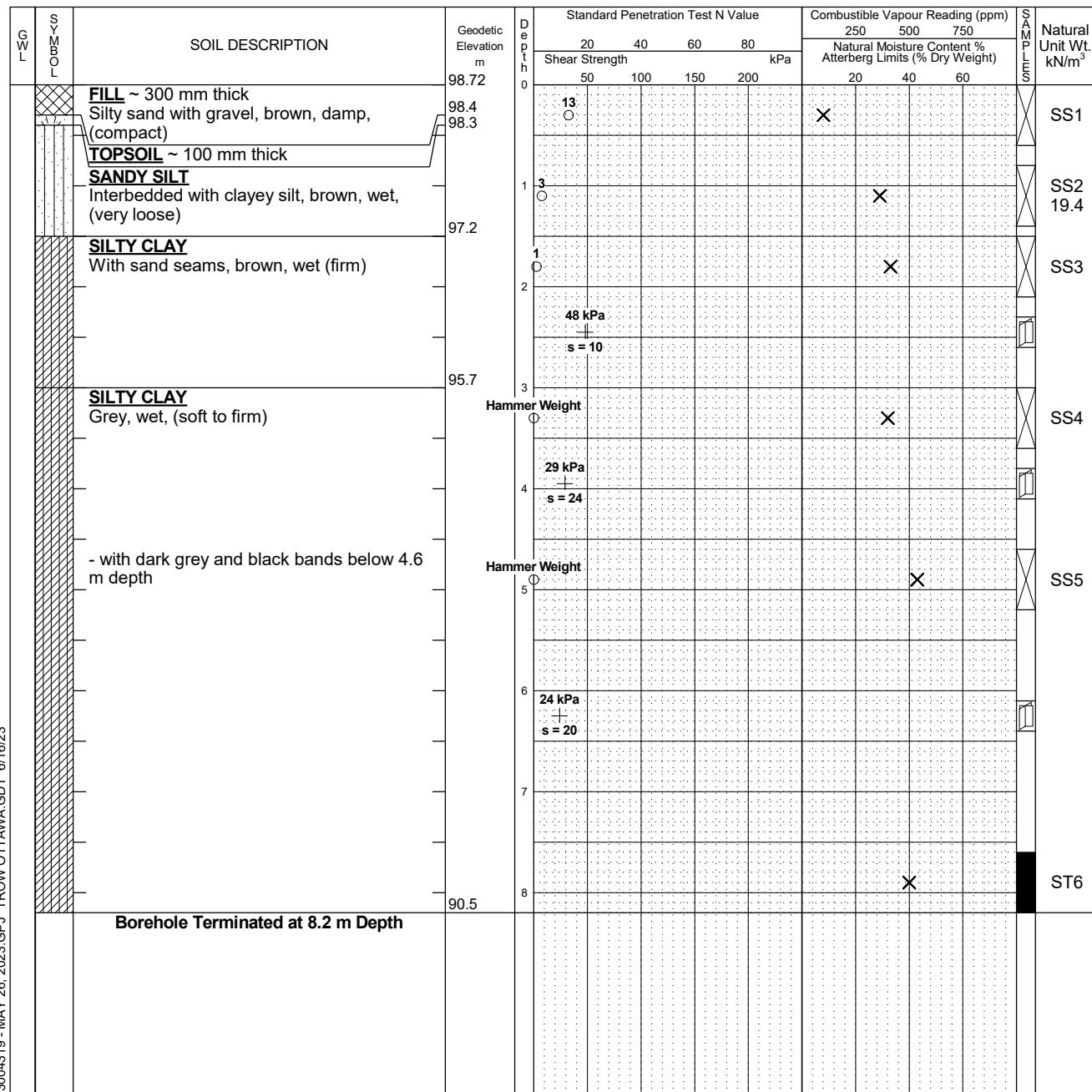
Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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
 ▲



NOTES:

- Borehole data requires interpretation by EXP before use by others
- Borehole was backfilled upon completion
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Upon Completion	5.8	7.6

CORE DRILLING RECORD

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

Log of Borehole BH-14



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 16

Page. 1 of 1

Date Drilled: May 18, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

Split Spoon Sample

Auger Sample

SPT (N) Value

Dynamic Cone Test

Shelby Tube

Shear Strength by

Vane Test

Combustible Vapour Reading

Natural Moisture Content

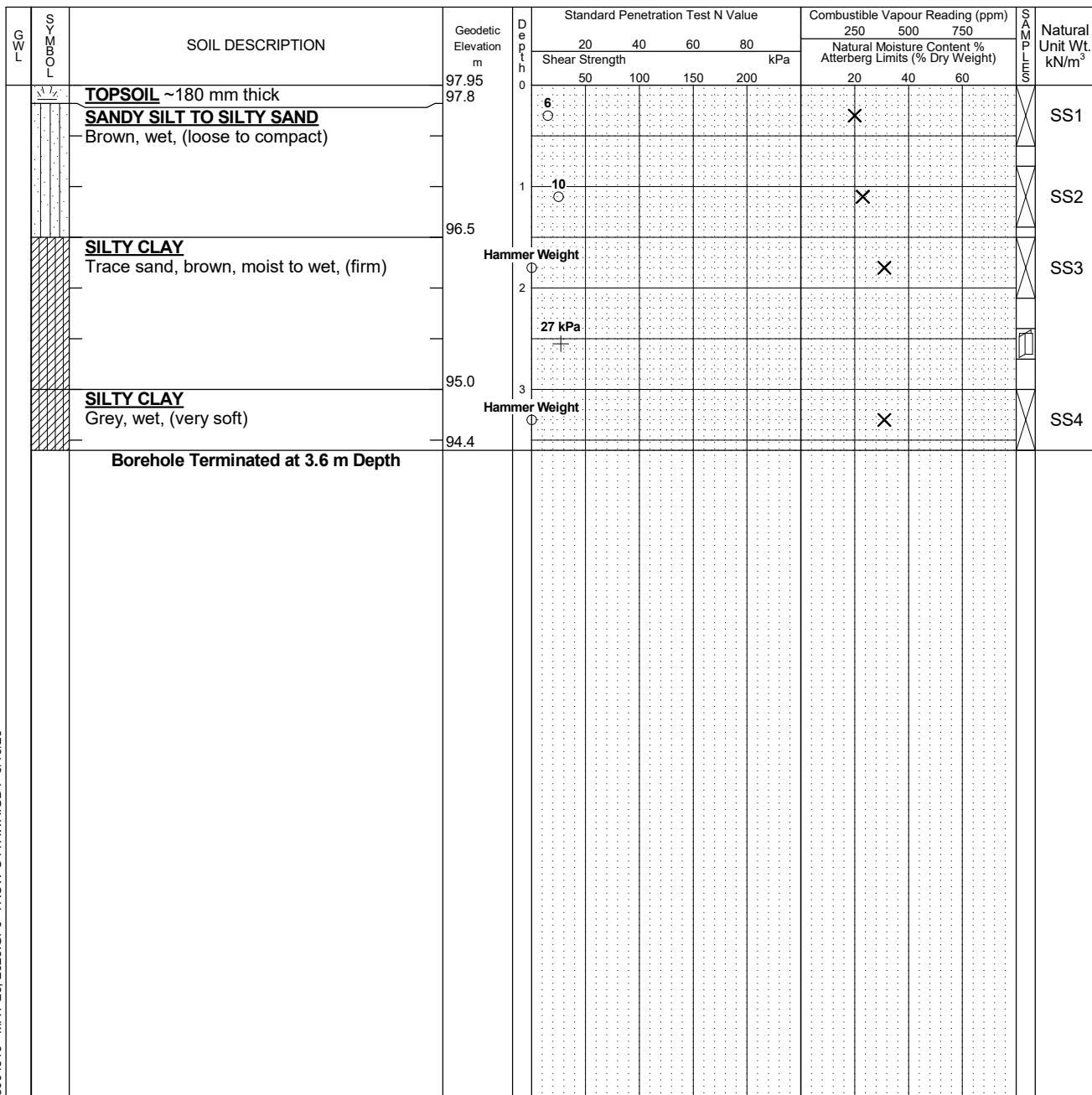
Atterberg Limits

Undrained Triaxial at

% Strain at Failure

Shear Strength by

Penetrometer Test



NOTES:

- Borehole data requires interpretation by EXP before use by others
- Borehole was backfilled upon completion
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
Upon Completion	3.0	3.6

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

Log of Borehole BH-15



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 17

Page. 1 of 1

Date Drilled: May 18, 2023

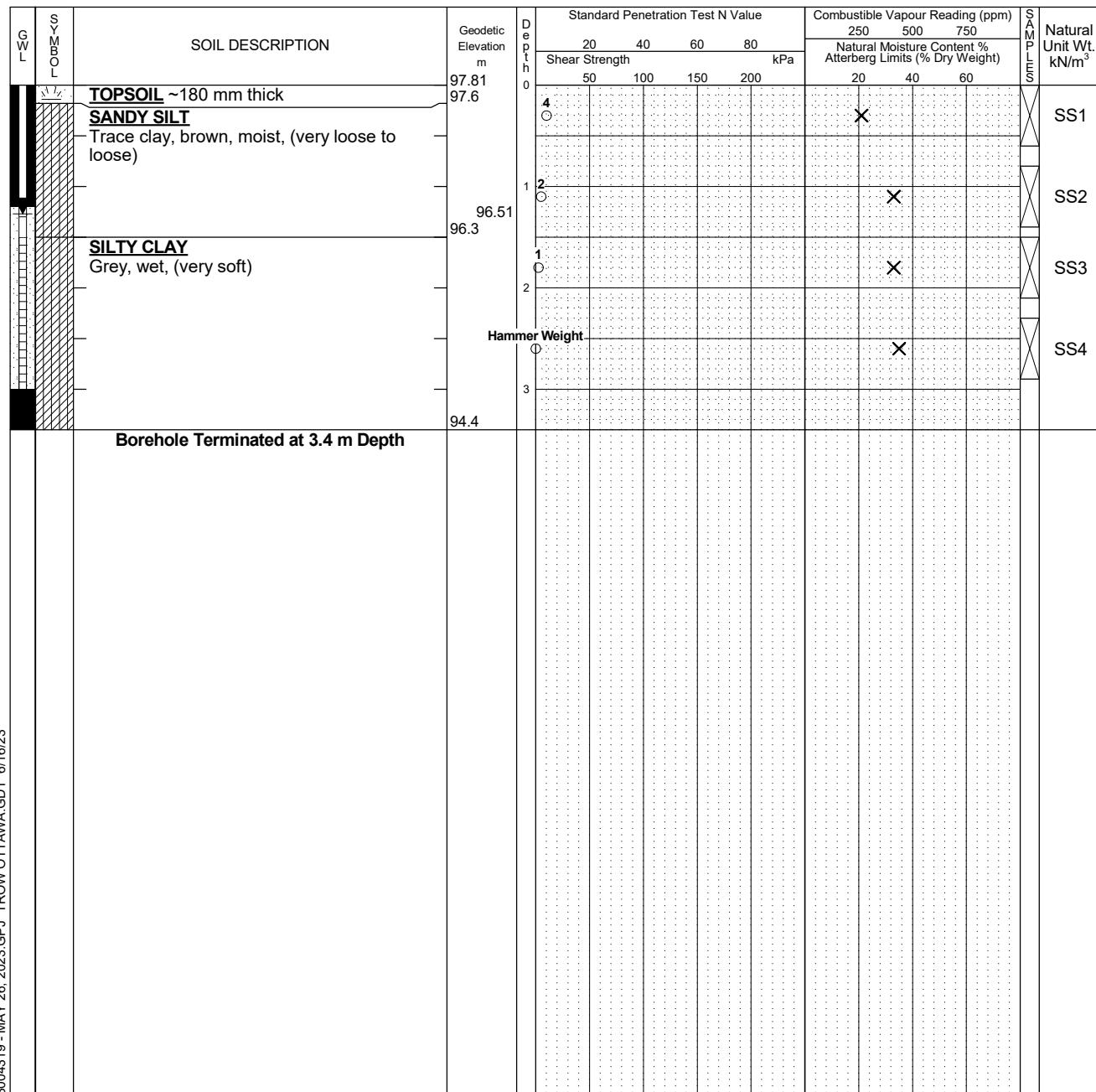
Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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
 ▲



NOTES:

- Borehole data requires interpretation by EXP before use by others
- 19 mm diameter standpipe installed as shown
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
June 6, 2023	1.3	

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

Log of Borehole BH-17



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 19

Page. 1 of 1

Date Drilled: May 17, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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 m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			Sample	Natural Unit Wt. kN/m³	
					20	40	60	80	250	500	750			
		FILL Silty sand and gravel, brown, damp, (very loose to loose)	99.42	0	Shear Strength kPa	50	100	150	200	20	40	60		SS1
		SANDY SILT Clayey, slightly cohesive, brown, wet, (soft to firm/very loose to loose)	98.6	1.4	Hammer Weight	0								SS2 18.8
		SILTY CLAY Brown, wet, (very soft)	97.8	2	Hammer Weight	0								SS3
			95.6	3	Hammer Weight	0								SS4
		SILTY CLAY With dark grey and black bands, grey, wet, (soft)	95.0	4.4	Hammer Weight	0								SS5
		Borehole Terminated at 4.4 m Depth												SS6

NOTES:

- Borehole data requires interpretation by EXP before use by others
- Borehole was backfilled upon completion
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

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

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

Log of Borehole BH-18



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 20

Page. 1 of 1

Date Drilled: May 18, 2023

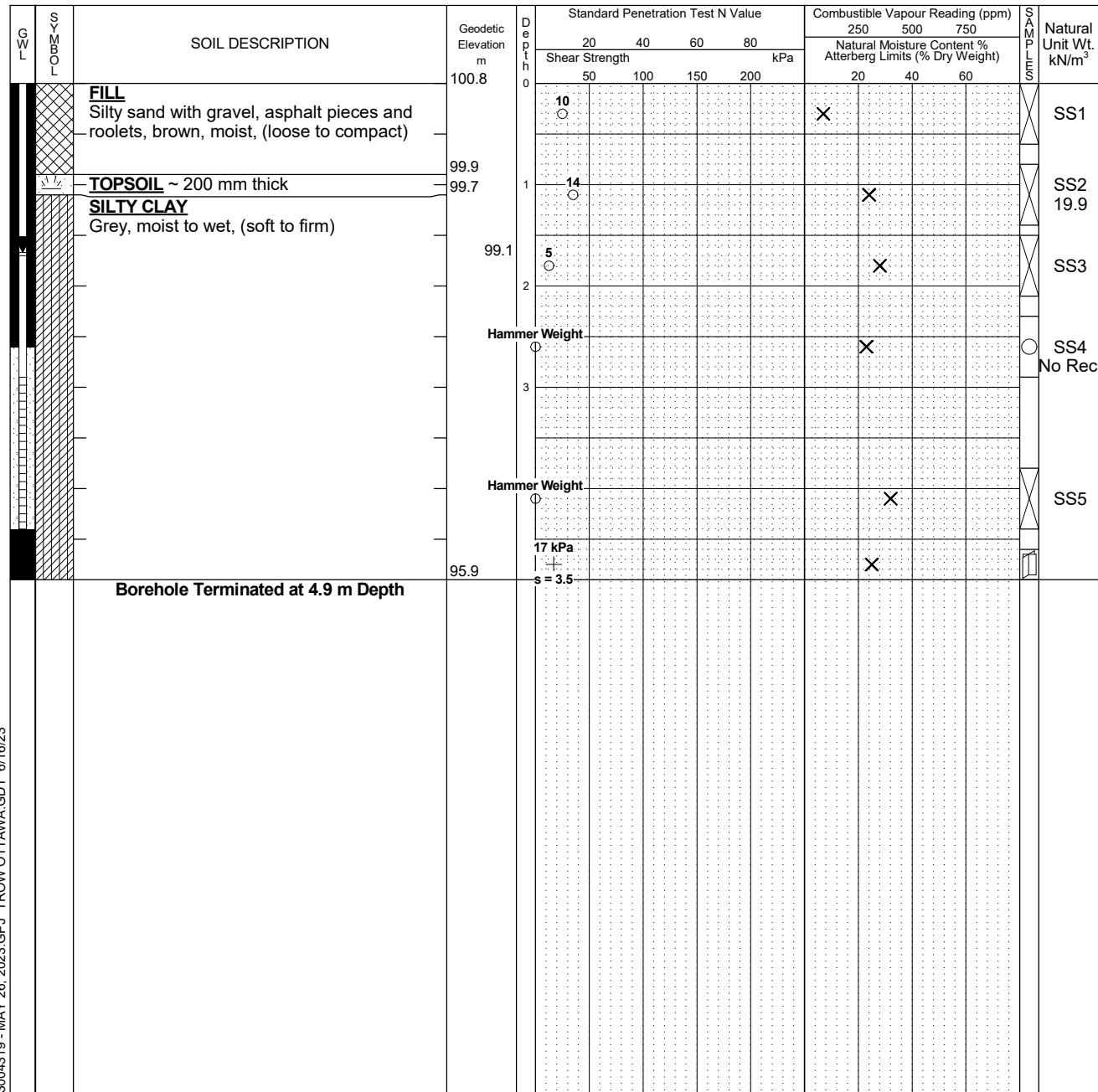
Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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
 ▲



NOTES:

- Borehole data requires interpretation by EXP before use by others
- 19 mm diameter standpipe installed as shown
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
June 6, 2023	1.7	

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

Log of Borehole BH-19



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 21

Page. 1 of 1

Date Drilled: May 17, 2023

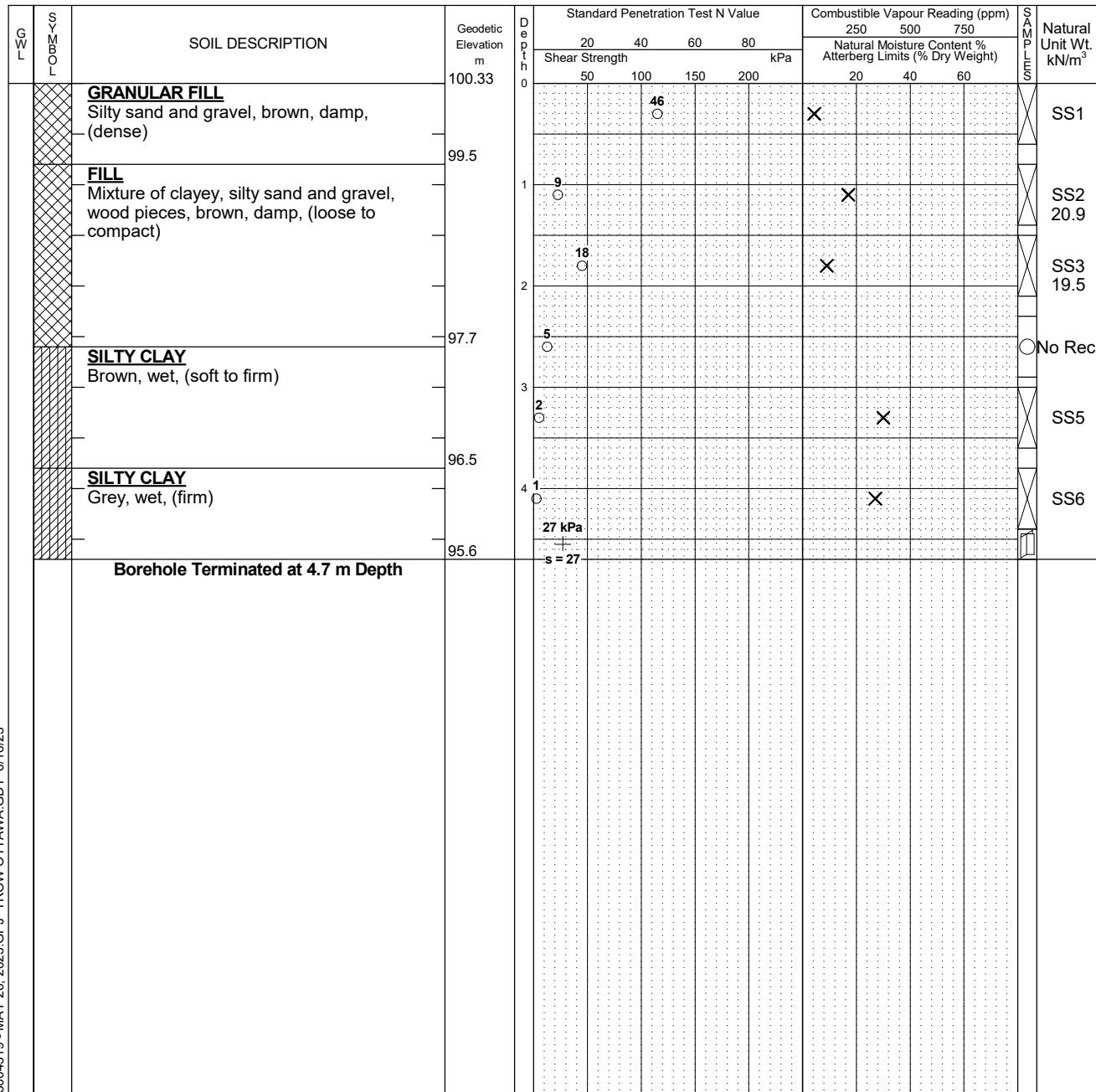
Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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
 ▲



NOTES:

- Borehole data requires interpretation by EXP before use by others
- Borehole was backfilled upon completion
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

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

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

Log of Borehole BH-20



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 22

Page. 1 of 1

Date Drilled: May 18, 2023

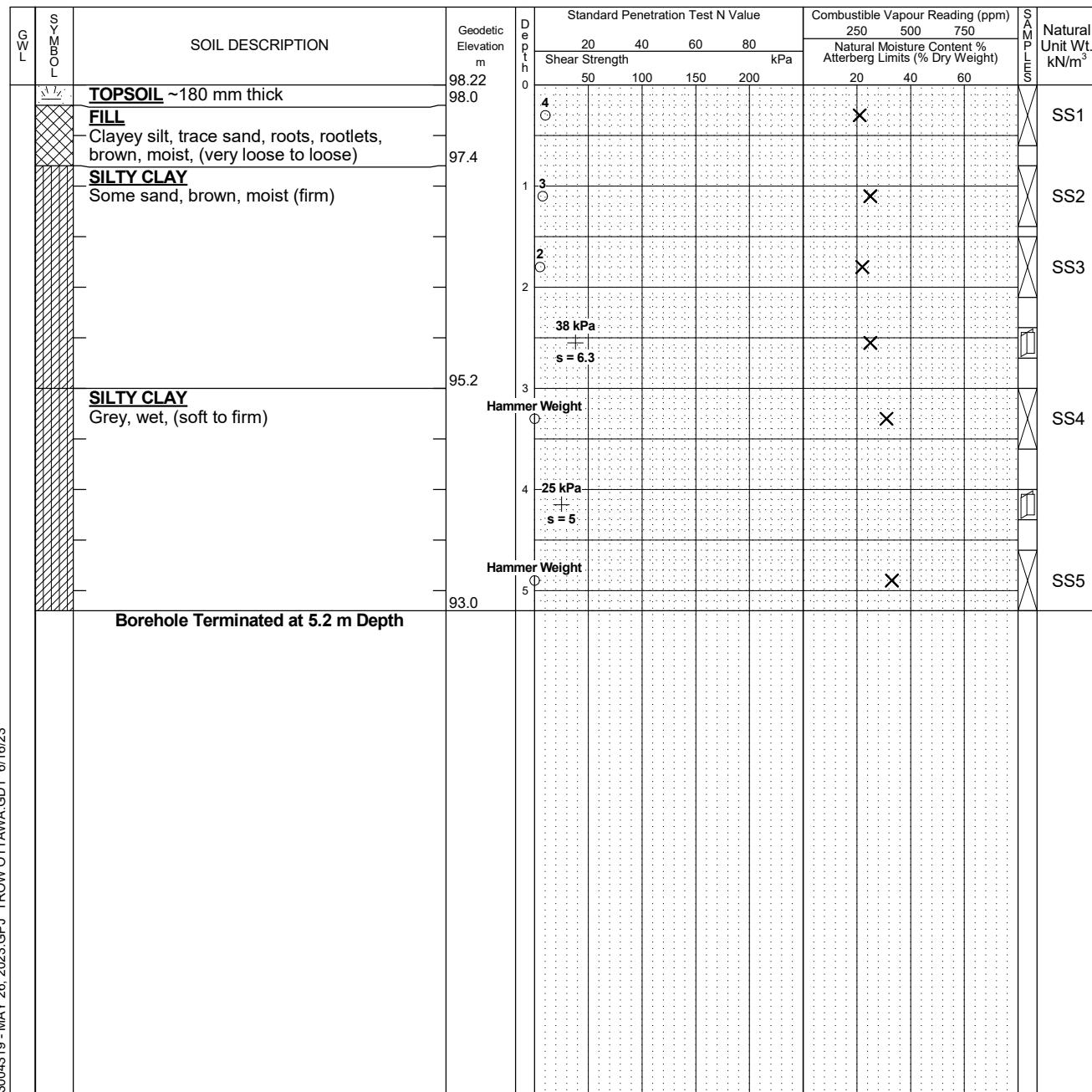
Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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
 ▲



NOTES:

- Borehole data requires interpretation by EXP before use by others
- Borehole was backfilled upon completion
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
Upon Completion	2.5	

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

Log of Borehole TP-02



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 24

Page. 1 of 1

Date Drilled: 'May 5, 2023

Split Spoon Sample

Combustible Vapour Reading

Auger Sample

Natural Moisture Content

SPT (N) Value

Atterberg Limits

Dynamic Cone Test

Undrained Triaxial at

Shelby Tube

% Strain at Failure

Shear Strength by

Shear Strength by

Vane Test

Penetrometer Test

Drill Type: CAT 320F Track Mounted Hydraulic Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

GWL SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			Natural Unit Wt. kN/m ³
				20	40	60	80	250	500	750	
				Shear Strength kPa				Natural Moisture Content % Atterberg Limits (% Dry Weight)			
	FILL Silty sand with gravel, plastic pieces, stone dust and topsoil pockets, brown, moist	97.56	0								
	SANDY SILT Some clay, brown and grey, moist to wet	97.0	1								
		95.6	2								
	Test Pit Terminated at 2.0 m Depth										

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Test pit backfilled upon completion of excavating operation.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
On Completion	dry	

CORE DRILLING RECORD

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

Log of Borehole TP-03



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 25

Page. 1 of 1

Date Drilled: May 5, 2023

Drill Type: CAT 320F Track Mounted Hydraulic Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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 m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			Natural Unit Wt. kN/m ³	
				20	40	60	80	250	500	750		
				Shear Strength kPa				50	100	150	200	20
	TOPSOIL ~400 mm thick	98.05	0									
	SANDY SILT Some clay, brown, moist to wet	97.7	1									X
	SILTY CLAY Grey, wet	96.6	2									X
	Test Pit Terminated at 2.2 m Depth	95.9										

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Test pit backfilled upon completion of excavating operation.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
On Completion	1.0	

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

Log of Borehole TP-04



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 26

Page. 1 of 1

Date Drilled: May 5, 2023

Drill Type: CAT 320F Track Mounted Hydraulic Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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 m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			SAMPLE COMPL.	Natural Unit Wt. kN/m ³		
				20	40	60	80	Natural Moisture Content % Atterberg Limits (% Dry Weight)						
				50	100	150	200	20	40	60				
	TOPSOIL ~400 mm thick	98.1	0											
	SANDY SILT Some clay, brown, wet	97.7	1											
	SILTY CLAY Grey, wet	96.6	2											
	Test Pit Terminated at 2.1 m Depth													

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Test pit backfilled upon completion of excavating operation.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
On Completion	1.0	

CORE DRILLING RECORD

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

Log of Borehole TP-05



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 27

Page. 1 of 1

Date Drilled: May 5, 2023

Drill Type: CAT 320F Track Mounted Hydraulic Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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 m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			Natural Unit Wt. kN/m ³	
				20	40	60	80	250	500	750		
				Shear Strength kPa				50	100	150	200	
	TOPSOIL ~ 200 mm thick	97.85	0									
	FILL Mixture of silty sand and clayey silt, topsoil inclusions, brown, moist	97.7	0.1									
	SILT Non-plastic, some sand and clay, brown to grey, wet	97.2	1									
	Test Pit Terminated at 1.8 m Depth	96.1										

NOTES:

- Borehole data requires interpretation by EXP before use by others
- Test pit backfilled upon completion of excavating operation.
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
On Completion	0.0	

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

Log of Borehole TP-06



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 28

Page. 1 of 1

Date Drilled: May 5, 2023

Drill Type: CAT 320F Track Mounted Hydraulic Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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 m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			Natural Unit Wt. kN/m ³	
				20	40	60	80	250	500	750		
				Shear Strength kPa				50	100	150	200	20
	TOPSOIL ~300 mm thick	97.96	0									
	SANDY SILT Some clay, brown to grey, wet	97.7	1									X
	SILTY CLAY Brown, wet	96.5	2									X
	Test Pit Terminated at 2.0 m Depth	96.0										

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Test pit backfilled upon completion of excavating operation.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
On Completion	0.0	

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

Log of Borehole TP-07



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 29

Page. 1 of 1

Date Drilled: May 5, 2023

Drill Type: CAT 320F Track Mounted Hydraulic Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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
 ▲

G W L	SY MBOL	SOIL DESCRIPTION	Geodetic Elevation m	Dep th m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			S AMP Com m	
					20	40	60	80	Natural Moisture Content %				
					50	100	150	200	kPa	20	40		
		TOPSOIL ~300 mm thick	98.02	0									
		SANDY SILT Some clay, brown, moist to wet	97.7	1									
		Grey below 1.5 m depth	96.2	2									
		SILTY CLAY Grey, wet	95.9										
		Test Pit Terminated at 2.1 m Depth											

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Test pit backfilled upon completion of excavating operation.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
On Completion	1.5	

CORE DRILLING RECORD

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

Log of Borehole TP-08



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 30

Page. 1 of 1

Date Drilled: May 5, 2023

Drill Type: CAT 320F Track Mounted Hydraulic Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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 m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			Natural Unit Wt. kN/m ³
				20	40	60	80	250	500	750	
				Shear Strength kPa				Natural Moisture Content % Atterberg Limits (% Dry Weight)			
	TOPSOIL ~400 mm thick	97.78	0								
	SANDY SILT Some clay, brown, moist	97.4	1								
	SILTY CLAY Brown to grey, wet	96.4	2								
	Test Pit Terminated at 2.0 m Depth	95.8	2								

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Test pit backfilled upon completion of excavating operation.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
On Completion	1.2	

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

Log of Borehole TP-09



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 31

Page. 1 of 1

Date Drilled: May 5, 2023

Drill Type: CAT 320F Track Mounted Hydraulic Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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 m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			Natural Unit Wt. kN/m ³
				20	40	60	80	250	500	750	
				Shear Strength kPa				Natural Moisture Content % Atterberg Limits (% Dry Weight)			
	TOPSOIL ~300 mm thick	98.32	0								
	SANDY SILT Some clay, brown, moist	98.0	1								
	SILTY CLAY Brown, wet	96.9	2								
	Test Pit Terminated at 2.0 m Depth	96.3									

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Test pit backfilled upon completion of excavating operation.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
On Completion	1.4	

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

Log of Borehole TP-10



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 32

Page. 1 of 1

Date Drilled: May 5, 2023

Drill Type: CAT 320F Track Mounted Hydraulic Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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 m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			Sample Comm.	Natural Unit Wt. kN/m³		
					20	40	60	80	Natural Moisture Content %						
					50	100	150	200	Atterberg Limits (% Dry Weight)						
		FILL Mixture of silty sand and clayey silt, some gravel, wood pieces, topsoil inclusions, brown, moist	99.86	0											
		GRANULAR FILL ~200 mm thick Crushed gravel, grey, moist	99.1										GS1		
		GRANULAR FILL ~200 mm thick Silty sand and gravel, brown, moist	98.9	1									GS2		
		TOPSOIL ~200 mm thick	98.7										GS3		
		SANDY SILT Some clay, grey, moist to wet	98.5										GS4		
		Test Pit Terminated at 2.0 m Depth	97.9	2									GS5		

NOTES:

- Borehole data requires interpretation by EXP before use by others
- Test pit backfilled upon completion of excavating operation.
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
On Completion	1.2	

CORE DRILLING RECORD

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

Log of Borehole TP-11



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 33

Page. 1 of 1

Date Drilled: May 5, 2023

Drill Type: CAT 320F Track Mounted Hydraulic Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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 m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			Natural Unit Wt. kN/m ³	
					20	40	60	80	Natural Moisture Content %				
					50	100	150	200	20	40	60		
		FILL Mixture of silty sand and clayey silt, some gravel, brown and grey, wet	99.99	0					X				
		GRANULAR FILL Silty sand and gravel, with asphalt, brick, plastic, and wood pieces, brown to grey, moist	99.7	1					X				
		TOPSOIL ~200 mm thick	98.6	2					X				
		SANDY SILT Brown, moist to wet	98.4										
		Test Pit Terminated at 2.2 m Depth	97.8										

NOTES:

- Borehole data requires interpretation by EXP before use by others
- Test pit backfilled upon completion of excavating operation.
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
On Completion	2.0	

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

Log of Borehole TP-12



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 34

Page. 1 of 1

Date Drilled: May 5, 2023

Drill Type: CAT 320F Track Mounted Hydraulic Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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 m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			Natural Unit Wt. kN/m ³	
				20	40	60	80	250	500	750		
				Shear Strength kPa				50	100	150	200	20
	TOPSOIL ~300 mm thick	98.28	0									
	SANDY SILT Some clay, brown, moist	98.0	1									
	SILTY CLAY Trace sand, grey, wet	96.9	2									
	Test Pit Terminated at 2.0 m Depth	96.3										

NOTES:

- Borehole data requires interpretation by EXP before use by others
- Test pit backfilled upon completion of excavating operation.
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
On Completion	1.4	

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

Log of Borehole TP-13



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. 35

Page. 1 of 1

Date Drilled: May 5, 2023

Drill Type: CAT 320F Track Mounted Hydraulic Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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 m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			Natural Unit Wt. kN/m ³	
				20	40	60	80	250	500	750		
				Shear Strength kPa				50	100	150	200	
	FILL Mixture of silty sand and clayey silt, some gravel, cobbles, boulders, concrete, metal strip, snow fence (plastic) and wood pieces, brown and grey, wet	99.7	0									
		98.2	1									
	TOPSOIL ~300 mm thick	97.9	2									
	SANDY SILT Non-plastic, some clay, brown, wet	97.7	2									
	Test Pit Terminated at 2.0 m Depth											

NOTES:

- Borehole data requires interpretation by EXP before use by others
- Test pit backfilled upon completion of excavating operation.
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
On Completion	1.8	

CORE DRILLING RECORD

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

Log of Borehole BH-25-01



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. A

Page. 1 of 3

Date Drilled: 'October 8, 2025

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: AN Checked by: SMP

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	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			SAMPLE	Natural Unit Wt. kN/m ³
				20	40	60	80	250	500	750		
Depth m	Shear Strength kPa	50	100	150	200	20	40	60	20	40	60	
0			98.68									
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	32 - 33.4		
2	33.4 - 34.9	100	63
3	34.9 - 36.4	98	97

Log of Borehole BH-25-01

Project No: OTT-23004319-A0

Project: New Catholic High School

Figure No. A

Page. 2 of 3



G W L	S Y M B O L	SOIL DESCRIPTION	Geodetic Elevation m	D e p h	Standard Penetration Test N Value								Combustible Vapour Reading (ppm) 250 500 750	S A M P L E S	Natural Unit Wt. kN/m ³				
					20 40 60 80				Shear Strength 50 100 150 200 kPa										
					Natural Moisture Content % Atterberg Limits (% Dry Weight) 20 40 60														
		INFERRRED OVERBURDEN SOIL Borehole advanced by power augering method and wash-boring method using casing to 32.0 m depth (continued)	86.68	12															
				13															
				14															
				15															
				16															
				17															
				18															
				19															
				20															
				21															
				22															
				23															
				24															
				25															
				26															

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	32 - 33.4		
2	33.4 - 34.9	100	63
3	34.9 - 36.4	98	97

Log of Borehole BH-25-01

Project No: OTT-23004319-A0

Project: New Catholic High School



Figure No. A

Page. 3 of 3

G W L	S Y M B O L	SOIL DESCRIPTION	Geodetic Elevation m	D e p h	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			S A M P L E S	Natural Unit Wt. kN/m ³	
					20	40	60	80	250	500	750			
					Shear Strength kPa				50	100	150	200		
		INFERRED OVERBURDEN SOIL Borehole advanced by power augering method and wash-boring method using casing to 32.0 m depth (continued)	72.28	27										
				28										
				29										
				30										
				31										
				32										
				33										
				34										
				35										
				36										
		LIMESTONE BEDROCK With shaly partings, grey (fair to excellent quality)	65.0	62.3										
		Borehole Terminated at 36.4 m Depth												
Run 1														
Run 2														
Run 3														

LOG OF BOREHOLE BH LOGS - 23004319-OCTOBER 2025 GPU TROW OTTAWA GDT 12/17/25

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

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

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %
1	32 - 33.4		
2	33.4 - 34.9	100	63
3	34.9 - 36.4	98	97

Log of Borehole BH-25-02



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. B

Page. 1 of 3

Date Drilled: 'October 9, 2025

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: AN Checked by: SMP

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	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			SAMPLE	Natural Unit Wt. kN/m ³	
				Dep'th	20	40	60	80	250	500	750		
			98.54	0	Shear Strength kPa	50	100	150	200	20	40	60	
		INFERRRED OVERBURDEN SOIL Borehole advanced by power augering technique from ground surface to 1.5 m depth.	97.0	1									
		INFERRRED OVERBURDEN SOIL Borehole advanced by conducting dynamic cone penetration test (DCPT) from 1.5 m to cone refusal at 33.1 m depth.		2									
				3									
				4									
				5									
				6									
				7									
				8									
				9									
				10									
				11									
				12									

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

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

Log of Borehole **BH-25-02**

Project No: OTT-23004319-A0

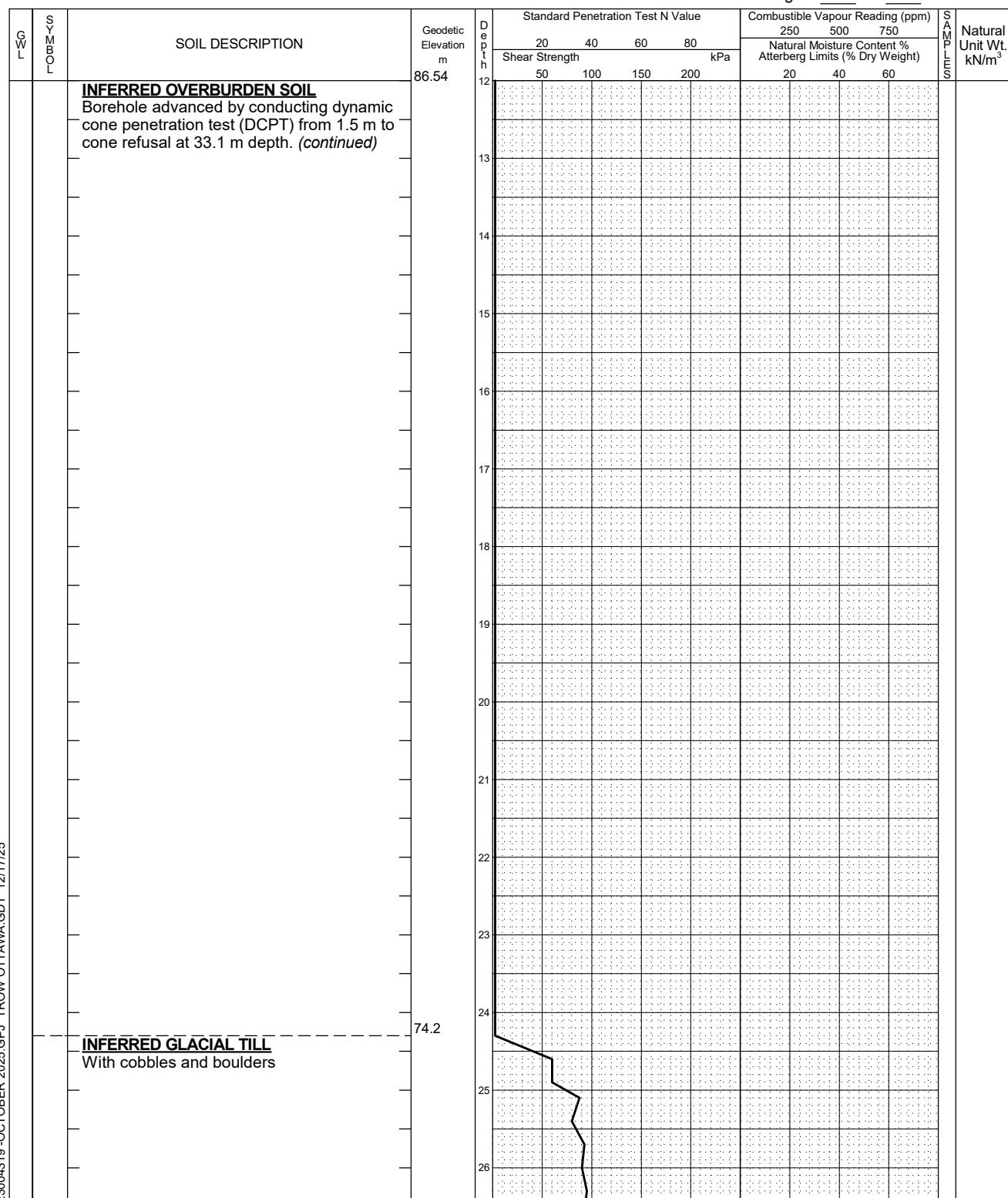
Project: New Catholic High School

Figure No. B

The logo for exp. features a cluster of colorful dots in shades of orange, yellow, and brown, followed by the lowercase letters "exp." in a black sans-serif font.

B

Page. 2 of 3



Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

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

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

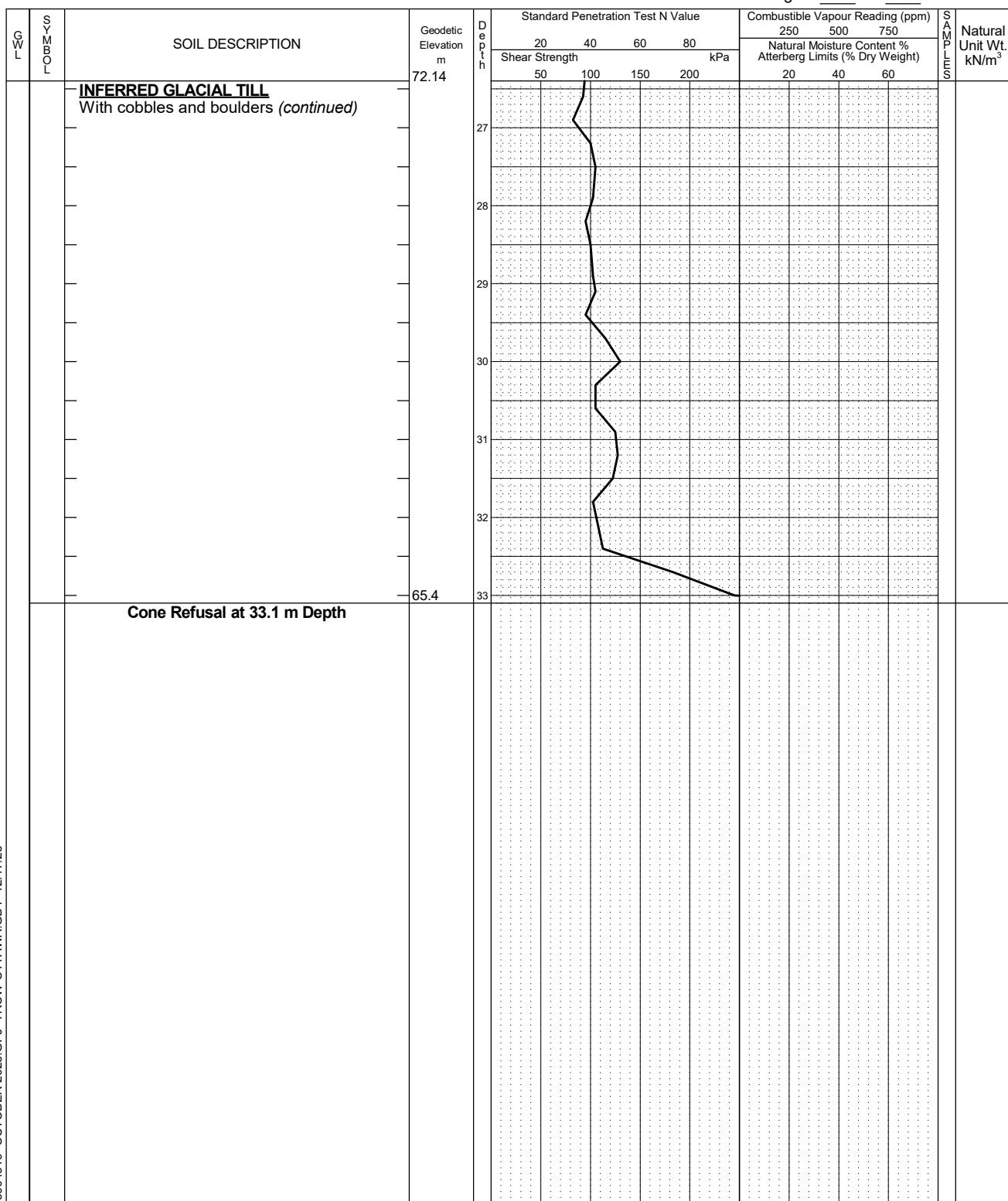
Log of Borehole BH-25-02

Project No: OTT-23004319-A0

Project: New Catholic High School

Figure No. B

Page. 3 of 3



LOG OF BOREHOLE BH LOGS - 23004319-OCTOBER 2025 GPU TROW OTTAWA GDT 12/17/25

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

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

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

Log of Borehole BH-25-04



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. C

Page. 1 of 3

Date Drilled: 'October 10, 2025

Split Spoon Sample

Combustible Vapour Reading

Drill Type: CME-55 Track Mounted Drill Rig

Auger Sample

Natural Moisture Content

Datum: Geodetic Elevation

SPT (N) Value

Atterberg Limits

Logged by: SB Checked by: SMP

Dynamic Cone Test

Undrained Triaxial at

Shelby Tube

% Strain at Failure

Shear Strength by

Shear Strength by

Vane Test

Penetrometer Test

GWL	Symbol	Soil Description	Geodetic Elevation m	Depth m	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			Sample	
					20	40	60	80	250	500	750		
					Shear Strength kPa	50	100	150	200	20	40	60	
		INFERRRED OVERBURDEN SOIL Borehole advanced by conducting dynamic cone penetration test (DCPT) from ground surface to cone refusal at 34.0 m depth	98.71	0									
				1									
				2									
				3									
				4									
				5									
				6									
				7									
				8									
				9									
				10									
				11									
				12									

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	34 - 34.9		
2	34.9 - 36.4	85	10
3	36.4 - 37.9	93	32
4	37.9 - 39.4	98	55

Log of Borehole BH-25-04

Project No: OTT-23004319-A0

Project: New Catholic High School

Figure No. C

The logo for exp. features the word "exp." in a lowercase, sans-serif font. To the left of the "e", there is a cluster of small, colorful dots in shades of orange, yellow, and green.

C

Page. 2 of 3

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

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

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %
1	34 - 34.9		
2	34.9 - 36.4	85	10
3	36.4 - 37.9	93	32
4	37.9 - 39.4	98	55

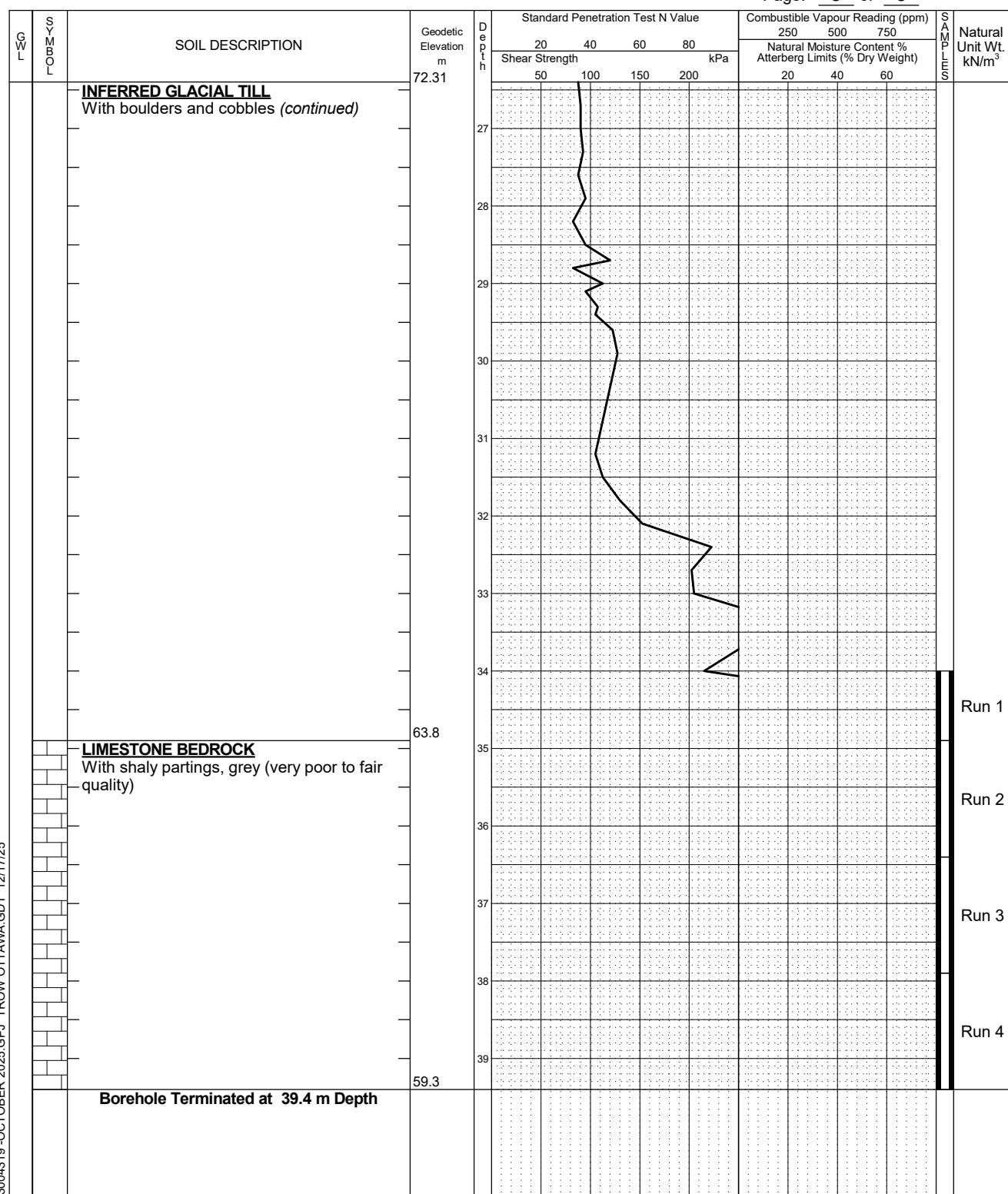
Log of Borehole BH-25-04

Project No: OTT-23004319-A0

Project: New Catholic High School

Figure No. C

Page. 3 of 3



LOG OF BOREHOLE BH LOGS - 23004319-OCTOBER 2025 GPU TROW OTTAWA GDT 12/17/25

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

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

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %
1	34 - 34.9		
2	34.9 - 36.4	85	10
3	36.4 - 37.9	93	32
4	37.9 - 39.4	98	55

Log of Borehole BH-25-05



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. D

Page. 1 of 3

Date Drilled: 'October 7, 2025

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: AN Checked by: SMP

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	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			SAMPLE	Natural Unit Wt. kN/m ³
				20	40	60	80	250	500	750		
Depth m	Shear Strength kPa	50	100	150	200	20	40	60	20	40	60	
0			98.87									
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

Continued Next Page

NOTES:

- Borehole data requires interpretation by EXP before use by others
- Borehole was backfilled upon completion
- Field work supervised by an EXP representative.
- See Notes on Sample Descriptions
- Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	29.5 - 30.4		
2	30.4 - 32	42	6
3	32 - 33.4	70	14
4	33.4 - 34.8	76	25

Log of Borehole **BH-25-05**

Project No: OTT-23004319-A0

Project: New Catholic High School

Figure No. D

The logo for exp. features a cluster of colorful dots in shades of orange, yellow, and brown, followed by the lowercase letters "exp." in a black sans-serif font.

Page. 2 of 3

Continued Next Page

LOG OF BOREHOLE BH LOGS - 2		Continued Next Page				
NOTES:		WATER LEVEL RECORDS			CORE DRILLING RECORD	
Date	Water Level (m)	Hole Open To (m)	Run No.	Depth (m)	% Rec.	RQD %
			1	29.5 - 30.4		
			2	30.4 - 32	42	6
			3	32 - 33.4	70	14
			4	33.4 - 34.8	76	25

Log of Borehole BH-25-05

Project No: OTT-23004319-A0

Project: New Catholic High School

Figure No. D

Page. 3 of 3



G W L	S Y M B O L	SOIL DESCRIPTION	Geodetic Elevation m	D e p h	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			S A M P L E S	Natural Unit Wt. kN/m ³		
					20 40 60 80				250 500 750						
					Shear Strength kPa 50 100 150 200				Natural Moisture Content % Atterberg Limits (% Dry Weight)						
		INFERRED OVERBURDEN SOIL Borehole advanced by power augering method and wash-boring method using casing from ground surface to 29.5 m depth. (continued)	72.47												
				27											
				28											
				29											
				30									Run 1		
				31									Run 2		
				32									Run 3		
				33									Run 4		
				34											
		Borehole Terminated at 34.8 m Depth	64.1												

LOG OF BOREHOLE BH LOGS - 23004319-OCTOBER 2025 GPU TROW OTTAWA GDT 12/17/25

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

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

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %
1	29.5 - 30.4		
2	30.4 - 32	42	6
3	32 - 33.4	70	14
4	33.4 - 34.8	76	25

Log of Borehole BH-25-06



Project No: OTT-23004319-A0

Project: New Catholic High School

Location: 5431 Fernbank Road, Ottawa, Ontario

Figure No. E

Page. 1 of 3

Date Drilled: 'October 9, 2025

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: AN Checked by: SMP

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	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			SAMPLE	Natural Unit Wt. kN/m ³
				20	40	60	80	250	500	750		
Depth	Shear Strength kPa	50	100	150	200	20	40	60	20	40	60	
0			98.73									
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	31.2 - 31.9		
2	31.9 - 33.5	60	35
3	33.5 - 34.9	98	98
4	34.9 - 36.4	100	100

Log of Borehole BH-25-06

Project No: OTT-23004319-A0

Project: New Catholic High School

Figure No. E

Page. 2 of 3



G W L	S Y M B O L	SOIL DESCRIPTION	Geodetic Elevation m	86.73	D e p h	Standard Penetration Test N Value								Combustible Vapour Reading (ppm) 250 500 750	S A M P L E S	Natural Unit Wt. kN/m ³			
						20 40 60 80				Shear Strength 50 100 150 200 kPa									
						20 40 60				Atterberg Limits (% Dry Weight)									
		INFERRRED OVERBURDEN SOIL Borehole advanced by power augering method and wash-boring method using casing from ground surface to 31.2 m depth. (continued)			12														
					13														
					14														
					15														
					16														
					17														
					18														
					19														
					20														
					21														
					22														
					23														
					24														
					25														
					26														

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	31.2 - 31.9		
2	31.9 - 33.5	60	35
3	33.5 - 34.9	98	98
4	34.9 - 36.4	100	100

Log of Borehole BH-25-06

Project No: OTT-23004319-A0

Project: New Catholic High School

Figure No. E

Page. 3 of 3



G W L	S Y M B O L	SOIL DESCRIPTION	Geodetic Elevation m	D e p t h	Standard Penetration Test N Value				Combustible Vapour Reading (ppm)			S A M P L E S	Natural Unit Wt. kN/m ³		
					20 40 60 80				250 500 750						
					Shear Strength kPa				Natural Moisture Content % Atterberg Limits (% Dry Weight)						
		INFERRED OVERBURDEN SOIL Borehole advanced by power augering method and wash-boring method using casing from ground surface to 31.2 m depth. (continued)	72.33												
				27											
				28											
				29											
				30											
				31									Run 1		
				32									Run 2		
		LIMESTONE BEDROCK With shaly partings, grey (poor to excellent quality)	65.9	33									Run 3		
				34									Run 4		
				35											
				36											
		Borehole Terminated at 36.4 m Depth	62.3												

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-23004319-A0

WATER LEVEL RECORDS

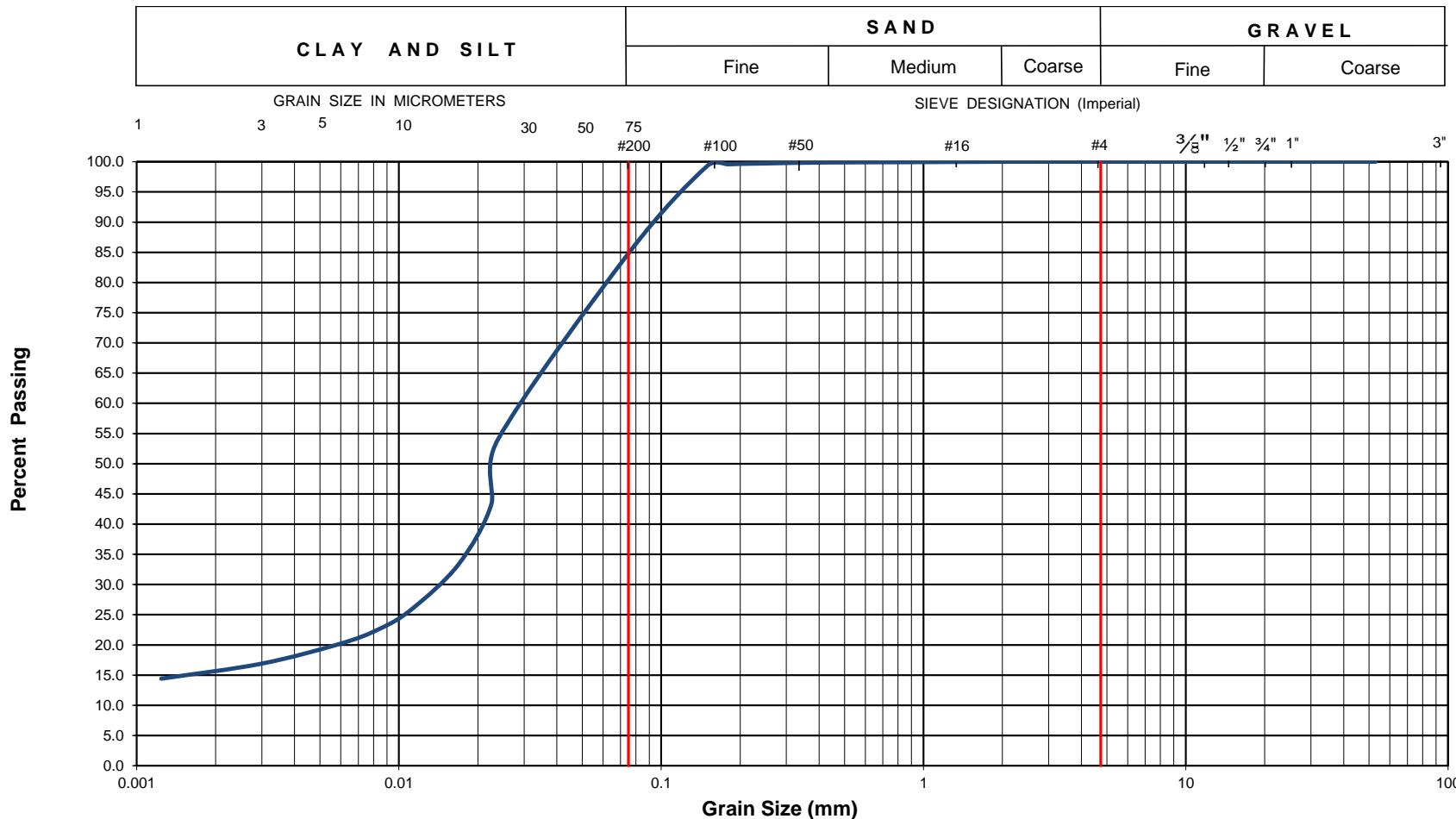
Date	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	31.2 - 31.9		
2	31.9 - 33.5	60	35
3	33.5 - 34.9	98	98
4	34.9 - 36.4	100	100

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

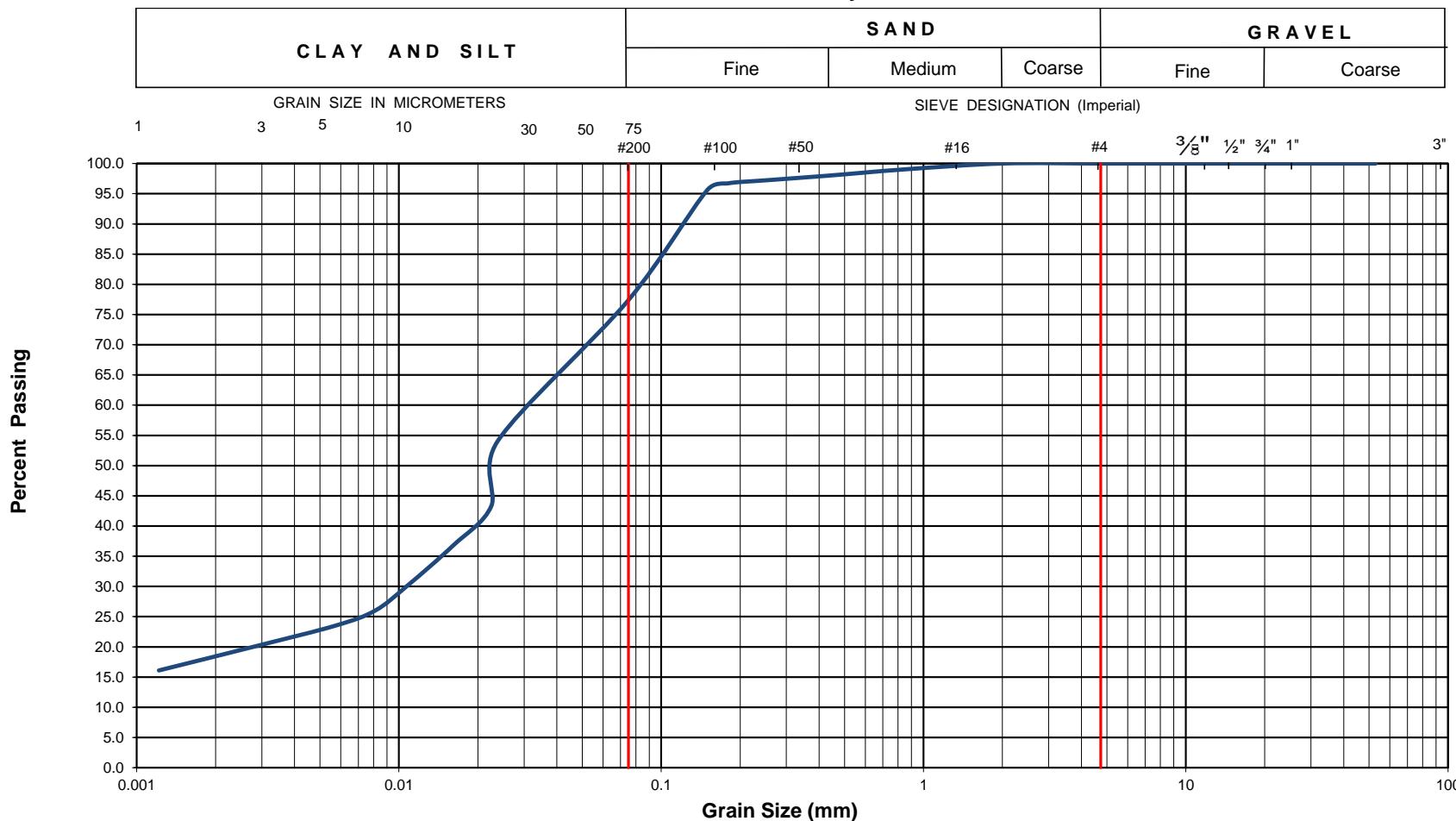
Unified Soil Classification System



EXP Project No.:	OTT-23004319-A0	Project Name :	Proposed New Catholic High School				
Client :	OCSB	Project Location :	5431 Fernbank Road, Ottawa, Ontario				
Date Sampled :	May 5, 2023	Borehole No:	TP5		Sample No.:	GS2	
Sample Description :		% Silt and Clay	85	% Sand	15	% Gravel	0
Sample Description :	Non-Plastic Silt (ML) -Some Sand and Clay						Figure : 36

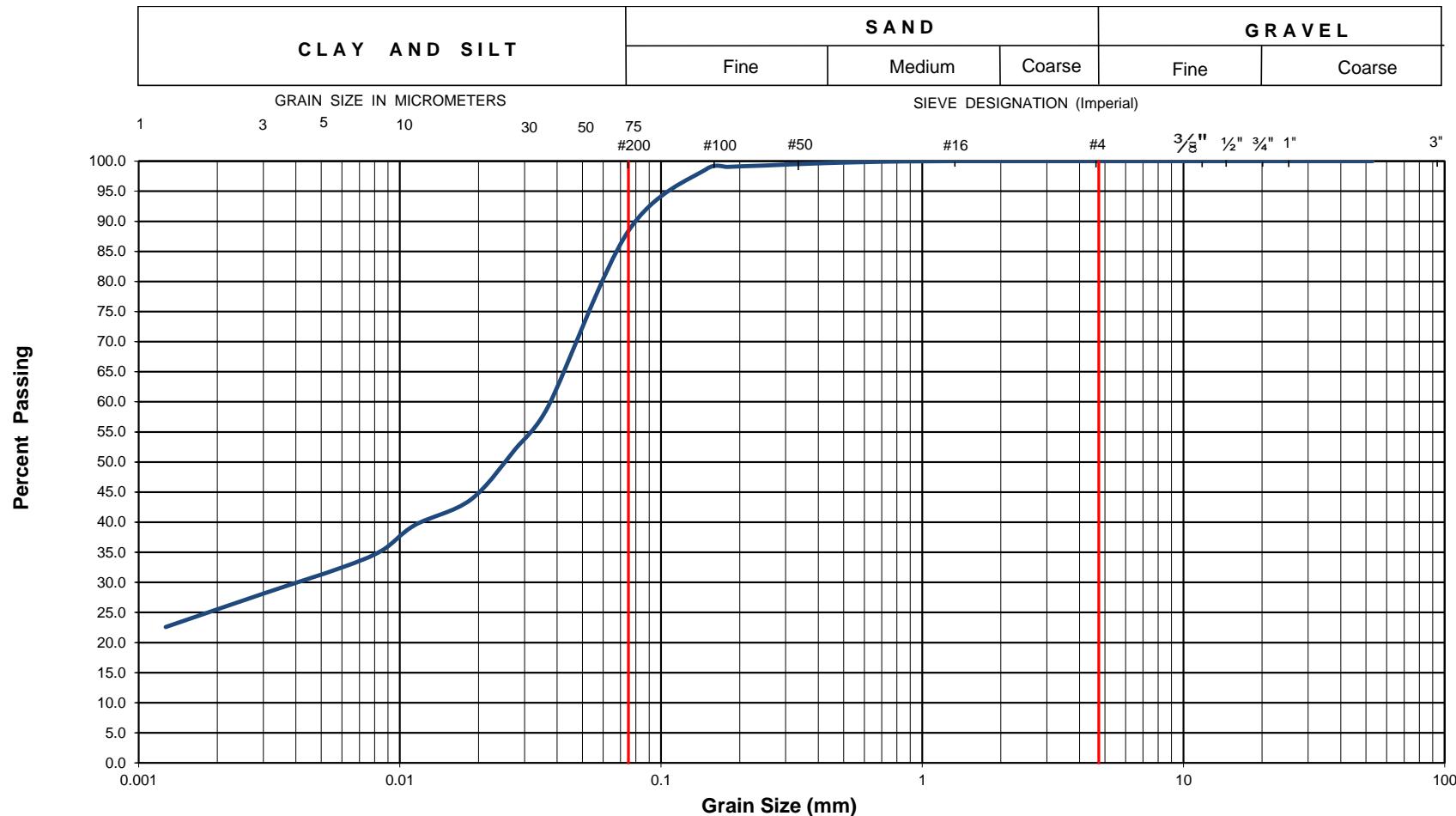
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422

Unified Soil Classification System

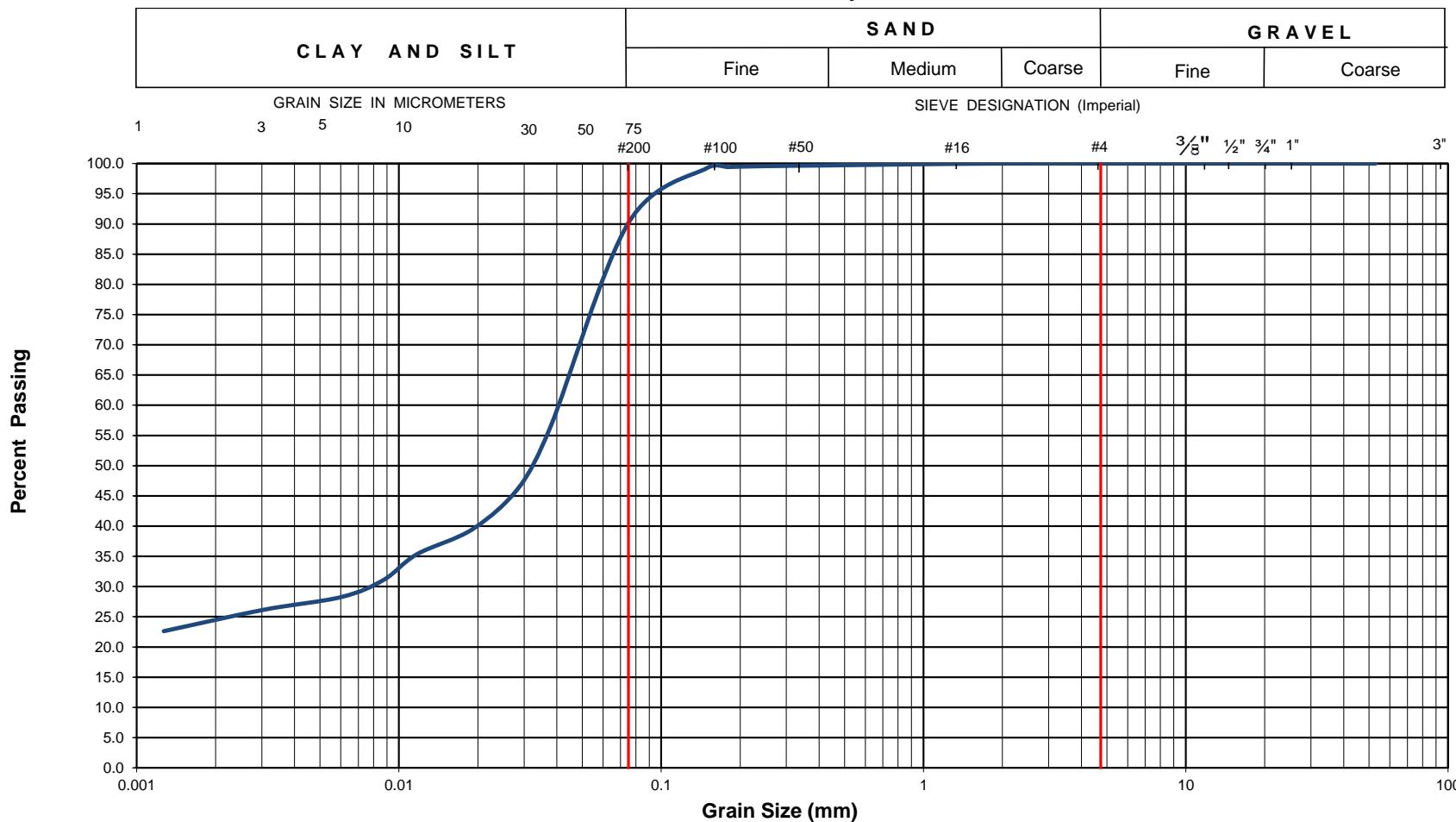


EXP Project No.:	OTT-23004319-A0	Project Name :	Proposed New Catholic High School					
Client :	OCSB	Project Location :	5431 Fernbank Road, Ottawa, Ontario					
Date Sampled :	May 5, 2023	Borehole No:	TP13	Sample No.:	GS3	Depth (m) :		
Sample Description :		% Silt and Clay	77	% Sand	23	% Gravel		
Sample Description :	Non-Plastic Sandy Silt (ML) -Some Clay						Figure :	37

Unified Soil Classification System



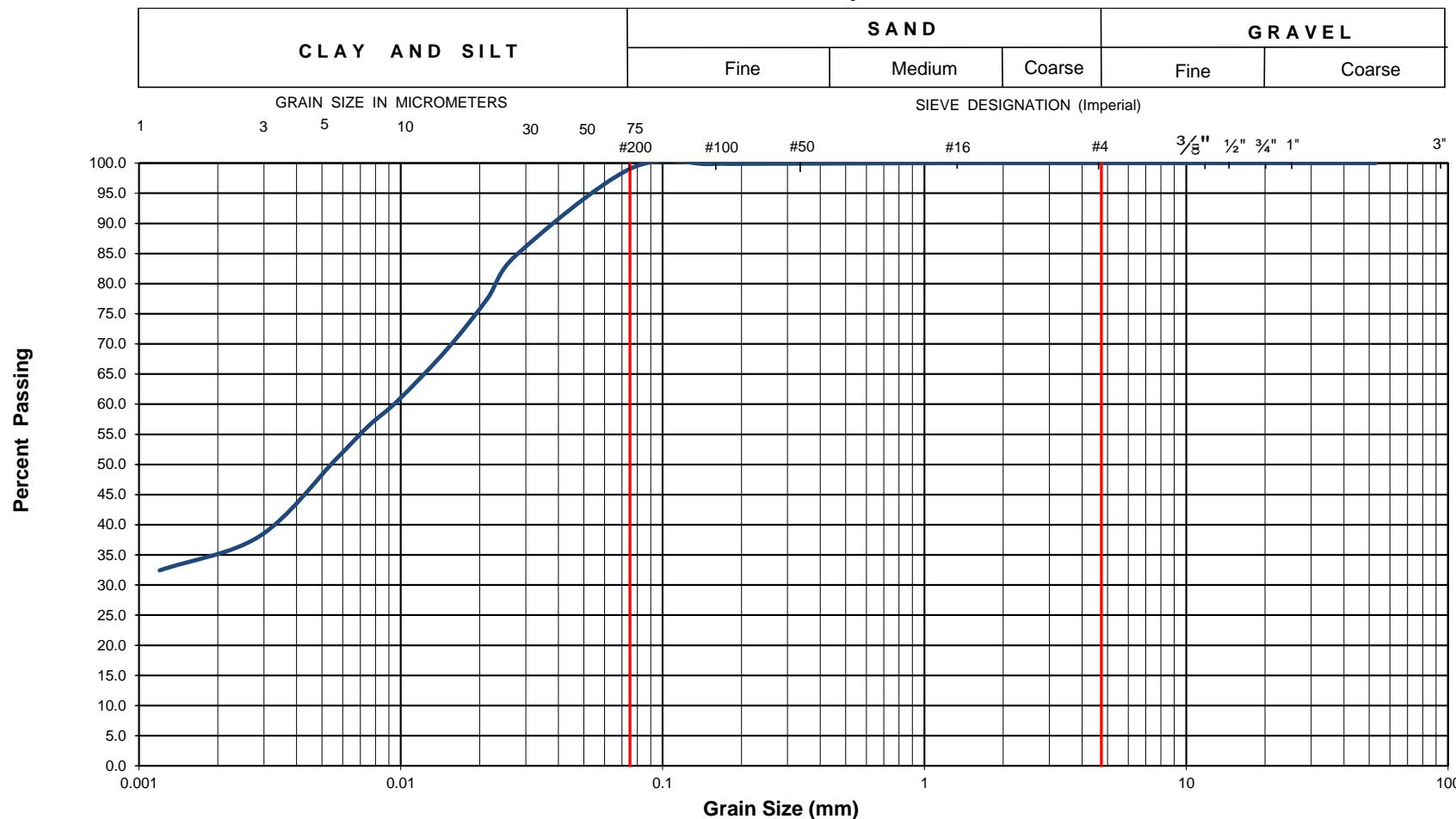
Unified Soil Classification System



EXP Project No.:	OTT-23004319-A0	Project Name :	Proposed New Catholic High School					
Client :	OCSB	Project Location :	5431 Fernbank Road, Ottawa, Ontario					
Date Sampled :	May 15, 2023	Borehole No:	BH2	Sample No.:	SS4	Depth (m) :		
Sample Description :		% Silt and Clay	90	% Sand	10	% Gravel		
Sample Description :	Silty Clay to Clayey Silt of Low Plasticity (CL-ML) - Trace to Some Sand						Figure :	39

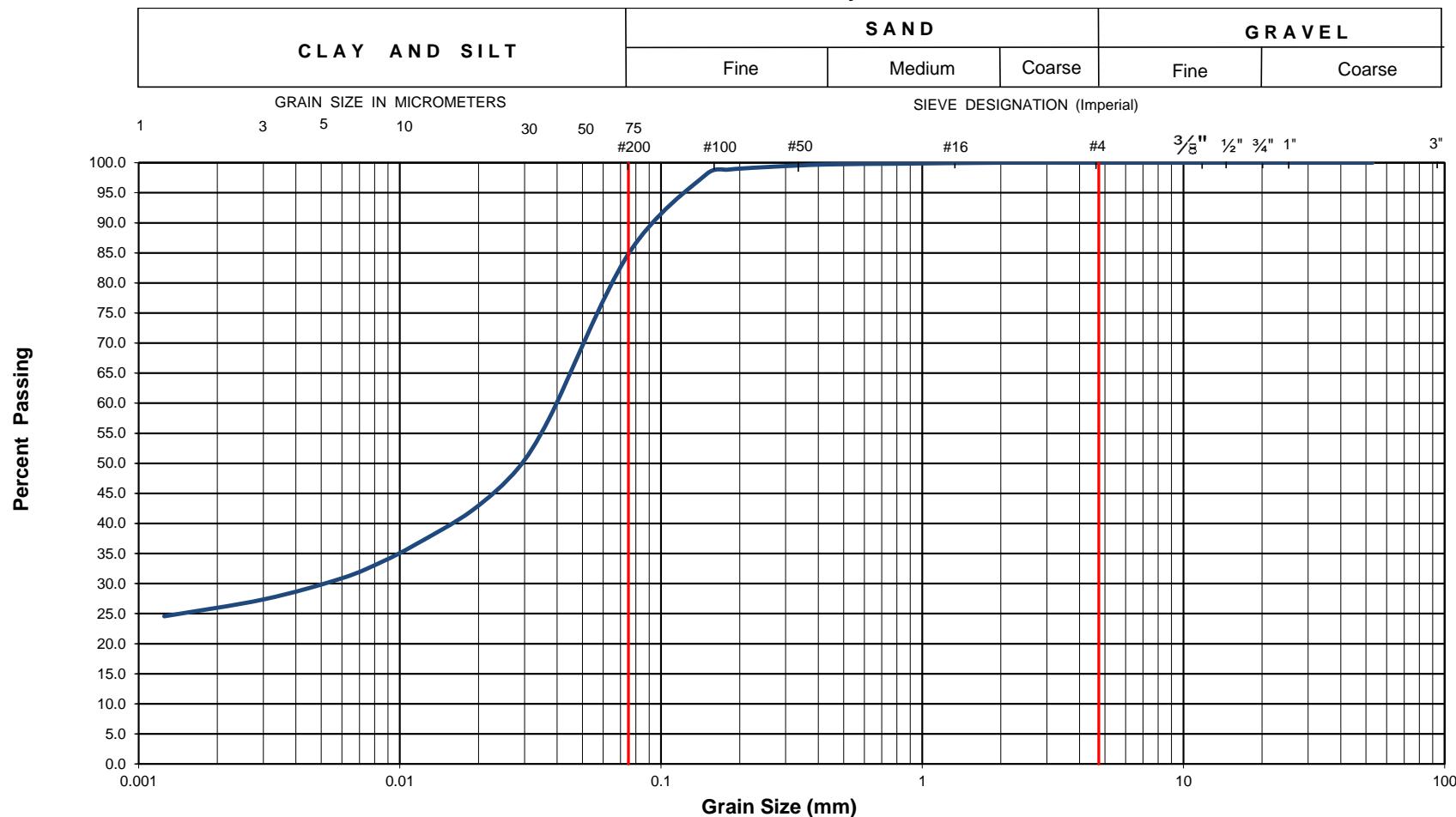
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422

Unified Soil Classification System

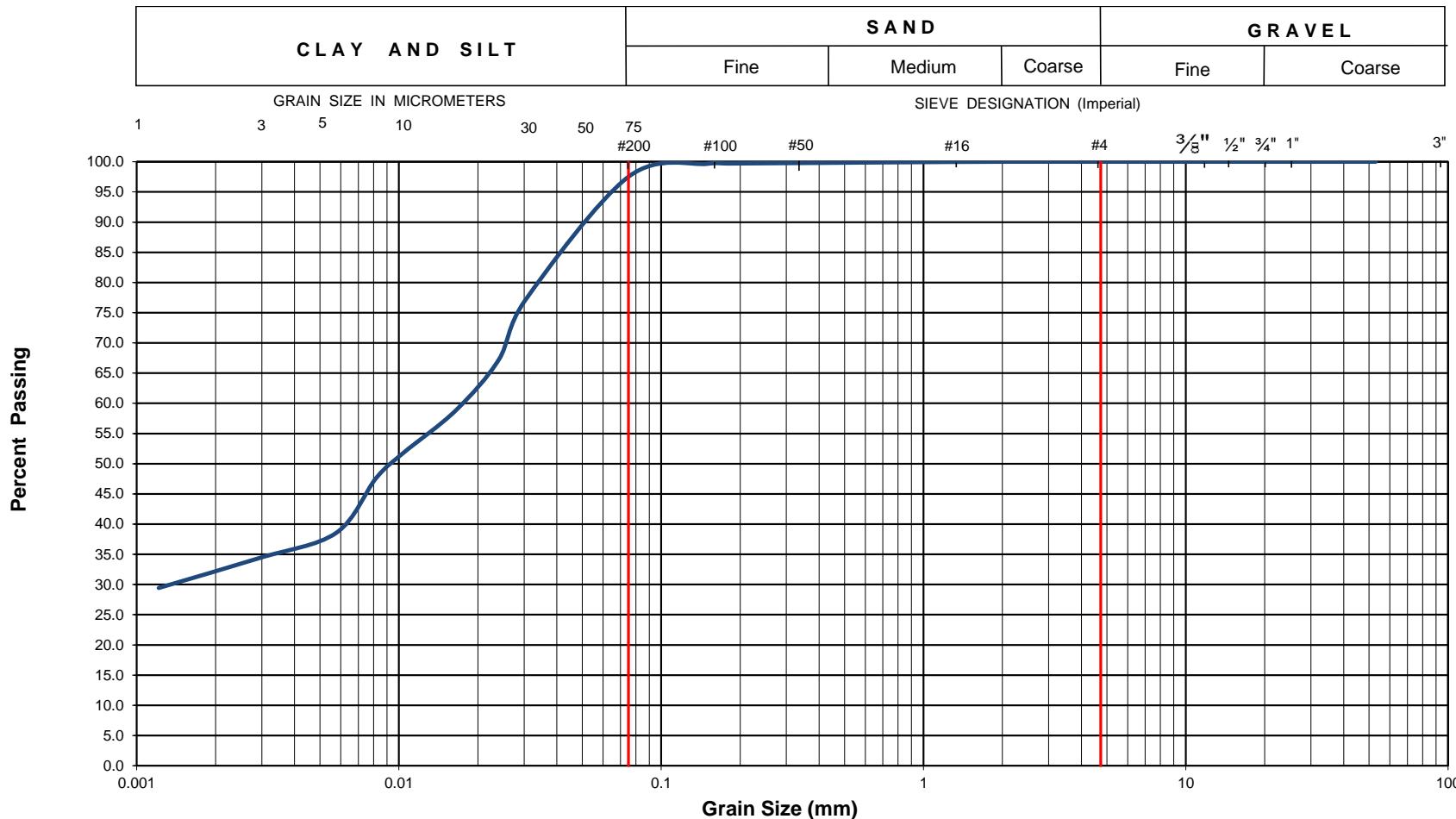


EXP Project No.:	OTT-23004319-A0	Project Name :	Proposed New Catholic High School				
Client :	OCSB	Project Location :	5431 Fernbank Road, Ottawa, Ontario				
Date Sampled :	May 15, 2023	Borehole No:	BH2		Sample No.:	SS6	Depth (m) :
Sample Description :		% Silt and Clay	99	% Sand	1	% Gravel	0
Sample Description :	Silty Clay of Medium Plasticity (CL) - Trace Sand					Figure :	40

Unified Soil Classification System

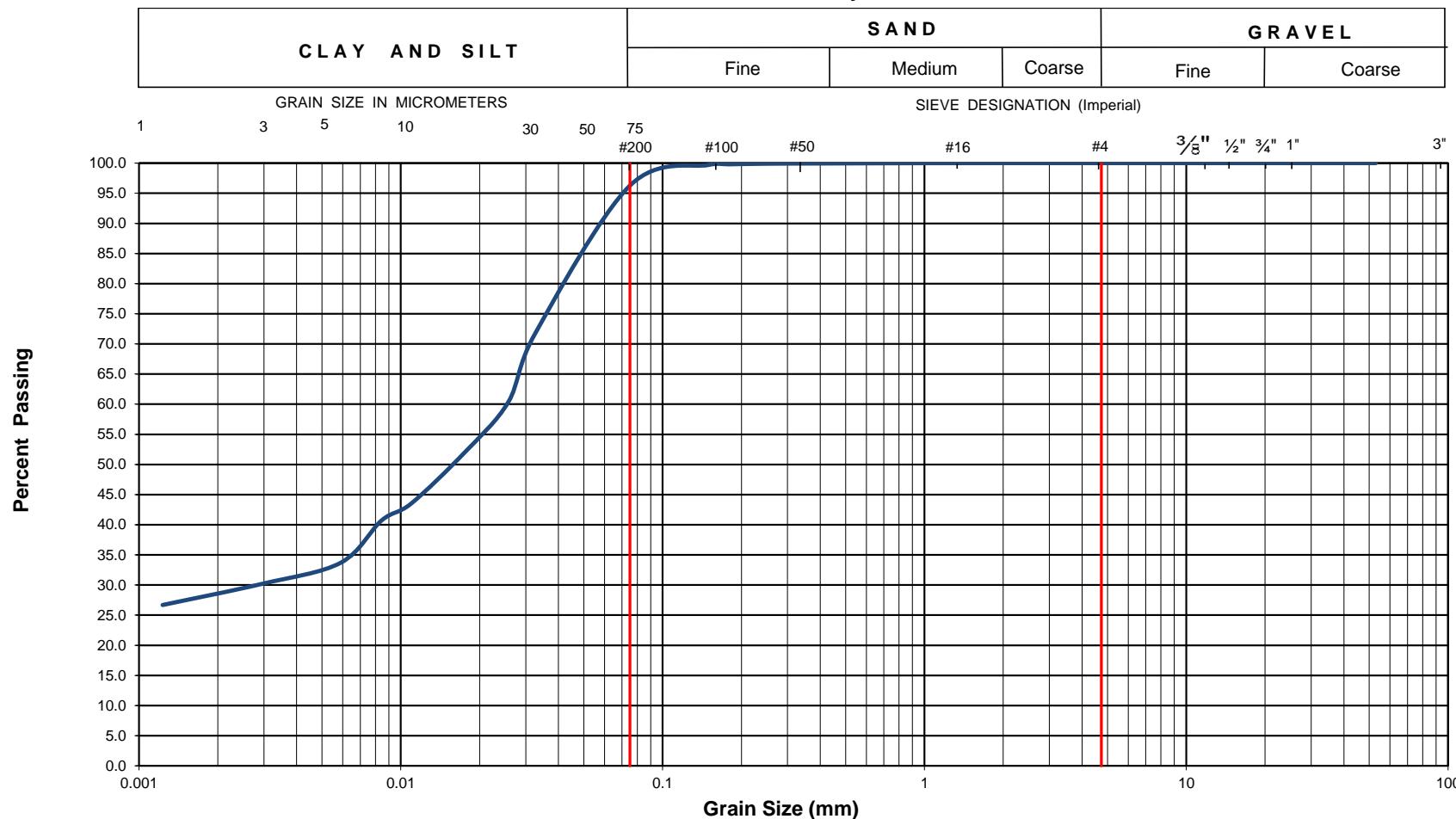


Unified Soil Classification System



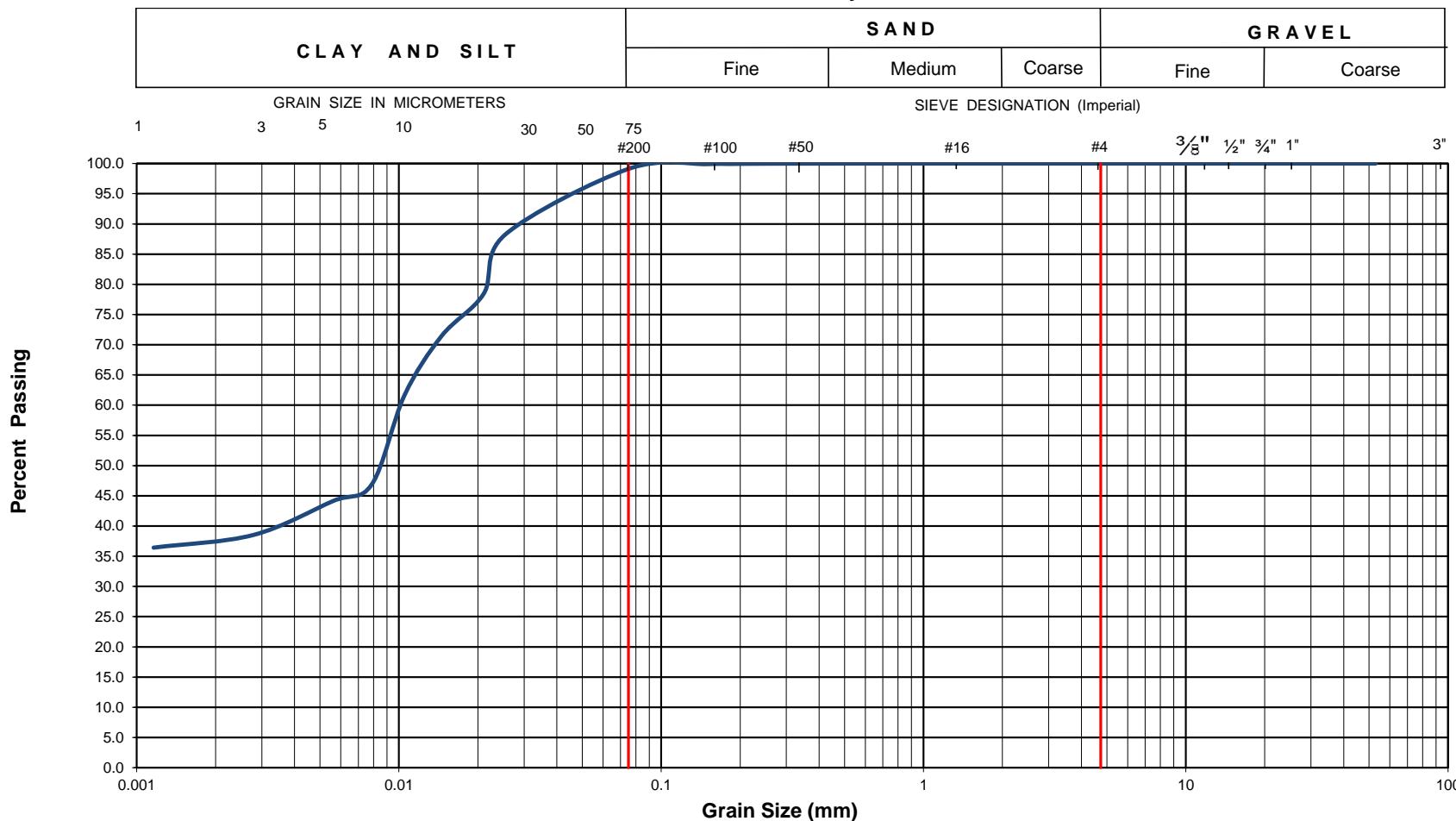
EXP Project No.:	OTT-23004319-A0	Project Name :	Proposed New Catholic High School					
Client :	OCSB	Project Location :	5431 Fernbank Road, Ottawa, Ontario					
Date Sampled :	May 15, 2023	Borehole No:	BH10	Sample No.:	SS5	Depth (m) :		
Sample Description :		% Silt and Clay	98	% Sand	2	% Gravel		
Sample Description :	Silty Clay of Low to Medium Plasticity (CL) -Trace Sand						Figure :	42

Unified Soil Classification System



EXP Project No.:	OTT-23004319-A0	Project Name :	Proposed New Catholic High School						
Client :	OCSB	Project Location :	5431 Fernbank Road, Ottawa, Ontario						
Date Sampled :	May 16, 2023	Borehole No:	BH11		Sample No.:	SS4			
Sample Description :		% Silt and Clay	96	% Sand	4	% Gravel	0		
Sample Description :	Silty Clay of Low Plasticity (CL) -Trace Sand							Figure :	43

Unified Soil Classification System



EXP Project No.:	OTT-23004319-A0	Project Name :	Proposed New Catholic High School			
Client :	OCSB	Project Location :	5431 Fernbank Road, Ottawa, Ontario			
Date Sampled :	May 16, 2023	Borehole No:	BH13	Sample No.:	SS5	Depth (m) :
Sample Description :	% Silt and Clay	99	% Sand	1	% Gravel	0
Sample Description :	Silty Clay of Medium Plasticity (CL) - Trace Sand				Figure :	44

Appendix A – Borehole Logs and Consolidation Test Results for Borehole Nos. 1, 9 and 10 – Paterson Group Inc.

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2233

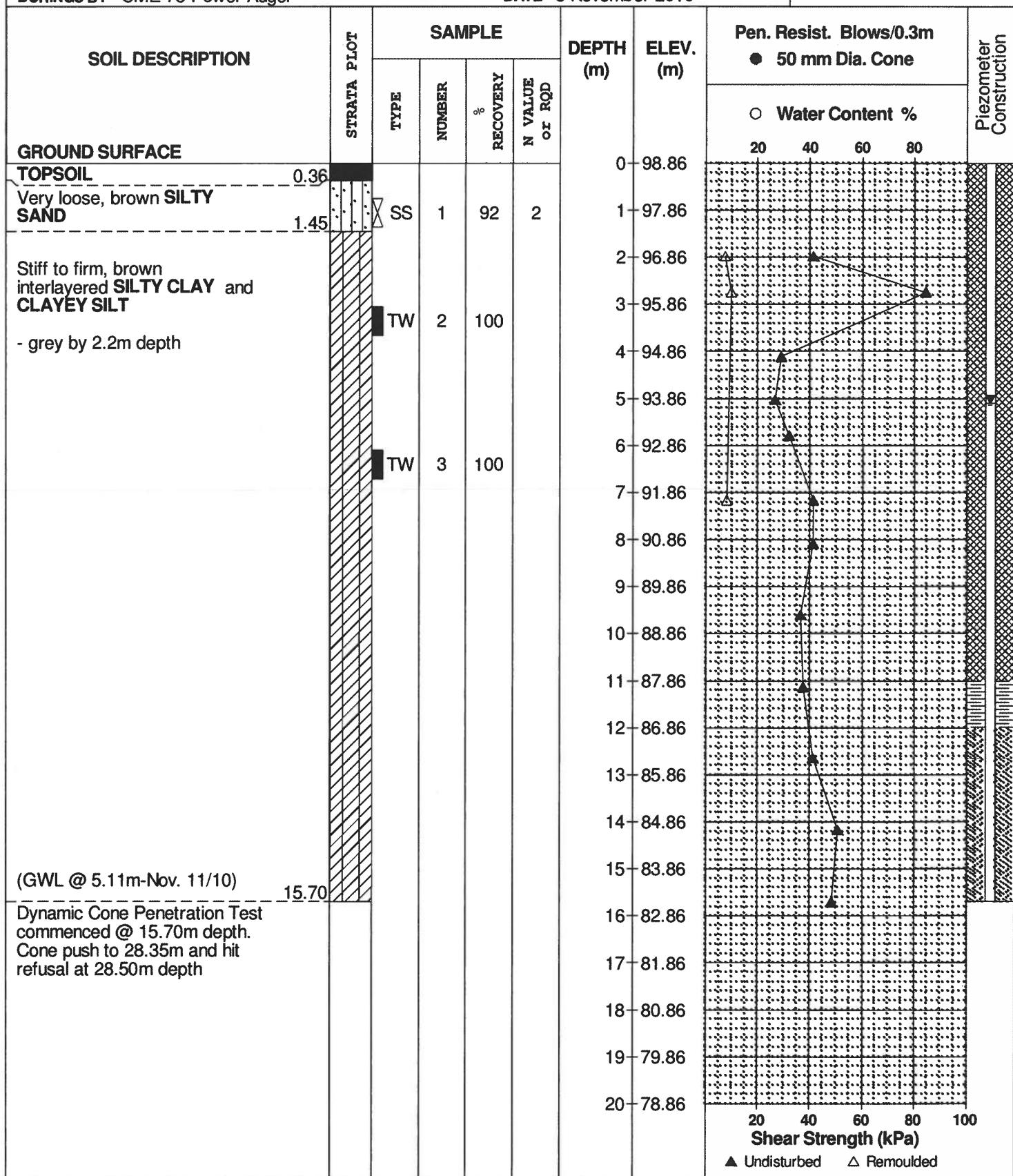
REMARKS

HOLE NO.

BORINGS BY CME 75 Power Auger

DATE 5 November 2010

BH 1



DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

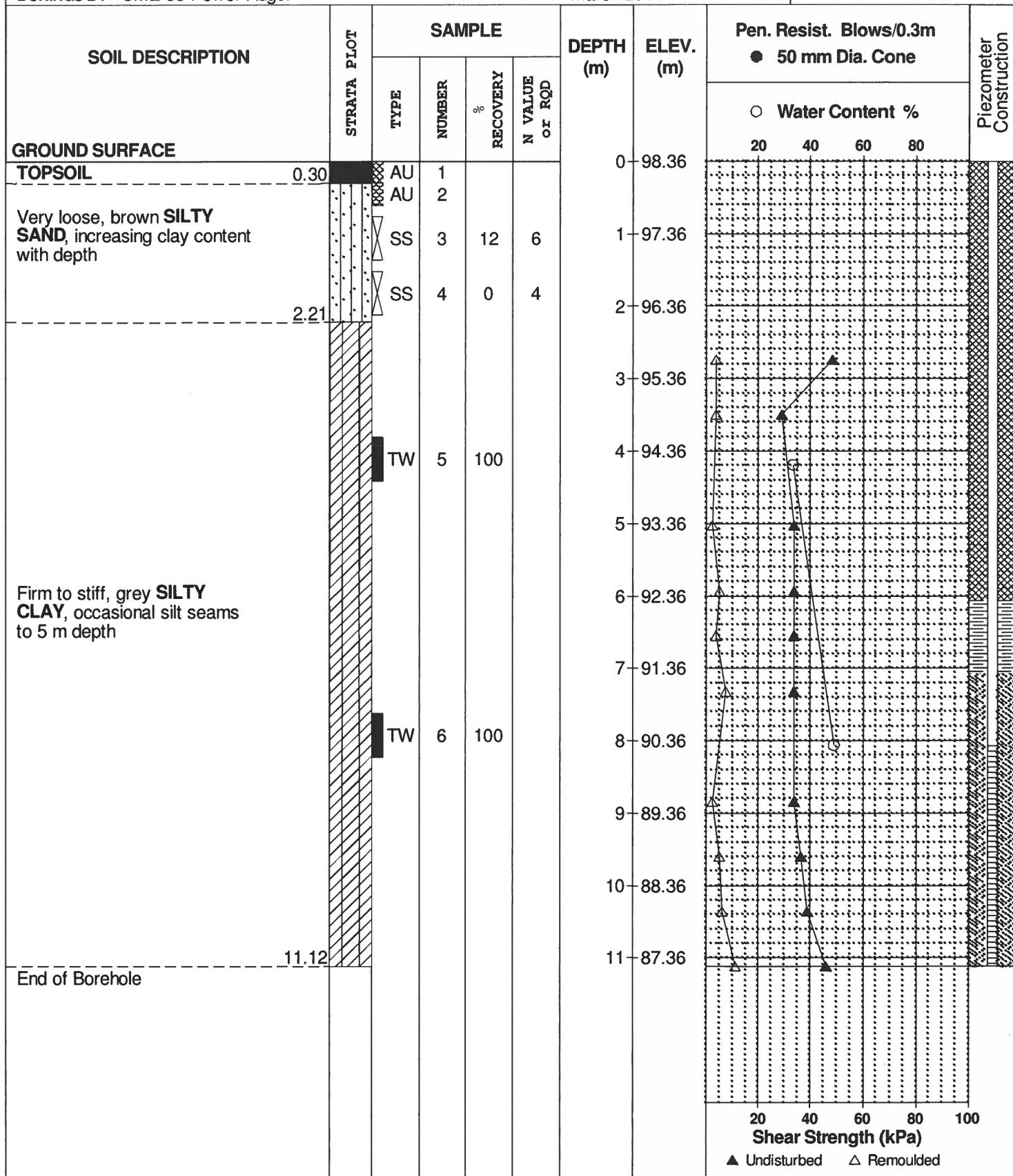
 FILE NO.
PG2233

REMARKS

 HOLE NO.
BH 9

BORINGS BY CME 55 Power Auger

DATE 7 March 2011



DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2233

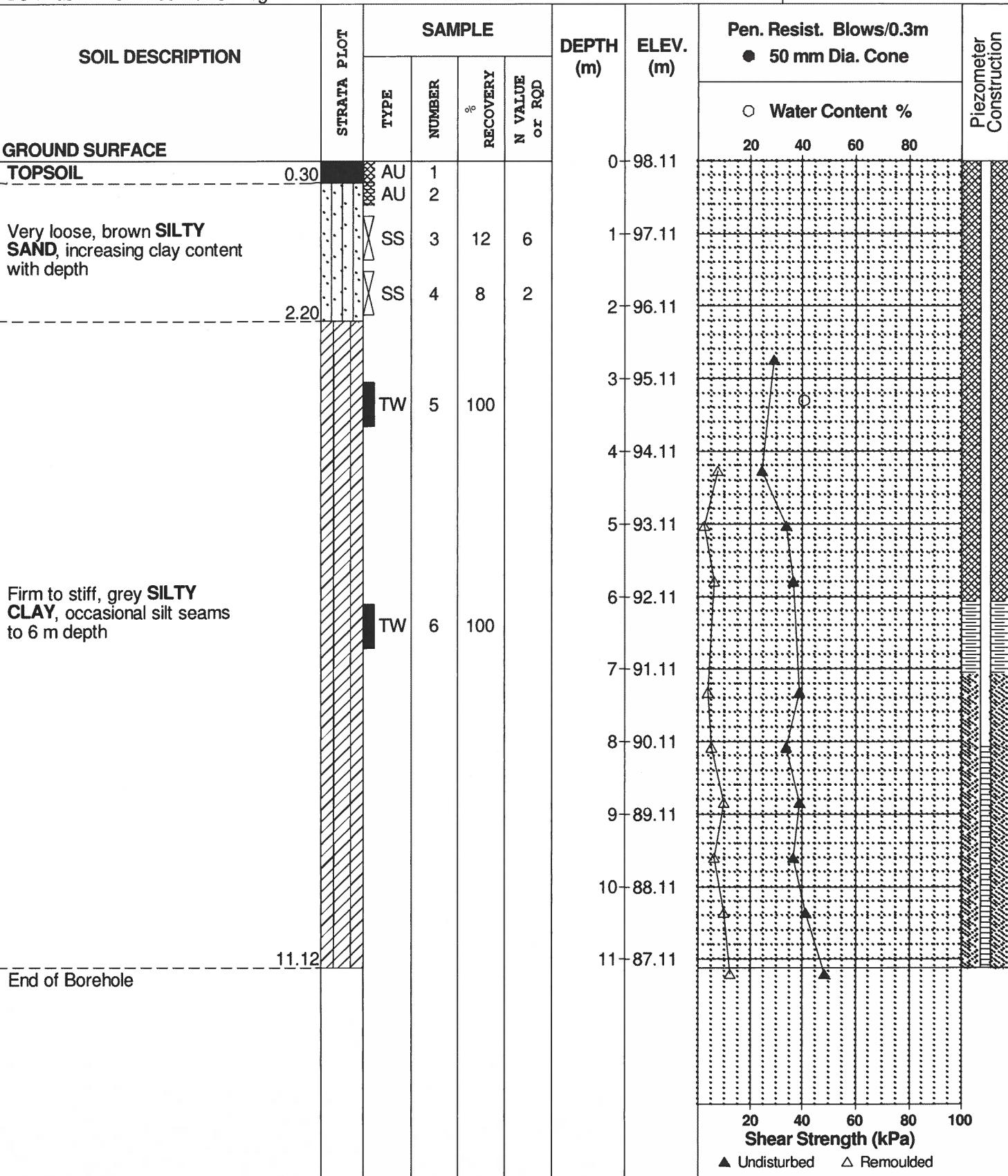
REMARKS

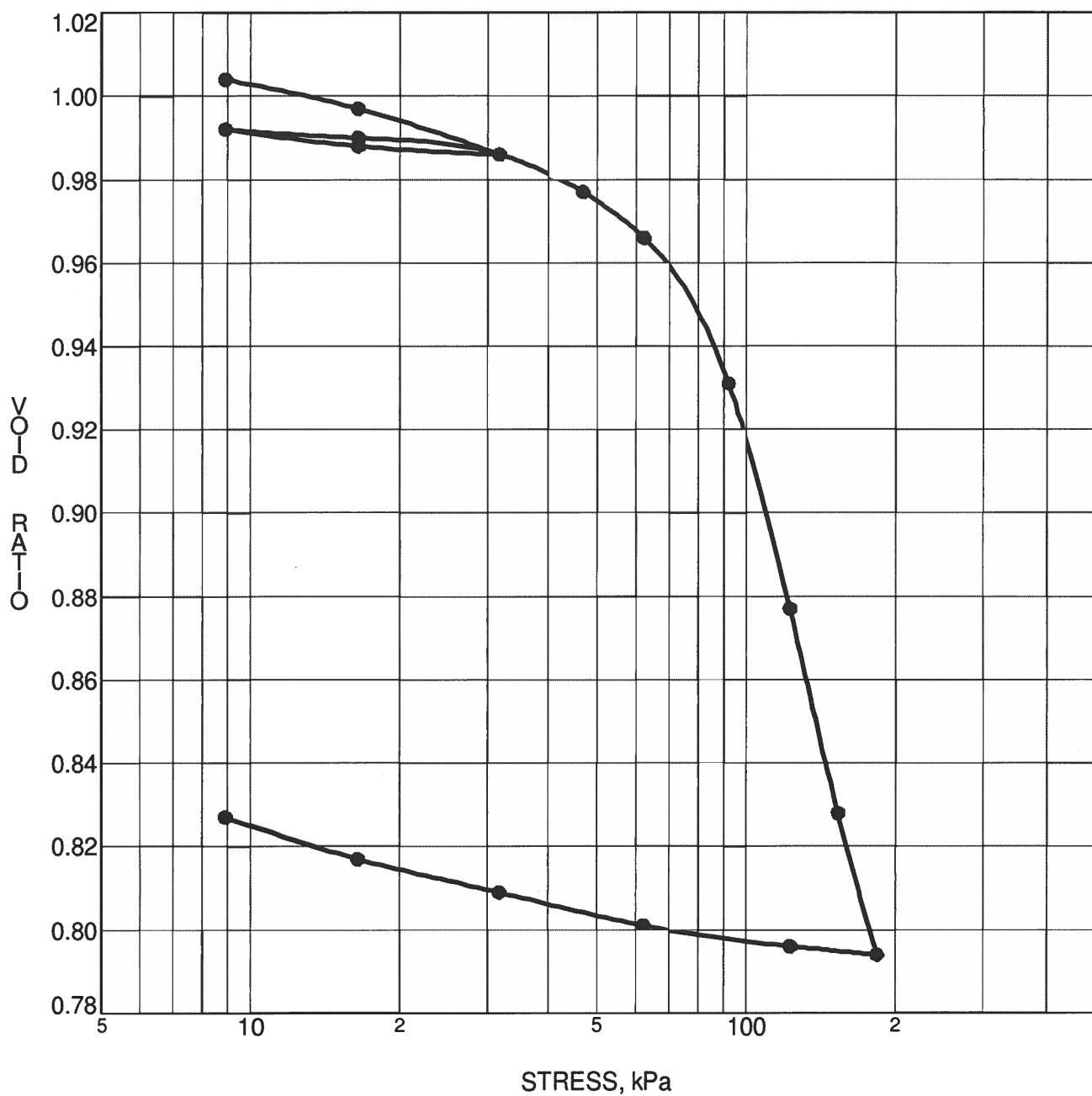
HOLE NO.

BH10

BORINGS BY CME 55 Power Auger

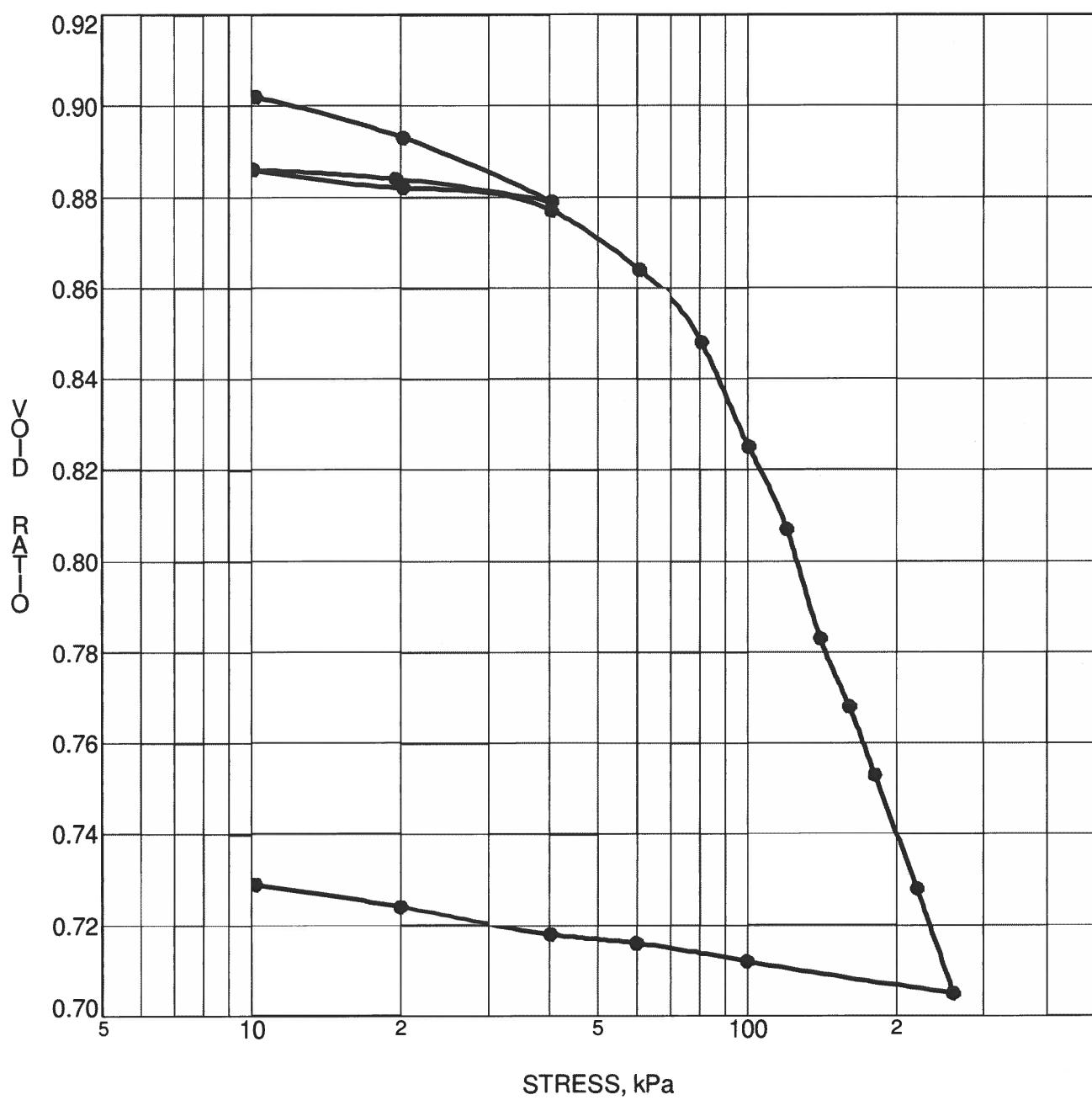
DATE 7 March 2011





CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	BH 1	p'_o	40	kPa	C _{cr} 0.012
Sample No.	TW 2	p'_c	78	kPa	C _c 0.471
Sample Depth	3.45 m	OC Ratio	2.0		W _o 36.7 %
Sample Elev.	95.41 m	Void Ratio	1.01		Unit Wt. 18.6 kN/m ³

CLIENT	Monarch Group	FILE NO.	PG2233
PROJECT	Supplemental Geotechnical Investigation - West	DATE	11/20/2010
Park Residential Development			
pattersongroup Consulting Engineers			
28 Concourse Gate, Unit 1, Ottawa, Ontario K2E 7T7			CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY				
Borehole No.	BH 9	p'_o	45 kPa	C _{cr} 0.015
Sample No.	TW 5	p'_c	77 kPa	C _c 0.290
Sample Depth	4.19 m	OC Ratio	1.7	W _o 33.3 %
Sample Elev.	94.17 m	Void Ratio	0.902	Unit Wt. 19.0 kN/m ³

CLIENT **Monarch Group**
 PROJECT **Supplemental Geotechnical Investigation - West**
Park Residential Development

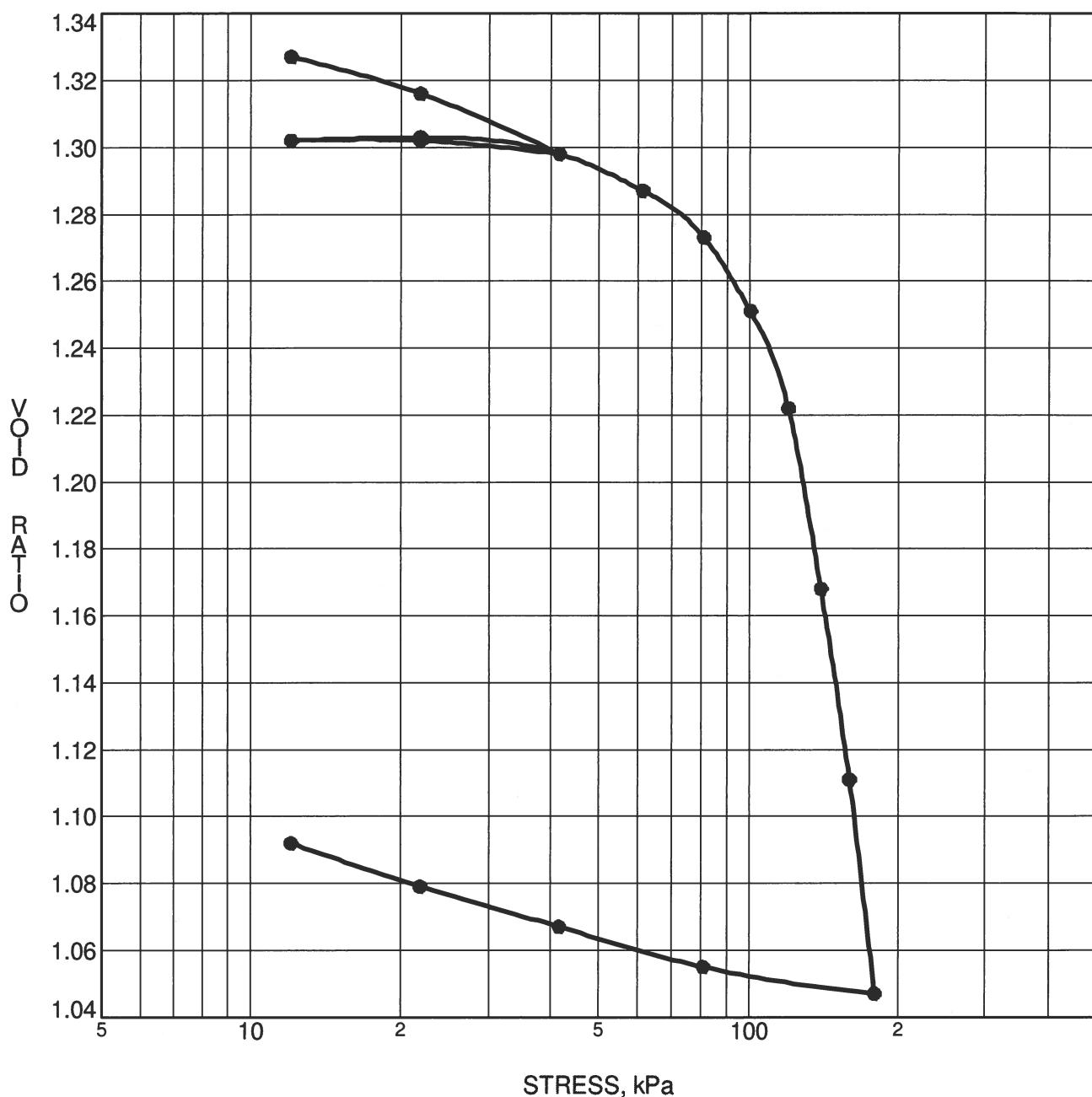
FILE NO. **PG2233**
 DATE **03/18/2011**

patersongroup

28 Concourse Gate, Unit 1, Ottawa, Ontario K2E 7T7

Consulting
Engineers

**CONSOLIDATION
TEST**



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	BH 9	p'_o	69 kPa	C _{cr}	0.015
Sample No.	TW 6	p'_c	116 kPa	C _c	1.104
Sample Depth	8.06 m	OC Ratio	1.7	W _o	48.9 %
Sample Elev.	90.30 m	Void Ratio	1.327	Unit Wt.	17.6 kN/m ³

CLIENT **Monarch Group**
 PROJECT **Supplemental Geotechnical Investigation - West**
Park Residential Development

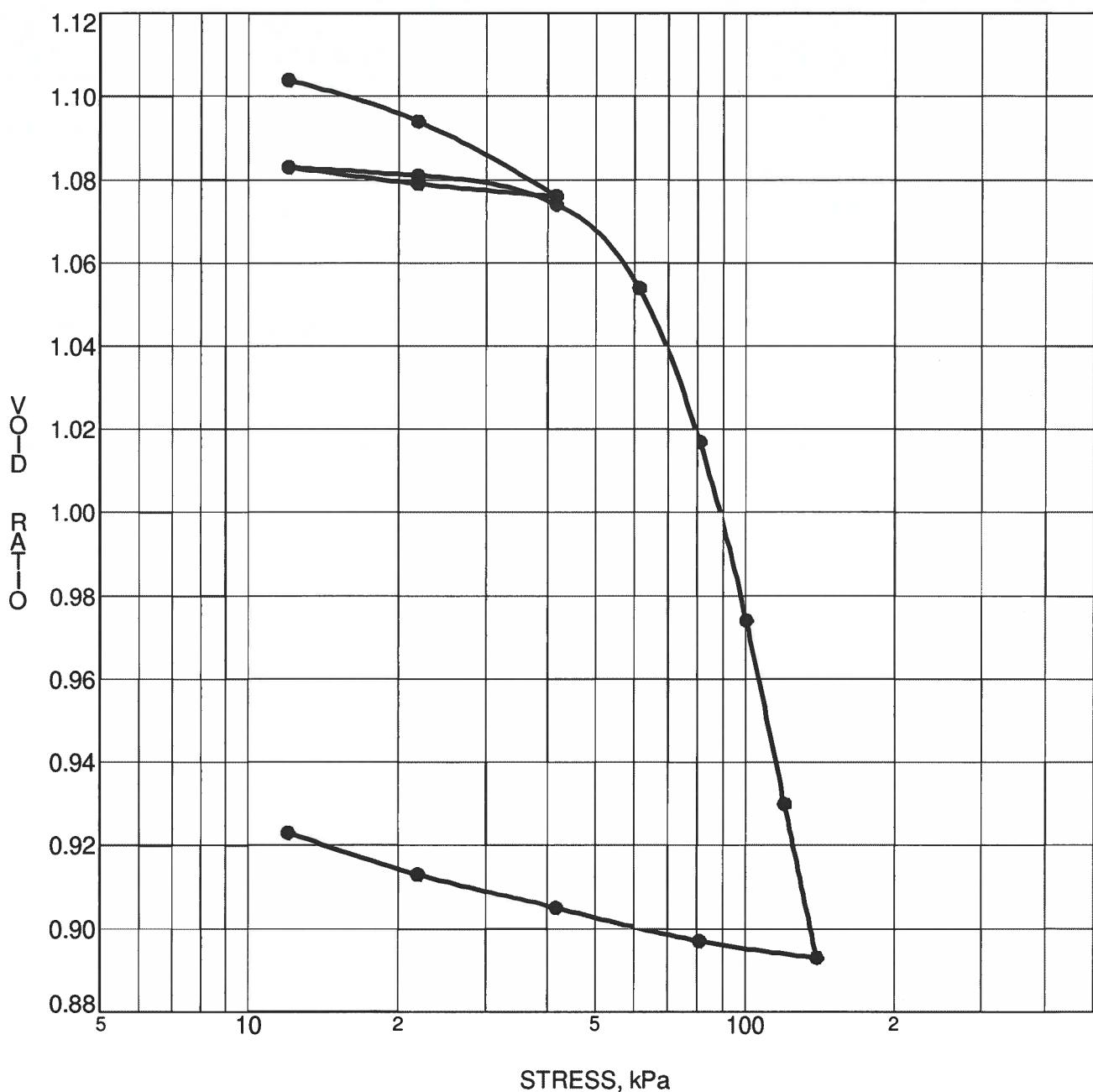
FILE NO. **PG2233**
 DATE **03/09/2011**

patersongroup

28 Concourse Gate, Unit 1, Ottawa, Ontario K2E 7T7

Consulting
Engineers

**CONSOLIDATION
TEST**



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	BH10	p'_o	36 kPa	C_{cr}	0.015
Sample No.	TW 5	p'_c	70 kPa	C_c	0.586
Sample Depth	3.30 m	OC Ratio	1.9	W_o	40.6 %
Sample Elev.	94.81 m	Void Ratio	1.104	Unit Wt.	18.4 kN/m ³

CLIENT **Monarch Group**
 PROJECT **Supplemental Geotechnical Investigation - West**
Park Residential Development

FILE NO. **PG2233**
 DATE **03/24/2011**

patersongroup

28 Concourse Gate, Unit 1, Ottawa, Ontario K2E 7T7

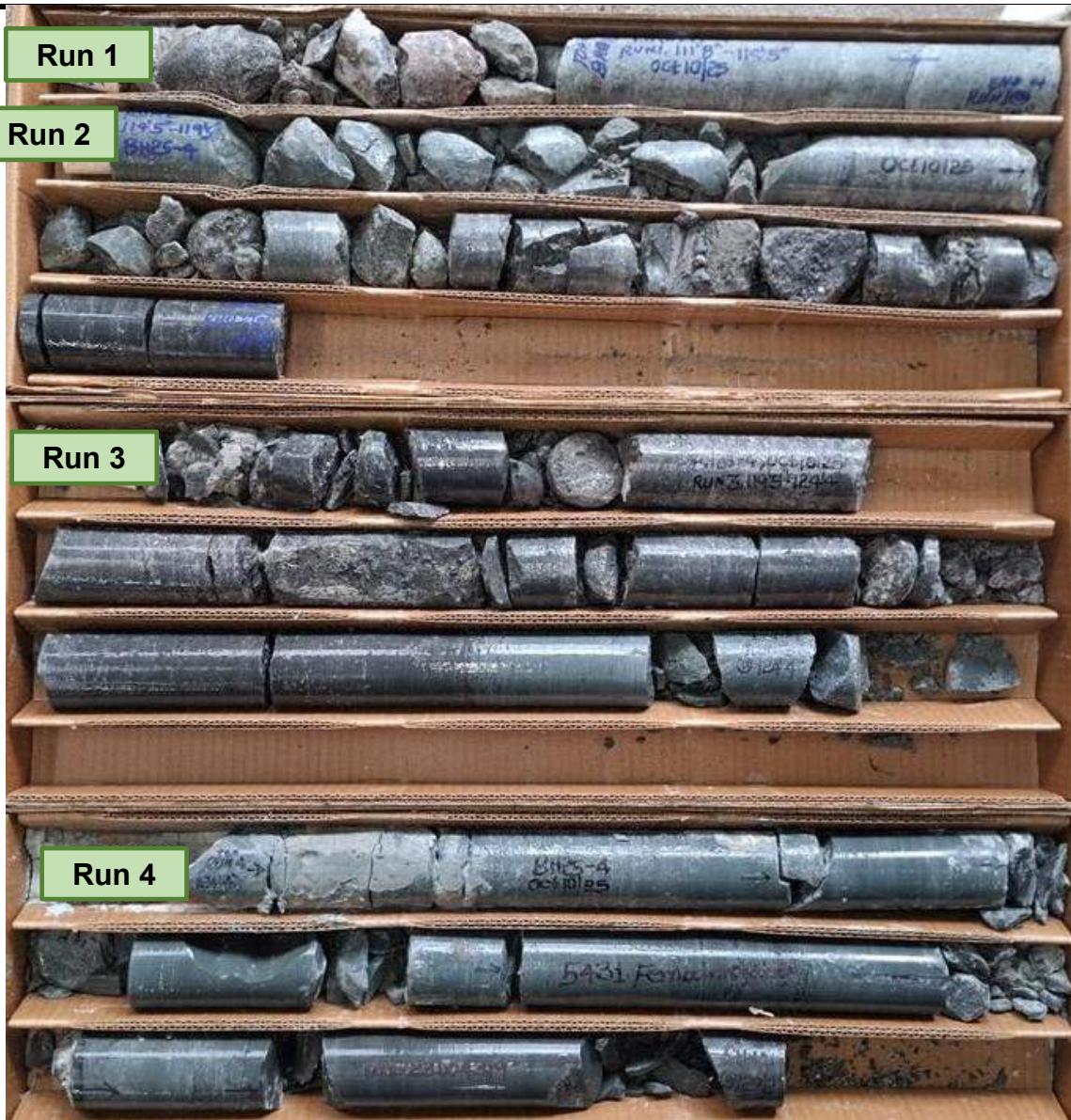
Consulting
Engineers

**CONSOLIDATION
TEST**

Appendix B – Bedrock Core Photographs



Borehole No: BH25-01	Core Runs Run 1: 32.0 m - 33.4 m Run 2: 33.4 m - 34.9 m Run 3 : 34.9 m - 36.4 m	project Proposed New Catholic High School, 5341 Fernbank Road, Ottawa Ontario	Project No: OTT-23004319-A0
Date Cored Oct 08, 2025		Rock Core Photographs	FIG B-1



Borehole No: BH25-04	Core Runs Run 1: 34.0 m - 34.9 m Run 2: 34.9 m - 36.4 m Run 3 : 36.4 m - 37.9 m Run 4: 37.9 m to 39.4 m	project Proposed New Catholic High School, School. 5341 Fernbank Road, Ottawa Ontario	Project No: OTT-23004319-A0
Date Cored Oct 10, 2025		Rock Core Photographs	FIG B-2



Borehole No: BH25-05	Core Runs Run 1: 29.5 m - 30.4 m Run 2: 30.4 m - 32.0 m Run 3 : 32.0 m - 33.4 m Run 4: 33.4 m to 34.8 m	project Proposed New Catholic High School, 5341 Fernbank Road, Ottawa Ontario.	Project No: OTT-23004319-A0
Date Cored Oct 07, 2025		Rock Core Photographs	FIG B-3



Borehole No: BH25-06	Core Runs Run 1: 31.2 m - 31.9 m Run 2: 31.9 m - 33.5 m Run 3: 33.5 m - 34.9 m Run 4: 34.9 m to 36.4 m	project Proposed New Catholic High School, 5341 Fernbank Road, Ottawa Ontario	Project No: OTT-23004319-A0
Date Cored Oct 09, 2025		Rock Core Photographs	FIG B-4

Appendix C -Laboratory Certificate of Analysis Report by AGAT

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

ATTENTION TO: Susan Potyondy

PROJECT: OTT-23004319-A0

AGAT WORK ORDER: 23Z027542

SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

DATE REPORTED: May 31, 2023

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 as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.
- 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.



CLIENT NAME: EXP SERVICES INC

SAMPLING SITE:

Certificate of Analysis

AGAT WORK ORDER: 23Z027542

PROJECT: OTT-23004319-A0

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

ATTENTION TO: Susan Potyondy

SAMPLED BY:

(Soil) Inorganic Chemistry

DATE RECEIVED: 2023-05-23

DATE REPORTED: 2023-05-31

SAMPLE DESCRIPTION:				BH#3 SS2 2.	BH#8 SS8	BH#12 SS5
SAMPLE TYPE:				Soil	Soil	Soil
DATE SAMPLED:				2023-05-12	2023-05-12	2023-05-16
Parameter	Unit	G / S	RDL	5011438	5011440	5011441
Chloride (2:1)	µg/g	2		8	1590	569
Sulphate (2:1)	µg/g	2		27	136	378
pH (2:1)	pH Units	NA		8.44	9.22	8.91
Resistivity (2:1) (Calculated)	ohm.cm	1		7870	301	606

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

5011438-5011441 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 *)



Nivine Basily



Quality Assurance

CLIENT NAME: EXP SERVICES INC

PROJECT: OTT-23004319-A0

SAMPLING SITE:

AGAT WORK ORDER: 23Z027542

ATTENTION TO: Susan Potyondy

SAMPLED BY:

Soil Analysis

RPT Date: May 31, 2023			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE				
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper			Lower		Recovery	Lower	Upper

(Soil) Inorganic Chemistry

Chloride (2:1)	5008771	13	13	0.0%	< 2	92%	70%	130%	96%	80%	120%	94%	70%	130%
Sulphate (2:1)	5008771	19	19	0.0%	< 2	95%	70%	130%	97%	80%	120%	99%	70%	130%
pH (2:1)	5011973	9.11	9.06	0.6%	NA	91%	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.



Nivine Basily

Certified By:



Method Summary

CLIENT NAME: EXP SERVICES INC

PROJECT: OTT-23004319-A0

SAMPLING SITE:

AGAT WORK ORDER: 23Z027542

ATTENTION TO: Susan Potyondy

SAMPLED BY:

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

Legal Notification

This report was prepared by EXP Services for the account of Ottawa Catholic 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:

Randy Leafloor randy.leafloor@ocsb.ca

Vladimir Popovic <vladimirp@n45.ca>