

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

#### Client:

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

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# **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 design elevation of the ground floor of the proposed new high school building and future addition and the design elevation of the final grades of the site were not available at the time of this geotechnical investigation.

#### **Test Hole Fieldwork Program**

The test hole fieldwork was undertaken from May 5 to 18,2023 and consists of thirty-three (33) test holes; twenty (20) 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 depths. 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. 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 FXP

#### **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 32.6 m depths (Elevation 68.2 m to 66.3 m). The groundwater level 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, **for no grade raise at the site**, the proposed school building and future building addition may be supported by strip and spread footings placed on top of the brown silty clay crust that is free of organic stains. The topsoil layer (surficial and buried), fill and sandy silt to silt are not suitable to support foundations for the proposed new high school and future building addition. For strip footings having a maximum width of 1.5 m and square pad footings having a maximum width and length of 3.0 m and founded on top of the brown silty clay crust (free of organic stains), the footings may be designed for a bearing pressure at serviceability limit state (SLS) of 60 kPa and factored geotechnical resistance at ultimate limit state (ULS) of 90 kPa. The ground floor of the proposed building may be designed as a slab-on-grade constructed on a minimum 300 mm thick engineered fill pad placed on the proofrolled sandy silt to silt. If the above SLS and factored ULS values recommended for footings are not sufficient to support the proposed high school building and building addition, the proposed building and addition will have to be supported by piles driven to practical refusal into the bedrock and designed in end bearing. The ground floor may be designed as a slab-on-grade as noted above.

If the grades at the site will be raised, the above SLS and factored ULS values for the footings will reduce to below 60 kPa and 90 kPa respectively. These lower values will likely be insufficient to support the proposed new high school and future building addition by footings. In this case, the proposed new high school building and future building addition would have to be supported by piles driven to practical refusal into the bedrock and designed in end bearing. The ground floor of the proposed high school building and building addition may be designed as a slab-ongrade as noted above. For pile foundations with slab-on-grade, the grades at the site may be raised to a maximum of 1.5 m.

Therefore, for the proposed school building and building addition supported by pile foundation and the ground floor designed as a slab-on-grade, **the maximum permissible site grade raise is 1.5 m.** 

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 bedrock is anticipated to be at or below 30.5 m to 32.6 m depths (Elevation 68.2 m to Elevation 66.3 m). 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. An additional geotechnical investigation consisting of boreholes that extend into the bedrock should be conducted to confirm the depth (elevation) of the bedrock for pile design.

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. The need for an underfloor perimeter drainage system will have to be assessed, once the design elevation of the ground floor of the proposed new high school and future building addition is available and compared with 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.

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).

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 design elevation of the ground floor of the proposed new high school building and future addition and the design elevation of the final grades of the site were not available at the time of this geotechnical investigation.

This geotechnical investigation was undertaken to:

- a) Establish the subsurface soil and groundwater conditions at 33 test holes (20 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 consists of thirty-three (33) test holes; twenty (20) 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. 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 a CME-55 and CME-55LC track-mounted drill rigs equipped with continuous flight hollow stem augers and soil sampling capabilities. 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 and 11 from 12.5 m, 12.8 m and 24.4 m depths to cone refusal depths of 30.5 m to 32.6 m below existing grade. The undrained shear strength of the clayey cohesive soils was measured by conducting in-situ vane tests. The subsurface soil conditions in each borehole were logged with each soil sample placed in a labelled plastic bag.

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 is summarized in Table I.

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



#### 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. 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										
Took Dit No		Grain-Size Analysis (%)				Atterberg Limits (%)				
Test Pit No. (TP) – Grab Sample No. (GS)	Depth (m)	Gravel	Sand	Silt	Clay	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification
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										
	Depth (m)	Grair	n-Size An	alysis (	(%)	Atterberg Limits (%)				
Borehole No. (BH) Sample No. (SS)		Gravel	Sand	Silt	Clay	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification
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	Depth (m)	Grai	n-Size A	nalysis	(%)	Atterberg Limits (%)				
No. (BH)  - Sample No. (SS)		Gravel	Sand	Silt	Clay	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification
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 Boulders or Bedrock

Dynamic cone penetration tests (DCPT) were performed in Boreholes Nos 1,8 and 11 from 12.5 m, 12.8 m and 24.4 m depths (Elevation 86.4 m, Elevation 85.7 m and Elevation 74.3 m) to cone refusal at 30.5 m to 32.6 m depths (Elevation 68.2 m to Elevation 66.3 m). Cone refusal may have occurred on cobbles/boulders within a glacial till or on bedrock.

#### 5.7 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 V.

Table V: 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 design elevation of the ground floor of the proposed new high school building and future addition and the design elevation of the final grades of the site were not available at the time of this geotechnical investigation.

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, **for no grade raise at the site**, the proposed school building and future building addition may be supported by strip and spread footings founded on top of the brown silty clay crust that is free of organic stains. The topsoil layer (surficial and buried), fill and sandy silt to silt are not suitable to support foundations for the proposed new high school and future building addition. For strip footings having a maximum width of 1.5 m and square pad footings having a maximum width and length of 3.0 m and founded on top of the brown silty clay crust (free of organic stains), the footings may be designed for a bearing pressure at serviceability limit state (SLS) of 60 kPa and factored geotechnical resistance at ultimate limit state (ULS) of 90 kPa. The ground floor of the proposed building may be designed as a slab-on-grade constructed on a minimum 300 mm thick engineered fill pad placed on the proofrolled sandy silt to silt. If the above SLS and factored ULS values recommended for footings are not sufficient to support the proposed high school building and building addition, the proposed building and addition will have to be supported by piles driven to practical refusal into the bedrock and designed in end bearing. The ground floor may be designed as a slab-on-grade as noted above.

If the grades at the site will be raised, the above SLS and factored ULS values for the footings will reduce to below 60 kPa and 90 kPa respectively. These lower values will likely be insufficient to support the proposed new high school and future building addition by footings. In this case, the proposed new high school building and future building addition would have to be supported by piles driven to practical refusal into the bedrock and designed in end bearing. The ground floor of the proposed high school building and building addition may be designed as a slab-ongrade as noted above. For pile foundations with slab-on-grade, the grades at the site may be raised to a maximum of 1.5 m.

Therefore, for the proposed school building and building addition supported by pile foundation and the ground floor designed as a slab-on-grade, **the maximum permissible site grade raise is 1.5 m.** 

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 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 design elevation of the ground floor of the proposed new high school building and future addition and the design elevation of the final grades of the site were not available at the time of this geotechnical investigation.

Based on a review of the test hole information, **for no grade raise at the site**, the proposed school building and future building addition may be supported by strip and spread footings founded on top of the brown silty clay crust that is free of organic stains. The topsoil layer (surficial and buried), fill and sandy silt to silt are not suitable to support foundations for the proposed new high school and future building addition. For strip footings having a maximum width of 1.5 m and square pad footings having a maximum width and length of 3.0 m and founded on top of the brown silty clay crust (free of organic stains), the footings may be designed for a bearing pressure at serviceability limit state (SLS) of 60 kPa and factored geotechnical resistance at ultimate limit state (ULS) of 90 kPa. The ground floor of the proposed building may be designed as a slab-on-grade constructed on a minimum 300 mm thick engineered fill pad placed on the proofrolled sandy silt to silt. If the above SLS and factored ULS values recommended for footings is not sufficient to support the proposed high school building and building addition, the proposed building and addition will have to be supported by piles driven to practical refusal into the bedrock and designed in end bearing. The ground floor may be designed as a slab-on-grade as noted above.

If the grades at the site will be raised, the above SLS and factored ULS values for the footings will reduce to below 60 kPa and 90 kPa respectively. These lower values will likely be insufficient to support the proposed new high school and future building addition by footings. In this case, the proposed new high school building and future building addition would have to be supported by piles driven to practical refusal into the bedrock and designed in end bearing. The ground floor of the proposed high school building and building addition may be designed as a slab-ongrade as noted above. For pile foundations with slab-on-grade, the grades at the site may be raised to a maximum of 1.5 m.

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

#### 9.1 Footings

If footings with **no site grade raise** and founded on top of the silty clay (free of organic stains) and designed for the above SLS and factored ULS values are considered feasible to support the proposed school building and building addition, the following should be undertaken:

- All footings beds should be examined by a geotechnical engineer to ensure that the founding surfaces are capable of supporting the recommended design bearing pressure at SLS and that the footing beds have been properly prepared.
- The exposed silty clay subgrade for footings will be susceptible to disturbance due to worker foot traffic, construction equipment and the prevailing weather conditions during construction. To prevent disturbance to the silty clay subgrade, it is recommended that the approved footing beds be covered with a 50 mm thick concrete mud slab within the same day of approval.
- A minimum of 1.5 m of earth cover should be provided to the footings to protect them from damage due
  to frost penetration. The frost cover should be increased to 2.1 m for unheated structures if snow will not
  be removed from their vicinity. IF snow will be removed from the vicinity of the unheated structures, the
  frost cover should be increased to 2.4 m. Rigid insulation thermally equivalent to the required soil cover



may be used instead of the soil cover. Alternatively, a combination of rigid insulation and soil cover may be used to achieve the required frost protection for the footings.

#### 9.2 Pile Foundation

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 bedrock is anticipated to be at or below 30.5 m to 32.6 m depths (Elevation 68.2 m to Elevation 66.3 m). Pile foundation may be used in conjunction with the maximum permissible site grade raise of 1.5 m. An additional geotechnical investigation consisting of boreholes that extend into the bedrock should be conducted to confirm the depth (elevation) of the bedrock for pile design.

The factored geotechnical resistance and structural capacity for various pile sections are shown in Table VI. 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 as a result of the maximum permissible grade raise of 1.5 m. The negative skin friction that the piles would be subjected to is also listed in Table VI. The allowable load on a pile may be computed by subtracting the negative skin friction from the factored structural capacity of the pile section. Since the allowable load carrying capacity of the pile (factored structural capacity of the pile minus negative skin friction) is less than the factored geotechnical capacity of the pile, the allowable load carrying capacity of the pile will be governed by the difference between the factored structural capacity of the pile and the negative skin friction.

Table VI: 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)			
	245 mm O.D. by 10 mm wall thickness	1320	1782	745	1037			
Steel Pipe	245 mm O.D. by 12 mm wall thickness	1490	2030	745	1285			
Section	324 mm O.D. by 12 mm wall thickness	2000	2910	985	1925			
НР	HP 310 x 110	2400	2640	1196	1444			
Section	HP 310 x 125	2700	2980	1208	1772			

The estimated negative skin friction and allowable load carrying capacity of the piles can be updated once the design site grade raise of the site is available and depth (elevation) of bedrock is known.

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.

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 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.

#### 9.3 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.

The need for an underfloor perimeter drainage system will have to be assessed, once the design elevation of the ground floor of the proposed new high school and future building addition is available and compared with the groundwater level.

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 m<sup>3</sup> and less than 400 m<sup>3</sup> per day. If more than 400 m<sup>3</sup> 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 VII. 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 VII: Recommended Pavement Structure Thicknesses								
		Computed Pavement Structure						
Pavement Layer	Compaction Requirements	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 VII.

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 overemphasized. 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 VIII. The laboratory certificate of analysis is shown in Appendix B.

Table VIII: Corrosion Test Results on Soil Samples									
Borehole – Sample No.	Depth (m)	Soil Type	рН	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 Geotechnical Investigation

An additional geotechnical investigation consisting of boreholes that extend into the bedrock should be conducted to confirm the depth (elevation) of the bedrock for pile design.



## 19. 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.



## 20. 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 16.09.2025

8.M. POTYONDY

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

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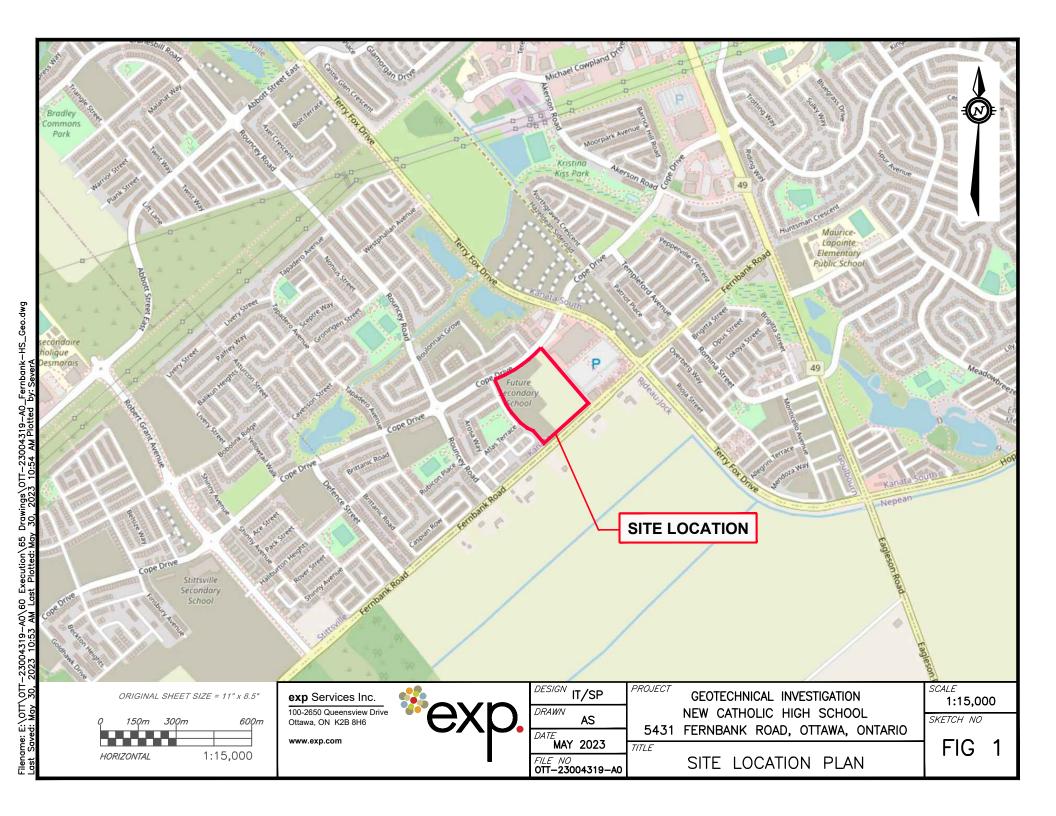


EXP Services Inc.

Geotechnical Investigation Proposed New Catholic High School 5431 Fernbank Road, Ottawa, ON OTT-23004319-A0 September 16,2025

## **Figures**





5431 FERNBANK ROAD, OTTAWA, ONTARIO

TEST HOLE LOCATION PLAN

2

FIG

*DATE* SEPTEMBER 2025

FILE NO OTT-23004319-A0

TITLE

Ottawa, ON K2B 8H6

www.exp.com

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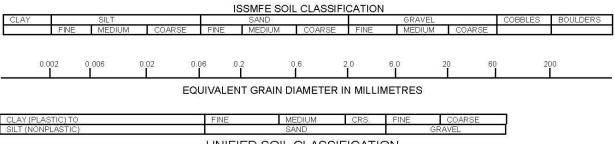
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Geotechnical Investigation Proposed New Catholic High School 5431 Fernbank Road, Ottawa, ON OTT-23004319-A0 September 16,2025

### **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.



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.



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Project No: OTT-23004319-A0
Project: New Catholic High School

Figure No. 3

of 3Page. Combustible Vapour Reading (ppm) 250 500 750 Standard Penetration Test N Value Natural Geodetic G W L 20 Shear Strength Natural Moisture Content % Atterberg Limits (% Dry Weight) SOIL DESCRIPTION Unit Wt. 88.49 200 SILTY CLAY Grey, wet, (soft to firm) (continued) 36 kPa Hammer Weight SS8 85.7 Dynamic Cone Penetration Test conducted from a 12.8 m depth to cone refusal at a 31.7 m depth below ground

NOTES:

23004319 - MAY 26, 2023.GPJ TROW OTTAWA.GDT 6/16/23

LOG OF 1

Borehole data requires interpretation by EXP before use by others

Continued Next Page

- 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	Depth	% Rec.	RQD %								
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Project No: OTT-23004319-A0
Project: New Catholic High School

Figure No. 3

3 of 3Page. Combustible Vapour Reading (ppm) 250 500 750 Standard Penetration Test N Value SYMBOL Natural Geodetic 250 20 Shear Strength SOIL DESCRIPTION Natural Moisture Content % Atterberg Limits (% Dry Weight) Unit Wt. kN/m<sup>3</sup> Elevation 200 76.49 Dynamic Cone Penetration Test conducted from a 12.8 m depth to cone refusal at a 31.7 m depth below ground surface. (continued) 23004319 - MAY 26, 2023.GPJ TROW OTTAWA.GDT 6/16/23 66.8 Cone Refusal at 31.7 m Depth

### NOTES:

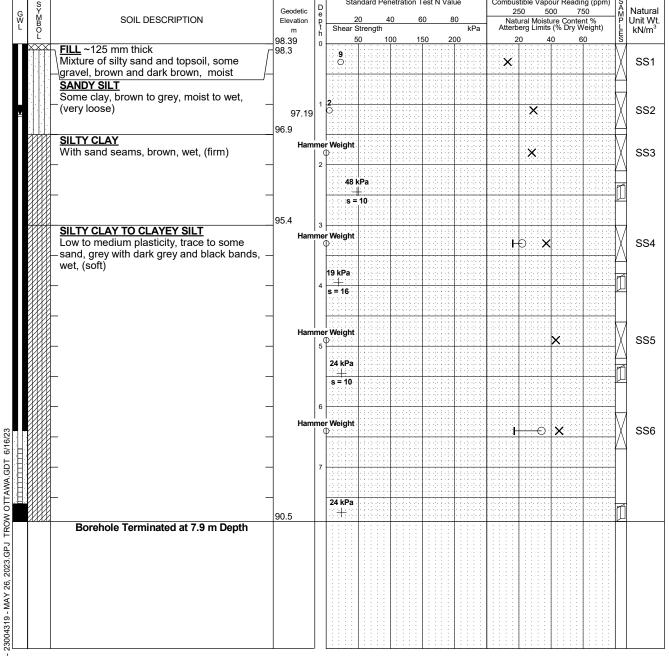
LOG OF 1

- 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										

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### NOTES:

BH LOGS

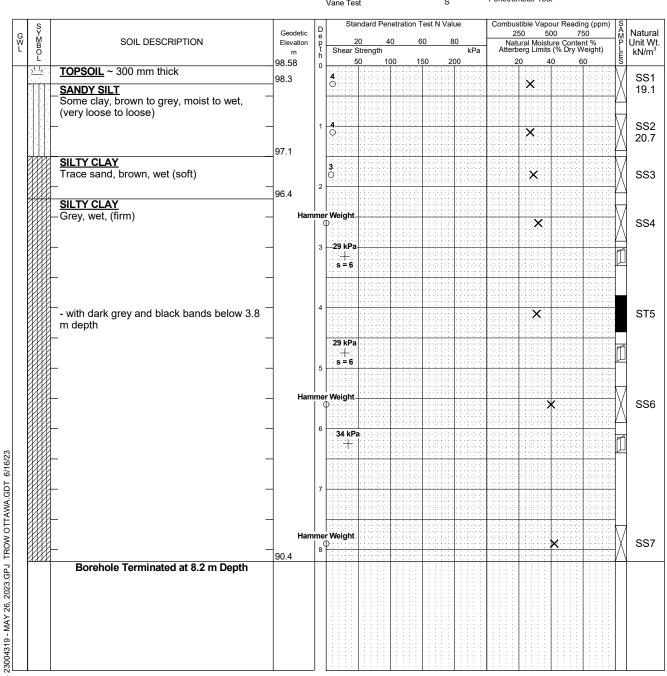
LOG OF BOREHOLE

- 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												
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Project:	New Catholic High School				Figure No. 5		
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BH LOGS

LOG OF 1

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

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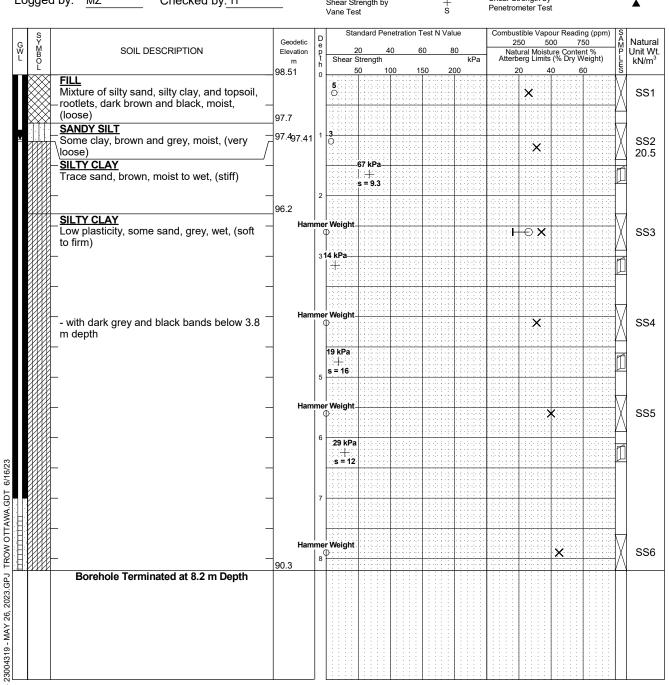
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  - 2. Borehole was backfilled upon completion
  - 3. Field work supervised by an EXP representative.
  - 4. See Notes on Sample Descriptions
  - 5. Log to be read with EXP Report OTT-23004319-A0

WAT	ER LEVEL RECO	RDS
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Upon Completion	dry	7.6

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Project:	New Catholic High School							
Location:	5431 Fernbank Road, Ottawa, Ontario						Page1_ of _1_	
Date Drilled	d: <u>'</u> May 15, 2023			Split Spoon Sample		$\boxtimes$	Combustible Vapour Reading	
Orill Type:	CME-55 Track Mounted Drill Rig					_		<b>×</b> —⊖
Datum:	Geodetic Elevation			•		_		$\oplus$
_ogged by:	MZ Checked by: IT	_		Shear Strength by Vane Test		+ s	Shear Strength by Penetrometer Test	•
S Y M	SOIL DESCRIPTION	Geodetic	D e n	Standard Penetra	tion Test N	Value 80	Combustible Vapour Reading (ppm) 250 500 750 Natural Moisture Content %	S A M Natural



BH LOGS

LOG OF 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

WAT	ER LEVEL RECO	RDS
Date	Water Level (m)	Hole Open To (m)
June 6,2023	1.1	

	CORE DR	RILLING RECOF	RD
Run No.	Depth (m)	% Rec.	RQD %
	,		

Pr	ojec	t No:	OTT-23004319-A0	DC	)[	en	Old	₽.	D	<u> </u>				•	•	3	xp
Pr	ojec	et:	New Catholic High School								_ F _	igure N		8	-		
Lc	cati	on:	5431 Fernbank Road, Ottawa, Ontario								_	Page. <u>1</u> of <u>1</u>					
Ͻa	ite D	Orilled:	'May 17, 2023	ıy 17, 2023 Split Spoon Sample ⊠					Combusti	ble Vapo	our Readi	ng		П			
Dr	ill Ty	/pe:	CME-55 Track Mounted Drill Rig			Auger S						Natural M		Content			_ × →
	itum	· ·	Geodetic Elevation		-	SPT (N) Dynamic		est	-			Atterberg Undraine	d Triaxial		-		<del>-</del>
_0	gge	d by:	MZ Checked by: IT		_	Shelby T Shear S Vane Te	trength b	ру		+ s		% Strain : Shear Str Penetrom	ength by				<b>▲</b>
G W L	S Y MB O L		SOIL DESCRIPTION	Geodetic Elevation	D e p		andard P	40	ation Te		0	25	0 50	our Readi 00 7 ure Conte (% Dry V	50	SAMPLES	Natural Unit Wt.
L	Ŏ V		_	98.73	h 0		Strength 50	100	150	20	kPa 10	Atterbe			Veight) 80	ES	kN/m³
	$\bigotimes$	— orga⊦	rice of silty sand, silty clay and nics, some gravel, rootlets, dark			15 O						*					SS1
	$\stackrel{\circ}{\parallel}$	SAN	n, damp to moist, (compact)  OY SILT e clay, brown, wet, (very loose)	97.9	1	<b>2</b> O							×				SS2
		SILT	Y CLAY	97.2		10.0010	1.1.5.0								10.0110	$\mathbb{H}$	
			n, wet, (stiff)	Han	2	er Weight							×		-2-5-1-2		SS3
	_	-			-2-2-1-2	58 kPa +					0.000						
				95.7	3	-5-1-1-5											
		SILT Grey	Y CLAY , wet, (firm)	Han	nme	er Weight						- 6- 6- 8- 6- 1			0.0000		SS4
			_		4	23 kPa										: : : :	
			_			s = 23											
		- with m de	dark grey and black bands below 4.6 pth	Han	nme	er Weight								×			SS5
						-2 (-1 -2										:/\ :	
			_														
			_		6	27 kPa + s = 13.	11.5.5						- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1		3333		
			-			-2-0-1-2	11120			2 6 6 2 2 3		0000	- 1 - 2 - 2 - 1 -		2012		
			-		7	-1-1-1-1											
			-	Han	nme	er Weight											SS6
		- В	orehole Terminated at 8.2 m Depth	90.5	8											1	

. 23004319 - MAY 26, 2023.GPJ TROW OTTAWA.GDT 6/16/23

- 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
- LOG OF BOREHOLE BH LOGS -5. Log to be read with EXP Report OTT-23004319-A0

W	ATER LEVEL RECC	RDS
Date	Water Level (m)	Hole Open To (m)
June 6,2023	1.3	

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

Proi	ect No:	OTT-23004319	Log of	f Bo	r	eh	ole	e _	Bl	<u>H-(</u>	<u>07</u>				*	9	xp
Proj		New Catholic I	<del></del>								F	igure N		9	-		
•	ation:		κ Road, Ottawa, Ontario									Pag	ge	1_ of	1_		
Date	e Drilled:	'May 17, 2023				Split Sp	oon Sam	nlo		$\boxtimes$	_	Combust	ible Vanc	our Readir	na		
	Drill Type: CME-55 Track Mounted Drill Rig			-	Auger S	Sample	pie				Natural N	Noisture (		ig		×	
	Datum: Geodetic Elevation		SPT (N) Valu				est	_			Atterberg Undraine		lat	ŀ		—⊖ ⊕	
	Logged by: MZ Checked by: IT			_	Shelby Shear S Vane T	Strength b	ру		+ s		% Strain Shear St Penetron	rength by	,			<b>⊕</b>	
G W L	S Y M B B O L	SOIL DE	SCRIPTION	Geodetic Elevation m	D e p t		tandard P 20 r Strength	enetrat 40	ion Tes	st N Valu		25	50 5	our Readir 00 7: ure Conte s (% Dry W	50	SAMPLES	Natural Unit Wt. kN/m³
×	FILL	sand and grave	I, brown, damp, (loose)	98.78	0	8	50	100	150	20	00	2	0 4	0 6	60	Š	SS1
		DY SILT n, moist, (very l	oose)	98.0	1	<b>3</b>							×				SS2 20.4
		Y CLAY n, wet, (firm)		97.3	2	1 0							>				SS3
			-	95.8		12.001	kPa = 21										
	Grey	Y CLAY , with dark grey to firm)	and black bands, wet,		nme	er Weigh							×				SS4
	_		-		4	27 kP + s = 2											
			-	Har	nme	er Weigh	ıt						>	(			SS5
			-		6	19 kPa											
			-			3 <del>1.</del> 1.							- 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2		-0 0 1 1 0 -0 0 1 1 0 -0 0 1 1 0		
			-	-	7	-2						-2-2-3-2-4	- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1				
	B	orehole Termin	ated at 8.2 m Depth	90.6	nme	er Weigh	it						· · · · · · · · · · · · · · · · · · ·	<b>k</b>		<u> </u>	SS6
			at old in popul														

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

- 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

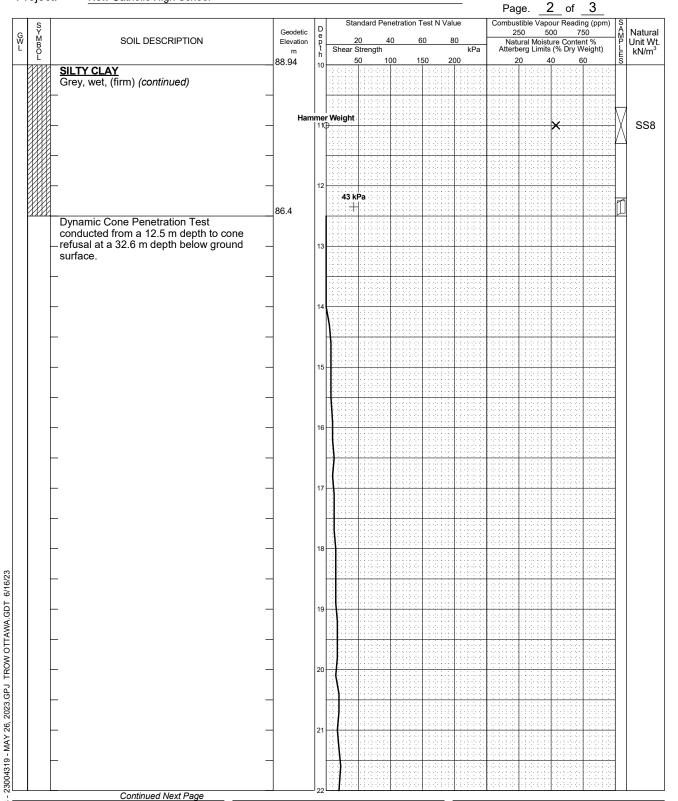
WAT	ER LEVEL RECO	RDS
Date	Water Level (m)	Hole Open To (m)
Upon Completion	dry	8.2

	CORE DR	RILLING RECOF	RD
Run No.	Depth (m)	% Rec.	RQD %
	,		

Project No: Project:		g of B								igure	-	10		_	<b>^</b>
ocation:	5431 Fernbank Road, Ottawa	. Ontario							-	Pa	age.	_1_ of	3_		
ate Drilled:	'May 12, 2023	, -		Split Spc	on Sam	nle.		$\boxtimes$	-	Combu	etible \/s	apour Rea	dina		
rill Type:	CME-55LC Rubber Track Mou	ınted Drill Ria		Auger Sa	ample	510				Natura	Moistur	e Content	-	_	X
atum:	Geodetic Elevation			SPT (N) Dynamic		est		0			rg Limits ned Tria:				<b>→</b> ⊕
ogged by:	MZ Checked by:	IT		Shelby T Shear St		v		+		Shear	in at Fail Strength	by			<b>⊕</b>
				Vane Te	st			+ s		Penetro	ometer T	Test			_
S Y M B O L	SOIL DESCRIPTION	Geode Elevati	etic	D e	andard Po 20	enetration 40	Test N 60	Value 80			250	apour Rea	750	I A	Natural Unit Wt
		98.94		h l	Strength		150	200	kPa	Atte	rberg Lin	oisture Cor nits (% Dry 40	Weight)	L E S	kN/m³
<u>x\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ </u>	SOIL ~ 1000 mm thick			6							×			: \ :::\	SS1
<u>\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ </u>				-2-1-1-1										/	
SANI	DY SILT	97.9		1							×				SS2
Som — comp	e clay, brown, moist to wet, (loo pact)	se to		-2-(-1-2										<u> </u>	20.6
				4										C	No Red
		96.6		2			1 2 3			0.000					
Low	Y CLAY plasticity, some sand, brown, w	et, –		3.			1 1 2 2		- 3 - 3 - 4 -		$+\infty$		<u> </u>		SS4
(firm)	)			3 48	kPa									: /	1
				S	# = 5										<u> </u>
		95.1													
	Y CLAY v, wet, (firm)	- I	lamn	ner Weight							×			$ \rangle$	SS5
		_		29 kPa											
				s = 3.8	1.1.2.5.1	101111									
	a dark grov and black bands bal	low F 2		3											,
m de	n dark grey and black bands bel epth	10W 5.3 F	lamn	ner Weight								*		$ \rangle$	SS6
		_		6 34 kP	a		1 3 3						0 0 0 0 1 0 0 0 0 1		
				3 3 4 3											
				-0.0110		0.100									
				7											
		_		12.11.12											,
		_ +	lamn	ner Weight								×			SS7
				2011											
		_		9 24 kPa			1 1 2 2 2								1
				10 11 10											]
OTES:	Continued Next Page	WA	TER	LEVEL R	ECORF	)S		 ] [		C	ORE DE	RILLING	RECOR	RD	
Borehole data r use by others	requires interpretation by EXP before	Date		Water Level (m)		Hole O To (n			Run No.	De	pth n)	% F			QD %
	packfilled upon completion	Upon Completion	1	dry		11.7			INU.	(I					
	ervised by an EXP representative.  Sample Descriptions														
	with EXP Report OTT-23004319-A0														

Project No: OTT-23004319-A0
Project: New Catholic High School

Figure No. 10



NOTES:

LOG OF 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

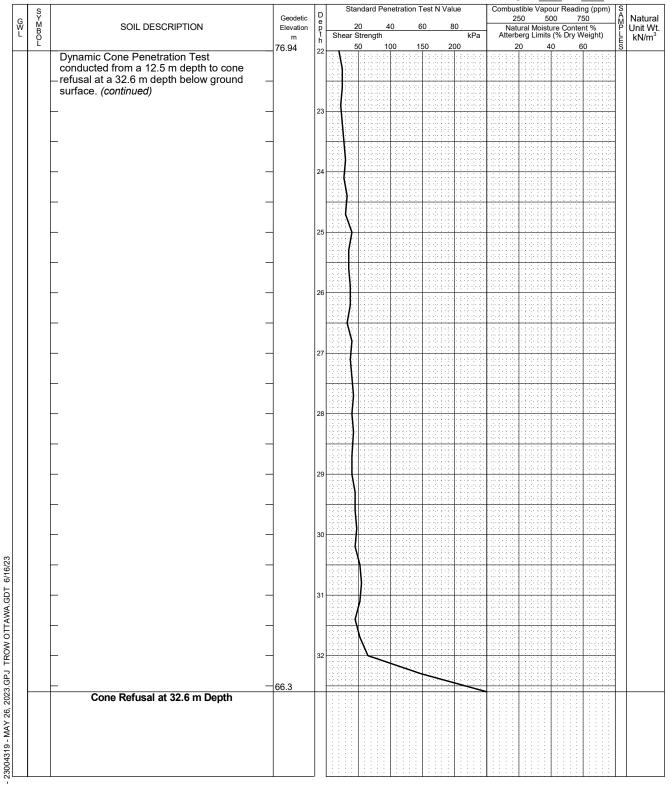
WATER LEVEL RECORDS										
Date	Water Level (m)	Hole Open To (m)								
Upon Completion		11.7								

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

Project No: OTT-23004319-A0

Figure No. 10

Project: New Catholic High School Page. 3 of 3



### NOTES

LOG OF 1

- Borehole data requires interpretation by EXP before use by others
- 2. Borehole was backfilled upon completion
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- 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	Depth	% Rec.	RQD %							
No.	(111)									

ı	Projec	t No:	OTT-23004319-A0	9 .		•	Ο.				<u> </u>	<u> </u>			44			7
ı	Projec	et:	New Catholic High School										Figure	_	11	- 1		- 4
ŀ	Locati	on:	5431 Fernbank Road, Ottawa	, Ontario								_	Pa	age	of _			
	Date D	Orilled:	'May 17, 2023			_	Split 9	Spoon	Sampl	е			Combu	ıstible Va	pour Readi	ng		
	Orill Ty	/pe:	CME-55 Track Mounted Drill F	Rig		_	-	r Sam (N) Va						l Moisture erg Limits	e Content	ı		× →
	Datum	1:	Geodetic Elevation			_	-	mic Co	one Te	st	_		Undrai	ned Triax in at Failt	dal at			$\oplus$
L	ogge	d by:	MZ Checked by:	IT				r Strer	gth by		+ s		Shear	Strength ometer T	by			<b>A</b>
	S Y M B O		SOIL DESCRIPTION		Geodetic Elevation m	1 6	She		4	netration 7	Гest N Va	lue 80 kPa		250	apour Readir 500 7: isture Conte nits (% Dry W	50	) SAMPLES	Natural Unit Wt. kN/m³
		FILL Silty: —(com	sand and gravel, brown, damp, pact)	_	98.76	0	1	50 <b>2:</b> C	3. j. j. j.	00 1	50 2	00	<b>&gt;</b>	20	40 6	60	Š	SS1
			DY SILT e clay, brown, wet, (very loose e)		98.0	1	<b>4</b> ⊙							×				SS2
			Y CLAY n, wet, (firm)		97.2	2	100								×		A	SS3 20.8
				-	_		13.45	12 kPa 	12 (0.1)								_[]	
		_		_	Ha	ımmı	er Weig	ght						×			$\bigvee$	SS4
			Y CLAY , wet, (soft)		94.8	4	19 kF											
		- with _m de	dark grey and black bands be pth	low 4.6	Ha		er Weig	ght	12 0 1						*			SS5
				_		6	-0.45 -0.45 -0.45 -0.45											
6/16/23		_		_	-		23 kl	100	-3-0-1-									
FAWA.GDT				_		7							- 2- 2- 3-					
rrow ot				_	<b>H</b> a		er Weig								*		X	SS6
GPJ .		В	orehole Terminated at 8.2 m D	epth	00.0								1::::					
23004319 - MAY 26, 2023.GPJ TROW OTTAWA.GDT																		
3004318																		
	NOTES:	l			WATE	 	E\/Eı	BEC	ORD	3				OBE DE	RILLING R	FCOR	 D	
BOREHOLE BH	use by 2. Boreh 3. Field v 4. See N	y others ole was b work supe lotes on S	equires interpretation by EXP before ackfilled upon completion rivised by an EXP representative. ample Descriptions with EXP Report OTT-23004319-A0	Dat Upon Cor	te		Wate <u>Level</u> dry	er (m)		Hole Op To (m) 8.2		Run No.	De	pth n)	% Re			QD %

- 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		8.2								

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

D : (N		g of B	or	eho	le _l	<u>BH-</u>	<u>10</u>				*(	9	xr	
•	OTT-23004319-A0						F	igure N	gure No12_					
Project:	New Catholic High School	Ontorio					_	Pag	ge	1_ of _	1_			
Location:	5431 Fernbank Road, Ottawa	, Untario					_							
	'May 15, 2023		_	Split Spoon S				Combust Natural M		our Reading	9		□ X	
Drill Type:	CME-55 Track Mounted Drill F	Rig		SPT (N) Valu	е	0		Atterberg	Limits		⊢		$\ominus$	
Datum:	Geodetic Elevation		_	Dynamic Cor Shelby Tube	e Iest			Undraine % Strain	at Failur	re			$\oplus$	
Logged by:	MZ Checked by:	<u>IT</u>		Shear Streng Vane Test	•	+ s		Shear Str Penetron	neter Te	st			<b>A</b>	
G S Y M B O L	SOIL DESCRIPTION	Geodet Elevatio m 98.34		20 Shear Strer	40		ue 80 kPa 00	25	iral Mois erg Limit	oour Reading 500 750 sture Contents (% Dry We 40 60	t % eight)		Natural Unit Wt kN/m³	
brow_	clay, trace sand, topsoil inclusion n and grey, moist, (very loose t	ons, o –		4					×			$\bigvee$	SS1	
	DY SILT /n, moist to wet, (very loose)	97.5	1	<u>2</u>					×			$\bigvee$	SS2	
	Y CLAY sand seams, brown to grey, we	96.8 et (firm)	lamme	er Weight					×				SS3	
				34 kPa s = 14										
Low	SILTY CLAY Low to medium plasticity, trace sand, greenwet (soft)		amme	er Weight					×				SS4	
	mlangiata, with dards	- -	4	19 kPa s = 16										
- low band	plasticity, with dark grey and bi s below 4.6 m depth	HACK H	lamme	er Weight  19 kPa					0 ;	×			SS5	
		-	6											
6/10/23		Н		er Weight						*		$\bigvee$	SS6	
TAWA.GD.			7											
Ō R	orehole Terminated at 7.9 m D	90.4 epth		24 kPa + -s = 20					- 2 - 2 - 2 - 3 - 3 - 3 - 3 - 3 - 3 - 3					
23004319 - MAY 26, 2023.GFJ 1KOW OTTAWA.GDT 6/16/12														
1		10/07		EVEL PECC	DD6		Liiii	CO	DE DDI		COBD			
NOTES:  1. Borehole data r use by others	requires interpretation by EXP before	Date		Water	Hole (		Run	Dept	th	LLING RE % Rec.		RC	QD %	
2. Borehole was b 3. Field work supe 4. See Notes on S	ackfilled upon completion ervised by an EXP representative. sample Descriptions with EXP Report OTT-23004319-A0	Upon Completion		<u>-evel (m)</u> 4.3	7.		No.	(m)						

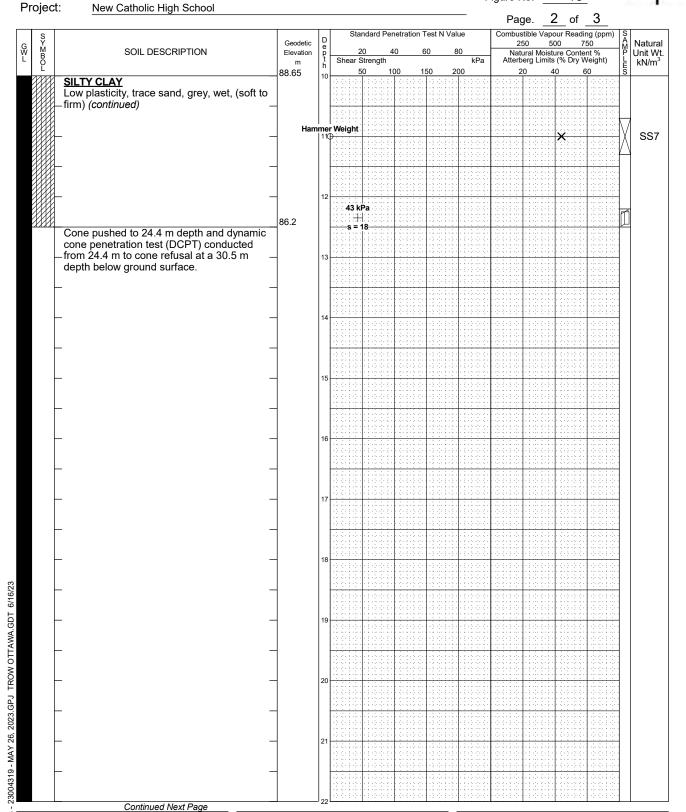
- Borehole data requires interpretation by EXP before use by others
- 2. Borehole was backfilled upon completion
- $3. \\ \mbox{Field}$  work supervised by an EXP representative.
- 4. See Notes on Sample Descriptions
- 5.Log to be read with EXP Report OTT-23004319-A0

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

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

roject No: roject:	New Catholic High School									F	igure P			13  of	_		
ocation:	5431 Fernbank Road, Ottawa,	Ontario										J					
ate Drilled:	'May 16, 2023		_	Split Spo					$\boxtimes$					ur Read	ling		
rill Type:	CME-55 Track Mounted Drill R	Rig	_	Auger S SPT (N)					I) 0		Natura Atterbe			Content	I		× →
atum:	Geodetic Elevation			Dynamic Shelby 1		e Test			_		Undrai % Stra						$\oplus$
ogged by:	MZ Checked by:	IT		Shear S Vane Te	trengt	th by			+ s		Shear Penetr						<b>A</b>
S Y M B O	SOIL DESCRIPTION	Geodeti Elevatio	on	e p t Shear	20	40	etration T	Γest N \	/alue 80	kPa		250	50		ling (ppm 750 ent % Weight)	- M P	Natura Unit Wt kN/m³
FILL		98.65		h 0	50	10	) 1	50	200			20			60	E S	KIN/III
Silty	sand, some gravel, asphalt pied bil inclusions, moist (loose)	ces,		6	1.1.3							×					SS1
<b>XX</b> .	. ,	97.9		-5 (-1.5	1.1.1												
Interl	<u>DY SILT</u> bedded with clayey silt, brown, v			1 4	1.1.2	3.1.						×	1.1.				SS2 19.8
(very	loose to loose)	97.	35	-3 (-1-)	1.1.1											(	15.0
				<b>2</b> ○	1111							×				$\left  \right\rangle$	SS3
CII T	Y CLAY	96.5		2	77	kPa										(	
	n, wet (stiff)	_		-2.6-1-2	1112	= 13	0110						2-1-			-[	
		95.7		3	1.1.5												
	Y CLAY plasticity, trace sand, grey, wet,	(soft to	amm	ner Weight								Но	×			$\bigvee$	SS4
—firm)		` -			1	311										1	
				34 kF	1::::												
				s=1	4												
		-	_	ner Weight													1
		- "	- 1	5										Κ		- X	SS5
				2512		211											
				10 (111)	1.1.3												
		_		6 24 kPa	1.1.2	0.10	0.1.3.0	1-2-0-1		. 3 - 3 - 4 -	- 0- 0- 0-	0   1 0 0   1 0 0   1 0	(-1-				
		_		3 11 3	1 1 1 1			-2-2-3			11.0.0					Щ	
				-0.0-1-0						13 131 61 13 131 61 13 131 61			1111				
		_		7													
		_															
		н	- 1	ner Weight									×			$\left\langle \right\rangle$	SS6
																/	
		-		-1-1-1-1						- 2 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3			1111				
				9									1111				
				34 kF + s = 7	1:1:2								1111				
		-															
	Continued Next Page		_ ₁	10									1.1.				
OTES:		WAT	ER	LEVEL R	ECO	RDS					С	ORE I	DRIL	LING F	RECOR	D	
use by others	requires interpretation by EXP before	Date		Water Level (m	)	Н	ole Op To (m)			Run No.		epth m)		% R	ec.	R	QD %
. 19 mm diamete	r standpipe installed as shown	June 6,2023		1.3							_					_	_

Project No: OTT-23004319-A0 Figure No. 13



NOTES:

LOG OF 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 %					
INO.	(111)							

Project No: OTT-23004319-A0
Project: New Catholic High School

3 of 3Page. Combustible Vapour Reading (ppm) 250 500 750 Standard Penetration Test N Value Natural Geodetic 20 Shear Strength SOIL DESCRIPTION Natural Moisture Content % Atterberg Limits (% Dry Weight) Unit Wt. 200 76.65 Cone pushed to 24.4 m depth and dynamic cone penetration test (DCPT) conducted from 24.4 m to cone refusal at a 30.5 m depth below ground surface. (continued) 68.2 23004319 - MAY 26, 2023.GPJ TROW OTTAWA.GDT 6/16/23 Cone Refusal at 30.5 m Depth

### NOTES

BH LOGS

LOG OF 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	Depth	% Rec.	RQD %					
No.	(m)							
l	i							

F	Project	No:	OTT-23004319-A0	9 0.		•	<b>O</b>	<b>U</b> I(						4.4			: ^ -
F	Project	:	New Catholic High School								i	Figure N	_	14	-		-
Ł	_ocatio	n:	5431 Fernbank Road, Ottawa	, Ontario								Pa	ge	1_ of	1		
	ate Dr	rilled:	'May 16, 2023			_	Split Spc	on Samp	ole	$\boxtimes$		Combus	tible Vap	our Readir	ng		
	Drill Typ	pe:	CME-55 Track Mounted Drill F	Rig		_	Auger Sa SPT (N)					Natural I		Content	ı	1	X →
	atum:		Geodetic Elevation			_	Dynamic	Cone Te	est			Undraine % Strain	ed Triaxia			.!	⊕
L	.ogged	l by:	MZ Checked by:	IT			Shelby T Shear St	rength by	/	+		Shear St Penetror	rength b	у			<b>A</b>
_					1		Vane Te			Ś							
Q V	S Y M B O L		SOIL DESCRIPTION		Geodetic Elevation m 98.72	n p	Shear	20 Strength		60 8	80 kPa	2: Nat Atterb	50	ture Conte ts (% Dry W	50	) MAPLIES	Natural Unit Wt. kN/m <sup>3</sup>
		Silty : (com	~ 300 mm thick sand with gravel, brown, damp, pact)		98.4 98.3	0	13 O					×				X	SS1
			SOIL ~ 100 mm thick												.5 (		
		Interl (very	pedded with clayey silt, brown, v loose)	wet,	97.2	1	0						×			X	SS2 19.4
		SILT With	Y CLAY sand seams, brown, wet (firm)	_	-	2	1 O			10.00000			×			A	SS3
		_		_			12.01.02										
					95.7		-: : s =	10				0010					
			Y CLAY , wet, (soft to firm)	_	1	3 Imme	r Weight					1 1 1 1 1	×			V	SS4
		_ _	, wot, (ook to min)	-						1 - 2 - 2 - 2 - 2			· · · ^			$-\Delta$	334
		_		_		4	29 kPa + s = 24										
							5-24										
		- with	dark grey and black bands bel	ow 4.6	Ha		r Weight					10.000					
		_m de	pui	_	_	5				1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		100000000000000000000000000000000000000		X		$\bot$	SS5
		_		_	-		-5 (-1 -5			1.5 (1.1)		0.010			3.3.1.		
		_		_		6						3000					
_							24 kPa + s = 20					0.000					
6/16/23		_		_	-		3 - 20			1.2 (1.1)		0.000					
		_		_	_	7	-2-2-1-2			1.5.0.1.5			- 1 - 2 - 2 - 1	1 2 1 2 2			
TAWA		_		_					1000			0.000					
TO WC							20010					2000		*			ST6
J TRO		- В	orehole Terminated at 8.2 m D	enth	90.5	8											
)23.GF		_	0.0.1010 10111111atou at 0.2 111 2	opu.													
, 26, 2(																	
- MA																	
23004319 - MAY 26, 2023.GPJ TROW OTTAWA.GDT																	
	OTES:					_			11111	<u> </u>				1::::			
ΧI		le data ro	equires interpretation by EXP before	D		ER L	EVEL R Water	ECORE	S Hole Op	en	Run	CO Dep		ILLING R % Re			QD %
т.	use hv r			Dat		L	evel (m)		To (m		No.	(m					
	use by o	le was b	ackfilled upon completion	Upon Cor	npletion		5.8		7.6								
	use by on the second se	ork supe	rvised by an EXP representative.	Upon Cor	npletion		5.8		7.6								
- BOREHOLE	use by on the control of the control	ork supe ites on S		Upon Cor	npletion		5.8		7.6								

- 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	5.8	7.6						

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

Projec	t No:	Log of	f Bo	r	eh	ole	<u> B</u>	<u> H-</u>	<u>13</u>				1	e	xp
Projec		New Catholic High School							F	igure N		15	-		
Locati		5431 Fernbank Road, Ottawa, Ontario							_	Pag	je	1_ of	_1_		
		'May 15, 2023			0-14-0	0	1-		_	0 1	U-1- \	D!			
Drill Ty		CME-55 Track Mounted Drill Rig			Split Spoo		е			Combust Natural M			ng		X
Datum		Geodetic Elevation			SPT (N) \ Dynamic		st			Atterberg Undraine		l at	ŀ		<b>→</b>
Logge		MZ Checked by: IT			Shelby Tu	ube		-		% Strain Shear Str	at Failure	9			<b>⊕</b>
Logge	u by.	MZ Checked by. 11			Shear Str Vane Tes			+ s		Penetron					•
G Y M B O		SOIL DESCRIPTION	Geodetic Elevation m	D e p t		0 4		Γest N Val		25	0 5	our Readi 00 7 ure Conte s (% Dry V	50	S A M P L	Natural Unit Wt. kN/m³
[ ] [ ] [ ] [ ]	TOPS	SOIL ~ 230 mm thick	98.41 98.2	h 0	5	-	00 1	50 20		2			80	Š	KIN/III
	FILL	y silt, brown, moist, (compact)	96.2		13 O					×					SS1
$\mathbf{A}$	•		97.697.61												
	Interl	<b>DY SILT</b> pedded with clayey silt, brown, moist to	-	1	6					<b>*</b>	<				SS2
		(loose) Y CLAY	96.9		34 kPa								-5-6-1-1	1/	
	Brow	n, wet, (soft to firm)			s = 14										
				2	-5 (-1-5 -		4-1-3-3	-1-1-1-1		3333	-1-0-6-1-				
		-	Ham	me	er Weight.	- 1 - 2 - 2 - 1 -	- 0- 1- 3- 0-	-3 -3 - 3 - 3 - 3 -		0.000	X		-2-5-1-2	$\left\{ \right\}$	SS3
	OU T	VOLAY	95.4	3	-24 kPa-									1/\	
	Medi	<u>Y CLAY</u> um plasticity, trace sand, grey, wet, to firm) –			s = 20						-1-0-1-1				
			Hom	_	er Weight					10.000	1001			-	
	- with m de	dark grey and black bands below 3.8 $^{-}$ pth	_ nam	(	or vveignt							*		X	SS4
		-			24 kPa		4-1-2-4								
	-	-	-	5	s = 20							1 1 1 1 1 1		-	
		-			-5 (-1.5)						-1-0-0-1				
		-	Ham	6	er Weight						-1-1-1-1			+	
		-	- main	(	o iii		- 0-1-2-0				0	×		1	SS5
		_		7	-0.0-1-0.0		0.000	-3 -3 - 3 - 3 - 3							
				ļ '											
		-	-		19 kPa										
	В	orehole Terminated at 7.9 m Depth	90.5		+ -s = 8		11111	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		100000		11111	1 1 1 1 1		
							1 : : : :								

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

- 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	0.8							

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

	Log of	f Bo	r	eh	ole	<u> </u>	<u> </u>	<u>14</u>				1		xr
Project No:	OTT-23004319-A0								igure N	Jo	16		_	<b>~</b> \
Project:	New Catholic High School							_ '	Pag		1 of	_		
Location:	5431 Fernbank Road, Ottawa, Ontario							_	1 45	,		<u> </u>		
Date Drilled	l: 'May 18, 2023		_	Split Spo	on Samp	e	$\boxtimes$		Combust	tible Vapo	our Readi	ing		
Drill Type:	CME-55 Track Mounted Drill Rig		_	Auger Sa SPT (N) \					Natural M Atterberg		Content	F		X →
Datum:	Geodetic Elevation		_	Dynamic		st	_		Undraine % Strain					$\oplus$
Logged by:	MZ Checked by: IT			Shelby To Shear Str Vane Tes	ength by		+ s		Shear St Penetror	rength by	,			•
S Y		Geodetic	D		ndard Pe	netration <sup>-</sup>	Γest N Val	ue	Combus 25			ing (ppm) '50	S A M P	Natural
G Y M B O L	SOIL DESCRIPTION	Elevation m	p t h	Shear S	Strength			kPa	Nati Atterb	ural Moist erg Limits	ure Conte s (% Dry V		PLES	Unit Wt. kN/m <sup>3</sup>
TOI	PSOIL ~180 mm thick	97.95 97.8	0	6	0 1	00 1	50 20	00	2	0 4	10 (	60	S	
	NDY SILT TO SILTY SAND wn, wet, (loose to compact)			0					:: :: : : <b>&gt;</b>	<			1	SS1
	-		1							×			$\frac{1}{}$	SS2
	TY CLAY	96.5 Han	nme	er Weight									1/	
Tra	ce sand, brown, moist to wet, (firm)	-	2	φ			-3 (-1-3-		-0.000	×	- 6- 1-0- 6-		1	SS3
	_			27 kPa									: m	
				0.00			-3 (-1-3-		00000			40010		
SIL	TY CLAY	95.0 Han	3 nme	er Weight									1	
	ey, wet, (very soft)	94.4		Φ		1 1 1 1 1 1	1-3-3-3-3-3			×			1	SS4
	Borehole Terminated at 3.6 m Depth													

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

- 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	3.0	3.6						

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

Project:	New Catholic High School										_ '					1				-
ocation:	5431 Fernbank Road, Ottawa, C	)ntario									_		Pag	je.	_1	of	f _	1_		
ate Drilled:	'May 18, 2023			Split S	Spooi	n Sam	ple			$\boxtimes$		Con	nbust	ible \	/apo	ur Rea	ading	I		
rill Type:	CME-55 Track Mounted Drill Rig			Auger												ontent	t			
atum:	Geodetic Elevation			SPT (I Dynan	nic C	one T	est		_	<u> </u>		Und	rberg Iraine	d Tri	axial	at		ı		<del>-</del>
ogged by:	MZ Checked by: IT	-	_	Shelby Shear	•		v			+ s		She	train ar St	rengt	h by					•
				Vane '						Ś		Pen	etron	neter	lest					_
SY MBO	SOIL DESCRIPTION	Geodel		2	Stan 20	dard P	enetra 40		Γest N 30	Valu 80			25	50	50		750	)	SAM MA	Natura
B O L	SOIL DESCRIPTION	Elevation m 97.81	ř			rength	100		50	20	kPa	<b> </b>	Nati Atterb 2		ioistu imits 4	re Cor (% Dry	ntent y We 60	ight)	SAMPLES	Unit W
	SOIL ~180 mm thick	97.6	C	4		1.50					1.2.0.0							 	V	SS1
- Trace loose	clay, brown, moist, (very loose to	o –				1.3.5.					1.1.1.1.								$-\!\!\!\!/\!\!\!\!/$	001
100se	)		1	2		1.5 (														000
		96.3	.51	0		1.2.0									×				$\Lambda$	SS2
	<u>/ CLAY</u> wet, (very soft)	90.3		1					12.4			111		1						SS3
Gley,	wet, (very sort)	_	2	2		1.50		1 - 2 - 2 -	100		1-1-0-1-	444		-1-0	×	. (. ) .)	( ) · ( )	) (+) + ) (+) +	$\Delta$	333
			lamm	er Weig	ıht									- 3 - 3-					17	
				Φ											×				X	SS4
		-	3	3																
Bo	prehole Terminated at 3.4 m Dep	94.4 <b>th</b>		1 1 1 1	1	1.1.1		1 1 1			1.1.1.1	1 1	1 1	111		1111				
												:::								
												:::								
											: : : :	1 : :								
OTES:  Borehole data re	equires interpretation by EXP before	WAT	ER I	EVEL		CORI									RIL	LING		COR		
use by others		Date		Wate Level (				e Op o (m)			Run No.		Dept (m)			% F	₹ec.		R	QD %
. 19 mm diameter	standpipe installed as shown	June 6,2023		1.3																

- Borehole data requires interpretation by EXP before use by others
- 2.19 mm diameter standpipe installed as shown
- $3. \\ \mbox{Field}$  work supervised by an EXP representative.
- 4. See Notes on Sample Descriptions
- 5.Log to be read with EXP Report OTT-23004319-A0

WAT	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 %								
	• •										

D :	Log of	Во	r	eh	ole	<u>B</u>	<u>H-</u>	<u> 16</u>					$\epsilon$	exr
•	OTT-23004319-A0							F	igure N	No	18	_		
•	New Catholic High School							_	Pag	ge	<b>1</b> _ of	1_		
	5431 Fernbank Road, Ottawa, Ontario													
Date Drilled:	'May 18, 2023			Split Spoo	•	е				tible Vapo		ng		×
Drill Type:	CME-55 Track Mounted Drill Rig			Auger Sa SPT (N) \			<b>Ⅲ</b> ○		Atterberg	Moisture ( g Limits	Jonteni		<u> </u>	<b>~</b>
Datum:	Geodetic Elevation			Dynamic Shelby Tu		st	_			ed Triaxia at Failure				$\oplus$
Logged by:	MZ Checked by: IT	_		Shear Str Vane Tes	ength by		+			rength by neter Tes				•
SY MBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Shear S	0 4 trength	0 6		80 kPa	2: Nati Atterb	ural Moist erg Limits	00 7 ure Conte s (% Dry V	50	i) NA P L ES	
SAND	OIL ~ 180 mm thick  Y SILT TO SILTY SAND clay, brown, moist, (very loose)	97.9	0	3						Κ				SS1
	_		1	<b>2</b> O						×		333	$\left\langle \right\rangle$	SS2
	CLAY sand seams, brown, wet, (firm)	96.6 <b>Ha</b> m	me	er Weight						×			$\rangle$	SS3
	_		_	27 kPa								10 0 1 10 0 1 10 0 1	- -11	
		95.1	3	s = 13.5										
Grey,	YCLAY wet, (soft)	94.5		3 ○						×		-2-6-1		SS4
Bo	prehole Terminated at 3.6 m Depth	94.5												

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

- 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

WAT	WATER LEVEL RECORDS									
Date Water Hole Open Level (m) To (m)										
Upon Completion	2.6	3.6								

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

Project No:		g or be	<i>)</i>	CII	U			<u> </u>						C	X
Project:	New Catholic High School									Figure	-		9_		
Location:	5431 Fernbank Road, Ottawa,	Ontario							_	Pa	age	<u>1</u> o	f <u>1</u>		
Date Drilled:	'May 17, 2023		_	Split Spo	on S	ample	)	$\boxtimes$		Combu	ıstible Va	pour Rea	ading		
Drill Type:	CME-55 Track Mounted Drill R	tig	_	Auger Sa SPT (N)							Moisturerg Limits	e Conten	t		X →
Datum:	Geodetic Elevation		_	Dynamic	Con		t			Undrai	ned Triax in at Fail	ial at		•	⊕
Logged by:	MZ Checked by:	IT		Shelby T Shear St Vane Te	rengt	h by		+ s		Shear	Strength ometer T	by			•
GW L SY MBOL	SOIL DESCRIPTION	Geodetic Elevatior m 99.42		Shear S	20	4		0 8	lue 80 kPa		250	500	ading (pp 750 ntent % y Weight) 60	1 1	1.81/3
FILL Silty loos	: sand and gravel, brown, damp, e to loose)	(very		4							×			<u> </u>	SS1
Clay	DY SILT ey, slightly cohesive, brown, we m/very loose to loose)	98.6 t, (soft	1	1 4							×			X	SS2 18.8
	Y CLAY vn, wet, (very soft)	97.8 Ha	  mm    2	er Weight				12 12 12 12 12 12 12 12 12 12 12 12 12 1				×			SS3
		Ha	ımm 	er Weight				-2-0-0-0			×			\ 	SS4
		_ Ha	imm 	er Weight				- 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2			×			$\backslash$	SS5
	TY CLAY a dark grey and black bands, gre )	95.6 y, wet, 95.0	ımm	er Weight				-3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -				×		\ \ 	SS6
23004319 - MAY 26, 2023 GPJ TROW OTTAWA.GDT 6/16/23	Borehole Terminated at 4.4 m De	epth													
NOTES:	requires interpretation by EVD before	WATE	ER I	LEVEL RI	ECO	RDS	;			C	ORE DE	RILLING	RECO	RD	
	requires interpretation by EXP before	Date		Water Level (m)	)	H	lole Ope To (m)	en	Run No.		pth n)	% F	Rec.	F	RQD %
3. Field work sup	packfilled upon completion ervised by an EXP representative.  Sample Descriptions with EXP Report OTT-23004319-A0														

WAT	ER LEVEL RECO								
Date	ate Water Hole Op Level (m) To (m)								

	CORE DR	ILLING RECOR	KD
Run No.	Depth (m)	% Rec.	RQD %
	\/		

Project	No:	OTT-230043	319-A0	<i>,</i>		•	•	•					<u> </u>				20		_	: <b>^</b>
Project:	:	New Catholi	c High School										۲	igure N			<u>20</u>	4		- 1
_ocatio	n:	5431 Fernba	ank Road, Ottawa, (	Ontario										Pa	ge	<u> </u>	ot _	<u> </u>		
Date Dr	illed:	'May 18, 202	3				Split	Spoo	on Sampl	e		$\boxtimes$		Combus	tible Vapo	our R	eadin	g		
Orill Typ	oe:	CME-55 Trac	ck Mounted Drill Rig	g			Auge SPT							Natural I	Moisture (	Conte	ent	L		X ⊕
Datum:		Geodetic Ele	evation				Dyna	mic	Cone Tes	st		_		Undraine	ed Triaxia at Failure			ī		Φ
ogged	by:	MZ	Checked by: I	Т			Shelt Shea Vane	ır Str	ength by			+ s		Shear St	trength by neter Tes	,				•
S Y M B O L		SOIL [	DESCRIPTION		Geodetic Elevation	D e p t		2		netration	Test N	Value 80		2	stible Vapo 50 5 ural Moist perg Limits	00	75	0	SAMPLES	Natural Unit Wt.
L 0 L	FILL			_	100.8	h 0	She		trength	00	150	200	kPa	1		10 10	Ory vv		Ē	kN/m³
	Silty	sand with gra ts, brown, mo	vel, asphalt pieces ist, (loose to compa	and act) –	-		. 11 C	0						×						SS1
	SILT	<u>SOIL</u> ~ 200 m Y CLAY			99.9 99.7	1		<b>14</b> _							×					SS2 19.9
<u> </u>	Grey	, moist to wet	, (soft to firm)	-	99.1		<b>5</b>								×					SS3
	_			_	Ham	2 me	r Wei	aht											1/	
	_			_		3	D:::								×					SS4 No Rec.
	-			_			-2-2-													
	_			_	Ham	nme	r Wei	ght_										2 2 1 2 2		
						(	P.: ::  ::::::								×					SS5
	-			_	05.0		17 kP	100					1111	0.000	×			5 (-1-5		
	В	orehole Term	inated at 4.9 m Dep	pth	95.9			100							*					

### NOTES:

- 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

WAT	ER LEVEL RECO	RDS
Date	Water Level (m)	Hole Open To (m)
June 6,2023	1.7	

CORE DRILLING RECORD										
Depth	% Rec.	RQD %								
(m)										
		Depth % Rec.								

## Log of Borohola BH-10

Project No:	OTT-23004319-A0_	טם וע	"	GII	Ole	; <u> </u>	<u> </u>				0.4			X
Project:	New Catholic High School							F	Figure N	_	<u>21</u>	_		
Location:	5431 Fernbank Road, Ottawa, Ontari	io							Paç	ge	1_ of			
Date Drilled: Drill Type: Datum: Logged by:	'May 17, 2023  CME-55 Track Mounted Drill Rig  Geodetic Elevation  MZ Checked by: IT		-	Split Spo Auger Sa SPT (N) ' Dynamic Shelby T Shear St Vane Tes	ample Value Cone Te ube rength by	st	<ul><li>□</li><li>+</li><li>s</li></ul>		Combus Natural M Atterberg Undraine % Strain Shear St Penetror	Moisture g Limits ed Triaxia at Failur	al at e y	ing  -		□ <b>×</b> → ⊕
G Y M B O L	SOIL DESCRIPTION	Geodetic Elevation m 100.33	D e p t h	Shear S	20 - Strength		est N Value 80 8	0 kPa	2: Nati Atterb	50 5 ural Mois erg Limit	ture Conte s (% Dry \	750	SAMPLIES	Natural Unit Wt. kN/m³
Silty (den	NULAR FILL sand and gravel, brown, damp, se)	99.5				<b>46</b> O			×					SS1
FILL Mixtu wood comp	ure of clayey, silty sand and gravel, d pieces, brown, damp, (loose to pact)		1	9.					×					SS2 20.9
		-	2	-5					×					SS3 19.5
SILT Brow	Y CLAY /n, wet, (soft to firm)	97.7	3	2 0						×				No Rec SS5
SILT Grey	Y CLAY v, wet, (firm)	96.5	4	1 O 27 kPa						×				SS6
B	Forehole Terminated at 4.7 m Depth	95.6		s = 27									·	

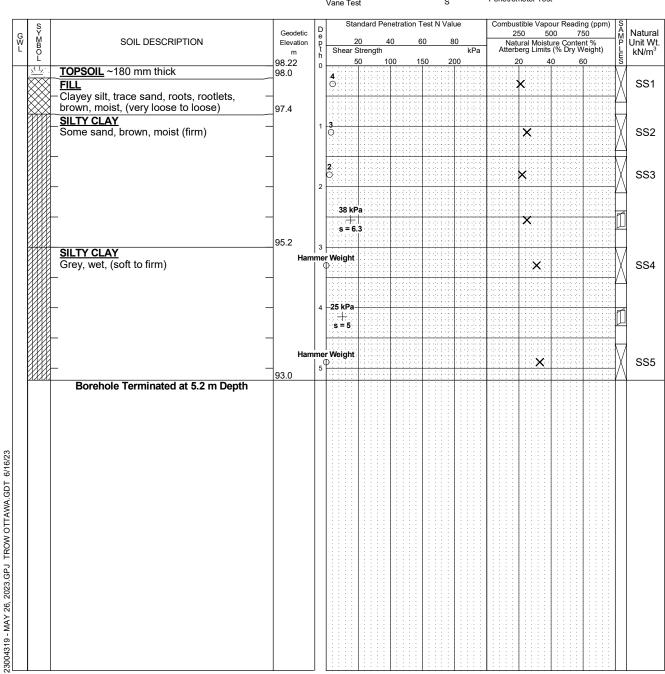
### NOTES:

- Borehole data requires interpretation by EXP before use by others
- 2. Borehole was backfilled upon completion
- $3. \\ \mbox{Field}$  work supervised by an EXP representative.
- 4. See Notes on Sample Descriptions
- LOG OF BOREHOLE BH LOGS 23004319 MAY 26, 2023.GPJ TROW OTTAWA.GDT 6/16/23 5. Log to be read with EXP Report OTT-23004319-A0

WAT	ER LEVEL RECO	RDS
Date	Water Level (m)	Hole Open To (m)

	CORE DR	LILLING RECOF	RD
Run	Depth	% Rec.	RQD %
No.	(m)		

		Log of	Bo	r	ehole <u>E</u>	3H	-20		100	2	vr
Proje	ect No:	OTT-23004319-A0						No		1	^ト
Proje	ect:	New Catholic High School					F	igure No. 22	_		
Loca	tion:	5431 Fernbank Road, Ottawa, Ontario						Page1_ of			
Date	Drilled:	'May 18, 2023			Split Spoon Sample		$\boxtimes$	Combustible Vapour Read	ling	!	
Orill T	Гуре:	CME-55 Track Mounted Drill Rig			Auger Sample SPT (N) Value			Natural Moisture Content Atterberg Limits	⊢		X ⊖
Datui	m:	Geodetic Elevation			Dynamic Cone Test Shelby Tube	-	_	Undrained Triaxial at % Strain at Failure	-	(	<b>⊕</b>
_ogg	ed by:	MZ Checked by: IT			Shear Strength by Vane Test		+ s	Shear Strength by Penetrometer Test			<b>A</b>
G M B O L		SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration  20 40  Shear Strength 50 100	Test N 60	Value 80 kPa 200	Combustible Vapour Reac 250 500 Natural Moisture Cont Atterberg Limits (% Dry 20 40	750 tent %	Ρ̈̈́ L	Natural Jnit Wt. kN/m³
<u>117</u>	TOP:	SOIL ~180 mm thick	98.0	0	4					$\sqrt{}$	SS1
-NV	VI CILL		1	l	1 🗸 1 1			1 1 2	1	ΛΙ	001



### NOTES

BH LOGS

LOG OF BOREHOLE

- 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

Date Water Hole Open Level (m) To (m)  Upon Completion 2.5	WAT	ER LEVEL RECO	RDS
Upon Completion 2.5	Date		
	Upon Completion	2.5	

	CORE DR	RILLING RECOF	RD
Run	Depth	% Rec.	RQD %
No.	(m)		

## Log of Borehole TP-01

Project No: 0	TT-23004319-A0	g 0. D	•		••			_			<u> </u>	•						20		-	7	사
Project: Ne	ew Catholic High School											F	igure			_		23				
Location: 54	31 Fernbank Road, Ottawa,	Ontario									_		Р	ag	e.	_1	_	of _	1_			
Date Drilled: 'Ma	ay 5, 2023		_	Split	Spo	on Sa	mple	e		$\boxtimes$			Comb	usti	ible V	'apo	ur R	eadir	ıg		[	
Drill Type: CA	AT 320F Track Mounted Hyd	raulic Excavator		_		mple /alue							Natura				onte	nt				X Đ
Datum: Ge	eodetic Elevation			Dyna	amic	Cone	Tes	t	_				Undra	ine	d Tria	ixial	at					Φ
Logged by: MZ	Z Checked by:	IT		Shea		ength	by			+ s			% Stra Shear Penet	Str	engtl	n by						<b>A</b>
_			1	Van	e Tes															, 1	0.1	
G Y M B L O	SOIL DESCRIPTION	Geodetic Elevation			2	:0	40	etratior 0	60		30			25	0	50	0	75	ig (ppi 50 nt % 'eight)	i li	PL	Natural Jnit Wt.
L	AD FILL 400 mm think	98.46	h 0	Sh		Streng 0	th 10	00	150	2	kF	a —	Atte	erbe		mits		Ory W			E S	kN/m³
Crushed	<b>LAR FILL</b> ~400 mm thick gravel, grey, wet																				000	
		98.1											×								<b>M</b>	GS1
NON-WO	DVEN GEOTEXTILE  L ~ 300 mm thick	98.1										- :		-	,		::				m	GS2
SANDY	SILT	97.8																				GSZ
Some cl	ay, brown, moist to wet																					
			1									. ; .	: : : :		×					/	m	GS3
												1										
												. į.										
Test	Pit Terminated at 1.8 m De	96.7 <b>pth</b>			::							÷					: :					
												:										
												-										
												:										
												:										
33												:										
6/16/23												:										
4.GDT												:										
TTAW.																						
0 NO:												:										
지 [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [												:										
23004319 - MAY 30, 2023.GPJ TROW OTTAWA.GDT												:										
× 30, 2												:										
9 - MA												:										
000431												:										
ν NOTES:			_	\ <u>-</u>		-00-			11:	7		-							-00			
SI.	res interpretation by EXP before	Date		Wa	ter	-COF		Hole O			Rur	·	D	ept	h	KIL		G RE	ECOF		RQ	D %
	oon completion of excavating	On Completion	L	evel 0.4	(m) 4			To (r	n)		No.	+	(	m)		+						
2. Test pit backfilled up	· ·	0 00p.o		٠.		- 1				- 1						- 1						
2. Test pit backfilled up operation.  3. Field work supervise	ed by an EXP representative.	on completion		٥.																		
operation.  3. Field work supervise  4. See Notes on Samp				0.																		

- 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

Date         Water Level (m)         Hole Open To (m)           On Completion         0.4	WA	TER LEVEL RECC	RDS
On Completion 0.4	Date		
	On Completion	0.4	

	CORE DR	RILLING RECOR	RD
Run No.	Depth (m)	% Rec.	RQD %

	Log of	f Bo	r	re	h	ole	<b>.</b>	T	<u>P-</u>	<u>02</u>					6	xr
Project No:	OTT-23004319-A0										Figure	No.	24	4	_	<b>~`</b> \_
Project:	New Catholic High School										-	_	1 of			
Location:	5431 Fernbank Road, Ottawa, Ontario											g				
Date Drilled:	'May 5, 2023		-	Spli	it Spo	on Samp	le		Þ		Combu	stible Va	pour Rea	ding		
Drill Type:	CAT 320F Track Mounted Hydraulic Ex	cavator			ger Sa Γ (N) \							Moisture g Limits	e Content	ŀ		× ⊸
Datum:	Geodetic Elevation		_	Dyn	namic	Cone Te	st			-		ed Triax n at Failu				$\oplus$
Logged by:	MZ Checked by: IT			She	elby Tu ear Str ne Tes	ength by	′		+	- S	Shear S	Strength meter T	by			•
S	_	Geodetic	De		Sta	ndard Pe	netrat	tion T	est N V	alue		stible Va	pour Rea	ding (ppm) 750	S A M P	Natural
G Y M B O L	SOIL DESCRIPTION	Elevation m	p t h	o L	hear S	Strength	40	60		80 kPa	Na Atter	tural Moi berg Lim	sture Cor its (% Dry	tent % v Weight)	PLES	Unit Wt. kN/m <sup>3</sup>
FILL Silty	sand with gravel, plastic pieces, stone and topsoil pockets, brown, moist	97.56	0	0	5	0	100	15	0	200	×	20	40	60	s m	GS1
SANI Some	DY SILT e clay, brown and grey, moist to wet	97.0	1	1					- 3 - 1 - 5 - 1			*			· · · · · · · · · · · · · · · · · · ·	GS2
	-	_													-	
T	Test Pit Terminated at 2.0 m Depth	95.6	2	22												

- NOTES:
  1. Boreh use b:
  2. Test p: opera
  3. Field
  4. See N
  5. Log to 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

WAT	ER LEVEL RECO	RDS
Date	Water Level (m)	Hole Open To (m)
On Completion	dry	

	CORE DR	LILLING RECOF	RD
Run	Depth	% Rec.	RQD %
No.	(m)		

# Log of Borehole TP-03

oject:	New Catholic High School								_ _	-	No		_		
cation:	5431 Fernbank Road, Ottawa, Onta	rio							_	Page. <u>1</u> of <u>1</u>					
te Drilled:	'May 5, 2023		_ Split Spoon Sample 🖂						Combustible Vapour Reading						
II Type:	CAT 320F Track Mounted Hydraulic	Excavator	Auger Sample						Natural Atterber	Moisture	Content	L		X ⊕	
tum:	Geodetic Elevation			Dynamic	Cone Te	st	_	<u> </u>		Undrain	ed Triaxia				Φ
gged by:	MZ Checked by: IT				rength by			+ s		Shear S	trength by	y			<b>A</b>
				Vane Te							meter Tes			101	
S Y M B O L	SOIL DESCRIPTION	Geodetic Elevation	D e p		andard Pe	netratio 10	on Test 60	: N Valu 80		2	50 5	00	ing (ppm) 750 ent %	SAMP-IIIO	Natural Unit Wt.
		98.05	h 0	Shear	Strength	00	150	20	kPa	1	tural Moist perg Limit 20		Weight) 60	LES	Unit Wt. kN/m <sup>3</sup>
TOP	SOIL ~400 mm thick														
11/2		97.7													
	DY SILT e clay, brown, moist to wet														
	<b>-</b> ,,			10000							×			, en	GS1
		-	1												
		96.6													
	Y CLAY v, wet													H	
3.0,	,										×			<b>8</b>	GS2
			2												
		95.9													
•	Test Pit Terminated at 2.2 m Depth														
							:   :				: : : :	: : : :	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		<b>/</b> 1	CII	Oit	<b>-</b>					00			X
Project: New Catholic High School  Location: 5431 Fernbank Road, Ottawa, Ontario								_	Figure N		<u>26</u>	_		
Location:	5431 Fernbank Road, Ottawa, Ontario							_	Paç	је	1_ of	_1_		
Date Drilled:	'May 5, 2023			Split Spo	on Samp	ıle	$\boxtimes$		Combus	tible Vap	our Readi	ng		П
Drill Type:	CAT 320F Track Mounted Hydraulic Ex	cavator	-	Auger Sa	ample				Natural M	Moisture (				×
Datum:	Geodetic Elevation		-	SPT (N)		st			Atterbero Undraine	ed Triaxia		F		<del>-</del>
Logged by:	MZ Checked by: IT		-	Shelby T Shear St		,	+		% Strain Shear St	trength by	y			<b>→</b>
55 ,				Vane Te			Ś		Penetror	neter Tes	st .			
S Y M B O	SOIL DESCRIPTION	Geodetic Elevation m	D e p t				Test N Valu		2	50 5	our Readi 500 7 ture Conte s (% Dry V	50	I A	Natural Unit Wt. kN/m³
L	SOIL ~400 mm thick	98.1	h 0	1	-	100 1	50 20		1			60	S	KIN/III
1/ 1/	<u>50.2</u> 150 mm tilok	97.7											-	
SAN	DY SILT	97.7												
Som	e clay, brown, wet			10000								4444		
	-	-	1						::::	×			m	GS1
														GST
		96.6		10000		1:::::	1.2.4.4.4.4		100000		1000			
SILT	Y CLAY v, wet	90.0											-	
Gley	, wet													
			2							×			·m	GS2
	Test Pit Terminated at 2.1 m Depth	96.0				+					<del>                                     </del>	+	+	
	·													
				1 : : : :	1 : : : :	: : : :	1:::::			1::::	1::::	1::::		

### NOTES:

LOG OF BOREHOLE TP LOGS -

- 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 %							

Project No:	OTT-23004319-A0	IDC	)	en	Ole	<del>,</del> –	<u> </u>	(	<u> </u>				**	e	XĽ
Project:	New Catholic High School								I	Figure N	_	27	_		
Location:	5431 Fernbank Road, Ottawa, Ontario								_	Pag	ge	1_ of			
Date Drilled:	'May 5, 2023			Split Spoo	on Samp	le		$\boxtimes$	_	Combust	tible Vap	our Readi	ina		П
Drill Type:	CAT 320F Track Mounted Hydraulic Ex	cavator		Auger Sa	mple					Natural N	Moisture (				X →
Datum:	Geodetic Elevation		-	Dynamic	Cone Te	st	_			Atterberg Undraine	ed Triaxia		ŗ		<del>-</del>
Logged by:	MZ Checked by: IT		-	Shelby Tu Shear Str Vane Tes	ength by			+		% Strain Shear St Penetror	rength by	y			<b>A</b>
G X		Geodetic	D e		ndard Pe					25	50 5		50	S A M	Natural
G Y M B O L	SOIL DESCRIPTION	Elevation m	t h	Shear S	trength	10 00	150	20	kPa	1		ture Conte s (% Dry V 40	ent % Veight) 60	SAMPLES	Unit Wt. kN/m <sup>3</sup>
TOPS	SOIL ~ 200 mm thick	97.85 97.7	0			Ĭ.	130					1			
FILL Mixtu inclu	ure of silty sand and clayey silt, topsoil sions, brown, moist	91.1													
		97.2									×	<b> </b>		m	GS1
SILT Non- grey,	plastic, some sand and clay, brown to		1								×			(%)	GS2
															002
				-9 (-1-9-)		0.11			• • • • • • •			+			
	-	1													
	- (B)(T   1   1   1   1   1   1   1   1   1	96.1													
1	est Pit Terminated at 1.8 m Depth														

- NOTES:
  1. Boreh use b. OH 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										

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

## Log of Borehole TP-06

Project No:	OTT-23004319-A0	•	_		•	•			-	•	•		<del>,</del>	-i ~	~ NI	اما		20		C	/	1
Project:	New Catholic High School													Figure		io je.		28	•			
_ocation:	5431 Fernbank Road, Ottawa, Ontario												_	F	'ag	je	<u>'</u>	OT .				
Date Drilled:	'May 5, 2023			Spli	t Sp	oon	Saı	nple				$\boxtimes$		Comb	ousti	ible Vap	our F	Readir	ng			]
Orill Type:	CAT 320F Track Mounted Hydraulic Ex	cavator	_			Samı ) Val										loisture Limits	Cont	ent		ı	<b>≻</b>	
Datum:	Geodetic Elevation							Test			_	<u> </u>		Undra	aine	d Triaxia					Ð	
ogged by:	MZ Checked by: IT		-		ar S	Tube Stren est		by				+ s		Shea	r Str	at Failur ength b neter Te	y				4	<b>\</b>
S Y M B O L	SOIL DESCRIPTION	Geodetic Elevation m	D e p t h	s		20 Stre		<u>40</u> h		6	0	N Vali	0 kPa		25 Natu terbe	ıral Mois erg Limit	500 ture ts (%	7: Conte Dry W	50 nt % /eight)	) NA	N Ur k	atural nit Wt. N/m³
	SOIL ~300 mm thick	97.96	0			50		100	)	15	50	20			20	)	40	6	0			
SAN Som	DY SILT  le clay, brown to grey, wet																					
																×				-	4 (	GS1
_	-		1																			
SII T	Y CLAY	96.5									-3-0-											
	vn, wet																					
	Toot Dit Torminated at 2.0 m Donth	96.0	2	13											1	×		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		m	9 (	GS2
	Test Pit Terminated at 2.0 m Depth																					

### NOTES:

- 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
- $5. \, \text{Log}$  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)	RQD %								

Dr	oioo	t No:	Log	of Bo	) 	e	h	ole	9	<u></u>	<u>P</u>	<u>-07</u>					е	XC
	-	t No:											Figure	No	29	<u>)                                    </u>		
	ojec catio		New Catholic High School	aria									Pa	ge	of	_1_		
			5431 Fernbank Road, Ottawa, Onta	ano														
			'May 5, 2023		-			oon Samp ample	ole			⊠ II			pour Read Content	ding		×
	II Ty		CAT 320F Track Mounted Hydraulio	c Excavator	-	SPT	(N)	Value				0	Atterber	g Limits		F		—
	tum		Geodetic Elevation		-	Shel		Cone Teube	est			_	Undrain % Strair	n at Failu	ıre			$\oplus$
Lo	gge	d by:	MZ Checked by: IT			Shea Van		trength b	y			+ s	Shear S Penetro					•
	S			0.15	D		Sta	andard Pe	enetr	ation T	est N	/alue			apour Read		S	Network
G W L	SYMBOL		SOIL DESCRIPTION	Geodetic Elevation m	e p t h			20 Strength	40	6	60	80 kPa		250 tural Mo berg Lim	500 isture Cont its (% Dry	750 tent % Weight)	SAMP-LES	Natural Unit Wt. kN/m <sup>3</sup>
	<u>7</u> 7	TOP	SOIL ~300 mm thick	98.02	n 0			-	100	1	50	200	1	20	40	60	S	
	1/ 1/			97.7														
	П	SAN	DY SILT le clay, brown, moist to wet	37.7														
		_30111	le clay, brown, moist to wet	-		11		1 1 1 1 1	1	1111								
																	m	004
		_			1									X				GS1
						10.5												
								1										
		Grey	below 1.5 m depth						1									
		SILT	Y CLAY	96.2														
			/, wet		2	111	11	11111	1	112 11	12 12 1			1111	×		m	GS2
	XXXX	•	Test Pit Terminated at 2.1 m Depth	95.9					1									
						::												

LOG OF BOREHOLE TP LOGS -

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

Project No:	OTT-23004319-A0		/1	CII	Oic	<b>,</b>			Figure N	lo.	30	. (		Χŀ
Project:	New Catholic High School							_ '	•	_	1 of	1		
Location:	5431 Fernbank Road, Ottawa, Ontario	ı						_	Pag	je	01 -			
Date Drilled:	'May 5, 2023		_	Split Spo	on Samp	e	$\boxtimes$		Combust	tible Vapo	our Readir	ıg		
Drill Type:	CAT 320F Track Mounted Hydraulic Ex	xcavator	_	Auger Sa SPT (N)					Natural M Atterberg		Content	L		X
Datum:	Geodetic Elevation		_	Dynamic	Cone Te	st			Undraine % Strain	d Triaxia		J		Φ
Logged by:	MZ Checked by: IT			Shelby T Shear St Vane Tes	rength by		+ s		Shear St Penetror	rength by	,			<b>A</b>
S Y M B O	SOIL DESCRIPTION	Geodetic Elevation m	D e p t	2		netration T	est N Valu		25	50 5	our Readir 00 75 ure Conter s (% Dry W	50	SAMPLES	Natural Unit Wt. kN/m³
L	SOIL ~400 mm thick	97.78	0		50 1	00 1	50 20	00	2	0 4	10 6	0	S	
1/ 2/1/		97.4												
Some	<u>DY SILT</u> e clay, brown, moist													
			1							×				GS1
			ľ											
SILT	Y CLAY	96.4												
Brow	n to grey, wet													
													-000	
	Test Pit Terminated at 2.0 m Depth	95.8	2	-2 (-1)						×			· (%)	GS2

### NOTES:

LOG OF BOREHOLE TP LOGS -

- 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  $\,$

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

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

Project No:	OTT-23004319-A0		•	0.	•	<b>,</b> , ,	′ <u> </u>		_	<del>,                                    </del>	igure N	lo.	3	1	-	7	^}
Project:	New Catholic High School									_	_	_	1 of				
Location:	5431 Fernbank Road, Ottawa, Ontario									_	Рац	је. <sub>_</sub>	0		-		
Date Drilled:	'May 5, 2023		_	Split Sp	oon	Sampl	е		$\boxtimes$		Combus	tible Va	oour Rea	ıding			
Drill Type:	CAT 320F Track Mounted Hydraulic Ex	cavator		Auger S							Natural M Atterberg		Conten		_		X Đ
Datum:	Geodetic Elevation			Dynam	ic C	one Tes	st	_	_		Undraine	ed Triax			•		⊕ ⊕
Logged by:	MZ Checked by: IT		-	Shelby Shear S					+ s		% Strain Shear St	rength I	ру				<u> </u>
				Vane T	est						Penetror	neter 1	est				
SY MBOL	SOIL DESCRIPTION	Geodetic Elevation m	D e p t h	Shear	20	4 ength		Test I 60 150	N Valu 80 20	0 kPa	2: Nati Atterb	50	pour Rea 500 sture Cor ts (% Dr	750	pm) it)	Ϋlι	Natural Jnit Wt. kN/m³
1 - 1 - 1	SOIL ~300 mm thick	98.32	0		30			130	- 20				Ĭ				
1/ 1/ CAN	DV CII T	98.0															
Som	<u>DY SILT</u> e clay, brown, moist _																
												×			4	m	GS1
	_		1														
WW SII T	Y CLAY	96.9				-2-0-1-				· • • • • • • • • • • • • • • • • • • •							
	/n, wet																
													×			m	GS2
		96.3															002
	Test Pit Terminated at 2.0 m Depth																

### NOTES:

- 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
- $5. \, \mathsf{Log}$  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	Depth	% Rec.	RQD %									
No.	(m)											

oject No: oject:	OTT-23004319-A0  New Catholic High School							F	igure	No.		32	-		
cation:	5431 Fernbank Road, Ottawa, Ontario	)							Р	age.	_1	_ of .	1_		
te Drilled:	'May 5, 2023			Split Spoo	on Sampl	0	$\boxtimes$		Comb	uetiblo	\/anoı	ır Readir	na.		
II Type:	CAT 320F Track Mounted Hydraulic E.	xcavator	-	Auger Sa	mple	C	Ī		Natura	al Moist	ure Co		ig		X
tum:	Geodetic Elevation	<del>Acaratoi</del>	-	SPT (N) \ Dynamic		st			Atterb Undra	Ŭ		at	ŀ		<b>⊕</b>
ged by:	MZ Checked by: IT		-	Shelby Tu Shear Str					% Stra						Φ
god by.	Official by. 11			Vane Tes			+ s		Peneti	romete	r Test				•
S Y		Geodetic	D				Test N Va			250	500	0 7	ng (ppm) 50	∐Â	Natura
M B O L	SOIL DESCRIPTION	Elevation	p t h	Shear S	Strength			kPa :00	Atte	atural I erberg I 20	Moistur imits ( 40	re Conte (% Dry W	nt % /eight) i0	PLEG	Unit Wi
FILL Mixt	re of silty sand and clayey silt, some	99.86	0				130 2	1		20	40				
💢 grave	el, wood pieces, topsoil inclusions, n, moist														
× blow	ii, moist														
$\otimes$										*				. m	GS1
	NULAR FILL ~200 mm thick	99.1							×						GS2
<b>GRA</b>	hed gravel, grey, moist  NULAR FILL ~200 mm thick	98.9	1											, eng	
Silty :	sand and gravel, brown, moist SOIL ~200 mm thick	98.7							×						GS3
1.1	DY SILT	98.5							+ 11						
Some	e clay, grey, moist to wet	-								×				m	GS4
		97.9	2							×				· m	GS5
1	est Pit Terminated at 2.0 m Depth														
1							1::::	1:::::	[::::	: [ ] ]	: :	::::			

- NOTES:
  1. Boreh use by
  2. Tests propera
  3. Field
  4. See N
  5. Log to 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	Depth	% Rec.	RQD %									
No.	(m)											

oject No: OTT-23004319-A0	ala a al								ſ	-igu	re N	lo		33	1 1	_	
oject: New Catholic High Sociation: 5431 Fernbank Road									_		Pag	je	1	of	1_		
-	, Ottawa, Ontario								_								
te Drilled: 'May 5, 2023			Split Spoon Sample ⊠ Auger Sample ■							ible Va loisture			ng		□ X		
II Type: CAT 320F Track Mou	nted Hydraulic Exca	vator		SPT (N) \	/alue			0		Atte	rberg	Limits	imits				⊕
tum: Geodetic Elevation				Dynamic Shelby Tu		esi		_		% S	train	at Failu	Triaxial at t Failure ngth by				$\oplus$
gged by: MZ Chec	ked by: IT	_		Shear Str Vane Tes		ру		+ s				rength neter T					•
S Y M SOIL DESCRIPT O L	ION	Geodetic Elevation m	p 20 40 60 80 t Shear Strength kF			kPa					SAMPLES	Natura Unit Wt kN/m³					
FILL Mixture of silty sand and cla gravel, brown and grey, we GRANULAR FILL	ayey silt, some	9.99	0			100	 30	200			2 		40		60	- F	GS1
Silty sand and gravel, with a plastic, and wood pieces, b	asphalt, brick,															Sub.	
moist										×							GS2
	_	98.6	1														
TOPSOIL ~200 mm thick	_																
SANDY SILT Brown, moist to wet	9	8.4									×						GS3
	-	7.8	2														
Test Pit Terminated at	2.2 m Depth																

- NOTES:
  1. Boreh use by
  2. Tests propera
  3. Field
  4. See N
  5. Log to 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

WAT	ER LEVEL RECO	RDS
Date	Water Level (m)	Hole Open To (m)
On Completion	2.0	

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

ject No: OTT-23004319-A0  ject: New Catholic High School							F	igure l		. 34	_			
cation: 5431 Fernbank Road, Ottawa, Ontar	io							Page1_ of _1_						
e Drilled: 'May 5, 2023		_ Split Spoon Sample 🖂					$\boxtimes$	Combus	stible Vapo	our Readi	ing			
Type: CAT 320F Track Mounted Hydraulic	Excavator	_	Auger Sa				II		Moisture (	Content			X ⊕	
um: Geodetic Elevation			Dynamic	Cone Te	st		o <del>-</del>	Undrain		ı				
ged by: MZ Checked by: IT		-	Shelby T Shear St	ube rength by		-	<b>-</b> + s	Shear S	n at Failure Strength by	,		⊕ <b>^</b>		
· ,							Ś	Penetro	meter Tes	st .			_	
S Y	Geodetic	D e		andard Pe				2	stible Vap	00 7	750	S A M	Natural	
S Y M B SOIL DESCRIPTION O L	Elevation m	t h	Shear	Strength	00	150	80 kPa 200	1	tural Moist berg Limits 20 <sup>2</sup>		ent % Veight) 60	NAMP LIES	Unit Wt kN/m³	
TOPSOIL ~300 mm thick	98.28	0				130	200	1 1 1 1	20 .					
1.27	98.0													
SANDY SILT Some clay, brown, moist														
									×			m	GS1	
			1-3-6-1-3											
<b>/</b> _		1	100000		1111				1.1.1.1.1					
	96.9													
SILTY CLAY Trace sand, grey, wet			10000	-  -  -  -  -  -  -  -  -  -  -  -  -					1::::::		10010			
Trace Sand, grey, wet														
									×			m	GS2	
Test Pit Terminated at 2.0 m Depth	96.3	2												
·														
			1::::	1::::	1:::	:   : : :	11::::	1::::	1::::	1::::	1::::			
								1::::	1::::	1 : : : :	1 1 1 1 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

WAT	ER LEVEL RECO	RDS
Date	Water Level (m)	Hole Open To (m)
On Completion	1.4	

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

Pi	roject	No:	Log o	f Bo	1(	re	r	C	ΙE	<b>,</b> _	T	P		<u>13</u>					***	e	xp
	roject		New Catholic High School											F	igur			35	_		
	catio		5431 Fernbank Road, Ottawa, Ontario											_	F	⊃ag	e	1_ of	_1_		
Da	ate Di	rilled:	'May 5, 2023			Spl	it Sp	oon	Sampl	e			M		Comi	bustil	ble Vai	oour Read	lina		П
	ill Ty		CAT 320F Track Mounted Hydraulic Ex	cavator		Aug	ger S	Samp	le .						Natu	ral M	oisture	Content	J		×
	atum:		Geodetic Elevation					) Valı ic Co	ue ne Te:	st			<u> </u>		Undr	ainec	Limits d Triaxi				—⊖ —⊕
Lc	gged	by:	MZ Checked by: IT		-	She			gth by				+ s		Shea	ar Stre	at Failu ength l eter Te	ру			<b>A</b>
G	S Y			Geodetic	De		St		rd Per							250	0	pour Read 500	750	) S A M P	Natural
G W L	SYMBOL		SOIL DESCRIPTION	Elevation m 99.7	t h	ľ	hear	20 r Stre 50	ngth	00	15		20	kPa	At	Natur terbe 20		sture Cont ts (% Dry 40	ent % Weight) 60	P L E S	Unit Wt. kN/m <sup>3</sup>
		FILL Mixtu grave	re of silty sand and clayey silt, some	99.7	0	3					3		20								
			snow fence (plastic) and wood es, brown and grey, wet																		
																	×			m	GS1
		_			1	1															
				00.0																	
		TOPS	SOIL ~300 mm thick	98.2													×			m	GS2
	1/ 1/1	0411	N OII T	97.9																Ė	
		Non-	DY SILT plastic, some clay, brown, wet	97.7	2											*				m	GS3
		Ť	est Pit Terminated at 2.0 m Depth																		

- Borehole data requires interpretation by EXP before use by others
- NOTES:
  1. Boreh use by
  2. Tests tropera
  3. Field
  4. See N
  5. Log to 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

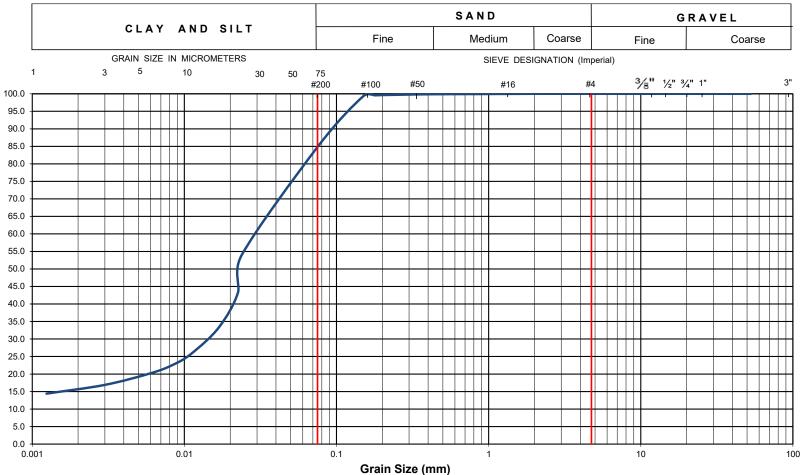
WAT	ER LEVEL RECO	RDS
Date	Water Level (m)	Hole Open To (m)
On Completion	1.8	

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



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

100-2650 Queensview Drive Ottawa, ON K2B 8H6

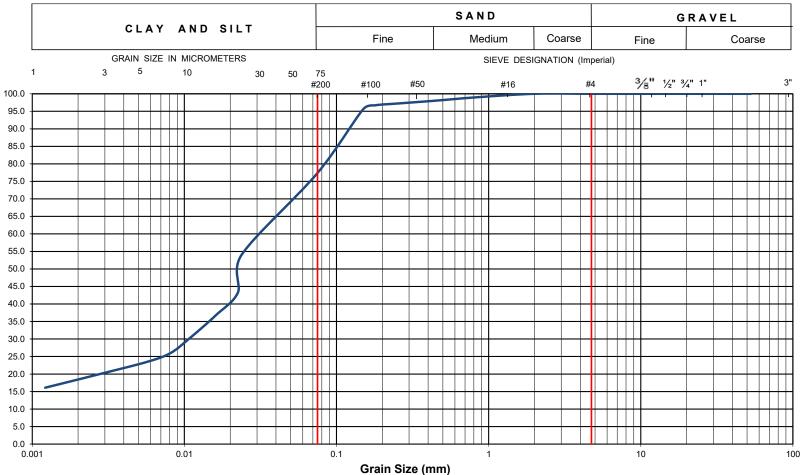


EXP Project No.:	OTT-23004319-A0	Project Name :	Project Name : Proposed New Catholic High School									
Client :	OCSB	Project Location	roject Location : 5431 Fernbank Road, Ottawa, Ontario									
Date Sampled :	May 5, 2023	Borehole No:		TP5	Sam	ple No.:	Depth (m):	0.9-1.1				
Sample Description :		% Silt and Clay	85	% Sand	15	% Gravel		0	Figure :	36		
Sample Description : Non-Plastic Silt (ML) -Some Sand and Clay									rigule :	36		



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

100-2650 Queensview Drive Ottawa, ON K2B 8H6

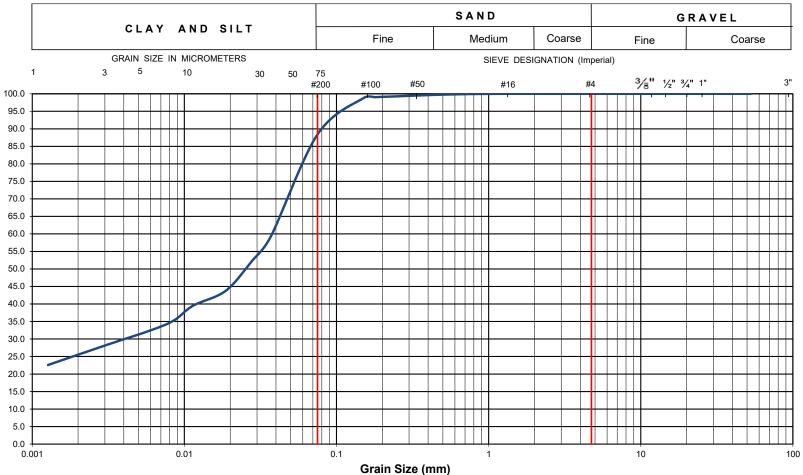


EXP Project No.:	OTT-23004319-A0	Project Name :	roject Name : Proposed New Catholic High School									
Client :	OCSB	Project Location	roject Location : 5431 Fernbank Road, Ottawa, Ontario									
Date Sampled :	May 5, 2023	Borehole No:		TP13	Sam	ple No.:	S3	Depth (m) :	1.8-2.0			
Sample Description :		% Silt and Clay	77	% Sand	23	% Gravel		0	Figure :	37		
Sample Description : Non-Plastic Sandy Silt (ML) -Some Clay								rigure .	37			



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

100-2650 Queensview Drive Ottawa, ON K2B 8H6

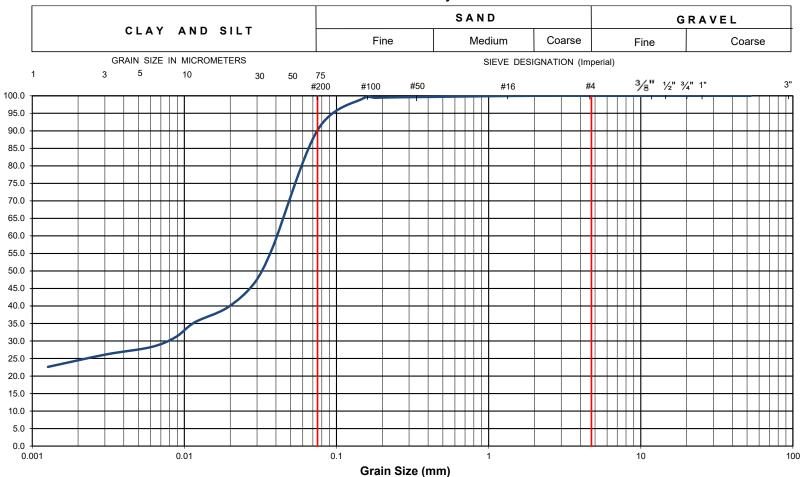


EXP Project No.:	OTT-23004319-A0	Project Name :	roject Name : Proposed New Catholic High School										
Client :	OCSB	Project Location	Project Location : 5431 Fernbank Road, Ottawa, Ontario										
Date Sampled :	May 12, 2023	Borehole No:		ВН8	Sam	Depth (m):	2.3-2.9						
Sample Description :		% Silt and Clay	88	% Sand	12	% Gravel		0	Figure :	38			
Sample Description : Silty Clay of Low Plasticity (CL) - Some Sand									Figure :	30			



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

100-2650 Queensview Drive Ottawa, ON K2B 8H6

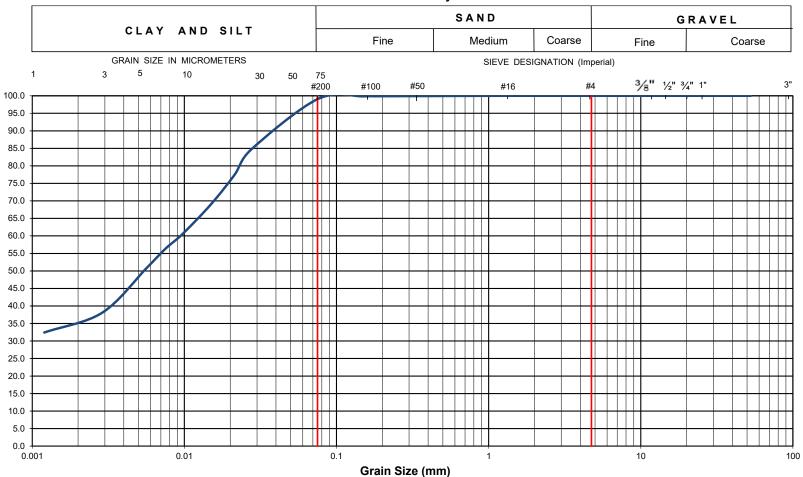


EXP Project No.:	OTT-23004319-A0 Project Name : Proposed New Catholic High School										
Client :	OCSB Project Location: 5431 Fernbank Road, Ottawa, Ontario										
Date Sampled :	May 15, 2023		Borehole No: BH2 Sample No.: SS4						Depth (m):	3.0-3.6	
Sample Description :	cription : % Silt and Clay 90 % Sand 10 % Gravel 0								Figure : 3	39	
Sample Description : Silty Clay to Clayey Silt of Low Plasticity (CL-ML) - Trace to Some Sand								Trigule :	39		



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

100-2650 Queensview Drive Ottawa, ON K2B 8H6

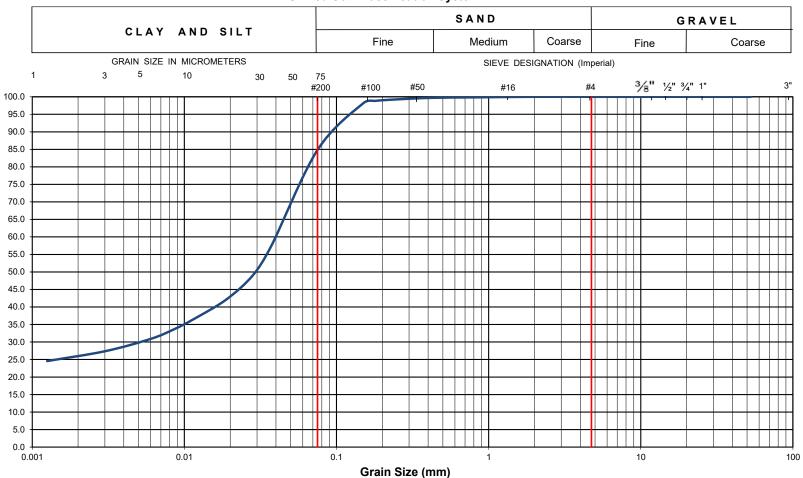


EXP Project No.: OTT-23004319-A0 Project Name : Proposed New Catholic High School										
Client :	OCSB	OCSB Project Location : 5431 Fernbank Road, Ottawa, Ontario								
Date Sampled :	May 15, 2023 Borehole No: BH2 Sample No.: SS6 December 15, 2023							Depth (m):	6.1-6.7	
Sample Description :		% Silt and Clay	99	% Sand	1	% Gravel		0	Figure :	40
Sample Description : Silty Clay of Medium Plasticity (CL) - Trace Sand							Figure :	40		



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

100-2650 Queensview Drive Ottawa, ON K2B 8H6

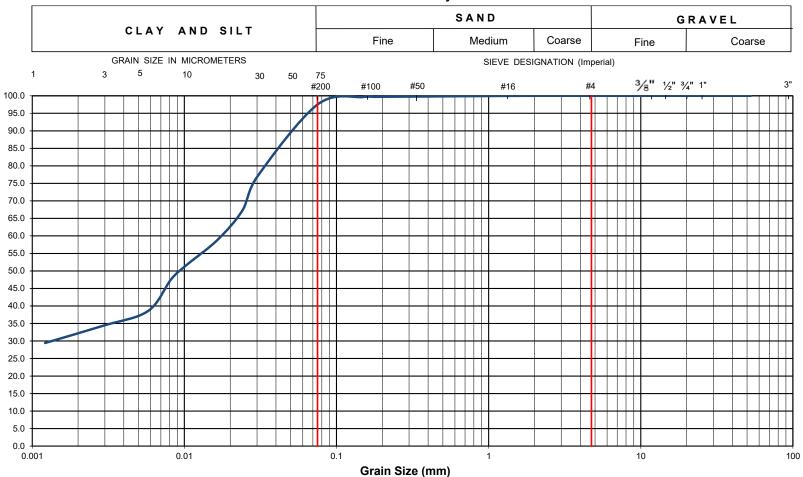


EXP Project No.: OTT-23004319-A0 Project Name : Proposed New Catholic High School										
Client :	OCSB Project Location : 5431 Fernbank Road, Ottawa, Ontario									
Date Sampled: May 15, 2023 Borehole No: BH5 Sample No.: SS3								Depth (m) :	2.3-2.9	
Sample Description : % Silt and Clay 85 % Sand 15 % Gravel 0								Figure : 4	41	
Sample Description : Silty Clay of Low Plasticity (CL) - Some Sand								Figure :	41	



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

100-2650 Queensview Drive Ottawa, ON K2B 8H6

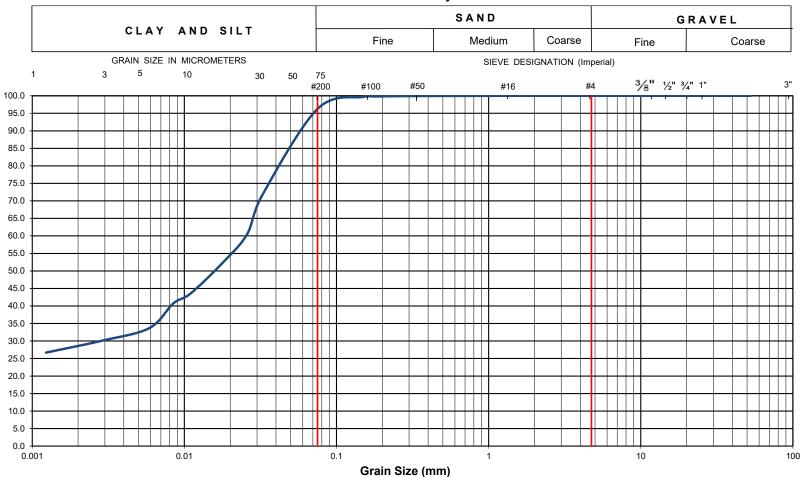


EXP Project No.:	t No.: OTT-23004319-A0 Project Name : Proposed New Catholic High School									
Client :	OCSB Project Location: 5431 Fernbank Road, Ottawa, Ontario									
Date Sampled :	May 15, 2023 Borehole No: BH10 Sample No.: SS5 December 15, 2023						Depth (m) :	4.6-5.2		
Sample Description : % Silt and Clay 98 % Sand 2 % Gravel 0							Figure: 42	42		
Sample Description : Silty Clay of Low to Medium Plasticity (CL) -Trace Sand							Figure :	42		



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

100-2650 Queensview Drive Ottawa, ON K2B 8H6

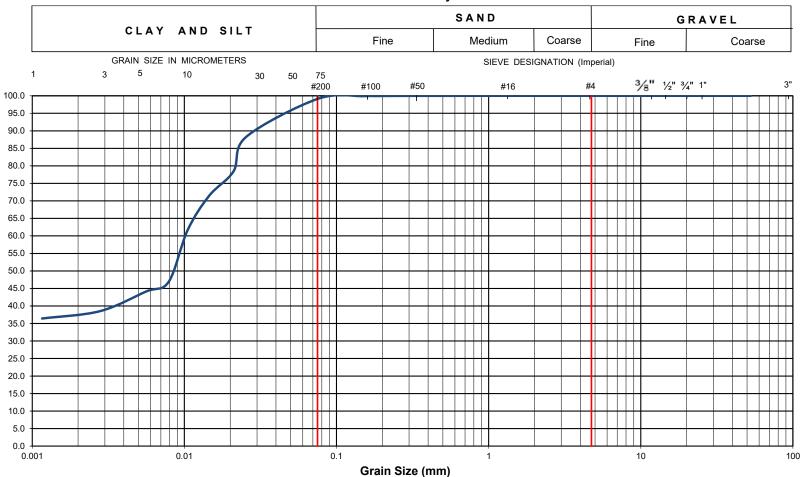


EXP Project No.: OTT-23004319-A0 Project Name : Proposed New Catholic High School										
Client :	OCSB Project Location: 5431 Fernbank Road, Ottawa, Ontario									
Date Sampled :	ate Sampled : May 16, 2023 Borehole No: BH11 Sample No.: SS4								Depth (m):	3.0-3.6
Sample Description : % Silt and Clay 96 % Sand 4 % Gravel 0								Figure: 43	43	
Sample Description : Silty Clay of Low Plasticity (CL) -Trace Sand								rigule :	43	



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

100-2650 Queensview Drive Ottawa, ON K2B 8H6



EXP Project No.: OTT-23004319-A0 Project Name : Proposed New Catholic High School										
Client :	OCSB Project Location : 5431 Fernbank Road, Ottawa, Ontario									
Date Sampled :	ampled: May 16, 2023 Borehole No: BH13 Sample No.: SS5								Depth (m):	6.1-6.7
Sample Description : % Silt and Clay 99 % Sand 1 % Gravel 0								Figure: 44	44	
Sample Description : Silty Clay of Medium Plasticity (CL) - Trace Sand								rigule :	44	

Geotechnical Investigation Proposed New Catholic High School 5431 Fernbank Road, Ottawa, ON OTT-23004319-A0 September 16,2025

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



## patersongroup

Consulting Engineers

### SOIL PROFILE AND TEST DATA

**Geotechnical Investigation** 

**West Park Residential Development** 28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7 Ottawa, Ontario Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd. FILE NO. **DATUM** PG2233 REMARKS HOLE NO. **BH 1 BORINGS BY** CME 75 Power Auger DATE 5 November 2010 SAMPLE Pen. Resist. Blows/0.3m Piezometer Construction PLOT **DEPTH** ELEV. **SOIL DESCRIPTION** • 50 mm Dia. Cone (m) (m) RECOVERY N VALUE of RQD STRATA NUMBER Water Content % **GROUND SURFACE** 

Stiff to firm, brown interlayered SILTY CLAY and **CLAYEY SILT** 

-98.86 **TOPSOIL** 0.36 Very loose, brown SILTY 1 + 97.86SS 92 2 1 SAŃD 2 + 96.863 + 95.862 100 - grey by 2.2m depth 4+94.86 5 + 93.866 + 92.863 100 7 + 91.868 + 90.869+89.86 10+88.86 11 + 87.8612+86.86 13+85.86 14+84.86 15+83.86 (GWL @ 5.11m-Nov. 11/10) 15.70 **Dynamic Cone Penetration Test** 16+82.86 commenced @ 15.70m depth. Cone push to 28.35m and hit 17+81.86 refusal at 28.50m depth 18+80.86 19 + 79.8620 + 78.8640 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

## patersongroup

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

Consulting Engineers

### **SOIL PROFILE AND TEST DATA**

Supplemental Geotechnical Investigation West Park Residential Development Ottawa, Ontario

Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd. **DATUM** FILE NO. **PG2233 REMARKS** HOLE NO. **BH9** DATE 7 March 2011 **BORINGS BY** CME 55 Power Auger **SAMPLE** Pen. Resist. Blows/0.3m Piezometer Construction PLOT **DEPTH** ELEV. 50 mm Dia. Cone **SOIL DESCRIPTION** (m) (m) RECOVERY N VALUE of RQD STRATA NUMBER Water Content % **GROUND SURFACE** 0 + 98.36**TOPSOIL** 0.30 AU AU 2 Very loose, brown SILTY SAND, increasing clay content 1 + 97.36SS 3 12 6 with depth SS 4 0 4 2 + 96.363 + 95.364 + 94.365 100 5+93.36Firm to stiff, grey SILTY 6 + 92.36CLAY, occasional silt seams to 5 m depth 7 + 91.366 100 8 + 90.369 + 89.3610+88.36 11.12 11 + 87.36End of Borehole 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

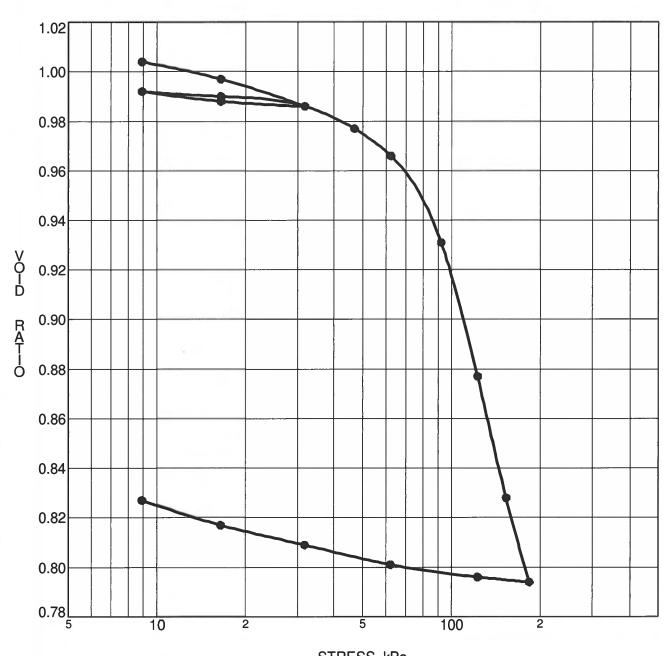
## patersongroup

Consulting Engineers

### **SOIL PROFILE AND TEST DATA**

Supplemental Geotechnical Investigation West Park Residential Development Ottawa, Ontario

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7 Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd. FILE NO. **DATUM PG2233 REMARKS** HOLE NO. **BH10 BORINGS BY** CME 55 Power Auger DATE 7 March 2011 SAMPLE Pen. Resist. Blows/0.3m Piezometer Construction PLOT **DEPTH** ELEV. 50 mm Dia. Cone **SOIL DESCRIPTION** (m) (m) RECOVERY N VALUE of RQD STRATA NUMBER Water Content % 60 **GROUND SURFACE** 0 + 98.11**TOPSOIL** 0.30 AU 1 AU 2 Very loose, brown SILTY 1+97.11SS 6 3 12 SAND, increasing clay content with depth SS 2 4 8 2 + 96.113 + 95.115 100 4+94.11 5 + 93.11Firm to stiff, grey SILTY 6 + 92.11CLAY, occasional silt seams 6 100 to 6 m depth 7 + 91.118+90.11 9 + 89.1110+88.11 11+87.11 End of Borehole 60 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded



STRESS, kPa
-------------

	CONSOLI	DATION TES	T DATA SU	MMARY	
Borehole No.	BH 1	p'o	<b>40</b> kPa	Ccr	0.012
Sample No.	TW 2	p'c	<b>78</b> kPa	Сс	0.471
Sample Depth	<b>3.45</b> m	OC Ratio	2.0	Wo	36.7 %
Sample Elev.	<b>95.41</b> m	Void Ratio	1.01	Unit Wt.	18.6 kN/m <sup>3</sup>

CLIENT Monarch Group FILE NO.

PROJECT Supplemental Geotechnical Investigation - West DATE

patersongroup

Consulting Engineers

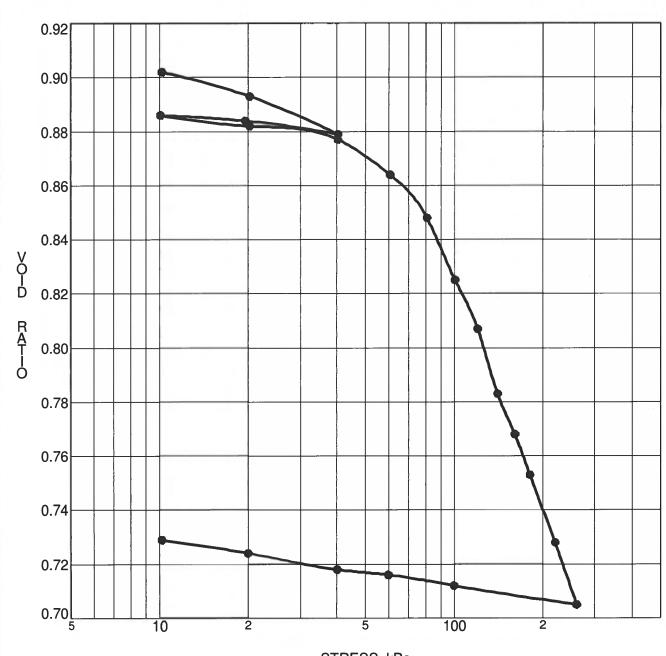
CONSOLIDATION TEST

PG2233

11/20/2010

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

**Park Residential Development** 



STRESS, kPa

	CONSOLI	DATION TES	T DATA SU	MMARY	
Borehole No.	BH 9	p'o	<b>45</b> kPa	Ccr	0.015
Sample No.	TW 5	p'c	<b>77</b> kPa	Cc	0.290
Sample Depth	<b>4.19</b> m	OC Ratio	1.7	Wo	33.3 %
Sample Elev.	<b>94.17</b> m	Void Ratio	0.902	Unit Wt.	19.0 kN/m <sup>3</sup>

CLIENT PROJECT

**Monarch Group** 

Supplemental Geotechnical Investigation - West

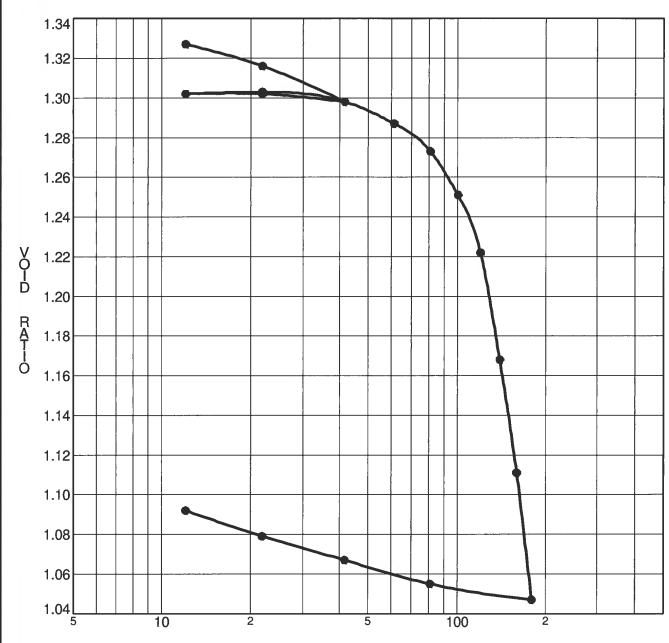
FILE NO. DATE PG2233 03/18/2011

**Park Residential Development** 

## patersongroup

Consulting Engineers CONSOLIDATION TEST

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



STRESS, kPa

	CONSOLI	DATION TES	T DATA SU	MMARY	
Borehole No.	BH 9	p'o	<b>69</b> kPa	Ccr	0.015
Sample No.	TW 6	p'c	<b>116</b> kPa	Cc	1.104
Sample Depth	<b>8.06</b> m	OC Ratio	1.7	Wo	48.9 %
Sample Elev.	<b>90.30</b> m	Void Ratio	1.327	Unit Wt.	17.6 kN/m <sup>3</sup>

CLIENT

**Monarch Group** 

**PROJECT** 

**Supplemental Geotechnical Investigation - West** 

**Park Residential Development** 

FILE NO. DATE

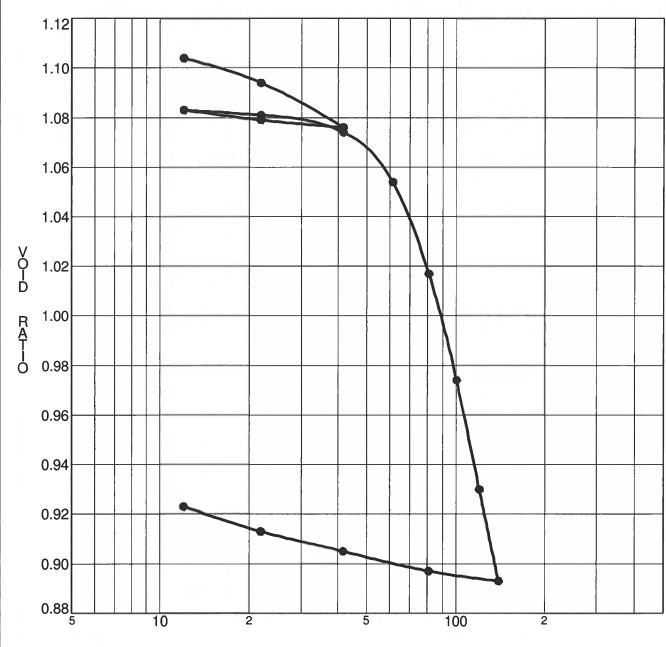
PG2233 03/09/2011

## patersongroup

Consulting **Engineers** 

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

**CONSOLIDATION TEST** 



STRESS, kPa

	CONSOLI	DATION TES	T DATA SU	IMMARY	
Borehole No.	BH10	p'o	<b>36</b> kPa	Ccr	0.015
Sample No.	TW 5	p'c	<b>70</b> kPa	Сс	0.586
Sample Depth	<b>3.30</b> m	OC Ratio	1.9	Wo	40.6 %
Sample Elev.	<b>94.81</b> m	Void Ratio	1.104	Unit Wt.	<b>18.4</b> kN/m <sup>3</sup>

CLIENT Monarch Group FILE NO.
PROJECT Supplemental Geotechnical Investigation - West DATE

Park Residential Development

## patersongroup

Consulting Engineers

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

CONSOLIDATION TEST

PG2233

03/24/2011

EXP Services Inc.

Geotechnical Investigation Proposed New Catholic High School 5431 Fernbank Road, Ottawa, ON OTT-23004319-A0 September 16,2025

**Appendix B - Laboratory Certificate of Analysis** 





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

CLIENT NAME: EXP SERVICES INC

2650 QUEENSVIEW DRIVE, UNIT 100

OTTAWA, ON K2B8H6

(613) 688-1899

**ATTENTION TO: Susan Potyondy** 

PROJECT: OTT-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.

AGAT Laboratories (V1)

Page 1 of 5

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA) AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



**CLIENT NAME: EXP SERVICES INC** 

**SAMPLING SITE:** 

### **Certificate of Analysis**

AGAT WORK ORDER: 23Z027542

PROJECT: OTT-23004319-A0
ATTENTION TO: Susan Potyondy

**SAMPLED BY:** 

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

### (Soil) Inorganic Chemistry

	(con y money												
DATE RECEIVED: 2023-05-23							DATE REPORTED: 2023-05-31						
				BH#3 SS2 2.	BH#8 SS8	BH#12 SS5							
		SAMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED:		5'-4.5'	35'-37'	15'-17'							
				Soil	Soil	Soil							
				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 \*)

Certified By:





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

### **Quality Assurance**

CLIENT NAME: EXP SERVICES INC

AGAT WORK ORDER: 23Z027542

PROJECT: OTT-23004319-A0

ATTENTION TO: Susan Potyondy

SAMPLING SITE: SAMPLED BY:

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

CHEMIST ON THE POSSIBLE OF THE

Certified By:



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

## **Method Summary**

CLIENT NAME: EXP SERVICES INC

PROJECT: OTT-23004319-A0

AGAT WORK ORDER: 23Z027542

ATTENTION TO: Susan Potyondy

SAMPLING SITE: 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



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

**Laboratory Use Only** 5835 Coopers Avenue 2270275112

Cooler Quantity:	1a- 1	ra-	Oric
Arrival Temperatures:	24.5	124.5	24.6
	3.0	13.1	2.
Custody Seal Intact:	TYes	□No	

Chain of Custody Record If this is a Drinking Water sample, please					e use Drinking Water Chain of Custody Form (potable water consumed by humans)							al Temperat	ures:	The same of the same of		1.5 24		
Report Information:  Company:  Contact:  Address:  Phone:  Reports to be sent to:  1. Email:  Report Information:  Ext Sequices Inc.  Susan Patyonaly  Offacus ON K 2B 8tto  Cols - G88 - 1891 Fax:  Susan Patyonaly  Ext Contact:  Susan Patyonaly  Ext				(Please	Regulatory Requirements:  (Please check all applicable boxes)  Regulation 153/04  Table					Custody Seal Intact: Yes No South Notes: Yes Notes: Yes No South Notes: Yes Notes: Ye						⊠Ń//		
Project Information:  Project: CTT - 23004319 - A0  Site Location: S431 Fern Lank rd., Coffawa  Sampled By:			Re	Is this submission for a Record of Site Condition?  Yes No			Report Guideline on Certificate of Analysis  Yes No					Please provide prior notification for rush TAT *TAT is exclusive of weekends and statutory holidays For 'Same Day' analysis, please contact your AGAT CPM						
AGAT ID #:  Please note: If quotation number is n  Invoice Information:  Company: Contact: Address: Email:		be billed full price for ill To Same: Ye	/	В	nple Matrix Legend Biota Ground Water Oil Paint Soil Sediment Surface Water	Field Filtered - Metals, Hg, CrVI, DOC	Metals & Inorganics				osal Characterizatio □vocs □ ABNs □ R(	Excess Soils SPLP Rainwater Leach SPLP: □ Metals □ Voos □ Svoos Excess Soils Characterization Package An InDARS Metals DTEX E1 E1	5	Late	417			
Sample Identification  RH # 3	Date Sampled May 12	Time Sampled  AM PM		Sample Matrix S S	Comments/ Special Instructions	Y/N	Metais &	BTEX, F1. Analyze F	PAHS	200	Landfill Disp TCIP. □ Mel	Excess SC SPLP: □ SPLP: □ N SPLP: □	Salt - EC/SAR	Harris	CAL		Descentific	
Samples Relinquished By (Print Name and Sign):  Samples Relinquished By (Print Name and Sign):  Samples Relinquished By (Print Name and Sign):	CC	May 2 May 2 AV 2 4	3/23 Time 2023/67	36 PM	Samples Received By (Print Name and Sign):  Samples Received By (Print Name and Sign):  Samples Received By (Print Name and Sign):			MA	7 2 7 0 10	ate 3	<b>2012</b>	Time 15440 Time	579	Pa Nº: <b>T</b> 1	age	_of_\_		

Geotechnical Investigation Proposed New Catholic High School 5431 Fernbank Road, Ottawa, ON OTT-23004319-A0 September 16,2025

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EXP Services Inc.

Geotechnical Investigation Proposed New Catholic High School 5431 Fernbank Road, Ottawa, ON OTT-23004319-A0 September 16,2025

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