Geotechnical Investigation

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J. L. Couroux Catholic Elementary School
10 Findlay Avenue, Carleton Place, ON
Project: 2025JLC117

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Executive Summary

EXP Services Inc. (EXP) is pleased to present the results of the geotechnical investigation completed for the proposed addition to the J.L. Couroux catholic elementary School, located at 10 Findlay Avenue, Carleton Place, Ontario (Figure 1). Terms and conditions of this assignment were outlined in EXP Services Inc. (EXP) proposal number: OTT-25006852-A0 dated April 29, 2025. Authorization for EXP to proceed with this work was provided by Conseil des Écoles Catholiques du Centre-Est (CECCE) by signed service agreement for Project No. 2025JLC117 dated April 30, 2025.

The proposed addition will comprise of one storey with no basement to be constructed on the east side of the existing school building. Design details such as the finished floor elevation (FFE), underside of footing (USF) and exterior final grade (FG) elevations are not known at the time of this report. However, it has been assumed that the FFE of the proposed addition and final grades will match the existing.

The fieldwork for this geotechnical investigation was undertaken on June 5 and 6, 2025, and consists of the drilling of ten (10) boreholes (Borehole Nos. 25-1 to 25-10) to auger refusal and termination depths ranging from 0.6 m to 4.6 m below the existing grade (Elevation 137.2 m to 132.8 m). The borehole fieldwork was supervised on a full-time basis by EXP. The locations and geodetic elevations of the boreholes were established by EXP and are shown on the borehole location plan, Figure 2. Terms also call for the excavation of five (5) test pits as part of the scope of work. This work was differed until the final location of the proposed addition is known.

The borehole information indicates the subsurface conditions consist of a surficial topsoil or asphaltic concrete layer underlain by fill containing boulders and cobbles. The fill is underlain by sandy dolostone bedrock. Refusal to augers was met in all the boreholes at depths ranging between 0.4 m to 2.9 m below grade (Elevation 137.6 m to Elevation 134.5 m). Wash-boring and core drilling techniques used to advance below auger refusal depth in Borehole Nos. 25-06 and 25-08 indicated that refusal was met on dolostone bedrock with sandstone partings. The groundwater table at the site was established to range between 2.8 to 3.0 m depths (Elevation 135.0 m to Elevation 134.6 m). The groundwater is subject to seasonal fluctuations and may be at higher elevations during wet weather conditions.

Based on the currently available information, the Site Class for the proposed addition is “C” as per Table 4.1.8.4.-A and Table 4.1.8.4.-B, OBC 2024. According to Section A-4.1.8.4 of OBC 2024, the in-situ measurements of shear wave velocity can be utilized to lower the demand in the seismic design. Therefore, field shear wave velocity measurements are recommended to be performed through non-intrusive (e.g. multichannel analysis of surface waves) and / or intrusive (e.g. downhole / cross hole techniques, or SCPT) geophysical tests.

Compressible soils were not encountered at the borehole locations and therefore there is no grade raise restriction at the site from a geotechnical point of view.

The building addition may be supported by strip and spread footings founded on the sound sandy dolostone to sandstone bedrock, competent and free of soil filled seams and designed for a factored geotechnical resistance at Ultimate Limit State (ULS) of 1000 kPa. The factored ULS values includes a resistance factor of 0.5. The SLS bearing pressure of the bedrock, required to produce 25 mm settlement of the structure will be much larger than the recommended value for factored geotechnical resistance at ULS. Therefore, the factored geotechnical resistance at ULS will govern the design for footings founded on bedrock.

The floor slab for the proposed building may be designed and constructed as a slab-on-grade placed on a 200 mm thick 19 mm sized clear stone bed placed on a engineered fill pad set on the approved bedrock surface constructed in accordance with section 7 of this report which requires removal of the fill from below the slab and grade and its replacement with engineered fill. The clear stone would minimize the capillary rise of moisture from the sub-soil to the floor slab. Alternatively, the floor slab may be cast on a 200 mm thick bed of OPSS Granular A overlain by a vapour barrier. Adequate saw cuts should be provided in the floor slabs to control cracking.

Since there is no basement and the groundwater level was measured at 2.8 m to 3.0 m depth below ground (Elevation 134.6 m and Elevation 139.0 m), perimeter and underfloor drainage system will not be required for the proposed school building. However, If a perimeter drainage system is encountered along the existing building at the location of the proposed addition, then it should be reinstated around the new addition.

Excavations in overburden may be undertaken by conventional heavy mechanical equipment and should comply with the most recent Occupational Health and Safety Act (OHSA), Ontario Regulations 213/91. Excavation of side slopes in sound bedrock may be undertaken with near vertical sides. The most suited method to excavate any bedrock must be determined by contractor bidding on this project taking into consideration close proximity of the school building and type and strength of bedrock.

It is anticipated that excavations will be at or above the recorded groundwater level and seepage of the surface and subsurface water into the excavations is anticipated. However, it should be possible to remove any water entering the excavation by collecting water and pumping from the low points or sumps. In areas of high infiltration or in areas where more permeable soil layers may exist, a higher seepage rate should be anticipated and will require high-capacity pumps to keep the excavation dry.

It is anticipated that the majority of the material required for backfilling purposes in the interior and exterior of the proposed building, trench backfill, and pavements would have to be imported and should preferably conform to Ontario Provincial Standard Specification (OPSS) 1010.

Pavement structure for light duty traffic areas should consist of 50 mm thick asphaltic concrete, 150 mm thick OPSS Granular A base and 250 mm thick OPSS Granular B Type II subbase.

Test pit which forms part of EXP contract must be completed once the final location of the proposed addition is established and to determine if rough auguring was met on weathered bedrock or on boulders and cobbles likely present within the fill as shown on the logs of boreholes.

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

1. Introduction

EXP Services Inc. (EXP) is pleased to present the results of the geotechnical investigation completed for the proposed addition to the J.L. Couroux catholic elementary School, located at 10 Findlay Avenue, Carleton Place, Ontario (Figure 1). Terms and conditions of this assignment were outlined in EXP Services Inc. (EXP) proposal number: OTT-25006852-A0 dated April 29, 2025, and authorization for EXP to proceed with this work was provided by Conseil des Écoles Catholiques du Centre-Est (CECCE) by signed service agreement for Project No. 2025JLC117 dated April 30, 2025.

The proposed addition will comprise of one storey with no basement proposed to be constructed on the east side of the existing school building. Design details such as the finished floor elevation (FFE), underside of footing (USF) and exterior final grade (FG) elevations are not known at the time of this report. However, it has been assumed that the FFE of the proposed addition and final grades will match the existing.

The geotechnical investigation was undertaken to:

a) Establish the subsurface soil and groundwater conditions at ten (10) boreholes,

b) Classify the site for seismic site response in accordance with the requirements of the 2024 Ontario Building Code and assess the potential for liquefaction of the subsurface soils during a seismic event,

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

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

e) Discuss Slab-on-grade construction and requirement for any underfloor or perimeter drainage system,

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

g) Provide pipe bedding requirements for underground services;

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

i) Recommend pavement structure thicknesses for access roads and parking lots, and

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

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

2. Site Description

The J. L. Couroux Catholic Elementary School is located in the area bounded by Findlay Avenue to the North, King's Highway 7 to the South and Franktown Road to the east. Commercial properties exist to the west side boundary. The existing building consists of a one-storey structure with no basement.

The location of the proposed addition currently consists of landscaped grass covered ground with occasional trees and asphalt access roads and parking.

The topography of the addition location is relatively flat with borehole elevations ranging from Elevation 137.36 m to Elevation 138.35 m.

3. Procedure

The fieldwork for this geotechnical investigation was undertaken on June 5 and 6, 2025, and consists of the drilling of ten (10) boreholes (Borehole Nos. 25-1 to 25-10) to auger refusal and termination depths ranging from 0.6 m to 4.6 m below the existing grade (Elevation 137.2 m to 132.8 m). The borehole fieldwork was supervised on a full-time basis by EXP. The locations and geodetic elevations of the boreholes were established by EXP and are shown on the borehole location plan, Figure 2.

Prior to the fieldwork, the locations of the boreholes were cleared of any public and private underground services by a locator subcontracted to EXP. It is noted that the boreholes proposed to be drilled close to the existing building had been relocated due to the presence of a fiber optic line identified by the locator close to the building line. This service will require relocation for the construction of the proposed addition.

The boreholes were drilled using a CME-55LC track-mounted drill rig equipped with continuous flight hollow-stem auger equipment and rock coring capabilities, operated by a drilling contractor subcontracted to EXP. Standard penetration tests (SPTs) were performed in all the boreholes at the surface or under the asphalt layer and below the ground surface at 0.8 m depth intervals and the soil samples were retrieved by the split-spoon sampler. Two (2) boreholes were advanced beyond the depth of refusal by conventional coring techniques using the N-size core barrel. A field record of wash water return, colour of wash water and any sudden drops of the drill rods were kept during rock coring operations. The subsurface soil conditions in each borehole were logged with each soil sample, labelled and placed in plastic bags. Similarly, the rock cores were visually examined, placed in core boxes, identified, and logged.

Two (2) nineteen-millimeter diameter standpipes were installed, one (1) in each of Borehole Nos. 25-6 and 25-8 for long-term monitoring of the groundwater table. The standpipes were installed in accordance with EXP standard practice, and the installation configuration is documented on the respective borehole log. The boreholes were backfilled upon completion of drilling and installation of the standpipes.

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

The geotechnical engineer also assigned the laboratory testing program which is summarized in Table I.

Table I: Summary of Laboratory Testing Program

Type of Test	Number of Tests Completed
Soil Samples	
Moisture Content Determination	27
Grain Size Analysis	2
Rock Samples	
Unconfined Compressive Strength and Unit Weight Determination	4
Corrosion Analysis (pH, sulphate, chloride and resistivity)	1

4. Subsurface Conditions and Groundwater Levels

A detailed description of the subsurface conditions and groundwater levels from the boreholes are given on the attached Borehole Logs, Figures 3 to 12. The borehole logs and related information depict subsurface conditions only at the specific locations and at the times indicated. Subsurface conditions and water levels at other locations may differ from conditions at the locations where sampling was conducted. The passage of time also may result in changes in the conditions interpreted to exist at the locations where sampling was conducted.

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

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

4.1 Topsoil

An 85 mm to 200 mm thick surficial topsoil layer was encountered in all the boreholes except Borehole No. 25-7.

4.2 Asphalt

A 40 mm thick asphalt layer was encountered at Borehole No. 25-7.

4.3 Granular Fill

Underlying the asphalt layer at Borehole No. 25-7 is crushed limestone granular fill with a thickness of 110 mm.

4.4 Fill

The surficial topsoil or pavement layer is underlain by fill in all the boreholes and extends to 0.4 m to 2.9 m depths (Elevation 137.6 m to Elevation 134.5 m). The fill ranges in consistency from silty clay to silty sand with gravel, organics such as roots and topsoil, and possible debris, cobbles or boulders. The fill in a very loose to dense state based on standard penetration tests (SPT) N-values ranging from 2 to 43. The moisture content ranged from 3 to 20 percent. The deep fill in Borehole No.25-06 is likely due to previous excavation completed in the general area of the site.

Results from grain-size analysis conducted on two (2) samples of the fill are summarized in Table II. The grain-size distribution curves are shown in Figures 13 and 14.

Table II: Summary of Results from Grain-Size Analysis – Fill Samples

Borehole No. (BH) – Sample No. (SS)	Depth (m)	Grain-Size Analysis (%)				Soil Classification
		Gravel	Sand	Silt	Clay	
BH25-6 - SS2	0.8 - 1.4	37	36	27	0	Silty Sand and Gravel (SM / GM)
BH25-10 - SS1	0.0 - 0.6	33	52	15	0	Silty Sand (SM), Gravelly

Based on a review of the results of the grain-size analysis, the soil may be classified as gravelly silty sand (SM) to silty sand and gravel (SM / GM).

4.5 Auger Refusal and Bedrock

Auger refusal was met at 0.4 m to 2.9 m depths (Elevation 137.6 m to Elevation 134.5 m) in all the boreholes.

A summary of the auger refusal depths as well as the depth of bedrock confirmed by coring are shown in Table III.

Table III: Summary of Auger Refusal and Bedrock Depths (Elevations) in Boreholes				
Borehole (BH) No.	Ground Surface Elevation (m)	Refusal Depth (m) (Elevation (m))	Depth (Elevation) of Proven Bedrock (m)	Comment wrt to Depth (Elevation) of Bedrock Surface
BH25-01	137.85	1.0 (136.9)	--	Auger refusal at 1.0 m
BH25-02	137.53	1.5 (136.0)	--	Auger refusal at 1.5 m
BH25-03	138.25	1.1 (137.2)	--	Auger refusal at 1.1 m
BH25-04	137.36	0.6 (136.8)	--	Auger refusal at 0.6 m
BH25-05	137.73	1.0 (136.7)	--	Auger refusal at 1.0 m
BH25-06	137.42	2.9 (134.5)	2.9 (134.5)	1.8 m length of bedrock cored below 2.9 m depth
BH25-07	137.95	1.5 (136.5)	--	Auger refusal at 1.5 m
BH25-08	137.97	0.4 (137.6)	0.4 (137.6)	2.7 m length of bedrock cored below 0.4 m depth
BH25-09	137.56	0.8 (136.8)	--	Auger refusal at 0.8 m
BH25-10	138.35	1.2 (137.2)	--	Auger refusal at 1.2 m

A review borehole logs Indicates that the total core recovery (TCR) ranges between 85 percent and 100 percent and the rock quality designation (RQD) ranges between 51 and 100 indicating the bedrock is of fair to excellent quality. Photographs of the bedrock cores are included in Appendix B.

The bedrock geology map Paleozoic Geology of the Carleton Place Area, Southern Ontario; Ontario Geological Survey Map P.2725 Geological Series – Preliminary Map, scale 1:50000. Geology 1982, indicates that the site is underlain by March Formation Interbedded quartz sandstone, sandy dolostone, and dolostone.

Unit weight determination and unconfined compressive strength tests were conducted on four (4) rock core samples. The test results are summarized in Table IV.

Table IV: Summary of Unconfined Compressive Strength Test Results – Bedrock Cores				
Borehole (BH) No. – Run No.	Depth (m)	Unit Weight (kN/m³)	Unconfined Compressive Strength (MPa)	Classification of Rock with respect to Strength
BH25-6 Run2 (Top)	3.1 - 3.3	27.6	228	Very Strong R5
BH25-6 Run2 (Bottom)	4.2 - 4.4	27.5	207	Very Strong R5
BH25-8 Run1	0.9 – 1.0	27.1	163	Very Strong R5
BH25-8 Run 2	1.9 – 2.1	27.8	159	Very Strong R5

A review of the test results in Table IV indicates the strength of the rock may be classified **as very strong** (R5) in accordance with the Canadian Foundation Engineering Manual (CFEM), Fifth Edition, 2023.

4.6 Groundwater Level Measurements

Groundwater levels measured within the standpipes installed in Borehole Nos. 25-06 and 25-08 on June 16, 2025 indicated the water to be in the bedrock at depths of 2.8 m to 3.0 (Elevation 135.0 m to 134.6 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.

5. Site Classification for Seismic Site Response and Liquefaction Potential of Soils

The recommendations for the geotechnical aspects to determine the earthquake loading for design in accordance with Section 4.1.8 Earthquake Load and Effects in the Ontario Building Code (OBC) 2024, are presented below.

5.1 Subsoil Conditions

The strata and groundwater information at this site have been examined in relation to Section 4.1.8.4 of the OBC (2024). The strata generally consist of fill and sandy dolostone bedrock. It is anticipated that the proposed basementless addition will be supported on conventional spread and strip footings founded on the bedrock surface.

5.2 Borehole Depth and In Situ Measurements

Table 4.1.8.4.-A Exceptions for Site Designation Using V_{s30} Calculated from In Situ Measurements and Table 4.1.8.4.-B Site Classes, S, for Site Designation X_s in OBC (2024) indicated that to determine the site classification, the average properties in the top 30 m (below the lowest basement level) are to be used. Site Classification can be determined using the average shear wave velocity (V_{s30}) as per the classifications stated in Table 4.1.8.4.-A and Table 4.1.8.4.-B. If in-situ shear wave velocity measurements are not available, the site designation X_s shall be determined based on the energy-corrected average standard penetration resistance (SPT) $\overline{N}_{60}$ or the average undrained shear strength S_u in accordance with Table 4.1.8.4.-B.

There are no shear wave measurements carried out at this site and therefore, the Site Designation will be determined based on the energy-corrected average SPT. The boreholes advanced at this site terminated at depths of 0.6 m to 4.6 m below existing grade. Therefore, the recommended site classification would be based on the available information as well as our interpretation of conditions below the boreholes based on our knowledge of the soil conditions in the subject area.

5.3 Site Classification and Liquefaction Potential of Soils

Based on the above assumptions and currently available information, the Site Class for the proposed structure is “C” as per Table 4.1.8.4.-A and Table 4.1.8.4.-B, OBC 2024. According to Section A-4.1.8.4 of OBC 2024, the in-situ measurements of shear wave velocity can be utilized to lower the demand in the seismic design. Therefore, field shear wave velocity measurements are recommended to be performed through non-intrusive (e.g. multichannel analysis of surface waves) and / or intrusive (e.g. downhole / cross hole techniques, or SCPT) geophysical tests.

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

6. Grade Raise Restrictions

Compressible soils were not encountered at the borehole locations and therefore there is no grade raise restriction at the site from a geotechnical point of view.

7. Site Grading

Site grading within the footprint of the **proposed addition** for the construction of the slab on grade should consist of the excavation and removal of the surficial topsoil layer and existing fill soils down to the bedrock surface. The exposed bedrock should be examined by a geotechnician. Once the bedrock subgrade has been approved, the grades may be raised to within 200 mm of the design underside of floor slab elevation by the construction of an engineered fill pad comprising of OPSS Granular B Type II material placed in 300 mm thick lifts and each lift compacted to 98 percent SPMDD. The placement and compaction of the engineered fill can in this way be undertaken to within 200 mm of the underside of the concrete floor slab with the remaining 200 mm backfilled using clear stone or OPSS Granular A compacted to 100 percent SPMDD and a vapour barrier. The engineered fill should be placed under the full-time supervision of a geotechnician working under the direction of a geotechnical engineer. In-place density tests should be undertaken on each lift of the engineered fill to ensure that it is properly compacted prior to placement of a subsequent lift.

Site grading within the **parking area** should consist of the removal of the surficial topsoil layer and organic stained soils and the exposed soil proofrolled with a heavy vibratory roller in the presence of a geotechnician. Any loose/soft areas identified during the proofrolling process should be excavated, removed and replaced with Ontario Provincial Standard Specification (OPSS) Granular B Type II or OPSS Select Subgrade Material (SSM) compacted to 95 percent standard Proctor maximum dry density (SPMDD).

8. Foundation Considerations

It has been assumed that the design FFE of the addition will be set at approximately the same elevation as the existing building. It has been assumed that the existing footings are founded on the bedrock surface.

A review of logs for the boreholes located within the proposed building addition footprint indicates that the depth of auger refusal was met at 0.4 m to 2.9 m depths (Elevation 137.6 m to Elevation 134.5 m). The presence of very strong sandy dolostone with minor sandstone bedrock was confirmed in Borehole Nos. BH25-06 and BH25-08 at depths of 2.9 m and 0.4 (Elevation 134.5 m and Elevation 137.6 m), respectively. It is suspected that the deep fill of 2.9 m contacted in Borehole No. 25-06 is likely due to previous excavation , i.e. trench in this area.

The building addition may be supported by strip and spread footings founded on the sound sandy dolostone to sandstone bedrock, competent and free of soil filled seams. The footings may be designed for a factored geotechnical resistance at Ultimate Limit State (ULS) of 1000 kPa. The factored ULS values includes a resistance factor of 0.5. The SLS bearing pressure of the bedrock, required to produce 25 mm settlement of the structure will be much larger than the recommended value for factored geotechnical resistance at ULS. Therefore, the factored geotechnical resistance at ULS will govern the design for footings founded on bedrock. In the area of Borehole No. 25-06, fill is required to be removed and replaced with lean mix concrete (15MPa) to the underside of the footing. The extent of the area of deep fill is not known.

All footing beds should be examined by a geotechnical engineer/technician to ensure that the founding surfaces are capable of supporting the design bearing pressure at ULS and that the footing beds have been properly prepared.

It is recommended that test pits are carried out to verify the depth and founding conditions of the existing footings on the east side of the existing building. For the construction of new footings immediately adjacent to the existing footings, the new footings should be ideally founded at the same level as the existing footings to eliminate the need for underpinning.

For footings of a heated structure where all the footings are founded on the sound bedrock, it is recommended the soil cover be 1.2 m to protect the footings from frost damage. For footings of an unheated structure founded on sound bedrock, the soil cover should be 1.5 m. Alternatively, frost protection may be provided by rigid insulation or by a combination of rigid insulation and earth cover.

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

9. Floor Slab and Drainage Requirements

The floor slab for the proposed building may be designed and constructed as a slab-on-grade placed on a 200 mm thick 19 mm sized clear stone bed placed on a minimum 300 mm thick engineered fill pad set on the approved bedrock surface constructed in accordance with section 7 of this report. The clear stone would minimize the capillary rise of moisture from the sub-soil to the floor slab. Alternatively, the floor slab may be cast on a 200 mm thick bed of OPSS Granular A overlain by a vapour barrier. Adequate saw cuts should be provided in the floor slabs to control cracking.

Since there is no basement and the groundwater level was measured at 2.8 m to 3.0 m depth below ground (Elevation 134.6 m and Elevation 139.0 m), a perimeter and underfloor drainage system will not be required for the proposed school building. If a perimeter drainage system is encountered along the existing building at the location of the proposed addition, then it should be reinstated around the new addition.

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

10. Excavation and De-Watering Requirements

10.1 Excess Soil Management

EXP completed excess soils sampling as part of this investigation and the findings are presented under a different cover.

10.2 Excavations

This section of the report discusses excavation requirements for the construction of the building addition, the construction of the underground services and the new surface parking lot.

Excavation for the construction of footings and the installation of underground services anticipated to extend to a maximum depth of 2.9 m below the existing grade approximately at Elevation 134.5 m and will extend through the existing asphaltic concrete, topsoil and fill, and into the sandy dolostone bedrock. The groundwater level ranges from 2.8 to 3.0 m depths (Elevation 134.6 m to Elevation 135.0 m). It is anticipated that the excavation will be at or above the recorded groundwater level.

10.2.1 Overburden (Soil) Excavation

Excavations in overburden soil may be undertaken by conventional heavy mechanical equipment capable of removing cobbles, boulders, or possible large debris within the fill.

The excavation within the subsurface soils should comply with the most recent Occupational Health and Safety Act (OHSA), Ontario Regulations 213/91. Based on the definitions contained in OHSA, the subsurface soils above the water table at the site are classified as Type 3 soil and sidewalls of open cut excavations 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 the required side slopes for open cut excavations cannot be achieved due to space restrictions on site, such as the proximity of the open cut excavation to property limits, properly dewatered excavations for the installation of underground services may be undertaken within the confines of a prefabricated support system (trench box) designed and installed in accordance with OHSA.

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.

10.2.2 Bedrock Excavations

It is anticipated that excavations will extend into the sandy dolostone bedrock for footings and underground services installation. The excavation of side slopes in the sound sandy dolostone bedrock may be undertaken with near vertical sides subject to examination by a geotechnical engineer.

Contractors bidding on this project should decide on their own the most preferred rock removal method, hoe ramming or line drilling and blasting.

10.2.3 Preconstruction Survey and Vibration Monitoring

It is recommended that a pre-construction condition survey of the existing school and surrounding infrastructure located within the construction zone of influence be undertaken prior to any earth (soil) and rock excavation work as well as vibration monitoring during excavation, blasting and construction operations. Prior to the commencement of blasting, a detailed blast methodology should be submitted by the Contractor.

10.3 De-Watering Requirements

It is anticipated that excavations will be at or above the recorded groundwater level and seepage of the surface and subsurface water into the excavations is anticipated. However, it should be possible to remove any water entering the excavation by

collecting water and pumping from the low points or sumps. In areas of high infiltration or in areas where more permeable soil layers may exist, a higher seepage rate should be anticipated and will require high-capacity pumps to keep the excavation dry.

For construction dewatering, an Environmental Activity and Sector Registry (EASR) approval may be obtained for water takings greater than 50 m^3 and less than 400 m^3 per day. If more than 400 m^3 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.

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

The on-site soils to be excavated are topsoil, fill, and shattered sandy dolostone rock. Portions of the on-site fill may be re-used as select subgrade material in the exterior of the building pending additional testing during construction. Otherwise, the fill may be used for landscaping purposes provided it is free of organics, cobbles, boulders and debris. Excavated bedrock is not suitable for use as backfill and should be discarded.

It is anticipated that the majority of the material required for backfilling purposes in the interior and exterior of the proposed building, trench backfill and parking lot would have to be imported and should preferably conform to the following specifications:

- Granular subbase for pavements, and underfloor fill including backfilling in service trenches inside the proposed addition - OPSS 1010 Granular B Type II placed in 300 mm thick lifts and each lift compacted to 100 percent SPMDD,
- Granular base for pavements, and underfloor fill within the top 200 mm of the slab - OPSS 1010 Granular A placed in 200 mm thick lifts and each lift compacted to 100 percent SPMDD,
- Backfill material against foundation walls located outside the proposed school addition – OPSS 1010 Granular B Type II placed in 300 mm thick lifts and each lift compacted to 95 percent SPMDD,
- Trench backfill outside building area, and fill placement to subgrade level for pavement – Approved on-site material or imported OPSS 1010 Select Subgrade Material (SSM), free of organics, debris and with a natural moisture content within 2 percent of the optimum moisture content. It should be placed in 300 mm thick lifts compacted to minimum 95 percent SPMDD; and
- Fill for landscaped areas should be clean fill free of debris, topsoil (organic soil), cobbles and boulders placed in 300 mm thick lifts and each lift compacted to 92 percent SPMDD.

12. Pipe Bedding Requirements

It is anticipated that the subgrade for the proposed underground services will be in the dolostone bedrock.

The pipe backfill including material specifications, thickness of cover material and compaction requirements should conform to municipal requirements and/or Ontario Provincial Standard Specification and Drawings (OPSS and OPSD). The pipe bedding should consist of 150 mm thick of OPSS Granular A bedding material. The bedding material should be compacted to at least 98 percent SPMDD.

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

To minimize the potential for bending stresses within the pipe, a transition zone treatment should be provided in areas where the pipe subgrade changes from overburden to bedrock and vice versa. In areas where the surface of the bedrock slopes at a steeper gradient than 3H:1V, the bedrock should be excavated and additional bedding material placed to create a 3H:1V transition zone.

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

13. Pavement Structure for Parking Lots

The subgrade for the pavement structures is anticipated to consist of the existing fill and sandy dolostone bedrock . Pavement structure thicknesses required for the parking lots set on the anticipated approved subgrade materials were computed and are shown in Table V. 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 V: Recommended Pavement Structure Thicknesses

Pavement Layer	Compaction Requirements	Light Duty Traffic (Cars Only)
Asphaltic Concrete (PG 58-34)	92 percent to 97 percent MRD	65 mm HL3/SP12.5 mm Cat. B
OPSS 1010 Granular A Base	100% percent SPMDD	150 mm
OPSS 1010 Granular B Type II Sub-base	100% percent SPMDD	300 mm

Notes:

1. SPMDD denotes standard Proctor maximum dry density, ASTM, D-698-12e2.
2. MRD denotes Maximum Relative Density, ASTM D2041.
3. The upper 300 mm of the subgrade fill must be compacted to 98% SPMDD.

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 geotextile fabric.

Additional comments on the construction of the parking lots are as follows:

1. As part of the subgrade preparation, the areas of the proposed parking area should be stripped of all existing fill, surficial and buried topsoil (organic) layers and organic stained soils down to the subgrade level. The subgrade should be properly shaped, crowned, then proofrolled 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).
2. 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.
3. 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 prior to construction to ensure they are consistent with the recommendations of this report.

14. Corrosion Potential

Chemical tests limited to pH, sulphate, chloride and resistivity were submitted on one (1) rock sample. A summary of the results will be provided when they become available.

15. Additional Comments

It is recommended that test pits are carried out at the existing foundation adjacent to the proposed addition to verify the depth and founding conditions of the existing footings and assist in the design of the proposed building addition foundation.

The test pits which form part of the EXP contract must be completed once the final location of the proposed addition is established and to determine if rough auguring was met on weathered bedrock or on boulders and cobbles likely present within the fill as shown on the logs of boreholes.

Based on the additional test hole information, the geotechnical engineering comments and recommendations indicated in this report may need to be updated.

All earthwork activities from subgrade preparation to placement and compaction of engineered fill, fill in service trenches, placement and compaction of granular materials and asphaltic concrete, should be inspected by qualified geotechnicians to ensure that construction proceeds according to the project specifications.

All the footing beds should be examined by a geotechnical engineer to ensure that the founding surfaces are capable of supporting the design bearing pressure and that the footing beds have been properly prepared.

16. General Comments

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

The information contained in this report is not intended to reflect on environmental aspects of the soils. Excess soil sampling was completed as part of this work and findings are provided under a separate cover.

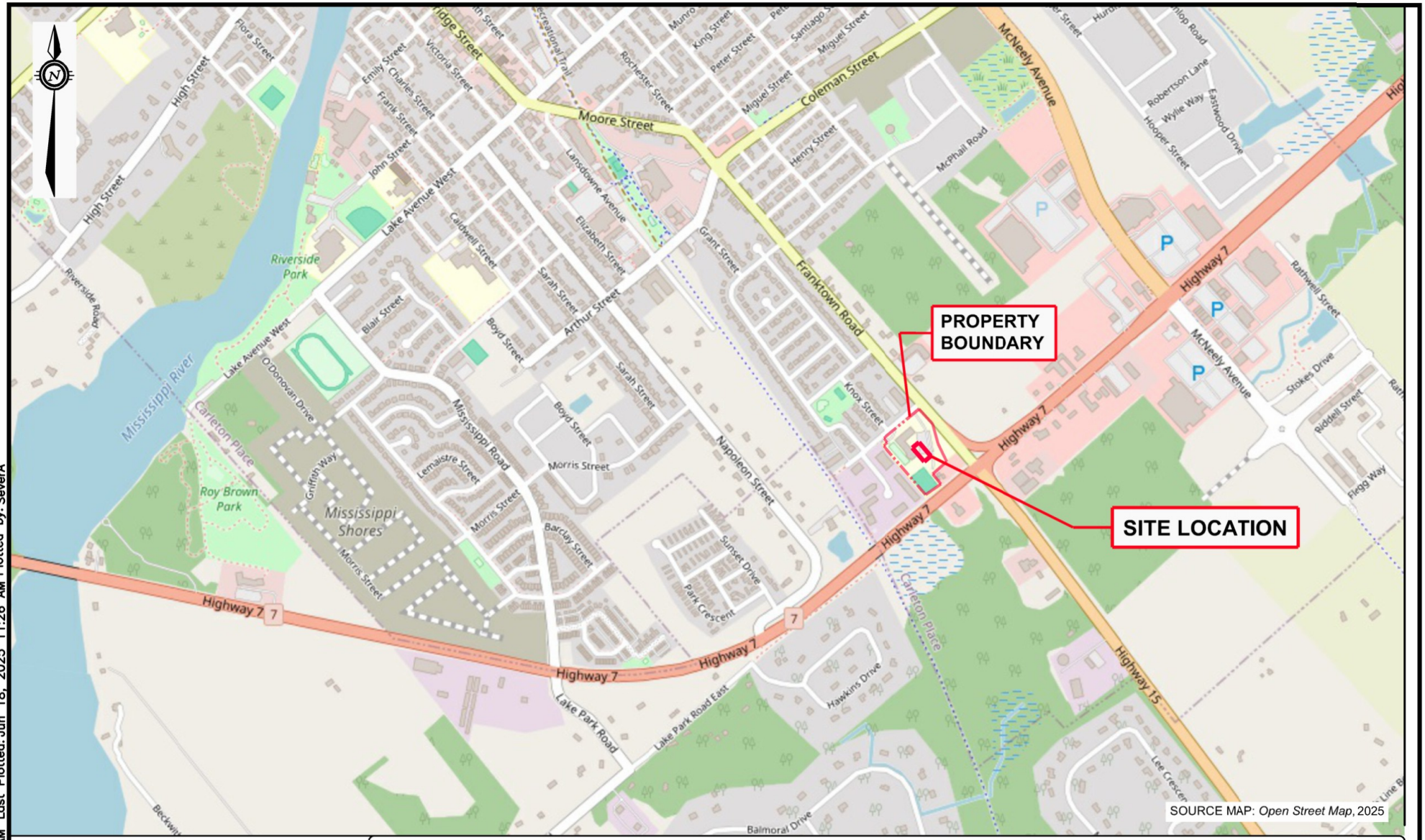
We trust that the information contained in this report will be satisfactory for your purposes. Should you have any questions, please do not hesitate to contact this office.

Sincerely

Matthew Zammit, M.A.Sc., P.Eng.
Geotechnical Engineer
Earth & Environment

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

Figures



ORIGINAL SHEET SIZE = 11" x 8.5"

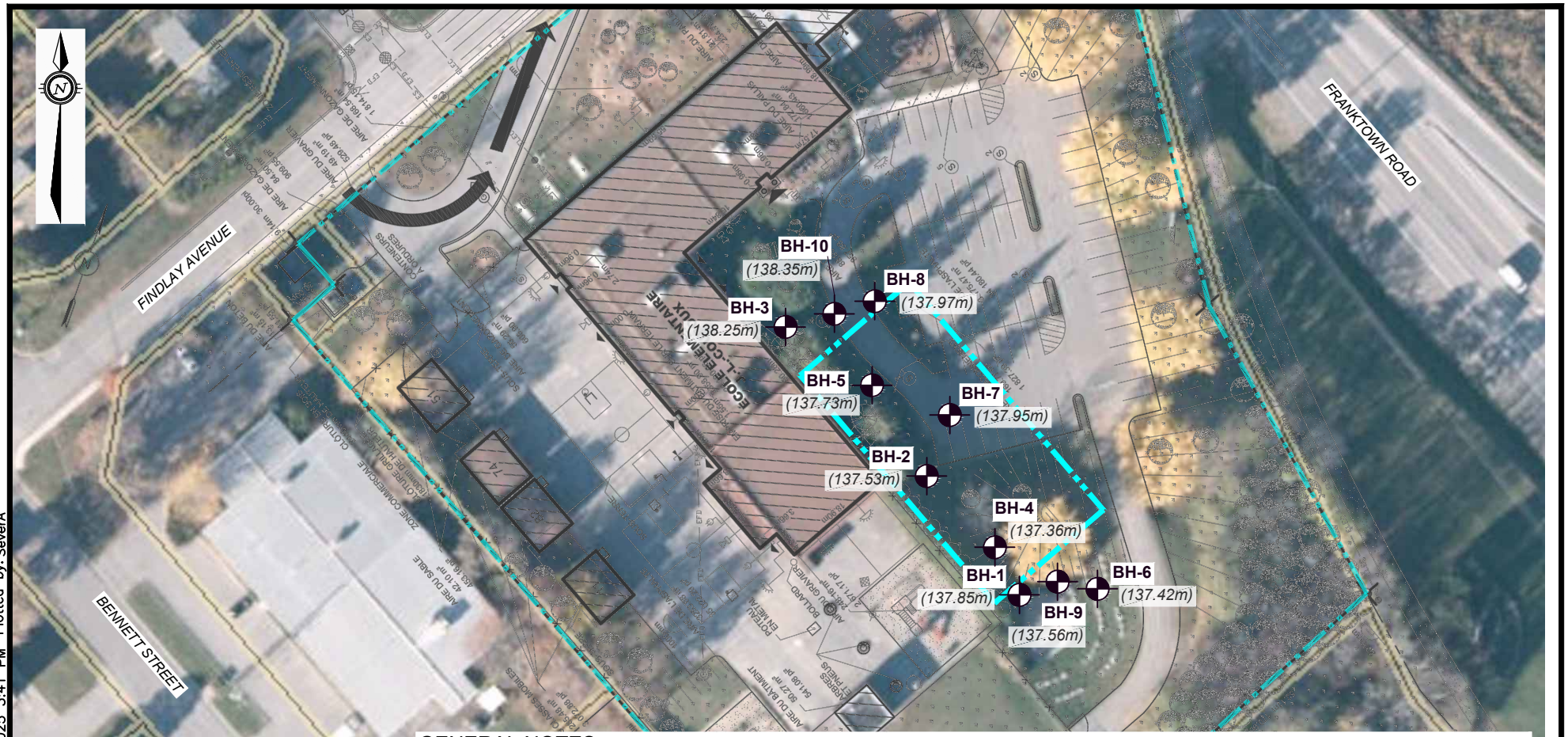
0 150m 300m 600m

HORIZONTAL 1:15,000

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

DATE: JUNE 2025	CLIENT: CONSEIL DES ÉCOLES CATHOLIQUES DU CENTRE-EST (CECCE)		project no. OTT-25006852-A0
DESIGN: MZ / CHECKED: IT	PROJECT: J. L. COUROUX SCHOOL ADDITION - GEOTECHNICAL INVESTIGATION		scale 1:15,000
DRAWN BY: AS	ADDRESS: 10 FINDLAY AVENUE, CARLETON PLACE, ONTARIO		
	SITE LOCATION PLAN		FIG 1

Filename: E:\OTT\OTT-25006852-A0\60 Execution\65 Drawings\OTT-2506852-A0_10-Findlay-Ave-CP_Geo.dwg
Last Saved: Jun 18, 2025 11:16 AM Last Plotted: Jun 18, 2025 11:26 AM Plotted by: SeverA



AERIAL PHOTOGRAPH SOURCE: *AgMaps*, (*www.lioapplications.lrc.gov.on.ca/AgMaps*)

GENERAL NOTES:

1. THE BOUNDARIES, SOIL AND ROCK TYPES HAVE BEEN ESTABLISHED ONLY AT BOREHOLE LOCATIONS. BETWEEN BOREHOLES THEY ARE ASSUMED AND MAY BE SUBJECT TO CONSIDERABLE ERROR.
2. SOIL AND ROCK SAMPLES WILL BE RETAINED IN STORAGE FOR THREE MONTHS AND THEN DESTROYED UNLESS THE CLIENT ADVISES THAT AN EXTENDED TIME PERIOD IS REQUIRED.
3. TOPSOIL AND ASPHALT QUANTITIES SHOULD NOT BE ESTABLISHED FROM THE INFORMATION PROVIDED AT THE BOREHOLE LOCATIONS.
4. BOREHOLE ELEVATIONS SHOULD NOT BE USED TO DESIGN BUILDING(S) OR FLOOR SLABS OR PARKING LOT(S) GRADES.
5. THIS DRAWING FORMS PART OF THE REPORT PROJECT NUMBER AS REFERENCED AND SHOULD BE USED ONLY IN CONJUNCTION WITH THIS REPORT.
6. BASE PLAN INFORMATION OBTAINED FROM *CECCE*, FILE No.: JLC_371_I01, SHEET No.: I-1/1, DATED: 2018.08.29.

LEGEND

APPROX. PROJECT BOUNDARY

BH-1 — BOREHOLE NO. AND LOCATION (2025)

(137.85m) — GROUND SURFACE ELEVATION (m)

ORIGINAL SHEET SIZE = 11" x 8.5"

0 10m 20m 40m

HORIZONTAL 1:1000

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

DATE: JUNE 2025	CLIENT: CONSEIL DES ÉCOLES CATHOLIQUES DU CENTRE-EST (CECCE)		project no. OTT-25006852-A0
DESIGN: MZ / CHECKED: IT	PROJECT: J. L. COUROUX SCHOOL ADDITION - GEOTECHNICAL INVESTIGATION		scale 1:1,000
DRAWN BY: AS	ADDRESS: 10 FINDLAY AVENUE, CARLETON PLACE, ONTARIO BOREHOLE LOCATION PLAN		FIG 2

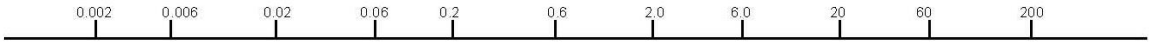
Filename: E:\OTT\OTT-25006852-A0\60 Execution\65 Drawings\OTT-2506852-A0_10-Findlay-Ave-CP_Geo.dwg
Last Saved: Jun 18, 2025 11:31 AM Last Plotted: Jun 18, 2025 3:41 PM Plotted by: SeverA

Notes On Sample Descriptions

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

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE		



EQUIVALENT GRAIN DIAMETER IN MILLIMETRES

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

UNIFIED SOIL CLASSIFICATION

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

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

Log of Borehole BH25-01

Project No: OTT-25006852-A0

Project: Proposed Classroom Addition - École Élémentaire Catholique J.-L.-Couroux

Location: 10 Findlay Avenue, Carleton Place , Ontario

Figure No. 3

Page. 1 of 1

Date Drilled: 'June 6, 2025

Drill Type: CME 55 LC- Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: SA Checked by: MZ

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~ 125 mm thick	137.85	0				
		FILL Sand and gravel with silty clay pockets, rootlets, rock fragments, brown, damp to moist, no odours, no stains, (loose to dense)	137.7		7 (SPT)	×	SS1	
			137.0		40, then 50 for 50mm (SPT)	×	SS2	
		HIGHLY WEATHERED BEDROCK **Auger Refusal at 1.0 m Depth**	136.9	1				

Note:

1) SS1 sample submitted for environmental laboratory analyses.

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-25006852-A0

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

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

LOG OF BOREHOLE JL COUROUX SCHOOL.GPJ TROW OTTAWA.GDT 6/23/25

Log of Borehole BH25-02

Project No: OTT-25006852-A0

Project: Proposed Classroom Addition - École Élémentaire Catholique J.-L.-Couroux

Location: 10 Findlay Avenue, Carleton Place , Ontario

Figure No. 4

Page. 1 of 1

Date Drilled: 'June 6, 2025

Drill Type: CME 55 LC- Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: SA Checked by: MZ

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		137.53		0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
		TOPSOIL ~ 100 mm thick	137.4					
		FILL Sand and gravel with rock fragments, rootlets, brown, damp to moist, no odours, no stains, (loose to dense)			7	✕	SS1	
		Augers grinding below 0.6 m depth on possible cobbles, boulders, or weathered bedrock		1	43	✕	SS2	
			136.1					
		HIGHLY WEATHERED BEDROCK	136.0					
		Auger Refusal at 1.5 m Depth						
		Note: 1) SS2 sample submitted for environmental laboratory analyses.						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-25006852-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

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

LOG OF BOREHOLE JL COUROUX SCHOOL.GPJ TROW OTTAWA.GDT 6/23/25

Log of Borehole BH25-03

Project No: OTT-25006852-A0

Project: Proposed Classroom Addition - École Élémentaire Catholique J.-L.-Couroux

Location: 10 Findlay Avenue, Carleton Place , Ontario

Figure No. 5

Page. 1 of 1

Date Drilled: 'June 5, 2025

Drill Type: CME 55 LC- Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: SA Checked by: MZ

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~ 100 mm thick	138.25	0				
		138.2						
		FILL Silty sand with gravel and silty clay pockets, contains rock fragments, inclusions of topsoil, rootlets, brown, moist, no odours, no stains, (loose)			8	×	SS1	
		Augers grinding below 0.6 m depth on possible cobbles, boulders, or weathered bedrock			7, then 50 for 127 mm	×	SS2	
			137.2	1				
		Auger Refusal at 1.1 m Depth						

Standard Penetration Test N Value: 20 40 60 80

Shear Strength kPa: 50 100 150 200

Combustible Vapour Reading (ppm): 250 500 750

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

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-25006852-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

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

LOG OF BOREHOLE JL COUROUX SCHOOL.GPJ TROW OTTAWA.GDT 6/23/25

Log of Borehole BH25-04

Project No: OTT-25006852-A0

Project: Proposed Classroom Addition - École Élémentaire Catholique J.-L.-Couroux

Location: 10 Findlay Avenue, Carleton Place , Ontario

Figure No. 6

Page. 1 of 1

Date Drilled: 'June 5, 2025

Drill Type: CME 55 LC- Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: SA Checked by: MZ

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~125 mm thick	137.36	0				
		FILL Silty sand and gravel with silty clay pockets, topsoil inclusions, rootlets, rock fragments, brown, moist, no odours, no stains, (compact)	137.2		17	×	SS1	
		Auger Refusal at 0.6 m Depth	136.8					

Note:

1) SS1 sample submitted for environmental laboratory analyses.

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-25006852-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

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

LOG OF BOREHOLE JL COUROUX SCHOOL.GPJ TROW OTTAWA.GDT 6/23/25

Log of Borehole BH25-05

Project No: OTT-25006852-A0

Project: Proposed Classroom Addition - École Élémentaire Catholique J.-L.-Couroux

Location: 10 Findlay Avenue, Carleton Place , Ontario

Figure No. 7

Page. 1 of 1

Date Drilled: 'June 5, 2025

Drill Type: CME 55 LC- Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: SA Checked by: MZ

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~ 200 mm thick	137.73	0				
		FILL Silty sand and gravel with silty clay pockets, inclusions of topsoil, rootlets, rock fragments, dark brown to brown, damp to moist, no odours, no stains, (very loose to dense)	137.5		3		SS1	
					6, then 50 for 50mm		SS2	
		Auger Refusal at 1.0 m Depth	136.7	1				

Note:

1) SS2 sample submitted for environmental laboratory analyses.

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-25006852-A0

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

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

LOG OF BOREHOLE JL COUROUX SCHOOL.GPJ TROW OTTAWA.GDT 6/23/25

Log of Borehole BH25-06

Project No: OTT-25006852-A0

Project: Proposed Classroom Addition - École Élémentaire Catholique J.-L.-Couroux

Location: 10 Findlay Avenue, Carleton Place , Ontario

Figure No. 8

Page. 1 of 1

Date Drilled: 'June 6, 2025

Drill Type: CME 55 LC- Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: SA Checked by: MZ

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~ 125 mm thick	137.42	0				
		137.4						
		FILL Silty sand with gravel, inclusions of rootlets, rock fragments and topsoil, brown, moist, no odours, no stains, (very loose to dense)			11	×	SS1	
		Augers grinding below 2.1 m depth on possible cobbles, boulders or weathered bedock		1	24	×	SS2	
					33	×	SS3	
		Wet below 2.3 m depth		2	2	×	SS4	
			134.62					
		134.5						
		DOLOSTONE BEDROCK Sandy, with sandstone partings, grey and brown		3			RUN1	
				4			RUN2	27.6
		132.8						
		Borehole Terminated at 4.6 m Depth						

Note:

1) SS4 sample submitted for environmental laboratory analyses.

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-25006852-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
June 16, 2025	2.8	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	2.9 - 3.1	100	100
2	3.1 - 4.6	93	75

LOG OF BOREHOLE JL COUROUX SCHOOL.GPJ TROW OTTAWA.GDT 6/23/25

Log of Borehole BH25-07

Project No: OTT-25006852-A0

Project: Proposed Classroom Addition - École Élémentaire Catholique J.-L.-Couroux

Location: 10 Findlay Avenue, Carleton Place , Ontario

Figure No. 9

Page. 1 of 1

Date Drilled: 'June 5, 2025

Drill Type: CME 55 LC- Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: SA Checked by: MZ

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth
		ASPHALT ~ 40 mm thick	137.95	0
		GRANULAR FILL ~110 mm thick Crusher run, grey, damp, (compact)	137.9	
		FILL Silty sand and gravel, inclusions of rock fragments, rootlets, and topsoil, brown, damp to moist, no odours, no stains, (compact)	137.8	
		Augers grinding below 0.6 m depth on possible cobbles, boulders, or weathered bedrock	136.5	1
		Auger Refusal at 1.5 m Depth		

Standard Penetration Test N Value: 20 40 60 80

Shear Strength: 50 100 150 200 kPa

Combustible Vapour Reading (ppm): 250 500 750

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

SAMPLES	Natural Unit Wt. kN/m³
SS1	
SS2	

Note:

1) SS2 sample submitted for environmental laboratory analyses.

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-25006852-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

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

LOG OF BOREHOLE JL COUROUX SCHOOL.GPJ TROW OTTAWA.GDT 6/23/25

Log of Borehole BH25-08

Project No: OTT-25006852-A0

Project: Proposed Classroom Addition - École Élémentaire Catholique J.-L.-Couroux

Location: 10 Findlay Avenue, Carleton Place , Ontario

Figure No. 10

Page. 1 of 1

Date Drilled: 'June 5, 2025

Drill Type: CME 55 LC- Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: SA Checked by: MZ

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~85 mm thick	137.97	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
		FILL	137.9		2, then 50 for 125mm	×	SS1	
		Silty sand with gravel, inclusions of rootlets, rock fragments and topsoil, moist, dark brown, no odours, no stains, (loose)	137.6					
		DOLOSTONE BEDROCK						
		Sandy, with sandstone partings, grey and reddish brown		1			RUN1 27.1	
				2			RUN2 27.8	
			134.97	3				
		Borehole Terminated at 3.1 m Depth	134.9					

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 19 mm diameter standpipe installed as shown.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-25006852-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
June 16, 2025	3.0	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	0.4 - 1.6	89	51
2	1.6 - 3.1	85	68

LOG OF BOREHOLE JL COUROUX SCHOOL.GPJ TROW OTTAWA.GDT 6/23/25

Log of Borehole BH25-09

Project No: OTT-25006852-A0

Project: Proposed Classroom Addition - École Élémentaire Catholique J.-L.-Couroux

Location: 10 Findlay Avenue, Carleton Place , Ontario

Figure No. 11

Page. 1 of 1

Date Drilled: 'June 6, 2025

Drill Type: CME 55 LC- Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: SA Checked by: MZ

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~ 175 mm thick	137.56	0				
		FILL Silty sand and gravel, with rock fragments and topsoil inclusions, moist, brown, no odours, no stains, (loose)	137.4		4	✕	SS1	
		Auger Refusal at 0.8 m Depth	136.8					

Standard Penetration Test N Value: 20 40 60 80

Shear Strength kPa: 50 100 150 200

Combustible Vapour Reading (ppm): 250 500 750

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

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-25006852-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

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

LOG OF BOREHOLE JL COUROUX SCHOOL.GPJ TROW OTTAWA.GDT 6/23/25

Log of Borehole BH25-10

Project No: OTT-25006852-A0

Project: Proposed Classroom Addition - École Élémentaire Catholique J.-L.-Couroux

Location: 10 Findlay Avenue, Carleton Place , Ontario

Figure No. 12

Page. 1 of 1

Date Drilled: 'June 5, 2025

Drill Type: CME 55 LC- Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: SA Checked by: MZ

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~100 mm thick	138.35	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
		138.3						
		FILL Silty sand and gravel, with rock fragments and topsoil inclusions, brown, moist, no odours, no stains, (compact)			13	×	SS1	
		Augers grinding below 0.6 m on possible cobbles, boulders, or weathered bedrock			6, and 50 for 127mm	×	SS2	
		137.4		1				
		HIGHLY WEATHERED BEDROCK						
		137.2						
		Auger Refusal at 1.2 m Depth						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. Borehole backfilled upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-25006852-A0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

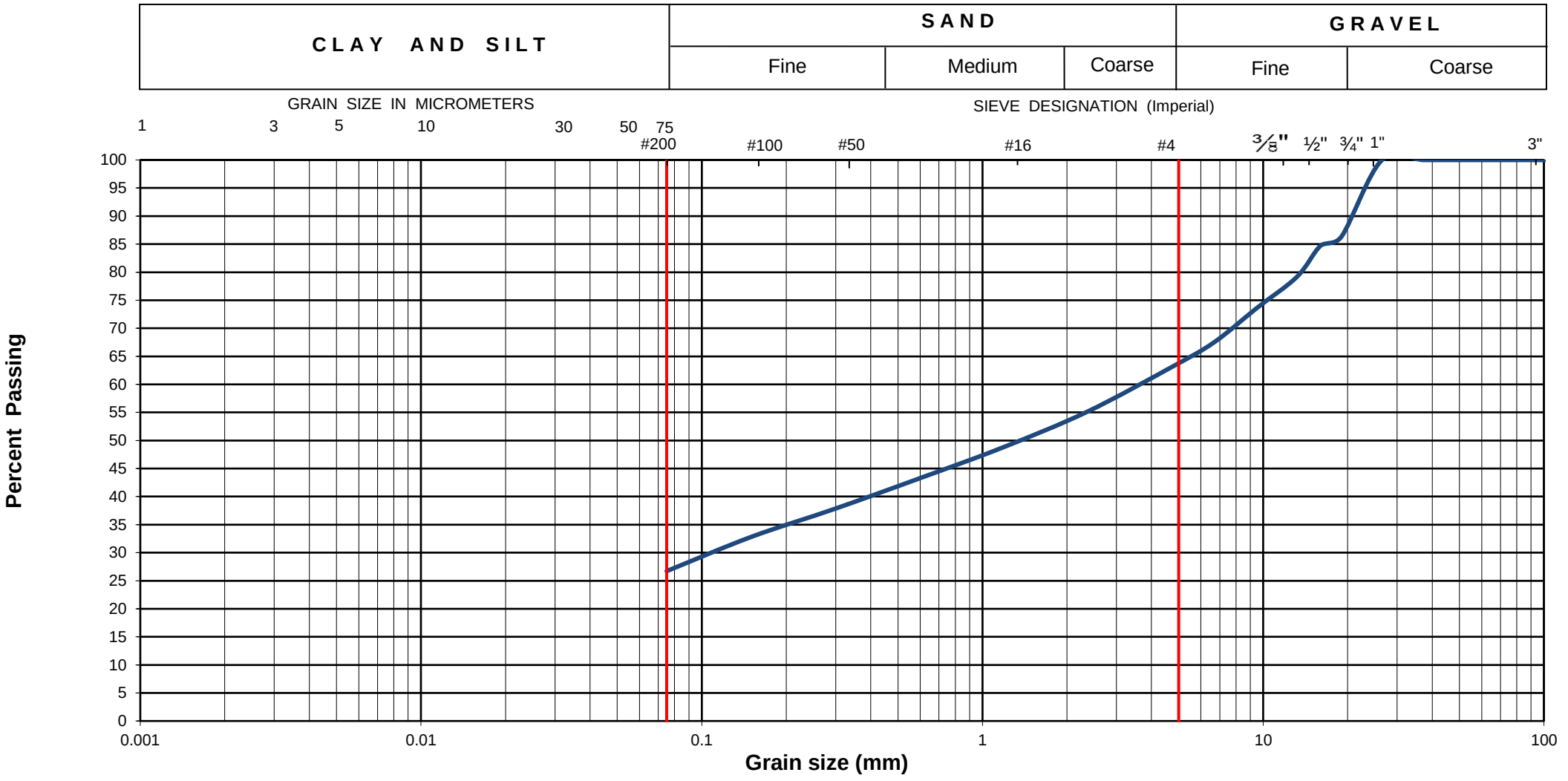
Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE JL COUROUX SCHOOL.GPJ TROW OTTAWA.GDT 6/23/25

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

Grain-Size Distribution Curve
Method of Test For Sieve Analysis of Aggregate
ASTM C-136

Unified Soil Classification System

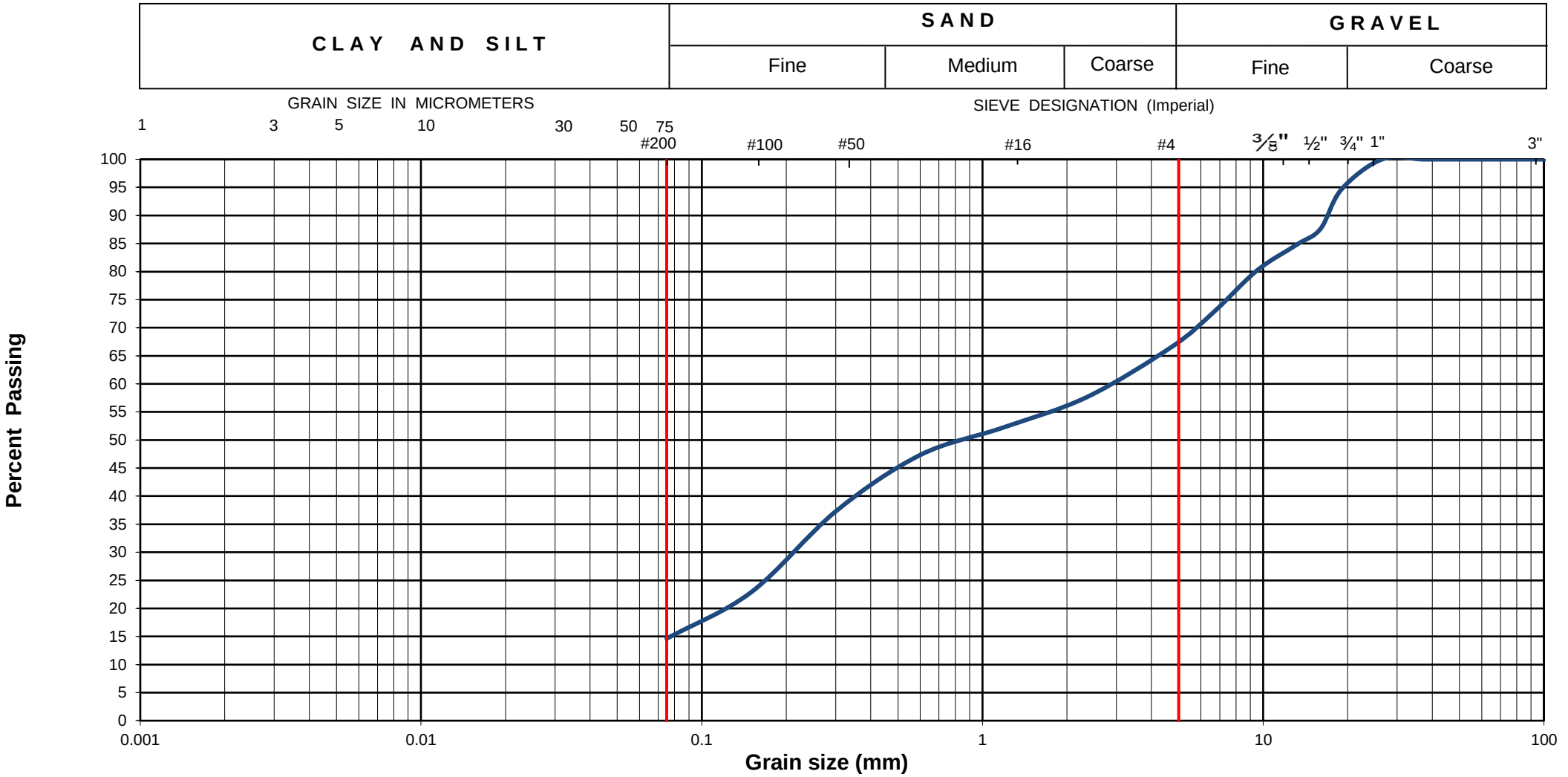


EXP Project No.:	**OTT-25006852-A0**	**Project Name :**	**Proposed Classroom Addition - J.L. Couroux Catholic Elementary School**						
Client :	**CECCE**	**Project Location :**	**10 Findlay Avenue, Carleton Place, Ontario**						
Date Sampled :	**June 6, 2025**	**Borehole No:**	**BH6**	**Sample:**	**SS2**	**Depth (m) :**	**0.8 - 1.4**		
Sample Composition :		**Gravel (%)**	**37**	**Sand (%)**	**36**	**Silt & Clay (%)**	**27**	**Figure :**	**13**
Sample Description :		**FILL: Silty Sand and Gravel (SM / GM)**							

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

Grain-Size Distribution Curve
Method of Test For Sieve Analysis of Aggregate
ASTM C-136

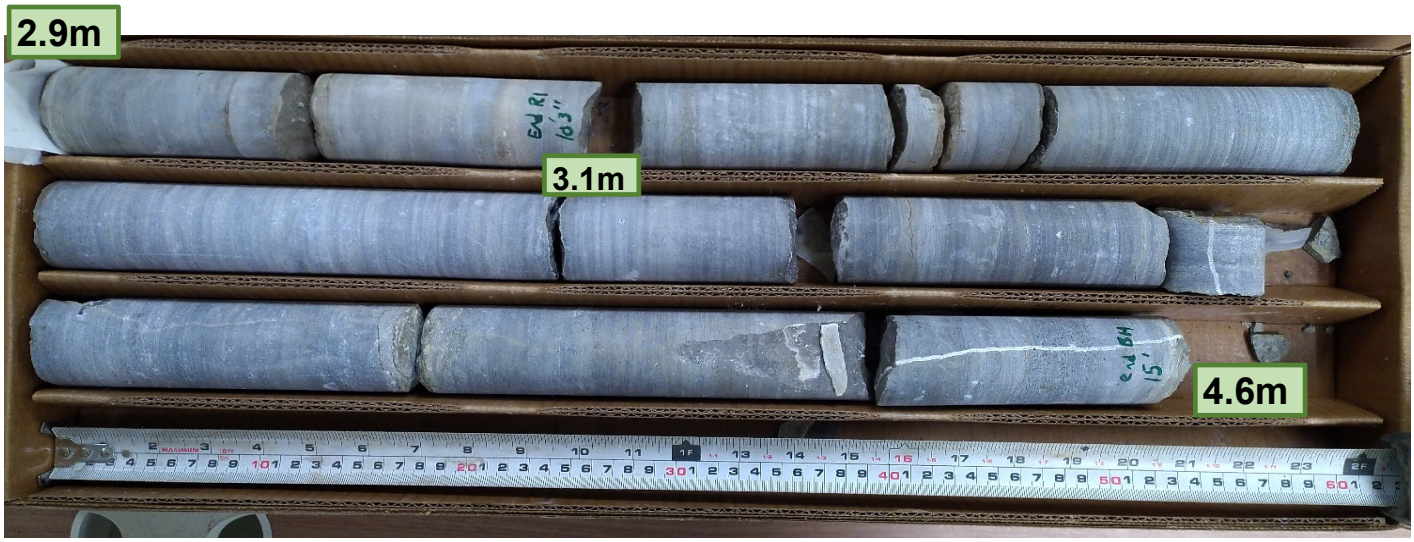
Unified Soil Classification System



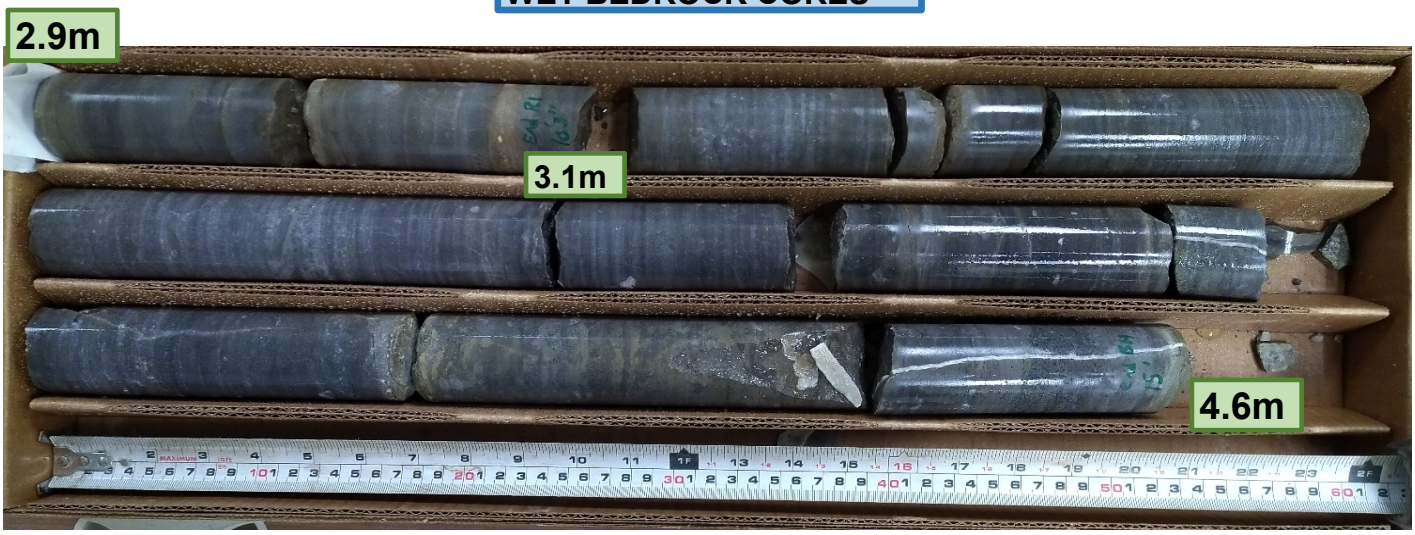
EXP Project No.:	**OTT-25006852-A0**	**Project Name :**	**Proposed Classroom Addition - J.L. Couroux Catholic Elementary School**						
Client :	**CECCE**	**Project Location :**	**10 Findlay Avenue, Carleton Place, Ontario**						
Date Sampled :	**June 6, 2025**	**Borehole No:**	**BH10**	**Sample:**	**SS1**	**Depth (m) :**	**0 - 0.6**		
Sample Composition :		**Gravel (%)**	**33**	**Sand (%)**	**52**	**Silt & Clay (%)**	**15**	**Figure :**	**14**
Sample Description :	**FILL: Silty Sand (SM), Gravelly**								

Appendix A – Bedrock Core Photographs

DRY BEDROCK CORES



WET BEDROCK CORES



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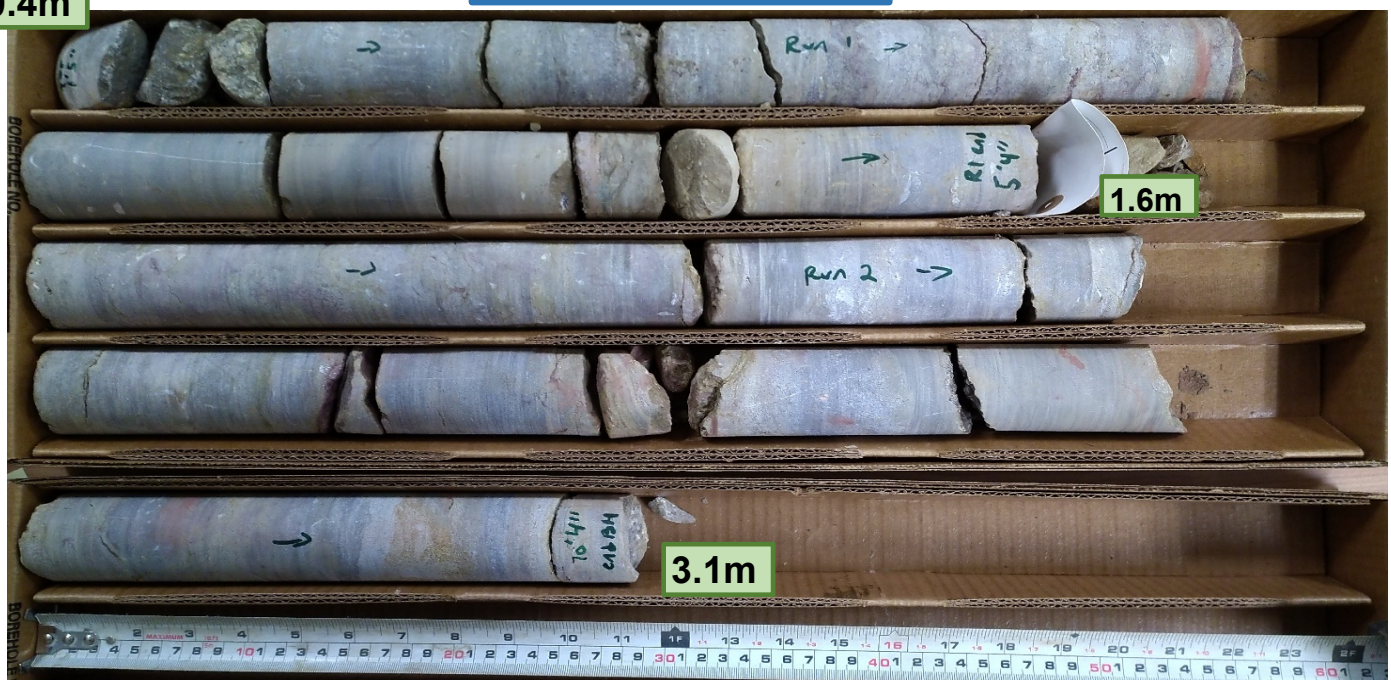
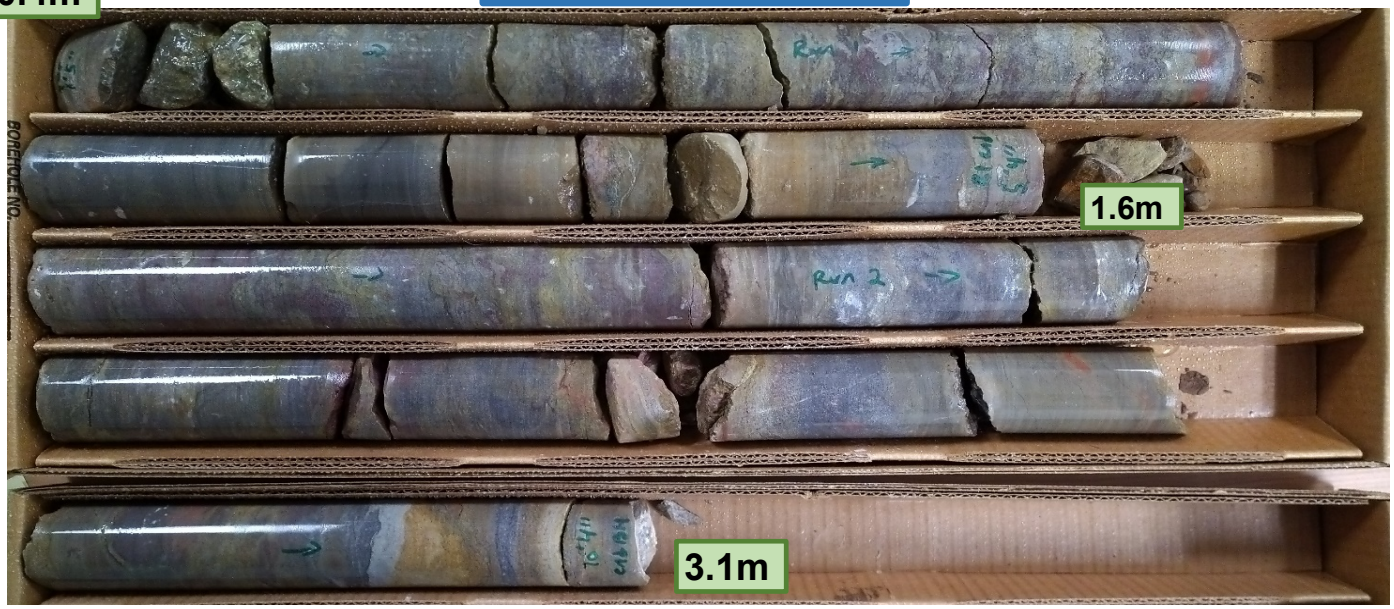
borehole no.	core runs	PROJECT		project no.
BH25-6	Run 1: 2.9m - 3.1m Run 2: 3.1m - 4.6m end of borehole		Proposed Classroom Addition - École Élementaire Catholique J.L. Couroux 10 Findlay Avenue, Carleton Place, Ontario	OTT-25006852-A0
date cored Jun 06, 2025			ROCK CORE PHOTOGRAPHS	FIG A1

DRY BEDROCK CORES



WET BEDROCK CORES



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borehole no.	core runs	PROJECT		project no.
BH25-8	Run 1: 0.4m - 1.6m Run 2: 1.6m - 3.1m end of borehole		Proposed Classroom Addition - École Élementaire Catholique J.L. Couroux 10 Findlay Avenue, Carleton Place, Ontario	OTT-25006852-A0
date cored Jun 05, 2025			ROCK CORE PHOTOGRAPHS	FIG A2

Appendix B – Legal Notification

Legal Notification

This report was prepared by EXP Services for the account of Conseil des Écoles Catholiques du Centre-Est.

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

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