Updated Geotechnical Investigation
Proposed Residential Development
355 Franktown Road
Carleton Place, Ontario

Client:
11309455 Canada Inc.
190 Lisgar Street
Ottawa, ON K2P 0C4

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Prepared By:
Matthew Zammit, M.A.Sc, P.Eng.
Geotechnical Engineer, Geotechnical Services
Earth and Environment

Reviewed / Approved By:
Ismail M. Taki, M.Eng., P.Eng.
Senior Manager, Earth and Environment, Eastern Ontario
Earth and Environment

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Executive Summary

EXP Services Inc. (EXP) is pleased to present the results of the updated geotechnical investigation completed for the proposed residential development proposed at the property registered by the street address of 355 Franktown Road, Carleton Place, Ontario (Figure No. 1). The updated investigations were authorized by 11309455 Canada Inc. (the client) on November 6, 2023, and February 12, 2024.

The proposed development will consist of the construction of two (2) condominium buildings (Buildings A and B) each four (4) stories high, consisting of forty-eight (48) units each, and one (1) block of two storey 6 units residential townhouse block (Building C). The condominium buildings will each have one level of underground parking extending beyond the footprint of the above ground buildings footprint whereas the townhouse block will also have one level of basement. Underground services, green space, surface parking and driveways, storm water management pond, and hard surface amenity space will also be constructed as part of the proposed development.

A conceptual lot grading plan was completed, and site servicing plans prepared by McIntosh Perry for the site under project number CCO-22-0402, drawing Number C101 and C102 and last revised on February 15 and 16, 2024 were provided to EXP as reference material. These plans indicate that the design underside of footing elevation for the condominium buildings and townhouse block are proposed to be set at Elevation 132.75 m and Elevation 131.36 m respectively. The final exterior grades around the condominium buildings will be as high as 136.75 m on the west side of the property and at Elevation 133.15 m surrounding the townhouse block on the east side of the property resulting in a grade raise of up to 3.6 m. The proposed storm water management pond at the south side of the property will have a base at Elevation 132.40 m. The proposed inverts for the sewers will range between Elevation 129.49 m to Elevation 133.93 m.

The fieldwork for the additional/updated geotechnical investigation was completed on November 10, 2023 and January 30, 2024 and comprised the excavation of fourteen (14) test pits (Nos. TP16 to TP29) advanced to refusal or termination depths of 0.2 m to 2.8 m below existing ground surface and the drilling of nine (9) boreholes (Nos. BH1 to BH9) advanced to refusal/ termination depths of 1.1 m to 4.2 m below the existing ground surface. Test Pit Nos. 14 and 15 were planned and omitted due to the presence of a septic field. Localized tree clearing was completed by the client to allow the completion of the additional test holes. All of the fieldwork was supervised on a full-time basis by a representative from EXP.

The subsurface conditions established by the thirty-eight test holes completed to date consists of 150 to 450 mm of topsoil underlain by a thin layer of fill and native soil overburden, extending to the surface of the bedrock contacted at depths of between 0.2 m to 3.0 m below the ground surface (Elevation 135.2 m to Elevation 130.4 m) with the exception of Test Hole Nos. TP20, BH7, and BH8, where bedrock was not contacted to 2.4 m to 2.9 m depth (Elevation 131.0 to 130.6 m) due to the limitations of the equipment used and/or an access issue. However, it is suspected that bedrock at these locations is within 1 m from the maximum depth investigated. Water levels were measured on February 14, 2024 at 0.1 m to 1.8 m below ground surface (Elevation 133.25 m to 133.46 m) in the monitoring wells installed within borehole Nos. 1 to 4.

Based on the test hole information, seismic site response **Class C** can be used for the site as per Table 4.1.8.4.A of the 2012 Ontario Building Code (as amended May 2, 2019). A higher site class will likely be obtained if a shear-wave velocity testing is completed at the site and provided that the footings are set on bedrock or maximum depth of overburden between the underside of footing and bedrock is less than 3 m, which is likely the case for this site. However, this will depend on the final design grades. The subsurface soils are not considered to be liquefiable during a seismic event.

For design purposes, the proposed maximum grade raise of up to 3.6 m is considered feasible at the site, provided that the recommendations in the geotechnical report are followed.

Based on the collected data to date, the footings for Condominium Building A and Townhouse Block (Building C) to be set at Elevation 132.75 m and 131.36 m respectively, will be set on the bedrock contacted at Elevation of 134.0 m to 135.8 m in test holes drilled at Building A and Elevation 132.8 m to 134.5 m in test holes drilled at Building C. Footings founded on the sound bedrock at the proposed USF elevation below any weathered or fractured zone may be designed for a factored geotechnical resistance at ULS of 1500 kPa. The factored geotechnical resistance at ULS includes a geotechnical resistance factor of 0.5. For footings founded on sound bedrock, factored geotechnical resistance at ULS will govern the design. Settlement of footings founded on sound bedrock is expected to be minimal.

At Condominium Building B with proposed underside of footing at Elevation 132.75 m, the founding material will be bedrock at the location of Test Holes Nos. TP9, TP18, TP24, and BH2, and in overburden at the location of Test Hole Nos. TP19 to TP22 and BH4 to BH9 which constitute approximately 33 percent of the building footprint as shown on Figure 2. Footings should not be founded partly on bedrock and partly on the overburden. It should be noted that the compressible silty clay contacted at the underside of footing is prone to consolidation under the 3.6 m of the additional fill that will be placed as part of the site grading. For this building, two foundation options are available due to the presence of thicker overburden in a portion of the building and the proposed grade raise of 3.6 m as described in the main body of the report and summarized below. These options apply to the section of the building where thicker overburden was contacted. The rest of the building where the founding material is bedrock can be designed for a factored geotechnical resistance at ULS of 1500 kPa as described above.

- Remove the compressible clay/loose soils to elevation 132.6 m and to provide a 0.6 m thick engineered fill. Once approved, raise the grade with engineered fill and design the footing for a design bearing pressure at serviceability limit state and factored geotechnical resistance at ultimate limit state of 80 kPa and 120 kPa respectively. The exact amount of material to be removed should be established in the field, and
- Remove the compressible clay to elevation 132.6 m and found the footings on sound bedrock in areas of bedrock and on micropiles in areas of deep overburden. Each of these options are discussed in detail in the main body of the report.

If part of the footings are founded on bedrock and part on engineered fill or granular soil in order to reduce the potential for differential settlement, a transition zone should be provided at the interface of soil and bedrock by the excavation of the bedrock to provide a sloped transition of 4 horizontal to 1 vertical. Structural control joints may also be required at this interface to be designed by the structural engineer.

The factored geotechnical resistance at ULS includes a geotechnical resistance factor of 0.5. Settlements of footings designed for the above SLS bearing pressure are expected to be within the tolerable limits of 25 mm total and 19 mm differential.

For foundations placed on the surface of the bedrock, a minimum of 1.2 m of earth cover should be provided to the exterior foundations of heated structures to protect them from damage due to frost penetration. The frost cover should be increased to 1.8 m for unheated structures if snow will not be removed from their vicinity and to 2.1 m if snow will be removed from the vicinity of the structure.

For foundations placed on native soil, a minimum of 1.8 m of earth cover should be provided to the exterior foundations of heated structures 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, and to 2.4 m if snow will be removed from the vicinity of the structure.

When earth cover is less than the minimum required, an equivalent thermal combination of earth cover and rigid insulation or rigid insulation alone should be provided. EXP can provide additional comments in this regard, if required.

The lowest floor of the proposed structures may be designed as a slab-on-grade set on a bed of clear stone placed on well compacted engineered fill set on the bedrock/native non-compressible soils and prepared as described in the body of the report. Perimeter and underfloor drainage systems should be provided for the proposed buildings with basements.

Excavations for the construction of the proposed buildings and underground services are expected to extend to a maximum depth of 2.0 to 4.0 m below the existing ground surface. These excavations will extend through the fill and into the bedrock with depths depending on the final design grades.

The overburden soils have been classified as Type 3 soils in accordance with the Occupational Health and Safety Act (OHSA), Ontario, Reg. 213/91 and therefore any open excavation must be sloped back at 1H:1V from the bottom of the excavation.

Excavations into the overburden soils may be undertaken using conventional equipment capable of removing cobbles and boulders from within the overburden soils. Excavation of the bedrock would require the use of hoe-ramming and/or line drilling and blasting and may be undertaken with near vertical sides. Contractors bidding on this project must review the available data and decide on their own the most suitable method to excavate the bedrock, i.e. line drilling, blasting, etc.

For excavations extending to up to 4.0 m below the existing grade, the excavations are anticipated to be below the groundwater level. Therefore, the removal of groundwater from the excavation is anticipated depending on the final design grades. It should be possible to collect water entering the excavations at low points and to remove it by conventional pumping techniques and high-capacity pumps where the infiltration rates are greater. An additional hydrogeological study is recommended to estimate the volume of water to be pumped from the site, it's possible impact on neighbouring properties and services and required permits to be acquired from the appropriate regulatory bodies.

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

It is anticipated that the majority of the material required for backfilling purposes would have to be imported and should preferably conform to the specifications described in the body of the report.

From a geotechnical point of view, there are no concerns regarding the proposed pond and its design. The pond bottom is expected to be below the long-term stabilised ground water level, however the development will likely lower the long-term groundwater level. A subdrain system may be necessary beneath the proposed stormwater pond to aid in draining the pond after rainfall events. The design grades are proposed at the conceptual stage only. These recommendations are to be reviewed once the design grades are finalized.

It is recommended that a hydrogeological investigation be completed utilizing the monitoring wells installed as part of this investigation to quantify the volume of dewatering required during construction and to provide additional design data for the proposed pond.

It is recommended that the data collected in the 2021 test pits be confirmed once the site is cleared from trees due to possible/suspect errors in the ground surface elevation/bedrock elevation which may have been compromised by interference of the tree cover during the survey conducted in 2021. Consideration should be also given to

excavating additional test pits to collect supplemental data on the bedrock elevation in areas not currently accessible as well in Building B in order to provide additional rock data for the contractor bidding on this project.

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

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1. Introduction

EXP Services Inc. (EXP) is pleased to present the results of the updated geotechnical investigation completed for the residential development proposed to be constructed at the property registered by the municipal address of 355 Franktown Road, Carleton Place, Ontario (Figure No. 1). This work was authorized by 11309455 Canada Inc. (the client) on November 6, 2023, and February 12, 2024.

A preliminary investigation was completed in 2021 by EXP and the results reported under Report Number OTT-21002179-A0. This report supersedes the 2021 report and includes the data collected in 2021.

The proposed development will consist of the construction of two (2) condominium buildings (Buildings A and B) each four (4) stories high, consisting of forty-eight (48) units each, and one (1) block of two storey 6 units residential townhouse block (Building C). The condominium buildings will each have one level of underground parking extending beyond the footprint of the above ground buildings footprint whereas the townhouse block will also have one level of basement. Underground services, green space, surface parking and driveways, storm water management pond, and hard surface amenity space will also be constructed as part of the proposed development.

A conceptual lot grading plan was completed and site servicing plans prepared by McIntosh Perry for the site under project number CCO-22-0402, drawing Number C101 and C102 and last revised on February 15 and 16, 2024 were provided to EXP as reference material. These plans indicate that the design underside of footing elevation for the condominium buildings and townhouse block are proposed to be set at Elevation 132.75 m and Elevation 131.36 m respectively. The final exterior grades around the condominium buildings will be as high as 136.75 m on the west side of the property and at Elevation 133.15 m surrounding the townhouse block on the east side of the property resulting in a grade raise of up to 3.6 m. The proposed storm water management pond at the south side of the property will have a base at Elevation 132.40 m. The proposed inverts for the sewers will range between Elevation 129.49 m to Elevation 133.93 m.

This updated geotechnical investigation was undertaken to:

a) Establish the subsurface soil and groundwater conditions at the locations of twenty-nine (29) test pits and nine (9) boreholes throughout the site,

b) Provide classification of the site for seismic design in accordance with requirements of the 2012 Ontario Building Code (OBC) as amended January 1, 2020 and assess the liquefication potential of the subsurface soils in a seismic event,

c) Discuss grade raise restrictions,

d) Provide the bearing pressure at Serviceability Limit State (SLS) and factored geotechnical resistance at Ultimate Limit State (ULS) of the most suitable type of foundation for the new buildings, as well as anticipated total and differential settlements,

e) Discuss earth pressures against basement and retaining walls,

f) Comment on slab-on-grade construction and permanent drainage requirements,

g) Discuss excavation conditions and dewatering requirements during construction,

h) Provide pipe bedding requirements for the new underground services,

i) Comment on backfilling requirements and suitability of the on-site soils for backfilling purposes,

j) Discuss pavement design and construction recommendations for roadways and parking,

k) Comment on subsurface concrete requirements, and;

l) Comment on stormwater management ponds construction.

The comments and recommendations given in this report assume that the above-described design concept will proceed to 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 subject site is located on the east side of Franktown Road in the town of Carleton Place, Ontario. It is bounded by a commercial property to the west, and by vacant undeveloped land to the north, south, and east (Figure No. 1). The subject site is a rectangular area which is currently undeveloped land. The site has some grassy vegetation in the west, but it is mostly forest-covered throughout. Some localized tree clearing was completed to allow the completion of the additional test pits and boreholes forming part of this additional investigation.

The site is fairly flat to gently undulating with ground surface elevations at the location of the test holes ranging between Elevation 133.16 m and Elevation 136.90 m. The ground surface elevation slopes gently downward from west to east across the site.

3. Background

Phase I and Phase II Environmental Site Assessments were completed by EXP at the subject site in 2019 and results reported under EXP project OTT-000252133-A0 dated April 26, 2019. As part of the Phase II ESA, one borehole was drilled at the southwest corner of the property to a depth of 4.6 m below grade and revealed the subsurface condition to comprise of 0.8 m thin deposit of overburden underlain by limestone bedrock. The groundwater was measured at a depth of 2.5 m below grade, 4 days following the completion of the fieldwork. The log of this borehole is attached in Appendix A.

A preliminary geotechnical investigation was completed in June 2021 at the subject site under project number OTT-21002179-A0. The preliminary geotechnical investigation included 15 test pits. Those test pits are included in this report. This report supersedes the 2021 report.

4. Procedure

The fieldwork for the 2021 preliminary geotechnical investigation was completed on May 25, 2021, and consisted of fifteen (15) test pits (Test Pit Nos. 1 to 13, 6A and 7A) advanced to refusal depths on intact bedrock ranging from 0.4 m to 2.1 m below the existing ground surface using a Caterpillar 320T hydraulic excavator and a Kubota KX080 hydraulic excavator, both operated by a local excavation contractor subcontracted to EXP. The elevations and locations of these test pits were established by EXP and was subjected to some estimation due to the tree covers and limitation of the equipment used.

The fieldwork for the additional/updated geotechnical investigation was completed on November 10, 2023, and January 30, 2024 and comprised the excavation of fourteen (14) test pits (Nos. TP16 to TP29) advanced to refusal or termination depths of 0.2 m to 2.8 m below existing ground and the drilling of nine (9) boreholes (Nos. BH1 to BH9) advanced to refusal/ termination depths of 1.1 m to 4.2 m below the existing ground surface. Test Pit Nos. 14 and 15 were planned and omitted due to the presence of septic field. Some localized tree clearing was completed by the client to allow the completion of the additional test holes. All of the fieldwork was supervised on a full-time basis by a representative from EXP.

Prior to the fieldwork, the locations of the test holes were cleared of any public and private underground services.

The test hole locations and geodetic elevations of the additional test holes were established by a survey crew from Annis O'Sullivan Vollebekk Ltd. retained by the client as shown on the Test Hole Location Plan (Figure No. 2).

The test pits for the additional investigation were advanced using a CAT 320F hydraulic excavator and Kubota EX-116 hydraulic excavator operated by a local contractor subcontracted to EXP. Grab samples were collected from selected depths from the test pits. Groundwater level observations were made in each test pit upon completion of excavating each test pit. All of the test pits were backfilled upon completion.

Borehole Nos. 1 to 3 were advanced using a CME-55 track mounted drill rig equipped with continuous flight hollow stem augers and conventional rock coring capabilities. Borehole Nos. 4 to 9 were advanced using manual equipment due to access issues and soft ground. The manual equipment utilized a one-third weight hammer. Standard Penetration Tests (SPTs) were completed in all boreholes at continuous intervals of 0.6 m and soil samples were retrieved using the split-barrel sampler. In Borehole Nos. 1 to 3, the presence of bedrock was confirmed using conventional rock coring techniques and N-size core barrel. A field record of wash water return, colour of wash water and any sudden drops of the core barrel were kept during the rock coring operation. A dynamic cone penetration test (DCPT) was completed at Borehole No. 4. Four (4) boreholes (Nos. 1 to 4) were outfitted with a 32 mm diameter monitoring well for long-term monitoring of the ground water levels. The monitoring wells were installed in accordance with EXP standard practice, and the installation configurations are documented on the respective borehole logs. The boreholes were backfilled upon completion of drilling and installation of the monitoring wells.

All soil samples were visually examined in the field for textural classification, logged, preserved in plastic bags and identified accordingly. Similarly, all of the rock cores were visually examined, placed in core boxes, identified and logged. On completion of the fieldwork, all the soil samples and rock cores were transported to the EXP laboratory in the City of Ottawa, Ontario, where they were visually examined by a geotechnical engineer, and test hole logs were prepared. The engineer also assigned the laboratory testing which are shown in Table I.

Table I: Summary of Laboratory Testing Program	
Type of Test	**Number of Tests Completed**
Soil Samples	
Natural Moisture Content	9* + 57
Natural Unit Weight	2*
Grain Size Analysis	7
Atterberg Limits Determination	3
Corrosion Analysis (pH, sulphate, chloride and resistivity)	1
Rock Core	
Unconfined Compressive Strength Test and Natural Unit Weight	6
Corrosion Analysis (pH, sulphate, chloride, and resistivity)	1
Note: *denotes testing that was completed as part of the June 2021 report	

5. Subsurface Soil and Groundwater Conditions

A detailed description of the geotechnical conditions encountered in all the test holes completed at the site is given on the test hole logs, Figure Nos. 3 to 40. 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 may also result in changes in the conditions interpreted to exist at the locations where sampling was conducted.

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

It should be noted that the soil and bedrock boundaries indicated on the test hole logs 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 test hole logs forms an integral part of this report and should be read in conjunction with this report.

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

5.1 Topsoil

A 100 mm to 500 mm thick layer of topsoil was encountered at ground surface in all test pits and boreholes. The topsoil or organic topsoil fill contains sand and gravel, cobbles, brick and metal pieces at Borehole No. 3 and Test Pit No. 17. The topsoil or topsoil fill extends to refusal/ top of weathered or sound bedrock at Test Pit Nos. 1, 3, 6A, 7, 7A, 8, 9, 10, 17, 18, and 23 to 29, and Borehole Nos. 1 to 3 and depths ranging from 0.1 m to 0.5 m below ground surface (Elevation 136.7 m to 132.8 m) in the remaining test holes.

5.2 Fill

The topsoil in Test Pit Nos. 2, 4, 5, 6, and 16 is underlain by a layer of sand fill containing silt and gravel, organics such as roots, topsoil and wood, and pieces of asphalt and brick and extends to depths ranging from 0.6 m to 1.8 m below existing grade (Elevation 135.3 m to 134.0 m). The fill extends to the top of weathered bedrock or excavator bucket refusal at Test Pit Nos. 5, 6, and 16 (Elevation 134.3 m to 134.0 m). The natural moisture content of the fill ranged from 5.2 percent to 18.4 percent. A grain size analysis was completed on one (1) sample of the fill material and the results are presented in Table II and shown in Figure 41 at the end of this report.

Table II: Summary of Grain-size Analysis Results – Fill Sample

Borehole No. – Sample No.	Depth (m)	Grain-size Analysis (%)			Soil Classification (USCS)
		Gravel	Sand	Silt and Clay	
TP16 – GS1	0.3 – 0.5	19	73	8	Poorly Graded Sand with Silt and Gravel (SP-SM)

Based on the grain size distribution analysis, the fill material may be classified as a Poorly Graded Sand with Silt and Gravel (SP-SM) according to the USCS and it is classified as Sand, Some Gravel, Trace Silt according to CFEM (2006).

5.3 Sandy Silt to Silty Sand

A deposit of native sandy silt to silty sand was encountered in Test Pit Nos. 11 to 13 and 19 to 22, and in Borehole Nos. 4 to 9 underlying the topsoil at depths ranging from 0.2 m to 1.2 m below existing grade (Elevation 134.9 m to 132.3 m). At Test Pit Nos. 11 to 13, the native silty sand deposit was yellow-brown in colour and contained gravel and silt, as well as rootlets. At Test Pit Nos. 11 to 13, the native sand deposit extended to highly weathered rock or refusal on the surface of the bedrock at depths ranging from 0.4 m to 0.6 m below existing grade (Elevation 134.5 m to 133.1 m).

At Test Pit Nos. 19 to 22 and Borehole Nos. 4 to 9, the sandy silt to silty sand was light brown to brown and contained some clayey seams to clay layers. The sandy silt to silty sand was also interrupted by a sand and gravel layer at Test Pit Nos. 20 and 21. At these test pits, the sandy silt to silty sand extends to depths of 0.8 m to 2.9 m (Elevation 132.8 m to 130.6 m), which corresponds to the maximum sampled depths or termination depths at Borehole Nos. 4, 7, and 8.

The sandy silt to silty sand was in a loose to dense state based on standard penetration test values ranging from 5 to 47. Natural moisture content in the native sandy silt to silty sand deposits ranged from 11 to 26 percent.

A grain size analysis was completed on one (1) sample of the sandy silt to silty sand material and the results are presented in Table III and shown in Figure 42 at the end of this report.

Table III: Summary of Grain-size Analysis Results – Sandy Silt Samples

Borehole No. – Sample No.	Depth (m)	Moisture Content (%)	Grain-size Analysis (%)				Soil Classification (USCS)
			Gravel	Sand	Silt	Clay	
BH8 – SS4	1.8 – 2.4	19	0	49	43	8	Sandy Silt (ML)

Based on the grain size distribution, the sandy silt to silty sand material may be classified as Sandy silt (ML) according to the USCS and it is classified as Sand and Silt, trace clay according to CFEM (2006).

5.4 Sand and Gravel

A silty sand with gravel to sand and gravel layer was encountered in Test Pit Nos. 20 and 21, and Borehole No. 4, 5, and 8 underlying the topsoil and silty sand layer. It was encountered at 0.3 m to 0.9 m depth (Elevation 133.1 m to 132.3 m) and extended to depths of 0.9 m to 1.4 m (Elevation 132.5 m to 131.9 m).

The silty sand with gravel to sand and gravel is in a loose state with standard penetration test values of 5 to 10. The natural moisture content of the silty sand with gravel to sand and gravel layer is 13 percent to 27 percent.

A grain size analysis was completed on one (1) sample of the silty sand with gravel to sand and gravel material and the results are presented in Table IV and shown in Figure 43 at the end of this report.

Table IV: Summary of Grain-size Analysis Results – Sand and Gravel Sample					
Borehole No. – Sample No.	Depth (m)	Grain-size Analysis (%)			Soil Classification (USCS)
		Gravel	Sand	Silt and Clay	
BH5 – SS2	0.6 – 1.2	16	57	27	Silty Sand with Gravel (SM)

Based on the grain size distribution, the silty sand with gravel to sand and gravel material may be classified as Silty Sand with gravel (SM) according to the USCS and it is classified as Silty Sand, some gravel according to CFEM (2006).

5.5 Silty Clay to Sandy Clayey Silt

A deposit of native sandy silty clay was encountered in Test Pit Nos. 2, 4, 20, 21, and 22, as well as Borehole Nos. 7 and 9, underlying topsoil, fill, sandy silt to silty sand, and sand and gravel material at depths ranging from 0.3 m to 2.2 m below existing grade (Elevation 135.3 m to 131.0 m). Pockets of the native sandy silty clay deposit were also observed in Test Pit Nos. 5 and 7. The native sandy silty clay deposit was grey to blue grey in colour and contained rootlets and root fragments in Test Pit No. 2 and 4, and sandy layers or inclusions in Test Pit Nos. 4, 20, 21, and 22, and Borehole Nos. 7 and 9. The native sandy silty clay deposit extended to refusal on inferred bedrock in Test Pit Nos. 2, 4, and 21, and Borehole No. 9 at depths ranging from 1.4 m to 2.4 m below existing grade (Elevation 134.8 m to 130.8 m). At Test Pit No. 22 the silty clay layer extended to 1.0 m depth (Elevation 132.2 m). At Test Pit No. 20 the silty clay layer extended to the maximum explored depth of 2.8 m (Elevation 130.4 m) and refusal was not met.

Pocket Penetrometer measurements of 144 kPa to 215 kPa indicate the silty clay has a very stiff to hard consistency, however the shallow silty clay layer at Borehole No. 7 was in a firm state based on a field vane measurement of 40 kPa. Natural moisture content in the native silty clay to sandy clayey silt deposit ranged from 20 percent to 43 percent. Natural unit weight was measured at 18.1 kN/m^3 and 20.2 kN/m^3. A grain size analysis was completed on two (2) samples and Atterberg limits determination was completed on three (3) samples of the silty clay to sandy clayey silt and the results are summarized in Table V and shown in Figures 44 and 45 at the end of this report.

Table V: Summary of Grain-size Analysis and Atterberg Limits Results – Silty Clay to Sandy Clayey Silt Samples										
Borehole No. – Sample No.	Depth (m)	Moisture Content (%)	Atterberg Limits			Grain-size Analysis (%)				Soil Classification (USCS)
			LL	PL	PI	Gravel	Sand	Silt	Clay	
TP21 – GS3	1.5 – 1.7	23	NP	NP	NP	0	29	46	25	Silt with Sand (ML)
BH7 – SS2	0.6 – 0.8	43	39	21	18	-	-	-	-	Clay of Low Plasticity (CL)
BH7 – SS3	1.2 – 1.8	27	35	18	17	0	11	46	43	Clay of Low Plasticity (CL)
Note – NP denotes not plastic										

Based on the grain size distribution and Atterberg limits determination, the silty clay to sandy clayey silt material may be classified as Silt with Sand (ML) to Clay of low plasticity (CL) according to the USCS and it is classified as Sandy, Clayey, Silt to silty clay, some sand according to CFEM (2006).

5.6 Glacial Till

Glacial Till was encountered underlying topsoil, sandy silt, and silty clay, at Test Pit Nos. 19 and 22. The glacial till was encountered at depths of 0.8 m to 1.0 m (Elevation 132.8 m to 132.2 m) and extended to excavator bucket refusal depths of 1.5 m to 1.7 m (Elevation 131.9 m to 131.7 m). The natural moisture content of the glacial till was 16 percent and 19 percent. A grain size distribution analysis was completed on one (1) sample of the glacial till and the results are summarized in Table VI below and shown in Figure 46 at the end of this report.

Table VI: Summary of Grain-size Analysis Results – Glacial Till Samples

Borehole No. – Sample No.	Depth (m)	Moisture Content (%)	Grain-size Analysis (%)				Soil Classification (USCS)
			Gravel	Sand	Silt	Clay	
TP19 – GS2	1.0 – 1.2	19	7	68	18	7	Silty Sand (SM)

Based on the grain size distribution analysis, the glacial till material may be classified as Silty Sand (SM) according to the USCS and it is classified as Sand, Some Silt, Trace Gravel and Clay according to CFEM (2006).

5.7 Highly Weathered Limestone Bedrock

Highly Weathered Limestone bedrock was encountered at Test Pit Nos. 6, 6A, 7, 7A, 8, 9, 11, 12, and 23 to 28, as well as Borehole No. 2. The highly weathered limestone bedrock contains occasional silty sand and some organic staining. The highly weathered limestone bedrock was encountered at depths of 0.15 m to 0.7 m (Elevation 134.6 m to 133.1 m) and extended to excavator bucket refusal depths of 0.3 m to 0.9 m (Elevation 134.5 m to 132.8 m). A grain size distribution was completed on one (1) sample of the highly weathered limestone bedrock material and the results are summarized in Table VII and shown in Figure 47 at the end of this report.

Table VII: Summary of Grain-size Analysis Results – Highly Weathered Limestone Bedrock Samples

Borehole No. – Sample No.	Depth (m)	Grain-size Analysis (%)			Soil Classification (USCS) and CFEM (2006)
		Gravel	Sand	Silt and Clay	
TP-27 – GS1	0.3 – 0.5	27	65	8	Poorly Graded Sand with Gravel and Silt (SP-SM)

Based on the grain size distribution analysis, the highly weathered limestone bedrock material may be classified as Poorly Graded Sand with Gravel and Silt (SP-SM) according to the USCS and it is classified as Gravelly Sand, Trace Silt and Clay according to CFEM (2006).

5.8 Limestone Bedrock and Inferred Bedrock

Refusal to hydraulic excavator bucket was met in all test pits other than Test Pit No. 20. Sampler refusal was met in Borehole Nos. 1 to 6, and 9. The refusal depth ranged from 0.1 m to 3.0 m below the existing ground surface (Elevation 135.2 m to 130.4 m). It was possible to excavate through the upper 0.1 m to 0.3 m layer of the weathered bedrock in Test Pit Nos. 6, 6A, 7, 7A, 8 to 12, and 23 to 28. The bedrock was verified by conventional rock coring at

Borehole Nos. 1 to 3 at depths of 0.1 m to 0.4 m (Elevation 134.7 m to 133.2 m). Refusal was not met at Test Hole Nos. TP20, BH7, and BH8 where bedrock was not contacted to 2.4 m to 2.9 m depth (Elevation 131.0 to 130.6 m) due to the limitations of the equipment used or access issues. However, it is suspected that bedrock at these locations is within 1 m from the maximum depth investigated.

A review of bedrock geology map (Map 1508A – Generalized Bedrock geology, Ottawa-Hull, Ontario and Quebec, Geological Survey of Canada, printed by the Surveys and Mapping Branch, 1979) indicates that the site is underlain by dolomite and limestone of the Oxford Formation. A summary of the inferred bedrock depths and elevations contacted in all test holes is shown in Table VIII.

Table VIII: Summary of Inferred Bedrock Depths (Elevations) at Test hole Locations

Borehole / Test Pit No.	Ground Surface Elevation (m)	Depth (Elevation) of Inferred Bedrock (m)	Bedrock Proven by Coring
BH-01 (2019)	136.48	0.8 (135.7)	Yes
TP-01	135.46	0.3 (135.2)	No
TP-02	136.90	2.1 (134.8)	No
TP-03	135.25	0.4 (134.9)	No
TP-04	136.24	1.4 (134.8)	No
TP-05	134.59	0.6 (134.0)	No
TP-06	134.85	0.8 (134.1)	No
TP-06A	134.85	0.25 (134.6)	No
TP-07**	134.30	0.25 (134.1)	No
TP-07A	133.89	0.5 (133.4)	No
TP-08	134.04	0.2 (133.8)	No
TP-09**	134.0	0.3 (133.7)	No
TP-10	133.51	0.5 (133.0)	No
TP-11	133.67	0.4 (133.3)	No
TP-12	133.48	0.4 (133.1)	No
TP-13	135.13	0.6 (134.5)	No
TP-16	134.98	0.7 (134.3)	No
TP-17	135.41	0.3 (135.1)	No
TP-18	133.65	0.3 (133.4)	No
TP-19	133.59	1.7 (131.9)	No
TP-20	133.16	>2.8 (<130.4)	No

Table VIII: Summary of Inferred Bedrock Depths (Elevations) at Test hole Locations			
Borehole / Test Pit No.	**Ground Surface Elevation (m)**	**Depth (Elevation) of Inferred Bedrock (m)**	**Bedrock Proven by Coring**
TP-21	133.16	2.4 (130.8)	No
TP-22	133.18	1.5 (131.7)	No
TP-23	133.64	0.3 (133.3)	No
TP-24	133.76	0.15 (133.6)	No
TP-25	133.70	0.2 (133.5)	No
TP-26	133.53	0.2 (133.3)	No
TP-27	133.58	0.2 (133.4)	No
TP-28	133.28	0.2 (133.1)	No
TP-29	133.51	0.2 (133.3)	No
BH-01 (2023)	133.39	0.2 (133.20)	Yes
BH-02	133.90	0.1 (133.8)	Yes
BH-03	135.12	0.4 (134.7)	Yes
BH-04	133.36	3.0 (130.4)	No
BH-05	133.27	1.4 (131.9)	No
BH-06	133.22	1.1 (132.1)	No
BH-07	133.38	>2.4 (<131.0)	No
BH-08	133.52	>2.9 (<130.6)	No
BH-09	133.45	2.3 (131.2)	No
** Ground surface elevations adjusted using the results of the recent received topographical survey			

A Total Core Recovery (TCR) and Rock Quality Designation (RQD) of 53 to 100 percent and 0 to 62 percent respectively were obtained from the recovered bedrock cores. On this basis, the bedrock quality within the depth investigated may be classified as very poor to fair.

A total of six (6) rock core samples were selected for unconfined compressive strength testing and the test results are presented in Table IX. A review of the test results indicates a bedrock with compressive strength ranging between 123 MPa and 239 MPa. Based on these values, the rock can be classified with respect to intact strength, as “very strong” (Canadian Foundation engineering manual, 4th edition, 2023). The unit weight of the bedrock ranged between 25.9 kN/m^3 and 27.5 kN/m^3.

Table IX: Results of Unconfined Compression Tests on Rock Core Samples			
Borehole No. - Run No.	Depth (m)	Compressive Strength (MPa)	Unit Weight of Bedrock (KN/m^3)
BH1 – Run 1	0.5 – 0.6	192.7	27.0
BH1 – Run 3	3.9 – 4.0	218.4	26.8
BH2 – Run 2	1.3 – 1.4	226.9	27.3
BH2 – Run 3	2.7 – 2.8	239.3	27.3
BH3 – Run 2	1.6 – 1.8	198.6	27.5
BH3 – Run 3	3.0 – 3.2	122.6	25.9

Photographs of the bedrock cores recovered are presented in Figures 48 to 50.

It is recommended that the data collected in the 2021 test pits be confirmed once the site is cleared from trees due to possible/suspect errors in the ground surface elevation/bedrock elevation which may have been compromised by interference of the tree cover with the survey conducted in 2021. Consideration should also be given to excavating additional test pits to collect supplemental data on the bedrock elevation in areas not currently accessible in order to provide additional rock data for the contractor bidding on this project.

5.9 Groundwater Level

Table X indicates depths of water measured in the monitoring wells installed at the site as part of the investigation.

Table X: Summary of Groundwater Level Measurements				
Borehole / Test Pit No.	Ground Surface Elevation (m)	Depth (Elevation) of Groundwater (m) at given Date of Measurement		
		Nov 15, 2023	Nov 22, 2023	Feb 14, 2024
BH-01 (2019)	136.48	3.46 (133.02)	3.35 (133.2)	Buried Under Ice
BH-01	133.39	0.5 (132.89)	0.5 (132.89)	0.1 (133.27)
BH-02	133.90	1.0 (132.90)	1.0 (132.90)	0.7 (133.25)
BH-03	135.12	2.2 (132.92)	2.3 (132.82)	1.8 (133.28)
BH-04	133.36	N/A	N/A	-0.1 (133.46) *
Note* Water was frozen inside and around monitoring well. Negative value indicates water level above ground surface.				

The stabilized groundwater level throughout the site at the most recent sample date of February 14, 2024 varied between 0.1 m above ground surface to 1.8 m below ground surface corresponding to elevations of 133.46 m to 133.25 m.

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.

Photos collected during the fieldwork are attached in Appendix C

6. Seismic Site Classification and Liquefaction Potential of Soils

6.1 Site Classification for Seismic Site Response

Based on the test hole information and Table 4.1.8.4.A in the 2012 Ontario Building Code (as amended January 1, 2020), the site classification for seismic site response is **Class C.**

A higher site class will likely be obtained if a shear-wave velocity testing is completed at the site for footings set on bedrock and in areas where the maximum depth of overburden between the underside of footing and bedrock is less than 3 m.

6.2 Liquefaction Potential of Soils

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

7. Grade Raise Restrictions

The investigation has revealed that the site is underlain by 0.2 m to 3.0+ m of overburden over bedrock.

A conceptual lot grading plan was completed by McIntosh Perry for the site under project number CCO-22-0402, drawing Number C101, and last revised on February 15, 2024 indicates that the final exterior grades around the condominium and townhouse buildings will range from Elevation 136.75 m to 133.15 m resulting in a grade raise of up to 3.6 m.

Based on the conceptual design grades shown above, all overburden material will be removed from the location of Condominium Building A and the Townhouse Block (Building C).

Based on the proposed underside of footing elevation of 132.75 m at Condominium Building B, portions of the building will be constructed in overburden and part on the bedrock depending on the options used. Some overburden materials at this location are susceptible to consolidation settlements. For preliminary design purposes, and provided that any compressible soils are removed from the envelope of Building B as described in Section 9, a grade raise of up to 3.6 m is considered feasible at the site.

8. Site Grading

Site grading within the **footprint of the proposed buildings** should consist of the removal of all topsoil, existing fill and organic stained soils down to bedrock at Building A and Townhouse Block, Building C and to the native silty sand to sandy silt, or bedrock, in Building B (depending on the option used to support the footings in Building B). The exposed native soil or bedrock subgrade should be examined by a geotechnician. Any loose/soft areas of the soil subgrade or loose rock pieces, soft/loose seams at the bedrock surface identified during the subgrade examination should be excavated, removed and replaced with Ontario Provincial Standard Specification (OPSS) Granular B Type II material compacted to 100 percent standard Proctor maximum dry density (SPMDD). Once the subgrade has been approved, the grades may be raised to the design floor slab elevation by the placement of an engineered fill pad constructed as described below.

The engineered fill pad under the building floor slabs should comprise of OPSS 1010 Granular B Type II placed in 300 mm lifts and each lift compacted to 100 percent of the standard Proctor maximum dry density (SPMDD) in accordance with ASTM D-698-12e2. The engineered fill pad must extend at least 0.6 m from the exterior edge of the slab and then slope down at a gradient of 1H:1V. In-place density tests must be conducted on each lift to ensure that the specified degree of compaction has been achieved.

Site grading within the **proposed parking lots and access road areas** should consist of the removal of all topsoil and organic stained soils down to native soils. The exposed soil subgrade should be proofrolled 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) Select Subgrade Material (SSM) compacted to 95 percent SPMDD or wit OPSS Granular B Type II in areas of water infiltration. The bedrock subgrade should be examined, and any loose rock pieces or soft/loose seams should be removed from the surface of the bedrock subgrade. Once the exposed subgrade has been approved, the grades may be raised to the underside of the pavement structure by the placement of OPSS select subgrade material (SSM) compacted to 95 percent SPMDD. In wet areas, crusher-run granular material may be required in the lower levels to stabilize the subgrade.

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

A conceptual lot grading plan completed by McIntosh Perry for the site under project number CCO-22-0402, drawing Number C101 and dated February 15, 2024, indicates the following;

- Building A – Underside of Footing 132.75 m, finished exterior grades 135.59 m to 136.75 m, existing grades 134.60 m to 136.96 m.
- Building B – Underside of Footing 132.75 m, finished exterior grades 134.15 m to 136.75 m, existing grades 133.16 m to 134.13 m.
- Townhouse Block (Building C) – Underside of Footing 131.36 m, finished exterior grades 133.15 m to 133.82 m, existing grades 133.28 m to 133.66 m.

9.1 Townhouse Block (Building C) and Condominium Building A

Based on the collected data to date, the footings for Condominium Building A and Townhouse Block (Building C) designed to be set at Elevation 132.75 m and 131.36 m respectively, will be founded on the bedrock contacted at Elevation of 134.0 m to 135.8 m in test holes drilled at Building A and Elevation 132.8 m to 134.5 m in test holes drilled at Building C.

Strip and spread footings founded on the sound bedrock at the proposed USF elevation below any weathered or fractured zone may be designed for a factored geotechnical resistance at Ultimate Limit State (ULS) of 1500 kPa. The factored geotechnical resistance at ULS includes a geotechnical resistance factor of 0.5. For footings founded on sound bedrock, factored geotechnical resistance at ULS will govern the design. Settlement of footings founded on sound bedrock is expected to be minimal.

9.2 Condominium Building B

For Condominium Building B with a proposed underside of footing at Elevation 132.75 m, the founding material will be bedrock at the location of Test Hole Nos. TP9, TP18, TP24, and BH2, and overburden at the location of Test Hole Nos. TP19 to TP22 and BH4 to BH9 which constitute approximately 33 percent of the building footprint as shown on Figure 2. Footings should not be founded partly on bedrock and partly on the overburden at the design underside of footing elevation. It should be noted that the compressible silty clay contacted at the underside of footing is prone to consolidation under the 3.6 m additional fill that will be placed as part of the site grading. For this building, two foundation options are available due to the presence of thicker overburden in a portion of the building and the proposed grade raise of 3.6 m. These options are discussed in the following subsections.

9.2.1 Option 1 Footings on Existing Overburden and Bedrock

At the location of Borehole Nos. 4 to 9, and Test Pit Nos. 19 to 22, the footings may be founded at the proposed Elevation 132.75 m on a minimum of 0.6 m of OPSS 1010 Granular B Type II placed on top of the native silty sand to sandy silt. The exception is Borehole No. 7 where a firm silty clay layer was contacted at the proposed USF which should be removed as part of the provision of the 0.6 m engineered fill. Additional removal may be required if directed by the geotechnical engineer.

Footing bases prepared as described above and constructed as strip footings with a maximum width of 1.5 m or pad footings with a maximum length and width of 3 m by 3 m, may be designed for a bearing pressure at serviceability

limit state (SLS) and factored geotechnical resistance at ultimate limit state (ULS) of 80 kPa and 120 kPa respectively. The factored geotechnical resistance at ULS includes a geotechnical resistance factor of 0.5. Settlements of footings designed for the above SLS bearing pressure are expected to be within the tolerable limits of 25 mm total and 19 mm differential. A 50 mm concrete mud slab is recommended to be placed on top of the native soils following review and approval.

Where the bedrock is shallow, footings founded on the sound bedrock below any weathered or fractured zone may be designed for a factored geotechnical resistance at ULS of 1500 kPa. The factored geotechnical resistance at ULS includes a geotechnical resistance factor of 0.5. For footings founded on sound bedrock, factored geotechnical resistance at ULS will govern the design. Settlement of footings founded on sound bedrock is expected to be minimal.

Footings for a single building should not bear partly on bedrock and partly on the native soils without some additional details. In this case, a transition taper zone and/or structural control joints should be provided at the interface of overburden/engineered fill and bedrock interface. The transition zone should comprise of the excavation of a zone of 4 horizontal to 1 vertical and backfill the area with OPSS Granular B Type II compacted to 100 % of the SPMDD. Structural and /or control joints should be provided and designed by the structural engineer at the interface of engineered fill and bedrock founding mediums.

If the recommended SLS and factored ULS values for footings founded on the native soils are not sufficient to support the proposed building, then it is recommended that the portions of Building B where the USF elevation lies within the native soils should be constructed on micro-piles as described in the following section 9.2.2, i.e. Option 2.

9.2.2 Option 2 Micro-piles Socketed in Bedrock

Portions of the proposed Building B where the design underside of footing elevation lies within the overburden soil may be supported by micro-piles socketed into the underlying sound bedrock. The underlying sound bedrock is contacted at 1.1 m to 3.0 m depth or greater (Elevation 132.1 m to 130.4 m) at Test Pit Nos. 19 to 22 and Borehole Nos. 4 to 9. It is noted that the depth (elevation) to sound bedrock may vary at locations away from the test holes.

The micro-pile should be cased in the overburden soil into the upper level of the bedrock with the construction of the remainder of the micro pile completed by drilling an uncased hole into the sound bedrock. Such a pile will carry the load in bond between the grout and the sound bedrock. The bond between the casing and the soil should be neglected. The casing of the micro-pile should extend into the upper level of the bedrock contacted at 1.1 m to 3.0 m depth (Elevation 132.1 m to 130.4 m). The load carrying capacity of the micro-pile may be computed from the following expression:

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

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

α_1 = The unfactored bond between the sound bedrock and grout at ultimate limit state (ULS) is 2500 kPa

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

d_1 = Diameter of drilled hole in bedrock, m

The computed ultimate capacity of the piles should be multiplied by a geotechnical resistance factor of 0.4 when computing the factored axial capacity at ultimate limit state (ULS).

It is noted that the pile borings should be cased in the overburden soil and any zone of cobbles and boulders ('bouldery' glacial till) to prevent cave-in of these materials and to reduce the groundwater seepage into the pile holes. It is imperative that the holes for installation of the piles are cleaned properly so that the grout is in contact with the clean bedrock that is free of any soil smearing. All water should be pumped out from the pile borings prior to the placement of the grout.

It is noted that the overburden soils may contain boulders and cobbles (glacial till) which the installation contractor should take into consideration when selecting the method of drilling of the micro-piles. The upper 1.0 m – 2.0 m of the limestone bedrock is fractured with an RQD value less than 50 percent. Therefore, the contractor should anticipate the possibility of significant grout takes within the fractured zone of the bedrock during grouting operations. Also, water inflow into the drilled micro-pile holes should be expected.

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

9.3 Retaining Walls

The retaining walls may be supported by a strip footing founded on the sound bedrock, native soil, or can be constructed on micro-piles, similar to the proposed condominium buildings and townhouses. The respective recommended SLS and factored ULS bearing capacity values are the same as those described in the above sections.

The factored sliding resistance at ULS between the underside of concrete of the footing and the sound rock is 0.56. If the footing is on silty sand to sandy silt with clay layers, the factored sliding resistance is 0.24. All given values include a geotechnical resistance factor of 0.8.

Additional review and design recommendations will be required once the final design of the retaining walls, USF and finished grades are available.

9.4 General Comments on Foundations

For foundations placed on the surface of the bedrock, a minimum of 1.2 m of earth cover should be provided to the exterior foundations of heated structures to protect them from damage due to frost penetration. The frost cover should be increased to 1.8 m for unheated structures if snow will not be removed from their vicinity and to 2.1 m if snow will be removed from the vicinity of the structure.

For foundations placed on native soil, a minimum of 1.8 m of earth cover should be provided to the exterior foundations of heated structures 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 and to 2.4 m if snow will be removed from the vicinity of the structure.

When earth cover is less than the minimum required, an equivalent thermal combination of earth cover and rigid insulation or rigid insulation alone should be provided. EXP can provide additional comments in this regard, if required.

The founding surfaces should be reviewed and approved by a geotechnician prior to placement of concrete.

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 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.

10. Slab-on-Grade Construction

The lowest floor slab of the proposed residential buildings may be designed as a slab-on-grade set on a 200 mm thick bed of clear stone placed on the bedrock or on well compacted engineered fill set on the bedrock or suitable native subgrade prepared as described below.

As part of lowest floor slab construction, all topsoil, fill, and unsuitable native material must be removed from the building envelopes and grades raised using OPSS 1010 Granular B Type II placed in 300 mm thick lifts and each lift compacted to 98 percent of the standard Proctor maximum dry density (SPMDD) in accordance with ASTM D-698-12e2. In-place density tests must be conducted on each lift to ensure that the specified degree of compaction has been achieved. The prepared subgrade must be reviewed by a geotechnician prior to placement of engineered fill.

Perimeter and underfloor drainage systems are required for the proposed buildings with basement. The perimeter drainage system may consist of 100 mm diameter perforated pipe set on the footings and surrounded with 150 mm thick 19 mm sized clear stone that is fully wrapped with an approved porous geotextile membrane, such as Terrafix 270R or equivalent. The underfloor drainage system may consist of 100 mm diameter perforated pipe or equivalent placed in parallel rows at 5 m to 6 m centers and at least 300 mm below the underside of the floor slab. The drains should be set on a 100 mm thick bed of 19 mm sized clear stone and covered on top and sides with 100 mm thick clear stone that is fully wrapped or covered with an approved porous geotextile membrane, such as Terrafix 270R or equivalent.

The perimeter and underfloor drainage systems should be connected to separate sumps equipped with backup (redundant) pumps and generators in case of mechanical failure and/or power outage, so that at least one system would be operational should the other fail.

The finished ground floor slab for all proposed buildings should be set at least 150 mm above the surrounding exterior grade to prevent ponding of surface water close to the exterior walls.

11. Lateral Earth Pressure

The lateral earth pressures of subsurface or basement walls for the proposed condominium buildings and townhouse block and retaining walls at the proposed ramp to the underground parking are presented in this section of the report.

11.1 Basement Walls

The subsurface basement walls should be backfilled with free draining material, such as Ontario Provincial Standard Specification (OPSS) Granular B Type II and equipped with a permanent drainage system to prevent the buildup of hydrostatic pressure behind the wall. The drainage system should have a suitable outlet to provide positive drainage.

The walls will be subjected to lateral static and dynamic (seismic) earth forces.

The expressions below assume free draining backfill material, a perimeter drainage system, level backfill surface behind the wall and vertical face on the back side of the wall.

For design purposes, the lateral static earth thrust against the subsurface walls may be computed from the following equation:

$$P = K_0 h (\tfrac{1}{2} \gamma h + q)$$

where P = lateral earth thrust acting on the subsurface wall, kN/m

K_0 = lateral earth pressure at rest coefficient, assumed to be 0.5 for Granular B Type II backfill material

γ = unit weight of free draining granular backfill; Granular B Type II = 22 kN/m^3

h = depth of point of interest below top of backfill, m

q = surcharge load stress, kPa

The lateral dynamic thrust may be computed from the equation given below:

$$\Delta_{Pe} = \gamma H^2 \frac{a_h}{g} F_b$$

where Δ_{Pe} = dynamic thrust in kN/m of wall

H = height of wall, m

γ = unit weight of backfill material = 22 kN/m^3

$\frac{a_h}{g}$ = earth pressure coefficient = 0.192 for Carleton Place; 2012 OBC (as amended January 1, 2020)

F_b = thrust factor = 1.0

The dynamic thrust does not take into account the surcharge load. The resultant force of the lateral dynamic thrust acts approximately at 0.63H above the base of the wall.

All subsurface walls should be properly dampproofed.

11.2 Retaining Walls

The retaining walls will be subjected to lateral static earth as well as lateral dynamic earth forces during a seismic event. Seismic loading will result in an increase in active lateral earth pressure on the wall.

The retaining walls should be backfilled with free draining material, such as OPSS Granular B Type II compacted to a minimum of 95% Standard Proctor maximum dry density (SPMDD) and equipped with a permanent drainage system to prevent the buildup of hydrostatic pressure behind the wall.

The seismic (dynamic) pressure distribution is an inverted triangle with maximum pressure at the top of the wall and a minimum at the bottom of the wall. Therefore, the resultant of earthquake pressure on the retaining wall is assumed to be applied at a height of 0.6 H above the base of the wall where H is the height the wall. The total active pressure distribution can be separated into static component and dynamic components and may be determined as follows (Mononobe and Matsuo, 1929):

$$\sigma_{AE}(z) = K_A \gamma z + (K_{AE} - K_A)\gamma(H - z) + q$$

Where $\sigma_{AE}(z)$ = the total combined active lateral earth pressure (dynamic and static) at depth z, (kPa).

z = depth below the top of the retaining wall

K_A = static lateral active earth pressure coefficient

K_{AE} = combined (static and dynamic) active earth pressure coefficient

γ = unit weight of the backfill soil (kN/m^3)

H = Total height of the wall (m)

q = surcharge such as traffic and compaction pressure, where applicable

As noted above, for the total active earth pressure, the seismic (dynamic) pressure distribution is an inverted triangle with maximum pressure at the top of the wall and a minimum at the bottom of the wall. Therefore, the resultant of the static and seismic (dynamic) pressures on the retaining wall is assumed to be applied at depths ranging between 0.67z from the top of the backfill behind the wall and 0.67 (H-z) from the bottom of the wall, respectively.

Additional Comments

The estimated lateral earth pressure parameters are summarized in Table XI.

Table XI: Lateral Earth Pressure Parameters	
Soil Type:	**OPSS Granular B Type II**
Unit Weight of Soil (γ); kN/m^3	22
Angle of Internal Friction (ϕ'); degrees	30 ^{o}
Coefficient of Static Active Lateral Earth Pressure Coefficient, K_A	0.33
Combined Lateral (static and seismic) Active Earth Pressure Coefficient, K_{AE} for a Yielding Wall (Retaining Wall)	0.39

For the calculation of the active dynamic (seismic) lateral earth pressure coefficients for retaining walls, the seismic coefficient in the horizontal direction, k_h, was taken as 0.5 times the PGA value of 0.192g. The calculated active dynamic (seismic) lateral earth pressure coefficients assume the seismic coefficient in the vertical direction, k_v, is zero. If vertical acceleration is taken into consideration, the computed active and dynamic (seismic) lateral earth pressure coefficients values would be somewhat different.

The K_{AE} value calculations assume the back face of the wall is vertical, there is no friction between the concrete of the wall and the backfill soil (behind the wall) and the ground surface of the backfill (behind the wall) is level or flat and the ground surface of the backfill behind the wall is at the same level as the top of the retaining wall.

The static active condition for a retaining wall will be reached when the outward displacement of the wall is approximately 0.001 H to 0.004 H for granular soil backfill where 'H' is the height of the wall. For the seismic condition for a retaining wall the K_{AE} value is applicable for a wall designed to move by up to approximately 80 mm.

The final design of the retaining walls should be reviewed by this office.

12. Excavation and De-Watering Requirements

12.1 Excess Soil Management

A new Ontario Regulation 406/19 made under the Environmental Protection Act (November 28, 2019) has been implemented as of January 1, 2021. The new regulation dictates the testing protocol that is 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. 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.

12.2 Excavations

Excavations for the construction of the new building and underground services are expected to extend to a maximum depth of 3.0 m to 4.0 m below the existing ground surface. These excavations will extend through the fill and into the native soil or bedrock and will be below the groundwater table.

The overburden soils have been classified as Type 3 soils in accordance with the Occupational Health and Safety Act (OHSA), Ontario, Reg. 213/91 and therefore any open excavation must be sloped back at 1H:1V from the bottom of the excavation.

Excavations into the overburden soils may be undertaken using conventional equipment capable of removing cobbles and boulders and large tree roots within the overburden soils. Excavation of the bedrock would require the use of hoe-ramming and/or line drilling and may be undertaken with near vertical sides. Contractors bidding on this project must review the available data and decide on their own the most suitable method to excavate the bedrock, i.e. line drilling, blasting, etc. It should be noted that laboratory testing has revealed the bedrock underlying the site to be very strong.

Vibrations should be monitored during construction to prevent damage to adjacent structures and services. A pre-condition survey of all the structures and services situated within the proximity of the site will be required prior to the commencement of construction and during the excavation of the bedrock. Care must be undertaken to ensure that the footings of the neighboring properties are not damaged during construction.

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

12.3 De-Watering Requirements and Impact on Surrounding Structures and Infrastructure

For excavations extending to 2.0 to 4.0 m below the existing grade, the excavations are anticipated to be below the groundwater level. Therefore, the removal of groundwater from the excavation will be required.

Seepage of the surface and subsurface water into these excavations is anticipated. However, it should be possible to collect water entering the excavations at low points and to remove it by conventional pumping techniques. It

must be noted that high infiltration is anticipated within excavations that extend into the bedrock, as well as in overburden at the locations of Test Pit Nos. 19 to 22 and Borehole Nos. 4 to 9. Therefore, a higher seepage rate is anticipated and the need for high-capacity pumps to keep the excavation dry may be required.

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 fieldwork, and commented on dewatering and potential 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.

An additional hydrogeological study is recommended to estimate the volume of water to be pumped from the site, it's possible impact on neighbouring properties and services and required permits to be acquired from the appropriate regulatory bodies.

13. Pipe Bedding Requirements

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

Based on the conceptual site servicing plan (Drawing C102) completed by McIntosh Perry and last revised Feb. 16, 2024, the proposed sewer inverts range between elevation 129.49 m to 133.93 m. The pipe subgrade material is anticipated to be bedrock, highly weathered bedrock, or native silty sand to silty clay, or glacial till. In this case, it is recommended the pipe bedding consist of 150 mm thick OPSS 1010 Granular A bedding material for the bedrock, highly weathered bedrock and 300 mm for the native silty sand to silty clay, or glacial till. It may be necessary to increase the bedding thickness in areas where the subgrade soil is significantly soft or wet. The bedding materials should be compacted to at least 98 percent SPMDD. The bedding material should be also placed along the sides and on top of the pipes to provide a minimum cover of 300 mm and should be compacted to at least 98 percent SPMDD.

A transition zone in the pipe bedding must be provided when the founding material changes from bedrock to overburden soils and vice versa if applicable anywhere on this site. In the areas where the bedrock slopes at a steeper gradient than 4H:1V, the bedrock should be excavated, and additional bedding material placed to create a 4H:1V transition zone.

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

The material to be excavated from the site will consist of topsoil, fill and native silty sand to silty clay, or glacial till overburden and highly weathered to shattered bedrock. The fill is comprised of sand with silt and contains roots, rootlets, topsoil inclusions, cobbles and boulders, and therefore is not considered suitable for use under structural elements, for backfilling purposes, or against foundation walls. It may be used however for general grading purposes in the landscaped areas. The excavated (shattered) bedrock material typically contains large cobble and boulder size particles and is not suitable for re-use without further processing, i.e crushing.

It is anticipated that the majority of the material required for underfloor fill and backfilling purposes would have to be imported and should preferably conform to the following specification:

- Engineered fill under the slab-on-grade area - OPSS 1010 Granular B Type II placed in 300 mm thick lifts and each lift compacted to 98 percent SPMDD.
- Backfill in footing trenches and against foundation walls – OPSS 1010 Granular B Type II placed in 300 mm thick lifts and each lift compacted to 98 percent of the SPMDD inside the building and 95 percent SPMDD outside the building respectively.
- Backfill in services trenches inside building – OPSS 1010 Granular B Type II placed in 300 mm thick lifts and each lift compacted to 98 percent of the SPMDD.
- Backfill in exterior services trenches or subgrade fill– OPSS 1010 Select Subgrade Material (SSM) placed in 300 mm thick lifts and each lift compacted to 95 percent of the SPMDD or on-site approved excavated material as noted above. Trench backfill and subgrade fill, select on-site material free if organics, boulders and cobbles and following further sampling and testing during construction.

15. Pavement Structure

The subgrade for the parking lots and access roads is anticipated to consist of bedrock or imported granular fill (compacted to 95 percent SPMDD) used to raise the grades at the site. Pavement structure thicknesses required for light and heavy-duty traffic on the access roads and in parking lots were computed and are shown in Table XII. The pavement structure thicknesses are based upon an estimate of the properties of the imported granular fill subgrade and functional design life of eight (8) to ten (10) years. The proposed functional design life represents the number of years to the first rehabilitation, assuming regular maintenance is carried out.

Table XII: Recommended Pavement Structure Thicknesses

Pavement Layer	Compaction Requirements	Light Duty Parking Areas	Heavy Duty Parking Areas and Access Roads	Lowest Parking Level if Concrete
Asphaltic Concrete (PG 58-34)	92% to 97 % MRD	65 mm – SP12.5 Cat B or HL3	40 mm – 12.5 Cat B/HL3 50 mm – 19 Cat B/HL8	150 mm of Concrete 32 MPa – 5 to 8 % Air
Granular A Base (OPSS 1010) (crushed limestone)	100% SPMDD	150 mm	150 mm	300 mm of Granular A
Granular B Sub-base, Type II (OPSS 1010)	100% SPMDD	300 mm	450 mm	Competent Subgrade
SPMDD denotes Standard Proctor Maximum Dry Density, ASTM-D698-12e2 MRD denotes Maximum Relative Density, ASTM D2041				

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

(1) As part of the subgrade preparation, the proposed access road and parking lot areas should be stripped of unsuitable fill and other obviously unsuitable material. Fill required to raise the grades to design elevations should be organic-free and at a moisture content which will permit compaction to the densities indicated. After all the underground services have been installed, the subgrade should be properly shaped, crowned and proof-rolled with a heavy 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.

(2) The long-term performance of the pavement structure is highly dependent upon the subgrade support conditions. Stringent construction control procedures should be maintained to ensure that uniform subgrade moisture and density conditions are achieved. The need for adequate drainage cannot be over-emphasized. As a minimum, drains should be installed for a distance of 3 m in all directions from the catch basins to intercept excess surface and subsurface water. 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

subdrainage 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 catch-basins / manholes 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 catch-basins and manholes to facilitate drainage of the granular fill.

(4) The finished pavement surface should be free of depressions and should be sloped (preferably at a minimum cross fall of 2 percent) to provide effective surface drainage towards catch basins. Surface water should not be allowed to pond adjacent to the outside edges of paved areas.

(5) The granular materials used for pavement construction should conform to Ontario Provincial Standard Specifications (OPSS) for Granular A and Granular B Type II and should be compacted to 100 percent SPMDD. The asphaltic concrete used and its placement should meet OPSS 1151 requirements. It should be placed and compacted in accordance with OPSS 311 and 313.

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

16. Subsurface Concrete Requirements

Chemical tests limited to pH, sulphate, chloride and electrical resistivity were undertaken on one soil and one rock sample and the results are shown in Table XIII. The laboratory test certificate is provided in Appendix A.

Table XIII: Results of pH, Chloride, Sulphate and Resistivity Tests on Selected Soil and Rock Samples

Borehole No. - Sample No.	Soil	Depth (m)	pH	Sulphate (%)	Chloride (%)	Resistivity (ohm.cm)
BH3 – Run 2	Bedrock	2.0 - 2.1	9.51	0.0012	0.0039	6130
TP21 – GS3	Clayey Silt	1.5 - 1.7	8.47	0.0026	0.002	5130

The results indicate a soil and rock with a sulphate and chloride content of less than 0.1 percent and 0.04 percent respectively. These concentrations of sulphate and chloride would have a negligible potential of sulphate and chloride attack on subsurface concrete. The concrete should be in accordance with Table Nos. 3 and 6 of CSA A.23.1-14. However, the concrete should be dense, well compacted and cured.

The results of the resistivity tests indicate that the soil and rock are mildly corrosive to bare steel. The test results should be taken into consideration for metal connections of the watermain. A corrosion expert should be contacted to provide corrosion protection recommendations.

17. Stormwater Management Pond

A stormwater management pond is proposed at the south side of the site. Three test pits and one borehole were drilled/excavated in the vicinity of the proposed pond, i.e. Test Pit Nos. 7A, 8 and 10 and Borehole No. 1 revealed the subsurface condition to comprise of shallow topsoil overburden underlain by highly weathered limestone and sound limestone bedrock contacted at Elevation 133.6 m to 133.0 m. The groundwater measurements taken at Borehole No. 1 was measured at 0.1 m below grade, i.e. Elevation 133.3 m on Feb. 14, 2024. The Test Pits remained dry upon completion of excavation on May 25, 2021.

The stormwater management pond is proposed with a bottom at elevation 132.40 m and 3H:1V side slopes to varying elevation 135.25 m on the west side and 133.56 m on the east side. The 1:100 year elevation is 133.48 m and emergency spill elevation is set at 133.40 m. It appears that the pond is intended to be dry as no low water level is indicated in the drawing number C101. No infiltration is anticipated beneath the pond, as the base will be located within the limestone bedrock.

The Conceptual Grading Plan, C101 rev. 2, dated February 15, 2024, was reviewed with respect to the underside of footing elevation for both the proposed residential units. The expected minimum underside of footing elevation within the proposed development is 131.36 m, or 1.04 m below the pond bottom.

The stormwater runoff from development will outlet through a 600 mm to 975 mm diameter storm sewer, located within the proposed roadways, flowing to the southeast across the site and connecting to proposed storm sewer at the southeast corner of the site at elevation 130.92 m where it outlets to the adjacent proposed development. The proposed 200 mm diameter sanitary sewer runs parallel to the storm sewer and outlets the site at the southeast corner at elevation 129.49 m where it connects to the infrastructure of the adjacent proposed development. It is expected that the blasted trenches for storm and sanitary sewers will lower the ground water table within the site and the vicinity of the proposed pond.

From a geotechnical point of view, there are no concerns regarding the proposed pond and its design. The pond bottom is expected to be below the long-term stabilised ground water level, however the development will likely lower the long-term groundwater level. A subdrain system may be necessary beneath the proposed stormwater pond to aid in draining the pond after rainfall events. The design grades are proposed at the conceptual stage only. These recommendations are to be reviewed once the design grades are finalized.

18. Additional Investigation

A hydrogeological investigation should be completed utilizing the monitoring wells installed as part of this investigation to quantify the volume of dewatering required during construction.

It is also recommended that the data collected in the 2021 test pits be confirmed once the site is cleared of trees. Consideration should be also given to excavating additional test pits to collect supplemental data on the bedrock elevation in areas not currently accessible as well as the extent od the overburden founding area in Building B.

19. General Comments

The comments given in this report are intended only for the guidance of design engineers. The number of test holes required to determine the localized underground conditions between test holes affecting construction costs, techniques, sequencing, equipment, scheduling, etc., would be much greater than has been carried out for 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 environmental aspects of the soils and groundwater. Should specific information be required, including for example the presence of pollutants, contaminants or other hazards in the soil, additional testing may be required.

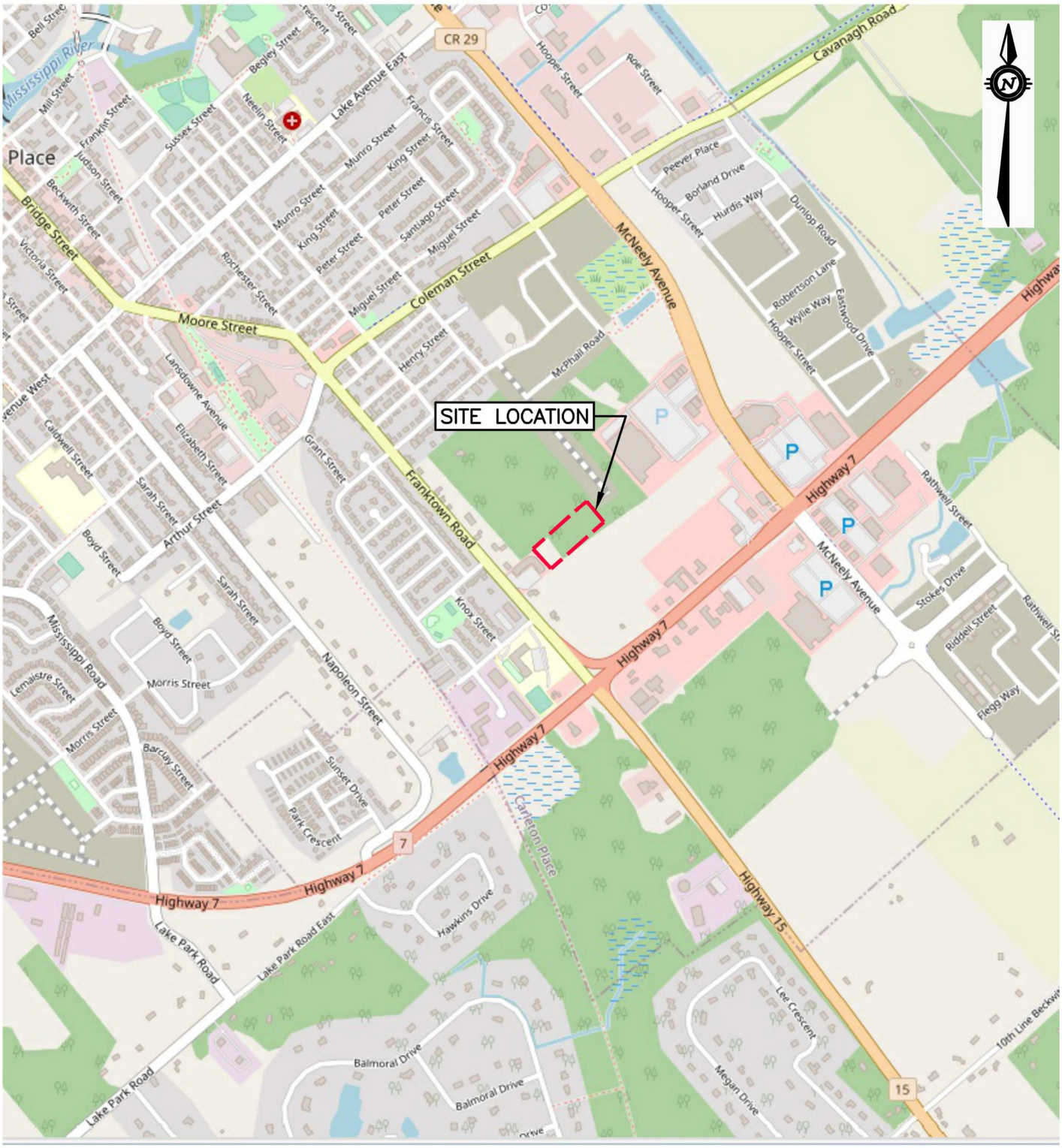
We trust that the information contained in this report is satisfactory for your purposes. Should you have any questions, please contact this office.

Sincerely,

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

Ismail Taki, M.Eng, P.Eng.
Senior Manager, Geotechnical Services
Earth and Environment

Figures



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100-2650 Queensview Drive
Ottawa, ON K2B 8H6
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DESIGN	IT/MZ
DRAWN	GC/AS
DATE	JANUARY 2024
FILE NO	OTT-21002179-B0

GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
355 FRANKTOWN ROAD, CARLETON PLACE, ON

SITE LOCATION PLAN

SCALE 1:15,000
SKETCH NO FIG 1

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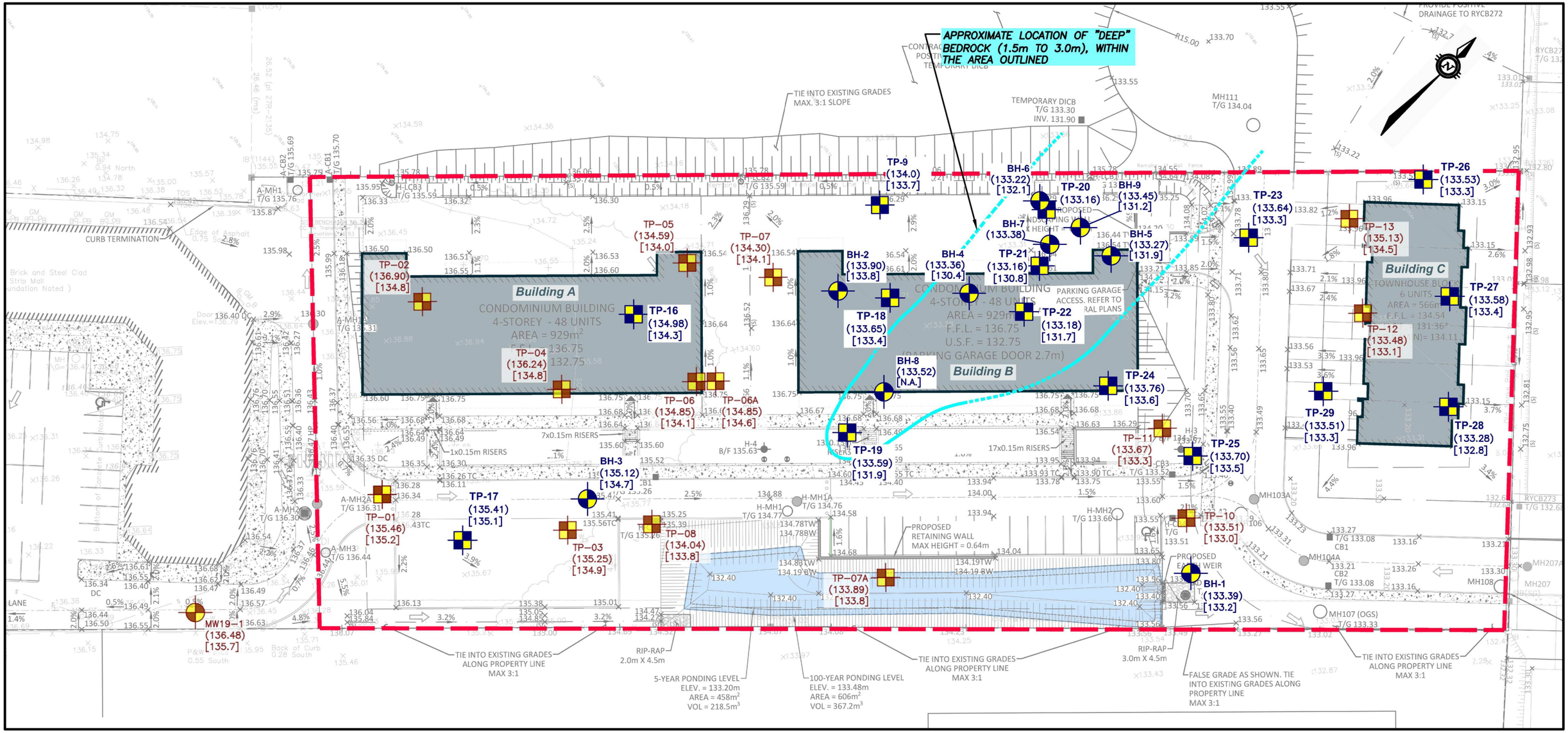

LEGEND

- TP-01 (135.25) [134.9] — TEST PIT LOCATION (JUNE 2021); GROUND SURFACE ELEVATION IN METERS; BEDROCK ELEVATION IN METERS
- MW19-1 (136.48) [135.7] — MONITORING WELL LOCATION (FROM *EXP* REPORT OTT-00252133-A0 DATED APRIL 26, 2019); GROUND SURFACE ELEVATION IN METERS; BEDROCK ELEVATION IN METERS
- TP-14 (136.31) [xx.x] — TEST PIT LOCATION (2023); GROUND SURFACE ELEVATION IN METERS; BEDROCK ELEVATION IN METERS
- BH-1 (133.39) [133.2] — BOREHOLE LOCATION (2023-2024); GROUND SURFACE ELEVATION IN METERS; BEDROCK ELEVATION IN METERS
- PROPERTY BOUNDARY
- PROPOSED NEW BUILDINGS

NOTES:

1. THE BOUNDARIES, ROCK AND SOIL TYPES HAVE BEEN ESTABLISHED ONLY AT TEST HOLE LOCATIONS. BETWEEN TEST HOLES THEY ARE ASSUMED AND MAY BE SUBJECT TO CONSIDERABLE ERROR.
2. ROCK AND SOIL 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 QUANTITIES SHOULD NOT BE ESTABLISHED FROM THE INFORMATION PROVIDED AT THE TEST HOLE LOCATIONS.
4. TEST HOLE ELEVATIONS SHOULD NOT BE USED TO DESIGN BUILDING(S) OR FLOOR SLABS OR PARKING LOT(S) GRADES.
5. THIS DRAWING FORMS PART OF THE REPORT PROJECT NUMBER AS REFERENCED AND SHOULD BE USED ONLY IN CONJUNCTION WITH THIS REPORT.
6. BASE PLAN INFORMATION OBTAINED FROM *FOTENN PLANNING + DESIGN*, PROJECT NO.: 21006, DATED: 2023-06-28
7. SURVEY/GRADING PLAN INFORMATION OBTAINED FROM: *MCINTOSH PERRY*, CONCEPTUAL LOT GRADING PLAN, PROJECT NO.: CCO-22-0402, DWG. NO.: C101, DATED: SEPTEMBER 1, 2023

exp Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6
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DESIGN	IT/MZ
DRAWN	GC/AS
DATE	MARCH 2024
FILE NO	OTT-21002179-B0

GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
355 FRANKTOWN ROAD, CARLETON PLACE, ON

TEST HOLE LOCATION PLAN

SCALE 1:600
SKETCH NO FIG 2

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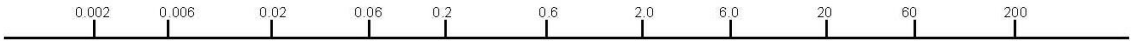
Notes On Sample Descriptions

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 Test Pit TP-01

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 03

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: CAT 320D Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

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 (20 40 60 80 / 50 100 150 200)	Combustible Vapour Reading (ppm) 250 500 750 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 20 40 60	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~300 mm thick	135.46	0				
			135.2					
		Excavator Bucket Refusal at 0.3 m Depth						

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. Test pit backfilled with excavated material and nominally compacted using excavator bucket.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS		
Elapsed Time	Water Level (m)	Hole Open To (m)

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-02

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 04

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: CAT 320D Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

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	136.9	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
			136.7					
		FILL Sand with silt, contains gravel, interbedded 0.2 - 0.3 m layers, contains wood pieces and rootlets, brown to dark brown, moist		1		×	GS1	
		SANDY SILTY CLAY contains rootlets, dark grey to blue grey, moist	135.1	2		×	GS2	18.1
			134.8					
		Excavator Bucket Refusal at 2.1 m Depth						

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. Test pit backfilled with excavated material and nominally compacted using excavator bucket.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-03

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 05

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: CAT 320D Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

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 (20 40 60 80 / 50 100 150 200)	Combustible Vapour Reading (ppm) 250 500 750 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 20 40 60	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~400 mm thick	135.25	0				
			134.9					
		Excavator Bucket Refusal at 0.4 m Depth						
		Note: 1) No water seepage or cave-in						

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. Test pit backfilled with excavated material and nominally compacted using excavator bucket.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-04

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 06

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: CAT 320D Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

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 ~150 mm thick	136.24	0				
		FILL Sand with silt, contains gravel, contains rootlets and root fragments, brown, moist	136.1			×	GS1	
		SANDY SILTY CLAY contains rootlets and root fragments, contains sandy pockets, dark grey to blue grey, very moist	135.3	1		×	GS2	20.2
		Excavator Bucket Refusal at 1.4 m Depth	134.8					

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. Test pit backfilled with excavated material and nominally compacted using excavator bucket.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS		
Elapsed Time	Water Level (m)	Hole Open To (m)

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-05

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 07

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: CAT 320D Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

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	134.59	0				
		FILL Sand with silt, contains gravel, contains rootlets and root fragments, brown, moist	134.4			×	GS1	
		- discontinuous seams/pockets of native blue-grey sandy silty clay	134.0					
		Excavator Bucket Refusal at 0.6 m Depth						

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. Test pit backfilled with excavated material and nominally compacted using excavator bucket.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS		
Elapsed Time	Water Level (m)	Hole Open To (m)

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-06

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 08

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: CAT 320D Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

Split Spoon Sample	⊠	Combustible Vapour Reading	□
Auger Sample	◧	Natural Moisture Content	×
SPT (N) Value	○	Atterberg Limits	⊢○
Dynamic Cone Test	——	Undrained Triaxial at % Strain at Failure	⊕
Shelby Tube	■	Shear Strength by Penetrometer Test	▲
Shear Strength by Vane Test	+ S		

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 ~450 mm thick	134.85	0				
		FILL Sand with silt, contains gravel, contains rootlets and root fragments, contains asphalt pieces, contains topsoil inclusions, grey-brown, moist	134.4			×	GS1	
		HIGHLY WEATHERED LIMESTONE BEDROCK Light grey	134.1					
		Excavator Bucket Refusal at 0.9 m Depth	134.0					

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. Test pit backfilled with excavated material and nominally compacted using excavator bucket.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS		
Elapsed Time	Water Level (m)	Hole Open To (m)

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-06A

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 09

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: Kubota KX080 Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~300 mm thick	134.85	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
			134.6					
		HIGHLY WEATHERED LIMESTONE BEDROCK Light grey	134.5					
		Excavator Bucket Refusal at 0.3 m Depth						

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. Test pit backfilled with excavated material and nominally compacted using excavator bucket.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-07

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 10

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: CAT 320D Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

Split Spoon Sample	⊠	Combustible Vapour Reading	□
Auger Sample	◧	Natural Moisture Content	×
SPT (N) Value	○	Atterberg Limits	⊢○
Dynamic Cone Test	——	Undrained Triaxial at % Strain at Failure	⊕
Shelby Tube	■	Shear Strength by Penetrometer Test	▲
Shear Strength by Vane Test	+ S		

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 ~250 mm thick	134.3	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
			134.1					
		HIGHLY WEATHERED LIMESTONE BEDROCK Light grey - discontinuous seams/pockets of native blue-grey sandy silty clay **Excavator Bucket Refusal at 0.4 m Depth**	133.9					

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. Test pit backfilled with excavated material and nominally compacted using excavator bucket.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS		
Elapsed Time	Water Level (m)	Hole Open To (m)

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-07A

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 11

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: Kubota KX080 Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

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 ~450 mm thick	133.89	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
			133.4					
		HIGHLY WEATHERED LIMESTONE BEDROCK Light grey	133.4					
		Excavator Bucket Refusal at 0.5 m Depth						

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. Test pit backfilled with excavated material and nominally compacted using excavator bucket.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS		
Elapsed Time	Water Level (m)	Hole Open To (m)

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-08

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 12

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: CAT 320D Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

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
		TOPSOIL ~250 mm thick	134.04	0
		HIGHLY WEATHERED LIMESTONE BEDROCK Light grey	133.8	
		Excavator Bucket Refusal at 0.4 m Depth	133.6	

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

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. Test pit backfilled with excavated material and nominally compacted using excavator bucket.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-09

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 13

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: Kubota KX080 Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

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 (20 40 60 80 / 50 100 150 200)	Combustible Vapour Reading (ppm) 250 500 750 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 20 40 60	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~300 mm thick	134	0				
			133.7					
		Excavator Bucket Refusal at 0.3 m Depth						
		Note: 1) No water seepage or cave-in						

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-10

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 14

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: Kubota KX080 Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~500 mm thick	133.51	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
			133.0					
		Excavator Bucket Refusal at 0.5 m Depth						
		Note: 1) No water seepage or cave-in						

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. Test pit backfilled with excavated material and nominally compacted using excavator bucket.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-11

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 15

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: Kubota KX080 Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

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 ~250 mm thick	133.67	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
			133.4					
		WELL-GRADED SAND Contains gravel and silt, contains rootlets and root fragments, yellow-brown, moist	133.3			×		GS1
			133.2					
		HIGHLY WEATHERED LIMESTONE BEDROCK Light grey						
		Excavator Bucket Refusal at 0.5 m Depth						

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. Test pit backfilled with excavated material and nominally compacted using excavator bucket.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-12

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 16

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: Kubota KX080 Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

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
		TOPSOIL ~250 mm thick	133.48	0
		WELL-GRADED SAND Contains gravel and silt, contains rootlets and root fragments, yellow-brown, moist	133.2	
		HIGHLY WEATHERED LIMESTONE BEDROCK Light grey	133.1	
		Excavator Bucket Refusal at 0.5 m Depth	133.0	

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: GS1

Natural Unit Wt. kN/m³

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. Test pit backfilled with excavated material and nominally compacted using excavator bucket.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-13

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 17

Page. 1 of 1

Date Drilled: 'May 25, 2021

Drill Type: Kubota KX080 Excavator

Datum: Geodetic Elevation

Logged by: G.C. Checked by: I.T.

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 ~250 mm thick	135.13	0				
		WELL-GRADED SAND Contains gravel and silt, contains rootlets and root fragments, yellow-brown, moist	134.9			×	GS1	
		Excavator Bucket Refusal at 0.6 m Depth	134.5					

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. Test pit backfilled with excavated material and nominally compacted using excavator bucket.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-16

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 18

Page. 1 of 1

Date Drilled: 'Nov 10, 2023

Drill Type: CAT 320F Track Mounted Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth
		TOPSOIL ~150 mm thick	134.98	0
		FILL Sand some gravel, trace silt, with cobbles, brown, moist	134.8	
			134.3	
		Excavator Bucket Refusal at 0.7 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: GS1

Natural Unit Wt. kN/m³

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-17

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 19

Page. 1 of 1

Date Drilled: 'Nov 10, 2023

Drill Type: CAT 320F Track Mounted Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test (S)

Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa (20 40 60 80 / 50 100 150 200)	Combustible Vapour Reading (ppm) 250 500 750 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 20 40 60	SAMPLES	Natural Unit Wt. kN/m³
		FILL ~300 mm thick Topsoil, sandy with gravel, cobbles and brick pieces, brown, moist	135.41	0		✕		GS1
			135.1					
		Excavator Bucket Refusal at 0.3 m Depth						
		Note: 1) No water seepage or cave-in						

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-18

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 20

Page. 1 of 1

Date Drilled: 'Nov 10, 2023

Drill Type: CAT 320F Track Mounted Excavator

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa (20 40 60 80 / 50 100 150 200)	Combustible Vapour Reading (ppm) 250 500 750 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 20 40 60	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~300 mm thick With roots, some cobbles, dark brown, moist	133.65	0				
			133.4					
		Excavator Bucket Refusal at 0.3 m Depth						
		Note: 1) No water seepage or cave-in						

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-19

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 21

Page. 1 of 1

Date Drilled: 'Nov 10, 2023

Drill Type: Kubota EX-116 Rubber Track Mounted Mini-Ex

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test (S)

Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth
		TOPSOIL ~250 mm thick	133.59	0
		SANDY SILT Brown, moist	133.3	
		GLACIAL TILL Silty sand, trace gravel, trace clay, with cobbles, brown to grey, moist to wet Boulders encountered below 1 m depth	132.8	1
		Excavator Bucket Refusal at 1.7 m Depth	131.9	

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: GS1, GS2

Natural Unit Wt. kN/m³

Note:

1) Water seeping in rapidly at 1.2 m depth

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-20

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 22

Page. 1 of 1

Date Drilled: 'Nov 10, 2023

Drill Type: Kubota EX-116 Rubber Track Mounted Mini-Ex

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test (S)

Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa (20 40 60 80 / 50 100 150 200)	Combustible Vapour Reading (ppm) 250 500 750 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 20 40 60	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~200 mm thick	133.16	0				
		SANDY SILT To silty sand, some clay, light brown, moist	133.0				GS1	
							GS2	
		SAND AND GRAVEL Silty, grey, wet, (loose)	132.5				GS3	
				1				
		SILTY SAND Grey, wet	131.9				GS4	
				2				
		SILTY CLAY With fine sand layers, grey, wet	131.0				GS5	
			130.4					
		Test Pit Terminated at 2.8 m Depth						

Note:

1) Water seeping in below 0.7 m depth

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS		
Elapsed Time	Water Level (m)	Hole Open To (m)

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-21

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 23

Page. 1 of 1

Date Drilled: 'Nov 10, 2023

Drill Type: Kubota EX-116 Rubber Track Mounted Mini-Ex

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test (S)

Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth
		TOPSOIL ~300 mm thick	133.16	0
		SILTY SAND Some gravel, with clay seams, brown, moist	132.9	
		SAND AND GRAVEL With cobbles, brown and grey, wet (only present on north side of test pit)	132.3	1
		CLAYEY SILT Interbedded with silty sand, non-plastic, brown to grey, moist, (hard) Layer starts at 0.9 m on south side of test pit	132.1	
		Excavator Bucket Refusal at 2.4 m Depth	130.8	2

Standard Penetration Test N Value: 20 40 60 80
Shear Strength: 50 100 150 200 kPa
216 kPa

Combustible Vapour Reading (ppm): 250 500 750
Natural Moisture Content % Atterberg Limits (% Dry Weight): 20 40 60

SAMPLES	Natural Unit Wt. kN/m³
GS1	
GS2A	
GS2	
GS3	

Note:

1) Water seeping in from 1.4 m depth

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-22

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 24

Page. 1 of 1

Date Drilled: 'Nov 10, 2023

Drill Type: Kubota EX-116 Rubber Track Mounted Mini-Ex

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test

Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth
		TOPSOIL ~ 300 mm thick	133.18	0
		SANDY SILT Brown, moist	132.9	
		SILTY CLAY Light brown, wet, (very stiff to hard)	132.4	
		GLACIAL TILL Silty sand with gravel, cobbles, and boulders, grey, wet	132.2	1
		Excavator Bucket Refusal at 1.5 m Depth	131.7	

Standard Penetration Test N Value: 20 40 60 80
Shear Strength: 50 100 150 200 kPa
192 kPa

Combustible Vapour Reading (ppm): 250 500 750
Natural Moisture Content % Atterberg Limits (% Dry Weight): 20 40 60

SAMPLES	Natural Unit Wt. kN/m³
GS1	
GS2	
GS3	

Note:

1) Water seeping in at 1.0 m depth.

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-23

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 25

Page. 1 of 1

Date Drilled: 'Nov 10, 2023

Drill Type: Kubota EX-116 Rubber Track Mounted Mini-Ex

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~ 300 mm thick	133.64	0	20 40 60 80 / 50 100 150 200	250 500 750 / 20 40 60		
			133.3					
		HIGHLY WEATHERED LIMESTONE BEDROCK	133.2			×	GS1	
		With silty sand, brown, damp						
		Excavator Bucket Refusal at 0.4 m Depth						

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS		
Elapsed Time	Water Level (m)	Hole Open To (m)

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-24

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 26

Page. 1 of 1

Date Drilled: 'Nov 10, 2023

Drill Type: Kubota EX-116 Rubber Track Mounted Mini-Ex

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	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 ~150 mm thick	133.76	0	20 40 60 80 / 50 100 150 200	250 500 750 / 20 40 60		
			133.6					
		HIGHLY WEATHERED LIMESTONE BEDROCK Brown	133.5			×	GS1	
		Excavator Bucket Refusal at 0.3 m Depth						

Note:

1) No water seepage or cave-in.

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-25

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 27

Page. 1 of 1

Date Drilled: 'Nov 10, 2023

Drill Type: Kubota EX-116 Rubber Track Mounted Mini-Ex

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	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 ~250 mm thick	133.7	0				
			133.5					
		HIGHLY WEATHERED LIMESTONE BEDROCK Brown	133.4			×	GS1	
		Excavator Bucket Refusal at 0.3 m Depth						

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS		
Elapsed Time	Water Level (m)	Hole Open To (m)

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-26

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 28

Page. 1 of 1

Date Drilled: 'Nov 10, 2023

Drill Type: Kubota EX-116 Rubber Track Mounted Mini-Ex

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	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	133.53	0				
		HIGHLY WEATHERED LIMESTONE BEDROCK Brown, damp	133.3			×		GS1
		Excavator Bucket Refusal at 0.4 m Depth	133.1					

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-27

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 29

Page. 1 of 1

Date Drilled: 'Nov 10, 2023

Drill Type: Kubota EX-116 Rubber Track Mounted Mini-Ex

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa (20 40 60 80 / 50 100 150 200)	Combustible Vapour Reading (ppm) 250 500 750 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 20 40 60	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~200 mm thick	133.58	0				
		HIGHLY WEATHERED LIMESTONE BEDROCK	133.4					
		Gravelly sand, trace silt, brown, moist	133.1			×	GS1	
		Excavator Bucket Refusal at 0.5 m Depth						

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS		
Elapsed Time	Water Level (m)	Hole Open To (m)

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-28

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 30

Page. 1 of 1

Date Drilled: 'Nov 10, 2023

Drill Type: Kubota EX-116 Rubber Track Mounted Mini-Ex

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth
		TOPSOIL ~ 200mm thick	133.28	0
		HIGHLY WEATHERED LIMESTONE BEDROCK	133.1	
		With silty sand, some organics, brown, moist	132.8	
		Excavator Bucket Refusal at 0.5 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: GS1

Natural Unit Wt. kN/m³

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)

CORE DRILLING RECORD

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Test Pit TP-29

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, ON

Figure No. 31

Page. 1 of 1

Date Drilled: 'Nov 10, 2023

Drill Type: Kubota EX-116 Rubber Track Mounted Mini-Ex

Datum: Geodetic Elevation

Logged by: MZ Checked by: IT

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	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	133.51	0	20 40 60 80 / 50 100 150 200	250 500 750 / 20 40 60		
			133.3					
		Excavator Bucket Refusal at 0.2 m Depth						

Note:

1) No water seepage or cave-in

NOTES:
1. Borehole/Test Pit 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. This Figure is to read with exp. Services Inc. report OTT-21002179-B0

WATER LEVEL RECORDS		
Elapsed Time	Water Level (m)	Hole Open To (m)

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

LOG OF TEST PIT TP LOGS - 21002179 - DEC 15, 2023.GPJ TROW OTTAWA.GDT 3/19/24

Log of Borehole BH-01

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, Ontario

Figure No. 32

Page. 1 of 1

Date Drilled: 'Nov. 13, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: I.T.

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

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

GWL	SYMBOL	SOIL DESCRIPTION	Geodetic Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL ~ 180 mm thick	133.39	0	13 /150 mm bouncing		SS1	
			133.27					
		LIMESTONE BEDROCK With sandstone partings, grey (very poor to fair quality)	133.2				Run 1	27.0
				1				
				2			Run 2	
				3			Run 3	26.8
			129.3	4				
		Borehole Terminated at 4.2 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

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 32 mm diameter monitoring well was 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-21002179-B0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov. 15, 2023	0.5	
Nov. 22, 2023	0.5	
Feb. 14, 2024	0.1	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	0.2 - 1.1	95	34
2	1.1 - 2.6	53	0
3	2.6 - 4.2	100	56

Log of Borehole BH-02

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, Ontario

Figure No. 33

Page. 1 of 1

Date Drilled: 'Nov. 13, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: I.T.

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	133.9	0				
		HIGHLY WEATHERED LIMESTONE BEDROCK	133.8		4, 33, 33 / 100 mm bouncing refusal		SS1	
		LIMESTONE BEDROCK With sandstone partings, grey (poor to fair quality)	133.5	1			Run 1	
			133.25				Run 2	27.3
				2				
				3			Run 3	27.3
			130.5					
		Borehole Terminated at 3.4 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. A 32 mm diameter monitoring well was 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-21002179-B0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov. 15, 2023	1.0	
Nov. 22, 2023	1.0	
Feb. 14, 2024	0.7	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	0.4 - 1	100	17
2	1 - 2.5	100	62
3	2.5 - 3.4	100	50

LOG OF BOREHOLE OTT-21002179-B0 355 FRANKTOWN BH LOGS.GPJ TROW OTTAWA.GDT 3/19/24

Log of Borehole BH-03

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, Ontario

Figure No. 34

Page. 1 of 1

Date Drilled: 'Nov. 13, 2023

Drill Type: CME-55 Track Mounted Drill Rig

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: I.T.

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 ~ 400 mm thick With sand and gravel fill, cobbles, metal pieces, dark brown, moist, (loose)	135.12	0	1, 4, 11 / 100 mm bouncing refusal		SS1	
		LIMESTONE BEDROCK With sandstone partings, grey (very poor to fair quality)	134.7	1			Run 1	
			133.28	2			Run 2	27.5
				3			Run 3	25.9
			131.5					
		Borehole Terminated at 3.6 m Depth						

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 32 mm diameter monitoring well was 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-21002179-B0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Nov. 15, 2023	2.2	
Nov. 22, 2023	2.3	
Feb. 14, 2024	1.8	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	0.4 - 1.1	86	21
2	1.1 - 2.6	100	54
3	2.6 - 3.6	100	39

LOG OF BOREHOLE OTT-21002179-B0 355 FRANKTOWN BH LOGS.GPJ TROW OTTAWA.GDT 3/19/24

Log of Borehole BH-04

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, Ontario

Figure No. 35

Page. 1 of 1

Date Drilled: 'Jan 30, 2024

Drill Type: Manual Equipment

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: I.T.

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test

Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

SOIL DESCRIPTION	Geodetic Elevation	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 ~ 250 mm thick	133.46	0				
	133.36					
SILTY SAND With gravel, brown wet, (loose)	133.1		5		SS1	
	132.5	1	7		SS2	
SILTY SAND With clayey layers, grey, wet, compact			13		SS3	
	131.6	2				
DCPT Cone conducted from 1.8 m depth to Bouncing Cone Refusal at 3.0 m depth below existing ground						
	130.4	3				
Cone Refusal at 3.0 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

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 32 mm diameter monitoring well was 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-21002179-B0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
Feb. 14, 2024	-0.1	

CORE DRILLING RECORD

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

LOG OF BOREHOLE OTT-21002179-B0 355 FRANKTOWN BH LOGS.GPJ TROW OTTAWA.GDT 3/19/24

Log of Borehole BH-05

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, Ontario

Figure No. 36

Page. 1 of 1

Date Drilled: 'Jan 30, 2024

Drill Type: Manual Equipment

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: I.T.

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 ~ 380 mm thick	133.27	0	3		SS1	
		SILTY SAND With gravel, topsoil inclusions in upper 0.2 m, brown, wet, (loose)	132.9	1	10		SS2	
					7 / 150 mm then bouncing		SS3	
		Sampler Refusal at 1.4 m Depth	131.9					

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 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-21002179-B0

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

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

LOG OF BOREHOLE OTT-21002179-B0 355 FRANKTOWN BH LOGS.GPJ TROW OTTAWA.GDT 3/19/24

Log of Borehole BH-06

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, Ontario

Figure No. 37

Page. 1 of 1

Date Drilled: 'Jan 30, 2024

Drill Type: Manual Equipment

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: I.T.

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 ~ 400 mm thick	133.22	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60	170	
			132.8		3		SS1	
		SANDY SILT Some clay, brown wet, (loose)			5		SS2	
			132.1	1				
		Sampler Refusal at 1.1 m Depth						

NOTES:
1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21002179-B0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

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

LOG OF BOREHOLE OTT-21002179-B0 355 FRANKTOWN BH LOGS.GPJ TROW OTTAWA.GDT 3/19/24

Log of Borehole BH-07

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, Ontario

Figure No. 38

Page. 1 of 1

Date Drilled: 'Jan 30, 2024

Drill Type: Manual Equipment

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: I.T.

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
		TOPSOIL ~ 250 mm thick	133.38	0
		SILTY CLAY Brown, moist, (firm)	133.1	
		SANDY SILT With clay seams, brown to grey, wet, (compact)	132.6	1
		SILTY CLAY Some sand, low plasticity, grey, moist, (hard)	131.9	
		SILTY SAND Grey, wet, (dense)	131.6	2
		Borehole Terminated at 2.4 m Depth	131.0	

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	214	2		
SS2		40 kPa	17	
SS3		28	216 kPa	
SS4		47		

NOTES:
1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21002179-B0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

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

LOG OF BOREHOLE OTT-21002179-B0 355 FRANKTOWN BH LOGS.GPJ TROW OTTAWA.GDT 3/19/24

Log of Borehole BH-08

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, Ontario

Figure No. 39

Page. 1 of 1

Date Drilled: 'Jan 30, 2024

Drill Type: Manual Equipment

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: I.T.

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 ~325 mm thick	133.52	0				
		SAND AND GRAVEL Silty, trace to some clay, brown, wet, (loose)	133.2		4		SS1	
					8		SS2	
		SILT AND SAND Trace gravel, brown to grey, wet, (dense)	132.3	1				
					31		SS3	
				2	30		SS4	
					44		SS5	
		Borehole Terminated at 2.9 m Depth	130.6					

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

NOTES:
1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21002179-B0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

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

LOG OF BOREHOLE OTT-21002179-B0 355 FRANKTOWN BH LOGS.GPJ TROW OTTAWA.GDT 3/19/24

Log of Borehole BH-09

Project No: OTT-21002179-B0

Project: Proposed Residential Development

Location: 355 Franktown Road, Carleton Place, Ontario

Figure No. 40

Page. 1 of 1

Date Drilled: 'Jan 30, 2024

Drill Type: Manual Equipment

Datum: Geodetic Elevation

Logged by: M.Z. Checked by: I.T.

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
		TOPSOIL ~ 380 mm thick	133.45	0
		SANDY SILT With gravel, trace clay, brown, wet, (very loose)	133.1	
		SILTY CLAY With sand seams, brown, moist, (very stiff)	132.9	
		SILTY SAND Interbedded with silty clay, brown to grey, wet, (dense)	132.3	1
		SILTY CLAY With sand seams, grey, wet, (hard)	131.7	
		Sampler Refusal at 2.3 m Depth	131.2	2

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

SPT (N) Value: 1 (SS1); 15 (SS2); 30 (SS3); 33 (SS4)
Shear Strength: 144 kPa (SS2)

SAMPLES	Natural Unit Wt. kN/m³
SS1	
SS2	
SS3	
SS4	

NOTES:
1. Borehole data requires interpretation by EXP before use by others
2. Borehole was backfilled upon completion
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-21002179-B0

WATER LEVEL RECORDS

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

CORE DRILLING RECORD

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

LOG OF BOREHOLE OTT-21002179-B0 355 FRANKTOWN BH LOGS.GPJ TROW OTTAWA.GDT 3/19/24

EXP Services Inc.
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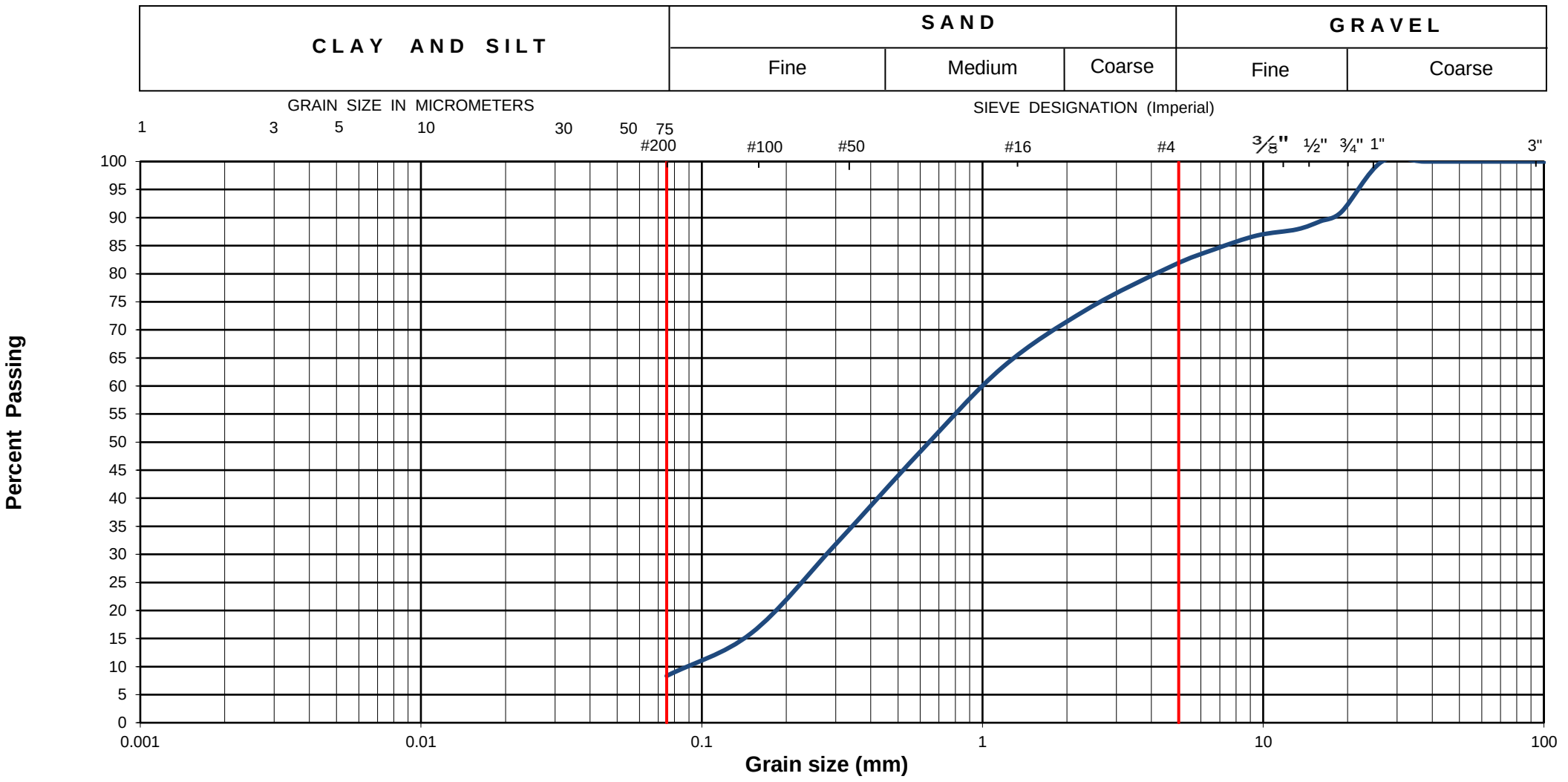
Grain-Size Distribution Curve
Method of Test For Sieve Analysis of Aggregate
ASTM C-136

Unified Soil Classification System



EXP Project No.:	**OTT-21002179-B0**	**Project Name :**	**Geotechnical Investigation - Proposed Residential Development**						
Client :	**11309455 Canada Inc.**	**Project Location :**	**355 Franktown Road, Carleton Place, ON**						
Date Sampled :	**November 10, 2023**	**Borehole No:**	**TP16**	**Sample:**	**GS1**	**Depth (m) :**	**0.3 - 0.5**		
Sample Composition :		**Gravel (%)**	**19**	**Sand (%)**	**73**	**Silt & Clay (%)**	**8**	**Figure :**	**41**
Sample Description :	**FILL - USCS: Poorly Graded Sand with Silt and Gravel (SP-SM)**								

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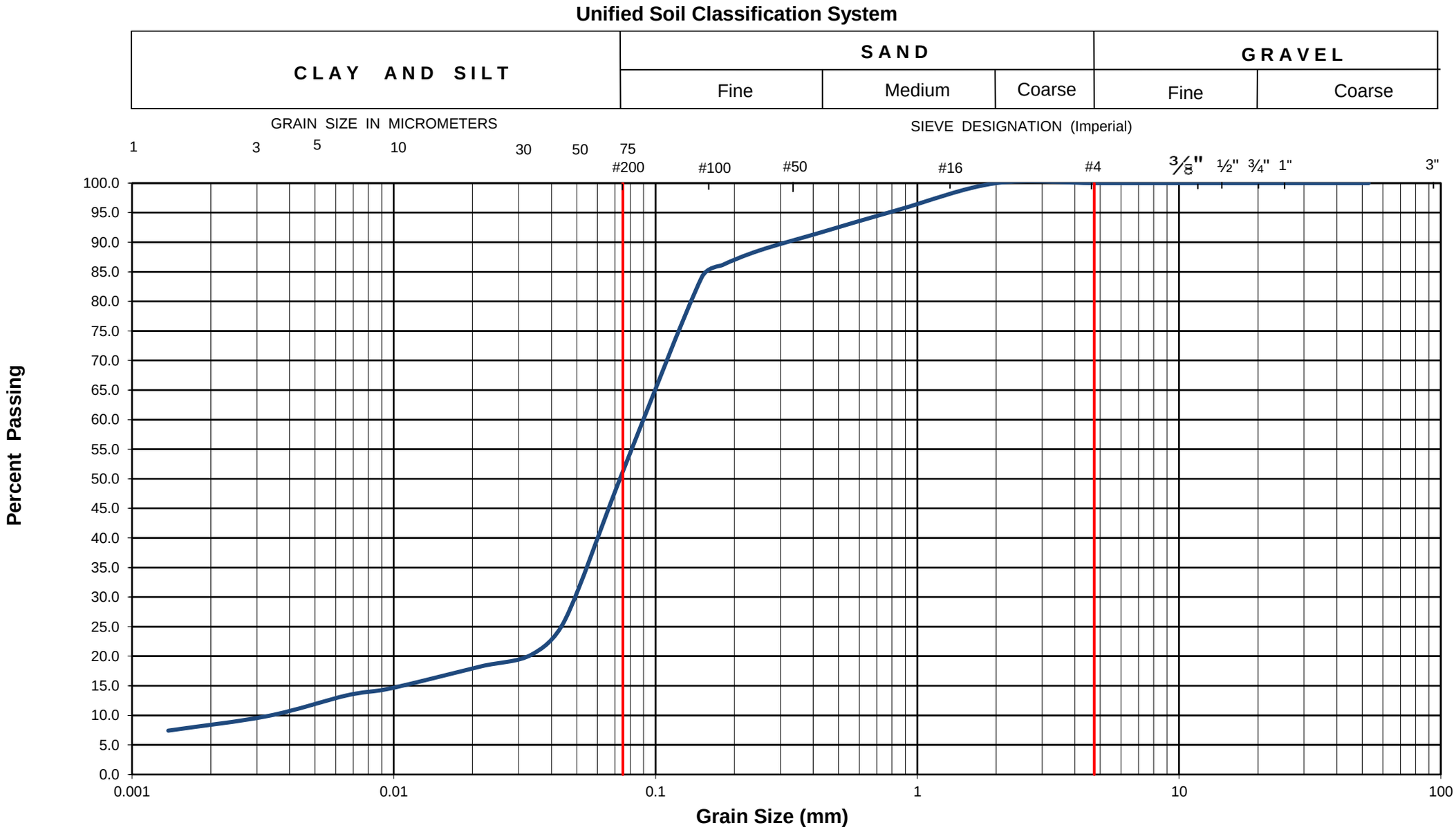
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	**OTT-21002179-B0**	**Project Name :**	**Geotechnical Investigation - Proposed Residential Development**						
Client :	**11309455 Canada Inc.**	**Project Location :**	**355 Franktown Road, Carleton Place, ON**						
Date Sampled :	**January 30, 2024**	**Borehole No:**	**BH8**		**Sample No.:**	**SS4**		**Depth (m) :**	**1.8-2.4**
Sample Description :		**% Silt and Clay**	**51**	**% Sand**	**49**	**% Gravel**	**0**	**Figure :**	**42**
Sample Description :	**USCS: Sandy Silt (ML), CFEM 2006: Sand and Silt, Trace Clay**								

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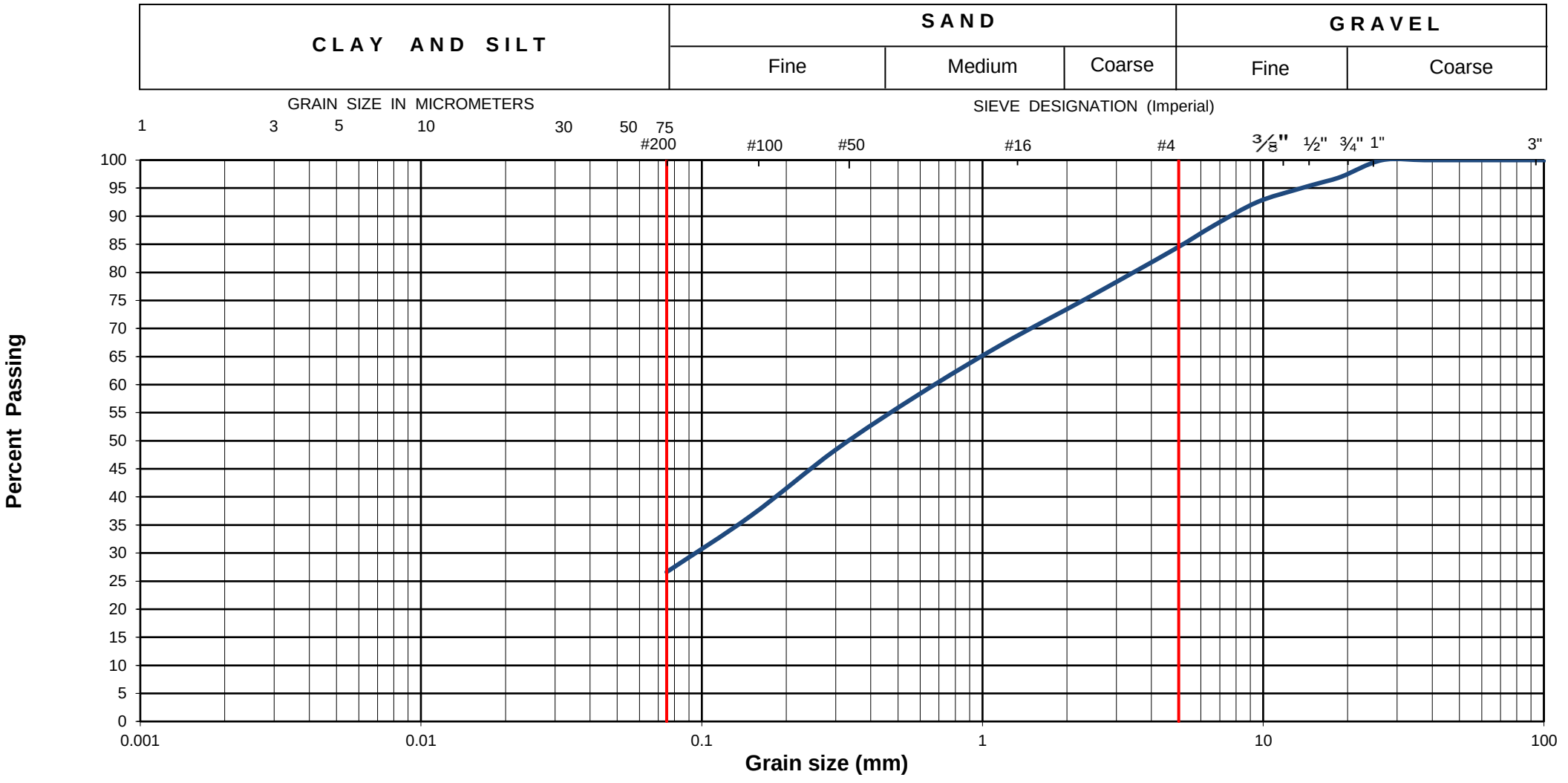
Grain-Size Distribution Curve
Method of Test For Sieve Analysis of Aggregate
ASTM C-136

Unified Soil Classification System



EXP Project No.:	**OTT-21002179-B0**	**Project Name :**	**Geotechnical Investigation - Proposed Residential Development**						
Client :	**11309455 Canada Inc.**	**Project Location :**	**355 Franktown Road, Carleton Place, ON**						
Date Sampled :	**January 30, 2024**	**Borehole No:**	**BH5**	**Sample:**	**SS2**	**Depth (m) :**	**0.6-1.2**		
Sample Composition :		**Gravel (%)**	**16**	**Sand (%)**	**57**	**Silt & Clay (%)**	**27**	**Figure :**	**43**
Sample Description :	**USCS: Silty Sand with Gravel (SM), CFEM 2006: Silty Sand, Some Gravel**								

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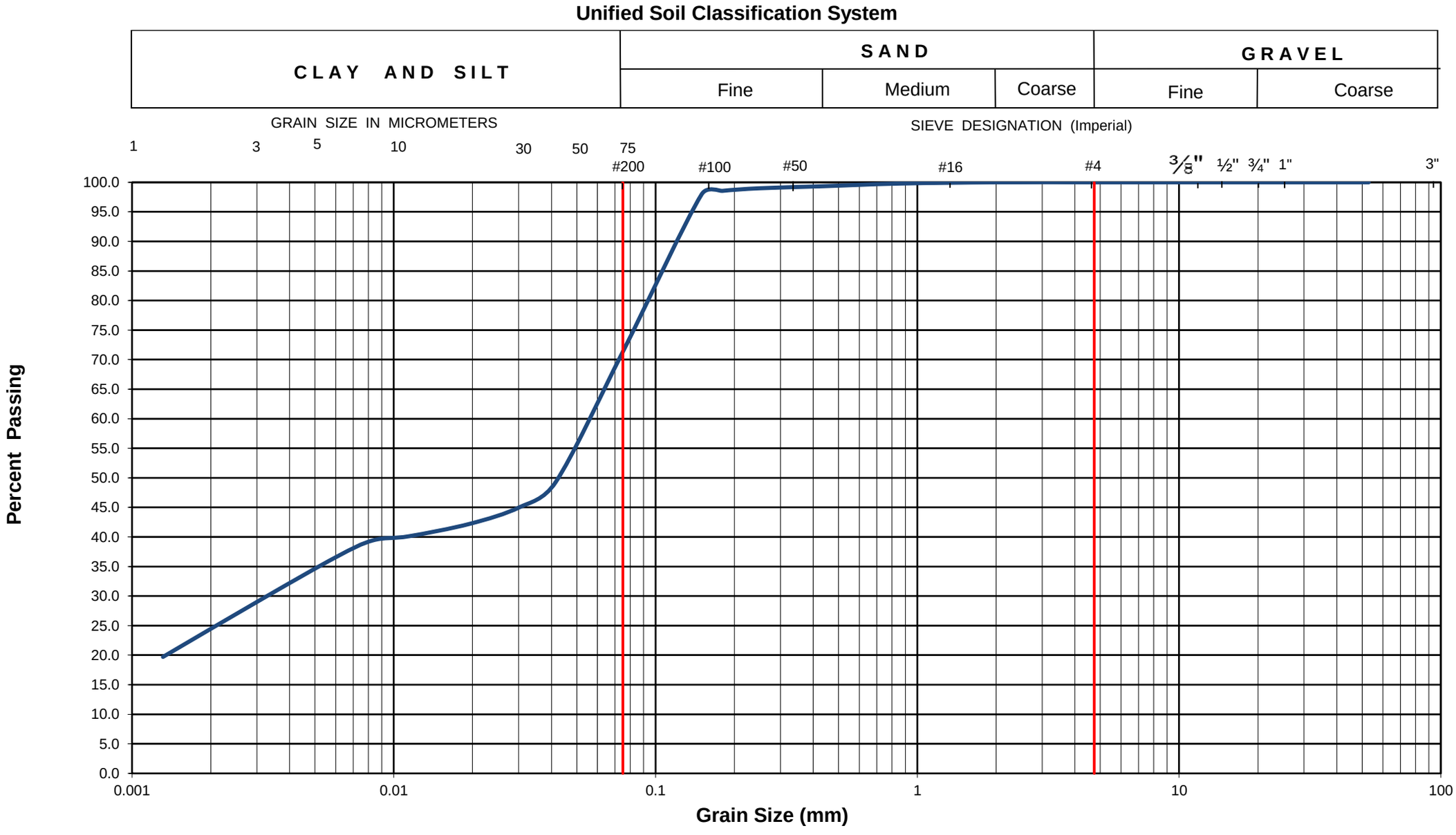
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	**OTT-21002179-B0**	**Project Name :**	**Geotechnical Investigation - Proposed Residential Development**						
Client :	**11309455 Canada Inc.**	**Project Location :**	**355 Franktown Road, Carleton Place, ON**						
Date Sampled :	**November 10, 2023**	**Borehole No:**	**TP21**		**Sample No.:**	**GS3**		**Depth (m) :**	**1.5 - 1.7**
Sample Description :		**% Silt and Clay**	**71**	**% Sand**	**29**	**% Gravel**	**0**	**Figure :**	**44**
Sample Description :	**USCS: Silt with Sand (ML), CFEM 2006: Sandy, Clayey Silt**								

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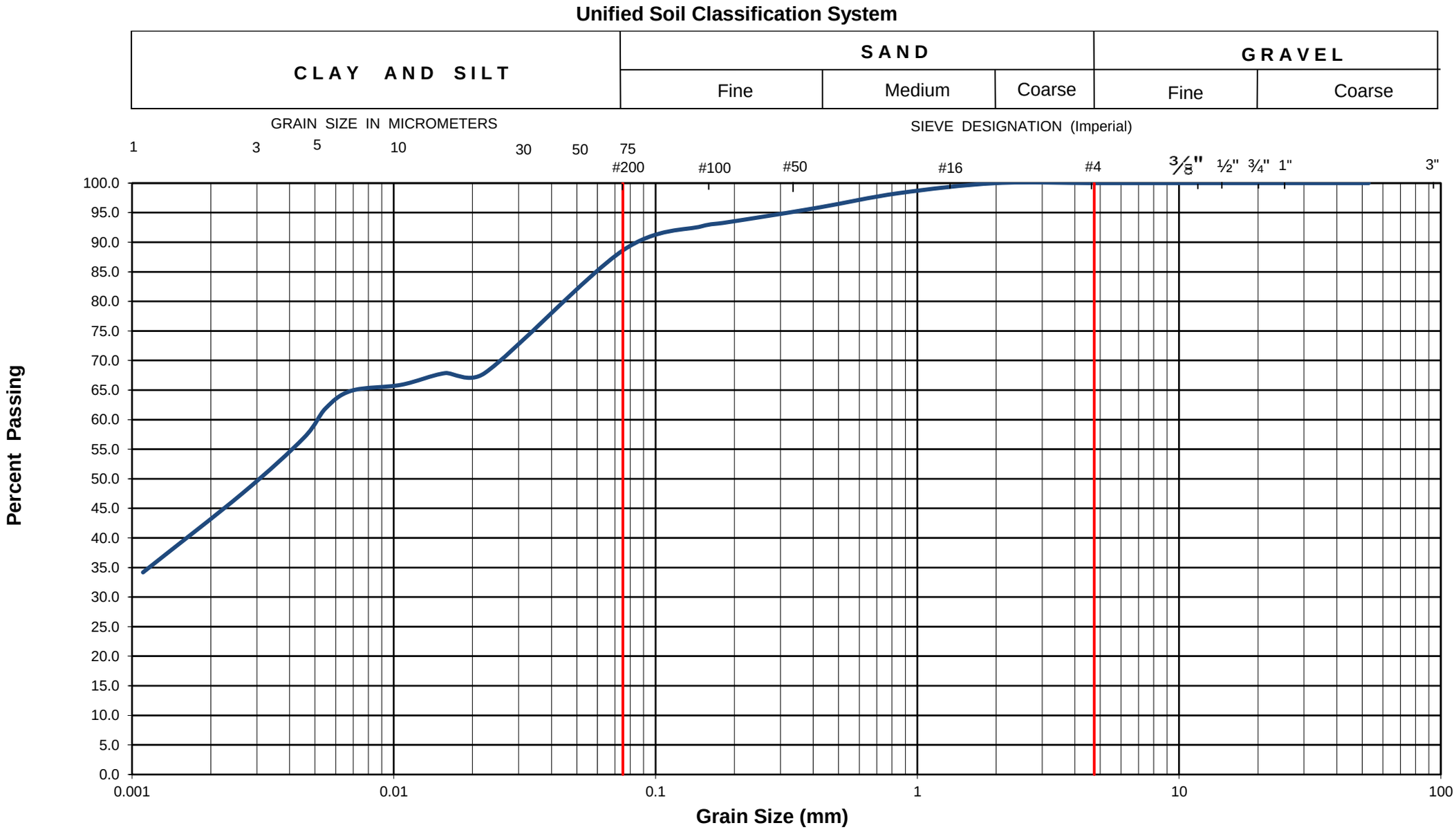
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	**OTT-21002179-B0**	**Project Name :**	**Geotechnical Investigation - Proposed Residential Development**						
Client :	**11309455 Canada Inc.**	**Project Location :**	**355 Franktown Road, Carleton Place, ON**						
Date Sampled :	**January 30, 2024**	**Borehole No:**	**BH7**	**Sample No.:**	**SS3**			**Depth (m) :**	**1.2 - 1.8**
Sample Description :		**% Silt and Clay**	**89**	**% Sand**	**11**	**% Gravel**	**0**	**Figure :**	**45**
Sample Description :	**USCS: Clay of Low Plasticity (CL), CFEM 2006: Silty Clay, Some Sand**								

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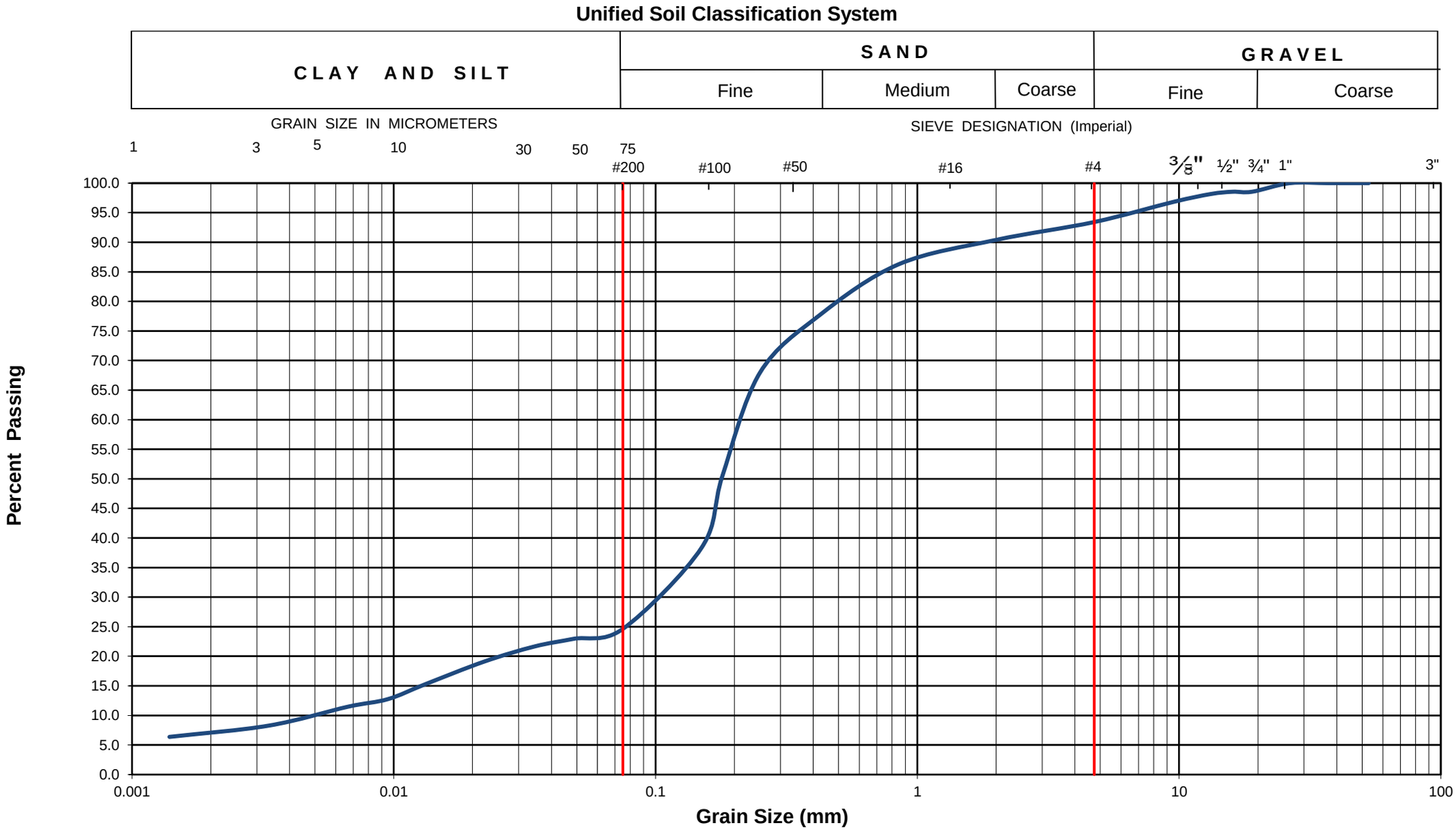
Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422



EXP Project No.:	**OTT-21002179-B0**	**Project Name :**	**Geotechnical Investigation - Proposed Residential Development**						
Client :	**11309455 Canada Inc.**	**Project Location :**	**355 Franktown Road, Carleton Place, ON**						
Date Sampled :	**November 10, 2023**	**Borehole No:**	**TP19**		**Sample No.:**	**GS2**		**Depth (m) :**	**1.0 - 1.2**
Sample Description :		**% Silt and Clay**	**25**	**% Sand**	**68**	**% Gravel**	**7**	**Figure :**	**46**
Sample Description :	**GLACIAL TILL - USCS: Silty Sand (SM), CFEM 2006: Sand, Some Silt, Trace Gravel and Clay**								

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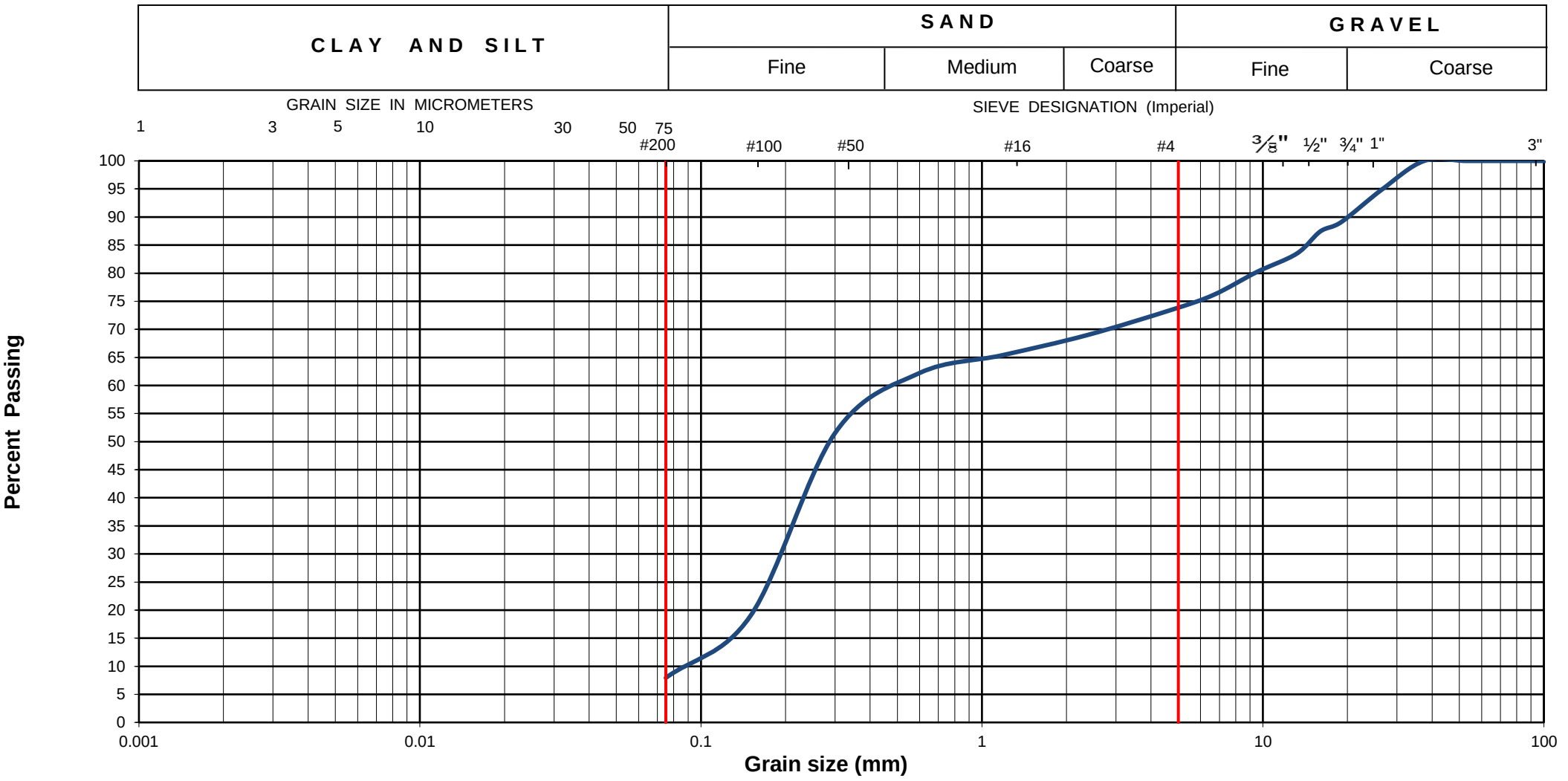
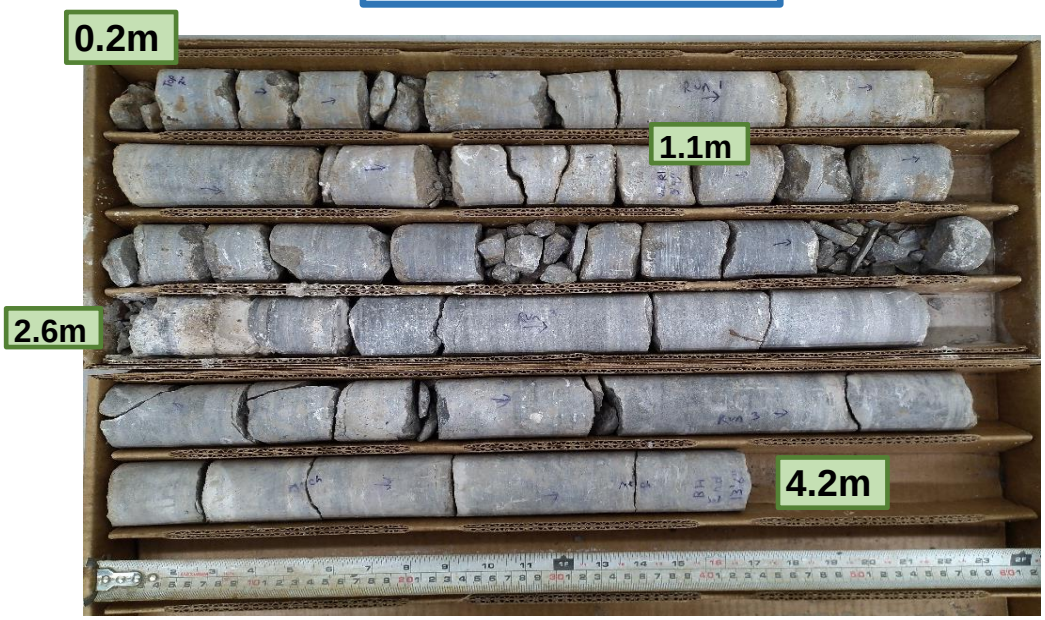
Grain-Size Distribution Curve
Method of Test For Sieve Analysis of Aggregate
ASTM C-136

Unified Soil Classification System

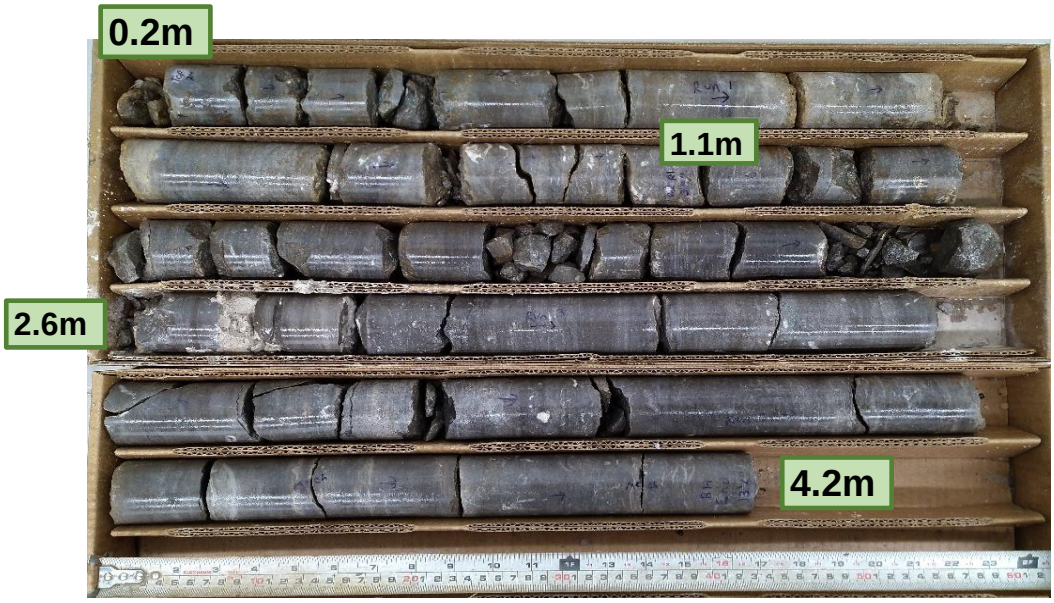


EXP Project No.:	**OTT-21002179-B0**	**Project Name :**	**Geotechnical Investigation - Proposed Residential Development**						
Client :	**11309455 Canada Inc.**	**Project Location :**	**355 Franktown Road, Carleton Place, ON**						
Date Sampled :	**November 10, 2023**	**Borehole No:**	**TP27**	**Sample:**	**GS1**	**Depth (m) :**	**0.3 - 0.5**		
Sample Composition :		**Gravel (%)**	**27**	**Sand (%)**	**65**	**Silt & Clay (%)**	**8**	**Figure :**	**47**
Sample Description :	**HIGHLY WEATHERED LIMESTONE-USCS: Poorly Graded Sand with Gravel and Silt (SP-SM)**								

DRY BEDROCK CORES



WET BEDROCK CORES



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

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borehole no.	core runs	PROJECT	project no.
BH-01	Run 1: 0.2m - 1.1m Run 2: 1.1m - 2.6m Run 3: 2.6m - 4.2m End of Borehole	PROPOSED RESIDENTIAL DEVELOPMENT 355 FRANKTOWN ROAD, CARLETON PLACE	OTT-21002179-B0
date cored Nov 13, 2023		ROCK CORE PHOTOGRAPHS	FIG 48

DRY BEDROCK CORES

WET BEDROCK CORES

exp Services Inc.
t: +1.613.688.1899 | f: +1.613.225.7337
2650 Queensview Drive, Suite 100
Ottawa, ON K2B 8H6
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borehole no.	core runs	PROJECT	project no.
BH-02	Run 1: 0.4m - 1.0m Run 2: 1.0m - 2.5m Run 3: 2.5m - 3.4m End of Borehole	PROPOSED RESIDENTIAL DEVELOPMENT 355 FRANKTOWN ROAD, CARLETON PLACE	OTT-21002179-B0
date cored Nov 13, 2023		ROCK CORE PHOTOGRAPHS	FIG 49

DRY BEDROCK CORES

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borehole no.	core runs	PROJECT	project no.
BH-03	Run 1: 0.4m - 1.1m Run 2: 1.1m - 2.6m Run 3: 2.6m - 3.6m End of Borehole	PROPOSED RESIDENTIAL DEVELOPMENT 355 FRANKTOWN ROAD, CARLETON PLACE	OTT-21002179-B0
date cored Nov 13, 2023		ROCK CORE PHOTOGRAPHS	FIG 50

Appendix A: Previous Borehole (2019)

Log of Borehole BH1

Project No: OTT-00252133-A0

Project: PIIESA

Location: 355 Franktown Road, Carleton Place, Ontario

Figure No. 1

Page. 1 of 1

Date Drilled: 4/12/19

Drill Type:

Datum: Estimated

Logged by: AN Checked by: MGM

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
		ASPHALT ~ 30 mm	136.48	0				
		SAND AND GRAVEL FILL	136.4					
		Crushed stone with trace silt, grey, dry to moist, no odour.	135.7		27	0	SS1	
		LIMESTONE BEDROCK		1			Run 1	
		Grey, some horizontal and vertical fractures, (good quality).		2			Run 2	
			134.02	3			Run 3	
				4			Run 4	
			131.6					
		Borehole Terminated at 4.87 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

NOTES:
1. Borehole/Test Pit data requires Interpretation by exp. before use by others
2. A flushmount monitoring well with a 51 mm slotted standpipe was installed in the borehole upon completion.
3. Field work was supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-00252133-A0

WATER LEVEL RECORDS

Elapsed Time	Water Level (m)	Hole Open To (m)
completion	4.2	-
4 days	2.5	-

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %
1	5.05 - 6.12	94	16
2	6.12 - 7.57	100	79
3	7.57 - 9.14	100	74

LOG OF BOREHOLE LOGS OF BOREHOLES FRANKTOWN- APRIL 2019.GPJ TROW OTTAWA.GDT 6/17/21

Appendix B: Laboratory Certificate of Analysis

AGAT Laboratories

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

CLIENT NAME: EXP SERVICES INC
2650 QUEENSVIEW DRIVE, UNIT 100
OTTAWA, ON K2B8H6
(613) 688-1899
ATTENTION TO: Matthew Zammit
PROJECT: OTT-21002179-A0
AGAT WORK ORDER: 23Z100239
SOIL ANALYSIS REVIEWED BY: Sukhwinder Randhawa, Inorganic Team Lead
DATE REPORTED: Dec 11, 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

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MISSISSAUGA, ONTARIO
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FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 23Z100239

PROJECT: OTT-21002179-A0

CLIENT NAME: EXP SERVICES INC

ATTENTION TO: Matthew Zammit

SAMPLING SITE:335 Franktown Rd, Carleton Place

SAMPLED BY:EXP

Inorganic Chemistry (Soil)

DATE RECEIVED: 2023-12-01 **DATE REPORTED: 2023-12-11**

				SAMPLE DESCRIPTION:	TP21 GS3 1. 5-1.7m	BH 3 run 2 6'6"-6'10"
				SAMPLE TYPE:	Soil	Rock
				DATE SAMPLED:	2023-11-10	2023-11-10
Parameter	Unit	G / S	RDL		5517897	5517908
Chloride (2:1)	µg/g		2		20	39
Sulphate (2:1)	µg/g		2		26	12
pH (2:1)	pH Units		NA		8.47	9.51
Resistivity (2:1) (Calculated)	ohm.cm		1		5130	6130

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

5517897-5517908 pH, Chloride and Sulphate were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water: 1 part soil). Resistivity is a calculated parameter.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

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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: 23Z100239

PROJECT: OTT-21002179-A0

ATTENTION TO: Matthew Zammit

SAMPLING SITE:335 Franktown Rd, Carleton Place

SAMPLED BY:EXP

Soil Analysis

RPT Date: Dec 11, 2023			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Inorganic Chemistry (Soil)															
Chloride (2:1)	5517672		386	380	1.6%	< 2	91%	70%	130%	94%	80%	120%	95%	70%	130%
Sulphate (2:1)	5517672		1100	1110	0.9%	< 2	94%	70%	130%	95%	80%	120%	NA	70%	130%
pH (2:1)	5525010		7.68	7.61	0.9%	NA	96%	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.

Matrix spike NA: Spike level < native concentration. Matrix spike acceptance limits do not apply and are not calculated.

Certified By:

AGAT Laboratories

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

Method Summary

CLIENT NAME: EXP SERVICES INC

AGAT WORK ORDER: 23Z100239

PROJECT: OTT-21002179-A0

ATTENTION TO: Matthew Zammit

SAMPLING SITE:335 Franktown Rd, Carleton Place

SAMPLED BY:EXP

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

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

Chain of Custody Record

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

Report Information:

Company: EXP Services Inc.
Contact: Matthew Zammit
Address: 2650 Queensview dr. Unit 100
Ottawa, ON, K2B 8H6
Phone: 613-688-1899 Fax:
Reports to be sent to:
1. Email: matthew.zammit@exp.com
2. Email:

Project Information:

Project: OTT-21002179-A0
Site Location: 355 Franktown rd., Carleton Place
Sampled By: EXP
AGAT ID #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☑ No ☐
Company:
Contact:
Address:
Email:

Regulatory Requirements:

(Please check all applicable boxes)

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

☐ Excess Soils R406
Table ____ *Indicate One*
☐ Regulation 558
☐ CCME

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

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

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

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Laboratory Use Only

Work Order #: 23Z100239

Cooler Quantity: n/a - no ice packs
Arrival Temperatures: 20.5 20.5 20.6 2.4 2.1 2.3
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
Notes: bagged/loose. zm

Turnaround Time (TAT) Required:

Regular TAT (Most Analysis) ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

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

OR Date Required (Rush Surcharges May Apply):

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

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

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI, DOC Y/N	O. Reg 153: Metals & Inorganics	O. Reg 153: Metals - ☐ CrVI, ☐ Hg, ☐ HWSB	O. Reg 153: BTEX, F1-F4 PHCs; Analyze F4G if required ☐ Yes ☐ No	O. Reg 153: PAHs	O. Reg 153: Total PCBs ☐ Aroclor	O. Reg 153: VOC	O. Reg 558: Landfill Disposal Characterization TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs; TCLP:	O. Reg 406: Excess Soils SPLP Rainwater Leach; SPLP: ☐ Metals ☐ VOCs ☐ SVOCs	O. Reg 406: Excess Soils Characterization Package pH, ICPMS Metals, BTEX, F1-F4	Salt - EC/SAR	pH	Sulphate	Chloride	resistivity	Potentially Hazardous or High Concentration (Y/N)
TP21 GS3 1.5-1.7m	Nov 10	/	1	S																
BH3 run 2 6'6"-6'10"	/	/	1	rock																
		AM PM																		
		AM PM																		
		AM PM																		
		AM PM																		
		AM PM																		
		AM PM																		
		AM PM																		
		AM PM																		
		AM PM																		
		AM PM																		

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Jeff MacMillan	Dec. 1/23	4:45 PM	C. Griffiths	12/01/23	16h47
CC to Dec 5	12/04/23	15h30		Dec 5	8:40 hr

Page 1 of 1
№: T 122914

Document ID: DW-78-1511-020
Pink Copy - Client | Yellow Copy - AGAT | White Copy- AGAT
Date Issued: December 8, 2020

Appendix C: Site Photos

Photo 1: Test Pit No. 2

Photo 2: Test Pit No. 4

Photo 3: Test Pit No. 5

Photo 4: Test Pit No. 7

Photo 5: Test Pit No. 11

Photo 6: Test Pit No. 12

Photo 7: Test Pit No. 16

Photo 8: Test Pit No. 17

Photo 9: Test Pit No. 18

Photo 10: Test Pit No. 19

Photo 11: Test Pit No. 20

Photo 12: Test Pit No. 21

Photo 13: Test Pit No. 22

Photo 14: Test Pit No. 23

Photo 15: Test Pit No. 24

Photo 16: Test Pit No. 25

Photo 17: Test Pit No. 26

Photo 18: Test Pit No. 27

Photo 19: Test Pit No. 28

Photo 20: Test Pit No. 29

Photo 21: Location of Test Pit No. TP-20 to TP-22, Facing North from TP-22

END OF PHOTO LOG

Appendix D: Legal Notification

Legal Notification

This report was prepared by EXP Services Inc. (EXP) for the account of 11309455 Canada Inc.

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 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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Carmine Zayoun, Group Heafey, carmine@zayoungroup.com

Raad Akrawi, Group Heafey, rakrawi@groupeheafey.com