PATERSON GROUP

Geotechnical Investigation

Proposed Sortation Facility

Project X Development
99 Bill Laethem Drive, 2 & 20 Leikin Drive and 11 Beckstead Road
Ottawa, Ontario

Prepared for Broccolini

Report PG5876-2 Revision 1 dated September 11, 2024

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Appendices

1.0 Introduction

Paterson Group (Paterson) was commissioned by Broccolini to conduct a geotechnical investigation for the proposed Project X Development to be located at 99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road in the City of Ottawa, Ontario (reference should be made to Figure 1 - Key Plan in Appendix 2 of this report for the general site location).

The objectives of the geotechnical investigation were to:

- Determine the subsoil and groundwater conditions at this site by means of test holes, and to
- Provide geotechnical recommendations pertaining to design of the proposed development including construction considerations which may affect the design.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains our findings and includes geotechnical recommendations pertaining to the design and construction of the subject development as they are understood at the time of writing this report.

Investigating the presence or potential presence of contamination on the subject property was not part of the scope of work of the present investigation. Therefore, the present report does not address environmental issues.

2.0 Proposed Development

Based on the available drawings, it is understood that the proposed development will consist of a multi-storey sortation facility building with a slab-on-grade and an approximate footprint of 60,000 m^2. The proposed building will be immediately surrounded by loading bays, access lanes and parking areas.

The proposed development will also include the construction of a sanitary alignment connected between Leathem Drive and Merivale Road, which is to be located south of the proposed building.

3.0 Method of Investigation

3.1 Field Investigation

Field Program

The field program for the current investigation was conducted between July 25 and August 7, 2024 and consisted of advancing a total of 32 boreholes to a maximum depth of 14.3 m below the existing grade.

These boreholes were advanced using a low clearance, track-mounted drill rig operated by a two-person crew. The drilling procedure consisted of augering to the required depths at the selected locations and sampling the overburden soils. All fieldwork was conducted under the full-time supervision of our personnel under the direction of a senior engineer from our geotechnical department.

Previous geotechnical investigations were completed by others in June to July 2023, and April to May 2021. During those investigations, a total of 18 boreholes, 68 test pits and 28 cone-penetration tests (CPTs) were advanced throughout the subject site to a maximum depth of 28.3 m below the existing ground surface. Additional historical boreholes were completed by others between June 1990 and October 1991, at which time 10 boreholes were drilled to a maximum depth of 22.7 m below the ground surface.

The test hole locations were distributed in a manner to provide general coverage of the subject site and taking into consideration underground utilities and site features. The locations of the test holes are shown on Drawing PG5876-1 - Test Hole Location Plan in Appendix 2.

The subsurface profiles are presented on the Test Hole Logs and Cone Penetration Testing (CPT) Logs by Others in Appendix 1.

Sampling and In Situ Testing

Soil samples collected from the boreholes were either recovered directly from the auger flights (AU) or collected using a 50 mm diameter split-spoon (SS) sampler. All samples were initially classified on site and subsequently placed in sealed plastic bags and transported to our laboratory for further examination and classification. The depths at which the auger and split spoon samples were recovered from the boreholes are shown as AU and SS, respectively, on the Soil Profile and Test Data Sheets presented in Appendix 1.

The Standard Penetration Test (SPT) was conducted in conjunction with the recovery of the split spoon samples. The SPT results are recorded as "N" values on the Soil Profile and Test Data sheets. The "N" value is the number of blows required to drive the split spoon sampler 300 mm into the soil after a 150 mm initial penetration using a 63.5 kg hammer falling from a height of 760 mm.

Undrained shear strength testing was conducted at regular intervals in cohesive soils (clay) where encountered, using a field vane apparatus.

The overburden thickness was evaluated by a dynamic cone penetration test (DCPT) completed at boreholes BH 1-24 to BH 17-24, BH 20-24, BH 21-24, and BH 30-24 to BH 32-24. The DCPT consists of driving a steel drill rod, equipped with a 50 mm diameter cone at the tip, using a 63.5 kg hammer falling from a height of 760 mm. The number of blows required to drive the cone into the soil is recorded for each 300 mm increment.

The subsurface conditions observed in the boreholes were recorded in detail in the field. The soil profiles are logged on the Soil Profile and Test Data sheets and Cone Penetration Testing (CPT) Logs, by others, presented in Appendix 1.

Groundwater

Boreholes BH 18-24, BH 22-24 to BH 25-24, BH 29-24 and BH 32-24 were fitted with 51 mm diameter PVC groundwater monitoring wells. Boreholes BH 5-24, BH 9-24, BH 11-24, BH 14-24 and BH 15-24 were fitted with flexible polyethylene standpipes to permit monitoring of the groundwater levels subsequent to the completion of the sampling program. The groundwater observations are discussed in Subsection 4.3 and presented in the Soil Profile and Test Data sheets in Appendix 1.

Typical monitoring well construction details are described below:

- Slotted 51 mm diameter PVC screen at the base of each borehole.
- 51 mm diameter PVC riser pipe from the top of the screen to the ground surface.
- No.3 silica sand backfill within annular space around screen.
- Bentonite hole plug directly above PVC slotted screen.
- Clean backfill from top of bentonite plug to the ground surface.

Reference should be made to the Soil Profile and Test Data sheets presented in Appendix 1 for specific well construction details.

3.2 Field Survey

The test hole locations and ground surface elevation at each test hole location were surveyed by Paterson using a high precision, handheld GPS and referenced to a geodetic datum. The location of the test holes and ground surface elevation at each the test hole location are presented on Drawing PG5876-1 - Test Hole Location Plan presented in Appendix 2.

3.3 Laboratory Review

Soil samples were recovered from the subject site and visually examined in our laboratory to review the results of the field logging. A total of 2 Atterberg limits tests were completed on selected soil samples obtained from the current investigation. Moisture content was completed on all retrieved soil samples. The results of the testing are discussed in Section 4.2 and are provided in Appendix 1.

Sample Storage

All samples from the current investigation will be stored in the laboratory for a period of 1 month after issuance of this report. They will then be discarded unless we are otherwise directed.

3.4 Analytical Testing

One (1) soil sample was submitted for analytical testing to assess the corrosion potential for exposed ferrous metals and the potential of sulphate attacks against subsurface concrete structures by Paterson. The sample was submitted to determine the concentration of sulphate and chloride, the resistivity, and the pH of the sample. The results are discussed further in Section 6.7 and presented in Appendix 1.

4.0 Observations

4.1 Surface Conditions

The majority of the subject site currently consists of agricultural fields. The existing ground surface was observed to be relatively flat at approximate geodetic elevation 90.5 m, although it has been noted that an approximately 5 m high stockpile of fill had been placed within the southwest portion of the subject site.

The site is bordered to the west and north by agricultural land, to the south by Bill Leathem Drive and a three-storey manufacturing facility on Paragon Avenue, and to the east by Leikin Drive. The subject site is at grade with the surrounding roadways.

4.2 Subsurface Profile

Overburden

Generally, the subsurface profile consists of topsoil underlain by a deep deposit of silty clay, followed by a glacial till deposit.

The silty clay deposit was observed to consist of a layer of hard to very stiff, brown silty clay crust extending to depths ranging between 2.9 and 4.5 m below ground surface. The brown silty clay layer was observed to be underlain by a firm to stiff, grey silty clay deposit extending to depths ranging between 9.0 and 17.0 m below the ground surface.

The silty clay deposit was underlain by a compact to very dense glacial till deposit. The fine matrix of the glacial till was observed to consist of either silty clay or silty sand, along with varying amounts of gravel, cobbles and boulders.

Practical refusal to DCPT was observed at depths ranging between 17.4 and 23.6 m below ground surface.

Reference should be made to the Soil Profile and Test Data sheets presented in Appendix 1 for details of the soil profile encountered at each borehole location.

Bedrock

Based on available geological mapping, the bedrock in the subject area consists of interbedded sandstone and dolomite of the March formation, with an overburden drift thickness of 15 to 25 m depth.

The bedrock was cored by others throughout the subject site at depths ranging between 19.3 and 25.4 m below the ground surface, and was observed to consist of a fair to good quality dolomite.

Atterberg Limit and Shrinkage Tests

Atterberg limits testing, as well as associated moisture content testing, were completed on the recovered silty clay samples at selected locations throughout the subject site. The results of the Atterberg limits tests are presented in Table 1 and on the Atterberg Limits Results by Others in Appendix 1.

Table 1 - Atterberg Limits Results

Test Hole and Sample	Depth (m)	LL (%)	PL (%)	PI (%)	w (%)	Classification
BH 4-24 SS2	0.7-1.3	61	25	36	38.6	CH
BH 16-24 SS3	1.5-2.1	40	19	21	34.0	CL

Notes: LL: Liquid Limit; PL: Plastic Limit; PI: Plasticity Index; w: water content;
CH: Inorganic Clay of High Plasticity CL: Lean Clay of Low Plasticity ML: Silt

Atterberg limits testing were also completed following previous investigations by others. The results of the Atterberg Limits testing completed by others are summarized in Table 2 and on the Laboratory Results by Others included in Appendix 1.

Table 2 - Atterberg Limits Results by Others

Test Hole and Sample	Depth (m)	LL (%)	PL (%)	PI (%)	w (%)	Classification
BH-01 ST-5	3.05	52	21	31	45	CH
BH-01 SS-11	9.15	50	24	26	68	CH
BH-02 ST-7	4.57	47	22	25	54	CL
BH-02 SS-3	1.52	38	17	21	27	CL
BH-02 SS-11	9.15	27	22	5	25	CL-ML
BH-02 SS-14	11.43	14	12	2	8	SM
BH-02 SS-19	15.24	13	11	2	8	SM
BH-03 SS-11	8.23	48	23	25	66	CL
BH-03 SS-14	12.19	26	18	8	39	CL
BH-03 SS-18	18.29	15	13	2	9	SM

Table 2 - Atterberg Limits Results by Others [continued]

Test Hole and Sample	Depth (m)	LL (%)	PL (%)	PI (%)	w (%)	Classification
BH-03 ST-13	10.67	41	22	19	58	CL
BH 101-23 SS-06	3.05-3.66	43	19	24	33	CL
BH 101-23 SS-08	4.57-5.18	46	21	25	50	CL
BH 101-23 SS-10	6.09-6.70	51	25	26	62	CH
BH 101-23 SS-12	7.62-8.23	48	23	25	63	CL
BH 102-23 SS-12	7.62-8.23	39	19	20	33	CL
BH 102-23 SS-14	10.1-10.7	44	20	24	52	CL
BH 102-23 SS-16	13.1-13.7	65	22	43	62	CH
BH 102-23 SS-17	14.6-15.3	43	21	22	51	CL

Notes: LL: Liquid Limit; PL: Plastic Limit; PI: Plasticity Index; w: water content;
CH: Inorganic Clay of High Plasticity CL: Lean Clay of Low Plasticity ML: Inorganic Silt

Grain Size Distribution and Hydrometer Testing

Grain size distribution was completed by others on 11 soil samples. The grain-size analysis results are summarized in Table 3 below, and also in Appendix 1.

Table 3 - Summary of Grain Size Distribution Analysis By Others

Test Hole	Sample	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
BH 01	ST 5	0	7	93	
BH 01	SS 11	0	7	93	
BH 02	SS 3	0	10	90	
BH 02	SS 11	0	2	98	
BH 02	SS 14	22	42	36	
BH 02	SS 19	26	40	34	
BH 03	SS 11	0	4	96	
BH 03	SS 14	0	6	67	27
BH 03	SS 18	25	45	23	7
BH 101-23	SS 12	0	0.7	99.3	
BH 101-23	SS 17	0	0.5	99.5	
BH 101-23	SS 18	0	0.5	99.5	
BH 102-23	SS 12	0	3.6	96.4	

4.3 Groundwater

Groundwater levels were measured on August 13, 2024 within the installed monitoring wells and piezometers. The measured groundwater levels are presented in Table 4 below and on the Soil Profile and Test Data Sheet in Appendix 1.

Table 4 – Summary of Groundwater Levels (Paterson – 2024 Investigation)

Borehole Number	Observation Method	Ground Surface Elevation (m)	Measured Groundwater Level		Date Recorded
			Depth (m)	Elevation (m)	
BH 5-24	Piezometer	90.56	1.15	89.41	August 13, 2024
BH 9-24	Piezometer	90.43	1.02	89.41	August 13, 2024
BH 11-24	Piezometer	90.52	1.02	89.50	August 13, 2024
BH 14-24	Piezometer	90.38	0.92	89.46	August 13, 2024
BH 15-24	Piezometer	90.46	0.63	89.83	August 13, 2024
BH 18-24	Monitoring Well	90.61	1.26	89.35	August 13, 2024
BH 22-24	Monitoring Well	90.37	1.08	89.29	August 13, 2024
BH 23-24	Monitoring Well	90.37	0.88	89.49	August 13, 2024
BH 24-24	Monitoring Well	90.25	0.45	89.80	August 13, 2024
BH 25-24	Monitoring Well	90.44	1.26	89.18	August 13, 2024
BH 29-24	Monitoring Well	90.34	1.33	89.01	August 13, 2024
BH 32-24	Monitoring Well	90.06	4.97	85.09	August 13, 2024

Long-term groundwater levels can also be estimated based on the observed colour and consistency of the subsurface profile. Based on these observations, the long-term groundwater table can be expected at a depth ranging between 2.5 to 3.5 m below the existing ground surface.

However, it should be noted that groundwater levels are subject to seasonal fluctuations. Therefore, the groundwater levels could vary at the time of construction.

5.0 Discussion

5.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is considered suitable for the proposed development. Based on preliminary foundation loads provided by the structural engineer, it is understood that the foundation loads will vary from approximately 5,000 to 8,000 kN. Accordingly, it is recommended that foundation support for the proposed building consist of one of the following:

- conventional spread footings bearing on the undisturbed, stiff silty clay in conjunction with significant lightweight fill placed under the building floor slab, or
- end-bearing piles driven to refusal on the bedrock surface

Due to the presence of a silty clay layer, the site is subjected to a permissible grade raise restriction. The permissible grade raise recommendations are discussed in Section 5.3.

Based on the anticipated excavation depth and the nature of the overburden, a temporary excavation support system is expected to be required for the construction of the proposed sanitary alignment.

The above and other considerations are discussed in the following sections.

5.2 Site Grading and Preparation

Stripping Depth

Topsoil and deleterious fill, such as those containing significant organic materials, should be stripped from under any buildings, paved areas, pipe bedding and other settlement sensitive structures.

Care should be taken not to disturb adequate bearing soils below the founding level during site preparation activities. Disturbance of the subgrade may result in sub-excavating the disturbed material and the placement of additional suitable fill material.

Fill Placement

Fill used for grading beneath the building area should consist, unless otherwise specified, of clean imported granular fill, such as Ontario Provincial Standard Specifications (OPSS) Granular A or Granular B Type II. The imported fill material should be tested and approved by Paterson personnel prior to delivery to site. The fill should be placed in lifts no greater than 300 mm thick and compacted using suitable compaction equipment for the lift thickness. Fill placed beneath the building footprint should be compacted to a minimum of 98% of the standard Proctor maximum dry density (SPMDD).

Non-specified existing fill along with site-excavated soil can be used as general landscaping fill where settlement of the ground surface is of minor concern. The material should be spread in thin lifts with a maximum thickness of 300 mm and at least compacted by the tracks of the spreading equipment to minimize voids.

If excavated brown silty clay, free of organics and deleterious materials, is to be used to build up the subgrade level for areas to be paved, it is recommended that the material be placed under dry conditions and above freezing temperatures. The silty clay should be compacted in thin lifts using suitable compaction equipment to a minimum density of 95% of its respective SPMDD.

5.3 Foundation Design

Conventional Spread Footings

Pad footings, up to 8 m wide, and strip footings up to 2.5 m wide, placed on the undisturbed, stiff silty clay can be designed using a bearing resistance value at serviceability limit states (SLS) of **150 kPa** and a factored bearing resistance value at ultimate limit states (ULS) of **225 kPa**. A geotechnical resistance factor of 0.5 was applied to the above-noted bearing resistance value at ULS.

It should be noted that these bearing resistance values and footing sizes can only be used in conjunction with a reduced permissible grade raise restriction within the building footprint. This is discussed further below in the “Permissible Grade Raise Recommendations” subsection.

An undisturbed soil bearing surface consists of a surface from which all topsoil and deleterious materials, such as loose, frozen or disturbed soil, whether in situ or not, have been removed, in the dry, prior to the placement of concrete for footings.

Footings placed on the undisturbed, stiff silty clay and designed using the bearing resistance values at SLS given above will be subjected to potential post construction total and differential settlements of 25 and 20 mm, respectively.

Pile Foundation

As an alternative to conventional spread footings and a reduced permissible grade raise restriction within the building footprint, a deep foundation consisting of end-bearing steel pipe piles could be employed.

Concrete filled steel pipe piles driven to refusal are a typical deep foundation option in Ottawa. Applicable pile resistance at serviceability limit states (SLS) and ultimate limit states (UL) are provided in Table 5 below. Additional resistance values can be provided if available pile sizes vary from those detailed in Table 5. Note that these are all geotechnical axial resistance values.

The geotechnical pile resistance values were estimated calculating the Hiley dynamic formula. The piles should be confirmed during pile installation with a program of dynamic monitoring. For this project, the dynamic monitoring of four piles is recommended. This is considered to be the minimum monitoring program, as the piles under shear walls may be required to be driven using the maximum recommended driving energy to achieve the greatest factored resistance at ULS values.

Table 5 - Pile Foundation Design Data

Pile Outside Diameter (mm)	Pile Wall Thickness (mm)	Geotechnical Axial Resistance Factored at ULS (kN)	Final Set (blows/12 m)	Transferred Hammer Energy (kJ)
245	9	1090	10	28.5
245	11	1260	10	34.2
245	13	1500	10	40.7

The minimum centre-to-centre pile spacing is 2.5 times the pile diameter. The closer the piles are spaced, however, the more potential that the driving of subsequent piles in a group could have influence on piles in the group that have already been driven. These effects, primarily consisting of uplift of previously driven piles, are checked as part of the field review of the pile driving operations.

Accordingly, re-striking of all piles, at least once, will also be required after at least 48 hours have elapsed since initial driving.

A full-time field review program carried out by Paterson personnel should be conducted during the pile driving operations, which is required under the Ontario Building Code (OBC) 2012 to record the pile lengths, and to ensure that the refusal criteria is met, and that piles are driven within the location tolerances (within 75 mm of proper location and within 2% of vertical).

Prior to the commencement of production pile driving, a limited number of indicator piles should be installed across the site. It is recommended that each indicator pile be dynamically load tested to evaluate pile stresses, hammer efficiency, pile load transfer, and end-of-driving criteria for end-bearing in the bedrock.

Down Drag Loads

Due to the presence of silty clay below the subject site and proposed grade raises at the site, down drag loads should be considered during the final design of the piles. Based on the available subsurface information, it is expected that the piles will be driven through approximately 21 to 26 m of stiff to soft silty clay. The silty clay generally has a cohesion of 30 to 70 kPa. Assigning an adhesion factor of 1.0 to 0.5 (as per the Canadian Foundation Engineering Manual), the silty clay can be taken to have an ultimate adhesion of 20 kPa against the sides of the piles.

The down drag load is effectively applied to each pile at the location of the “neutral plane,” where negative (i.e., down drag) skin friction becomes positive shaft resistance. In the case of the end-bearing piles at this site, the neutral plane will be located near the bedrock surface.

The down drag load is a structural pile capacity criterion and does not affect the geotechnical capacity of the piles. The structural axial capacity of the pile is governed by its structural strength at the neutral plane when subjected to the permanent load plus the down drag load. Transient live load is not to be included. At or below the pile cap, the structural strength of the embedded pile is determined as a short column subjected to the permanent load plus the transient live load, but down drag load is to be excluded.

At the depth of the neutral plane where the down drag load is applied, the pile structure is well confined. The 4th edition of the Canadian Foundation Engineering Manual recommends that the allowable structural axial capacity of piles at the neutral plane, for resisting permanent load plus the down drag load, can be determined by applying a factor of safety of 1.5 to the pile material strength (steel yield and concrete 28 day compressive strength).

Foundation Lateral Load Resistance

Lateral loads on the foundations can be resisted using passive resistance on the sides of the foundations. For Limit States Design, the resistance factor to be applied to the ultimate lateral resistance, including passive pressure, is 0.50. The total lateral resistance will be comprised of the individual contributions from up to several material layers.

Geotechnical parameters for the native silty clay and glacial till, and for typical backfill materials, compacted to 98% of SPMDD in 300 mm lift thicknesses, are provided in Table 6 below. In addition, earth pressure coefficients are provided in Table 6 for the horizontal resistance calculated for pile caps or grade beams under lateral loads. Friction factors between concrete and the various subgrade materials are also provided in Table 6, where normal loads allow them to be used.

Where granular soils and/or granular backfill materials are present, the passive pressure can be calculated using a triangular distribution equal to $K_P \cdot \gamma \cdot H$ where:

K_P = factored passive earth pressure coefficient of the applicable retained soil
γ = unit weight of the fill of the applicable retained soil (kN/m^3)
H = height of the equivalent wall or footing side (m)

Note that for cases where the depth to the top of the structure pushing against the soil does not exceed 50% of the depth to the base of the structure, the effective value of H in the above noted relationship will be the overall depth to the base of the structure. There will also be “edge effects” where the effective width of soil providing the resistance can be increased by 50% of the effective depth on each side of the pushing structural component.

Note that where the foundation extends below the groundwater level, the effective unit weight should be utilized for the saturated portion of the soil or fill.
Should additional passive resistance be required, the horizontal component of the axial resistance of battered piles (up to 1H:3V inclination), or anchors can be used in the building foundation design. This resistance would be considered in conjunction with additional sources of lateral load resistance considered for the structure.

Foundation Uplift Resistance

Uplift forces on the proposed foundations can be resisted using the dead weight of the concrete foundations, the weight of the materials overlying the foundations, and the submerged weight of the piles. Unit weights of materials are provided in Table 6.

For soil above the groundwater level, uplift forces should be calculated using the drained unit weight. For calculations below groundwater level, the effective unit weight should be used. Backfilled excavations in low permeability soils can be expected to fill with water. Then, effective unit weights should be used if drainage of the anchor footings is not allowed.

As noted above, the piles will be mostly located below the groundwater level, so the submerged, or effective, weights of the piles, where used, will be available to contribute to the uplift resistance. Considering that this is a reliable uplift resistance, and is counteracting a dead load, it is our opinion that a resistance factor of 0.9 is applicable for the ULS weight component. Should the pile uplift resistance capacities be insufficient for the foundation uplift loads, rock anchors should be utilized if a deadman anchor is not considered economical (i.e., dead weight of buried concrete foundation members). Detailed design recommendations for rock anchors can be provided upon request, if needed.

A sieve analysis and standard Proctor test should be completed on each of the fill materials proposed to obtain an accurate soil density to be expected, so the applicable unit weights can be estimated.

Table 6 – Geotechnical Parameters for Uplift and Lateral Resistance Design

Material Description	Unit Weight (kN/m^3)		Internal Friction Angle (°) φ'	Friction Factor, tan δ	Earth Pressure Coefficients		
	Drained γ_{dr}	Effective γ'			Active K_A	At-Rest K_0	Passive K_p
OPSS Granular A (Crushed Stone)	22.0	13.7	38	0.60	0.22	0.36	8.80
OPSS Granular B Type II (Well-Graded Sand-Gravel)	21.5	13.4	36	0.55	0.26	0.41	7.50
In-Situ Silty Clay	17.0	10.0	33	0.40	0.30	0.45	3.40
In-Situ Glacial Till	20.0	12.0	33	0.50	0.29	0.46	3.39

Notes:

- ❒ Properties for fill materials are for condition of 98% of standard Proctor maximum dry density.
- ❒ The earth pressure coefficients provided are for horizontal backfill profile.
- ❒ Passive pressure coefficients incorporate wall friction of 0.5 φ'.

Permissible Grade Raise Recommendations

If the proposed building is supported on conventional spread footings bearing on the undisturbed stiff silty clay, a reduced permissible grade raise restriction of **0.4 m** is required inside and within 3 m of the building footprint. With this permissible grade raise restriction and the available preliminary grading for the site, it is expected that significant lightweight fill (about 1.0 m thickness or more) would be required below the slab-on-grade.

If the proposed building is supported on end-bearing piles, a permissible grade raise restriction of **1.5 m** is applicable inside and within 3 m of the building footprint.

A permissible grade raise restriction of **2.0 m** may be considered throughout the remainder of the subject site, regardless of the foundation type of the proposed building.

As noted above, if higher than permissible grade raises are required, lightweight fill and/or other measures should be investigated to reduce the risks of unacceptable long-term post construction total and differential settlements.

However, once detailed grading plans have been finalized for the subject development, Paterson should complete a review of the proposed grades for the subject site to ensure they are suitable from a geotechnical perspective, and to specify lightweight fill thicknesses, where required.

5.4 Design for Earthquakes

The site class for seismic site response can be taken as **Class D** for foundations constructed at the subject site. The soils underlying the subject site are not susceptible to liquefaction. Reference should be made to the latest revision of the 2012 Ontario Building Code for a full discussion of the earthquake design requirements.

5.5 Slab-on-Grade Construction

With the removal of all topsoil and fill within the footprint of the proposed building, the native and undisturbed silty clay deposit will be considered to be an acceptable subgrade upon which to commence backfilling for floor slab construction.

The upper 300 mm of sub-slab fill is recommended to consist of OPSS Granular A crushed stone. All backfill material within the footprint of the proposed building should be placed in maximum 300 mm thick loose lifts and compacted to a minimum of 98% of its SPMDD.

If the top of the slab-on-grade extends above the permissible grade raise restriction, then lightweight fill (LWF) would be required under the 300 mm thickness of OPSS Granular A crushed stone. The specific thickness of LWF would depend on the final elevation of the slab-on-grade.

5.6 Pavement Design

Car only parking areas, access lanes, heavy truck parking areas, and concrete aprons are anticipated at this site. The proposed pavement structures are presented in Tables 7 to 9 below.

Table 7 – Recommended Light Duty Pavement Structure for Car Only Parking Areas

Thickness (mm)	Material Description
50	**Wear Course** - HL-3 or Superpave 12.5 Asphaltic Concrete
150	**BASE** - OPSS Granular A Crushed Stone
450	**SUBBASE** - OPSS Granular B Type II
Separation Layer	**Woven Geotextile** - Terrafix 200W or equivalent
SUBGRADE – Either approved fill, in-situ soil, or OPSS Granular B Type I or II material placed on in-situ soil or fill.	

Table 8 - Recommended Flexible Pavement Structure for Access Lanes and Heavy Truck Parking Areas

Thickness (mm)	Material Description
40	**Wear Course** - HL-3 or Superpave 12.5 Asphaltic Concrete
50	**Upper Binder Course** - HL-8 or Superpave 19.0 Asphaltic Concrete
50	**Lower Binder Course** - HL-8 or Superpave 19.0 Asphaltic Concrete
150	**BASE** - OPSS Granular A Crushed Stone
550	**SUBBASE** - OPSS Granular B Type II
Separation Layer	**Woven Geotextile** - Terrafix 200W or equivalent
SUBGRADE - Either approved fill, in-situ soil, or OPSS Granular B Type I or II material placed on in-situ soil or fill.	

Table 9 - Recommended Rigid Structure for Concrete Aprons	
Thickness (mm)	**Material Description**
Specified by Others	Reinforced Concrete Slab
150	**BASE** - OPSS Granular A Crushed Stone
600	**SUBBASE** - OPSS Granular B Type II
100	HI-40 Rigid Insulation
SUBGRADE - Either approved fill, in-situ soil, or OPSS Granular B Type I or II material placed on in-situ soil or fill.	

The pavement granular base and subbase should be placed in maximum 300 mm thick lifts and compacted to a minimum of 100% of the material's SPMDD using suitable compaction equipment. If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be excavated and replaced with OPSS Granular B Type II material.

Grade Raise Fill for Paved Areas

It is anticipated the cut and fill operation throughout the subject site will result in portions of the paved areas to be located over grade raise fill. This fill may consist of a workable brown silty clay material generated by site excavations. It should be noted that grey or wet/saturated portions of the silty clay will not be considered suitable for this purpose. If additional material will be imported to accommodate the proposed grades, the geotechnical consultant should review the additional material at the source prior to being delivered to site to assess its suitability for this purpose.

Site-approved grade raise fill should be spread in maximum 300 mm thick loose lifts and compacted using a suitably sized vibratory sheepsfoot roller. It is anticipated the material may be compacted by several passes of the suitably sized equipment (i.e.- 5 to 6 passes and as deemed appropriate by the geotechnical consultant at the time of construction). The material should be placed in **dry and above-freezing conditions**. Frozen material may not be considered for this purpose.

Surfaces should be shaped to minimize ponding of water and promote sheet drainage of rain. Areas exposed to heavy rainfall events should be given a sufficient period to dry to avoid over-wetting of the surface and potential for soft spots to develop throughout the fill. Compaction efforts and placement of site-generated fill should be reviewed by the geotechnical consultant at the time of construction to ensure the placement of grade raise fill is carried out satisfactorily.

Paving Timeline

It is recommended to delay paving over the grade raise fill areas by a minimum of one freeze-thaw seasons (i.e.- raise subgrade with suitable fill prior to winter and freezing temperatures, pave the following summer or fall. It is not recommended to carry out paving within the early-spring in consideration of the thawing of soils affected by frost migration.

Frost Tapers

For utility trenches and other subgrade structures backfilled with non-frost susceptible granular material or at the interface between the concrete apron and flexible pavement structure, consideration should be given to installing a 1V:5H frost tapers in hard landscaped areas and below pavement structures to lessen the effects of differential frost heaving. Consideration could also be given to installing rigid insulation which requires tapering with various insulation thicknesses.

Rigid Pavement Apron - Frost Protection and Taper Recommendations

To improve the long-term performance of the concrete apron and lessen the effects of frost penetration and movement, the following insulation detail is suggested:

- ❒ Insulation type required……HI-40 or equivalent
- ❒ HI-40 Insulation thickness (directly under the concrete apron) ……...100 mm
- ❒ HI-40 Insulation thickness (0 to 1.2 m beyond the edge of the apron)…..75 mm
- ❒ HI-40 Insulation thickness (1.2 to 2.4 m beyond the edge of the apron)..50 mm
- ❒ HI-40 Insulation thickness (2.4 to 3.6 m beyond the edge of the apron)..25 mm

Pavement Structure Drainage

The pavement structure performance is dependent on the moisture condition at the contact zone between the subgrade material and granular base. Failure to provide adequate drainage under conditions of heavy wheel loading could result in the subgrade fines pumped into the stone subbase voids, thereby reducing the load bearing capacity.

Due to the impervious nature of the subgrade materials and transitions between various pavement structures, consideration should be provided to installing subdrains during the pavement construction. At transition zones between various pavement structures, subdrains will be installed longitudinally to drain any potential water trapped in the granular layers. This recommendation should be considered at the transition between rigid aprons against the building footprints and the flexible pavement structure. The subdrains at catch basins should extend in four orthogonal directions and longitudinally when placed along a curb.

The clear crushed stone surrounding the drainage lines or the pipe, should be wrapped with suitable filter cloth. The subdrain inverts should be approximately 300 mm below subgrade level. The subgrade surface should be shaped to promote water flow to the drainage lines. Discharge of the subdrains should be directed by gravity to storm sewers or deeper drainage ditches.

6.0 Design and Construction Precautions

6.1 Foundation Drainage and Backfill

Foundation Drainage

It is recommended that a perimeter foundation drainage system be provided for the proposed structure. The system should consist of a 150 mm diameter, perforated and corrugated plastic pipe which is wrapped in a geosock and surrounded by 150 mm of 19 mm clear crushed stone, placed at the footing level around the exterior perimeter of the structure. The 19 mm clear crushed stone should be wrapped in a non-woven geotextile. The pipes should have a positive outlet, such as a gravity connection to storm sewer or sump pump.

Foundation Backfill

Backfill against the exterior sides of the foundation walls should consist of free-draining, non-frost susceptible granular materials. Foundation backfill located below pavement structures and hard landscaped areas should be spread in 300 mm thick loose lifts and compacted to a minimum of 95% of the materials SPMDD.

Sidewalks and Walkways

To avoid differential settlement within proposed sidewalks adjacent to the building, it is recommended that the upper 600 mm of backfill placed below concrete sidewalk and walkways adjacent to the proposed building footprint consist of free draining, non-frost susceptible material, such as OPSS Granular A or Granular B Type II.

The granular material should be shaped to promote positive drainage towards the building perimeter drainage system. The granular material should be placed in maximum 300 mm thick loose lifts and compacted to at least 98% of the materials SPMDD under dry and above-freezing conditions, and using suitable compaction equipment. Consideration could be given to placing a rigid insulation layer below the granular fill layer to prevent frost heave issues at the building entrance.

6.2 Protection of Footings Against Frost Action

Perimeter footings and pile caps of heated structures are required to be insulated against the deleterious effects of frost action. A minimum 1.5 m thick soil cover, or a combination of soil cover in conjunction with insulation, should be provided in this regard.

Exterior unheated foundations, such as those for isolated exterior piers, are more prone to deleterious movement associated with frost action than the exterior walls of the heated structure. These structures require additional protection, such as 2.1 m of soil cover or and equivalent combination of soil cover and rigid insulation.

6.3 Excavation Side Slopes and Temporary Shoring

The side slopes of excavations at the subject site should be cut back at acceptable slopes from the start of the excavation until structures are backfilled. It is expected that sufficient room will be available for excavations to be undertaken by open-cut methods.

However, if insufficient room is available to permit the proposed sanitary alignment excavation to be constructed by open-cut methods (i.e., unsupported excavations), then a temporary shoring system would be required.

Unsupported Excavations

The excavation side slopes above the groundwater level extending to a maximum depth of 3 m should be cut back at 1H:1V or flatter. The flatter slope is required for excavation below groundwater level. The subsurface soil is mainly a Type 2 and 3 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects. Excavated soil should not be stockpiled directly at the top of excavations and heavy equipment should maintain safe working distance from the excavation sides.

Slopes in excess of 3 m in height should be periodically inspected by the geotechnical consultant in order to detect if the slopes are exhibiting signs of distress.

Excavated soil and other material should not be stockpiled directly at the top of excavations and heavy equipment should be kept away from the excavation sides.

It is recommended that a trench box be used at all times to protect personnel working in trenches with steep or vertical sides. It is expected that services will be installed by “cut and cover” methods and excavations will not be left open for extended periods of time.

Temporary Shoring

Temporary shoring may be required for support of the overburden soils to complete the required excavations for the installation of the sanitary alignment, where insufficient room is available for open cut methods.

If a temporary shoring system is required, the design and implementation of these temporary systems will be the responsibility of the excavation contractor and their design team. The shoring requirements, designed by a structural engineer specializing in those works, will depend on the depth of the excavation, the proximity of the adjacent structures, and the elevation of the adjacent building foundations and underground services. The design and implementation of these temporary systems will be the responsibility of the excavation contractor and their design team. Inspections and approval of the temporary system will also be the responsibility of the designer.

Geotechnical information provided below is to assist the designer in completing a suitable and safe shoring system. The designer should take into account the impact of a significant precipitation event and designate design measures to ensure that precipitation will not negatively impact the shoring system or soils supported by the system. Any changes to the approved shoring design system should be reported immediately to the owner's structural design prior to implementation.

The temporary system could consist of soldier pile and lagging system or interlocking steel sheet piling.

Any additional loading due to street traffic, construction equipment, adjacent structures and facilities, etc., should be included to the earth pressures described below. These systems could be cantilevered, anchored or braced. Generally, it is expected that the shoring systems will be provided with tie-back rock anchors to ensure their stability. The shoring system is also recommended to be adequately supported to resist toe failure and inspected to ensure that the sheet piles extend well below the excavation base.

The earth pressures acting on the shoring system may be calculated with the following parameters.

Table 10 – Soil Parameters for Shoring System Design

Parameters	Values
Active Earth Pressure Coefficient (K_a)	0.33
Passive Earth Pressure Coefficient (K_p)	3
At-rest Earth Pressure Coefficient (K_o)	0.5
Total Unit Weight (γ), kN/m^3	20
Submerged Unit Weight (γ'), kN/m^3	13

The active earth pressure should be calculated where wall movements are permissible while the at-rest pressure should be calculated if no movement is permissible. The dry unit weight should be calculated above the groundwater level while the effective unit weight should be calculated below the groundwater level.

The hydrostatic groundwater pressure should be included to the earth pressure distribution wherever the effective unit weights are calculated for earth pressures. If the groundwater level is lowered, the dry unit weight for the soil/bedrock should be calculated full weight, with no hydrostatic groundwater pressure component.

Excavation Base Stability

Excavation base stability for the deep sanitary alignment should be reviewed based on the final invert elevations.

The base of supported excavations can fail by 3 general modes:

- Shear failure within the ground caused by inadequate resistance to loads imposed by grade difference inside and outside of the excavation,
- Piping from water seepage through granular soils, and
- Heave of layered soils due to water pressures confined by intervening low permeability soils.

The factor of safety with respect to base heave, FS_b, is:

$$FS_b = N_b s_u / \sigma_z$$

where:

N_b - stability factor dependent upon the geometry of the excavation and given in the figure on the following page.
s_u - undrained shear strength of the soil below the base level.
σ_z - total overburden and surcharge pressures at the bottom of the excavation.

Shear failure of excavation bases is typically rare in granular soils if adequate lateral support is provided. Inadequate dewatering can cause instability in excavations made through granular or layered soils. The potential for base heave in cohesive soils should be determined for stability of flexible retaining systems.

As a preliminary precaution, service trench excavations exceeding 4 to 5 m in depth should be assessed for excavation base stability during the design phase to verify the suitability of conventional cut-and-cover excavation techniques.

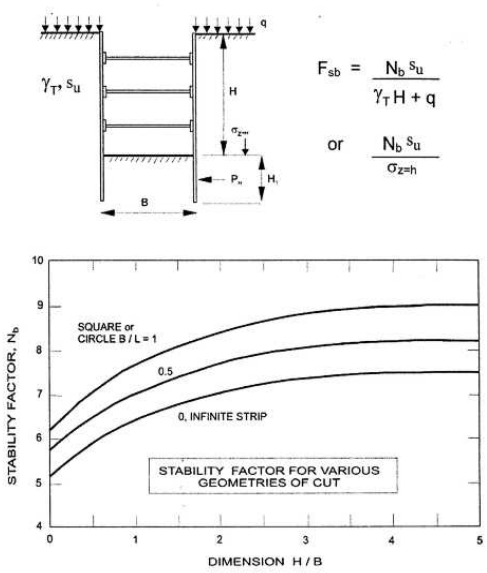

Figure for Stability Factor N_b

6.4 Pipe Bedding and Backfill

Bedding and backfill materials should be in accordance with the most recent Material Specifications and Standard Detail Drawings from the Department of Public Works and Services, Infrastructure Services Branch of the City of Ottawa.

At least 150 mm of OPSS Granular A should be used for pipe bedding for sewer and water pipes when placed on a soil subgrade. If the bedding subgrade consists of grey silty clay, the thickness of the bedding should be increased to 300 mm for sewer pipes. The bedding should also extend to the spring line of the pipe.

Cover material, from the spring line to at least 300 mm above the obvert of the pipe, should consist of OPSS Granular A or Granular B Type II with a maximum size of 25 mm. The bedding and cover materials should be placed in maximum 225 mm thick lifts compacted to 99% of the material's SPMDD.

It should generally be possible to re-use the site materials above the cover material if the operations are carried out in dry weather conditions.

Where hard surface areas are considered above the trench backfill, the trench backfill material within the frost zone (about 1.8 m below finished grade) should match the soils exposed at the trench walls to minimize differential frost heaving. The trench backfill should be placed in maximum 300 mm thick loose lifts and compacted to a minimum of 95% of the material's SPMDD.

To reduce long-term lowering of the groundwater level at this site, clay seals should be provided in the service trenches. The seals should be at least 1.5 m long and should extend from trench wall to trench wall. Generally, the seals should extend from the frost line and fully penetrate the bedding, sub-bedding and cover material. The barriers should consist of relatively dry and compactable brown silty clay placed in maximum 225 mm thick loose lifts and compacted to a minimum of 95% of the material's SPMDD. The clay seals should be placed at the site boundaries and at no more than 60 m intervals in the service trenches.

6.5 Groundwater Control

Groundwater Control for Building Construction

It is anticipated that groundwater infiltration into the excavations should be controllable using open sumps. The contractor should be prepared to direct water away from all bearing surfaces and subgrades, regardless of the source, to prevent disturbance to the founding medium.

Dewatering Permit

A temporary Ministry of Environment, Conservation and Parks (MECP) permit to take water (PTTW) may be required if more than 400,000 L/day of ground and/or surface water are to be pumped during the construction phase. At least 4 to 5 months should be allowed for completion of the application and issuance of the permit by the MECP.

For typical ground or surface water volumes being pumped during the construction phase, typically between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of two to four weeks should be allotted for completion of the EASR registration and the Water Taking and Discharge Plan to be prepared by a Qualified Persons as stipulated under O.Reg. 63/16.

6.6 Winter Construction

Precautions must be taken if winter construction is considered for this project.

The subsoil conditions at this site consist of frost susceptible materials. In the presence of water and freezing conditions, ice could form within the soil mass with potentially intolerable settlement upon thawing.

In the event of construction during below zero temperatures, the founding stratum should be protected from freezing temperatures by propane heaters and tarpaulins or other suitable means. Additional means may consist of backfilling the foundation with an appropriate thickness of fill extending above and beyond the base of the footing. It would be further recommended to mitigate heavy-truck traffic in proximity to the foundation and across the insulating soil to minimize the effect of compressing frost-affected soils against sufficiently insulated soils.

The base of the excavations should be insulated from sub-zero temperatures immediately upon exposure and until such time as heat is adequately supplied to the building and the footings are protected with sufficient soil cover to prevent freezing at founding level.

Trench excavations and pavement construction are difficult activities to complete during freezing conditions without introducing frost in the subgrade or in the excavation walls and bottoms. Precautions should be considered if such activities are to be completed during freezing conditions. Additional information could be provided, if required.

6.7 Corrosion Potential and Sulphate

The results of analytical testing show that the sulphate content is less than 0.1%. This result is indicative that Type 10 Portland cement (normal cement) would be appropriate for this site. The chloride content and the pH of the sample indicate that they are not significant factors in creating a corrosive environment for exposed ferrous metals at this site, whereas the resistivity is indicative of a non-aggressive to slightly aggressive corrosive environment.

6.8 Tree Planting Restrictions

Paterson completed a soils review of the site to determine the applicable tree planting setbacks, in accordance with the City of Ottawa's "Tree Planting in Sensitive Marine Clay Soils (2017 Guidelines)". Atterberg limits testing was completed for selected silty clay samples. Sieve analysis testing was also completed on selected soil samples. The results of the testing are presented in Tables 1, 2, and 3 in Section 4.2 and included in Appendix 1.

Based on the results of our review, the plasticity index of the silty clay deposit at the subject site does not exceed 40%. Therefore, the following tree planting setbacks are recommended for the silty clay deposit. Large trees (mature height over 14 m) can be planted within the silty clay areas provided a tree to foundation setback equal to the full mature height of the tree can be provided (e.g., in a park or other green space).

Tree planting setback limits may be reduced to **4.5 m** for small (mature height up to 7.5 m) and medium size trees (mature tree height 7.5 to 14 m), provided that the conditions noted below are met.

- ❒ The underside of footing (USF) is 2.1 m or greater below the lowest finished grade must be satisfied for footings within 10 m from the tree, as measured from the centre of the tree trunk and verified by means of the Grading Plan as indicated procedural changes below.

- ❒ A small tree must be provided with a minimum 25 m^3 of available soil volume while a medium tree must be provided with a minimum of 30 m^3 of available soil volume, as determined by the Landscape Architect. The developer is to ensure that the soil is generally un-compacted when backfilling in street tree planting locations.

- ❒ The tree species must be small (mature tree height up to 7.5 m) to medium size (mature tree height 7.5 m to 14 m) as confirmed by the Landscape Architect.

- ❒ The foundation walls are to be reinforced at least nominally (minimum of two upper and two lower 15M bars in the foundation wall).

- ❒ Grading surrounding the tree must promote drainage to the tree root zone (in such a manner as not to be detrimental to the tree).

It is well documented in the literature, and is our experience, that fast-growing trees located near buildings founded on cohesive soils that shrink on drying can result in long-term differential settlements of the structures. Tree varieties that have the most pronounced effect on foundations are seen to consist of poplars, willows, and some maples (i.e., Manitoba Maples) and, as such, they should not be considered in the landscaping design.

7.0 Recommendations

It is a requirement for the foundation design data provided herein to be applicable that a material testing and observation program be performed by the geotechnical consultant. The following aspects of the program should be performed by the geotechnical consultant:

- Review detailed grading plan(s) from a geotechnical perspective.
- Observation of all bearing surfaces prior to the placement of concrete.
- Sampling and testing of the concrete and fill materials.
- Periodic observation of the condition of unsupported excavation side slopes in excess of 3 m in height, if applicable.
- Observation of all subgrades prior to backfilling.
- Field density tests to determine the level of compaction achieved.
- Sampling and testing of the bituminous concrete including mix design reviews.

All excess soils, with the exception of engineered crushed stone fill, generated by construction activities that will be transported on-site or off-site should be handled as per *Ontario Regulation 406/19: On-Site and Excess Soil Management.*

A report confirming that these works have been conducted in general accordance with our recommendations could be issued upon the completion of a satisfactory inspection program by the geotechnical consultant.

8.0 Statement of Limitations

The recommendations provided are in accordance with the present understanding of the project. Paterson requests permission to review the recommendations when the drawings and specifications are completed.

A soils investigation is a limited sampling of a site. Should any conditions at the site be encountered which differ from those at the test locations, Paterson requests immediate notification to permit reassessment of our recommendations.

The recommendations provided herein should only be used by the design professionals associated with this project. They are not intended for contractors bidding on or undertaking the work. The latter should evaluate the factual information provided in this report and determine the suitability and completeness for their intended construction schedule and methods. Additional testing may be required for their purposes.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than Broccolini or their agents is not authorized without review by Paterson for the applicability of our recommendations to the alternative use of the report.

Paterson Group Inc.

Fernanda Carrozzi, PhD. Geoph. Scott S. Dennis, P.Eng.

Report Distribution:

- ❑ Broccolini (digital copy)
- ❑ Paterson Group (1 copy)

APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

TEST HOLE LOGS BY OTHERS

ATTERBERG LIMITS TESTING RESULTS

LABORATORY TESTING RESULTS BY OTHERS

ANALYTICAL TESTING RESULTS

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366796.64 **NORTHING:** 5017980.42 **ELEVATION:** 90.61

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 25, 2024

FILE NO. : PG5876

HOLE NO. : BH 1-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.25m [90.36m]		0	SS 1	100	2-3-5-6 8	23.45			90
Hard to very stiff, brown **SILTY CLAY**						33.51			
		1	SS 2	100	3-3-4-5 7	34.81			89
2.13m [88.48m]		2	SS 3	100	1-1-2-2 3	41.73			
Dynamic Cone Penetration Test commenced at 2.13 m depth									88
		3							87
		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366796.64 **NORTHING:** 5017980.42 **ELEVATION:** 90.61

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GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
19.76m [70.85m]		20							70
End of Borehole		21							69
Cone pushed up to 18.59 m depth.		22							68
Practical refusal to DCPT at 19.76 m depth.		23							67
		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366763.67 **NORTHING:** 5018024.57 **ELEVATION:** 90.58

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 25, 2024

FILE NO. : PG5876

HOLE NO. : BH 2-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.23m [90.35m]		0	SS 1	90	2-2-4-6	21.6			90
Hard to very stiff, brown **SILTY CLAY**					6	30.72			
		1	SS 2	90	4-3-5-4	38.67			89
					8				
2.13m [88.45m]		2	SS 3	70	5-2-2-2	26.76			88
Dynamic Cone Penetration Test commenced at 2.13 m depth					4				
		3							87
		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366763.67 **NORTHING:** 5018024.57 **ELEVATION:** 90.58

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 25, 2024

FILE NO. : PG5876

HOLE NO. : BH 2-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19					■		71
		20					■ ■ ■ ■		70
20.45m [70.13m]		21							69
End of Borehole Cone pushed up to 18.90 m depth. Practical refusal to DCPT at 20.45 m depth.		22							68
		23							67
		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366721.56 **NORTHING:** 5018070.21 **ELEVATION:** 90.51

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 25, 2024

FILE NO. : PG5876

HOLE NO. : BH 3-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.25m [90.26m]		0							90
Very stiff brown **SILTY CLAY**		1					89.0		89
		2					229.0		88
2.90m [87.61m]		3							87
Firm to stiff, grey **SILTY CLAY**		4							86
		5							85
		6							84
7.32m [83.19m]		7							83
Dynamic Cone Penetration Test commenced at 7.32 m depth		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366721.56 **NORTHING:** 5018070.21 **ELEVATION:** 90.51

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 25, 2024

FILE NO. : PG5876

HOLE NO. : BH 3-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / △ REMOULDED SHEAR STRENGTH, Cur (kPa) ▲ PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
19.74m [70.77m]		20							70
End of Borehole		21							69
Cone pushed up to 17.63 m depth.		22							68
Practical refusal to DCPT at 19.74 m depth.		23							67
		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366657.86 **NORTHING:** 5018035.99 **ELEVATION:** 90.54

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 26, 2024

FILE NO. : PG5876

HOLE NO. : BH 4-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.18m [90.36m]		0	SS 1	70	2-2-4-5	23.66			90
Very stiff brown **SILTY CLAY**					6	27.53			
		1	SS 2	100	3-4-5-4	39.95			89
					9				
2.13m [88.41m]		2	SS 3	100	2-1-2-2	29.8			88
					3				
Dynamic Cone Penetration Test commenced at 7.32 m depth		3							87
		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366657.86 **NORTHING:** 5018035.99 **ELEVATION:** 90.54

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 26, 2024

FILE NO. : PG5876

HOLE NO. : BH 4-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
19.61m [70.93m]		20							70
End of Borehole		21							69
Cone pushed up to 13.87 m depth.		22							68
Practical refusal to DCPT at 19.61 m depth.		23							67
		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366644.70 **NORTHING:** 5017962.75 **ELEVATION:** 90.56

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 26, 2024

FILE NO. : PG5876

HOLE NO. : BH 5-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.25m [90.31m]		0							90
Hard to very stiff, brown **SILTY CLAY**		1					119.0	1.1 m 2024-08-13	89
		2					99.0		88
2.97m [87.59m]		3					109.0		87
Stiff, grey **SILTY CLAY**		4							86
- Firm at 3.81 m depth		5							85
6.55m [84.01m]		6							84
Dynamic Cone Penetration Test commenced at 6.55 m depth		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366644.70 **NORTHING:** 5017962.75 **ELEVATION:** 90.56

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 26, 2024

FILE NO. : PG5876

HOLE NO. : BH 5-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / △ REMOULDED SHEAR STRENGTH, Cur (kPa) ▲ PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
		20							70
20.96m [69.60m]		21							69
End of Borehole		22							68
Cone pushed up to 15.19 m depth.		23							67
Practical refusal to DCPT at 20.96 m depth.		24							66
(GWL at 1.15 m depth - August 13, 2024)		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366682.93 **NORTHING:** 5017929.77 **ELEVATION:** 90.46

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 26, 2024

FILE NO. : PG5876

HOLE NO. : BH 6-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80	REMOULDED SHEAR STRENGTH, Cur (kPa) ▲ PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80	PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE											
TOPSOIL 0.25m [90.21m]		0	SS 1	60	2-3-4-6 7	29.87 29.63					90
Very stiff brown **SILTY CLAY**		1	SS 2	100	2-4-5-6 9	29.44					89
2.13m [88.33m]		2	SS 3	100	1-2-2-2 4	32.89					88
Dynamic Cone Penetration Test commenced at 2.13 m depth		3									87
		4									86
		5									85
		6									84
		7									83
		8									82
		9									81
		10									80
		11									79
		12									78
		13									

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366682.93 **NORTHING:** 5017929.77 **ELEVATION:** 90.46

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 26, 2024

FILE NO. : PG5876

HOLE NO. : BH 6-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
		20							70
		21							69
		22							68
		23							67
23.62m [66.84m]		24							66
End of Borehole		25							65
Cone pushed up to 18.90 m depth.		26							
Practical refusal to DCPT at 23.63 m depth.									

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366749.06 **NORTHING:** 5017944.55 **ELEVATION:** 90.45

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 26, 2024

FILE NO. : PG5876

HOLE NO. : BH 7-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.28m [90.17m]		0	SS 1	50	1-2-4-5 6	23.2 30.11			90
Very stiff brown **SILTY CLAY**		1	SS 2	100	2-4-5-6 9	33.87			89
2.13m [88.32m]		2	SS 3	100	1-1-2-2 3	30.88			88
Dynamic Cone Penetration Test commenced at 2.13 m depth		3							87
		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366749.06 **NORTHING:** 5017944.55 **ELEVATION:** 90.45

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 26, 2024

FILE NO. : PG5876

HOLE NO. : BH 7-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / △ REMOULDED SHEAR STRENGTH, Cur (kPa) ▲ PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
20.19m [70.26m]		20							70
End of Borehole		21							69
Cone pushed up to 15.34 m depth.		22							68
Practical refusal to DCPT at 20.19 m depth.		23							67
		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366712.80 **NORTHING:** 5017973.11 **ELEVATION:** 90.53

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 29, 2024

FILE NO. : PG5876

HOLE NO. : BH 8-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.20m [90.33m]		0	SS 1	50	2-2-3-3 5	23.74			90
Hard to very stiff, brown **SILTY CLAY**						32.22			
		1	SS 2	50	3-5-4-4 9	45.79			89
2.13m [88.40m]		2	SS 3	60	3-2-3-3 5	26.74			88
Dynamic Cone Penetration Test commenced at 2.13 m depth		3							87
		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366712.80 **NORTHING:** 5017973.11 **ELEVATION:** 90.53

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 29, 2024

FILE NO. : PG5876

HOLE NO. : BH 8-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / △ REMOULDED SHEAR STRENGTH, Cur (kPa) / ▲ PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
19.89m [70.64m]		20							70
End of Borehole		21							69
Cone pushed up to 14.17 m depth.		22							68
Practical refusal to DCPT at 19.89 m depth.		23							67
		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366708.14 **NORTHING:** 5018020.56 **ELEVATION:** 90.43

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 29, 2024

FILE NO. : PG5876

HOLE NO. : BH 9-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.28m [90.15m]		0							90
Hard to very stiff, brown **SILTY CLAY**		1					229.0		89
		2					139.0		88
		3							87
3.73m [86.70m]		4							86
Firm to stiff, grey **SILTY CLAY**		5							85
		6							84
6.55m [83.88m]		7							83
Dynamic Cone Penetration Test commenced at 6.55 m depth		8							82
		9							81
		10							80
		11							79
		12							78
		13							

▽ 2024-08-13

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366708.14 **NORTHING:** 5018020.56 **ELEVATION:** 90.43

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 29, 2024

FILE NO. : PG5876

HOLE NO. : BH 9-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / △ REMOULDED SHEAR STRENGTH, Cur (kPa) ▲ PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
		20							70
21.01m [69.42m]		21							69
End of Borehole Cone pushed up to 14.05 m depth. Practical refusal to DCPT at 21.01 m depth. (GWL at 1.02 m depth - August 13, 2024)		22							68
		23							67
		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366626.06 **NORTHING:** 5017875.49 **ELEVATION:** 90.52

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 29, 2024

FILE NO. : PG5876

HOLE NO. : BH 10-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		0							90
FILL: Brown silty sand, with crushed stone and gravel 0.08m [90.44m]			SS 1		3-6-4-3 10	8.57 31.55 22.85			
TOPSOIL 0.30m [90.22m]		1	SS 2	70	2-5-7-7 12	34.35			89
Hard to very stiff, brown **SILTY CLAY** 2.13m [88.39m]		2	SS 3	100	2-3-3-3 6	29.1			88
Dynamic Cone Penetration Test commenced at 2.13 m depth		3							87
		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366626.06 **NORTHING:** 5017875.49 **ELEVATION:** 90.52

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 29, 2024

FILE NO. : PG5876

HOLE NO. : BH 10-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / △ REMOULDED SHEAR STRENGTH, Cur (kPa) / ▲ PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
		20							70
		21							69
		22							68
22.68m [67.84m]		23							67
End of Borehole		24							66
Cone pushed up to 19.91 m depth.		25							65
Practical refusal to DCPT at 22.68 m depth.		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366567.02 **NORTHING:** 5017860.06 **ELEVATION:** 90.52

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

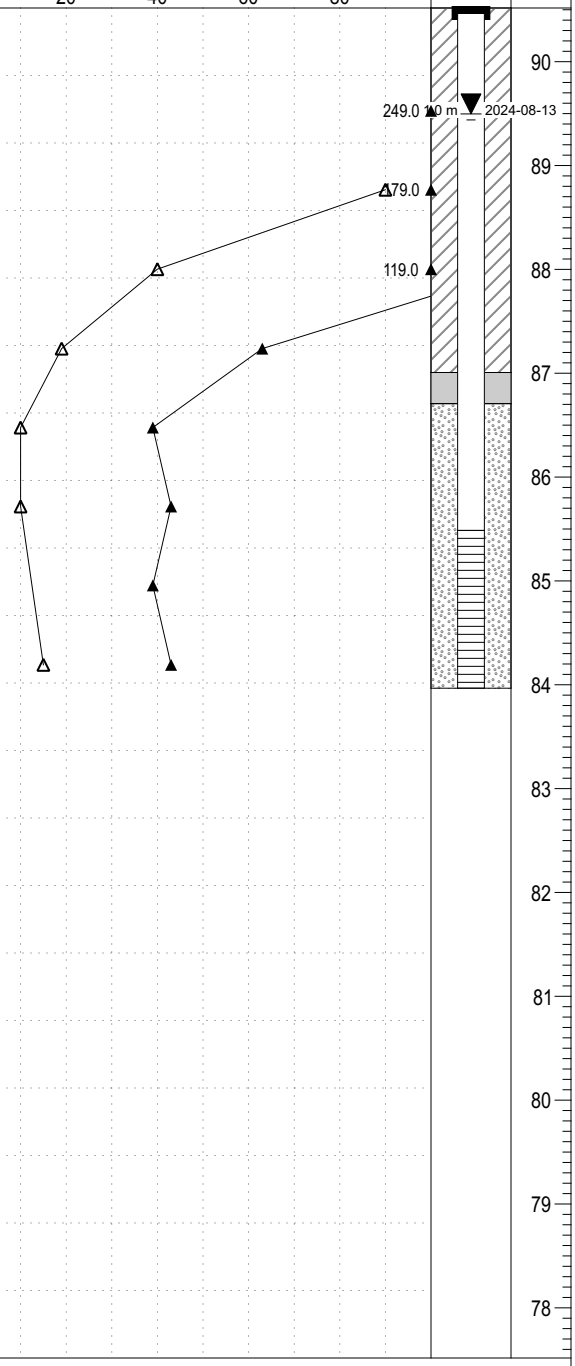
REMARKS:

DATE: July 29, 2024

FILE NO. : PG5876

HOLE NO. : BH 11-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		0							90
TOPSOIL 0.30m [90.22m]									
Hard to very stiff, brown **SILTY CLAY**		1							89
		2							88
3.35m [87.17m]		3							87
Firm, grey **SILTY CLAY**		4							86
		5							85
6.55m [83.97m]		6							84
Dynamic Cone Penetration Test commenced at 6.55 m depth		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							



SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366567.02 **NORTHING:** 5017860.06 **ELEVATION:** 90.52

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 29, 2024

FILE NO. : PG5876

HOLE NO. : BH 11-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / △ REMOULDED SHEAR STRENGTH, Cur (kPa) ▲ PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
		20							70
		21							69
21.84m [68.68m]		22							68
End of Borehole		23							67
Cone pushed up to 19.18 m depth.		24							66
Practical refusal to DCPT at 21.84 m depth.		25							65
(GWL at 1.02 m depth - August 13, 2024)		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366521.69 **NORTHING:** 5017840.31 **ELEVATION:** 90.53

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 29, 2024

FILE NO. : PG5876

HOLE NO. : BH 12-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.25m [90.28m]		0	SS 1	60	2-5-6-7 11	19.96 33.56			90
Hard to very stiff, brown **SILTY CLAY**		1	SS 2	100	3-5-5-6 10	38.05			89
2.13m [88.40m]		2	SS 3	100	1-2-2-3 4	36.41			88
Dynamic Cone Penetration Test commenced at 2.13 m depth		3							87
		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366521.69 **NORTHING:** 5017840.31 **ELEVATION:** 90.53

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 29, 2024

FILE NO. : PG5876

HOLE NO. : BH 12-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
19.96m [70.57m]		20							70
End of Borehole		21							69
Cone pushed up to 17.45 m depth.		22							68
Practical refusal to DCPT at 19.96 m depth.		23							67
		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366818.35 **NORTHING:** 5017939.97 **ELEVATION:** 90.57

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 30, 2024

FILE NO. : PG5876

HOLE NO. : BH 13-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.28m [90.29m]		0	SS 1	60	1-2-3-5	24.24	○		90
Hard to very stiff, brown **SILTY CLAY**					5	33.07	○		
		1	SS 2	60	3-5-8-8	34.29	○		89
					13				
2.13m [88.44m]		2	SS 3	100	2-2-3-2	32.03	○		88
					5				
Dynamic Cone Penetration Test commenced at 2.13 m depth		3							87
		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366818.35 **NORTHING:** 5017939.97 **ELEVATION:** 90.57

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 30, 2024

FILE NO. : PG5876

HOLE NO. : BH 13-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
19.61m [70.96m]		20							70
End of Borehole		21							69
Cone pushed up to 14.33 m depth.		22							68
Practical refusal to DCPT at 19.61 m depth.		23							67
		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366739.01 **NORTHING:** 5017875.54 **ELEVATION:** 90.38

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

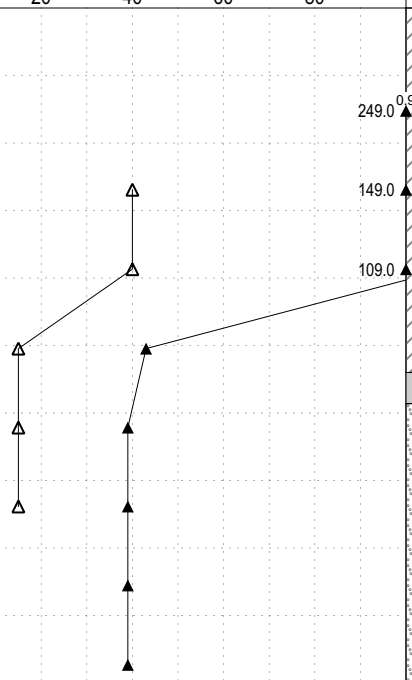
REMARKS:

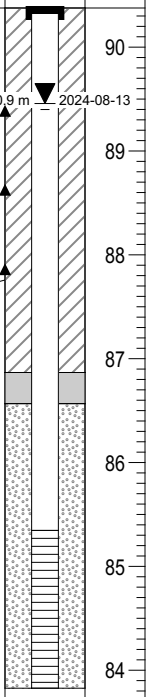
DATE: July 30, 2024

FILE NO. : PG5876

HOLE NO. : BH 14-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		0							90
TOPSOIL 0.25m [90.13m]									
Hard to very stiff, brown **SILTY CLAY**		1							89
		2							88
2.97m [87.41m]		3							87
Firm, grey **SILTY CLAY**		4							86
		5							85
6.55m [83.83m]		6							84
Dynamic Cone Penetration Test commenced at 6.55 m depth		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							





SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366739.01 **NORTHING:** 5017875.54 **ELEVATION:** 90.38

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 30, 2024

FILE NO. : PG5876

HOLE NO. : BH 14-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
19.02m [71.36m]		19							71
End of Borehole		20							70
Cone pushed up to 19.02 m depth.		21							69
Practical refusal to DCPT at 14.63 m depth.		22							68
(GWL at 0.92 m depth - August 13, 2024)		23							67
		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366681.92 **NORTHING:** 5017868.47 **ELEVATION:** 90.46

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 30, 2024

FILE NO. : PG5876

HOLE NO. : BH 15-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.30m [90.16m]		0							90
Hard to stiff, brown **SILTY CLAY**		1						0.6 m 2023-08-13	89
		2					249.0 / 179.0		88
3.05m [87.41m]		3							87
Firm to stiff, grey **SILTY CLAY**		4							86
		5							85
6.55m [83.91m]		6							84
Dynamic Cone Penetration Test commenced at 6.55 m depth		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366681.92 **NORTHING:** 5017868.47 **ELEVATION:** 90.46

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 30, 2024

FILE NO. : PG5876

HOLE NO. : BH 15-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / △ REMOULDED SHEAR STRENGTH, Cur (kPa) ▲ PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
		20							70
		21							69
22.00m [68.46m]		22							68
End of Borehole		23							67
Cone pushed up to 15.24 m depth.		24							66
Practical refusal to DCPT at 22.00 m depth.		25							65
(GWL at 0.63 m depth - August 13, 2024)		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366608.67 **NORTHING:** 5017827.16 **ELEVATION:** 90.38

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 30, 2024

FILE NO. : PG5876

HOLE NO. : BH 16-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.25m [90.13m]		0	SS 1	60	1-3-3-6	29.64			90
Very stiff, brown **SILTY CLAY**					6	33.03			
		1	SS 2	100	2-4-5-5	38.36			89
					9				
2.13m [88.25m]		2	SS 3	100	1-2-2-2	34.04			88
					4				
Dynamic Cone Penetration Test commenced at 2.13 m depth		3							87
		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366608.67 **NORTHING:** 5017827.16 **ELEVATION:** 90.38

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 30, 2024

FILE NO. : PG5876

HOLE NO. : BH 16-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / △ REMOULDED SHEAR STRENGTH, Cur (kPa) ▲ PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
		20							70
		21							69
21.18m [69.20m]									
End of Borehole		22							68
Cone pushed up to 15.24 m depth.		23							67
Practical refusal to DCPT at 21.18 m depth.		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366552.75 **NORTHING:** 5017783.74 **ELEVATION:** 90.29

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 30, 2024

FILE NO. : PG5876

HOLE NO. : BH 17-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.20m [90.09m]		0	SS 1	70	1-2-3-3 5	33.35			90
Very stiff, brown **SILTY CLAY**		1	SS 2	100	3-4-5-5 9	37.61			89
2.13m [88.16m]		2	SS 3	100	2-2-3-3 5	35.13			88
Dynamic Cone Penetration Test commenced at 2.13 m depth		3							87
		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366552.75 **NORTHING:** 5017783.74 **ELEVATION:** 90.29

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 30, 2024

FILE NO. : PG5876

HOLE NO. : BH 17-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
19.86m [70.43m]		20							70
End of Borehole Cone pushed up to 15.24 m depth. Practical refusal to DCPT at 19.86 m depth.		21							69
		22							68
		23							67
		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366298.58 **NORTHING:** 5017778.70 **ELEVATION:** 90.61

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 31, 2024

FILE NO. : PG5876

HOLE NO. : BH 18-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.28m [90.33m]		0	SS 1	70	3-4-5-7 9	19.12 32.74			90
Hard to stiff, brown **SILTY CLAY**		1	SS 2	80	6-6-5-5 11	36.56		1.3 m 2024-08-13	89
		2	SS 3	100	2-3-2-3 5	33.2			88
			SS 4	100	2-1-1-1 2	39.88			
3.66m [86.95m]		3							87
Firm, grey **SILTY CLAY**		4							86
5.18m [85.43m]		5	SS 5	100	1-2-1-1 3	66.71			85
End of Borehole		6							84
(GWL at 1.26 m depth - August 13, 2024)		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366342.71 **NORTHING:** 5017902.32 **ELEVATION:** 90.60

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 31, 2024

FILE NO. : PG5876

HOLE NO. : BH 19-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.25m [90.35m]		0	SS 1	30	2-3-5-6 8	23.24 27.82			90
Very stiff brown **SILTY CLAY**		1	SS 2	100	3-3-4-5 7	40.33			89
		2	SS 3	100	2-1-2-2 3	33.4			88
3.51m [87.09m]		3					101.0		87
Firm, grey **SILTY CLAY** 4.27m [86.33m]		4							86
End of Borehole		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366496.91 **NORTHING:** 5017771.92 **ELEVATION:** 90.44

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 31, 2024

FILE NO. : PG5876

HOLE NO. : BH 20-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.25m [90.19m]		0							90
Very stiff, brown **SILTY CLAY**		1							89
		2							88
3.35m [87.09m]		3							87
Firm to stiff grey **SILTY CLAY**		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
11.13m [79.31m]		11							79
Dynamic Cone Penetration Test commenced at 11.13 m depth		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366496.91 **NORTHING:** 5017771.92 **ELEVATION:** 90.44

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: July 31, 2024

FILE NO. : PG5876

HOLE NO. : BH 20-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
20.35m [70.09m]		20							70
End of Borehole		21							69
Cone pushed up to 17.37 m depth.		22							68
Practical refusal to DCPT at 20.35 m depth.		23							67
		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366644.01 **NORTHING:** 5017774.89 **ELEVATION:** 90.06

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 01, 2024

FILE NO. : PG5876

HOLE NO. : BH 21-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		0							90
TOPSOIL and organics									
0.25m [89.81m]									
Very stiff, brown **SILTY CLAY**		1							89
		2							88
		3							87
3.66m [86.40m]									
Firm to stiff, grey **SILTY CLAY**		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
11.13m [78.93m]		11							79
Dynamic Cone Penetration Test commenced at 11.13 m depth		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366644.01 **NORTHING:** 5017774.89 **ELEVATION:** 90.06

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 01, 2024

FILE NO. : PG5876

HOLE NO. : BH 21-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / △ REMOULDED SHEAR STRENGTH, Cur (kPa) ▲ PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
		20							70
20.45m [69.61m]		21							69
End of Borehole		22							68
Cone pushed up to 14.17 m depth.		23							67
Practical refusal to DCPT at 20.45 m depth.		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366590.72 **NORTHING:** 5017655.28 **ELEVATION:** 90.37

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 01, 2024

FILE NO. : PG5876

HOLE NO. : BH 22-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.28m [90.09m]		0	SS 1	30	2-4-5-4 9	22.87 35.85			90
Hard to firm, brown **SILTY CLAY**		1	SS 2	100	2-3-5-5 8	30.43		1.1 m 2024-08-13	89
		2	SS 3	100	1-2-2-2 4	31.12			88
4.57m [85.80m]		3					119.0		87
End of Borehole		4							86
(GWL at 1.08 m depth - August 13, 2024)		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366775.72 **NORTHING:** 5017808.64 **ELEVATION:** 90.37

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 01, 2024

FILE NO. : PG5876

HOLE NO. : BH 23-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	RECOVERY (%)	N, Nc OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.38m [89.99m]		0	SS 1	30	3-4-6-6	32.32			90
Hard to very stiff, brown **SILTY CLAY**					10	36.56			
		1	SS 2	100	3-4-4-4	35.04			89
					8				
		2	SS 3	100	2-3-3-3	32.5			88
					6				
3.51m [86.86m]		3					119.0		87
Firm to stiff, grey **SILTY CLAY**		4							86
		5							85
6.71m [83.66m]		6	SS 4	100	P	66.42		0.9 m 2024-08-13	84
End of Borehole		7							83
(GWL at 0.88 m depth - August 13, 2024)		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366832.58 **NORTHING:** 5017838.09 **ELEVATION:** 90.25

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 02, 2024

FILE NO. : PG5876

HOLE NO. : BH 24-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.28m [89.97m]		0	SS 1	70	1-2-3-5	48.7			90
Hard to very stiff, brown **SILTY CLAY**					5	33.85			
		1	SS 2	100	2-4-5-5	37.36			89
					9				
		2	SS 3	100	1-2-3-2	26.64			88
					5				
3.51m [86.73m]		3					149.0		87
Firm, grey **SILTY CLAY**		4							86
		5							85
		6	SS 4	100	P	61.06			84
7.32m [82.93m]		7							83
End of Borehole		8							82
(GWL at 0.45 m depth - August 13, 2024)		9							81
		10							80
		11							79
		12							78
		13							

0.5 m 2024-08-13

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366792.13 **NORTHING:** 5017856.33 **ELEVATION:** 90.44

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 02, 2024

FILE NO. : PG5876

HOLE NO. : BH 25-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / △ REMOULDED SHEAR STRENGTH, Cur (kPa) / ▲ PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.30m [90.14m]		0							90
Very stiff, brown **SILTY CLAY**		1						1.3 m ▼ 2024-08-13	89
		2							88
		3							87
3.66m [86.78m]									
Firm to stiff, grey **SILTY CLAY**		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
11.13m [79.31m]		11							79
End of Borehole		12							78
(GWL at 1.26 m depth - August 13, 2024)		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366921.89 **NORTHING:** 5017932.86 **ELEVATION:** 90.32

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 02, 2024

FILE NO. : PG5876

HOLE NO. : BH 26-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / △ REMOULDED SHEAR STRENGTH, Cur (kPa) ▲ PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		0							90
TOPSOIL 0.25m [90.07m]									
Hard to very stiff, brown **SILTY CLAY**		1							89
		2							88
		3							87
3.66m [86.66m]									
Firm to stiff, grey **SILTY CLAY**		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
11.89m [78.43m]		12							78
End of Borehole		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366935.39 **NORTHING:** 5017999.30 **ELEVATION:** 90.28

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 06, 2024

FILE NO. : PG5876

HOLE NO. : BH 27-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.30m [89.98m]		0	SS 1	70	1-1-3-4	29.76			90
Hard to very stiff, brown **SILTY CLAY**					4	34.01			
		1	SS 2	90	2-3-5-5	33.52			89
					8				
		2	SS 3	90	1-3-3-4	28.94			88
					6				
2.90m [87.38m]							119.0		
Firm, grey **SILTY CLAY**		3							87
		4							86
5.03m [85.25m]		5							85
End of Borehole		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366899.03 **NORTHING:** 5018108.15 **ELEVATION:** 90.59

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 06, 2024

FILE NO. : PG5876

HOLE NO. : BH 28-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.25m [90.34m]		0	SS 1	50	3-6-7-8	25.63			90
Hard to very stiff, brown **SILTY CLAY**					13	27.78			
		1	SS 2	100	2-3-4-4	39.72			89
					7				
		2	SS 3	100	1-1-1-2	36.02			88
					2				
3.05m [87.54m]		3							87
Firm, grey **SILTY CLAY**		4							86
5.03m [85.56m]		5							85
End of Borehole		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12							78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 366989.29 **NORTHING:** 5018132.77 **ELEVATION:** 90.34

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 06, 2024

FILE NO. : PG5876

HOLE NO. : BH 29-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80	REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80	PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		0									90
TOPSOIL 0.28m [90.06m]			SS 1	40	3-5-6-6 11	23.46 17.06					
Compact **SANDY SILT**, trace clay 0.69m [89.65m]		1	SS 2	100	4-4-5-7 9	37.11				1.3 m 2024-08-13	89
Hard to very stiff, brown **SILTY CLAY**		2	SS 3	100	2-3-3-3 6	28.26					88
		3									87
4.42m [85.92m]		4									86
Stiff, grey **SILTY CLAY**		5									85
5.03m [85.31m]		6									84
End of Borehole		7									83
(GWL at 1.33 m depth - August 13, 2024)		8									82
		9									81
		10									80
		11									79
		12									78
		13									

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 367033.99 **NORTHING:** 5017996.72 **ELEVATION:** 90.01

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 06, 2024

FILE NO. : PG5876

HOLE NO. : BH 30-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) / PL (%) WATER CONTENT (%) LL (%)	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE							20 40 60 80		
TOPSOIL 0.33m [89.68m]		0				34.8			90
Very stiff, brown **SILTY CLAY**						37.48			
		1							89
		2							88
		3							87
3.66m [86.35m]									
Firm to Stiff, grey **SILTY CLAY**		4							86
		5							85
		6							84
		7							83
		8							82
		9							81
		10							80
		11							79
		12	SS 1		P	45.86			78
12.80m [77.21m]			SS 2	100	P	54.61			
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 367033.99 **NORTHING:** 5017996.72 **ELEVATION:** 90.01

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 06, 2024

FILE NO. : PG5876

HOLE NO. : BH 30-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
Dynamic Cone Penetration Test commenced at 12.8 m depth		13							77
		14							76
		15							75
		16							74
		17							73
		18							72
		19							71
		20							70
		21							69
21.44m [68.57m]									
End of Borehole		22							68
Cone pushed up to 19.91 m depth.		23							67
Practical refusal to DCPT at 21.44 m depth.		24							66
		25							65
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 367067.25 **NORTHING:** 5018068.19 **ELEVATION:** 89.99

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 07, 2024

FILE NO. : PG5876

HOLE NO. : BH 31-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.28m [89.71m]		0							89
Very stiff, brown **SILTY CLAY**		1							88
		2							87
3.66m [86.33m]		3							86
Firm to stiff, grey **SILTY CLAY**		4							85
		5							84
		6							83
		7							82
		8							81
		9							80
		10							79
		11							78
11.89m [78.10m]		12							77
Dynamic Cone Penetration Test commenced at 11.89 m depth		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 367067.25 **NORTHING:** 5018068.19 **ELEVATION:** 89.99

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 07, 2024

FILE NO. : PG5876

HOLE NO. : BH 31-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE: TYPE AND NO.	SAMPLE: RECOVERY (%)	SAMPLE: N, Nc OR RQD	SAMPLE: WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							76
		14							75
		15							74
		16							73
		17							72
		18							71
18.90m [71.09m]		19							70
End of Borehole		20							69
Cone pushed up to 18.85 m depth.		21							68
Practical refusal to DCPT at 18.90 m depth.		22							67
		23							66
		24							65
		25							64
		26							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 367157.38 **NORTHING:** 5018138.45 **ELEVATION:** 90.06

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 07, 2024

FILE NO. : PG5876

HOLE NO. : BH 32-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.30m [89.77m]		0							90
Very stiff, brown **SILTY CLAY**		1							89
		2							88
		3							87
3.66m [86.41m]									
Firm to stiff, grey **SILTY CLAY**		4							86
		5						5.0 m ▼ 2024-08-13	85
		6							84
		7							83
		8							82
- Very stiff by 8.60 m Depth		9	SS 1	100	P	50.29		121.0	81
		10	SS 2	100	P	55.13			80
		11	SS 3	100	P	51.89			79
- Silt seam by 11.40 m Depth			SS 4	50	P	28.49		121.0	
- Silt seam by 12.10 m Depth		12	SS 5	50	P	27.28			78
		13							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstead Road - Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 367157.38 **NORTHING:** 5018138.45 **ELEVATION:** 90.06

PROJECT: Project X Development

BORINGS BY: CME 55 Low Clearance Drill

REMARKS:

DATE: August 07, 2024

FILE NO. : PG5876

HOLE NO. : BH 32-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N, Nc OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH, Cur (kPa) / PEAK SHEAR STRENGTH, Cu (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE		13							77
		14	SS 6	30	P	27.74			76
14.33m [75.73m]									
Dynamic Cone Penetration Test commenced at 14.33 m depth		15							75
		16							74
		17							73
		18							72
		19							71
19.76m [70.30m]									
End of Borehole Cone pushed up to 15.77 m depth. Practical refusal to DCPT at 19.76 m depth. (GWL at 4.97 m depth - August 13, 2024)		20							70
		21							69
		22							68
		23							67
		24							66
		25							65
		26							

SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the strength of cohesionless soils is the relative density, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm.

Relative Density	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their “sensitivity”. The sensitivity is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NXL size core. However, it can be used on smaller core sizes, such as BX, if the bulk of the fractures caused by drilling stresses (called “mechanical breaks”) are easily distinguishable from the normal in situ fractures.

RQD %	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC%	-	Natural moisture content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic limit, % (water content above which soil behaves plastically)
PI	-	Plasticity index, % (difference between LL and PL)
Dxx	-	Grain size which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D30)^2$ / (D10 x D60)
Cu	-	Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:
Well-graded gravels have: $1 < Cc < 3$ and $Cu > 4$
Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$
Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.
Cc and Cu are not applicable for the description of soils with more than 10% silt and clay
(more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

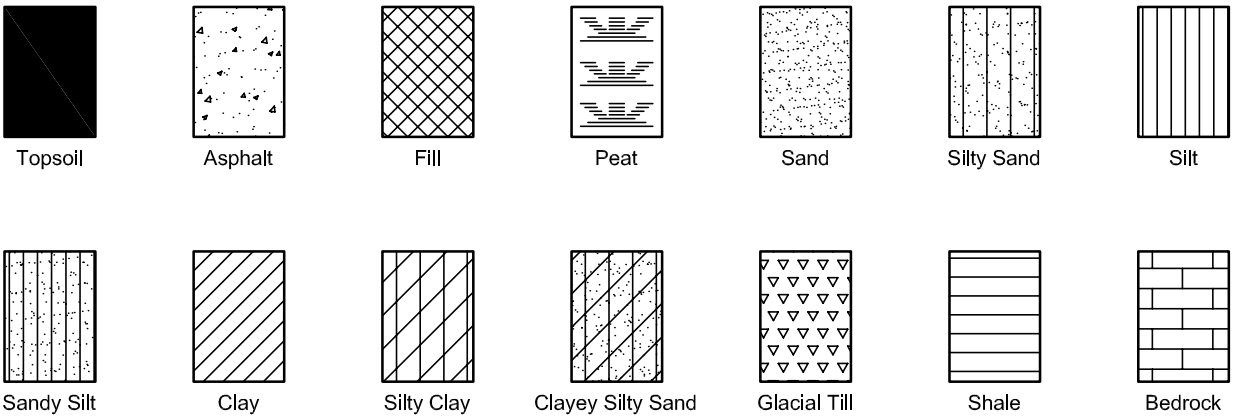
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

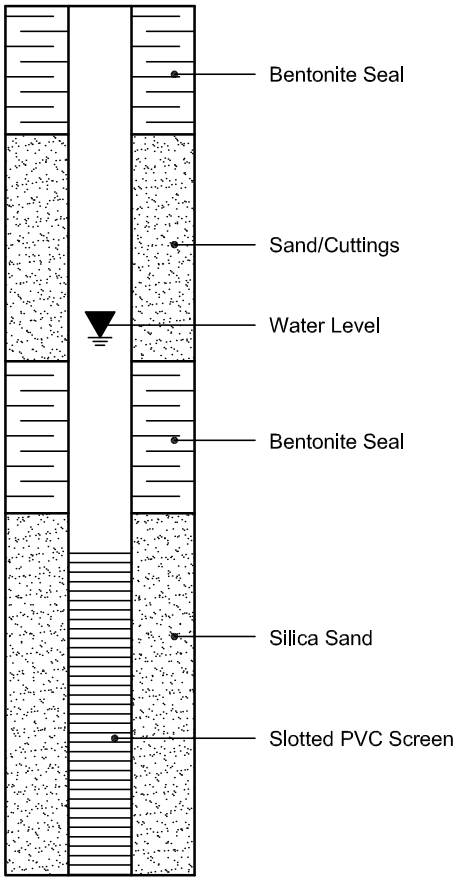
SYMBOLS AND TERMS (continued)

STRATA PLOT

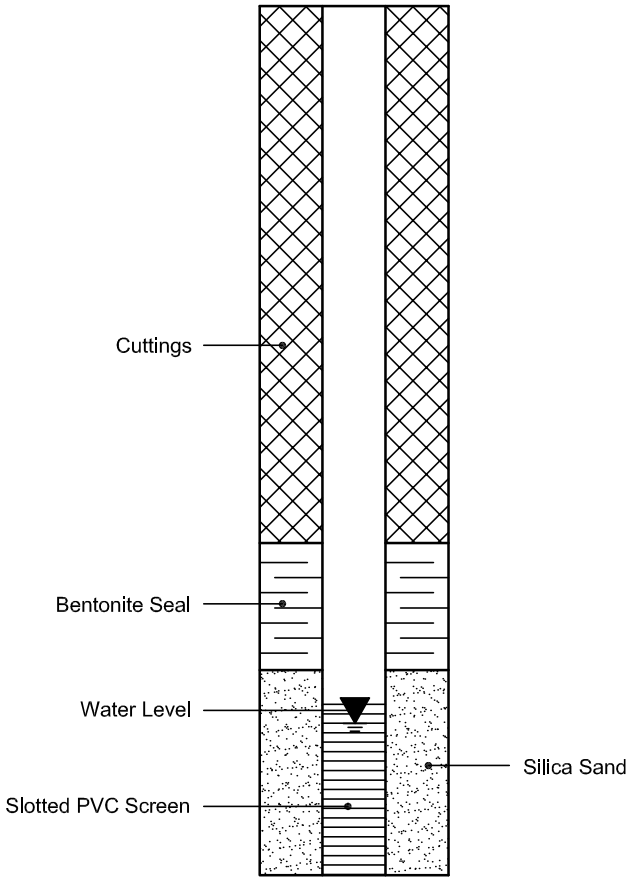


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



BOREHOLE REPORT

Reference No.: 12615684-A1

Borehole No. **BH-101-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Drilling Contractor : **George Downing Estate Drilling Limited**

Borehole Type : **Auger and Casing**

Borehole Diameter : **200 mm & 76 mm** Core Bit Size : **NQ**

Described by : **David Vincent, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X: **366614.6**
Y: **5017753.8**
Z: **90.67**

Date (Start) : **2023-07-03**
Date (Finish) : **2023-07-06**
Borehole Depth (m): **28.30**
Location Plan No.: **FIGURE 1**

SAMPLE TYPE
SS(E) : Split Spoon (Environment)
RC : Rock diamond core
GS(E) : Grab sample (Environment)
AU(E) : Auger (Environment)
TEE : Sample tube environment
ST : Shelby tube

TERMINOLOGY

"traces"	1-10%
"some"	10-20%
"adjective" (...y)	20-35%
"and"	35-50%

BEDROCK QUALITY INDEX

% RQD	QUALIFYING
0-25	Very poor
25-50	Poor
50-75	Fair
75-90	Good
90-100	Excellent

COMPACTNESS INDEX "N"

Very loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very dense	>50

WATER LEVEL
Date: 2023-08-22 Depth:
Date: 2023-07-20 Depth:

SAMPLE STATE
Remoulded
Intact
Lost
Diamond drilling

SYMBOLS
N: Standard penetration index
R: Refusal (N > 100)
R.Q.D.: Rock Quality Designation

$$\%\ R.Q.D. = \frac{\Sigma\ \text{Core} > 4\ \text{in. (10 cm)}}{\text{drilled length}}$$

CLASSIFICATION (UNIFIED SYSTEM)

Clay	< 0.002 mm
Silt	0.002 - 0.075 mm
Sand	0.075 - 4.75 mm
Gravel	4.75 - 75 mm
Cobbles	75 - 300 mm
Boulders	> 300 mm

CONSISTENCY / SHEAR RESISTANCE (Su)

Very soft	<12 kPa
Soft	12-25 kPa
Firm	25-50 kPa
Stiff	50-100 kPa
Very stiff	100-200 kPa
Hard	>200 kPa

DEPTH - m	DEPTH - ft	ELEVATION / DEPTH - m	STRATIGRAPHY: DESCRIPTION SOIL AND BEDROCK	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SUB - SAMPLE	STATE	RECOVERY %	N, Nc or RQD	BLOW COUNT/15cm PENETRATION	GRAPHIC	WATER LEVEL	TEST SYMBOL
		90.67	Ground surface										
		0.00	**Topsoil**: Brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets).		SS-01 B			74	6	1-2-4-9			
		90.06 / 0.61	**Native Soil**: Stiff, brown-grey-orange silt, some clay, moist.		SS-02 B			100	15	4-7-8-10			
1		89.45 / 1.22	Firm to stiff, grey-orange to grey clayey silt to silt and clay, traces of sand, moist.		SS-03 B			100	9	4-4-5-5			
	5				SS-04 B			100	7	4-4-3-4			
2					SS-05 B			100	1	0-1-0-1			
					ST-06			100					Su = 75 kPa OCT GSA, H LL = 43% PL = 19% W = 33.0% Su = 78 kPa
3	10	86.94 / 3.73	Firm to stiff, grey clayey silt to slity clay, moist.		SS-07 B			100	0	0-0-0-0			
					ST-08			100					LL = 46% PL = 21% W = 50.0% Su = 46 kPa
4	15				SS-09 B			100	0	0-0-0-0			
					ST-10			100					Su = 42 kPa LL = 51% PL = 25% W = 62.0%
5	20												
6													

GRAPHIC: ▲ : N (standard pen.); △ : Nc (dynamic pen.); ▼ : Su (laboratory); ▽ : Sur (laboratory); × : Su (field); + : Sur (field); PL W LL; 20 40 60 80

WATER LEVEL: 2023-08-22 - 2.16 m; 2023-08-22 - 1.72 m; 2023-08-22 - 1.53 m

TEST SYMBOL
CA : chemical analysis
GSA : particle size analysis
H : hydrometer testing
LL : liquid limit
PL : plastic limit
W : water content
Su : undrained shear
Sur : remoulded shear
UCS : compression test
k : permeability
Dup : spec. duplicate collected

Remark(s) : OCT: Oedometer Consolidation Test

Borehole - standard.sty

BOREHOLE REPORT

Reference No.: 12615684-A1

Borehole No. **BH-101-23**

DEPTH - m	DEPTH - ft	ELEVATION / DEPTH - m	STRATIGRAPHY: DESCRIPTION SOIL AND BEDROCK	STRATIGRAPHY: SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: SUB - SAMPLE	SAMPLE: STATE	SAMPLE: RECOVERY %	SAMPLE: N, Nc or RQD	BLOW COUNT/15cm PENETRATION	GRAPHIC	WATER LEVEL	TEST SYMBOL
					SS-11 B			100	0	0-0-0-0			Su = 41 kPa
	25												
8					ST-12			100					OCT GSA LL = 48% PL = 23% W = 63.0%
					SS-13 B			100	0	0-0-0-0			Su = 37 kPa
9	30												Su = 42 kPa
					SS-14 B			100	0	0-0-0-0			
10													Su = 44 kPa
	35				SS-15 B			100	0	0-0-0-0			
11													Su = 43 kPa
12													Su = 42 kPa
	40				SS-16 B			100	0	0-0-0-0			
		77.72											
13		12.95	Firm to stiff, grey clayey silt, traces of sand, moist.										Su = 47 kPa
	45				SS-17 B			74	1	0-1-0-1			GSA
14													Su = 59 kPa
15													
	50				SS-18 B			82	2	1-1-1-0			GSA Su = 58 kPa
16		74.52											
		16.15	Loose to compact, grey silty sand, some gravel, some to traces of clay, moist.										
	55												
17					SS-19 B			49	8	4-5-3-4			GSA
18													
	60				SS-20 B			25	16	6-8-8-7			
19		71.62											
		19.05	becoming with presence of cobbles and/or boulders										

GRAPHIC: ▲ : N (standard pen.); △ : Nc (dynamic pen.); ▼ : Su (laboratory); ▽ : Sur (laboratory); × : Su (field); + : Sur (field); PL W LL; 20 40 60 80

TEST SYMBOL: CA : chemical analysis; GSA : particle size analysis; H : hydrometer testing; LL : liquid limit; PL : plastic limit; W : water content; Su : undrained shear; Sur : remoulded shear; UCS : compression test; k : permeability; Dup : spec. duplicate collected

Borehole - standard.sty

BOREHOLE REPORT

Reference No.: 12615684-A1

Borehole No. **BH-101-23**

DEPTH - m	DEPTH - ft	ELEVATION / DEPTH - m	STRATIGRAPHY: DESCRIPTION SOIL AND BEDROCK	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SUB - SAMPLE	STATE	RECOVERY %	N, Nc or RQD	BLOW COUNT/15cm PENETRATION
20					SS-21 B			57	26	23-12-14-19
21	70									
22					RC-22 NQ			100	*0*	
23	75				RC-23 NQ			42	*0*	
24										
25	80				RC-24 NQ			22	*0*	
		65.24				A				
26	85	25.43	**Bedrock**: Grey dolomite, excellent quality.		RC-25 NQ	B		91	*91*	
27										
28	90	62.37			RC-26 NQ			95	*95*	
29	95	28.30	End of borehole							
30										
31	100									
32	105									

GRAPHIC

▲ : N (standard pen.)
△ : Nc (dynamic pen.)
▼ : Su (laboratory)
▽ : Sur (laboratory)
× : Su (field)
\+ : Sur (field)

PL W LL

20 40 60 80

WATER LEVEL

TEST SYMBOL

CA : chemical analysis
GSA : particle size analysis
H : hydrometer testing
LL : liquid limit
PL : plastic limit
W : water content
Su : undrained shear
Sur : remoulded shear
UCS : compression test
k : permeability
Dup : spec. duplicate collected

Borehole - standard.sty

BOREHOLE REPORT

Reference No.: 12615684-A1

Borehole No. **BH-102-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Drilling Contractor : **George Downing Estate Drilling Limited**

Borehole Type : **Auger and Casing**

Borehole Diameter : **200 mm** Core Bit Size :

Described by : **David Vincent, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X: **366511.8**
Y: **5017682.3**
Z: **95.18**

Date (Start) : **2023-07-10**
Date (Finish) : **2023-07-11**
Borehole Depth (m): **22.90**
Location Plan No.: **FIGURE 1**

SAMPLE TYPE
SS(E) : Split Spoon (Environment)
RC : Rock diamond core
GS(E) : Grab sample (Environment)
AU(E) : Auger (Environment)
TEE : Sample tube environment
ST : Shelby tube

TERMINOLOGY

"traces"	1-10%
"some"	10-20%
"adjective" (...y)	20-35%
"and"	35-50%

BEDROCK QUALITY INDEX

% RQD	QUALIFYING
0-25	Very poor
25-50	Poor
50-75	Fair
75-90	Good
90-100	Excellent

COMPACTNESS INDEX "N"

Very loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very dense	>50

WATER LEVEL
Date: Depth:
Date: Depth:

SAMPLE STATE
Remoulded
Intact
Lost
Diamond drilling

SYMBOLS
N: Standard penetration index
R: Refusal (N > 100)
R.Q.D.: Rock Quality Designation
% R.Q.D. = Σ Core > 4 in. (10 cm) / drilled length

CLASSIFICATION (UNIFIED SYSTEM)

Clay	< 0.002 mm
Silt	0.002 - 0.075 mm
Sand	0.075 - 4.75 mm
Gravel	4.75 - 75 mm
Cobbles	75 - 300 mm
Boulders	> 300 mm

CONSISTENCY / SHEAR RESISTANCE (Su)

Very soft	<12 kPa
Soft	12-25 kPa
Firm	25-50 kPa
Stiff	50-100 kPa
Very stiff	100-200 kPa
Hard	>200 kPa

DEPTH - m	DEPTH - ft	ELEVATION / DEPTH - m	STRATIGRAPHY: DESCRIPTION SOIL AND BEDROCK	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SUB - SAMPLE	STATE	RECOVERY %	N, Nc or RQD	BLOW COUNT/15cm PENETRATION
		95.18	Ground surface							
		0.00	**Topsoil**: Brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets).		SS-01 B			61	10	3-4-6-7
		94.57 / 0.61	**Fill**: Brown-grey clayey silt, traces of sand, moist. Presence of organic matter (rootlets).		SS-02 B			74	11	4-5-6-6
1	5				SS-03 B			66	9	2-4-5-6
		93.35 / 1.83	Grey-brown to grey clayey silt, traces of sand, moist. Presence of organic matter (rootlets).		SS-04 B			66	13	5-6-7-7
2					SS-05 B			66	7	1-3-4-5
3	10				SS-06 B			66	7	2-3-4-6
4					SS-07 B			0	10	2-4-6-7
	15				SS-08 B			66	12	3-4-8-7
5					SS-09 B			66	19	7-8-11-13
		89.69 / 5.49	Grey-orange clayey silt, moist.		SS-10 B			100	13	2-6-7-10
6	20				SS-11 B			100	8	2-3-5-5

GRAPHIC
▲ : N (standard pen.)
△ : Nc (dynamic pen.)
▼ : Su (laboratory)
▽ : Sur (laboratory)
× : Su (field)
+ : Sur (field)
PL W LL
20 40 60 80

WATER LEVEL

TEST SYMBOL
CA : chemical analysis
GSA : particle size analysis
H : hydrometer testing
LL : liquid limit
PL : plastic limit
W : water content
Su : undrained shear
Sur : remoulded shear
UCS : compression test
k : permeability
Dup : spec. duplicate collected

Su = 70 kPa

Remark(s) : OCT: Oedometer Consolidation Test

Borehole - standard.sty

BOREHOLE REPORT

Reference No.: 12615684-A1

Borehole No. **BH-102-23**

DEPTH - m	DEPTH - ft	ELEVATION / DEPTH - m	STRATIGRAPHY: DESCRIPTION SOIL AND BEDROCK	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SUB - SAMPLE	STATE	RECOVERY %	N, Nc or RQD	BLOW COUNT/15cm PENETRATION	GRAPHIC	WATER LEVEL	TEST SYMBOL
		88.01											
		7.17	**Native Soil**: Firm to stiff, grey clayey silt, traces of sand, moist.										Su = 80 kPa
	25				ST-12			100					OCT GSA LL = 39% PL = 19% W = 33.0%
8		86.76											
		8.42	Firm to stiff, grey clayey silt to silty clay, moist.		SS-13 B			100	0	0-0-0-0			Su = 58 kPa
9	30												Su = 42 kPa
10					ST-14			82					LL = 44% PL = 20% W = 52.0% Su = 46 kPa
11	35												Su = 42 kPa
12					SS-15 B			100	0	0-0-0-0			
	40												Su = 43 kPa
13					ST-16			100					OCT GSA, H LL = 65% PL = 22% W = 62.0% Su = 49 kPa Su = 44 kPa
14	45												
15					ST-17			100					LL = 43% PL = 21% W = 51.0% Su = 48 kPa
	50												
16					SS-18 B			100	0	0-0-0-0			Su = 50 kPa
	55												
17		77.90											
		17.28	Firm to stiff, grey clayey silt, traces of sand, moist.										
18					SS-19 B			0	2	0-1-1-1			
	60												
19					SS-20			100	8	2-3-5-3			

GRAPHIC: ▲ : N (standard pen.); △ : Nc (dynamic pen.); ▼ : Su (laboratory); ▽ : Sur (laboratory); × : Su (field); + : Sur (field); PL W LL; 20 40 60 80

TEST SYMBOL: CA : chemical analysis; GSA : particle size analysis; H : hydrometer testing; LL : liquid limit; PL : plastic limit; W : water content; Su : undrained shear; Sur : remoulded shear; UCS : compression test; k : permeability; Dup : spec. duplicate collected

Borehole - standard.sty

BOREHOLE REPORT

Reference No.: 12615684-A1

Borehole No. **BH-102-23**

DEPTH - m	DEPTH - ft	ELEVATION / DEPTH - m	STRATIGRAPHY: DESCRIPTION SOIL AND BEDROCK	STRATIGRAPHY: SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: SUB - SAMPLE	SAMPLE: STATE	SAMPLE: RECOVERY %	SAMPLE: N, Nc or RQD	BLOW COUNT/15cm PENETRATION	GRAPHIC
20					B						
21	70				SS-21 B			90	9	4-3-6-6	
22											
23	75	72.28			SS-22 B			16	3	1-2-1-2	
24		22.90	End of borehole								
25	80										
26											
27	85										
28											
29	90										
30											
31	95										
32	100										
	105										

GRAPHIC: ▲ : N (standard pen.); △ : Nc (dynamic pen.); ▼ : Su (laboratory); ▽ : Sur (laboratory); × : Su (field); + : Sur (field); PL W LL; 20 40 60 80

WATER LEVEL

TEST SYMBOL

CA : chemical analysis
GSA : particle size analysis
H : hydrometer testing
LL : liquid limit
PL : plastic limit
W : water content
Su : undrained shear
Sur : remoulded shear
UCS : compression test
k : permeability
Dup : spec. duplicate collected

Borehole - standard.sty

BOREHOLE REPORT

Reference No.: 12615684-A1

Borehole No. **BH-103-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Drilling Contractor : **George Downing Estate Drilling Limited**

Borehole Type : **Auger and Casing**

Borehole Diameter : **200 mm & 76 mm** Core Bit Size : **NQ**

Described by : **David Vincent, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X: **366472.6**
Y: **5017591.4**
Z: **90.66**

Date (Start) : **2023-07-06**
Date (Finish) : **2023-07-10**
Borehole Depth (m): **25.25**
Location Plan No.: **FIGURE 1**

SAMPLE TYPE
SS(E) : Split Spoon (Environment)
RC : Rock diamond core
GS(E) : Grab sample (Environment)
AU(E) : Auger (Environment)
TEE : Sample tube environment
ST : Shelby tube

TERMINOLOGY

"traces"	1-10%
"some"	10-20%
"adjective" (...y)	20-35%
"and"	35-50%

BEDROCK QUALITY INDEX

% RQD	QUALIFYING
0-25	Very poor
25-50	Poor
50-75	Fair
75-90	Good
90-100	Excellent

COMPACTNESS INDEX "N"

Very loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very dense	>50

WATER LEVEL
Date: 2023-08-22 Depth:
Date: 2023-07-20 Depth:

SAMPLE STATE
Remoulded
Intact
Lost
Diamond drilling

SYMBOLS
N: Standard penetration index
R: Refusal (N > 100)
R.Q.D.: Rock Quality Designation

$$\% \text{ R.Q.D.} = \frac{\Sigma \text{ Core} > 4 \text{ in. (10 cm)}}{\text{drilled length}}$$

CLASSIFICATION (UNIFIED SYSTEM)

Clay	< 0.002 mm
Silt	0.002 - 0.075 mm
Sand	0.075 - 4.75 mm
Gravel	4.75 - 75 mm
Cobbles	75 - 300 mm
Boulders	> 300 mm

CONSISTENCY / SHEAR RESISTANCE (Su)

Very soft	<12 kPa
Soft	12-25 kPa
Firm	25-50 kPa
Stiff	50-100 kPa
Very stiff	100-200 kPa
Hard	>200 kPa

DEPTH - m	DEPTH - ft	ELEVATION / DEPTH - m	STRATIGRAPHY: DESCRIPTION SOIL AND BEDROCK	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SUB - SAMPLE	STATE	RECOVERY %	N, Nc or RQD	BLOW COUNT/15cm PENETRATION	GRAPHIC	WATER LEVEL	TEST SYMBOL
		90.66	Ground surface										
		0.00	**Topsoil**: Brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets).		SS-01 B			41	12	2-5-7-9			
		90.05 / 0.61	**Native Soil**: Stiff, brown silt, some clay, moist. Presence of organic matter (rootlets).		SS-02 B			100	13	4-6-7-9			
1	5	89.29 / 1.37	Firm to stiff, grey-orange clayey silt, traces of sand, moist. Presence of organic matter (rootlets).		SS-03 B			100	5	2-3-2-4			
2					SS-04 B			100	3	1-2-1-1			
3	10				SS-05 B			100	2	0-1-1-1			Su = 50 kPa
4		86.54 / 4.12	Firm to stiff, grey clayey silt to silty clay, moist.										Su = 61 kPa
5	15				ST-06			100					LL = 47% PL = 23% W = 51.0%
6	20				SS-07 B			100	0	0-0-0-0			Su = 48 kPa

GRAPHIC: ▲ : N (standard pen.); △ : Nc (dynamic pen.); ▼ : Su (laboratory); ▽ : Sur (laboratory); × : Su (field); + : Sur (field); PL W LL; 20 40 60 80

WATER LEVEL: 2023-08-22 - 2.32 m; 2023-08-22 - 1.99 m; 2023-08-22 - 1.89 m

TEST SYMBOL
CA : chemical analysis
GSA : particle size analysis
H : hydrometer testing
LL : liquid limit
PL : plastic limit
W : water content
Su : undrained shear
Sur : remoulded shear
UCS : compression test
k : permeability
Dup : spec. duplicate collected

Remark(s) :

Borehole - standard.sty

BOREHOLE REPORT

Reference No.: 12615684-A1

Borehole No. **BH-103-23**

DEPTH - m	DEPTH - ft	ELEVATION / DEPTH - m	STRATIGRAPHY: DESCRIPTION SOIL AND BEDROCK	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SUB - SAMPLE	STATE	RECOVERY %	N, Nc or RQD	BLOW COUNT/15cm PENETRATION	GRAPHIC	WATER LEVEL	TEST SYMBOL
											▲ : N (standard pen.) △ : Nc (dynamic pen.) ▼ : Su (laboratory) ▽ : Sur (laboratory) × : Su (field) + : Sur (field) PL W LL 20 40 60 80		CA : chemical analysis GSA : particle size analysis H : hydrometer testing LL : liquid limit PL : plastic limit W : water content Su : undrained shear Sur : remoulded shear UCS : compression test k : permeability Dup : spec. duplicate collected
25					ST-08			100					LL = 54% PL = 23% W = 58.0% Su = 52 kPa
8													
9	30				SS-09 B			100	0	0-0-0-0			
10													Su = 48 kPa
	35				ST-10			100					LL = 52% PL = 21% W = 58.0%
11		79.36											
		11.30	Firm to stiff, grey clayey silt, traces of sand, moist.										
12	40				ST-11			0					Su = 52 kPa
13													
	45				SS-12 B			100	2	2-1-1-0			
14		76.32											Su = 58 kPa
		14.34	Very loose to loose, grey sandy silt, some clay, traces of gravel, moist.										
15	50				SS-13 B			100	3	1-1-2-2			
16													
	55				SS-14 B			0	8	8-4-4-3			
17		73.28											
		17.38	Compact to dense, grey silty sand, some gravel and clay, moist.										
18	60				SS-15 B			0	17	10-6-11-19			
19													

Borehole - standard.sty

BOREHOLE REPORT

Reference No.: 12615684-A1

Borehole No. **BH-103-23**

DEPTH - m	DEPTH - ft	ELEVATION / DEPTH - m	STRATIGRAPHY: DESCRIPTION SOIL AND BEDROCK	STRATIGRAPHY: SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: SUB - SAMPLE	SAMPLE: STATE	SAMPLE: RECOVERY %	SAMPLE: N, Nc or RQD	BLOW COUNT/15cm PENETRATION	GRAPHIC	WATER LEVEL	TEST SYMBOL
20													
21	70				SS-16 B			90	47	11-20-27-34			GSA
22		68.03											
	75	22.63	**Bedrock**: Brown-grey dolomite, poor quality.		RC-17 NQ			100	*44*				
23		66.91											
24		23.75	becoming grey, excellent quality										
	80				RC-18 NQ			95	*95*				
25		65.41											
		25.25	End of borehole										
26	85												
27													
	90												
28													
29	95												
30													
	100												
31													
32	105												

GRAPHIC: ▲ : N (standard pen.); △ : Nc (dynamic pen.); ▼ : Su (laboratory); ▽ : Sur (laboratory); × : Su (field); + : Sur (field); PL W LL; 20 40 60 80

TEST SYMBOL: CA : chemical analysis; GSA : particle size analysis; H : hydrometer testing; LL : liquid limit; PL : plastic limit; W : water content; Su : undrained shear; Sur : remoulded shear; UCS : compression test; k : permeability; Dup : spec. duplicate collected

Borehole - standard.sty

BOREHOLE REPORT

Reference No.: 12615684-A1

Borehole No. **BH-104-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**
Drilling Contractor : **George Downing Estate Drilling Limited**
Borehole Type : **Auger and Casing**
Borehole Diameter : **200 mm** Core Bit Size :
Described by : **David Vincent, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X: **366549.1**
Y: **5017733.7**
Z: **91.01**

Date (Start) : **2023-06-29**
Date (Finish) : **2023-06-29**
Borehole Depth (m): **22.33**
Location Plan No.: **FIGURE 1**

SAMPLE TYPE
SS(E) : Split Spoon (Environment)
RC : Rock diamond core
GS(E) : Grab sample (Environment)
AU(E) : Auger (Environment)
TEE : Sample tube environment
ST : Shelby tube

TERMINOLOGY

"traces"	1-10%
"some"	10-20%
"adjective" (...y)	20-35%
"and"	35-50%

BEDROCK QUALITY INDEX

% RQD	QUALIFYING
0-25	Very poor
25-50	Poor
50-75	Fair
75-90	Good
90-100	Excellent

COMPACTNESS INDEX "N"

Very loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very dense	>50

WATER LEVEL
Date: 2023-08-22 Depth: 1.19
Date: 2023-07-20 Depth: 1.83

SAMPLE STATE
Remoulded
Intact
Lost
Diamond drilling

SYMBOLS
N: Standard penetration index
R: Refusal (N > 100)
R.Q.D.: Rock Quality Designation

$$\%\ R.Q.D. = \frac{\Sigma\ \text{Core} > 4\ \text{in. (10 cm)}}{\text{drilled length}}$$

CLASSIFICATION (UNIFIED SYSTEM)

Clay	< 0.002 mm
Silt	0.002 - 0.075 mm
Sand	0.075 - 4.75 mm
Gravel	4.75 - 75 mm
Cobbles	75 - 300 mm
Boulders	> 300 mm

CONSISTENCY / SHEAR RESISTANCE (Su)

Very soft	<12 kPa
Soft	12-25 kPa
Firm	25-50 kPa
Stiff	50-100 kPa
Very stiff	100-200 kPa
Hard	>200 kPa

DEPTH - m	DEPTH - ft	ELEVATION / DEPTH - m	STRATIGRAPHY: DESCRIPTION SOIL AND BEDROCK	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SUB - SAMPLE	STATE	RECOVERY %	N, Nc or RQD	BLOW COUNT/15cm PENETRATION
		91.01	Ground surface							
		0.00 90.91	**Topsoil**: Brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets).		SS-01 B	A B		77	8	2-3-5-7
		0.10 90.40								
		0.61	**Fill**: Brown clayey silt, traces of sand, moist. Presence of organic matter (rootlets). becoming brown-grey becoming grey-orange		SS-02 B			74	9	4-3-6-6
1		89.79 1.22			SS-03 B			100	7	3-3-4-6
	5									
2					SS-04 B			100	8	5-5-3-4
		88.57 2.44	**Native Soil**: Firm to stiff, grey-orange clayey silt, traces of sand, moist. Presence of organic matter (rootlets).		SS-05 B			100	3	2-2-1-1
3	10				SS-06 B			100	2	1-1-1-1
4					SS-07 B			100	2	1-1-1-1
		86.51 4.50	Firm to stiff, grey clayey silt to silty clay, moist.							
	15				SS-08 B			100	0	0-0-0-0
5										
					SS-09 B			100	0	0-0-0-0
6	20									
					SS-10 B			100	0	0-0-0-0

GRAPHIC
▲ : N (standard pen.)
△ : Nc (dynamic pen.)
▼ : Su (laboratory)
▽ : Sur (laboratory)
× : Su (field)
+ : Sur (field)
PL W LL
20 40 60 80

WATER LEVEL
2023-08-22 - 1.19 m

TEST SYMBOL
CA : chemical analysis
GSA : particle size analysis
H : hydrometer testing
LL : liquid limit
PL : plastic limit
W : water content
Su : undrained shear
Sur : remoulded shear
UCS : compression test
k : permeability
Dup : spec. duplicate collected

Remark(s) :

Borehole - standard.sty

BOREHOLE REPORT

Reference No.: 12615684-A1

Borehole No. **BH-104-23**

DEPTH - m	DEPTH - ft	ELEVATION / DEPTH - m	STRATIGRAPHY: DESCRIPTION SOIL AND BEDROCK	STRATIGRAPHY: SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: SUB - SAMPLE	SAMPLE: STATE	SAMPLE: RECOVERY %	SAMPLE: N, Nc or RQD	BLOW COUNT/15cm PENETRATION
					SS-11 B			100	0	0-0-0-0
	25									
8					SS-12 B			100	0	0-0-0-0
					SS-13 B			100	0	0-0-0-0
9	30									
					SS-14 B			100	0	0-0-0-0
10					SS-15 B			100	0	0-0-0-0
	35									
11					SS-16 B			100	0	0-0-0-0
12										
	40				SS-17 B			90	0	0-0-0-0
13		77.77								
		13.24	becoming with traces of sand							
	45									
14					SS-18 B			100	0	0-0-0-0
15										
	50				SS-19 B			100	0	0-0-0-0
		75.19								
16		15.82	End of sampling							
	55									
17										
18										
	60									
19										

GRAPHIC

▲ : N (standard pen.)
△ : Nc (dynamic pen.)
▼ : Su (laboratory)
▽ : Sur (laboratory)
× : Su (field)
\+ : Sur (field)

PL W LL

20 40 60 80

5 7 8 7 7 7 8 8 7 7 9 7 7 7 8 8 8 7 9 10 9 8 9 12 8 9 12 9 8 21 15 21 20 20 7 15 20 21 29 24

WATER LEVEL

TEST SYMBOL

CA : chemical analysis
GSA : particle size analysis
H : hydrometer testing
LL : liquid limit
PL : plastic limit
W : water content
Su : undrained shear
Sur : remoulded shear
UCS : compression test
k : permeability
Dup : spec. duplicate collected

Borehole - standard.sty

BOREHOLE REPORT

Reference No.: 12615684-A1

Borehole No. **BH-104-23**

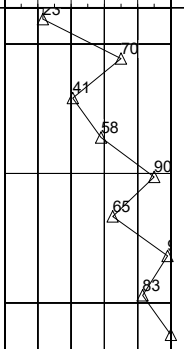
DEPTH - m	DEPTH - ft	ELEVATION / DEPTH - m	STRATIGRAPHY: DESCRIPTION SOIL AND BEDROCK	STRATIGRAPHY: SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: SUB - SAMPLE	SAMPLE: STATE	SAMPLE: RECOVERY %	SAMPLE: N, Nc or RQD	BLOW COUNT/15cm PENETRATION	GRAPHIC	WATER LEVEL
20												
21	70											
22		68.68										
		22.33	End of dynamic penetration test End of borehole									
	75											
23												
24												
	80											
25												
26	85											
27												
	90											
28												
29	95											
30												
	100											
31												
32	105											

GRAPHIC

▲ : N (standard pen.)
△ : Nc (dynamic pen.)
▼ : Su (laboratory)
▽ : Sur (laboratory)
× : Su (field)
\+ : Sur (field)

PL W LL

20 40 60 80



WATER LEVEL

TEST SYMBOL

CA : chemical analysis
GSA : particle size analysis
H : hydrometer testing
LL : liquid limit
PL : plastic limit
W : water content
Su : undrained shear
Sur : remoulded shear
UCS : compression test
k : permeability
Dup : spec. duplicate collected

Borehole - standard.sty

BOREHOLE REPORT

Reference No.: 12615684-A1

Borehole No. **BH-105-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**
Drilling Contractor : **George Downing Estate Drilling Limited**
Borehole Type : **Auger**
Borehole Diameter : **200 mm** Core Bit Size :
Described by : **David Vincent, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X: **366555.1**
Y: **5017688.8**
Z: **93.05**

Date (Start) : **2023-07-11**
Date (Finish) : **2023-07-11**
Borehole Depth (m): **4.57**
Location Plan No.: **FIGURE 1**

SAMPLE TYPE
SS(E) : Split Spoon (Environment)
RC : Rock diamond core
GS(E) : Grab sample (Environment)
AU(E) : Auger (Environment)
TEE : Sample tube environment
ST : Shelby tube

TERMINOLOGY

"traces"	1-10%
"some"	10-20%
"adjective" (...y)	20-35%
"and"	35-50%

BEDROCK QUALITY INDEX

% RQD	QUALIFYING
0-25	Very poor
25-50	Poor
50-75	Fair
75-90	Good
90-100	Excellent

COMPACTNESS INDEX "N"

Very loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very dense	>50

WATER LEVEL
Date: 2023-08-22 Depth: 1.25
Date: 2023-07-20 Depth: 1.77

SAMPLE STATE
Remoulded
Intact
Lost
Diamond drilling

SYMBOLS
N: Standard penetration index
R: Refusal (N > 100)
R.Q.D.: Rock Quality Designation
% R.Q.D. = Σ Core > 4 in. (10 cm) / drilled length

CLASSIFICATION (UNIFIED SYSTEM)

Clay	< 0.002 mm
Silt	0.002 - 0.075 mm
Sand	0.075 - 4.75 mm
Gravel	4.75 - 75 mm
Cobbles	75 - 300 mm
Boulders	> 300 mm

CONSISTENCY / SHEAR RESISTANCE (Su)

Very soft	<12 kPa
Soft	12-25 kPa
Firm	25-50 kPa
Stiff	50-100 kPa
Very stiff	100-200 kPa
Hard	>200 kPa

DEPTH - m	DEPTH - ft	ELEVATION / DEPTH - m	STRATIGRAPHY: DESCRIPTION SOIL AND BEDROCK	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SUB - SAMPLE	STATE	RECOVERY %	N, Nc or RQD	BLOW COUNT/15cm PENETRATION
		93.05	Ground surface							
		0.00	**Topsoil**: Brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets).		SS-01 B			41	9	2-4-5-7
		92.44 / 0.61	**Fill**: Brown silt, some clay, traces of sand. Presence of organic matter (rootlets).		SS-02 B			90	17	5-7-10-12
1	5	91.83 / 1.22	**Native Soil**: Firm to stiff, grey-orange clayey silt, traces of sand, moist. Presence of organic matter (rootlets).		SS-03 B			100	7	3-3-4-5
2		91.22 / 1.83	End of sampling (Destructive drilling)							
3	10									
4										
	15	88.48 / 4.57	End of borehole							
5										
6	20									

GRAPHIC
▲ : N (standard pen.)
△ : Nc (dynamic pen.)
▼ : Su (laboratory)
▽ : Sur (laboratory)
× : Su (field)
\+ : Sur (field)
PL W LL
20 40 60 80

WATER LEVEL
2023-08-22 - 1.25 m

TEST SYMBOL
CA : chemical analysis
GSA : particle size analysis
H : hydrometer testing
LL : liquid limit
PL : plastic limit
W : water content
Su : undrained shear
Sur : remoulded shear
UCS : compression test
k : permeability
Dup : spec. duplicate collected

Remark(s) :

Borehole - standard.sty

Geotechnical Investigation - Proposed Distribution Center
Bill Leathem Drive, Ottawa, Ontario

Photographic Report of Rock Samples

Project : 12615684-A1

Client :	Medusa Limited Partnership	**Borehole Date :**	July 3-6, 2023
Site :	Ottawa, Ontario	**Depth :**	25.43 to 28.30 m
Borehole :	BH-101-23	**Elevation :**	65.24 to 62.37 m

Photograph of Dry Rock

Photograph of Wet Rock

Photographic Report of Rock Samples

Project : 12615684-A1

Client :	Medusa Limited Partnership	**Borehole Date :**	July 6-10, 2023
Site :	Ottawa, Ontario	**Depth :**	22.63 to 25.25 m
Borehole :	BH-103-23	**Elevation :**	68.03 to 65.41 m

Photograph of Dry Rock

Photograph of Wet Rock

BOREHOLE REPORT

Borehole No. BH-01

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366477.6
Y : 5017942.8
Z : 90.59

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 0.83

Location plan : 11220797-A1-1

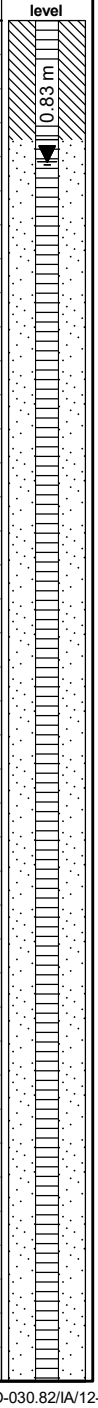
Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-19
Date (finish) : 2021-04-19

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water content (%) △ C_u (Field, kPa); Atterberg limits (%) □ C_u (Lab, kPa); "N" Standard penetration test value; "N_C" Dynamic penetration test value; 10 20 30 40 50 60 70 80 90
0.00	90.59		Ground surface								Water level
			Topsoil:		SS-1A						
0.14	90.45		Clayey silt, traces of sand								
			Native soil: Stiff to very stiff, brown silt and clay, moist		SS-1B	72			1-2-4-4	6	
0.90	89.69		becoming grey		SS-2	100			4-5-7-8	12	
1.52	89.07		becoming with presence of silt beddings		SS-3	100			2-2-3-3	5	
2.28	88.31		becoming stiff, very moist		SS-4	100			1-2-1-2	3	
					ST-5	100	GSA A w				
3.81	86.78		becoming firm, saturated		SS-6	100			1-0-0-1	0	
					SS-7	100			1-0-0-1	0	
					SS-8	100			1-0-0-1	0	
6.10	84.49		becoming with presence of silt beddings		SS-9	100			1-0-0-1	0	
7.62	82.97		becoming grey to dark grey		SS-10	100			1-0-0-0	0	



See the attached explicative note for the complete list of symbols and abbreviations

BOREHOLE REPORT

Borehole No. BH-01

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366477.6
Y : 5017942.8
Z : 90.59

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 0.83

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-19
Date (finish) : 2021-04-19

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD
8.00	82.59		Ground surface							
					SS-11	100	GSA A w		1-0-0-0	0
9.76	80.83		End of sampling Beginning of dynamic penetration test							0
										0
										0
										0
										0
										0
										0
										0
										0
										1
										0
										1
										1
										5
										4
										5
										4
										5
										6
										5
										6

TESTS RESULTS: ○ Water content (%) △ C_u (Field, kPa); Atterberg limits (%) □ C_u (Lab, kPa); w_P w_L; ● "N" Standard penetration test value; ▲ "N_C" Dynamic penetration test value

10 20 30 40 50 60 70 80 90

Water level

See the attached explicative note for the complete list of symbols and abbreviations

BOREHOLE REPORT

Borehole No. BH-01

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366477.6
Y : 5017942.8
Z : 90.59

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 0.83

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-19
Date (finish) : 2021-04-19

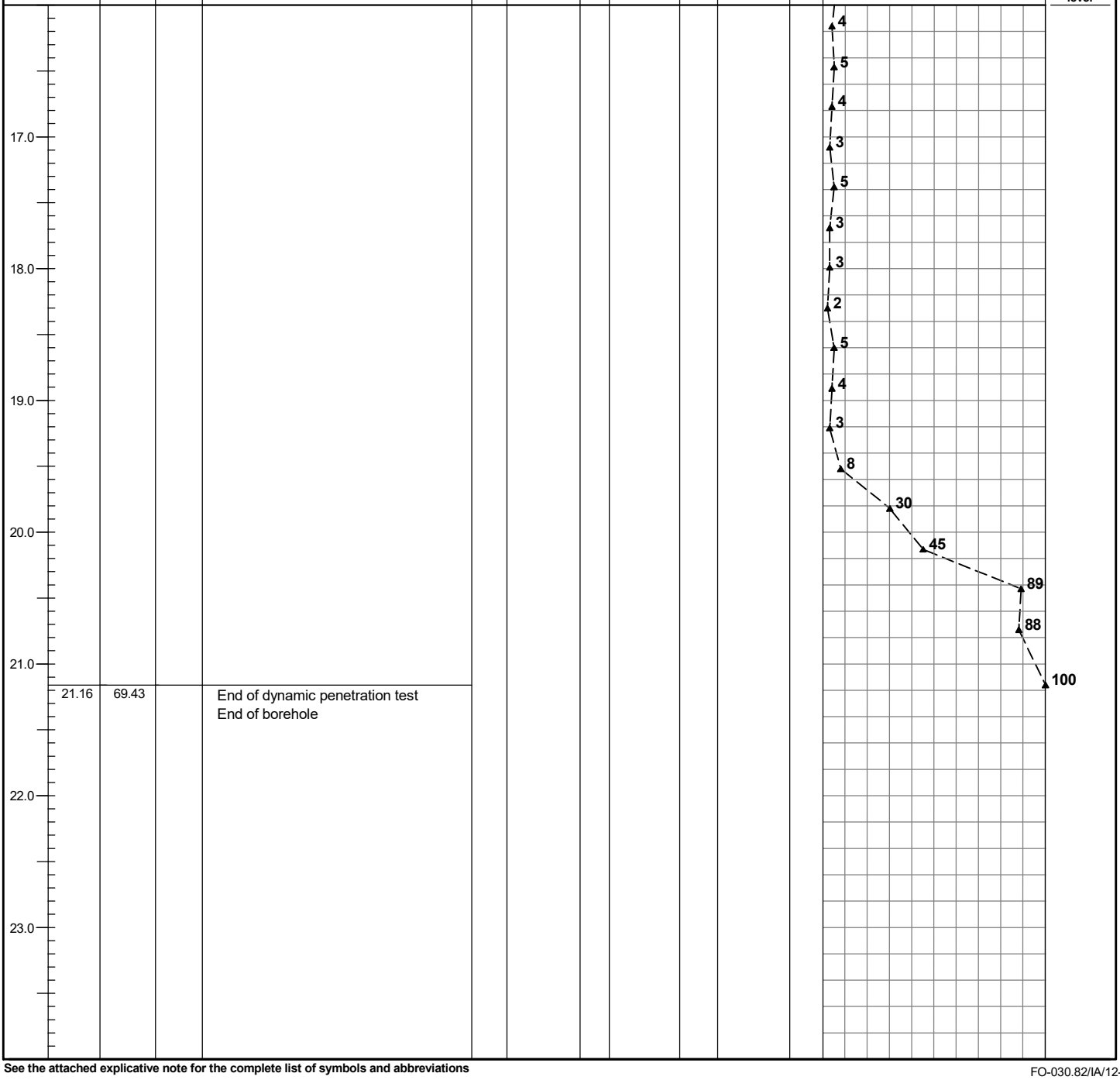
SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water level
16.00	74.59		Ground surface							10 20 30 40 50 60 70 80 90	
21.16	69.43		End of dynamic penetration test End of borehole								

○ Water content (%) △ C_u (Field, kPa)
w_P w_L Atterberg limits (%) □ C_u (Lab, kPa)
● "N" Standard penetration test value
▲ "N_C" Dynamic penetration test value



BOREHOLE REPORT

Borehole No. BH-02

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366599.6
Y : 5018011.4
Z : 90.61

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 1.1 0.93 ; 1.35

Location plan : 11220797-A1-1

Borehole type : Auger + Casing
Core bit size : B+NQ
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-21
Date (finish) : 2021-04-22

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD
0.00	90.61		Ground surface							
0.10	90.51		**Topsoil:** Clayey silt, traces of sand		SS-1A					
			Native soil: Stiff to very stiff, grey-brown silt and clay, moist		SS-1B	54			1-2-4-4	6
1.00	89.61		becoming grey		SS-2	100			3-4-6-6	10
1.52	89.09		becoming with presence of sand beddings		SS-3	82	GSA A w		2-3-3-3	6
2.28	88.33		becoming stiff		SS-4	100			1-1-1-1	2
3.40	87.21		becoming firm, saturated		SS-5	100			1-0-0-1	0
					SS-6	100			1-0-0-1	0
					ST-7	100	A w			
					SS-8	100			1-0-0-1	0
6.10	84.51		becoming with presence of silt beddings		SS-9	100			1-0-0-1	0
					SS-10	100			1-0-0-1	0

TESTS RESULTS: ○ Water content (%) △ C_u (Field, kPa); w_P w_L Atterberg limits (%) □ C_u (Lab, kPa); ● "N" Standard penetration test value; ▲ "N_C" Dynamic penetration test value

10 20 30 40 50 60 70 80 90

Water level: 0.93 m, 1.1 m, 1.35 m

See the attached explicative note for the complete list of symbols and abbreviations

BOREHOLE REPORT

Borehole No. BH-02

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366599.6
Y : 5018011.4
Z : 90.61

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 1.1 0.93 ; 1.35

Location plan : 11220797-A1-1

Borehole type : Auger + Casing
Core bit size : B+NQ
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-21
Date (finish) : 2021-04-22

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD
8.00	82.61		Ground surface							
9.15	81.46		Stiff, grey clayey silt, traces of sand, saturated		SS-11	49	GSA A w		1-0-0-0	0
					SS-12	51			4-3-2-2	5
10.67	79.94		Loose to very loose, grey silty and gravelly sand, traces of clay, saturated		SS-13	100			1-2-2-2	4
					SS-14	71	GSA A w		1-1-4-1	5
					SS-15	100			2-1-0-3	1
					SS-16	57			3-1-1-2	2
					SS-17	100			1-1-1-3	2
					SS-18	13			1-1-0-1	1
					SS-19	72	GSA A w		1-5-1-1	6

TESTS RESULTS: ○ Water content (%) △ C_u (Field, kPa); w_P w_L Atterberg limits (%) □ C_u (Lab, kPa); ● "N" Standard penetration test value; ▲ "N_C" Dynamic penetration test value

10 20 30 40 50 60 70 80 90

Water level

BOREHOLE REPORT

Borehole No. BH-02

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366599.6
Y : 5018011.4
Z : 90.61

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 1.1 0.93 ; 1.35

Location plan : 11220797-A1-1

Borehole type : Auger + Casing
Core bit size : B+NQ
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-21
Date (finish) : 2021-04-22

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

Depth (m)	Elevation (m)	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD
16.00	74.61	Ground surface							
				SS-20	85			2-1-2-9	3
17.0				SS-21	61			4-1-1-1	2
18.0									
18.29	72.32	becoming compact		SS-22	28			4-5-5-6	10
19.0									
19.10	71.51	becoming with presence of cobbles							
20.0				SS-23	49			15-7-13-8	20
21.0									
21.21	69.40	becoming dense		SS-24	62			17-21 29-28	50
22.0									
22.13	68.48	**Bedrock:** Grey dolomite, fair rock quality		RC-25	74				*61*
22.78	67.83	becoming good rock quality							
23.0				RC-26	95				*86*
23.62	66.99	End of borehole							

TESTS RESULTS

○ Water content (%) △ C_u (Field, kPa)
w_P w_L Atterberg limits (%) □ C_u (Lab, kPa)
● "N" Standard penetration test value
▲ "N_C" Dynamic penetration test value

10 20 30 40 50 60 70 80 90

Water level

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : BH-02 Core box – Dry rock

Photo 2 : BH-02 Core box – Wet rock

Borehole No. BH-02

Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

BOREHOLE REPORT

Borehole No. BH-03

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366427.8
Y : 5017867.9
Z : 90.52

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 1.1 0.86 ; 1.31

Location plan : 11220797-A1-1

Borehole type : Auger + Casing
Core bit size : B+NQ
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-19
Date (finish) : 2021-04-20

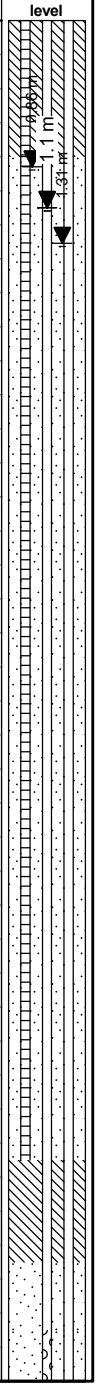
SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water level
0.00	90.52		Ground surface								
0.13	90.39		**Topsoil:** Clayey silt, traces of sand		SS-1A						
			Native soil: Stiff to very stiff, brown silt and clay, moist		SS-1B	48			2-3-4-5	7	
1.0					SS-2	100			4-8-7-7	15	
1.10	89.42		becoming brey-brown								
1.52	89.00		becoming stiff, grey with presence of sand beddings		SS-3	100			2-2-3-4	5	
2.0					SS-4	100			1-2-2-2	4	
3.0					SS-5	100			1-1-1-1	2	
3.50	87.02		becoming firm, saturated								
4.0					SS-6	100			1-0-0-1	0	
4.57	85.95		becoming with presence of cobbles		SS-7	69			6-5-4-4	9	
5.0					SS-8	100			2-1-0-0	1	
6.0					SS-9	100			1-0-0-1	0	
7.0					ST-10	0					

Water content (%) △ C_u (Field, kPa)
Atterberg limits (%) □ C_u (Lab, kPa)
"N" Standard penetration test value
"N_C" Dynamic penetration test value
10 20 30 40 50 60 70 80 90



See the attached explicative note for the complete list of symbols and abbreviations

BOREHOLE REPORT

Borehole No. BH-03

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366427.8
Y : 5017867.9
Z : 90.52

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 1.1 0.86 ; 1.31

Location plan : 11220797-A1-1

Borehole type : Auger + Casing
Core bit size : B+NQ
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-19
Date (finish) : 2021-04-20

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD
8.00	82.52		Ground surface							
8.23	82.29		becoming with presence of silt beddings		SS-11	100	GSA A w		2-1-1-1	2
					ST-12	100				
					ST-13	100	A w			
12.19	78.33		Firm to stiff, grey clayey silt, traces of sand, saturated		SS-14	100	GSA - H A w		1-0-0-0	0
					ST-15	0				
					SS-16	100			1-1-1-1	2

Water content (%) △ C_u (Field, kPa)
Atterberg limits (%) □ C_u (Lab, kPa)
"N" Standard penetration test value
"N_C" Dynamic penetration test value

10 20 30 40 50 60 70 80 90

Water level

BOREHOLE REPORT

Borehole No. BH-03

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366427.8
Y : 5017867.9
Z : 90.52

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 1.1 0.86 ; 1.31

Location plan : 11220797-A1-1

Borehole type : Auger + Casing
Core bit size : B+NQ
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-19
Date (finish) : 2021-04-20

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water content (%) △ C_u (Field, kPa); Atterberg limits (%) □ C_u (Lab, kPa); "N" Standard penetration test value; "N_C" Dynamic penetration test value (10 20 30 40 50 60 70 80 90)
16.00	74.52		Ground surface								
16.20	74.32		Compact to loose, grey gravelly and silty sand, traces of clay, saturated								
					SS-17	59			2-6-6-7	12	
					SS-18	64	GSA - H A w		3-3-6-7	9	
					SS-19	43			27 50/8cm	R	
19.97	70.55		**Bedrock:** Grey dolomite, good rock quality								
					RC-20	97				79	
			- joint from 20.75 to 20.76m								
			- fractured from 21.26 to 21.36m								
					RC-21	92				76	
22.81	67.71		End of borehole								

Water level

Photo 3 : BH-03 Core box – Dry rock

Photo 4 : BH-03 Core box – Wet rock

Borehole No. BH-03

Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

BOREHOLE REPORT

Borehole No. BH-04

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366567.3
Y : 5017946.1
Z : 90.50

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 0.81

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-19
Date (finish) : 2021-04-19

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water level
0.00	90.50		Ground surface							10 20 30 40 50 60 70 80 90	
0.13	90.37		**Topsoil:** Clayey silt, traces of sand		SS-1A						
			Native soil: Stiff to very stiff, brown silt and clay, moist		SS-1B	64			2-3-4-5	7	
0.61	89.89		becoming grey-brown		SS-2	100			5-5-5-5	10	
1.52	88.98		becoming grey with presence of sand beddings		SS-3	100			2-2-3-2	5	
2.28	88.22		becoming stiff, very moist		SS-4	100			1-1-1-1	2	
3.25	87.25		becoming firm, saturated		SS-5	100			1-0-1-1	1	
					SS-6	100			1-0-0-1	0	
					ST-7	100					
5.33	85.17		becoming with presence of silt beddings		SS-8	100			1-0-0-1	0	
					SS-9	100			1-0-0-0	0	
6.71	83.79		End of sampling Beginning of dynamic penetration test							0 0 0 0 0	

Water level: 0.81 m

BOREHOLE REPORT

Borehole No. BH-04

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366567.3
Y : 5017946.1
Z : 90.50

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 0.81

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-19
Date (finish) : 2021-04-19

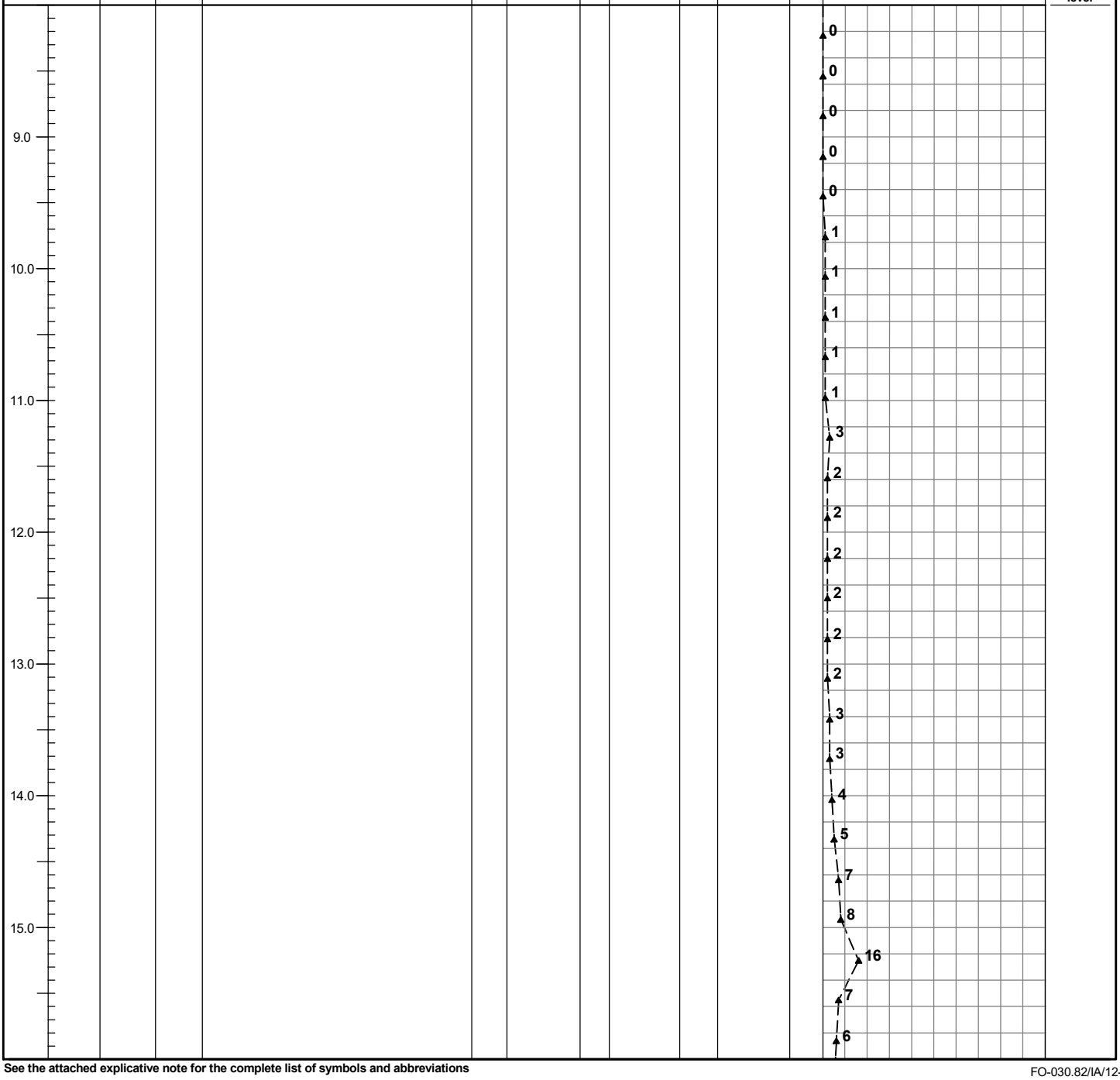
SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water level
8.00	82.50		Ground surface							10 20 30 40 50 60 70 80 90	

○ Water content (%) △ C_u (Field, kPa)
w_P w_L Atterberg limits (%) □ C_u (Lab, kPa)
● "N" Standard penetration test value
▲ "N_C" Dynamic penetration test value



BOREHOLE REPORT

Borehole No. BH-04

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366567.3
Y : 5017946.1
Z : 90.50

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 0.81

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-19
Date (finish) : 2021-04-19

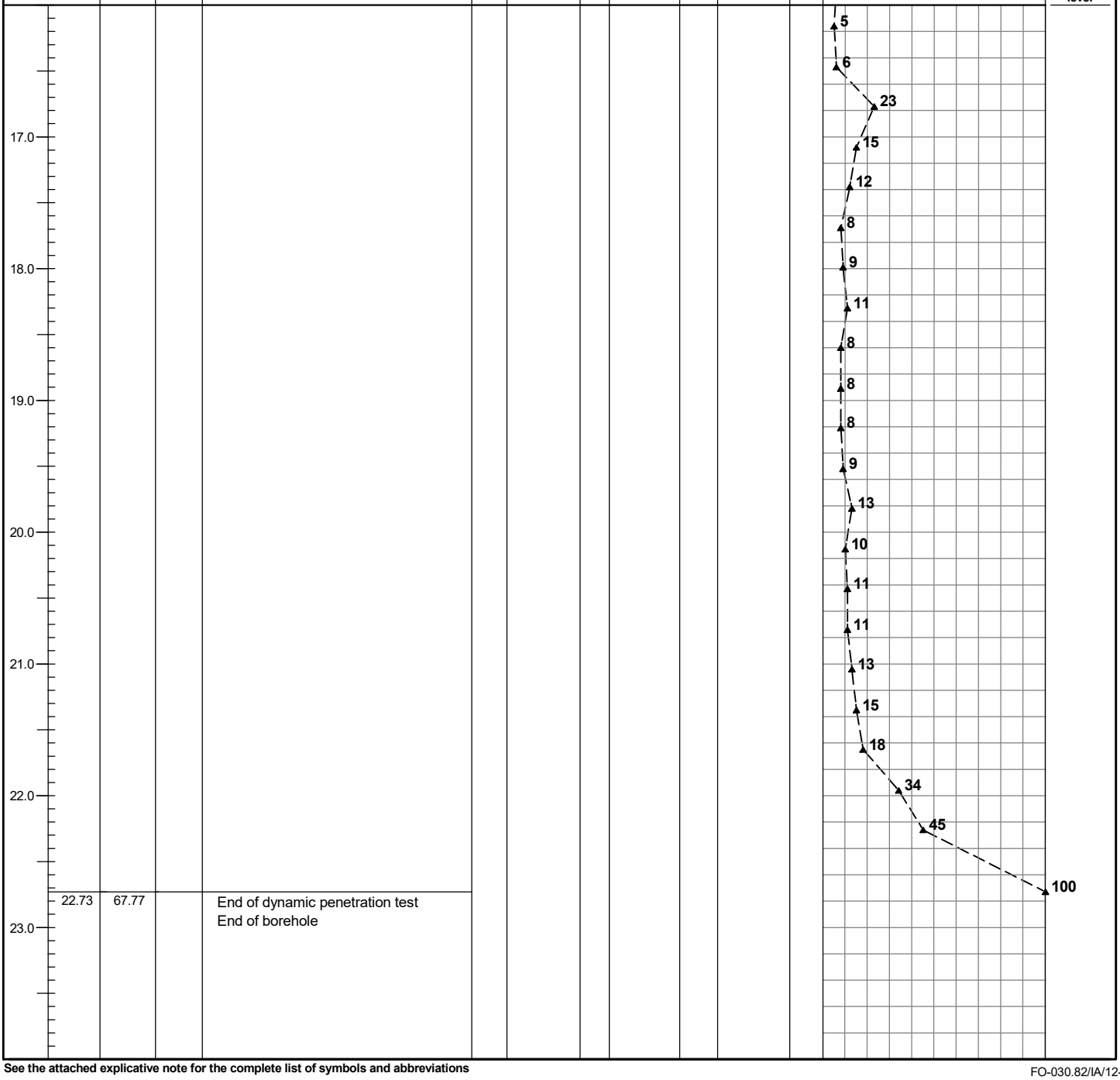
SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water level
16.00	74.50		Ground surface							10 20 30 40 50 60 70 80 90	
22.73	67.77		End of dynamic penetration test End of borehole								

○ Water content (%) △ C_u (Field, kPa)
w_P w_L Atterberg limits (%) □ C_u (Lab, kPa)
● "N" Standard penetration test value
▲ "N_C" Dynamic penetration test value



BOREHOLE REPORT

Borehole No. BH-05

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366518.8
Y : 5017869.4
Z : 90.47

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 0.92

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-28
Date (finish) : 2021-04-28

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water level
0.00	90.47		Ground surface							10 20 30 40 50 60 70 80 90	
			Topsoil:		SS-1A						
0.15	90.32		Clayey silt, traces of sand								
			Native soil: Stiff to very stiff, brown silt and clay, moist		SS-1B	92			1-3-5-5	8	
0.81	89.66		becoming grey-brown		SS-2	82			2-5-6-5	11	
1.52	88.95		becoming grey with presence of sand beddings		SS-3	100			2-2-3-3	5	
2.28	88.19		becoming stiff, very moist		SS-4	100			1-2-1-2	3	
3.27	87.20		becoming firm, saturated		SS-5	100			1-0-1-0	1	
					SS-6	100			1-0-0-1	0	
					ST-7	100					
					SS-8	100			1-0-0-0	0	
5.94	84.53		End of sampling								
6.10	84.37		Beginning of dynamic penetration test							0 0 1 0 0 1 0	0.92 m

Water content (%) △ C_u (Field, kPa)
Atterberg limits (%) □ C_u (Lab, kPa)
"N" Standard penetration test value
"N_C" Dynamic penetration test value

See the attached explicative note for the complete list of symbols and abbreviations

BOREHOLE REPORT

Borehole No. BH-05

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366518.8
Y : 5017869.4
Z : 90.47

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 0.92

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-28
Date (finish) : 2021-04-28

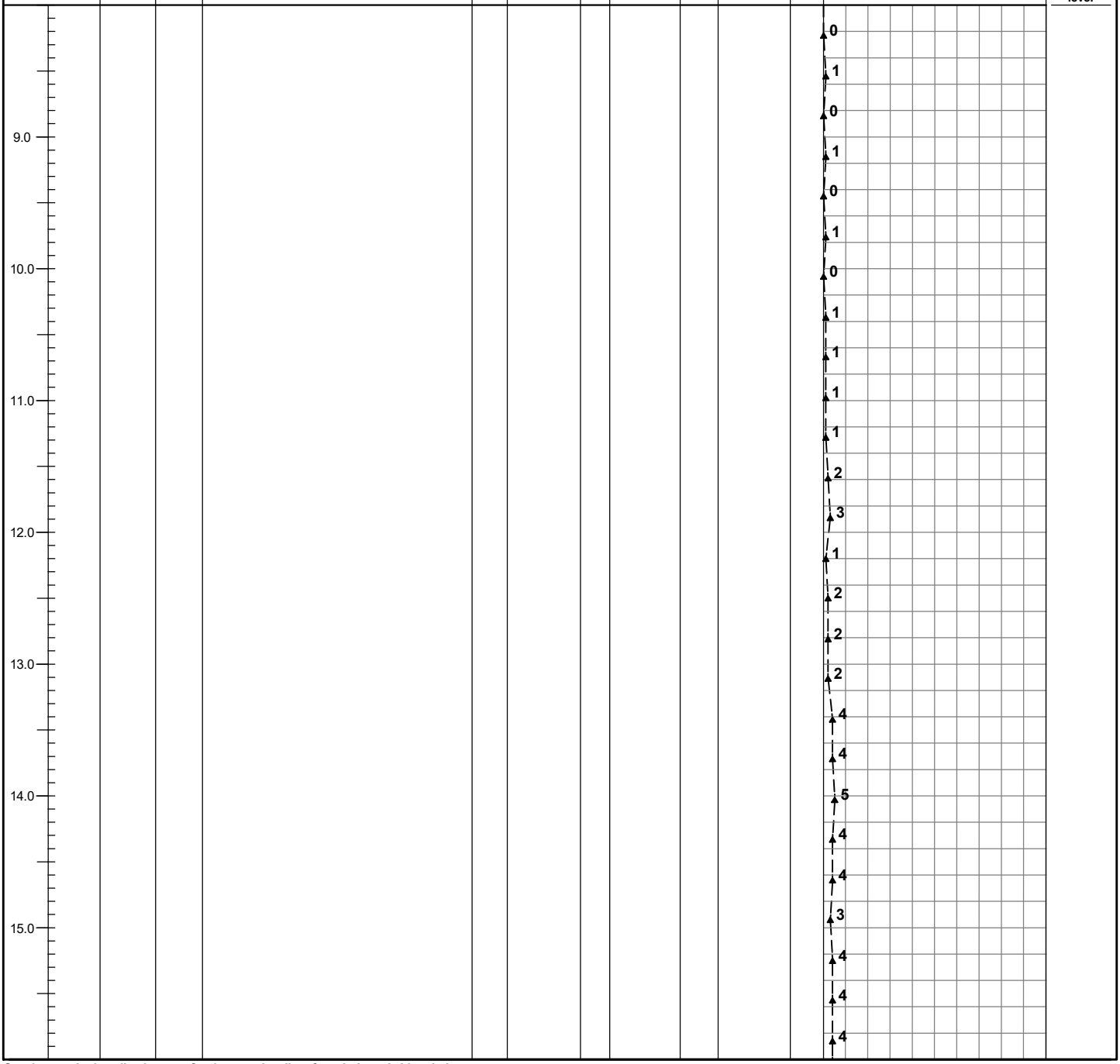
SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water level
8.00	82.47		Ground surface							10 20 30 40 50 60 70 80 90	

○ Water content (%) △ C_u (Field, kPa)
w_P w_L Atterberg limits (%) □ C_u (Lab, kPa)
● "N" Standard penetration test value
▲ "N_C" Dynamic penetration test value



BOREHOLE REPORT

Borehole No. BH-05

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366518.8
Y : 5017869.4
Z : 90.47

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 0.92

Location plan : 11220797-A1-1

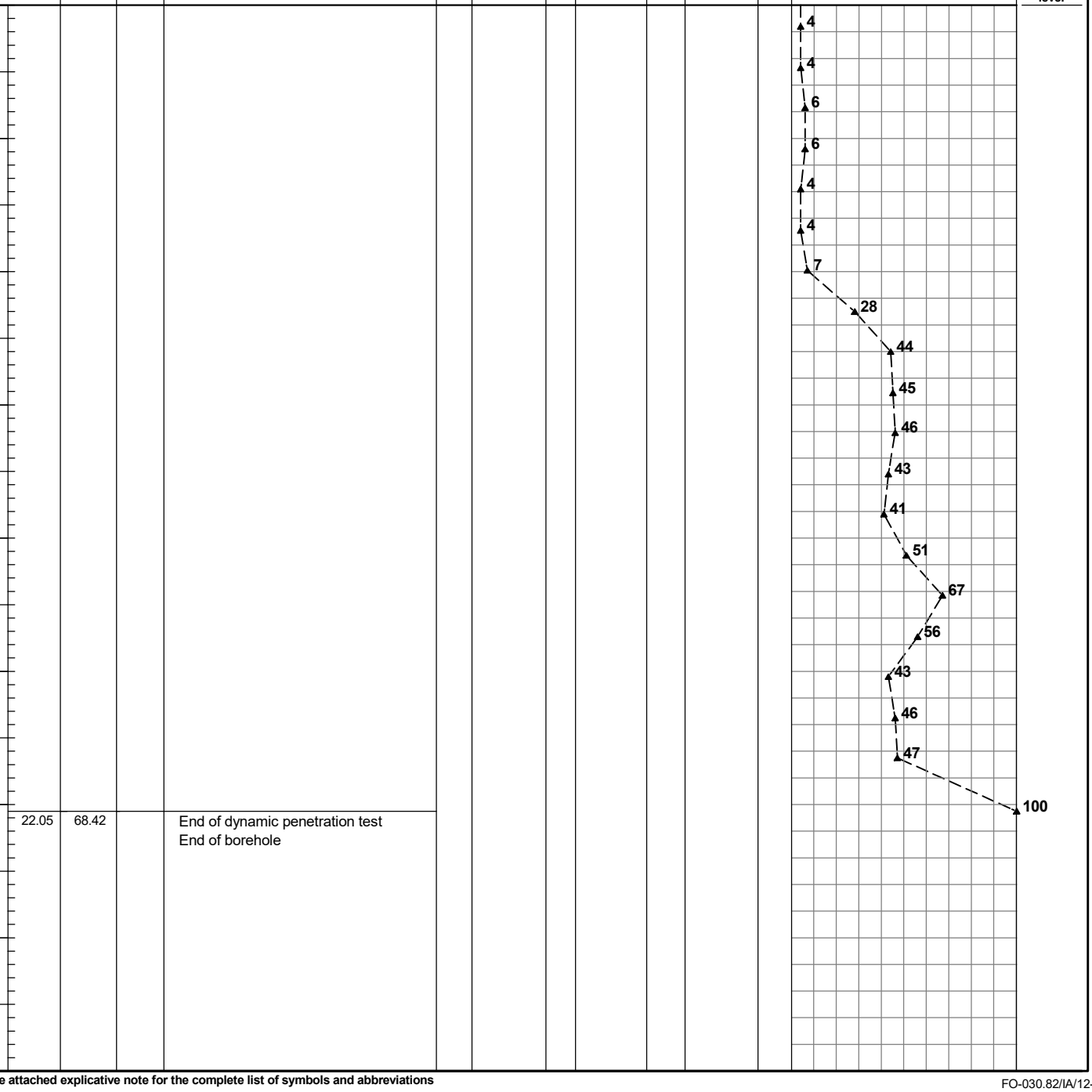
Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-28
Date (finish) : 2021-04-28

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD
16.00	74.47		Ground surface							
22.05	68.42		End of dynamic penetration test End of borehole							



See the attached explicative note for the complete list of symbols and abbreviations

BOREHOLE REPORT

Borehole No. BH-06

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366640.1
Y : 5017937.4
Z : 90.53

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 1.1

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-28
Date (finish) : 2021-04-28

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water level
0.00	90.53		Ground surface							10 20 30 40 50 60 70 80 90	
	0.16	90.37	**Topsoil:** Clayey silt, traces of sand		SS-1	44			2-3-5-5	8	
	0.61	89.92	**Native soil:** Stiff to very stiff, brown silt and clay, moist								
1.0			becoming compact, grey-brown		SS-2	100			3-4-6-6	10	
	1.52	89.01	becoming very moist		SS-3	46			2-3-3-4	6	
2.0	2.28	88.25	becoming stiff, saturated		SS-4	89			2-1-2-1	3	
3.0	3.05	87.48	becoming with presence of silt beddings		SS-5	100			1-1-1-1	2	
	3.81	86.72	becoming firm, saturated		SS-6	100			1-0-0-1	0	
4.0					SS-7	100			1-0-0-0	0	
5.0					ST-8	100					
6.0	5.94	84.59	End of sampling								
	6.10	84.43	Beginning of dynamic penetration test							1	
7.0										0	
										0	
										1	
										0	
										0	
										1	

1.1 m

BOREHOLE REPORT

Borehole No. BH-06

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)

X : 366640.1
Y : 5017937.4
Z : 90.53

▼ - WATER LEVEL

Date : 2021-05-19
Depth (m) : 1.1

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-28
Date (finish) : 2021-04-28

SAMPLE TYPE

SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE

Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL

GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water level
8.00	82.53		Ground surface							10 20 30 40 50 60 70 80 90	

○ Water content (%) △ C_u (Field, kPa)
w_P w_L Atterberg limits (%) □ C_u (Lab, kPa)
● "N" Standard penetration test value
▲ "N_C" Dynamic penetration test value

9.0
10.0
11.0
12.0
13.0
14.0
15.0

0 0 1 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 4 4 6 5 5 4 6 6 4

BOREHOLE REPORT

Borehole No. BH-06

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366640.1
Y : 5017937.4
Z : 90.53

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 1.1

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-28
Date (finish) : 2021-04-28

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water content (%), Atterberg limits (w_P w_L), "N" Standard penetration test value, "N_C" Dynamic penetration test value, C_u (Field, kPa), C_u (Lab, kPa)
16.00	74.53		Ground surface								10 20 30 40 50 60 70 80 90 Water level
											4 5 6 5 5 3 5 7 5 6 11 13 8 13 14 17 21 16 22 100
21.97	68.56		End of dynamic penetration test End of borehole								

BOREHOLE REPORT

Borehole No. BH-11

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366474.0
Y : 5017740.7
Z : 95.01

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 5.4

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-29
Date (finish) : 2021-04-29

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water content (%) ○; Atterberg limits (%) w_P w_L ⊢●⊣; "N" Standard penetration test value ●; "N_C" Dynamic penetration test value ▲; C_u (Field, kPa) △; C_u (Lab, kPa) □ — 10 20 30 40 50 60 70 80 90
0.00	95.01		Ground surface								
			Topsoil: Clayey silt, traces of sand								
0.30	94.71		**Fill:** Stiff to very stiff, brown clayey silt, moist. Presence of topsoil		SS-1 SSE-1	48			2-2-4-7	6	
					SS-2 SSE-2	66			4-5-7-7	12	
1.42	93.59		becoming grey with traces of sand and gravel		SS-3A SSE-3A SS-3B SSE-3B	61			4-7-9-9	16	
1.83	93.18		becoming with presence of topsoil inclusion		SS-4 SSE-4	82			3-5-9-8	14	
					SS-5 SSE-5	48			3-4-8-8	12	
					SS-6 SSE-6	89			3-4-6-6	10	
					SS-7 SSE-7	54			2-4-5-5	9	
					SS-8 SSE-8	64			2-4-5-6	9	
					SS-9 SSE-9	70			5-8-10-10	18	
5.64	89.37		**Native soil:** Stiff to very stiff, brown silt and clay, moist. Presence of topsoil		SS-10A SSE-10A SS-10B SSE-10B	82			2-3-5-5	8	
					SS-11 SSE-11	100			2-2-2-2	4	
					SS-12	100			2-2-2-1	4	
					SS-13	100			1-1-2-2	3	

Water level: 5.4 m

See the attached explicative note for the complete list of symbols and abbreviations

BOREHOLE REPORT

Borehole No. BH-11

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366474.0
Y : 5017740.7
Z : 95.01

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 5.4

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-29
Date (finish) : 2021-04-29

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	10 20 30 40 50 60 70 80 90
8.00	87.01		Ground surface								
8.33	86.68		becoming stiff, very moist with presence of beddings of sand		SS-14	100			1-1-2-1	3	
					ST-15	100					
					SS-16	100			1-0-0-1	0	
10.51	84.50		End of borehole								

○ Water content (%) △ C_u (Field, kPa)
w_P w_L Atterberg limits (%) □ C_u (Lab, kPa)
● "N" Standard penetration test value
▲ "N_C" Dynamic penetration test value

Water level

9.0
10.0
11.0
12.0
13.0
14.0
15.0

See the attached explicative note for the complete list of symbols and abbreviations

BOREHOLE REPORT

Borehole No. BH-12

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366605.0
Y : 5017606.5
Z : 90.31

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 1.12

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-28
Date (finish) : 2021-04-28

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

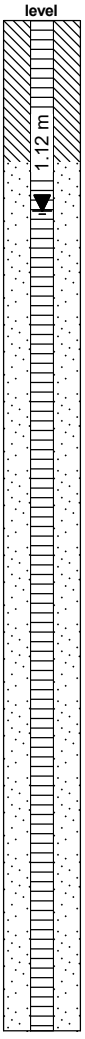
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD
0.00	90.31		Ground surface							
0.05	90.26		**Topsoil:** Loose, dark brown silt, moist		SS-1A					
			Fill: Stiff, brown silty clay, moist		SS-1B	57			2-3-3-3	6
0.61	89.70		**Native soil:** Stiff to very stiff, brown silt and clay, moist		SS-2	100			4-5-6-8	11
1.0					SS-3	100			4-4-5-5	9
2.0										
2.28	88.03		becoming stiff, grey-brown		SS-4	100			2-1-2-1	3
3.0										
3.05	87.26		becoming grey		ST-5	100				
3.81	86.50		becoming firm, very moist		SS-6	100			1-0-0-1	0
4.0										
4.57	85.74		becoming saturated		SS-7	100			1-0-0-0	0
5.0										
					SS-8	100			1-0-0-0	0
6.0										
5.94	84.37		End of sampling							
6.10	84.21		Beginning of dynamic penetration test							1
										1
										2
7.0										3
										3
										3
										3

TESTS RESULTS

○ Water content (%) △ C_u (Field, kPa)
w_P w_L Atterberg limits (%) □ C_u (Lab, kPa)
● "N" Standard penetration test value
▲ "N_C" Dynamic penetration test value

10 20 30 40 50 60 70 80 90

Water level



See the attached explicative note for the complete list of symbols and abbreviations

BOREHOLE REPORT

Borehole No. BH-12

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366605.0
Y : 5017606.5
Z : 90.31

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 1.12

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-28
Date (finish) : 2021-04-28

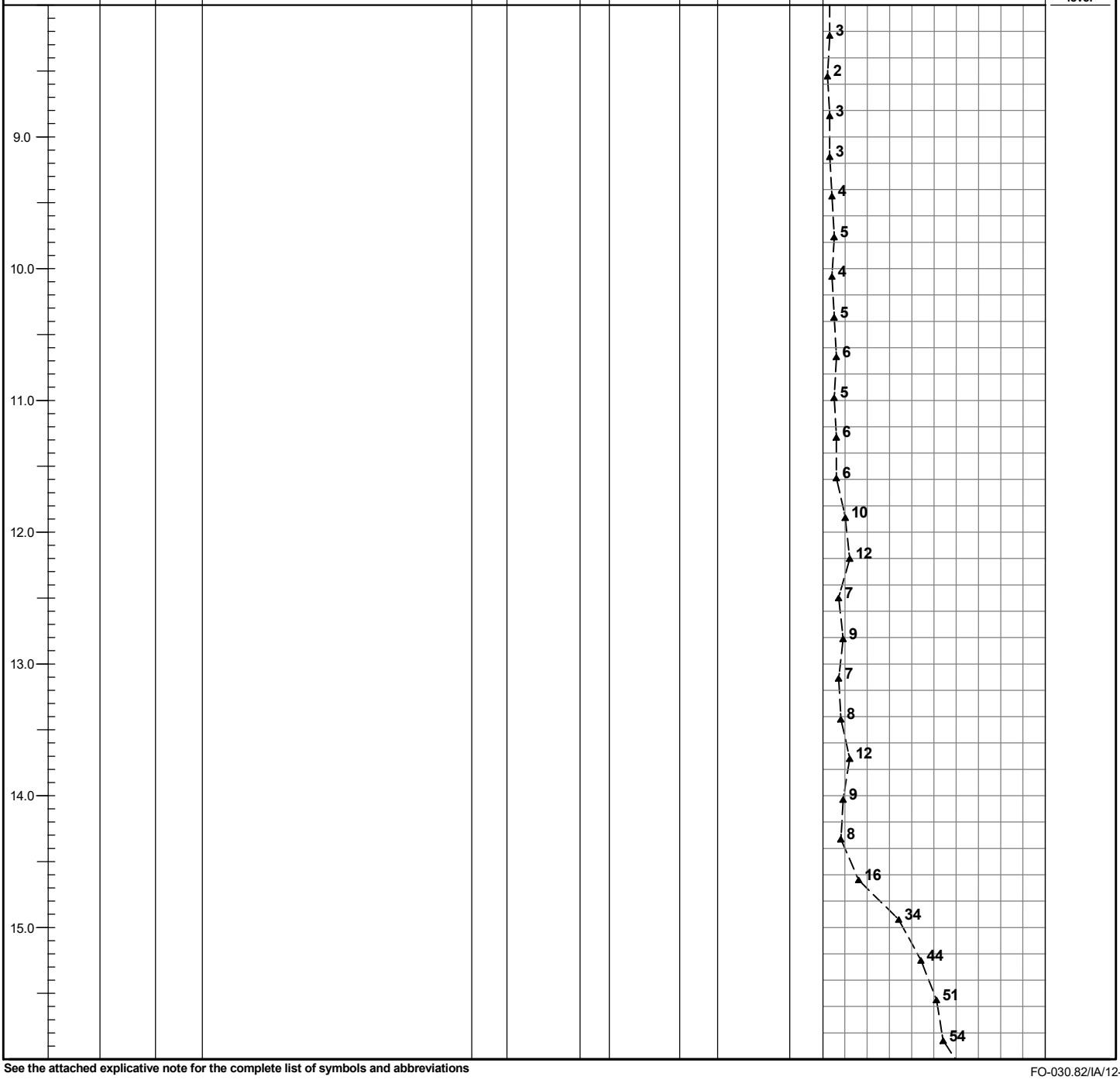
SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water level
8.00	82.31		Ground surface							10 20 30 40 50 60 70 80 90	

○ Water content (%) △ C_u (Field, kPa)
w_P w_L Atterberg limits (%) □ C_u (Lab, kPa)
● "N" Standard penetration test value
▲ "N_C" Dynamic penetration test value



See the attached explicative note for the complete list of symbols and abbreviations

BOREHOLE REPORT

Borehole No. BH-12

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366605.0
Y : 5017606.5
Z : 90.31

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 1.12

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-28
Date (finish) : 2021-04-28

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water content (%) △ C_u (Field, kPa); Atterberg limits (%) □ C_u (Lab, kPa); "N" Standard penetration test value; "N_C" Dynamic penetration test value; 10 20 30 40 50 60 70 80 90; Water level
16.00	74.31		Ground surface								
17.53	72.78		End of dynamic penetration test End of borehole								

66
77
76
93
100

17.0
18.0
19.0
20.0
21.0
22.0
23.0

See the attached explicative note for the complete list of symbols and abbreviations

BOREHOLE REPORT

Borehole No. BH-13

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366809.6
Y : 5017824.8
Z : 90.38

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 0.8

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-29
Date (finish) : 2021-04-29

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS	
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD	Water content (%) △ C_u (Field, kPa); Atterberg limits (%) □ C_u (Lab, kPa); "N" Standard penetration test value; "N_C" Dynamic penetration test value; 10 20 30 40 50 60 70 80 90
0.00	90.38		Ground surface								
0.09	90.29		**Topsoil:** Loose, dark brown silt, moist		SS-1A						
			Native soil: Stiff to very stiff, grey silt and clay, moist		SS-1B	84			2-3-4-4	7	
1.0					SS-2	100			6-5-7-8	12	
1.52	88.86		becoming with presence of beddings of sand		S-S3	100			2-3-3-3	6	
2.0											
2.28	88.10		becoming stiff		SS-4	100			1-1-1-1	2	
3.0											
3.05	87.33		becoming very moist		SS-5	100			1-0-1-0	1	
3.81	86.57		becoming firm, saturated with presence of shells		SS-6	100			1-0-0-1	0	
4.0											
					SS-7	100			1-0-0-1	0	
5.0											
6.0					SS-8	100			1-0-0-0	0	
7.0											
					ST-9	100					

Water level: 0.8 m

See the attached explicative note for the complete list of symbols and abbreviations

BOREHOLE REPORT

Borehole No. BH-13

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366809.6
Y : 5017824.8
Z : 90.38

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 0.8

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-29
Date (finish) : 2021-04-29

SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY | **SAMPLE** | **TESTS RESULTS**

Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD
8.00	82.38		Ground surface							
					SS-10	100			1-0-0-0	0
10.67	79.71		becoming with presence of beddings of silt		SS-11	100			1-0-0-0	0
11.28	79.10		End of borehole Beginning of dynamic penetration test							

Tests results: ○ Water content (%) △ C_u (Field, kPa); Atterberg limits (%) □ C_u (Lab, kPa); ● "N" Standard penetration test value; ▲ "N_C" Dynamic penetration test value

10 20 30 40 50 60 70 80 90

Water level

1 2 3 3 2 3 9 8 8 11 27 20 13 17 14 17

BOREHOLE REPORT

Borehole No. BH-13

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DESCRIBED BY: F. ARGUIN VERIFIED BY: M.-A. RICHARD / A. FIORILLI

GEODETIC COORDINATES (MTM, NAD-83) (m)
X : 366809.6
Y : 5017824.8
Z : 90.38

▼ - WATER LEVEL
Date : 2021-05-19
Depth (m) : 0.8

Location plan : 11220797-A1-1

Borehole type : Auger
Core bit size : B
Hammer type : Automatic
Energy ratio :
Date (start) : 2021-04-29
Date (finish) : 2021-04-29

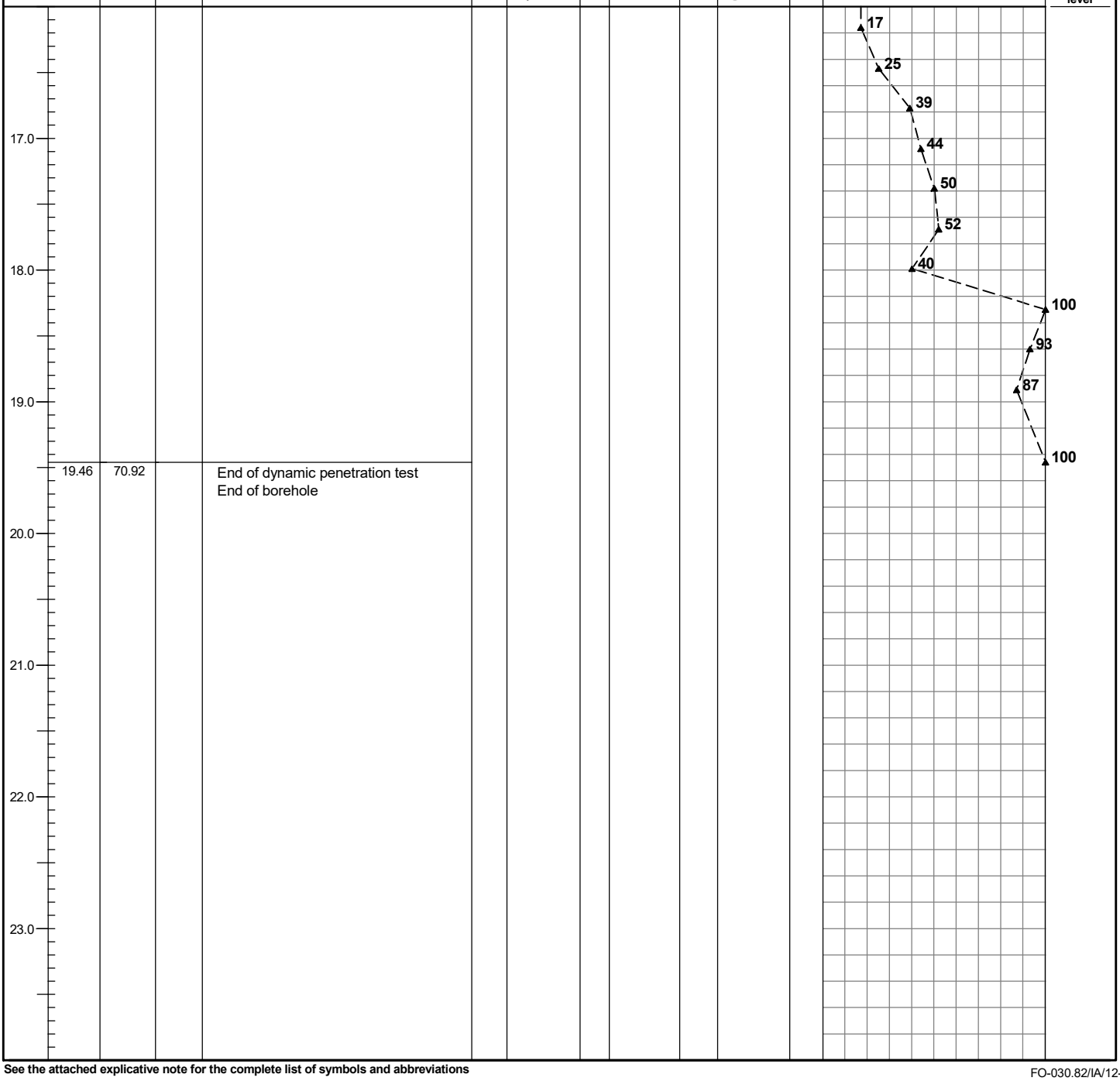
SAMPLE TYPE
SS(E) - Split Spoon (Environment)
RC(E) - Rock diamond core
AU(E) - Auger
TEE - Sampling Tube Environment
ST - Shelby tube
GS(E) - Grab sample

SAMPLE STATE
Remoulded
Intact
Diamond drilling
Lost

TEST SYMBOL
GSA: grain size analysis
CA: chemical analysis
w_L: liquid limit
w_P: plastic limit
w : water content
C_u: undrained shear strength
S_T: sensitivity
Dup: duplicate sample

STRATIGRAPHY				SAMPLE						TESTS RESULTS
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N_C or RQD
16.00	74.38		Ground surface							10 20 30 40 50 60 70 80 90 Water level
19.46	70.92		End of dynamic penetration test End of borehole							

○ Water content (%) △ C_u (Field, kPa)
w_P w_L Atterberg limits (%) □ C_u (Lab, kPa)
● "N" Standard penetration test value
▲ "N_C" Dynamic penetration test value



See the attached explicative note for the complete list of symbols and abbreviations

O-A756-A

FONDEX

BOREHOLE NUMBER BH-91-3

PROJECT South Merivale Business Park

LOCATION Merivale Rd. & Highway 16, Nepean, Ont.

DATUM Ass. Geodetic BOREHOLE TYPE CME-55, Hollow Stem

DRILLING DATE Oct 18/91

REPORT DATE Nov/91

DRAWN BY M.K.

Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLES NUMBER	TYPE	BLOWS (N)	% RECOVERY
89.42						
0.00	Silty Clay					
	-very stiff, brown, occasional oxidation stains and silty seams trace white shells, moist.					
1.00			1	SS	2	
2.00						
3.00			2	SS	4	
	-becoming, grey, stiff, wet					
4.00			3	SS	WH	
5.00	-becoming, layered, with silty seams.					
6.00			4	SS	WH	
82.42						
7.00	(continued on next page)					

DYNAMIC PENETRATION RESISTANCE BLOWS
0 20 40 60 80

SHEAR STRENGTH kPa
FIELD VANE SHEAR *
LAB VANE SHEAR ●
0 50 100 150 200 250

● undisturbed
○ remolded

CONSISTENCY:
NATURAL MOISTURE CONTENT (W)
LIQUID LIMIT (W)
PLASTIC LIMIT (Wp)
% 0 20 40 60 80

O-A756-A

FONDEX

BOREHOLE NUMBER BH-91-3

PROJECT South Merivale Business Park

LOCATION Merivale Rd. & Highway 16, Nepean, Ont.

DATUM Ass. Geodetic BOREHOLE TYPE CME-55, Hollow Stem

DRILLING DATE Oct 18/91

REPORT DATE Nov/91

DRAWN BY M.K.

Elev. / Depth	DESCRIPTION	STRATIGRAPHY	SAMPLES: NUMBER	TYPE	(N) BLOWS	% RECOVERY
82.42						
7.00	Clayey Silt -Loose to compact, grey interbeded clay seams, wet.		5	SS	WH	
8.00						
9.00			6	SS	2	
10.00			7	SS	6	
78.19	End of Borehole					
11.23						

Notes

-piezometer installed and destroyed

DYNAMIC PENETRATION RESISTANCE BLOWS
0 20 40 60 80

SHEAR STRENGTH kPa
FIELD VANE SHEAR •
LAB VANE SHEAR ●
0 50 100 150 200 250

CONSISTENCY:
NATURAL MOISTURE CONTENT (W) ——
LIQUID LIMIT (W) ——o——
PLASTIC LIMIT (Wp) ——|——
% 0 20 40 60 80

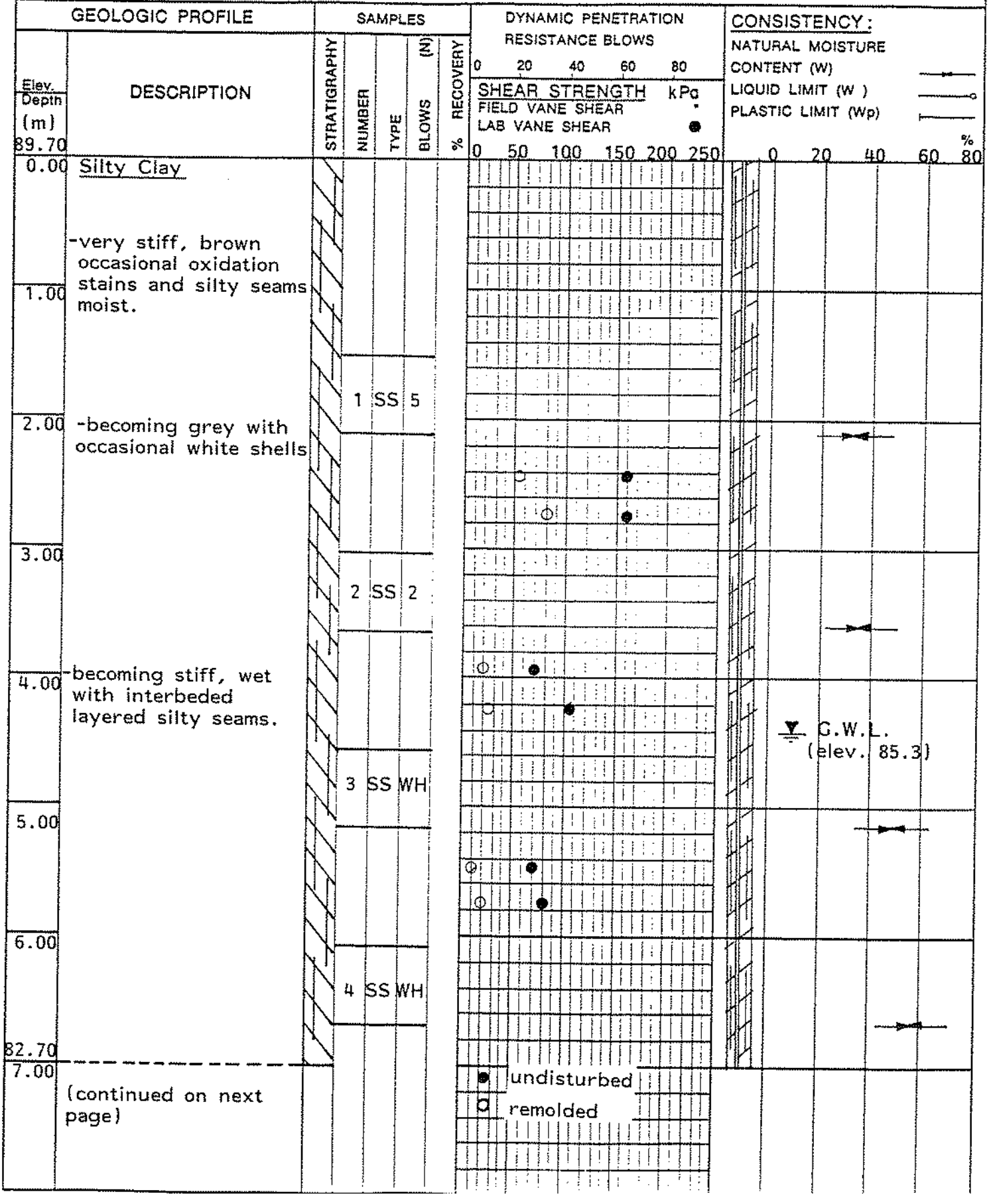
O-A756-A

FONDEX

BOREHOLE NUMBER BH-91-4

PROJECT South Merivale Business Park
LOCATION Merivale Rd. & Highway 16, Nepean, Ont.
DATUM Ass. Geodetic BOREHOLE TYPE CME-55, Hollow Stem

DRILLING DATE Oct 21/91
REPORT DATE Nov/91
DRAWN BY M.K.



O-A756 -A

FONDEX

BOREHOLE NUMBER BH-91-4

PROJECT South Merivale Business Park

LOCATION Merivale Rd. & Highway 16, Nepean, Ont.

DATUM Ass. Geodetic BOREHOLE TYPE CME-55, Hollow Stem

DRILLING DATE Oct 21/91

REPORT DATE Nov/91

DRAWN BY M.K.

Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLES NUMBER	TYPE	BLOWS (N)	% RECOVERY
82.70						
7.00	Clayey Silt -loose to compact, grey interbeded clay seams, wet.		5	SS	WH	
8.00						
9.00			6	SS	WH	
10.00						
78.47	End of Borehole		7	SS	4	
11.23						

DYNAMIC PENETRATION RESISTANCE BLOWS
0 20 40 60 80

SHEAR STRENGTH kPa
FIELD VANE SHEAR •
LAB VANE SHEAR ●
0 50 100 150 200 250

CONSISTENCY:
NATURAL MOISTURE CONTENT (W)
LIQUID LIMIT (W)
PLASTIC LIMIT (Wp)
0 20 40 60 80 %

Notes

1. Piezometer installed
2. Water Level

date	depth
Nov 1	4.4 m

O-A756-A

FONDEX

BOREHOLE NUMBER BH-91-5

PROJECT South Merivale Business Park

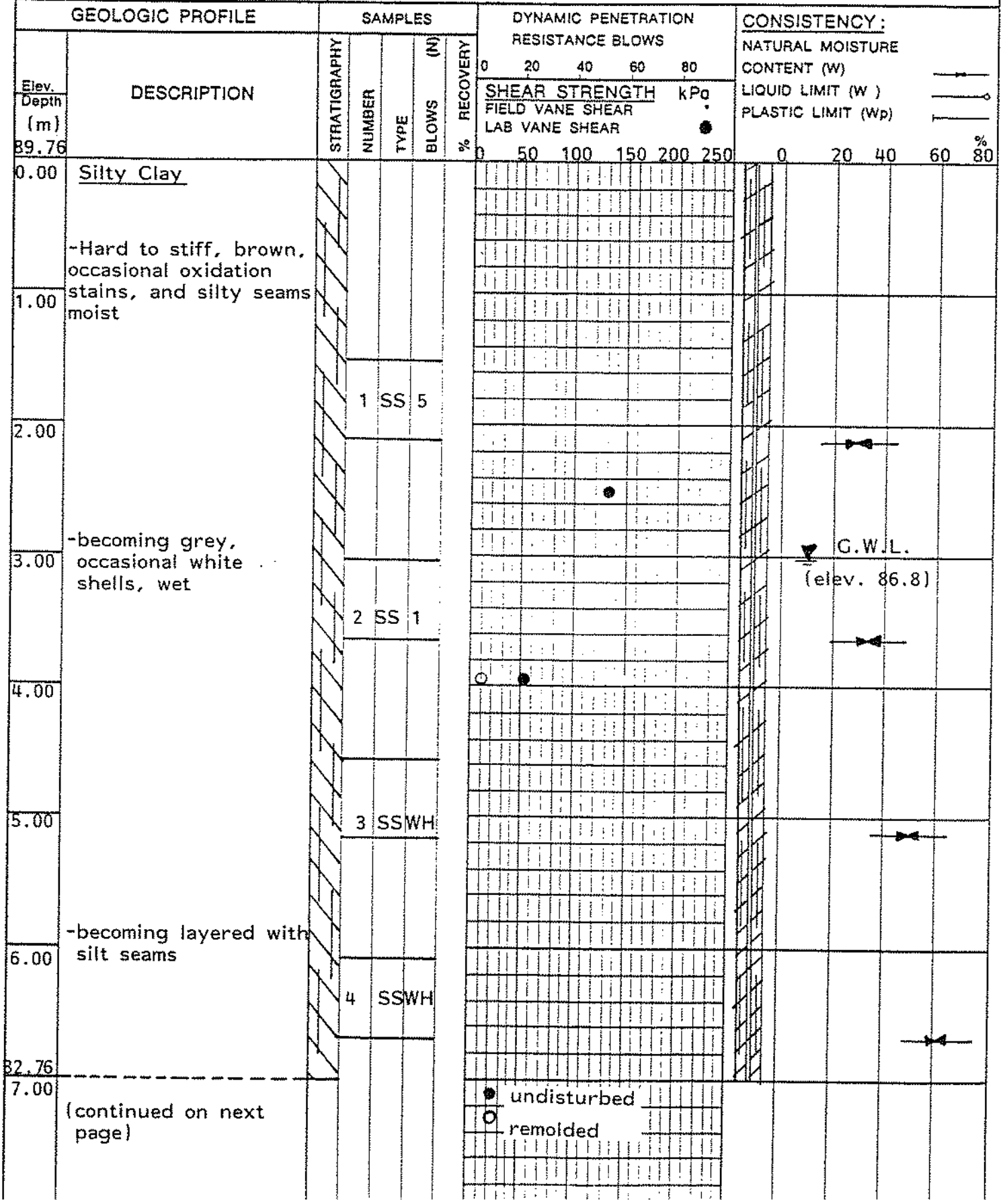
LOCATION Merivale Rd. & Highway 16, Nepean, Ont.

DATUM Ass. Geodetic BOREHOLE TYPE CME-55, Hollow Stem

DRILLING DATE Oct 21/91

REPORT DATE Nov/91

DRAWN BY M.K.



O-A756-A

FONDEX

BOREHOLE NUMBER BH-91-5

PROJECT South Merivale Business Park

LOCATION Merivale Rd. & Highway 16, Nepean, Ont.

DATUM Ass. Geodetic BOREHOLE TYPE CME-55, Hollow Stem

DRILLING DATE Oct 21/91

REPORT DATE Nov/91

DRAWN BY M.K.

Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLES: NUMBER	TYPE	BLOWS (N)	% RECOVERY
82.76						
7.00	Clayey Silt -loose to compact, grey interbeded with clay seams, wet.					
8.00			5	SS	WH	
9.00			6	SS	WH	
10.00			7	SS	WH	
78.53	End of Borehole					
11.23						

DYNAMIC PENETRATION RESISTANCE BLOWS
0 20 40 60 80

SHEAR STRENGTH kPa
FIELD VANE SHEAR •
LAB VANE SHEAR ●
0 50 100 150 200 250

CONSISTENCY:
NATURAL MOISTURE CONTENT (W)
LIQUID LIMIT (W)
PLASTIC LIMIT (Wp)
0 20 40 60 80 %

Notes

1. Piezometer installed
2. water level

Date	Level
Nov 1	3.0 m

O-A756-A

FONDEX

BOREHOLE NUMBER BH-91-6

PROJECT South Merivale Business Park

LOCATION Merivale Rd. & Highway 16, Nepean, Ont.

DATUM Ass. Geodetic BOREHOLE TYPE CME-55, Hollow Stem

DRILLING DATE Oct 21/91

REPORT DATE Nov/91

DRAWN BY M.K.

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH kPa (FIELD VANE SHEAR •, LAB VANE SHEAR ●) 0 50 100 150 200 250	CONSISTENCY: NATURAL MOISTURE CONTENT (W), LIQUID LIMIT (W), PLASTIC LIMIT (Wp) 0 20 40 60 80 %
Elev. Depth (m) 89.36	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	% RECOVERY		
0.00	Silty Clay							
	-very stiff, brown, occaisional oxidation stains and silty seams moist							
1.00			1	SS	5			
2.00								
	- becoming stiff, grey, presence of white shells, wet							
3.00			2	SS	2			
4.00			3	SS	WH			
5.00	-becoming layered with silty seams.							
6.00			4	SS	WH			
82.36								
7.00	(continued on next page)						● undisturbed ⊖ remolded	

O-A756-A

FONDEX

BOREHOLE NUMBER BH-91-6

PROJECT South Merivale Business Park

LOCATION Merivale Rd. & Highway 16, Nepean, Ont.

DATUM Ass. Geodetic BOREHOLE TYPE CME-55, Hollow Stem

DRILLING DATE Oct 21/91

REPORT DATE Nov/91

DRAWN BY M.K.

Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLES NUMBER	TYPE	BLOWS (N)	RECOVERY %
82.36						
7.00	Clayey Silt - loose to compact, grey interbeded clay seams, wet.					
			5	SS	WH	
8.00						
			6	SS	WH	
9.00						
10.00						
78.13	End of Borehole		7	SS	WH	
11.23						

DYNAMIC PENETRATION RESISTANCE BLOWS
0 20 40 60 80

SHEAR STRENGTH kPa
FIELD VANE SHEAR •
LAB VANE SHEAR ●
0 50 100 150 200 250

CONSISTENCY:
NATURAL MOISTURE CONTENT (W)
LIQUID LIMIT (W)
PLASTIC LIMIT (Wp)
% 0 20 40 60 80

Notes

- Piezometer installed and destroyed

O-A756-A

FONDEX

BOREHOLE NUMBER BH-91-7

PROJECT South Merivale Business Park

LOCATION Merivale Rd. & Highway 16, Nepean, Ont.

DATUM Ass. Geodetic BOREHOLE TYPE CME-55, Hollow Stem

DRILLING DATE Oct 21/91

REPORT DATE Nov/91

DRAWN BY M.K.

Elev. Depth (M)	DESCRIPTION	STRATIGRAPHY	SAMPLES NUMBER	TYPE	BLOWS (N)	% RECOVERY
88.97						
0.00	Silty Clay					
	-very stiff, borwn, occasional silty seams and oxidation stains, presence of white fossils, moist.		1	SS	3	
1.00						
2.00			2	SS	3	
3.00	- becoming grey, stiff, wet					
4.00			3	SS	WH	
5.00	-becoming layered with silty seams					
6.00			4	SS	WH	
81.97						
7.00	(continued on next page)					

DYNAMIC PENETRATION RESISTANCE BLOWS
0 20 40 60 80

SHEAR STRENGTH kPa
FIELD VANE SHEAR •
LAB VANE SHEAR ●
0 50 100 150 200 250

● undisturbed
○ remolded

CONSISTENCY:
NATURAL MOISTURE CONTENT (W)
LIQUID LIMIT (W)
PLASTIC LIMIT (Wp)
0 20 40 60 80 %

G.W.L. (Elev. 85.0)

O-A756-A

FONDEX

BOREHOLE NUMBER BH-91-7

PROJECT South Merivale Business Park

LOCATION Merivale RD. & Highway 16, Nepean, Ont.

DATUM Ass. Geodetic BOREHOLE TYPE CME-55, Hollow Stem

DRILLING DATE Oct 21/91

REPORT DATE Nov/91

DRAWN BY M.K.

Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLES NUMBER	TYPE	BLOWS (N)	% RECOVERY
81.97						
7.00	Clayey Silt -loose to compact, grey, interbeded with clay seams, wet.		5	SS	WH	
8.00						
9.00			6	SS	1	
10.00						
77.74	End of Borehole		7	SS	1	
11.23						

DYNAMIC PENETRATION RESISTANCE BLOWS
0 20 40 60 80

SHEAR STRENGTH kPa
FIELD VANE SHEAR •
LAB VANE SHEAR ●
0 50 100 150 200 250

CONSISTENCY:
NATURAL MOISTURE CONTENT (W)
LIQUID LIMIT (W)
PLASTIC LIMIT (Wp)
0 20 40 60 80 %

Notes

-piezometer installed

- Water Level

Date	Depth
Nov 1	4.0 m

O-A756

FONDEX

BOREHOLE NUMBER BH-1 (1 of 3)

PROJECT Geotechnical Investigation — DRILLING DATE June 22/90

LOCATION South Merivale Business Park — REPORT DATE July/90

DATUM Geodetic — BOREHOLE TYPE CME-55 — DRAWN BY M.T.W.

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH kPa FIELD VANE SHEAR * LAB VANE SHEAR × 50 100 150 200	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W_L) PLASTIC LIMIT (W_P) 20 40 60 80 %
Elev. / Depth 89.53	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	RECOVERY %		
0.0	Corn and 330 mm clayey topsoil over		1	SS	9			
1.0	Silty Clay: occasional thin beds of silt and fine sand, trace shells; hard to stiff, olive-brown, moist		2	SS	4			
2.0			3	SS	2			G.W.L. ▽ July 12/90 (piezo tip 'B')
3.0			4	SS	2			
85.72 3.81	becoming firm to soft, grey, and wet		5	SS	-			
4.0			6	ST	-			
5.0								
6.0	Trace charcoal-grey organic spots		7	SS	-			
82.82 6.71	becoming stiff							
7.0			8	SS	1			
8.0								
9.0			9	SS	1		in-situ, re-moulded	G.W.L. ▽ July 12/90 (piezo. tip 'A')
10.0	Continued on next sheet							

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FONDEX

BOREHOLE NUMBER BH-1 (2 of 3)

PROJECT Geotechnical Investigation

LOCATION South Merivale Busines Park

DATUM Geodetic BOREHOLE TYPE CME-55

DRILLING DATE June 22/90

REPORT DATE July/90

DRAWN BY M.T.W.

Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	RECOVERY %	DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH kPa: FIELD VANE SHEAR *, LAB VANE SHEAR x	CONSISTENCY: NATURAL MOISTURE CONTENT (W), LIQUID LIMIT (W_L), PLASTIC LIMIT (W_P) 20 40 60 80 %
79.53	CONTINUED							
10.0 / 78.53	Silty Clay: Stiff, Grey, wet							
11.0								
12.0	Clayey Silt: stratified, thin clay layers, loose, grey, wet		10	SS	4			
13.0								
14.0 / 75.20								
14.33								
15.0	Silt/Clay Till: some sand and gravel, loose to compact, grey, wet		11	SS	4			
16.0								
17.0								
18.0			12	SS	11			
70.33	Auger Refusal							
19.20	Sandstone Bedrock horizontal bedding, sound, light grey							
20.0	Continued next sheet							

O-A756

FONDEX

BOREHOLE NUMBER BH-1 (3 of 3)

PROJECT Geotechnical Investigation — DRILLING DATE June 25/90

LOCATION South Merivale Business Park — REPORT DATE July/90

DATUM Geodetic — BOREHOLE TYPE CME-55 — DRAWN BY M. T. W.

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80	CONSISTENCY: NATURAL MOISTURE CONTENT (W) —•— LIQUID LIMIT (W_L) —o— PLASTIC LIMIT (W_P) |-|
Elev. Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	RECOVERY %	SHEAR STRENGTH kPa; FIELD VANE SHEAR *; LAB VANE SHEAR x	%
69.53	CONTINUED							
20.0	Sandstone Bedrock horizontal bedding, sound, light grey. Becoming less sandy and more dolimitic with depth		13	RC	55	89		
21.0			14	RC	64	100		
22.0			15	RC	64	100		
66.82								
22.71	End of Borehole							

Notes:

1. Two piezometer standpipes installed:
   A) Piezometer tip 'A' installed at 18.3m;
   B) Piezometer tip 'B' at 6.1 m;
   C) 500 mm thick Bentonite Seals at 18.0 m, 6.7m, and 5.5 m.

2. Water Level Record

Time	Water Level (m)	
	A	B
June 25/90	2.0 (in augers)	
June 26/90	13.3	4.1
July 6/90	7.9	2.5
July 12/90	9.0	2.4

3. ▲ Pocket Penetrometer Values

4. The low blow counts in values in the till may be attributed to saturated and disturbed conditions due to drilling

O-A756

FONDEX

BOREHOLE NUMBER BH-7

PROJECT Geotechnical Investigation

LOCATION South Merivale Business Park

DATUM Geodetic BOREHOLE TYPE CME-55

DRILLING DATE June 22/90

REPORT DATE July /90

DRAWN BY M.T.W.

Elev. / Depth	DESCRIPTION	STRATIGRAPHY	SAMPLES: NUMBER	TYPE	BLOWS (N)	RECOVERY %	DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH kPa FIELD VANE SHEAR * LAB VANE SHEAR 50 100 150 200 ×	CONSISTENCY: NATURAL MOISTURE CONTENT (W) / LIQUID LIMIT (W_L) / PLASTIC LIMIT (W_P) 20 40 60 80 %
90.07								
0.0	Corn and 250 mm clayey topsoil over							
			1	SS	7			
1.0	Silty Clay occasional silt and fine sand lenses, trace shells, very stiff to stiff, olive-brown, moist						▲	
			2	SS	3		▲	G.W.L. July 6/90
2.0								
			3	SS	2		* *	
3.0			4	SS	2			
86.26	becoming firm to soft,							
3.81	grey, wet		5	SS	-		* *	
4.0								
			6	SS	-			
5.0								
6.0	Trace charcoal-grey organic spots		7	SS	-		* *	
83.37								
6.7	End of Borehole							

in-situ
re-moulded

Notes:

1. ▲ Pocket Penetrometer values
2. Standpipe piezometer installed to 6.1 m
3. Chemical Analysis performed on water sample obtained from 5 m depth
4. Water Level Record

Time	Water Level (m)
on compl.	5.0 (in augers)
June 25/90	1.8
June 26/90	1.8
July 6/90	1.9

Q-A756

FONDEX

BOREHOLE NUMBER BH-8

PROJECT Geotechnical Investigation

LOCATION South Merivale Business Park

DATUM Geodetic BOREHOLE TYPE CME-55

DRILLING DATE June 22/90

REPORT DATE July/90

DRAWN BY M.T.W.

Elev. / Depth	DESCRIPTION	STRATIGRAPHY	SAMPLES: NUMBER	TYPE	BLOWS (N)	RECOVERY %
89.89						
0.0	Corn and 275 mm clayey topsoil over					
	Silty Clay:					
1.0	Trace fine sand, trace shells, very stiff to stiff, olive-brown, moist		1	SS	6	
			2	SS	3	
2.0			3	SS	2	
3.0			4	SS	1	
			5	SS	1	
4.0						
85.62	becoming soft to firm, grey, wet					
4.27			6	SS	-	
5.0						
6.0	trace charcoal, grey organic spots		7	SS	-	
83.19						
6.7	End of Borehole					

DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80

SHEAR STRENGTH kPa

FIELD VANE SHEAR *

LAB VANE SHEAR × 50 100 150 200

CONSISTENCY:

NATURAL MOISTURE CONTENT (W)

LIQUID LIMIT (WL)

PLASTIC LIMIT (Wp)

20 40 60 80 %

G.W.L. ▽

July 6/90

in situ

re-moulded

Note:

1. ▲ Pocket Penetrometer Values
2. Standpipe Piezometer installed to 6.1 m.
3. Water Level Records

Time	Water Level (m) on comp. dry (in augers)
June 25/90	2.3
June 26/90	2.3
July 6/90	2.3

O-A756

FONDEX

BOREHOLE NUMBER BH-9 (1 of 3)

PROJECT Geotechnical Investigation

DRILLING DATE June 26/90

LOCATION South Merivale Business Park

REPORT DATE July/90

DATUM Geodetic BOREHOLE TYPE CME-55

DRAWN BY M.T.W.

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH kPa FIELD VANE SHEAR * LAB VANE SHEAR X 50 100 150 200	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W_L) PLASTIC LIMIT (W_P) % 20 40 60 80
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS	RECOVERY		
90.65								
0.0	Grass and 200 mm clayey topsoil over							
	Silty Clay:		1	SS	8			
1.0	Trace fine sand and silt lenses occasional shells, very stiff to stiff, olive-brown, moist		2	SS	3			G.W.L. July 12/90 Piezo 'B'
2.0			3	SS	-			
87.65	becoming firm, grey and wet							
3.0			4	SS	-			G.W.L. July 12/90 Piezo 'A'
86.84	Trace charcoal-grey organic spots		5	SS	-			
3.81	to bottom of clay							
4.0			6	SS	-			
5.0								
6.0			7	SS	-			
7.0			8	ST	-		X	
8.0								
9.0			9	SS	-			
10.0	Continued on next sheet							

O-A756

FONDEX

BOREHOLE NUMBER BH-9 (2 of 3)

PROJECT Geotechnical Investigation

LOCATION South Merivale Business Park

DATUM Geodetic BOREHOLE TYPE CME-55

DRILLING DATE June 26/90

REPORT DATE July/90

DRAWN BY M.T.W.

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH kPa FIELD VANE SHEAR * LAB VANE SHEAR × 50 100 150 200	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W_L) PLASTIC LIMIT (W_P) 20 40 60 80 %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	RECOVERY %		
80.65	Continued							
10.0	Silty Clay: firm, grey, wet							
11.0								
12.0			10	SS	-			
13.0								
14.0								
75.41 / 15.24	Transition to very loose clayey silt with occasional silty clay layers, grey, wet		11	SS	-			
16.0								
73.43 / 17.22	Clay/Silt/Sand/Gravel Till: occasional boulders, compact to dense, grey, wet							
18.0			12	SS	22			
19.0								
20.0	Continued on next page							

O-A756

FONDEX

BOREHOLE NUMBER BH-9 (3 of 3)

PROJECT Geotechnical Investigation — DRILLING DATE June 26/90

LOCATION South Merivale Business Park — REPORT DATE July/90

DATUM Geodetic — BOREHOLE TYPE CME-55 — DRAWN BY M.T.W.

GEOLOGIC PROFILE		SAMPLES					DYNAMIC PENETRATION RESISTANCE BLOWS 0 20 40 60 80 / SHEAR STRENGTH kPa FIELD VANE SHEAR * LAB VANE SHEAR x	CONSISTENCY: NATURAL MOISTURE CONTENT (W) LIQUID LIMIT (W_L) PLASTIC LIMIT (W_P) 20 40 60 80 %
Elev. / Depth	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	RECOVERY %		
70.65	Continued							
20.0	Clay/Silt/Sand/Gravel Till : dense, grey, wet, occasional boulders (auger refusal at 20.7 m)		13	RC				
21.0			14	SS	40			
68.91	Split spoon refusal							
21.74	End of Borehole							

Notes:

1. ▲ Pocket Penetrometer values
2. Two Piezometer standpipe installed.
   A) Piezometer tip 'A' installed at 21.3 m
   B) piezometer tip 'B' installed at 6.1 m
   C) 500 mm thick Bentonite seals at 20.7 m, 6.4 m, and 5.5 m.
3. Water Level Record

Time	'A'	'B'
July 6/90	3.0	1.5
July 12/90	3.1	1.7

4. 300 m of rock coring at a depth of 20.7 m (sample RC-13) confirmed the existence of a boulder

TEST PIT REPORT

Reference No.: 12615684-A1

Test Pit No.: **TP-101-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Executed by : **Demolition Plus**

Described by : **Mathieu Chénier, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X : **366591**
Y : **5017776**
Z : **90.51**

Location Plan No.: **FIGURE 1**
Date (Start) : **2023-07-07**
Date (Finish) : **2023-07-07**
Test Pit Depth (m): **3.00**

DEPTH - m	ELEVATION / DEPTH - m	STRATIGRAPHY: SOIL DESCRIPTION	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: STATE	WATER INFILTRATION	TEST SYMBOL
	90.51	Ground Surface					
0.5	0.00 89.91	**Topsoil**: Brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets) (1-5%).		GS-01			
1.0	0.60 89.11	**Native Soil**: Firm to stiff, grey clay and silt, traces of sand, moist. Presence of organic matter (rootlets) (1%).		GS-02			GSA, H LL = 70% PL = 31% W = 33.0%
1.5	1.40	Firm to stiff, grey-orange clayey silt, traces of sand, moist.		GS-03			
2.0	88.41						
2.5	2.10	Firm to stiff, grey clayey silt to silty clay, moist.		GS-04			
3.0	87.51 3.00	End of test pit (voluntary termination)					
3.5							
4.0							
4.5							
5.0							
5.5							

TEST SYMBOL

GSA : Particle Size Analysis
H : Hydrometer Testing
CA : Chemical Analysis
LL : Liquid Limit
PL : Plastic Limit
W : Water Content
Dup : Duplicate Sample Taken
OM : Organic Matter Content

Remark(s) :
Easy to excavate
No water infiltration
Stables walls
The compactness / consistency is estimated

TEST PIT REPORT

Reference No.: 12615684-A1

Test Pit No.: **TP-102-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Executed by : **Demolition Plus**

Described by : **Mathieu Chénier, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X : **366530**
Y : **5017774**
Z : **90.77**

Location Plan No.: **FIGURE 1**
Date (Start) : **2023-07-07**
Date (Finish) : **2023-07-07**
Test Pit Depth (m): **3.00**

DEPTH - m	ELEVATION / DEPTH - m	STRATIGRAPHY: SOIL DESCRIPTION	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: STATE	WATER INFILTRATION
	90.77	Ground Surface				
	0.00	**Topsoil**:		GS-01		
	90.46	Brown silt, some clay, traces of sand, moist. Presence of				
	0.30	organic matter (rootlets) (1-5%).				
0.5		**Native Soil**:				
		Firm to stiff, brown silt, some clay, traces of sand, moist.				
		Presence of organic matter (rootlets) (1%).		GS-02		
1.0						
	89.36					
1.5	1.41	Firm to stiff, grey-orange silt, some clay to clayey, traces of sand, moist.				
				GS-03		
2.0						
2.5				GS-04		
	87.77					
3.0	3.00	End of test pit (voluntary termination)				
3.5						
4.0						
4.5						
5.0						
5.5						

TEST SYMBOL

GSA : Particle Size Analysis
H : Hydrometer Testing
CA : Chemical Analysis
LL : Liquid Limit
PL : Plastic Limit
W : Water Content
Dup : Duplicate Sample Taken
OM : Organic Matter Content

Remark(s) :
Easy to excavate
No water infiltration
Stables walls
The compactness / consistency is estimated

Production Date: 2023-08-22

TEST PIT REPORT

Reference No.: 12615684-A1

Test Pit No.: **TP-103-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Executed by : **Demolition Plus**

Described by : **Mathieu Chénier, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X : **366498**
Y : **5017740**
Z : **93.33**

Location Plan No.: **FIGURE 1**
Date (Start) : **2023-07-07**
Date (Finish) : **2023-07-07**
Test Pit Depth (m): **4.80**

DEPTH - m	ELEVATION / DEPTH - m	STRATIGRAPHY: SOIL DESCRIPTION	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: STATE	WATER INFILTRATION	TEST SYMBOL
	93.33	Ground Surface					GSA : Particle Size Analysis H : Hydrometer Testing CA : Chemical Analysis LL : Liquid Limit PL : Plastic Limit W : Water Content Dup : Duplicate Sample Taken OM : Organic Matter Content
0.5	0.00 92.83	**Fill**: Brown clayey silt, traces of sand, moist. Presence of organic matter (rootlets) (1-5%).		GS-01			
	0.50 92.53	Loose to compact, brown silt, some sand, traces of clay and gravel, moist.		GS-02			
1.0	0.80	Brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets) (1%).		GS-03			GSA LL = 47% PL = 27% W = 22.0%
1.5	91.53						
2.0	1.80	Brown-grey clayey silt, traces of sand, moist. Presence of organic matter (rootletss) (1%).		GS-04			
2.5	90.73						
3.0	2.60	Grey-brown silt, some clay to clayey, traces of sand, moist. Presence of organic matter (rootlets) (1%).		GS-05			
	89.93						
3.5	3.40	**Native Soil**: Firm to stiff, grey-orange clayey silt, traces of sand, moist.		GS-06			
4.0							
4.5	88.53						
	4.80	End of test pit (voluntary termination)					
5.0							
5.5							

Remark(s) :
Easy to excavate
No water infiltration
Stables walls
The compactness / consistency is estimated

TEST PIT REPORT

Reference No.: 12615684-A1

Test Pit No.: **TP-104-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Executed by : **Demolition Plus**

Described by : **Mathieu Chénier, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X : **366619**
Y : **5017713**
Z : **90.41**

Location Plan No.: **FIGURE 1**
Date (Start) : **2023-07-07**
Date (Finish) : **2023-07-07**
Test Pit Depth (m): **3.00**

DEPTH - m	ELEVATION / DEPTH - m	STRATIGRAPHY: SOIL DESCRIPTION	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: STATE	WATER INFILTRATION	TEST SYMBOL
	90.41	Ground Surface					
0.5	0.00	**Topsoil**: Brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets) (1-5%).		GS-01			
	89.71						
1.0	0.70	**Native Soil**: Firm to stiff, grey-brown-orange silt, some clay, traces of sand, moist.		GS-02			
	89.31						
1.5	1.10	Firm to stiff, grey-orange clayey silt, traces of sand, moist.		GS-03			SA
2.0							
2.5				GS-04			
3.0	87.41						
	3.00	End of test pit (voluntary termination)					
3.5							
4.0							
4.5							
5.0							
5.5							

TEST SYMBOL

GSA : Particle Size Analysis
H : Hydrometer Testing
CA : Chemical Analysis
LL : Liquid Limit
PL : Plastic Limit
W : Water Content
Dup : Duplicate Sample Taken
OM : Organic Matter Content

Remark(s) :
Easy to excavate
No water infiltration
Stables walls
The compactness / consistency is estimated
SA: Soil Aggressiveness

Production Date: 2023-08-22

TEST PIT REPORT

Reference No.: 12615684-A1

Test Pit No.: **TP-105-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Executed by : **Demolition Plus**

Described by : **Mathieu Chénier, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X : **366489**
Y : **5017715**
Z : **94.88**

Location Plan No.: **FIGURE 1**
Date (Start) : **2023-07-07**
Date (Finish) : **2023-07-07**
Test Pit Depth (m): **5.50**

DEPTH - m	ELEVATION / DEPTH - m	STRATIGRAPHY: SOIL DESCRIPTION	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: STATE	WATER INFILTRATION	TEST SYMBOL
	94.88	Ground Surface					
0.5	0.00	**Fill**: Brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets) (1-5%).		GS-01			
1.0				GS-02			
	93.58						
1.5	1.30	Grey silt, some clay to clayey, traces of sand, moist. Presence of organic matter (rootlets) (1%).					
2.0				GS-03			
2.5							
3.0				GS-04			
3.5							
4.0				GS-05			GSA LL = 56% PL = 27% W = 28.0%
4.5	90.38 4.50	**Native Soil**: Firm to stiff, grey-orange clayey silt, traces of sand, moist.					
5.0				GS-06			
5.5	89.38 5.50	End of test pit (voluntary termination)					

TEST SYMBOL

GSA : Particle Size Analysis
H : Hydrometer Testing
CA : Chemical Analysis
LL : Liquid Limit
PL : Plastic Limit
W : Water Content
Dup : Duplicate Sample Taken
OM : Organic Matter Content

Remark(s) :
Easy to excavate
No water infiltration
Stables walls
The compactness / consistency is estimated

TEST PIT REPORT

Reference No.: 12615684-A1

Test Pit No.: **TP-106-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Executed by : **Demolition Plus**

Described by : **Mathieu Chénier, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X : **366454**
Y : **5017706**
Z : **91.11**

Location Plan No.: **FIGURE 1**
Date (Start) : **2023-07-07**
Date (Finish) : **2023-07-07**
Test Pit Depth (m): **3.00**

DEPTH - m	ELEVATION / DEPTH - m	STRATIGRAPHY: SOIL DESCRIPTION	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: STATE	WATER INFILTRATION	TEST SYMBOL
	91.11	Ground Surface					
	0.00	**Topsoil**:					
	90.80	Brown silt, some clay, traces of sand, moist. Presence of		GS-01			
	0.30	organic matter (rootlets) (1-5%).					
0.5		**Native Soil**: Firm to stiff, brown silt, some clay, traces of sand and gravel, moist. Presence of organic matter (rootlets) (1-5%).		GS-02			
1.0	89.91						
	1.20	Firm to stiff, grey silt, some clay, traces of gravel and sand, moist.					
1.5				GS-03			
2.0	89.11						
	2.00	Firm to stiff, grey-orange clayey silt, traces of sand, moist.					
2.5				GS-04			LL = 45% PL = 18% W = 31.0%
3.0	88.11						
	3.00	End of test pit (voluntary termination)					
3.5							
4.0							
4.5							
5.0							
5.5							

TEST SYMBOL

GSA : Particle Size Analysis
H : Hydrometer Testing
CA : Chemical Analysis
LL : Liquid Limit
PL : Plastic Limit
W : Water Content
Dup : Duplicate Sample Taken
OM : Organic Matter Content

Remark(s) :
Easy to excavate
No water infiltration
Stables walls
The compactness / consistency is estimated

Production Date: 2023-08-22

TEST PIT REPORT

Reference No.: 12615684-A1

Test Pit No.: **TP-107-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Executed by : **Demolition Plus**

Described by : **Mathieu Chénier, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X : **366586**
Y : **5017673**
Z : **90.65**

Location Plan No.: **FIGURE 1**
Date (Start) : **2023-07-07**
Date (Finish) : **2023-07-07**
Test Pit Depth (m): **3.00**

DEPTH - m	ELEVATION / DEPTH - m	STRATIGRAPHY: SOIL DESCRIPTION	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: STATE	WATER INFILTRATION
	90.65	Ground Surface				
	0.00	**Topsoil**: Brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets) (1-5%).		GS-01		
0.5	89.95					
	0.70	**Native Soil**: Compact, brown-grey silt, some sand and clay, moist. Presence of organic matter (rootlets) (1%).		GS-02		
1.0	89.55					
	1.10	Stiff, grey silt, some clay, moist.		GS-03		
1.5						
2.0	88.65					
	2.00	Firm to stiff, grey-orange clayey silt, traces of sand, moist.		GS-04		
2.5						
3.0	87.65					
	3.00	End of test pit (voluntary termination)				
3.5						
4.0						
4.5						
5.0						
5.5						

TEST SYMBOL

GSA : Particle Size Analysis
H : Hydrometer Testing
CA : Chemical Analysis
LL : Liquid Limit
PL : Plastic Limit
W : Water Content
Dup : Duplicate Sample Taken
OM : Organic Matter Content

Remark(s) :
Easy to excavate
No water infiltration
Stables walls
The compactness / consistency is estimated

TEST PIT REPORT

Reference No.: 12615684-A1

Test Pit No.: **TP-108-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Executed by : **Demolition Plus**

Described by : **Mathieu Chénier, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X : **366455**
Y : **5017672**
Z : **91.00**

Location Plan No.: **FIGURE 1**
Date (Start) : **2023-07-07**
Date (Finish) : **2023-07-07**
Test Pit Depth (m): **3.00**

DEPTH - m	ELEVATION / DEPTH - m	SOIL DESCRIPTION	SYMBOL	SAMPLE TYPE AND NUMBER	STATE	WATER INFILTRATION
	91.00	Ground Surface				
	0.00	**Topsoil**: Brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets) (1-5%).		GS-01		
	90.60					
0.5	0.40	**Native Soil**: Firm to stiff, grey-brown silt, some clay and sand, moist. Presence of cobbles (1-5%).		GS-02		
1.0	89.90					
	1.10	Firm to stiff, grey silt, some clay to clayey, traces of sand, moist.				
1.5				GS-03		
	89.00					
2.0	2.00	Firm to stiff, grey-orange clayey silt, traces of sand, moist.				
2.5				GS-04		
	88.00					
3.0	3.00	End of test pit (voluntary termination)				
3.5						
4.0						
4.5						
5.0						
5.5						

TEST SYMBOL

GSA : Particle Size Analysis
H : Hydrometer Testing
CA : Chemical Analysis
LL : Liquid Limit
PL : Plastic Limit
W : Water Content
Dup : Duplicate Sample Taken
OM : Organic Matter Content

Remark(s) :
Easy to excavate
No water infiltration
Stables walls
The compactness / consistency is estimated

Production Date: 2023-08-22

TEST PIT REPORT

Reference No.: 12615684-A1

Test Pit No.: **TP-109-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Executed by : **Demolition Plus**

Described by : **Mathieu Chénier, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X : **366605**
Y : **5017642**
Z : **90.81**

Location Plan No.: **FIGURE 1**
Date (Start) : **2023-07-07**
Date (Finish) : **2023-07-07**
Test Pit Depth (m): **3.00**

DEPTH - m	ELEVATION / DEPTH - m	STRATIGRAPHY: SOIL DESCRIPTION	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: STATE	WATER INFILTRATION	TEST SYMBOL
	90.81	Ground Surface					
	0.00	**Topsoil**:		GS-01			
	90.51	Brown silt, some clay, traces of sand, moist. Presence of					
	0.30	organic matter (rootlets) (1-5%).					
0.5		**Native Soil**:		GS-02			
		Firm to stiff, brown silt, some clay, traces of sand, moist.					
		Presence of cobbles (1-5%) and organic matter (rootlets)					
	89.91	(1-5%).					
1.0	0.90	Firm to stiff, brown silt, some clay, traces of sand, moist.					
		Presence of organic matter (rootlets) (1%).		GS-03			LL = 69% PL = 26% W = 26.0%
1.5							
	89.01						
	1.80	Firm to stiff, grey-orange silt, some clay, traces of sand,					
2.0		moist.					
				GS-04			
2.5							
	87.81						
3.0	3.00	End of test pit (voluntary termination)					
3.5							
4.0							
4.5							
5.0							
5.5							

TEST SYMBOL

GSA : Particle Size Analysis
H : Hydrometer Testing
CA : Chemical Analysis
LL : Liquid Limit
PL : Plastic Limit
W : Water Content
Dup : Duplicate Sample Taken
OM : Organic Matter Content

Remark(s) :
Easy to excavate
No water infiltration
Stables walls
The compactness / consistency is estimated

TEST PIT REPORT

Reference No.: 12615684-A1

Test Pit No.: **TP-110-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Executed by : **Demolition Plus**

Described by : **Mathieu Chénier, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X : **366481**
Y : **5017640**
Z : **90.51**

Location Plan No.: **FIGURE 1**
Date (Start) : **2023-07-07**
Date (Finish) : **2023-07-07**
Test Pit Depth (m): **3.00**

DEPTH - m	ELEVATION / DEPTH - m	STRATIGRAPHY: SOIL DESCRIPTION	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: STATE	WATER INFILTRATION	TEST SYMBOL
	90.51	Ground Surface					
	0.00	**Topsoil**:					
	90.20	Brown silt, some clay, traces of sand, moist. Presence of		GS-01			
	0.30	organic matter (rootlets) (1-5%).					
0.5		**Native Soil**:					
		Firm to stiff, brown-grey silt, some clay, traces of sand, moist.					
		Presence of organic matter (rootlets) (1%).		GS-02			
1.0	89.31						
	1.20	Firm to stiff, grey silt, some clay, traces of sand, moist.					
1.5				GS-03			
2.0	88.51						
	2.00	becoming grey-orange					
2.5				GS-04			GSA, H LL = 45% PL = 18% W = 36.0%
	87.51						
3.0	3.00	End of test pit (voluntary termination)					
3.5							
4.0							
4.5							
5.0							
5.5							

TEST SYMBOL

GSA : Particle Size Analysis
H : Hydrometer Testing
CA : Chemical Analysis
LL : Liquid Limit
PL : Plastic Limit
W : Water Content
Dup : Duplicate Sample Taken
OM : Organic Matter Content

Remark(s) :
Easy to excavate
No water infiltration
Stables walls
The compactness / consistency is estimated

TEST PIT REPORT

Reference No.: 12615684-A1

Test Pit No.: **TP-111-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Executed by : **Demolition Plus**

Described by : **Mathieu Chénier, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X : **366513**
Y : **5017631**
Z : **90.52**

Location Plan No.: **FIGURE 1**
Date (Start) : **2023-07-07**
Date (Finish) : **2023-07-07**
Test Pit Depth (m): **3.00**

DEPTH - m	ELEVATION / DEPTH - m	STRATIGRAPHY: SOIL DESCRIPTION	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: STATE	WATER INFILTRATION
	90.52	Ground Surface				
	0.00	**Topsoil**: Brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets) (1-5%).		GS-01		
	90.17 / 0.35	**Native Soil**: Firm to stiff, brown-grey silt, some clay, traces of sand, moist. Presence of organic matter (rootlets) (1%).		GS-02		
0.5	89.62					
1.0	0.90	Firm to stiff, grey silt, some clay, traces of sand, moist. Presence of organic matter (rootlets) (1%).		GS-03		
1.5	88.72					
2.0	1.80	Firm to stiff, grey-orange silt, some clay to clayey, traces of sand, moist.		GS-04		
2.5						
3.0	87.52 / 3.00	End of test pit (voluntary termination)				
3.5						
4.0						
4.5						
5.0						
5.5						

TEST SYMBOL

GSA : Particle Size Analysis
H : Hydrometer Testing
CA : Chemical Analysis
LL : Liquid Limit
PL : Plastic Limit
W : Water Content
Dup : Duplicate Sample Taken
OM : Organic Matter Content

Remark(s) :
Easy to excavate
No water infiltration
Stables walls
The compactness / consistency is estimated

TEST PIT REPORT

Reference No.: 12615684-A1

Test Pit No.: **TP-112-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Executed by : **Demolition Plus**

Described by : **Mathieu Chénier, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X : **366582**
Y : **5017624**
Z : **90.71**

Location Plan No.: **FIGURE 1**
Date (Start) : **2023-07-07**
Date (Finish) : **2023-07-07**
Test Pit Depth (m): **3.00**

DEPTH - m	ELEVATION / DEPTH - m	STRATIGRAPHY: SOIL DESCRIPTION	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: STATE	WATER INFILTRATION
	90.71	Ground Surface				
	0.00	**Topsoil**:		GS-01		
	90.41	Brown silt, some clay and sand, moist. Presence of organic				
	0.30	matter (rootlets) (1-5%).				
0.5		**Native Soil**:		GS-02		
		Firm to stiff, brown silt, some clay and sand, moist. Presence				
	89.81	of organic matter (rootlets) (1%).				
	0.90	Firm to stiff, grey-orange clayey silt, traces of sand, moist.				
1.0						
1.5				GS-03		
	88.71					
2.0	2.00	Firm to stiff, grey clayey silt to silt and clay, moist.				
2.5				GS-04		
	87.71					
3.0	3.00	End of test pit (voluntary termination)				
3.5						
4.0						
4.5						
5.0						
5.5						

TEST SYMBOL

GSA : Particle Size Analysis
H : Hydrometer Testing
CA : Chemical Analysis
LL : Liquid Limit
PL : Plastic Limit
W : Water Content
Dup : Duplicate Sample Taken
OM : Organic Matter Content

Remark(s) :
Easy to excavate
No water infiltration
Stables walls
The compactness / consistency is estimated

Production Date: 2023-08-22

TEST PIT REPORT

Reference No.: 12615684-A1

Test Pit No.: **TP-113-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Executed by : **Demolition Plus**

Described by : **Mathieu Chénier, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X : **366436**
Y : **5017625**
Z : **90.56**

Location Plan No.: **FIGURE 1**
Date (Start) : **2023-07-07**
Date (Finish) : **2023-07-07**
Test Pit Depth (m): **2.90**

DEPTH - m	ELEVATION / DEPTH - m	STRATIGRAPHY: SOIL DESCRIPTION	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: STATE	WATER INFILTRATION	TEST SYMBOL
	90.56 Ground Surface						
0.5	0.00 / 90.21	**Topsoil**: Brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets) (1-5%).		GS-01			
	0.35 / 89.81	**Native Soil**: Firm to stiff, brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets) (1-5%).		GS-02			
1.0	0.75	Firm to stiff, grey silt, some clay, moist.		GS-03			SA
1.5	88.76						
2.0	1.80	Firm to stiff, grey-orange clayey silt, traces of sand, moist.		GS-04			
2.5	87.66						
3.0	2.90	End of test pit (voluntary termination)					
3.5							
4.0							
4.5							
5.0							
5.5							

TEST SYMBOL

GSA : Particle Size Analysis
H : Hydrometer Testing
CA : Chemical Analysis
LL : Liquid Limit
PL : Plastic Limit
W : Water Content
Dup : Duplicate Sample Taken
OM : Organic Matter Content

Remark(s) :
Easy to excavate
No water infiltration
Stables walls
The compactness / consistency is estimated
SA: Soil Aggressiveness

TEST PIT REPORT

Reference No.: 12615684-A1

Test Pit No.: **TP-114-23**

Client : **Medusa Limited Partnership**

Project : **Geotechnical Investigation - Proposed Distribution Center**

Preliminary

Location : **Bill Leathem Drive, Ottawa, Ontario**

Executed by : **Demolition Plus**

Described by : **Mathieu Chénier, Tech.** Verified by : **Keshini Rangasamy, CEP**

Geodetic Coordinates MTM-9 (NAD-1983)
X : **366577**
Y : **5017568**
Z : **90.27**

Location Plan No.: **FIGURE 1**
Date (Start) : **2023-07-07**
Date (Finish) : **2023-07-07**
Test Pit Depth (m): **3.00**

DEPTH - m	ELEVATION / DEPTH - m	STRATIGRAPHY: SOIL DESCRIPTION	SYMBOL	SAMPLE: SAMPLE TYPE AND NUMBER	SAMPLE: STATE	WATER INFILTRATION	TEST SYMBOL
	90.27	Ground Surface					
	0.00	**Topsoil**:					
	89.96	Brown-grey silt, some clay and sand, moist. Presence of organic matter (rootlets) (1-5%).		GS-01			
	0.30						
0.5		**Native Soil**: Firm to stiff, brown silt, some clay, traces of sand, moist. Presence of organic matter (rootlets) (1%).		GS-02			
	89.37						
1.0	0.90	Firm to stiff, grey-orange silt, some clay to clayey, traces of sand, moist.					
1.5				GS-03			
2.0							
2.5				GS-04			SA
	87.27						
3.0	3.00	End of test pit (voluntary termination)					
3.5							
4.0							
4.5							
5.0							
5.5							

TEST SYMBOL

GSA : Particle Size Analysis
H : Hydrometer Testing
CA : Chemical Analysis
LL : Liquid Limit
PL : Plastic Limit
W : Water Content
Dup : Duplicate Sample Taken
OM : Organic Matter Content

Remark(s) :
Easy to excavate
No water infiltration
Stables walls
The compactness / consistency is estimated
SA: Soil Aggressiveness

Production Date: 2023-08-22

TEST PIT REPORT

TEST PIT No. TP-01

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366239.2
Y : 5017861.2
Z : 90.67

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.67		**Remoulded native soil / topsoil:** Clayey silt, traces of sand. Traces of roots and organics	GS-1 GSE-1		
0.30	90.37		**Native soil:** Stiff to very stiff, brown-grey silt and clay, very moist	GS-2		
0.80	89.87		becoming grey	GS-3	w = 33.0% Wl = 63.0% Wp = 26.0 %	
1.50	89.17		becoming stiff, saturated	GS-4		
2.80	87.87		End of test pit Note: Slight water infiltration at 2.80m			<

Photo 1 : TP-01 excavation.

Photo 2 : TP-01 materials.

Test Pit No. TP-01
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-02

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366350.8
Y : 5017942.4
Z : 90.59

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.59					
			Remoulded native soil / topsoil: Clayey silt, traces of sand. Traces of roots and organics	GS-1		
0.30	90.29		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	89.89		becoming grey	GS-3		
1.50	89.09		becoming stiff, saturated	GS-4		
3.00	87.59		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-02 excavation.

Photo 2 : TP-02 materials.

Test Pit No. TP-02
Proposed Sortation Facility

Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-03

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366431.0
Y : 5017938.4
Z : 90.52

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.52					
			Remoulded native soil / topsoil: Clayey silt, traces of sand. Traces of roots and organics	GS-1		
0.30	90.22		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	89.82		becoming grey, very moist	GS-3		
1.80	88.72		becoming stiff with traces of sand, saturated	GS-4		
2.90	87.62		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-03 excavation.

Photo 2 : TP-03 materials.

Test Pit No. TP-04
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-04

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366476.0
Y : 5018013.0
Z : 90.46

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.46					
			Remoulded native soil / topsoil: Clayey silt, traces of sand. Traces of roots and organics	GS-1 GSE-1		
0.30	90.16		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	89.76		becoming very moist	GS-3		
1.60	88.86		becoming stiff with traces of sand, grey, saturated	GS-4 GS-5		
3.10	87.36		End of test pit Note: Slight water infiltration at 3.10m			<

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-04 excavation.

Photo 2 : TP-04 materials.

Test Pit No. TP-04
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-05

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366565.4
Y : 5018013.4
Z : 90.60

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.60					
			Remoulded native soil / topsoil: Clayey silt, traces of sand. Traces of roots and organics	GS-1		
0.30	90.30		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	89.90		becoming grey, very moist	GS-3		
				GS-4		
2.20	88.40		becoming stiff, saturated	GS-5		
3.00	87.60		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-05 excavation.

Photo 2 : TP-05 materials.

Test Pit No. TP-05
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-06

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366603.7
Y : 5018084.5
Z : 90.61

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-04

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-04

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.61		**Remoulded native soil / topsoil:** Clayey silt, traces of sand. Traces of roots and organics	GS-1 GSE-1		
0.30	90.31		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.80	89.81		becoming grey, very moist	GS-3		
1.80	88.81		becoing stiff, saturated	GS-4		
3.00	87.61		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Photo 1 : TP-06 excavation.

Photo 2 : TP-06 materials.

TEST PIT REPORT

TEST PIT No. TP-15

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366292.5
Y : 5017826.9
Z : 90.65

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.65		**Remoulded native soil / topsoil:** Clayey silt, traces of sand. Traces of roots and organics	GS-1		
0.30	90.35		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	89.95		becoming grey, very moist	GS-3		
1.60	89.05		becoming stiff, saturated	GS-4		
2.80	87.85		End of test pit Note: Slight water infiltration at 2.80m			<

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-15 excavation.

Photo 1 : TP-15 materials.

Test Pit No. TP-15
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-16

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366351.7
Y : 5017860.4
Z : 90.62

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.62		**Remoulded native soil / topsoil:** Clayey silt, traces of sand. Traces of roots and organics	GS-1 GSE-1		
0.30	90.32		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.80	89.82		becoming grey, very moist	GS-3		
1.50	89.12		becoming stiff, saturated	GS-4 GS-5		
3.00	87.62		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-16 excavation.

Photo 2 : TP-16 materials.

Test Pit No. TP-16
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-17

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366450.1
Y : 5017904.3
Z : 90.59

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.59		**Remoulded native soil / topsoil:** Clayey silt, traces of sand. Traces of roots and organics	GS-1		
0.30	90.29		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.80	89.79		becoming grey, very moist	GS-3		
1.45	89.14		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Photo 1 : TP-17 excavation.

Photo 10 : TP-17 materials.

TEST PIT REPORT

TEST PIT No. TP-18

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366524.8
Y : 5017946.2
Z : 90.55

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.55					
			Remoulded native soil / topsoil: Clayey silt, traces of sand. Traces of roots and organics	GS-1		
0.30	90.25		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.90	89.65		becoming grey, very moist	GS-3		
1.50	89.05		End of test pit Note: No water infiltration			

0.5 — 1.0 — 1.5 — 2.0 — 2.5 — 3.0 — 3.5 — 4.0 — 4.5

Photo 1 : TP-18 excavation.

Photo 2 : TP-18 materials.

Test Pit No. TP-18
Proposed Sortation Facility

Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-19

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366584.3
Y : 5017980.1
Z : 90.68

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-04

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-04

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.68		**Remoulded native soil / topsoil:** Clayey silt, traces of sand. Traces of roots and organics	GS-1 GSE-1		
0.30	90.38		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	89.98		becoming grey, very moist	GS-3		
1.50	89.18		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Photo 1 : TP-19 excavation.

Photo 1 : TP-19 materials.

Test Pit No. TP-19
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-20

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366653.2
Y : 5017996.1
Z : 90.52

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-04

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-04

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.52		**Remoulded native soil / topsoil:** Clayey silt, traces of sand. Traces of roots and organics	GS-1 GSE-1		
0.30	90.22		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	89.82		becoming grey, very moist	GS-3		
1.40	89.12		becoming stiff with traces of sand, saturated	GS-4 GS-5		
3.00	87.52		End of test pit Note: Slight water infiltration at 3.0m			<

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-20 excavation.

Photo 2 : TP-20 materials.

Test Pit No. TP-20
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-24

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366263.6
Y : 5017757.8
Z : 90.68

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.68		**Remoulded native soil / topsoil:** Clayey silt, traces of sand. Traces of roots and organics	GS-1		
0.50	90.18		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
1.00	89.68		becoming grey, very moist	GS-3		
2.00	88.68		becoming stiff, saturated	GS-4		
3.00	87.68		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-24 excavation.

Photo 2 : TP-24 materials.

Test Pit No. TP-24
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-25

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366327.0
Y : 5017764.9
Z : 90.71

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.71		**Remoulded native soil / topsoil:** Clayey silt, traces of sand. Traces of roots and organics	GS-1 GSE-1		
0.30	90.41		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	90.01		becoming grey, very moist to saturated	GS-3	w = 37.0% WI = 53.0% Wp = 24.0 %	
2.10	88.61		Firm, grey sandy and clayey silt, saturated	GS-4		
2.90	87.81		Stiff, grey clayey silt, saturated	GS-5		
3.30	87.41		End of test pit Note: No water infiltration			

0.5 — 1.0 — 1.5 — 2.0 — 2.5 — 3.0 — 3.5 — 4.0 — 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-25 excavation.

Photo 2 : TP-25 materials.

Test Pit No. TP-25
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-26

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366386.2
Y : 5017798.3
Z : 90.68

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.68					
			Remoulded native soil / topsoil: Clayey silt, traces of sand. Traces of roots and organics	GS-1		
0.30	90.38		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	89.98		becoming grey, very moist	GS-3		
1.80	88.88		becoming stiff, saturated	GS-4		
2.90	87.78		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-26 excavation.

Photo 2 : TP-26 materials.

TEST PIT REPORT

TEST PIT No. TP-27

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366471.1
Y : 5017866.9
Z : 90.58

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.58					
			Remoulded native soil / topsoil: Clayey silt, traces of sand. Traces of roots and organics	GS-1 GSE-1		
0.30	90.28		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	89.88		becoming grey, very moist	GS-3		
1.50	89.08		End of test pit Note: No water infiltration			

0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-27 excavation.

Photo 2 : TP-27 materials.

TEST PIT REPORT

TEST PIT No. TP-28

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366545.7
Y : 5017908.9
Z : 90.71

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.71		**Remoulded native soil / topsoil:** Clayey silt, traces of sand. Traces of roots and organics	GS-1 GSE-1		
0.30	90.41		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.80	89.91		becoming grey, very moist	GS-3		
1.50	89.21		End of test pit Note: No water infiltration			

0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-28 excavation.

Photo 2 : TP-28 materials.

TEST PIT REPORT

TEST PIT No. TP-29

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366605.4
Y : 5017942.6
Z : 90.72

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-04

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-04

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.72		**Remoulded native soil / topsoil:** Clayey silt, traces of sand. Traces of roots and organics	GS-1		
0.30	90.42		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	90.02		becoming grey, very moist	GS-3		
1.45	89.27		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-29 excavation.

Photo 2 : TP-29 materials.

TEST PIT REPORT

TEST PIT No. TP-30

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366492.8
Y : 5017827.9
Z : 90.56

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-03

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-03

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.56		**Remoulded native soil / topsoil:** Clayey silt, traces of sand. Traces of roots and organics	GS-1 GSE-1		
0.30	90.26		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	89.86		becoming grey, very moist	GS-3		
1.70	88.86		becoming stiff with traces of sand	GS-4		
2.60	87.96		Stiff, grey sandy and clayey silt, saturated	GS-5		
3.00	87.56		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-30 excavation.

Photo 2 : TP-30 materials.

TEST PIT REPORT

TEST PIT No. TP-31

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366627.4
Y : 5017903.3
Z : 90.41

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-04

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-04

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.41		**Remoulded native soil / topsoil:** Clayey silt, traces of sand. Traces of roots and organics	GS-1 GSE-1		
0.30	90.11		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.80	89.61		becoming grey, very moist	GS-3		
1.70	88.71		becoming stiff with traces of sand, saturated	GS-4		
3.00	87.41		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-31 excavation.

Photo 2 : TP-31 materials.

TEST PIT REPORT

TEST PIT No. TP-35

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366558.2
Y : 5017809.8
Z : 90.46

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-05

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-05

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.46					
			Topsoil: Brown clayey silt, moist. Traces of roots and organics	GS-1		
0.30	90.16		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	89.76		becoming grey, very moist	GS-3	w = 30.0% WI = 59.0% Wp = 25.0 %	
1.80	88.66		becoming stiff, very moist to saturated	GS-4		
3.00	87.46		End of test pit Note: No water infiltration			

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-35 excavation.

Photo 2 : TP-35 materials.

TEST PIT REPORT

TEST PIT No. TP-36

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366701.1
Y : 5017889.7
Z : 90.34

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-05

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-05

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.34					
			Topsoil: Brown clayey silt, moist. Traces of roots and organics	GS-1		
0.30	90.04		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	89.64		becoming stiff, grey, very moist to saturated	GS-3		
				GS-4		
3.00	87.34		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-36 excavation.

Photo 2 : TP-36 materials.

Test Pit No. TP-36
Proposed Sortation Facility

Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-40

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366658.9
Y : 5017827.6
Z : 90.51

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-06

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-06

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.51		**Topsoil:** Brown clayey silt, moist. Traces of roots and organics	GS-1 GSE-1		
0.5				GS-2		
0.60	89.91		**Native soil:** Stiff, grey silt and clay, very moist			
1.0				GS-3		
1.5						
1.60	88.91		becoming stiff with traces of sand, very moist to saturated			
2.0				GS-4		
2.5						
				GS-5		
3.0						<
3.00	87.51		End of test pit Note: Slight water infiltration at 3.0m			
3.5						
4.0						
4.5						

See the attached explicative note for the complete list of symbols and abbreviations

Photo 7 : TP-40 excavation.

Photo 8 : TP-40 materials.

TEST PIT REPORT

TEST PIT No. TP-43

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366526.6
Y : 5017723.1
Z : 93.75

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-05

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-05

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	Tests ▼ / <
0,0	93.75		**Fill:** Stiff, brown clayey silt mixed with roots and organics, moist	GS-1		
0.50	93.25		Grey to brown clayey silt, moist	GS-2		
				GS-3		
				GS-4		
				GS-5		
				GS-6		
3.35	90.40		End of test pit Note: No water infiltration			

0.5 — 1.0 — 1.5 — 2.0 — 2.5 — 3.0 — 3.5 — 4.0 — 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-43 excavation.

Photo 2 : TP-43 materials.

Test Pit No. TP-43
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-44

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366587.9
Y : 5017715.6
Z : 90.55

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-05

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-05

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.55					
			Topsoil: Brown clayey silt, moist. Traces of roots and organics	GS-1		
0.5						
0.50	90.05		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.75	89.80		becoming grey, very moist	GS-3	w = 39.0% WI = 74.0% Wp = 34.0 %	
1.0						
1.5						
1.80	88.75		becoming stiff with traces of sand	GS-4		
2.0						
2.5						
3.0						
3.00	87.55		End of test pit Note: No water infiltration			
3.5						
4.0						
4.5						

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-44 excavation.

Photo 2 : TP-44 materials.

Test Pit No. TP-44
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-45

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366763.1
Y : 5017843.2
Z : 90.52

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-06

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-06

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.52					
			Topsoil: Brown clayey silt, moist. Traces of roots and organics	GS-1 GSE-1		
0.30	90.22		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.60	89.92		becoming grey, very moist	GS-3		
1.60	88.92		becoming stiff with traces of sand, very moist to saturated	GS-4 GS-5		
3.00	87.52		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-45 excavation.

Photo 2 : TP-45 materials.

TEST PIT REPORT

TEST PIT No. TP-46

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366877.5
Y : 5017907.6
Z : 90.36

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-06

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-06

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.36					
			Topsoil: Brown clayey silt, moist. Traces of roots and organics	GS-1 GSE-1		
0.30	90.06		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	89.66		becoming grey with traces of sand, very moist	GS-3		
1.60	88.76		becoing stiff very moist to saturated	GS-4		
3.00	87.36		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-46 excavation.

Photo 2 : TP-46 materials.

Test Pit No. TP-46
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-47

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366973.4
Y : 5017961.2
Z : 90.31

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-06

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-06

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.31		**Topsoil:** Brown clayey silt, moist. Traces of roots and organics	GS-1 GS-2		
0.60	89.71		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-3		
1.70	88.61		becoming stiff with traces of sand, vert moist to saturated	GS-4		
3.00	87.31		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-47 excavation.

Photo 2 : TP-47 materials.

Test Pit No. TP-47
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-49

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366510.8
Y : 5017662.8
Z : 90.87

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-05

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-05

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.87					
			Fill: Brown clayey silt, moist. Presence of roots and organics	GS-1		
0.70	90.17		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
1.30	89.57		becoming stiff, grey, very moist to saturated	GS-3		
				GS-4		
3.00	87.87		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-49 excavation.

Photo 2 : TP-49 materials.

Test Pit No. TP-49
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-49PILE

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X :
Y :
Z : 92.90

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-05

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-05

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	92.90		**Fill:** Brown clayey silt, moist	GS-1 GSE-1		
0.5				GS-2 GSE-2		
1.0				GS-3 GSE-3		
1.5				GS-4 GSE-4		
2.0	2.00		End of test pit Note: No water infiltration			
2.5						
3.0						
3.5						
4.0						
4.5						

Photo 1 : TP-49-PILE excavation.

Test Pit No. TP-49-PILE
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-50

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366472.0
Y : 5017605.6
Z : 90.55

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-05

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-05

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.55					
			Topsoil: Brown clayey silt, moist. Traces of roots and organics	GS-1		
0.20	90.35		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.70	89.85		becoming grey, very moist	GS-3		
1.50	89.05		becoming stiff, saturated	GS-4		
				GS-5		
3.00	87.55		End of test pit Note: Slight water infiltration at 3.0m			<

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-50 excavation.

Photo 1 : TP-50 materials.

TEST PIT REPORT

TEST PIT No. TP-51

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366550.3
Y : 5017657.8
Z : 90.42

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-05

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-05

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	90.42					
			Topsoil: Brown clayey silt, moist. Traces of roots and organics	GS-1		
0.30	90.12		**Native soil:** Stiff to very stiff, brown silt and clay, moist	GS-2		
0.80	89.62		becoming grey	GS-3		
1.60	88.82		becoming stiff with traces of sand, moist to very moist	GS-4		
3.00	87.42		End of test pit Note: No water infiltration			

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

See the attached explicative note for the complete list of symbols and abbreviations

Photo 1 : TP-51 excavation.

Test Pit No. TP-51
Proposed Sortation Facility
Leikin Drive and Merivale Road Intersection, Nepean, Ontario

TEST PIT REPORT

TEST PIT No. TP-52

CLIENT: MEDUSA LP

PROJECT: PROPOSED SORTATION FACILITY

LOCATION: LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

GEODETIC COORDINATES (m) (MTM, NAD-83)
X : 366538.8
Y : 5017605.5
Z : 92.69

< - INFILTRATION

▼ - WATER LEVEL

DESCRIBED BY: M. CHÉNIER

DATE: 2021-05-05

VERIFIED BY: M.-A. RICHARD / A. FIORILLI

DATE: 2021-05-05

Sample type

CA : Chemical analysis
PS : Proctor Sample
MSS: Manual split spoon
AU: Auger
RC : Rock core
GS(E) : Grab sample (environment)

Manual tests

PA : Panda (q_d)
PP : Portable penetrometer (C_u)
DP: Dynamic penetrometer (E_{25})
GVT: Geonor Vane tester (C_u)

Depth (m)	Elevation (m)	Symbol	STRATIGRAPHY	Sample type & Number	Tests Type	▼ / <
0,0	92.69		**Fill:** Brown clayey silt, moist	GS-1		
0.5				GS-2		
1.0				GS-3		
1.5				GS-4		
2.0				GS-5		
2.5						
2.70	89.99		**Native soil:** Stiff, grey clayey silt, very moist	GS-6		
3.0						
3.32	89.37		End of test pit Note: No water infiltration			
3.5						
4.0						
4.5						

See the attached explicative note for the complete list of symbols and abbreviations

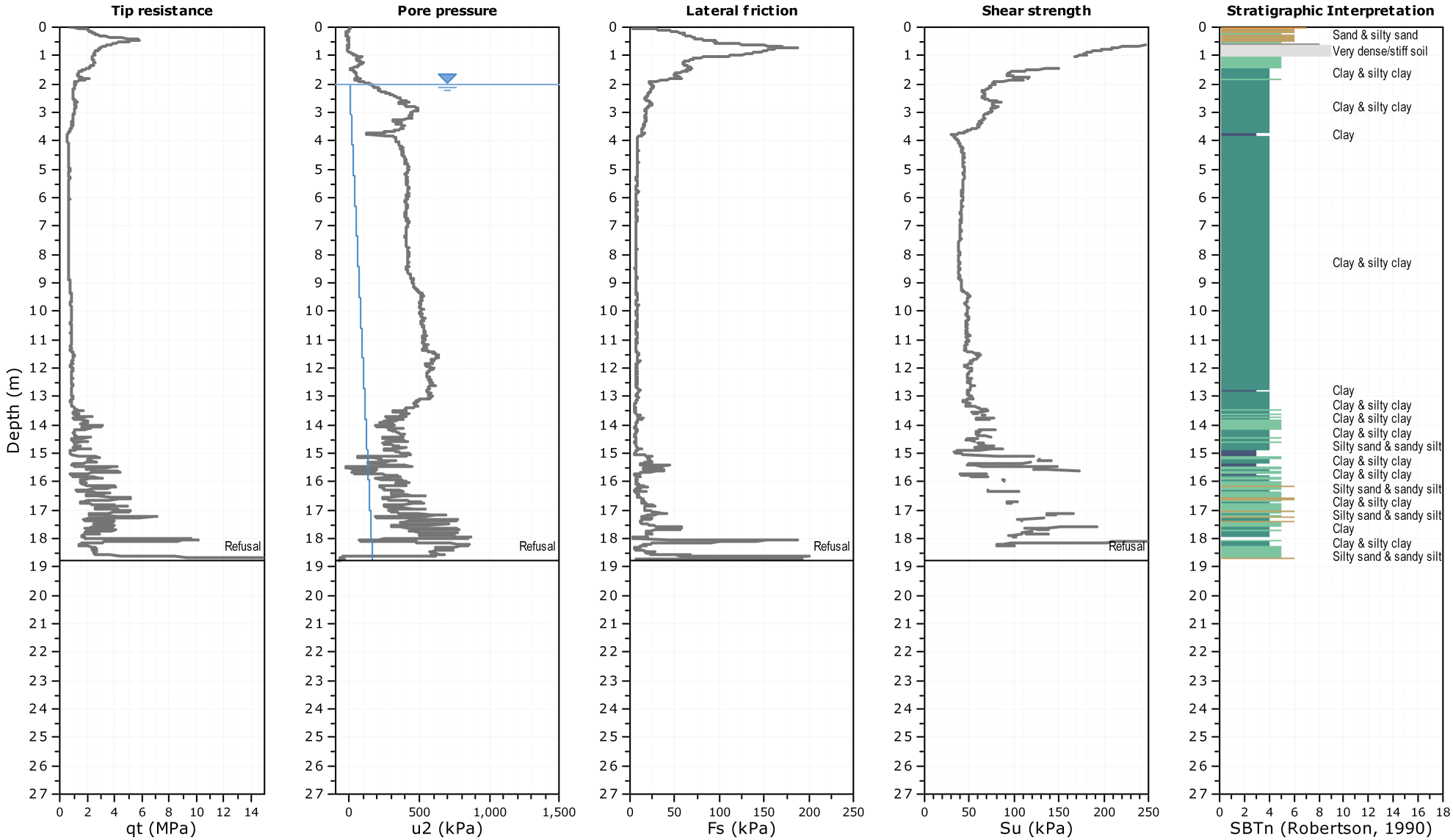
Photo 1 : TP-52 excavation.

Photo 2 : TP-52 materials.

Geotechnical Investigation
Project No: 12615684-A1
Client: Medusa Limited Partnership

Sounding No: CPT-101-23
Total depth: 18.77 m, Date: 7/10/2023
Surface Elevation: 90.80 m
Cone Type: 100 Mpa, ID #60257
Cone Operator: Stratum

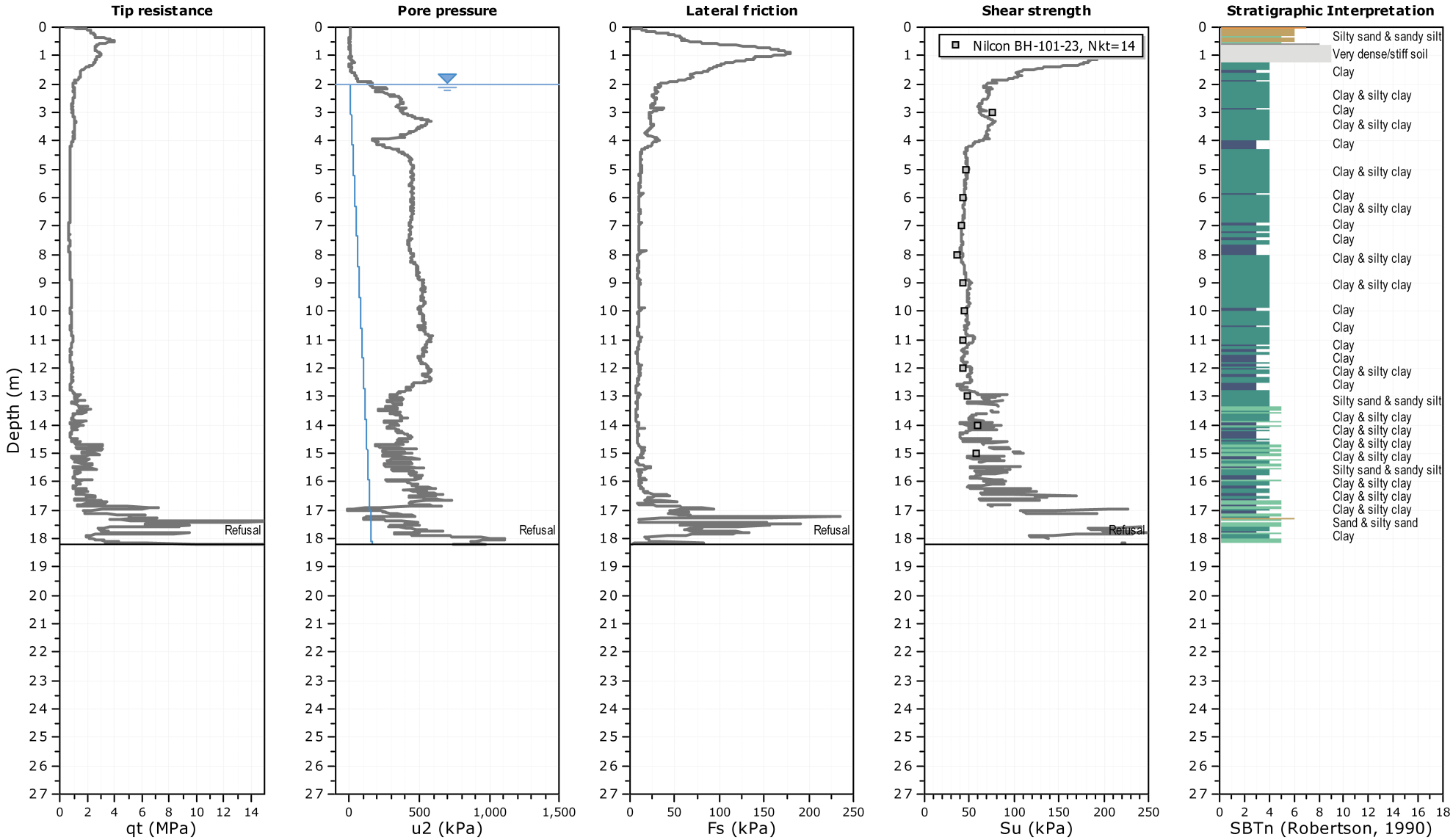
Project: Proposed Distribution Center
Location: Bill Leathem Drive, Ottawa, Ontario



Geotechnical Investigation
Project No: 12615684-A1
Client: Medusa Limited Partnership

Sounding No: CPT-102-23
Total depth: 18.21 m, Date: 7/10/2023
Surface Elevation: 90.66 m
Cone Type: 100 Mpa, ID #60298
Cone Operator: Stratum

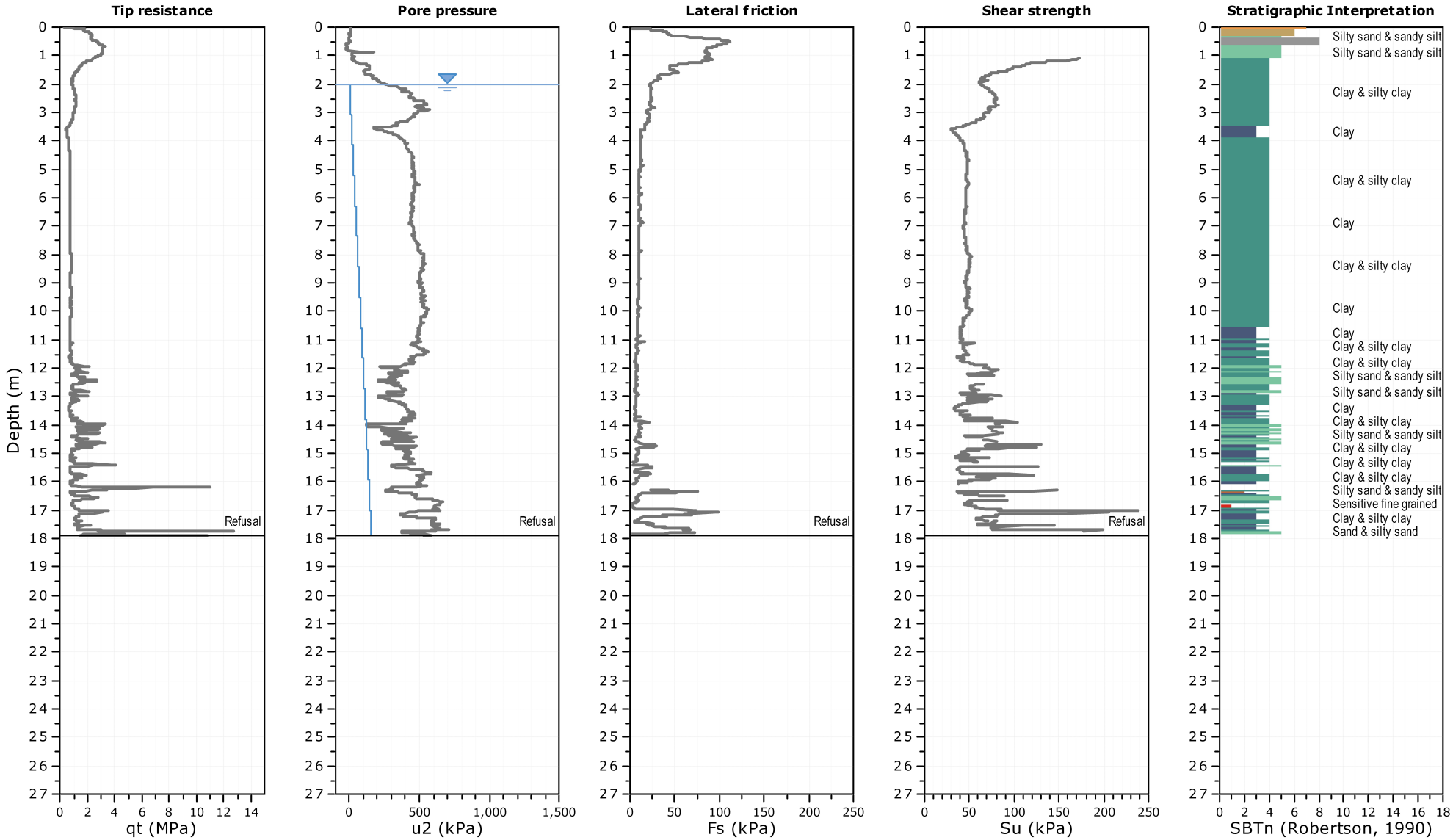
Project: Proposed Distribution Center
Location: Bill Leathem Drive, Ottawa, Ontario



Geotechnical Investigation
Project No: 12615684-A1
Client: Medusa Limited Partnership

Sounding No: CPT-103-23
Total depth: 17.89 m, Date: 7/10/2023
Surface Elevation: 90.48 m
Cone Type: 100 Mpa, ID #60298
Cone Operator: Stratum

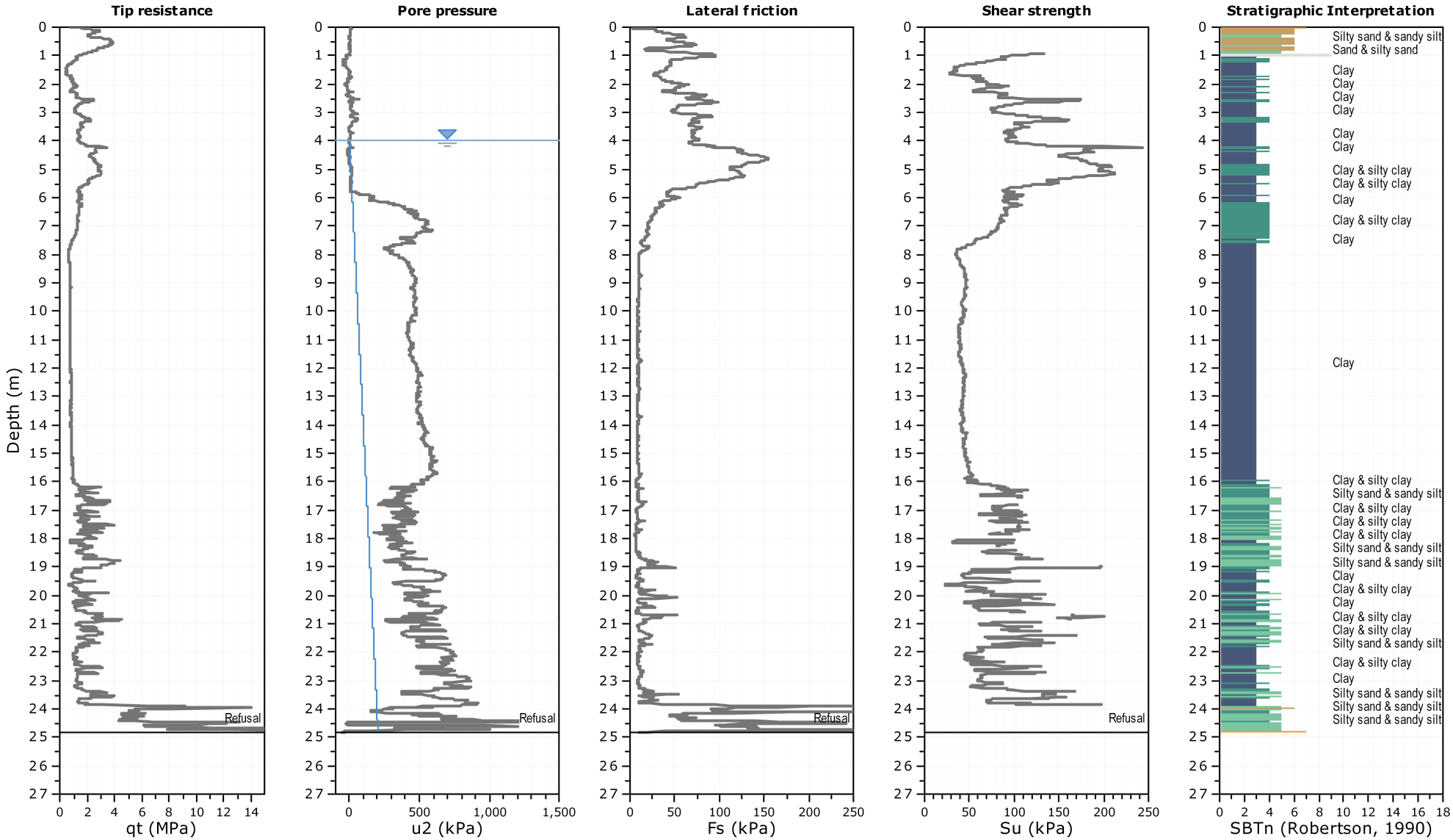
Project: Proposed Distribution Center
Location: Bill Leathem Drive, Ottawa, Ontario



Geotechnical Investigation
Project No: 12615684-A1
Client: Medusa Limited Partnership

Sounding No: CPT-104-23
Total depth: 24.84 m, Date: 7/11/2023
Surface Elevation: 93.96 m
Cone Type: 100 Mpa, ID #60298
Cone Operator: Stratum

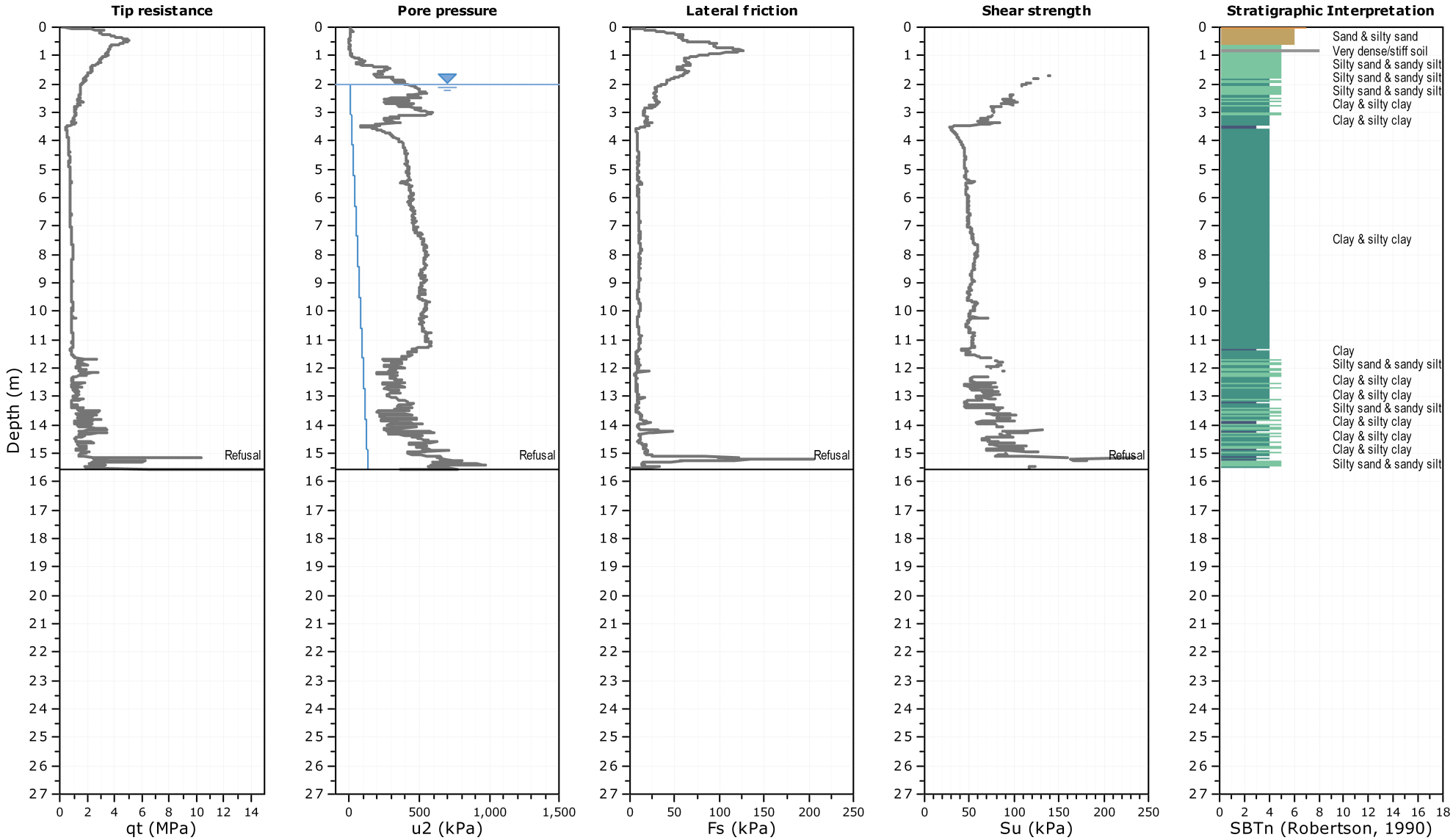
Project: Proposed Distribution Center
Location: Bill Leathem Drive, Ottawa, Ontario



Geotechnical Investigation
Project No: 12615684-A1
Client: Medusa Limited Partnership

Sounding No: CPT-105-23
Total depth: 15.56 m, Date: 7/10/2023
Surface Elevation: 90.60 m
Cone Type: 100 Mpa, ID #60257
Cone Operator: Stratum

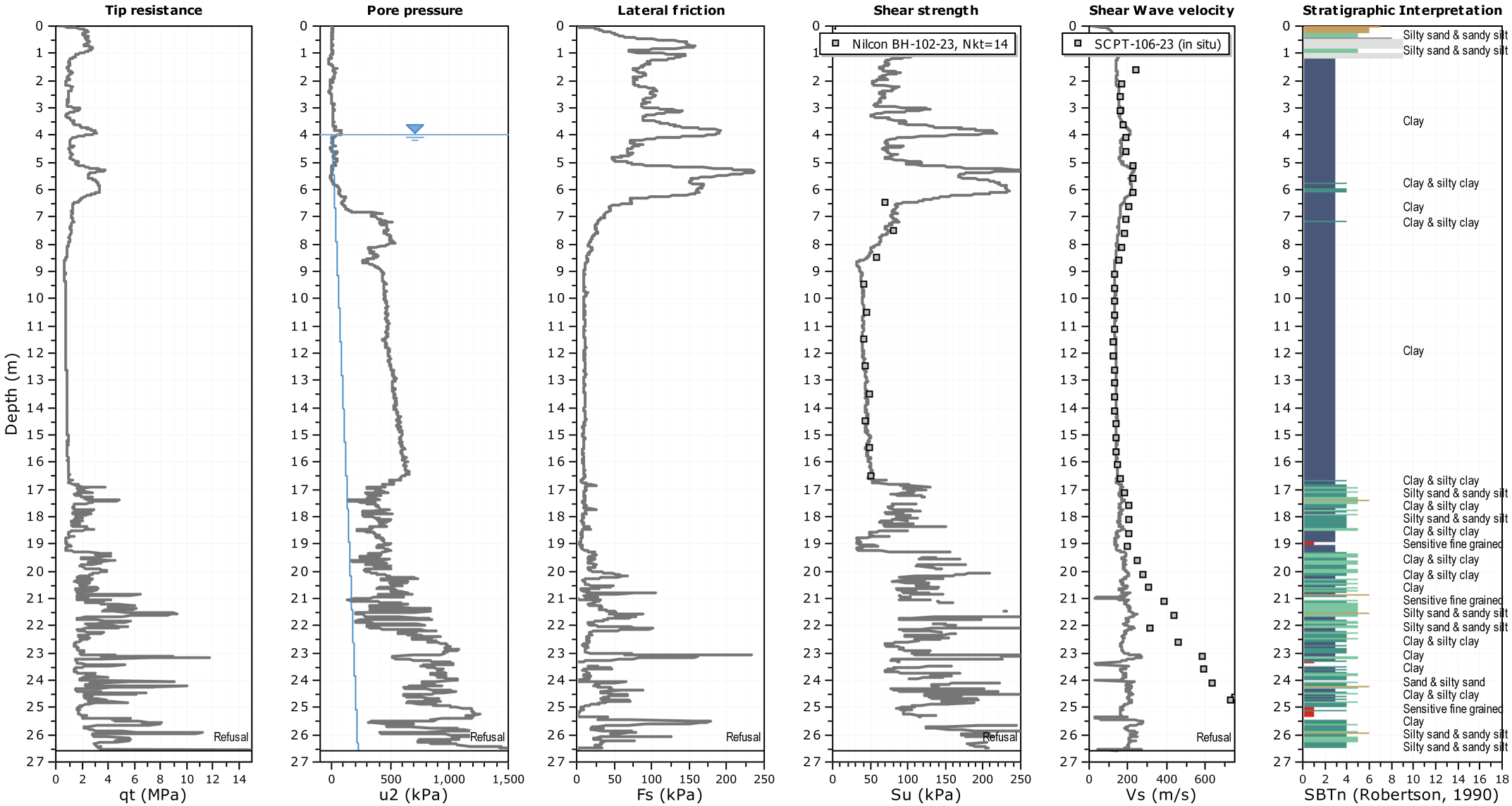
Project: Proposed Distribution Center
Location: Bill Leathem Drive, Ottawa, Ontario



Geotechnical Investigation
Project No: 12615684-A1
Client: Medusa Limited Partnership

Sounding No: CPT-106-23
Total depth: 26.57 m, Date: 7/10/2023
Surface Elevation: 95.20 m
Cone Type: 100 Mpa, ID #60257
Cone Operator: Stratum

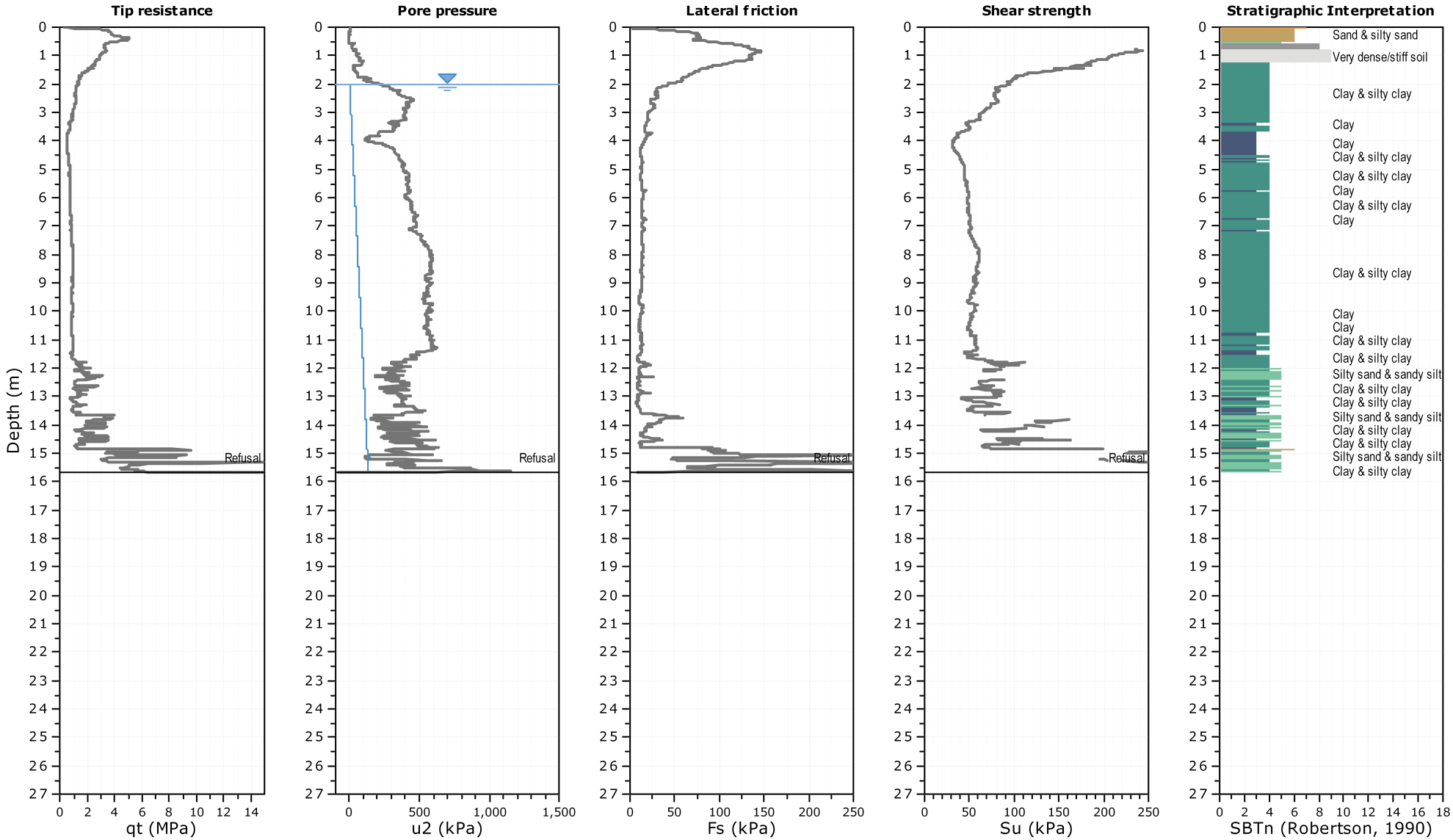
Project: Proposed Distribution Center
Location: Bill Leathem Drive, Ottawa, Ontario



Geotechnical Investigation
Project No: 12615684-A1
Client: Medusa Limited Partnership

Sounding No: CPT-107-23
Total depth: 15.69 m, Date: 7/11/2023
Surface Elevation: 90.55 m
Cone Type: 100 Mpa, ID #60298
Cone Operator: Stratum

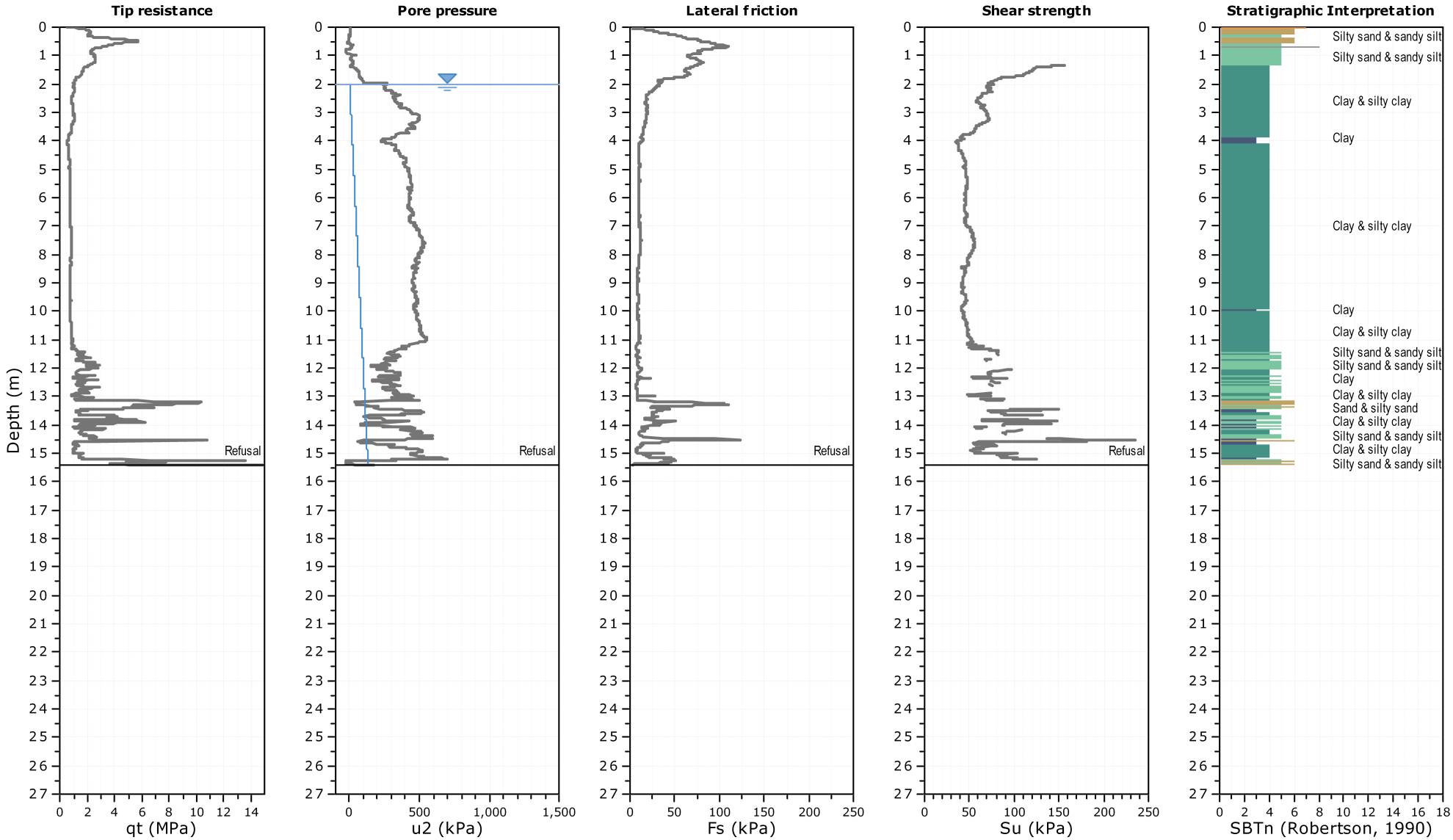
Project: Proposed Distribution Center
Location: Bill Leathem Drive, Ottawa, Ontario



Geotechnical Investigation
Project No: 12615684-A1
Client: Medusa Limited Partnership

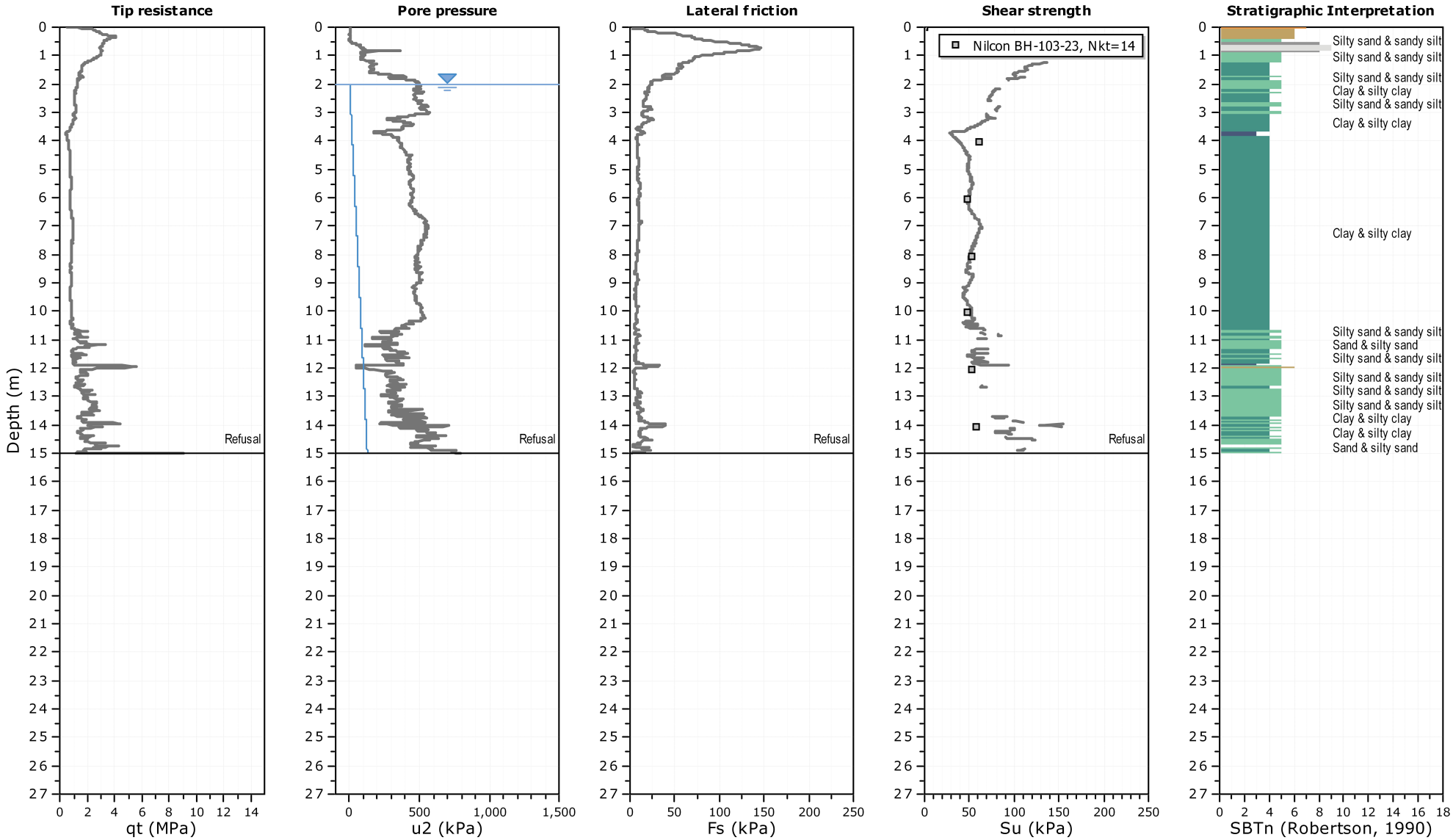
Sounding No: CPT-108-23
Total depth: 15.42 m, Date: 7/11/2023
Surface Elevation: 90.57 m
Cone Type: 100 Mpa, ID #60257
Cone Operator: Stratum

Project: Proposed Distribution Center
Location: Bill Leathem Drive, Ottawa, Ontario



Project: Proposed Distribution Center
Location: Bill Leathem Drive, Ottawa, Ontario

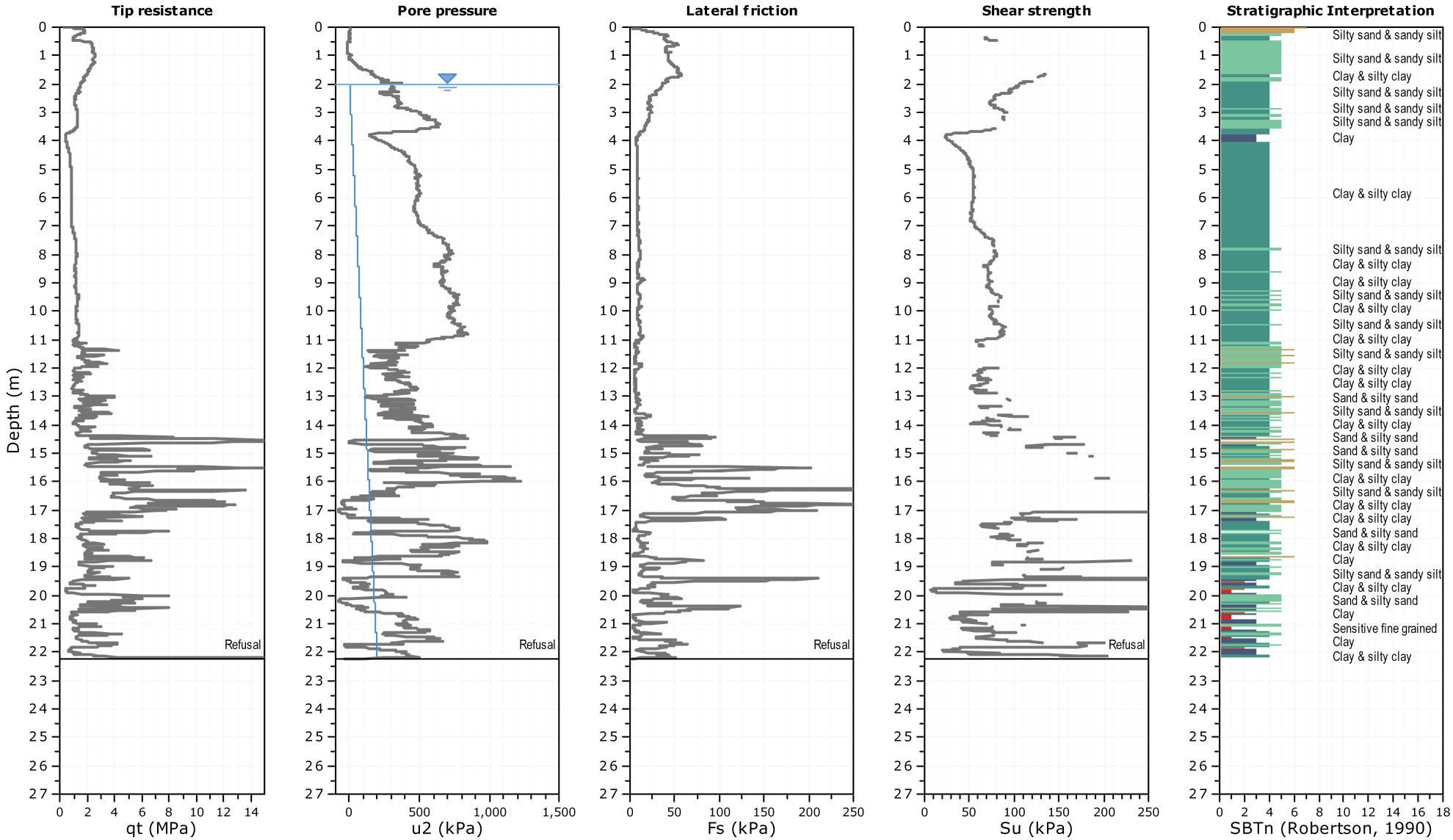
Sounding No: CPT-109-23
Total depth: 15.02 m, Date: 7/11/2023
Surface Elevation: 90.59 m
Cone Type: 100 Mpa, ID #60298
Cone Operator: Stratum



Geotechnical Investigation
Project No: 12615684-A1
Client: Medusa Limited Partnership

Sounding No: CPT-110-23
Total depth: 22.26 m, Date: 7/11/2023
Surface Elevation: 90.24 m
Cone Type: 100 Mpa, ID #60257
Cone Operator: Stratum

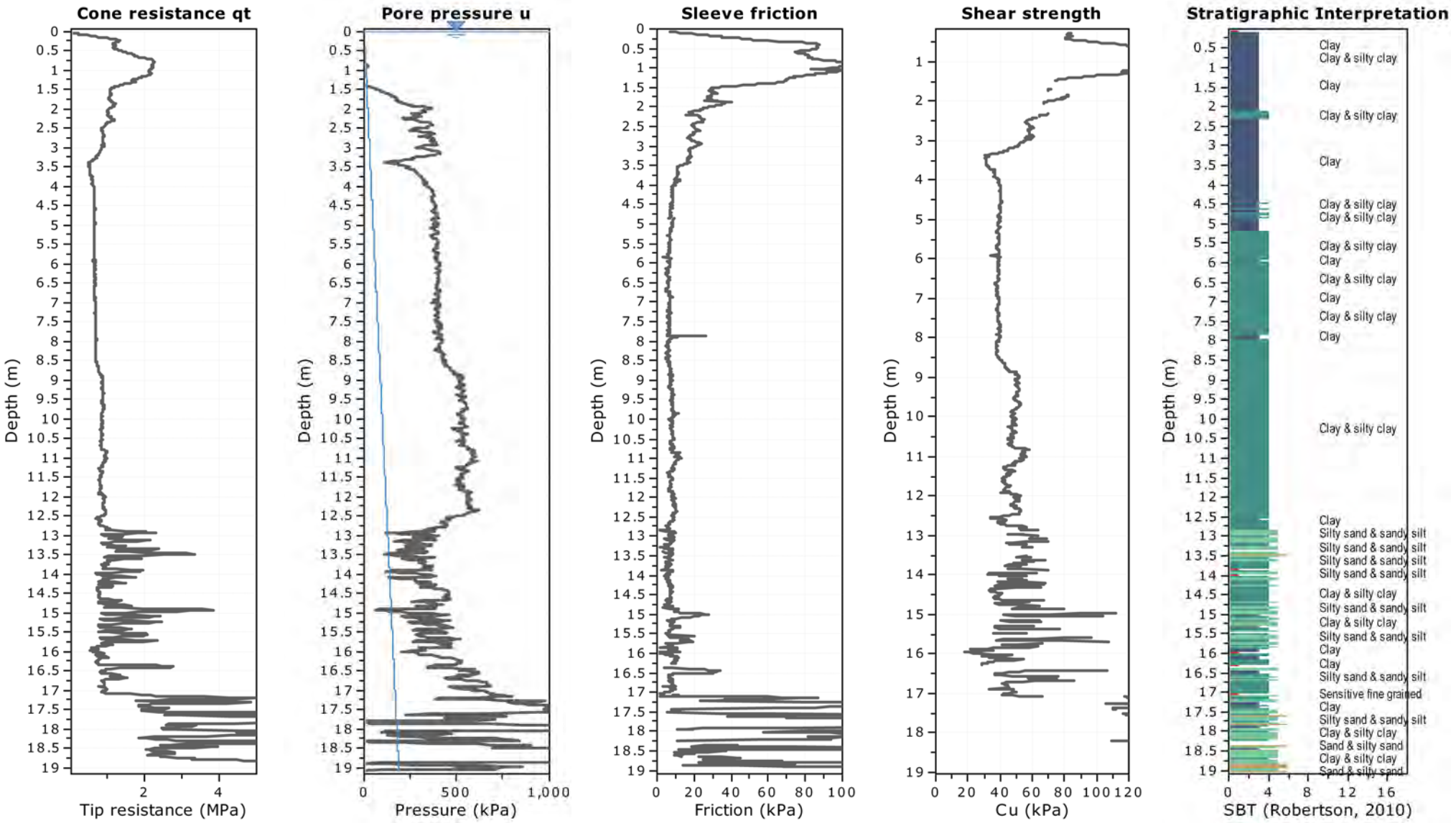
Project: Proposed Distribution Center
Location: Bill Leathem Drive, Ottawa, Ontario



11227097-A1
Performed by Stratum CPT
Interpreted by Marc-Andre Richard, ing. jr
Verified by Kamel Hamouche, ing. Ph. D.

Project: Geotechnical Investigation - Proposed Sortation Facility
Location: Leikin Drive and Merival Road Intersection, Nepean, Ontario

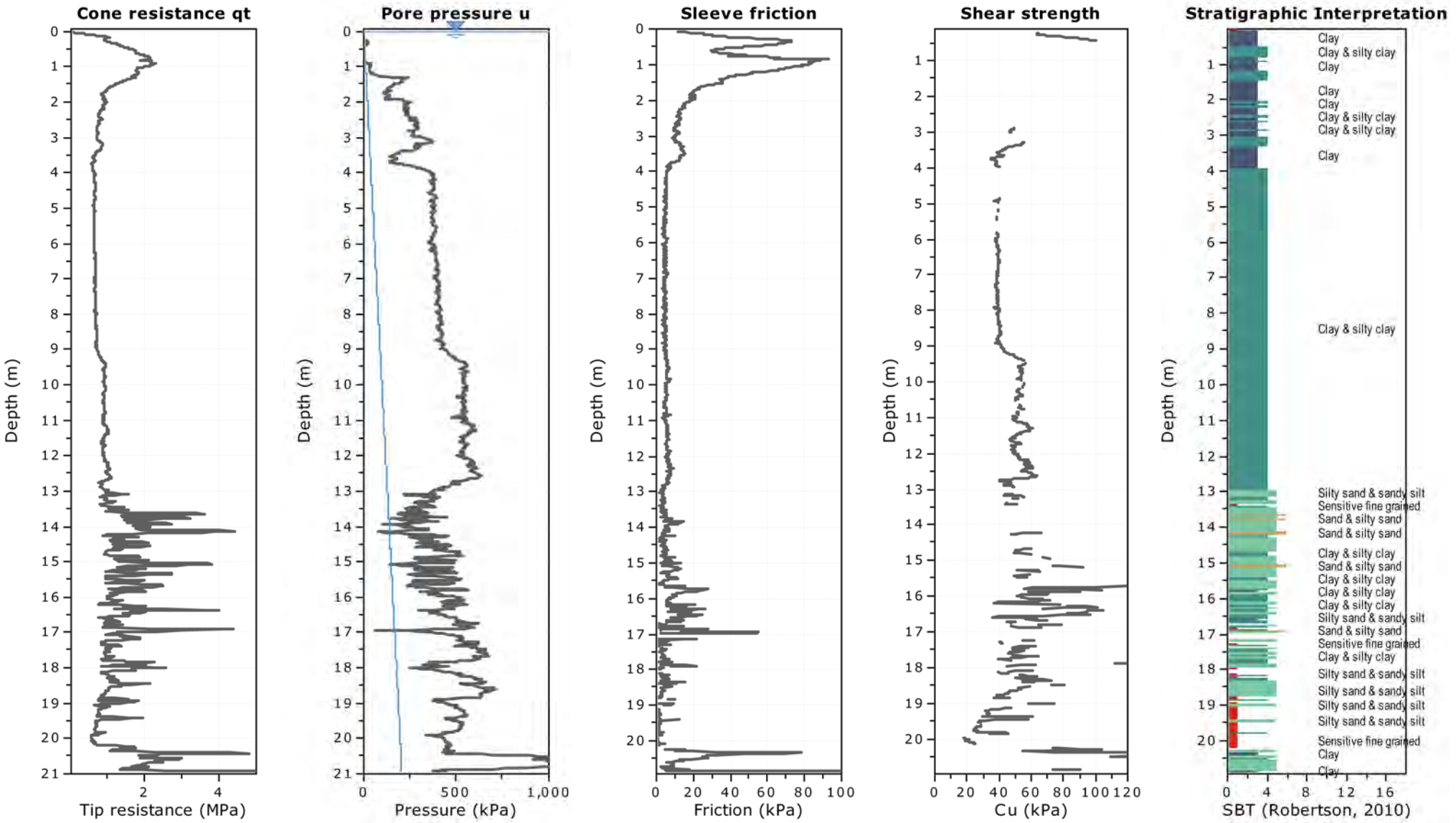
CPT-01
Total depth: 19.08 m



11227097-A1
Performed by Stratum CPT
Interpreted by Marc-Andre Richard, ing. jr
Verified by Kamel Hamouche, ing. Ph. D.

Project: Geotechnical Investigation - Proposed Sortation Facility
Location: Leikin Drive and Merival Road Intersection, Nepean, Ontario

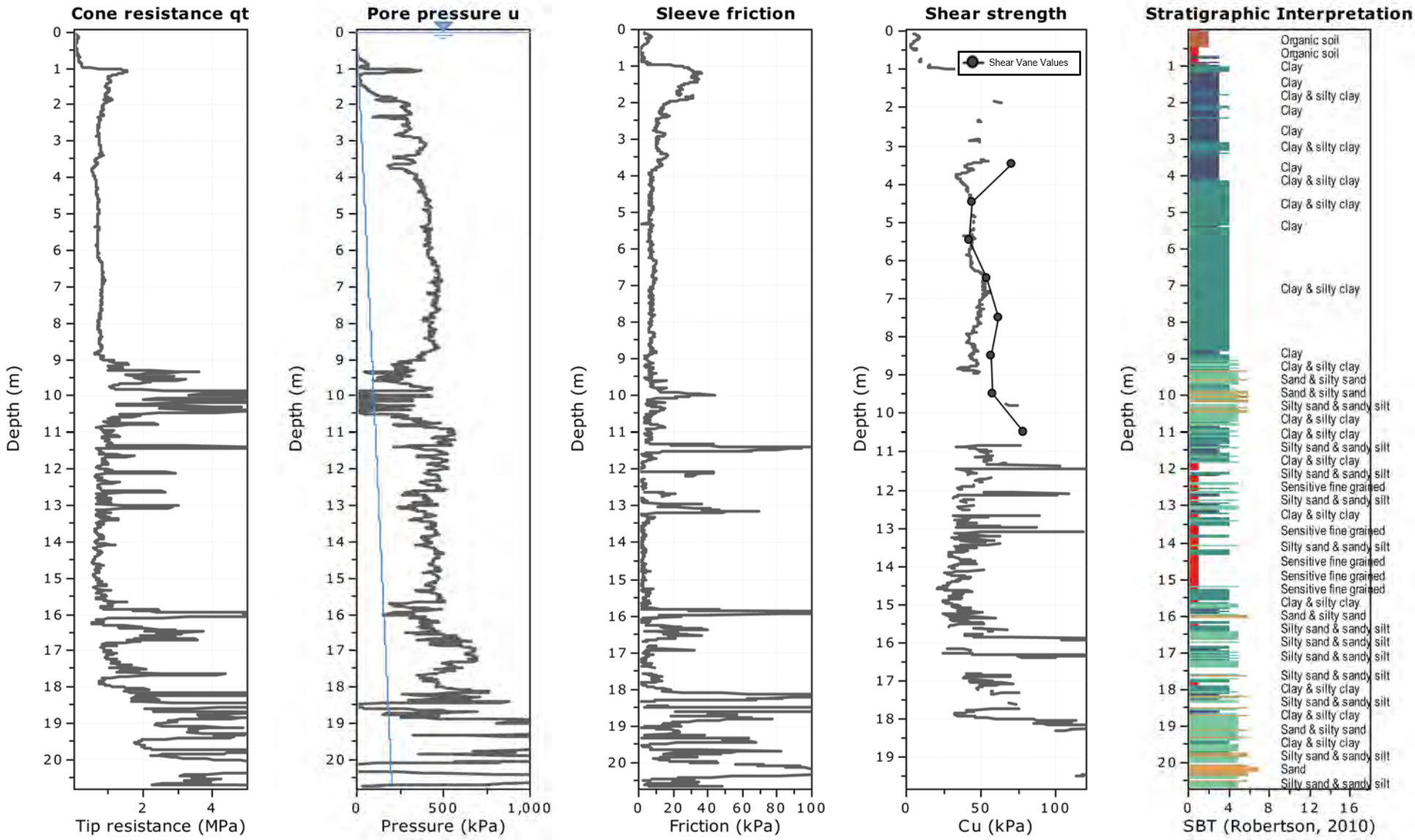
CPT-02
Total depth: 20.92 m



11227097-A1
Performed by Stratum CPT
Interpreted by Marc-Andre Richard, ing. jr
Verified by Kamel Hamouche, ing. Ph. D.

Project: Geotechnical Investigation - Proposed Sortation Facility
Location: Leikin Drive and Merival Road Intersection, Nepean, Ontario

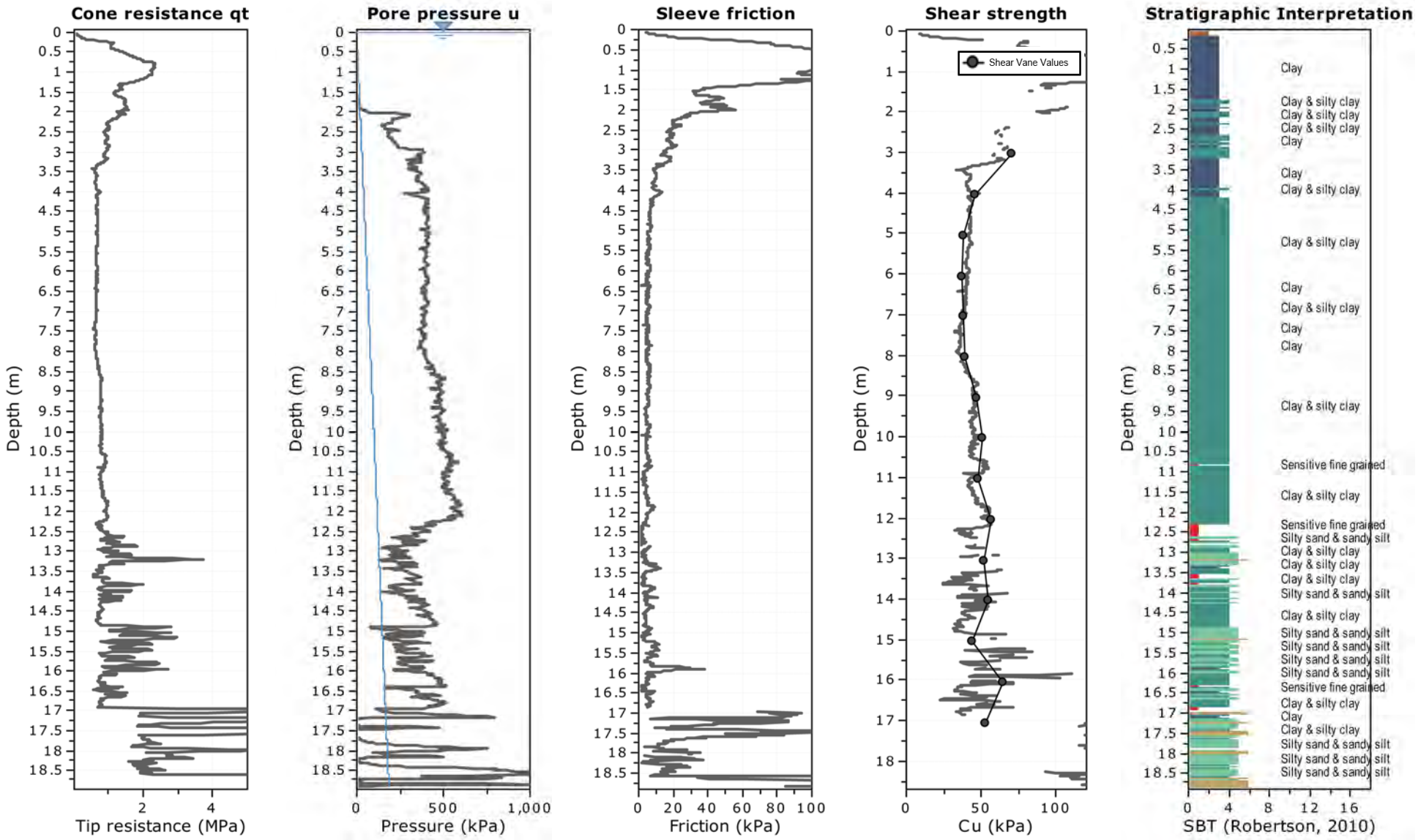
CPT-03
Total depth: 20.72 m



11227097-A1
Performed by Stratum CPT
Interpreted by Marc-Andre Richard, ing. jr
Verified by Kamel Hamouche, ing. Ph. D.

Project: Geotechnical Investigation - Proposed Sortation Facility
Location: Leikin Drive and Merival Road Intersection, Nepean, Ontario

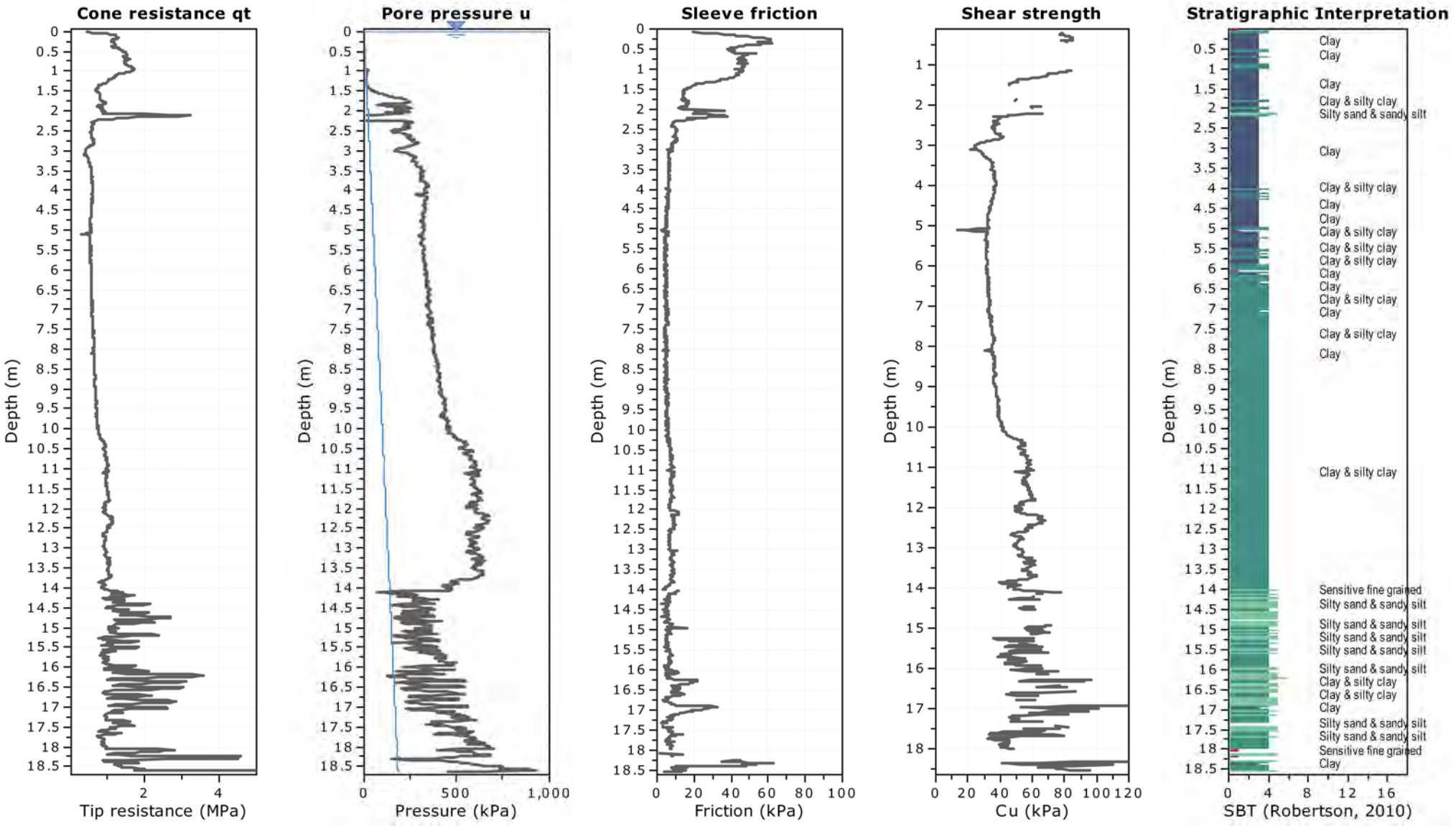
CPT-04
Total depth: 18.89 m



11227097-A1
Performed by Stratum CPT
Interpreted by Marc-Andre Richard, ing. jr
Verified by Kamel Hamouche, ing. Ph. D.

Project: Geotechnical Investigation - Proposed Sortation Facility
Location: Leikin Drive and Merival Road Intersection, Nepean, Ontario

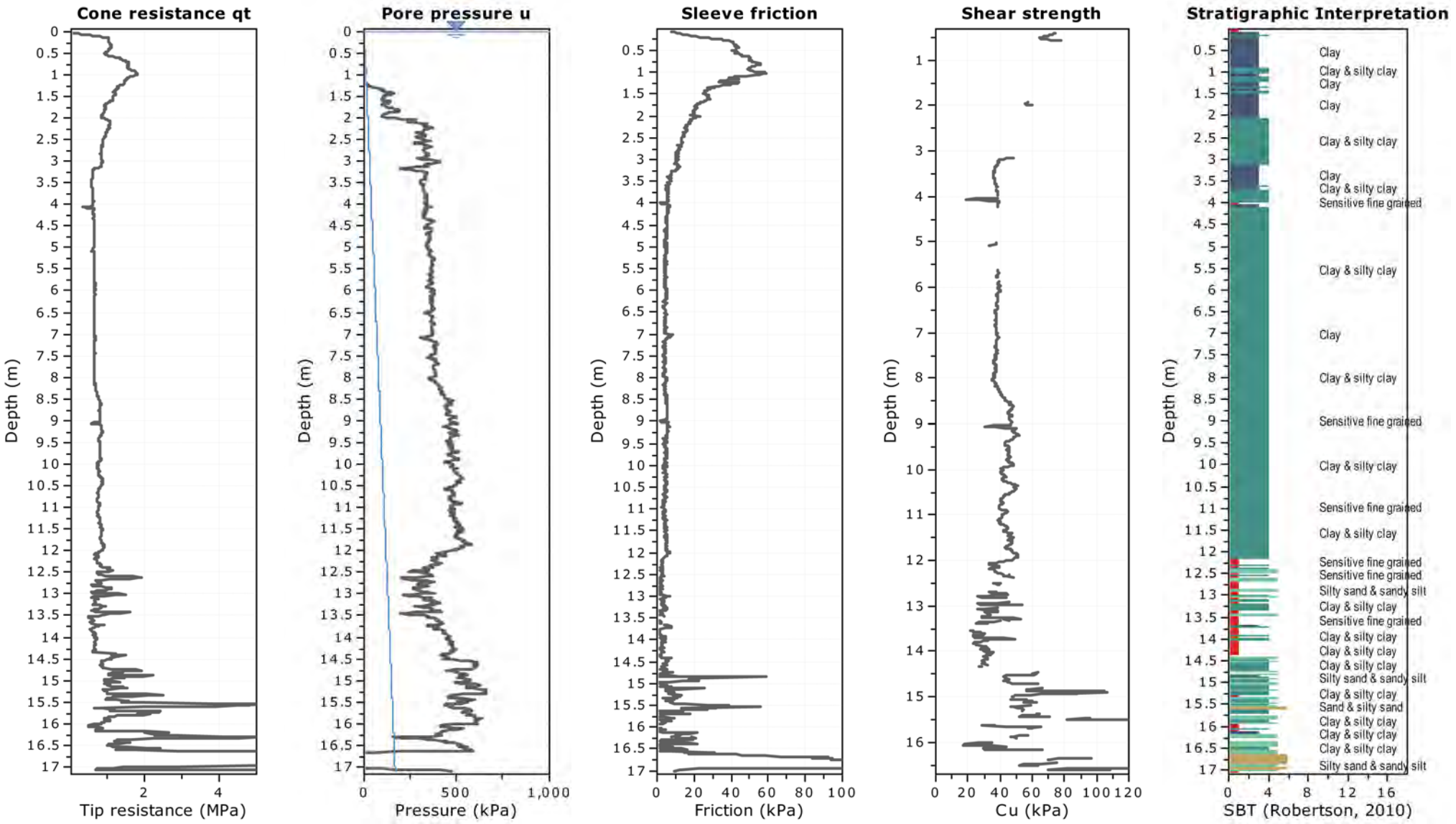
CPT-05
Total depth: 18.63 m



11227097-A1
Performed by Stratum CPT
Interpreted by Marc-Andre Richard, ing. jr
Verified by Kamel Hamouche, ing. Ph. D.

Project: Geotechnical Investigation - Proposed Sortation Facility
Location: Leikin Drive and Merival Road Intersection, Nepean, Ontario

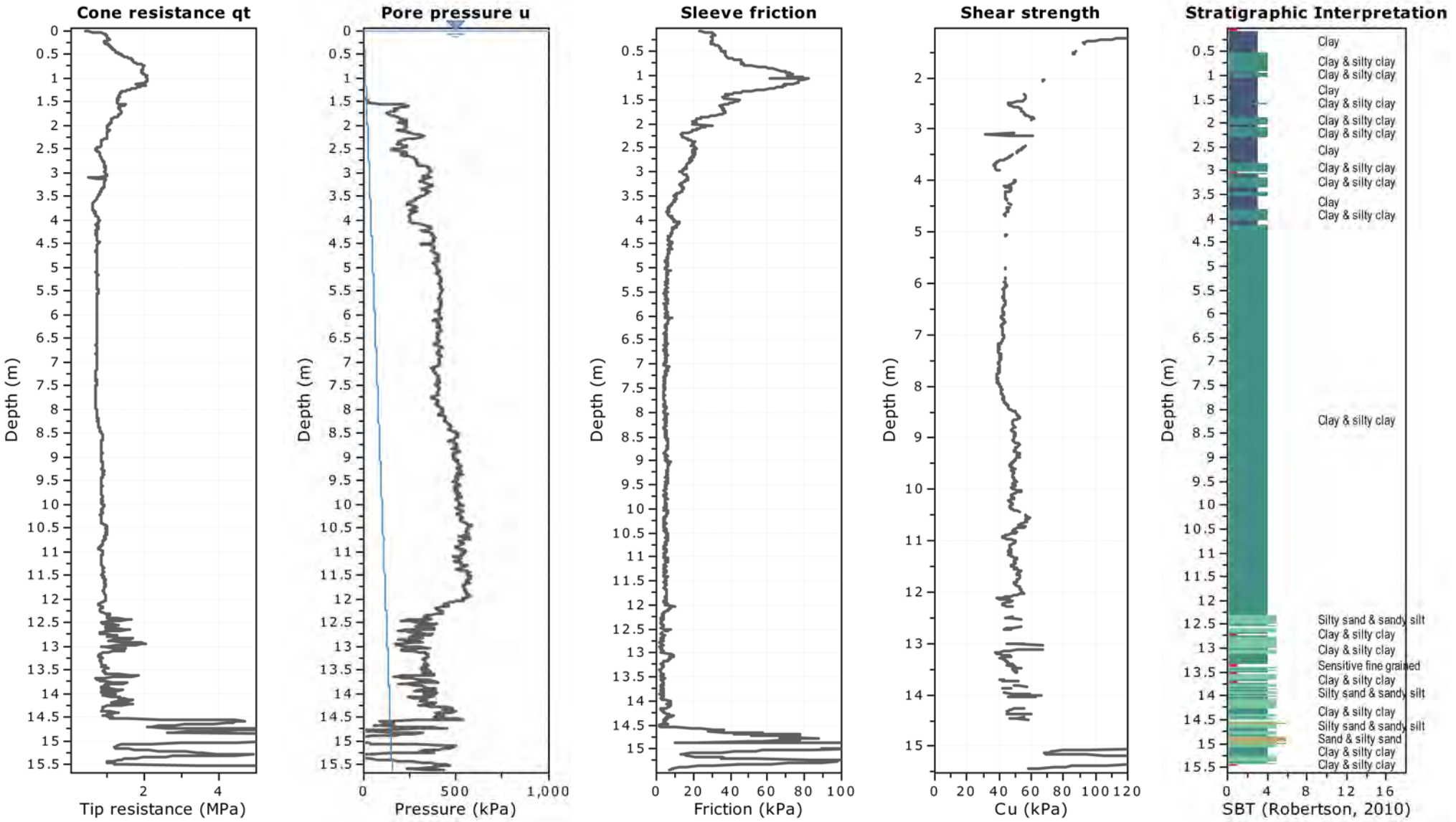
CPT-06
Total depth: 17.10 m



11227097-A1
Performed by Stratum CPT
Interpreted by Marc-Andre Richard, ing. jr
Verified by Kamel Hamouche, ing. Ph. D.

Project: Geotechnical Investigation - Proposed Sortation Facility
Location: Leikin Drive and Merival Road Intersection, Nepean, Ontario

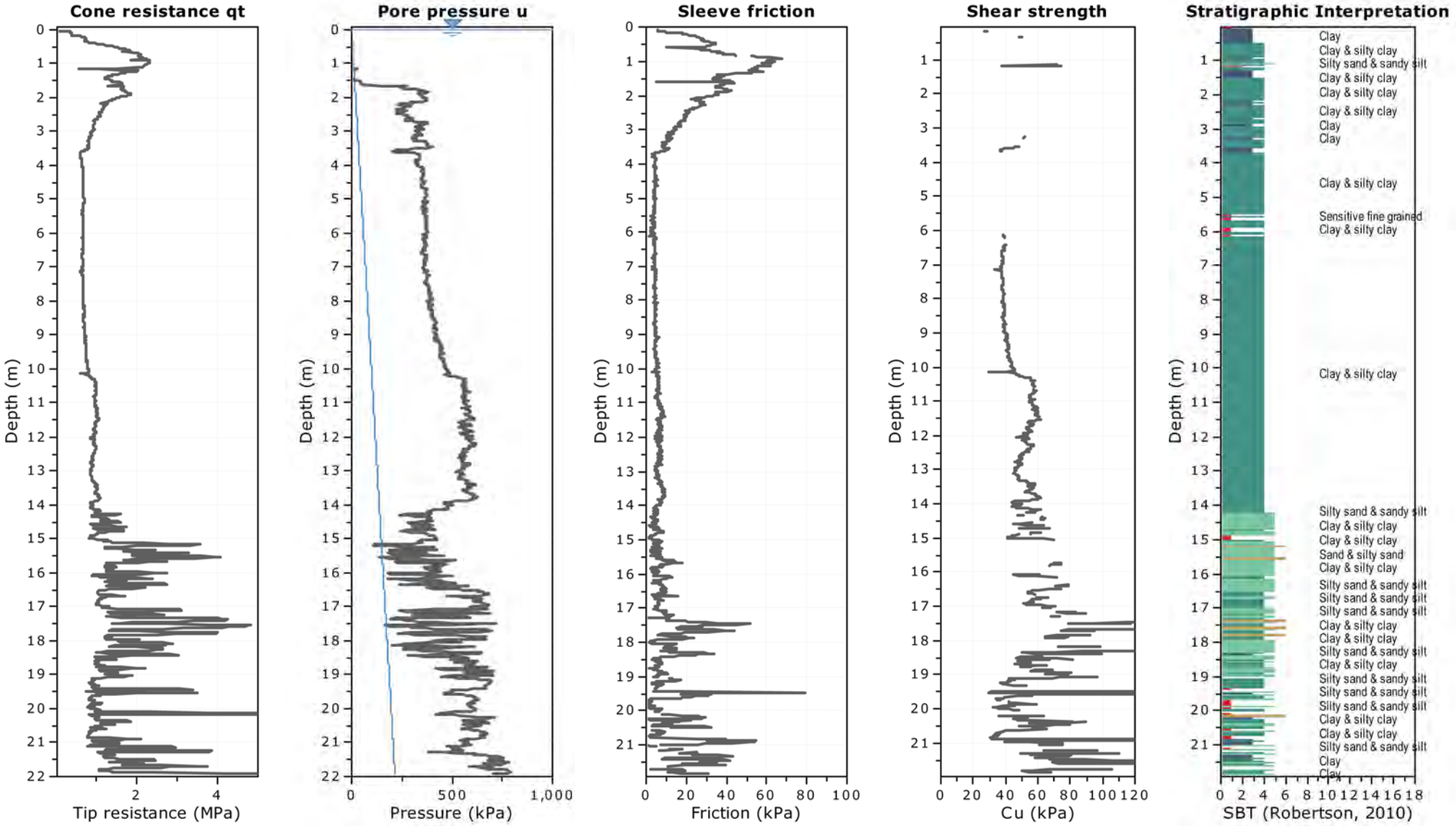
CPT-07
Total depth: 15.62 m



11227097-A1
Performed by Stratum CPT
Interpreted by Marc-Andre Richard, ing. jr
Verified by Kamel Hamouche, ing. Ph. D.

Project: Geotechnical Investigation - Proposed Sortation Facility
Location: Leikin Drive and Merival Road Intersection, Nepean, Ontario

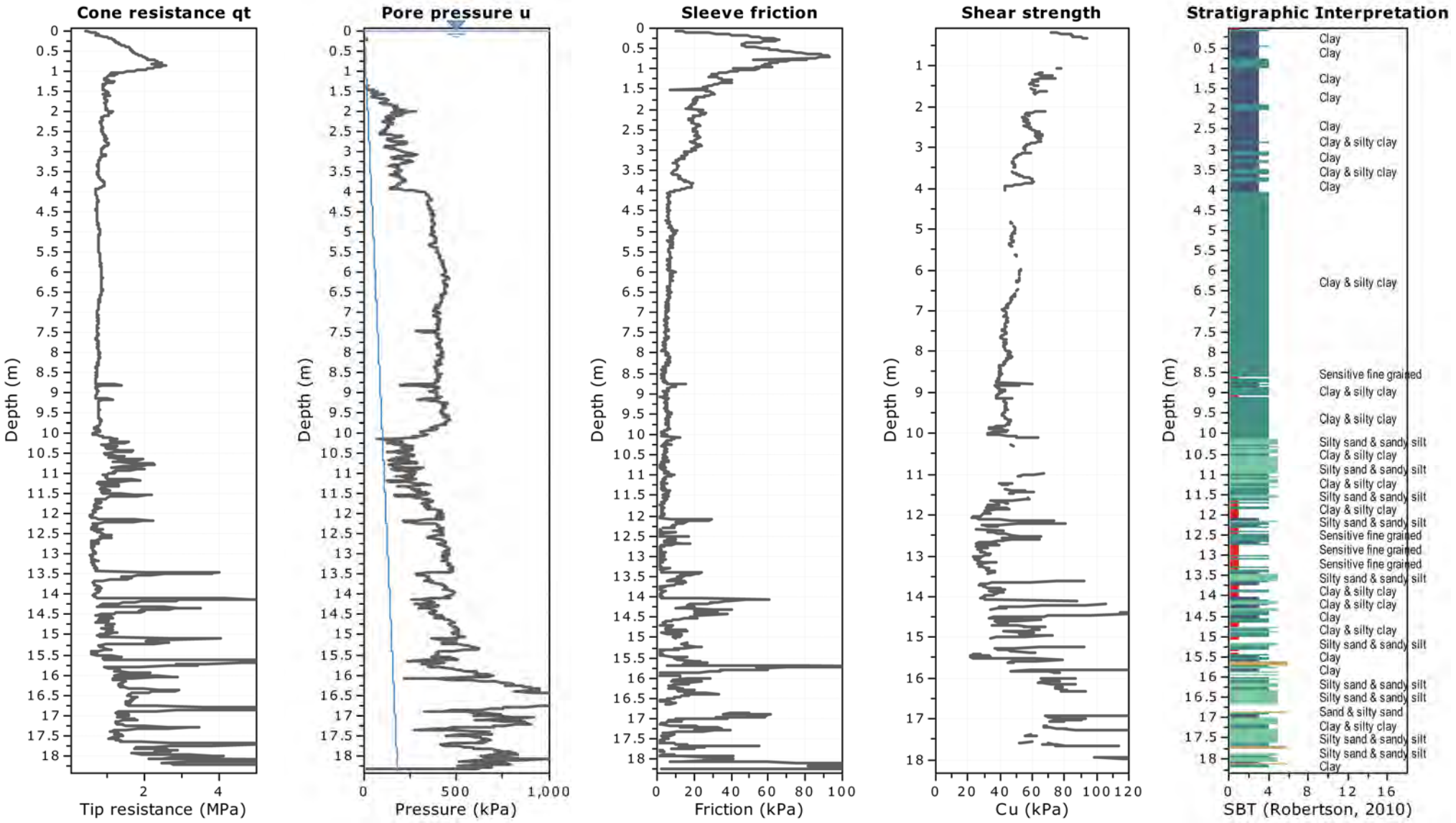
CPT-08
Total depth: 21.93 m



11227097-A1
Performed by Stratum CPT
Interpreted by Marc-Andre Richard, ing. jr
Verified by Kamel Hamouche, ing. Ph. D.

Project: Geotechnical Investigation - Proposed Sortation Facility
Location: Leikin Drive and Merival Road Intersection, Nepean, Ontario

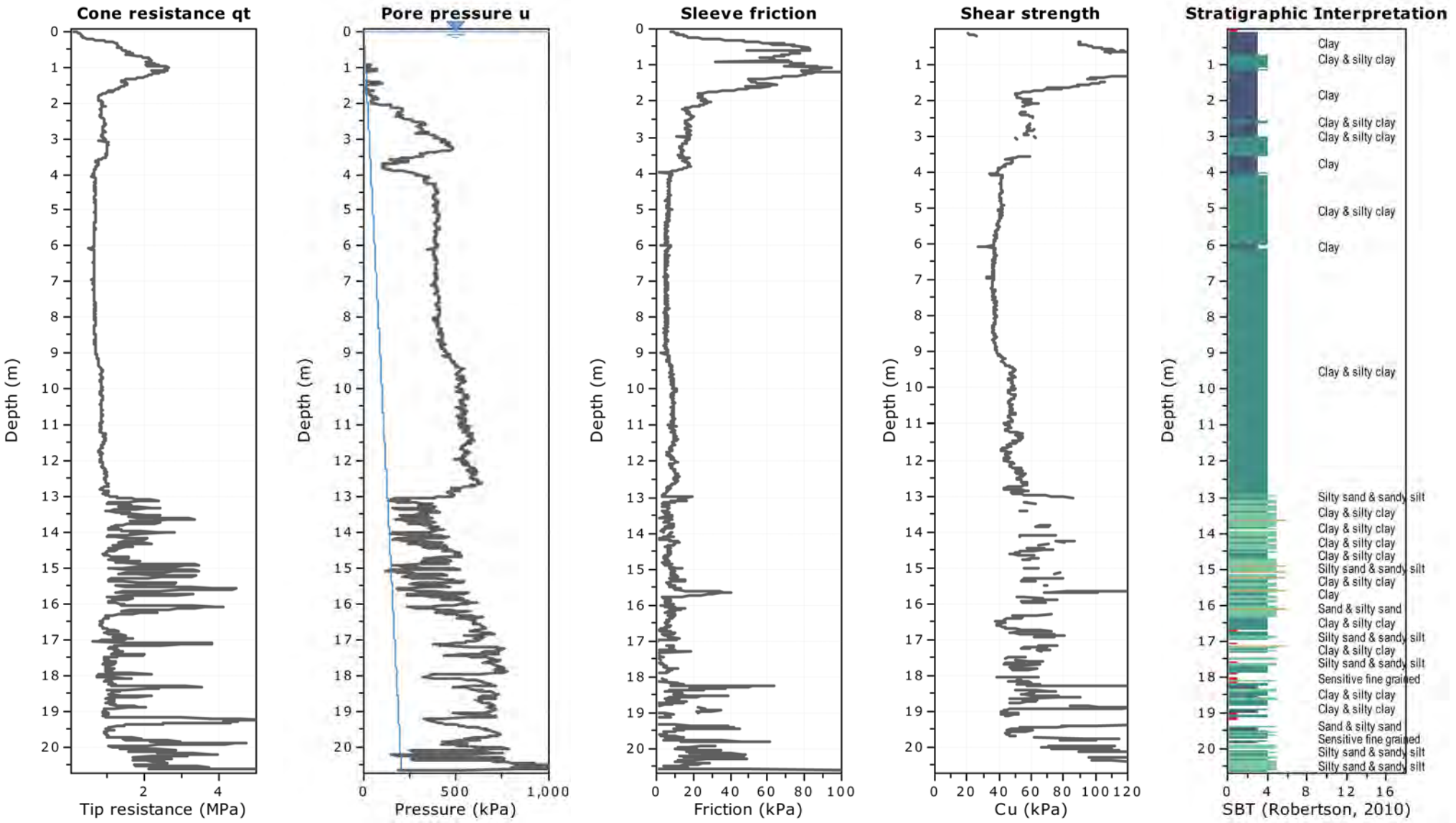
CPT-14
Total depth: 18.37 m



11227097-A1
Performed by Stratum CPT
Interpreted by Marc-Andre Richard, ing. jr
Verified by Kamel Hamouche, ing. Ph. D.

Project: Geotechnical Investigation - Proposed Sortation Facility
Location: Leikin Drive and Merival Road Intersection, Nepean, Ontario

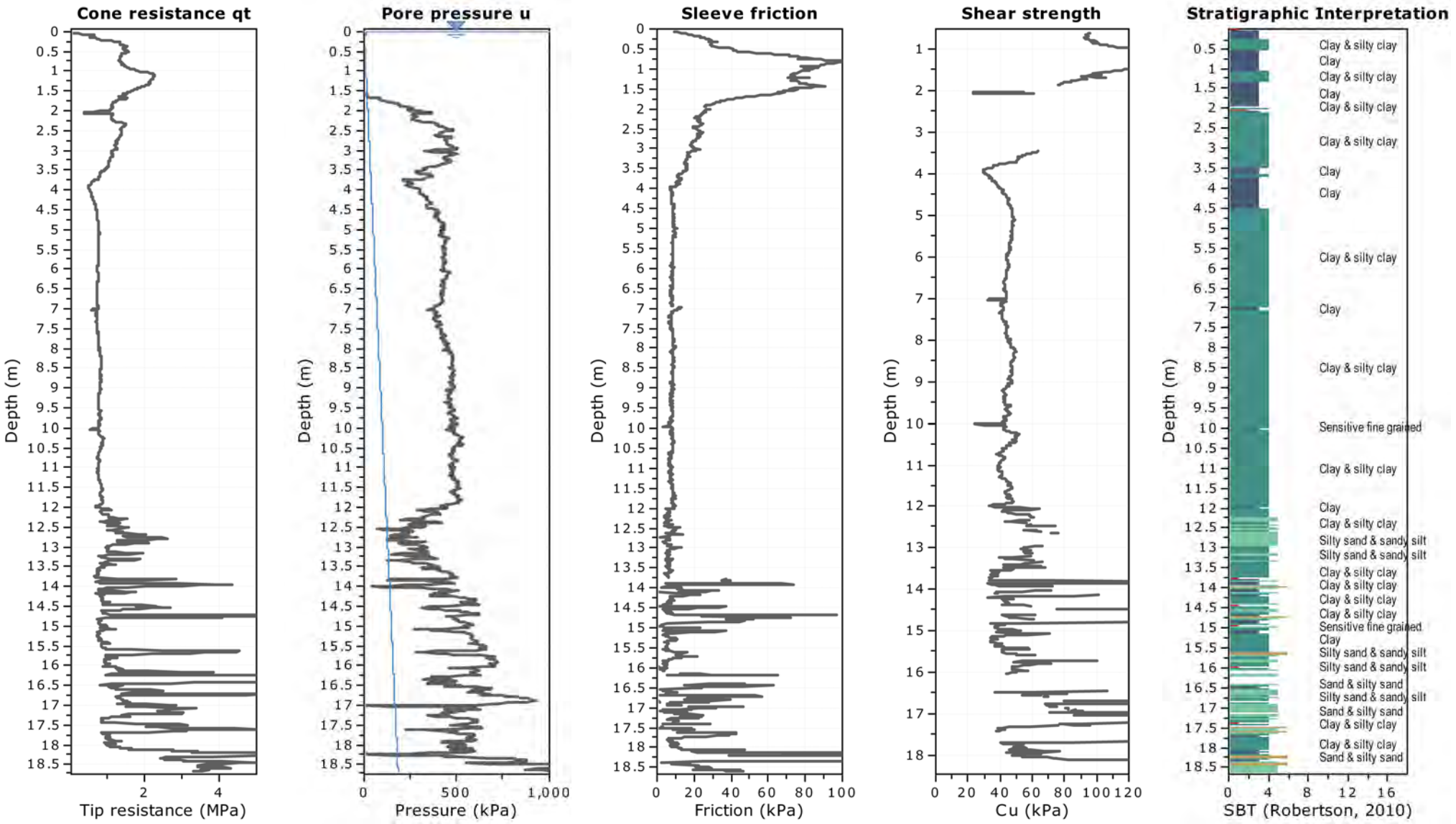
CPT-16
Total depth: 20.66 m

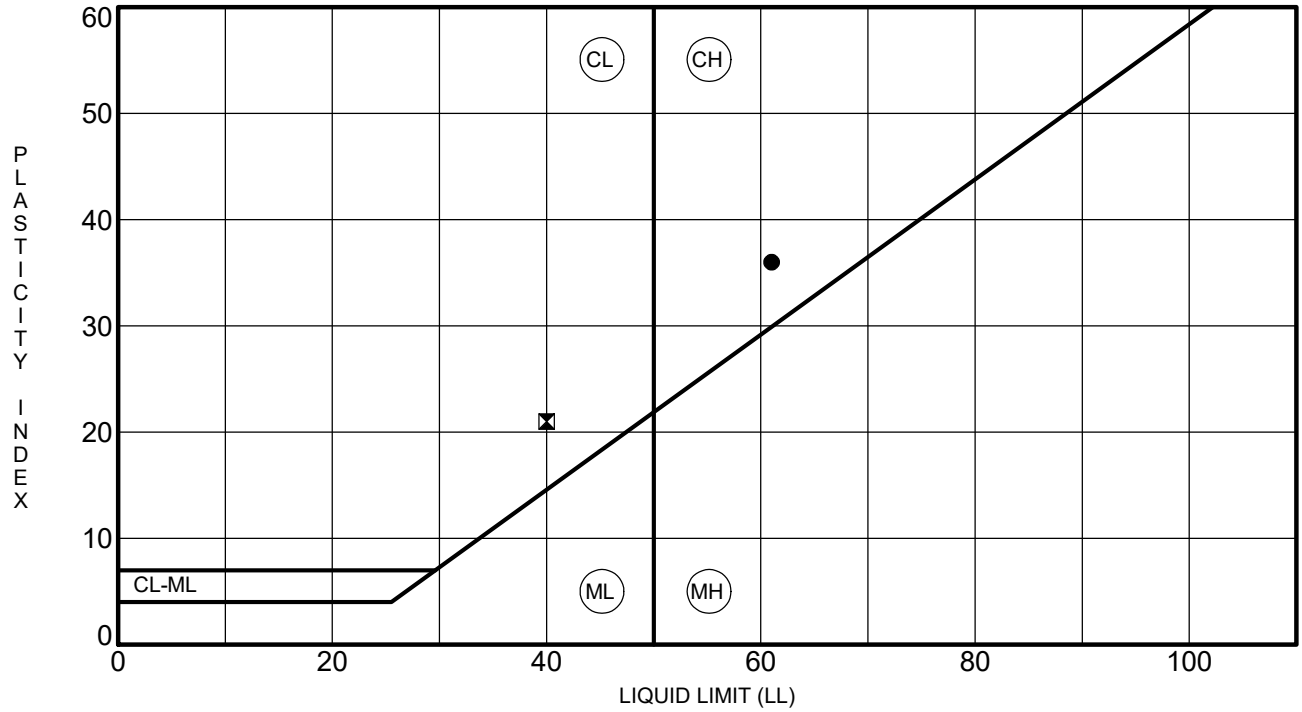


11227097-A1
Performed by Stratum CPT
Interpreted by Marc-Andre Richard, ing. jr
Verified by Kamel Hamouche, ing. Ph. D.

Project: **Geotechnical Investigation - Proposed Sortation Facility**
Location: **Leikin Drive and Merival Road Intersection, Nepean, Ontario**

CPT-18
Total depth: 18.66 m





Specimen Identification		LL	PL	PI	Fines	Classification
● BH 4-24	SS2	61	25	36		CH-Inorganic clays of high plasticity
⊠ BH16-24	SS3	40	19	21		CL-Inorganic clays of low-medium plasticity

CLIENT **Medusa LP**

PROJECT **Geotechnical Investigation - 99 Bill Leathem Drive, 2 & 20 Leikin Drive & 11 Beckstear Road**

FILE NO. **PG5876**

DATE **24 Aug 24**

PATERSON GROUP

9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

ATTERBERG LIMITS' RESULTS

PLASTICITY CHART

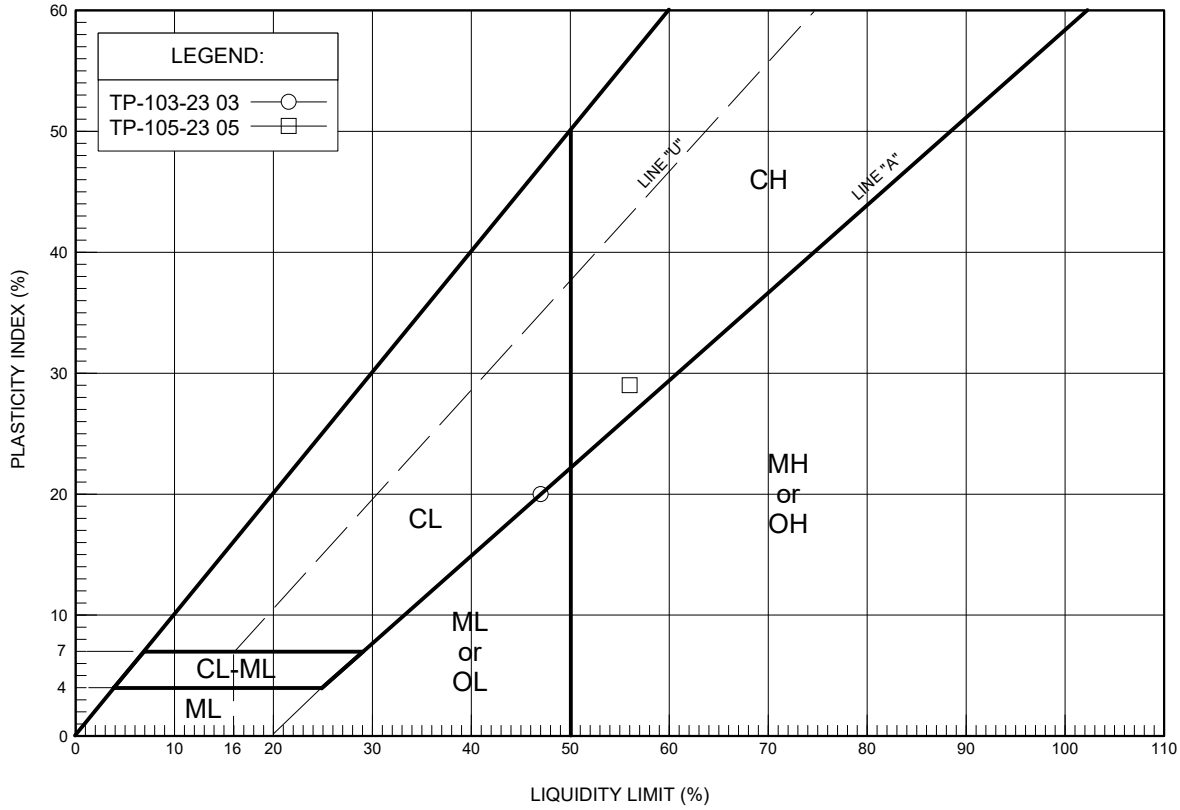
Client: **Medusa Limited Partnership**

Reference No.: 12615684-A1

Project: **Geotechnical Investigation - Proposed Distribution Center**

Location: **Bill Leathem Drive, Ottawa, Ontario**

PLASTICITY CHART (ASTM D-2487 STANDARD)



RESULTS INTERPRETATION AND WATER CONTENT

LEGEND	SOUNDING	SPL.	DEPTH (m)	DESCRIPTION	W	LL	PL	PI	LI	USCS
—○—	TP-103-23	03	0.80 - 1.80	Fill	22.0	47.0	27.0	20.0	-0.3	CL
—□—	TP-105-23	05	3.40 - 4.50	Fill	28.0	56.0	27.0	29.0	0.0	CH

Prepared by: Aman Azizi Date : 2023-08-01

Verified by: Mark Gamboz Date : 2023-08-01

PLASTICITY CHART

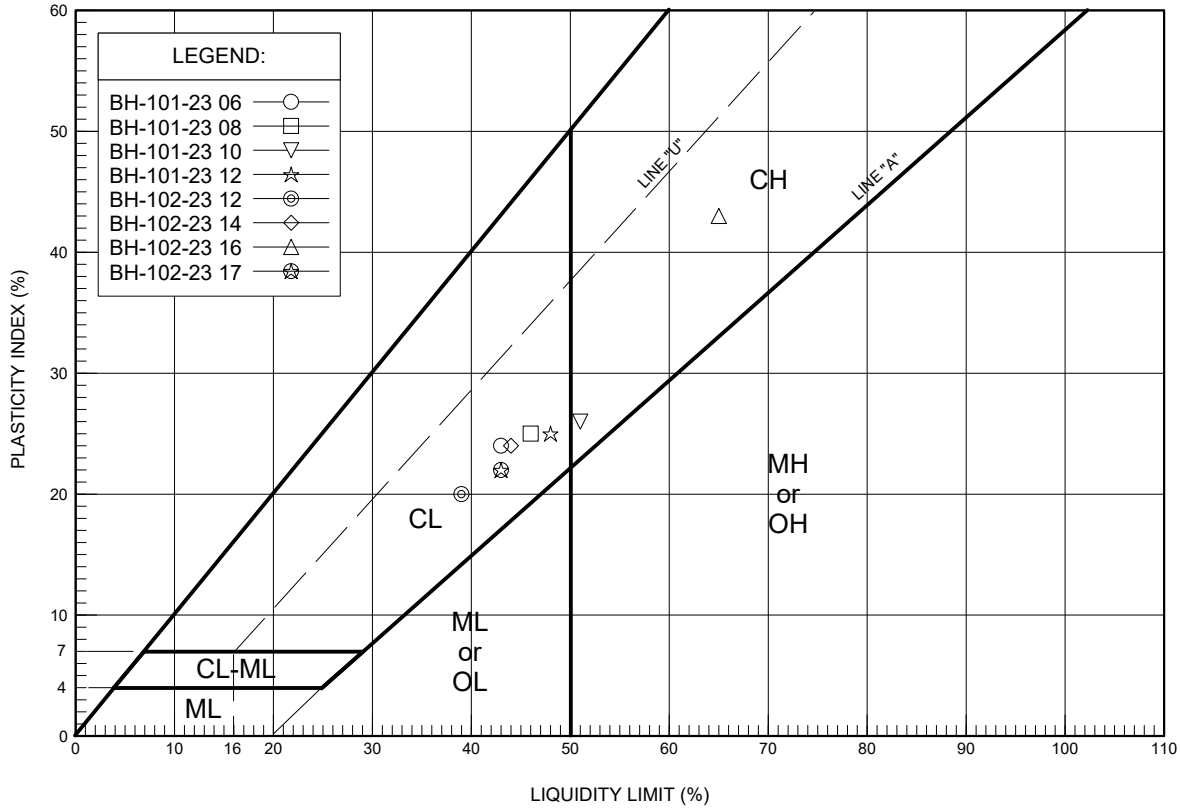
Client: **Medusa Limited Partnership**

Reference No.: 12615684-A1

Project: **Geotechnical Investigation - Proposed Distribution Center**

Location: **Bill Leathem Drive, Ottawa, Ontario**

PLASTICITY CHART (ASTM D-2487 STANDARD)



RESULTS INTERPRETATION AND WATER CONTENT

LEGEND	SOUNDING	SPL.	DEPTH (m)	DESCRIPTION	W	LL	PL	PI	LI	USCS
○	BH-101-23	06	3.05 - 3.66	Clayey Silt to Silty Clay Deposit	33.0	43.0	19.0	24.0	0.6	CL
□	BH-101-23	08	4.57 - 5.18	Clayey Silt to Silty Clay Deposit	50.0	46.0	21.0	25.0	1.2	CL
▽	BH-101-23	10	6.09 - 6.70	Clayey Silt to Silty Clay Deposit	62.0	51.0	25.0	26.0	1.4	CH
☆	BH-101-23	12	7.61 - 8.22	Clayey Silt to Silty Clay Deposit	63.0	48.0	23.0	25.0	1.6	CL
◎	BH-102-23	12	7.62 - 8.23	Clayey Silt to Silty Clay Deposit	33.0	39.0	19.0	20.0	0.7	CL
◇	BH-102-23	14	10.13 - 10.74	Clayey Silt to Silty Clay Deposit	52.0	44.0	20.0	24.0	1.3	CL
△	BH-102-23	16	13.17 - 13.78	Clayey Silt to Silty Clay Deposit	62.0	65.0	22.0	43.0	0.9	CH
⛤	BH-102-23	17	14.69 - 15.30	Clayey Silt to Silty Clay Deposit	51.0	43.0	21.0	22.0	1.4	CL

Prepared by: Aman Azizi Date : 2023-08-01

Verified by: Mark Gamboz Date : 2023-08-01

Plasticity - standard.sty

PLASTICITY CHART

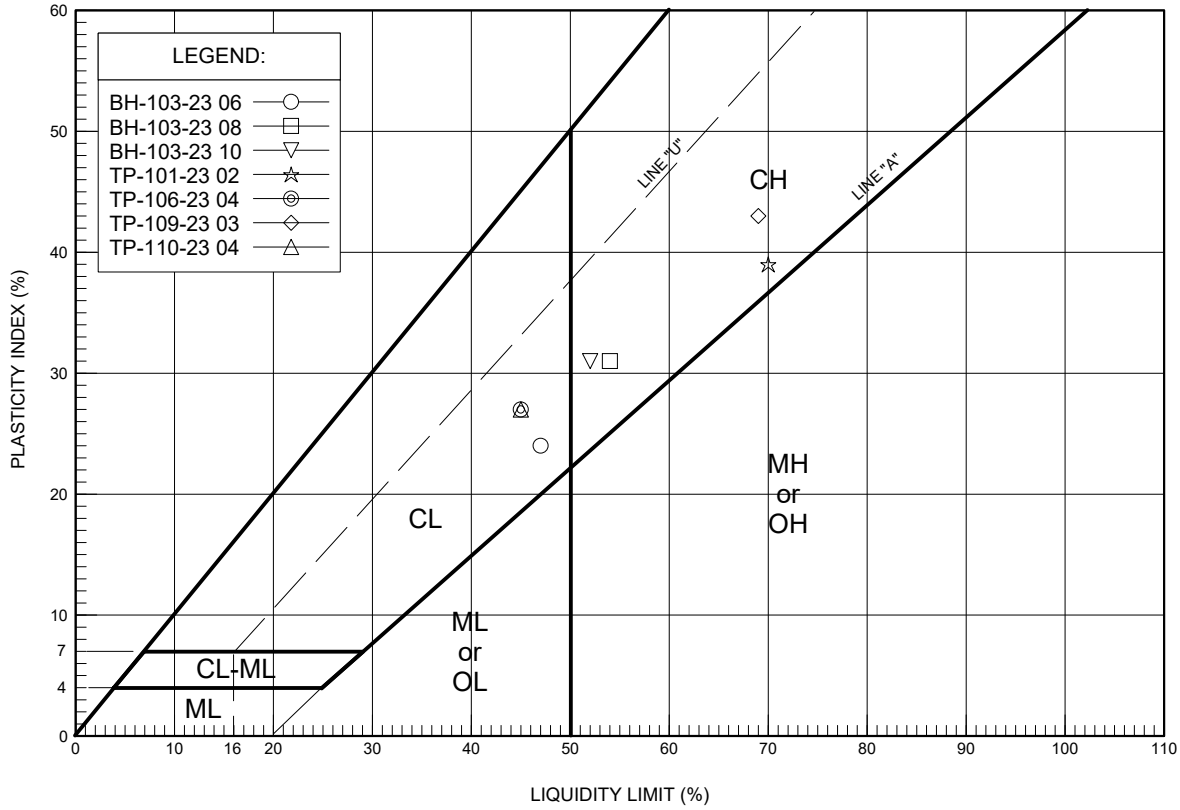
Client: **Medusa Limited Partnership**

Reference No.: 12615684-A1

Project: **Geotechnical Investigation - Proposed Distribution Center**

Location: **Bill Leathem Drive, Ottawa, Ontario**

PLASTICITY CHART (ASTM D-2487 STANDARD)



RESULTS INTERPRETATION AND WATER CONTENT

LEGEND	SOUNDING	SPL.	DEPTH (m)	DESCRIPTION	W	LL	PL	PI	LI	USCS
○	BH-103-23	06	4.56 - 5.17	Clayey Silt to Silty Clay Deposit	51.0	47.0	23.0	24.0	1.2	CL
□	BH-103-23	08	7.60 - 8.21	Clayey Silt to Silty Clay Deposit	58.0	54.0	23.0	31.0	1.1	CH
▽	BH-103-23	10	10.23 - 10.84	Clayey Silt to Silty Clay Deposit	58.0	52.0	21.0	31.0	1.2	CH
☆	TP-101-23	02	0.60 - 1.40	Clayey Silt to Silty Clay Deposit	33.0	70.0	31.0	39.0	0.1	CH
◎	TP-106-23	04	2.00 - 3.00	Clayey Silt to Silty Clay Deposit	31.0	45.0	18.0	27.0	0.5	CL
◇	TP-109-23	03	0.90 - 1.80	Clayey Silt to Silty Clay Deposit	26.0	69.0	26.0	43.0	0.0	CH
△	TP-110-23	04	2.00 - 3.00	Clayey Silt to Silty Clay Deposit	36.0	45.0	18.0	27.0	0.7	CL

Prepared by: Aman Azizi Date : 2023-08-01

Verified by: Mark Gamboz Date : 2023-08-01

CLASSIFICATION OF FINE GRAINED SOILS

CLIENT : MEDUSA LP

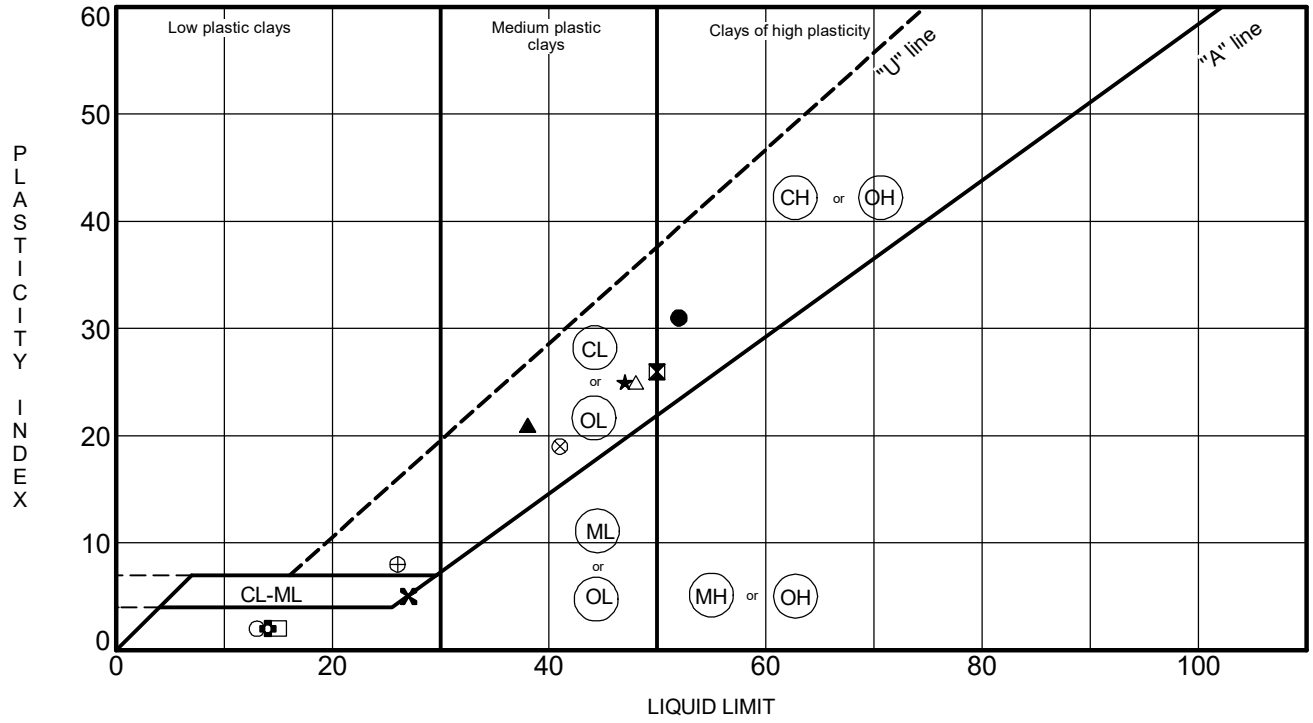
PROJECT : PROPOSED SORTATION FACILITY

REFERENCE No. : 11227097-A1

LOCATION : LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

DATE : 5/11/2021

Plasticity Chart (ASTM D2487)



	Bore No.	Sample	Depth	w	W_L	W_{L-S}	W_P	I_P	I_L	C_u	C_{ur}	S_T	Classification
●	BH-01	ST-5	3.05	45	52		21	31					CH
⊠	BH-01	SS-11	9.15	68	50		24	26					CH
▲	BH-02	SS-3	1.52	27	38		17	21					CL
★	BH-02	ST-7	4.57	54	47		22	25					CL
✕	BH-02	SS-11	9.15	25	27		22	5					CL-ML
✿	BH-02	SS-14	11.43	8	14		12	2					SM
○	BH-02	SS-19	15.24	8	13		11	2					SM
△	BH-03	SS-11	8.23	66	48		23	25					CL
⊗	BH-03	ST-13	10.67	58	41		22	19					CL
⊕	BH-03	SS-14	12.19	39	26		18	8					CL
□	BH-03	SS-18	18.29	9	15		13	2					SM

Legend

(CL) Inorganic clay of low plasticity
(OL) Organic silt
(CH) Inorganic clay of high plasticity
(ML) Inorganic silt
(OH) Organic clay and organic silt
(MH) Inorganic silt and very fine sand

w : Water content (%)
w_{L-S} : Oven dried liquid limit (%)
w_L : Liquid limit (%)
w_P : Plastic limit (%)
I_P : Plasticity index (%)

I_L : Liquidity index (%)
C_u : Intact undrained shear strength (kPa)
C_{ur} : Remoulded undrained shear strength (kPa)
S_T : Sensitivity

Prepared by : Mark Gamboz, B.Sc. Geology

Verified by : Mark Gamboz, B.Sc. Geology

CLASSIFICATION OF FINE GRAINED SOILS

REFERENCE No. : 11227097-A1

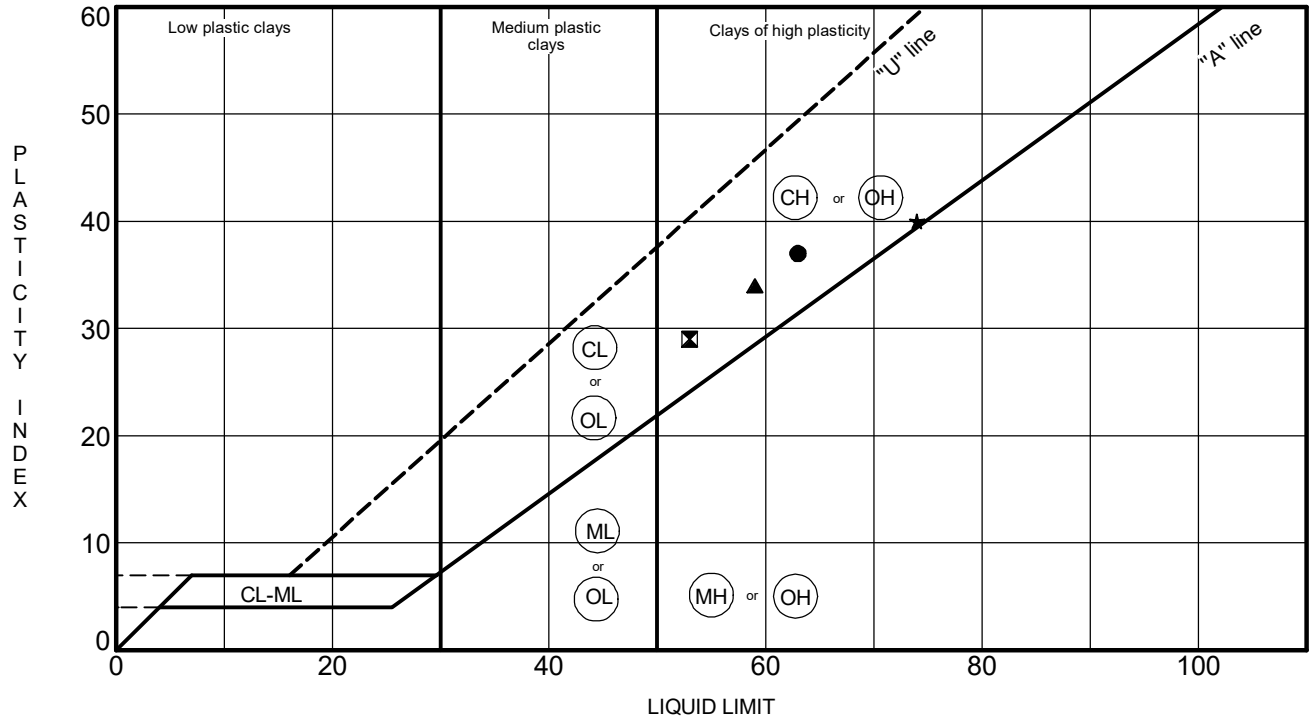
CLIENT : MEDUSA LP

LOCATION : LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

PROJECT : PROPOSED SORTATION FACILITY

DATE : 5/31/2021

Plasticity Chart (ASTM D2487)



	Bore No.	Sample	Depth	w	W_L	W_{L-S}	W_P	I_P	I_L	C_u	C_{ur}	S_T	Classification
●	TP-01	GS-3	0.80	33	63		26	37					CH
⊠	TP-25	GS-3	0.70	37	53		24	29					CH
▲	TP-35	GS-3	0.70	30	59		25	34					CH
★	TP-44	GS-3	0.75	39	74		34	40					CH

Legend

(CL) Inorganic clay of low plasticity
(OL) Organic silt
(CH) Inorganic clay of high plasticity
(ML) Inorganic silt
(OH) Organic clay and organic silt
(MH) Inorganic silt and very fine sand

w : Water content (%)
w_{L-S} : Oven dried liquid limit (%)
w_L : Liquid limit (%)
w_P : Plastic limit (%)
I_P : Plasticity index (%)

I_L : Liquidity index (%)
C_u : Intact undrained shear strength (kPa)
C_{ur} : Remoulded undrained shear strength (kPa)
S_T : Sensitivity

Prepared by : Mark Gamboz, B.Sc. Geology

Verified by : Mark Gamboz, B.Sc. Geology

GRAIN SIZE ANALYSIS REPORT

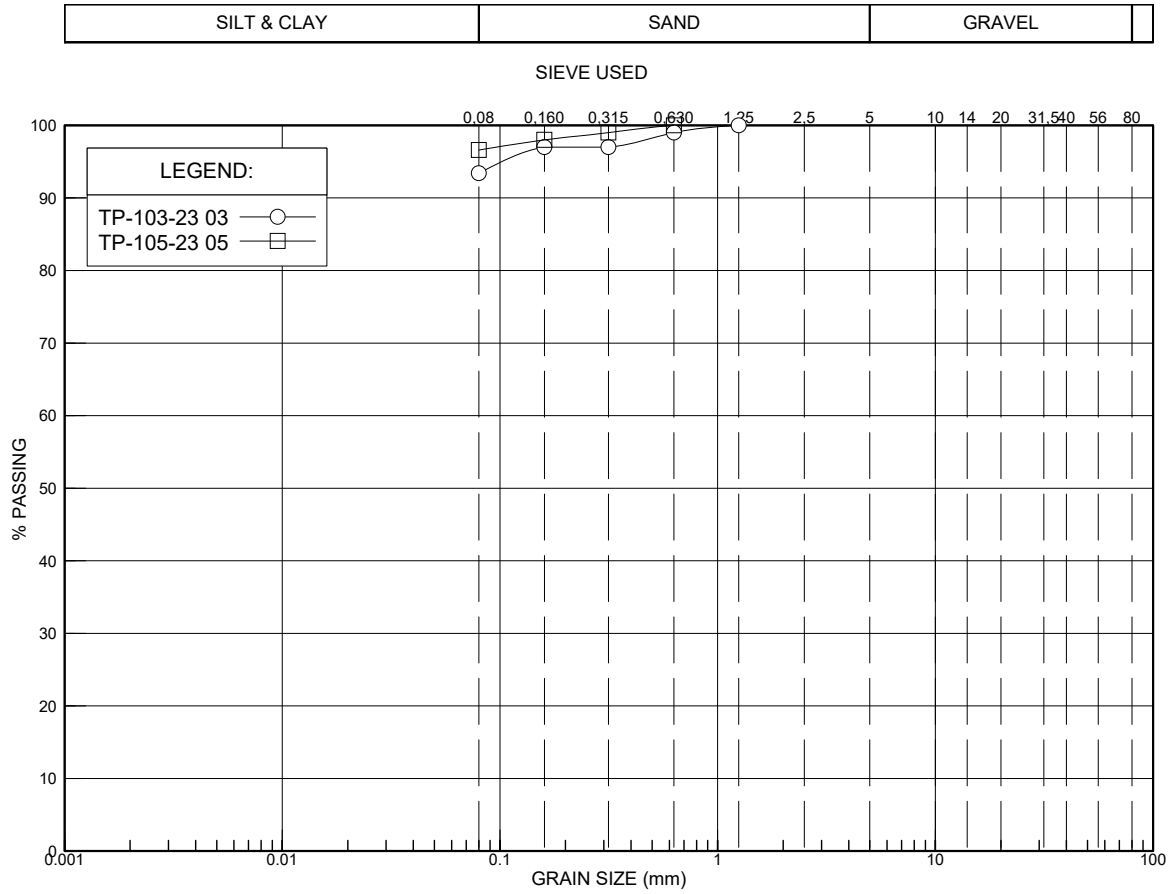
Client: **Medusa Limited Partnership**

Reference No.: 12615684-A1

Project: **Geotechnical Investigation - Proposed Distribution Center**

Location: **Bill Leathem Drive, Ottawa, Ontario**

UNIFIED SOIL CLASSIFICATION



LEGEND	0.001 mm	0.01 mm	0.023 mm	0.051 mm	0,08 mm	0.16 mm	0,315 mm	0,630 mm	1,25 mm	2,5 mm	5 mm	10 mm	14 mm	20 mm	28 mm	31,5 mm
—○—	-	-	-	-	93.40	97.00	97.00	99.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
—□—	-	-	-	-	96.60	98.00	99.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

RESULTS INTERPRETATION AND WATER CONTENT

LEGEND	SOUNDING	SPL.	DEPTH (m)	DESCRIPTION	GRAVEL	SAND	SILT & CLAY	W	USCS
—○—	TP-103-23	03	0.80 - 1.80	Fill	0.0 %	6.6 %	93.4 %	22.0 %	CL
—□—	TP-105-23	05	3.40 - 4.50	Fill	0.0 %	3.4 %	96.6 %	28.0 %	CH

Prepared by: Aman Azizi Date : 2023-08-01

Verified by: Mark Gamboz Date : 2023-08-01

GRAIN SIZE ANALYSIS REPORT

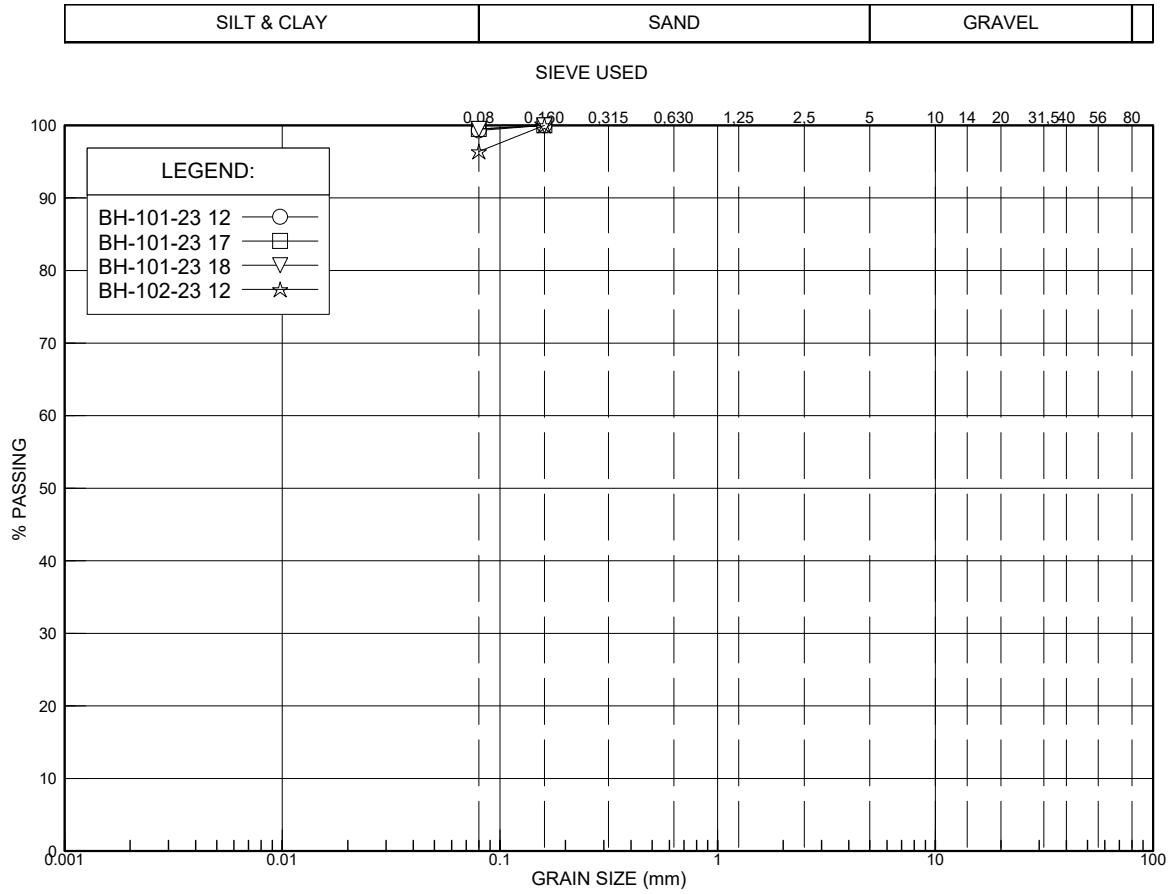
Client: **Medusa Limited Partnership**

Reference No.: 12615684-A1

Project: **Geotechnical Investigation - Proposed Distribution Center**

Location: **Bill Leathem Drive, Ottawa, Ontario**

UNIFIED SOIL CLASSIFICATION



LEGEND	0.001 mm	0.01 mm	0.023 mm	0.051 mm	0,08 mm	0.16 mm	0,315 mm	0,630 mm	1,25 mm	2,5 mm	5 mm	10 mm	14 mm	20 mm	28 mm	31,5 mm
○	-	-	-	-	99.30	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
□	-	-	-	-	99.50	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
▽	-	-	-	-	99.50	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
☆	-	-	-	-	96.40	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

RESULTS INTERPRETATION AND WATER CONTENT

LEGEND	SOUNDING	SPL.	DEPTH (m)	DESCRIPTION	GRAVEL	SAND	SILT & CLAY	W	USCS
○	BH-101-23	12	7.61 - 8.22	Clayey Silt to Silty Clay Deposit	0.0 %	0.7 %	99.3 %	63.0 %	CL
□	BH-101-23	17	13.40 - 14.01	Clayey Silt to Silty Clay Deposit	0.0 %	0.5 %	99.5 %	-	-
▽	BH-101-23	18	14.92 - 15.53	Clayey Silt to Silty Clay Deposit	0.0 %	0.5 %	99.5 %	-	-
☆	BH-102-23	12	7.62 - 8.23	Clayey Silt to Silty Clay Deposit	0.0 %	3.6 %	96.4 %	33.0 %	CL

Prepared by: Aman Azizi Date : 2023-08-01

Verified by: Mark Gamboz Date : 2023-08-01

HYDROMETER ANALYSIS REPORT

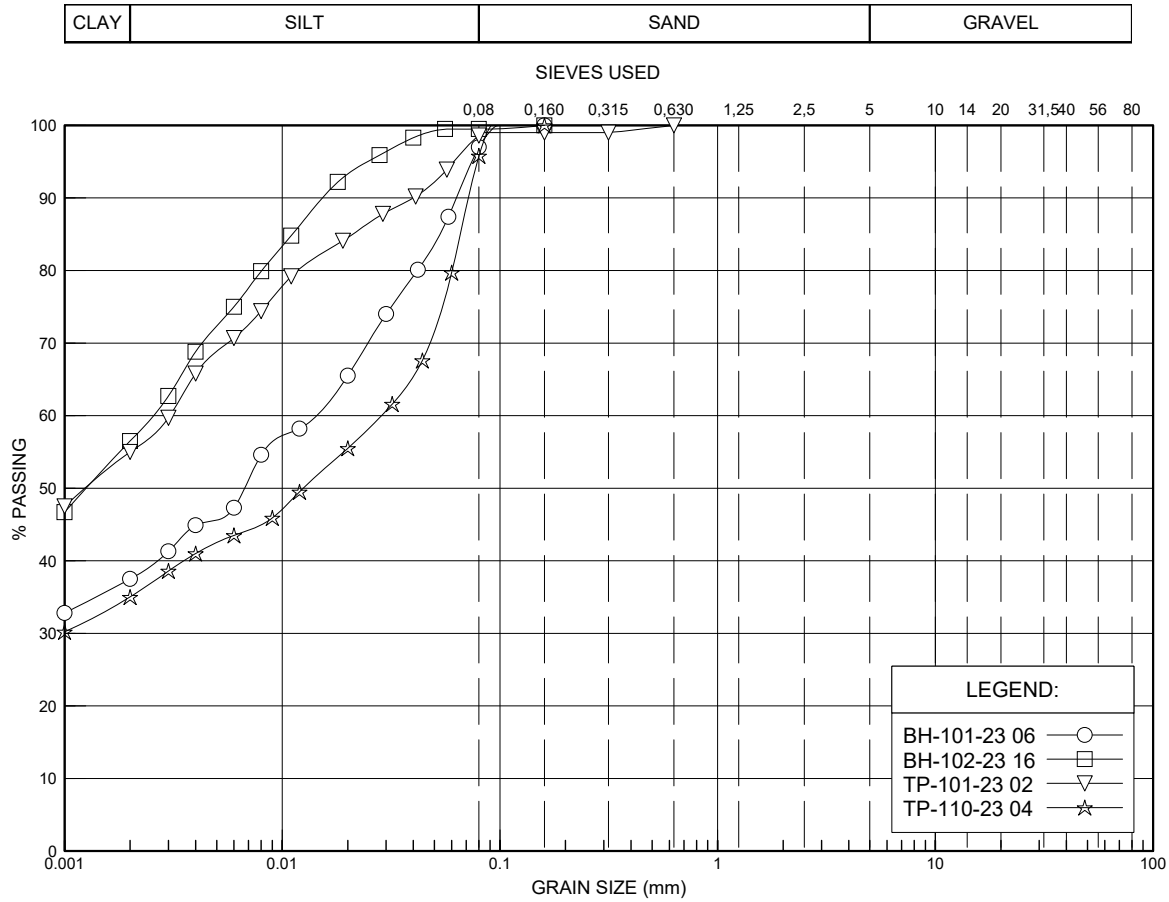
Client : **Medusa Limited Partnership**

Reference No.: 12615684-A1

Project : **Geotechnical Investigation - Proposed Distribution Center**

Location : **Bill Leathem Drive, Ottawa, Ontario**

UNIFIED SOIL CLASSIFICATION



LEGEND	0.001 mm	0.01 mm	0.023 mm	0.051 mm	0,08 mm	0.16 mm	0,315 mm	0,630 mm	1,25 mm	2,5 mm	5 mm	10 mm	14 mm	20 mm	28 mm	31,5 mm
○	32.80	57.26	68.43	84.07	97.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
□	46.70	83.35	94.50	99.31	99.50	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
▽	47.50	77.86	85.81	92.43	98.59	99.00	99.01	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
☆	30.20	47.09	57.18	72.30	95.80	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

RESULTS INTERPRETATION AND WATER CONTENT

LEGEND	SOUNDING	SPL.	DEPTH (m)	DESCRIPTION	GRAVEL	SAND	SILT	CLAY	W	USCS
○	BH-101-23	06	3.05 - 3.66	Clayey Silt to Silty Clay Deposit	0.0 %	3.0 %	59.5 %	37.5 %	33.0 %	CL
□	BH-102-23	16	13.17 - 13.78	Clayey Silt to Silty Clay Deposit	0.0 %	0.5 %	43.0 %	56.5 %	62.0 %	CH
▽	TP-101-23	02	0.60 - 1.40	Clayey Silt to Silty Clay Deposit	0.0 %	1.4 %	43.6 %	55.0 %	33.0 %	CH
☆	TP-110-23	04	2.00 - 3.00	Clayey Silt to Silty Clay Deposit	0.0 %	4.2 %	60.8 %	35.0 %	36.0 %	CL

Prepared by: Aman Azizi Date : 2023-08-01

Verified by: Mark Gamboz Date : 2023-08-01

GRAIN SIZE ANALYSIS REPORT

CLIENT: MEDUSA LP

PROJECT : PROPOSED SORTATION FACILITY

LOCATION : LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

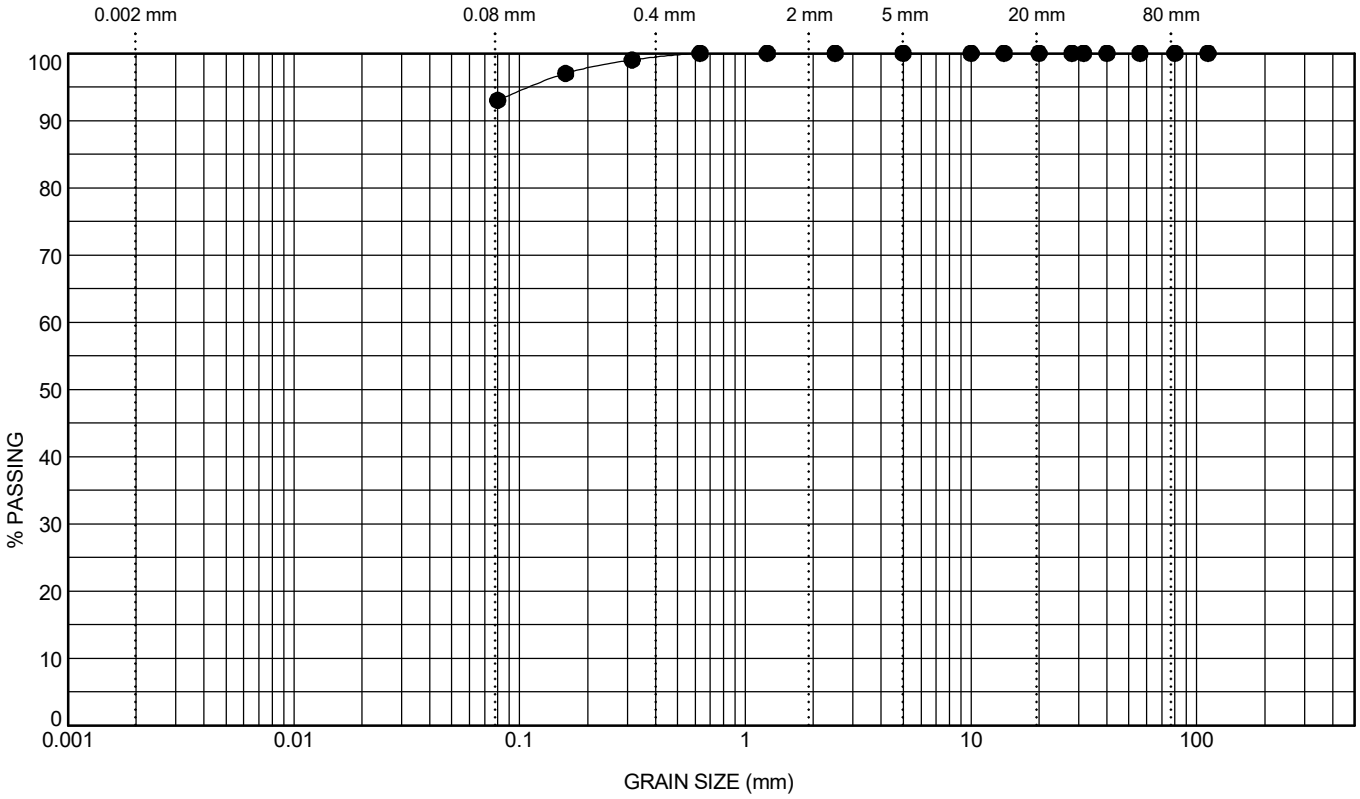
REFERENCE No. : 11227097-A1

BORING No. : BH-01

SAMPLE No. : ST-5

DEPTH : 3.05 m **DATE :** 5/11/2021

UNIFIED SOIL CLASSIFICATION (BASED ON THE STANDARD LC 21-040)



CLAY	SILT	SAND			GRAVEL		COBBLES AND BOULDERS
		fine	medium	coarse	fine	coarse	

Description	w (%)	W_L (%)	I_P (%)	Classification (1)
Silt, traces of sand	45	52	31	CH

(1) USCS

% Gravel	% Sand	% Silt and % Clay	c_U	c_C	D85	D60	D50	D30	D15	D10
0	7	73								

Remarks :

Prepared by : Mark Gamboz, B.Sc. Geology

Verified by : Mark Gamboz, B.Sc. Geology

GRAIN SIZE ANALYSIS REPORT

CLIENT: MEDUSA LP

PROJECT : PROPOSED SORTATION FACILITY

LOCATION : LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

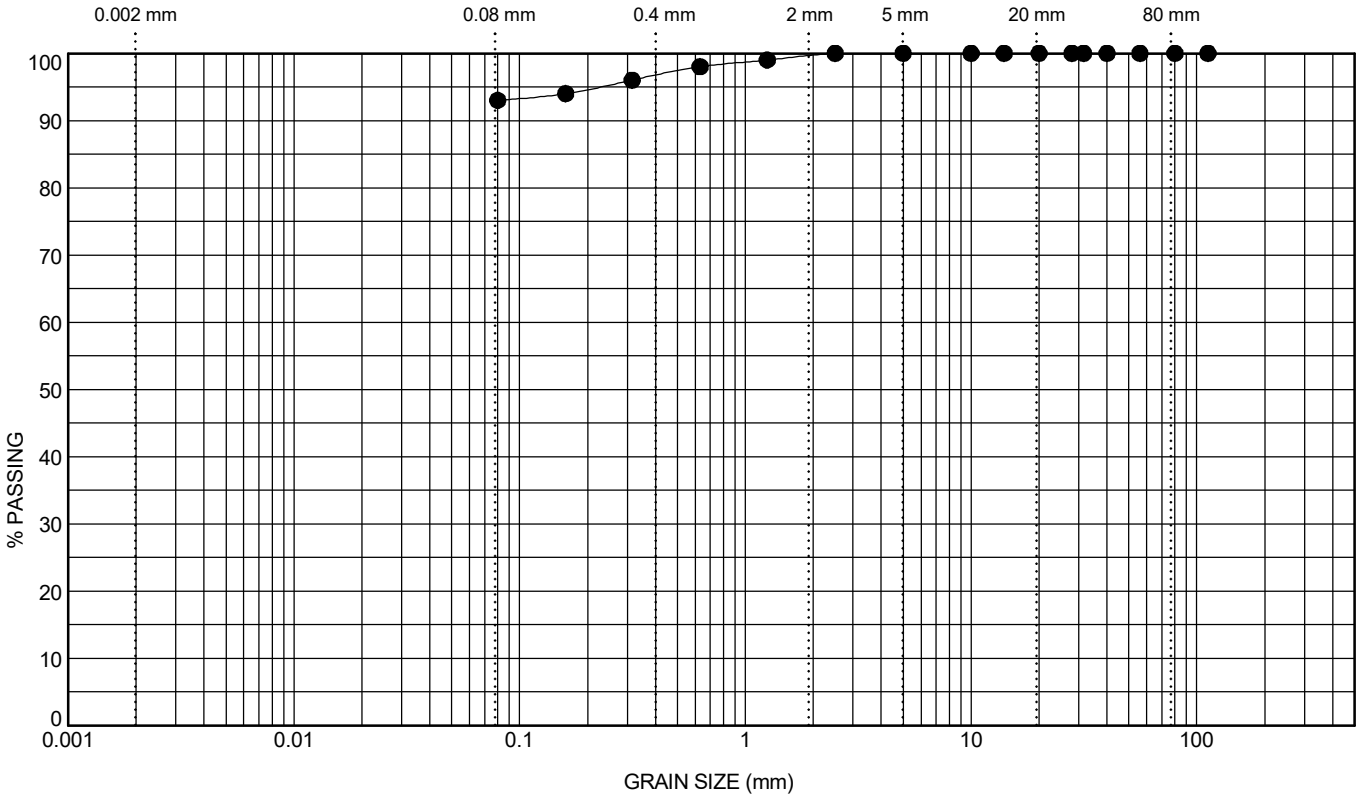
REFERENCE No. : 11227097-A1

BORING No. : BH-01

SAMPLE No. : SS-11

DEPTH : 9.15 m **DATE :** 5/11/2021

UNIFIED SOIL CLASSIFICATION (BASED ON THE STANDARD LC 21-040)



CLAY	SILT	SAND			GRAVEL		COBBLES AND BOULDERS
		fine	medium	coarse	fine	coarse	

Description	w (%)	W_L (%)	I_P (%)	Classification (1)
Silt, traces of sand	68	50	26	CH

(1) USCS

% Gravel	% Sand	% Silt and % Clay	c_U	c_C	D85	D60	D50	D30	D15	D10
0	7	93								

Remarks :

Prepared by : Mark Gamboz, B.Sc. Geology

Verified by : Mark Gamboz, B.Sc. Geology

GRAIN SIZE ANALYSIS REPORT

CLIENT: MEDUSA LP

PROJECT : PROPOSED SORTATION FACILITY

LOCATION : LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

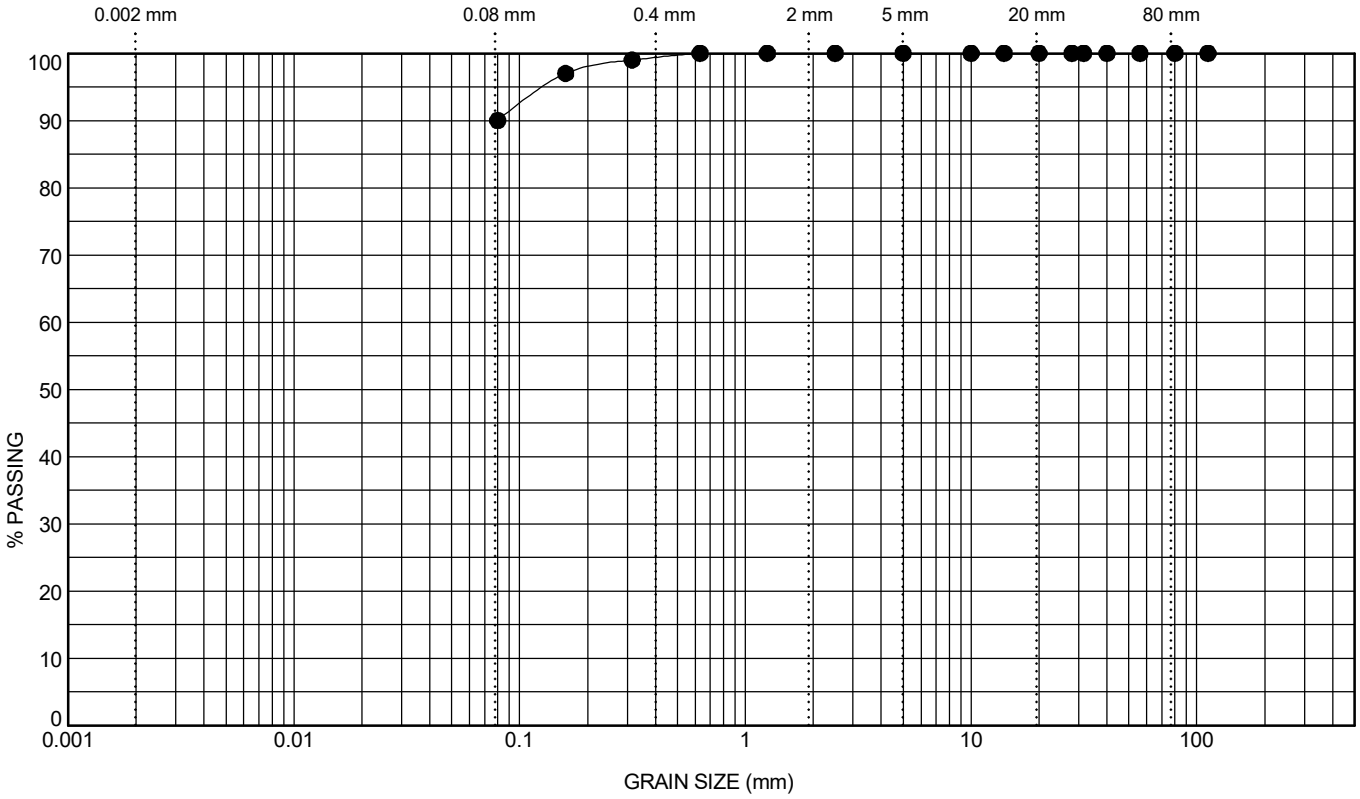
REFERENCE No. : 11227097-A1

BORING No. : BH-02

SAMPLE No. : SS-3

DEPTH : 1.52 m **DATE :** 5/11/2021

UNIFIED SOIL CLASSIFICATION (BASED ON THE STANDARD LC 21-040)



CLAY	SILT	SAND			GRAVEL		COBBLES AND BOULDERS
		fine	medium	coarse	fine	coarse	

Description	w (%)	W_L (%)	I_P (%)	Classification (1)
Silt, traces of sand	27	38	21	CL

(1) USCS

% Gravel	% Sand	% Silt and % Clay	c_U	c_C	D85	D60	D50	D30	D15	D10
0	10	90								

Remarks :

Prepared by : Mark Gamboz, B.Sc. Geology

Verified by : Mark Gamboz, B.Sc. Geology

GRAIN SIZE ANALYSIS REPORT

CLIENT: MEDUSA LP

PROJECT : PROPOSED SORTATION FACILITY

LOCATION : LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

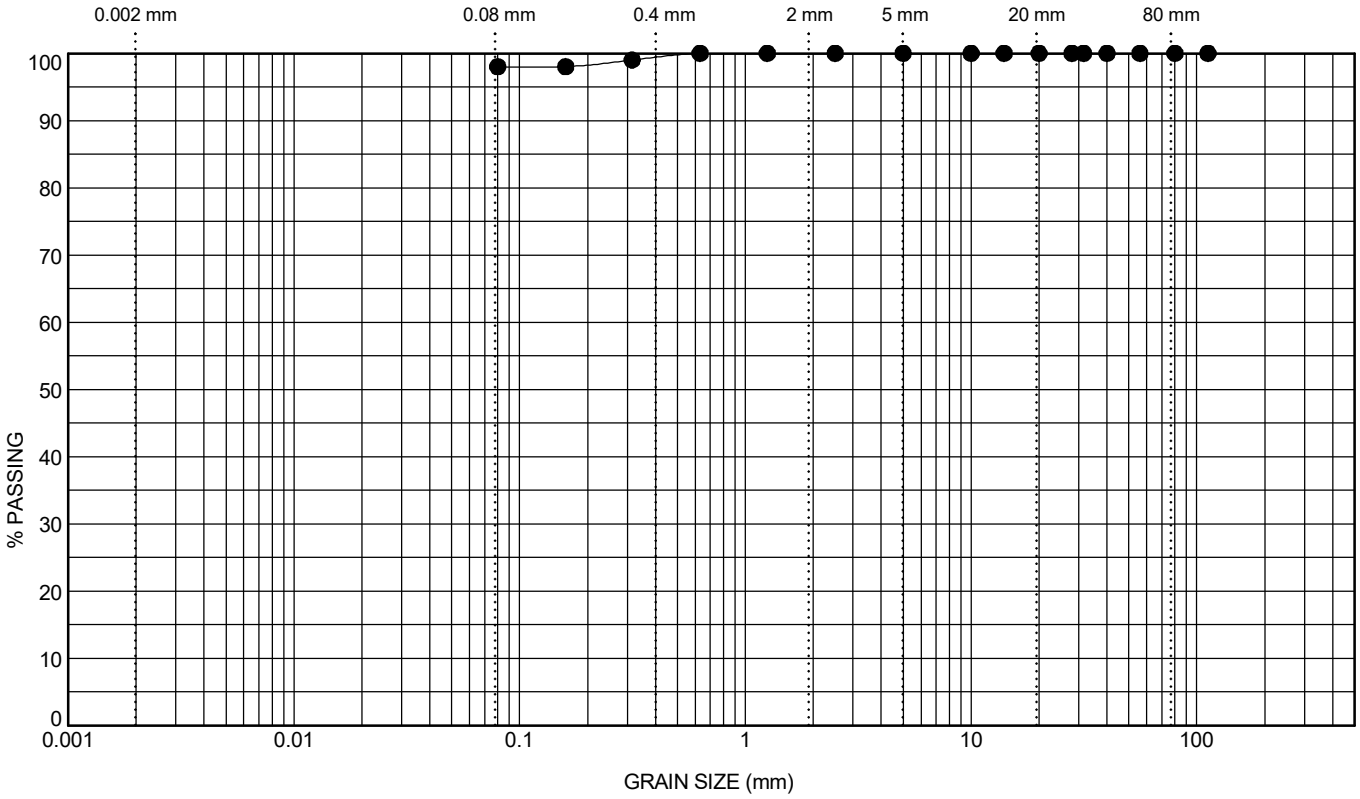
REFERENCE No. : 11227097-A1

BORING No. : BH-02

SAMPLE No. : SS-11

DEPTH : 9.15 m **DATE :** 5/11/2021

UNIFIED SOIL CLASSIFICATION (BASED ON THE STANDARD LC 21-040)



CLAY	SILT	SAND			GRAVEL		COBBLES AND BOULDERS
		fine	medium	coarse	fine	coarse	

Description	w (%)	W_L (%)	I_P (%)	Classification (1)
Silt, traces of sand	25	27	5	CL-ML

(1) USCS

% Gravel	% Sand	% Silt and % Clay	c_U	c_C	D85	D60	D50	D30	D15	D10
0	2	98								

Remarks :

Prepared by : Mark Gamboz, B.Sc. Geology

Verified by : Mark Gamboz, B.Sc. Geology

GRAIN SIZE ANALYSIS REPORT

CLIENT: MEDUSA LP

PROJECT : PROPOSED SORTATION FACILITY

LOCATION : LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

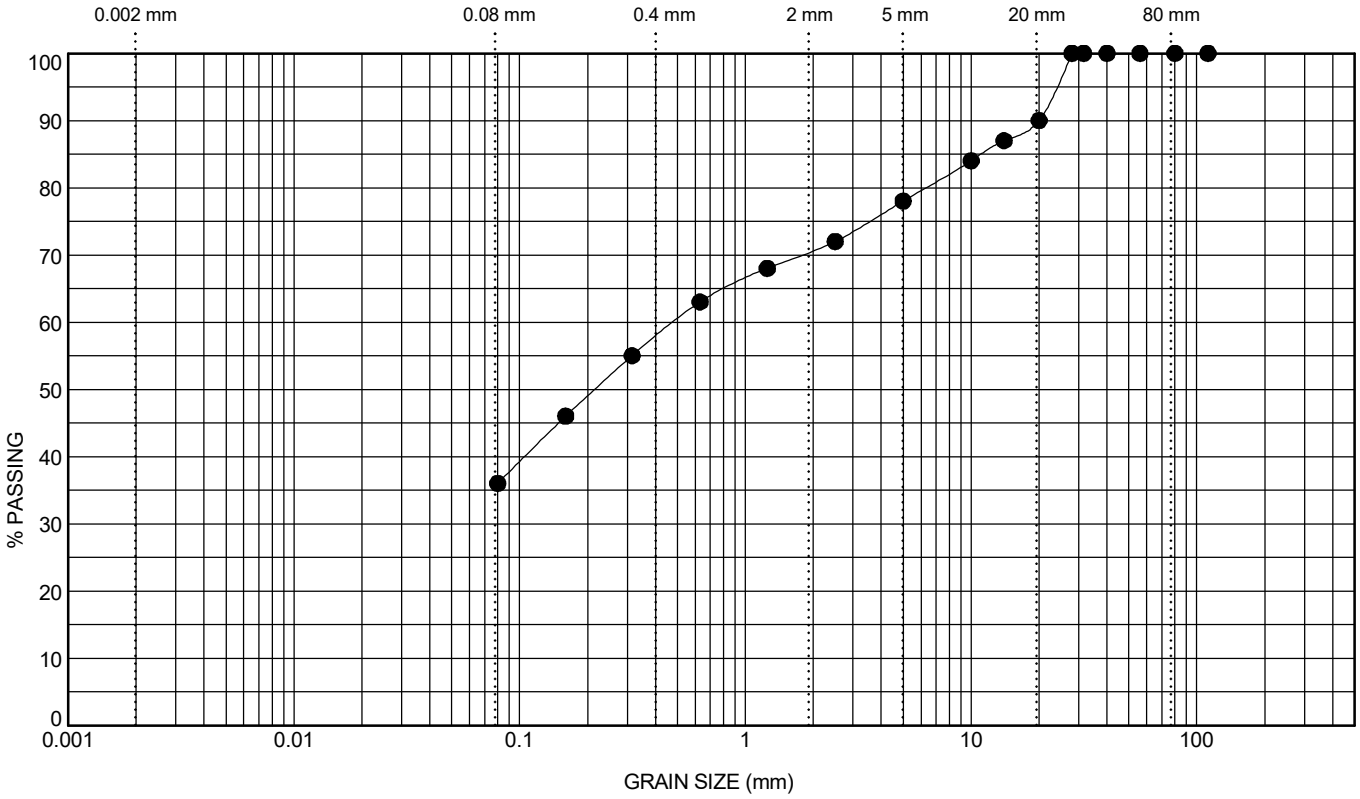
REFERENCE No. : 11227097-A1

BORING No. : BH-02

SAMPLE No. : SS-14

DEPTH : 11.43 m **DATE :** 5/11/2021

UNIFIED SOIL CLASSIFICATION (BASED ON THE STANDARD LC 21-040)



CLAY	SILT	SAND			GRAVEL		COBBLES AND BOULDERS
		fine	medium	coarse	fine	coarse	

Description	w (%)	W_L (%)	I_P (%)	Classification (1)
Gravelly sand and silt	8	14	2	SM

(1) USCS

% Gravel	% Sand	% Silt and % Clay	c_U	c_C	D85	D60	D50	D30	D15	D10
22	42	36								

Remarks :

Prepared by : Mark Gamboz, B.Sc. Geology

Verified by : Mark Gamboz, B.Sc. Geology

GRAIN SIZE ANALYSIS REPORT

CLIENT: MEDUSA LP

PROJECT : PROPOSED SORTATION FACILITY

LOCATION : LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

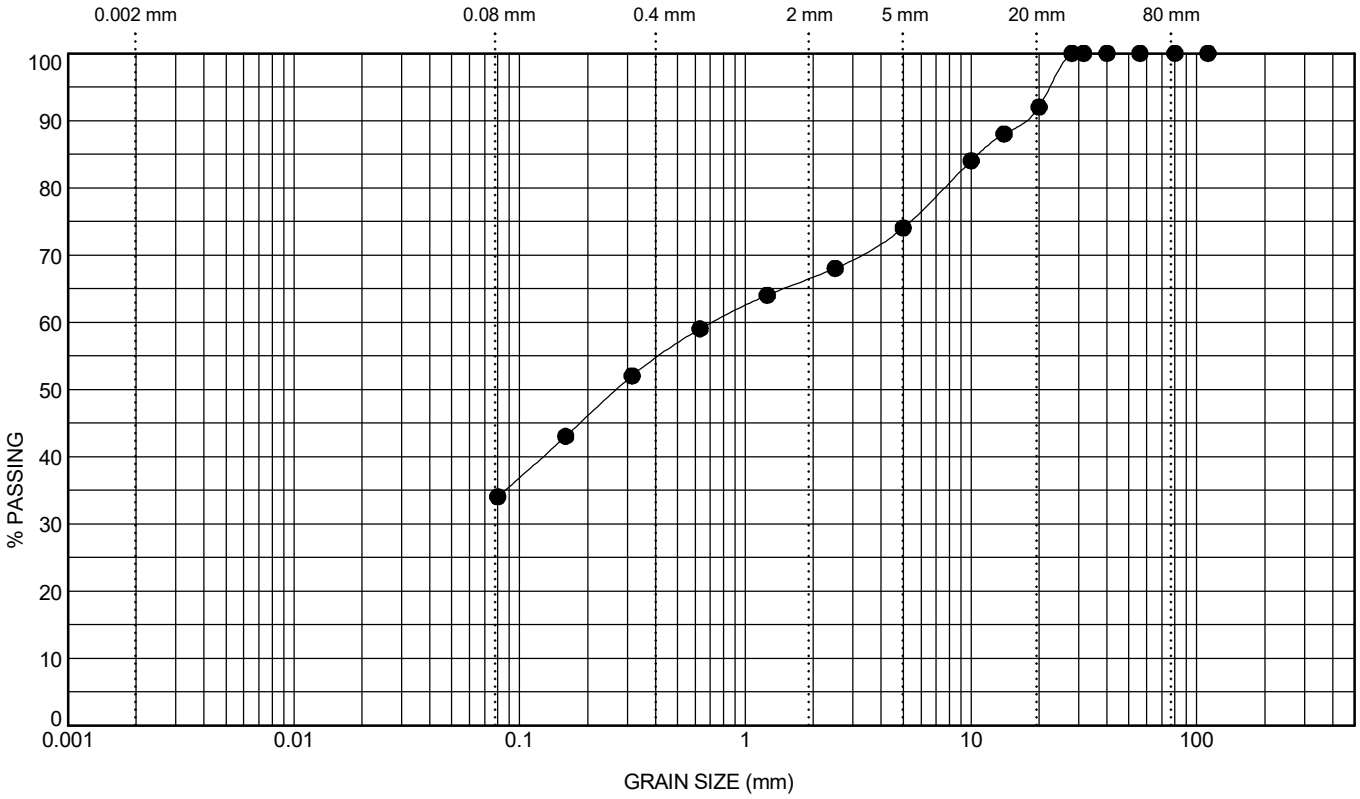
REFERENCE No. : 11227097-A1

BORING No. : BH-02

SAMPLE No. : SS-19

DEPTH : 15.24 m **DATE :** 5/11/2021

UNIFIED SOIL CLASSIFICATION (BASED ON THE STANDARD LC 21-040)



CLAY	SILT	SAND			GRAVEL		COBBLES AND BOULDERS
		fine	medium	coarse	fine	coarse	

Description	w (%)	W_L (%)	I_P (%)	Classification (1)
Silty and gravelly sand	8	13	2	SM

(1) USCS

% Gravel	% Sand	% Silt and % Clay	c_U	c_C	D85	D60	D50	D30	D15	D10
26	40	34								

Remarks :

Prepared by : Mark Gamboz, B.Sc. Geology

Verified by : Mark Gamboz, B.Sc. Geology

GRAIN SIZE ANALYSIS REPORT

CLIENT: MEDUSA LP

PROJECT : PROPOSED SORTATION FACILITY

LOCATION : LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

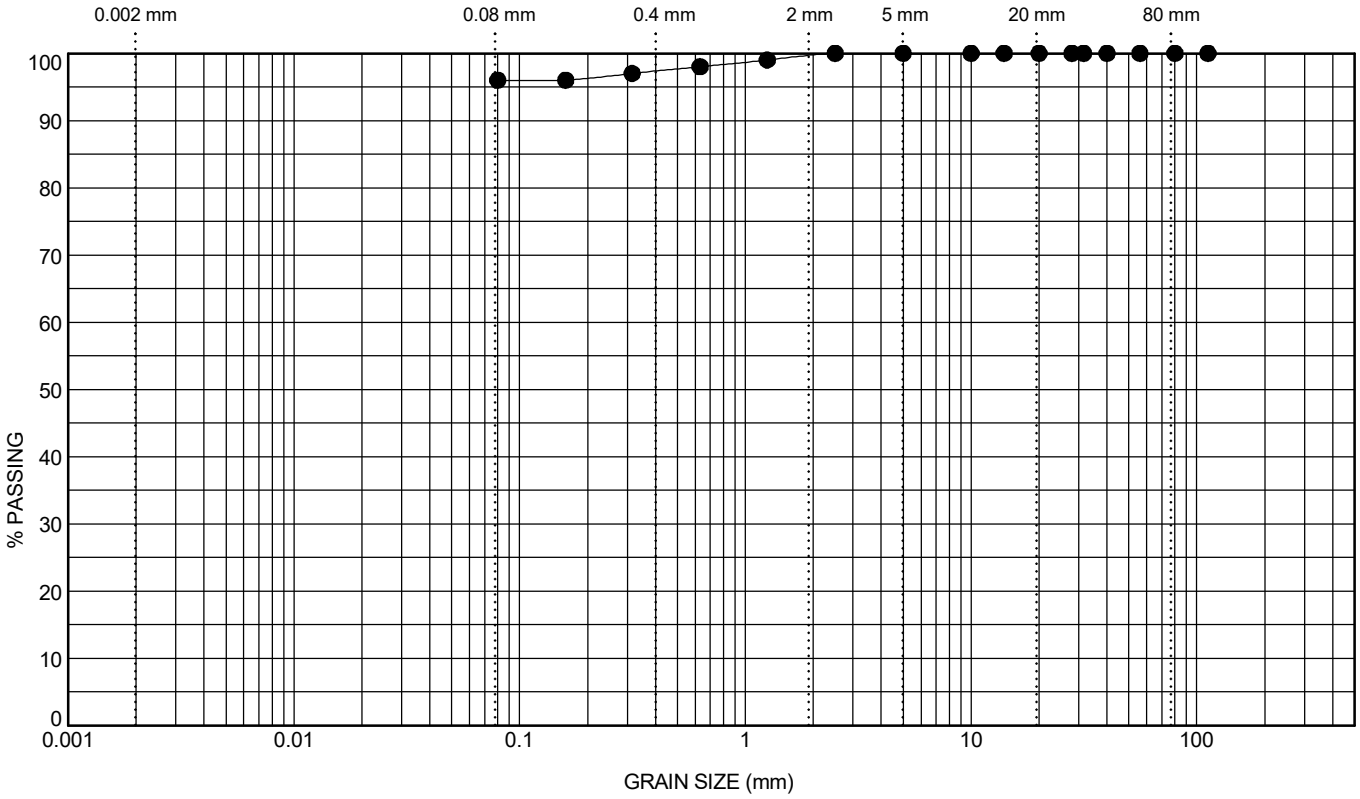
REFERENCE No. : 11227097-A1

BORING No. : BH-03

SAMPLE No. : SS-11

DEPTH : 8.23 m **DATE :** 5/11/2021

UNIFIED SOIL CLASSIFICATION (BASED ON THE STANDARD LC 21-040)



CLAY	SILT	SAND			GRAVEL		COBBLES AND BOULDERS
		fine	medium	coarse	fine	coarse	

Description	w (%)	W_L (%)	I_P (%)	Classification (1)
Silt, traces of sand	66	48	25	CL

(1) USCS

% Gravel	% Sand	% Silt and % Clay	c_U	c_C	D85	D60	D50	D30	D15	D10
0	4	96								

Remarks :

Prepared by : Mark Gamboz, B.Sc. Geology

Verified by : Mark Gamboz, B.Sc. Geology

GRAIN SIZE ANALYSIS REPORT
(WITH SEDIMENTATION)

CLIENT: MEDUSA LP

PROJECT : PROPOSED SORTATION FACILITY

LOCATION : LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

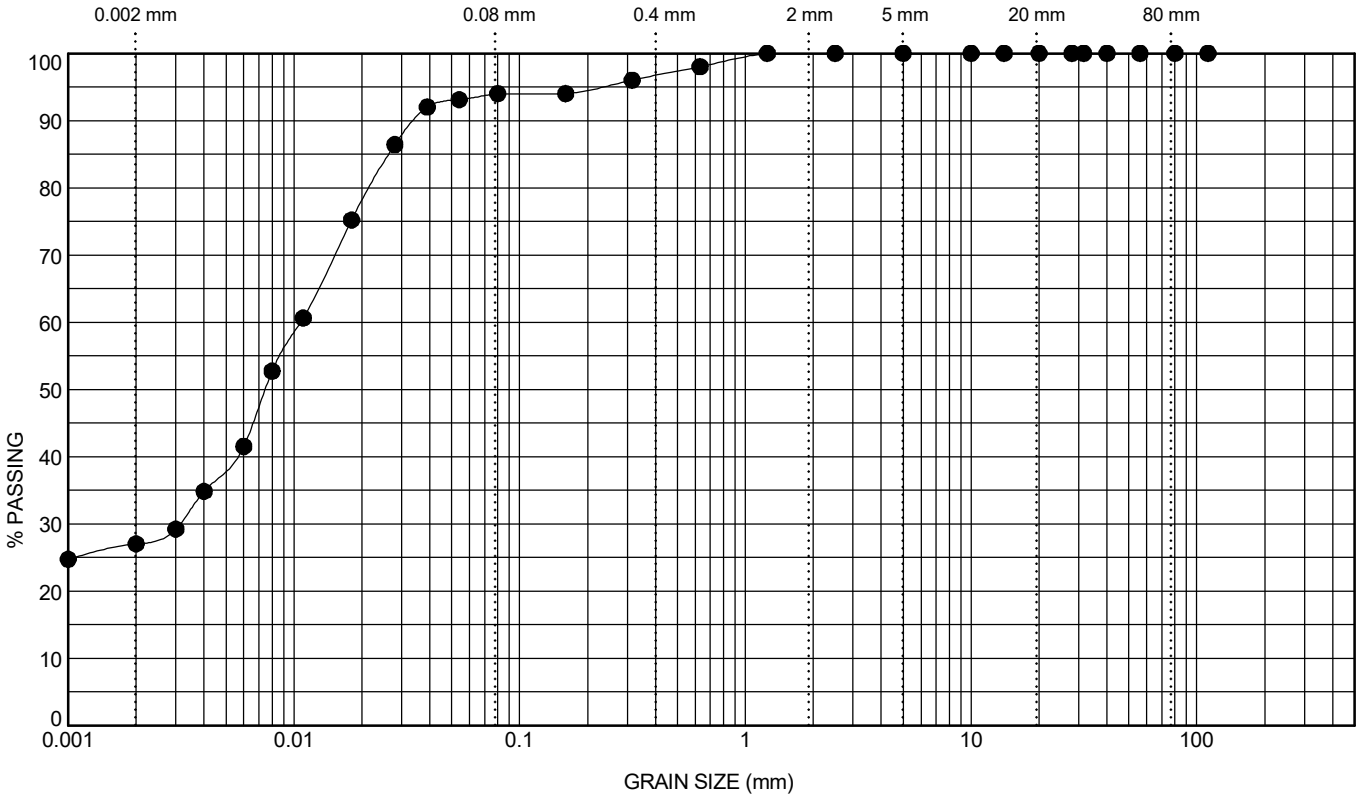
REFERENCE No. : 11227097-A1

BORING No. : BH-03

SAMPLE No. : SS-14

DEPTH : 12.19 m **DATE :** 5/11/2021

UNIFIED SOIL CLASSIFICATION (BASED ON THE STANDARD LC 21-040)



CLAY	SILT	SAND			GRAVEL		COBBLES AND BOULDERS
		fine	medium	coarse	fine	coarse	

Description	w (%)	W_L (%)	I_P (%)	Classification (1)
Clayey silt, traces of sand	39	26	8	CL

(1) USCS

% Gravel	% Sand	% Silt	% Clay	c_U	c_C	D85	D60	D50	D30	D15	D10
0	6	67	27								

Remarks :

Prepared by : Mark Gamboz, B.Sc. Geology

Verified by : Mark Gamboz, B.Sc. Geology

GRAIN SIZE ANALYSIS REPORT
(WITH SEDIMENTATION)

CLIENT: MEDUSA LP

PROJECT : PROPOSED SORTATION FACILITY

LOCATION : LEIKIN DRIVE AND MERIVALE ROAD INTERSECTION, NEPEAN, ONTARIO

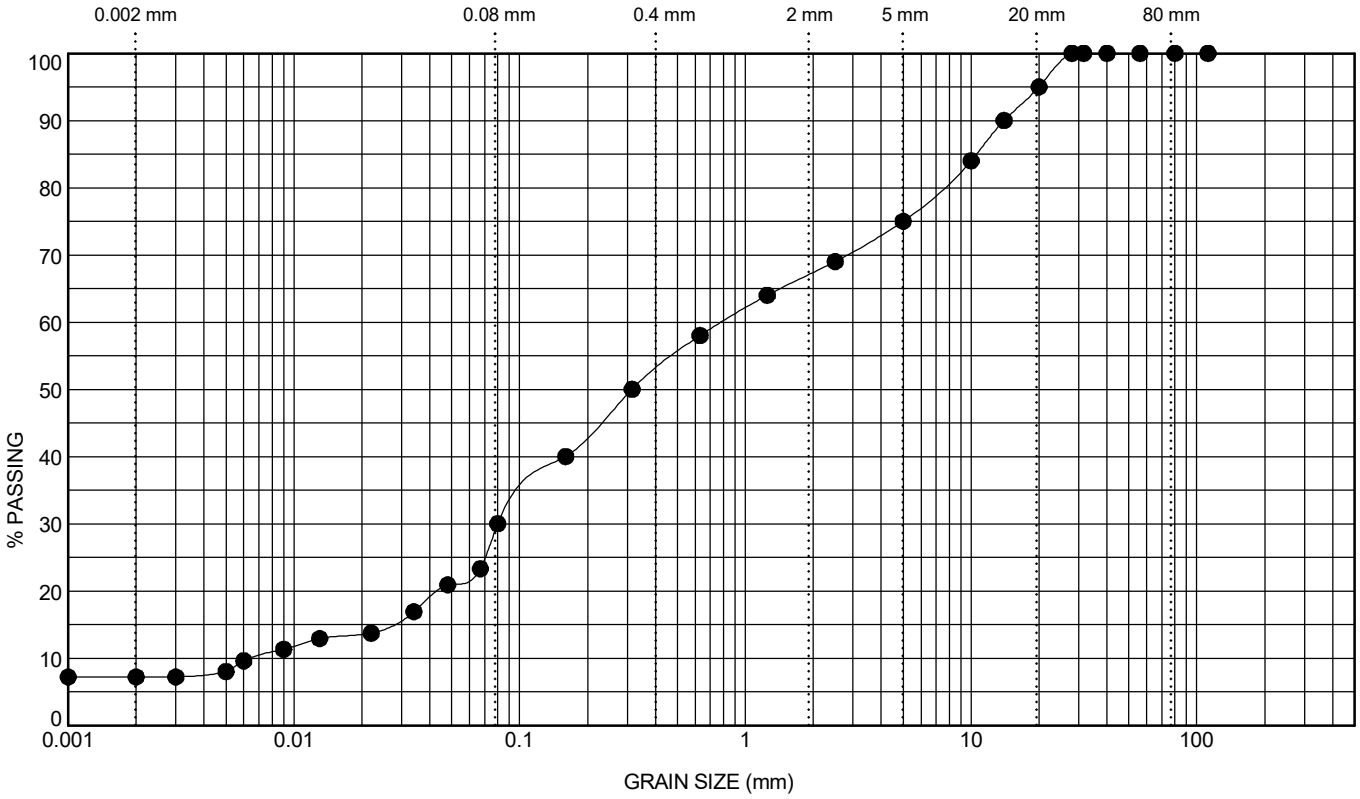
REFERENCE No. : 11227097-A1

BORING No. : BH-03

SAMPLE No. : SS-18

DEPTH : 18.29 m **DATE :** 5/11/2021

UNIFIED SOIL CLASSIFICATION (BASED ON THE STANDARD LC 21-040)



CLAY	SILT	SAND			GRAVEL		COBBLES AND BOULDERS
		fine	medium	coarse	fine	coarse	

Description	w (%)	W_L (%)	I_P (%)	Classification (1)
Gravelly and silty sand, traces of clay	9	15	2	SM

(1) USCS

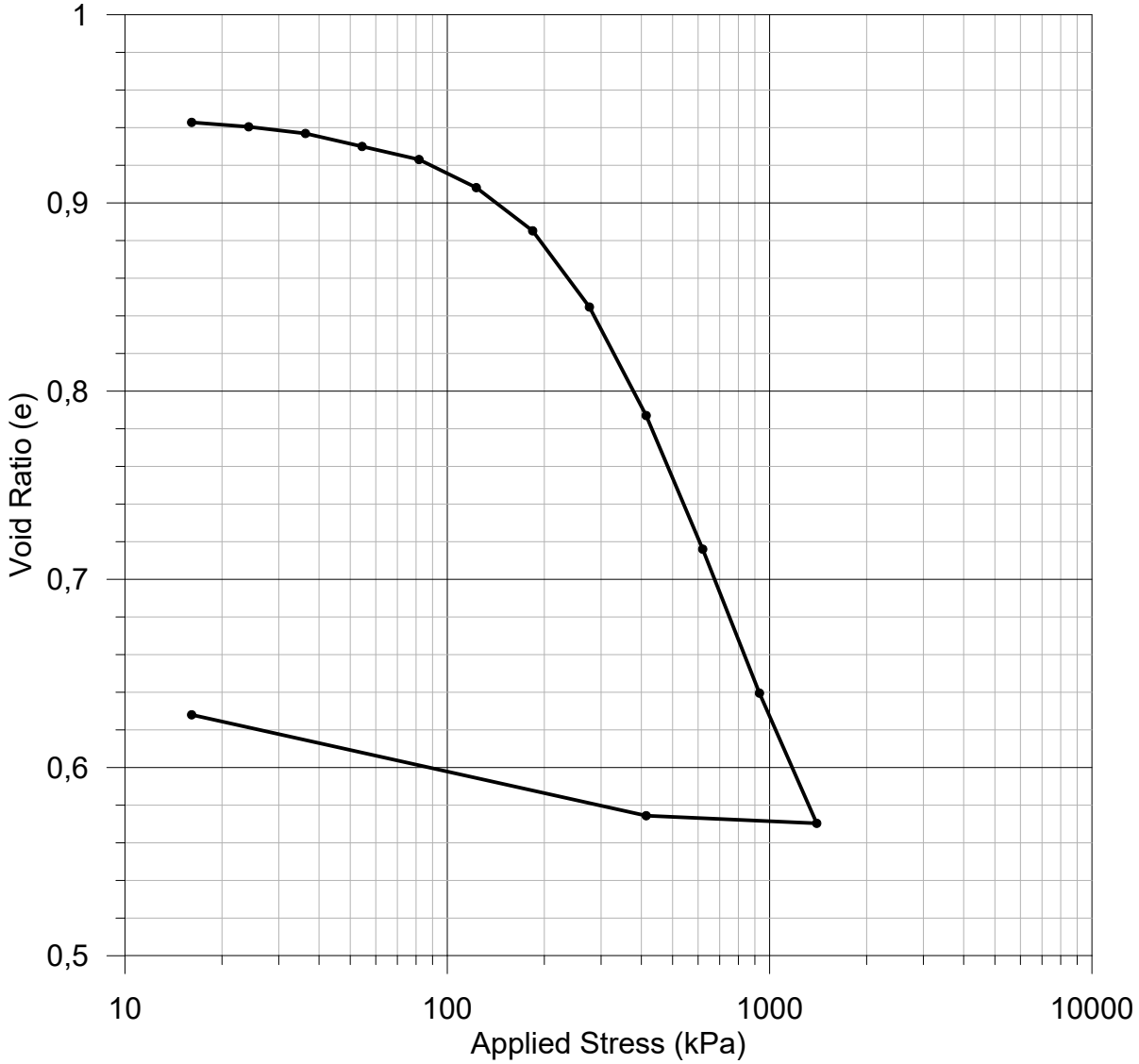
% Gravel	% Sand	% Silt	% Clay	c_U	c_C	D85	D60	D50	D30	D15	D10
25	45	23	7								

Remarks :

Prepared by : Mark Gamboz, B.Sc. Geology

Verified by : Mark Gamboz, B.Sc. Geology

Oedometric Consolidation Test - BH-101-23 ST-06



Sample Before Test

Diameter :	6,35 cm
Height :	2,56 cm
Unit Weight :	18,13 kN/m^3
Water Content :	33,65%
Void Ratio :	0,95
Degree of Saturation :	95,38%
Specific Gravity :	2,70 (Assumed)

Sample After Test

Water Content : 25,24%

Sample Description (Visual)

Firm to stiff, grey silt and clay, traces of sand (CH)

Test Results

Recompression Index (c_r)* :	0,03
Compression Index (c_c) :	0,39
Decompression Index (c_d) :	0,03
Preconsolidation Pressure (σ'_p) :	234 kPa
Preconsolidation Pressure ($\sigma'_{p\text{-}min}$) :	150 kPa
Preconsolidation Pressure ($\sigma'_{p\text{-}max}$) :	275 kPa

* : Calculated in the first steps

Loading Rate : 50%
Test Method Used :
ASTM D 2435-04

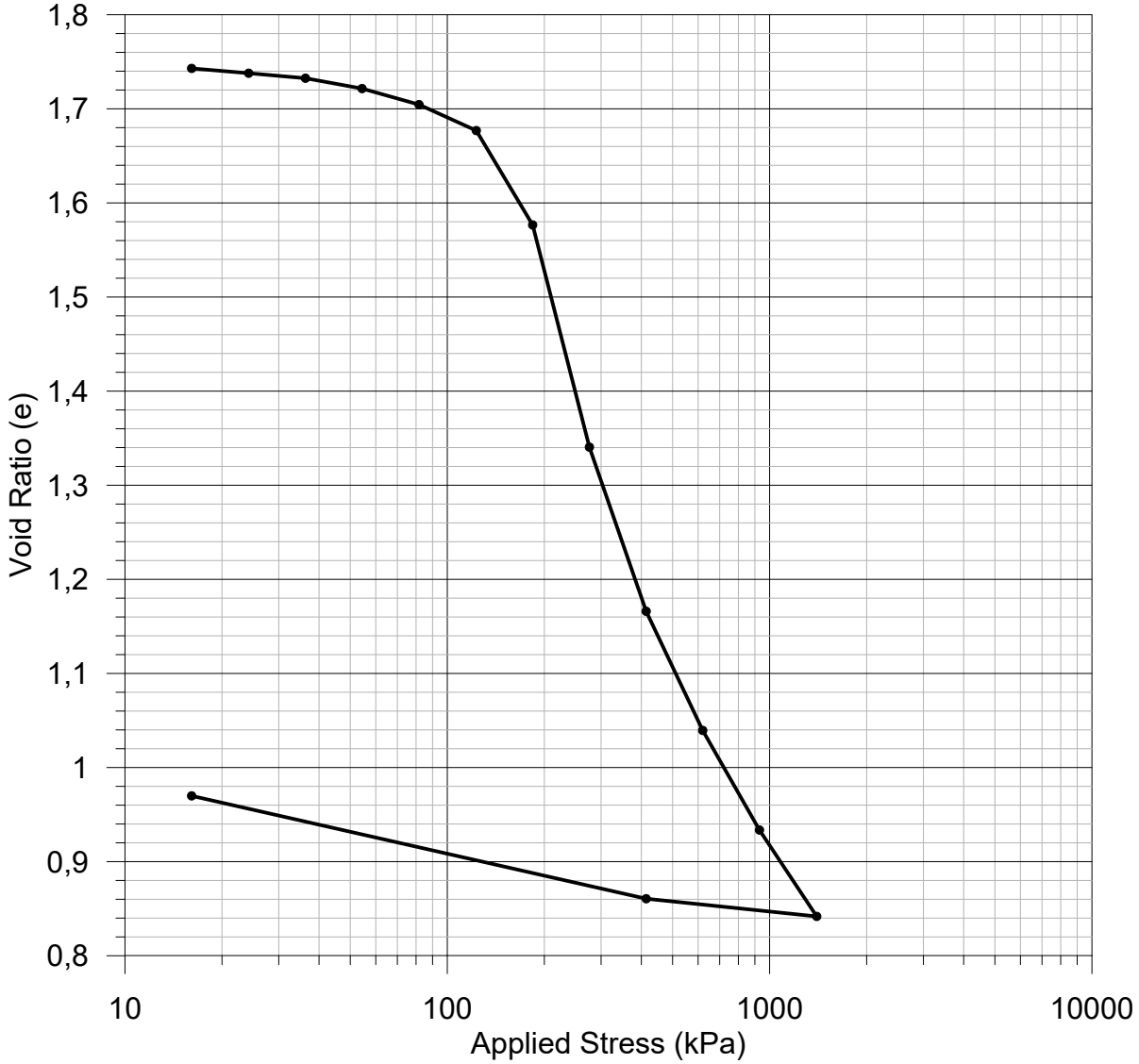
GHD

Borehole	: BH-101-23
Sample	: ST-06
Depth (m)	: 3,42 to 3,52

Client	: Medusa Limited Partnership
Project	: Geotechnical Investigation - Proposed Distribution Center
Site	: Bill Leathem Drive, Ottawa, Ontario
Date	: 2023-08-08

Project No. : 12615684-A1
Laboratory No. : 2023-S092

Oedometric Consolidation Test - BH-101-23 ST-12



Sample Before Test

Diameter :	6,35 cm
Height :	2,55 cm
Unit Weight :	15,92 kN/m^3
Water Content :	65,69%
Void Ratio :	1,76
Degree of Saturation :	100,97%
Specific Gravity :	2,70 (Assumed)

Sample After Test

Water Content : 38,23%

Sample Description (Visual)

Firm to stiff, grey clayey silt to silty clay (CH)

Test Results

Recompression Index (c_r)* :	0,06
Compression Index (c_c) :	1,34
Decompression Index (c_d) :	0,04
Preconsolidation Pressure (σ'_p) :	162 kPa
Preconsolidation Pressure ($\sigma'_{p\text{-}min}$) :	135 kPa
Preconsolidation Pressure ($\sigma'_{p\text{-}max}$) :	183 kPa

* : Calculated in the first steps

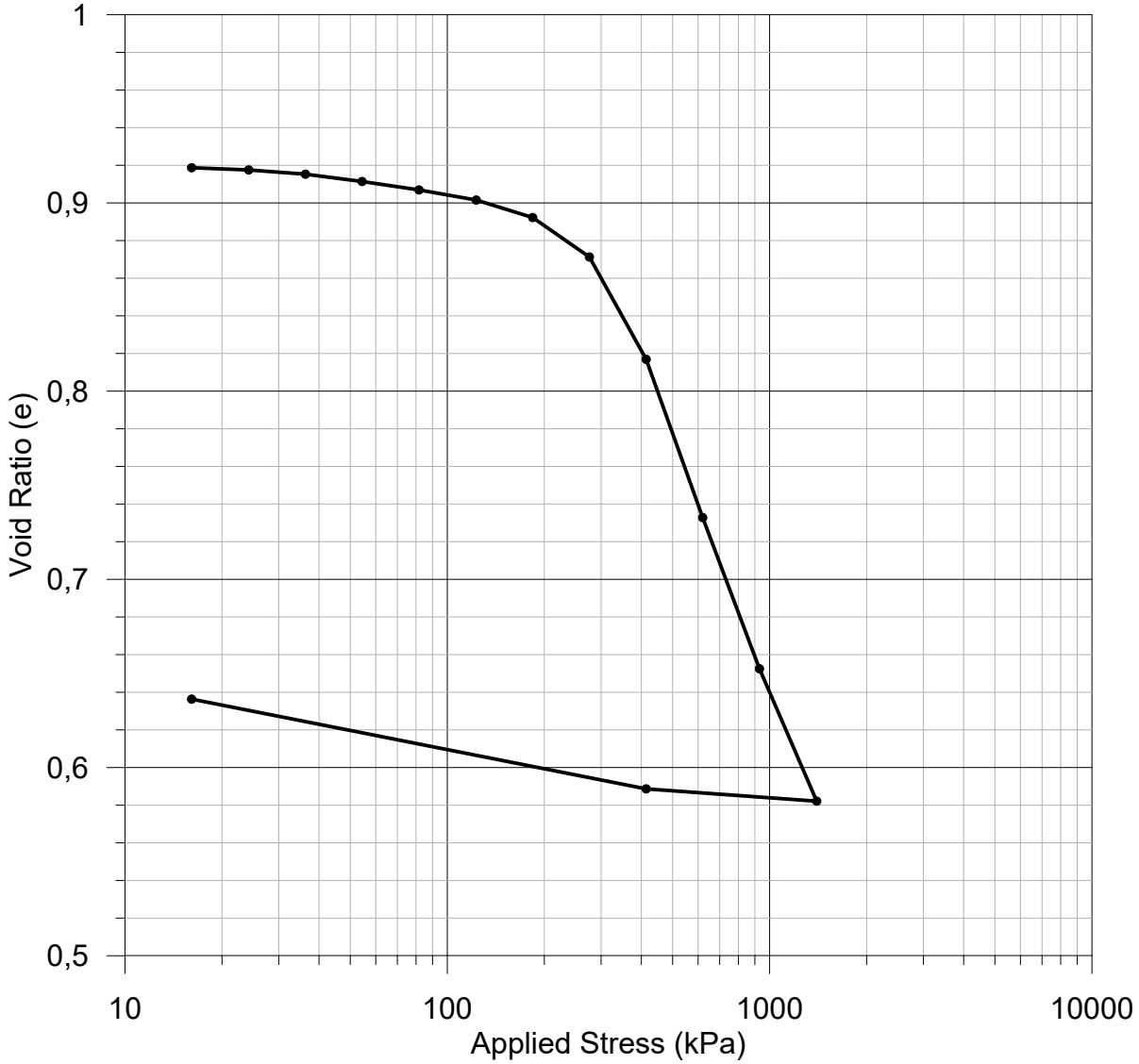
Loading Rate : 50%
Test Method Used :
ASTM D 2435-04

Borehole	: BH-101-23
Sample	: ST-12
Depth (m)	: 7,98 to 8,08

Client : Medusa Limited Partnership
Project : Geotechnical Investigation - Proposed Distribution Center
Site : Bill Leathem Drive, Ottawa, Ontario
Date : 2023-08-08

Project No. : 12615684-A1
Laboratory No. : 2023-S092

Oedometric Consolidation Test - BH-102-23 ST-12



Sample Before Test

Diameter :	6,35 cm
Height :	2,56 cm
Unit Weight :	18,45 kN/m^3
Water Content :	33,80%
Void Ratio :	0,92
Degree of Saturation :	99,08%
Specific Gravity :	2,70 (Assumed)

Sample After Test

Water Content : 25,22%

Sample Description (Visual)

Firm to stiff, grey clayey silt to silty clay (CL)

Test Results

Recompression Index (c_r)* :	0,02
Compression Index (c_c) :	0,47
Decompression Index (c_d) :	0,03
Preconsolidation Pressure (σ'_p) :	336 kPa
Preconsolidation Pressure ($\sigma'_{p\text{-}min}$) :	248 kPa
Preconsolidation Pressure ($\sigma'_{p\text{-}max}$) :	411 kPa

* : Calculated in the first steps

Loading Rate : 50%
Test Method Used :
ASTM D 2435-04

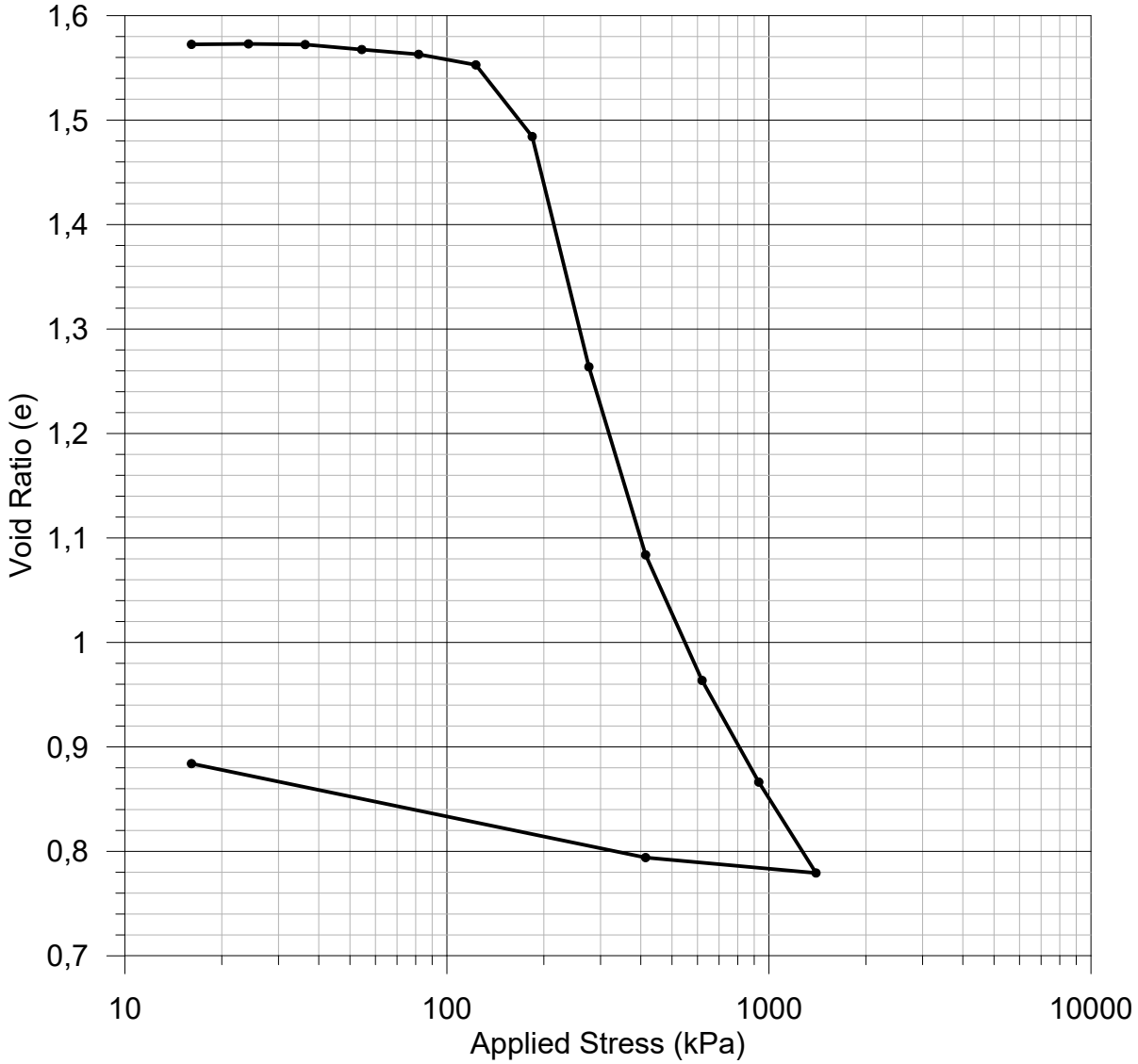
GHD

Borehole	: BH-102-23
Sample	: ST-12
Depth (m)	: 7,99 to 8,09

Client	: Medusa Limited Partnership
Project	: Geotechnical Investigation - Proposed Distribution Center
Site	: Bill Leathem Drive, Ottawa, Ontario
Date	: 2023-08-11

Project No. : 12615684-A1
Laboratory No. : 2023-S092

Oedometric Consolidation Test - BH-102-23 ST-16



Sample Before Test

Diameter :	6,35 cm
Height :	2,55 cm
Unit Weight :	16,31 kN/m^3
Water Content :	58,81%
Void Ratio :	1,58
Degree of Saturation :	100,59%
Specific Gravity :	2,70 (Assumed)

Sample After Test

Water Content : 35,39%

Sample Description (Visual)

Firm to stiff, grey clayey silt to silty clay (CH)

Test Results

Recompression Index (c_r)* :	0,03
Compression Index (c_c) :	1,25
Decompression Index (c_d) :	0,05
Preconsolidation Pressure (σ'_p) :	169 kPa
Preconsolidation Pressure ($\sigma'_{p\text{-}min}$) :	156 kPa
Preconsolidation Pressure ($\sigma'_{p\text{-}max}$) :	183 kPa

* : Calculated in the first steps

Loading Rate : 50%
Test Method Used :
ASTM D 2435-04

Borehole	: BH-102-23
Sample	: ST-16
Depth (m)	: 13,49 to 13,59

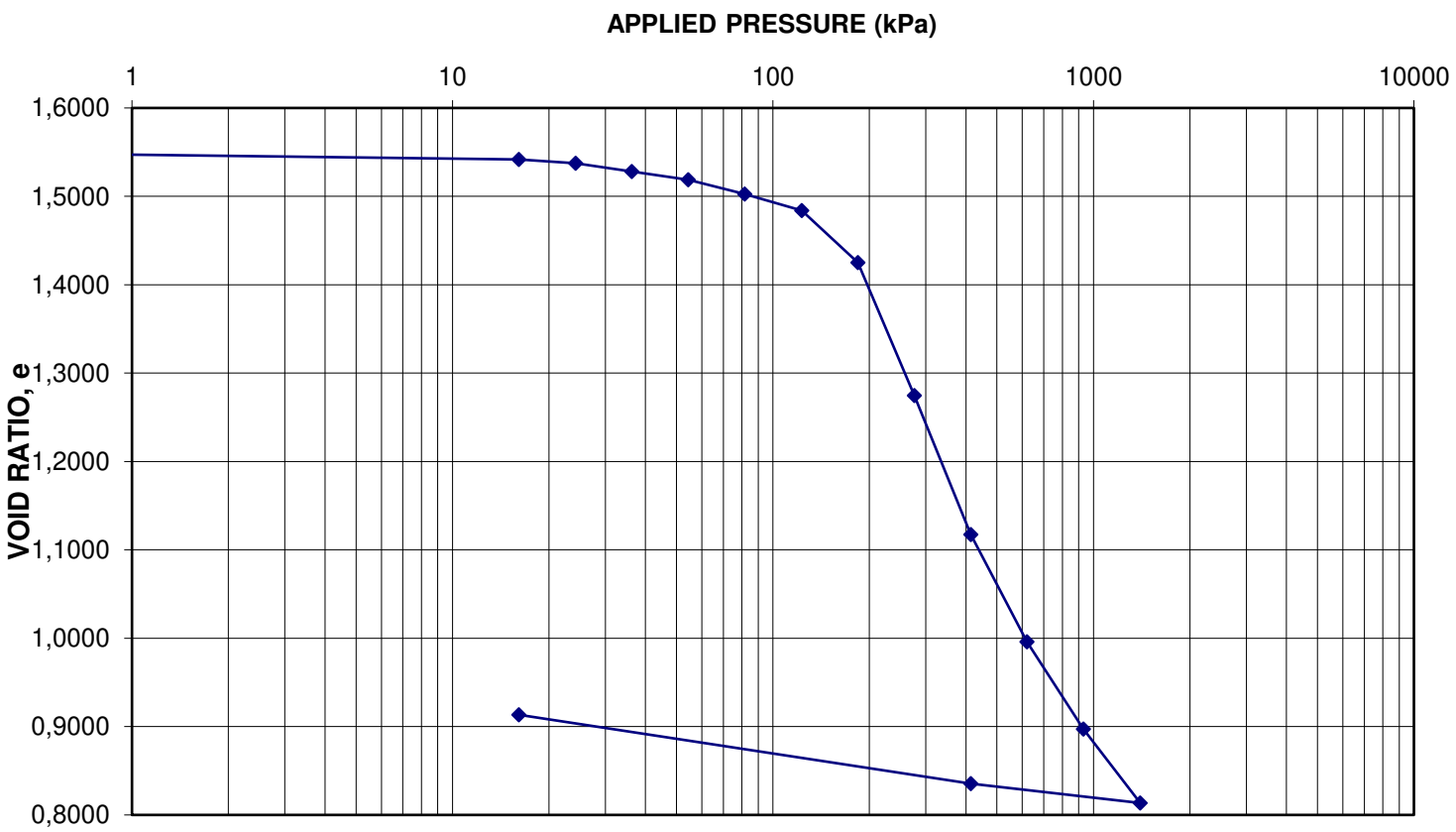
Client : Medusa Limited Partnership
Project : Geotechnical Investigation - Proposed Distribution Center
Site : Bill Leathem Drive, Ottawa, Ontario
Date : 2023-08-11

Project No. : 12615684-A1
Laboratory No. : 2023-S092

Client:	Medusa LP	Lab No:	2021-S0081
Project:	Nepean, Ontario	Project No:	11227097-A1

Borehole No:	BH02	Sample No:	TM7	Depth:	4,81-4,98 m

Description of Material: CL (medium)



COMPRESSIBILITY PARAMETERS

s'_p Preconsolidation pressure (kPa):	167	e_o Initial void ratio:	1,5606
s'_{vo} Effective pressure:	42	c_r Recompression index:	0,07
$s'_p - s'_{vo}$ Overconsolidation:	125	c_c Compression index:	0,87
Overconsolidation ratio ("OCR"):	4,0	c_s Swelling index:	0,04

Size of Sample:	Diameter (mm):	63,52	Moisture Content (W) %		
	Height (mm):	25,48	Initial:	58,0	Final: 35,7

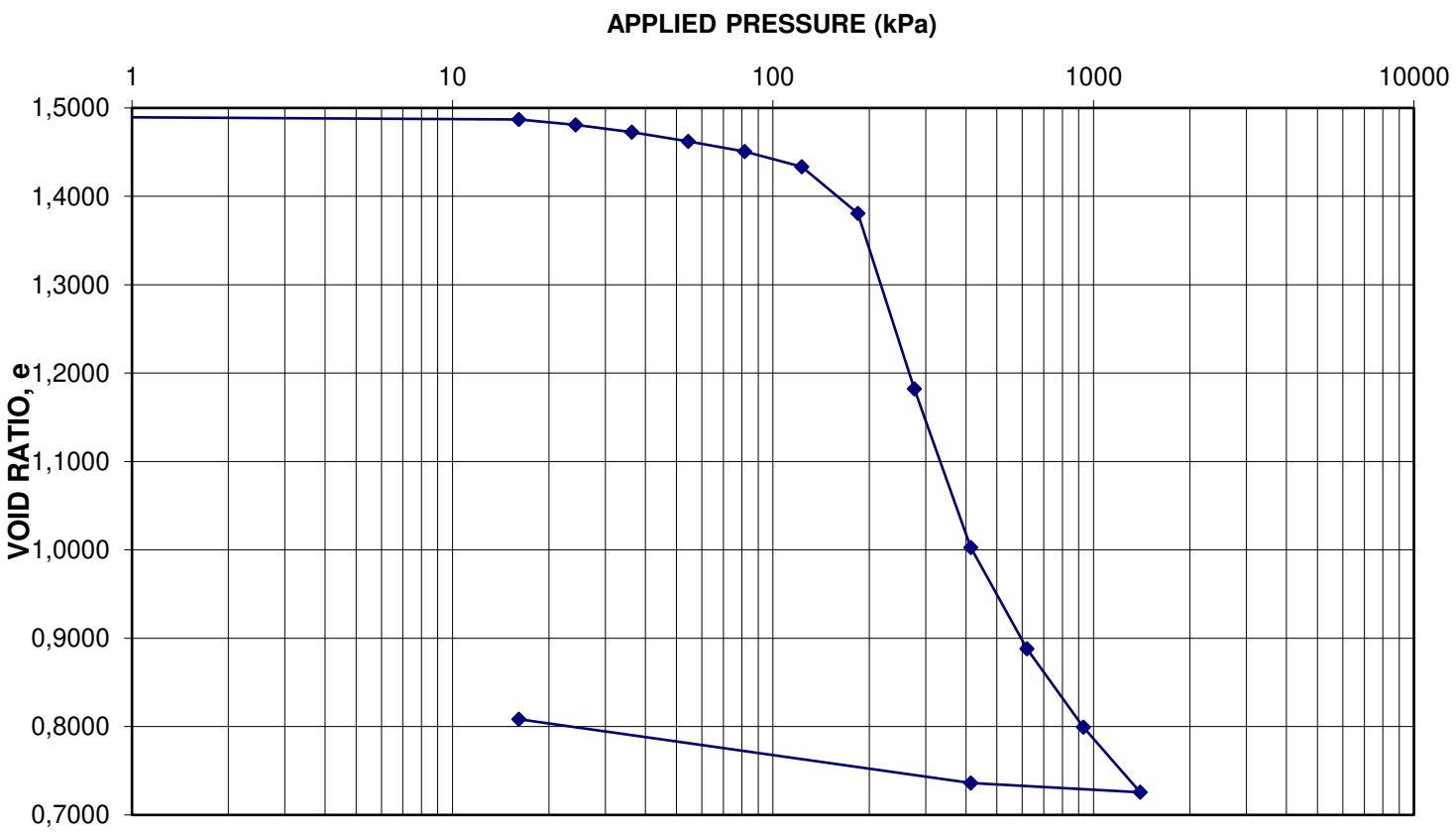
Notes:

Preformed By:	A. Azizi	Date:	2021-05-30
Checked By:	M. Gamboz	Date:	2021-06-04

Client:	Medusa LP	Lab No:	2021-S0081
Project:	Nepean, Ontario	Project No:	11227097-A1

Borehole No:	BH03	Sample No:	TM13	Depth:	10,87-11,02 m

Description of Material: CL (medium)



COMPRESSIBILITY PARAMETERS

s'_p Preconsolidation pressure (kPa):	176	e_o Initial void ratio:	1,4955
s'_{vo} Effective pressure:	81	c_r Recompression index:	0,06
$s'_p - s'_{vo}$ Overconsolidation:	95	c_c Compression index:	1,13
Overconsolidation ratio ("OCR"):	2,2	c_s Swelling index:	0,04

Size of Sample:	Diameter (mm):	63,52	Moisture Content (W) %		
	Height (mm):	25,48	Initial:	56,2	Final: 32,2

Notes:

Preformed By:	A. Azizi	Date:	2021-06-02
Checked By:	M. Gamboz	Date:	2021-06-07

Certificate of Analysis

Report Date: 22-Aug-2024

Client: **Paterson Group Consulting Engineers (Ottawa)**

Order Date: 16-Aug-2024

Client PO: 61024

Project Description: PG5876

	Client ID:	BH6-24 SS3	-	-	-		
	Sample Date:	16-Aug-24 09:00	-	-	-	-	-
	Sample ID:	2433647-01	-	-	-		
	Matrix:	Soil	-	-	-		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	75.7	-	-	-	-	-
General Inorganics							
pH	0.05 pH Units	7.68	-	-	-	-	-
Resistivity	0.1 Ohm.m	69.5	-	-	-	-	-
Anions							
Chloride	10 ug/g	<10	-	-	-	-	-
Sulphate	10 ug/g	<10	-	-	-	-	-

Dossier Bureau Veritas: C340864
Date du rapport: 2023/08/31

GHD Consultants Ltée
Votre # du projet: 12615684-A1
Adresse du site: BROCCOLINI, NEPEAN
Votre # de commande: 762-003432
Initiales du préleveur: DV

PARAMÈTRES CONVENTIONNELS (SOL)

ID Bureau Veritas		MA7807	MA7808	MA7809		
Date d'échantillonnage		2023/07/07	2023/07/07	2023/07/07		
# Bordereau		N-A	N-A	N-A		
	Unités	**TP-104-23 VR-03 1,10-2,00**	**TP-113-23 VR-03 0,75-1,80**	**TP-114-23 VR-04 1,90 À 3,00**	**LDR**	**Lot CQ**
% HUMIDITÉ	%	23	26	26	N/A	N/A
CONVENTIONNELS						
Chlorures (Cl) †	mg/kg	1.2	3.1	2.3	1.0	2431102
Sulfates (SO4) †	mg/kg	8.4	15	9.2	5.0	2431102

LDR = Limite de détection rapportée
Lot CQ = Lot contrôle qualité
N/A = Non Applicable
† Accréditation non existante pour ce paramètre

Bureau Veritas Bureau Veritas 889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tel: (514) 448-9001 Fax: (514) 448-9199 Ligne sans frais : 1-877-462-9926

APPENDIX 2

FIGURE 1 - KEY PLAN

DRAWING PG5876-1 - TEST HOLE LOCATION PLAN

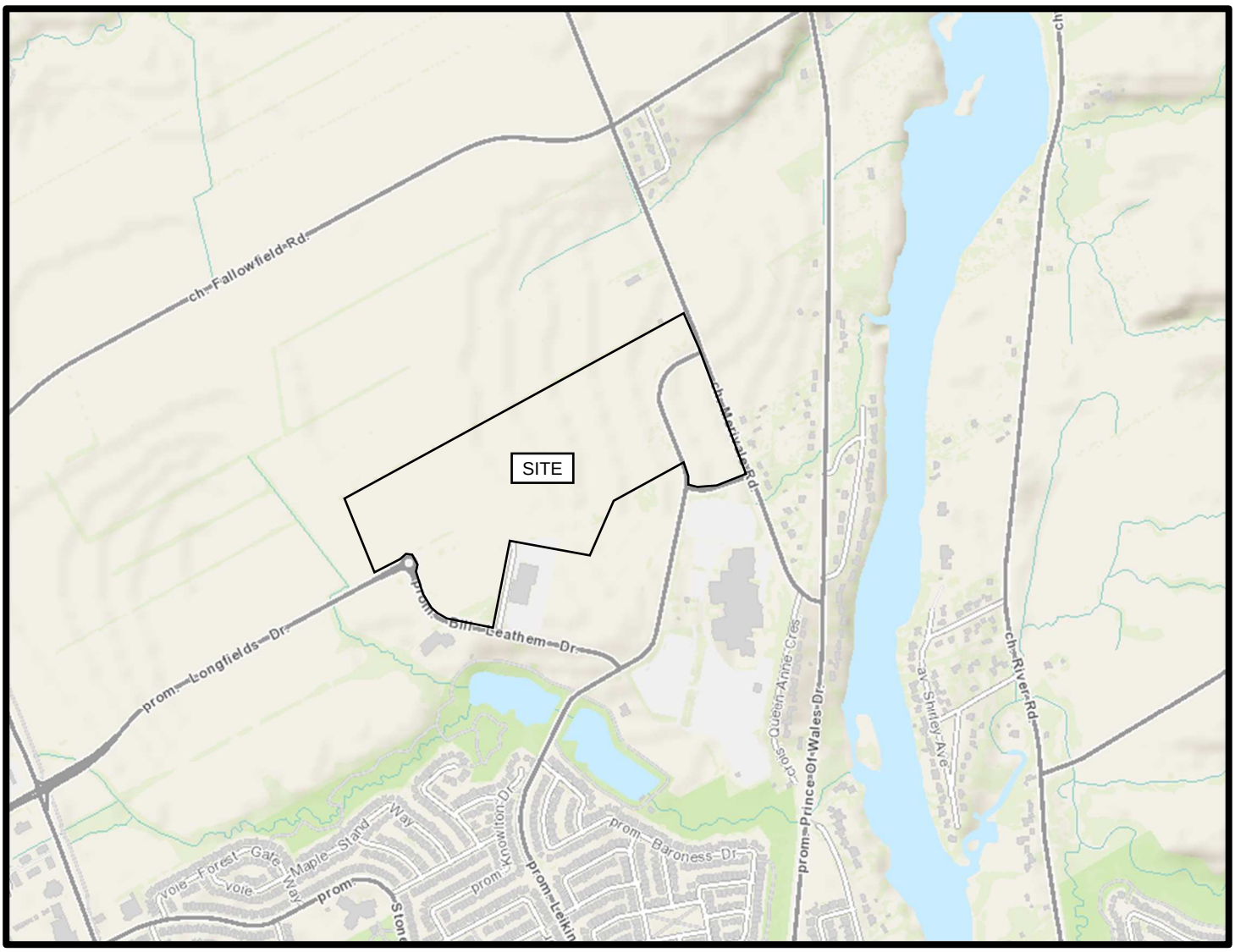
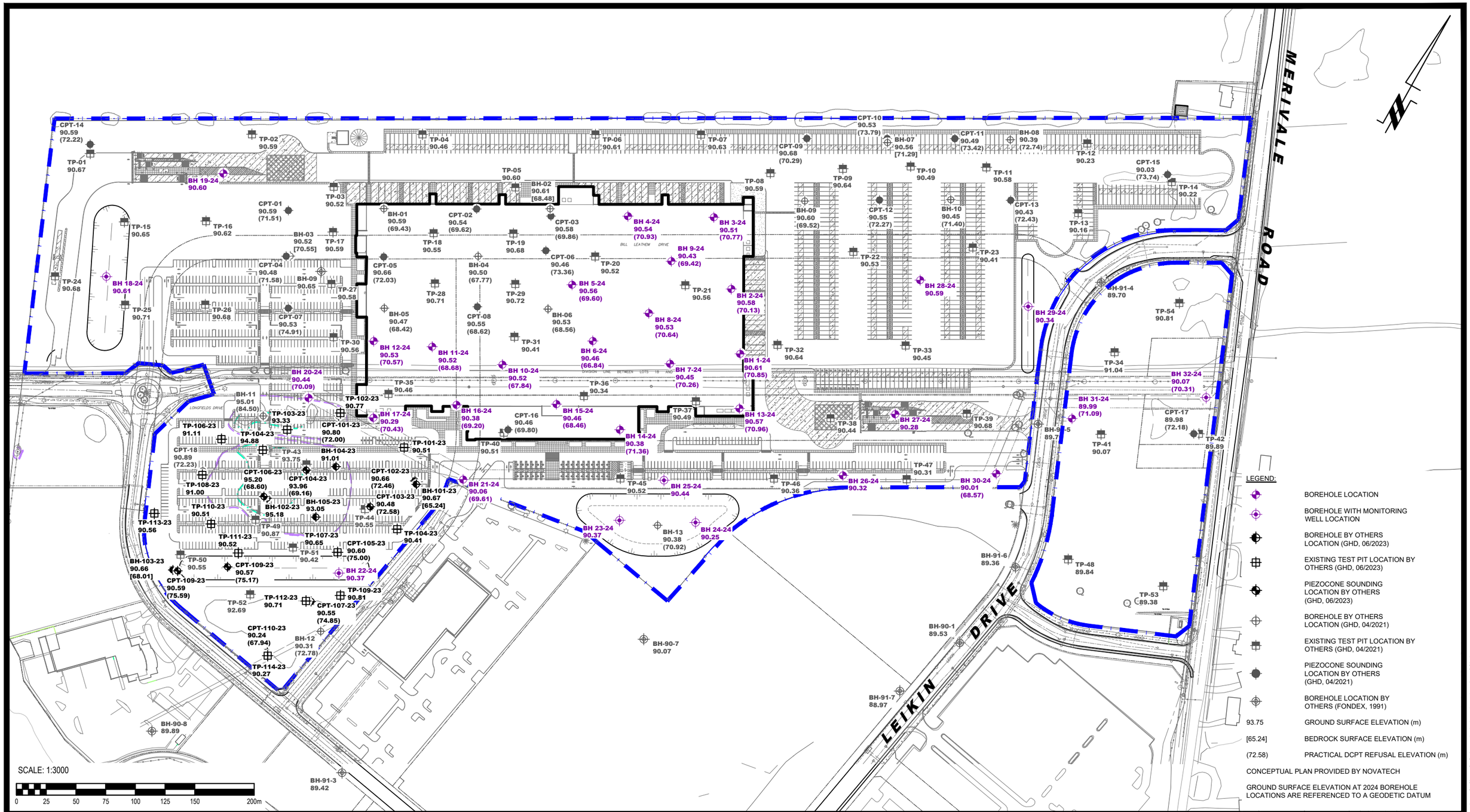


FIGURE 1

KEY PLAN

PATERSON GROUP



PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DD/MM/YYYY	INITIAL
2	2024 BOREHOLES ADDED TO PLAN UPDATED TO NEW CONCEPTUAL PLAN	30/08/2024	FC
1	AS PER REVISED SITE PLAN	16/07/2024	FC

BROCCOLINI
GEOTECHNICAL INVESTIGATION
PROJECT X DEVELOPMENT - 90 BILL LEATHEM DRIVE,
2 & 20 LEIKIN DRIVE & 11 BECKSTEAD ROAD
OTTAWA, ONTARIO

Title:
TEST HOLE LOCATION PLAN

Scale: 1:3000	Date: 05/2021
Drawn by: NFRV	Report No.: PG5876-1
Checked by: FC	Dwg. No.: PG5876-1
Approved by: DP	Revision No.: 2

p:\autocad drawings\geotechnical\pg58xx\pg5876\pg5876-1-test hole location plan (rev.02).dwg

11x17