PATERSON GROUP

Geotechnical Investigation

East Urban Community

Mer Bleue Road
Ottawa, Ontario

Prepared for Richcraft Group of Companies

Report PG3130-3 Revision 2 dated April 24, 2025

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Appendices

1.0 Introduction

Paterson Group (Paterson) was commissioned by Richcraft Group of Companies (Richcraft) to complete a geotechnical investigation for the proposed East Urban Community (EUC) development to be located along Mer Bleue Road, in the City of Ottawa (refer to Figure 1 – Key Plan presented in Appendix 2).

The objective of the study is:

- Determine the subsurface soil and groundwater conditions based on available subsoil information and supplemental borehole investigation.
- Provide geotechnical recommendations for the 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 current plans, it is understood that the proposed development will consist of a series of residential and commercial buildings with associated driveways, access roads, landscaped areas and parking areas. The proposed development is also understood to be municipally serviced.

The subject site is located to the north of Renaud Road and to the south of Innes Road. Mer Bleue Road runs in a north-south direction through the east portion of the site and the existing Hydro corridor runs in roughly an east-west direction through the south portion of the site.

3.0 Method of Investigation

3.1 Field Investigation

Field Program

The field program for the current investigation was conducted between June 11 and June 26, 2018. At that time, a total of 45 boreholes were advanced to a maximum depth of 9.75 m or auger refusal. The historical geotechnical field investigations were completed by Paterson between March 2002 and September 2014. During that time, a total of 64 test holes, consisting of boreholes, test pits and hand auger holes, were extended to a maximum depth of 22 m. Previous geotechnical investigations were also completed by others within the area of the subject site. The results of the previous investigations by others are discussed in the present report. The locations of the test holes are shown on Drawing PG3130-6 – Test Hole Location Plan included in Appendix 2.

The boreholes were completed using a track-mounted auger drill rig operated by a two-person crew. The test pits were completed using a rubber tire backhoe. All fieldwork was conducted under the full-time supervision of personnel from our geotechnical division under the direction of a senior engineer. The testing procedure consisted of augering to the required depths and at the selected locations sampling the overburden.

Sampling and In Situ Testing

Soil samples were collected from the boreholes using a 50 mm diameter split-spoon (SS) sampler, using 73 mm diameter thin walled (TW) Shelby tubes in conjunction with a piston sampler, or from the auger flights. Soil samples were also recovered along the sidewalls of the test pits by hand during excavation.

All soil samples were visually inspected and initially classified on site. The split-spoon samples were placed in sealed plastic bags and the Shelby tubes were sealed at both ends on site. All samples were transported to our laboratory for examination and classification. The depths at which the split-spoon, Shelby tube, auger and grab samples were recovered from the test holes are shown as SS, TW, AU and G, 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 carried out at regular depth intervals in cohesive soils. Undrained shear strength testing in test pits was completed using a handheld, portable vane apparatus (field inspection vane tester Roctest Model H-60).

All soil samples were classified on site, placed in sealed plastic bags and were transported to our laboratory for visual inspection.

Overburden thickness was evaluated during the course of the site investigations by dynamic cone penetration testing (DCPT) at several of the borehole locations. 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 at the borehole and test pits were recorded in detail in the field. The soil profiles are presented on the Soil Profile and Test Data sheets and Borehole Logs by Others in Appendix 1.

Groundwater

Flexible standpipes were installed in all boreholes to monitor the groundwater levels subsequent to the completion of the sampling program. Groundwater infiltration levels were noted at the time of excavation at the test pit locations.

The groundwater observations are discussed in Subsection 4.3 and presented in the Soil Profile and Test Data sheets in Appendix 1.

3.2 Field Survey

The borehole locations were determined by Paterson personnel taking into consideration the presence of underground and aboveground services. The location and ground surface elevation at each borehole location were provided by Stantec Geomatics. It is understood that the elevations were referenced to a geodetic datum. The test hole locations and ground surface elevations at the test hole locations are presented on Drawing PG3130-6 – Test Hole Location Plan in Appendix 2.

3.3 Laboratory Review

The soil samples recovered from the subject site were visually examined in our laboratory to review the results of the field logging.

A total of 19 Shelby tube samples were submitted for unidimensional consolidation during the current and the previous geotechnical investigations. The results of the consolidation and Atterberg testing are presented on the Consolidation Test sheets presented in Appendix 1 and are further discussed in Sections 4.

A total of 36 Atterberg limit tests were completed on selected soil samples. The results are presented under Subsection 4.2. In addition, 12 soil samples were submitted for grain size distribution and hydrometer analysis. The results of our testing are presented in Subsection 4.2 and on Grain Size Distribution sheets in Appendix 1.

3.4 Analytical Testing

Three (3) soil samples were submitted for analytical testing (2 from current investigation) to assess the corrosion potential for exposed ferrous metals and the potential of sulphate attacks against subsurface concrete structures. The samples were submitted to determine the concentration of sulphate and chloride, the resistivity and the pH of the samples. The results are presented in Appendix 1 and are discussed further in Subsection 6.9.

4.0 Observations

4.1 Surface Conditions

Currently, the subject site consists of agricultural lands and lands formerly used for agricultural purposes. A portion of the east side is occupied by an existing snow disposal facility. The site and regional topography are relatively flat with a slight downslope towards the west and south. The site is approximately at grade with neighboring properties and adjacent roadways. It should be noted that an existing Hydro corridor runs roughly in an east-west direction through the south portion of the site.

4.2 Subsurface Profile

Overburden

Generally, the subsurface profile encountered at the test hole locations varies between shallow bedrock and a deep silty clay deposit across the subject site. Shallow bedrock was encountered below a cultivated organic zone/topsoil followed by a silty sand, stiff silty clay and/or clayey silt layer within the north portion of the site. The remainder of the subject site was underlain by a sensitive silty clay deposit. Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 for specific details of the soil profiles encountered at each test hole location.

Bedrock

Based on available geological mapping, the bedrock in this area mostly consists of interbedded limestone and dolomite of the Gull River formation with an overburden drift thickness of 0 to 30 m depth.

Atterberg Limit Tests

Atterberg limit testing of 36 samples was completed. The Plasticity Index of the underlying silty clay was measured to range from 24 to 51. The results of the Atterberg limit testing on select silty clay samples are presented in Appendix 1.

Grain Size Distribution Tests

Twelve (12) sieve analyses were completed to classify selected soil samples according to the Unified Soil Classification System (USCS). The results are presented in Appendix 1.

4.3 Groundwater

Generally, the groundwater levels recovered from the piezometers installed at the borehole locations varied between 0.2 and 7.3 m below existing ground surface. It is important to note that groundwater readings at piezometers can be influenced by surface water perched within the borehole backfill material. Long-term groundwater conditions can also be estimated based on the observed colour and consistency of the recovered soil samples.

Based on these observations, it is estimated that long-term groundwater level can be expected between **2.5 to 3.5 m** depth. Groundwater levels are subject to seasonal fluctuations and therefore could vary during time of construction. The groundwater conditions observed at the borehole and test pits were recorded in detail in the field. Our groundwater observations are presented in the Soil Profile and Test Data sheets in Appendix 1.

5.0 Discussion

5.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is adequate for the proposed development. Bedrock removal may require line drilling and blasting or hoe ramming depending on the depth of bedrock removal required. Due to the presence of the sensitive silty clay layer, residential buildings should be designed in accordance with Part 4 of the current Ontario Building Code (OBC). Also, due to the sensitive silty clay deposit, the proposed development will be subjected to grade raise restrictions.

Permissible grade raise recommendations have been designed for the subject site. The recommended permissible grade raise areas are presented in Drawing PG3130-7 – Permissible Grade Raise Plan in Appendix 2. If higher than permissible grade raises are required, preloading with or without a surcharge, lightweight fill and/or other measures should be investigated to reduce the risks of unacceptable long-term post construction total and differential settlements.

Municipal services are anticipated within the subject site and will generally be completed through OHSA Type 2 and 3 soils.

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

5.2 Site Grading and Preparation

Stripping Depth

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

Due to the relatively shallow depth of the bedrock surface within the north portion of the site and the anticipated founding level for the proposed buildings, bedrock removal may be required.

Bedrock Removal

Bedrock removal can be accomplished by hoe ramming where only a small quantity of the bedrock needs to be removed. Sound bedrock may be removed by line drilling and controlled blasting and/or hoe ramming.

Prior to considering blasting operations, the blasting effects on the existing services, buildings and other structures should be addressed. A pre-blast or pre-construction survey of the existing structures located in proximity of the blasting operations should be completed prior to commencing site activities. The extent of the survey should be determined by the blasting consultant and should be sufficient to respond to any inquiries/claims related to the blasting operations.

As a general guideline, peak particle velocities (measured at the structures) should not exceed 25 mm/s during the blasting program to reduce the risks of damage to the existing structures.

The blasting operations should be planned and conducted under the supervision of a licensed professional engineer who is also an experienced blasting consultant.

Excavation side slopes in sound bedrock can be excavated almost vertical side walls. A minimum 1 m horizontal ledge should remain between the overburden excavation and the bedrock surface. The ledge will provide an area to allow for potential sloughing or a stable base for the overburden shoring system.

Vibration Considerations

Construction operations are the cause of vibrations, and possibly, sources of nuisance to the community. Therefore, means to reduce the vibration levels as much as possible should be incorporated in the construction operations to maintain, as much as possible, a cooperative environment with the residents.

The following construction equipment could be the source of vibrations: hoe ram, compactor, dozer, crane, truck traffic, etc. Vibrations, whether caused by blasting operations or by construction operations, could be the source of detrimental vibrations on the nearby buildings and structures. Therefore, all vibrations are recommended to be limited.

Two parameters are used to determine the permissible vibrations, namely, the maximum peak particle velocity and the frequency. For low frequency vibrations, the maximum allowable peak particle velocity is less than that for high frequency vibrations. As a guideline, the peak particle velocity should be less than 15 mm/s between frequencies of 4 to 12 Hz, and 50 mm/s above a frequency of 40 Hz (interpolate between 12 and 40 Hz). The guidelines are for current construction standards. Considering that these guidelines are above perceptible human level and, in some cases, could be very disturbing to some people, a pre-construction survey is recommended be completed to minimize the risks of claims during or following the construction of the proposed building.

Fill Placement

Fill used for grading beneath the building areas should consist, unless otherwise specified, of clean imported granular fill, such as Ontario Provincial Standard Specifications (OPSS) Granular A or Granular B Type II material. This material should be tested and approved prior to delivery to the 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 buildings should be compacted to at least 98% of its 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. These materials should be spread in thin lifts and at least compacted by the tracks of the spreading equipment to minimize voids. If excavated stiff brown silty clay, free of organics and deleterious materials, is to be used to build up the subgrade level for areas to be paved, the silty clay, under dry conditions, should be compacted in thin lifts to a minimum density of 95% of their respective SPMDD. Non-specified existing fill and site-excavated soils are not suitable for use as backfill against foundation walls unless a composite drainage blanket connected to a perimeter drainage system is provided.

5.3 Foundation Design

Bearing Resistance Values

Conventional style shallow footings for buildings can be designed using the bearing resistance values presented in Table 1. A geotechnical resistance factor of 0.5 was applied to the bearing resistance values at ULS.

Table 1 – Bearing Resistance Values

Bearing Surface	Bearing Resistance Values at SLS (kPa)	Factored Bearing Resistance Value at ULS (kPa)
Undisturbed, Compact Sandy Silt	60	150
Undisturbed, Firm Clayey Silt/Silty Clay	60	150
Undisturbed, Stiff Silty Clay/Clayey Silt	100	180
Undisturbed, Compact Glacial Till	150	250
Clean, Surface Sounded Bedrock	-	500

Note: Pad footings, up to 3 m wide, and strip footings, up to 2 m wide, can be designed using the above noted bearing resistance values placed over an undisturbed, silty clay bearing surface.

The bearing resistance values are provided on the assumption that the footings will be placed on undisturbed soil bearing surfaces. An undisturbed soil bearing surface consists of one 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.

The bearing resistance values at SLS for shallow footing bearing on the above noted soils will be subjected to potential post-construction total and differential settlements of 25 and 15 mm, respectively.

A clean, surface-sounded bedrock bearing surface should be free of loose materials, and have no near surface seams, voids, fissures or open joints which can be detected from surface sounding with a rock hammer. Footings bearing on an acceptable bedrock bearing surface and designed using the bearing resistance values provided herein will be subjected to negligible potential post-construction total and differential settlements.

Where a building is founded partly on bedrock and partly on soil, it is recommended to decrease the soil bearing resistance value by 25% for the footings placed on soil bearing media to reduce the potential long term total and differential settlements. Also, at the soil/bedrock and bedrock/soil transitions, it is recommended that the upper 0.5 m of the bedrock be removed for a minimum length of 2 m (on the bedrock side) and replaced with nominally compacted OPSS Granular A or Granular B Type II material. The width of the subexcavation should be at least the proposed footing width plus 0.5 m. Steel reinforcement, extending at least 3 m on both sides of the 2 m long transition, should be placed in the top part of the footings and foundation walls.

Settlement/Grade Raise

During the current investigation, a total of 9 consolidation tests were completed within the subject site. Also, 10 consolidation tests were conducted as part of the previous investigations within the immediate area of the subject site. The results of the consolidation tests from the previous investigations are presented in Tables 2, 3, 4 and 5 and in Appendix 1.

The value for p'_c is the preconsolidation pressure and p'_o is the effective overburden pressure of the test sample. The difference between these values is the available preconsolidation. The increase in stress on the soil due to the cumulative effects of the fill surcharge, the footing pressures, the slab loadings and the lowering of the groundwater should not exceed the available preconsolidation if unacceptable settlements are to be avoided.

The values for C_{cr} and C_c are the recompression and compression indices, respectively. These soil parameters are a measure of the compressibility due to stress increases below and above the preconsolidation pressures. The higher values for the C_c, as compared to the C_{cr}, illustrate the increased settlement potential above, as compared to below, the preconsolidation pressure.

Table 2 – Summary of Consolidation Test Results (Current Investigation)

Borehole	Sample	Depth (m)	p'_c (kPa)	p'_o (kPa)	C_{cr}	C_c	Q*
BH 1-18	TW 3	3.53	98.5	41.2	0.039	1.868	G
BH 3-18	TW 4	4.27	92.9	45.8	0.018	0.961	A
BH 6-18	TW 4	4.22	100	48.4	0.031	2.756	A
BH 27-18	TW 4	5.05	145.9	66.9	0.023	3.182	G
BH 28-18	TW 5	4.98	121.7	66.43	0.028	4.375	A
BH 35-18	TW 4	4.29	94	54.1	0.026	1.989	A
BH 36-18	TW 4	4.98	104.7	60.1	0.035	3.182	A
BH 42-18	TW 4	5.05	132.2	66.9	0.022	3.777	A
BH 44-18	TW 4	5.03	85.8	66.8	0.027	1.823	P

* - Q – Quality assessment of sample – G: Good A: Acceptable P: Likely disturbed

Table 3 – Summary of Consolidation Test Results (Paterson Investigation PG2392)

Borehole	Sample	Depth (m)	p'c (kPa)	p'o (kPa)	Ccr	Cc	Q*
BH 7	TW 2	4.36	90	53	0.016	1.643	A
BH 9	TW 3	4.33	106	53	0.021	4.008	A
BH 11	TW 4	4.32	85	53	0.027	2.735	P

* - Q – Quality assessment of sample – G: Good A: Acceptable P: Likely disturbed

Table 4 – Summary of Consolidation Test Results (Paterson Investigation PG0861)

Borehole	Sample	Depth (m)	p'_C (kPa)	p'_O (kPa)	C_{Cr}	C_C	Q*
BH 9-08	TW 2	4.8	126	55	0.026	3.260	A
BH 12-08	TW 4	9.4	109	68	0.031	3.080	A
BH 13-08	TW 2	3.42	142	43	0.025	1.334	A
BH 15-08	TW 2	4.91	87	50	0.029	1.890	A
BH 19-08	TW 3	4.9	99	43	0.025	3.100	A

* - Q – Quality assessment of sample – G: Good A: Acceptable P: Likely disturbed

Table 5 – Summary of Consolidation Test Results (Paterson Investigation G8533)

Borehole	Sample	Depth (m)	p'_c (kPa)	p'_o (kPa)	C_{cr}	C_c	Q*
BH 3	TW 5	6.53	103	64	0.043	2.967	A
BH 3	TW 7	9.6	175	82	0.028	3.046	A

* - Q – Quality assessment of sample – G: Good A: Acceptable P: Likely disturbed

The values of p'_c, p'_o, C_{cr} and C_c are determined using standard engineering testing procedures and are estimates only. Natural variations within the soil deposit will affect the results. The p'_o parameter is directly influenced by the groundwater level. Groundwater levels were measured during the site investigation. Groundwater levels vary seasonally which has an impact on the available preconsolidation. Lowering the groundwater level increases the p'_o and therefore reduces the available preconsolidation. Unacceptable settlements could be induced by a significant lowering of the groundwater level.

The p'_o values for the consolidation tests during the investigation are based on the long-term groundwater level being at 0.5 m below the existing groundwater table. The groundwater level is based on the colour and undrained shear strength profile of the silty clay.

The total and differential settlements will be dependent on characteristics of the proposed buildings. For design purposes, the total and differential settlements are estimated to be 25 and 20 mm, respectively. A post-development groundwater lowering of 0.5 m was assumed.

The potential post construction total and differential settlements are dependent on the position of the long-term groundwater level when building are situated over deposits of compressible silty clay. Efforts can be made to reduce the impacts of the proposed development on the long-term groundwater level by placing clay dykes in the service trenches, reducing the sizes of paved areas, leaving green spaces to allow for groundwater recharge or limiting planting of trees to areas away from the buildings. However, it is not economically possible to control the groundwater level.

To reduce potential long-term liabilities, consideration should be given to accounting for a larger groundwater lowering and to provide means to reduce long term groundwater lowering (e.g. clay dykes, restriction on planting around the dwellings, etc). Buildings on silty clay deposits increases the likelihood of movements and therefore of cracking. The use of steel reinforcement in foundations placed at key structural locations will tend to reduce foundation cracking compared to unreinforced foundations.

Based on the undrained shear strength testing results, consolidation testing and experience with the local silty clay deposit. **The recommended permissible grade raise areas for buildings are defined in Drawing PG3130-7 – Permissible Grade Raise Plan in Appendix 2.**

Where proposed grade raises exceed our permissible grade raise recommendations, several options could be considered for the foundation support of the proposed buildings:

Scenario A

Where the grade raise is close to, but below, the maximum permissible grade raise, consideration should be given to using more reinforcement in the design of the foundation (footings and walls) to reduce the risks of cracking in the concrete foundation. The use of control joints within the brick work between the garage and basement area should also be considered.

Scenario B

Where the grade raise cannot be accommodated with soil fill, the following options could be used alone or in combination.

Option 1 – Use of Lightweight Fill

Lightweight fill (LWF) can be used, consisting of EPS (expanded polystyrene) Type 19 or 22 blocks or other light weight materials which allow for raising the grade without adding a significant load to the underlying soils. However, these materials are expensive and, in the case of the EPS, are more difficult to use under the groundwater level, as they are buoyant, and must be protected against potential hydrocarbon spills. Use lightweight fill within the interior of the garage and porch areas to reduce the fill- related loads. LWF shall not be used within the rights-of-way (ROWs) or servicing alignments.

Option 2 – Preloading or Surcharging

It is possible to preload or surcharge the proposed site in localized areas provided sufficient time is available to achieve the desired settlements based on theoretical values from the settlement analysis. If this option is considered, a monitoring program using settlement plates will have to be implemented. This program will determine the amount of settlement in the preloaded or surcharged areas. Preloading to proposed finished grades will allow for consolidation of the underlying clays over a longer time period.

Surcharging the site with additional fill above the proposed finished grade will add additional load to the underlying clays accelerating the consolidation process and allowing for accelerated settlements. Once the desired settlements are achieved, the site can be unloaded and the f ill can be used elsewhere on site.

Once the required grade raises are established, the above options could be further discussed along with further recommendations on specific requirements.

5.4 Design for Earthquakes

The site class for seismic site response can be taken as **Class C** for the foundations bearing on a compact to dense glacial till and/or bedrock within the north portion of the subject site. A higher site class, such as Class A or B, is applicable for footings bearing on the bedrock surface. However, a site specific seismic shear wave test will be required to confirm the Class A or B seismic site classification. A seismic site response **Class D** is applicable for design of the proposed buildings bearing over a stiff to firm silty clay deposit throughout the remainder of the site.

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 Basement Floor Slab/Slab on Grade Construction

With the removal of all topsoil and fill, containing deleterious or organic materials, the native soil or existing granular fill approved by the geotechnical consultant at the time of excavation will be considered to be an acceptable subgrade surface on which to commence backfilling for basement floor slab or slab on grade construction. Any soft areas should be removed and backfilled with appropriate backfill material. OPSS Granular A or Granular B Type II, with a maximum particle size of 50 mm, are recommended for backfilling below the floor slab.

It is recommended that the upper 200 mm of sub-floor fill for basement slab construction consist of 19 mm clear crushed stone. It is also recommended that the upper 300 mm sub-floor fill below slab on grade construction consist of OPSS Granular A crushed stone. All backfill materials within the footprint of the proposed buildings should be placed in maximum 300 mm thick loose layers and compacted to at least 98% of its SPMDD.

5.6 Pavement Structure

For design purposes, the pavement structure presented in the following tables could be used for the design of car only parking areas and local roadways.

Table 6 – Recommended Pavement Structure – Car Only Parking Areas/Driveways

Thickness (mm)	Material Description
50	**Wear Course** – HL-3 or Superpave 12.5 Asphaltic Concrete
150	**BASE** – OPSS Granular A Crushed Stone
300	**SUBBASE** – OPSS Granular B Type II
SUBGRADE – Either in situ soil or OPSS Granular B Type I or II material placed over in situ soil.	

Table 7 – Recommended Pavement Structure – Local Roadways

Thickness (mm)	Material Description
40	**Wear Course** – HL-3 or Superpave 12.5 Asphaltic Concrete
50	**Binder Course** – HL-8 or Superpave 19.0 Asphaltic Concrete
150	**BASE** – OPSS Granular A Crushed Stone
450	**SUBBASE** – OPSS Granular B Type II
SUBGRADE – Either in situ soil or OPSS Granular B Type I or II material placed over in situ soil.	

Table 8 – Recommended Pavement Structure – Arterial Roadways with Bus Traffic

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
450	**SUBBASE** – OPSS Granular B Type II
SUBGRADE – Either in situ soil or OPSS Granular B Type I or II material placed over in situ soil.	

Minimum Performance Graded (PG) 58-34 asphalt cement should be used for this project.

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 I or II material.

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 vibratory equipment.

Pavement Structure Drainage

Satisfactory performance of the pavement structure is largely dependent on keeping the contact zone between the subgrade material and the base stone in a dry condition. Failure to provide adequate drainage under conditions of heavy wheel loading can result in the fine subgrade soil being pumped into the voids in the stone subbase, thereby reducing its load carrying capacity.

Due to the low permeability of the subgrade materials consideration should be given to installing subdrains during the pavement construction as per City of Ottawa standards. The subdrain inverts should be approximately 300 mm below subgrade level. The subgrade surface should be crowned to promote water flow to the drainage lines.

6.0 Design and Construction Precautions

6.1 Foundation Drainage and Backfill

It is recommended that a perimeter foundation drainage system be provided for the proposed structures. The system should consist of a 150 mm diameter perforated corrugated plastic pipe, surrounded on all sides by 150 mm of 10 mm clear crushed stone, placed at the footing level around the exterior perimeter of the structure. The pipe should have a positive outlet, such as a gravity connection to the storm sewer.

Backfill against the exterior sides of the foundation walls should consist of free-draining non frost susceptible granular materials. The greater part of the site excavated materials will be frost susceptible and, as such, are not recommended for re-use as backfill against the foundation walls, unless used in conjunction with a composite drainage system, such as Delta Drain 6000 or an approved equivalent. Imported granular materials, such as clean sand or OPSS Granular B Type I granular material, should otherwise be used for this purpose.

6.2 Protection of Footings Against Frost Action

Perimeter footings of heated structures are required to be insulated against the deleterious effect of frost action. A minimum of 1.5 m thick soil cover (or equivalent) should be provided in this regard.

Exterior unheated footings, such as those for isolated exterior piers, are more prone to deleterious movement associated with frost action than the exterior walls of the structure proper and require additional protection, such as soil cover of 2.1 m or a combination of soil cover and foundation insulation.

6.3 Excavation Side Slopes

The side slopes of excavations in the overburden materials should either be cut back at acceptable slopes or should be retained by shoring systems from the start of the excavation until the structure is backfilled. It is assumed that sufficient room will be available for the greater part of the excavations to be undertaken by open-cut methods (i.e. 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 subsoil at this site is considered to be 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 be kept away 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.

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.

Excavation Base Stability

The base of supported excavations can fail by three (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.

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.

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 Figure 1 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.

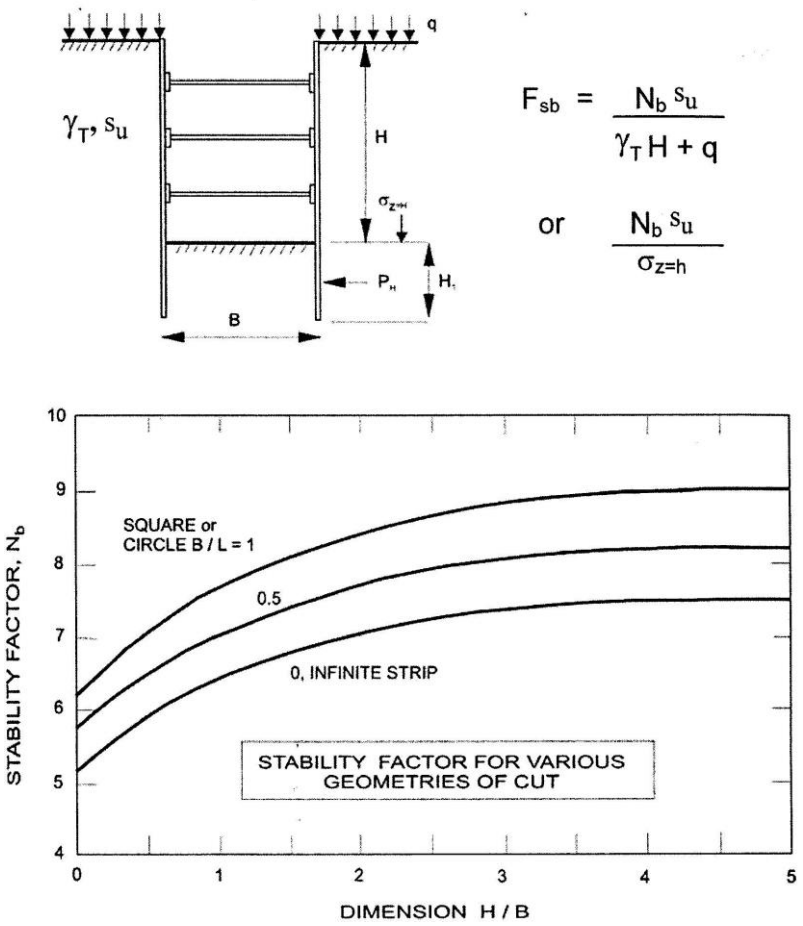

Figure 1 – Stability Factor for Various Geometries of Cut

In the case of soft to firm clays, a factor of safety of 2 is recommended for base stability.

6.4 Pipe Bedding and Backfill

Bedding and backfill materials should be in accordance with the most recent Material Specifications & 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 bedding for sewer and water pipes when placed on soil subgrade. The bedding should 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 (concrete or PSM PVC pipes) or sand (concrete pipe). The bedding and cover materials should be placed in maximum 225 mm thick lifts compacted to a minimum of 95% of the material's SPMDD.

Generally, it should be possible to re-use the moist, not wet, silty clay above the cover material if the excavation and filling operations are carried out in dry weather conditions. The wet silty clay should be given a sufficient drying period to decrease its moisture content to an acceptable level to make compaction possible prior to being re-used.

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, subbedding and cover material. The barriers should consist of relatively dry and compactable brown silty clay placed in maximum 225 mm thick loose layers and compacted to a minimum of 95% of the material's SPMDD. The clay seals should be placed at the site boundaries and at strategic locations at no more than 60 m intervals in the service trenches.

6.5 Groundwater Control

Groundwater Control for Building Construction

Due to the relatively impervious nature of the silty clay/clayey silt materials, it is anticipated that groundwater infiltration into the excavations should be low and controllable using open sumps. Pumping from open sumps should be sufficient to control the groundwater influx through the sides of shallow excavations. 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.

Permit to Take Water

A temporary Ministry of the Environment, Conservation and Parks (MECP) permit to take water (PTTW) may be required for this project if more than 400,000 L/day of ground and/or surface water is to be pumped during the construction phase. A minimum of 4 to 5 months should be allowed for completion of the PTTW application package 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 Person as stipulated under O.Reg. 63/16. If a project qualifies for a PTTW based upon anticipated conditions, an EASR will not be allowed as a temporary dewatering measure while awaiting the MECP review of the PTTW application.

6.6 Stormwater Management Pond Removal

Prior to backfilling of the temporary stormwater pond, all vegetation, topsoil, loose sediment and other deleterious materials should be removed.

Fill used for grading beneath building areas should consist, unless otherwise specified, of clean imported granular fill, such as Ontario Provincial Standard Specifications (OPSS) Granular A or Granular B Type II or approved alternative. The fill should be placed in loose lifts and compacted using suitable compaction equipment for the lift thickness. Fill placed beneath building areas should be compacted to a minimum 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 and beneath parking areas where settlement of the ground surface is of minor concern. In landscaped areas, these materials should be spread in thin lifts and at least compacted by the tracks of the spreading equipment to minimize voids. If these materials are to be used to build up the subgrade level for areas to be paved, they should be compacted in thin lifts to a minimum density of 95% of the SPMDD. Non-specified existing fill and site-excavated soils are not suitable for use as backfill against foundation walls unless a composite drainage blanket connected to a perimeter drainage system is provided.

Where hard surface areas are considered above the trench backfill, the trench backfill material within the frost zone (about 1.5 m below finished grade) and above the cover material should match the soils exposed at the trench walls to minimize differential frost heaving. The trench backfill should be placed in maximum 225 mm thick loose lifts and compacted to a minimum of 95% of the material standard Proctor maximum dry density.

It should generally be possible to re-use the site materials for backfill beneath landscaped areas if the operations are carried out in dry weather conditions. If the site-excavated material consists of moist to wet silty clay, the material should be spread in thin lifts and allowed adequate time to dry before being placed.

If buildings are proposed in the area of the temporary stormwater pond, Paterson should review the proposed grades to determine the LWF requirements.

6.7 Cut-Off Swale Design

The excavation for the cut-off swale will be through either sand or stiff silty clay. It is anticipated that bedrock will be located 0 to 1.5 m below the bottom of the cut-off swale.

The cut-off swale should consist of 3H:1V side slopes, or shallower. Where sand is encountered within the excavation for the swale, flatter slopes could be required to prevent raveling and maintain a stable slope. The side slopes should be vegetated immediately upon excavation to promote side slope stability. The side slope excavation should be reviewed by Paterson at the time of excavation.

Rock dams can be considered to reduce the water flow velocity within the swale. If required, Paterson can provide detailed recommendations for rock dams.

Excavated material should not be stockpiled directly at the top of the side slopes and heavy equipment should be kept away from the excavation sides when not in use.

Paterson should conduct geotechnical assessments on proposed side slope designs with slopes steeper than 3H:1V, if applicable.

6.8 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. Heaving and settlement upon thawing could occur.

In the event of construction during below zero temperatures, the founding stratum should be protected from freezing temperatures by the use of straw, propane heaters and tarpaulins or other suitable means. In this regard, 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 also difficult activities to complete during freezing conditions without introducing frost in the subgrade or in the excavation walls and bottoms. Precautions should be taken if such activities are to be carried out during freezing conditions.

6.9 Corrosion Potential and Sulphate

The results of analytical testing show that the sulphate content is less than 0.1%. These results are indicative that Type 10 Portland cement (normal cement) would be appropriate for this site. The results of the chloride content, pH and resistivity indicate the presence of a non-aggressive to slightly aggressive environment for exposed ferrous metals at this site.

6.10 Landscaping Consideration

Tree Planting Restrictions

In accordance with the City of Ottawa Tree Planting in Sensitive Marine Clay Soils (2017 Guidelines), Paterson completed the required soil testing to aid in determining the applicable tree planting setbacks. However, it should be noted that Paterson is also relying on our engineering expertise to determine the applicable tree planting setback for the subject site.

Atterberg limits testing was completed for recovered silty clay samples at selected locations throughout the subject site. Sieve analysis testing was also completed on selected soil samples. The above noted soil samples were recovered from elevations below the anticipated design underside of footing elevation and 3.5 m depth below anticipated finished grade. The results of our testing are presented in Appendix 1.

Based on the colouring and moisture levels of the recovered soil samples and the undrained shear strength values in close proximity to design underside of footing elevation, Paterson has determined that the following tree planting setbacks are recommended. Large trees (mature height over 14 m) can be planted within these 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 is 4.5 m for small (mature tree height up to 7.5m) and medium size trees (mature tree height 7.5 m 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 of 25 m3 of available soil volume while a medium tree must be provided with a minimum of 30 m3 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), as noted on the subdivision Grading Plan.

Swimming Pools

The in-situ soils are considered to be acceptable for in-ground swimming pools. Above ground swimming pools must be placed at least 5 m away from the residence foundation and neighbouring foundations. Otherwise, pool construction is considered routine, and can be constructed in accordance with the manufacturer`s requirements.

Aboveground Hot Tubs

Additional grading around the hot tub should not exceed permissible grade raises. Otherwise, hot tub construction is considered routine, and can be constructed in accordance with the manufacturer's specifications.

Installation of Decks and Additions

Additional grading around proposed deck or addition should not exceed permissible grade raises. Otherwise, standard construction practices are considered acceptable.

7.0 Recommendations

It is recommended that the following be carried out by Paterson once preliminary and future details of the proposed development have been prepared:

- ❑ Review preliminary and detailed grading, servicing and landscaping plans from a geotechnical perspective.

- ❑ Review of the geotechnical aspects of the foundation drainage systems prior to construction, if applicable.

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 Paterson:

- ❑ Review and inspection of the installation of the foundation drainage systems.

- ❑ Observation of all bearing surfaces prior to the placement of concrete.

- ❑ Sampling and testing of the concrete and fill materials used.

- ❑ 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 and field density tests to determine the level of compaction achieved.

- ❑ Sampling and testing of the bituminous concrete including mix design reviews.

A report confirming that these works have been conducted in general accordance with our recommendations could be issued, upon request, following the completion of a satisfactory materials testing and observation program by the geotechnical consultant.

All excess soil must be handled as per ***Ontario Regulation 406/19: On-Site and Excess Soil Management*.**

8.0 Statement of Limitations

The recommendations made in this report are in accordance with Paterson's present understanding of the project. Paterson requests permission to review the grading plan once available. Paterson's recommendations should be reviewed when the drawings and specifications are complete.

The client should be aware that any information pertaining to soils and all test hole logs are furnished as a matter of general information only. Test hole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those of the test holes.

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 to be notified immediately in order to permit reassessment of the recommendations.

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 Richcraft Group of Companies or their agent(s) is not authorized without review by this firm for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.

Owen R. Canton, B.Eng.

Scott S. Dennis, P.Eng.

Report Distribution:

- ❑ Richcraft Group of Companies (Email Copy)
- ❑ Paterson Group (1 Copy)

APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

BOREHOLES BY OTHERS

SYMBOLS AND TERMS

CONSOLIDATION TESTING RESULTS

ATTERBERG LIMITS TESTING RESULTS

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

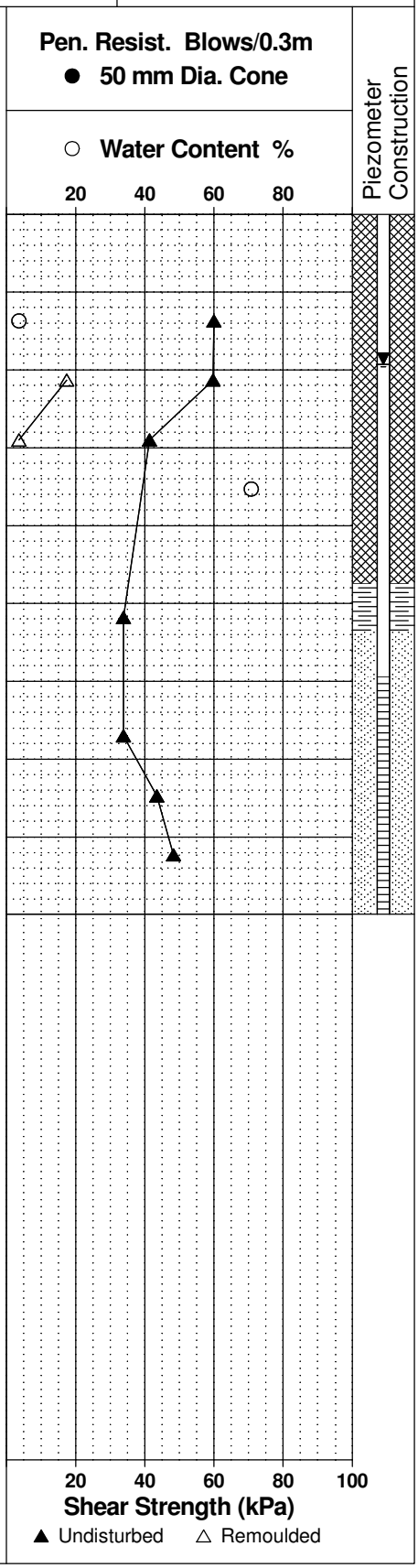
FILE NO. PG3130

REMARKS

HOLE NO. BH 1-18

BORINGS BY CME 55 Power Auger **DATE** June 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.67
Topsoil & organics 0.10		AU	1				
Brown **SILTY CLAY** with sand 0.69		SS	2	71	5	1	86.67
Very stiff to stiff, brown **SILTY CLAY**						2	85.67
- firm and grey by 2.5m depth		TW	3	92		3	84.67
						4	83.67
		SS	4	92	W	5	82.67
						6	81.67
						7	80.67
						8	79.67
8.99		SS	5	96	W		
End of Borehole							
(GWL @ 1.93m - July 20, 2018)							



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

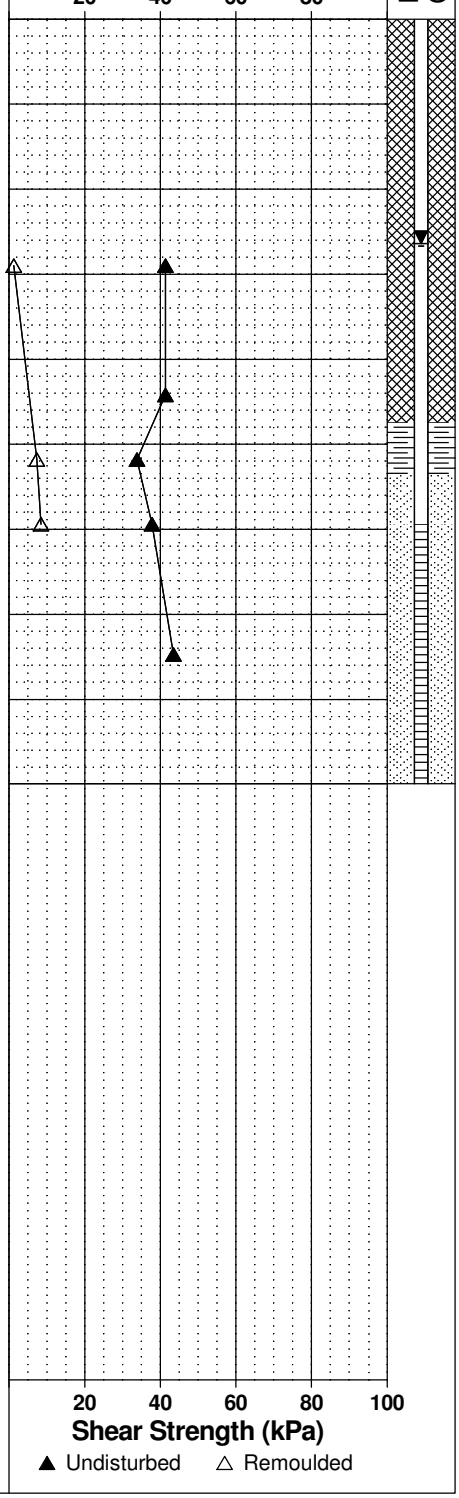
FILE NO. PG3130

REMARKS

HOLE NO. BH 2-18

BORINGS BY CME 55 Power Auger **DATE** June 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.64
Brown **SILTY CLAY** with organics, trace topsoil (0.15 / 0.69)		AU	1				
Brown **SILTY CLAY** with sand		SS	2	79	7	1	86.64
		SS	3	88	2	2	85.64
Very stiff to stiff, brown **SILTY CLAY**							
- firm and grey by 2.2m depth		TW	4	100		3	84.64
						4	83.64
						5	82.64
		SS	5	92	W	6	81.64
						7	80.64
						8	79.64
End of Borehole (8.99)		SS	6	96	W		
(GWL @ 2.64m - July 20, 2018)							



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

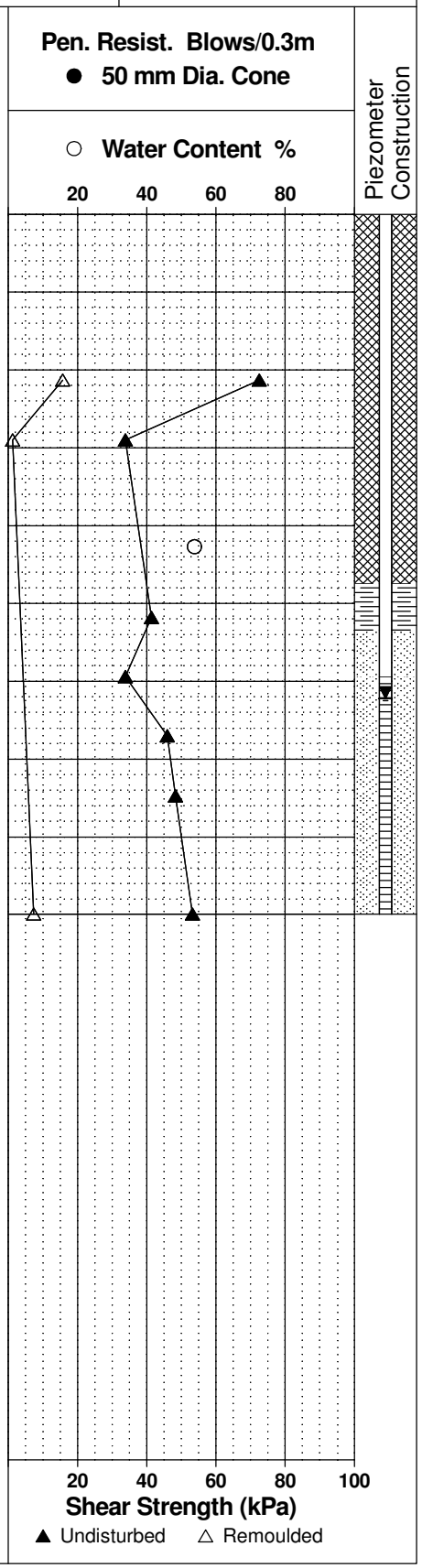
FILE NO. PG3130

REMARKS

HOLE NO. BH 3-18

BORINGS BY CME 55 Power Auger **DATE** June 11, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.47
FILL: Brown silty sand, some crushed stone, organics 0.18		AU	1				
		SS	2	71	8	1	86.47
Very stiff to stiff, brown **SILTY CLAY**						2	85.47
- firm and grey by 2.2m depth		TW	3	0		3	84.47
		TW	4	100		4	83.47
						5	82.47
						6	81.47
						7	80.47
		SS	5	96	W	8	79.47
8.99 End of Borehole							
(GWL @ 6.22m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

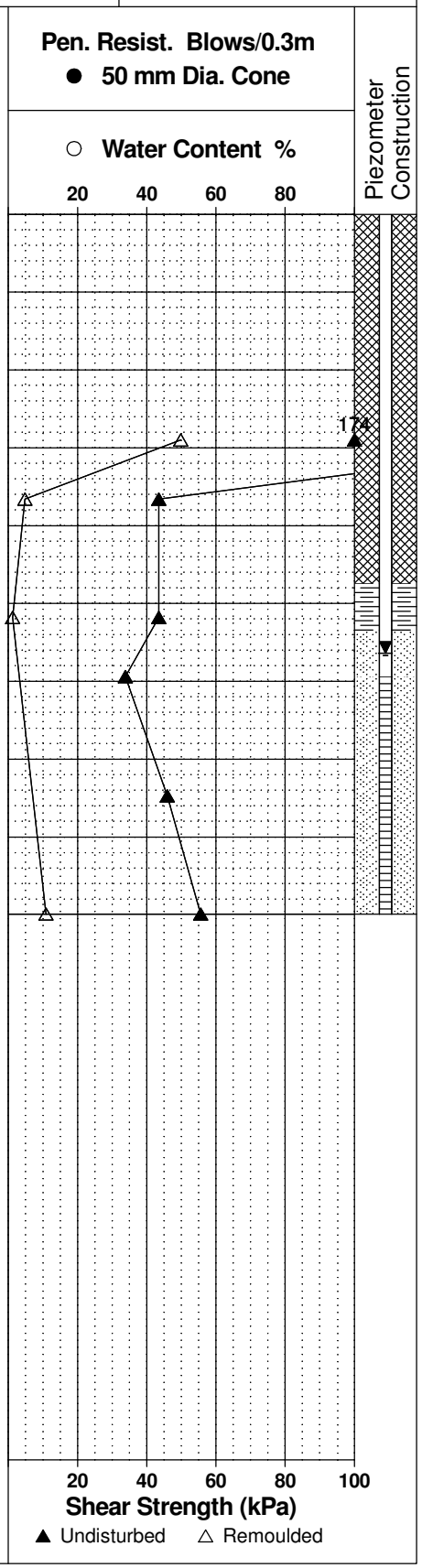
FILE NO. PG3130

REMARKS

HOLE NO. BH 4-18

BORINGS BY CME 55 Power Auger **DATE** June 12, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.36
Brown **SILTY CLAY** with organics, trace topsoil 0.15		AU	1				
		SS	2	92	7	1	86.36
		SS	3		3	2	85.36
Very stiff to stiff, brown **SILTY CLAY**							
- Firm and grey by 2.7m depth						3	84.36
		TW	4	92		4	83.36
						5	82.36
		SS	5	96	W	6	81.36
						7	80.36
		SS	6	96	W	8	79.36
8.99 End of Borehole							
(GWL @ 5.64m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

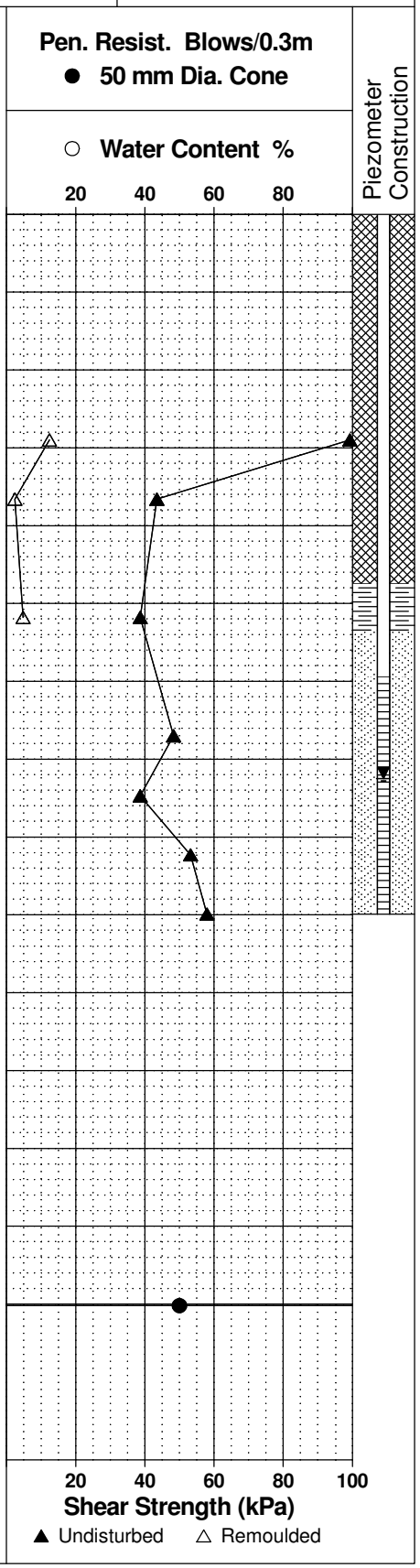
FILE NO. PG3130

REMARKS

HOLE NO. BH 5-18

BORINGS BY CME 55 Power Auger **DATE** June 12, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.34
Brown **SILTY CLAY** with organics &topsoil (0.18)		AU	1				
		SS	2	75	10	1	86.34
		SS	3	88	4	2	85.34
Very stiff to stiff, brown **SILTY CLAY**							
- firm and grey by 2.7m depth						3	84.34
		TW	4	92		4	83.34
						5	82.34
		SS	5		W	6	81.34
						7	80.34
						8	79.34
8.99						9	78.34
Dynamic Cone Penetration Test commenced at 8.99m depth. cone pushed to 13.7m depth.						10	77.34
						11	76.34
						12	75.34
						13	74.34
14.02						14	73.34
End of Borehole							
Practical DCPT refusal at 14.02m depth							
(GWL @ 7.25m - July 20, 2018)							



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

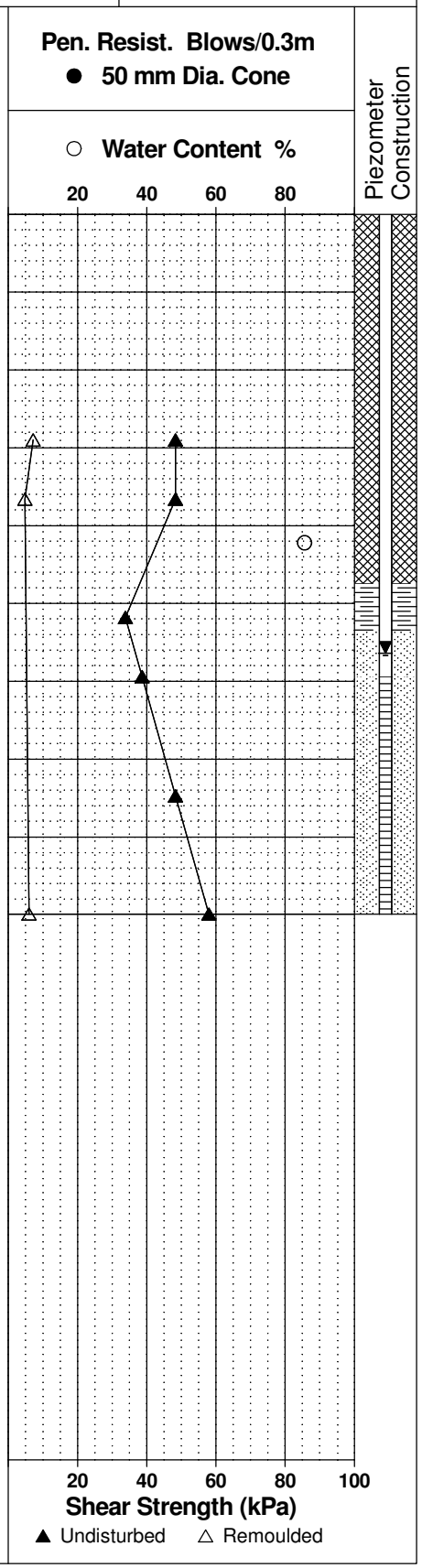
FILE NO. PG3130

REMARKS

HOLE NO. BH 6-18

BORINGS BY CME 55 Power Auger **DATE** June 12, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.79
FILL: Brown silty clay with sand, crushed stone and organics 0.28		AU	1				
		SS	2	21	8	1	86.79
		SS	3	38	8	2	85.79
Very stiff to stiff, brown **SILTY CLAY**							
- firm and grey by 2.2m depth						3	84.79
		TW	4	88		4	83.79
						5	82.79
		SS	5	96	W	6	81.79
						7	80.79
		SS	6	92	W	8	79.79
8.99 End of Borehole							
(GWL @ 5.64m - July 20, 2018)							



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

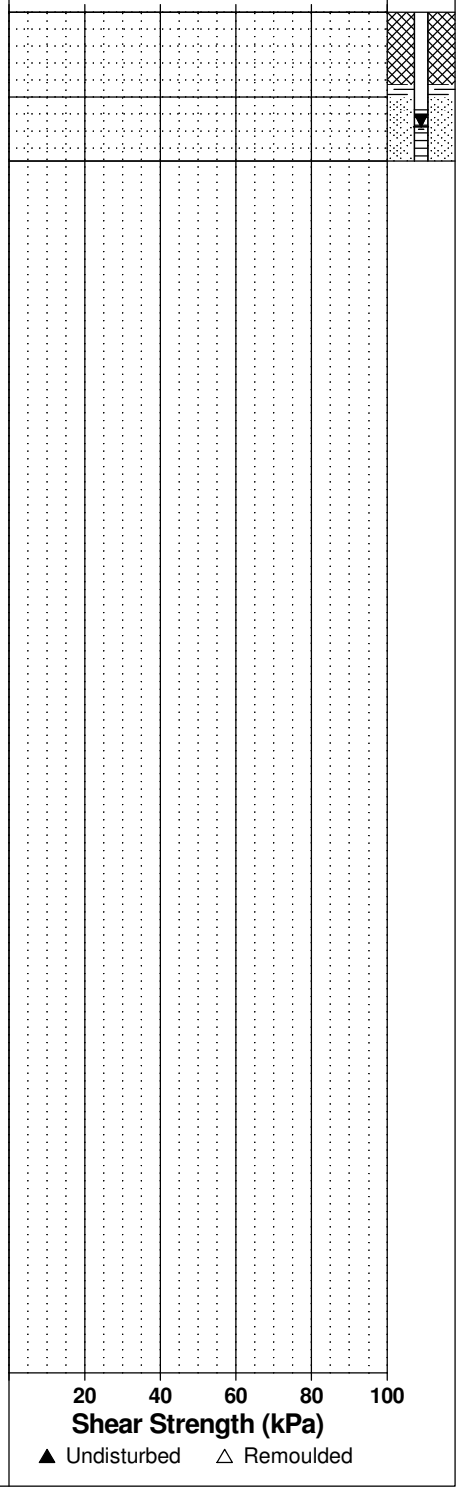
FILE NO. PG3130

REMARKS

HOLE NO. BH 7-18

BORINGS BY CME 55 Power Auger **DATE** June 13, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
Brown **SILTY CLAY** with organics, some topsoil	0.13	AU	1			0	88.68		
Very stiff, brown **SILTY CLAY**		SS	2	75	14	1	87.68		
	1.75	SS	3		50+				
End of Borehole									
Practical refusal to augering at 1.75m depth									
(GWL @ 1.35m - July 20, 2018)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

FILE NO. PG3130

REMARKS

HOLE NO. BH 8-18

BORINGS BY CME 55 Power Auger **DATE** June 13, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.80
Topsoil and organics with brown silty clay		AU	1				
0.10							
		SS	2	88	9	1	87.80
Very stiff to stiff, brown **SILTY CLAY**		SS	3	79	6	2	86.80
- firm by 2.2m depth		SS	4	17	1		
3.12		SS	5	0	50+	3	85.80
End of Borehole							
Practical refusal to augering at 3.12m depth							
(GWL @ 1.46m - July 20, 2018)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

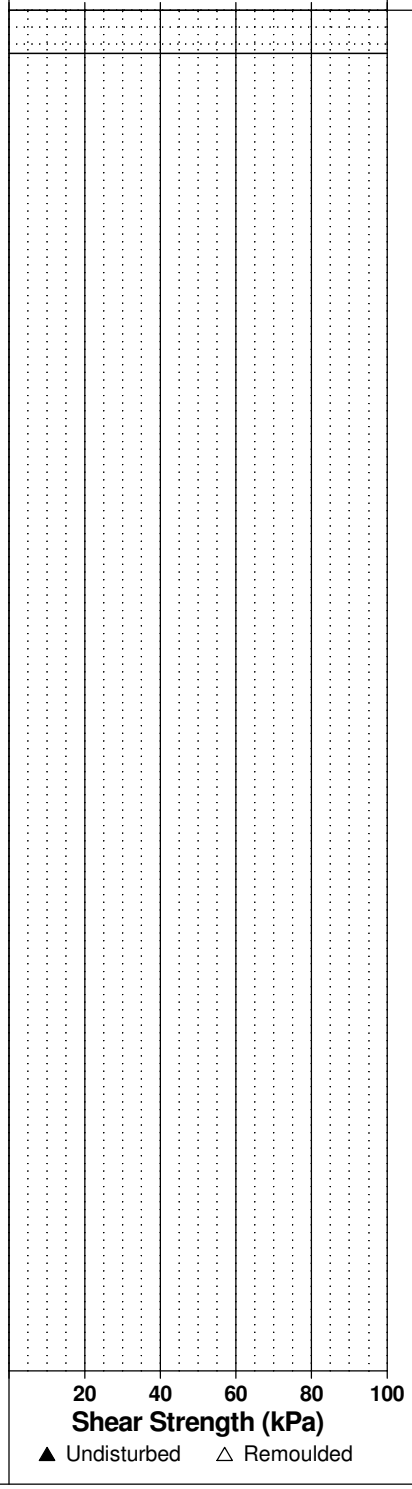
FILE NO. PG3130

REMARKS

HOLE NO. BH 9-18

BORINGS BY CME 55 Power Auger **DATE** June 13, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
Topsoil & organics with brown silty clay 0.15		AU	1			0	89.56		
Brown **SILTY CLAY** 0.51									
End of Borehole									
Practical refusal to augering at 0.51m depth									
(BH dry upon completion)									



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

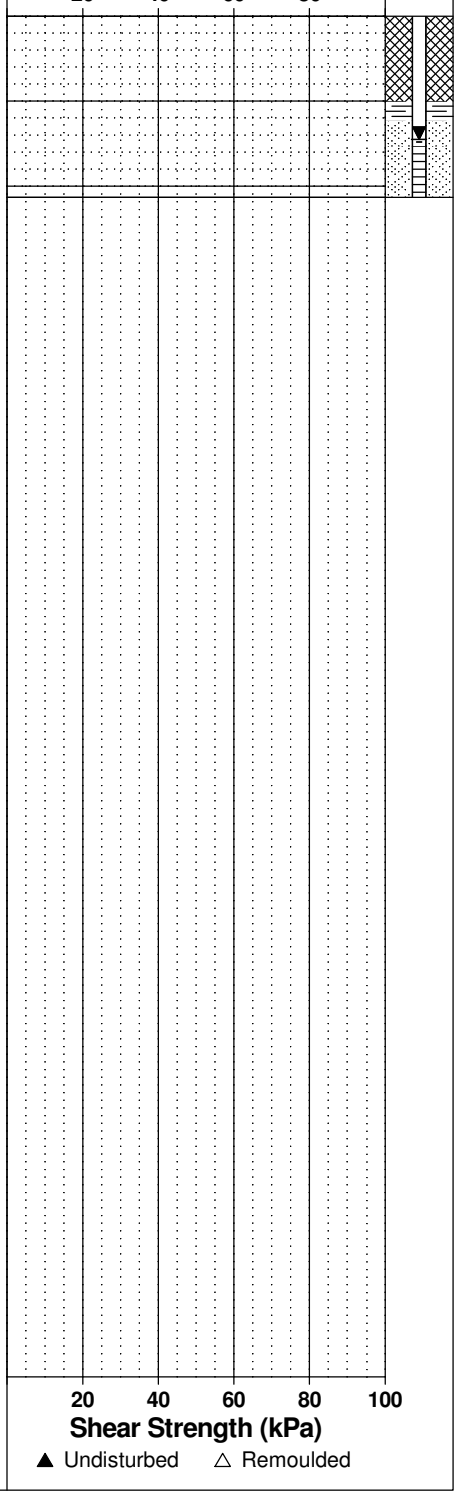
FILE NO. PG3130

REMARKS

HOLE NO. BH10-18

BORINGS BY CME 55 Power Auger **DATE** June 13, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
Brown **SILTY CLAY** wiht sand, some organics & topsoil 0.18		AU	1			0	88.65		
		SS	2	79	8	1	87.65		
Brown **SILTY CLAY**									
2.13		SS	3	88	5	2	86.65		
End of Borehole									
Practical refusal to augering at 2.13m depth									
(GWL @ 1.45m - July 20, 2018)									



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

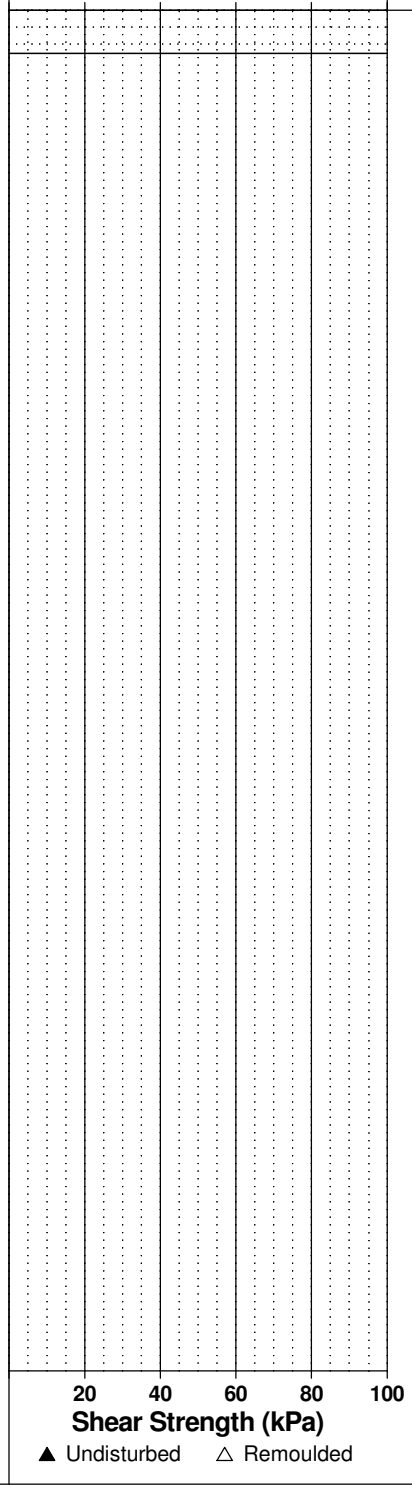
FILE NO. PG3130

REMARKS

HOLE NO. BH11-18

BORINGS BY CME 55 Power Auger **DATE** June 13, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
Topsoil & organics with brown silty clay 0.10		AU	1			0	89.38		
Brown **SILTY CLAY** 0.51									
End of Borehole									
Practical refusal to augering at 0.51m depth									
(BH dry upon completion)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

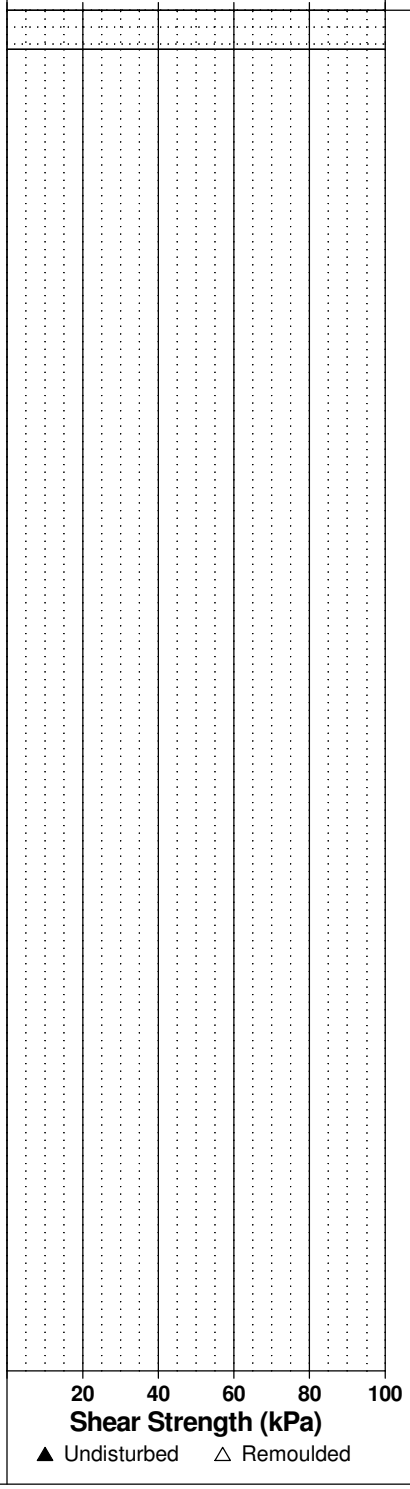
FILE NO. PG3130

REMARKS

HOLE NO. BH12-18

BORINGS BY CME 55 Power Auger **DATE** June 13, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
Brown **SILTY SAND,** some topsoil & organics 0.13 / 0.46		AU	1			0	90.29		
Brown **SILTY SAND,** some gravel, occ. cobbles									
End of Borehole									
Practical refusal to augering at 0.46m depth									
(BH dry upon completion)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

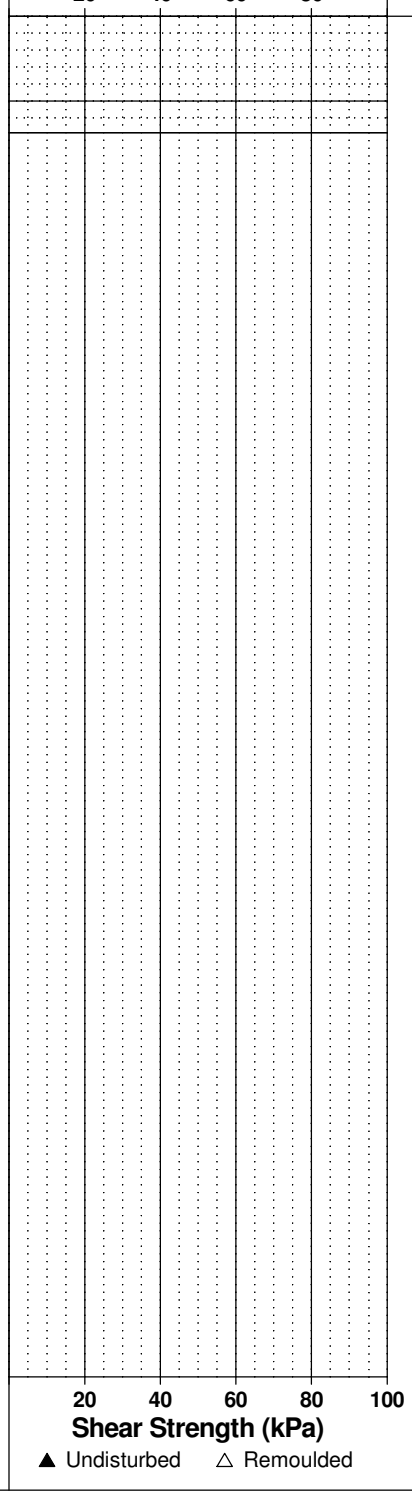
FILE NO. PG3130

REMARKS

HOLE NO. BH13-18

BORINGS BY CME 55 Power Auger **DATE** June 13, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
Brown **SILTY CLAY** with organics, some topsoil 0.08		AU	1			0	90.12		
Very stiff, brown **SILTY CLAY**		SS	2	83	13	1	89.12		
1.37									
End of Borehole									
Practical refusal to augering at 1.37m depth									
(BH dry upon completion)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

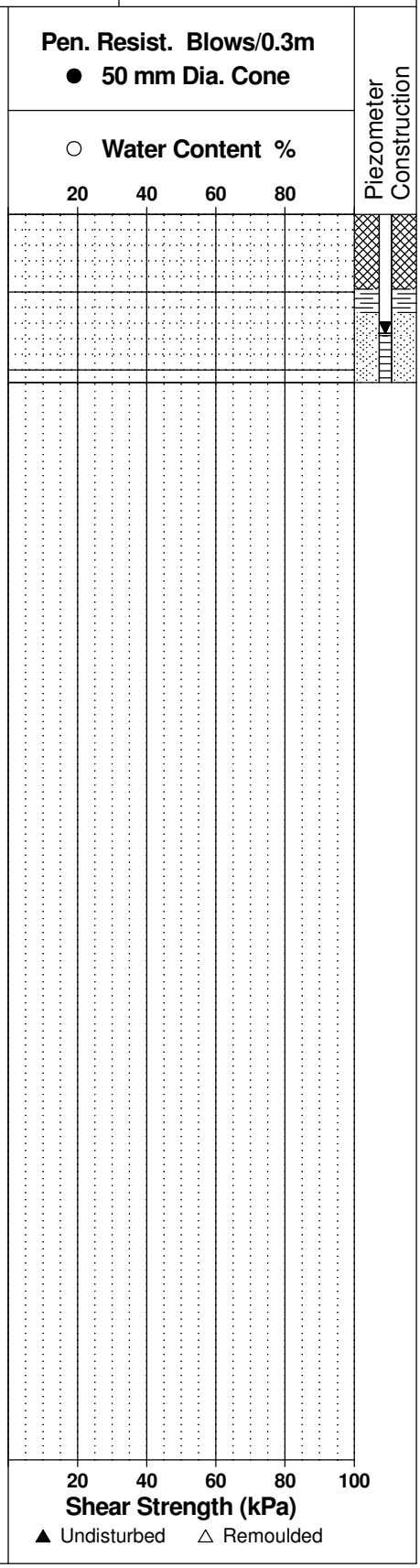
FILE NO. PG3130

REMARKS

HOLE NO. BH14-18

BORINGS BY CME 55 Power Auger **DATE** June 13, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
Brown **SILTY CLAY** with organics, some topsoil 0.18		AU	1			0	89.27		
		SS	2	75	13	1	88.27		
Very stiff, brown **SILTY CLAY**		SS	3	88	5				
2.16						2	87.27		
End of Borehole									
Practical refusal to augering at 2.16m depth									
(GWL @ 1.53m - July 20, 2018)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

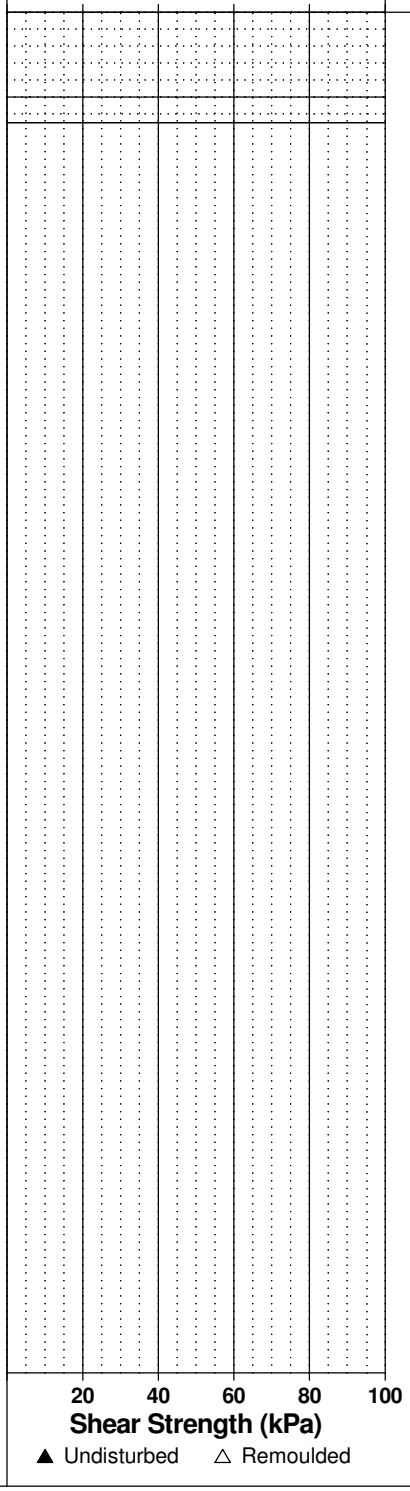
FILE NO. PG3130

REMARKS

HOLE NO. BH15-18

BORINGS BY CME 55 Power Auger **DATE** June 13, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
Brown **SILTY CLAY** with organics, some topsoil 0.13		AU	1			0	89.44		
Very stiff, brown **SILTY CLAY** 1.30		SS	2	90	11	1	88.44		
End of Borehole									
Practical refusal to augering at 1.30m depth									
(BH dry upon completion)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

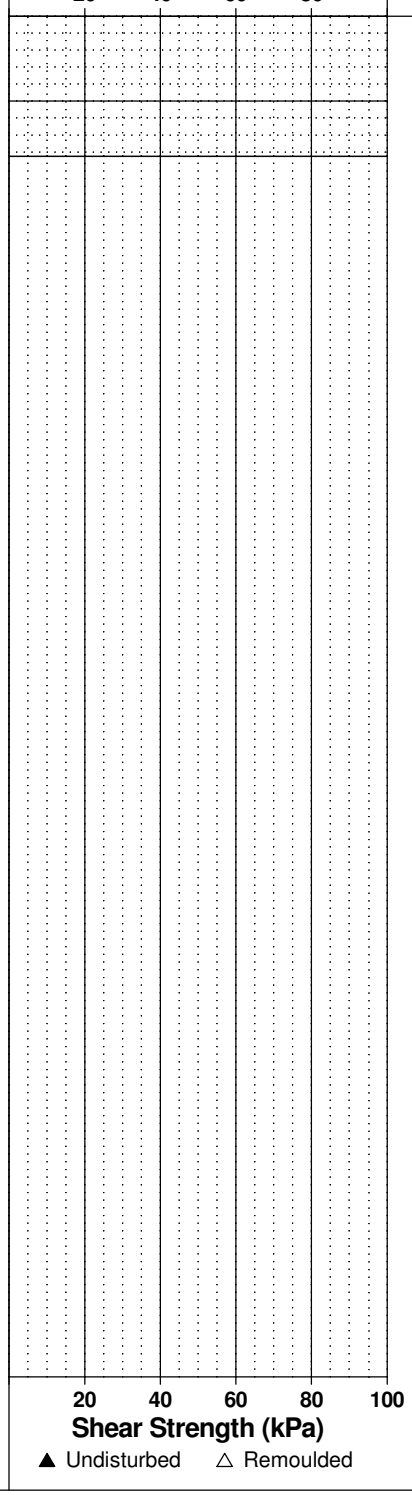
FILE NO. PG3130

REMARKS

HOLE NO. BH16-18

BORINGS BY CME 55 Power Auger **DATE** June 14, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
Brown **SILTY CLAY,** some organics, trace topsoil		AU	1			0	89.49		
0.10									
Very stiff, brown **SILTY CLAY**		SS	2		11	1	88.49		
1.65		SS	3		50+				
End of Borehole									
Practical refusal to augering at 1.65m depth									
(BH dry upon completion)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

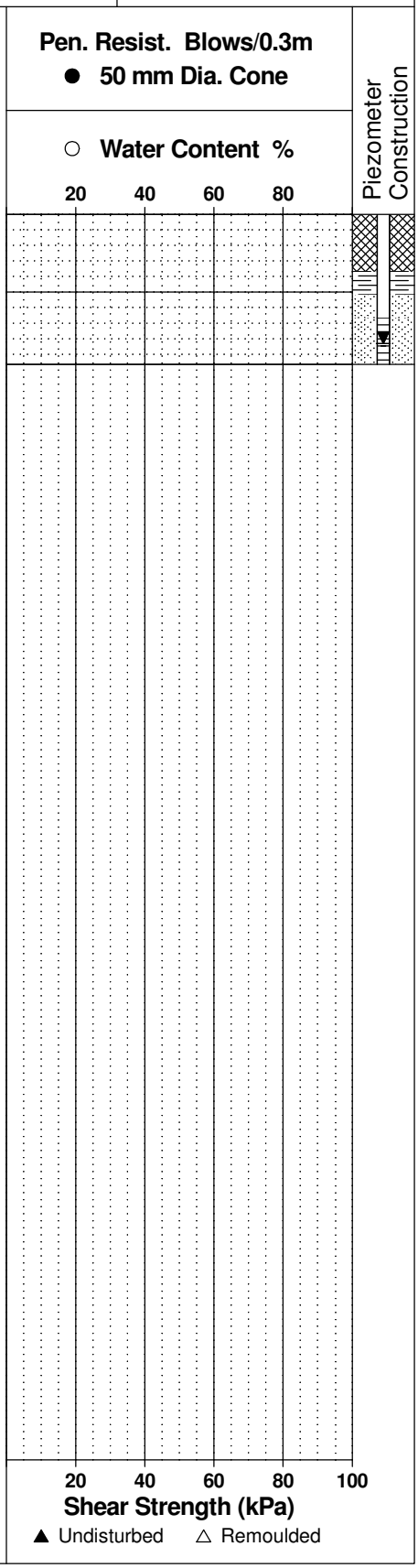
FILE NO. PG3130

REMARKS

HOLE NO. BH17-18

BORINGS BY CME 55 Power Auger **DATE** June 14, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.88
Brown **SILTY CLAY,** some organics, trace topsoil		AU	1				
0.10							
Very stiff, brown **SILTY CLAY**		SS	2	75	9	1	87.88
- trace sand by 1.7m depth		SS	3	88	7		
1.93							
End of Borehole							
Practical refusal to augering at 1.93m depth							
(GWL @ 1.66m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

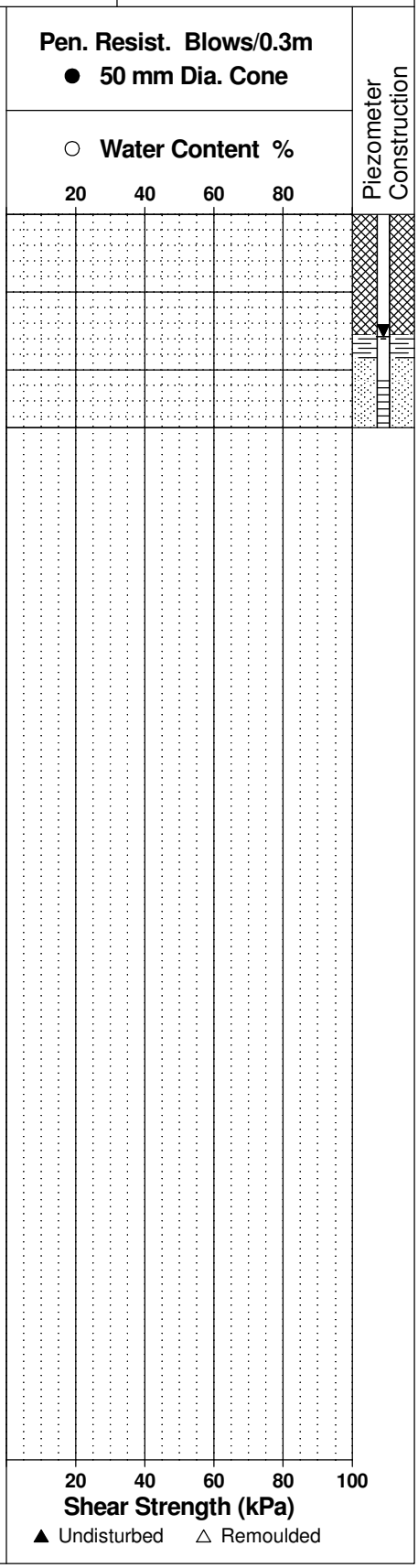
FILE NO. PG3130

REMARKS

HOLE NO. BH18-18

BORINGS BY CME 55 Power Auger **DATE** June 14, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.82
Topsoil & organics, some silty clay 0.18		AU	1				
		SS	2	71	10	1	87.82
Very stiff, brown **SILTY CLAY**		SS	3	83	9		
2.74		SS	4	100	50+	2	86.82
End of Borehole							
Practical refusal to augering at 2.74m depth							
(GWL @ 1.57m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

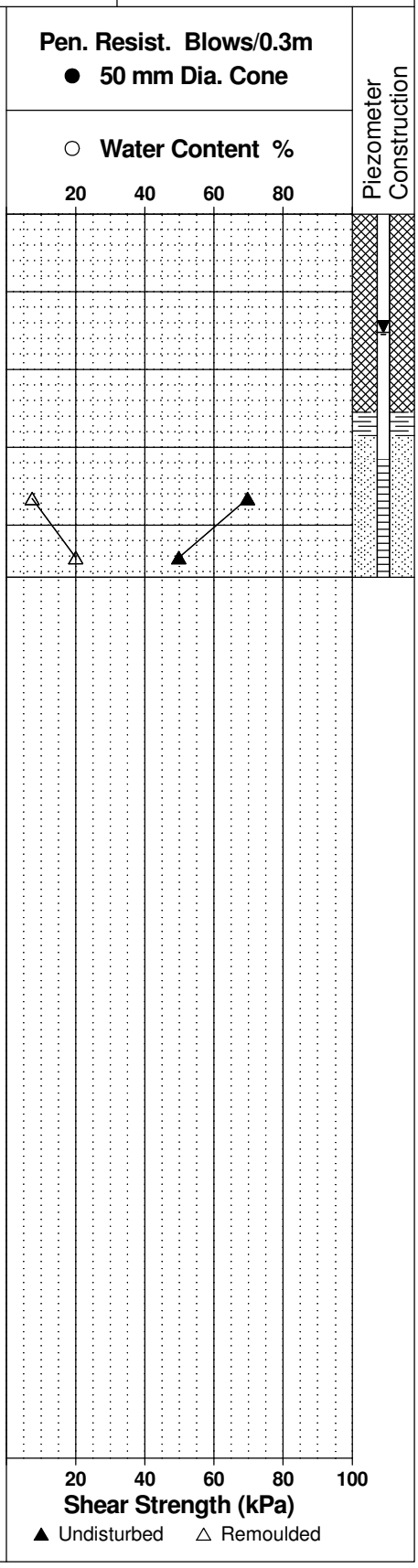
FILE NO. PG3130

REMARKS

HOLE NO. BH19-18

BORINGS BY CME 55 Power Auger **DATE** June 14, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.22
Brown **SILTY CLAY,** some organics, trace topsoil		AU	1				
0.10							
		SS	2	88	9	1	87.22
		SS	3	38	10	2	86.22
Very stiff to stiff, brown **SILTY CLAY**							
		SS	4	46	4	3	85.22
- stiff to firm and grey by 3.8m depth						4	84.22
4.67							
End of Borehole							
Practical refusal to augering at 4.67m depth							
(GWL @ 1.52m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

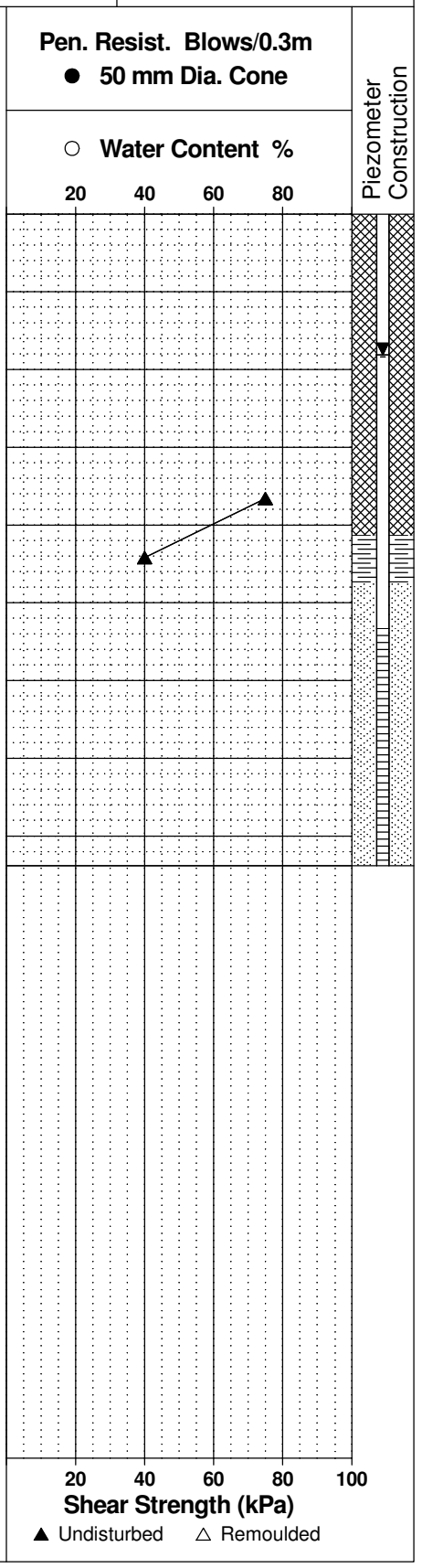
FILE NO. PG3130

REMARKS

HOLE NO. BH20-18

BORINGS BY CME 55 Power Auger **DATE** June 14, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.30
Brown **SILTY CLAY** with organics, trace topsoil 0.18		AU	1				
		SS	2	83	7	1	87.30
		SS	3	92	9	2	86.30
Very stiff to stiff, brown **SILTY CLAY**		SS	4	96	4		
						3	85.30
- stiff to firm and grey by 3.8m depth						4	84.30
		SS	5	96	W	5	83.30
		SS	6	96	1		
6.10						6	82.30
		SS	7		6		
GLACIAL TILL: Grey silty clay, some sand, trace gravel, cobbles, boulders						7	81.30
8.38						8	80.30
End of Borehole							
Practical refusal to augering at 8.38m depth							
(GWL @ 1.81m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

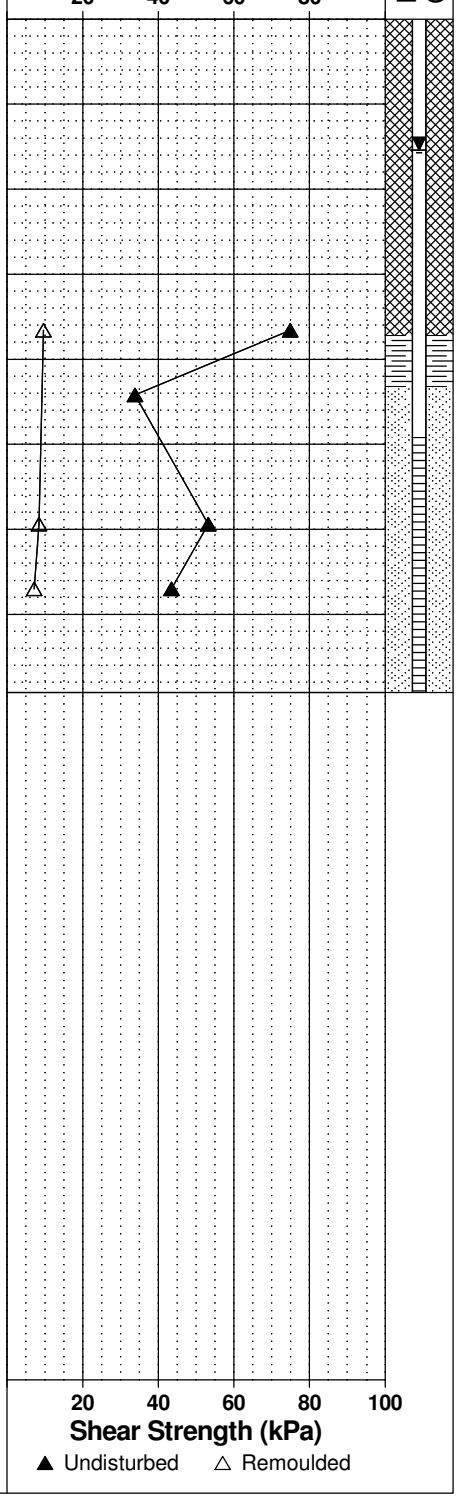
FILE NO. PG3130

REMARKS

HOLE NO. BH21-18

BORINGS BY CME 55 Power Auger **DATE** June 14, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.50
Brown **SILTY CLAY,** some organics, trace topsoil		AU	1				
0.10							
		SS	2	83	10	1	86.50
		SS	3	88	7	2	85.50
Very stiff to stiff, brown **SILTY CLAY**		SS	4		2		
						3	84.50
- firm and grey by 3.7m depth						4	83.50
		TW	5	83		5	82.50
						6	81.50
		SS	6	96	W	7	80.50
7.92		SS	7		50+		
End of Borehole							
Practical refusal to augering at 7.92m depth							
(GWL @ 1.54m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

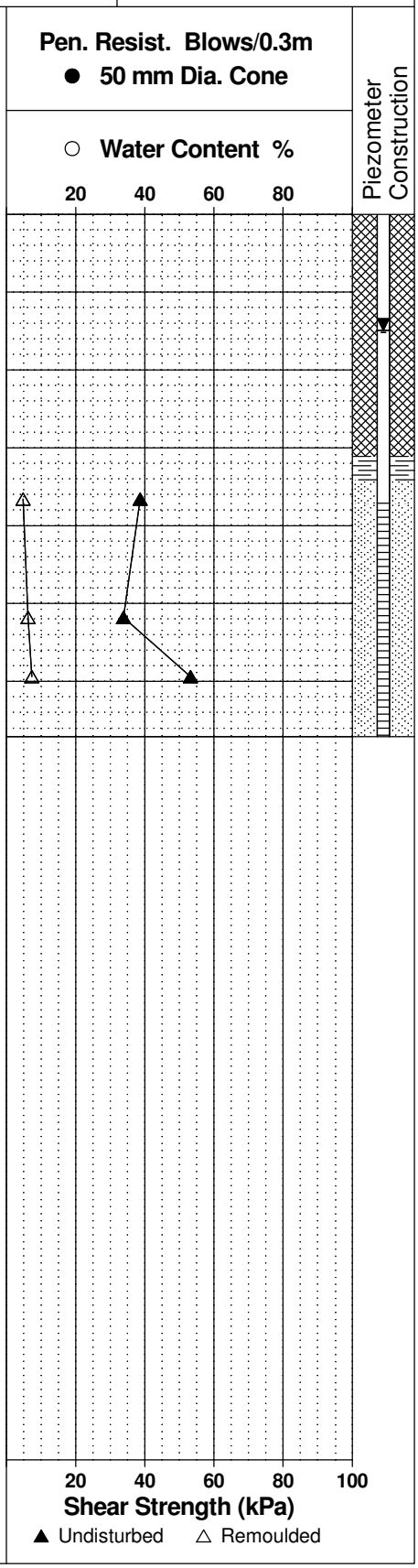
FILE NO. PG3130

REMARKS

HOLE NO. BH22-18

BORINGS BY CME 55 Power Auger **DATE** June 15, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.72
Brown **SILTY CLAY** with organics, trace topsoil 0.08		AU	1				
		SS	2	79	5	1	86.72
Very stiff to stiff, brown **SILTY CLAY**		SS	3	88	6	2	85.72
		SS	4	46	3		
- firm and grey by 3.0m depth						3	84.72
		TW	5	100		4	83.72
						5	82.72
6.20						6	81.72
GLACIAL TILL: Stiff, grey silty clay, trace sand and gravel 6.71		SS	6		11		
End of Borehole							
Practical refusal to augering at 6.71m depth							
(GWL @ 1.49m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

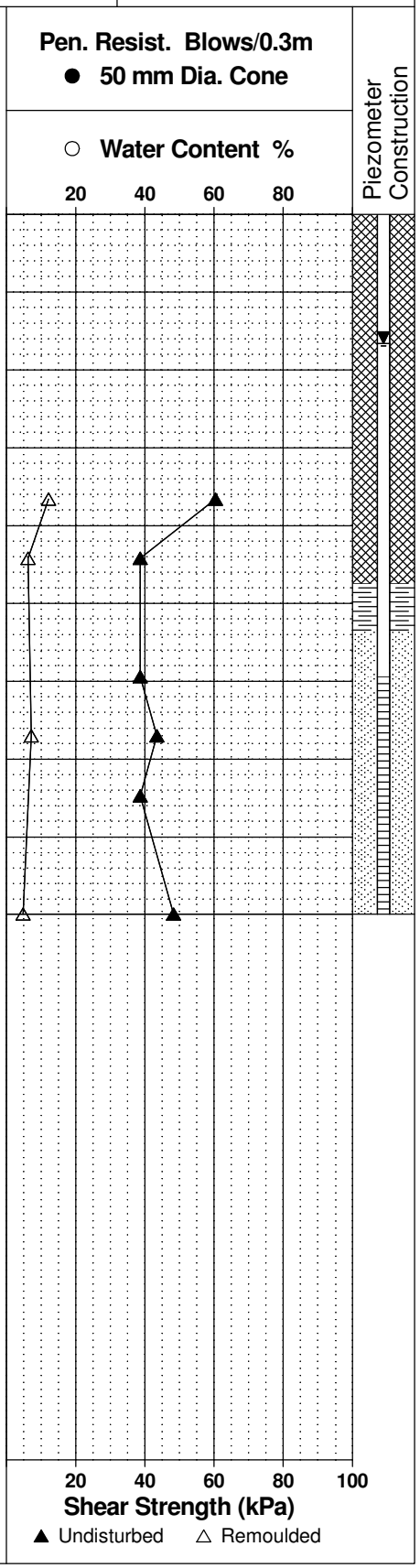
FILE NO. PG3130

REMARKS

HOLE NO. BH23-18

BORINGS BY CME 55 Power Auger **DATE** June 15, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.27
Brown **SILTY CLAY** with organics and topsoil 0.18		AU	1				
		SS	3	58	7	1	86.27
		SS	2	83	6		
		SS	4	96	3	2	85.27
Very stiff to stiff, brown **SILTY CLAY**						3	84.27
- firm and grey by 3.7m depth						4	83.27
		TW	5	98		5	82.27
						6	81.27
						7	80.27
		SS	6	100	W	8	79.27
8.99 End of Borehole							
(GWL @ 1.66m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

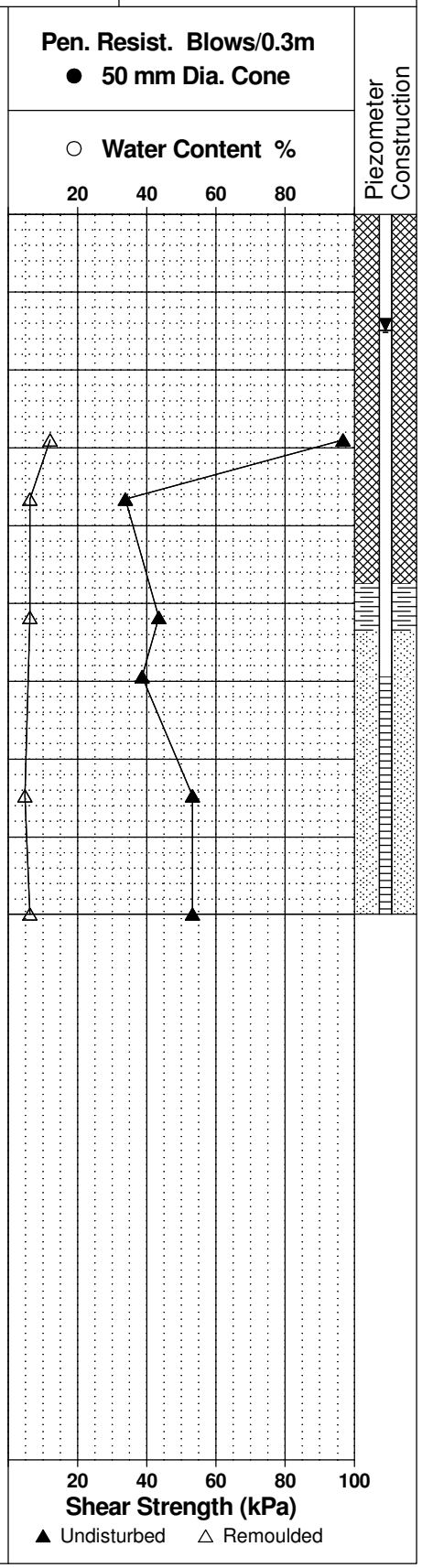
FILE NO. PG3130

REMARKS

HOLE NO. BH24-18

BORINGS BY CME 55 Power Auger **DATE** June 15, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.12
Brown **SILTY CLAY** with organics, trace topsoil 0.10		AU	1				
		SS	2	88	6	1	86.12
		SS	3	96	7	2	85.12
Very stiff to stiff, brown **SILTY CLAY**							
- firm and grey by 3.0m depth						3	84.12
		TW	4	100		4	83.12
						5	82.12
		SS	5	96	W	6	81.12
						7	80.12
		TW	6	96		8	79.12
8.99 End of Borehole							
(GWL @ 1.49m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

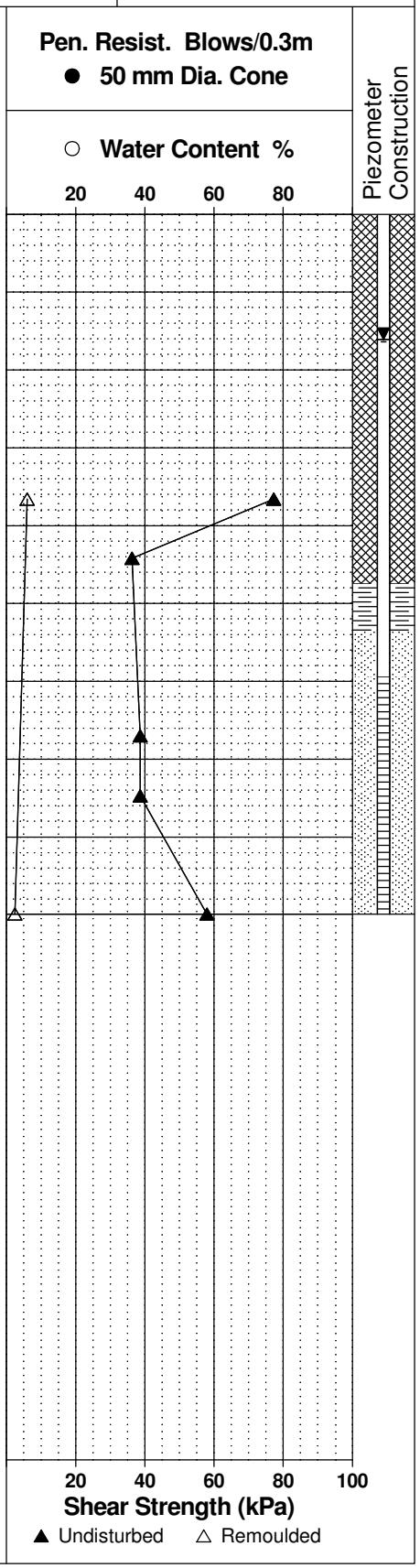
FILE NO. PG3130

REMARKS

HOLE NO. BH25-18

BORINGS BY CME 55 Power Auger **DATE** June 18, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.05
Brown **SILTY CLAY** with organics, trace topsoil (0.10)		AU	1				
		SS	2	79	8	1	86.05
		SS	3	92	10	2	85.05
		SS	4	92	3	3	84.05
Very stiff to stiff, brown **SILTY CLAY**							
- firm and grey by 3.7m depth						4	83.05
		TW	5	0		5	82.05
		TW	6	98		6	81.05
						7	80.05
		SS	7	92	W	8	79.05
(8.99) End of Borehole							
(GWL @ 1.61m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

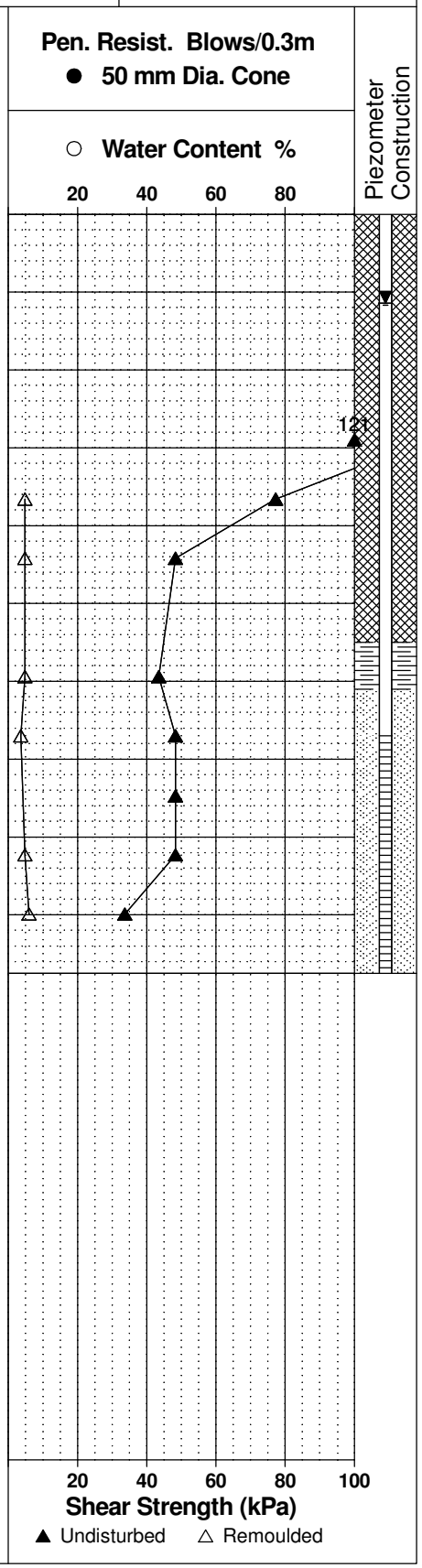
FILE NO. PG3130

REMARKS

HOLE NO. BH26-18

BORINGS BY CME 55 Power Auger **DATE** June 19, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	86.73
Brown **SILTY CLAY** with organics, some topsoil 0.10		AU	1				
		SS	2	83	6	1	85.73
		SS	3	96	6	2	84.73
Very stiff to stiff, brown **SILTY CLAY**						3	83.73
- firm and grey by 3.7m depth						4	82.73
		TW	4	92		5	81.73
						6	80.73
						7	79.73
						8	78.73
						9	77.73
9.75		SS	5	29	W		
End of Borehole							
(GWL @ 1.14m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

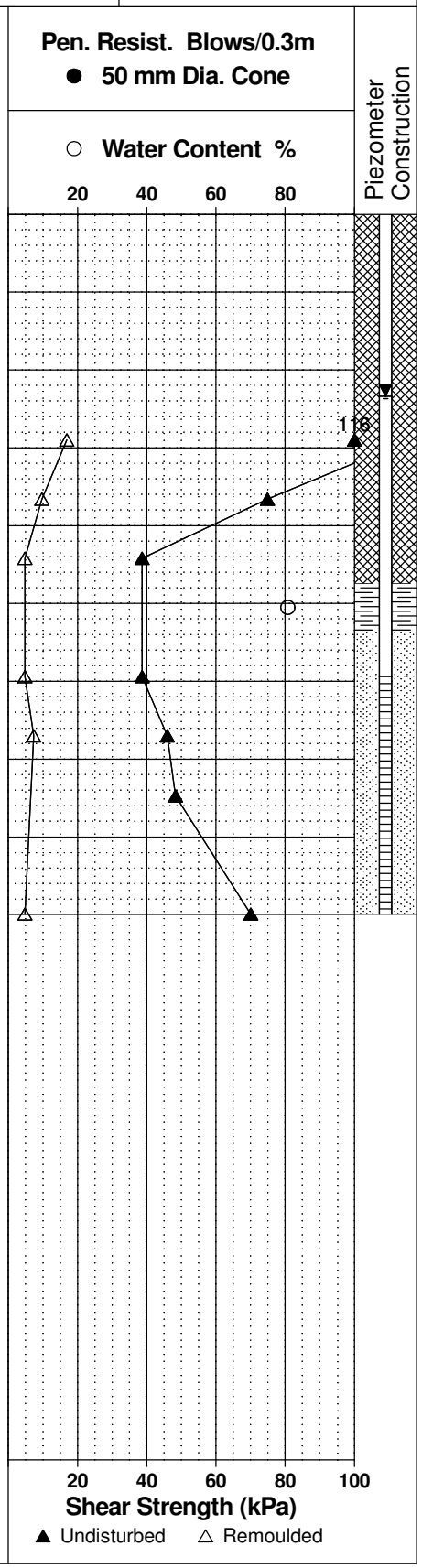
FILE NO. PG3130

REMARKS

HOLE NO. BH27-18

BORINGS BY CME 55 Power Auger **DATE** June 19, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	86.69
Brown **SILTY CLAY** with organics, trace topsoil 0.43		AU	1				
		SS	2	92	7	1	85.69
		SS	3	83	7	2	84.69
Very stiff to stiff, brown **SILTY CLAY**						3	83.69
- firm and grey by 3.7m depth						4	82.69
		TW	4	92		5	81.69
						6	80.69
						7	79.69
		SS	5	0	W	8	78.69
8.99 End of Borehole							
(GWL @ 2.34m - July 20, 2018)							



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

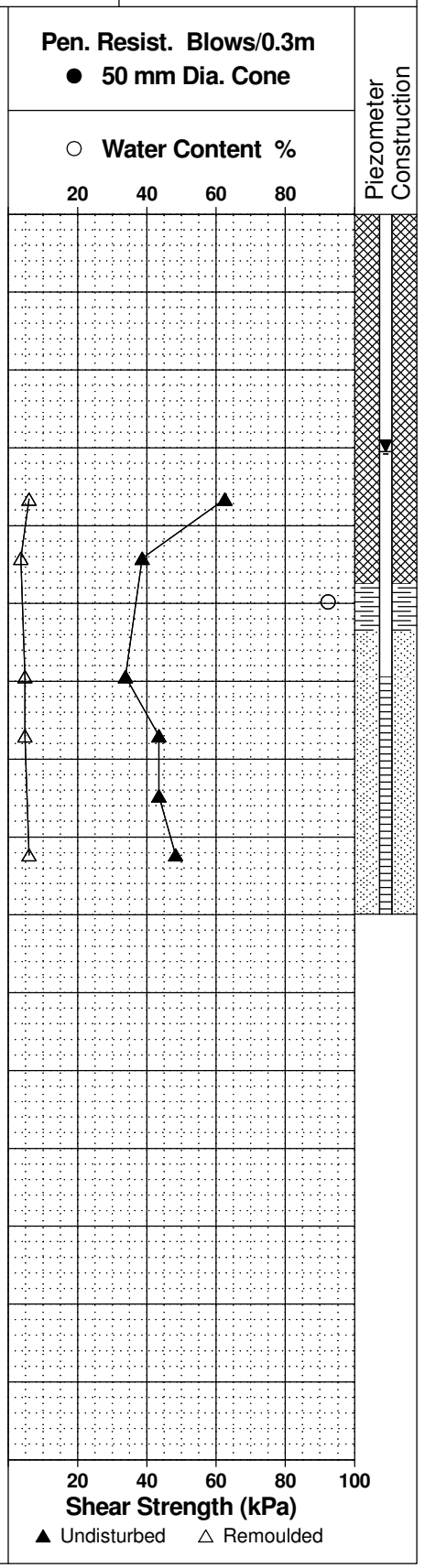
FILE NO. PG3130

REMARKS

HOLE NO. BH28-18

BORINGS BY CME 55 Power Auger **DATE** June 19, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	86.80
Brown **SILTY CLAY** with organics, trace topsoil 0.18		AU	1				
		SS	2	92	6	1	85.80
		SS	3	83	8	2	84.80
		SS	4	75	2	3	83.80
Very stiff to stiff, brown **SILTY CLAY**							
- firm and grey by 3.7m depth						4	82.80
		TW	5	100		5	81.80
						6	80.80
						7	79.80
						8	78.80
8.99		SS	6	92	W	9	77.80
Dynamic Cone Penetration Test commenced at 8.99m depth. Cone pushed to 21.6m depth.						10	76.80
						11	75.80
						12	74.80
						13	73.80
						14	72.80
						15	71.80
						16	70.80



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

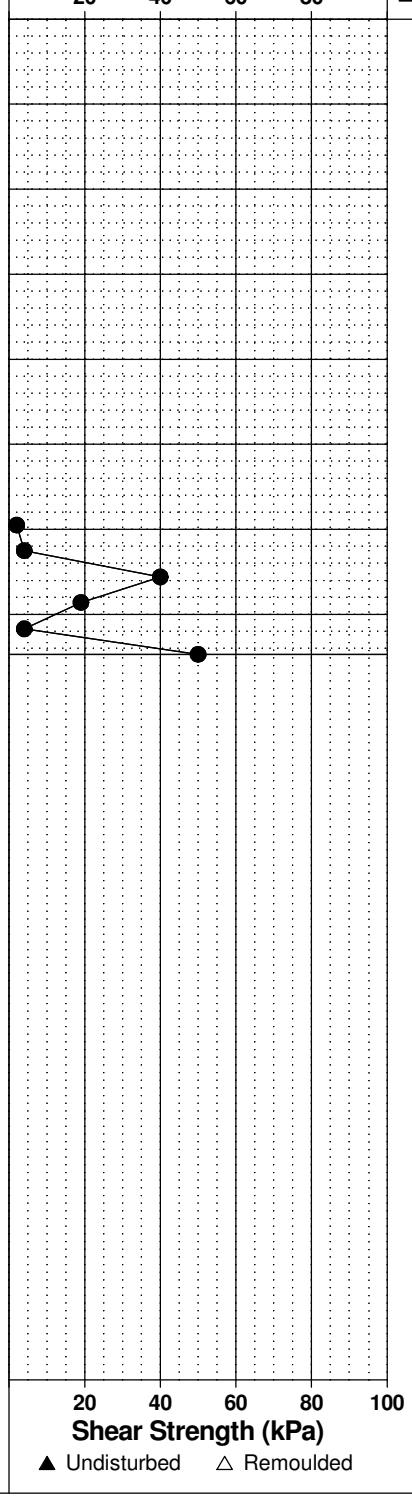
FILE NO. PG3130

REMARKS

HOLE NO. BH28-18

BORINGS BY CME 55 Power Auger **DATE** June 19, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
						16	70.80		
						17	69.80		
						18	68.80		
						19	67.80		
						20	66.80		
						21	65.80		
						22	64.80		
						23	63.80		
23.47									
End of Borehole Practical DCPT refusal at 23.47m depth. (GWL @ 3.05m - July 20, 2018)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

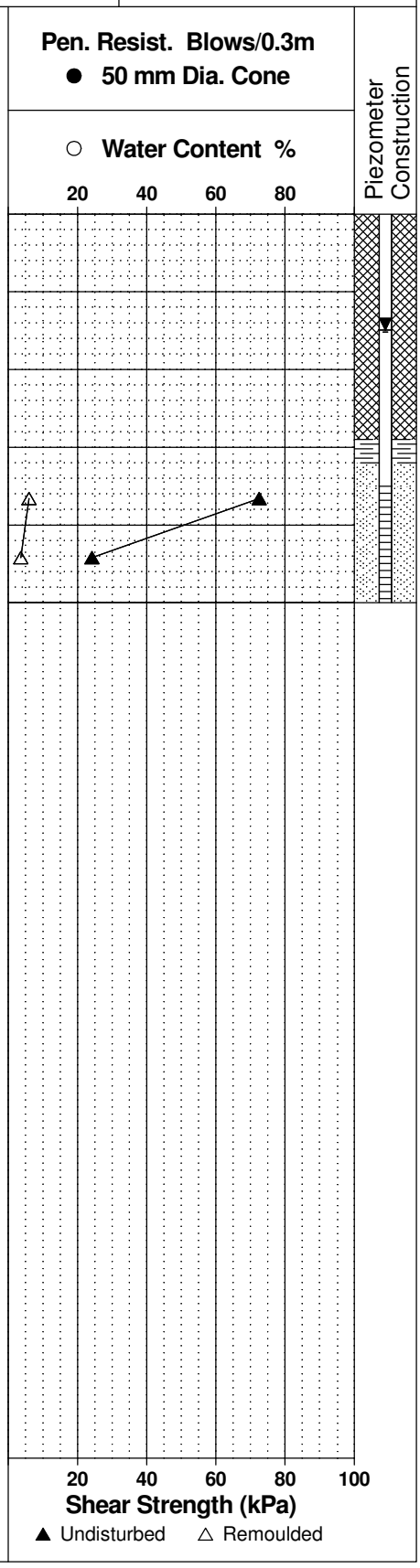
FILE NO. PG3130

REMARKS

HOLE NO. BH29-18

BORINGS BY CME 55 Power Auger **DATE** June 20, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.90
Brown **SILTY CLAY** with organics, trace topsoil 0.15		AU	1				
		SS	2	83	14	1	86.90
		SS	3	96	7	2	85.90
Very stiff to stiff, brown **SILTY CLAY**		SS	4	92	3		
- firm and grey by 3.7m depth						3	84.90
5.00		TW	5	29		4	83.90
End of Borehole						5	82.90
Practical refusal to augering at 5.00m depth							
(GWL @ 1.49m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

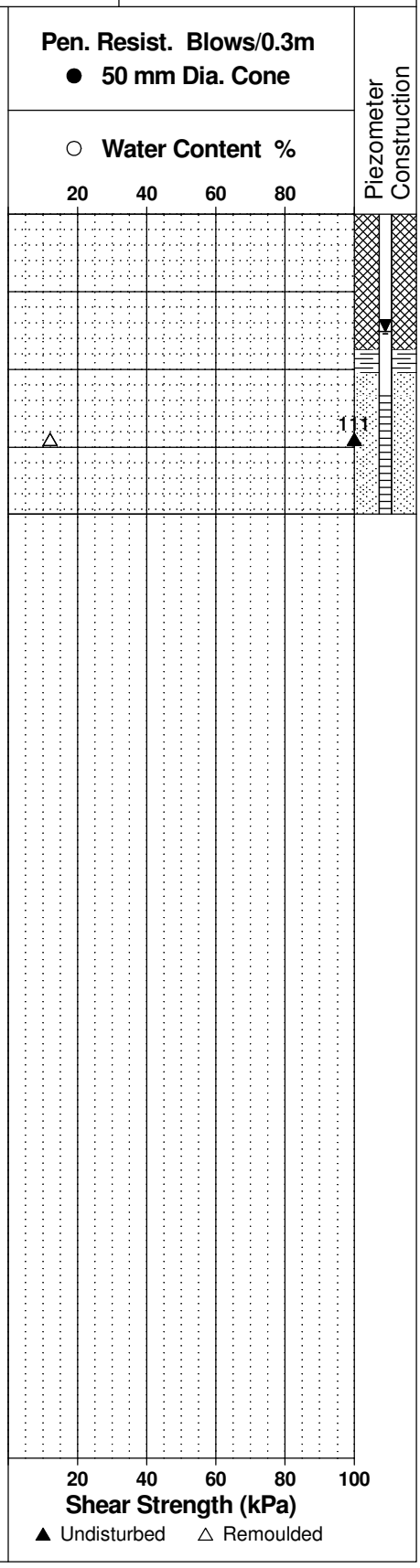
FILE NO. PG3130

REMARKS

HOLE NO. BH30-18

BORINGS BY CME 55 Power Auger **DATE** June 20, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.40
Topsoil & organics, trace silty clay 0.18		AU	1				
Very stiff to stiff, brown **SILTY CLAY**		SS	2	83	7	1	87.40
		SS	3	88	10	2	86.40
- stiff and grey by 3.0m depth							
		SS	4	96	3	3	85.40
3.86		SS	5	0	50+		
End of Borehole							
Practical refusal to augering at 3.86m depth							
(GWL @ 1.51m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

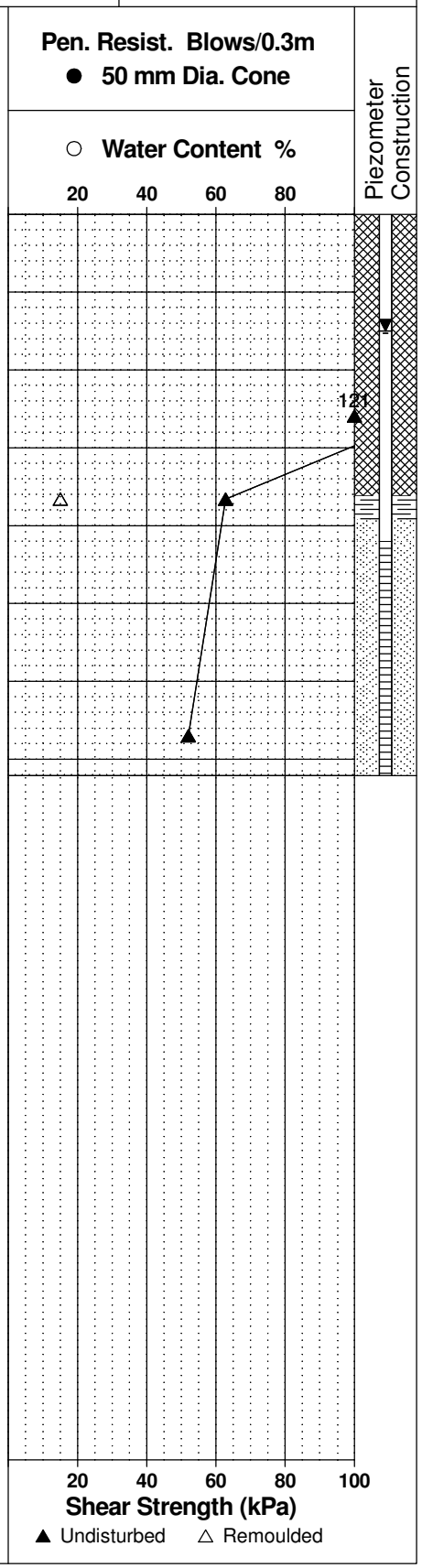
FILE NO. PG3130

REMARKS

HOLE NO. BH31-18

BORINGS BY CME 55 Power Auger **DATE** June 20, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.12
Brown **SILTY CLAY** with organics &topsoil		AU	1				
		SS	2	83	10	1	87.12
		SS	3	96	9	2	86.12
Very stiff to stiff, brown **SILTY CLAY**							
- firm and grey by 3.7m depth						3	85.12
		SS	4	0	W	4	84.12
		SS	5	96	1	5	83.12
		SS	6	100	W		
6.02						6	82.12
GLACIAL TILL: Stiff, grey silty clay, trace sand and gravel							
7.21						7	81.12
End of Borehole							
Practical refusal to augering at 7.21m depth							
(GWL @ 1.50m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

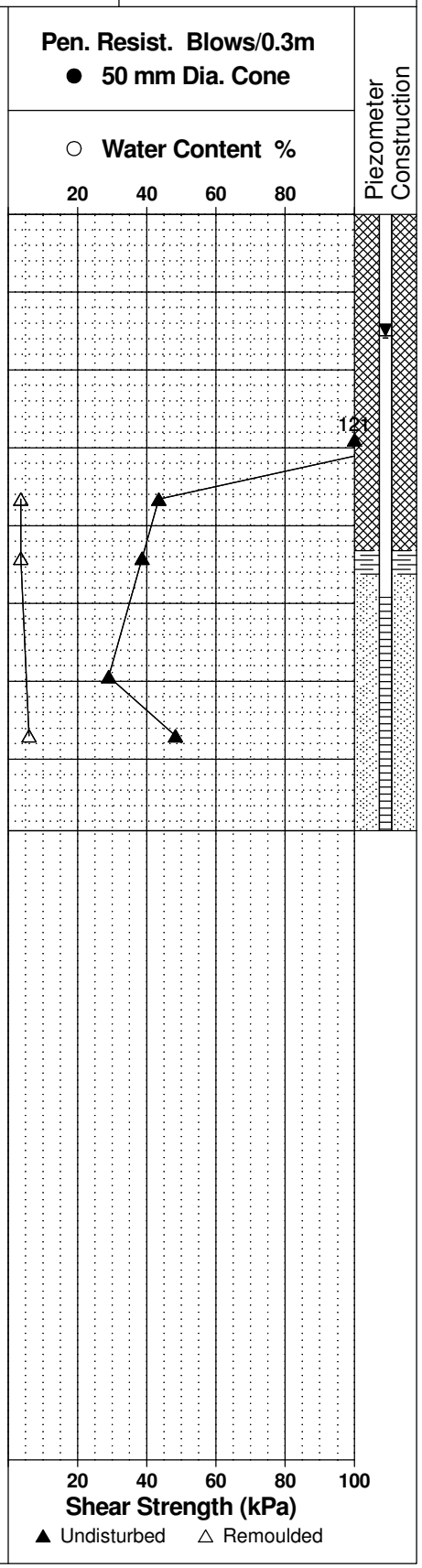
FILE NO. PG3130

REMARKS

HOLE NO. BH32-18

BORINGS BY CME 55 Power Auger **DATE** June 20, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
Topsoil with organics, some silty clay 0.20		AU	1			0	87.85
		SS	2	54	8	1	86.85
		SS	3	92	9	2	85.85
Very stiff to stiff, brown **SILTY CLAY**						3	84.85
- firm and grey by 3.7m depth						4	83.85
		TW	4	100		5	82.85
6.70						6	81.85
GLACIAL TILL: Grey silty clay, some gravel, cobbles and boulders		SS	5	83	W	7	80.85
7.92		SS	6	100	50+		
End of Borehole							
Practical refusal to augering at 7.92m depth							
(GWL @ 1.56m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

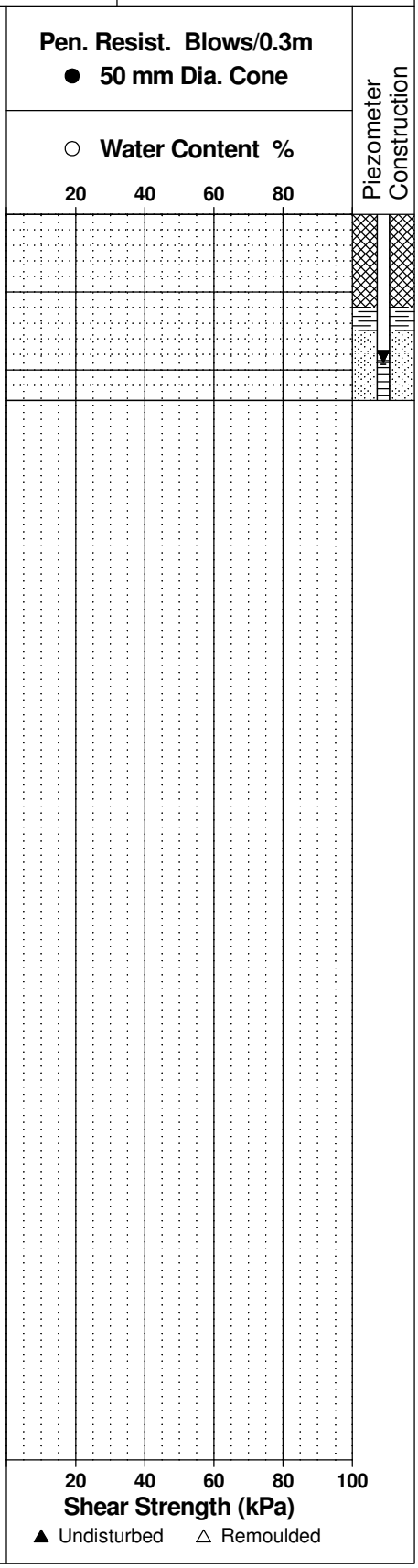
FILE NO. PG3130

REMARKS

HOLE NO. BH33-18

BORINGS BY CME 55 Power Auger **DATE** June 20, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.41
Topsoil & organics 0.30		AU	1				
		SS	2	79	10	1	87.41
Very stiff, brown **SILTY CLAY**		SS	3	96	8	2	86.41
2.39		SS	4	36	50+		
End of Borehole							
Practical refusal to augering at 2.39m depth							
(GWL @ 1.90m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

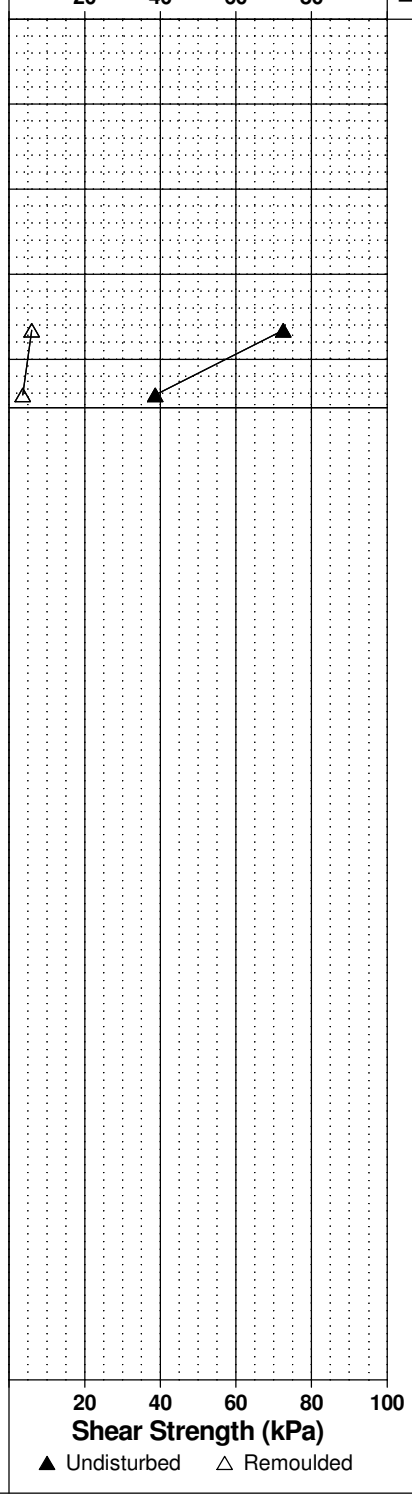
FILE NO. PG3130

REMARKS

HOLE NO. BH34-18

BORINGS BY CME 55 Power Auger **DATE** June 21, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.08		
Brown **SILTY CLAY** with organics & topsoil (0.23)		AU	1						
		SS	2	83	12	1	87.08		
		SS	3	79	7	2	86.08		
Very stiff to stiff, brown **SILTY CLAY**		SS	4	92	3				
						3	85.08		
- firm and grey by 3.7m depth						4	84.08		
(4.57)									
End of Borehole									
Practical refusal to augering at 4.57m depth									
(GWL @ 1.52m - July 20, 2018)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

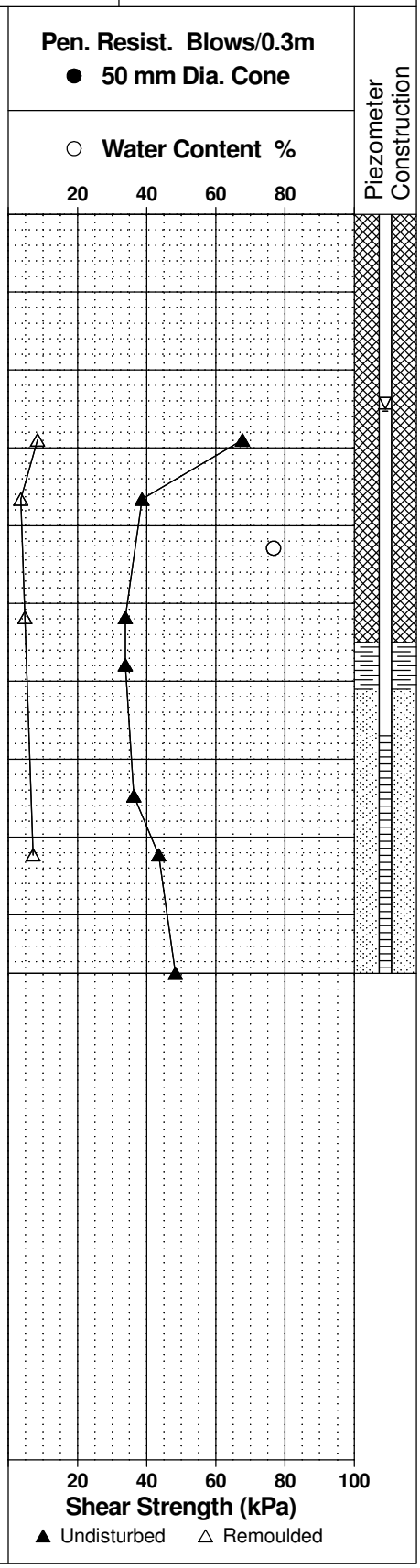
FILE NO. PG3130

REMARKS

HOLE NO. BH35-18

BORINGS BY CME 55 Power Auger **DATE** June 22, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.81
Brown **SILTY CLAY** with organics, some topsoil 0.30		AU	1				
		SS	2	71	10	1	86.81
		SS	3	88	7	2	85.81
Very stiff to stiff, brown **SILTY CLAY**							
- firm and grey by 3.0m depth						3	84.81
		TW	4	100		4	83.81
						5	82.81
		SS	5	96	W	6	81.81
						7	80.81
		SS	6	96	W	8	79.81
						9	78.81
9.75 End of Borehole							
(Piezometer dry - July 20, 2018)							
(GWL @ 2.5m depth based on field observations)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

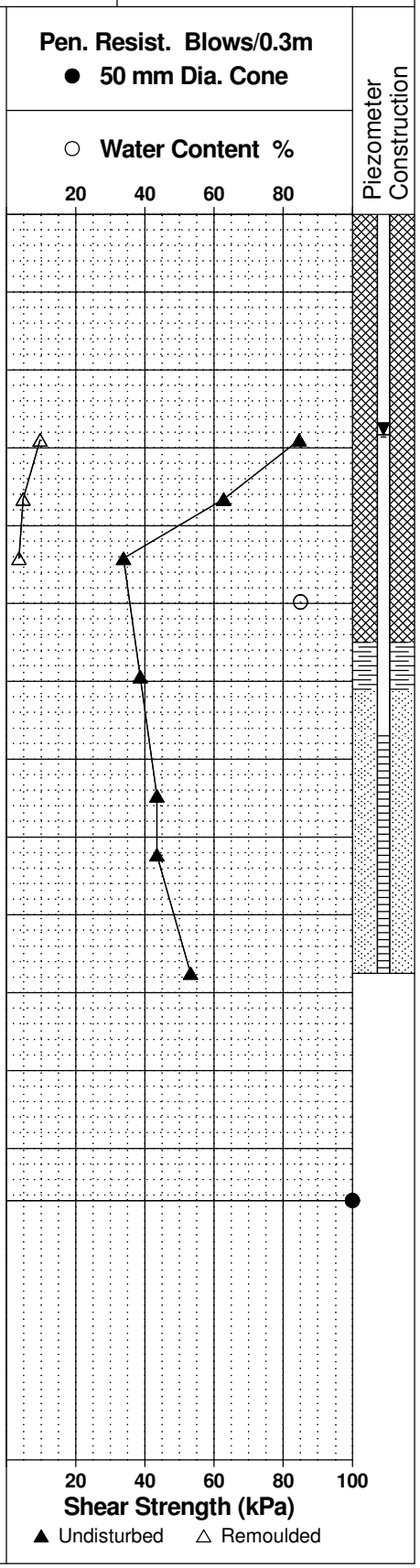
FILE NO. PG3130

REMARKS

HOLE NO. BH36-18

BORINGS BY CME 55 Power Auger **DATE** June 22, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.44
Brown **SILTY CLAY** with organics, some topsoil 0.23		AU	1				
		SS	2	75	9	1	86.44
		SS	3	96	7	2	85.44
Very stiff to stiff, brown **SILTY CLAY**						3	84.44
- firm and grey by 3.7m depth						4	83.44
		TW	4	100		5	82.44
		SS	5	92	W	6	81.44
						7	80.44
						8	79.44
		SS	6	96	W	9	78.44
9.75							
Dynamic Cone Penetration Test commenced at 9.75m depth. Cone pushed to 12.6m depth.						10	77.44
						11	76.44
						12	75.44
12.67							
End of Borehole							
Practical DCPT refusal at 12.67m depth							
(GWL @ 2.83m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

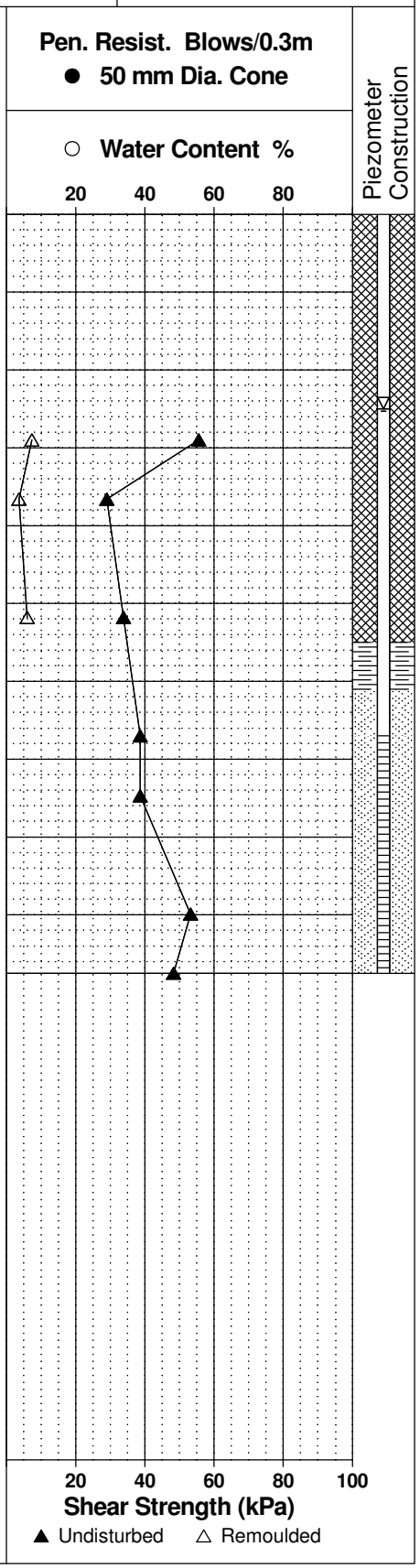
FILE NO. PG3130

REMARKS

HOLE NO. BH37-18

BORINGS BY CME 55 Power Auger **DATE** June 22, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.83
Brown **SILTY CLAY** with organics, some topsoil 0.43		AU	1				
		SS	2	83	7	1	86.83
		SS	3	96	2	2	85.83
Very stiff to stiff, brown **SILTY CLAY**							
- firm and grey by 2.7m depth						3	84.83
		TW	4	100		4	83.83
		SS	5	96	W	5	82.83
						6	81.83
						7	80.83
		SS	6	96	W	8	79.83
						9	78.83
9.75							
End of Borehole							
(Piezometer blocked at 2.78m depth - July 20, 2018)							
(GWL @ 2.5m depth based on field observations)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

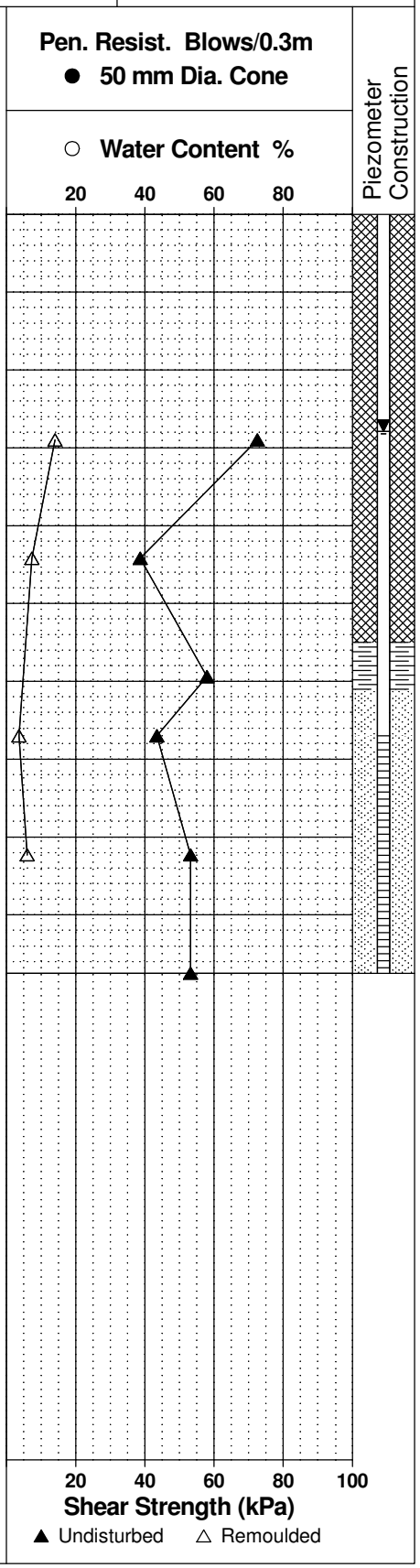
FILE NO. PG3130

REMARKS

HOLE NO. BH38-18

BORINGS BY CME 55 Power Auger **DATE** June 22, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.50
Topsoil & organics, some silty clay 0.30		AU	1				
		SS	2	96	7	1	86.50
		SS	3	96	5	2	85.50
Very stiff to stiff, brown **SILTY CLAY**							
- firm and grey by 3.0m depth		SS	4		W	3	84.50
		TW	5	100		4	83.50
						5	82.50
						6	81.50
		SS	6		W	7	80.50
						8	79.50
		SS	7	96	W	9	78.50
9.75 End of Borehole							
(GWL @ 2.79m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

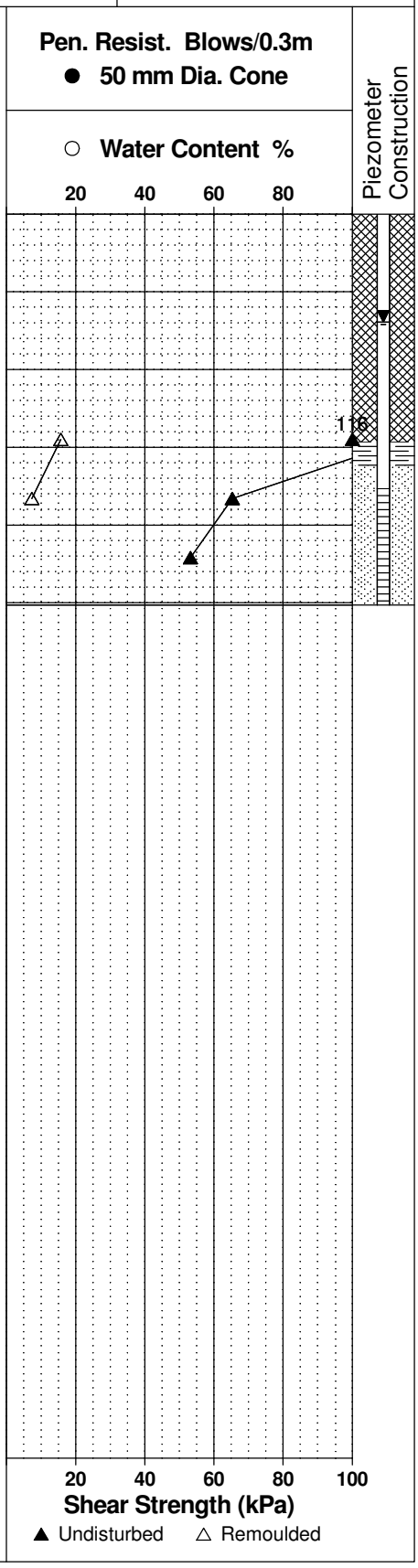
FILE NO. PG3130

REMARKS

HOLE NO. BH39-18

BORINGS BY CME 55 Power Auger **DATE** June 22, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.36
Topsoil & organics, some silty clay 0.30		AU	1				
		SS	2	71	9	1	87.36
		SS	3	88	9	2	86.36
Very stiff to stiff, brown **SILTY CLAY**							
- grey by 3.7m depth						3	85.36
4.50						4	84.36
GLACIAL TILL: Stiff, grey silty clay, trace sand, gravel, occ. cobbles & boulders 5.03		SS	4	78	50+	5	83.36
End of Borehole							
Practical refusal to augering at 5.03m depth							
(GWL @ 1.39m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

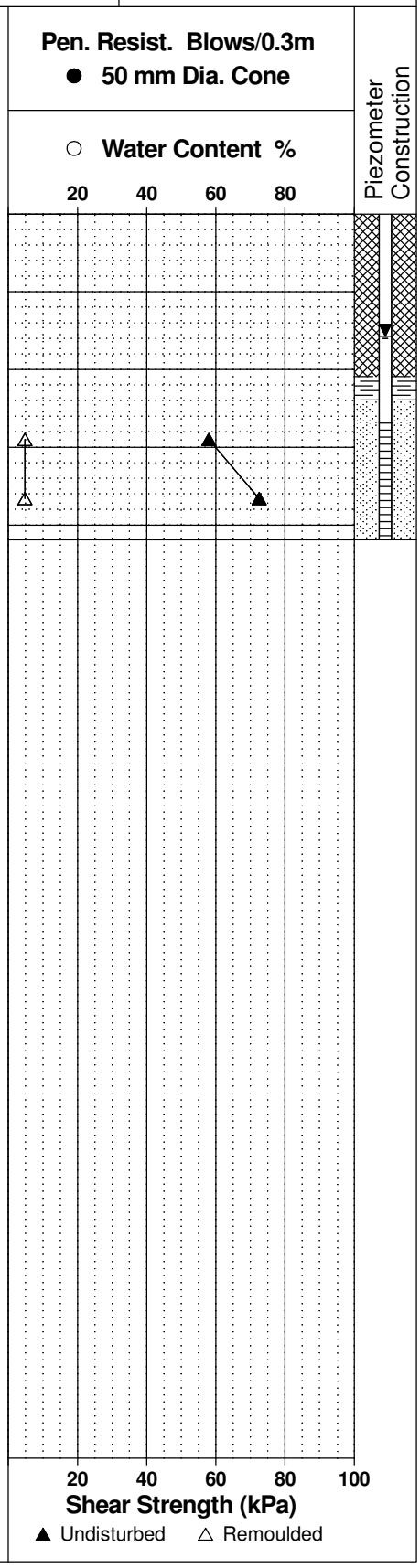
FILE NO. PG3130

REMARKS

HOLE NO. BH40-18

BORINGS BY CME 55 Power Auger **DATE** June 22, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.59
Brown **SILTY CLAY** with organics, some topsoil 0.28		AU	1				
		SS	2	88	8	1	87.59
Very stiff to stiff, brown **SILTY CLAY**		SS	3	92	7	2	86.59
						3	85.59
3.73							
GLACIAL TILL: Grey silty clay, some gravel, occ. cobbles, boulders 4.19		SS	4	53	50+	4	84.59
End of Borehole							
Practical refusal to augering at 4.19m depth							
(GWL @ 1.57m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

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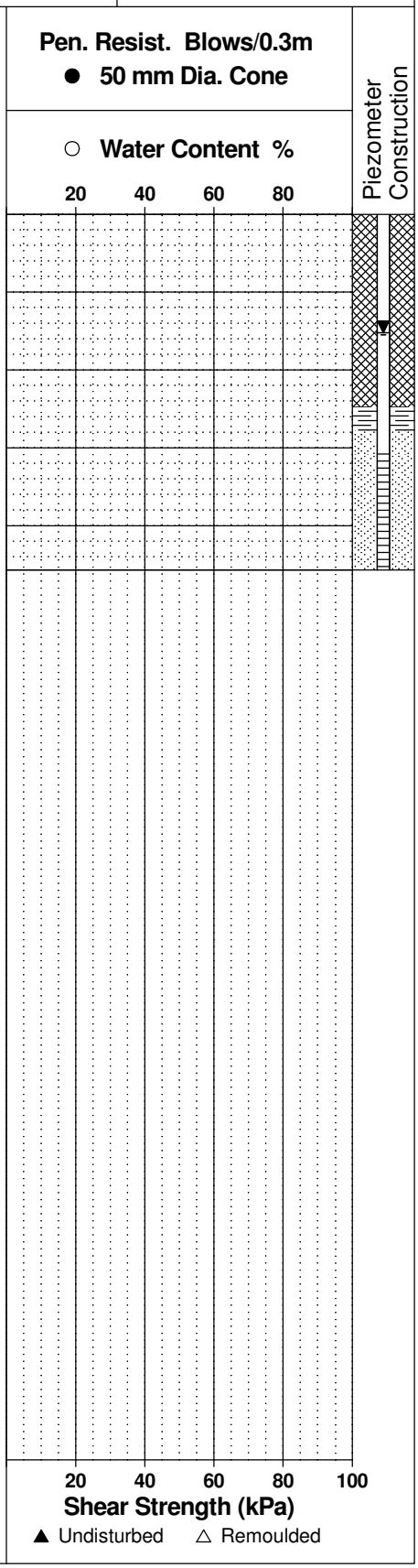
FILE NO. PG3130

REMARKS

HOLE NO. BH41-18

BORINGS BY CME 55 Power Auger **DATE** June 22, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.62
Brown **SILTY CLAY** with organics, some topsoil 0.33		AU	1				
Very stiff to stiff, brown **SILTY CLAY**		SS	2	58	12	1	87.62
		SS	3	88	5		
- stiff and grey by 2.2m depth						2	86.62
2.97		SS	4	33	2		
		SS	5	29	6	3	85.62
GLACIAL TILL: Grey silty clay, some gravel, cobbles, boulders		SS	6	54	13		
4.57						4	84.62
End of Borehole							
Practical refusal to augering at 4.57m depth							
(GWL @ 1.52m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

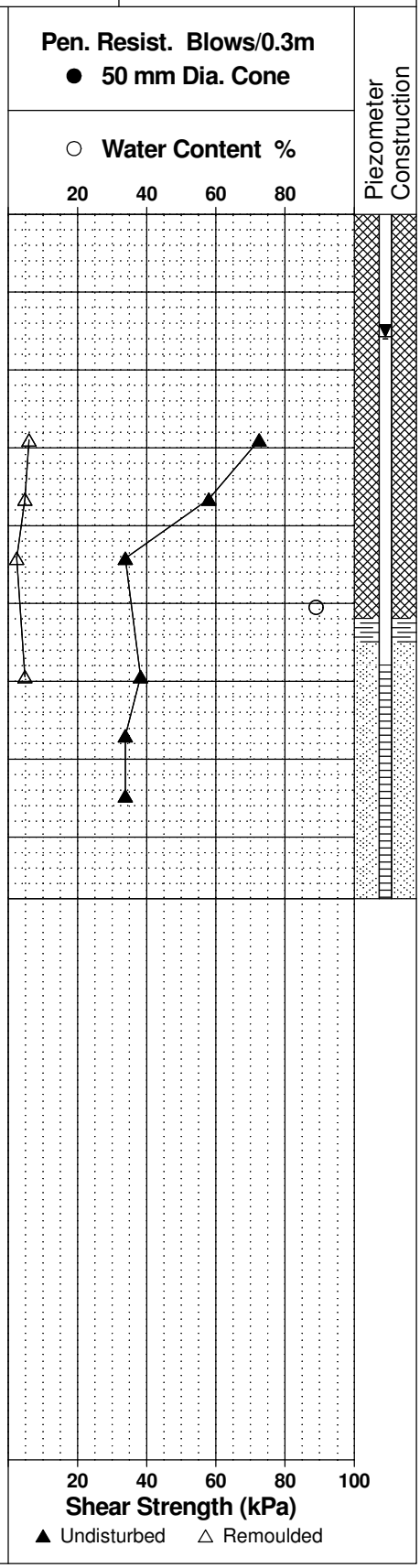
FILE NO. PG3130

REMARKS

HOLE NO. BH42-18

BORINGS BY CME 55 Power Auger **DATE** June 22, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.96
Topsoil & organics, some silty clay 0.30		AU	1				
		SS	2	54	10	1	86.96
		SS	3	92	6	2	85.96
Very stiff to stiff, brown **SILTY CLAY**						3	84.96
- firm and grey by 3.7m depth						4	83.96
		TW	4	100		5	82.96
						6	81.96
						7	80.96
		SS	5	96	W	8	79.96
8.46							
GLACIAL TILL: Grey silty clay, some sand, gravel, cobbles, boulders 8.79		SS	6	50	50+		
End of Borehole							
Practical refusal to augering at 8.79m depth							
(GWL @ 1.57m - July 20, 2018)							



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

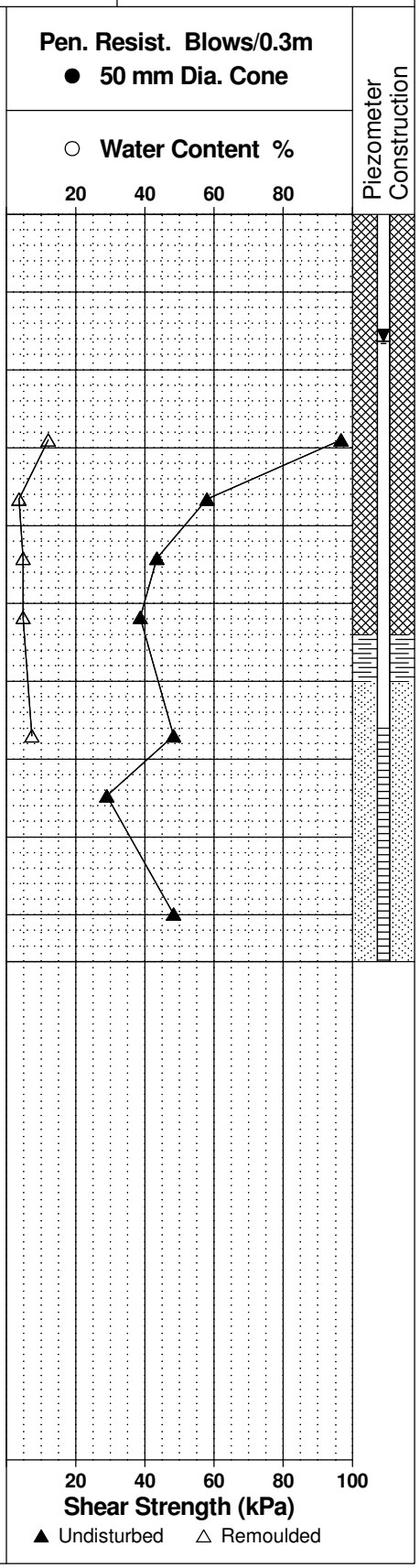
FILE NO. PG3130

REMARKS

HOLE NO. BH43-18

BORINGS BY CME 55 Power Auger **DATE** June 26, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.92
Brown **SILTY CLAY** with organics, some topsoil 0.30		AU	1				
		SS	2	67	12	1	86.92
		SS	3	17	10	2	85.92
Very stiff to stiff, brown **SILTY CLAY**						3	84.92
- firm and grey by 3.7m depth						4	83.92
		TW	4	100		5	82.92
						6	81.92
						7	80.92
		SS	5	96	W	8	79.92
9.14							
GLACIAL TILL: Stiff, grey silty clay, trace gravel, occ. cobbles, boulders 9.60		SS	6	51	5	9	78.92
End of Borehole							
Practical refusal to augering at 9.60m depth							
(GWL @ 1.63m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

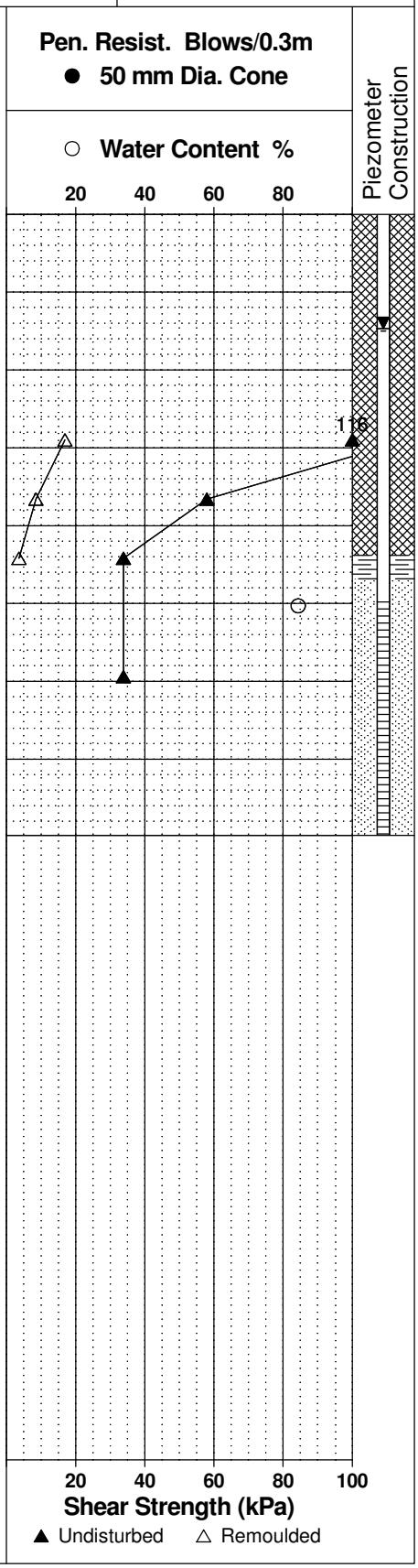
FILE NO. PG3130

REMARKS

HOLE NO. BH44-18

BORINGS BY CME 55 Power Auger **DATE** June 26, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.02
Brown **SILTY CLAY,** some topsoil, organics 0.13		AU	1				
		SS	2	79	6	1	87.02
		SS	3	88	4	2	86.02
Very stiff to stiff, brown **SILTY CLAY**							
						3	85.02
- firm and grey by 3.7m depth						4	84.02
		TW	4	100		5	83.02
6.02							
		SS	5	67	56	6	82.02
GLACIAL TILL: Hard, grey silty clay, some sand, gravel, occasional cobbles, boulders		SS	6	71	6	7	81.02
7.98		SS	7	44	50+		
End of Borehole							
Practical refusal to augering at 7.98m depth							
(GWL @ 1.47m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community (EUC) Mixed-Use CDP
Mer Bleue Road, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Limited.

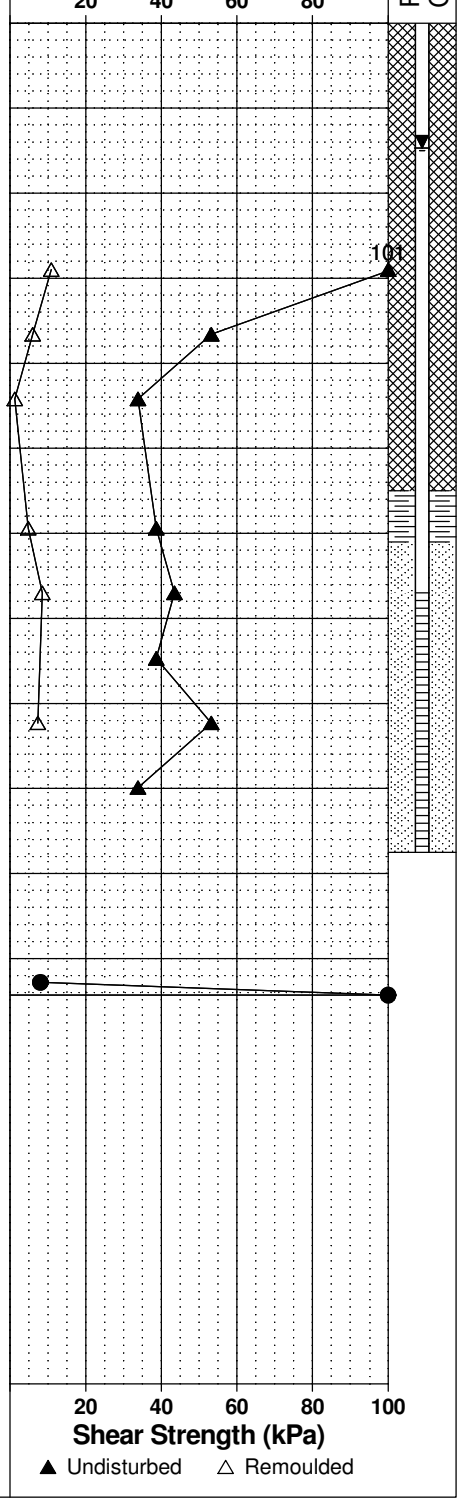
FILE NO. PG3130

REMARKS

HOLE NO. BH45-18

BORINGS BY CME 55 Power Auger **DATE** June 26, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.95
FILL: Crushed stone 0.15		AU	1				
Brown **SILTY CLAY** with organics, trace topsoil 0.33		SS	2	71	10	1	86.95
		SS	3	58	10	2	85.95
Very stiff to stiff, brown **SILTY CLAY**						3	84.95
- firm and grey by 3.7m depth						4	83.95
		TW	4	100		5	82.95
						6	81.95
						7	80.95
						8	79.95
						9	78.95
9.75		SS	5	96	W		
Dynamic Cone Penetration Test commenced at 9.75m depth. Cone pushed to 11.0m depth.						10	77.95
11.43						11	76.95
End of Borehole							
Practical DCPT refusal at 11.43m depth.							
(GWL @ 1.47m - July 20, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community - Navan Road
Ottawa, Ontario

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

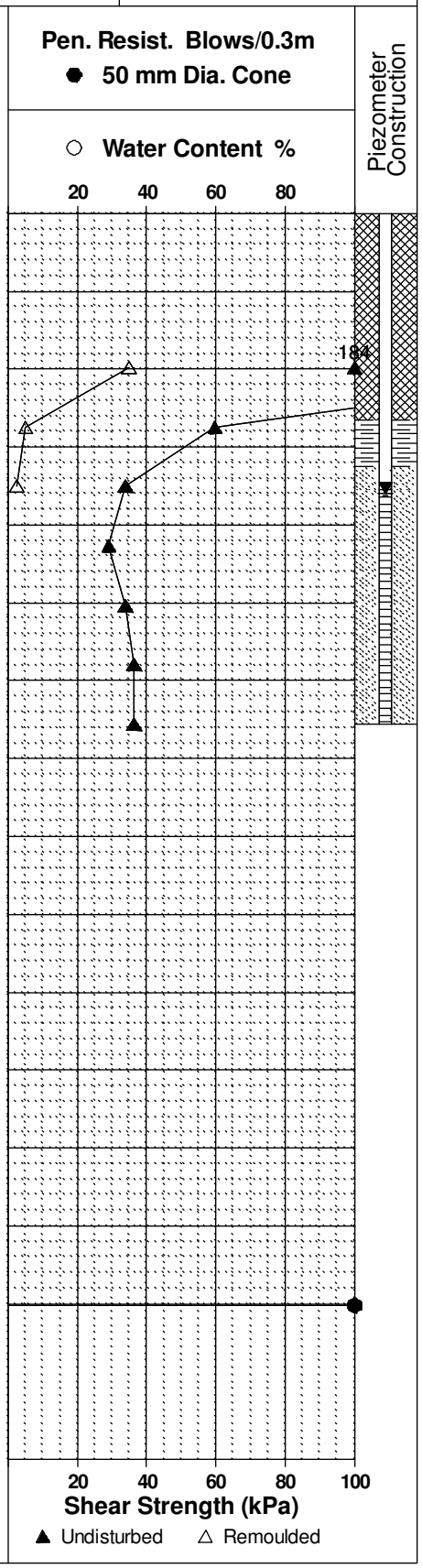
FILE NO. PG3130

REMARKS

HOLE NO. BH 1-14

BORINGS BY CME 55 Power Auger **DATE** September 12, 2014

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.68
TOPSOIL 0.28		AU	1				
		SS	2	83	9	1	86.68
Very stiff to stiff, brown **SILTY CLAY**						2	85.68
- firm and grey by 2.9m depth						3	84.68
						4	83.68
						5	82.68
						6	81.68
6.55							
Dynamic Cone Penetration Test commenced at 6.55m depth. Cone pushed to 14.0m depth.						7	80.68
						8	79.68
						9	78.68
						10	77.68
						11	76.68
						12	75.68
						13	74.68
14.02						14	73.68
End of Borehole							
Practical DCPT refusal at 14.02m depth.							
(GWL @ 3.60m-Sept. 24, 2014)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community - Navan Road
Ottawa, Ontario

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

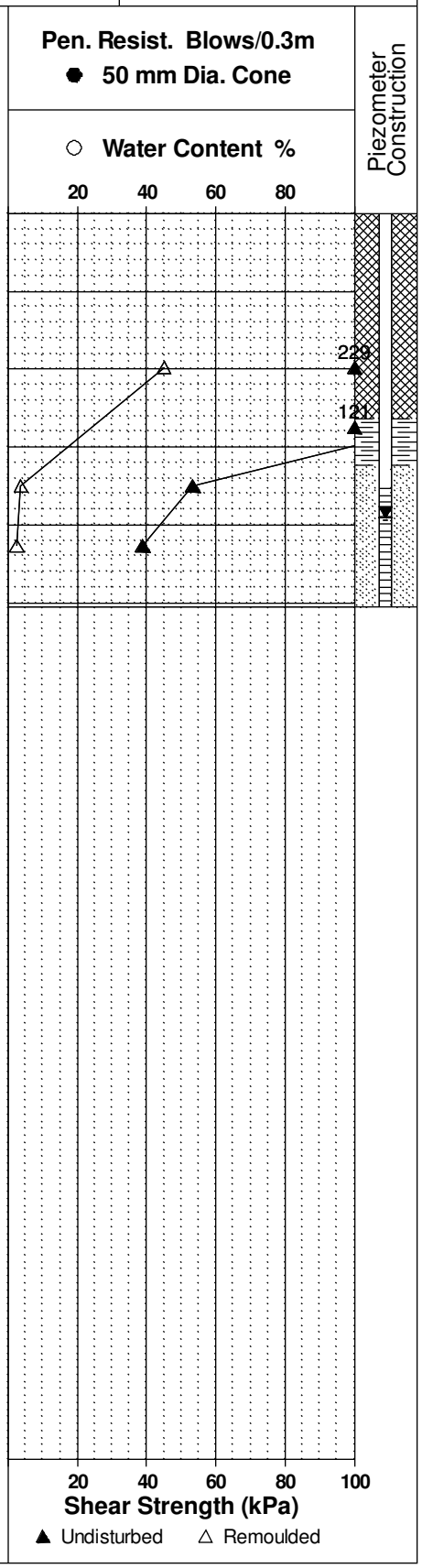
FILE NO. PG3130

REMARKS

HOLE NO. BH 2-14

BORINGS BY CME 55 Power Auger **DATE** September 12, 2014

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.13
TOPSOIL 0.33		AU	1				
		SS	2	83	12	1	87.13
Hard to very stiff, brown **SILTY CLAY**						2	86.13
- stiff to firm and grey by 2.9m depth						3	85.13
4.42						4	84.13
GLACIAL TILL: Grey-brown silty clay with sand, gravel, cobbles, boulders 5.05		SS	3		50+	5	83.13
End of Borehole							
Practical refusal to augering at 5.05m depth							
(GWL @ 3.91m-Sept. 24, 2014)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community - Navan Road
Ottawa, Ontario

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

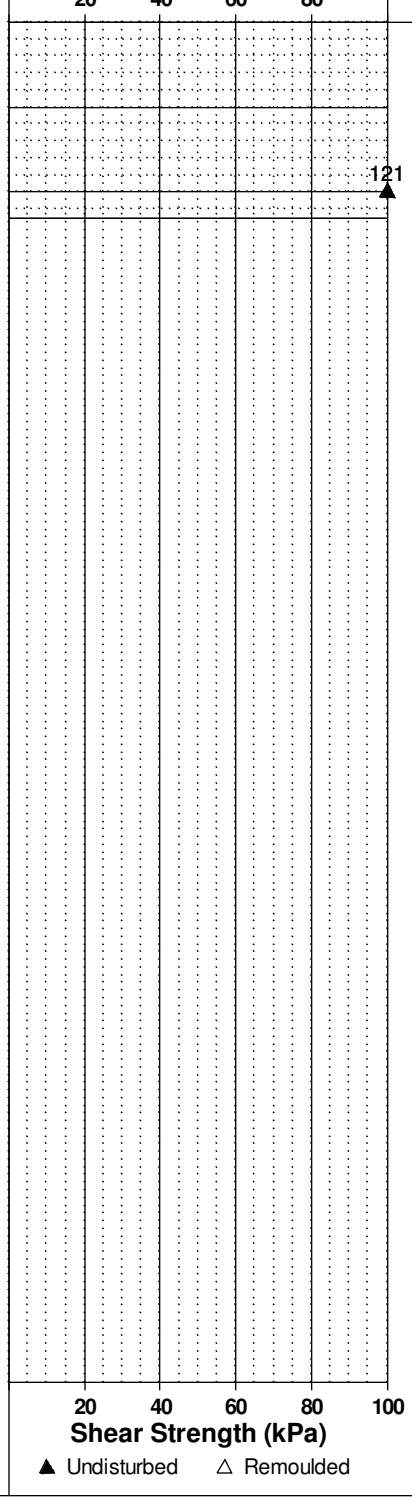
FILE NO. PG3130

REMARKS

HOLE NO. BH 3-14

BORINGS BY CME 55 Power Auger **DATE** September 12, 2014

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.28		AU	1			0	88.74		
Very stiff, brown **SILTY CLAY**		SS	2		11	1	87.74		
2.13						2	86.74		
GLACIAL TILL: Brown silty clay with sand, gravel, cobbles and boulders 2.31		SS	3	0	50+				
End of Borehole									
Practical refusal to augering at 2.31m depth									
(BH dry upon completion)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community - Navan Road
Ottawa, Ontario

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

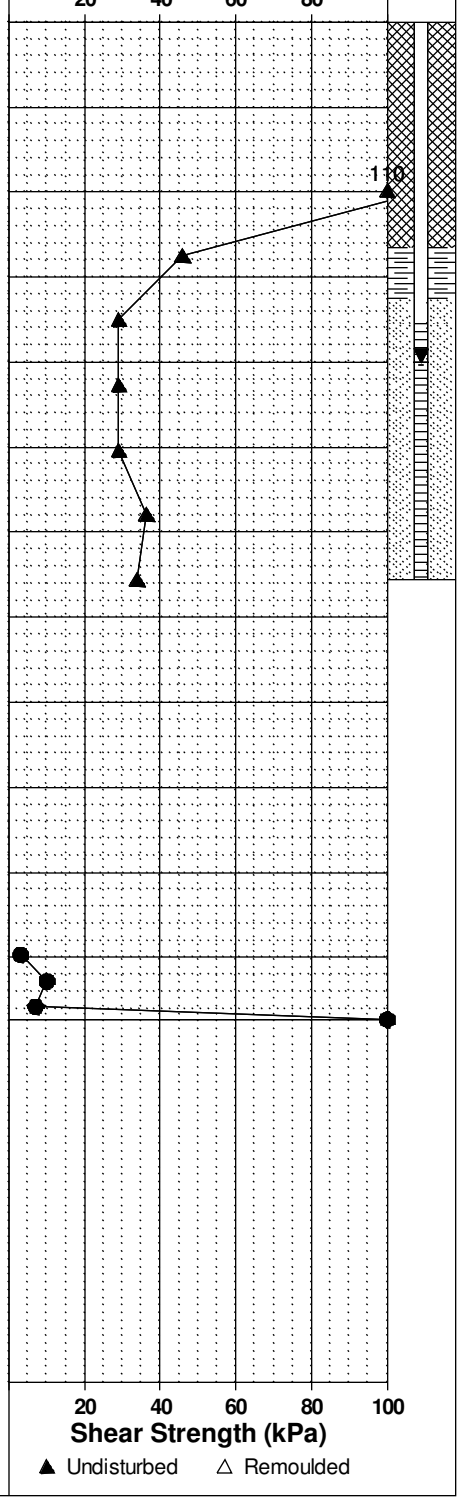
FILE NO. PG3130

REMARKS

HOLE NO. BH 4-14

BORINGS BY CME 55 Power Auger **DATE** September 12, 2014

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.15
TOPSOIL 0.28							
		SS	1	83	6	1	87.15
Very stiff to stiff, brown **SILTY CLAY**						2	86.15
						3	85.15
- firm and grey by 2.9m depth						4	84.15
						5	83.15
						6	82.15
6.55							
Dynamic Cone Penetration Test commenced at 6.55m depth. Cone pushed to 10.7m depth.						7	81.15
						8	80.15
						9	79.15
						10	78.15
						11	77.15
11.73							
End of Borehole							
Practical DCPT refusal at 11.73m depth							
(GWL @ 4.00m-Sept. 24, 2014)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community - Navan Road
Ottawa, Ontario

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

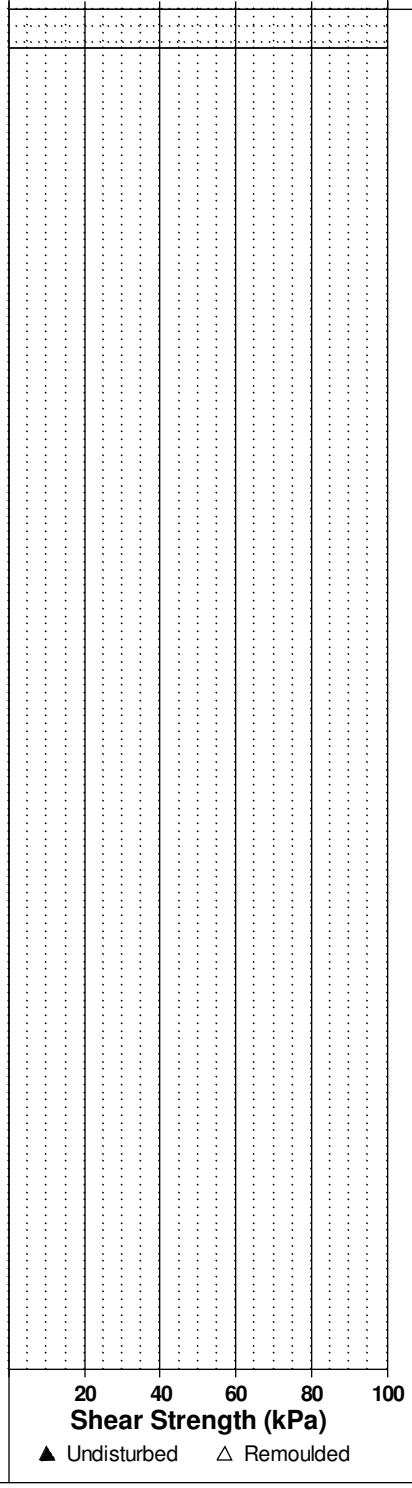
FILE NO. PG3130

REMARKS

HOLE NO. BH 5-14

BORINGS BY CME 55 Power Auger **DATE** September 15, 2014

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	90.54		
TOPSOIL 0.13									
GLACIAL TILL: Brown silty clay with sand, gravel and cobbles 0.46									
End of Borehole									
Practical refusal to augering at 0.46m depth									
(BH dry upon completion)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community - Navan Road
Ottawa, Ontario

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

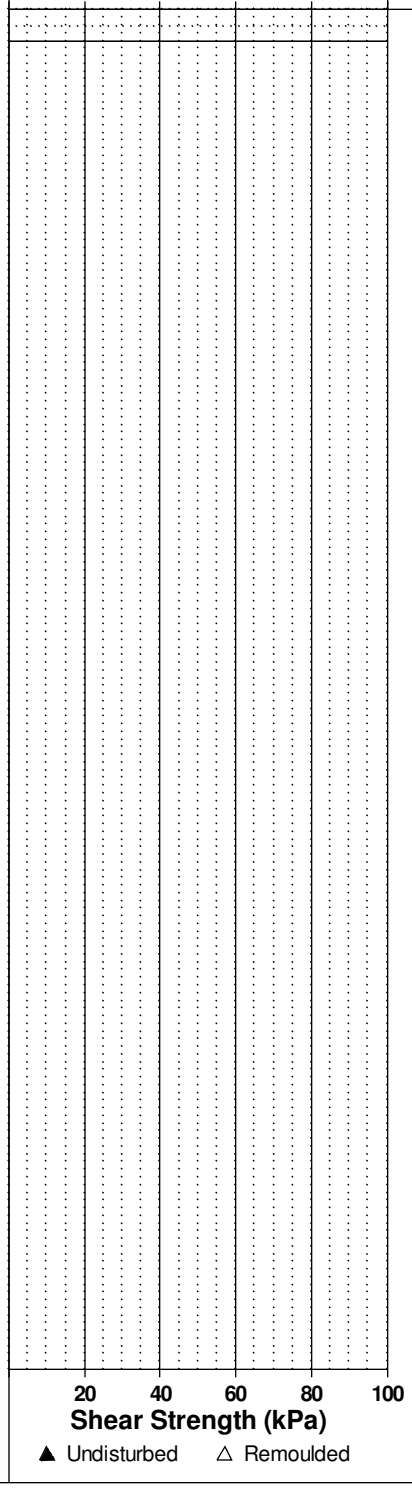
FILE NO. PG3130

REMARKS

HOLE NO. BH 6-14

BORINGS BY CME 55 Power Auger **DATE** September 15, 2014

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	89.34		
TOPSOIL 0.20		AU	1						
Brown **SILTY CLAY,** trace sand 0.38									
End of Borehole									
Practical refusal to augering at 0.38m depth									
(BH dry upon completion)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community - Navan Road
Ottawa, Ontario

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

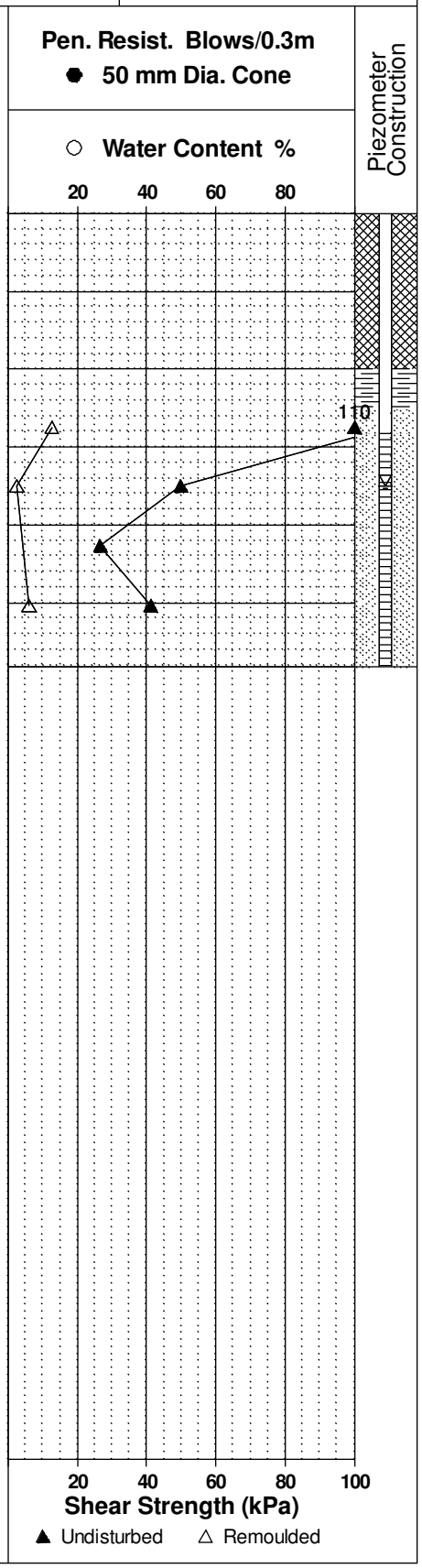
FILE NO. PG3130

REMARKS

HOLE NO. BH 7-14

BORINGS BY CME 55 Power Auger **DATE** September 15, 2014

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.99
TOPSOIL 0.23		AU	1				
		SS	2	100		1	86.99
		SS	3	100	5	2	85.99
Very stiff to stiff, brown **SILTY CLAY**							
- firm and grey by 2.9m depth						3	84.99
						4	83.99
5.18						5	82.99
GLACIAL TILL: Grey-brown silty clay with sand, gravel, cobbles and boulders 5.82		SS	4	100	12		
End of Borehole							
Practical refusal to augering at 5.82m depth							
(GWL @ 3.5m depth based on field observations)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community - Navan Road
Ottawa, Ontario

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

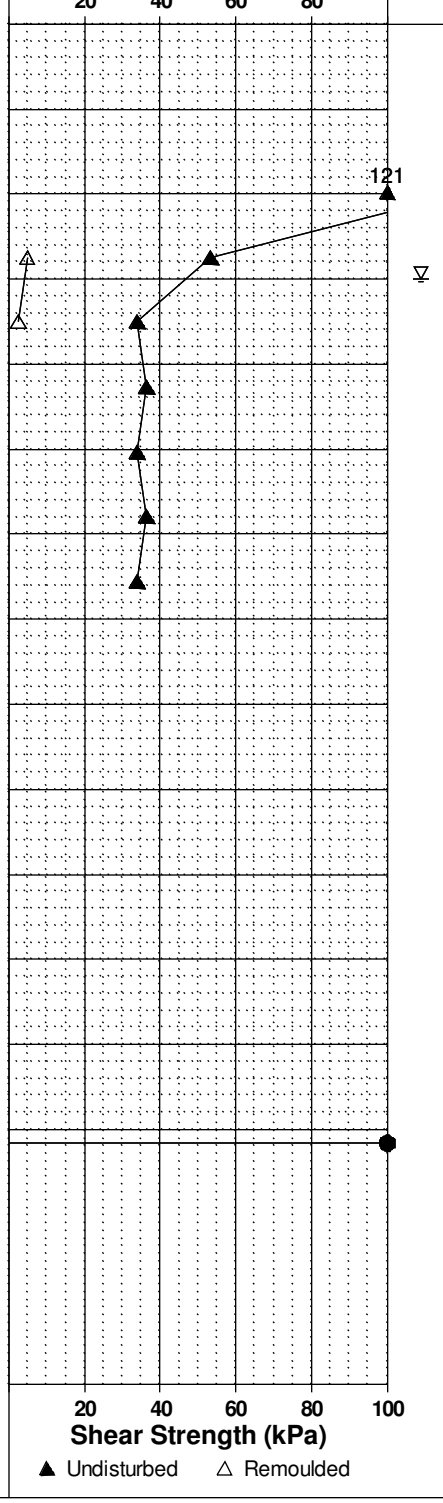
FILE NO. PG3130

REMARKS

HOLE NO. BH 8-14

BORINGS BY CME 55 Power Auger **DATE** September 15, 2014

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.46
TOPSOIL 0.25		AU	1				
		SS	2	100	3	1	86.46
						2	85.46
Very stiff to stiff, brown **SILTY CLAY**						3	84.46
- firm and grey by 2.9m depth						4	83.46
						5	82.46
						6	81.46
6.55							
Dynamic Cone Penetration Test commenced at 6.55m depth. Cone pushed to 13.1m depth.						7	80.46
						8	79.46
						9	78.46
						10	77.46
						11	76.46
						12	75.46
						13	74.46
13.16							
End of Borehole							
Practical DCPT refusal at 13.16m depth							
(GWL @ 3.0m depth based on field observations)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community - Navan Road
Ottawa, Ontario

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

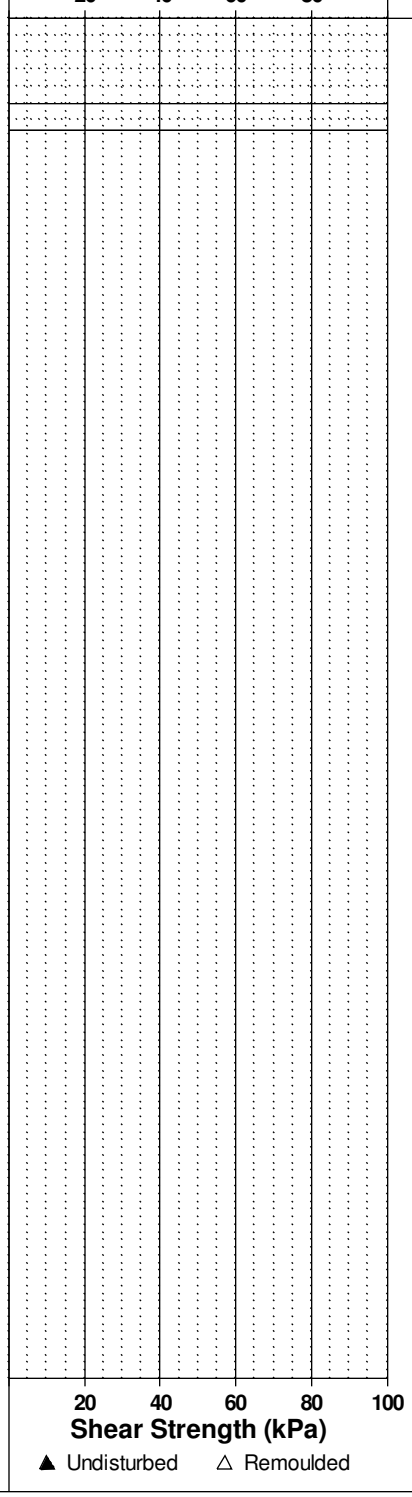
FILE NO. PG3130

REMARKS

HOLE NO. BH 9-14

BORINGS BY CME 55 Power Auger **DATE** September 15, 2014

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.20		AU	1			0	89.97		
Very stiff, brown **SILTY CLAY** 1.32		SS	2		14	1	88.97		
End of Borehole									
Practical refusal to augering at 1.32m depth									
(BH dry upon completion)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
East Urban Community - Navan Road
Ottawa, Ontario

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

FILE NO. PG3130

REMARKS

HOLE NO. BH10-14

BORINGS BY CME 55 Power Auger **DATE** September 15, 2014

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.44		
TOPSOIL 0.28		AU	1						
		SS	2	83	9	1	87.44		
		SS	3	83	5	2	86.44		
Very stiff to stiff, brown **SILTY CLAY**						3	85.44		
- firm and grey by 3.7m depth						4	84.44		▽
						5	83.44		
						6	82.44		
7.14						7	81.44		
End of Borehole Practical refusal to augering at 7.14m depth (GWL @ 4.0m depth based on field observations)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development-Trails Edge Phase 2
Ottawa, Ontario

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

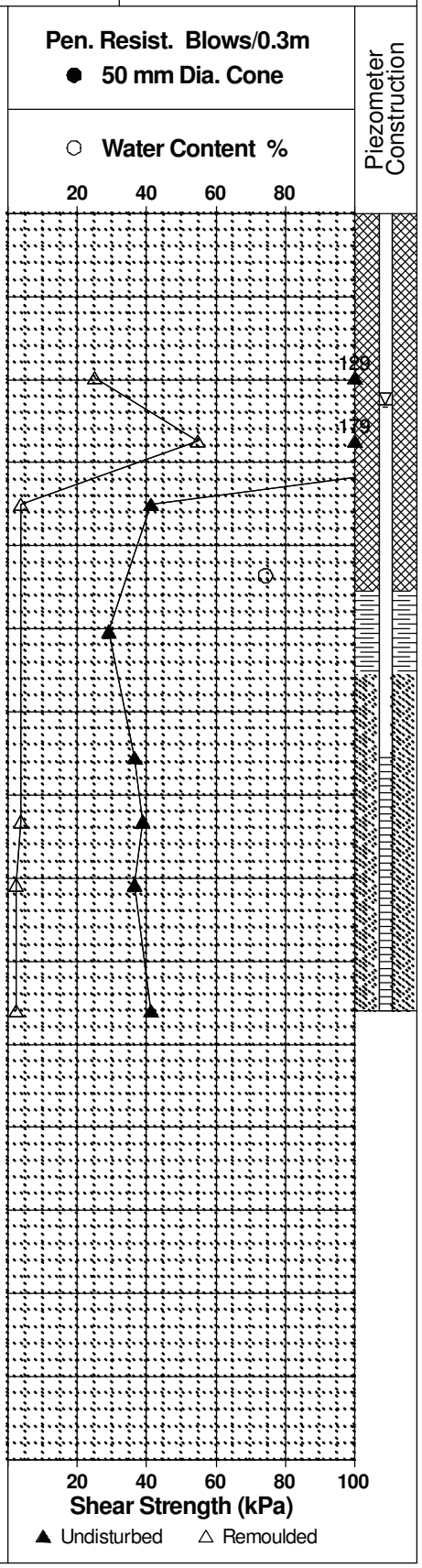
FILE NO. PG2392

REMARKS

HOLE NO. BH 7

BORINGS BY CME 55 Power Auger **DATE** 17 August 2011

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.15
TOPSOIL 0.20							
Loose, brown **SILTY SAND** 0.30		SS	1	67	7	1	86.15
Very stiff to stiff, brown **SILTY CLAY**						2	85.15
3.30						3	84.15
		TW	2	100		4	83.15
		TW	3	100		5	82.15
Firm, grey **SILTY CLAY**						6	81.15
						7	80.15
						8	79.15
		TW	4	100		9	78.15
9.60							
Dynamic Cone Penetration Test commenced @ 9.60m depth. Cone pushed to 23.5m depth.						10	77.15
						11	76.15
						12	75.15
						13	74.15
						14	73.15
						15	72.15



Piezometer Construction

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development-Trails Edge Phase 2
Ottawa, Ontario

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

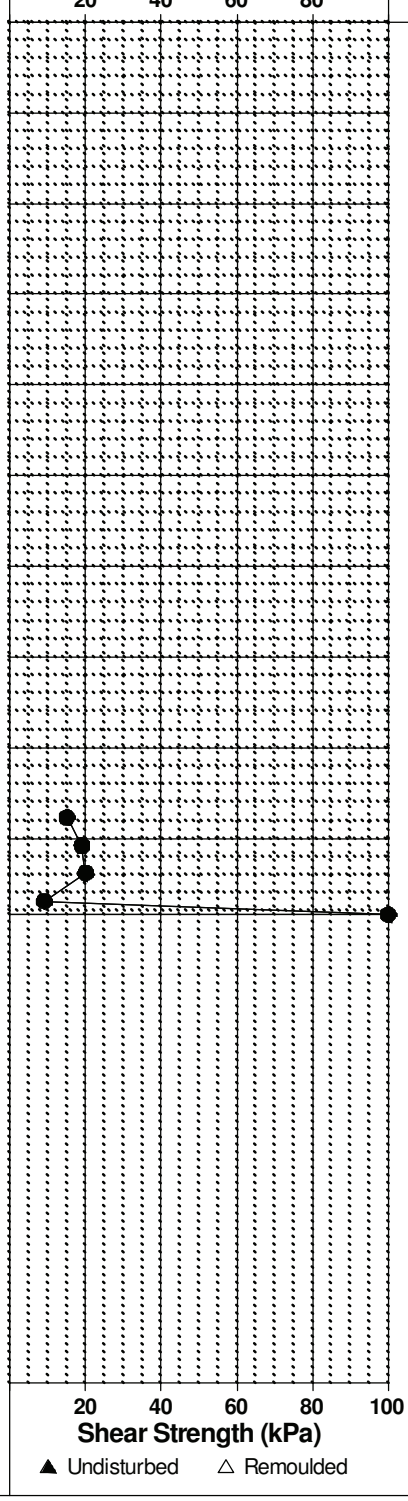
FILE NO. PG2392

REMARKS

HOLE NO. BH 7

BORINGS BY CME 55 Power Auger **DATE** 17 August 2011

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
						15	72.15		
						16	71.15		
						17	70.15		
						18	69.15		
						19	68.15		
						20	67.15		
						21	66.15		
						22	65.15		
						23	64.15		
						24	63.15		
24.84									
End of Borehole Practical cone refusal @ 24.84m depth (GWL @ 2.3m depth based on field observations)									



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development-Trails Edge Phase 2
Ottawa, Ontario

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

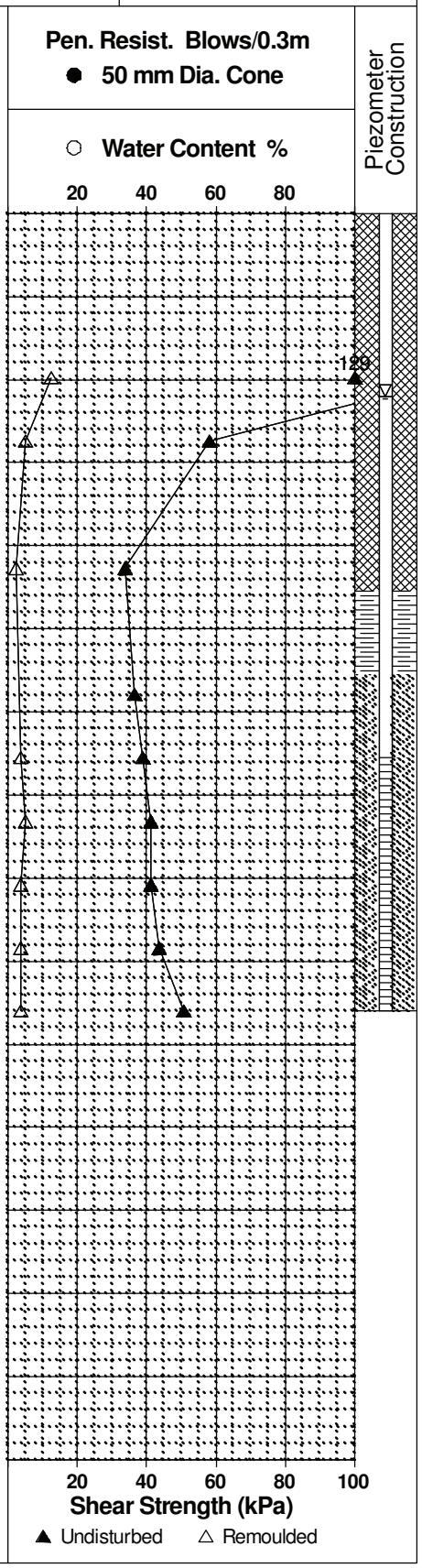
FILE NO. PG2392

REMARKS

HOLE NO. BH 8

BORINGS BY CME 55 Power Auger **DATE** 9 February 2012

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	86.93
TOPSOIL 0.25		AU	1				
		SS	2		8	1	85.93
Very stiff to stiff, brown **SILTY CLAY**						2	84.93
2.90						3	83.93
		TW	3	83		4	82.93
		TW	4	100		5	81.93
Firm, grey **SILTY CLAY**						6	80.93
						7	79.93
						8	78.93
						9	77.93
9.60							
Dynamic Cone Penetration Test commenced @ 9.60m depth. Cone pushed to 19.8m depth.						10	76.93
						11	75.93
						12	74.93
						13	73.93
						14	72.93
						15	71.93



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development-Trails Edge Phase 2
Ottawa, Ontario

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

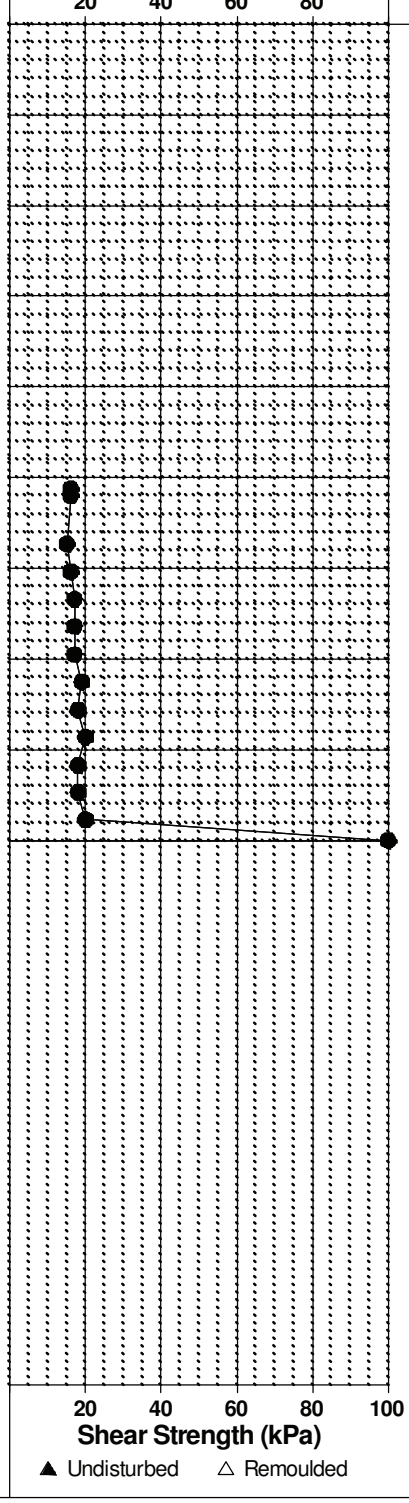
FILE NO. PG2392

REMARKS

HOLE NO. BH 8

BORINGS BY CME 55 Power Auger **DATE** 9 February 2012

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						15	71.93		
						16	70.93		
						17	69.93		
						18	68.93		
						19	67.93		
						20	66.93		
						21	65.93		
						22	64.93		
						23	63.93		
24.00						24	62.93		
End of Borehole Practical DCPT refusal @ 24.00m depth. (GWL @ 2.2m depth based on field observations)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development-Trails Edge Phase 2
Ottawa, Ontario

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

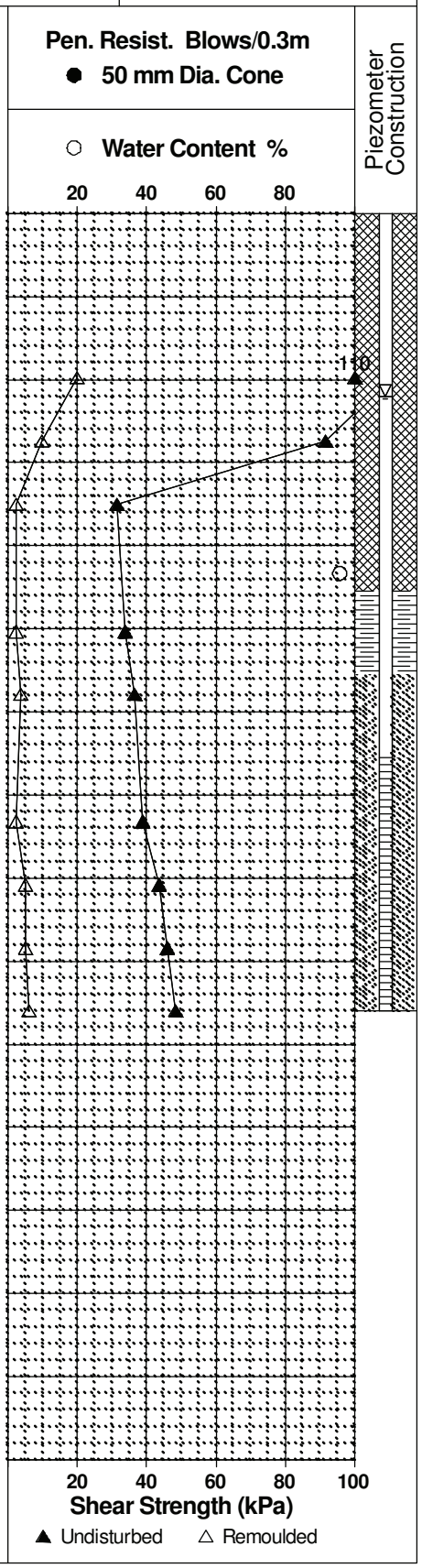
FILE NO. PG2392

REMARKS

HOLE NO. BH 9

BORINGS BY CME 55 Power Auger **DATE** 10 February 2012

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	86.96
TOPSOIL 0.23		AU	1				
		SS	2	100	8	1	85.96
Very stiff to stiff, brown **SILTY CLAY**						2	84.96
2.90						3	83.96
		TW	3	100		4	82.96
Firm, grey **SILTY CLAY**						5	81.96
		TW	4	100		6	80.96
						7	79.96
						8	78.96
9.60						9	77.96
Dynamic Cone Penetration Test commenced at 9.60m depth. Cone pushed to 19.8m depth.						10	76.96
						11	75.96
						12	74.96
						13	73.96
						14	72.96
						15	71.96



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development-Trails Edge Phase 2
Ottawa, Ontario

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

FILE NO. PG2392

REMARKS

HOLE NO. BH 9

BORINGS BY CME 55 Power Auger **DATE** 10 February 2012

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						15	71.96		
						16	70.96		
						17	69.96		
						18	68.96		
						19	67.96		
						20	66.96		
						21	65.96		
						22	64.96		
						23	63.96		
						24	62.96		
						25	61.96		
26.16						26	60.96		
End of Borehole Practical DCPT refusal @ 26.16m depth. (GWL @ 2.2m depth based on field observations)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development-Trails Edge Phase 2
Ottawa, Ontario

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

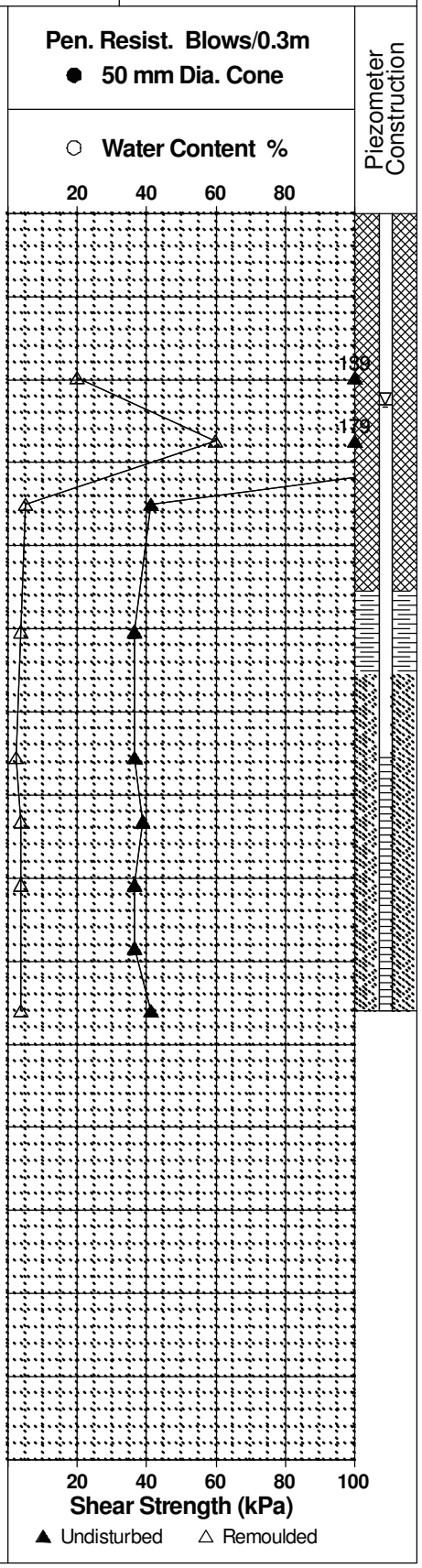
FILE NO. PG2392

REMARKS

HOLE NO. BH10

BORINGS BY CME 55 Power Auger **DATE** 17 August 2011

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	86.97
TOPSOIL 0.20		AU	1				
Brown **SILTY CLAY** with sand, trace gravel 0.69		SS	2	92	7	1	85.97
Very stiff to stiff, brown **SILTY CLAY**						2	84.97
3.30						3	83.97
		TW	2			4	82.97
		TW	3			5	81.97
Firm, grey **SILTY CLAY**						6	80.97
						7	79.97
						8	78.97
						9	77.97
9.60							
Dynamic Cone Penetration Test commenced @ 25.27m depth. Cone pushed to 22.7m depth.						10	76.97
						11	75.97
						12	74.97
						13	73.97
						14	72.97
						15	71.97



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development-Trails Edge Phase 2
Ottawa, Ontario

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

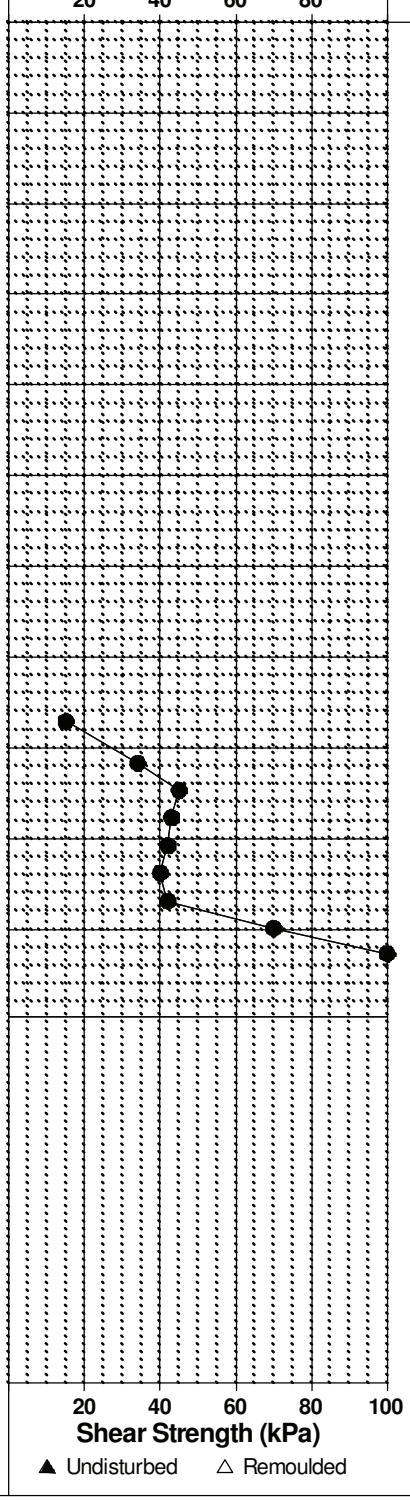
FILE NO. PG2392

REMARKS

HOLE NO. BH10

BORINGS BY CME 55 Power Auger **DATE** 17 August 2011

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
						15	71.97		
						16	70.97		
						17	69.97		
						18	68.97		
						19	67.97		
						20	66.97		
						21	65.97		
						22	64.97		
						23	63.97		
						24	62.97		
						25	61.97		
25.27									
End of Borehole Practical cone refusal @ 25.27m depth (GWL @ 2.3m depth based on field observations)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development-Trails Edge Phase 2
Ottawa, Ontario

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

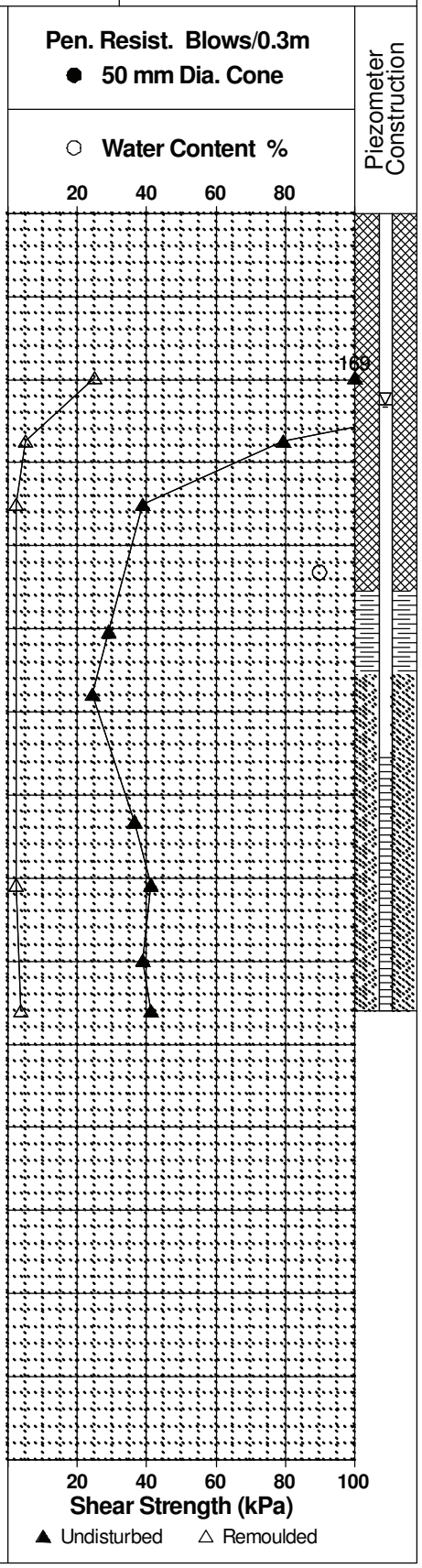
FILE NO. PG2392

REMARKS

HOLE NO. BH11

BORINGS BY CME 55 Power Auger **DATE** 9 February 2012

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.17
TOPSOIL 0.25		AU	1				
		AU	2				
Very stiff to stiff, brown **SILTY CLAY**		SS	3	83	12	1	86.17
2.90						2	85.17
						3	84.17
		TW	4	100		4	83.17
						5	82.17
Firm, grey **SILTY CLAY**						6	81.17
		TW	5	100		7	80.17
						8	79.17
						9	78.17
9.60						10	77.17
Dynamic Cone Penetration Test commenced @ 9.60m depth. Cone pushed to 20.4m depth.						11	76.17
						12	75.17
						13	74.17
						14	73.17
						15	72.17



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development-Trails Edge Phase 2
Ottawa, Ontario

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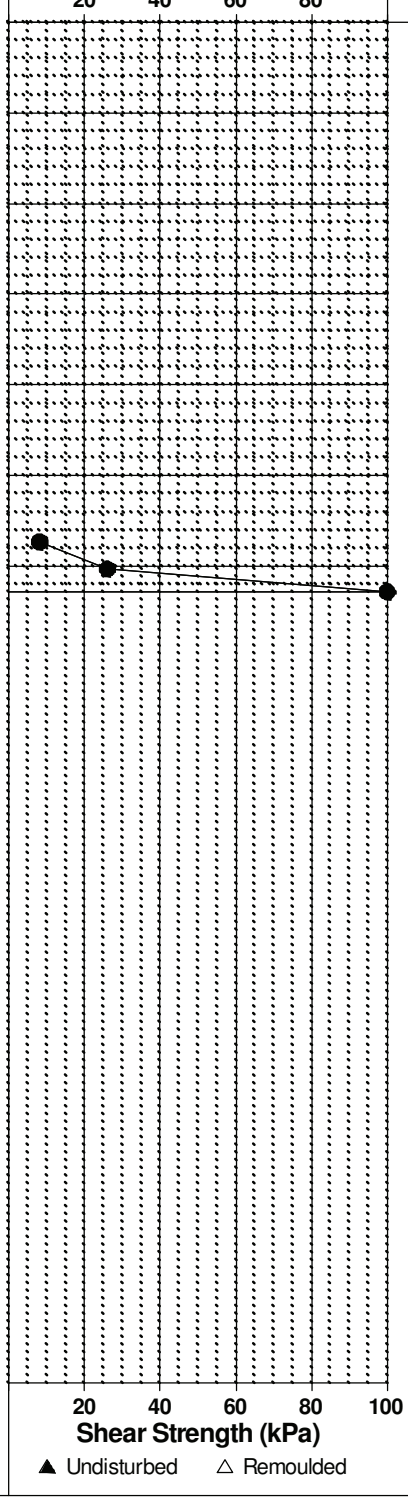
FILE NO. PG2392

REMARKS

HOLE NO. BH11

BORINGS BY CME 55 Power Auger **DATE** 9 February 2012

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						15	72.17		
						16	71.17		
						17	70.17		
						18	69.17		
						19	68.17		
						20	67.17		
						21	66.17		
21.28									
End of Borehole Practical DCPT refusal @ 21.28m depth. (GWL @ 2.3m depth based on field observations)									



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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

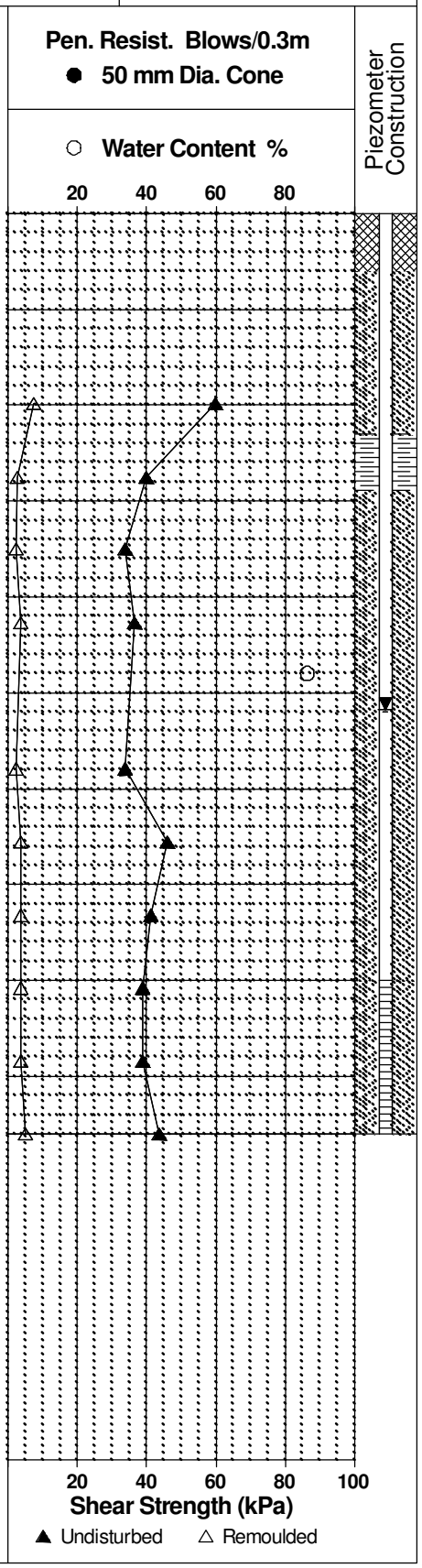
FILE NO. PG0861

REMARKS

HOLE NO. BH 9-08

BORINGS BY CME 55 Power Auger **DATE** 7 August 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	86.92
TOPSOIL 0.40							
Loose, light brown **SILTY SAND** 0.75		SS	1	67	7	1	85.92
Very stiff to stiff, brown **SILTY CLAY**						2	84.92
						3	83.92
- firm and grey by 2.7m depth						4	82.92
		TW	2	100		5	81.92
						6	80.92
						7	79.92
						8	78.92
						9	77.92
9.60							
End of Borehole							
(GWL @ 5.17m-Aug. 28/08)							



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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

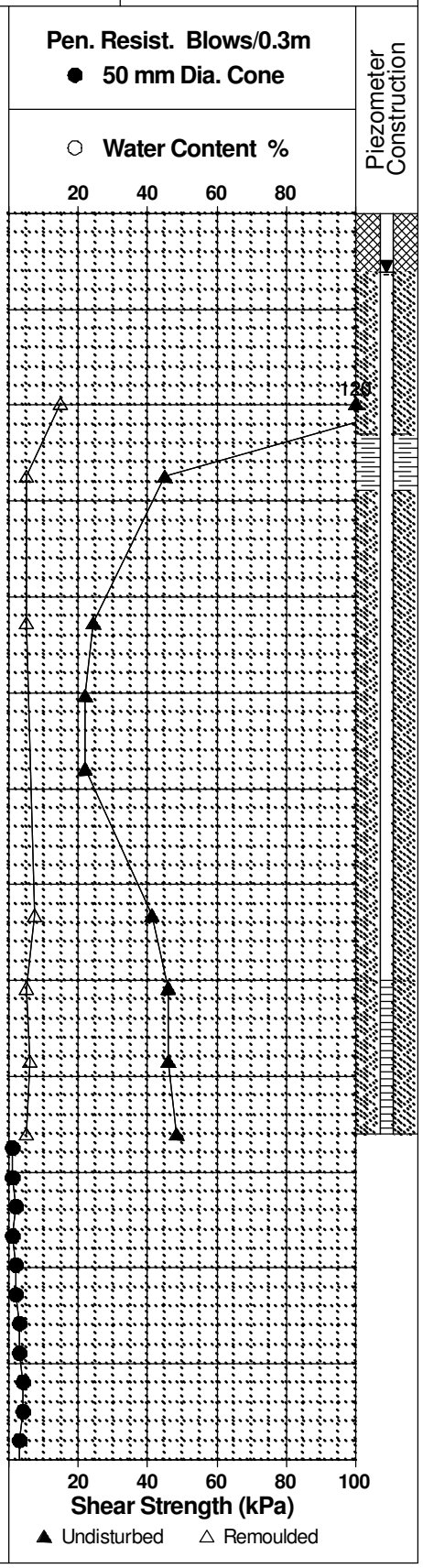
FILE NO. PG0861

REMARKS

HOLE NO. BH11-08

BORINGS BY CME 55 Power Auger **DATE** 7 August 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.14
TOPSOIL 0.20							
		SS	1		9	1	86.14
Very stiff to stiff, brown **SILTY CLAY**						2	85.14
- firm and grey by 2.9m depth		TW	2	88		3	84.14
						4	83.14
						5	82.14
		TW	3	100		6	81.14
						7	80.14
						8	79.14
						9	78.14
9.60							
Dynamic Cone Penetration Test commenced @ 9.60m depth						10	77.14
Inferred **SILTY CLAY**						11	76.14
						12	75.14
						13	74.14



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

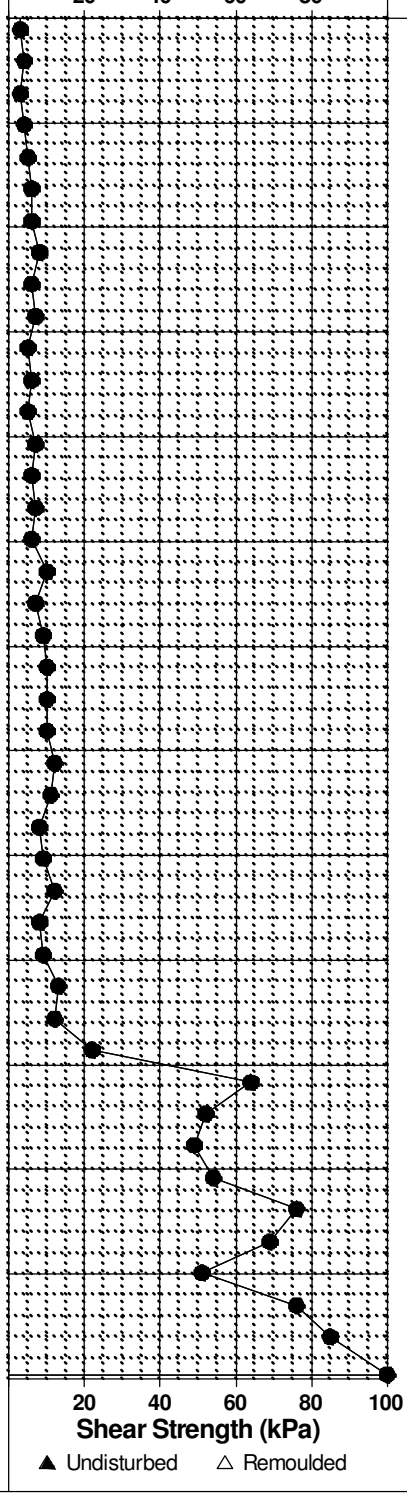
FILE NO. PG0861

REMARKS

HOLE NO. BH11-08

BORINGS BY CME 55 Power Auger **DATE** 7 August 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						13	74.14		
						14	73.14		
						15	72.14		
Inferred **SILTY CLAY**						16	71.14		
						17	70.14		
						18	69.14		
						19	68.14		
						20	67.14		
						21	66.14		
						22	65.14		
Inferred **SILTY CLAY**						23	64.14		
22.90									
Inferred **GLACIAL TILL**						24	63.14		
						25	62.14		
25.96									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

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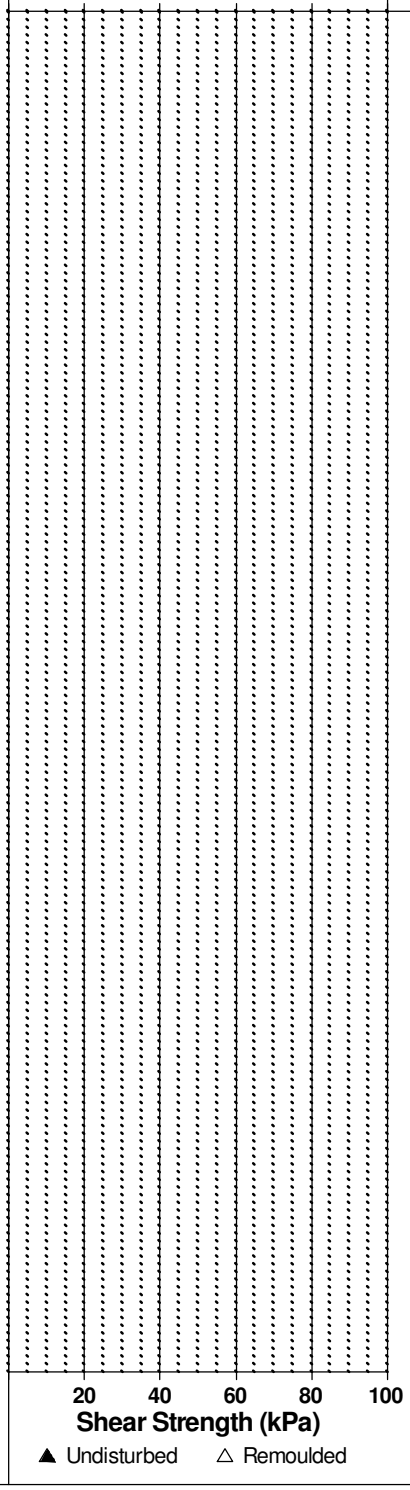
FILE NO. PG0861

REMARKS

HOLE NO. BH11-08

BORINGS BY CME 55 Power Auger **DATE** 7 August 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
End of Borehole Practical DCPT refusal @ 25.96m depth (GWL @ 0.61m-Aug. 28/08)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

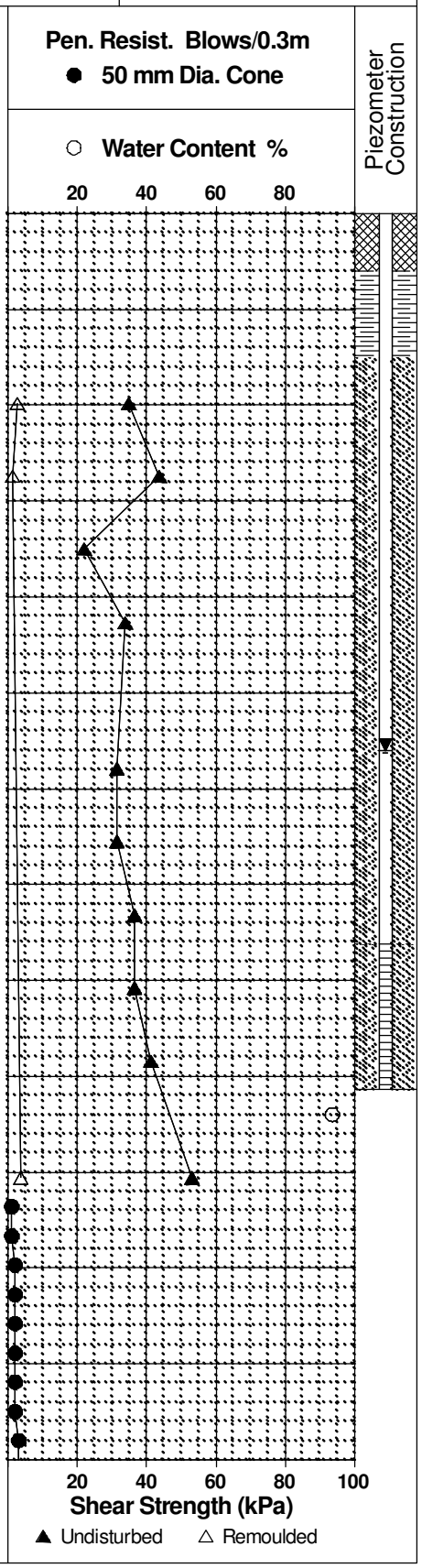
FILE NO. PG0861

REMARKS

HOLE NO. BH12-08

BORINGS BY CME 75 Power Auger **DATE** 16 October 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.62
TOPSOIL 0.20		AU	1				
Stiff to firm, brown **SILTY CLAY**		SS	2	58	5	1	86.62
- grey by 1.3m depth						2	85.62
						3	84.62
						4	83.62
		TW	3	100		5	82.62
						6	81.62
						7	80.62
						8	79.62
						9	78.62
		TW	4			10	77.62
10.06							
Dynamic Cone Penetration Test commenced @ 10.06m depth						11	76.62
Inferred **SILTY CLAY**						12	75.62
						13	74.62



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

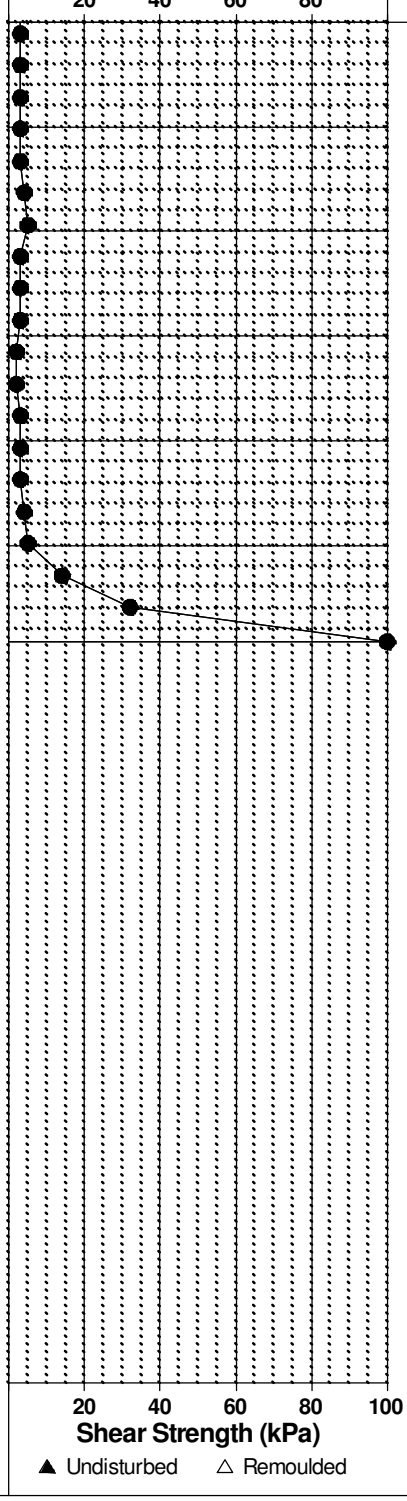
FILE NO. PG0861

REMARKS

HOLE NO. BH12-08

BORINGS BY CME 75 Power Auger **DATE** 16 October 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
Inferred **SILTY CLAY**						13	74.62		
						14	73.62		
						15	72.62		
						16	71.62		
						17	70.62		
18.00						18	69.62		
Inferred **GLACIAL TILL**									
18.92									
End of Borehole									
Practical DCPT refusal @ 18.92m depth									
(GWL @ 5.60m-Oct. 23/08)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

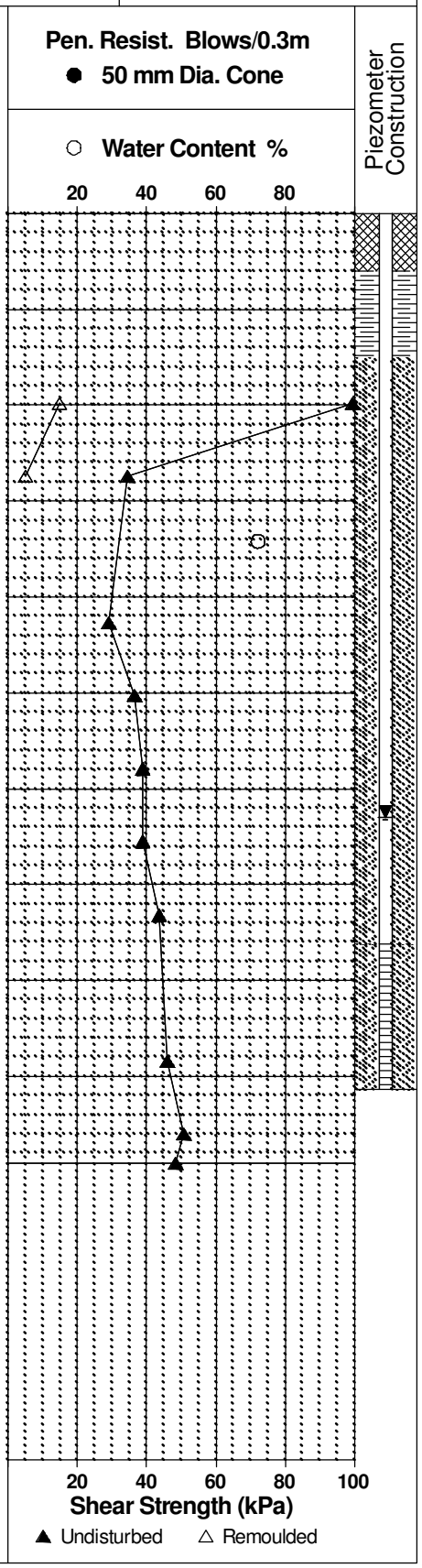
FILE NO. PG0861

REMARKS

HOLE NO. BH13-08

BORINGS BY CME 75 Power Auger **DATE** 16 October 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.38
TOPSOIL 0.20							
		SS	1			1	86.38
Stiff to firm, brown **SILTY CLAY**						2	85.38
- grey by 2.5m depth		TW	2	88		3	84.38
						4	83.38
						5	82.38
		SS	3	100		6	81.38
						7	80.38
		TW	4	100		8	79.38
						9	78.38
		SS	5	100			
9.91							
End of Borehole							
(GWL @ 6.30m-Oct. 23/08)							



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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

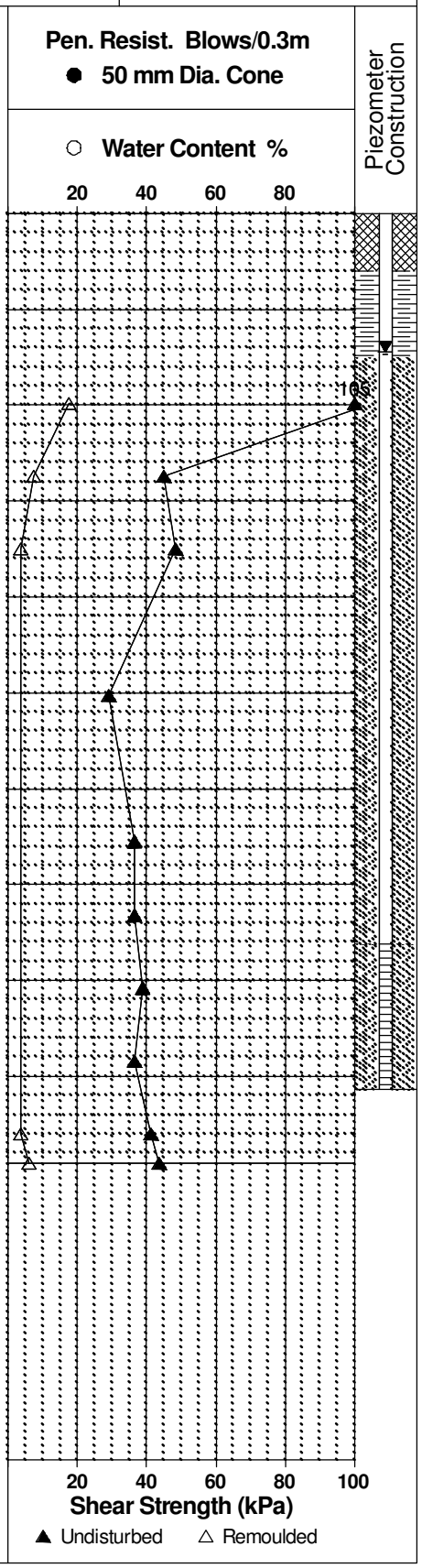
FILE NO. PG0861

REMARKS

HOLE NO. BH14-08

BORINGS BY CME 75 Power Auger **DATE** 15 October 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.03
TOPSOIL 0.20		AU	1				
		SS	2	75	9	1	86.03
Very stiff to stiff, brown **SILTY CLAY**						2	85.03
- firm and grey by 2.0m depth						3	84.03
		TW	3	100		4	83.03
						5	82.03
		TW	4	100		6	81.03
						7	80.03
						8	79.03
						9	78.03
9.91 End of Borehole							
(GWL @ 1.45m-Oct. 23/08)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

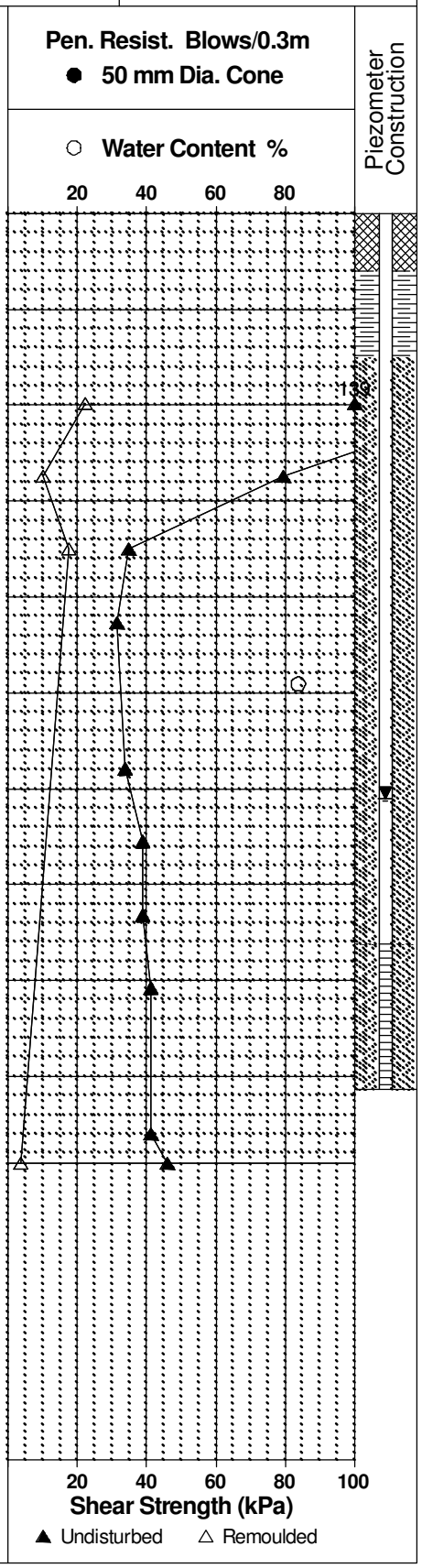
FILE NO. PG0861

REMARKS

HOLE NO. BH15-08

BORINGS BY CME 75 Power Auger **DATE** 16 October 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.24
TOPSOIL 0.20							
		SS	1	67	11	1	86.24
Very stiff to stiff, brown **SILTY CLAY**						2	85.24
						3	84.24
- stiff to firm and grey by 2.5m depth						4	83.24
		TW	2	100		5	82.24
						6	81.24
						7	80.24
		SS	3	100		8	79.24
		AU	5				
		TW	4	100		9	78.24
9.91							
End of Borehole							
(GWL @ 6.10m-Oct. 23/08)							



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

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. BH 3

BORINGS BY CME 75 Power Auger **DATE** 5 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	89.00
TOPSOIL 0.23							
Very stiff, brown **SILTY CLAY** 0.76							
GLACIAL TILL: Dense, brown silty sand with clay, gravel, cobbles and boulders 1.19		SS	1	67	50+	1	88.00
End of Borehole							
Practical refusal to augering @ 1.19m depth							
(GWL @ 0.45m-Apr. 12/06)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %
20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. BH 4

BORINGS BY CME 75 Power Auger **DATE** 5 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.38
TOPSOIL 0.23							
Very stiff to stiff, brown **SILTY CLAY**		SS	1	62	12	1	87.38
		SS	2	100	8	2	86.38
- stiff to firm and grey by 2.6m depth		SS	3	100	1	3	85.38
		SS	4	100	1	4	84.38
4.72							
End of Borehole							
(GWL @ 0.40m-Apr. 12/06)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

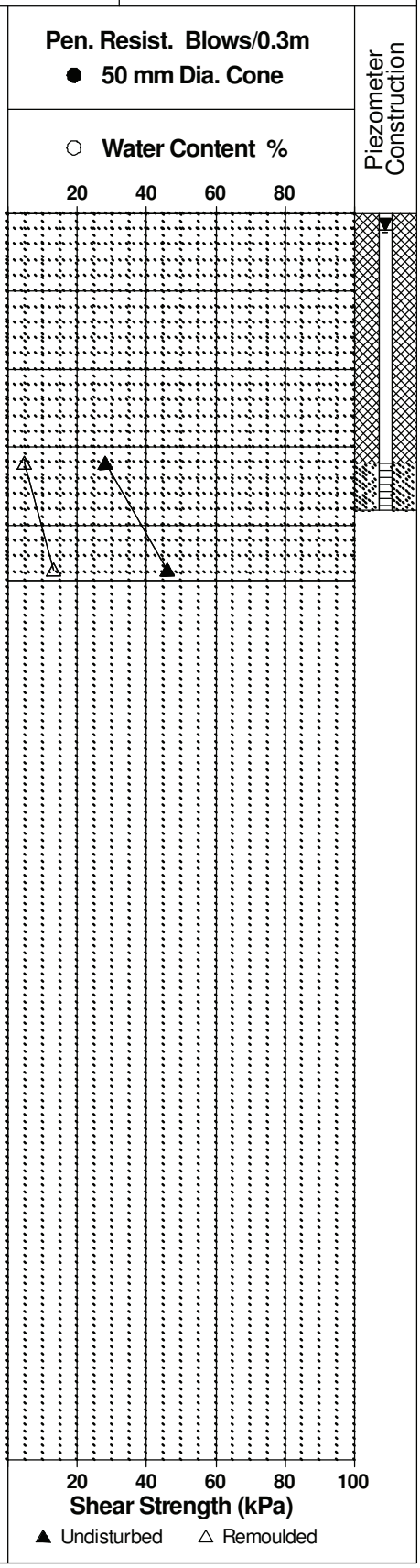
FILE NO. PG0811

REMARKS

HOLE NO. BH 5

BORINGS BY CME 75 Power Auger **DATE** 5 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.46
TOPSOIL 0.10							
Brown **CLAYEY SILT**, trace sand 0.60		SS	1	75	12	1	87.46
		SS	2	83	7	2	86.46
Stiff, brown **SILTY CLAY**		SS	3	100	4	3	85.46
- firm and grey by 2.9m depth		SS	4	100	1	4	84.46
4.72							
End of Borehole							
(GWL @ 0.21m-Apr. 12/06)							



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

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. BH 6

BORINGS BY CME 75 Power Auger **DATE** 5 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.25						0	89.47		
Brown **SILTY CLAY**, trace sand 0.76		AU	1						
End of Borehole									
Practical refusal to augering @ 0.76m depth									

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

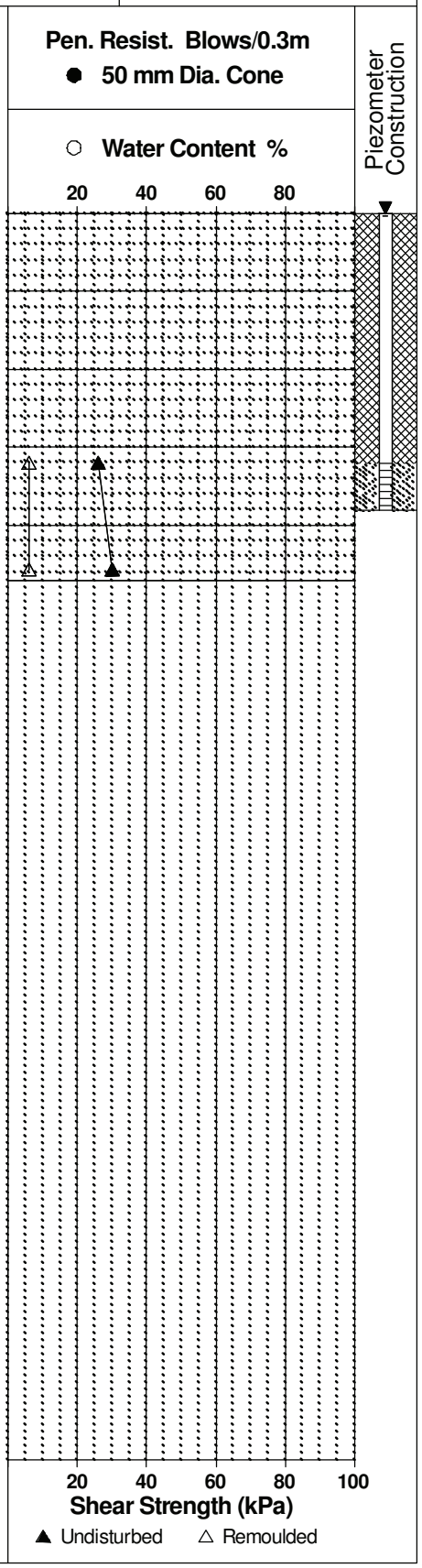
FILE NO. PG0811

REMARKS

HOLE NO. BH 7

BORINGS BY CME 75 Power Auger **DATE** 5 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.20
TOPSOIL 0.23							
Very stiff to stiff, red-brown **SILTY CLAY**, trace sand		SS	1	75	9	1	87.20
		SS	2	100	4	2	86.20
- firm and brown by 2.1m depth		SS	3	100	3		
- grey by 2.7m depth						3	85.20
		SS	4	100	1	4	84.20
4.72							
End of Borehole							
(GWL @ ground surface - April 12/06)							



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

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

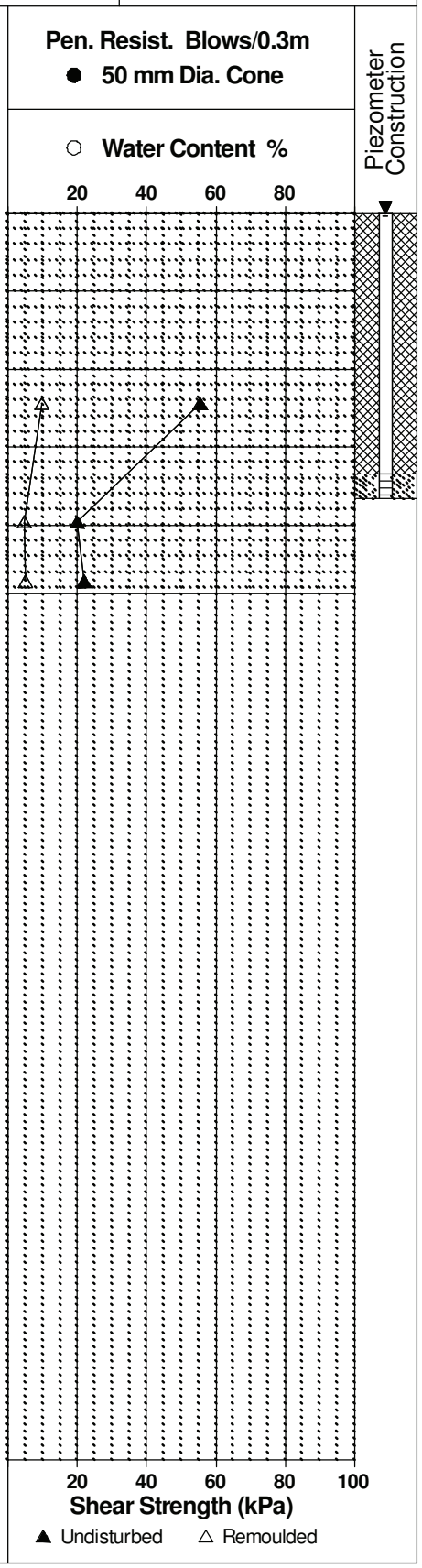
FILE NO. PG0811

REMARKS

HOLE NO. BH 8

BORINGS BY CME 75 Power Auger **DATE** 5 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.28
TOPSOIL 0.19							
Very stiff to stiff, brown to red-brown **SILTY CLAY**		SS	1	50	11	1	87.28
		SS	2	75	7	2	86.28
- firm to soft and grey by 2.6m depth		SS	3	100	1	3	85.28
						4	84.28
4.88							
End of Borehole							
(GWL @ ground surface - April 12/06)							



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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Subdivision, 4th Line Road
Ottawa, Ontario

DATUM Approximate geodetic, based on base plan provided by Webster and Simmonds Surveying Ltd.

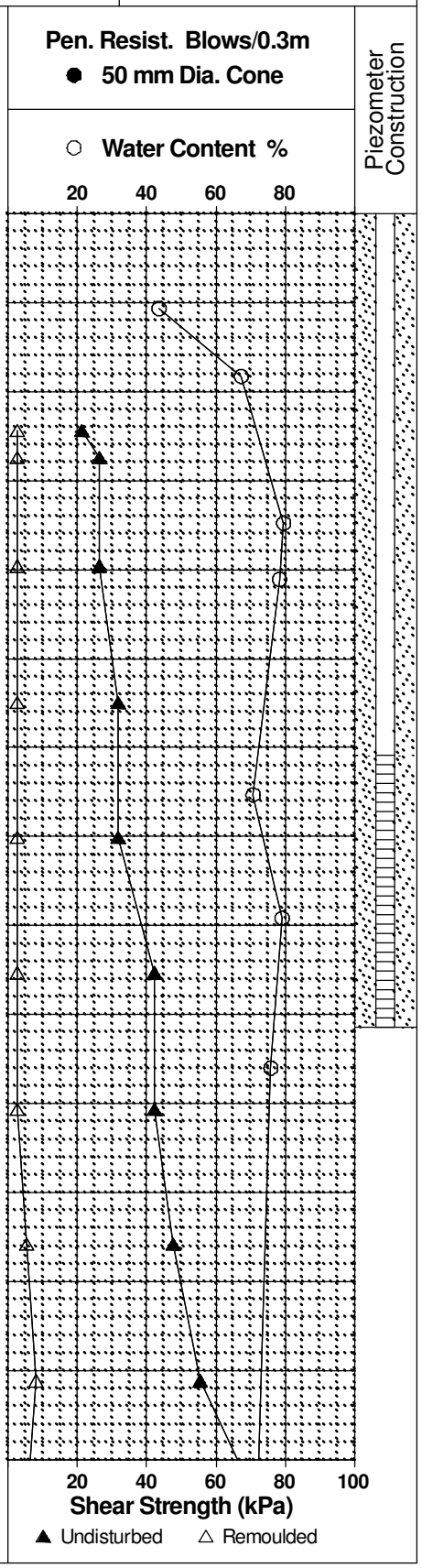
FILE NO. G8533

REMARKS

HOLE NO. BH 3

BORINGS BY CME 55 Power Auger **DATE** 12 Mar 02

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.50
TOPSOIL 0.15							
Stiff to very stiff, grey-brown **SILTY CLAY**		SS	1	62	5	1	86.50
		SS	2	58	3	2	85.50
- firm by 2.4m depth							
- grey by 3.0m depth		TW	3			3	84.50
		SS	4	100	1	4	83.50
		TW	5			5	82.50
		SS	6	100	1	6	81.50
		TW	7			7	80.50
		SS	8	100	1	8	79.50
		SS	9	100	1	9	78.50
						10	77.50
						11	76.50
						12	75.50
						13	74.50
14.00						14	73.50



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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Subdivision, 4th Line Road
Ottawa, Ontario

DATUM Approximate geodetic, based on base plan provided by Webster and Simmonds Surveying Ltd.

FILE NO. G8533

REMARKS

HOLE NO. BH 3

BORINGS BY CME 55 Power Auger **DATE** 12 Mar 02

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
Stiff, grey **SILTY CLAY**		SS	10	100	1	14	73.50		
		TW	11			15	72.50		
						16	71.50		
						17	70.50		
						18	69.50		
						19	68.50		
						20	67.50		
20.73									
GLACIAL TILL: Dense, grey silty sand and gravel						21	66.50		
21.56		SS	12		50+				
End of Borehole									
(Standpipe damaged - March 26/02)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Subdivision, 4th Line Road
Ottawa, Ontario

DATUM Approximate geodetic, based on base plan provided by Webster and Simmonds Surveying Ltd.

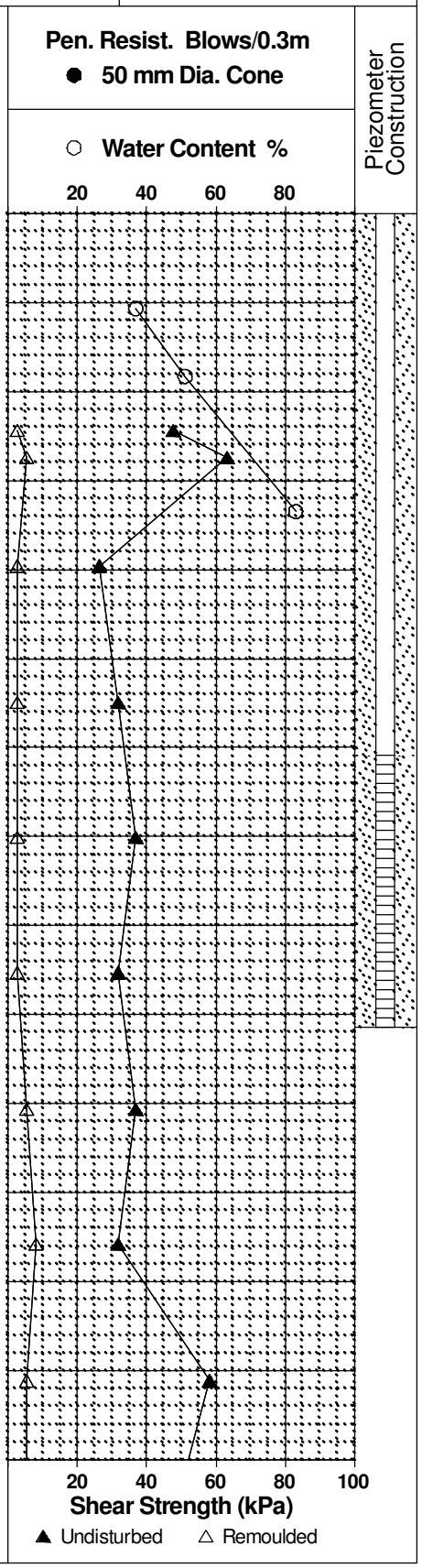
FILE NO. G8533

REMARKS

HOLE NO. BH 4

BORINGS BY CME 55 Power Auger **DATE** 12 Mar 02

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.40
TOPSOIL 0.15							
Very stiff to stiff, brown-grey **SILTY CLAY**		SS	1	50	9	1	86.40
		SS	2	67	6	2	85.40
- firm and grey by 3.0m depth		SS	3	100	1	3	84.40
		SS	4	100	1	4	83.40
		SS	5	100	1	5	82.40
		SS	6	100	1	6	81.40
		SS	7	100	1	7	80.40
		SS	8	100	1	8	79.40
		SS	9	100	1	9	78.40
						10	77.40
						11	76.40
						12	75.40
						13	74.40
14.00						14	73.40



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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Subdivision, 4th Line Road
Ottawa, Ontario

DATUM Approximate geodetic, based on base plan provided by Webster and Simmonds Surveying Ltd.

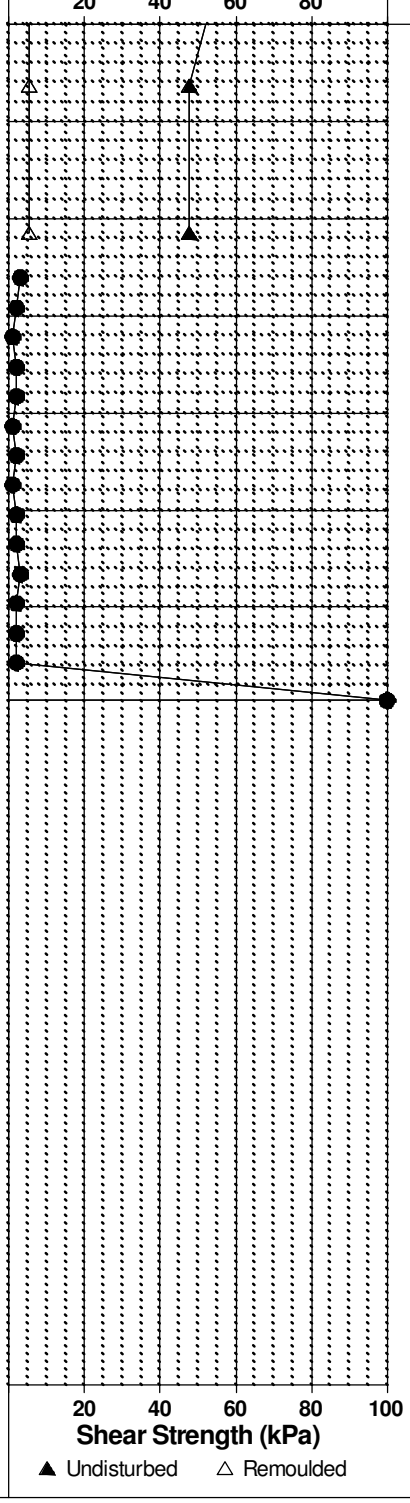
FILE NO. G8533

REMARKS

HOLE NO. BH 4

BORINGS BY CME 55 Power Auger **DATE** 12 Mar 02

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
Firm to stiff, grey **SILTY CLAY**		SS	10	100	1	14	73.40
		SS	11	100	1	15	72.40
						16	71.40
16.46							
Dynamic Cone Penetration test commenced @ 16.46m depth						17	70.40
						18	69.40
						19	68.40
						20	67.40
20.96							
End of Borehole Cone refusal @ 20.96m depth (Standpipe damaged - March 26/02)							



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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Subdivision, 4th Line Road
Ottawa, Ontario

DATUM Approximate geodetic, based on base plan provided by Webster and Simmonds Surveying Ltd.

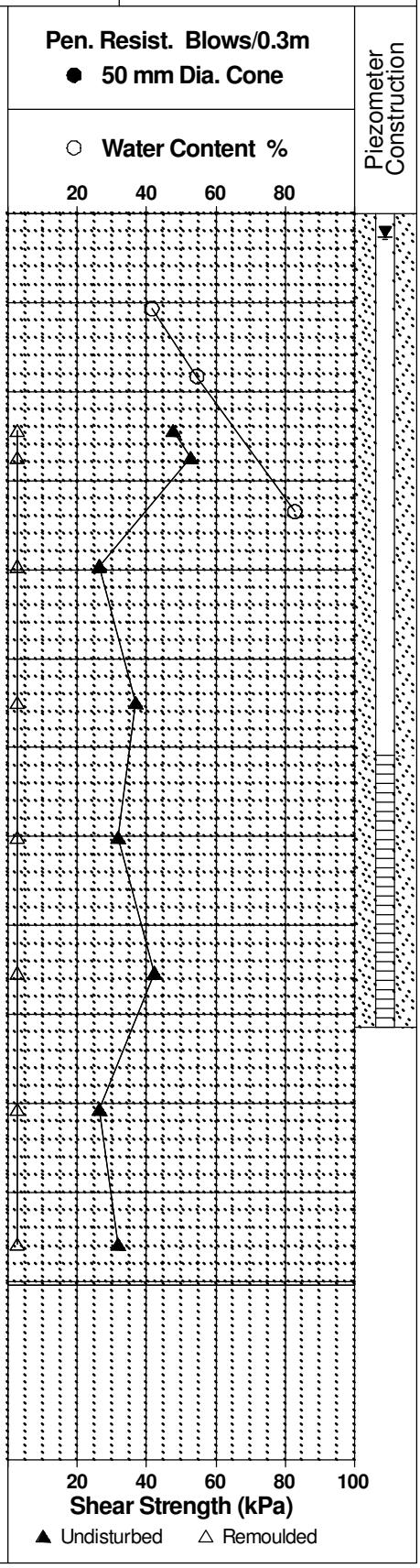
FILE NO. G8533

REMARKS

HOLE NO. BH 5

BORINGS BY CME 55 Power Auger **DATE** 13 Mar 02

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.70
TOPSOIL 0.18							
Stiff to very stiff, brown-grey **SILTY CLAY**		SS	1	75	7	1	86.70
- firm to stiff by 1.5m depth		SS	2	79	2	2	85.70
- firm and grey by 3.0m depth		SS	3	100	1	3	84.70
		SS	4	100	1	4	83.70
		TW	5			5	82.70
		SS	6	100	1	6	81.70
		SS	7	100	1	7	80.70
		SS	8	100	1	8	79.70
						9	78.70
						10	77.70
						11	76.70
12.04						12	75.70
End of Borehole							
Practical refusal to augering @ 12.04m depth							
(GWL @ 0.27m-March 26/02)							



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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Subdivision, 4th Line Road
Ottawa, Ontario

DATUM Approximate geodetic, based on base plan provided by Webster and Simmonds Surveying Ltd.

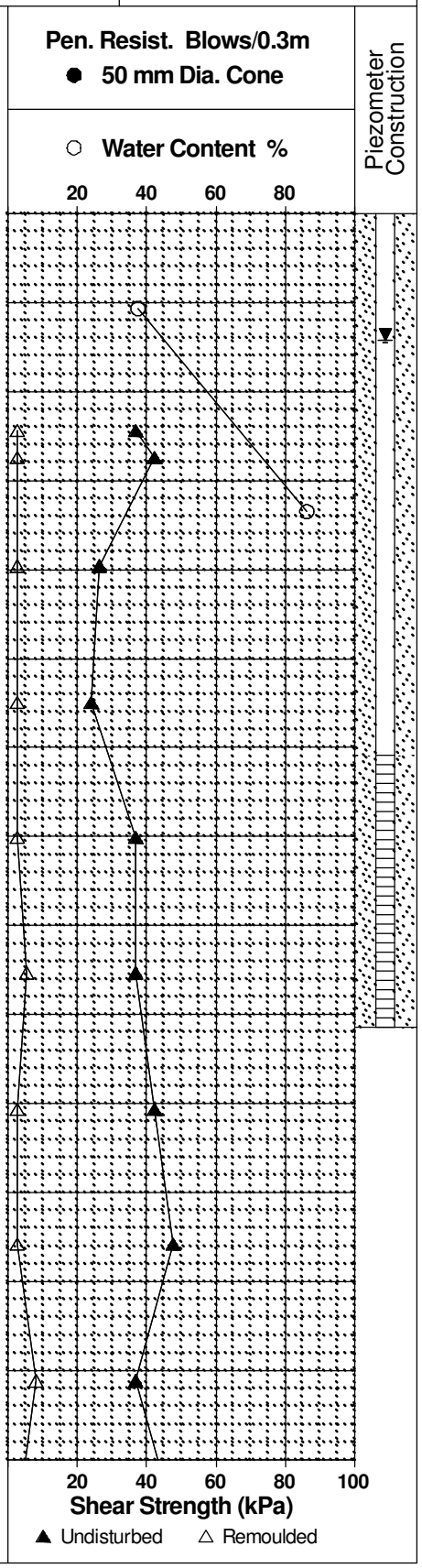
FILE NO. G8533

REMARKS

HOLE NO. BH 6

BORINGS BY CME 55 Power Auger **DATE** 13 Mar 02

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	87.30
TOPSOIL 0.15							
Stiff to very stiff, brown-grey **SILTY CLAY**		SS	1	67	11	1	86.30
- firm by 1.5m depth		SS	2	79	2	2	85.30
- grey by 3.0m depth		SS	3	29	1	3	84.30
		TW	4			4	83.30
		SS	5	100	1	5	82.30
		SS	6	100	1	6	81.30
		SS	7	100	1	7	80.30
		SS	8	100	1	8	79.30
		SS	9	100	1	9	78.30
						10	77.30
						11	76.30
						12	75.30
						13	74.30
14.00						14	73.30



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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Subdivision, 4th Line Road
Ottawa, Ontario

DATUM Approximate geodetic, based on base plan provided by Webster and Simmonds Surveying Ltd.

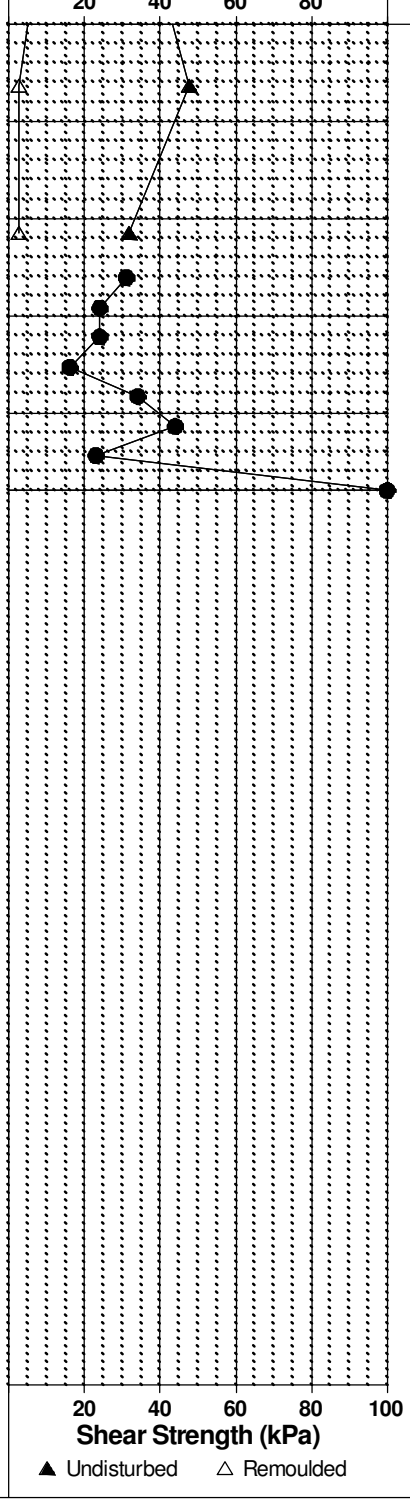
FILE NO. G8533

REMARKS

HOLE NO. BH 6

BORINGS BY CME 55 Power Auger **DATE** 13 Mar 02

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
Firm, grey **SILTY CLAY**		SS	10	100	1	14	73.30
		SS	11	100	1	15	72.30
						16	71.30
16.46						17	70.30
Dynamic Cone Penetration test commenced @ 16.46m depth						18	69.30
18.80							
End of Borehole Cone refusal @ 18.80m depth (GWL @ 1.42m-March 26/02)							



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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Subdivision, 4th Line Road
Ottawa, Ontario

DATUM Approximate geodetic, based on base plan provided by Webster and Simmonds Surveying Ltd.

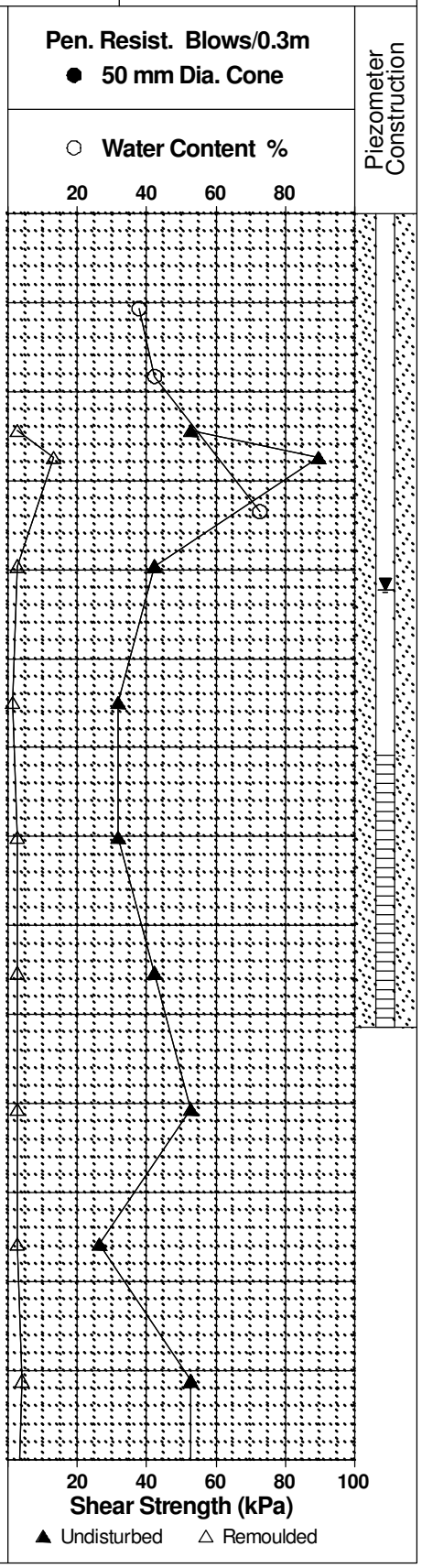
FILE NO. G8533

REMARKS

HOLE NO. BH 7

BORINGS BY CME 55 Power Auger **DATE** 14 Mar 02

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	86.80
TOPSOIL 0.18							
Very stiff to stiff, brown-grey **SILTY CLAY**		SS	1	58	10	1	85.80
		SS	2	67	7	2	84.80
- firm and grey by 3.0m depth		SS	3	71	2	3	83.80
		SS	4	100	1	4	82.80
		SS	5	100	1	5	81.80
		SS	6	100	1	6	80.80
		SS	7	100	1	7	79.80
- stiff to firm by 10.0m depth		SS	8	100	1	8	78.80
		SS	9	100	1	9	77.80
						10	76.80
						11	75.80
						12	74.80
						13	73.80
14.00						14	72.80



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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Subdivision, 4th Line Road
Ottawa, Ontario

DATUM Approximate geodetic, based on base plan provided by Webster and Simmonds Surveying Ltd.

FILE NO. G8533

REMARKS

HOLE NO. BH 7

BORINGS BY CME 55 Power Auger **DATE** 14 Mar 02

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
Stiff, grey **SILTY CLAY**		SS	10	100	1	14	72.80		
		SS	11	100	1	15	71.80		
						16	70.80		
16.46						17	69.80		
Dynamic Cone Penetration test commenced @ 16.46m depth						18	68.80		
						19	67.80		
19.30									
End of Borehole Cone refusal @ 19.30m depth (GWL @ 4.23m-March 26/02)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %; 20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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Consulting Engineers

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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

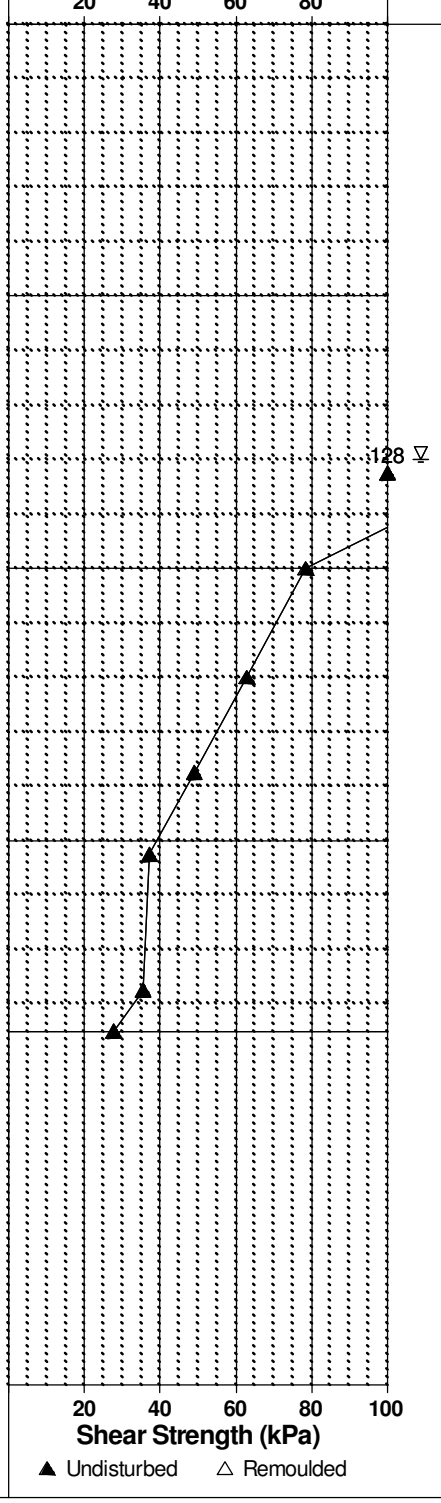
FILE NO. PG0861

REMARKS

HOLE NO. TP 9-08

BORINGS BY Hydraulic Shovel **DATE** 28 August 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	86.92		
TOPSOIL 0.15									
Loose, light brown **SILTY SAND** 0.75						1	85.92		
Very stiff to stiff, brown **SILTY CLAY**						2	84.92		
- firm and grey by 2.7m depth						3	83.92		
3.70									
End of Test Pit									
(GWL @ 1.6m-Aug. 28/08)									



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Consulting Engineers

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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PG0861

REMARKS

HOLE NO. TP11-08

BORINGS BY Hydraulic Shovel **DATE** 28 August 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.20						0	87.14		
Very stiff to stiff, brown **SILTY CLAY**						1	86.14	128 128 128 128	
						2	85.14		
- stiff to firm and grey by 2.9m depth						3	84.14		
3.70 End of Test Pit (GWL @ 1.0m-Aug. 28/08)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

Water Content % axis: 20 40 60 80

Shear Strength (kPa) axis: 20 40 60 80 100

▲ Undisturbed △ Remoulded

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Consulting Engineers

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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PG0861

REMARKS

HOLE NO. TP16-08

BORINGS BY Hydraulic Shovel **DATE** 28 August 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	86.81		
TOPSOIL 0.20									
Very stiff to stiff, brown **SILTY CLAY**						1	85.81	128 128	▽
- firm and grey by 2.3m depth						2	84.81		
						3	83.81		
3.85 End of Test Pit (GWL @ 1.1m-Aug. 28/08)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

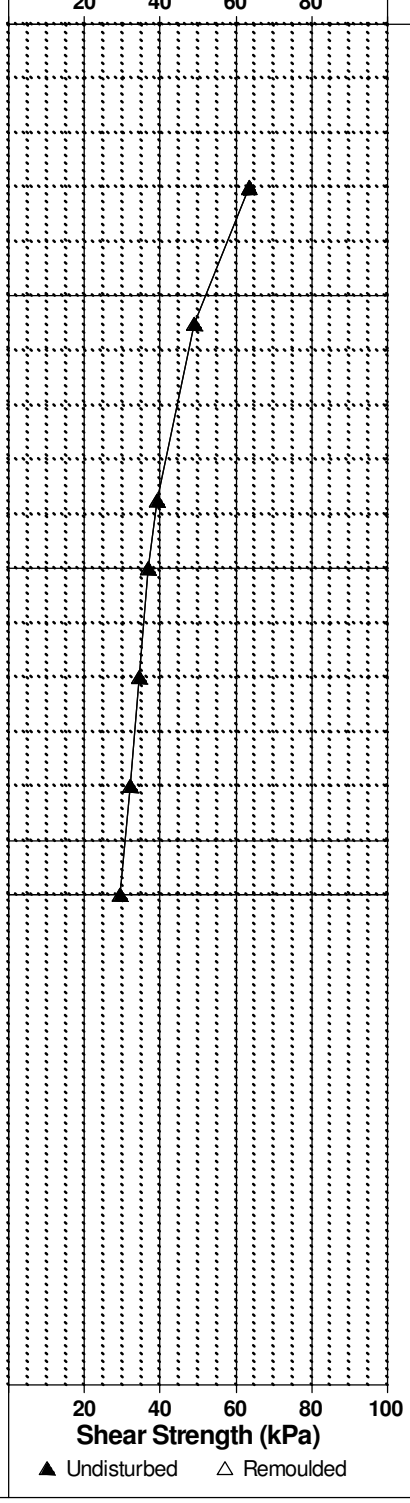
FILE NO. PG0861

REMARKS

HOLE NO. TP17-08

BORINGS BY Backhoe **DATE** 24 October 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.15						0	87.62		
Stiff to firm, brown **SILTY CLAY**						1	86.62		
- firm and grey by 1.3m depth						2	85.62		
3.20						3	84.62		
End of Test Pit									
(TP dry upon completion)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PG0861

REMARKS

HOLE NO. TP18-08

BORINGS BY Backhoe **DATE** 24 October 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	87.38		
TOPSOIL 0.15									
Stiff, brown **SILTY CLAY**						1	86.38		▽
- firm and grey by 2.5m depth						2	85.38		
3.10						3	84.38		
End of Test Pit (Groundwater infiltration @ 1.5m depth)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PG0861

REMARKS

HOLE NO. TP19-08

BORINGS BY Backhoe **DATE** 24 October 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	87.03		
TOPSOIL 0.15									
Stiff, brown **SILTY CLAY**						1	86.03		▽
- stiff to firm and grey by 2.3m depth						2	85.03		
						3	84.03		
3.35 End of Test Pit									
(Groundwater infiltration @ 1.6m depth)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %; 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100; ▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Residential Development - Eden Park East Portion
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

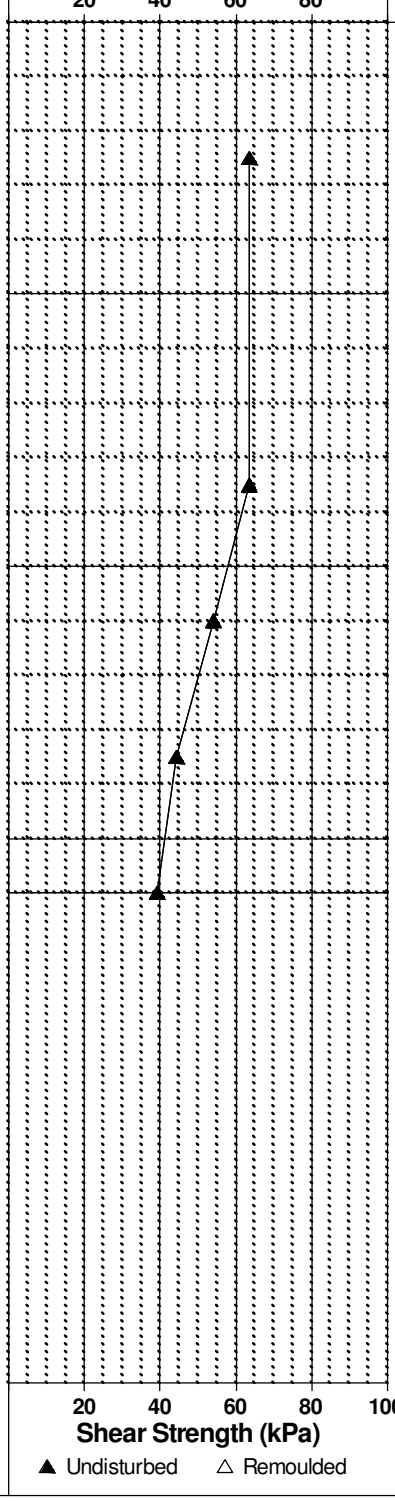
FILE NO. PG0861

REMARKS

HOLE NO. TP20-08

BORINGS BY Backhoe **DATE** 24 October 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	87.24		
TOPSOIL 0.30									
Stiff, brown **SILTY CLAY**						1	86.24		
						2	85.24		
- firm and grey by 2.5m depth						3	84.24		▽
3.20 End of Test Pit (Groundwater infiltration @ 3.0m depth)									



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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP14

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	89.06		
TOPSOIL 0.30									
Stiff, brown **SILTY CLAY**									
1.00						1	88.06		
End of Test Pit TP terminated on bedrock surface @ 1.00m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

Shear Strength (kPa)
20 40 60 80 100
▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP15

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.15						0	88.63		
Very stiff, grey-brown **SILTY CLAY**		G	1						
1.10						1	87.63		▽
End of Test Pit TP terminated on bedrock surface @ 1.10m depth (Open hole GWL @ 1.0m depth)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP16

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.48	20 40 60 80	
TOPSOIL 0.15									
Very stiff to stiff, grey-brown **SILTY CLAY**						1	87.48		▽
						2	86.48		
3.10						3	85.48		
End of Test Pit (Open hole GWL @ 1.8m depth)								20 40 60 80 100 **Shear Strength (kPa)** ▲ Undisturbed △ Remoulded	

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP17

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.47	20 40 60 80	
TOPSOIL									
0.30									
Stiff, grey-brown **SILTY CLAY**						1	87.47		▽
						2	86.47		
						3	85.47		
3.20									
End of Test Pit (Open hole GWL @ 1.0m depth)								20 40 60 80 100 **Shear Strength (kPa)** ▲ Undisturbed △ Remoulded	

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP18

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	89.14		
TOPSOIL 0.30									
Stiff, brown to grey-brown **SILTY CLAY**						1	88.14		
1.10									
End of Test Pit TP terminated on bedrock surface @ 1.10m depth (Open hole GWL @ 1.1m depth)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP19

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	89.26		
TOPSOIL									
0.30									
Brown **SILTY CLAY**									
0.60									
End of Test Pit									
TP terminated on bedrock surface @ 0.60m depth									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP20

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.94		
TOPSOIL 0.30									
Stiff, brown **SILTY CLAY**									
1.00						1	87.94		
End of Test Pit TP terminated on bedrock surface @ 1.00m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP21

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.53		
TOPSOIL 0.30									
Stiff, grey-brown **SILTY CLAY**						1	87.53		
1.70									
End of Test Pit TP terminated on bedrock surface @ 1.70m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP22

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.78		
TOPSOIL 0.30									
Stiff, grey-brown **SILTY CLAY**						1	87.78		
1.40									
End of Test Pit TP terminated on bedrock surface @ 1.40m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP23

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.49	20 40 60 80	
TOPSOIL									
0.30									
Stiff, brown to grey-brown **SILTY CLAY**						1	87.49		
						2	86.49		▽
						3	85.49		
3.30									
End of Test Pit (Open hole GWL @ 2.0m depth)									

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP24

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.71	20 40 60 80	
TOPSOIL									
0.30									
Stiff, grey-brown **SILTY CLAY**						1	87.71		▽
						2	86.71		
						3	85.71		
3.30									
End of Test Pit (Open hole GWL @ 1.4m depth)								20 40 60 80 100 **Shear Strength (kPa)** ▲ Undisturbed △ Remoulded	

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP25

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.82		
TOPSOIL									
0.40									
Stiff, grey-brown **SILTY CLAY**						1	87.82		▽
						2	86.82		
2.40									
End of Test Pit TP terminated on bedrock surface @ 2.40m depth (Open hole GWL @ 1.6m depth)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

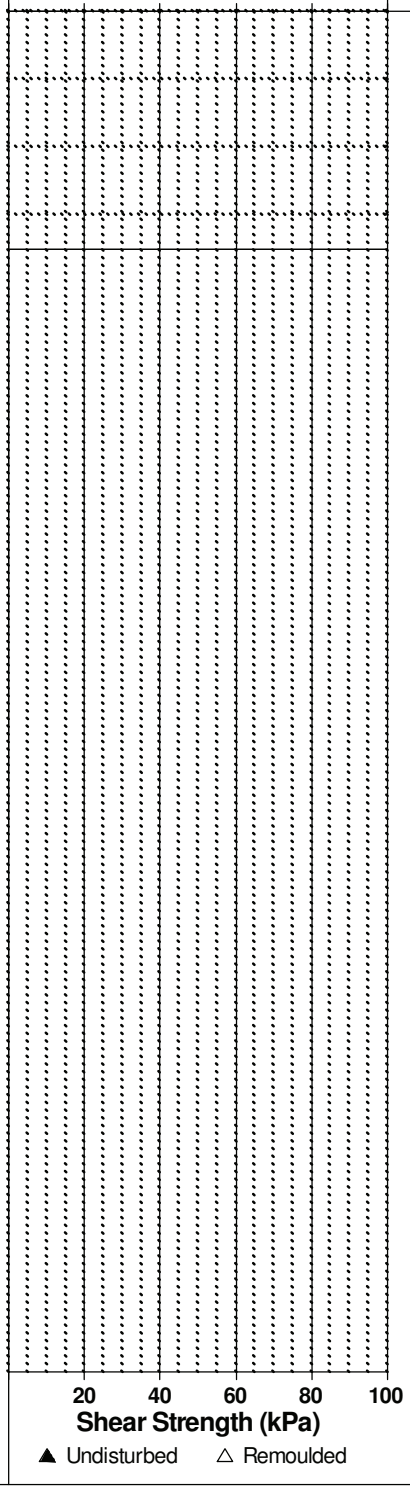
FILE NO. PG0811

REMARKS

HOLE NO. TP26

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	89.48		
TOPSOIL									
0.30									
Stiff, brown **SILTY CLAY**									
0.70									
End of Test Pit									
TP terminated on bedrock surface @ 0.70m depth									
(TP dry upon completion)									



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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP27

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.54		
TOPSOIL									
0.30									
Stiff, grey-brown **SILTY CLAY**						1	87.54		▽
						2	86.54		
2.30									
End of Test Pit TP terminated on bedrock surface @ 2.30m depth (Open hole GWL @ 1.2m depth)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP28

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.15	20 40 60 80	
TOPSOIL									
0.30									
Stiff, grey-brown **SILTY CLAY**						1	87.15		
						2	86.15		
2.40									
End of Test Pit TP terminated on bedrock surface @ 2.40m depth (Open hole GWL @ 1.3m depth)									

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP29

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.12		
TOPSOIL									
0.30									
Stiff, grey-brown **SILTY CLAY**		G	1			1	87.12		
- grey by 1.8m depth						2	86.12		
						3	85.12		
3.20									
End of Test Pit									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP30

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	89.09		
TOPSOIL 0.20									
Stiff, brown **SILTY CLAY**						1	88.09		
1.10									
End of Test Pit TP terminated on bedrock surface @ 1.10m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

patersongroup

Consulting Engineers

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

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP31

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.63		
TOPSOIL									
0.30									
Stiff, grey-brown **SILTY CLAY**						1	87.63		
						2	86.63		
2.50									
End of Test Pit TP terminated on bedrock surface @ 2.50m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup

Consulting Engineers

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

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP32

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	89.18		
TOPSOIL 0.30									
Stiff, brown **SILTY CLAY** 0.80									
End of Test Pit TP terminated on bedrock surface @ 0.80m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup

Consulting Engineers

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

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP33

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.99		
TOPSOIL 0.30									
Stiff, grey-brown **SILTY CLAY**						1	87.99		
- some boulders by 1.2m depth 1.40									
End of Test Pit TP terminated on bedrock surface @ 1.40m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup

Consulting Engineers

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

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Pharand Lands - Innes Road at Mer Bleeu Road
Ottawa, Ontario

DATUM Geodetic, as provided by Stantec Consulting Ltd.

FILE NO. PG0811

REMARKS

HOLE NO. TP34

BORINGS BY Backhoe **DATE** 12 Apr 06

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.49	20 40 60 80	
TOPSOIL									
0.30									
Stiff, grey-brown **SILTY CLAY**						1	87.49		
						2	86.49		
2.30									
End of Test Pit TP terminated on bedrock surface @ 2.30m depth (TP dry upon completion)									

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup

Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development-Renaud Road
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Hand Auger **DATE** 11 May 2009

FILE NO. PG1605

HOLE NO. HA 3-09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0		20 40 60 80	
TOPSOIL									
0.25									
Very stiff, brown **SILTY CLAY**						1		128	
1.60								128	
End of Hand Auger Hole								20 40 60 80 100 **Shear Strength (kPa)** ▲ Undisturbed △ Remoulded	

patersongroup

Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development-Renaud Road
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Hand Auger **DATE** 11 May 2009

FILE NO. PG1605

HOLE NO. HA 4-09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0		20 40 60 80	
TOPSOIL									
0.25									
Brown **SILTY** fine **SAND**									
0.35									
Very stiff, brown **SILTY CLAY**						1		128	
								128	
1.56									
End of Hand Auger Hole									

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

patersongroup

Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development-Renaud Road
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Hand Auger **DATE** 11 May 2009

FILE NO. PG1605

HOLE NO. HA 5-09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0		20 40 60 80	
TOPSOIL									
0.30									
Very stiff, brown **SILTY CLAY**						1		128	
								128	
1.60									
End of Hand Auger Hole								20 40 60 80 100 **Shear Strength (kPa)** ▲ Undisturbed △ Remoulded	

patersongroup

Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development-Renaud Road
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Hand Auger **DATE** 11 May 2009

FILE NO. PG1605

HOLE NO. HA 6-09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0		20 40 60 80	
TOPSOIL									
0.30									
Brown **SILTY CLAY** with sand									
0.50									
Very stiff, brown **SILTY CLAY**						1		128	
								128	
1.60									
End of Hand Auger Hole									

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

PROJECT: 05-1120-163

RECORD OF BOREHOLE: 05-1

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: Oct. 26, 2005

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									
0	Power Auger 203mm Diam. (Hollow Stem)	TOPSOIL		0.00							
		Stiff grey brown SILTY CLAY, slight black organic mottling (Weathered Crust)		0.28	1	SS	6				
1											
					2	SS	8				
2		Loose brown SILTY SAND, some gravel, trace clay, occasional boulder (GLACIAL TILL)		2.29	3	SS	>100				
		End of Borehole Sampler Refusal		2.72							
3											
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: R.I.
CHECKED: M.I.C.

BOREHOLE: 05-1120-163.GPJ GLDR_CAN.GDT 12/5/05

PROJECT: 05-1120-163

RECORD OF BOREHOLE: 05-2

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: Oct. 26, 2005

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp — W — Wl (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									
0	Power Auger 200mm Diam. (Hollow Stem)	TOPSOIL		0.00							
		Stiff grey brown and red brown SILTY CLAY, slight black organic mottling (Weathered Crust)		0.20	1	50 DO	10				
1											
					2	50 DO	7				
2		Compact brown SILTY SAND, some gravel, trace clay (GLACIAL TILL)		2.13	3	50 DO	>100				
		End of Borehole Sampler Refusal		2.36							
3											
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: R.I.
CHECKED: M.I.C.

BOREHOLE: 05-1120-163.GPJ GLDR_CAN.GDT 12/5/05

PROJECT: 05-1120-163

RECORD OF BOREHOLE: 05-3

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: Oct. 21, 2005

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE											
0	Power Auger 200mm Diam. (Hollow Stem)	TOPSOIL		0.00									
		Very stiff to stiff with depth grey brown and red brown SILTY CLAY (Weathered Crust)		0.22	1	SS DO	10						
1					2	SS DO	6						Native Backfill
2					3	SS DO	2						
3		Firm grey SILTY CLAY		3.20	4	SS DO	WH						Bentonite Seal
4													Silica Sand
5					5	SS DO	1						Standpipe
		Probably Glacial Till		5.03									
		End of Borehole Auger Refusal		5.33									Water level at 0.39m depth below ground surface on Nov. 8, 2005
6													
7													
8													
9													
10													

BOREHOLE 05-1120-163.GPJ GLDR_CAN.GDT 12/5/05

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: P.A.H.
CHECKED: M.J.C.

PROJECT: 05-1120-163

RECORD OF BOREHOLE: 05-4

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: Oct. 26, 2005

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7})	WATER CONTENT PERCENT (Wp W Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE											
0	Power Auger 200mm Diam. (Hollow Stem)	TOPSOIL		0.00									
		Stiff grey brown and red brown SILTY CLAY, slight organic mottling (Weathered Crust)		0.30	1	SS DO	9						
1													
					2	SS DO	7						
2													
					3	SS DO	2						
3													
4		Soft to firm grey SILTY CLAY		4.47									
5													
6					4	SS DO	WH						
7		End of Borehole		7.32									
8													
9													
10													

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: R.I.

CHECKED: M.I.C.

BOREHOLE 05-1120-163.GPJ GLDR_CAN.GDT 12/5/05

PROJECT: 05-1120-163

RECORD OF BOREHOLE: 05-5

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: Oct. 27, 2005

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT (Wp W Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE									
		TOPSOIL		0.00							Silica Sand
		Firm to stiff grey brown SILTY CLAY (Weathered Crust)		0.08							
1	Power Auger 200mm Diam. (Hollow Stem)				1	SS	10				
2					2	SS	4				Native Backfill
3					3	SS	WH				
		Firm grey SILTY CLAY		3.05							
4											
											Bentonite Seal
5											Silica Sand
											Standpipe
6											Water level in standpipe at 2.0m depth below ground surface on Nov. 8, 2005
		End of Borehole		6.71							
7											
8											
9											
10											

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: H.E.C.

CHECKED: M.J.C.

BOREHOLE 05-1120-163.GPJ GLDR_CAN.GDT 12/5/05

JACQUES WHITFORD LIMITED

BOREHOLE RECORD

CLIENT McNeely Engineering Consultants Ltd.
LOCATION Orleans South Feedermain, Orleans, Ontario
DATES: BORING 95-05-15 WATER LEVEL 95-05-19

BOREHOLE No. 95-1
PROJECT No. 10629
DATUM Local

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY mm	SAMPLES N-VALUE OR RQD
0	98.37							
		Compact, brown and grey, SANDY SILT, trace clay						
1	97.3				SS	1	560	13
		Very stiff to stiff, greyish-brown, SILTY CLAY			SS	2	610	7
2					SS	3	610	4
3	95.3				SS	4	610	4
		Firm to stiff, grey, SILTY CLAY						
6				▽	SS	5	610	2
9					SS	6	610	2
	88.6							
10		End of Borehole Standpipe installed						
11								

UNDRAINED SHEAR STRENGTH - kPa
50 100 150 200
WATER CONTENT & ATTERBERG LIMITS W_P W W_L
DYNAMIC PENETRATION TEST, BLOWS/0.3m *
STANDARD PENETRATION TEST, BLOWS/0.3m ●
10 20 30 40 50 60 70 80 90

▽ Proposed Pipe Invert

■ Field Vane Test, kPa
□ Remoulded Vane Test, kPa
△ Pocket Penetrometer Test, kPa

JACQUES WHITFORD LIMITED

BOREHOLE RECORD

CLIENT McNeely Engineering Consultants Ltd. BOREHOLE No. 95-2

LOCATION Orleans South Feedermain, Orleans, Ontario PROJECT No. 10629

DATES: BORING 95-05-15 WATER LEVEL 95-05-19 DATUM Local

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY mm	SAMPLES N-VALUE OR RQD
0	99.60	Stiff to very stiff, greyish-brown, SILTY CLAY						
1					SS	1	560	9
2					SS	2	610	2
3	96.6	Firm to stiff, grey, SILTY CLAY						
4					SS	3	610	1
5								
6					SS	4	610	2
7	92.9	End of Borehole Standpipe installed						
8								
9								
10								
11								

UNDRAINED SHEAR STRENGTH - kPa

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC PENETRATION TEST, BLOWS/0.3m ★

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90

30

▽ Proposed Pipe Invert

□ Field Vane Test, kPa

□ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

JACQUES WHITFORD LIMITED

BOREHOLE RECORD

CLIENT McNeely Engineering Consultants Ltd. BOREHOLE No. 95-3

LOCATION Orleans South Feedermain, Orleans, Ontario PROJECT No. 10629

DATES: BORING 95-05-15 WATER LEVEL 95-05-19 DATUM Local

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	NUMBER	RECOVERY mm	N-VALUE OR RQD
0	99.54	Firm to very stiff, greyish-brown, SILTY CLAY		▽				
1					SS	1	610	12
2	97.2							
					SS	2	610	2
3								
4					SS	3	610	2
5		Firm, grey, SILTY CLAY						
6					SS	4	610	1
	92.8							
7		End of Borehole Standpipe installed						
8								
9								
10								
11								

UNDRAINED SHEAR STRENGTH - kPa

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC PENETRATION TEST, BLOWS/0.3m ★

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90

▽ Proposed Pipe Invert

□ Field Vane Test, kPa

□ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

JACQUES WHITFORD LIMITED

BOREHOLE RECORD

CLIENT McNeely Engineering Consultants Ltd.
BOREHOLE No. 95-4
LOCATION Orleans South Feedermain, Orleans, Ontario
PROJECT No. 10629
DATES: BORING 95-05-15
WATER LEVEL 95-05-19
DATUM Local

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY mm	SAMPLES N-VALUE OR RQD
0	99.69	Stiff to very stiff, grey-brown, SILTY CLAY						
1					SS	1	610	17
2					SS	2	610	3
3	96.6	Firm, grey, SILTY CLAY						
4					SS	3	610	2
5								
6					SS	4	610	1
7	93.0	End of Borehole Standpipe installed						
8								
9								
10								
11								

UNDRAINED SHEAR STRENGTH - kPa
50 100 150 200
WATER CONTENT & ATTERBERG LIMITS W_P W W_L
DYNAMIC PENETRATION TEST, BLOWS/0.3m ★
STANDARD PENETRATION TEST, BLOWS/0.3m ●
10 20 30 40 50 60 70 80 90

Proposed Pipe Invert

□ Field Vane Test, kPa
□ Remoulded Vane Test, kPa
△ Pocket Penetrometer Test, kPa

JACQUES WHITFORD LIMITED

BOREHOLE RECORD

CLIENT McNeely Engineering Consultants Ltd.
LOCATION Orleans South Feedermain, Orleans, Ontario
DATES: BORING 95-05-16 WATER LEVEL 95-05-19

BOREHOLE No. 95-5
PROJECT No. 10629
DATUM Local

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES N-VALUE OR RQD
	99.91	Loose, gravel fill at surface					mm	
0		Stiff to very stiff, grey-brown, SILTY CLAY						
1					SS	1	500	10
2								
					SS	2	530	4
3	96.9							
4		Firm, grey, SILTY CLAY			SS	3	610	1
5								
6	93.2				SS	4	610	1
7		End of Borehole Standpipe installed						
8								
9								
10								
11								

UNDRAINED SHEAR STRENGTH - kPa
50 100 150 200
WATER CONTENT & ATTERBERG LIMITS W_P W W_L
DYNAMIC PENETRATION TEST, BLOWS/0.3m ★
STANDARD PENETRATION TEST, BLOWS/0.3m ●
10 20 30 40 50 60 70 80 90

Proposed Pipe Invert

□ Field Vane Test, kPa
□ Remoulded Vane Test, kPa
△ Pocket Penetrometer Test, kPa

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

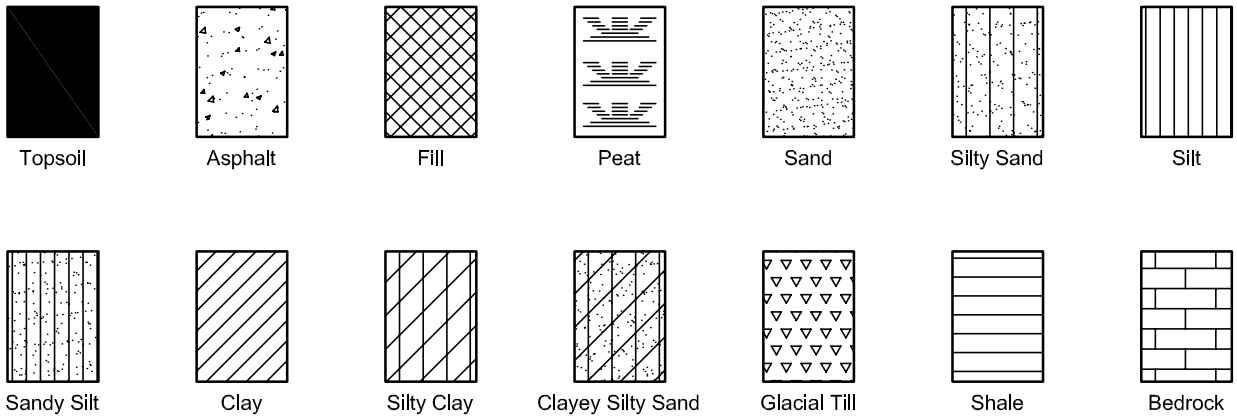
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void 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.

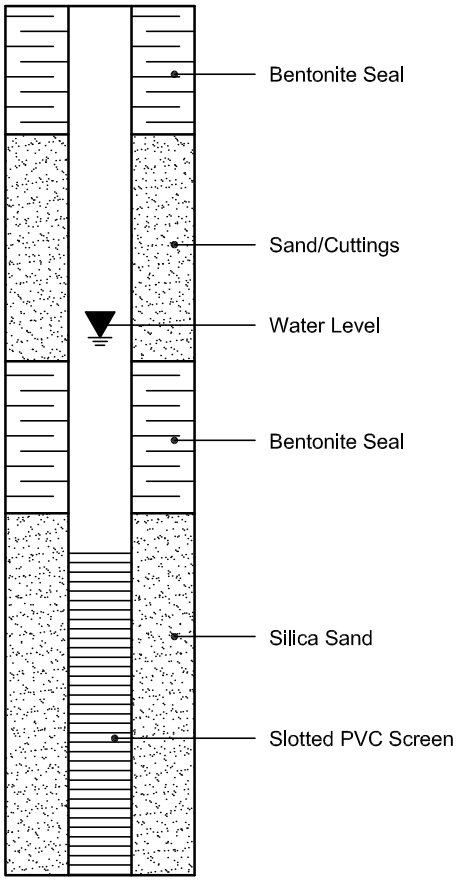
SYMBOLS AND TERMS (continued)

STRATA PLOT

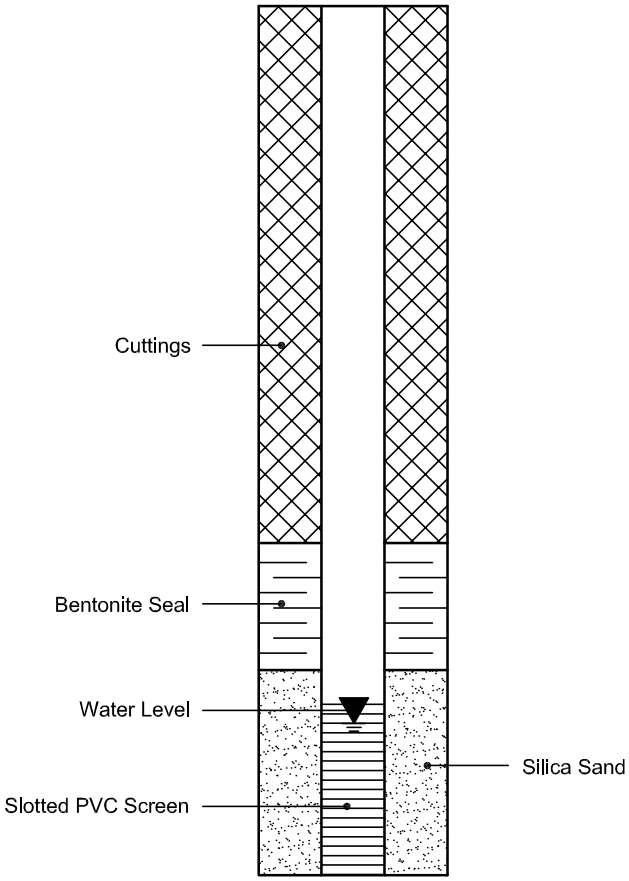


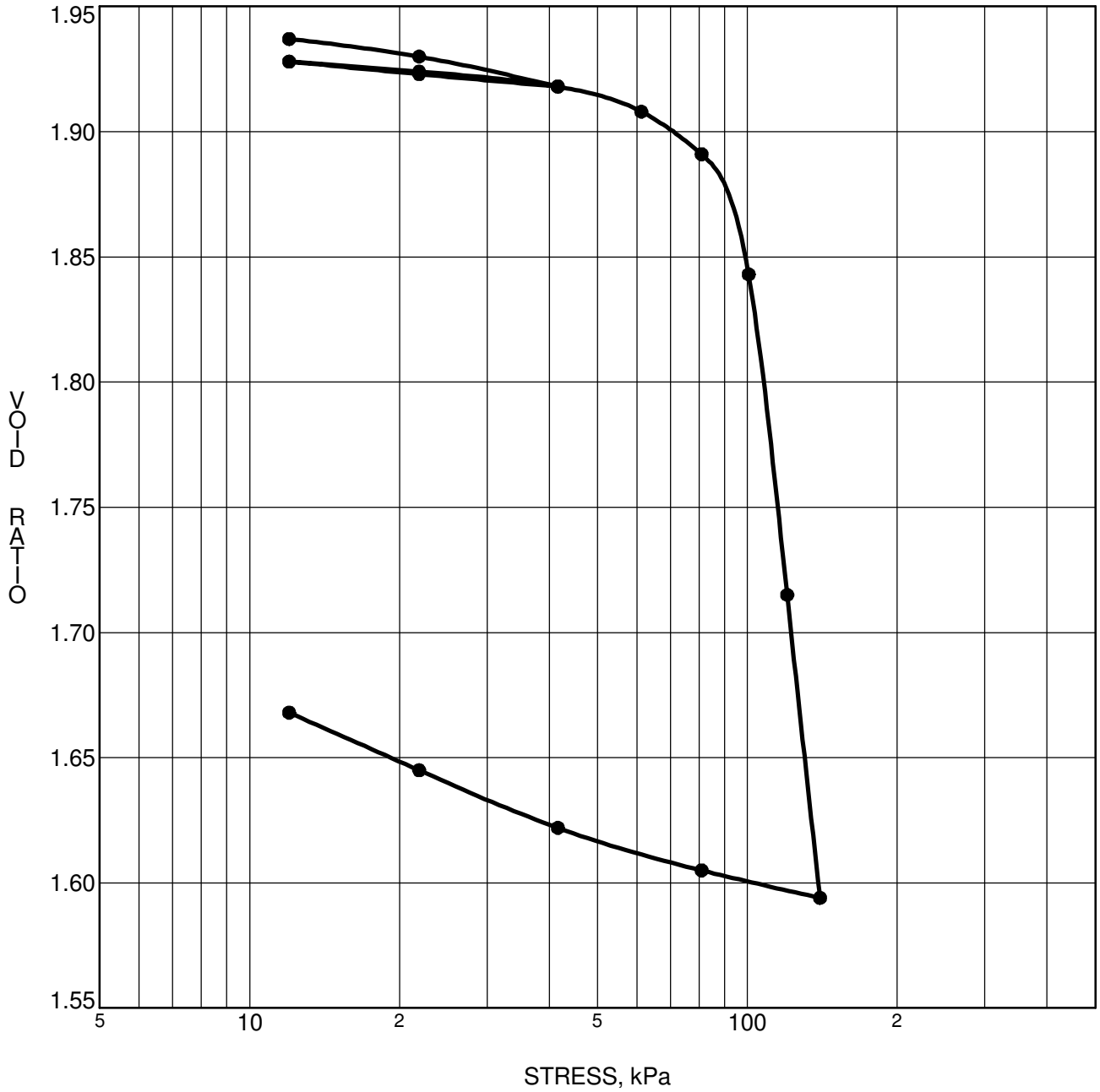
MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION





CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH 1-18**	p'o	**41.23** kPa	Ccr	**0.039**
Sample No.	**TW 3**	p'c	**98.48** kPa	Cc	**1.868**
Sample Depth	**3.53** m	OC Ratio	**2.4**	Wo	**70.8** %
Sample Elev.	**84.14** m	Void Ratio	**1.947**	Unit Wt.	**15.6** kN/m ^{3}

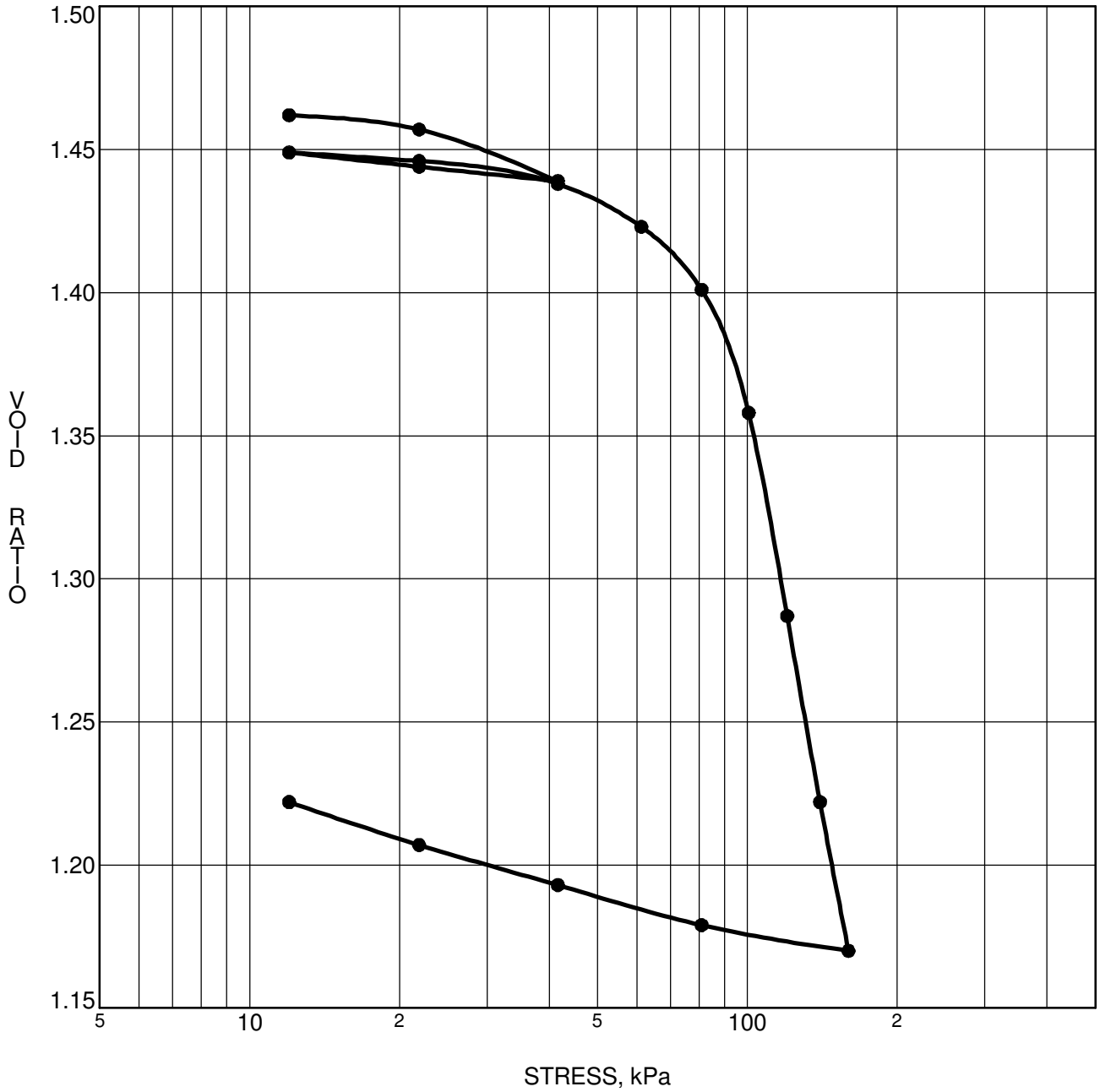
CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **03/07/2018**

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH 3-18**	p'_o	**45.79** kPa	Ccr	**0.018**
Sample No.	**TW 4**	p'_c	**92.9** kPa	Cc	**0.961**
Sample Depth	**4.27** m	OC Ratio	**2.0**	Wo	**53.8** %
Sample Elev.	**83.20** m	Void Ratio	**1.479**	Unit Wt.	**16.7** kN/m ^{3}

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **30/07/2018**

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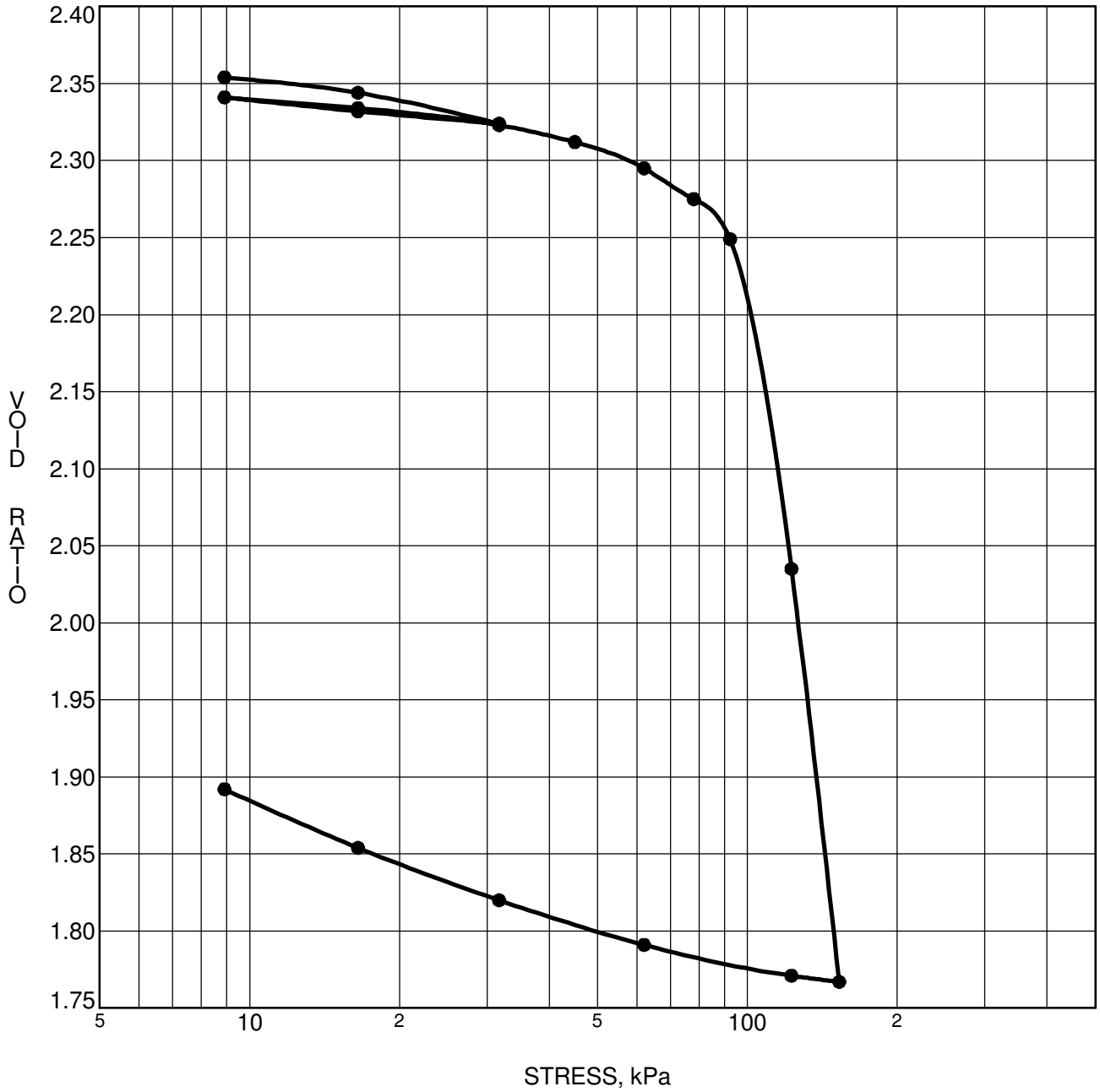
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH 6-18**	p'o	**48.42** kPa	Ccr	**2.756**
Sample No.	**TW 4**	p'c	**100** kPa	Cc	**0.031**
Sample Depth	**4.22** m	OC Ratio	**2.1**	Wo	**85.6** %
Sample Elev.	**83.57** m	Void Ratio	**2.354**	Unit Wt.	**14.9** kN/m ^{3}

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **30/07/2018**

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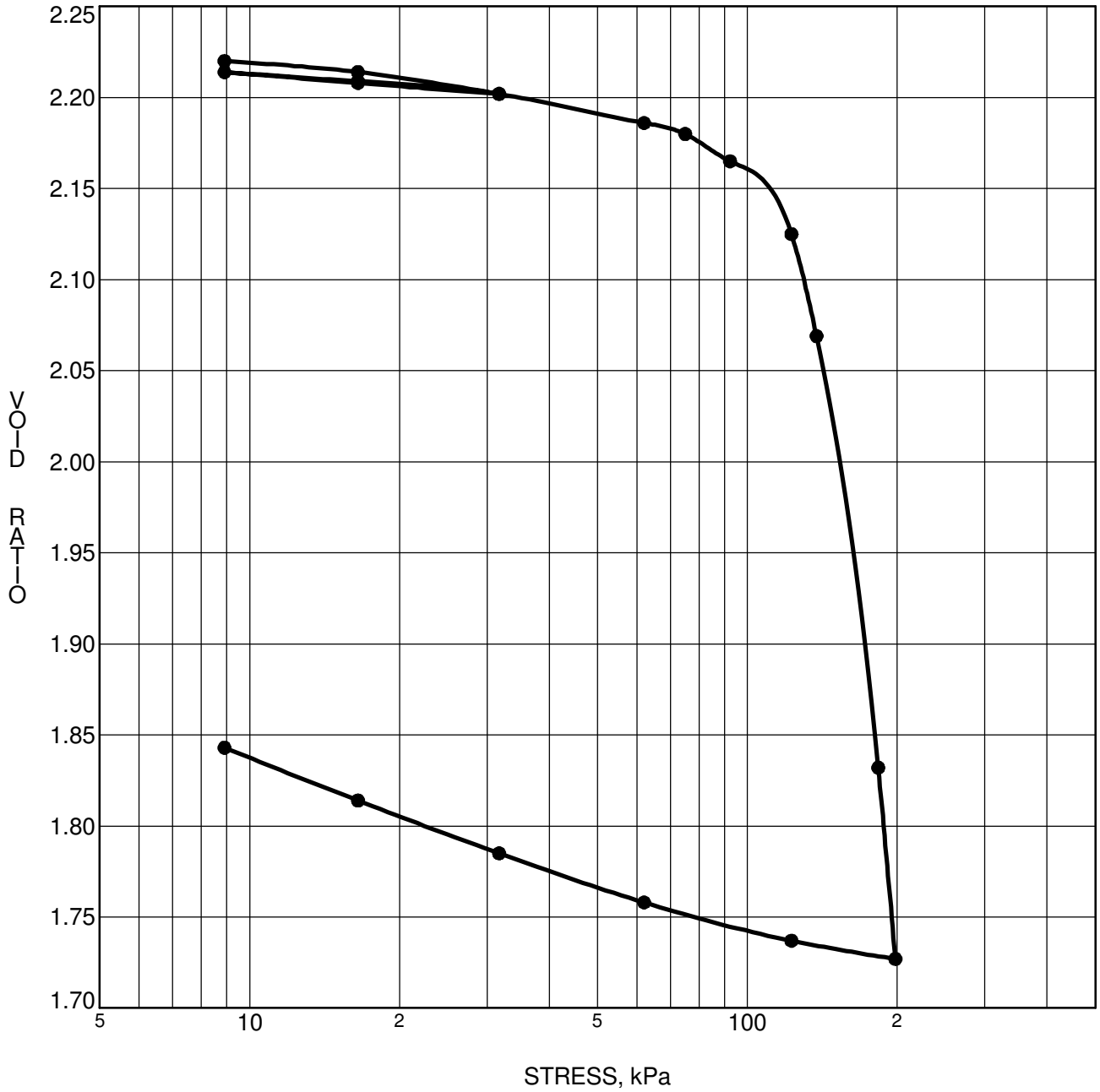
CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH27-18**	p'o	**66.9** kPa	Ccr	**3.182**
Sample No.	**TW 4**	p'c	**145.9** kPa	Cc	**0.023**
Sample Depth	**5.05** m	OC Ratio	**2.2**	Wo	**80.8** %
Sample Elev.	**81.64** m	Void Ratio	**2.221**	Unit Wt.	**15.1** kN/m ^{3}

CLIENT	**Richcraft Group of Companies**	FILE NO.	**PG3130**
PROJECT	**Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP**	DATE	**17/07/2018**

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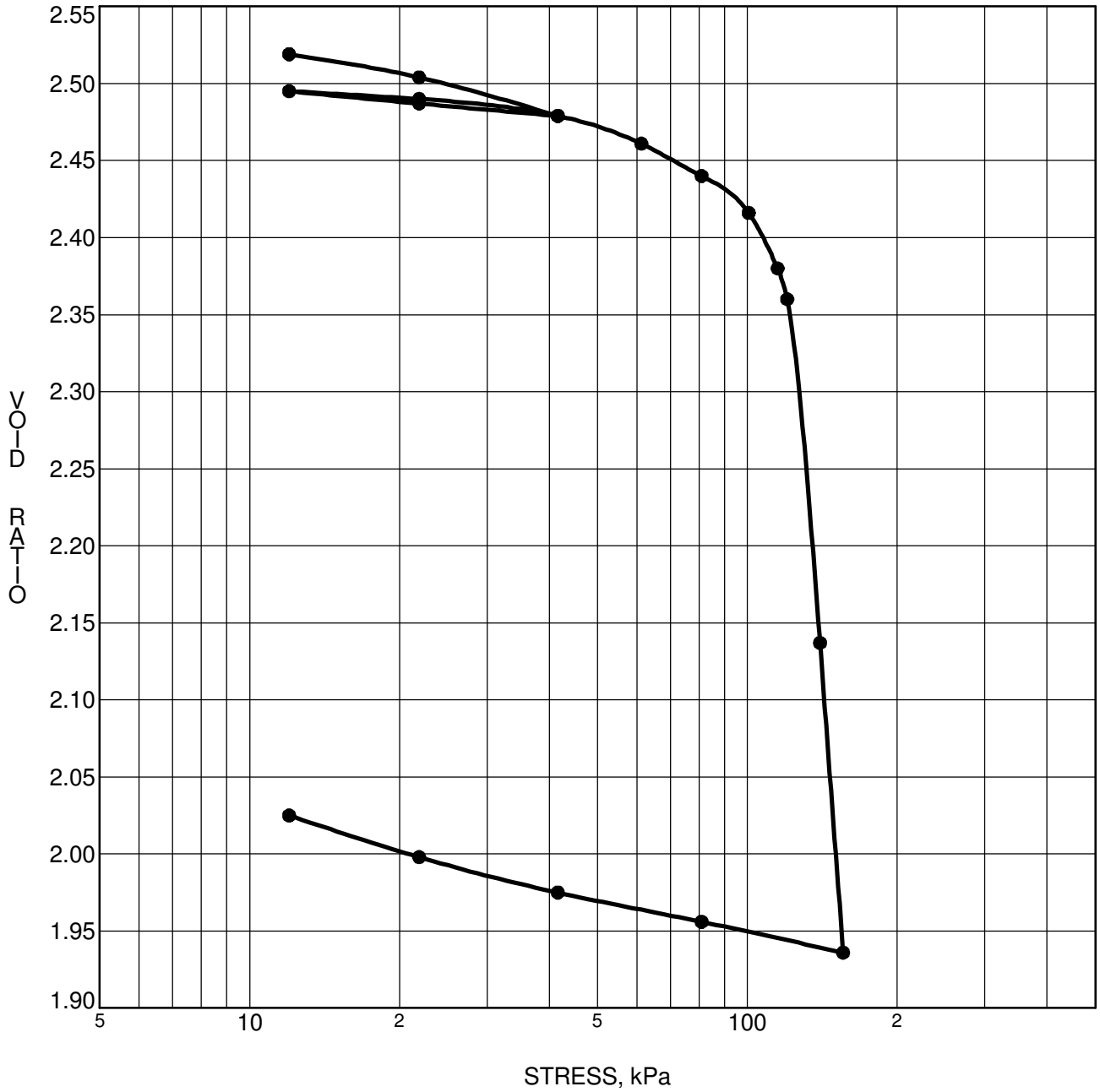
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH28-18**	p'_o	**66.43** kPa	Ccr	**0.028**
Sample No.	**TW 5**	p'_c	**121.7** kPa	Cc	**4.375**
Sample Depth	**4.98** m	OC Ratio	**1.8**	Wo	**92.4** %
Sample Elev.	**81.82** m	Void Ratio	**2.54**	Unit Wt.	**14.7** kN/m ^{3}

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **03/07/2018**

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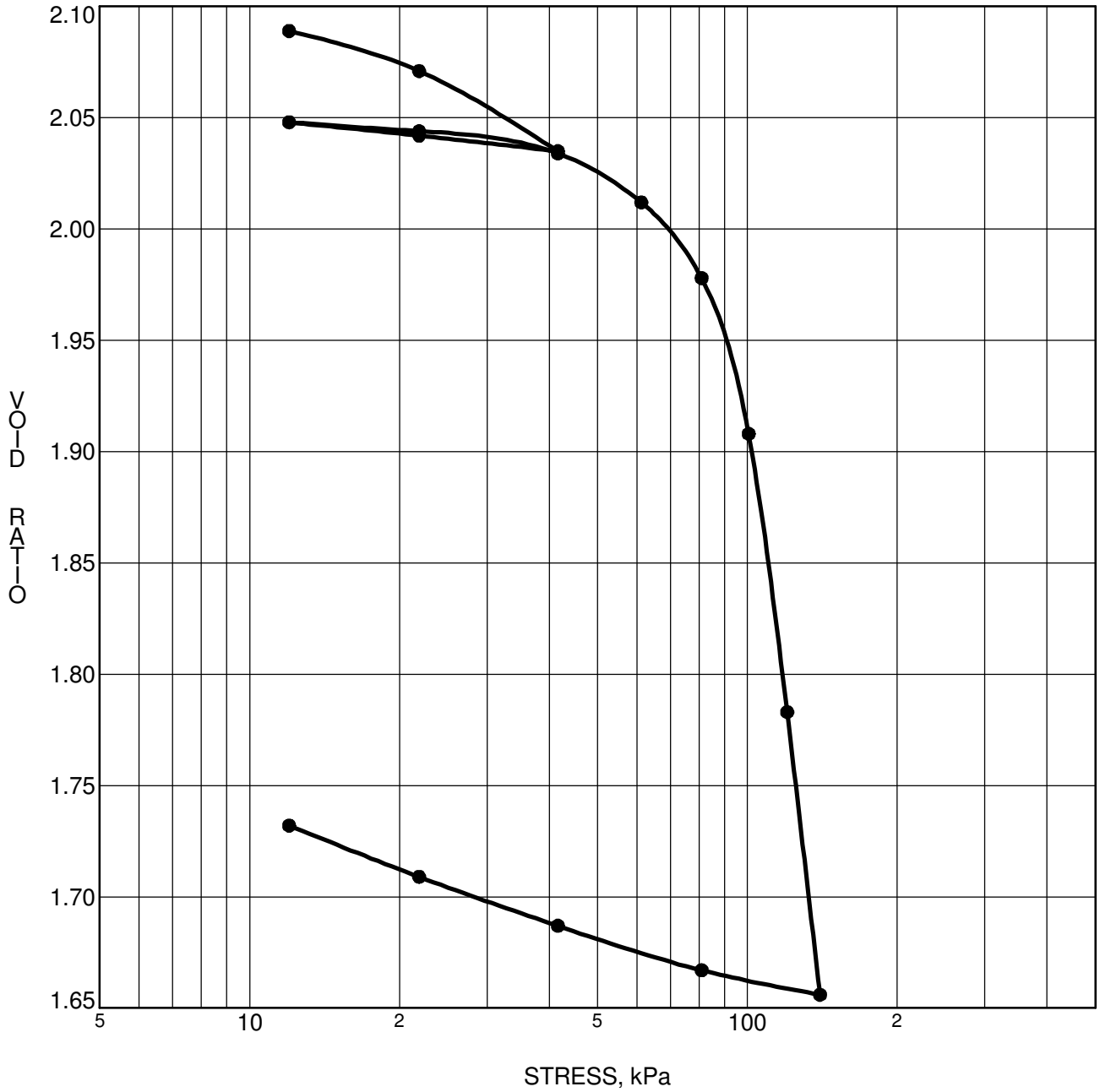
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH35-18**	p'o	**54.07** kPa	Ccr	**1.989**
Sample No.	**TW 4**	p'c	**94.04** kPa	Cc	**0.026**
Sample Depth	**4.29** m	OC Ratio	**1.7**	Wo	**76.7** %
Sample Elev.	**83.52** m	Void Ratio	**2.109**	Unit Wt.	**15.3** kN/m ^{3}

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **13/07/2018**

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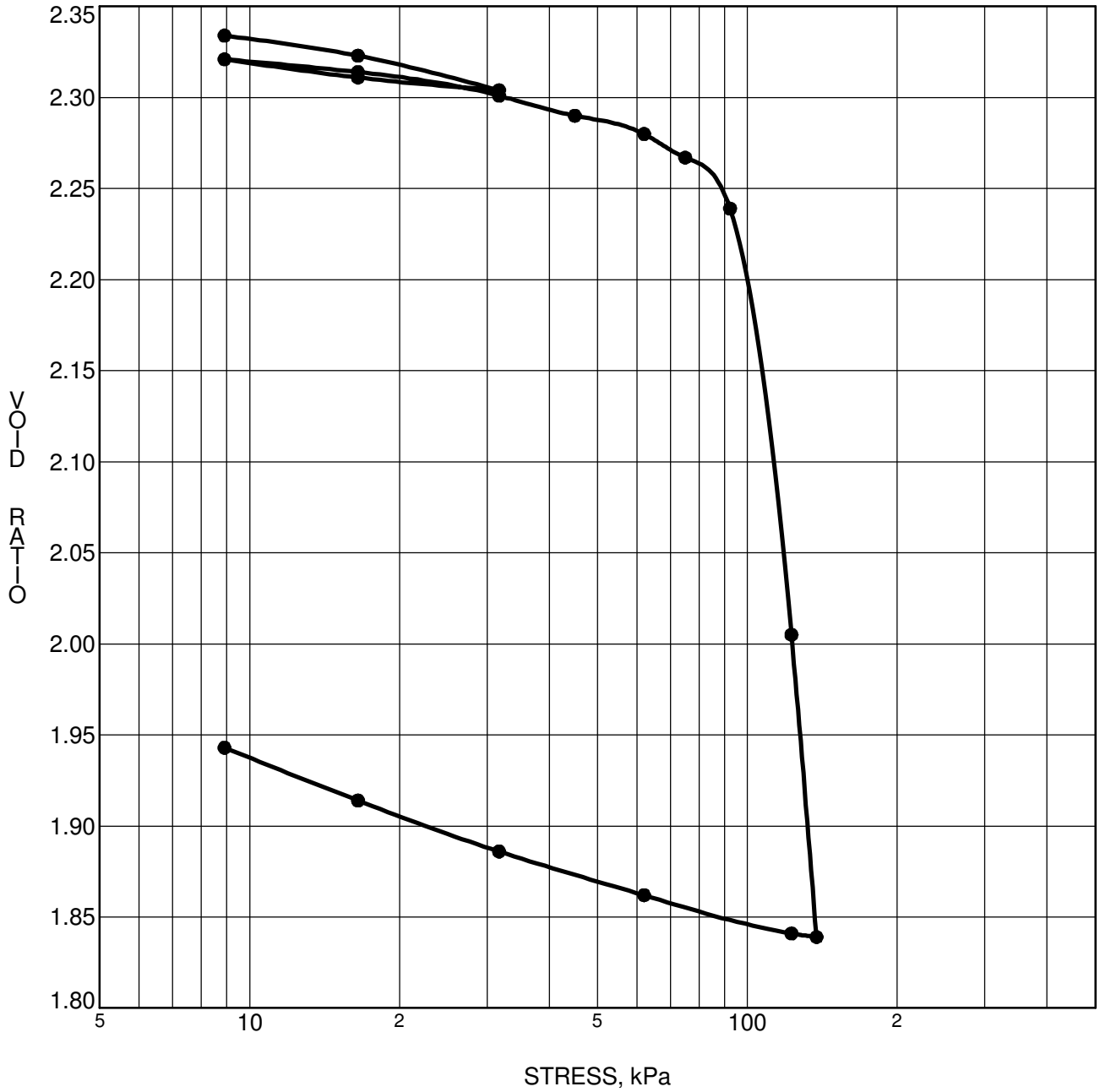
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH36-18**	p'o	**60.06** kPa	Ccr	**0.035**
Sample No.	**TW 4**	p'c	**104.71** kPa	Cc	**3.182**
Sample Depth	**4.98** m	OC Ratio	**1.7**	Wo	**85.0** %
Sample Elev.	**82.46** m	Void Ratio	**2.337**	Unit Wt.	**15.0** kN/m ^{3}

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **03/07/2018**

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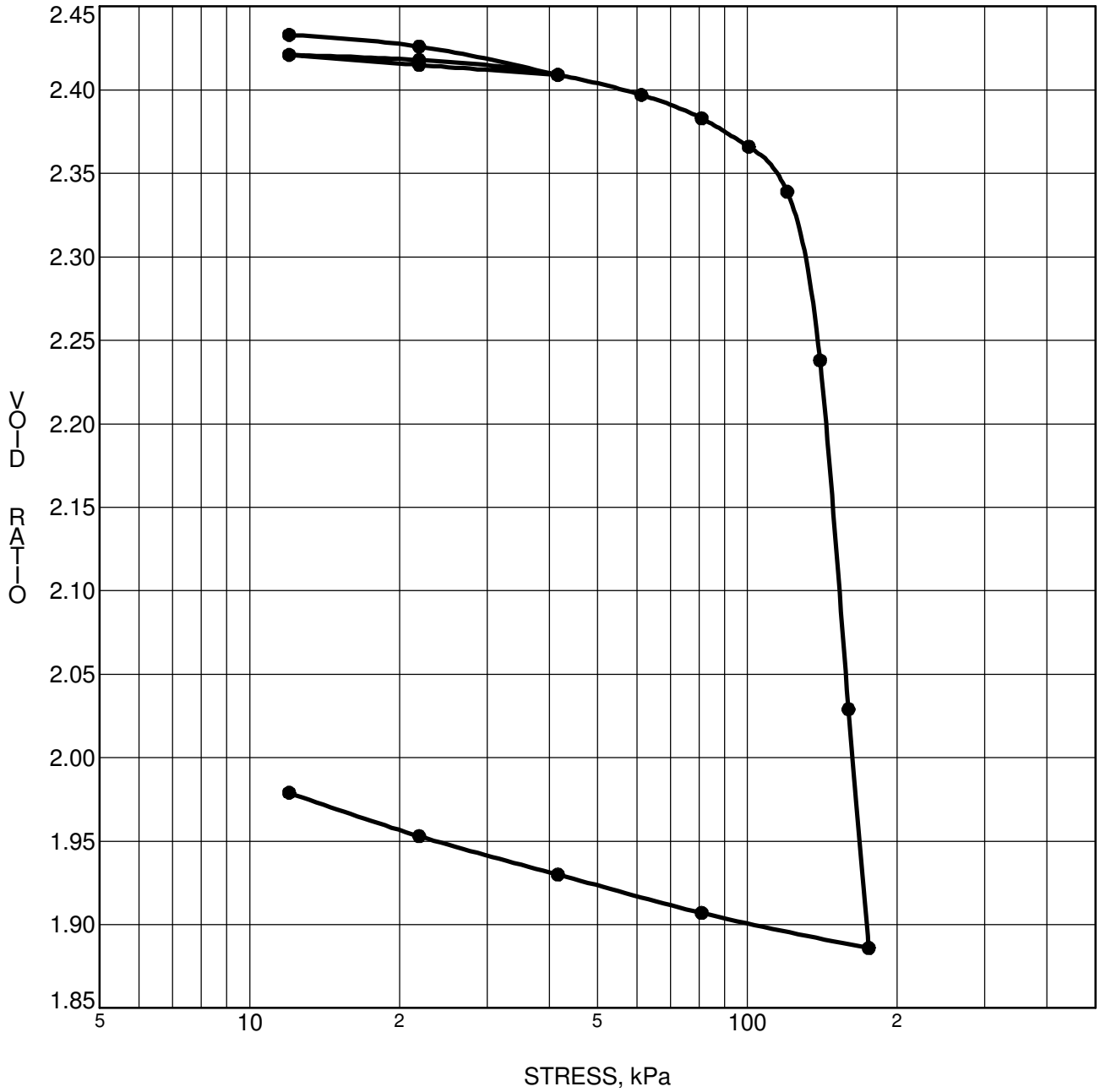
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH42-18**	p'o	**66.9** kPa	Ccr	**0.022**
Sample No.	**TW 4**	p'c	**132.23** kPa	Cc	**3.777**
Sample Depth	**5.05** m	OC Ratio	**2.0**	Wo	**89.0** %
Sample Elev.	**82.91** m	Void Ratio	**2.447**	Unit Wt.	**14.8** kN/m ^{3}

CLIENT	**Richcraft Group of Companies**	FILE NO.	**PG3130**
PROJECT	**Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP**	DATE	**27/07/2018**

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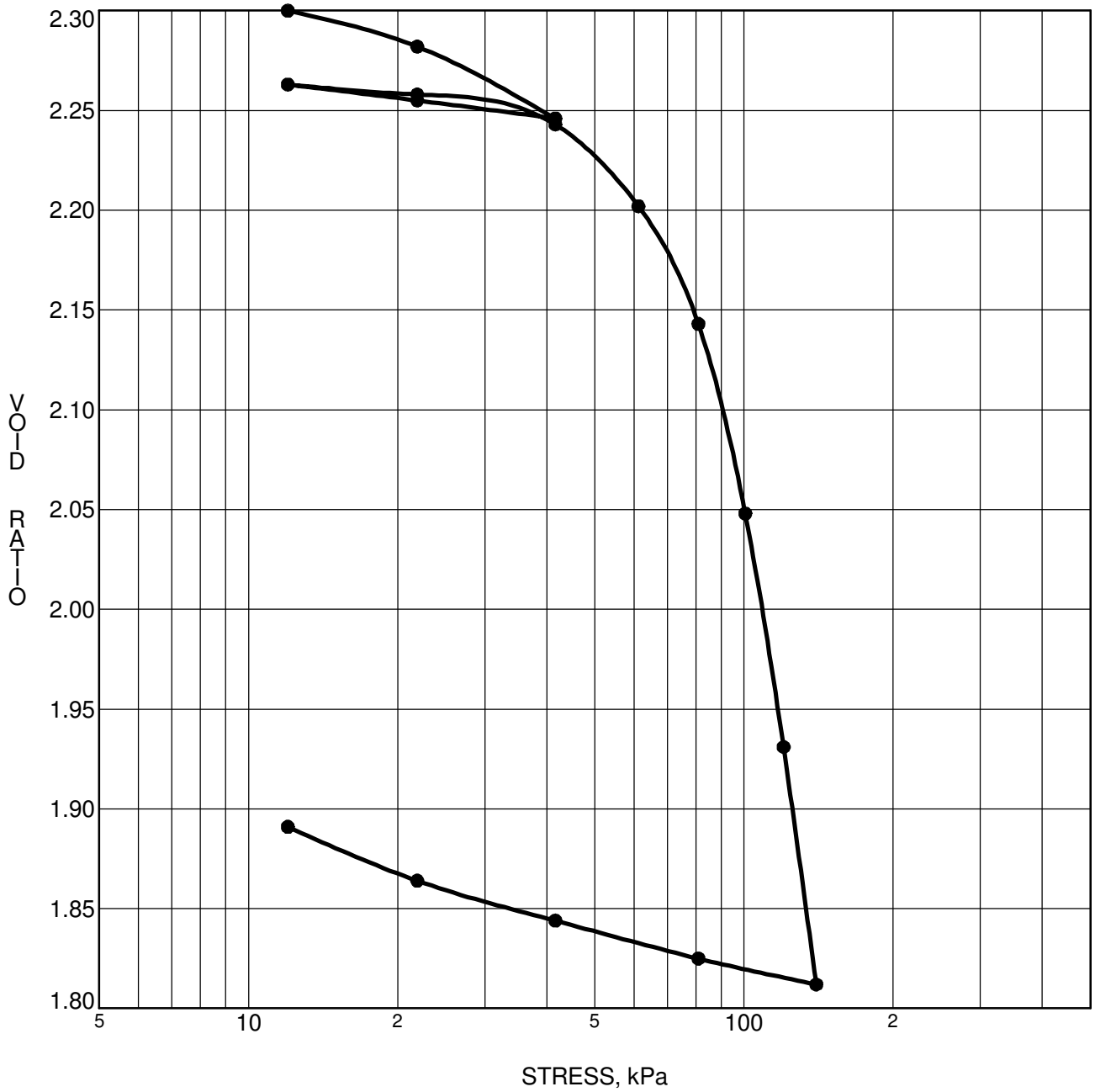
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH44-18**	p'o	**66.75** kPa	Ccr	**1.823**
Sample No.	**TW 4**	p'c	**85.77** kPa	Cc	**0.027**
Sample Depth	**5.03** m	OC Ratio	**1.3**	Wo	**84.4** %
Sample Elev.	**82.99** m	Void Ratio	**2.32**	Unit Wt.	**15.0** kN/m ^{3}

CLIENT	**Richcraft Group of Companies**	FILE NO.	**PG3130**
PROJECT	**Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP**	DATE	**15/07/2018**

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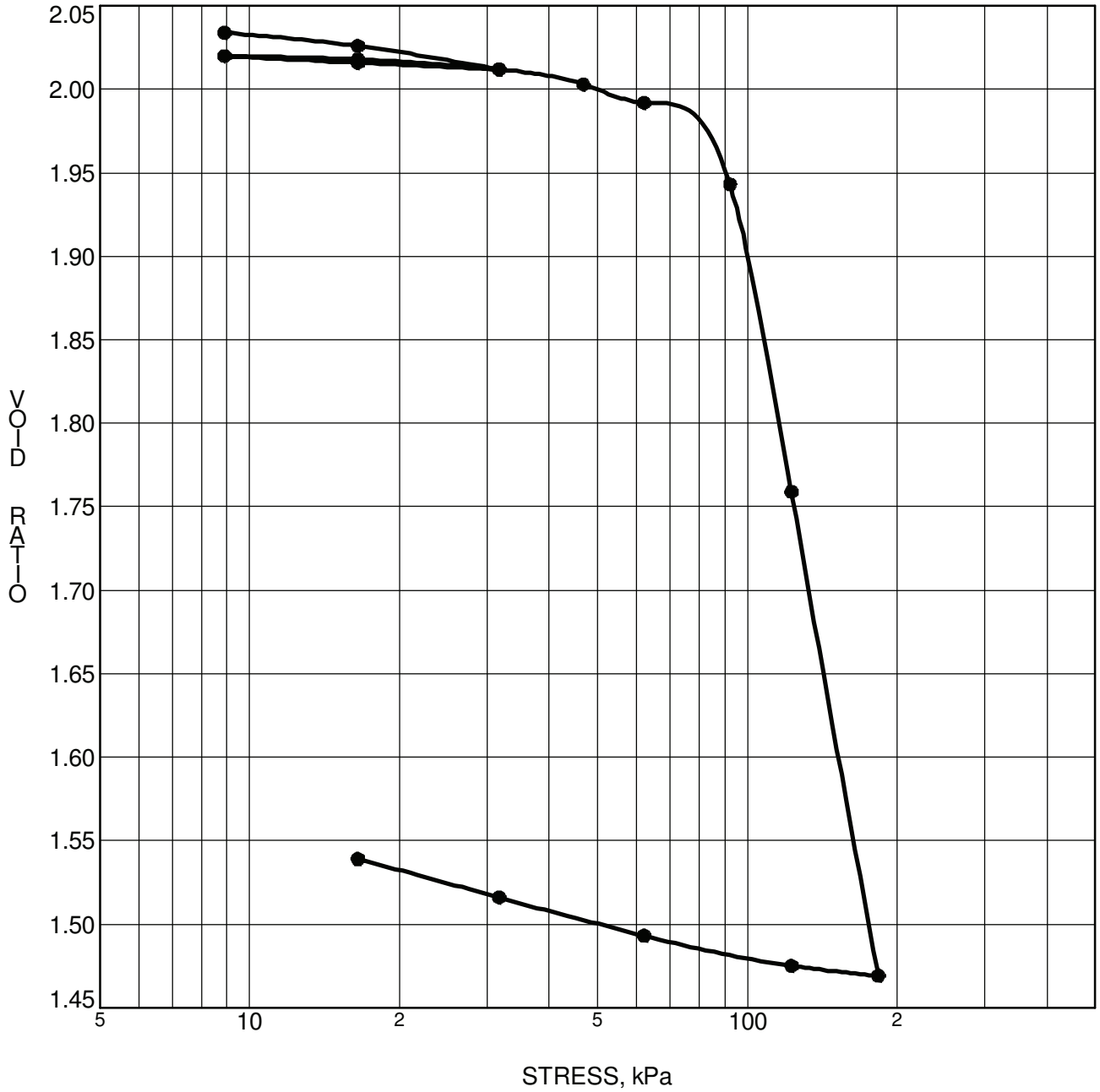
CONSOLIDATION TEST

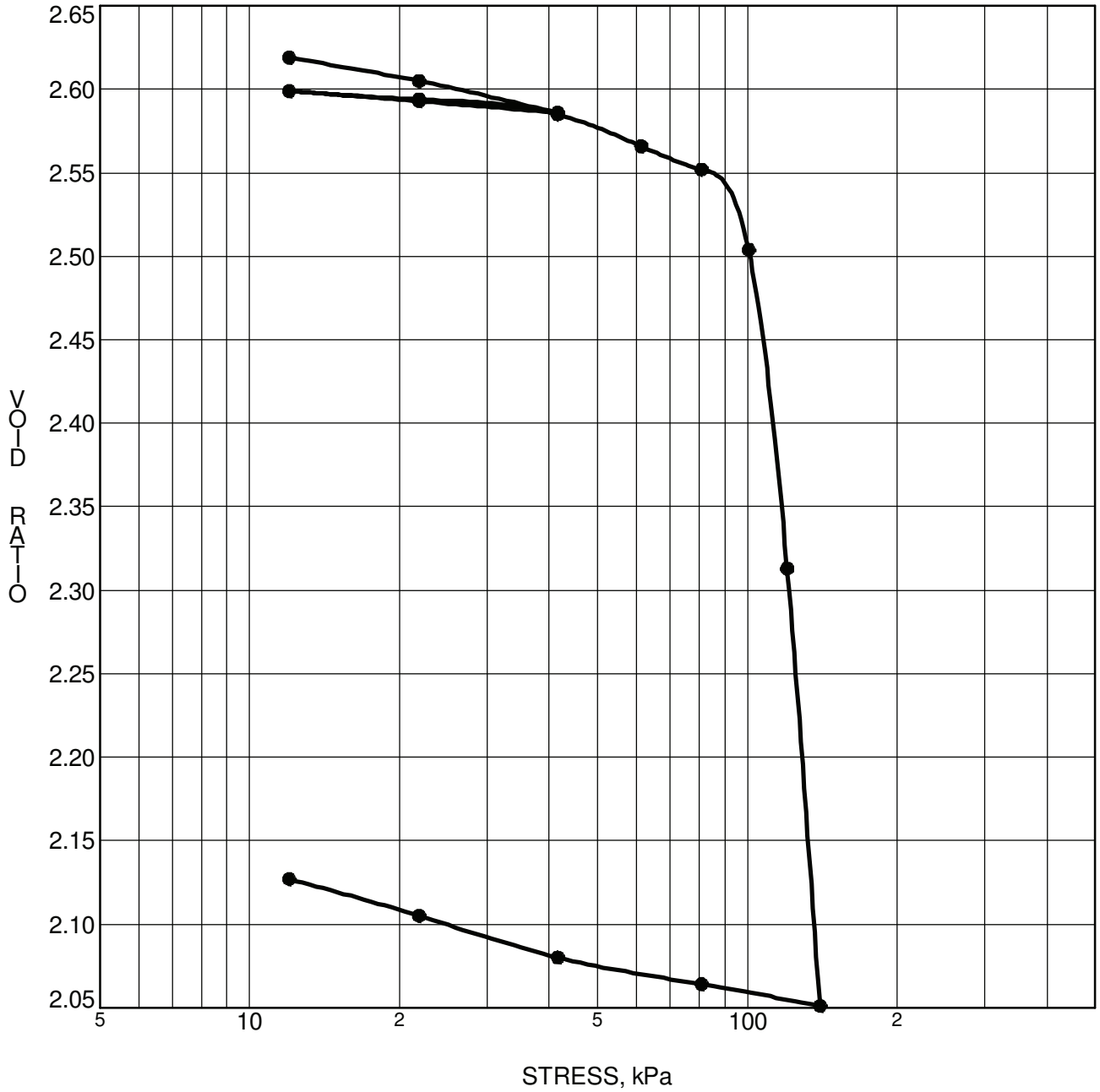


CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH 7**	p'_o	**53** kPa	Ccr	**0.016**
Sample No.	**TW 2**	p'_c	**90** kPa	Cc	**1.643**
Sample Depth	**4.36** m	OC Ratio	**1.7**	Wo	**74.3** %
Sample Elev.	**82.79** m	Void Ratio	**2.043**	Unit Wt.	**15.7** kN/m ^{3}

CLIENT	**Minto Communities Inc.**	FILE NO.	**PG2392**
PROJECT	**Geotechnical Investigation - Prop. Residential Development-Trails Edge Phase 2**	DATE	**08/23/2011**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH 9**	p'_o	**53** kPa	Ccr	**0.021**
Sample No.	**TW 3**	p'_c	**106** kPa	Cc	**4.008**
Sample Depth	**4.33** m	OC Ratio	**2.0**	Wo	**95.8** %
Sample Elev.	**82.63** m	Void Ratio	**2.634**	Unit Wt.	**15.0** kN/m ^{3}

CLIENT	**Minto Communities Inc.**	FILE NO.	**PG2392**
PROJECT	**Geotechnical Investigation - Prop. Residential Development-Trails Edge Phase 2**	DATE	**02/19/2012**

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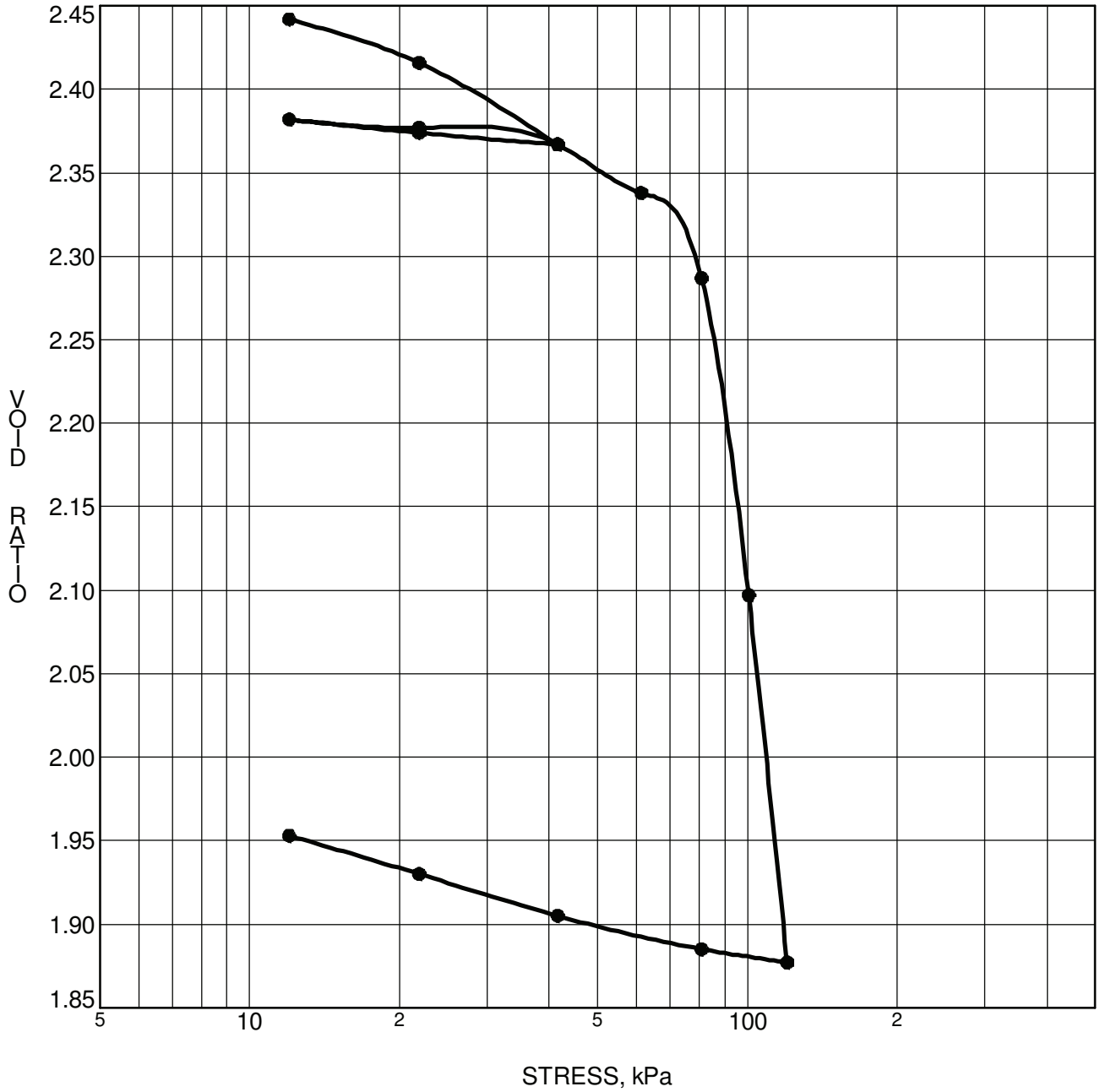
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH11**	p'_o	**53** kPa	Ccr	**0.027**
Sample No.	**TW 4**	p'_c	**85** kPa	Cc	**2.735**
Sample Depth	**4.32** m	OC Ratio	**1.6**	Wo	**89.9** %
Sample Elev.	**82.85** m	Void Ratio	**2.472**	Unit Wt.	**15.1** kN/m ^{3}

CLIENT	**Minto Communities Inc.**	FILE NO.	**PG2392**
PROJECT	**Geotechnical Investigation - Prop. Residential Development-Trails Edge Phase 2**	DATE	**02/17/2012**

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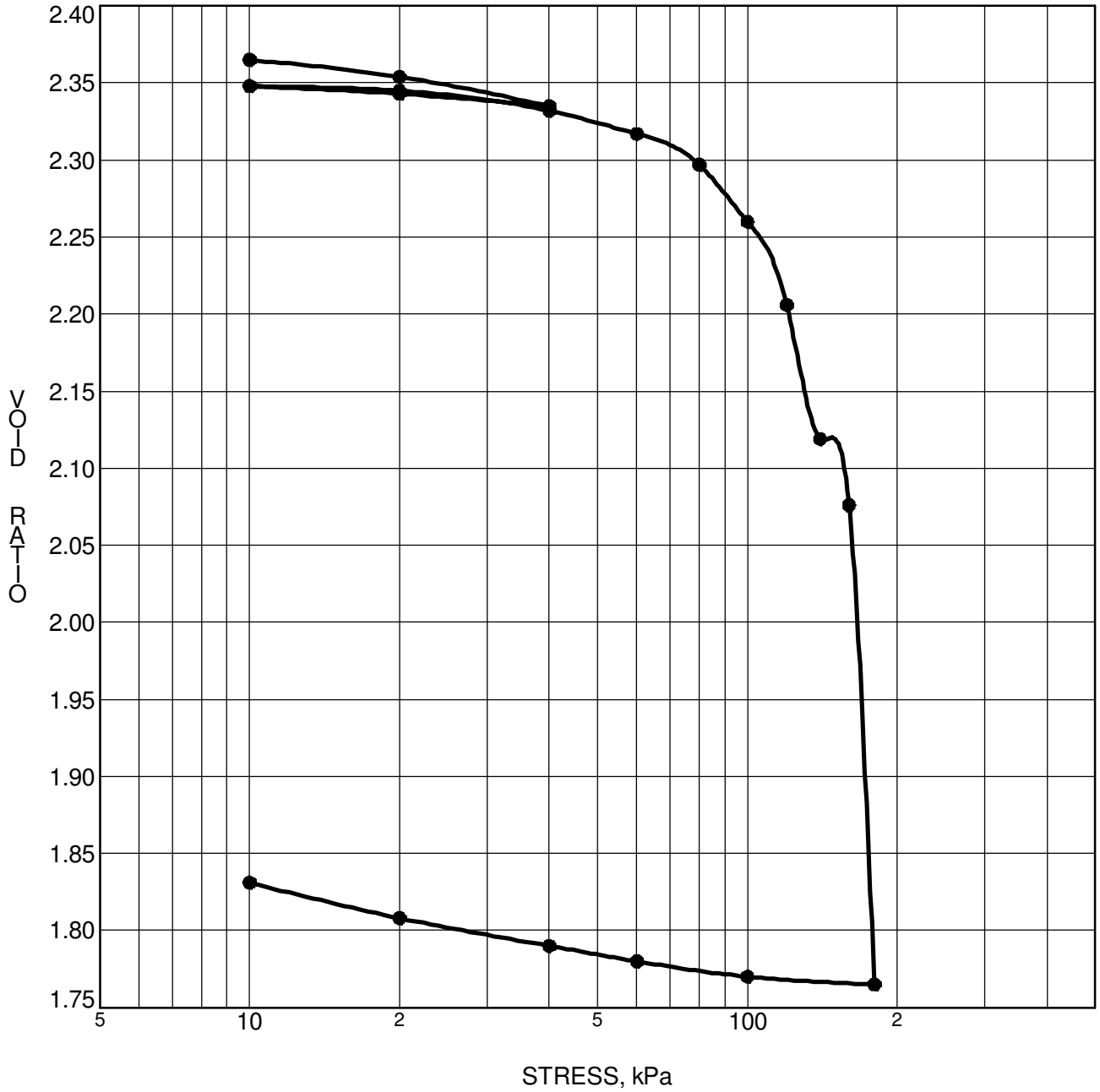
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH 9-08**	p'_o	**55** kPa	Ccr	**0.026**
Sample No.	**TW 2**	p'_c	**126** kPa	Cc	**3.260**
Sample Depth	**4.80** m	OC Ratio	**2.3**	Wo	**86.4** %
Sample Elev.	**82.12** m	Void Ratio	**2.376**	Unit Wt.	**16.2** kN/m ^{3}

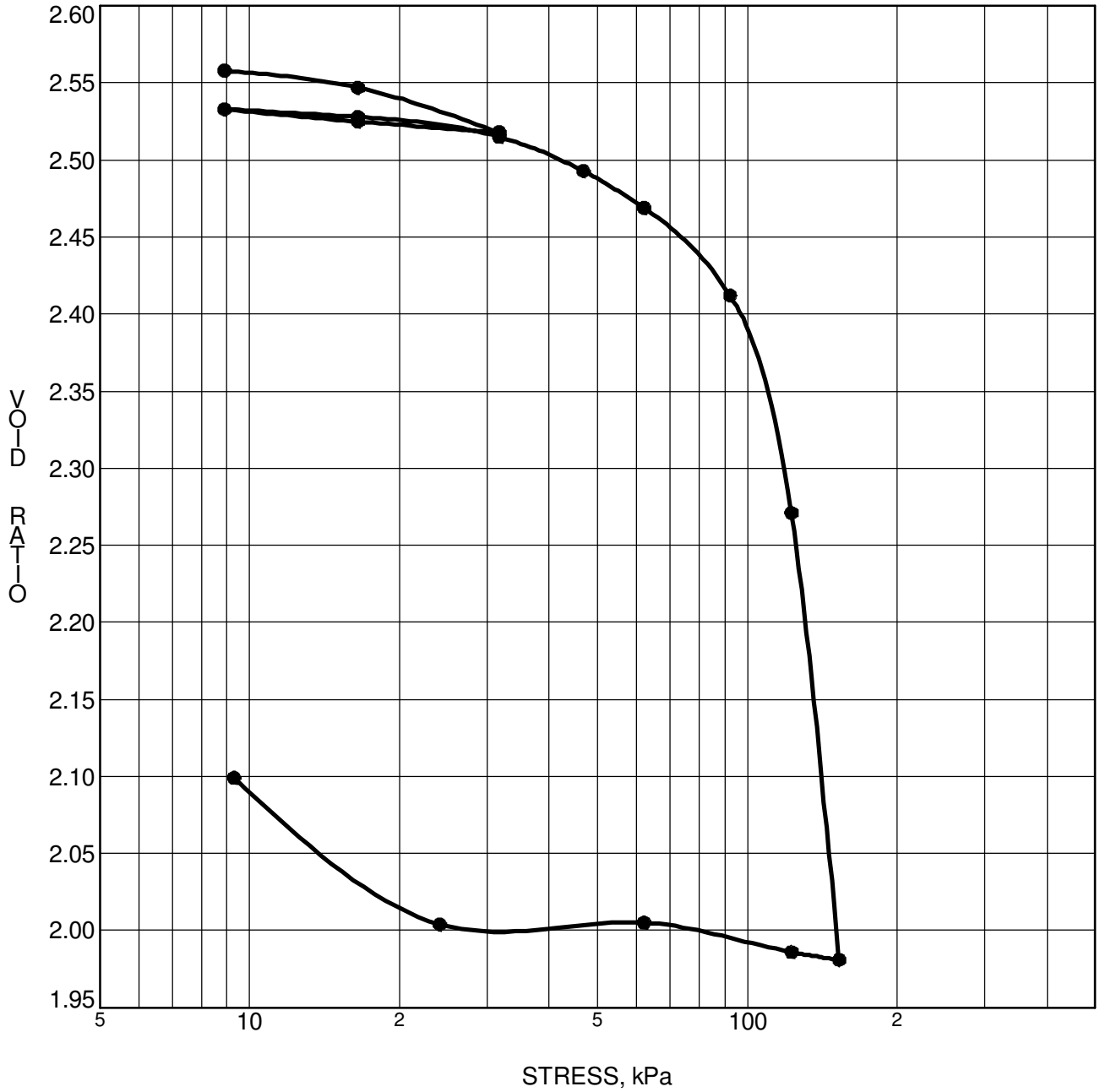
CLIENT **Richcraft Homes** FILE NO. **PG0861**

PROJECT **Geotechnical Investigation - Residential Development - Eden Park East Portion** DATE **08/12/08**

patersongroup Consulting Engineers

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

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH12-08**	p'_o	**68** kPa	Ccr	**0.031**
Sample No.	**TW 4**	p'_c	**109** kPa	Cc	**3.080**
Sample Depth	**9.40** m	OC Ratio	**1.6**	Wo	**93.6** %
Sample Elev.	**78.22** m	Void Ratio	**2.575**	Unit Wt.	**16.0** kN/m ^{3}

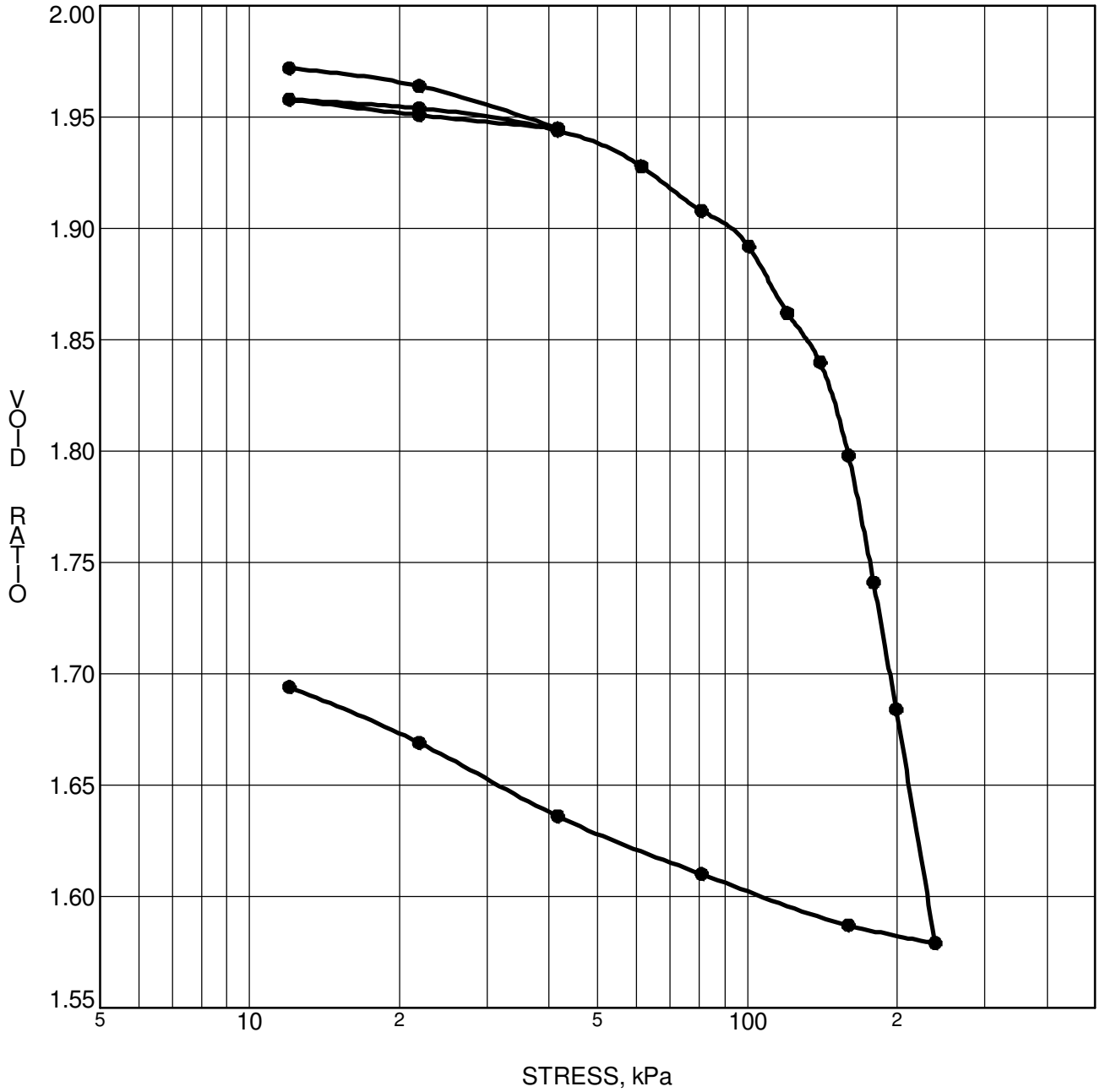
CLIENT **Richcraft Homes** FILE NO. **PG0861**

PROJECT **Geotechnical Investigation - Residential Development - Eden Park East Portion** DATE **10/27/08**

patersongroup Consulting Engineers

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

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH13-08**	p'_o	**43** kPa	Ccr	**0.025**
Sample No.	**TW 2**	p'_c	**142** kPa	Cc	**1.334**
Sample Depth	**3.42** m	OC Ratio	**3.3**	Wo	**72.2** %
Sample Elev.	**83.96** m	Void Ratio	**1.985**	Unit Wt.	**16.5** kN/m ^{3}

CLIENT **Richcraft Homes** FILE NO. **PG0861**

PROJECT **Geotechnical Investigation - Residential Development - Eden Park East Portion** DATE **10/28/08**

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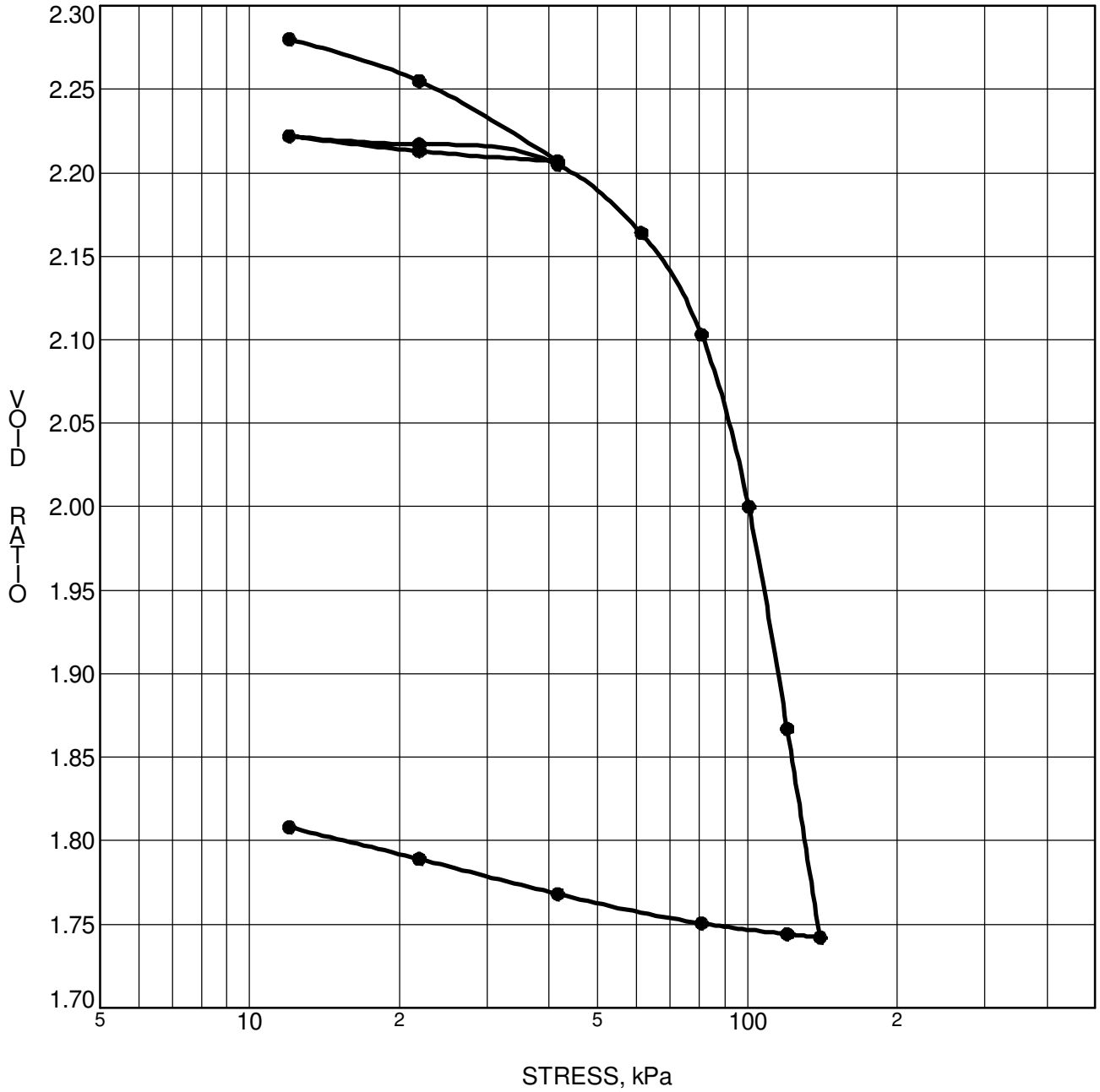
28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

CONSOLIDATION TEST

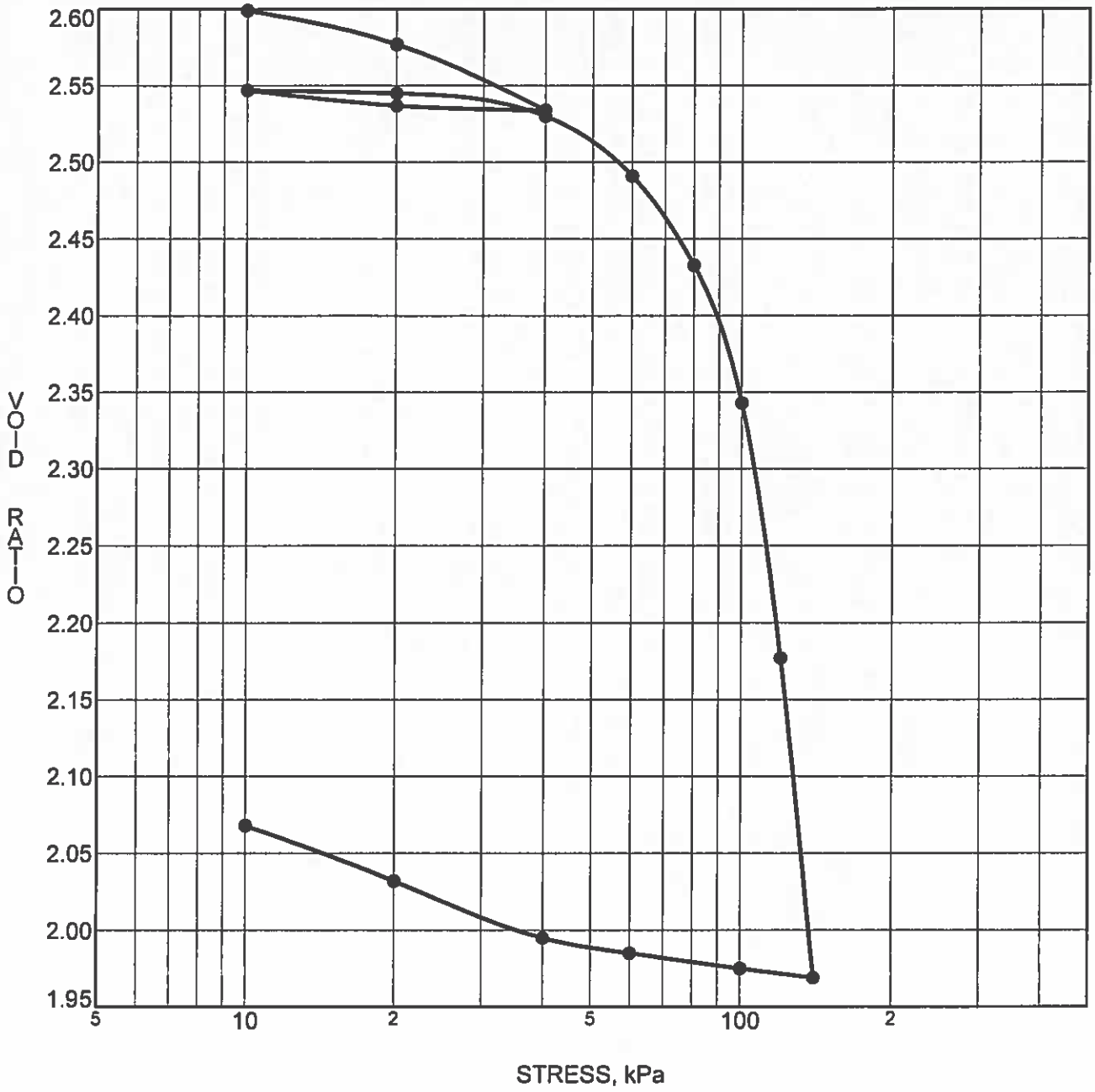


CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH15-08**	p'_o	**50** kPa	Ccr	**0.029**
Sample No.	**TW 2**	p'_c	**87** kPa	Cc	**1.890**
Sample Depth	**4.91** m	OC Ratio	**1.7**	Wo	**83.8** %
Sample Elev.	**82.33** m	Void Ratio	**2.303**	Unit Wt.	**16.0** kN/m ^{3}

CLIENT	**Richcraft Homes**	FILE NO.	**PG0861**
PROJECT	**Geotechnical Investigation - Residential Development - Eden Park East Portion**	DATE	**10/27/08**

patersongroup Consulting Engineers
28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

CONSOLIDATION TEST



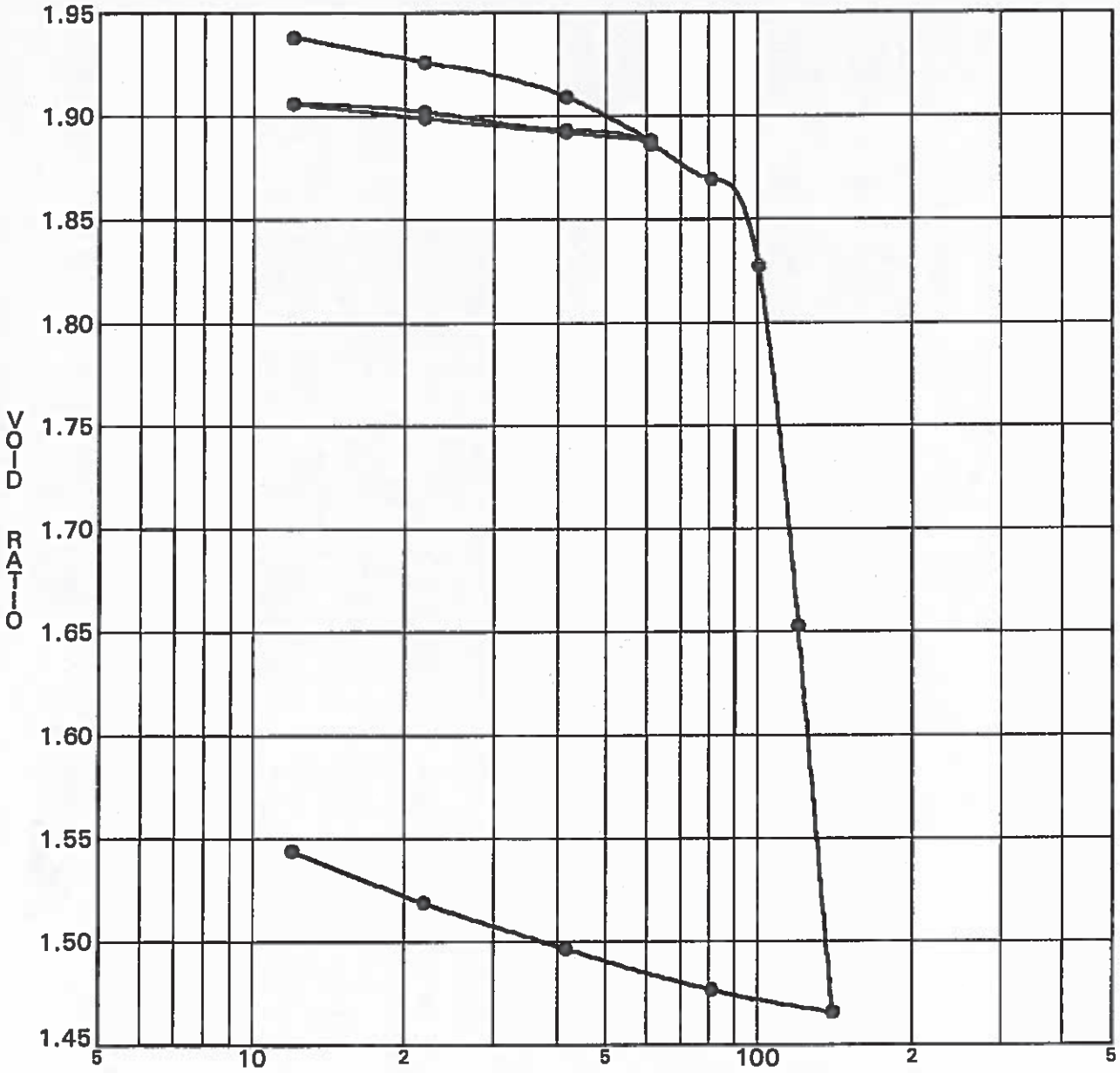
CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	BH19-08	p'_o	43 kPa	Ccr	0.025
Sample No.	TW 3	p'_c	99 kPa	Cc	3.100
Sample Depth	4.9 m	OC Ratio	2.3	Wo	95.1 %
Sample Elev.	81.9 m	Void Ratio	2.615	Unit Wt.	16.0 kN/m^3

CLIENT **Richcraft Homes** FILE NO. **PG0861**

PROJECT **Geotechnical Investigation - Residential Development - Eden Park East Portion** DATE **10/21/08**

patersongroup Consulting Engineers
28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

CONSOLIDATION TEST

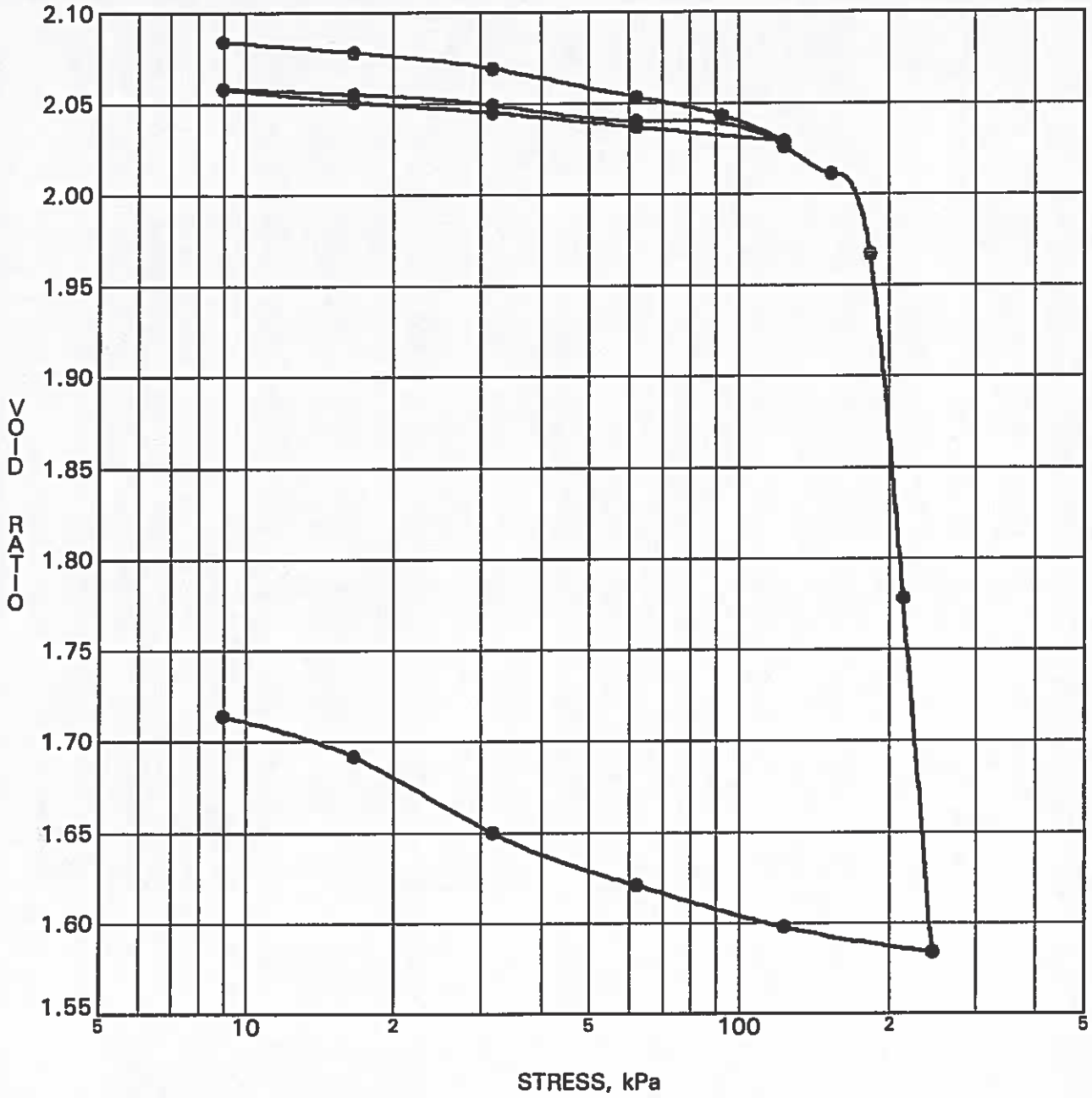


CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	BH 3	p'_o	64 kPa	Ccr	0.043
Sample No.	TW 5	p'_c	103 kPa	Cc	2.967
Sample Depth	6.53 m	OC Ratio	1.6	Wo	70.8 %
Sample Elev.	80.97 m	Void Ratio	1.951	Unit Wt.	14.9 kN/m^3

CLIENT	Richcraft Homes	FILE NO.	G8533
PROJECT	Geotechnical Investigation - Proposed Residential Subdivision, 4th Line Road	DATE	20/03/02

CONSOLIDATION TEST

JOHN D. PATERSON & ASSOCIATES LTD.
Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7

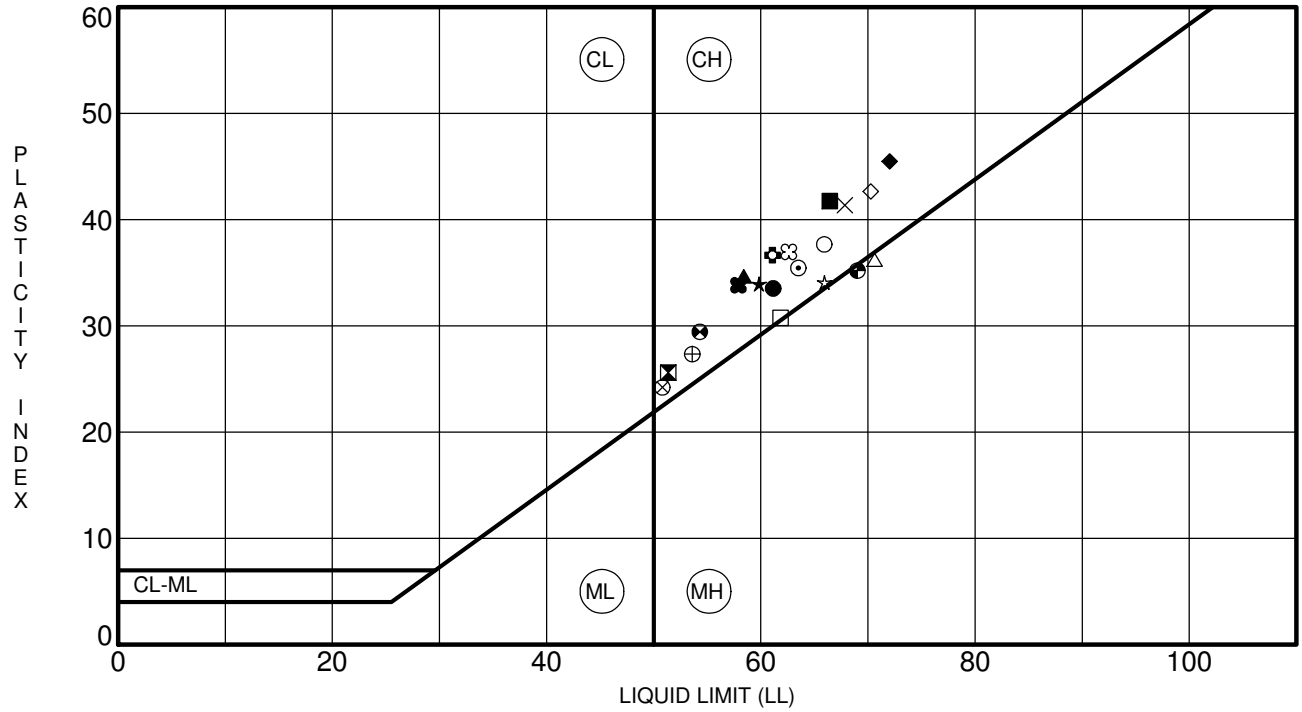


CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	BH 3	p'_o	82 kPa	Ccr	0.028
Sample No.	TW 7	p'_c	175 kPa	Cc	3.046
Sample Depth	9.60 m	OC Ratio	2.1	Wo	75.9 %
Sample Elev.	77.90 m	Void Ratio	2.084	Unit Wt.	15.4 kN/m^3

CLIENT	Richcraft Homes	FILE NO.	G8533
PROJECT	Geotechnical Investigation - Proposed Residential Subdivision, 4th Line Road	DATE	20/03/02

CONSOLIDATION TEST

JOHN D. PATERSON & ASSOCIATES LTD.
Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7



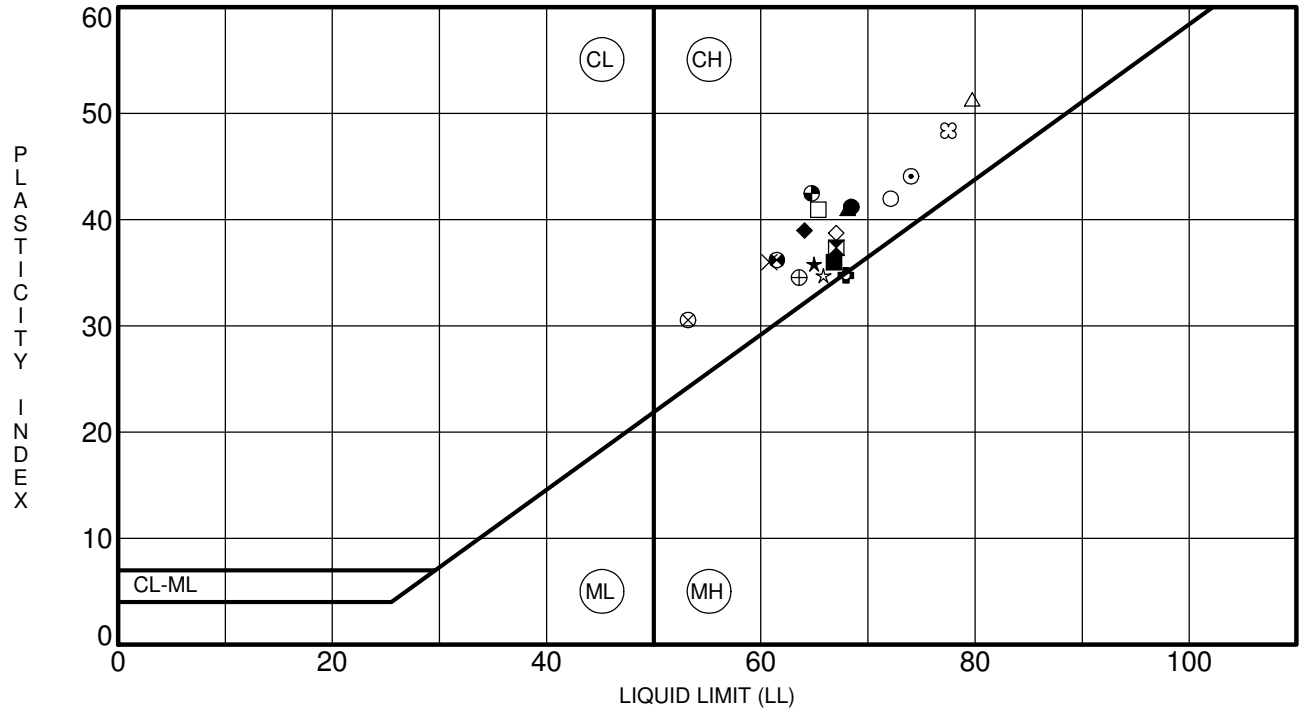
Specimen Identification			LL	PL	PI	Fines	Classification
●	BH 1-18	SS2	61	28	34		CH - Inorganic clays of high plasticity
⊠	BH 2-18	SS3	51	26	26		CH - Inorganic clays of high plasticity
▲	BH 3-18	SS2	58	24	35		CH - Inorganic clays of high plasticity
★	BH 4-18	SS3	60	26	34		CH - Inorganic clays of high plasticity
⊙	BH 5-18	SS2	64	28	35		CH - Inorganic clays of high plasticity
✿	BH 6-18	SS3	61	24	37		CH - Inorganic clays of high plasticity
○	BH 7-18	SS2	66	28	38		CH - Inorganic clays of high plasticity
△	BH 8-18	SS2	71	34	36		CH - Inorganic clays of high plasticity
⊗	BH10-18	SS3	51	27	24		CH - Inorganic clays of high plasticity
⊕	BH13-18	SS2	54	26	27		CH - Inorganic clays of high plasticity
□	BH14-18	SS3	62	31	31		CH - Inorganic clays of high plasticity
⊜	BH17-18	SS3	54	25	29		CH - Inorganic clays of high plasticity
◕	BH18-18	SS4	69	34	35		CH - Inorganic clays of high plasticity
☆	BH19-18	SS3	66	32	34		CH - Inorganic clays of high plasticity
⊠	BH20-18	SS4	63	26	37		CH - Inorganic clays of high plasticity
■	BH21-18	SS3	66	25	42		CH - Inorganic clays of high plasticity
◆	BH22-18	SS4	72	27	45		CH - Inorganic clays of high plasticity
◇	BH23-18	SS3	70	28	43		CH - Inorganic clays of high plasticity

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **18 Jun 18**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

ATTERBERG LIMITS' RESULTS



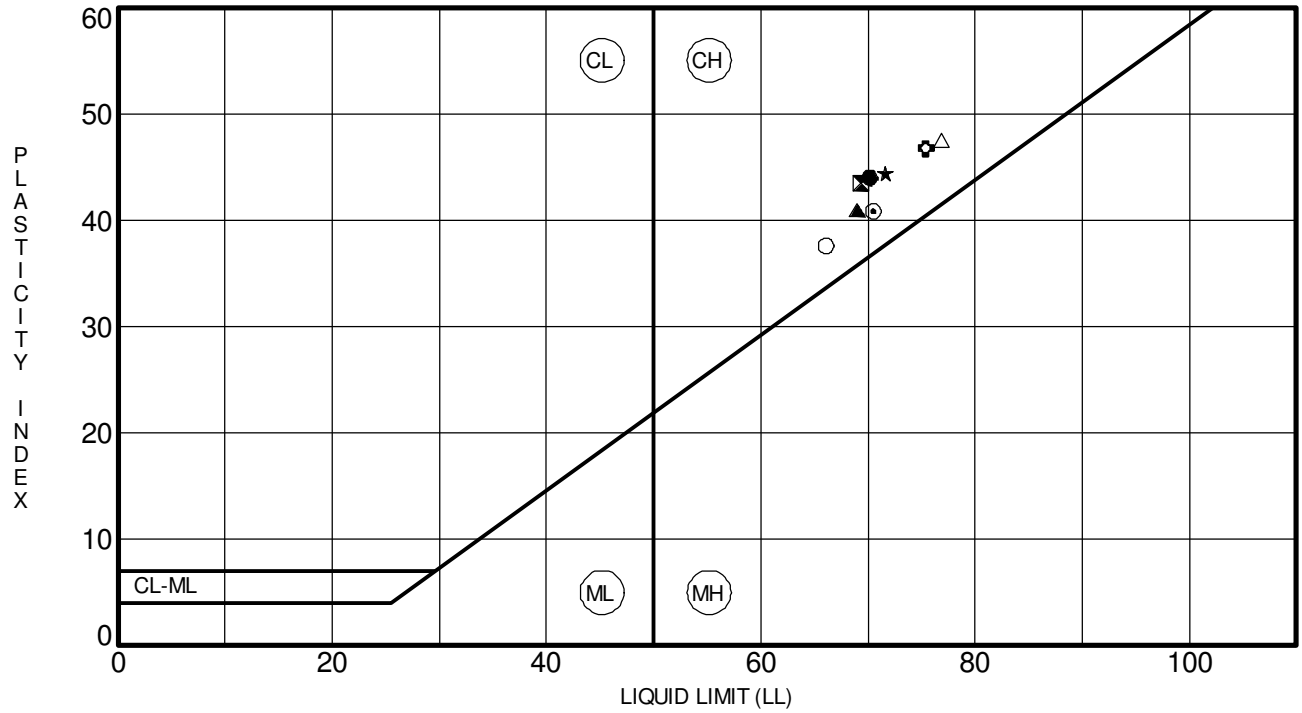
Specimen Identification			LL	PL	PI	Fines	Classification
●	BH26-18	SS3	68	27	41		CH - Inorganic clays of high plasticity
⊠	BH27-18	SS2	67	30	37		CH - Inorganic clays of high plasticity
▲	BH28-18	SS4	68	27	41		CH - Inorganic clays of high plasticity
★	BH29-18	SS3	65	29	36		CH - Inorganic clays of high plasticity
⊙	BH30-18	SS2	74	30	44		CH - Inorganic clays of high plasticity
✿	BH31-18	SS2	68	33	35		CH - Inorganic clays of high plasticity
○	BH32-18	SS2	72	30	42		CH - Inorganic clays of high plasticity
△	BH34-18	SS4	80	28	51		CH - Inorganic clays of high plasticity
⊗	BH35-18	SS2	53	23	31		CH - Inorganic clays of high plasticity
⊕	BH36-18	SS3	64	29	35		CH - Inorganic clays of high plasticity
□	BH37-18	SS2	65	24	41		CH - Inorganic clays of high plasticity
⊖	BH38-18	SS2	61	25	36		CH - Inorganic clays of high plasticity
◒	BH39-18	SS3	65	22	42		CH - Inorganic clays of high plasticity
☆	BH40-18	SS2	66	31	35		CH - Inorganic clays of high plasticity
⊠	BH41-18	SS3	78	29	48		CH - Inorganic clays of high plasticity
■	BH42-18	SS2	67	31	36		CH - Inorganic clays of high plasticity
◆	BH43-18	SS2	64	25	39		CH - Inorganic clays of high plasticity
◇	BH44-18	SS3	67	28	39		CH - Inorganic clays of high plasticity

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **26 Jun 18**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

ATTERBERG LIMITS' RESULTS



	Specimen Identification	LL	PL	PI	Fines	Classification
●	**BH 1-08**	**70**	**26**	**44**		**CH - Clay with high plasticity (TW 5)**
⊠	**BH 3-08**	**69**	**26**	**44**		**CH - Clay with high plasticity (TW 3)**
▲	**BH 5-08**	**69**	**28**	**41**		**CH - Clay with high plasticity (TW 5)**
★	**BH 6-08**	**72**	**27**	**44**		**CH - Clay with high plasticity (TW 3)**
⊙	**BH 9-08**	**70**	**30**	**41**		**CH - Clay with high plasticity (TW 2)**
✿	**BH10-08**	**75**	**29**	**47**		**CH - Clay with high plasticity (TW 3)**
○	**BH15-08**	**66**	**28**	**38**		**CH-Inorganic Clays of High Plasticity (TW2)**
△	**BH17-08**	**77**	**29**	**48**		**CH-Inorganic Clays of High Plasticity (TW3)**

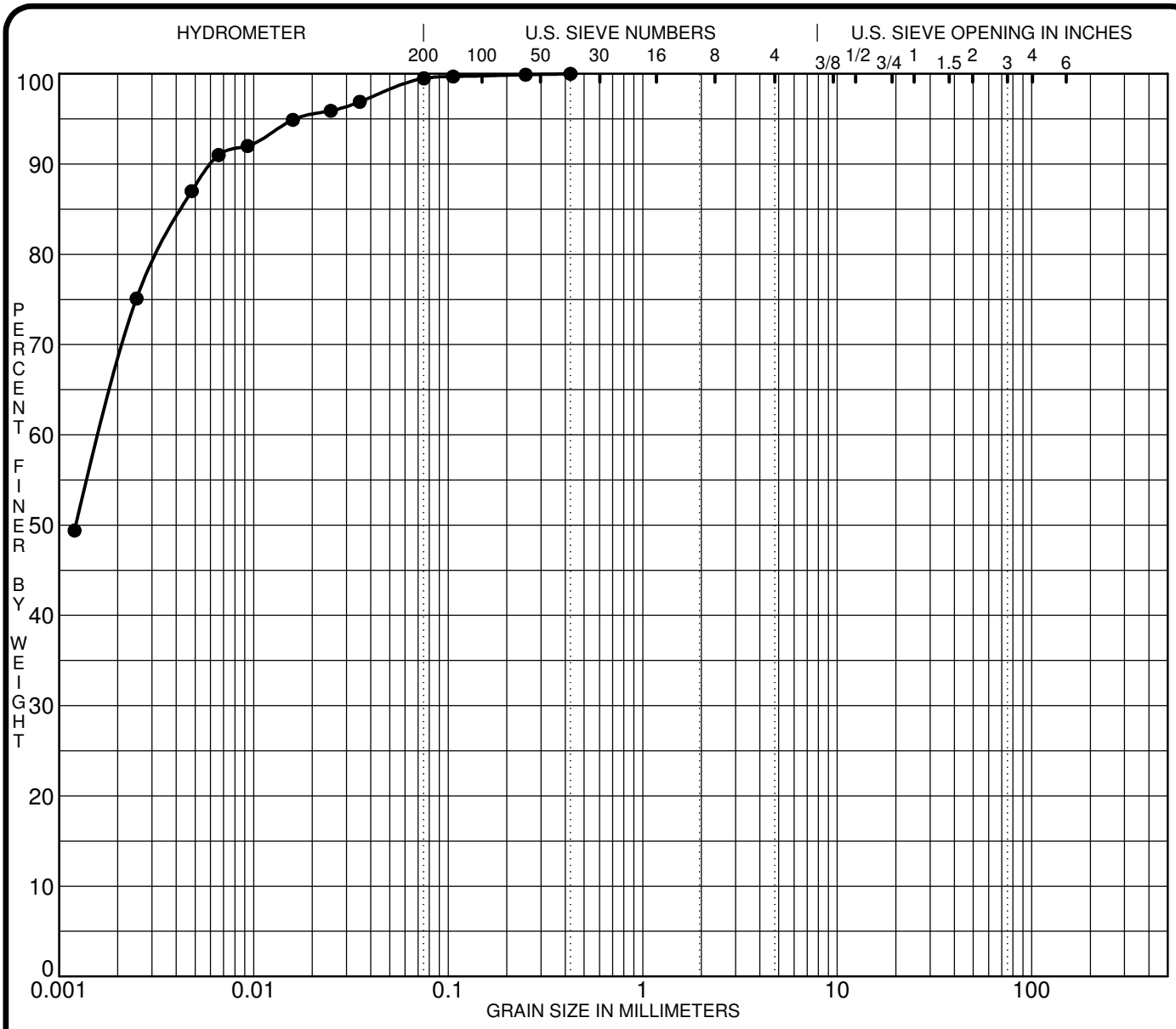
CLIENT **Richcraft Homes** FILE NO. **PG0861**

PROJECT **Geotechnical Investigation - Residential Development - Eden Park East Portion** DATE **15 Oct 08**

patersongroup Consulting Engineers

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

ATTERBERG LIMITS' RESULTS



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH 2-18 SS2**	**CH - Inorganic clays of high plasticity**						

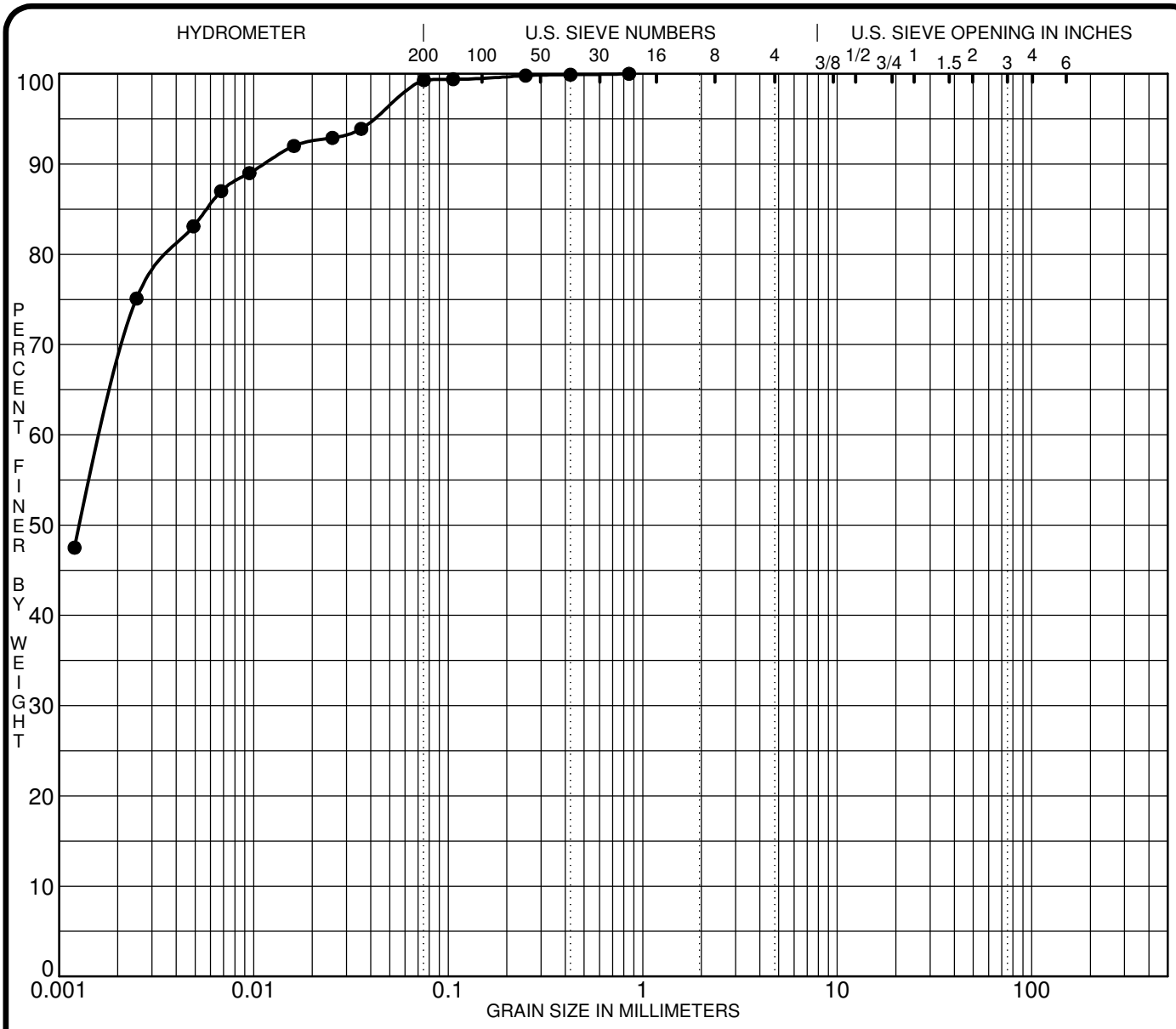
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH 2-18 SS2**	**0.43**	**0.00**			**0.0**	**0.5**	**99.5**	

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **11 Jun 18**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH 4-18 SS2**	**CH - Inorganic clays of high plasticity**						

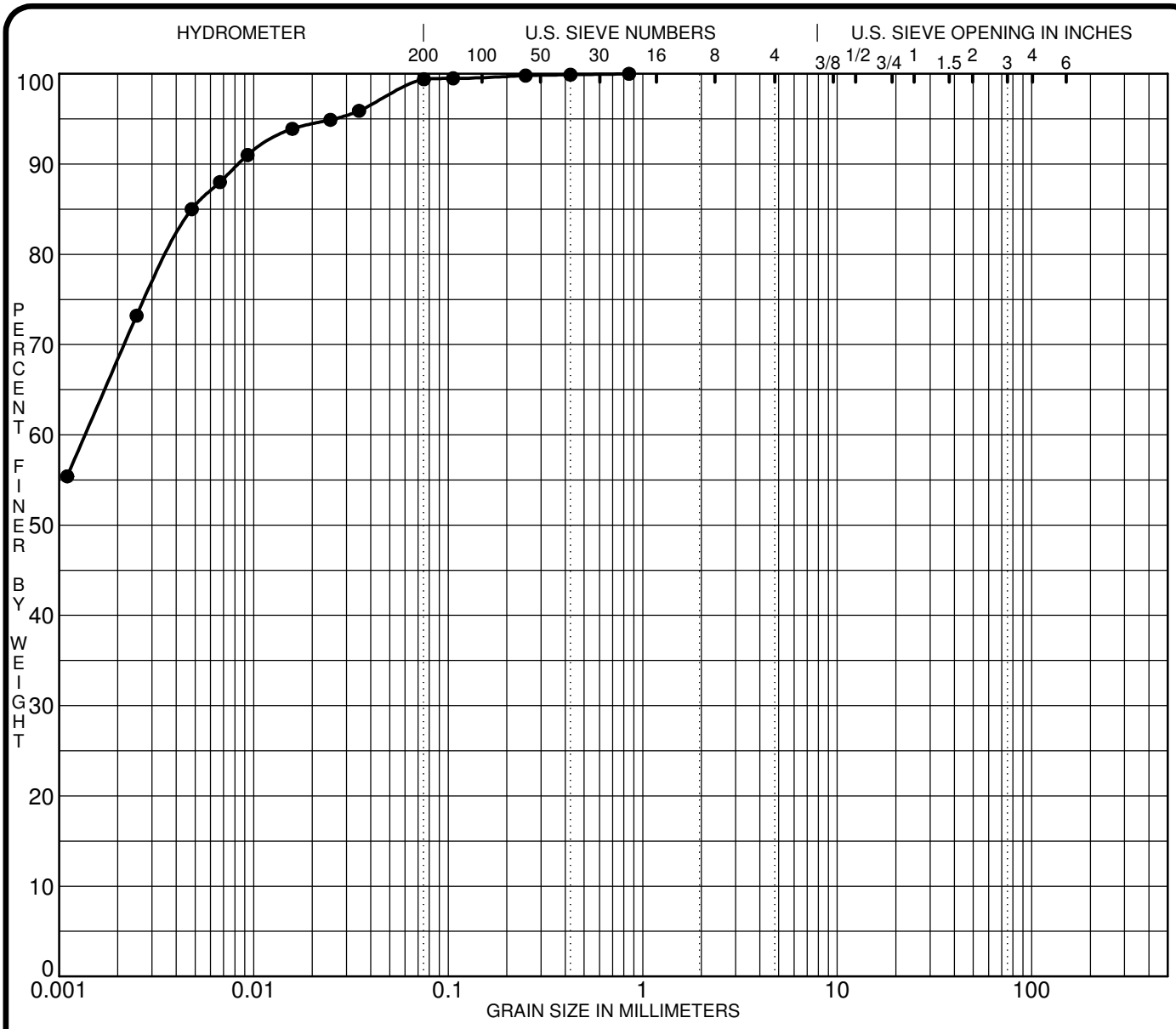
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH 4-18 SS2**	**0.85**	**0.00**			**0.0**	**0.7**	**99.3**	

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **12 Jun 18**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH10-18 SS2**	**CH - Inorganic clays of high plasticity**						

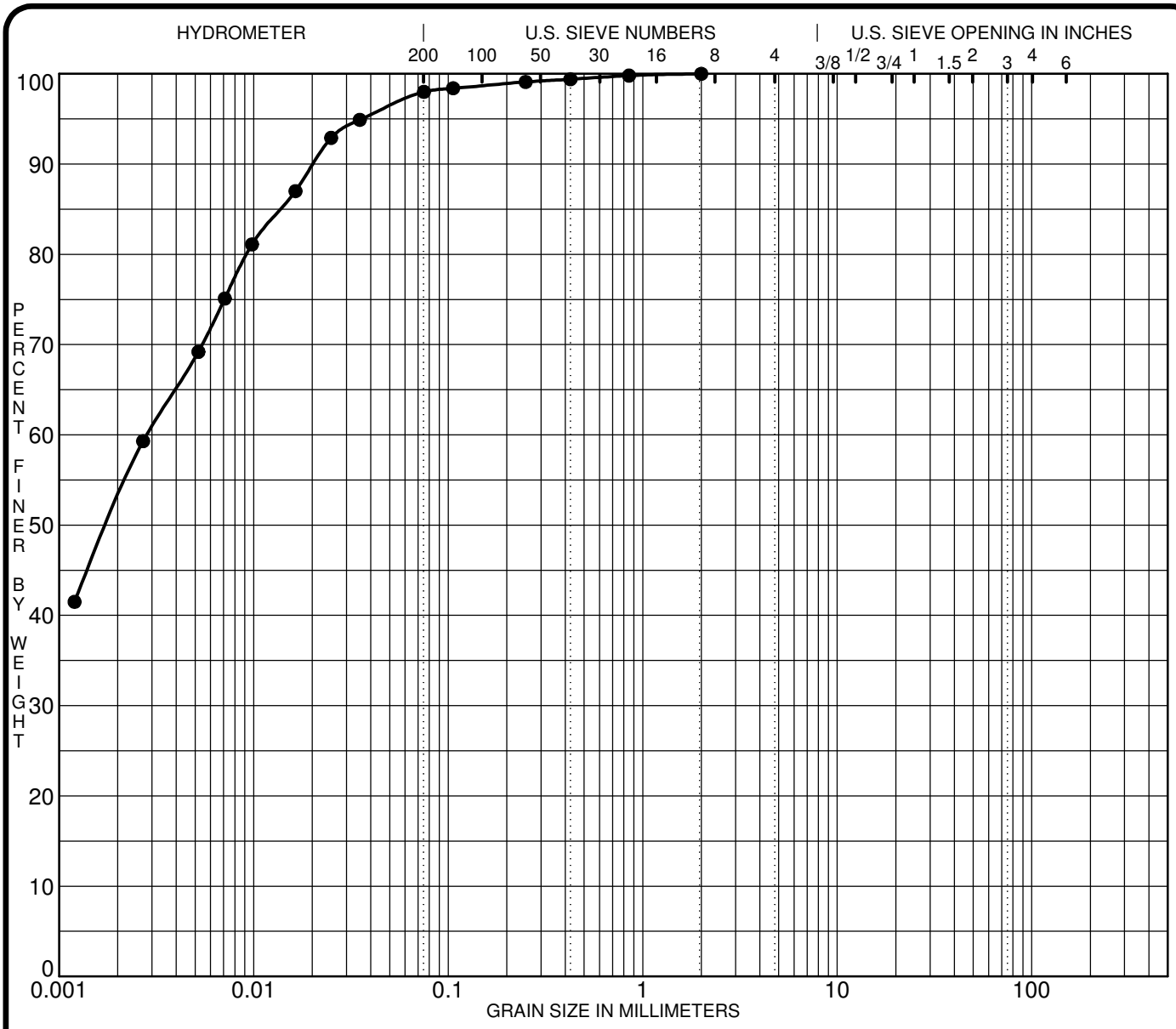
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH10-18 SS2**	**0.85**	**0.00**			**0.0**	**0.6**	**99.4**	

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **13 Jun 18**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH15-18 SS2**	**CH - Inorganic clays of high plasticity**						

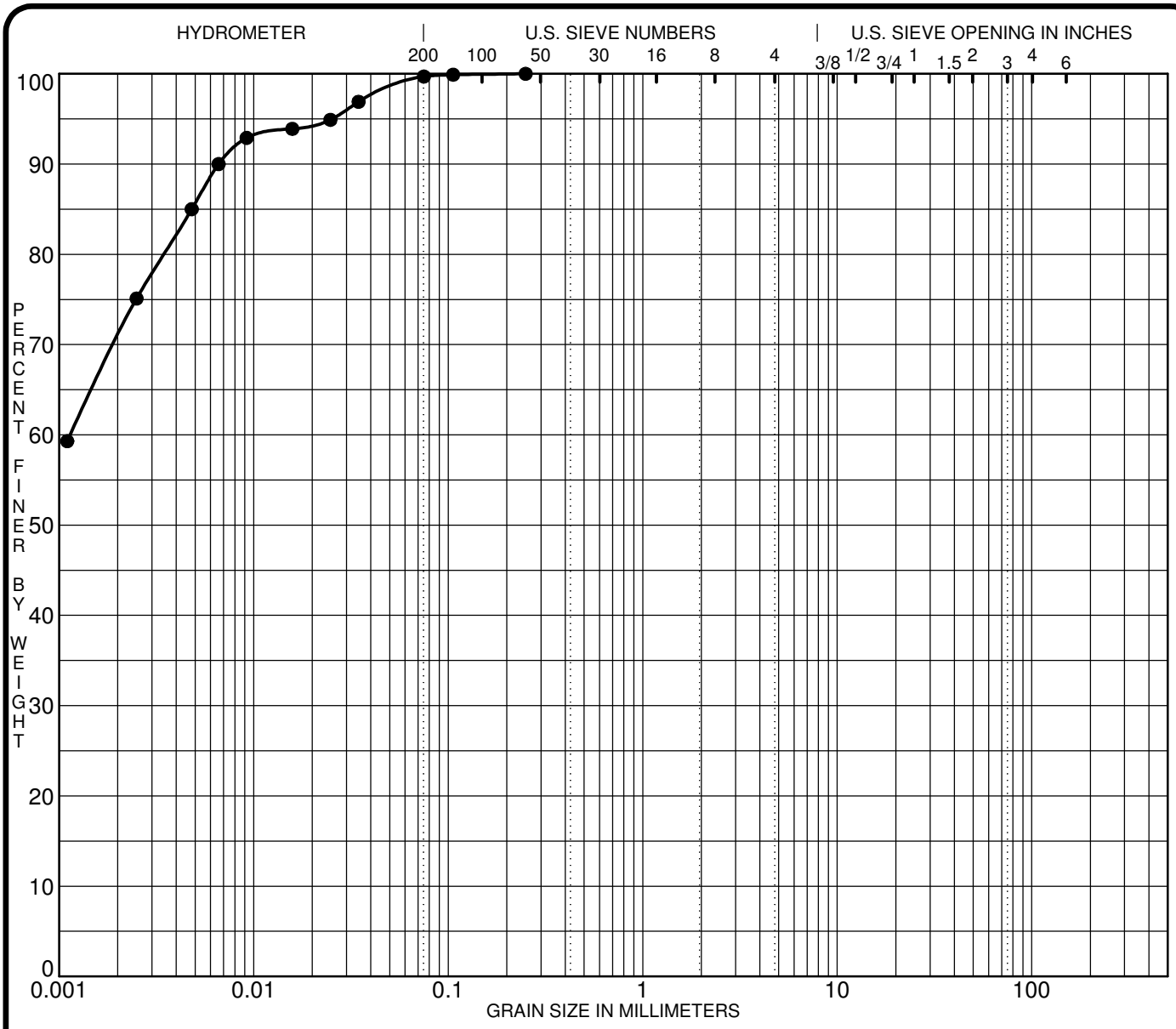
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH15-18 SS2**	**2.00**	**0.00**			**0.0**	**2.0**	**98.0**	

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **13 Jun 18**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH20-18 SS3**	**CH - Inorganic clays of high plasticity**						

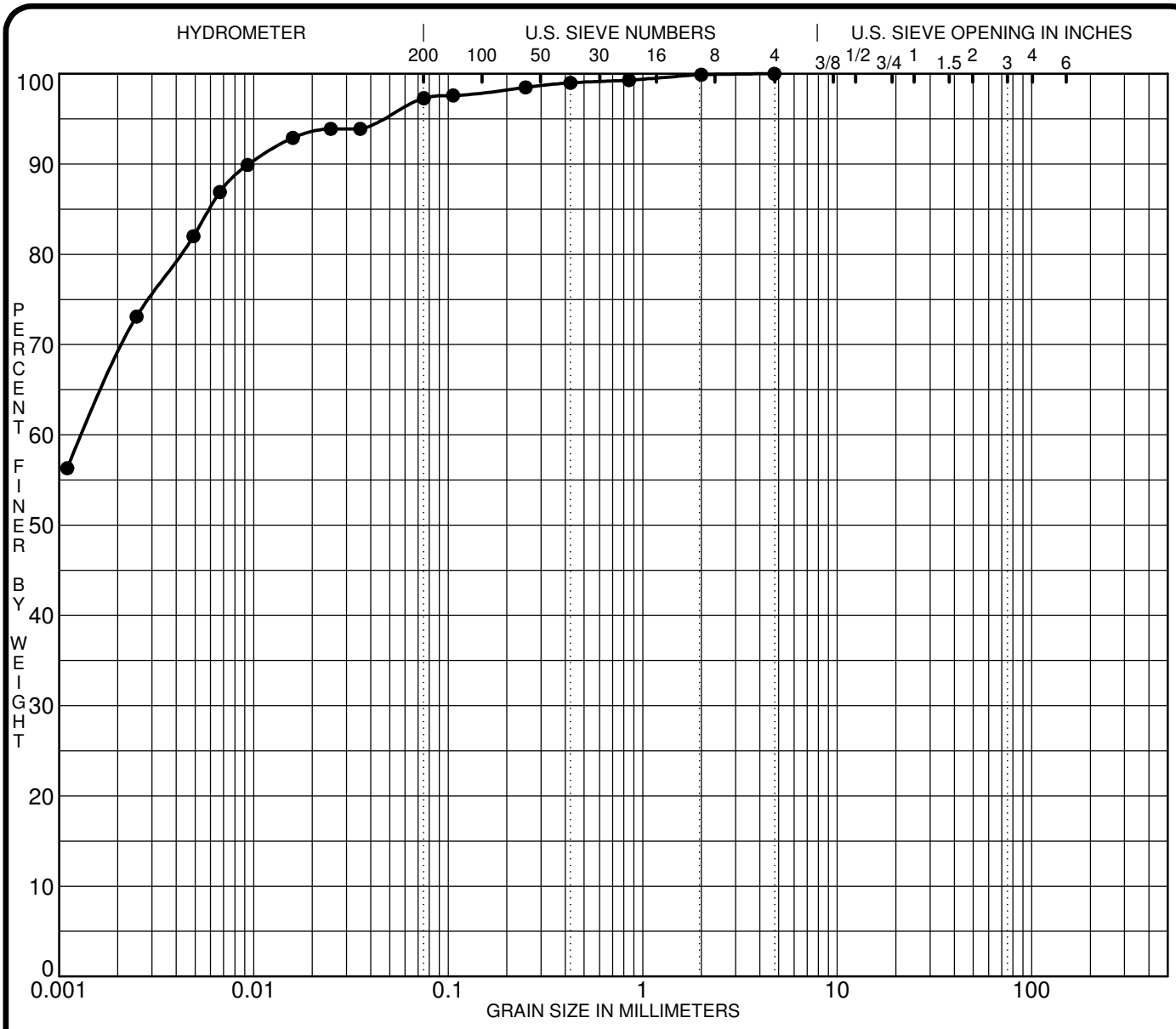
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH20-18 SS3**	**0.25**	**0.00**			**0.0**	**0.3**	**99.7**	

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **14 Jun 18**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH23-18 SS2**	**CH - Inorganic clays of high plasticity**						

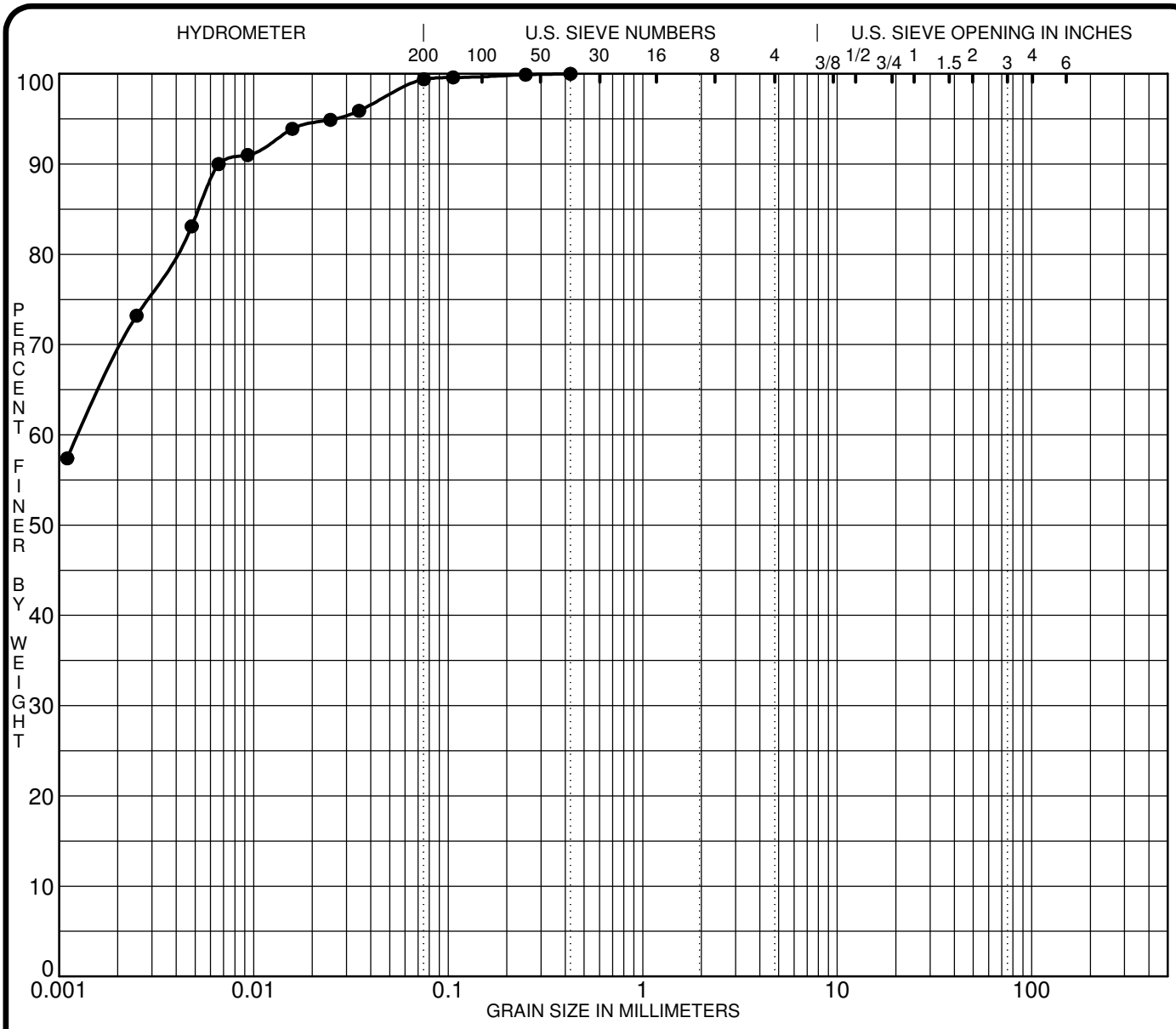
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH23-18 SS2**	**4.75**	**0.00**			**0.0**	**2.7**	**97.3**	

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **15 Jun 18**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH28-18 SS3**	**CH - Inorganic clays of high plasticity**						

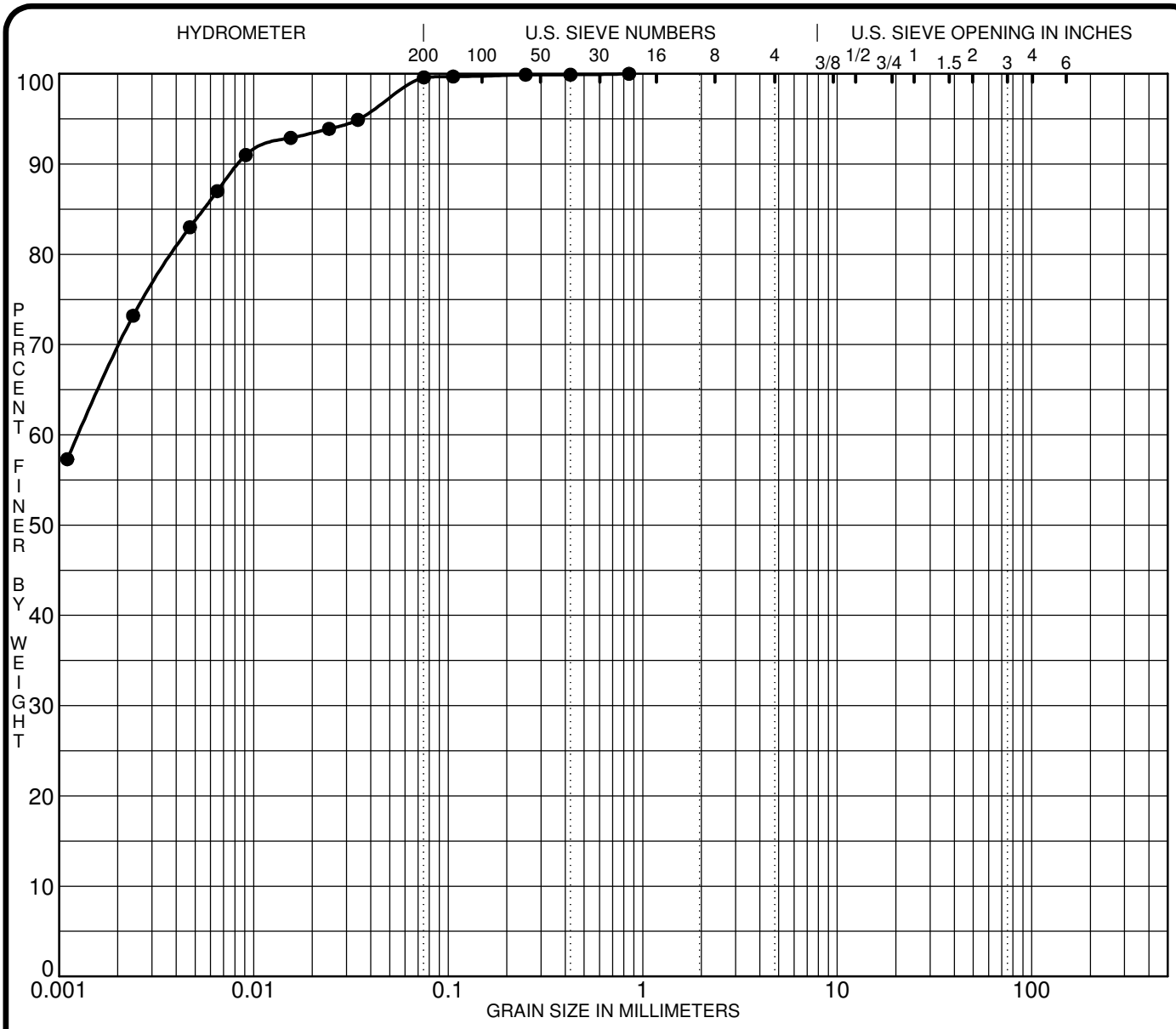
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH28-18 SS3**	**0.43**	**0.00**			**0.0**	**0.6**	**99.4**	

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **19 Jun 18**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH30-18 SS3**	**CH - Inorganic clays of high plasticity**						

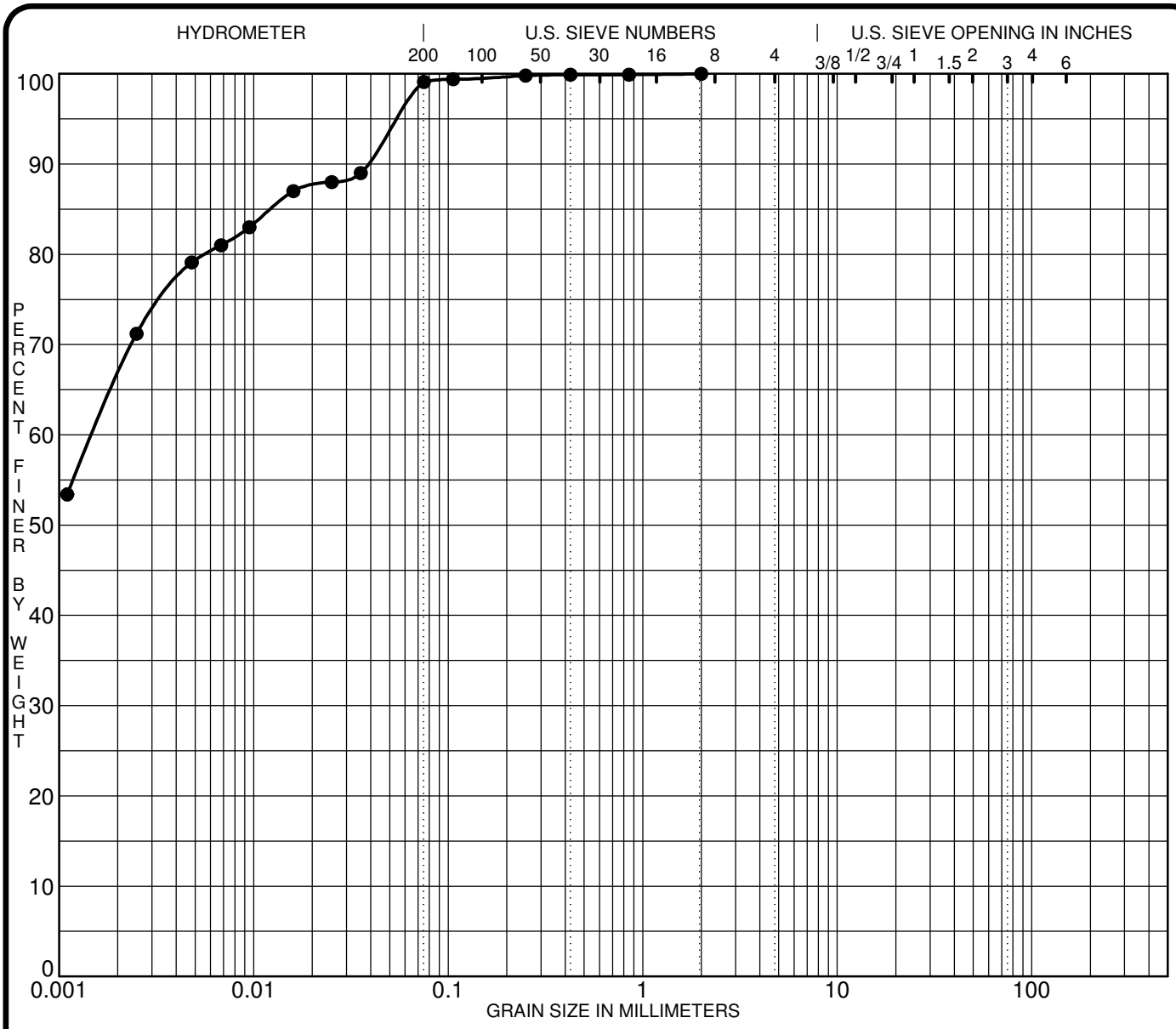
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH30-18 SS3**	**0.85**	**0.00**			**0.0**	**0.4**	**99.6**	

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **20 Jun 18**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH33-18 SS3**	**CH - Inorganic clays of high plasticity**						

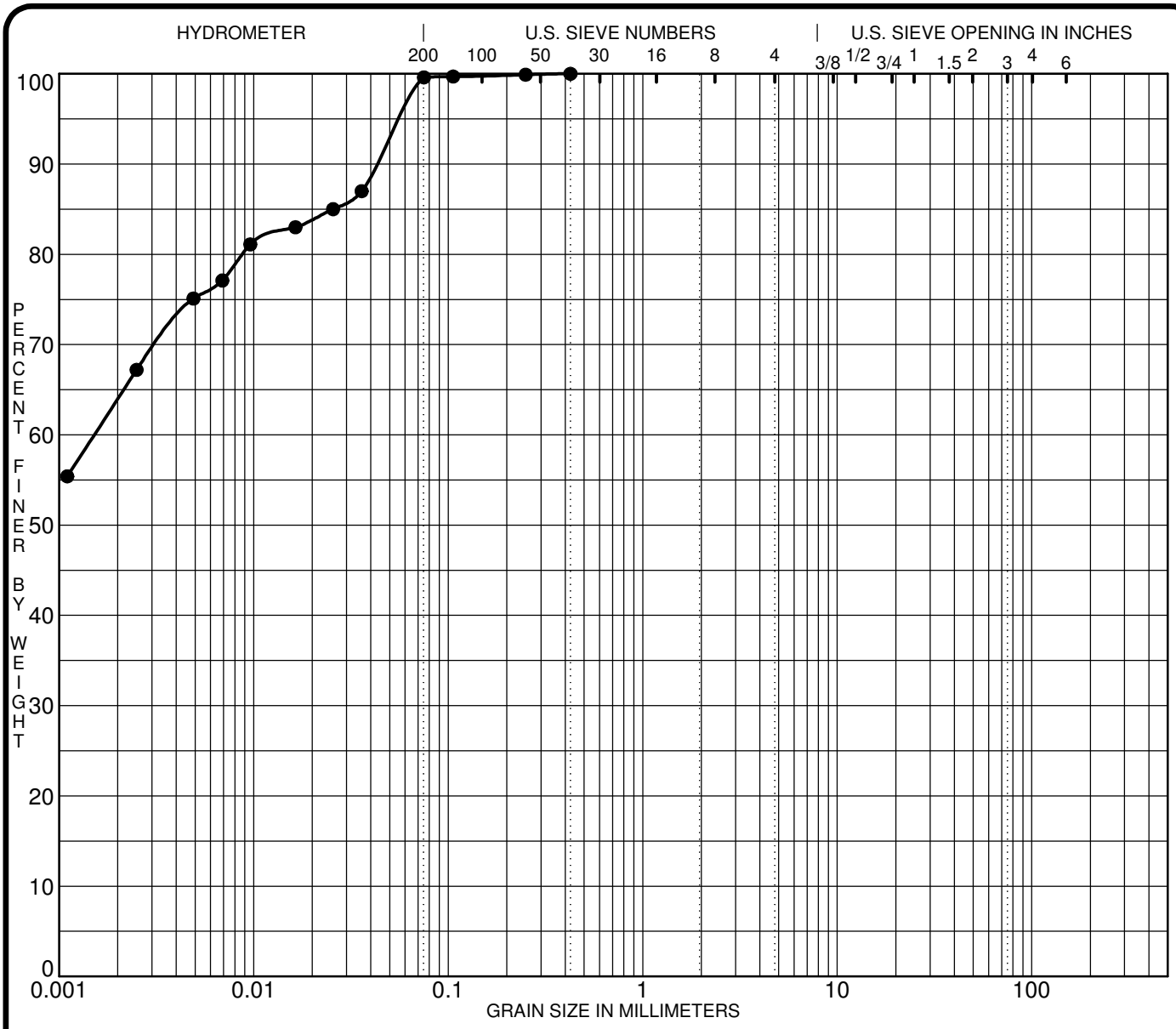
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH33-18 SS3**	**2.00**	**0.00**			**0.0**	**0.9**	**99.1**	

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **20 Jun 18**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH38-18 SS3**	**CH - Inorganic clays of high plasticity**						

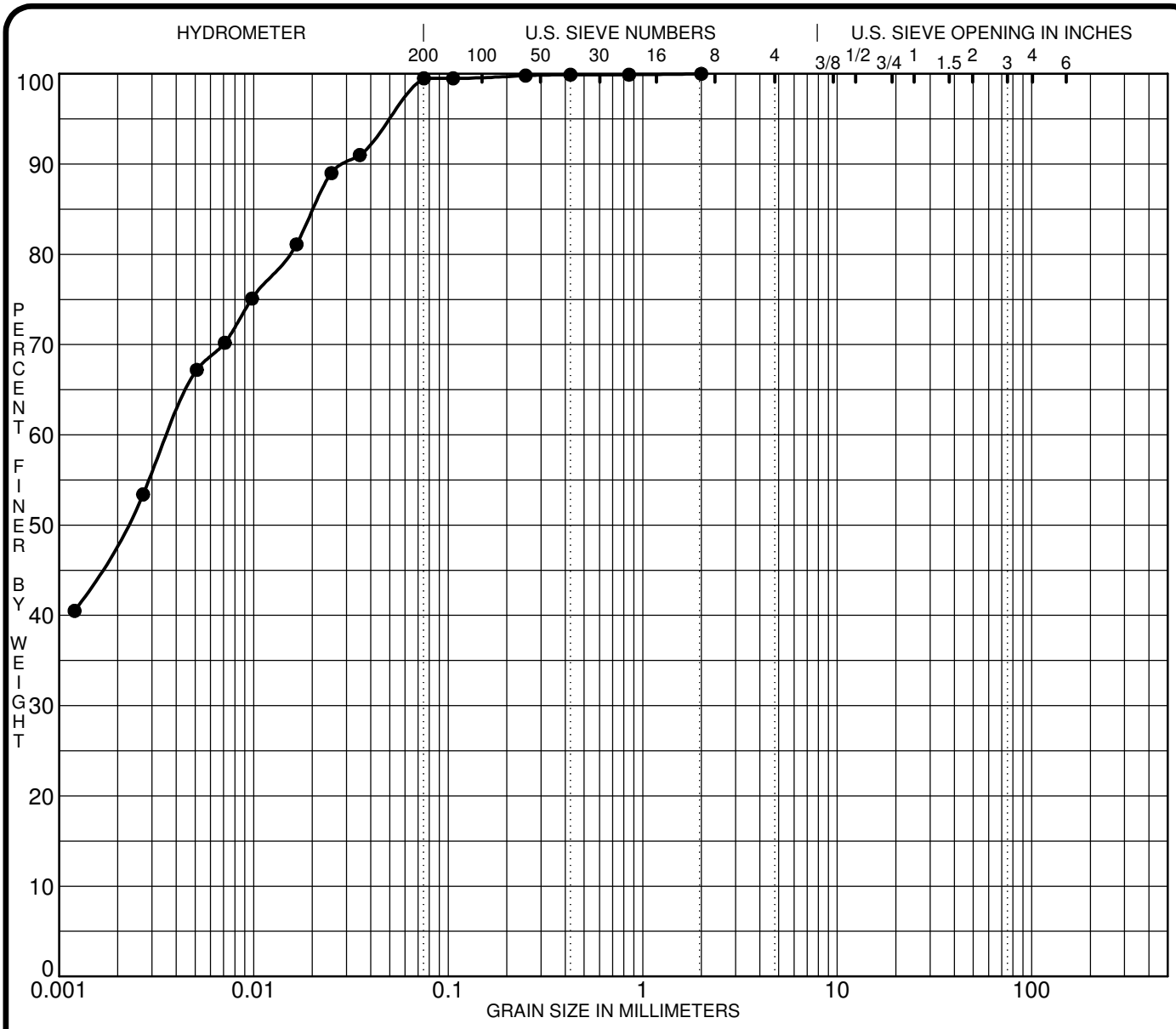
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH38-18 SS3**	**0.43**	**0.00**			**0.0**	**0.4**	**99.6**	

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **22 Jun 18**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

	Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH41-18 SS4**	**CH - Inorganic clays of high plasticity**						

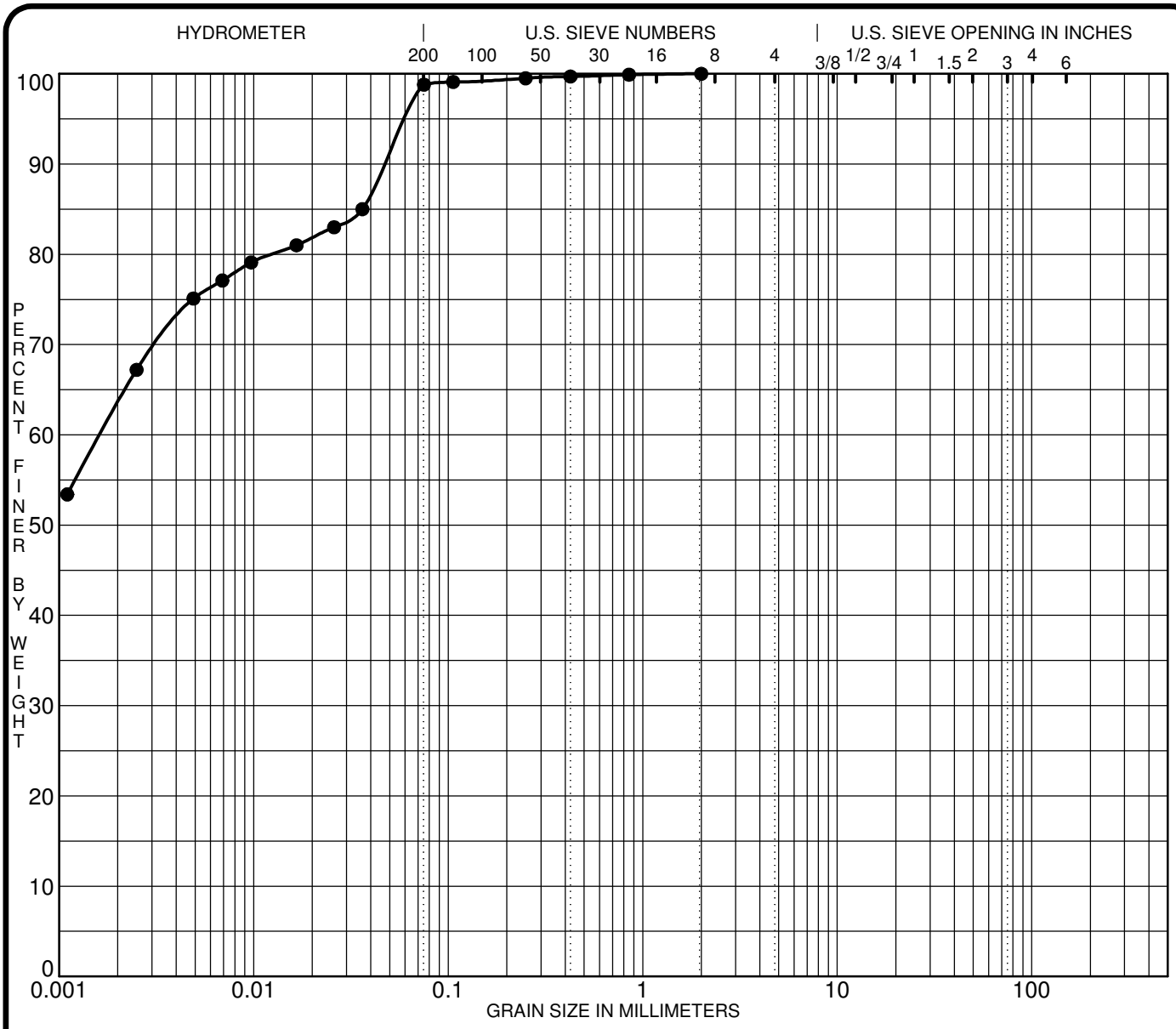
	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH41-18 SS4**	**2.00**	**0.00**			**0.0**	**0.5**	**99.5**	

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **22 Jun 18**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH42-18 SS3**	**CH - Inorganic clays of high plasticity**						

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH42-18 SS3**	**2.00**	**0.00**			**0.0**	**1.2**	**98.8**	

CLIENT **Richcraft Group of Companies** FILE NO. **PG3130**

PROJECT **Geotechnical Investigation - East Urban Community (EUC) Mixed-Use CDP** DATE **22 Jun 18**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION

PARACEL LABORATORIES LTD.

Order #: 1438144

Certificate of Analysis

Report Date: 22-Sep-2014
Order Date:16-Sep-2014

Client: **Paterson Group Consulting Engineers**
Client PO: 16408

Project Description: PG3130

	Client ID:	BH7-SS3	-	-	-
	Sample Date:	15-Sep-14	-	-	-
	Sample ID:	1438144-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	64.4	-	-	-
General Inorganics					
pH	0.05 pH Units	7.29	-	-	-
Resistivity	0.10 Ohm.m	52.2	-	-	-
Anions					
Chloride	5 ug/g dry	<5	-	-	-
Sulphate	5 ug/g dry	14	-	-	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 24172

Report Date: 26-Jun-2018

Order Date: 21-Jun-2018

Project Description: PG3130

	Client ID:	BH29-18-SS2	-	-	-
	Sample Date:	06/20/2018 00:00	-	-	-
	Sample ID:	1825617-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	75.0	-	-	-
General Inorganics					
pH	0.05 pH Units	7.20	-	-	-
Resistivity	0.10 Ohm.m	80.1	-	-	-
Anions					
Chloride	5 ug/g dry	42	-	-	-
Sulphate	5 ug/g dry	34	-	-	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 24178

Report Date: 29-Jun-2018

Order Date: 26-Jun-2018

Project Description: PG3130

Client ID:		BH37-18-SS3	-	-	-
Sample Date:		06/22/2018 09:00	-	-	-
Sample ID:		1826207-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	68.3	-	-	-
General Inorganics					
pH	0.05 pH Units	7.86	-	-	-
Resistivity	0.10 Ohm.m	62.6	-	-	-
Anions					
Chloride	5 ug/g dry	8	-	-	-
Sulphate	5 ug/g dry	19	-	-	-

APPENDIX 2

FIGURE 1 – KEY PLAN

DRAWING PG3130-6 – TEST HOLE LOCATION PLAN

DRAWING PG3130-7 – PERMISSIBLE GRADE RAISE PLAN

DRAWING PG3130-8 – BEDROCK CONTOUR PLAN

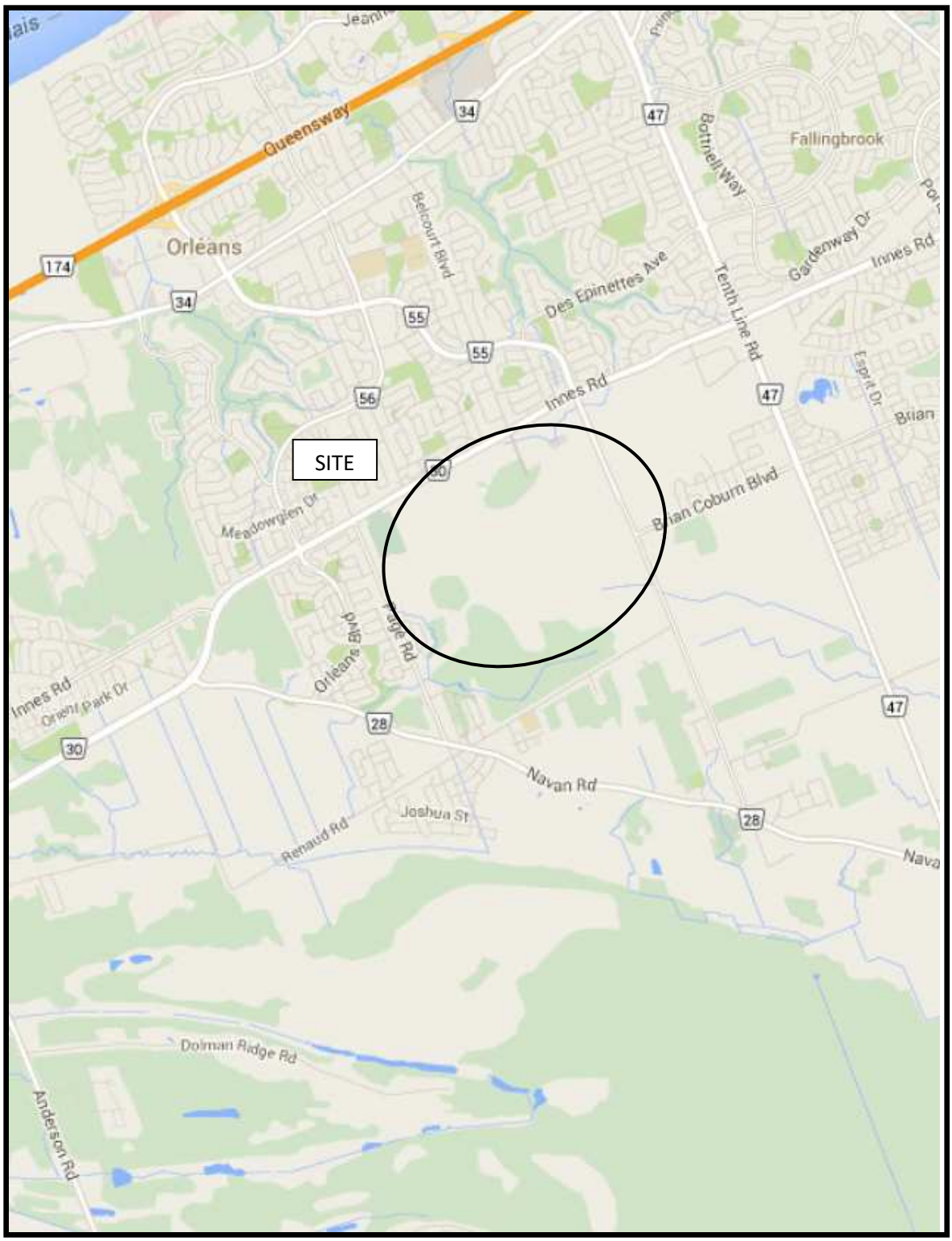
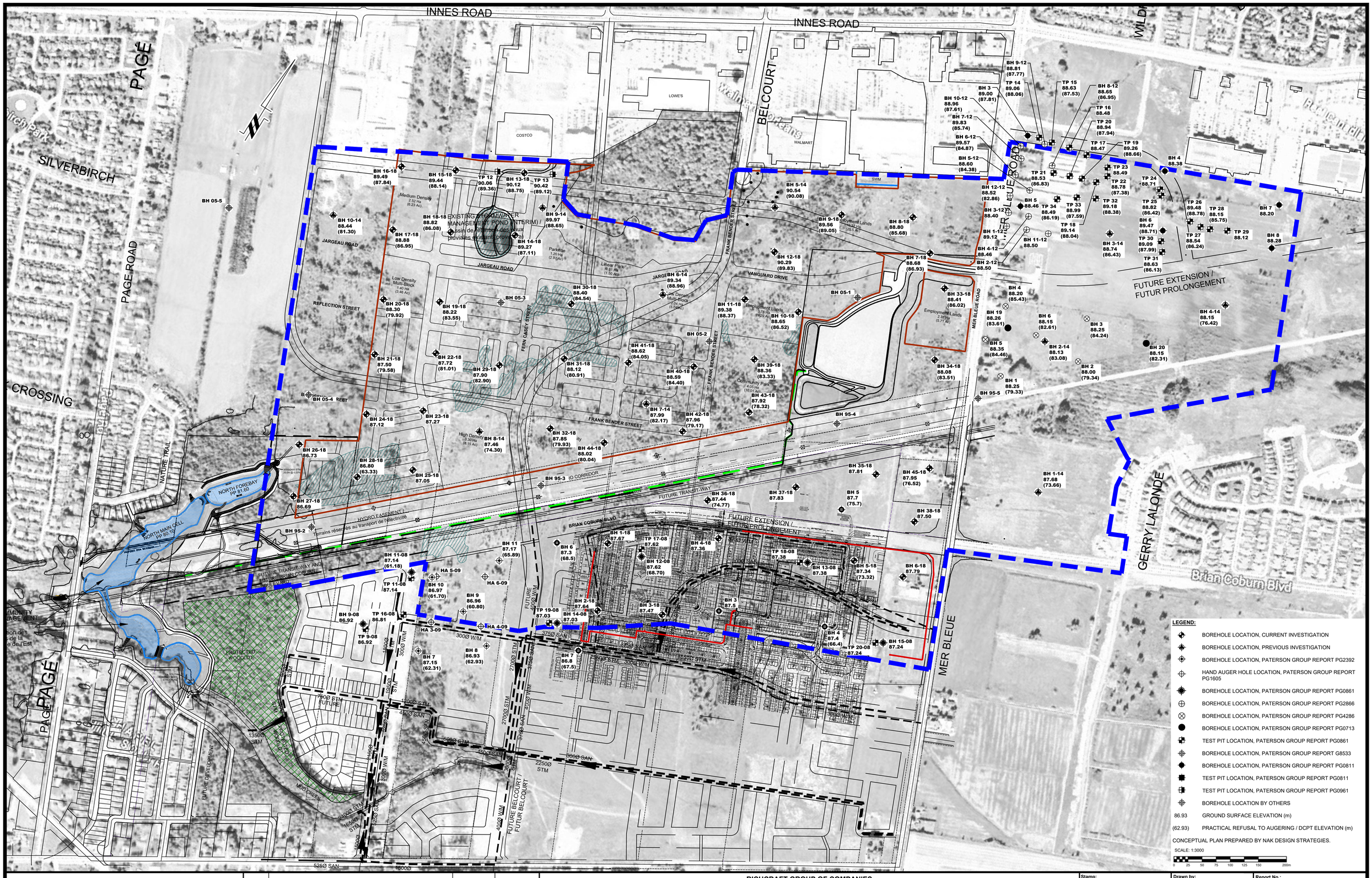


FIGURE 1

KEY PLAN

PATERSON GROUP



LEGEND:

- BOREHOLE LOCATION, CURRENT INVESTIGATION
- BOREHOLE LOCATION, PREVIOUS INVESTIGATION
- BOREHOLE LOCATION, PATERSON GROUP REPORT PG2392
- HAND AUGER HOLE LOCATION, PATERSON GROUP REPORT PG1605
- BOREHOLE LOCATION, PATERSON GROUP REPORT PG0861
- BOREHOLE LOCATION, PATERSON GROUP REPORT PG2866
- BOREHOLE LOCATION, PATERSON GROUP REPORT PG4286
- BOREHOLE LOCATION, PATERSON GROUP REPORT PG0713
- TEST PIT LOCATION, PATERSON GROUP REPORT PG0861
- BOREHOLE LOCATION, PATERSON GROUP REPORT G8533
- BOREHOLE LOCATION, PATERSON GROUP REPORT PG0811
- TEST PIT LOCATION, PATERSON GROUP REPORT PG0811
- TEST PIT LOCATION, PATERSON GROUP REPORT PG0961
- BOREHOLE LOCATION BY OTHERS

86.93 GROUND SURFACE ELEVATION (m)

(62.93) PRACTICAL REFUSAL TO AUGERING / DCPT ELEVATION (m)

CONCEPTUAL PLAN PREPARED BY NAK DESIGN STRATEGIES.

SCALE: 1:3000

0 25 50 75 100 125 150 200m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7S9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
1	REVISED WITH UPDATED CONCEPTUAL PLAN	15/04/2025	OC

RICHCRAFT GROUP OF COMPANIES

EXISTING CONDITIONS REPORT
EAST URBAN COMMUNITY MIXED-USE DEVELOPMENT
OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Stamp:

Drawn by: MPG	Report No.: PG3130-2
Checked by: CDS	Drawing No.: PG3130-6
Scale: 1:4000	
Date: 09/2014	

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INNES PARK WOODS
FRANK BENDER
LOWE'S
WATER TOWER
WALMART
CANADIAN TIRE
HOME OUTFITTERS
CUT-OFF SWALE
RETAINING WALL
PARK
PARKETTE
EXISTING SNOW DISPOSAL FACILITY
HYDRO EASEMENT
HYDRO CORRIDOR
COULOIR DE TRANSPORT D'ÉLECTRICITÉ
FUTURE BRT CORRIDOR
COULOIR FUTUR DU TCRA
BRIAN COBURN BOULEVARD
MER BLEUE ROAD
CASEY STREET
SCHOOL
INSTITUTIONAL
PROTECTED WOODLOT
WALKWAY
PERMISSIBLE GRADE RAISE:
UP TO 1.7m
UP TO 2.0m
UP TO 2.5m
LEGEND:
BOREHOLE LOCATION, CURRENT INVESTIGATION
BOREHOLE LOCATION, PREVIOUS INVESTIGATION
BOREHOLE LOCATION, PATERSON GROUP REPORT PG2392
HAND AUGER HOLE LOCATION, PATERSON GROUP REPORT PG1605
BOREHOLE LOCATION, PATERSON GROUP REPORT PG0861
BOREHOLE LOCATION, PATERSON GROUP REPORT PG2866
BOREHOLE LOCATION, PATERSON GROUP REPORT PG4286
BOREHOLE LOCATION, PATERSON GROUP REPORT PG0713
TEST PIT LOCATION, PATERSON GROUP REPORT PG0861
BOREHOLE LOCATION, PATERSON GROUP REPORT G8533
BOREHOLE LOCATION, PATERSON GROUP REPORT PG0811
TEST PIT LOCATION, PATERSON GROUP REPORT PG0811
TEST PIT LOCATION, PATERSON GROUP REPORT PG0961
BOREHOLE LOCATION BY OTHERS
86.93 GROUND SURFACE ELEVATION (m)
(62.93) PRACTICAL REFUSAL TO AUGERING / DCPT ELEVATION (m)
CONCEPTUAL PLAN PREPARED BY NAK DESIGN STRATEGIES.
SCALE: 1:3000
0 25 50 75 100 125 150 200m

PATERSON GROUP
9 AURIGA DRIVE
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K2E 7S9
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NO.	REVISIONS	DATE	INITIAL
1	REVISED WITH UPDATED CONCEPTUAL PLAN	14/05/2025	OC

RICHCRAFT GROUP OF COMPANIES

GEOTECHNICAL INVESTIGATION
EAST URBAN COMMUNITY MIXED-USE DEVELOPMENT
OTTAWA, ONTARIO

Title:

PERMISSIBLE GRADE RAISE PLAN

Stamp:

Drawn by: RCG	Report No.:	PG3130-2
Checked by: CDS	Drawing No.:	
Scale: 1:3000		PG3130-7
Date: 07/2018		

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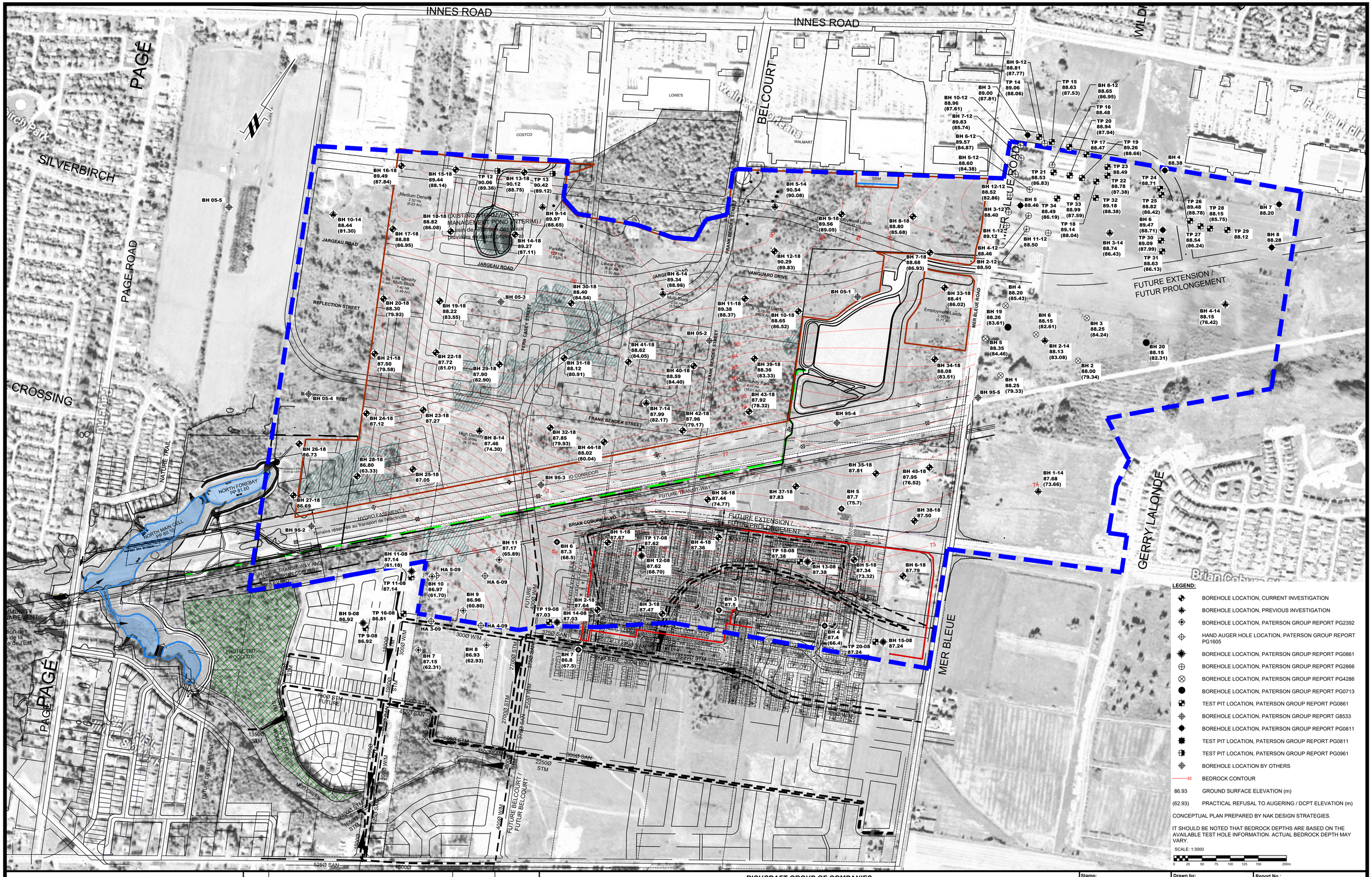

LEGEND:

- BOREHOLE LOCATION, CURRENT INVESTIGATION
- BOREHOLE LOCATION, PREVIOUS INVESTIGATION
- BOREHOLE LOCATION, PATERSON GROUP REPORT PG2392
- HAND AUGER HOLE LOCATION, PATERSON GROUP REPORT PG1605
- BOREHOLE LOCATION, PATERSON GROUP REPORT PG0861
- BOREHOLE LOCATION, PATERSON GROUP REPORT PG2866
- BOREHOLE LOCATION, PATERSON GROUP REPORT PG4286
- BOREHOLE LOCATION, PATERSON GROUP REPORT PG0713
- TEST PIT LOCATION, PATERSON GROUP REPORT PG0861
- BOREHOLE LOCATION, PATERSON GROUP REPORT G8533
- BOREHOLE LOCATION, PATERSON GROUP REPORT PG0811
- TEST PIT LOCATION, PATERSON GROUP REPORT PG0811
- TEST PIT LOCATION, PATERSON GROUP REPORT PG0961
- BOREHOLE LOCATION BY OTHERS
- 82 BEDROCK CONTOUR
- 86.93 GROUND SURFACE ELEVATION (m)
- (62.93) PRACTICAL REFUSAL TO AUGERING / DCPT ELEVATION (m)

CONCEPTUAL PLAN PREPARED BY NAK DESIGN STRATEGIES.

IT SHOULD BE NOTED THAT BEDROCK DEPTHS ARE BASED ON THE AVAILABLE TEST HOLE INFORMATION. ACTUAL BEDROCK DEPTH MAY VARY.

SCALE: 1:3000

0 25 50 75 100 125 150 200m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7S9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
1	REVISED WITH UPDATED CONCEPTUAL PLAN	15/04/2025	OC

RICHCRAFT GROUP OF COMPANIES

EXISTING CONDITIONS REPORT
EAST URBAN COMMUNITY MIXED-USE DEVELOPMENT
OTTAWA, ONTARIO

Title:

BEDROCK CONTOUR PLAN

Stamp:

Drawn by: MPG	Report No.: PG3130-2
Checked by: CDS	Drawing No.: PG3130-8
Scale: 1:4000	
Date: 09/2014	

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APPENDIX 3

PG3130-MEMO.10 – Geotechnical Recommendations – Phase 5

PATERSON GROUP

memorandum

re: **Geotechnical Recommendations – Phase 5**
Trailsedge Phase 5 Subdivision
Mer Bleue Road – Ottawa

to: Richcraft Group of Companies – **Ms. May Pham** – mpham@richcraft.com

date: April 24, 2025

file: PG3130-MEMO.10

Further to your request, Paterson Group (Paterson) prepared the current memorandum to provide geotechnical recommendations for Phase 5 of the subject development. The following memorandum should be read in conjunction with Paterson Group Report PG3130-3 Revision 2, dated April 24, 2025 and Memorandum PG3130-MEMO.09 dated April 24, 2025.

1.0 Proposed Development

Based on current plans, it is understood that the proposed development will consist of low, medium and high-density residential buildings with associated driveways, rights-of-way (ROWs), landscaped areas and parks, as well as industrial and logistics developments. The proposed development is anticipated to be municipally serviced.

2.0 Method of Investigation

2.1 Field Investigations

Field Program

The field investigations for the area currently identified as Phase 5 were conducted between March 2002 and June 2018, and consisted of boreholes, test pits, and hand auger holes. Previous investigations were also completed by others within Phase 5 of the subject site. The Soil Profile and Test Data Sheets are presented in Appendix 1 of the above-noted report. The locations and ground surface elevations of the test holes are presented on Drawing PG3130-6 – Test Hole Location Plan, presented in Appendix 2 of the above-noted report.

Sampling and In-Situ Testing

Soil samples were collected from the boreholes using a 50 mm diameter split-spoon (SS) sampler, using 73 mm diameter thin walled (TW) Shelby tubes in conjunction with a piston sampler, or from the auger flights. Soil samples were also recovered along the sidewalls of the test pits by hand during excavation.

All soil samples were visually inspected and initially classified on site.

The split-spoon samples were placed in sealed plastic bags and the Shelby tubes were sealed at both ends on site. All samples were transported to our laboratory for examination and classification. The depths at which the split-spoon, Shelby tube, auger and grab samples were recovered from the test holes are shown as SS, TW, AU and G, respectively, on the Soil Profile and Test Data sheets presented in Appendix 1 of the above-noted report.

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 carried out at regular depth intervals in cohesive soils. Undrained shear strength testing in test pits was completed using a handheld, portable vane apparatus (field inspection vane tester Roctest Model H-60).

All soil samples were classified on site, placed in sealed plastic bags and were transported to our laboratory for visual inspection.

Overburden thickness was evaluated during the course of the site investigations by dynamic cone penetration testing (DCPT) at several of the borehole locations. 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 at the borehole and test pits were recorded in detail in the field. The soil profiles are presented on the Soil Profile and Test Data sheets and Borehole Logs by Others in Appendix 1.

Groundwater

Flexible standpipes were installed in all boreholes to monitor the groundwater levels subsequent to the completion of the sampling program. Groundwater infiltration levels were noted at the time of excavation at the test pit locations.

The groundwater observations are discussed in Section 4.3 and presented in the Soil Profile and Test Data sheets in Appendix 1.

2.2 Field Survey

The borehole locations were determined by Paterson personnel taking into consideration the presence of underground and above-ground services.

The location and ground surface elevation at each borehole location were provided by Stantec Geomatics, Webster and Simmonds Surveying Limited, or Annis, O'Sullivan, Vollebekk Limited. It is understood that the elevations were referenced to a geodetic datum. The test hole locations and ground surface elevations at the test hole locations are presented on Drawing PG3130-6 – Test Hole Location Plan in Appendix 2.

2.3 Laboratory Review & Testing

The soil samples recovered from the subject site were visually examined in our laboratory to review the results of the field logging.

Shelby tube samples were submitted for unidimensional consolidation during the current and the previous geotechnical investigations. The results of the consolidation and Atterberg testing are presented on the Consolidation Test sheets presented in Appendix 1 of the above-noted report, and are further discussed in Section 3.2 below.

Atterberg limit tests and grain size distribution and hydrometer analyses were completed on selected soil samples. The results of our testing are presented in Appendix 1 of the above-noted report and are further discussed in Section 4.2.

3.0 Observations

3.1 Surface Conditions

The subject site consists of agricultural lands, and lands formerly used for agricultural purposes. The site and regional topography are relatively flat with a slight downslope towards the west and south. The site is approximately at-grade with neighboring properties and adjacent roadways.

3.2 Subsurface Profile

Overburden

Generally, the subsurface profile encountered at the test hole locations varies between shallow bedrock and a deep silty clay deposit within the subject site site.

Shallow bedrock was encountered below a thin cultivated organic zone/topsoil followed by a very stiff to stiff, brown silty clay or glacial till within the north portion of the site, transitioning to a thin organic/topsoil layer underlain by very stiff to stiff, brown silty clay layer to the south. As the silty clay deposit deepens to the south, the very stiff to stiff, brown silty clay is underlain by firm, grey silty clay and further by glacial till, with occurrences of the glacial till directly underlying the very stiff to stiff, brown silty clay.

Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 of the above-noted report for specific details of the soil profiles encountered at each test hole location.

Bedrock

Based on available geological mapping, the bedrock in this area mostly consists of interbedded limestone and dolomite of the Gull River formation with an overburden drift thickness of 0 to 30 m depth.

Atterberg Limit Tests

Atterberg limit testing of 26 samples was completed. The Plasticity Index of the underlying silty clay was measured to range from 24 to 51. The results of the Atterberg limit testing on select silty clay samples are presented in Appendix 1 of the above-noted report.

Grain Size Distribution Tests

Nine (9) sieve analyses were completed to classify selected soil samples according to the Unified Soil Classification System (USCS). The results are presented in Appendix 1 of the above-noted report.

3.3 Groundwater

Generally, the groundwater levels recovered from the piezometers installed at the borehole locations varied between 1.5 and 2.5 m below existing ground surface, with the exception of boreholes along the northern border of the site which were observed to be dry. It is important to note that groundwater readings at piezometers can be influenced by surface water perched within the borehole backfill material. Long-term groundwater conditions can also be estimated based on the observed colour and consistency of the recovered soil samples.

Based on these observations, it is estimated that the long-term groundwater level can be expected between **1.5 to 2.5 m** depth, corresponding to an approximate geodetic elevation of **85.5 to 87.5 m**. Within the northern portion of the site, the long-term groundwater level can be expected below the bedrock surface. Groundwater levels are subject to seasonal fluctuations and may vary during the time of construction. The groundwater conditions observed at the borehole and test pits were recorded in detail in the field. Our groundwater observations are presented in the Soil Profile and Test Data sheets in Appendix 1 of the above-noted report.

4.0 Discussion

4.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is adequate for the proposed development. Bedrock removal may require line drilling and blasting or hoe ramming depending on the depth of bedrock removal required. Due to the presence of the sensitive silty clay layer, residential buildings should be designed in accordance with Part 4 of the current Ontario Building Code (OBC).

Due to the sensitive silty clay deposit, the proposed development will be subjected to grade raise restrictions. The recommended permissible grade raise areas are presented in Drawing PG3130-7 – Permissible Grade Raise Plan in Appendix 2 of the above-noted report. If higher than permissible grade raises are required, preloading with or without a surcharge, lightweight fill and/or other measures should be investigated to reduce the risks of unacceptable long-term, post-construction total and differential settlements.

Municipal services are anticipated within the subject site and will generally be completed through OHSA Type 2 and 3 soils.

4.2 Foundation Design

Bearing Resistance Values

Conventional style shallow footings for buildings can be designed using the bearing resistance values presented in Table 1. A geotechnical resistance factor of 0.5 was applied to the bearing resistance values at ULS.

Table 1 – Bearing Resistance Values

Bearing Surface	Bearing Resistance Values at SLS (kPa)	Factored Bearing Resistance Value at ULS (kPa)
Undisturbed, Firm Silty Clay	60	150
Undisturbed, Stiff to Very Stiff Silty Clay	100	180
Undisturbed, Compact Glacial Till	150	250
Clean, Surface Sounded Bedrock	-	500

Note: Pad footings, up to 3 m wide, and strip footings, up to 2 m wide, can be designed using the above noted bearing resistance values placed over an undisturbed, silty clay bearing surface.

An undisturbed soil bearing surface consists of one 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.

The bearing resistance values at SLS for shallow footing bearing on the above noted soils will be subjected to potential post-construction total and differential settlements of 25 and 15 mm, respectively.

A clean, surface-sounded bedrock bearing surface should be free of loose materials, and have no near surface seams, voids, fissures or open joints which can be detected from surface sounding with a rock hammer. Footings bearing on an acceptable bedrock bearing surface and designed using the bearing resistance values provided herein will be subjected to negligible potential post-construction total and differential settlements.

Bedrock to Soil Transition

Where a building is founded partly on bedrock and partly on soil, it is recommended to decrease the soil bearing resistance value by 25% for the footings placed on soil bearing media to reduce the potential long-term total and differential settlements. Also, at the soil/bedrock and bedrock/soil transitions, it is recommended that the upper 0.5 m of the bedrock be removed for a minimum length of 2 m (on the bedrock side) and replaced with nominally compacted OPSS Granular A or Granular B Type II material. The width of the subexcavation should be at least the proposed footing width plus 0.5 m. Steel reinforcement, extending at least 3 m on both sides of the 2 m long transition, should be placed in the top part of the footings and foundation walls.

Settlement/Grade Raise

A total of 4 consolidation tests were completed within the subject site. The results of the consolidation tests are presented in Table 2 and in Appendix 1 in the above-noted report.

The value for p'_c is the preconsolidation pressure and p'_o is the effective overburden pressure of the test sample. The difference between these values is the available preconsolidation. The increase in stress on the soil due to the cumulative effects of the fill surcharge, the footing pressures, the slab loadings and the lowering of the groundwater should not exceed the available preconsolidation if unacceptable settlements are to be avoided.

The values for C_{cr} and C_c are the recompression and compression indices, respectively. These soil parameters are a measure of the compressibility due to stress increases below and above the preconsolidation pressures. The higher values for the C_c, as compared to the C_{cr}, illustrate the increased settlement potential above, as compared to below, the preconsolidation pressure.

Table 2 – Summary of Consolidation Test Results (Current Investigation)							
Borehole	**Sample**	**Depth (m)**	**p'_c (kPa)**	**p'_o (kPa)**	**C_{cr}**	**C_c**	**Q***
BH 27-18	TW 4	5.05	145.9	66.9	0.023	3.182	G
BH 28-18	TW 5	4.98	121.7	66.43	0.028	4.375	A
BH 42-18	TW 4	5.05	132.2	66.9	0.022	3.777	A
BH 44-18	TW 4	5.03	85.8	66.8	0.027	1.823	P
* - Q – Quality assessment of sample – G: Good A: Acceptable P: Likely disturbed							

The values of p'_c, p'_o, C_{cr} and C_c are determined using standard engineering testing procedures and are estimates only. Natural variations within the soil deposit will affect the results. The p'_o parameter is directly influenced by the groundwater level. Groundwater levels were measured during the site investigation. Groundwater levels vary seasonally which has an impact on the available preconsolidation. Lowering the groundwater level increases the p'_o and therefore reduces the available preconsolidation. Unacceptable settlements could be induced by a significant lowering of the groundwater level.

The p'_o values for the consolidation tests during the investigation are based on the long-term groundwater level being at 0.5 m below the existing groundwater table. The groundwater level is based on the colour and undrained shear strength profile of the silty clay.

The total and differential settlements will be dependent on characteristics of the proposed buildings. For design purposes, the total and differential settlements are estimated to be 25 and 20 mm, respectively. A post-development groundwater lowering of 0.5 m was assumed.

The potential post construction total and differential settlements are dependent on the position of the long-term groundwater level when building are situated over deposits of compressible silty clay. Efforts can be made to reduce the impacts of the proposed development on the long-term groundwater level by placing clay dykes in the service trenches, reducing the sizes of paved areas, leaving green spaces to allow for groundwater recharge or limiting planting of trees to areas away from the buildings. However, it is not economically possible to control the groundwater level.

To reduce potential long-term liabilities, consideration should be given to accounting for a larger groundwater lowering and to provide means to reduce long term groundwater lowering (e.g. clay dykes, restriction on planting around the dwellings, etc). Buildings on silty clay deposits increases the likelihood of movements and therefore of cracking. The use of steel reinforcement in foundations placed at key structural locations will tend to reduce foundation cracking compared to unreinforced foundations.

Based on the undrained shear strength testing results, consolidation testing and experience with the local silty clay deposit. **The recommended permissible grade raise areas for buildings are defined in Drawing PG3130-7 – Permissible Grade Raise Plan in Appendix 2 of the above-noted report.**

Where proposed grade raises exceed our permissible grade raise recommendations, several options could be considered for the foundation support of the proposed buildings. Reference should be made to Subsection 5.3 of the above-noted report for options concerning proposed grades that exceed the permissible grade raise restrictions.

4.3 Design for Earthquakes

The site class for seismic site response can be taken as **Class X**$_C$ for the foundations bearing on a compact to dense glacial till and/or bedrock within the north portion of the subject site. A higher site class, such as Class X_A or X_B, is applicable for footings bearing on the bedrock surface. However, a site specific seismic shear wave test will be required to confirm the Class X_A or X_B for seismic site classification. A seismic site response **Class** X_D is applicable for design of the proposed buildings bearing over a stiff to firm silty clay deposit throughout the remainder of the site.

Soils underlying the subject site are not susceptible to liquefaction. Reference should be made to the latest revision of the 2024 Ontario Building Code for a full discussion of the earthquake design requirements.

5.0 Additional Considerations

5.1 Stormwater Management Pond Removal

Prior to backfilling of the temporary stormwater pond, all vegetation, topsoil, loose sediment and other deleterious materials should be removed.

Fill used for grading beneath building areas should consist, unless otherwise specified, of clean imported granular fill, such as Ontario Provincial Standard Specifications (OPSS) Granular A or Granular B Type II or approved alternative. The fill should be placed in loose lifts and compacted using suitable compaction equipment for the lift thickness. Fill placed beneath building areas should be compacted to a minimum 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 and beneath parking areas where settlement of the ground surface is of minor concern. In landscaped areas, these materials should be spread in thin lifts and at least compacted by the tracks of the spreading equipment to minimize voids.

If these materials are to be used to build up the subgrade level for areas to be paved, they should be compacted in thin lifts to a minimum density of 95% of the SPMDD. Non-specified existing fill and site-excavated soils are not suitable for use as backfill against foundation walls unless a composite drainage blanket connected to a perimeter drainage system is provided.

Where hard surface areas are considered above the trench backfill, the trench backfill material within the frost zone (about 1.5 m below finished grade) and above the cover material should match the soils exposed at the trench walls to minimize differential frost heaving. The trench backfill should be placed in maximum 225 mm thick loose lifts and compacted to a minimum of 95% of the material standard Proctor maximum dry density.

It should generally be possible to re-use the site materials for backfill beneath landscaped areas if the operations are carried out in dry weather conditions. If the site-excavated material consists of moist to wet silty clay, the material should be spread in thin lifts and allowed adequate time to dry before being placed.

5.2 Cut-Off Swale Design

The excavation for the cut-off swale will be through either sand or stiff silty clay. It is anticipated that bedrock will be located 0 to 1.5 m below the bottom of the cut-off swale.

The cut-off swale should consist of 3H:1V side slopes, or shallower. Where sand is encountered within the excavation for the swale, flatter slopes could be required to prevent raveling and maintain a stable slope. The side slopes should be vegetated immediately upon excavation to promote side slope stability. The side slope excavation should be reviewed by Paterson at the time of excavation.

Rock dams can be considered to reduce the water flow velocity within the swale. If required, Paterson can provide detailed recommendations for rock dams.

Excavated material should not be stockpiled directly at the top of the side slopes and heavy equipment should be kept away from the excavation sides when not in use.

Paterson should conduct geotechnical assessments on proposed side slope designs with slopes steeper than 3H:1V, if applicable.

5.3 Landscaping Consideration

Tree Planting Restrictions

In accordance with the City of Ottawa Tree Planting in Sensitive Marine Clay Soils (2017 Guidelines), Paterson completed the required soil testing to aid in determining the applicable tree planting setbacks.

However, it should be noted that Paterson is also relying on our engineering expertise to determine the applicable tree planting setback for the subject site.

Atterberg limits testing was completed for recovered silty clay samples at selected locations throughout the subject site. Sieve analysis testing was also completed on selected soil samples. The above noted soil samples were recovered from elevations below the anticipated design underside of footing elevation and 3.5 m depth below anticipated finished grade. The results of our testing are presented in Appendix 1.

Based on the colouring and moisture levels of the recovered soil samples and the undrained shear strength values in close proximity to design underside of footing elevation, Paterson has determined that the following tree planting setbacks are recommended. Large trees (mature height over 14 m) can be planted within these 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 is 4.5 m for small (mature tree height up to 7.5m) and medium size trees (mature tree height 7.5 m 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 of 25 m3 of available soil volume while a medium tree must be provided with a minimum of 30 m3 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), as noted on the subdivision Grading Plan.

Swimming Pools

The in-situ soils are considered to be acceptable for in-ground swimming pools. Above ground swimming pools must be placed at least 5 m away from the residence foundation and neighbouring foundations. Otherwise, pool construction is considered routine, and can be constructed in accordance with the manufacturer`s requirements.

Aboveground Hot Tubs

Additional grading around the hot tub should not exceed permissible grade raises. Otherwise, hot tub construction is considered routine, and can be constructed in accordance with the manufacturer's specifications.

Installation of Decks and Additions

Additional grading around proposed deck or addition should not exceed permissible grade raises. Otherwise, standard construction practices are considered acceptable.

We trust that this information satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

Owen R. Canton, B.Eng.

Scott S. Dennis, P.Eng.