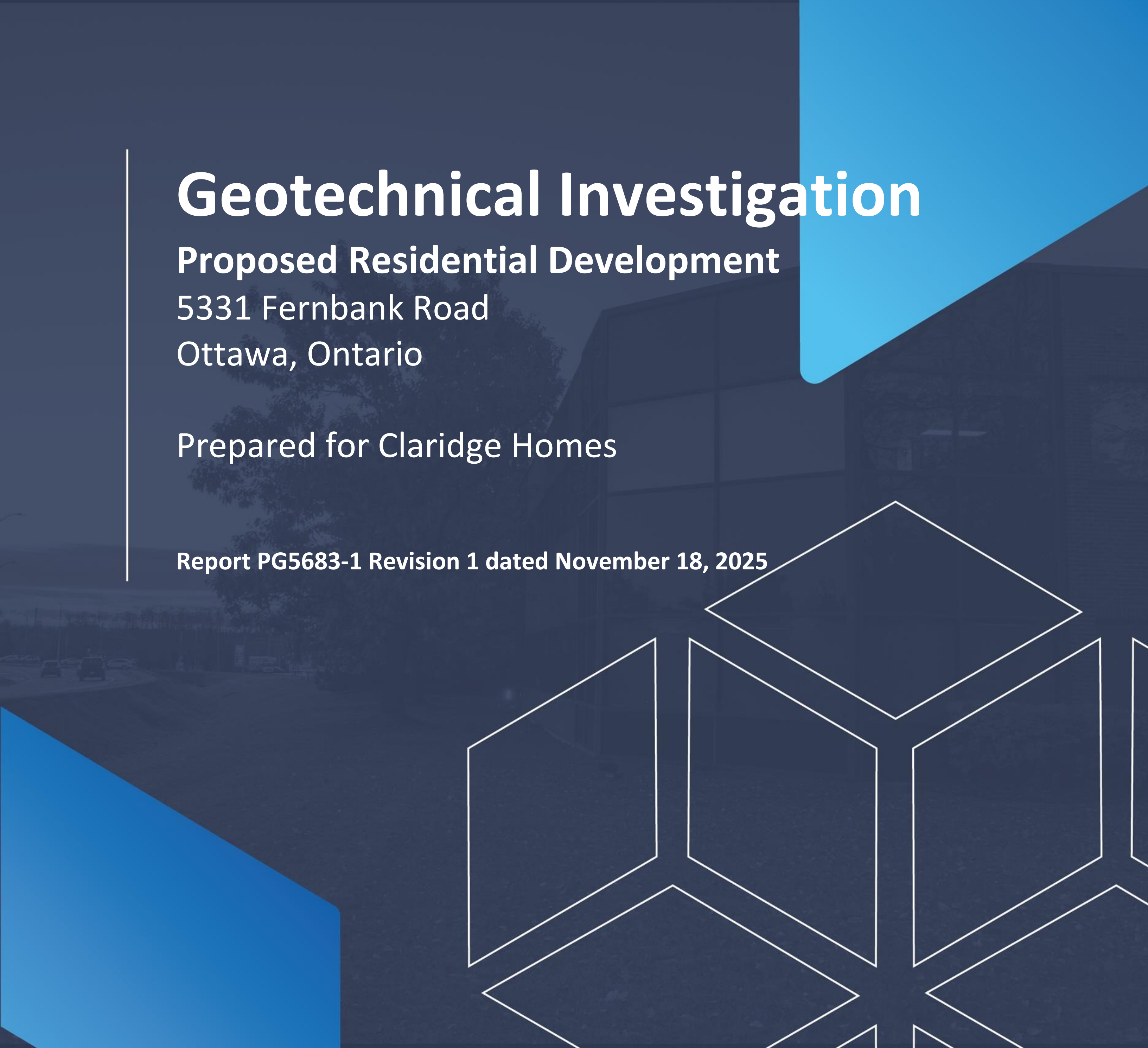

Geotechnical Investigation

Proposed Residential Development

5331 Fernbank Road
Ottawa, Ontario

Prepared for Claridge Homes

Report PG5683-1 Revision 1 dated November 18, 2025

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1.0 Introduction

Paterson Group (Paterson) was commissioned by Claridge Homes to conduct a geotechnical investigation for the proposed residential development to be located at 5331 Fernbank Road in the City of Ottawa (refer to Figure 1 – Key Plan presented in Appendix 2 for the general site location).

The objectives of the geotechnical investigation were to:

☐ determine the subsurface soil and groundwater conditions by means of boreholes.

☐ provide geotechnical recommendations for the foundation design of the proposed buildings, and provide geotechnical construction precautions which may affect the design.

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

2.0 Proposed Development

It is understood that the proposed development will consist of several residential townhouse structures, each having a basement level.

Access lanes, car parking areas and landscaped areas will surround the proposed buildings. It is further understood that the site will be serviced by future municipal services.

3.0 Method of Investigation

3.1 Field Investigation

Field Program

The field program for the current investigation was carried out on February 9, 2021. At that time, 5 boreholes were advanced to a maximum depth of 6.7 m below the existing ground surface. Previous field investigations were completed by Paterson at the subject site in January 2018 and May 2006. A total of 9 boreholes were advanced to a maximum depth of 14.6 m during the previous investigations. The test hole locations were placed in a manner to provide general coverage of the subject site taking into consideration site features and underground utilities. The test hole locations are presented on Drawing PG5683 1 – Test Hole Location Plan included in Appendix 2.

The boreholes were completed using a track mounted drill rig operated by a two person crew. All fieldwork was conducted under the full-time supervision of Paterson personnel under the direction of a senior engineer from the geotechnical division. 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. All samples were visually inspected and initially classified on site and subsequently placed in sealed plastic bags. The depths at which the auger, split spoon, and Shelby tube samples were recovered from the test holes are shown as AU, SS, and TW, respectively, on the Soil Profile and Test Data sheets 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 in cohesive soils using a field vane apparatus.

The overburden thickness was evaluated by a dynamic cone penetration test (DCPT) completed at borehole BH 1. 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.

Subsurface conditions observed in the test holes were recorded in detail in the field. Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 for details of the soil profile encountered at the test hole locations.

Groundwater

All boreholes were fitted with a flexible polyethylene standpipe to allow groundwater level monitoring. The groundwater level reading were obtained after a suitable stabilization period subsequent to the completion of the field investigation. 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 test hole locations were determined by Paterson personnel and surveyed in the field by Paterson. The test hole elevation are referred to the geodetic datum. The locations of the boreholes are presented on Drawing PG5683-1 – Test Hole Location Plan in Appendix 2.

3.3 Laboratory Testing

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 1 shrinkage test, 2 grain size distribution analyses and 5 Atterberg limits tests were completed on selected soil samples from the current investigation. Furthermore, 2 soil sample from the previous investigations were submitted for an Atterberg limits test. The results of our testing are presented in Section 4.2 and on Grain Size Distribution and Hydrometer Testing and Atterberg Limit’s Results sheets presented in Appendix 1.

A total of 4 Shelby tube sample from the previous investigation were submitted for unidimensional consolidation. The results of the consolidation testing are presented on the Unidimensional Consolidation Test Results sheets in Appendix 1 and are further discussed in Subsection 5.3.

3.4 Analytical Testing

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

4.0 Observations

4.1 Surface Conditions

The subject site currently consists of undeveloped agricultural land, with a relatively flat ground surface which is approximately 0.5 m below the grade of surrounding roadways. A former roadway with an adjacent approximately 0.5 m deep ditch was noted to traverse the subject site along the east property boundary. The former roadway was observed to consist of a gravel pathway overgrown with light brush.

The subject site is bordered to the north by Cope Drive, to the east by a residential subdivision, to the south by Fernbank Road, and to the west by Terry Fox Drive.

4.2 Subsurface Profile

Overburden

Generally, the subsurface soil profile encountered at the test hole locations consisted of a topsoil layer underlain by interbedded brown silty sand with stiff brown clayey silt to silty clay. Underlying the above noted layers is a deep deposit of firm grey silty clay with some sand.

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

Bedrock

A DCPT was completed at boreholes BH 2 and BH 8-18. Practical refusal to the DCPT was encountered at a depth of 36.7 m below the existing ground surface at borehole BH 2. Practical refusal was not encountered within the upper 30.5 m below existing ground surface at borehole BH 8-18. Based on available geological mapping, the bedrock in the area is part of the Gull River formation, which consists of interbedded limestone and dolomite with an overburden drift thickness ranging between 25 to 50 m.

Atterberg Limit and Shrinkage Tests

Atterberg limits testing was completed on the recovered silty clay samples at selected locations throughout the subject site. The results of the Atterberg limits tests are presented in Table 1 and on the Atterberg Limits Results sheet in Appendix 1.

Table 1 – Atterberg Limits Results

Sample	Depth (m)	LL (%)	PL (%)	PI (%)	Classification
BH 1-21	0.8 - 1.4	24	20	4	ML
BH 2-21	1.5 - 2.3	25	21	4	ML
BH 3-21	1.5 - 2.3	26	23	3	ML
BH 4-21	1.5 - 2.3	22	19	3	ML
BH 5-21	1.5 - 2.3	28	25	3	ML
BH 2-21	4.6 - 5.2	46	22	24	CL
BH 2-21	12.2 - 12.8	39	20	19	CL

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

The results of the shrinkage limit testing indicate a shrinkage limit of 6.8% and a shrinkage ratio of 2.21.

Grain Size Distribution and Hydrometer Testing

Grain size distribution (sieve and hydrometer analysis) was also completed on 2 selected soil samples. The results of the grain size analysis are summarized In Table 2 and presented on the Grain-Size Distribution and Hydrometer Testing Results sheets in Appendix 1.

Table 2 – Summary of Grain Size Distribution Analysis

Test Hole	Depth (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
BH 1-21	1.5 - 2.3	0	4.5	76.8	18.7
BH 4-21	0.8 - 1.4	0	13.5	72.5	14

4.3 Groundwater

Groundwater level readings were recorded on February 19, 2021. The groundwater level readings are presented in the Soil Profile and Test Data sheets in Appendix 1. It should be noted that surface water can become trapped within a backfilled borehole that can lead to higher than typical groundwater level observations. Long-term groundwater level can also be estimated based on the observed color, moisture levels and consistency of the recovered soil samples. Based on these observations, the long-term groundwater level is expected between a **1.5 to 2.5 m depth**. It should be noted that groundwater levels are subject to seasonal fluctuations, therefore the groundwater levels could vary at the time of construction.

5.0 Discussion

5.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is suitable for the proposed residential development. It is recommended that the proposed buildings be founded over conventional shallow footings placed on an undisturbed silty sand or firm silty clay bearing surface.

Due to the presence of the sensitive silty clay deposit, the proposed development will be subjected to grade raise restrictions. The recommended permissible grade raise areas are presented in Subsection 5.3. 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.

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 significant amounts of organic materials, should be stripped from under any buildings, paved areas, pipe bedding and other settlement sensitive structures. Care should be taken not to disturb subgrade soils during site preparation activities.

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 or approved alternative. Granular material should be tested and approved prior to delivery to the site. The fill should be placed in loose lifts of 300 mm thick or less and compacted using suitable compaction equipment for the lift thickness. Fill placed beneath the building areas should be compacted to at least 98% of the Standard Proctor Maximum Dry Density (SPMDD).

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

Where non-specified imported fill material is considered to build up the subgrade level for areas to be paved, it should be compacted in maximum 300 mm thick loose lifts to at least 95% of the material's SPMDD. The non-specified fill should be compacted using a suitably sized vibratory roller, while clay-dominant soils should be compacted using a suitably sized sheepsfoot roller. Importing and placement of non-specified fill should be reviewed and approved by the geotechnical consultant at the time of construction.

All non-specified engineered fill should be placed **under dry conditions and above freezing temperatures** and should be approved by Paterson at the time of placement. It is further recommended that all soil, stone and other fill particles with a diameter greater than 300 mm in their longest dimension be segregated from the fill prior to placement of the fill to minimize voids created by their presence in the fill layers.

In-Filling Existing Ditches

In-filling the site's existing ditches should be completed in a stepped fashion within the lateral support zone of the proposed buildings. The fill should consist of clean imported granular fill, such as OPSS Granular A or Granular B Type II material. The steps should have a minimum horizontal length of 1.5 m and minimum vertical height of 0.5 m and should be compacted using suitable compaction equipment to a minimum of 98% of the material's SPMDD.

5.3 Foundation Design

Bearing Resistance Value

Strip footings, up to 3 m wide, and pad footings, up to 5 m wide, placed on an undisturbed, compact silty sand and/or stiff silty clay bearing surface can be designed using a bearing resistance value at serviceability limit states (SLS) of **120 kPa** and a factored bearing resistance value at ultimate limit states (ULS) of **180 kPa**. A geotechnical resistance factor of 0.5 was applied to the above noted bearing resistance value at ULS. Any loose or poor performing silty sand material should be proof rolled and approved by the geotechnical consultant prior to placement of the footings.

Strip footings, up to 2 m wide, and pad footings, up to 4 m wide, placed on an undisturbed, firm grey silty clay bearing surface can be designed using a bearing resistance value at serviceability limit states (SLS) of **70 kPa** and a factored bearing resistance value at ultimate limit states (ULS) of **100 kPa**. A geotechnical resistance factor of 0.5 was applied to the above noted bearing resistance value at ULS.

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 20 mm, respectively.

Lateral Support

The bearing medium under footing-supported structures is required to be provided with adequate lateral support with respect to excavations and different foundation levels. Adequate lateral support is provided to a silty sand or firm silty clay/clayey silt above the groundwater table when a plane extending down and out from the bottom edge of the footing at a minimum of 1.5H:1V passes only through in situ soil of the same or higher capacity as the bearing medium soil.

Permissible Grade Raise Recommendations

Undrained shear strength testing was completed using a vane apparatus at each borehole location. In addition to the shear strength testing, undisturbed silty clay samples were collected using 73 mm diameter thin walled (TW) Shelby tube in conjunction with a piston sampler. The Shelby tube sample was sealed at both ends and transported to our laboratory for unidimensional consolidation testing.

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 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.

Four (4) site specific consolidation tests were conducted as part of the previous investigation. The results of the consolidation tests from our investigation is presented in Table 3 and in Appendix 1.

Table 3 – Summary of Consolidation Test Results

Borehole No.	Sample	Depth (m)	p'$_c$ (kPa)	p'$_o$ (kPa)	C_{cr}	C_c	Q (*)
BH 3-18	TW 3	4.04	111	42	0.013	0.898	A
BH 7-18	TW 3	4.83	78	41	0.021	0.021	A
BH 2	TW 5	5.00	115	52	0.011	0.011	A
BH 2	TW 9	12.60	163	114	0.017	0.017	P

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

It should be noted that the values of p'$_c$, p'$_o$, C_{cr}, and C_c are determined using standard engineering practices and are estimates only.

The effective overburden stress, p'$_o$, is directly influenced by the groundwater level. The effective overburden stresses for the consolidation test samples were estimated using a conservatively low groundwater depth.

It has been considered that the groundwater level will vary seasonally and may be affected by other factors that could reduce groundwater infiltration as part of development (pavements, storm sewers, etc.) or promote groundwater depletion (trees, dry seasons, etc.). As such, our analyses considered the post-development long-term groundwater level at a position 0.5 m lower than the assumed long-term level.

Based on our experience with local clay deposits, consolidation testing results and undrained shear strength values at the borehole locations, the permissible grade raise recommendation for finished grading within 6 m of a building footprint is **1.5 m**, and our permissible grade raise restriction for finished grading along access lanes and parking lots is **2.0 m**.

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 permissible grade raise recommendations are exceeded, the following options could be employed:

Option 1 – Use of Lightweight Fill

Lightweight fill (LWF) can be used, consisting of EPS (expanded polystyrene) Type 12 or 15 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. Lightweight fill can also be used within the interior of the garage and porch areas to reduce the fill- related loads.

Option 2 – Surcharge Settlement Monitoring Program

Provided sufficient time is available to induce the required settlements, consideration could be given to surcharging the subject site. Settlement plates to monitor long term settlement should be installed at selected locations. Once the desired settlements have taken place, the surcharged portion can be removed, and the site is considered acceptable for development.

Once available, the final grading plan should be reviewed by Paterson and the above options could be further discussed along with further recommendations on specific requirements.

5.4 Design for Earthquakes

The seismic site designation is **Class X_E** is applicable for design of the proposed buildings bearing over a deep silty clay deposit throughout the subject site. Reference should be made to the latest revision of the Ontario Building Code (OBC) 2024 for a full discussion of the earthquake design requirements.

5.5 Basement Slab

With the removal of all topsoil, peat, and deleterious fill, containing organic matter, within the footprints of the proposed buildings, the undisturbed native soil surface will be considered acceptable subgrade on which to commence backfilling for floor slab construction. Any soft areas should be removed and backfilled with appropriate backfill material. OPSS 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-slab fill consist of 19 mm clear crushed stone.

A clear crushed stone fill is recommended for backfilling below the floor slab for limited span slab-on-grade areas, such as front porch or garage footprints. It is recommended that the upper 200 mm of sub-slab fill consist of 19 mm clear crushed stone below basement floor slabs.

5.6 Pavement Structure

For design purposes, the pavement structure presented in the following tables could be used for the design of the car only parking areas, heavy truck traffic and access lanes anticipated at this site.

Table 4 – Recommended Pavement Structure - Car-Only Parking Areas

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

Table 5 – Recommended Pavement Structure – Access Lanes and Heavy Truck Parking Areas

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

If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be excavated and replaced with OPSS Granular B Type II material. Weak subgrade conditions may be experienced over service trench fill materials. This may require the use of a geotextile, thicker subbase or other measures that can be recommended at the time of construction as part of the field observation program.

Minimum Performance Graded (PG) 58-34 asphalt cement should be used for driveways and local roadways, and PG 64-34 asphalt cement should be used for roadways with bus traffic. The pavement granular base and subbase should be placed in maximum 300 mm thick lifts and compacted to a minimum of 99% of the material's SPMDD using suitable vibratory equipment.

Pavement Structure Drainage

Satisfactory performance of the pavement structure is largely dependent on the contact zone between the subgrade material and the base stone being 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 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, Waterproofing and Backfill

A perimeter foundation drainage system is recommended for the proposed structures. The system should consist of a 100 mm diameter, geotextile-wrapped, perforated and corrugated plastic pipe which is surrounded on all sides by 150 mm of 19 mm clear crushed stone, placed at the footing level around the exterior perimeter of the each 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 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 an equivalent thickness of soil cover and foundation insulation, 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 an equivalent thickness of soil cover and foundation insulation.

6.3 Excavation Side Slopes and Service Trenches

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 expected 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 in the following
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

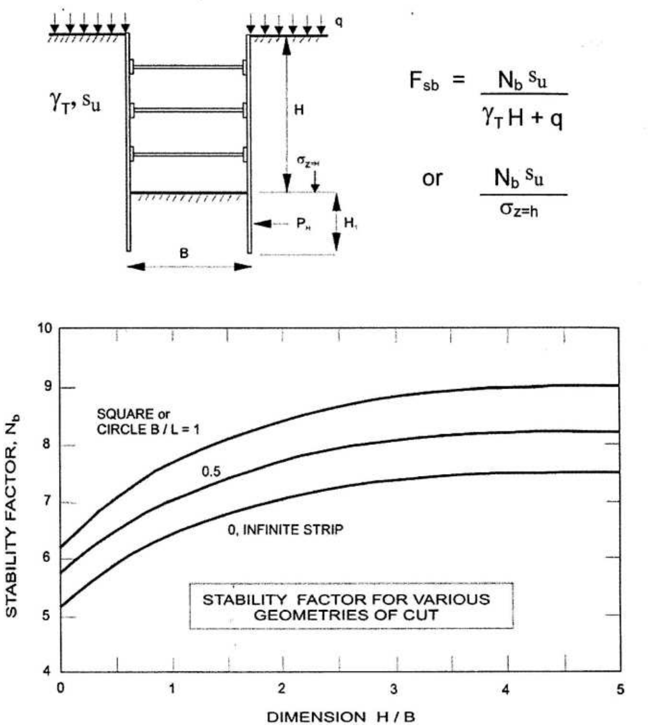


Figure 1 – Stability Factor for Various Geometries of Cut

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 pipe bedding for sewer and water pipes. The bedding layer should be increased to a minimum of 300 mm where the subgrade consists of a firm grey silty clay. The bedding material should be placed in maximum 300 mm thick lifts, compacted to a minimum of 95% of its SPMDD and extend to the spring line of the pipe.

The cover material, which should consist of OPSS Granular A, should extend from the spring line of the pipe to at least 300 mm above the obvert of the pipe. The material should be placed in maximum 300 mm thick lifts and compacted to a minimum of 99% of its SPMDD.

Generally, it should be possible to re-use the moist (not wet) brown silty clay and silty clay with sand above the cover material if the excavation and filling operations are carried out in dry weather conditions.

Wet silty clay materials will be difficult to re-use, as the high water contents make compacting impractical without an extensive drying period.

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 (in the trench direction) and should extend from trench wall to trench wall. 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 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. Periodic inspection of the clay seal placement work should be completed by Paterson personnel during servicing installation work.

6.5 Groundwater Control

Due to the relatively impervious nature of the silty clay materials, it is anticipated that groundwater infiltration into the excavations should be low to moderate 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

Under the current regulations enacted by the Ministry of Environment, Conservation and Parks (MECP), any dewatering in excess of 50,000 L/day requires a registration on the Environmental Activity and Sector Registry (EASR), provided that dewatering is related to construction. If the dewatering is not related to construction, a Permit to Take Water obtained from the MECP will be required.

In the event that an EASR is required to facilitate dewatering of the proposed development, a minimum of three 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. Should a Permit to Take Water be required, a minimum of five to six months should be allotted for completion of the permit, due to the minimum review period imposed by the MECP.

Impacts on Neighbouring Structures

Based on the existing groundwater level and low permeability of the adjacent soils, the extent of any significant groundwater lowering will take place within a limited range of the subject site. Based on the proximity of the neighboring residential development and minimal zone impacted by the ground water lowering, the proposed development will not negatively impact the neighboring structures. It should be noted that no issues are expected with respect to groundwater lowering that would cause long term damage to adjacent structures surrounding the proposed building.

6.6 Winter Construction

Precautions must be taken if winter construction is considered for this project. The subsoil conditions at this site consist of frost susceptible materials. In the presence of water and freezing conditions, ice could form within the soil mass. 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.

The trench excavations should be constructed in a manner that will avoid the introduction of frozen materials into the trenches. Additionally, pavement construction is difficult during winter. The subgrade consists of frost susceptible soils which will experience total and differential frost heaving as the work takes place. In addition, the introduction of frost, snow, or ice into the pavement materials, which is difficult to avoid, could adversely affect the performance of the pavement structure. Additional information could be provided, if required.

6.7 Corrosion Potential and Sulphate

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

6.8 Landscaping Considerations

Tree Planting Restrictions

Paterson completed a soils review of the site to determine applicable tree planting setbacks, in accordance with the City of Ottawa Tree Planting in Sensitive Marine Clay Soils (2017 Guidelines) for trees planted within a public right-of-way (ROW). Atterberg limits testing was completed for recovered silty clay samples at selected locations throughout the subject site. Grain size distribution and hydrometer testing was also completed on selected soil samples. The above-noted test results were completed on samples taken at depths between the anticipated underside of footing elevation and a 3.5 m depth below finished grade. The results of our testing are presented in Tables 1 and 2 in Section 4.2 and in Appendix 1.

Based on the results of the Atterberg limit testing mentioned above, the plasticity index was found to be less than 40% in all the tested clay samples. In addition, based on the clay content found in the clay samples from the grain size distribution test results, moisture levels and consistency, the silty clay across the subject site is considered low to medium sensitivity clay and should not be designated as sensitive marine clays.

Low to Medium Sensitivity Clays

A low to medium sensitivity clay soil was encountered between the anticipated design underside of footing elevations and 3.5 m below finished grade as per City Guidelines for the entire site. Based on our Atterberg limits test results, the modified plasticity index does not exceed 40% across the site. The following tree planting setback is recommended for the entire subject site due to the presence of low to medium sensitivity clays. 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 limits may be reduced to **4.5 m** for small (mature height up to 7.5 m) and medium size trees (mature tree height 7.5 to 14 m), provided that the conditions noted on the following page 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 m^3 of available soil volume while a medium tree must be provided with a minimum of 30 m^3 of available soil volume, as determined by the Landscape Architect. The developer is to ensure that the soil is generally un-compacted when backfilling in street tree planting locations.

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

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

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

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

Aboveground Swimming Pools, Hot Tubs, Decks and Additions

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 neighboring foundations. Otherwise, pool construction is considered routine, and can be constructed in accordance with the manufacturer`s requirements.

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.

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 also recommended that the following be carried out by Paterson once preliminary and/or detailed designs of the proposed development have been prepared:

☐ Review detailed grading, servicing, and landscaping plans, from a geotechnical perspective.

☐ Based on the results of the peat delineation program, an additional test pit program should be conducted to further delineate the peat deposit within and south of the hydro corridor, once excavation allowances are granted within the hydro corridor.

It is a requirement for the foundation design data provided herein to be applicable that a materials testing and observation services program including the following aspects be performed by the geotechnical consultant.

☐ Grading plan review from a geotechnical perspective, once the final grading plan is available.

☐ 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.

☐ 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 soils, with the exception of engineered crushed stone fill, generated by construction activities that will be transported on-site or off-site should be handled ***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 the test hole log 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 Claridge Homes 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.

O. Canton

Owen R. Canton, B.Eng.

LICENSED PROFESSIONAL ENGINEER
Nov. 18, 2025
S. S. DENNIS
100519516
Scott Dennis
PROVINCE OF ONTARIO

Scott Dennis

Scott S. Dennis, P.Eng.

Report Distribution:

☐ Claridge Homes
☐ Paterson Group

APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

UNIDIMENSIONAL CONSOLIDATION TEST SHEETS

GRAIN-SIZE DISTRIBUTION AND HYDROMETER TESTING RESULTS

ATTERBERG LIMIT TESTING RESULTS

ANALYTICAL TESTING RESULTS

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development
5331 Fernbank Road - Ottawa, Ontario

DATUM Geodetic

REMARKS

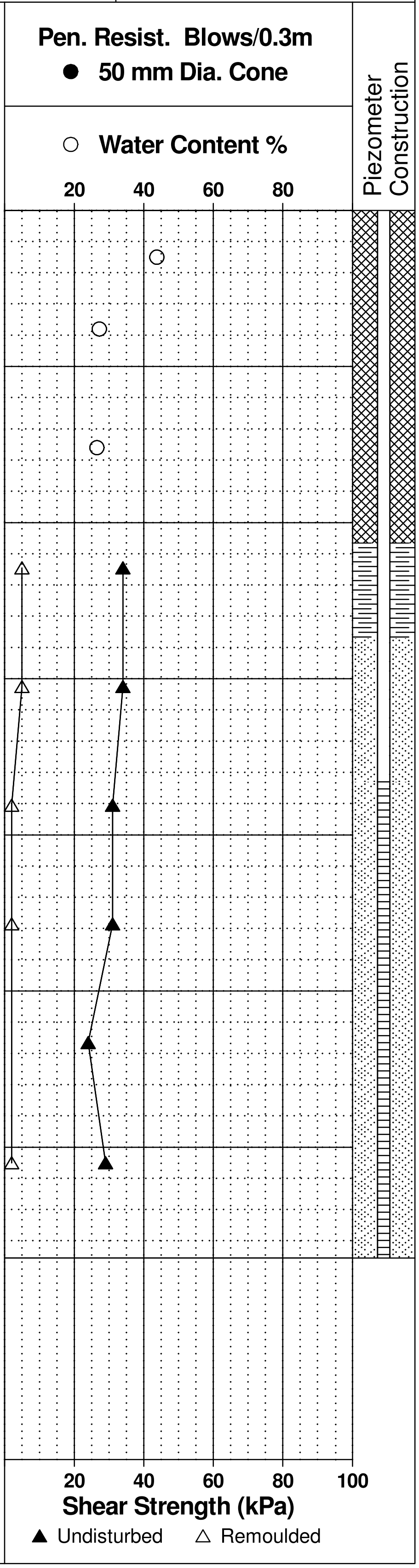
BORINGS BY CME 55 Power Auger

DATE 2021 February 9

FILE NO. PG5683

HOLE NO. BH 1-21

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	96.70
TOPSOIL 0.30							
Interbedded brown **SILTY SAND** with stiff brown **CLAYEY SILT** to **SILTY CLAY**		AU	1				
- Increasing clay content with depth		SS	2	58	6	1	95.70
1.57							
Firm grey **SILTY CLAY**, some sand		SS	3	92	W	2	94.70
- Decreasing sand content with depth						3	93.70
						4	92.70
						5	91.70
						6	90.70
6.71							
End of Borehole (Piezometer dry/blocked - Feb 19, 2021)							



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development
5331 Fernbank Road - Ottawa, Ontario

DATUM Geodetic

REMARKS

BORINGS BY CME 55 Power Auger

DATE 2021 February 9

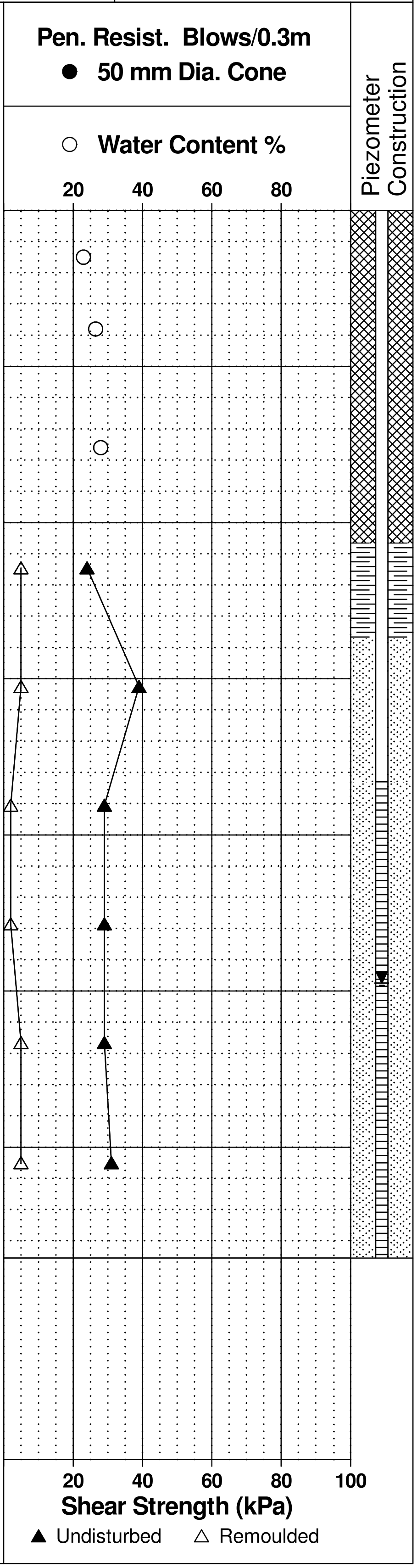
FILE NO. PG5683

HOLE NO. BH 2-21

SOIL DESCRIPTION	Depth to base (m)
GROUND SURFACE	
TOPSOIL	0.30
Interbedded brown **SILTY SAND** with stiff brown **CLAYEY SILT** to **SILTY CLAY** - Increasing clay content with depth	2.13
Firm grey **SILTY CLAY**, some sand - Decreasing sand content with depth	6.71
End of Borehole (GWL @ 4.95 m depth - Feb 19, 2021)	

TYPE	NUMBER	% RECOVERY	N VALUE or RQD
AU	1		
SS	2	50	5
SS	3	33	3

DEPTH (m)	ELEV. (m)
0	96.80
1	95.80
2	94.80
3	93.80
4	92.80
5	91.80
6	90.80



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development
5331 Fernbank Road - Ottawa, Ontario

DATUM Geodetic

REMARKS

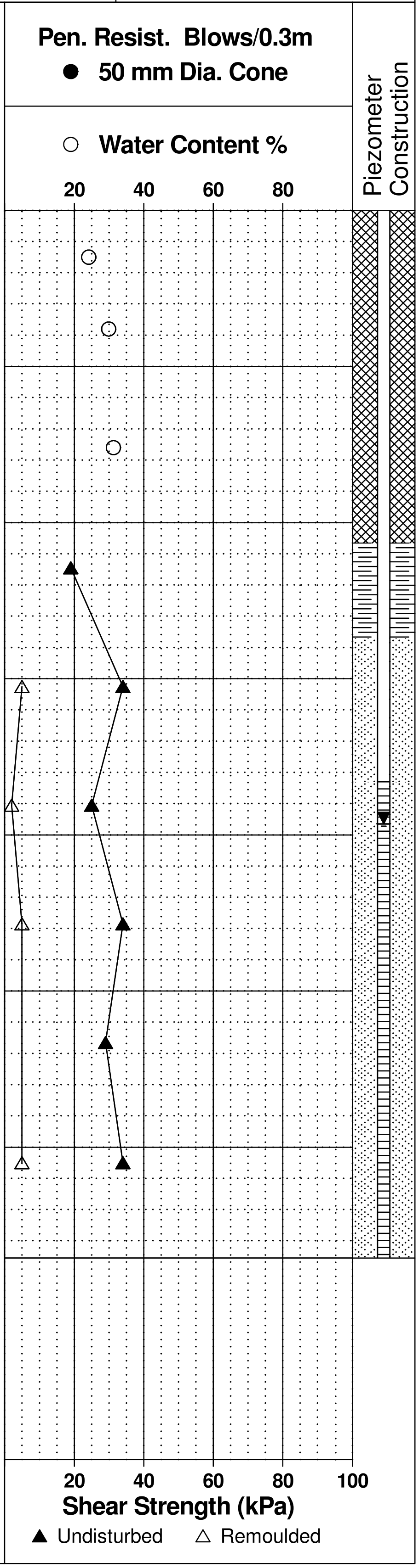
BORINGS BY CME 55 Power Auger

DATE 2021 February 9

FILE NO. PG5683

HOLE NO. BH 3-21

SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						
TOPSOIL 0.30					0	96.68
Interbedded brown **SILTY SAND** with stiff brown **CLAYEY SILT** to **SILTY CLAY**	AU	1				
- Increasing clay content with depth	SS	2	58	4	1	95.68
2.13	SS	3	50	3	2	94.68
Firm grey **SILTY CLAY**, some sand						
- Decreasing sand content with depth					3	93.68
					4	92.68
					5	91.68
					6	90.68
6.71						
End of Borehole						
(GWL @ 3.93 m depth - Feb 19, 2021)						



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development
5331 Fernbank Road - Ottawa, Ontario

DATUM Geodetic

REMARKS

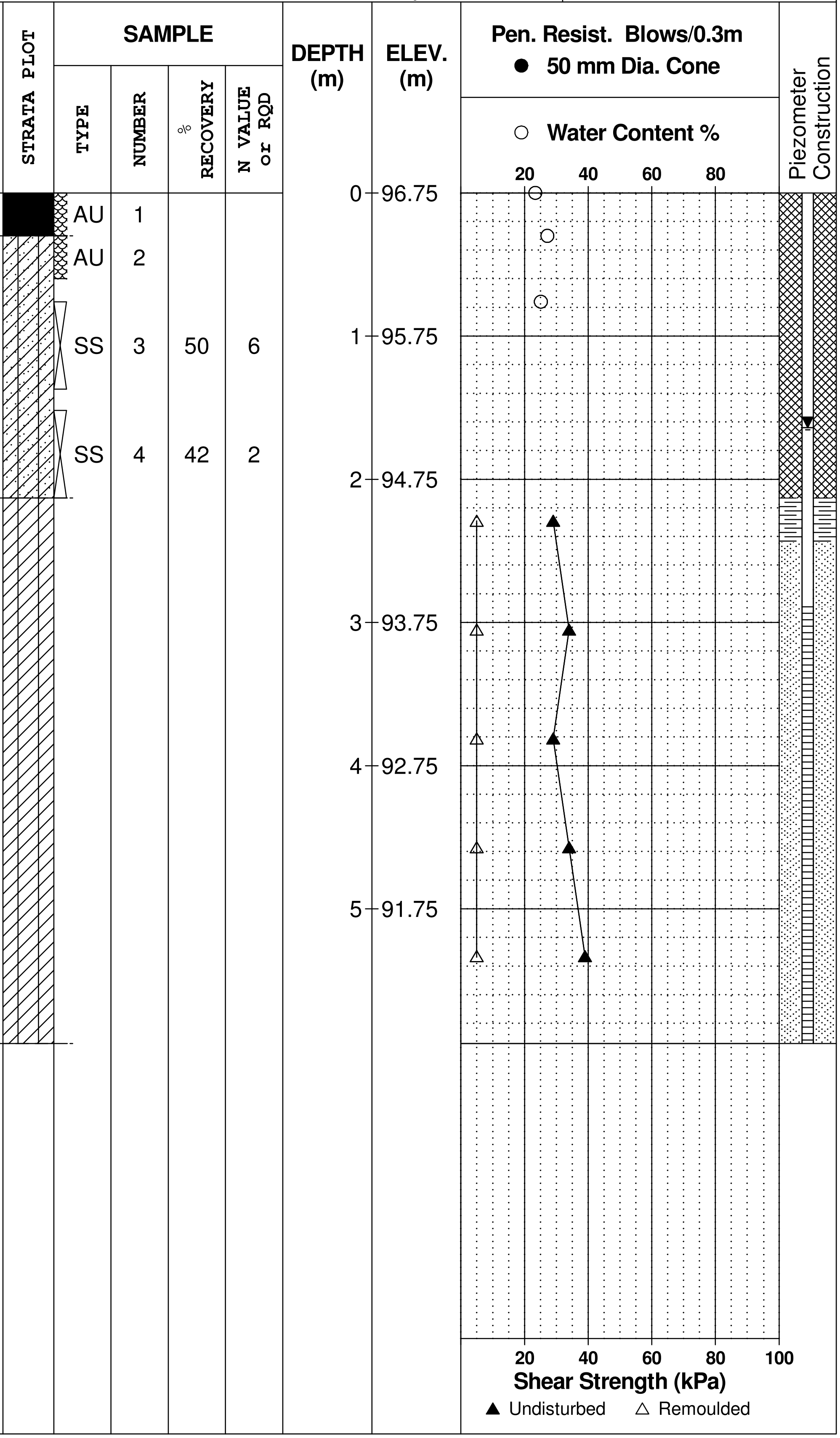
BORINGS BY CME 55 Power Auger

DATE 2021 February 9

FILE NO. PG5683

HOLE NO. BH 4-21

SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	% RECOVERY	N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE					0	96.75
TOPSOIL 0.30	AU	1				
Interbedded brown **SILTY SAND** with stiff brown **CLAYEY SILT** to **SILTY CLAY**	AU	2				
- Increasing clay content with depth	SS	3	50	6	1	95.75
- Grey by 1.5 m depth 2.13	SS	4	42	2	2	94.75
Firm grey **SILTY CLAY**, some sand						
- Decreasing sand content with depth					3	93.75
					4	92.75
					5	91.75
5.94						
End of Borehole (GWL @ 1.64 m depth - Feb 19, 2021)						



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SOIL PROFILE AND TEST DATA

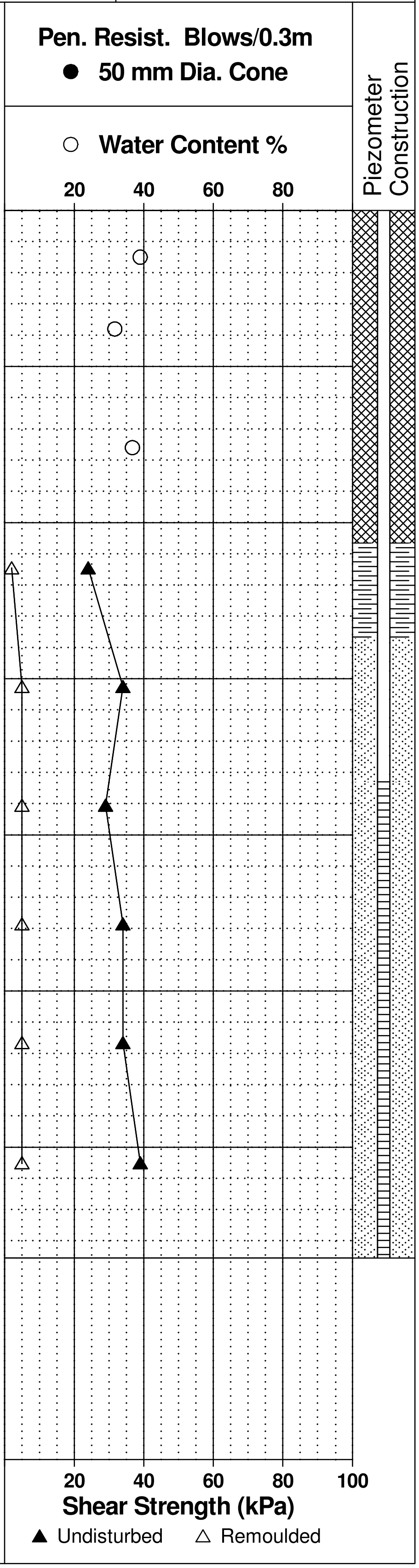
Geotechnical Investigation
Proposed Residential Development
5331 Fernbank Road - Ottawa, Ontario

DATUM Geodetic
REMARKS
BORINGS BY CME 55 Power Auger
DATE 2021 February 9
FILE NO. PG5683
HOLE NO. BH 5-21

SOIL DESCRIPTION	Depth to base (m)
GROUND SURFACE	
TOPSOIL	0.36
Interbedded brown **SILTY SAND** with stiff brown **CLAYEY SILT** to **SILTY CLAY** -Increasing clay content with depth	1.52
Stiff to firm brown **SILTY CLAY**, some sand - Firm and grey by 2.1 m depth - Decreasing sand content with depth	6.71
End of Borehole (Piezometer dry/blocked - Feb 19, 2021)	

SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD
AU	1		
SS	2	50	2
SS	3	50	2

DEPTH (m)	ELEV. (m)
0	96.54
1	95.54
2	94.54
3	93.54
4	92.54
5	91.54
6	90.54



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Commercial Development - Terry Fox Dr. @ Cope Dr.
Ottawa, Ontario

DATUM Geodetic elevations provided by Stantec Geomatics Limited.

REMARKS

BORINGS BY CME 55 Power Auger

DATE January 15, 2018

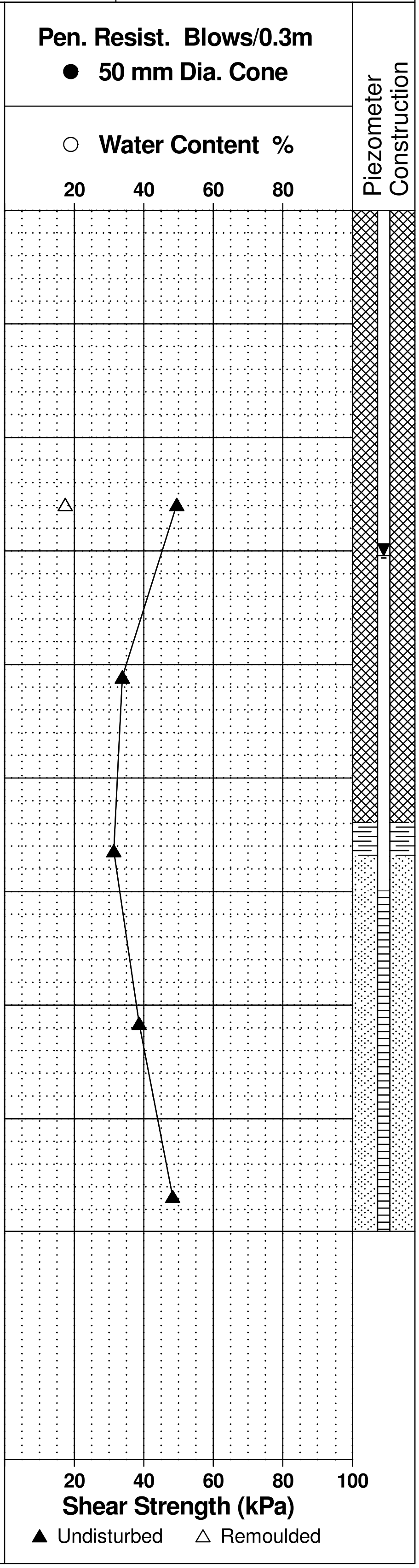
FILE NO. PG4411

HOLE NO. BH 1-18

SOIL DESCRIPTION	Depth (m)
GROUND SURFACE	
FILL: Crushed stone with silt and sand, trace organics, topsoil	0.53
Loose, brown **SILTY SAND,** trace clay	1.83
Stiff to firm, grey **SILTY CLAY,** some sand	8.99
End of Borehole (GWL @ 3.04m - Feb. 13, 2018)	

SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD
AU	1		
SS	2	54	9
SS	3	46	P
SS	4	71	P

DEPTH (m)	ELEV. (m)
0	96.97
1	95.97
2	94.97
3	93.97
4	92.97
5	91.97
6	90.97
7	89.97
8	88.97



SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Commercial Development - Terry Fox Dr. @ Cope Dr.
Ottawa, Ontario

DATUM Geodetic elevations provided by Stantec Geomatics Limited.

REMARKS

BORINGS BY CME 55 Power Auger

DATE January 15, 2018

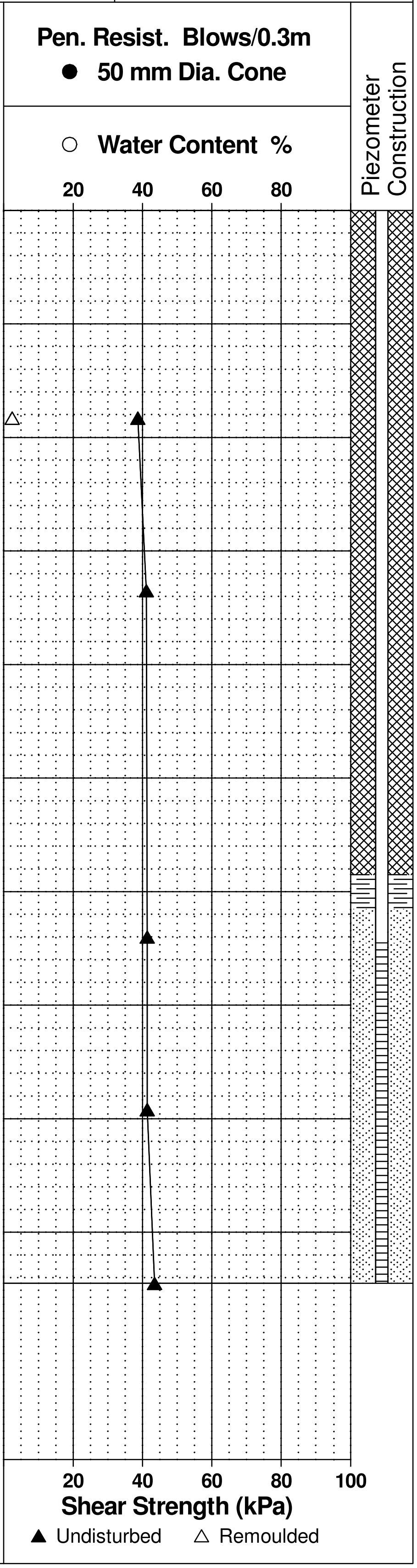
FILE NO. PG4411

HOLE NO. BH 2-18

SOIL DESCRIPTION	Depth (m)
GROUND SURFACE	
TOPSOIL	0.28
Interlayered grey **SILTY SAND** and firm **CLAYEY SILT/SILTY CLAY**	1.07
Grey **SANDY SILT,** trace clay	3.96
Firm, grey **SILTY CLAY,** some sand	9.45
End of Borehole (Piezometer dry to 5.39m depth - Feb. 13, 2018)	

SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD
AU	1		
TW	2	88	

DEPTH (m)	ELEV. (m)
0	96.79
1	95.79
2	94.79
3	93.79
4	92.79
5	91.79
6	90.79
7	89.79
8	88.79
9	87.79



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Commercial Development - Terry Fox Dr. @ Cope Dr.
Ottawa, Ontario

DATUM Geodetic elevations provided by Stantec Geomatics Limited.

REMARKS

BORINGS BY CME 55 Power Auger

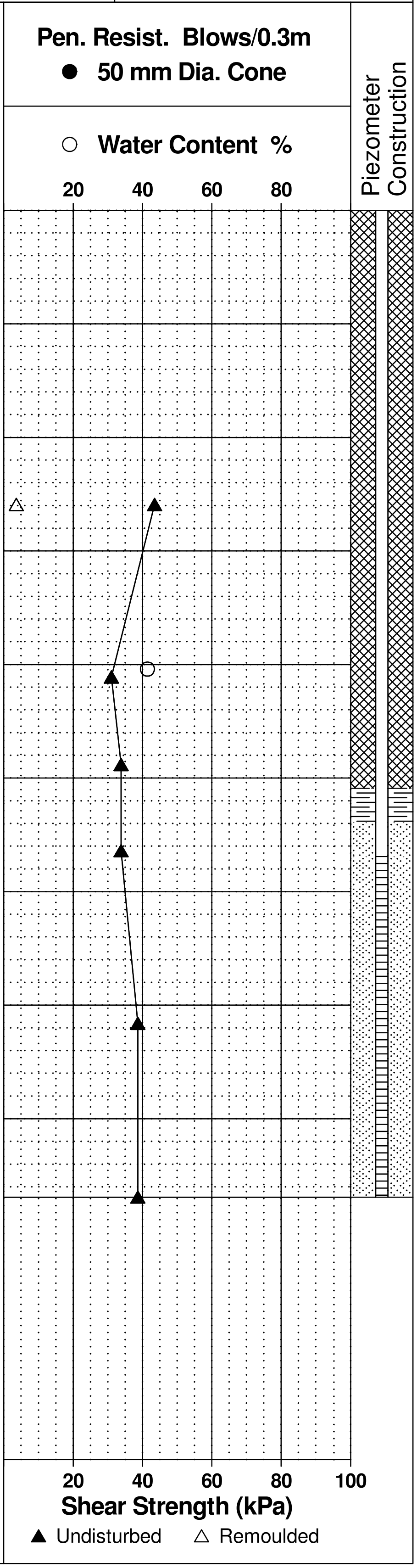
DATE January 15, 2018

FILE NO. PG4411

HOLE NO. BH 3-18

SOIL DESCRIPTION	Depth to base (m)	SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD
GROUND SURFACE					
TOPSOIL	0.28	AU	1		
Loose, brown **SILTY SAND,** trace clay	1.83	SS	2	58	8
Firm, grey **SILTY CLAY,** some sand	8.69	TW	3	88	
End of Borehole (Piezometer damaged - Feb. 13, 2018)					

DEPTH (m)	ELEV. (m)
0	96.68
1	95.68
2	94.68
3	93.68
4	92.68
5	91.68
6	90.68
7	89.68
8	88.68



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Commercial Development - Terry Fox Dr. @ Cope Dr.
Ottawa, Ontario

DATUM Geodetic elevations provided by Stantec Geomatics Limited.

REMARKS

BORINGS BY CME 55 Power Auger

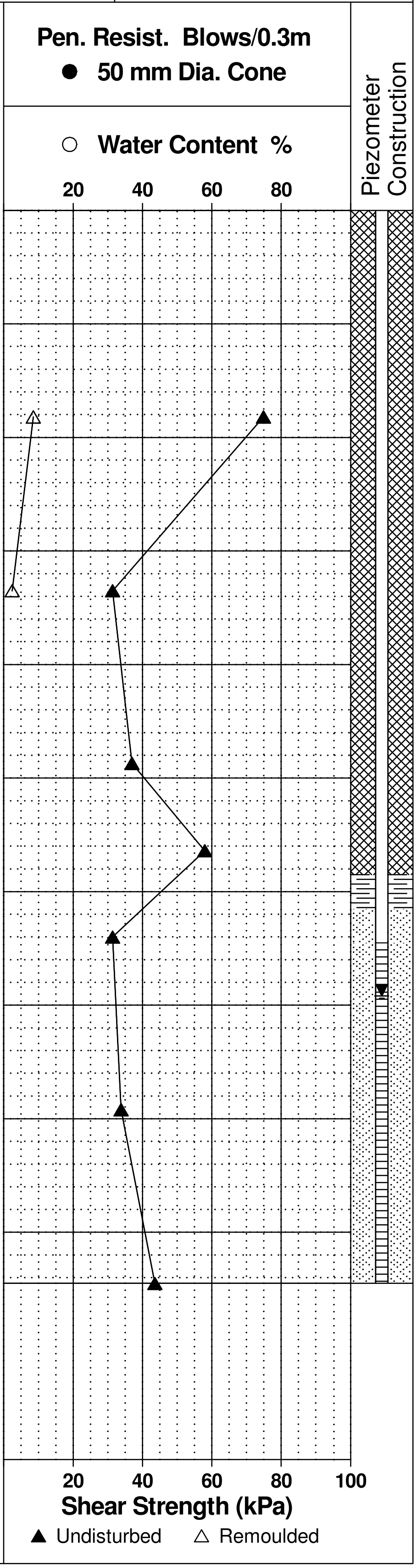
DATE January 16, 2018

FILE NO. PG4411

HOLE NO. BH 4-18

SOIL DESCRIPTION	Depth to base (m)	SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD
GROUND SURFACE					
TOPSOIL	0.33	AU	1		
Interlayered stiff, brown **CLAYEY SILT** to **SILTY CLAY,** some sand	0.91				
Brown **SILTY SAND,** trace clay	2.59	SS	2	46	P
Grey **SANDY SILT,** trace clay	3.96				
Stiff to firm, grey **SILTY CLAY,** trace sand	9.45	TW	3	96	
End of Borehole (GWL @ 6.92m - Feb. 13, 2018)					

DEPTH (m)	ELEV. (m)
0	96.68
1	95.68
2	94.68
3	93.68
4	92.68
5	91.68
6	90.68
7	89.68
8	88.68
9	87.68



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Commercial Development - Terry Fox Dr. @ Cope Dr.
Ottawa, Ontario

DATUM Geodetic elevations provided by Stantec Geomatics Limited.

REMARKS

BORINGS BY CME 55 Power Auger

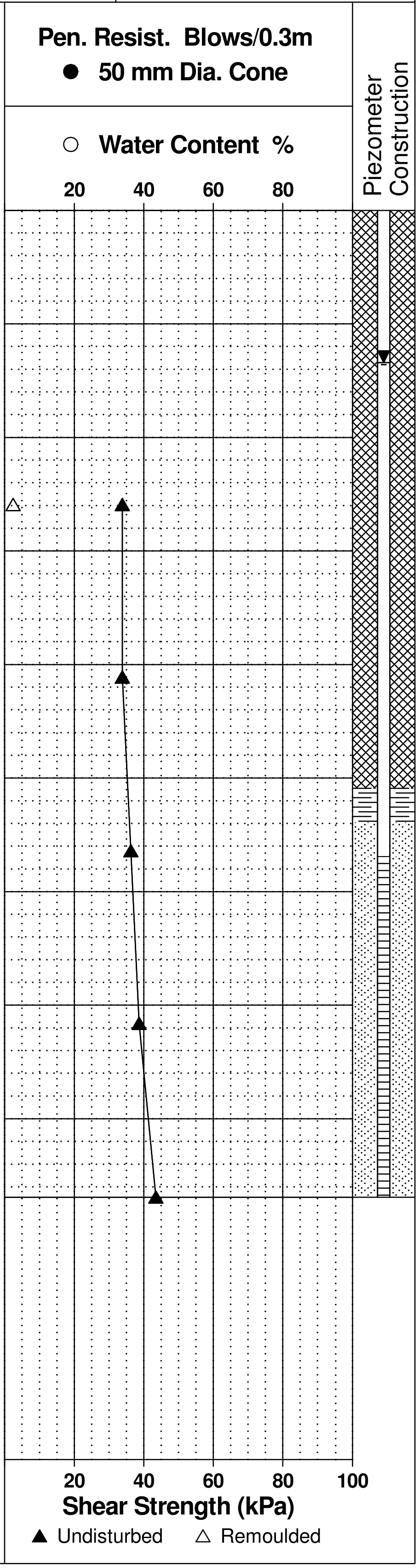
DATE January 16, 2018

FILE NO. PG4411

HOLE NO. BH 5-18

SOIL DESCRIPTION	Depth to base (m)	SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD
GROUND SURFACE					
TOPSOIL	0.23				
Interlayered loose, grey **SILTY SAND** and **CLAYEY SILT/SILTY CLAY**	0.69	AU	1		
Loose, brown **SILTY SAND,** trace clay	1.83	SS	2	75	8
Loose, grey **SANDY SILT,** trace clay	3.20				
Firm, grey **SILTY CLAY,** trace sand	8.69				
End of Borehole (GWL @ 1.34m - Feb. 13, 2018)					

DEPTH (m)	ELEV. (m)
0	96.76
1	95.76
2	94.76
3	93.76
4	92.76
5	91.76
6	90.76
7	89.76
8	88.76



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Commercial Development - Terry Fox Dr. @ Cope Dr.
Ottawa, Ontario

DATUM Geodetic elevations provided by Stantec Geomatics Limited.

REMARKS

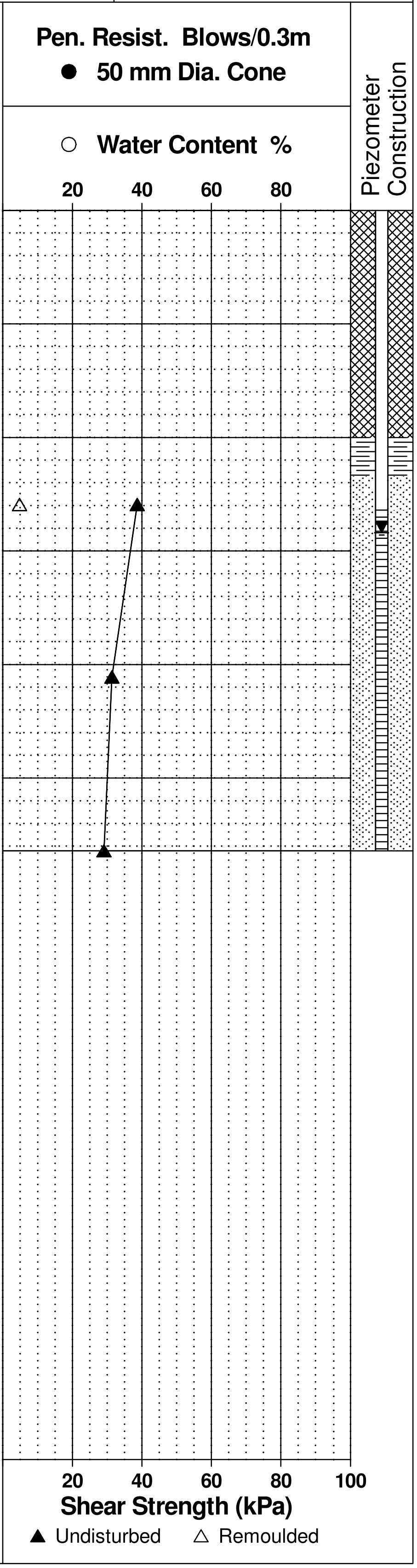
BORINGS BY CME 55 Power Auger

DATE January 16, 2018

FILE NO. PG4411

HOLE NO. BH 6-18

SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	% RECOVERY	N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE					0	96.72
TOPSOIL 0.30	AU	1				
Very loose, brown **SILTY SAND,** trace clay 1.83	SS	2	67	1	1	95.72
Firm, brown **SILTY CLAY,** trace sand - grey by 3.8m depth 5.64					2 3 4 5	94.72 93.72 92.72 91.72
End of Borehole (GWL @ 2.84m - Feb. 13, 2018)						



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Commercial Development - Terry Fox Dr. @ Cope Dr.
Ottawa, Ontario

DATUM Geodetic elevations provided by Stantec Geomatics Limited.

REMARKS

BORINGS BY CME 55 Power Auger

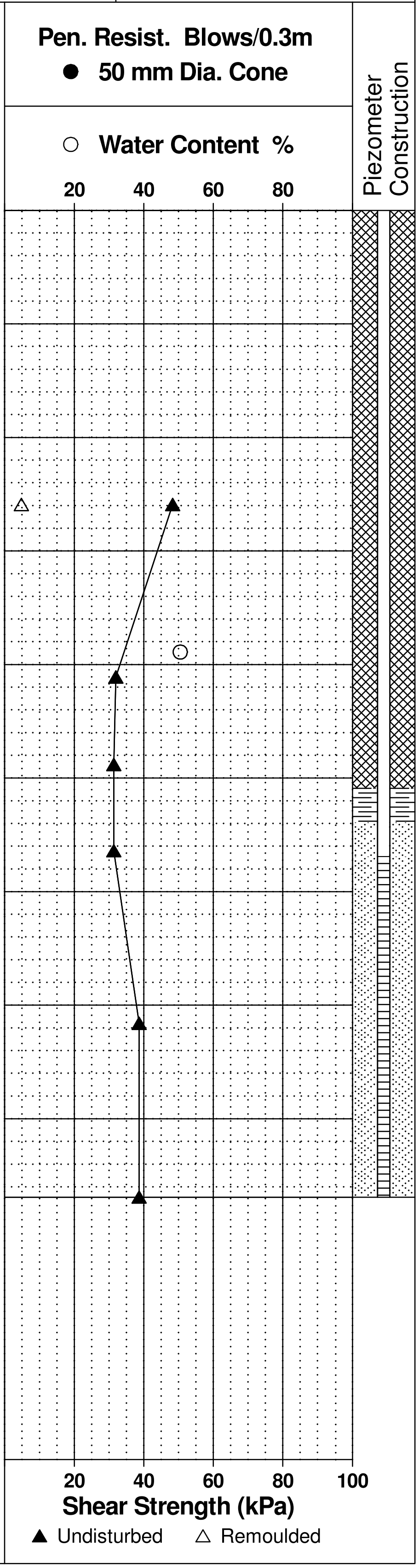
DATE January 16, 2018

FILE NO. PG4411

HOLE NO. BH 7-18

SOIL DESCRIPTION		SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD
GROUND SURFACE					
FILL: Crushed stone with silt and sand	0.48	AU	1		
Loose, brown **SILTY SAND,** trace clay	1.83	SS	2	50	9
Firm, grey **SILTY CLAY,** trace sand	8.69	TW	3	90	
End of Borehole (Piezometer blocked at 0.51m depth - Feb. 13, 2018)					

DEPTH (m)	ELEV. (m)
0	97.13
1	96.13
2	95.13
3	94.13
4	93.13
5	92.13
6	91.13
7	90.13
8	89.13



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Commercial Development - Terry Fox Dr. @ Cope Dr.
Ottawa, Ontario

DATUM Geodetic elevations provided by Stantec Geomatics Limited.

REMARKS

BORINGS BY CME 55 Power Auger

DATE January 17, 2018

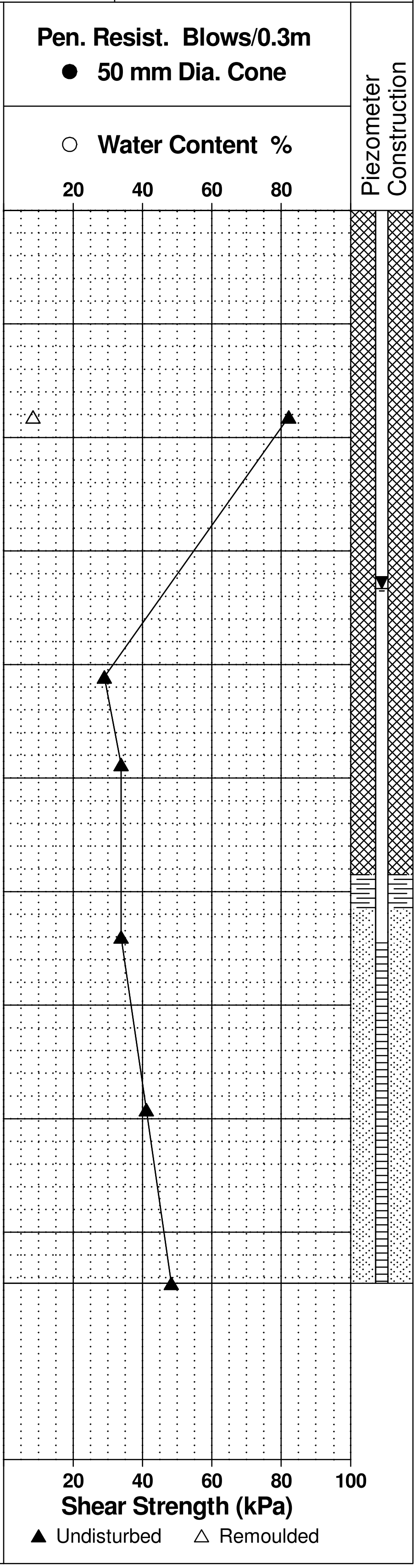
FILE NO. PG4411

HOLE NO. BH 8-18

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	97.10
FILL: Crushed stone with silt and sand 0.33		AU	1				
						1	96.10
		SS	2	54	P		
						2	95.10
						3	94.10
Very stiff to firm, brown **SILTY CLAY,** some sand		TW	3	92			
- grey by 3.8m depth						4	93.10
						5	92.10
						6	91.10
						7	90.10
						8	89.10
9.45						9	88.10

Dynamic Cone Penetration Test commenced at 9.45m depth. Cone pushed to 30.48m depth, no refusal encountered.

(GWL @ 3.33m - Feb. 13, 2018)



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

SOIL PROFILE & TEST DATA

Preliminary Geotechnical Investigation
Terry Fox Drive at Fernbank Road
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY CME 75 Power Auger

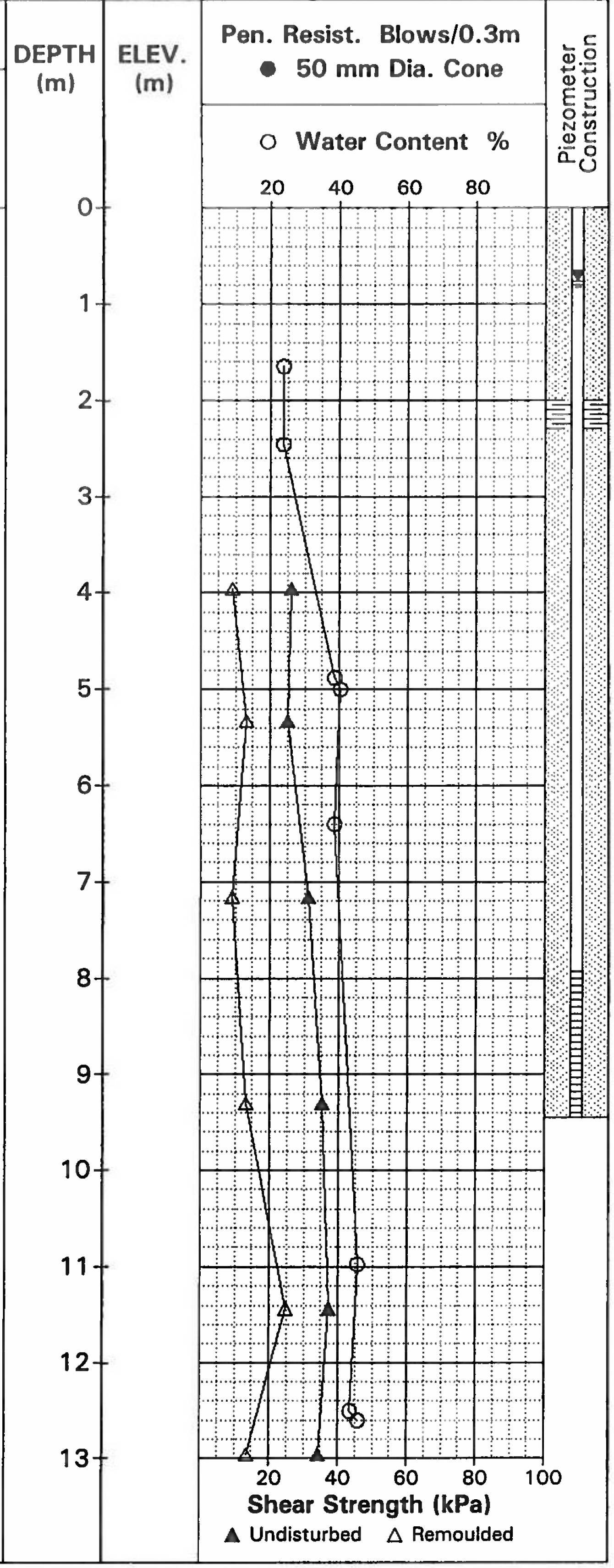
DATE 1 MAY 06

FILE NO. PG0812

HOLE NO. BH 2

SOIL DESCRIPTION	DEPTH (m)
GROUND SURFACE	0
TOPSOIL	0.19
Compact, brown SILTY SAND, trace clay - grey by 1.8m depth	2.74
Firm, grey SILTY CLAY/CLAYEY SILT, trace silty sand seams	

SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD
SS	1	0	12
SS	2	17	8
SS	3	25	5
SS	4	0	2
TW	5	100	
SS	6	100	1
TW	7	100	
SS	8	100	1
TW	9	100	



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

SOIL PROFILE & TEST DATA

Preliminary Geotechnical Investigation
Terry Fox Drive at Fernbank Road
Ottawa, Ontario

DATUM

REMARKS

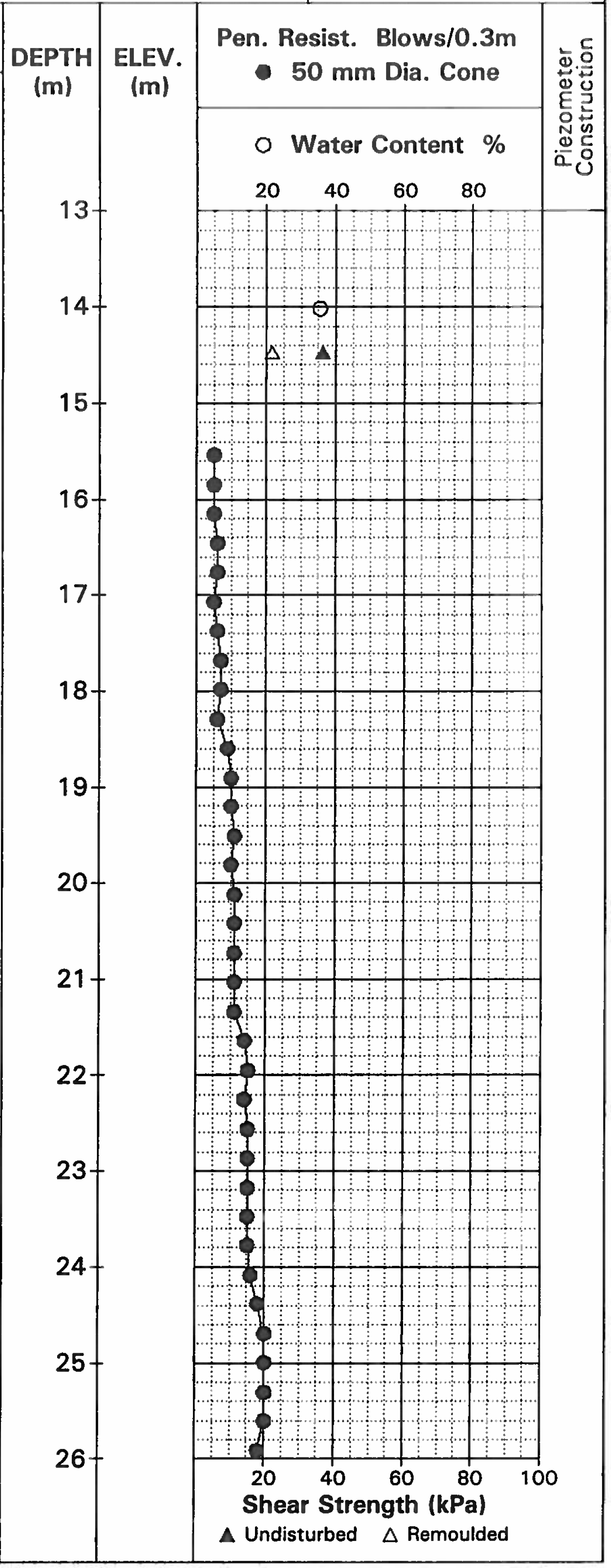
BORINGS BY CME 75 Power Auger

DATE 1 MAY 06

FILE NO. PG0812

HOLE NO. BH 2

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD
Firm, grey SILTY **CLAY/CLAYEY SILT**					
		SS	10	100	1
14.63					
Dynamic Cone Penetration Test commenced @ 14.63m depth					
Inferred SILTY **CLAY/CLAYEY SILT**					



patersongroup Consulting Engineers

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

SOIL PROFILE & TEST DATA

Preliminary Geotechnical Investigation
Terry Fox Drive at Fernbank Road
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY CME 75 Power Auger

DATE 1 MAY 06

FILE NO. PG0812

HOLE NO. BH 2

SOIL DESCRIPTION

Inferred SILTY CLAY/CLAYEY SILT

30.00

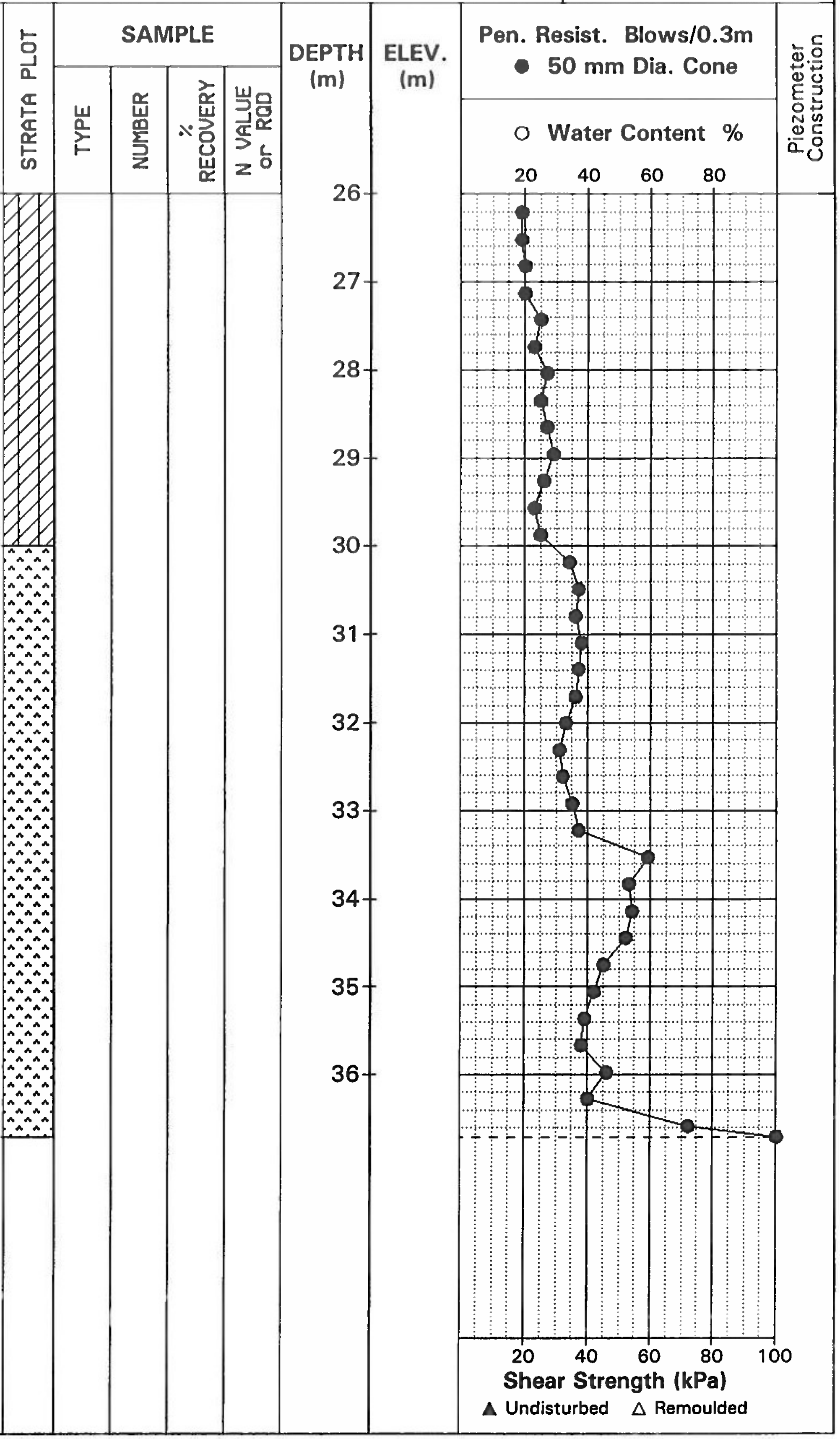
Inferred GLACIAL TILL

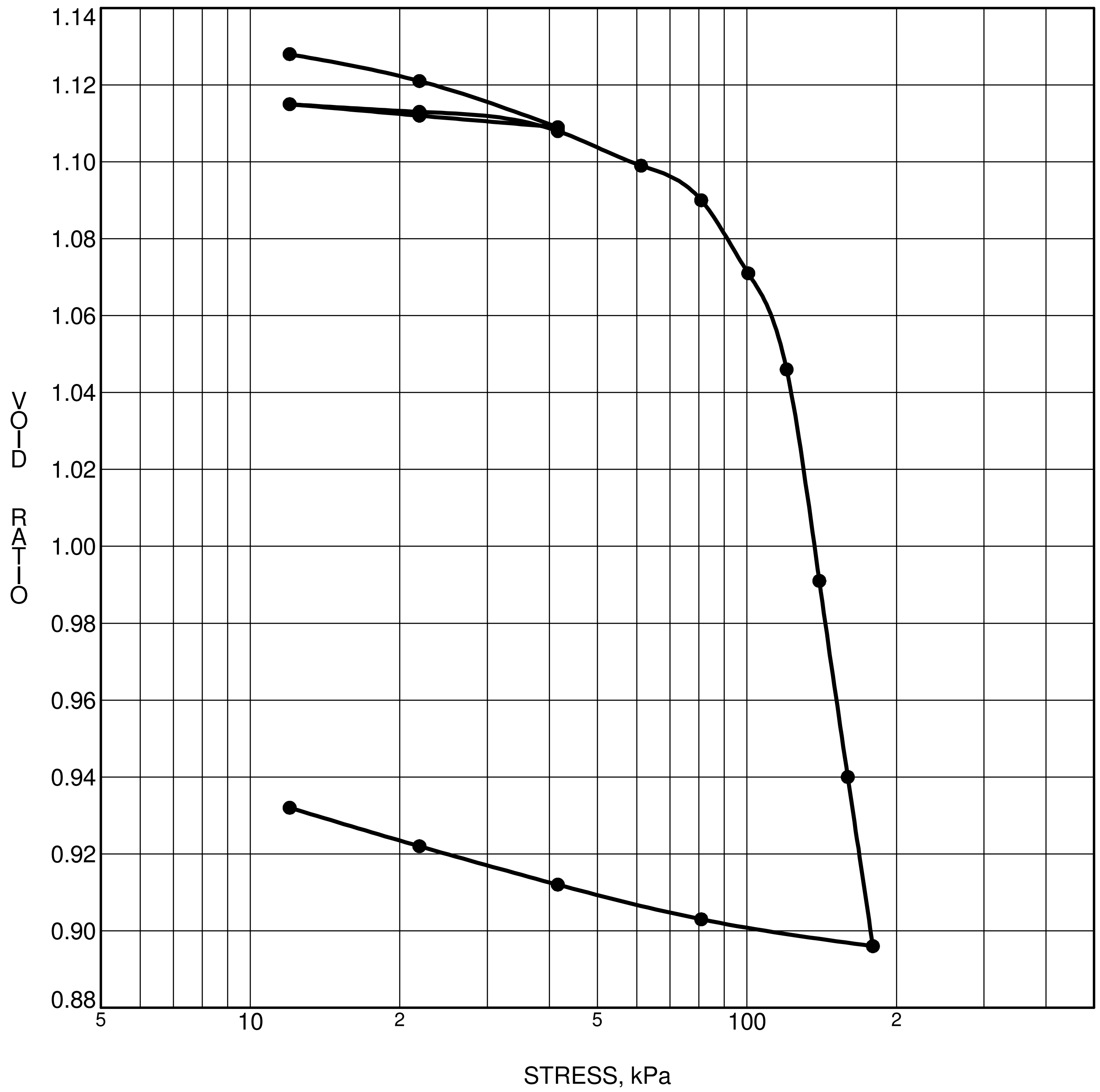
36.70

End of Borehole

DCPT refusal @ 36.70m depth

(GWL @ 0.77m-May 11/06)





CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH 3-18**	p'_o	**41.54** kPa	Ccr	**0.013**
Sample No.	**TW 3**	p'_c	**110.66** kPa	Cc	**0.898**
Sample Depth	**4.04** m	OC Ratio	**2.7**	Wo	**41.4** %
Sample Elev.	**92.64** m	Void Ratio	**1.139**	Unit Wt.	**17.8** kN/m ^{3}

CLIENT **Street Properties**

FILE NO. **PG4411**

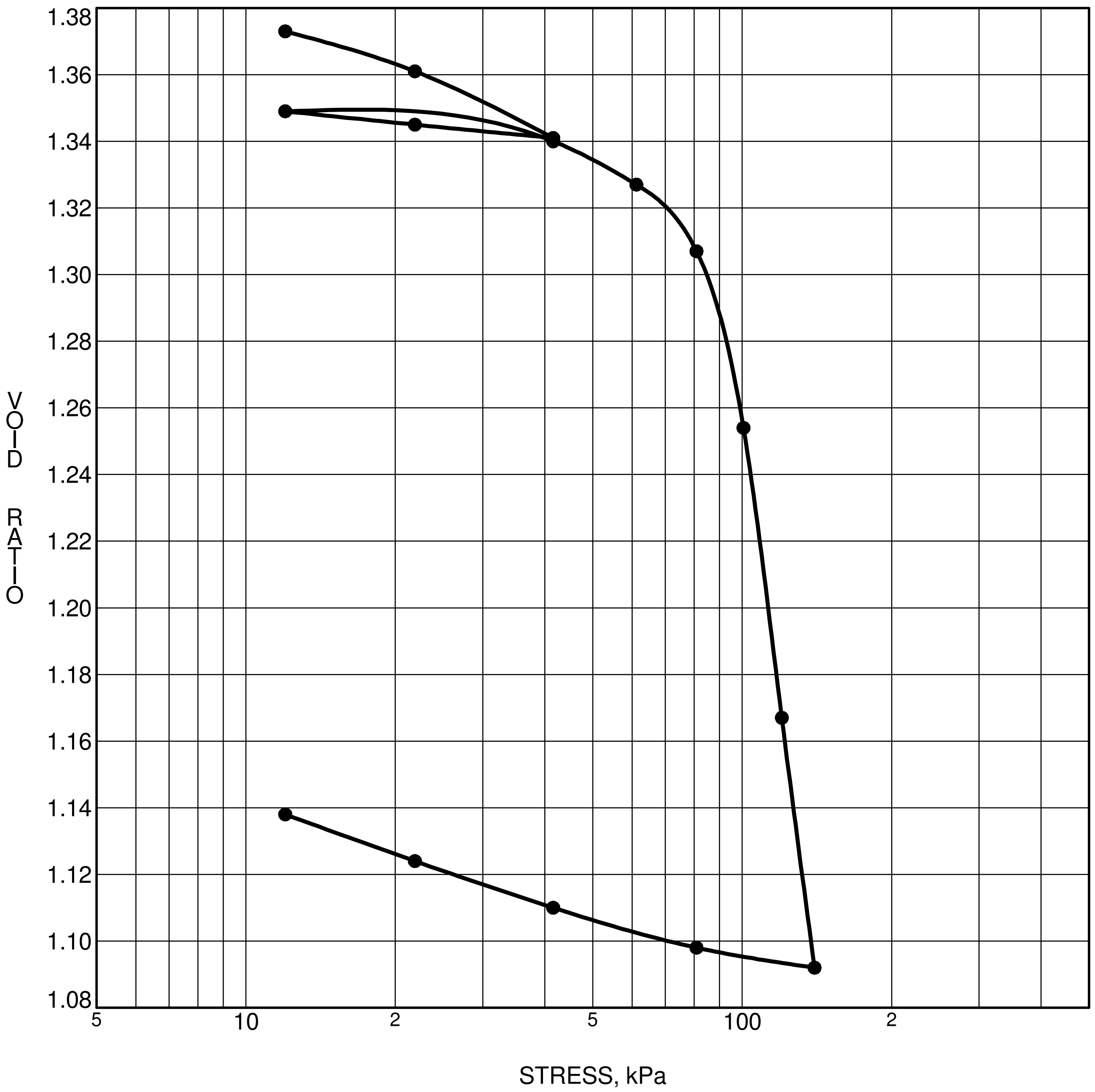
PROJECT **Geotechnical Investigation - Prop. Commercial Development - Terry Fox Drive**

DATE **03/02/2018**

patersongroup **Consulting Engineers**

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH 7-18**	p'o	**40.6** kPa	Ccr	**0.021**
Sample No.	**TW 3**	p'c	**90** kPa	Cc	**1.190**
Sample Depth	**3.89** m	OC Ratio	**2.2**	Wo	**50.5** %
Sample Elev.	**93.24** m	Void Ratio	**1.389**	Unit Wt.	**17.0** kN/m ^{3}

CLIENT **Street Properties**

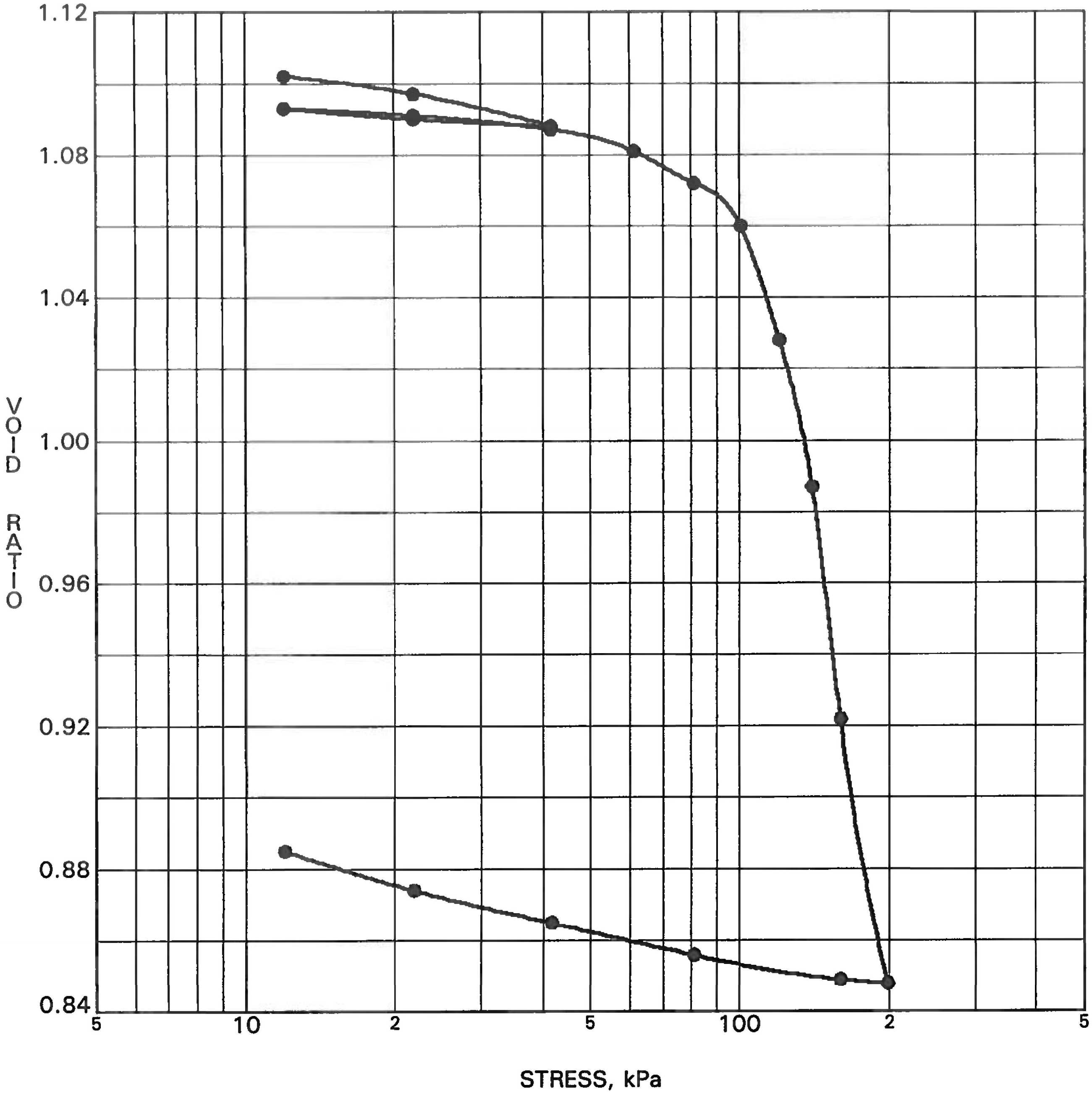
PROJECT **Geotechnical Investigation - Prop. Commercial Development - Terry Fox Drive**

FILE NO. **PG4411**

DATE **05/02/2018**

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

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY

Borehole No.	BH 2	p'_o	52 kPa	Ccr	0.011
Sample No.	TW 5	p'_c	115 kPa	Cc	0.984
Sample Depth	5.00 m	OC Ratio	2.2	Wo	40.3 %
Sample Elev.	m	Void Ratio	1.107	Unit Wt.	18.0 kN/m^3

CLIENT **John Van Gaal**

PROJECT **Preliminary Geotechnical Investigation - Terry Fox Drive at Fernbank Road**

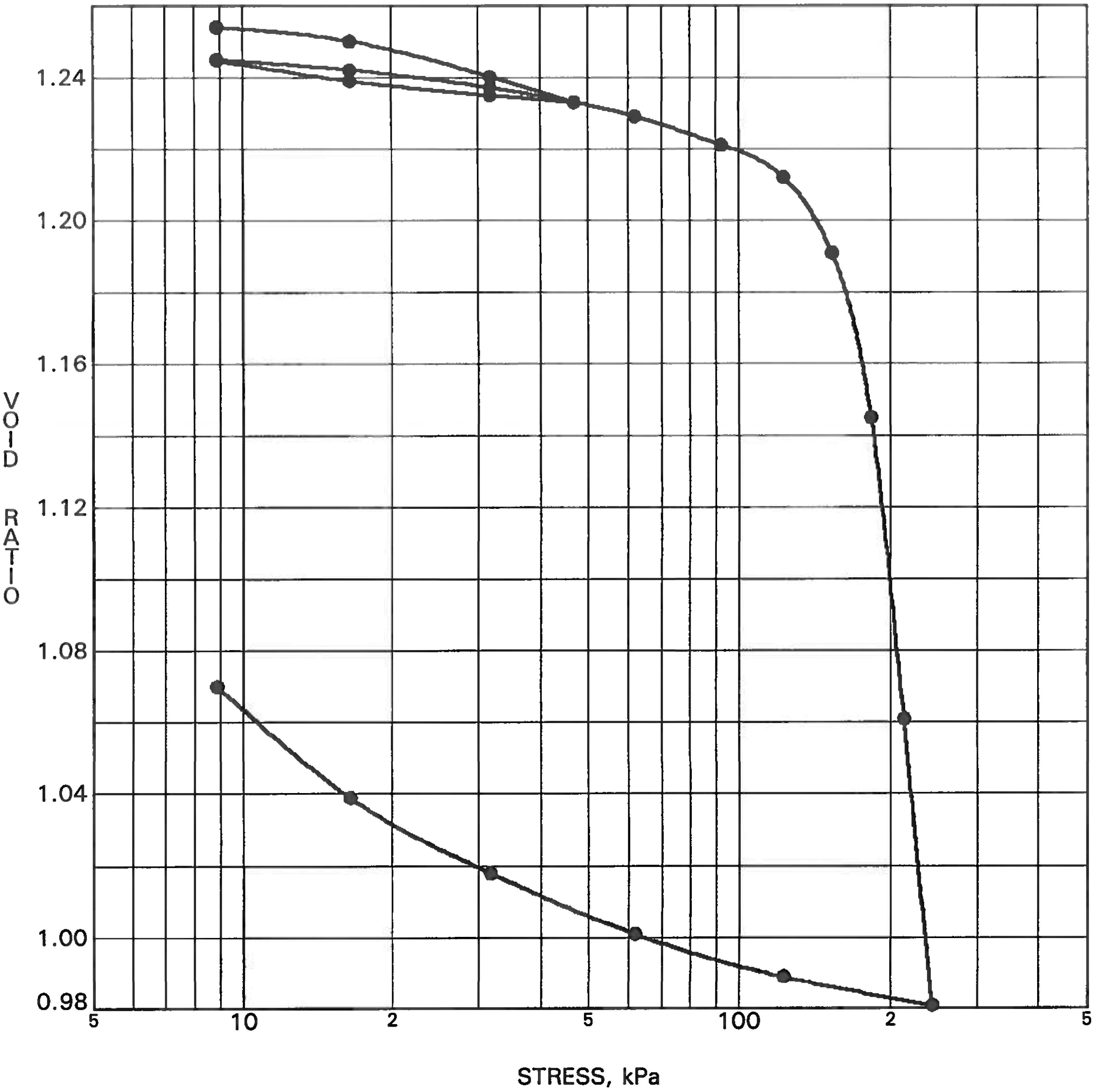
FILE NO. **PG0812**

DATE **05/06/06**

patersongroup **Consulting Engineers**

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

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	BH 2	p'o	114 kPa	Ccr	0.017
Sample No.	TW 9	p'c	163 kPa	Cc	1.319
Sample Depth	12.60 m	OC Ratio	1.4	Wo	45.7 %
Sample Elev.	m	Void Ratio	1.256	Unit Wt.	17.4 kN/m^3

CLIENT **John Van Gaal**

PROJECT **Preliminary Geotechnical Investigation - Terry Fox Drive at Fernbank Road**

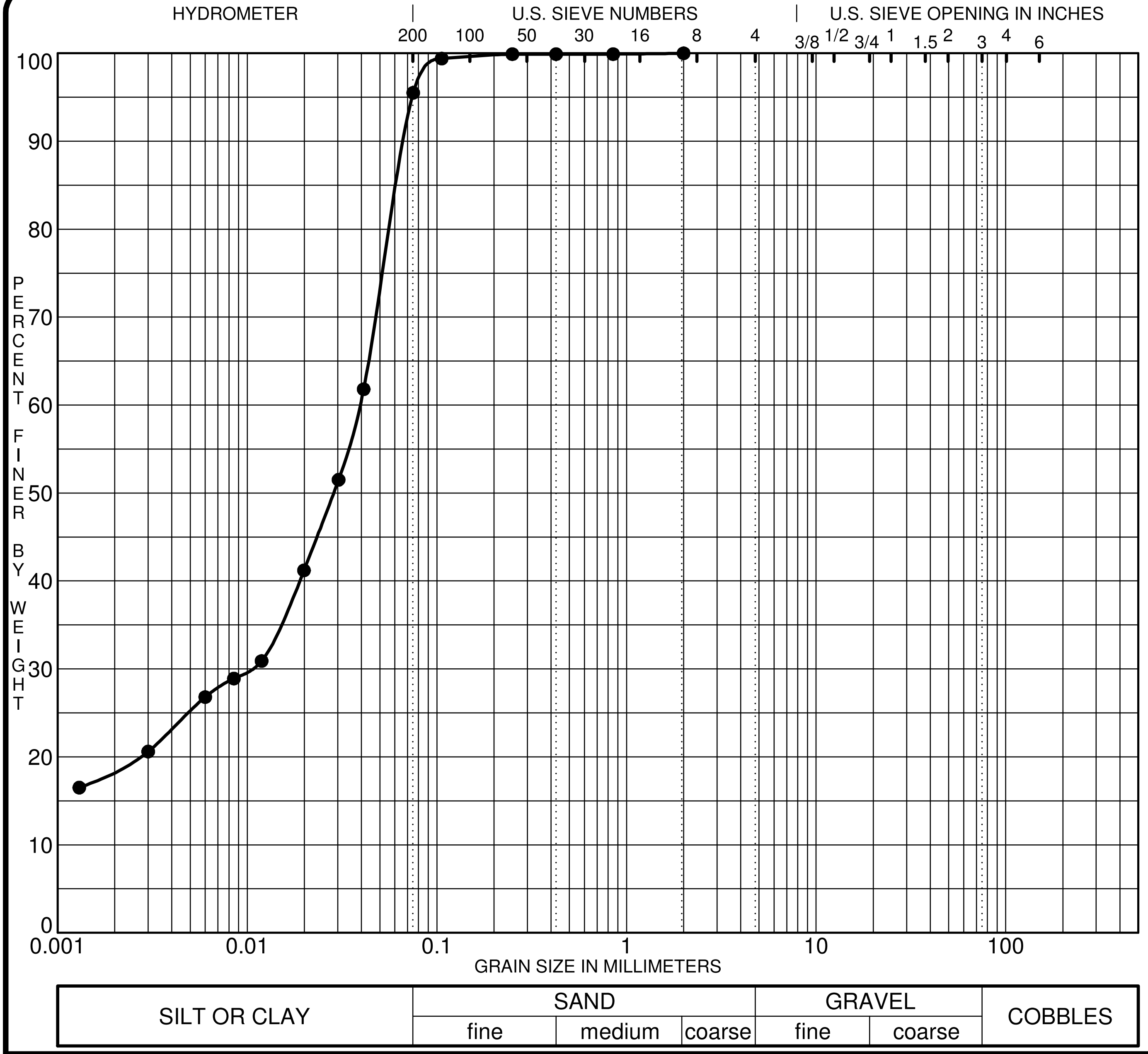
FILE NO. **PG0812**

DATE **05/06/06**

patersongroup Consulting Engineers

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

CONSOLIDATION TEST



Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH 1-21 SS3**							

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH 1-21 SS3**	**2.00**	**0.04**	**0.010**		**0.0**	**4.5**	**95.5**	

CLIENT **Claridge Homes**

FILE NO. **PG5683**

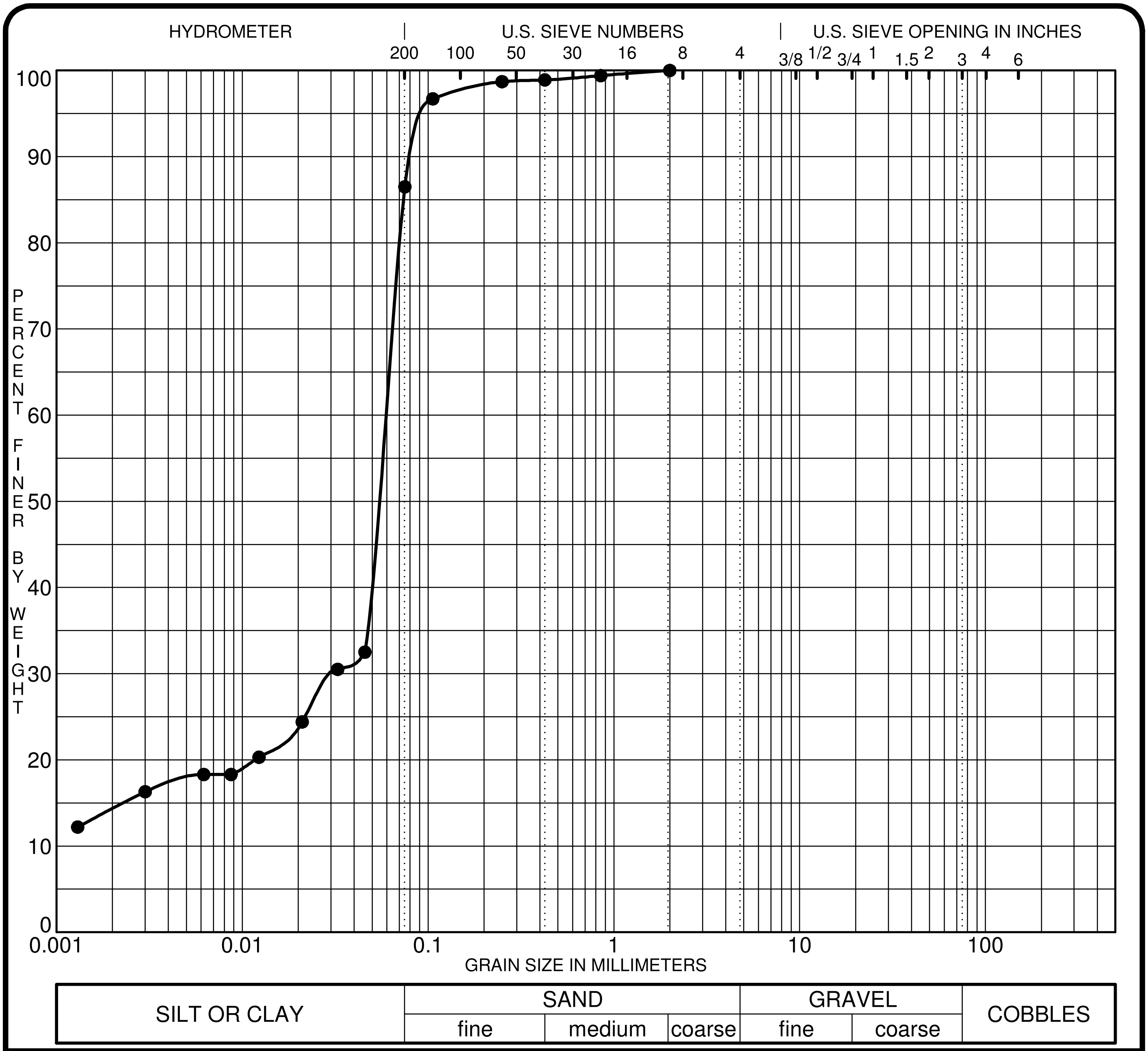
PROJECT **Geotechnical Investigation - Proposed Residential Development**

DATE **9 Feb 21**

patersongroup **Consulting Engineers**

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH 4-21 SS2**							

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 4-21 SS2**	**2.00**	**0.06**	**0.031**		**0.0**	**13.5**	**86.5**	

CLIENT **Claridge Homes**

FILE NO. **PG5683**

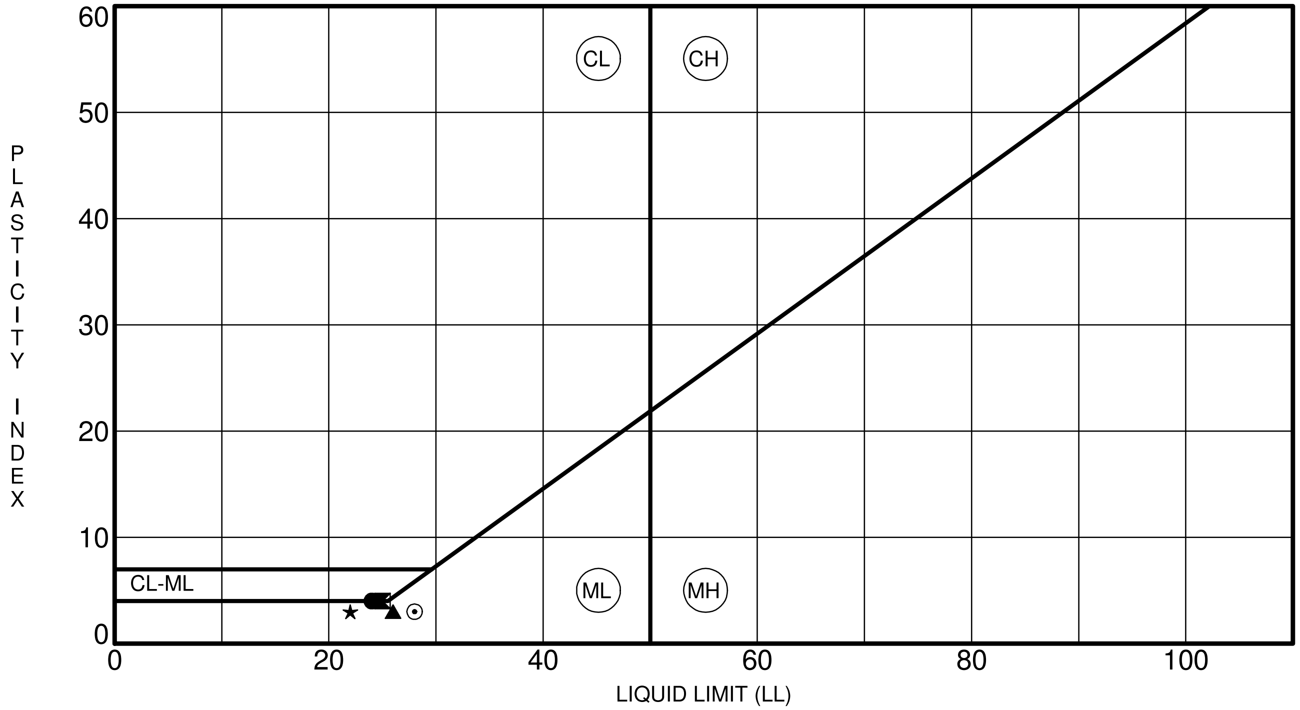
PROJECT **Geotechnical Investigation - Proposed Residential Development**

DATE **9 Feb 21**

patersongroup **Consulting Engineers**

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



	Specimen Identification	LL	PL	PI	Fines	Classification
●	**BH 1-21 SS2**	**24**	**20**	**4**		**ML = Inorganic Silts of Low Plasticity**
⧗	**BH 2-21 SS3**	**25**	**21**	**4**		**ML = Inorganic Silts of Low Plasticity**
▲	**BH 3-21 SS3**	**26**	**23**	**3**		**ML = Inorganic Silts of Low Plasticity**
★	**BH 4-21 SS3**	**22**	**19**	**3**		**ML = Inorganic Silts of Low Plasticity**
⊙	**BH 5-21 SS3**	**28**	**25**	**3**		**ML = Inorganic Silts of Low Plasticity**

CLIENT **Claridge Homes**

FILE NO. **PG5683**

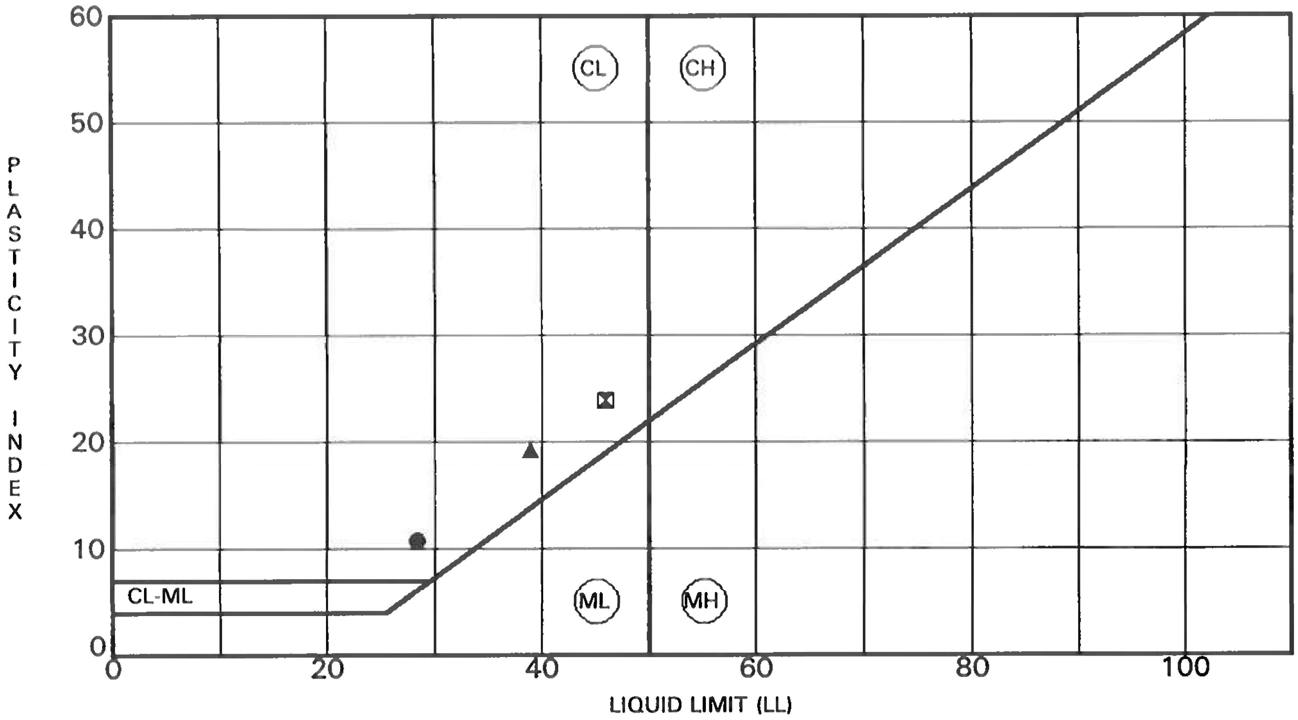
PROJECT **Geotechnical Investigation - Proposed**
Residential Development

DATE **9 Feb 21**

patersongroup **Consulting Engineers**

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

ATTERBERG LIMITS' RESULTS



Specimen Identification	LL	PL	PI	Fines	Classification
● BH 1	28	18	10		
☒ BH 2	46	22	24		
▲ BH 2	39	20	19		

CLIENT **John Van Gaal**

PROJECT **Preliminary Geotechnical Investigation - Terry Fox Drive at Fernbank Road**

FILE NO. **PG0812**

DATE **28 APR 06**

patersongroup **Consulting Engineers**

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

ATTERBERG LIMITS' RESULTS

Order #: 1806239

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 23169

Report Date: 12-Feb-2018

Order Date: 6-Feb-2018

Project Description: PG4411

	Client ID:	BH3-18-SS2	-	-	-
	Sample Date:	06-Feb-18	-	-	-
	Sample ID:	1806239-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	81.1	-	-	-
General Inorganics					
pH	0.05 pH Units	7.65	-	-	-
Resistivity	0.10 Ohm.m	62.6	-	-	-
Anions					
Chloride	5 ug/g dry	17	-	-	-
Sulphate	5 ug/g dry	41	-	-	-

APPENDIX 2

FIGURE 1 – KEY PLAN

DRAWING PG5683-1 – TEST HOLE LOCATION PLAN

DRAWING PG5683-2 – GRANDE RETAINING WALL DESIGN

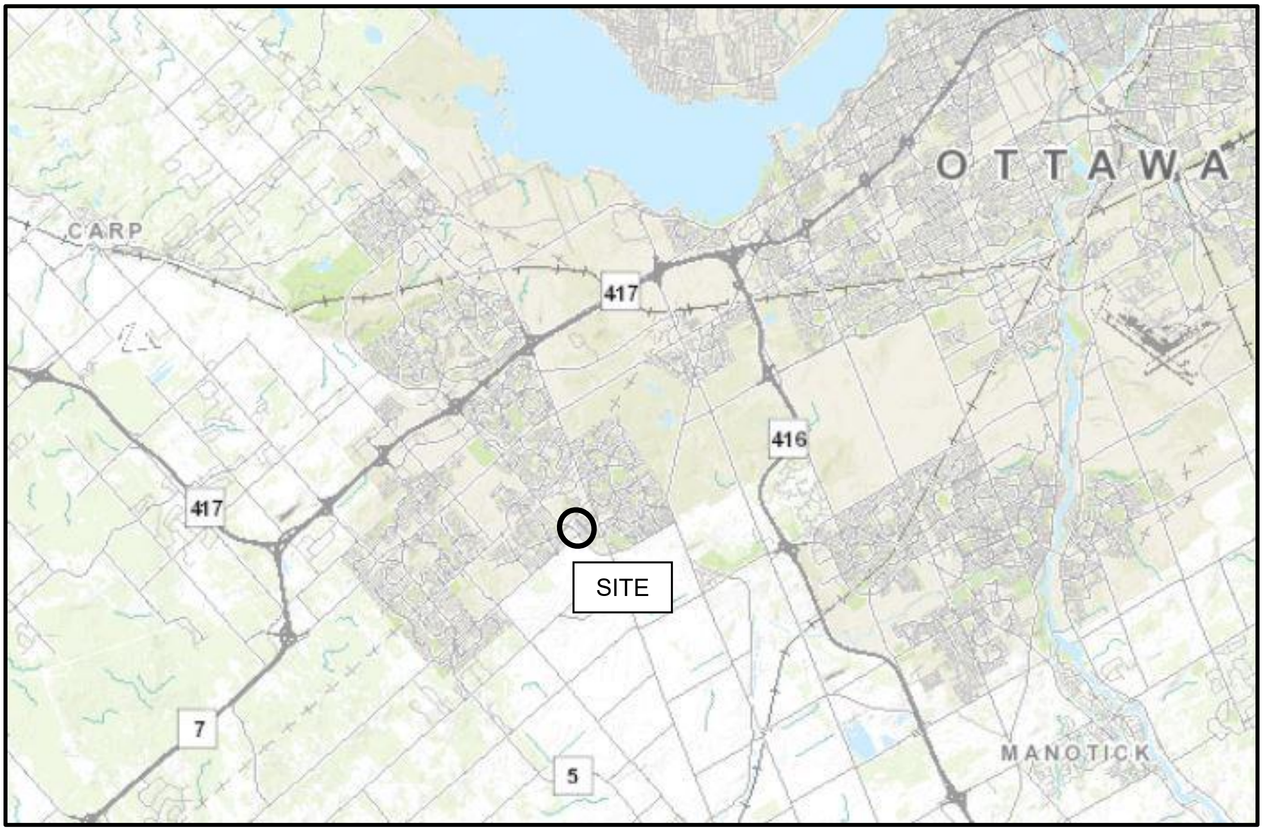
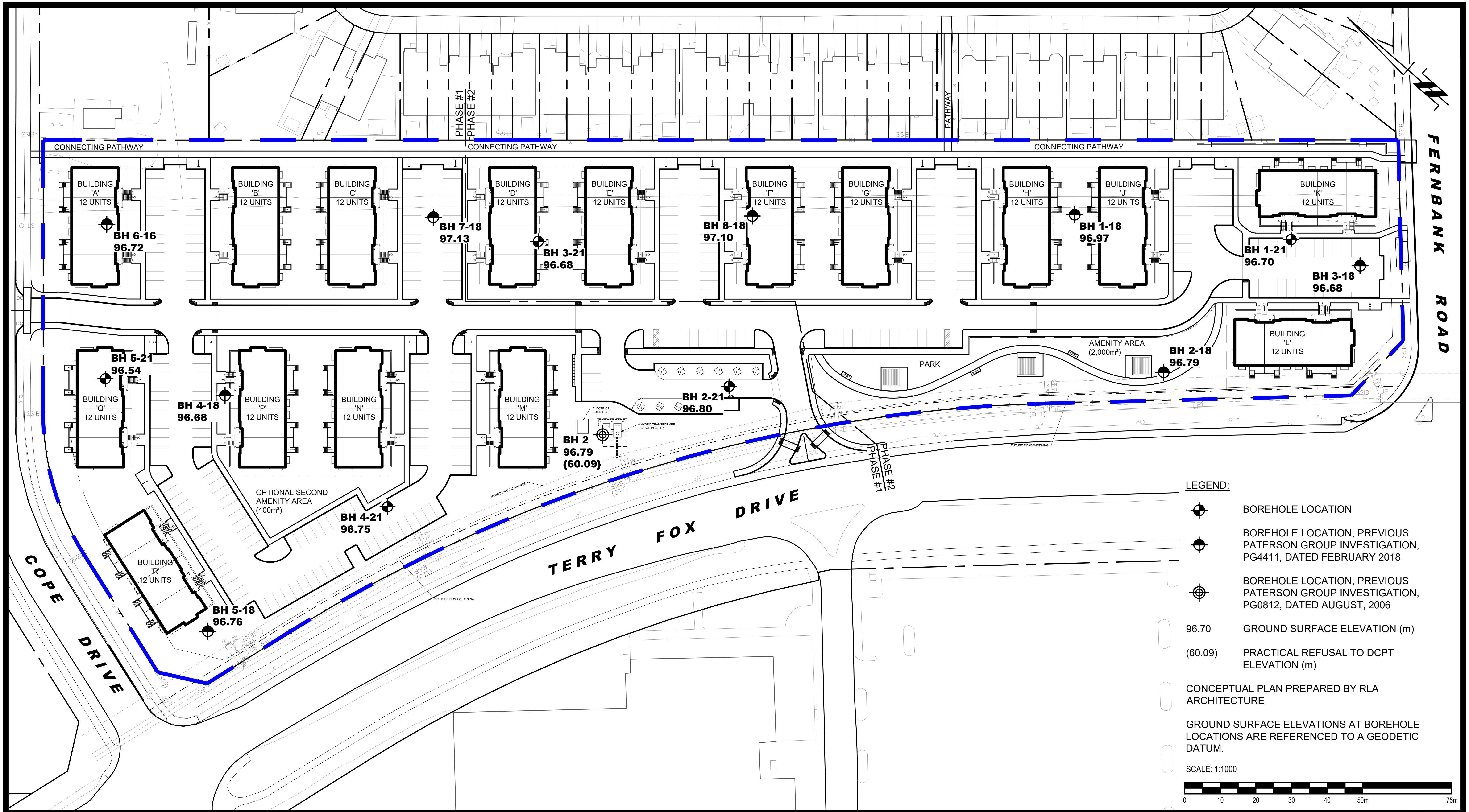


FIGURE 1

KEY PLAN

PATERSON GROUP



LEGEND:

⊕	BOREHOLE LOCATION
⊕	BOREHOLE LOCATION, PREVIOUS PATERSON GROUP INVESTIGATION, PG4411, DATED FEBRUARY 2018
⊗	BOREHOLE LOCATION, PREVIOUS PATERSON GROUP INVESTIGATION, PG0812, DATED AUGUST, 2006
96.70	GROUND SURFACE ELEVATION (m)
(60.09)	PRACTICAL REFUSAL TO DCPT ELEVATION (m)

CONCEPTUAL PLAN PREPARED BY RLA ARCHITECTURE

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DD/MM/YYYY	INITIAL
1	REVISED WITH UPDATED CONCEPTUAL PLAN	22/10/2025	OC

CLARIDGE HOMES
GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
5331 FERNBANK ROAD
OTTAWA, ONTARIO

Title:
TEST HOLE LOCATION PLAN

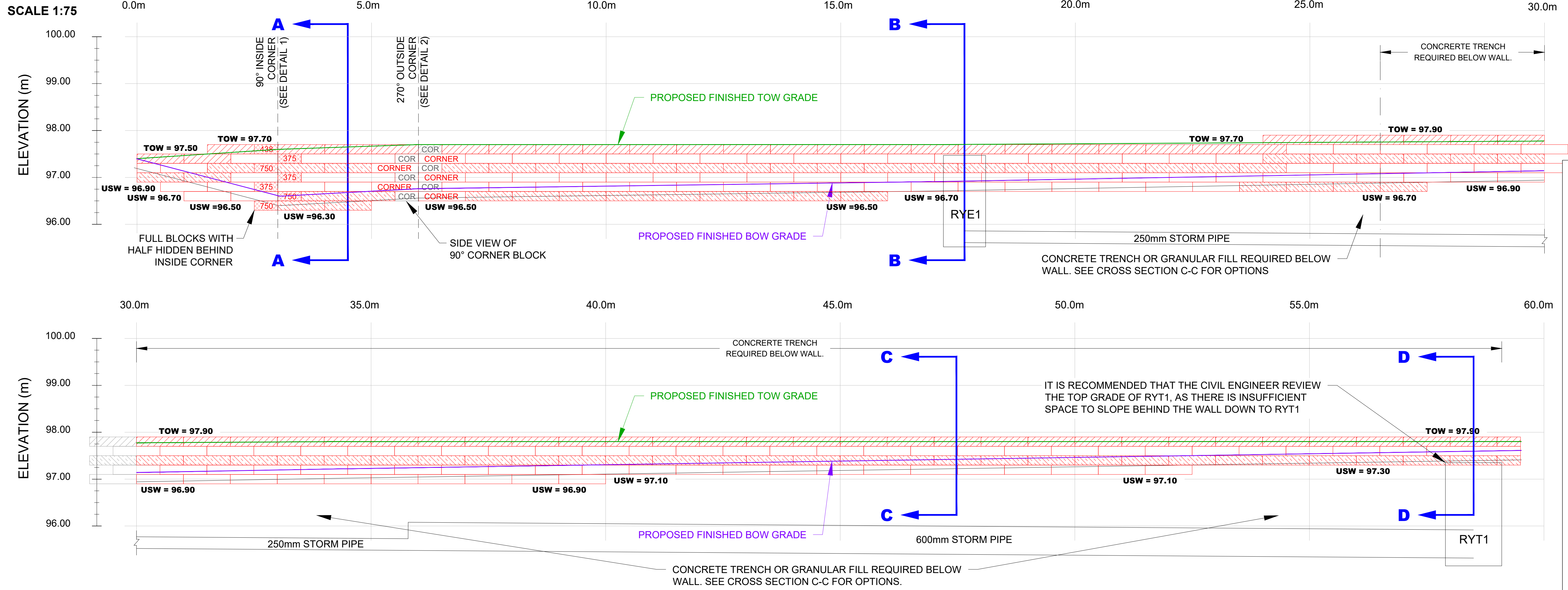
Scale: 1:1000
Date: 02/2021
Drawn by: NFRV
Report No.: PG5683-1
Checked by: VD
Dwg. No.: PG5683-1
Approved by: DJG
Revision No.: 1

p:\autocad drawings\geotechnical\pg56xx\pg5683\pg5683-1-test hole location plan (rev.01).dwg

11x17

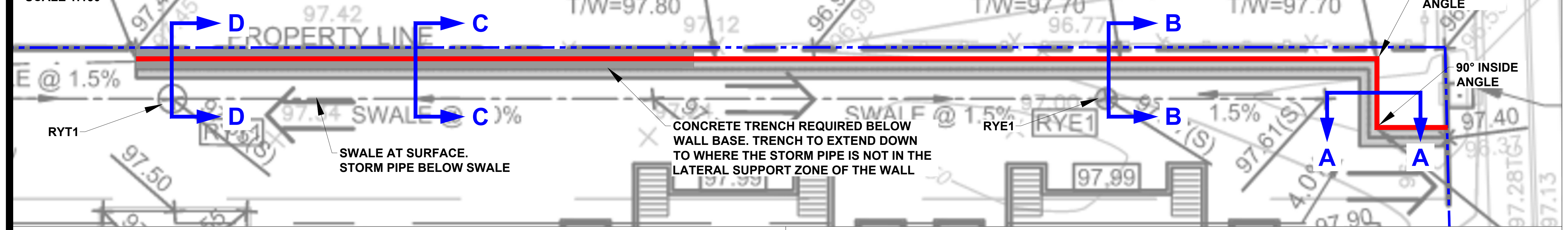
PROFILE VIEW (SS1):

SCALE 1:75



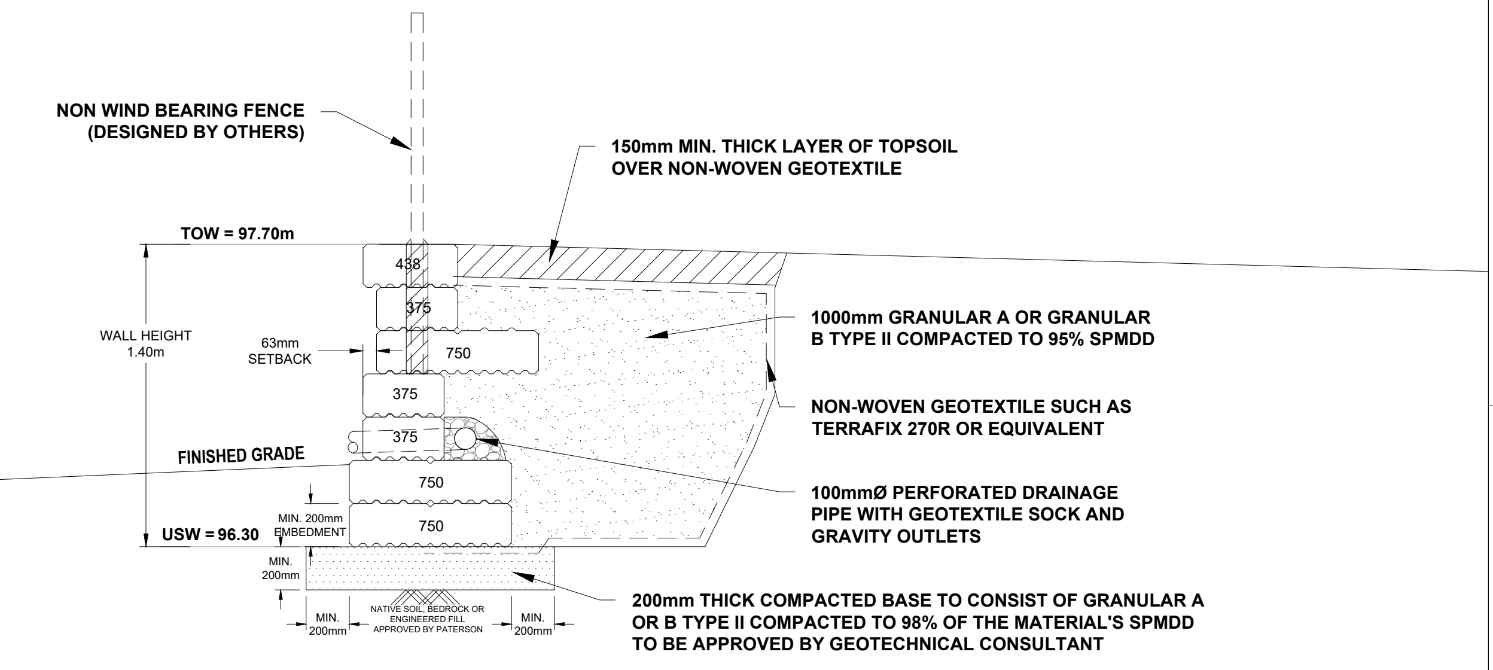
GRADING PLAN (SS1):

SCALE 1:150



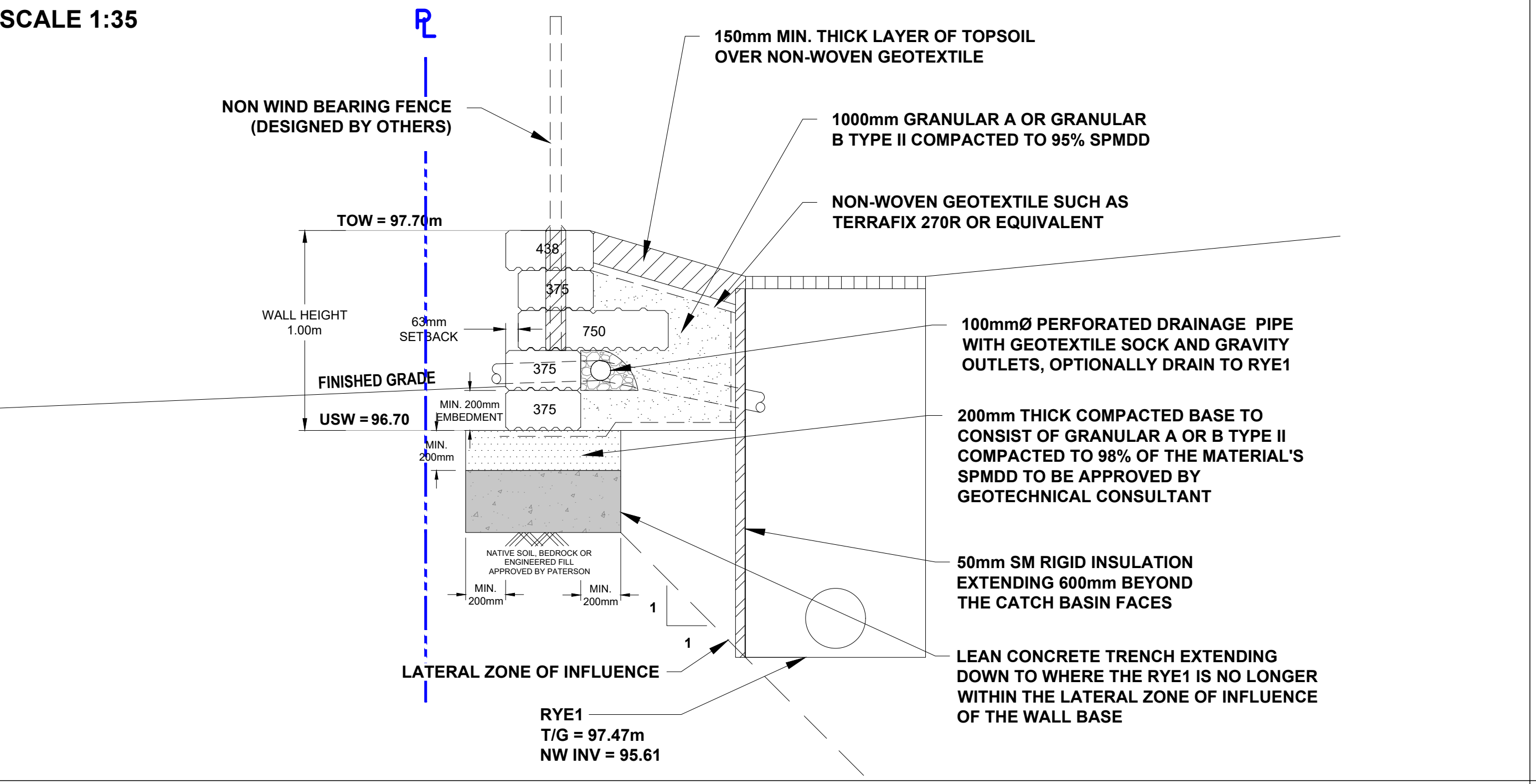
CROSS SECTION A-A:

SCALE 1:35



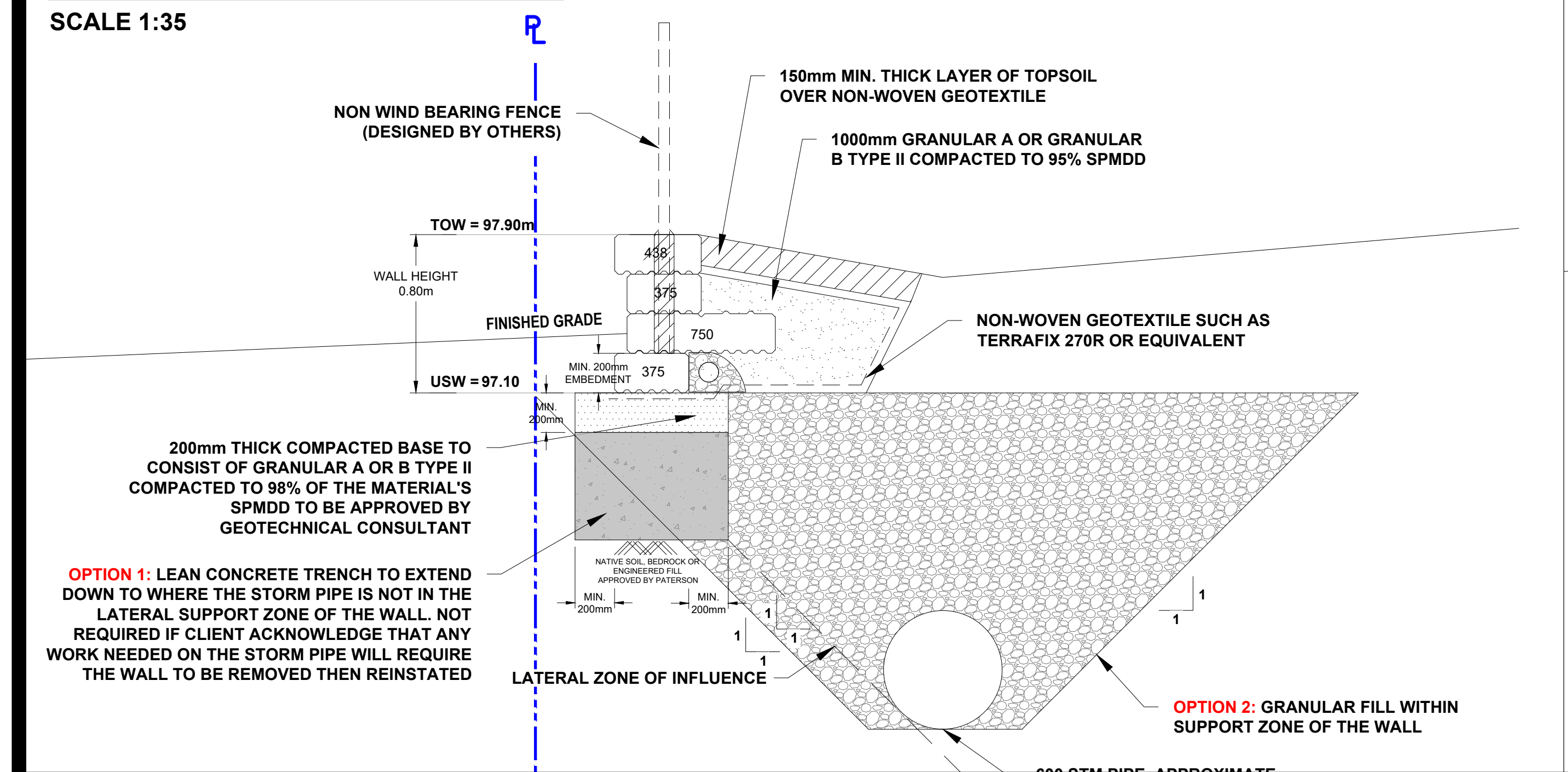
CROSS SECTION B-B:

SCALE 1:35



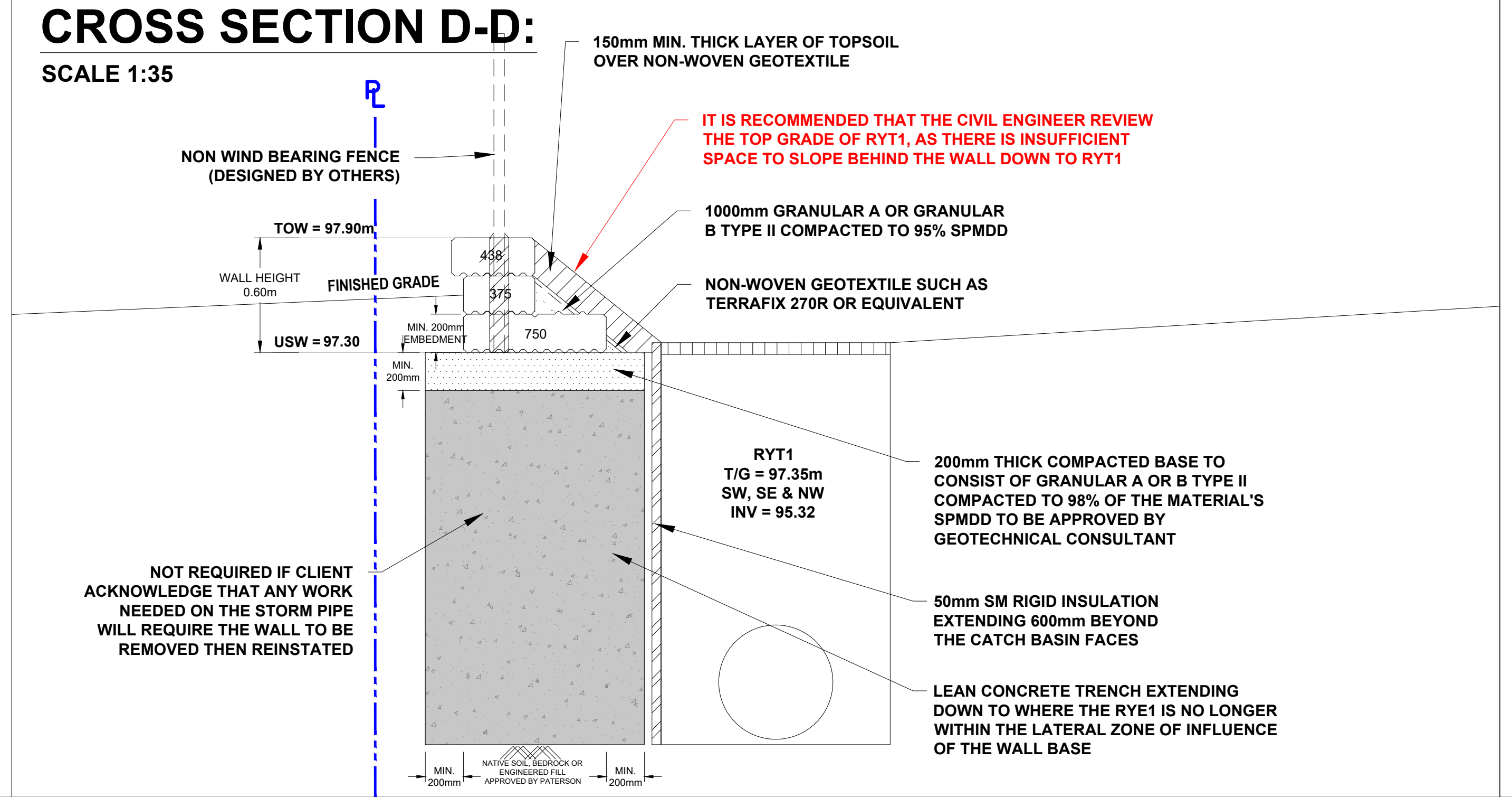
CROSS SECTION C-C:

SCALE 1:35



CROSS SECTION D-D:

SCALE 1:35



Item	Count
375	147
438	61
750	79
CORNER	5

AREA = ± 58.0 m^2
LENGTH = ± 59.5 m
BATTER = 9°
SURCHARGE = 4.2kPa

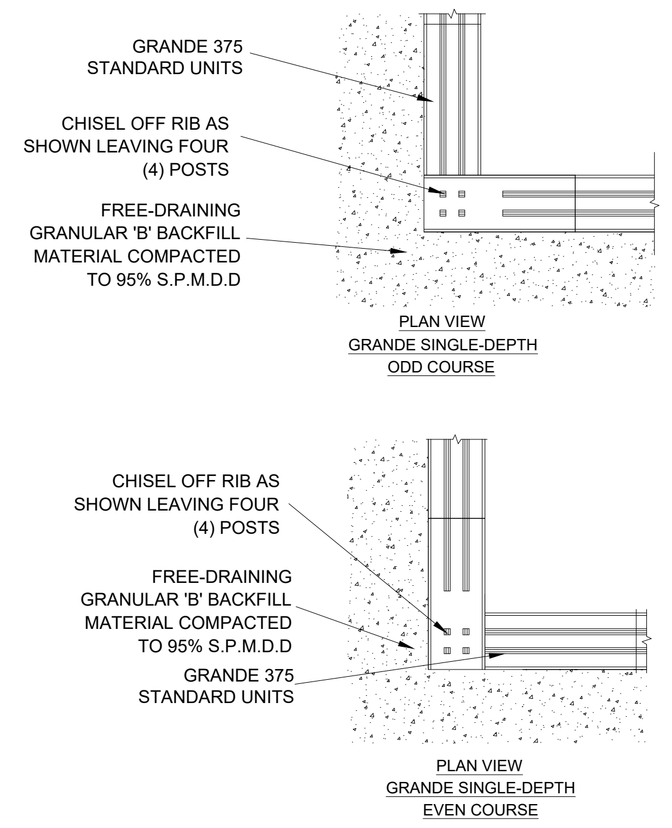
BLOCK LEGEND:

▨	438
▭	375
▨	750

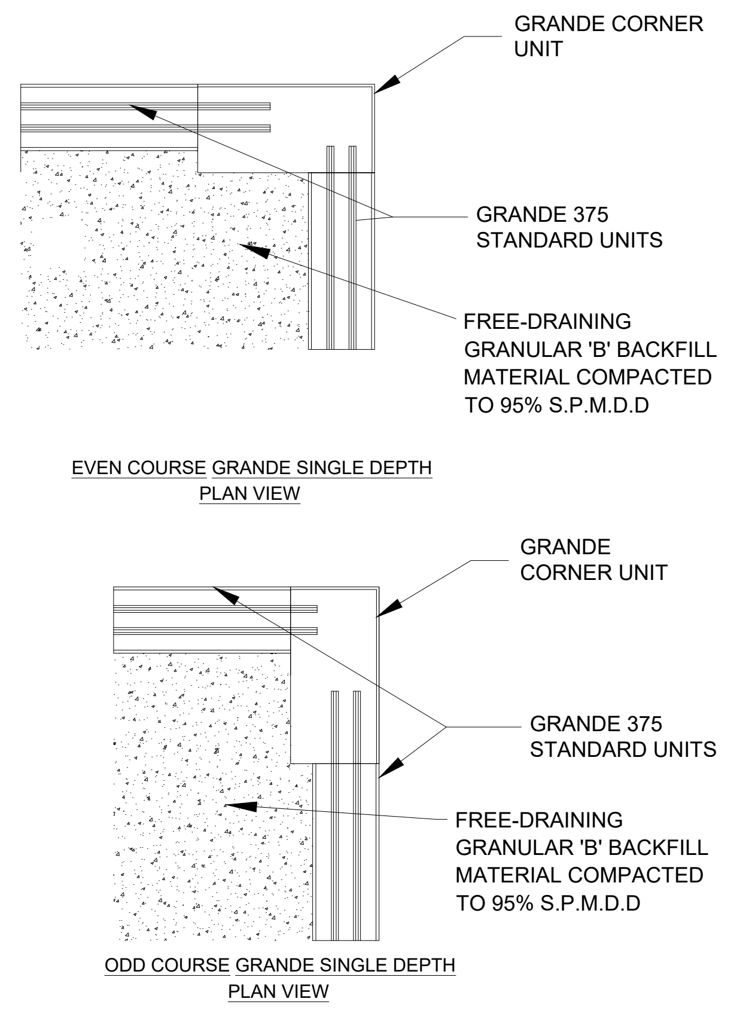
DETAIL 1 - CORNERS:

N.T.S.

PLAN VIEW - INSIDE CORNER



PLAN VIEW - OUTSIDE CORNER



NOTES:

1. IT IS POSSIBLE TO START ON AN ODD OR EVEN COURSE. REFER TO DESIGN
2. COURSES MUST ALTERNATE BETWEEN EVEN AND ODD COURSES
3. ALMOST ANY ANGLE CAN BE ACHIEVED USING THE SAME METHODOLOGY AS SHOWN
4. PLACE MIRAGRID 3XT AS SHOWN ON THE PROFILE VIEW
5. ANGLES ARE SHOWN ON THE PLAN AND PROFILE VIEWS

NOTES:

1. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR UTILITY CLEARANCE AND CONSTRUCTION SITE SAFETY. CLARIDGE HOMES AND PATERSON GROUP SHALL NOT BE RESPONSIBLE FOR MEANS OR METHODS OF CONSTRUCTION OR FOR SAFETY OF WORKERS OR OF THE PUBLIC. THE LOCATION OF EXISTING OR PROPOSED UTILITIES MUST BE VERIFIED PRIOR TO CONSTRUCTION. IT IS RECOMMENDED THAT UTILITIES BE OFFSET FROM THE WALL TO PREVENT ADDITIONAL LOADING ON ANY CONDUIT UNLESS ACCOUNTED FOR IN DESIGN OF THE UTILITY, AS WELL AS TO ENSURE FUTURE ACCESS TO THE UTILITY WITHOUT UNDERMINING THE WALL.
2. THIS DESIGN IS BASED ON THE FOLLOWING SOIL PROPERTIES:

PROPERTY	RETAINED FILL	FOUNDATION MEDIUM
SOIL TYPE	GRANULAR B TYPE II	STIFF SILTY CLAY
FRICTION ANGLE - ϕ	38°	33°
UNIT WEIGHT - ɣ	21 kN/m³	17 kN/m³
COHESION - C	0 kPa	5 kPa

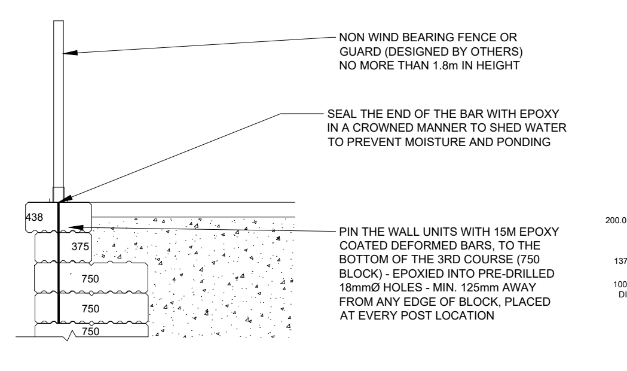
MATERIAL PROPERTIES ARE BASED ON SITE EVALUATION BY PATERSON GROUP, SEISMIC LOADING WAS EVALUATED ACCORDING TO THE CURRENT CHBDC CSA-S6:19, WITH A PEAK GROUND ACCELERATION VALUE OF 0.305.

3. THE DESIGN ELEVATIONS USED WERE BASED ON A GRADING PLAN DRAWN BY NOVATECH, PROJECT 121011-GR2, REV.7 (DATE: APRIL 2024). THE WALL BASE DESIGN ASSUMES A BEARING RESISTANCE AT SLS OF 100 kPa ON STIFF SILTY CLAY. PATERSON GROUP ENGINEER SHOULD OBSERVE THE BEARING CONDITIONS AND ADJUST THE THICKNESS OF THE GRANULAR BASE TO ACCOMMODATE THE SITE CONDITIONS, IF NECESSARY AND IF SOFT SPOT ARE ENCOUNTERED.
4. THE DESIGN HAS BEEN REVIEWED FOR THE STABILITY OF THE PRECAST MODULAR RETAINING WALL SYSTEM AND GLOBAL STABILITY WITH A FACTOR OF SAFETY OF 1.5 FOR STATIC CONDITIONS AND 1.1 UNDER SEISMIC CONDITIONS. WALL GEOMETRY AND GRADE ELEVATIONS ABOVE AND BELOW THE WALL SHOULD CONFORM WITH THE GRADING PLAN PROVIDED HEREIN. IF ACTUAL SITE GRADES VARY SIGNIFICANTLY FROM THOSE SHOWN OR IF THE BACK SLOPE DOES NOT CONFORM, INSTALLATION SHALL NOT PROCEED UNTIL THE DESIGN IS VERIFIED OR MODIFIED IN THE APPLICABLE AREA.
5. PRECAST UNITS SHALL BE GRANDE RETAINING WALL UNITS MANUFACTURED UNDER A LICENSED SUPPLIER.
6. PRIOR TO CONTRUCTION, ALL UTILITIES AND STRUCTURES BEHIND AND/OR BELOW THE WALL MUST BE REVIEWED BY OTHERS TO ENSURE THE SERVICES ARE CAPABLE OF WITHSTANDING ANY LOADING APPLIED BY THE RETAINING WALL.
7. UTILITIES AND STRUCTURES BEHIND THE RETAINING WALL MUST BE INSTALLED AT THE SAME TIME THE RETAINING WALL IS BEING CONSTRUCTED
8. THE WALL BASE SHALL CONSIST OF A MINIMUM OF 200mm OF OPSS GRANULAR B TYPE II. THE GRANULAR BEDDING LAYER SHOULD EXTEND AT LEAST 200mm BEYOND THE FRONT BLOCK FACE AND A MINIMUM OF 200mm BEYOND THE REAR BLOCK FACE. THE BASE SHALL BE SMOOTHED TO ENSURE COMPLETE CONTACT OF RETAINING WALL UNIT WITH BASE. SURFACE OF GRANULAR BASE MAY BE DRESSED WITH FINER AGGREGATE TO AID LEVELING. ENSURE GRADATION OF DRESSING MATERIAL IS SUCH AS TO PRECLUDE LOSS OF FINES INTO BASE. THE THICKNESS OF DRESSING LAYER SHOULD NOT EXCEED 3 TIMES THE MAXIMUM PARTICLE SIZE USED.
9. WALL IS DESIGNED WITH A MIN. 200mm TOE EMBEDMENT WITH A GRANULAR BEDDING LAYER EXTENDING A MINIMUM 200mm BEYOND THE FACE, AND A MINIMUM 200mm BEYOND THE HEEL OF THE BASE BLOCK.
10. PATERSON SHOULD REVIEW THE BEARING SURFACE DURING THE CONSTRUCTION. IF FILL MATERIAL IS ENCOUNTERED, A REVIEW OF THE BEARING CONDITIONS SHOULD BE CONDUCTED BY PATERSON PERSONNEL PRIOR TO THE PLACEMENT OF THE GRANULAR BASE. PROOF ROLLING OF THE BEARING SURFACE WILL ALSO BE REQUIRED UNDER THE SUPERVISION OF PATERSON PERSONNEL TO REHABILITATE THE BEARING MEDIUM AND TO ACHIEVE THE DESIGN BEARING CAPACITIES. A BIAXIAL GEOGRID SUCH AS TBX 2500 MAY BE REQUIRED TO BE PLACED ON THE BEARING SURFACE AND WRAP AROUND THE EDGES OF THE GRANULAR BASE. ALTERNATIVELY, FILL MATERIAL CAN BE REMOVED AND REPLACED WITH ENGINEERED FILL SUCH AS GRANULAR B TYPE II PLACED IN MIN. 300mm THICK LIFTS COMPACTED TO A MINIMUM 98% OF THE MATERIAL'S SPMDD EXTENDING TO THE UNDERLYING NATIVE SOIL. A REVIEW OF THE BEARING SURFACE SHOULD BE CONDUCTED ON SITE AT THE TIME OF EXCAVATION.
11. TO ACHIEVE A 9° BATTER, STEP EVERY SECOND COURSE BACK BY 63mm, SEE CROSS SECTIONS.
12. THE BACKFILL ABOVE THE WALL MUST BE GRADED TO PROMOTE RUNOFF OVER TOP OF THE WALL. NO UNUSUAL SURCHARGE LOADING SHOULD BE ADJACENT TO THE TOP OF THE WALL. ONLY HAND OPERATED COMPACTION EQUIPMENT TO BE USED WITHIN 1.0m BEHIND THE RETAINING WALL.
13. PROVISIONS OF A DESIGN SPECIFIC ENGINEERING PEDESTRIAN GUARD OR FENCE SYSTEM ON THE TOP SIDE OF THE WALL MAY REQUIRE DESIGN MODIFICATIONS. THE WALLS ARE DESIGNED TO HAVE A NON WIND BEARING FENCE OR GUARD NO MORE THAN 1.8m IN HEIGHT.
14. BACKFILL MATERIAL SHALL BE APPROVED BY THE SITE GEOTECHNICAL ENGINEER PRIOR TO USE AND SHOULD CONSIST OF OPSS GRANULAR B TYPE II B FOLLOWED BY SUITABLE BACKFILL MATERIAL. ALL FILL WITHIN A 1H:1V ZONE UP AND BACK FROM THE HEEL SHOULD ALSO BE COMPACTED. BACKFILL SHALL BE PLACED IN MAXIMUM 300mm LOOSE LIFTS AND COMPACTED TO A MINIMUM OF 95% OF SPMDD. MOISTURE CONTENT SHOULD BE CONTROLLED AND MAINTAINED WITHIN -3 TO +4 PERCENT OF OPTIMUM.
15. MAINTAIN TEMPORARY GRADES TO DIVERT SURFACE WATER AWAY FROM THE RETAINING WALL EXCAVATION. SLOPE FINAL BACKFILL TO PROVIDE POSITIVE DRAINAGE AND TO ELIMINATE PONDING.
16. TO REDUCE THE POTENTIAL FOR STAINING OF THE RETAINING WALL FACE, PRE-WET THE ENTIRE FACE OF THE BLOCKS PRIOR TO CORING. WASH THE AREA IMMEDIATELY AFTER CORING IS COMPLETE.
17. EXCAVATION SIDE SLOPE SHOULD BE PROTECTED TEMPORARILY DURING CONSTRUCTION FROM PRECIPITATION EVENTS BY PLACEMENT OF TARPS.
18. ALL RETAINING WALL RELATED INSPECTIONS (BEARING SURFACE, COMPACTION, BLOCK INSTALLATION, ETC.) MUST BE COMPLETED BY PATERSON GROUP. ONCE THE WALL CONSTRUCTION IS COMPLETED AND REVIEWED BY PATERSON DURING CONSTRUCTION, A CERTIFICATE LETTER WILL BE ISSUED BY PATERSON GROUP.
19. INSTALL 100mm DIAMETER PERFORATED PIPE DRAIN WRAPPED IN GEOTEXTILE BEHIND HEEL OF WALL (OR ALTERNATIVELY UNDER LOWER COURSE OF WALL). PROVIDE CLEAR STONE SURROUNDING THE DRAIN TO PROTECT PIPE FROM CLOGGING AND DAMAGE. PROVIDE OUTLETS THROUGH WALL BASE LAYER AT LOW AREAS, NO FURTHER APART THAN 30m CENTRES. IF OUTLET NOT AVAILABLE, RAISE DRAINAGE PIPE TO FINISHED GRADE AND DRAIN AT THE ENDS OF THE WALL AND OUTLET THROUGH THE FACE OF THE WALL (WITH RODENT GUARD) NO FURTHER APART THAN 30m CENTRES.
20. ANY CUTTING OF BLOCKS TO SUIT SITE CONDITIONS OR WALL DESIGN WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
21. THE CONTRACTOR SHOULD REFER TO THE INSTALLATION MANUAL PROVIDED FOR THE RETAINING WALL BLOCK TYPE PROVIDED HEREIN FOR ADDITIONAL DETAILS ON ACCEPTABLE INSTALLATION PRACTICES.
22. IF WINTER CONSTRUCTION IS CONSIDERED, HEAT MUST BE MAINTAINED WHEN THE BASE IS EXPOSED. THE WALL BASE MUST BE COVERED WITH INSULATION TARPS TO MAINTAIN HEAT AND PROTECT THE BASE FROM POTENTIAL FROSTHEAVE. ONCE THE BASE IS BACKFILLED, THE TOP OF WALL MUST BE COVERED WITH INSULATION TARPS OVERNIGHT UNTIL THE WALL CONSTRUCTION IS COMPLETED. THE WALL MUST NOT BE CONSTRUCTED ON A FROZEN BASE AND MUST NOT BE BACKFILLED WITH FROZEN MATERIAL. THIS MUST BE VERIFIED BY PATERSON DURING CONSTRUCTION OF THE WALL
23. THE GEOTECHNICAL CONSULTANT SHOULD BE NOTIFIED AT THE BEGINNING OF THE WALL CONSTRUCTION TO COMPLETE PERIODIC INSPECTIONS AND PROVIDE GEOTECHNICAL RECOMMENDATIONS AS THE WALL CONSTRUCTION PROGRESSES.
24. DURING THE CONSTRUCTION OF THE RETAINING WALL, THE CONTRACTOR MUST ENSURE THAT A SAFE SLOPE IS PROVIDED BEHIND THE RETAINING WALL. THE GEOTECHNICAL CONSULTANT SHOULD COMPLETE PERIODIC INSPECTIONS TO ENSURE A PROPER SLOPE IS PROVIDED AS PER THE SITE GEOTECHNICAL RECOMMENDATIONS.
25. ANY INADEQUATE PERFORMING SUBGRADE SHOULD BE SUB-EXCAVATED AND REPLACED WITH OPSS GRANULAR B TYPE II, COMPACTED TO 98% OF THE MATERIALS SPMDD.
26. LEVELING OF THE BASE COURSE BLOCKS IS CRITICAL TO PROPER CONSTRUCTION OF THE WALL. THE USE OF SHIMS TO LEVEL THE BLOCKS IS NOT PERMITTED UNLESS REVIEWED ON SITE PRIOR TO THEIR USE. SHOULD SHIMS BE APPROVED FOR USE BY PATERSON, THE SPECIFICATIONS AND DETAILS OF THE SHIMS USED TO SUPPORT THE BLOCKS SHOULD BE PROVIDED TO PATERSON’S DESIGNER TO CONFIRM THAT NO LONG-TERM ISSUES MAY OCCUR AS A RESULT OF THE USE OF NON-SUITABLE SHIMS IN RELATION TO THE LOAD EXPECTED FROM THE BLOCKS ABOVE.
27. THE DESIGN ASSUMES THE FOLLOWING: THE MAXIMUM GROUNDWATER ELEVATION IS BELOW THE BASE OF THE WALL, THERE WILL BE NO HYDROSTATIC PRESSURE WITHIN OR BEHIND THE WALL, THE SURROUNDING STRUCTURES WILL NOT EXERT ANY ADDITIONAL LOADING ON THE WALL, THERE ARE NO STRUCTURES (UTILITIES SUCH AS GAS/WATER MAINS, STORM SEWERS, ELECTRICAL/COMMUNICATIONS CABLES, ETC) TO BE PLACED WITHIN OR BELOW THE REINFORCED FILL DURING OR AFTER CONSTRUCTION. ALTERNATIVELY, SEE DETAILS.
28. RETAINING WALL CONSTRUCTION SHOULD BEGIN AT LOW POINTS, CORNERS OF THE WALL, OR KNOWN PROVIDED WORKING POINTS TO ENSURE WALL DIMENSIONS ARE FOLLOWED. DIMENSIONS PROVIDED MIGHT REQUIRE FIELD CUTTING TO ADJUST FOR FIELD CONDITIONS BASED ON BLOCK TOLERANCES.
29. STEP LOCATIONS FOR THE BASE AND TOP OF WALL STATIONS AND ELEVATIONS ARE APPROXIMATE AND MUST BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION OF THE RETAINING WALL. THE DRAWING ILLUSTRATES HOW THE WALL IS TO BE CONSTRUCTED AND DOES NOT NECESSARILY REPRESENT "AS-BUILT" CONDITIONS.

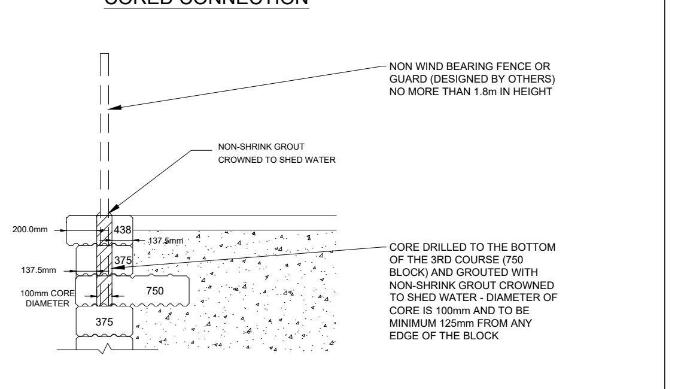
DETAIL 2 - FENCE CONNECTION:

N.T.S.

PIN CONNECTION



CORED CONNECTION



MAX CORE DIAMETER TABLE

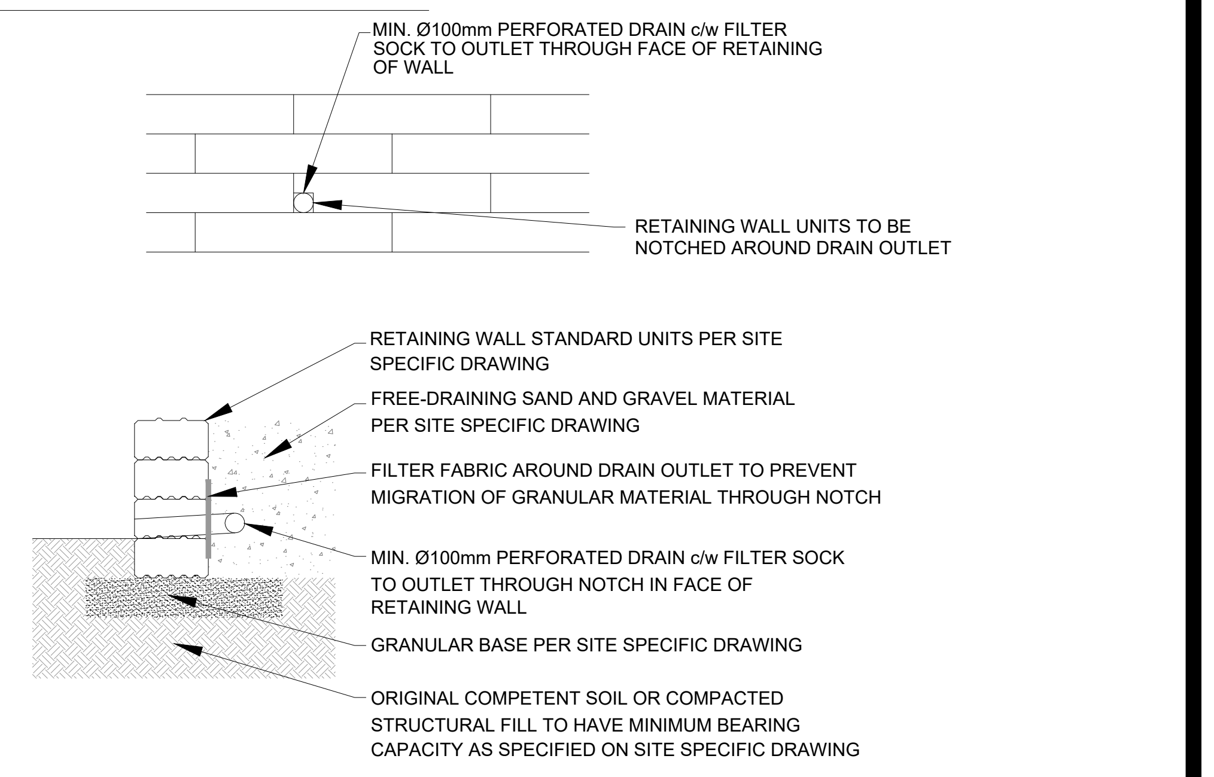
Batter	Top 3 Courses	Max. Core Diameter
0-dagree	438, 375, 375	4" (125mm)
9-degree	438, 375, 375	3" (75mm)
9-degree	438, 375, 750	4" (125mm)

NOTES:

1. WALL IS DESIGNED TO HAVE A NON BEARING FENCE
2. MAXIMUM HEIGHT OF THE FENCE IS 1.8m. IF THE FENCE IS TO BE HIGHER THAN 1.8m, THE FENCE SHOULD BE INSTALLED BEHIND THE WALL
3. FENCE AND FENCE ATTACHMENTS TO BE DESIGNED BY OTHERS
4. BACKFILL THE WALL WITH FREE-DRAINING MATERIAL AS THE HEIGHT INCREASES IDEALLY EVERY ONE OR TWO COURSES. AT NO TIME SHOULD THE HEIGHT OF THE WALL EXCEEDS TWO COURSES WITHOUT BACKFILL.

DETAIL 3 - DRAINAGE:

N.T.S.



ISSUED FOR REVIEW

PATERSON GROUP

9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
3	AS PER REVISED GRADING PLAN	12/11/2025	JV
2	TO LABEL THE STAMPS FROM A GEOTECHNICAL AND STRUCTURAL PREPECTIVE, AS PER THE CITY REQUEST	02/03/2022	FA
1	AS PER REVISED GRADING PLAN	02/03/2022	JV

CLARIDGE HOMES

5331 FERNBANK ROAD

OTTAWA, ONTARIO

Title:

GRANDE RETAINING WALL DESIGN

Stamp:
12/11/2025
J. R. VILLENEUVE
100504344

Stamp:

Scale: AS SHOWN
Drawn by: MLB
Checked by: JV
Approved by: JV
Date: 11/2025

File No.: PG5683
Drawing No.: PG5683-2
Revision No.: 3

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