Geotechnical Investigation

Proposed Residential Development

4624 Spratt Road
Ottawa, Ontario

Prepared for Claridge Homes

Report PG5641-1 Rev. 1 dated January 16, 2026

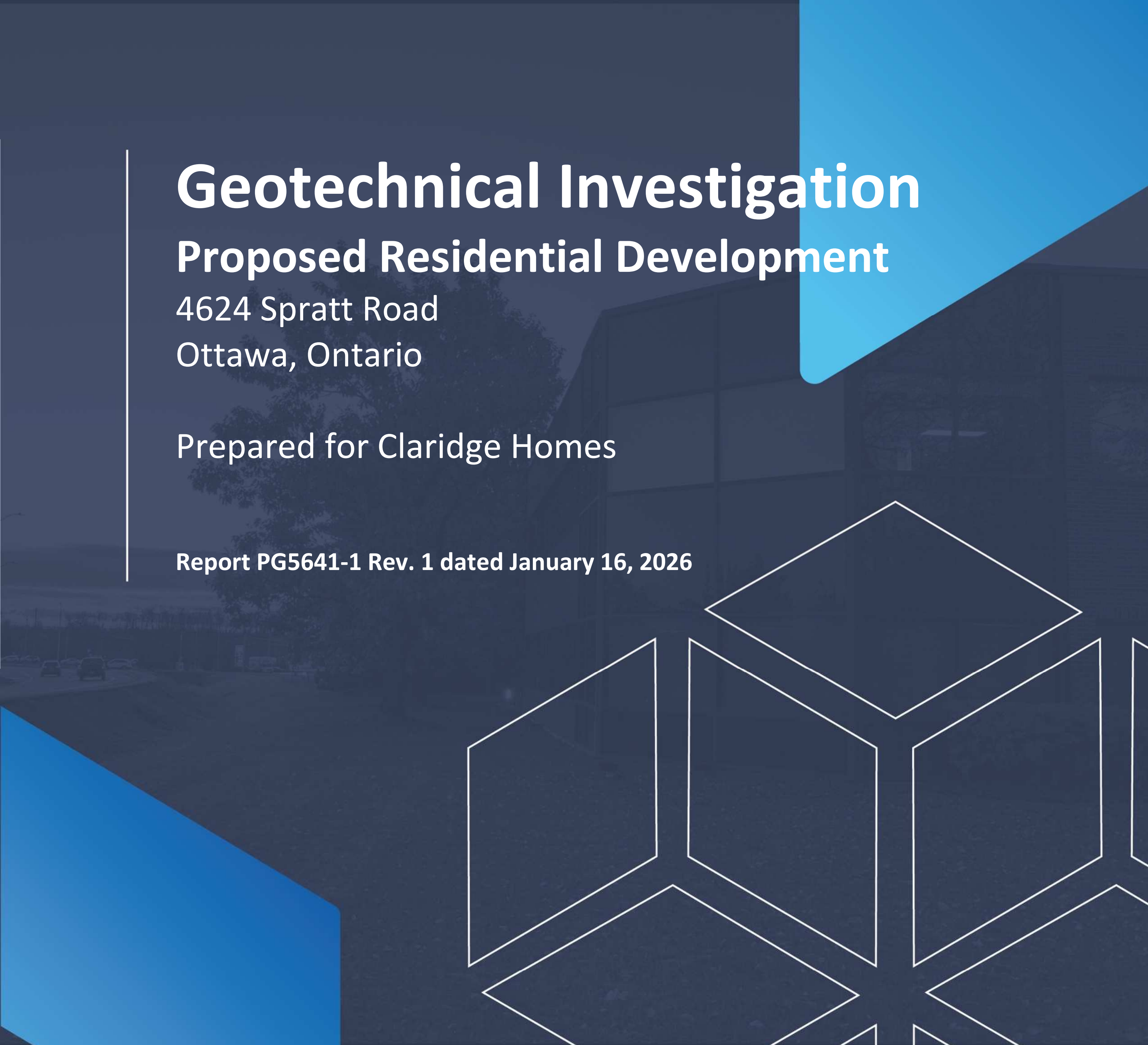


Table of Contents

Appendices

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 4624 Spratt 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 subsoil and groundwater conditions at this site by means of test holes.
- ☐ Provide geotechnical recommendations pertaining to the design of the proposed development including construction considerations 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

Based on the available site plan, the proposed development at the subject site will consist of a series of townhouse blocks, each with a partial basement level. The proposed townhouse blocks will be immediately surrounded by asphalt-paved access lanes and parking areas, walkways, and landscaped areas. Further, it is understood that the proposed development will be municipally serviced.

3.0 Method of Investigation

3.1 Field Investigation

This field program for the current geotechnical investigation was carried out on January 14 and 15, 2021. During that time, a total of 6 boreholes were advanced to a maximum depth of 6.2 m below existing ground surface. The boreholes were distributed in a manner to provide general coverage of the subject site taking into consideration site features, underground utilities and existing test holes completed during the previous investigation. The locations of the boreholes are presented on Drawing PG5641-1 - Test Hole Location Plan included in Appendix 2.

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

Sampling and In Situ Testing

Soil samples from the boreholes were collected using a 50 mm diameter split-spoon sampler. All soil samples were visually inspected and initially classified on site. The auger and split-spoon samples were placed in sealed plastic bags. All samples were transported to the our laboratory for examination and classification. The depths at which the auger and split-spoon were recovered from the test holes are shown as AU and SS, respectively, on the Soil Profile and Test Data sheets presented in Appendix 1.

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

Undrained shear strength testing was conducted in cohesive soils using a field vane apparatus.

The thickness of the overburden was evaluated by dynamic cone penetration testing (DCPT) completed at borehole BH 3-21. 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 locations were recorded in detail in the field. Our findings are presented in the Soil Profile and Test Data sheets in Appendix 1.

Groundwater Monitoring

Flexible standpipes were installed in all boreholes to permit monitoring of the groundwater levels subsequent to the completion of the sampling program.

3.2 Field Survey

The borehole locations, and ground surface elevation at each borehole location, were recovered in the field by Paterson personnel and referenced to a geodetic datum. The borehole locations, and ground surface elevation at each borehole location, are presented on Drawing PG5641-1 - Test Hole Location Plan in Appendix 2.

3.3 Laboratory Testing

The soil samples recovered from the subject site were examined in our laboratory to review the results of the field logging. Additional soil review was carried out in accordance with the City of Ottawa Tree Planting in Sensitive Marine Clay Soils (2017 Guidelines) and included additional laboratory testing, consisting of 4 Atterberg Limits tests, 2 grain size distribution tests, and 1 shrinkage limit test. The results are summarized in Section 4.0 and are further discussed in Section 6.8.

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

3.4 Analytical Testing

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

4.0 Observations

4.1 Surface Conditions

The subject site is vacant, and generally has a grassed surface with some trees around the perimeter. An existing fill pile with an approximate height of 3 to 4 m was also observed in the north-central portion of the site. The site is bordered by Spratt Road to the east, Stockholm Private Road to the north, residential properties to the west, and vacant land to the south. The existing ground surface across the site is relatively level at approximate geodetic elevation 91 m.

4.2 Subsurface Profile

Overburden

Generally, the soil conditions encountered at the borehole locations consist of a topsoil layer and/or fill which is underlain by a loose to compact, brown sandy silt.

A stiff to firm, grey silty clay to clayey silt was generally encountered underlying the sandy silt at approximate depths of 2.1 to 3.7 m below the existing ground surface.

A glacial till deposit was generally encountered underlying the silty clay to clayey silt, and was observed to consist of a compact to dense, grey silty sand to sandy silt with gravel cobbles and boulders. The boreholes were generally terminated in the glacial till deposit at approximate depths of 5.9 to 6.2 m below the existing ground surface.

Practical refusal to the DCPT was encountered in borehole BH 3-21 at a depth of 11.8 m.

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 at the subject site consists of interbedded sandstone and dolomite of the March formation with a drift thickness of 10 to 15 m.

Laboratory Testing Results

Atterberg limits testing, as well as associated moisture content testing, was completed on the recovered silty clay to clayey silt 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. The tested silty clay samples classify as inorganic clays of low plasticity (CL) in accordance with the Unified Soil Classification System.

Table 1 - Atterberg Limits Results

Sample	Depth (m)	LL (%)	PL (%)	PI (%)	w (%)	Classification
BH 1-21	3.8	35	17	18	33	CL
BH 2-21	3.8	39	20	19	36	CL
BH 5-21	2.3	40	20	20	43	CL
BH 6-21	2.3	32	18	14	30	CL

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

The results of the shrinkage limit test indicate a shrinkage limit of 14% and a shrinkage ratio of 1.92.

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 below and presented on the Grain Size Distribution Results sheets in Appendix 1.

Table 2 - Summary of Grain Size Distribution Analysis

Test Hole	Sample	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
BH 2-21	SS5	0.0	13.2	53.8	33.0
BH 5-21	SS4	0.0	14.6	54.9	30.5

4.3 Groundwater

Groundwater level readings were recorded on January 22, 2021 within the piezometers which were installed within the open boreholes during the course of the field investigation. The groundwater level readings are presented in Table 3 below and on the Soil Profile and Test Data sheets in Appendix 1.

Table 3 – Summary of Groundwater Levels

Borehole Number	Ground Surface Elevation (m)	Measured Groundwater Level		Dated Recorded
		Depth (m)	Elevation (m)	
BH 1-21	91.42	Blocked	-	January 22, 2021
BH 2-21	91.33	1.95	89.38	
BH 3-21	91.45	3.70	87.75	
BH 4-21	91.24	1.45	89.79	
BH 5-21	91.27	2.45	88.82	
BH 6-21	91.36	2.36	89.00	

Note: The ground surface elevation at each test hole location was surveyed using a GPS referenced to a geodetic datum.

It should be noted that surficial water from rain events can become trapped within a monitoring well installed in low permeability soils. Long-term groundwater levels can also be estimated based on the observed colour, moisture levels and consistency of the recovered soil samples.

Based on these observations, the long-term groundwater level is expected between an approximate **3 to 4 m** depth. However, it should be noted that groundwater levels are subject to seasonal fluctuations, and therefore, the groundwater levels could vary at the time of construction.

5.0 Discussion

5.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is considered suitable for the proposed development. It is recommended that the proposed buildings be founded on conventional spread footings bearing on the undisturbed, compact sandy silt, firm to stiff silty clay, or compact glacial till.

Due to the presence of a silty clay to clayey silt deposit, a permissible grade raise restriction is required for the subject site.

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.

Fill Placement

Fill used for grading beneath the proposed residential buildings should consist, unless otherwise specified, of clean imported granular fill, such as Ontario Provincial Standard Specifications (OPSS) Granular A or Granular B Type II. The fill should be placed in maximum 300 mm thick lifts 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. If excavated brown silty clay, free of organics and deleterious materials, is to be used to build up the subgrade level for areas to be paved, it is recommended that the material be placed under dry conditions and in above freezing temperatures, and compacted in thin lifts using suitable compaction equipment for the lift thickness by making several passes which are observed and approved by the geotechnical consultant.

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 for Conventional Spread Footings

Strip footings, up to 2 m wide, and pad footings, up to 5 m wide, placed on an undisturbed, compact sandy silt, firm to stiff silty clay, or compact glacial till bearing surface can be designed using a bearing resistance value at serviceability limit states (SLS) of **100 kPa** and a factored bearing resistance value at ultimate limit states (ULS) of **190 kPa**.

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

Footings designed using the above-noted bearing resistance value at SLS 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 the in-situ bearing medium soils 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

Due to the presence of the silty clay deposit, a permissible grade raise restriction of **3 m** is recommended for grading at the subject site.

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.

5.4 Design for Earthquakes

The site class for seismic site response can be taken as **Class X_C** for the foundations considered at the subject site. The soils underlying the subject site are not susceptible to liquefaction. Reference should be made to the latest revision of the Ontario Building Code (OBC) 2024 for a full discussion of the earthquake design requirements.

5.5 Basement Slab

With the removal of all topsoil and deleterious fill from within the footprint of the proposed buildings, the native soil surface will be considered an acceptable subgrade on which to commence backfilling for floor slab construction.

Any soft areas should be removed and backfilled with appropriate backfill material prior to placing any fill. OPSS Granular B Type II, with a maximum particle size of 50 mm, are recommended for backfilling below the floor slab.

It is also recommended that the upper 200 mm of sub-floor fill consists of 19 mm clear crushed stone.

5.6 Pavement Design

Car only parking areas and heavy truck traffic and access lanes are anticipated at this site. The proposed pavement structures are shown in Tables 4 and 5.

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

Thickness (mm)	Material Description
50	**Wear Course** – Sup0erpave 12.5 Asphaltic Concrete
150	**BASE** – OPSS Granular A Crushed Stone
300	**SUBBASE** – OPSS Granular B Type II
SUBGRADE – Either fill, in situ soils or OPSS Granular B Type I or II material placed over in situ soil or bedrock.	

Table 5 – Recommended Asphalt Pavement Structure Access Lanes and Heavy Truck Parking Areas	
Thickness (mm)	**Material Description**
40	**Wear Course** – Superpave 12.5 Asphaltic Concrete
50	**Binder Course** – Superpave 19.0 Asphaltic Concrete
150	**BASE** – OPSS Granular A Crushed Stone
450	**SUBBASE** – OPSS Granular B Type II
SUBGRADE – Either fill, in situ soils or OPSS Granular B Type I or II material placed over in situ soil or bedrock.	

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, which will require the use of a woven geotextile liner, such as Terratrack 200 or equivalent.

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

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 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 and all subdrains should be provided with a positive outlet to the storm sewer.

6.0 Design and Construction Precautions

6.1 Foundation Drainage and Backfill

A perimeter foundation drainage system is recommended for each proposed structure. The system should consist of a 150 mm diameter, geotextile-wrapped, perforated and corrugated plastic pipe which is surrounded on all sides by 150 mm of 19 mm clear crushed stone and 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 or sump pit.

A geocomposite drainage board, such as Delta Drain 6000, should be installed over the exterior below-grade foundation walls and connected to the perimeter drainage system.

The backfill against the exterior sides of the foundation wall may consist of on-site excavated fill, provided it is maintained in an unfrozen state and at a suitable moisture content for compaction. Otherwise, imported granular materials, such as clean sand or OPSS Granular B Type I granular material, should be used for this purpose.

6.2 Protection of Footings Against Frost Action

Perimeter foundations of heated structures are required to be insulated against the deleterious effects of frost action. A minimum 1.5 m thick soil cover, or an equivalent thickness of soil cover and foundation insulation, should be provided in this regard.

Exterior unheated foundations, such as isolated piers, are more prone to deleterious movement associated with frost action than the exterior walls of the structure, and require additional protection, such as soil cover of 2.1 m, or an equivalent 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. For the proposed development, it is anticipated that sufficient room will be available for the greater pat of the excavation to be undertaken by open-cut methods (i.e. unsupported excavations).

The excavation side slopes in the overburdened soils, above the groundwater level extending to a maximum depth of 3 m should be cut back at 1H:1V or flatter. A flatter slope is required for excavation below groundwater level, such as 3H:1V. The subsurface soil at this site is considered to be mainly 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 is used 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.

6.4 Pipe Bedding and Backfill

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

The pipe bedding for sewer and water pipes placed on a relatively dry, undisturbed subgrade surface should consist of at least 150 mm of OPSS Granular A material. Where the bedding is located within the firm grey silty clay, the thickness of the bedding material should be increased to a minimum of 300 mm. The material should be placed in maximum 300 mm thick lifts and compacted to a minimum of 95% of its SPMDD. The bedding material should extend at least 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 300 mm above the obvert of the pipe. The material should be placed in 300 mm thick lifts and compacted to a minimum of 95% of its SPMDD.

Generally, it should be possible to re-use the moist (not wet) brown sandy silt and silty clay above the cover material, if the excavation and filling operations are carried out in dry weather conditions. Wet silty clay material will be difficult to re-use, as the high water content makes 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 at this site, clay seals should be provided within the service trenches excavated through the silty clay deposit. 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 excavated through the silty clay deposit.

6.5 Groundwater Control

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

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 3 to 4 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 5 to 6 months should be allotted for completion of the permit, due to the minimum review period imposed by the MECP.

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 using 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 into the subgrade or in the excavation walls and bottoms. Precautions should be taken if such activities are to be carried out during freezing conditions. Additional information could be provided, if required.

6.7 Corrosion Potential and Sulphate

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

6.8 Tree Planting Setbacks

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

Based on the results of our review, the plasticity index of the silty clay deposit at the subject site does not exceed 40%. Therefore, the following tree planting setbacks are recommended for the silty clay deposit. Large trees (mature height over 14 m) can be planted within the silty clay areas provided a tree to foundation setback equal to the full mature height of the tree can be provided (e.g., in a park or other green space). Tree planting setback limits may be reduced to **4.5 m** for small (mature height up to 7.5 m) and medium size trees (mature tree height 7.5 to 14 m), provided that the conditions noted below are met:

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

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

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

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

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

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

Aboveground 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 recommendations.

Aboveground Hot Tubs

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

Decks and Building Additions

Additional grading around proposed decks or additions 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 detailed designs of the proposed development have been prepared:

- ☐ Observation of all bearing surfaces prior to the placement of concrete.
- ☐ 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.
- ☐ 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 follow-up field density tests to determine the level of compaction achieved.
- ☐ 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 the completion of a satisfactory inspection 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 provided are in accordance with the present understanding of the project. We request that we be permitted to review the grading plan once available and to review our recommendations when the drawings and specifications are complete.

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

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

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

Paterson Group Inc.

Scott Dennis

Scott S. Dennis, P.Eng.

LICENSED PROFESSIONAL ENGINEER
Jan. 16, 2026
S. S. DENNIS
100519516
Scott Dennis
PROVINCE OF ONTARIO

David J. Gilbert, P.Eng.

Report Distribution:

☐ Claridge Homes (e-mail copy)
☐ Paterson Group (1 copy)

APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

ATTERBERG LIMITS TESTING RESULTS

GRAIN SIZE DISTRIBUTION RESULTS

ANALYTICAL TESTING RESULTS

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - 4624 Spratt Road
Ottawa, Ontario

DATUM Geodetic

REMARKS

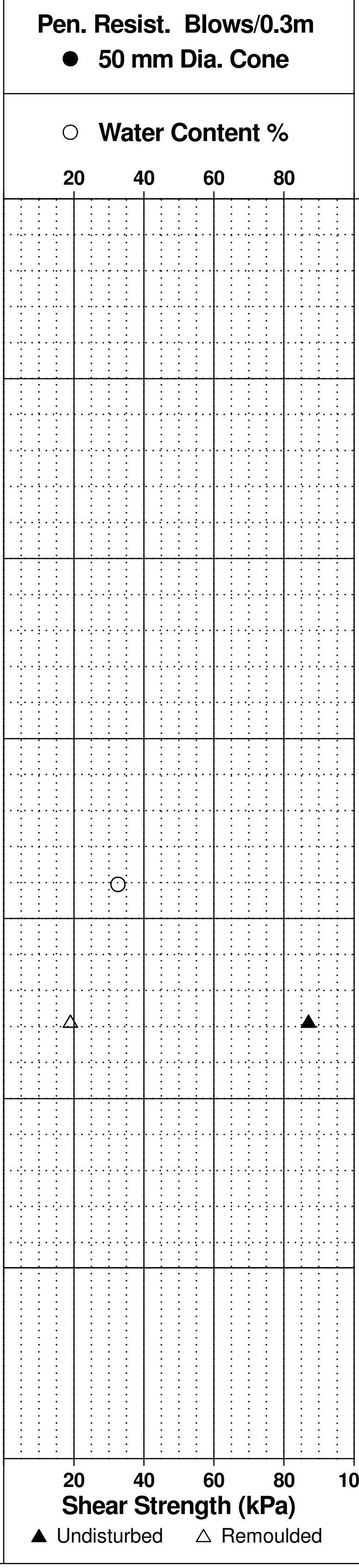
BORINGS BY CME 75 Power Auger

DATE 2021 January 15

FILE NO. PG5641

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	91.42
FILL: Crushed stone with brown silty sand		AU	1				
0.76							
Brown **SANDY SILT** some clay		SS	2	58	10	1	90.42
		SS	3	100	2		
						2	89.42
		SS	4	100	2		
						3	88.42
		SS	5	100	2		
3.66							
Stiff grey **SILTY CLAY**, trace sand							
		SS	6	100	W	4	87.42
						5	86.42
5.33							
GLACIAL TILL: Compact grey, silty sand some clay, gravel, cobbles and boulders		SS	7	100	23		
5.94							
End of Borehole							
(Standpipe Blocked - Jan 22, 2021)							



Piezometer Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - 4624 Spratt Road
Ottawa, Ontario

DATUM Geodetic

REMARKS

BORINGS BY CME 75 Power Auger

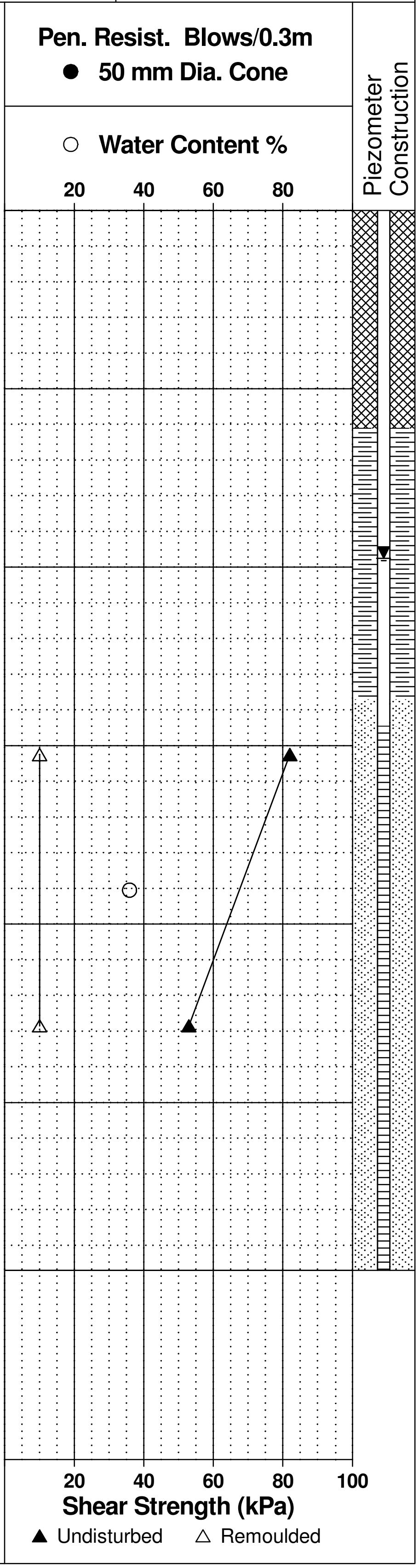
DATE 2021 January 15

FILE NO. PG5641

HOLE NO. BH 2-21

SOIL DESCRIPTION	TYPE	NUMBER	% RECOVERY	N VALUE or RQD
GROUND SURFACE				
TOPSOIL				
0.30	AU	1		
Brown **SANDY SILT** some clay	SS	2	50	9
	SS	3	67	5
	SS	4	100	2
3.05				
Stiff grey **CLAYEY SILT** some sand	SS	5	100	W
	SS	6	100	W
5.94				
End of Borehole (GWL @ 1.95 m depth - Jan 22, 2021)				

DEPTH (m)	ELEV. (m)
0	91.33
1	90.33
2	89.33
3	88.33
4	87.33
5	86.33

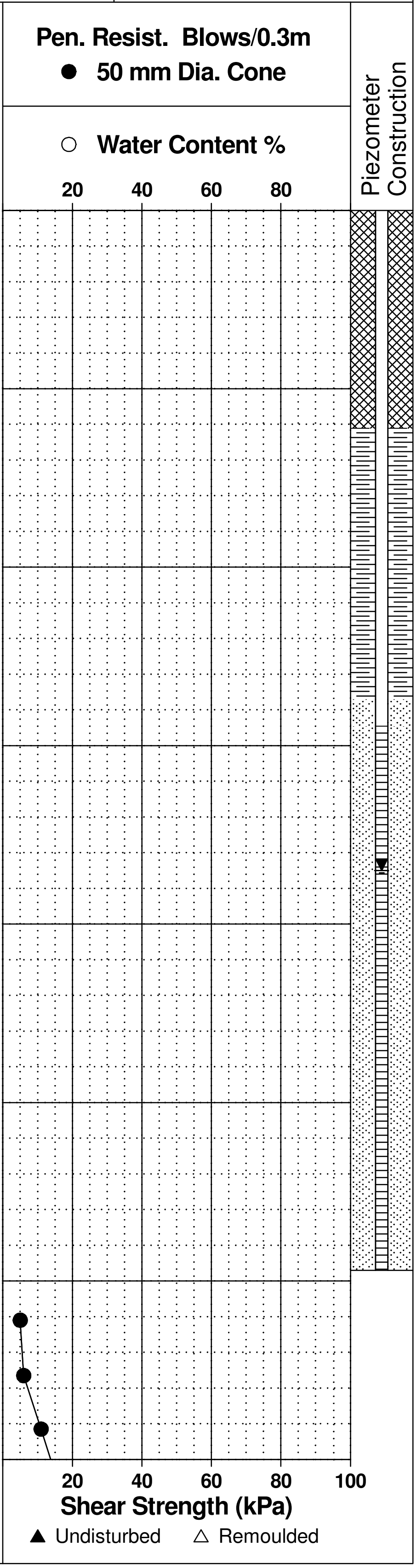


SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - 4624 Spratt Road
Ottawa, Ontario

DATUM Geodetic
REMARKS
BORINGS BY CME 75 Power Auger
DATE 2021 January 14
FILE NO. PG5641
HOLE NO. BH 3-21

SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	% RECOVERY	N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE					0	91.45
TOPSOIL 0.30	AU	1				
Brown **SANDY SILT** some clay	SS	2	100	4	1	90.45
	SS	3	100	2	2	89.45
2.44						
GLACIAL TILL: Compact to dense brown silty sand some clay with cobbles and boulders	SS	4	50	55		
	SS	5	58	35	3	88.45
- Grey by 3.78 m depth	SS	6	42	15	4	87.45
	SS	7	33	14	5	86.45
	SS	8	8	14		
					6	85.45
6.22 Dynamic Cone Penetration Test commenced at 6.22 m depth.						
					7	84.45



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - 4624 Spratt Road
Ottawa, Ontario

DATUM Geodetic

REMARKS

BORINGS BY CME 75 Power Auger

DATE 2021 January 14

FILE NO. PG5641

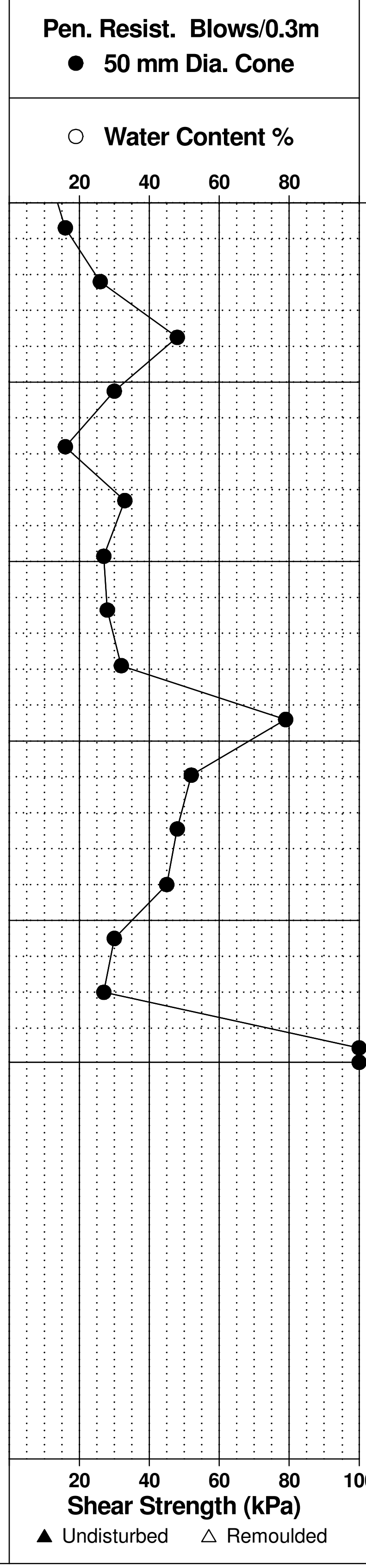
HOLE NO. BH 3-21

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Piezometer Construction
GROUND SURFACE						7	84.45	
						8	83.45	
Inferred **GLACIAL TILL**						9	82.45	
						10	81.45	
						11	80.45	
11.79								

End of Borehole

Practical DCPT refusal at 11.79m depth

(GWL @ 3.70 m - Jan 22, 2021)



SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - 4624 Spratt Road
Ottawa, Ontario

DATUM Geodetic

REMARKS

BORINGS BY CME 75 Power Auger

DATE 2021 January 15

FILE NO. PG5641

HOLE NO. BH 4-21

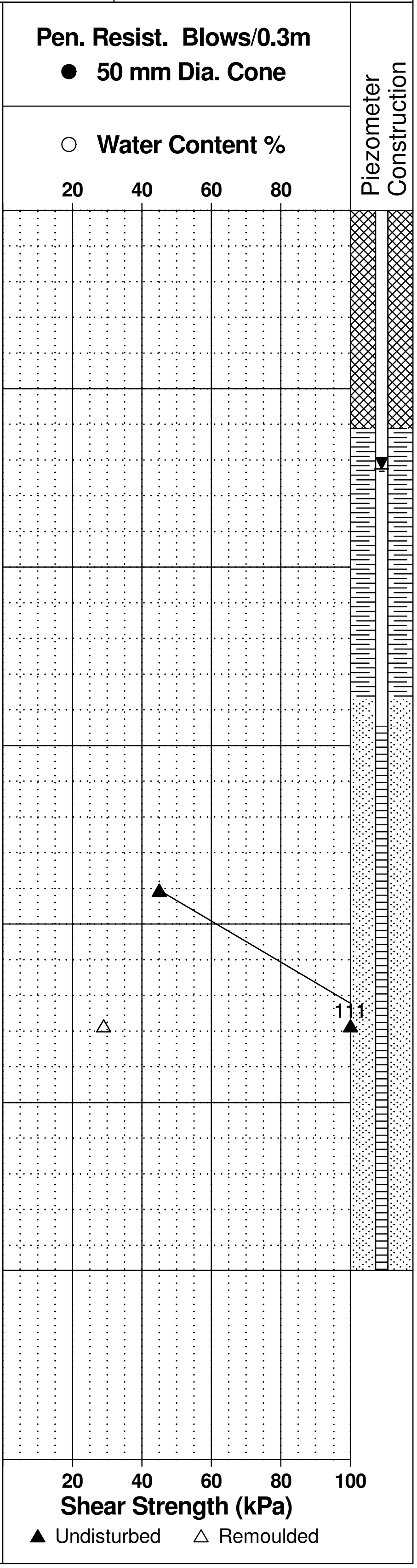
SOIL DESCRIPTION	Depth to base (m)
GROUND SURFACE	
TOPSOIL	0.30
Brown **SANDY SILT** some clay	3.05
Firm to stiff grey **SILTY CLAY**, trace sand	5.64
GLACIAL TILL: Compact to dense grey silty sand, some clay, gravel, cobbles and boulders	5.94

End of Borehole

(GWL @ 1.45 m - Jan 22, 2021)

TYPE	NUMBER	% RECOVERY	N VALUE or RQD
AU	1		
SS	2	83	5
SS	3	100	4
SS	4	100	3
SS	5	67	W
SS	6	100	12

DEPTH (m)	ELEV. (m)
0	91.24
1	90.24
2	89.24
3	88.24
4	87.24
5	86.24



patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - 4624 Spratt Road
Ottawa, Ontario

DATUM Geodetic

REMARKS

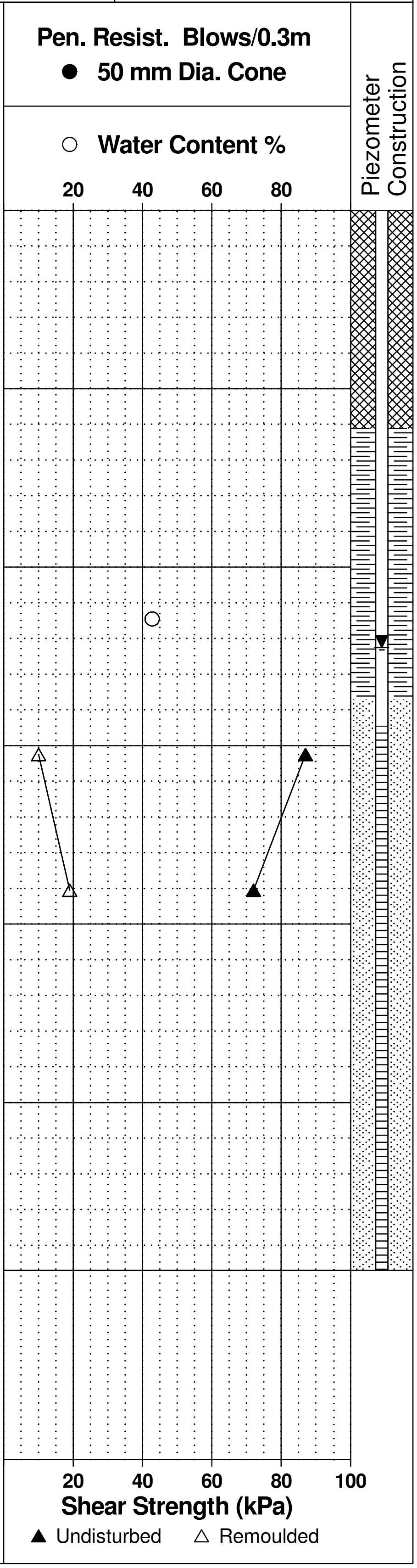
BORINGS BY CME 75 Power Auger

DATE 2021 January 14

FILE NO. PG5641

HOLE NO. BH 5-21

SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE					0	91.27
TOPSOIL 0.30	AU	1				
Brown **SANDY SILT** , some clay	SS	2	100	4	1	90.27
2.13	SS	3	100	2	2	89.27
Stiff brown **CLAY EY SILT**, some sand	SS	4	100	W	3	88.27
4.57					4	87.27
GLACIAL TILL: Grey sandy silt, some clay, trace gravel, cobbles and boulders	SS	5	100	6	5	86.27
5.94	SS	6	100	2		
End of Borehole (GWL @ 2.45 m depth - Jan 22, 2021)						



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

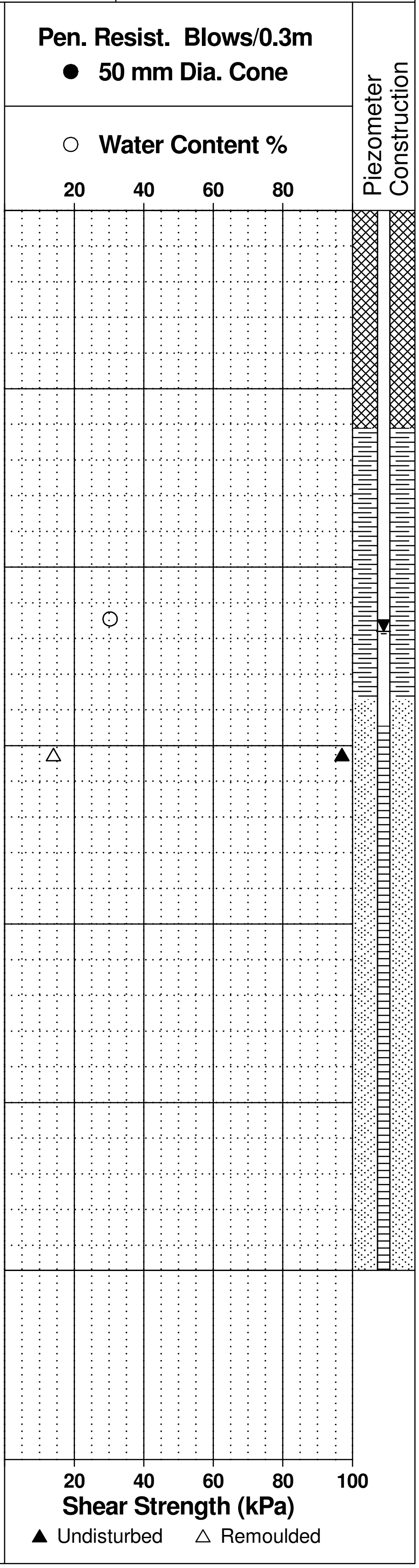
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - 4624 Spratt Road
Ottawa, Ontario

DATUM Geodetic
REMARKS
BORINGS BY CME 75 Power Auger
DATE 2021 January 14
FILE NO. PG5641
HOLE NO. BH 6-21

SOIL DESCRIPTION	SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE					0	91.36
TOPSOIL 0.30	AU	1				
Brown **SANDY SILT** some clay	SS	2	100	4	1	90.36
	SS	3	100	2	2	89.36
2.29 Stiff grey **SILTY CLAY** some sand	SS	4	100	2		
					3	88.36
3.91 **GLACIAL TILL:** Dense grey silty sand some gravel, cobbles and boulders	SS	5	58	39	4	87.36
	SS	6	33	42	5	86.36
	SS	7	75	40		
5.94 End of Borehole						

(GWL @ 2.36 m - Jan 22, 2021)



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)

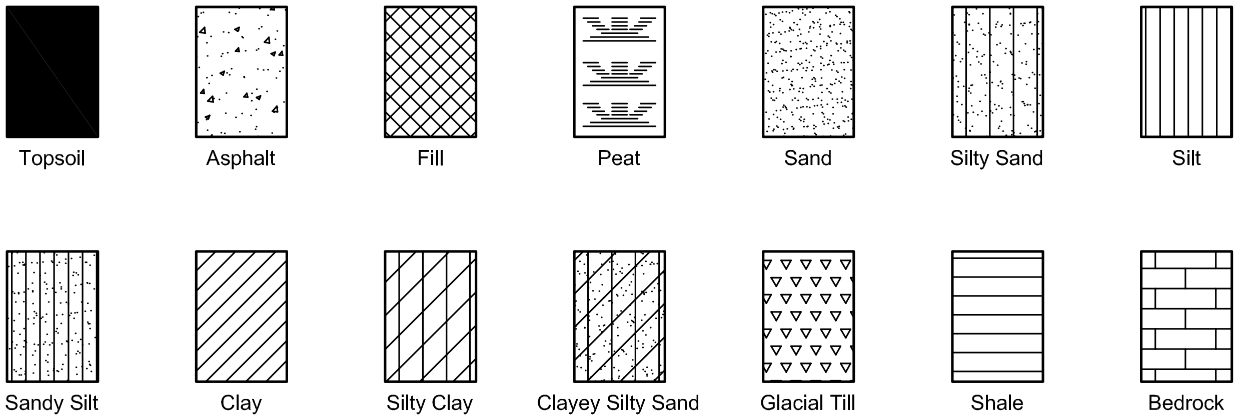
OC Ratio Overconsolidaton ratio = p'_c / p'_o
Void Ratio Initial sample void ratio = volume of voids / volume of solids
Wo - Initial water content (at start of consolidation test)

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.

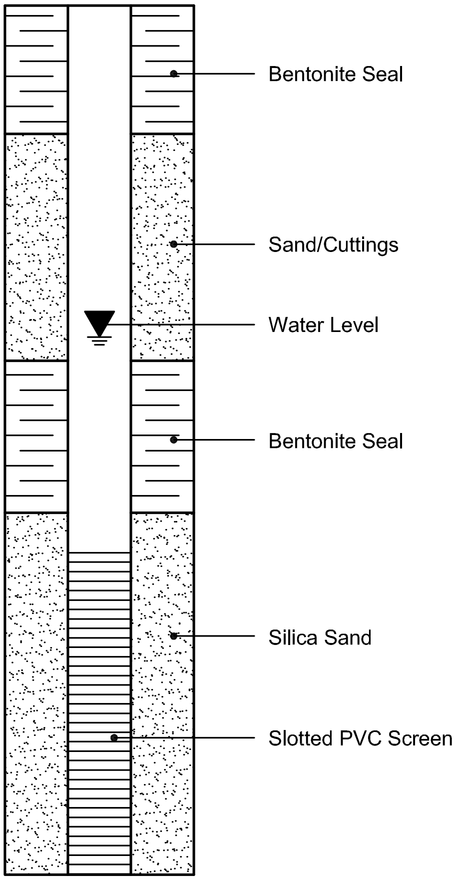
SYMBOLS AND TERMS (continued)

STRATA PLOT

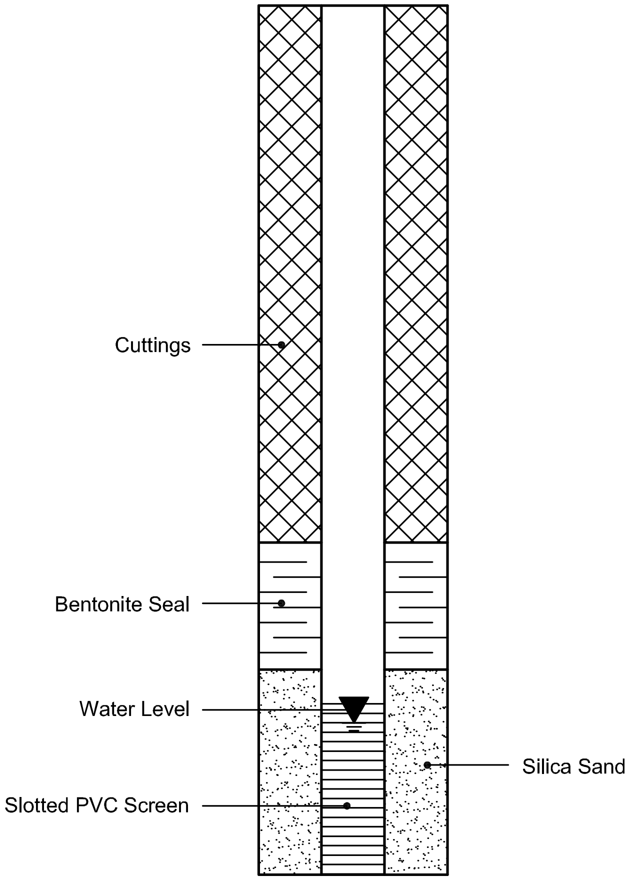


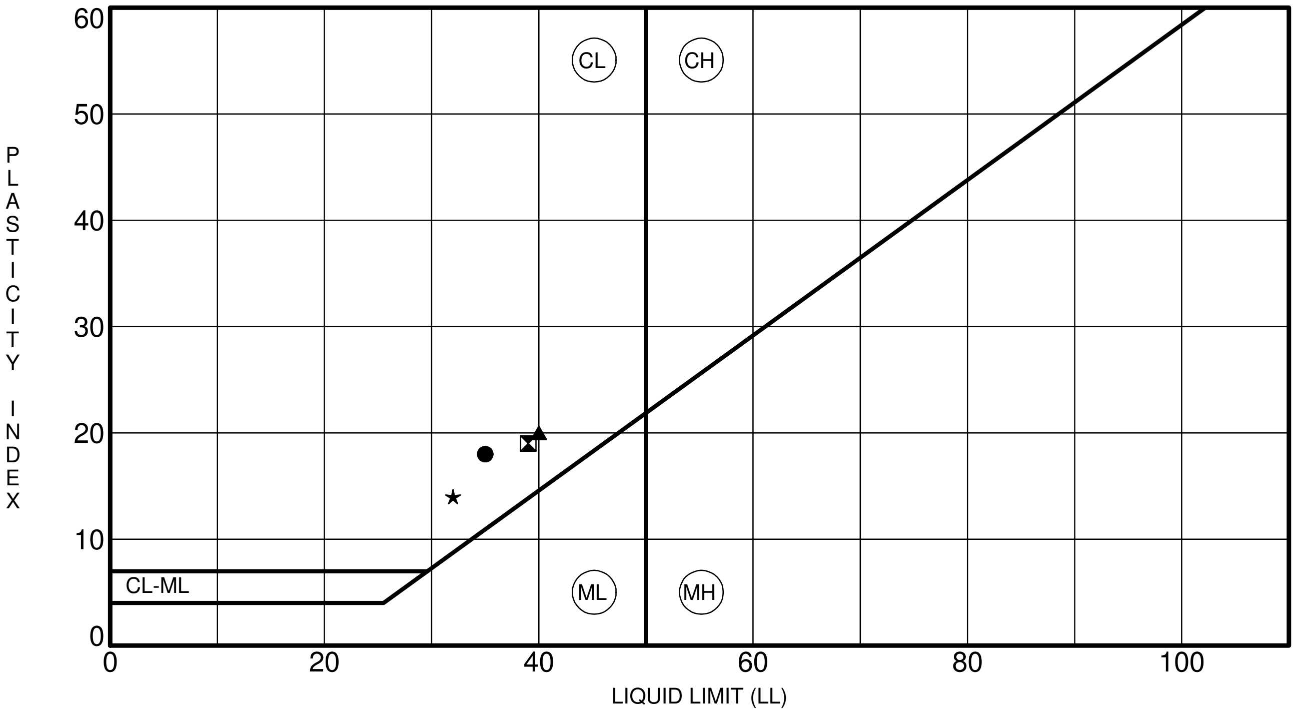
MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION





Specimen Identification		LL	PL	PI	Fines	Classification
●	**BH 1-21 SS6**	**35**	**17**	**18**		**CL = Inorganic Clays of Low Plasticity**
⧗	**BH 2-21 SS5**	**39**	**20**	**19**		**CL = Inorganic Clays of Low Plasticity**
▲	**BH 5-21 SS4**	**40**	**20**	**20**		**CL = Inorganic Clays of Low Plasticity**
★	**BH 6-21 SS4**	**32**	**18**	**14**		**CL = Inorganic Clays of Low Plasticity**

CLIENT **Claridge Homes**

PROJECT **Geotechnical Investigation - Proposed Residential Development - 4624 Spratt Road**

FILE NO. **PG5641**

DATE **14 Jan 21**

patersongroup **Consulting Engineers**

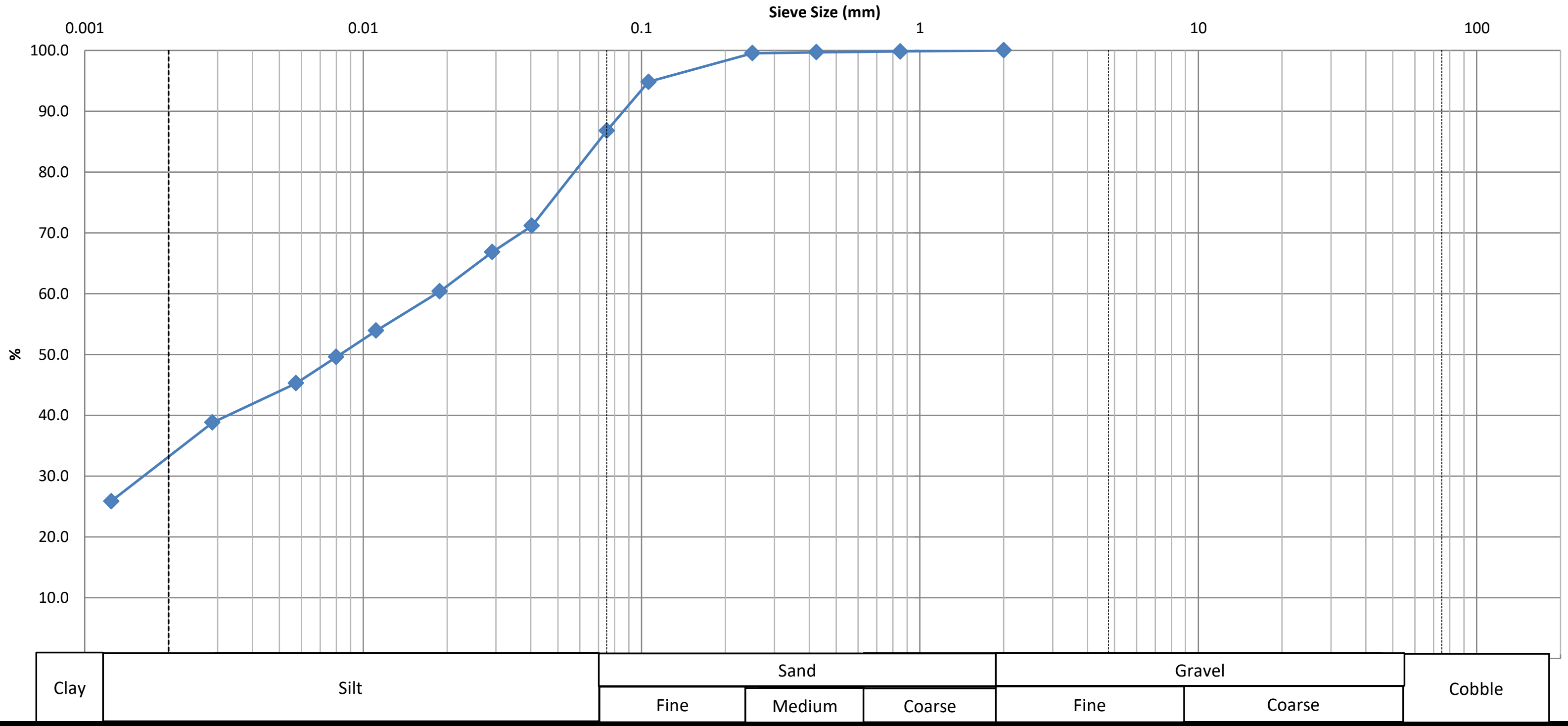
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

ATTERBERG LIMITS' RESULTS

patersongroup
consulting engineers

SIEVE ANALYSIS
ASTM C136

CLIENT:	Claridge Homes	DEPTH:	12' 6" - 14' 6"	FILE NO:	PG5641
CONTRACT NO.:		BH OR TP No.:	BH2-21 SS5	LAB NO:	23384
PROJECT:	4624 Spratt			DATE RECEIVED:	21-Jan-21
				DATE TESTED:	26-Jan-21
DATE SAMPLED:	15-Jan-21			DATE REPORTED:	29-Jan-21
SAMPLED BY:	Zach			TESTED BY:	C.S.



Identification	Soil Classification	MC(%)	LL	PL	PI	Cc	Cu
		37.4					

D100	D60	D30	D10	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
				0.0	13.2	53.8	33.0

Comments:

REVIEWED BY:	Curtis Beadow	Joe Fosyth, P. Eng.

patersongroup
consulting engineers

HYDROMETER
LS-702 ASTM-422

CLIENT:	Claridge Homes	DEPTH:	12' 6" - 14' 6"	FILE NO.:	PG5641
PROJECT:	4624 Spratt	BH OR TP No.:	BH2-21 SS5	DATE SAMPLED	15-Jan-21
LAB No. :	23384	TESTED BY:	C.S.	DATE RECEIVE	21-Jan-21
SAMPLED BY:	Zach	DATE REPT'D:	29-Jan-21	DATE TESTED:	26-Jan-21

SAMPLE INFORMATION

SAMPLE MASS	SPECIFIC GRAVITY
112.9	2.700

		HYGROSCOPIC MOISTURE		
INITIAL WEIGHT	50.00			
WEIGHT CORRECTED	45.87	TARE WEIGHT	50.00	ACTUAL WEIGHT
WT. AFTER WASH BACK SIEVE	6.86	AIR DRY	150.00	100.00
SOLUTION CONCENTRATION	40 g/L	OVEN DRY	141.73	91.73
		CORRECTED	0.917	

GRAIN SIZE ANALYSIS

SIEVE DIAMETER (mm)	WEIGHT RETAINED (g)	PERCENT RETAINED	PERCENT PASSING
26.5			
19			
13.2			
9.5			
4.75			
2.0	**0.0**	0.0	**100.0**
Pan	**112.9**		
0.850	**0.09**	0.2	**99.8**
0.425	**0.16**	0.3	**99.7**
0.250	**0.24**	0.5	**99.5**
0.106	**2.59**	5.2	**94.8**
0.075	**6.62**	13.2	**86.8**
Pan	**6.86**		
SIEVE CHECK 0.0	MAX = 0.3%		

HYDROMETER DATA

ELAPSED	TIME (24 hours)	Hs	Hc	Temp. (^{o}C)	DIAMETER	(P)	TOTAL PERCENT PASSING
1	9:09	39.0	6.0	23.0	0.0404	71.1	**71.1**
2	9:10	37.0	6.0	23.0	0.0291	66.8	**66.8**
5	9:13	34.0	6.0	23.0	0.0188	60.4	**60.4**
15	9:23	31.0	6.0	23.0	0.0111	53.9	**53.9**
30	9:38	29.0	6.0	23.0	0.0080	49.6	**49.6**
60	10:08	27.0	6.0	23.0	0.0057	45.3	**45.3**
250	1:18	24.0	6.0	23.0	0.0029	38.8	**38.8**
1440	9:08	18.0	6.0	23.0	0.0012	25.9	**25.9**

COMMENTS:

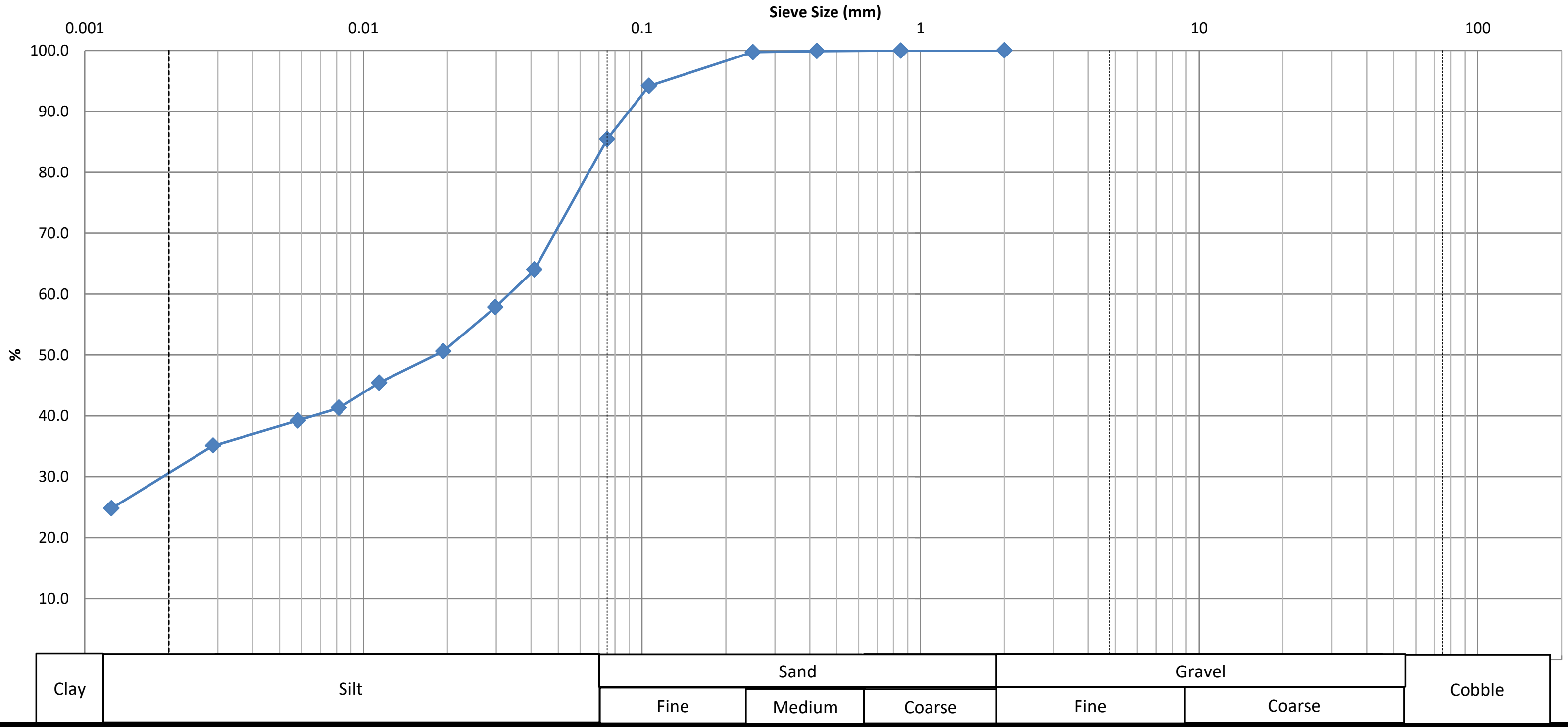
Moisture = 37.41%

REVIEWED BY:	C. Beadow	Joe Forsyth, P. Eng.

patersongroup
consulting engineers

SIEVE ANALYSIS
ASTM C136

CLIENT:	Claridge Homes	DEPTH:	7' 6" - 9' 6"	FILE NO:	PG5641
CONTRACT NO.:		BH OR TP No.:	BH5-21 SS4	LAB NO:	23385
PROJECT:	4624 Spratt			DATE RECEIVED:	21-Jan-21
				DATE TESTED:	26-Jan-21
DATE SAMPLED:	15-Jan-21			DATE REPORTED:	29-Jan-21
SAMPLED BY:	Zach			TESTED BY:	C.S.



Identification	**Soil Classification**				**MC(%)**	**LL**	**PL**	**PI**	**Cc**	**Cu**
					36.2					
	D100	D60	D30	D10	Gravel (%)	Sand (%)		Silt (%)	Clay (%)	
					0.0	14.6		54.9	30.5	

Comments:

REVIEWED BY:	**Curtis Beadow**	**Joe Fosyth, P. Eng.**

patersongroup
consulting engineers

HYDROMETER
LS-702 ASTM-422

CLIENT:	Claridge Homes	DEPTH:	7' 6" - 9' 6"	FILE NO.:	PG5641
PROJECT:	4624 Spratt	BH OR TP No.:	BH5-21 SS4	DATE SAMPLE	15-Jan-21
LAB No. :	23385	TESTED BY:	C.S.	DATE RECEIVE	21-Jan-21
SAMPLED BY:	Zach	DATE REPT'D:	29-Jan-21	DATE TESTED:	26-Jan-21

SAMPLE INFORMATION

SAMPLE MASS	SPECIFIC GRAVITY
113.1	2.700

INITIAL WEIGHT	50.00	**HYGROSCOPIC MOISTURE**		
WEIGHT CORRECTED	47.87	TARE WEIGHT	50.00	ACTUAL WEIGHT
WT. AFTER WASH BACK SIEVE	7.58	AIR DRY	150.00	100.00
SOLUTION CONCENTRATION	40 g/L	OVEN DRY	145.74	95.74
		CORRECTED	0.957	

GRAIN SIZE ANALYSIS

SIEVE DIAMETER (mm)	WEIGHT RETAINED (g)	PERCENT RETAINED	PERCENT PASSING
26.5			
19			
13.2			
9.5			
4.75			
2.0	**0.0**	0.0	**100.0**
Pan	**113.1**		
0.850	**0.01**	0.0	**100.0**
0.425	**0.05**	0.1	**99.9**
0.250	**0.14**	0.3	**99.7**
0.106	**2.92**	5.8	**94.2**
0.075	**7.29**	14.6	**85.4**
Pan	**7.58**		
SIEVE CHECK 0.0	MAX = 0.3%		

HYDROMETER DATA

ELAPSED	TIME (24 hours)	Hs	Hc	Temp. (^{o}C)	DIAMETER	(P)	TOTAL PERCENT PASSING
1	9:22	37.0	6.0	23.0	0.0411	64.0	**64.0**
2	9:23	34.0	6.0	23.0	0.0298	57.8	**57.8**
5	9:26	30.5	6.0	23.0	0.0194	50.6	**50.6**
15	9:36	28.0	6.0	23.0	0.0114	45.4	**45.4**
30	9:51	26.0	6.0	23.0	0.0082	41.3	**41.3**
60	10:21	25.0	6.0	23.0	0.0058	39.2	**39.2**
250	1:31	23.0	6.0	23.0	0.0029	35.1	**35.1**
1440	9:21	18.0	6.0	23.0	0.0012	24.8	**24.8**

COMMENTS:

Moisture = 36.16%

REVIEWED BY:	**C. Beadow**	**Joe Forsyth, P. Eng.**

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 31683

Report Date: 22-Jan-2021

Order Date: 19-Jan-2021

Project Description: PG5641

	Client ID:	BH4-21-SS3	-	-	-
	Sample Date:	15-Jan-21 17:00	-	-	-
	Sample ID:	2104185-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	75.4	-	-	-
General Inorganics					
pH	0.05 pH Units	7.10	-	-	-
Resistivity	0.10 Ohm.m	102	-	-	-
Anions					
Chloride	5 ug/g dry	<5	-	-	-
Sulphate	5 ug/g dry	18	-	-	-

APPENDIX 2

FIGURE 1 - KEY PLAN

DRAWING PG5641-1 - TEST HOLE LOCATION PLAN

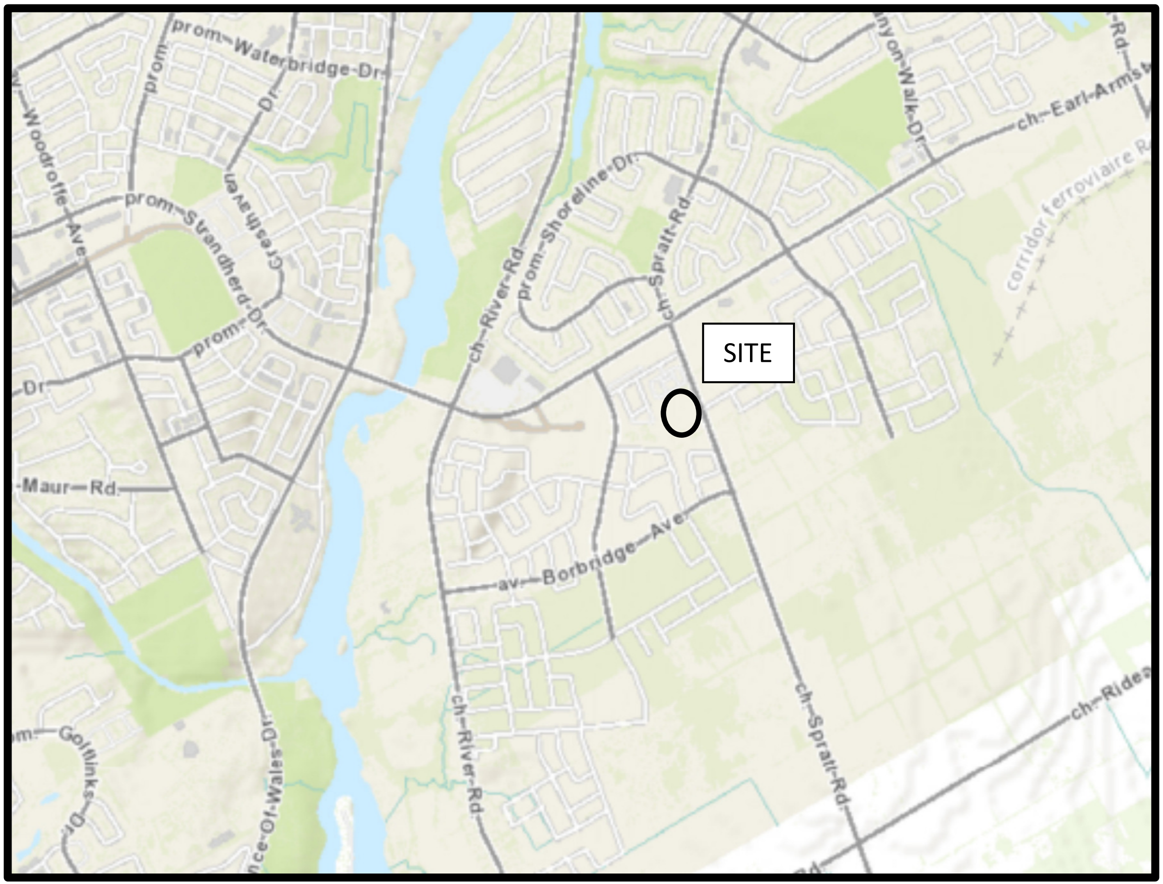
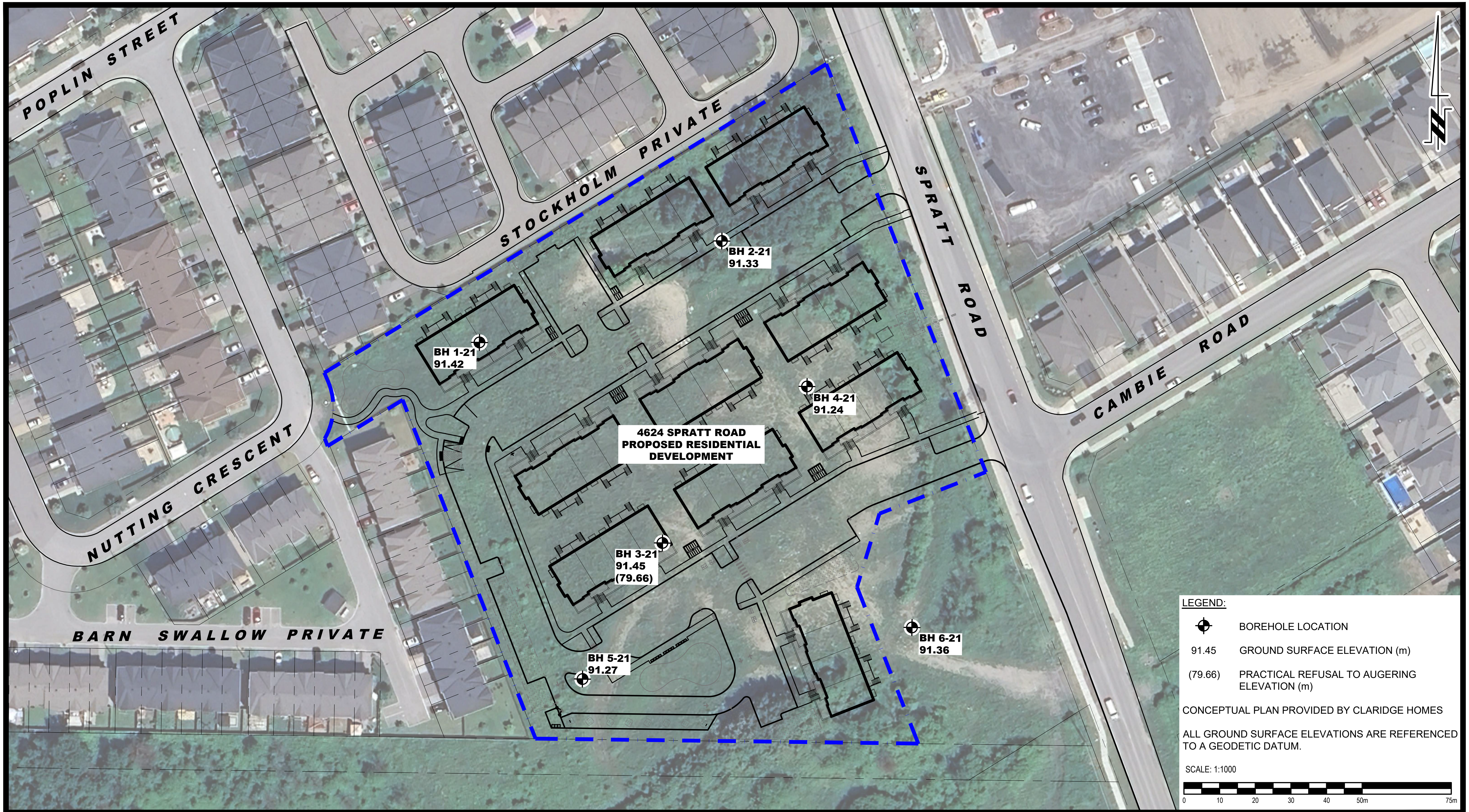


FIGURE 1

KEY PLAN

patersongroup



LEGEND:

⊕	BOREHOLE LOCATION
91.45	GROUND SURFACE ELEVATION (m)
(79.66)	PRACTICAL REFUSAL TO AUGERING ELEVATION (m)

CONCEPTUAL PLAN PROVIDED BY CLARIDGE HOMES

ALL GROUND SURFACE ELEVATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:1000

0 10 20 30 40 50m 75m

PATERSON GROUP

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

NO.	REVISIONS	DATE	INITIAL
1	UPDATED CONCEPTUAL PLAN	15/01/2026	SD

CLARIDGE HOMES
GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
4624 SPRATT ROAD

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:1000

Date: 02/2021

Drawn by: NFRV

Report No.: PG5641-1

Checked by: SD

Dwg. No.: PG5641-1

Approved by: DJG

Revision No.: 1

11x17

p:\autocad drawings\geotechnical\pg56xx\pg5641\pg5641-1 test hole location plan (rev.01).dwg