PATERSON GROUP

Geotechnical Investigation

s

Proposed Residential Development

Block 3 – SNTC Lands
3288 Greenbank Road - Ottawa, Ontario

Prepared for Mattamy Homes

Report PG5608-1 Revision 1 - dated August 28, 2023

Table of Contents

Appendices

1.0 Introduction

Paterson Group (Paterson) was commissioned by Mattamy Homes to prepare a geotechnical investigation report for the proposed residential development to be located at 3288 Greenbank Road, Ottawa, Ontario, which is designated as Block 3 of the SNTC Lands (refer to Figure 1 - Key Plan presented in Appendix 2).

The objective of the geotechnical investigation was to:

☐ determine the subsoil and groundwater conditions at the site by means of test holes.

☐ provide geotechnical recommendations for the design of the proposed development including construction considerations which may affect its design.

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

2.0 Proposed Development

The subject site consists of Block 3 of the SNTC Lands. It is understood that the subject block is being considered for residential development. It is further understood that the proposed development will consist of townhouse style housing blocks. Local roadways, car parking and landscaped areas are also anticipated as part of the development. It is expected that the proposed development will be municipally serviced.

3.0 Method of Investigation

3.1 Field Investigation

Field Program

The field program for the current geotechnical investigation pertaining to Block 3 of the SNTC Lands was carried out from October 19 to 22, 2020. As part of our investigations, five (5) boreholes were completed across the subject site extending to a maximum depth of 18 m below existing ground surface. The test hole locations were placed in a manner to provide general coverage of the subject site. Previous investigations were also completed by Paterson within the SNTC Lands during the early stages of the development, between October 2012 and February 2019. One historical borehole BH 11-1 and one test pit TP 1 were located within the limits of Block 3. The test hole locations are illustrated on Drawing PG5608-1 - Test Hole Location Plan presented in Appendix 2.

The boreholes were completed using a low-clearance auger 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 two different techniques, namely, sampled directly from the auger flights (AU) or collected using a 50 mm diameter split- spoon (SS) sampler. The bedrock was cored to assess the bedrock quality. All samples were visually inspected and initially classified on site. The auger and split- spoon samples were placed in sealed plastic bags, and rock cores were placed in cardboard boxes. All samples were transported to our laboratory for further examination and classification. The depths at which the auger, split spoon and rock core samples were recovered from the boreholes are shown as AU, SS and RC, 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.

Rock samples were recovered from all the boreholes drilled during the current investigation (BH 1-20 to BH 5-20) using a core barrel and diamond drilling techniques. The bedrock samples were classified on site, placed in hard cardboard core boxes and transported to Paterson's laboratory. The depths at which rock core samples were recovered from the boreholes are presented as RC on the Soil Profile and Test Data sheets in Appendix 1.

The recovery value and a Rock Quality Designation (RQD) value were calculated for each drilled section of bedrock and are presented on the borehole logs. The recovery value is the length of the bedrock sample recovered over the length of the drilled section. The RQD value is the total length of intact rock pieces longer than 100 mm over the length of the core run. The values indicate the bedrock quality.

The subsurface conditions observed at the test hole locations were recorded in detail in the field. The soil profiles are presented on the Soil Profile and Test Data sheets in Appendix 1 of this report.

Groundwater

All boreholes were fitted with 51 mm diameter PVC groundwater monitoring wells. Typical monitoring well construction details are described below:

- ☐ 1.5 m of slotted 51 mm diameter PVC screen at the base of the boreholes.
- ☐ 51 mm diameter PVC riser pipe from the top of the screen to the ground surface.
- ☐ No. 3 silica sand backfill within annular space around screen.
- ☐ 300 mm thick bentonite hole plug directly above PVC slotted screen.
- ☐ Clean backfill from top of bentonite plug to the ground surface.

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 selected by Paterson to provide general coverage of the subject site. The test hole locations and ground surface elevation at each test hole location were surveyed by Paterson using a high precision GPS and referenced to a geodetic datum. The location of the test holes is presented on Drawing PG5608-1 - Test Hole Location Plan in Appendix 2.

3.3 Laboratory Testing

The soil samples recovered from the field investigation were examined in our laboratory to review field notes and soil samples.

Four (4) samples were submitted for grain size analysis testing. In addition, as part of the initial investigation of the SNTC development, Atterberg limit testing was completed on selected samples from the historical test holes completed during the previous investigation. The results are presented on the test sheets presented in Appendix 1 and are further discussed in Sections 4 and 5.

4.0 Observations

4.1 Surface Conditions

Currently, the subject site is under the early stages of development, and it formerly consisted of agricultural lands and associated farmhouse and outbuildings occupying the northeast portion of the site. The majority of the ground surface across the subject site is relatively flat and slopes gradually downwards to the west.

The site is bound by Greenbank Road to the east, Chapman Mills Drive to the north, and by ongoing subdivisions of the SNTC to the other sides.

4.2 Subsurface Profile

Overburden

Generally, the soil conditions encountered at the test hole locations consist of a cultivated topsoil/organic layer followed by a silty clay deposit overlying a compact to dense, glacial till layer. The silty clay deposit was observed to consist of a very stiff to stiff brown crust at the top, followed by firm grey silty clay at an approximate depth of 3m below existing ground surface. Bedrock consisting of poor to excellent quality grey interbedded limestone and dolostone was cored at all boreholes at depths of 9 to 11 m below the existing ground surface

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

Bedrock

Based on available geological mapping, the bedrock in this area mostly consists of interbedded limestone and dolomite of the Gull River formation with an overburden drift thickness of 10 to 15 m depth

4.3 Groundwater

Groundwater levels (GWL) were measured in the monitoring wells installed in the boreholes and results are summarized in Table 1. It should be noted that surface water can become perched within a backfilled borehole, which can lead to higher than normal groundwater level readings. The long-term groundwater level can also be estimated based on moisture levels and color of the recovered soil samples.

Based on these observations, the long-term groundwater table is expected between 2.5 to 3 m below original ground surface. It should be noted that groundwater levels are subject to seasonal fluctuations. Therefore, the groundwater levels could vary at the time of construction.

Table 1 - Summary of Groundwater Level Readings

Borehole Number	Ground Surface Elevation (m)	Groundwater Level (m)	Groundwater Elevation (m)	Recording Date
BH 1	92.70	2.26	90.44	October 29, 2020
BH 2	92.62	0.84	91.78	
BH 3	93.95	0.87	93.08	
BH 4	95.03	0.33	94.70	
BH 5	94.52	1.69	92.83	

5.0 Discussion

5.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is considered suitable for the proposed residential development. It is recommended that the proposed buildings be founded over conventional spread footings bearing on the undisturbed stiff brown silty clay bearing surface. Paterson shall be provided with design grading plans and updated development concepts, once available, to confirm our geotechnical design assumptions.

Due to the presence of the silty clay deposit at the subject site, a permissible grade raise restriction will be required for the proposed grading. If higher than the 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. Our permissible grade raise recommendations are provided under Subsection 5.3 and the recommended grade raise areas are shown on Drawing PG5608-2 - Permissible Grade Raise Restriction Plan in Appendix 2.

Due to the presence of a low to medium sensitivity marine clay within the proposed development, the site will be subjected to tree planting setback restrictions. Our tree planting setback recommendations are provided under Subsection 6.7 and the recommended tree planting setback areas are shown on Drawing PG5608-3 – Tree Planting Setback Restrictions Plan in Appendix 2.

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

5.2 Site Grading and Preparation

Stripping Depth

Topsoil and deleterious fill, such as those containing significant 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.

Existing foundation walls and other construction debris should be entirely removed from within the building perimeters. Under paved areas, existing construction remnants such as foundation walls should be excavated to a minimum of 1 m below final grade.

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. Granular material should be tested and approved prior to delivery to the site. The fill should be placed in 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 and beneath parking areas where settlement of the ground surface is of minor concern. In landscaped areas, these materials should be spread in thin lifts and at least compacted by the tracks of the spreading equipment to minimize voids. If these materials are to be used to build up the subgrade level for areas to be paved, they should be compacted in thin lifts to a minimum density of 95% of the SPMDD. Non-specified existing fill and site-excavated soils are not suitable for use as backfill against foundation walls unless a composite drainage blanket connected to a perimeter drainage system is provided.

5.3 Foundation Design

Bearing Resistance Values (Conventional Shallow Footings)

Using continuously applied loads, footings for the proposed building placed over an undisturbed silty clay or glacial till bearing surface can be designed using the bearing resistance values presented in Table 42

Table 2 - Bearing Resistance Values

Bearing Surface	Bearing Resistance Value at SLS (kPa)	Factored Bearing Resistance Value at ULS (kPa)
Stiff brown silty clay	100	200
Compact Glacial till	150	300

Note: Strip footings, up to 2.5 m wide, and pad footings, up to 5 m wide, placed over a silty clay bearing surface can be designed using the above noted bearing resistance values.

The bearing resistance values are provided on the assumption that the footings will be placed on undisturbed soil bearing surfaces or clean, surface-sounded bedrock bearing surface.

An undisturbed soil bearing surface consists of one from which all topsoil and deleterious materials, such as loose, frozen or disturbed soil, have been removed, in the dry, prior to the placement of concrete footings.

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.

Settlement/Grade Raise

Based on the undrained shear strength values of the silty clay deposit encountered within the vicinity of the subject site, a **permissible grade raise restriction of 2.3 m** and **3.0 m** is recommended for the western and eastern portions of the site, respectively. Reference should be made to Drawing PG5608-2 – Permissible Grade Raise Plan presented in Appendix 2. The final grading plans for the development should be reviewed by Paterson.

5.4 Design for Earthquakes

The site class for seismic site response can be taken as **Class C** for foundations constructed at the subject site, according to Table 4.1.8.4.A of the 2012 Ontario Building Code (OBC 2012). A higher seismic site class, such as Class A, would be applicable for the proposed building if a site specific seismic shear wave velocity test is completed at the subject site.

The soils underlying the subject site are not susceptible to liquefaction. Reference should be made to the latest revision of the 2012 Ontario Building Code for a full discussion of the earthquake design requirements.

5.5 Floor Slab Construction

With the removal of all topsoil and deleterious fill, containing organic matter, within the footprints of the proposed buildings, 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.

5.6 Pavement Design

For design purposes, the pavement structure presented in the following tables could be used for the design of driveways, local residential streets, and roadways with bus traffic.

Table 3 – Recommended Pavement Structure – Driveways and 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 soil, or OPSS Granular B Type I or II material over in-situ soil. **Minimum Performance Graded** (PG) 58-34 asphalt cement should be used for this Pavement Structure.	

Table 4 – Recommended Pavement Structure – Local Residential Roadways

Thickness (mm)	Material Description
40	**Wear Course –** Superpave 12.5 Asphaltic Concrete
50	**Wear Course –** Superpave 19.0 Asphaltic Concrete
150	**BASE –** OPSS Granular A Crushed Stone
400	**SUBBASE –** OPSS Granular B Type II
SUBGRADE – Either in-situ soil, or OPSS Granular B Type I or II material over in-situ soil. **Minimum Performance Graded** (PG) 58-34 asphalt cement should be used for this Pavement Structure.	

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.

Minimum Performance Graded (PG) 58-34 asphalt cement should be used. The pavement granular base and subbase should be placed in maximum 300 mm thick lifts and compacted to a minimum of 100% of the material's SPMDD using suitable vibratory equipment.

Pavement Structure Drainage

Satisfactory performance of the pavement structure is largely dependent on 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.

6.0 Design and Construction Precautions

6.1 Foundation Drainage and Backfill

Foundation Drainage and Backfill

A perimeter foundation drainage system is required for the proposed buildings. The system should consist of a 150 mm diameter perforated corrugated plastic or PVC 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 below-grade structure. The clear stone should be wrapped in a non-woven geotextile. The pipe should have a positive outlet, such as a gravity connection to a storm sewer or sump pump.

Backfill against the exterior sides of the foundation walls should consist of free-draining, non-frost susceptible granular materials. 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 drainage geocomposite, such as Delta Drain 6000, connected to the perimeter foundation drainage system. 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 1.5 m thick soil cover (or equivalent) should be provided in this regard.

Other 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 proper structure. These footings should be provided with a minimum 2.1 m thick soil cover (or insulation equivalent).

6.3 Excavation Side Slopes

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

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.

6.4 Pipe Bedding and Backfill

At least 150 mm of OPSS Granular A should be used for pipe bedding for sewer and water pipes. The bedding should extend to the spring line of the pipe. Cover material, from the spring line to at least 300 mm above the obvert of the pipe, should consist of OPSS Granular A or Granular B Type II with a maximum size of 25 mm. The bedding layer should be increased to a minimum thickness of 300 mm where the subgrade consists of grey silty clay. The bedding and cover materials should be placed in maximum 225 mm thick lifts compacted to 95% of the material’s standard Proctor maximum dry density.

It should generally be possible to re-use the upper portion of the dry to moist (not wet) overburden material above the cover material if the excavation and filling operations are carried out in dry weather conditions. Any stones greater than 200 mm in their longest dimension should be removed from these materials prior to placement.

The backfill material within the frost zone (about 1.8 m below finished grade) should match the soils exposed at the trench walls to reduce potential differential frost heaving. The 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, clay seals should be provided in the service trenches. The seals should be a minimum of 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 impervious material placed in maximum 225 mm thick loose lifts 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 a maximum of 60 m intervals in the service trenches.

6.5 Groundwater Control

Groundwater Control for Building Construction

Based on our observations, it is anticipated that groundwater infiltration into the excavations should be low to medium and controllable using open sumps. Pumping from open sumps should be sufficient to control the groundwater influx through the sides of shallow excavations. The contractor should be prepared to direct water away from all bearing surfaces and subgrades, regardless of the source, to prevent disturbance to the founding medium.

Permit to Take Water

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

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

6.6 Winter Construction

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

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

In the event of construction during below zero temperatures, the founding stratum should be protected from freezing temperatures by the use of straw, propane heaters and tarpaulins or other suitable means. In this regard, the base of the excavations should be insulated from sub-zero temperatures immediately upon exposure and until such time as heat is adequately supplied to the building and the footings are protected with sufficient soil cover to prevent freezing at founding level.

Trench excavations and pavement construction are also difficult activities to complete during freezing conditions without introducing frost in the subgrade or in the excavation walls and bottoms. Precautions should be taken if such activities are to be carried out during freezing conditions.

6.7 Landscaping Considerations

Tree Planting Considerations

In accordance with the City of Ottawa Tree Planting in Sensitive Marine Clay Soils (2017 Guidelines), Paterson completed a soils review of the site to determine applicable tree planting setbacks. Atterberg limits testing and grain size analysis were completed for recovered silty clay samples at selected locations throughout the subject site. The soil samples were recovered from elevations below the anticipated design underside of footing elevation and 3.5 m depth below anticipated finished grade. The results of our testing are presented in Table 2 and Table 3 in Subsection 4.2 and in Appendix 1.

Low/Medium Sensitivity Clay Soils

Based on the Atterberg Limits test results, the modified plasticity limit for the encountered silty clay deposit at the subject site does not exceed 40%. Therefore, the encountered silty clay deposit is classified as low to medium sensitivity clay soil as per City Guidelines. **Large trees (mature height over 14 m) can be planted within the subject site 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 tree height up to 7.5m) and medium size trees (mature tree height 7.5 m to 14 m) provided that the conditions noted below are met**:

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

- ☐ A small tree must be provided with a minimum of 25 m^3 of available soils 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), as noted on the subdivision Grading Plan.

Above-Ground Swimming Pools, Hot Tubs, Decks and Additions

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

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

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

7.0 Recommendations

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

☐ Review of the grading and site servicing plans from a geotechnical perspective.

☐ Review of the proposed excavation activities

☐ Observation of all bearing surfaces prior to the placement of concrete.

☐ Sampling and testing of the concrete and fill materials.

☐ Periodic observation of the condition of unsupported excavation side slopes in excess of 3 m in height, if applicable.

☐ Observation of all subgrades prior to backfilling.

☐ Field density tests to ensure that the specified level of compaction has been achieved.

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

All excess soils generated by construction activities should be handled as per *Ontario Regulation 406/19: On-Site and Excess Soil Management*.

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

8.0 Statement of Limitations

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

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

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

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

Paterson Group Inc.

LICENSED PROFESSIONAL ENGINEER
August 28, 2023
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Report Distribution:

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APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

RECORDS OF BOREHOLES BY OTHERS

ATTERBERG LIMITS TESTING RESULTS

GRAIN SIZE DISTRIBUTION TEST RESULTS

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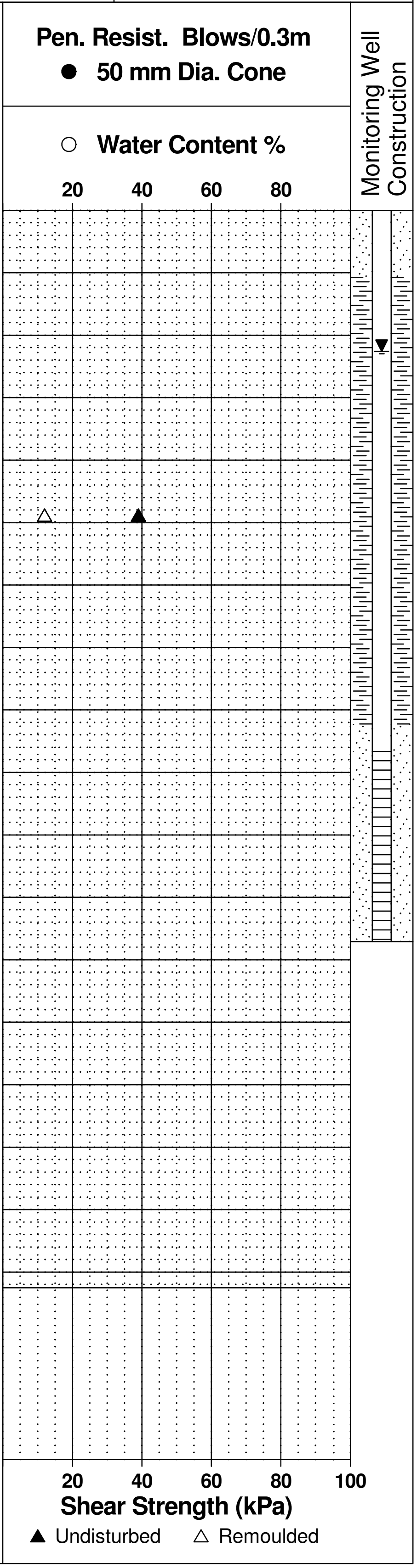
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development
3288 Greenbank Road, Ottawa, Ontario

DATUM Geodetic
REMARKS
BORINGS BY CME-55 Low Clearance Drill
DATE October 19, 2020
FILE NO. **PG5608**
HOLE NO. **BH 1-20**

SOIL DESCRIPTION	Layer bottom (m)	TYPE	NUMBER	% RECOVERY	N VALUE or RQD
GROUND SURFACE					
Brown **SILTY CLAY** with sand, trace organics	0.05	AU	1		
Very stiff to stiff, brown **SILTY CLAY**	3.05	SS	2	100	3
Firm, grey **SILTY CLAY**	6.30	SS	3	100	W
GLACIAL TILL: Grey clayey silt with sand, gravel, cobbles, occasional boulders - clay content increasing with depth	9.14	SS SS SS SS	4 5 6 7	67 67 42	10 14 9 19
Very dense, brown **SILTY fine to medium SAND,** trace gravel	10.21	SS SS	8 9	 67	50+ 50+
BEDROCK: Poor to excellent quality, grey interbedded limestone and dolostone	17.25	RC RC RC RC RC RC	1 2 3 4 5 6	100 100 100 100 100 100	38 72 96 62 92 100
End of Borehole (GWL @ 2.26m - Oct. 29, 2020)					

DEPTH (m)	ELEV. (m)
0	92.70
1	91.70
2	90.70
3	89.70
4	88.70
5	87.70
6	86.70
7	85.70
8	84.70
9	83.70
10	82.70
11	81.70
12	80.70
13	79.70
14	78.70
15	77.70
16	76.70
17	75.70



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development
3288 Greenbank Road, Ottawa, Ontario

DATUM Geodetic

REMARKS

BORINGS BY CME-55 Low Clearance Drill

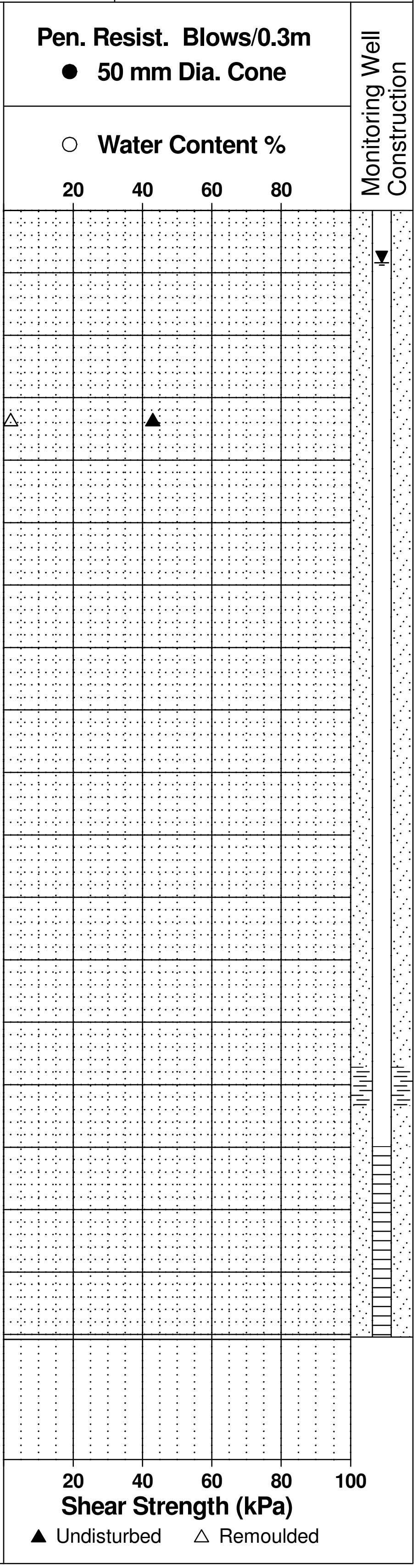
DATE October 20, 2020

FILE NO. PG5608

HOLE NO. BH 2-20

SOIL DESCRIPTION	Depth to base (m)	SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD
GROUND SURFACE					
Brown **SILTY CLAY** with sand, trace organics	0.05	AU	1		
Very stiff to stiff, brown **SILTY CLAY**	3.05	SS	2	100	3
Firm, grey **SILTY CLAY**	6.10	SS	3	17	2
GLACIAL TILL: Grey silty clay to clayey silt with sand, gravel, cobbles, occasional boulders	10.77	SS	4	75	7
		SS	5	67	58
		SS	6	33	2
BEDROCK: Fair to excellent quality, grey interbedded limestone and dolostone	18.08	RC	1	100	70
		RC	2	100	26
		RC	3	100	69
		RC	4	100	34
		RC	5	100	100
		RC	6	100	67
		RC	7	100	100
End of Borehole					
(GWL @ 0.84m - Oct. 29, 2020)					

DEPTH (m)	ELEV. (m)
0	92.62
1	91.62
2	90.62
3	89.62
4	88.62
5	87.62
6	86.62
7	85.62
8	84.62
9	83.62
10	82.62
11	81.62
12	80.62
13	79.62
14	78.62
15	77.62
16	76.62
17	75.62
18	74.62



SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development
3288 Greenbank Road, Ottawa, Ontario

DATUM Geodetic

REMARKS

BORINGS BY CME-55 Low Clearance Drill

DATE October 21, 2020

FILE NO. PG5608

HOLE NO. BH 3-20

SOIL DESCRIPTION	Depth (m)
GROUND SURFACE	
Brown **SILTY CLAY,** trace organics	0.05
Very stiff, brown **SILTY CLAY**	1.73
GLACIAL TILL: Brown silty sand to sandy silt with gravel, cobbles, boulders	3.05
GLACIAL TILL: Grey clayey silt with sand, gravel, cobbles, occasional boulders - clay content increasing with depth	8.84
Very dense, grey **SILTY fine to medium SAND** with gravel	9.37
BEDROCK: Very poor to excellent quality, grey interbedded limestone and dolostone - interbedded black shale from 10.7 to 15.8m depth	17.93
End of Borehole (GWL @ 0.87m - Oct. 29, 2020)	

SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD
AU	1		
SS	2	67	59
SS	3	42	10
SS	4	33	52
SS	5	42	26
SS	6	33	12
SS	7	11	50+
RC	1	100	16
RC	2	100	50
RC	3	100	64
RC	4	100	35
RC	5	100	46
RC	6	100	73
RC	7	100	70
RC	8	100	85
RC	9	100	98

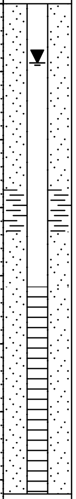
DEPTH (m)	ELEV. (m)
0	93.95
1	92.95
2	91.95
3	90.95
4	89.95
5	88.95
6	87.95
7	86.95
8	85.95
9	84.95
10	83.95
11	82.95
12	81.95
13	80.95
14	79.95
15	78.95
16	77.95
17	76.95

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %
20 40 60 80

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

Monitoring Well Construction



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development
3288 Greenbank Road, Ottawa, Ontario

DATUM Geodetic

REMARKS

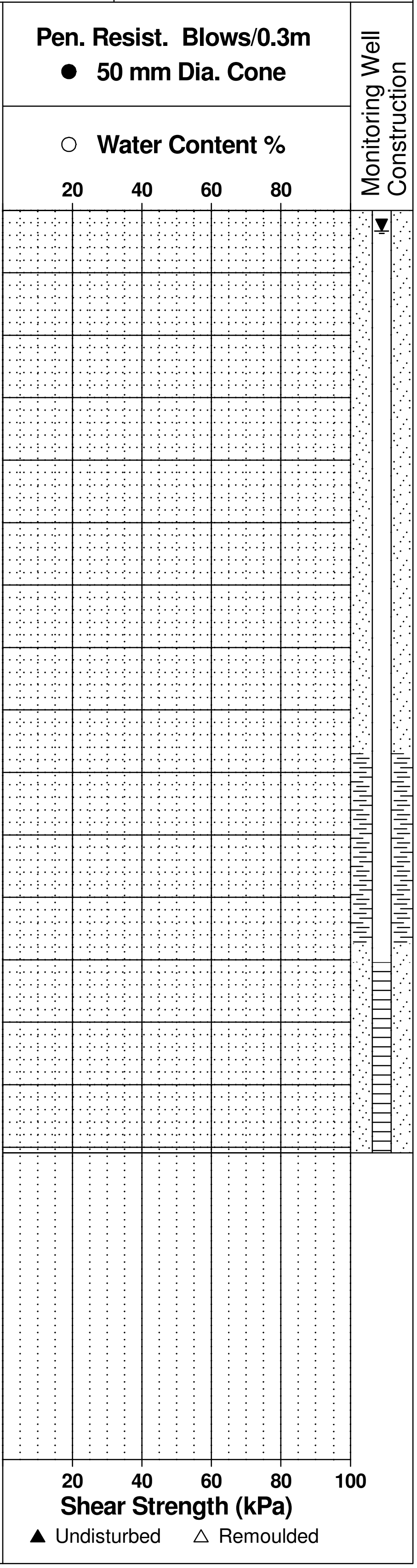
BORINGS BY CME-55 Low Clearance Drill

DATE October 21, 2020

FILE NO. PG5608

HOLE NO. BH 4-20

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	95.03
FILL: Crushed stone with silty sand 0.10		AU	1				
Brown **SILTY CLAY,** trace organics 0.15						1	94.03
Very stiff to stiff, brown **SILTY CLAY,** some sand, trace gravel 2.59		SS	2	67	22	2	93.03
GLACIAL TILL: Brown to grey clayey silt with sand, gravel, cobbles, occasional boulders		SS	3	50	21	3	92.03
						4	91.03
		SS	4	75	35	5	90.03
						6	89.03
		SS	5	50	40	7	88.03
		SS	6	50	36	8	87.03
9.24						9	86.03
BEDROCK: Very poor to excellent quality, grey interbedded limestone and dolostone		RC	1	100	0		
- black shale from 9.24 to 9.7m, 12.1 to 12.2m and 13 tp 13.2m depths		RC	2	100	63	10	85.03
		RC	3	100	86	11	84.03
						12	83.03
		RC	4	100	80	13	82.03
						14	81.03
15.09		RC	5	100	93	15	80.03
End of Borehole							
(GWL @ 0.33m - Oct. 29, 2020)							



SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development
3288 Greenbank Road, Ottawa, Ontario

DATUM Geodetic

REMARKS

BORINGS BY CME-55 Low Clearance Drill

DATE October 22, 2020

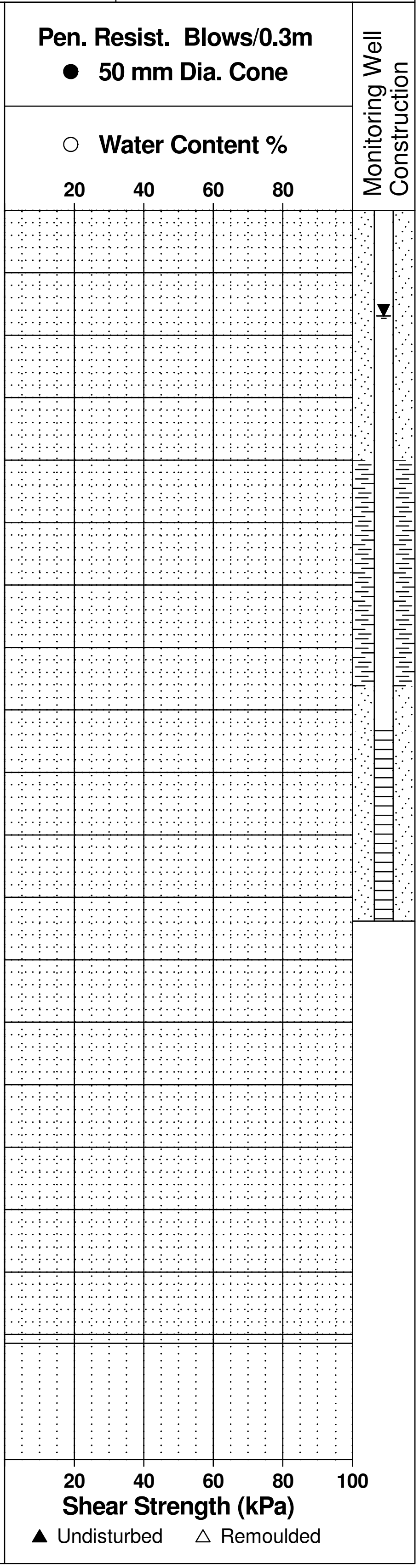
FILE NO. PG5608

HOLE NO. BH 5-20

SOIL DESCRIPTION	Depth to base (m)
GROUND SURFACE	
FLL: Crushed stone with sand, some clay	0.25
FILL: Browns andy silt with gravel, cobbles, occasional boulders, trace clay	2.97
GLACIAL TILL: Grey clayey silt with sand, gravel, cobbles, boulders	8.10
GLACIAL TILL: Grey silty sand with gravel, cobbles, boulders, trace clay	8.71
BEDROCK: Fair to excellent quality, black to grey interbedded limestone and dolostone	18.14
End of Borehole	
(GWL @ 1.69m - Oct. 29, 2020)	

SAMPLE TYPE	NUMBER	% RECOVERY	N VALUE or RQD
AU	1		
SS	2	83	46
SS	3	42	6
SS	4	12	23
SS	5	42	12
SS	6	42	78
RC	1	100	54
RC	2	100	82
RC	3	100	83
RC	4	100	63
RC	5	100	67
RC	6	100	66
RC	7	100	59

DEPTH (m)	ELEV. (m)
0	94.52
1	93.52
2	92.52
3	91.52
4	90.52
5	89.52
6	88.52
7	87.52
8	86.52
9	85.52
10	84.52
11	83.52
12	82.52
13	81.52
14	80.52
15	79.52
16	78.52
17	77.52
18	76.52



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development
3288 Greenbank Road, Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.

FILE NO. PG2743

REMARKS

HOLE NO. TP 1

BORINGS BY Excavator

DATE February 19, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Piezometer Construction
GROUND SURFACE						0	93.85	
TOPSOIL 0.20								
Brown **SILTY SAND** with clay 0.40								
Stiff, brown **CLAYEY SILT**						1	92.85	
		G	1					
1.80								
GLACIAL TILL: Brown clayey silt with sand, gravel, cobbles and boulders		G	2			2	91.85	▽
		G	3					
2.60								
End of Test Pit (GWL @ 2.0m depth based on field observations)								

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

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

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)

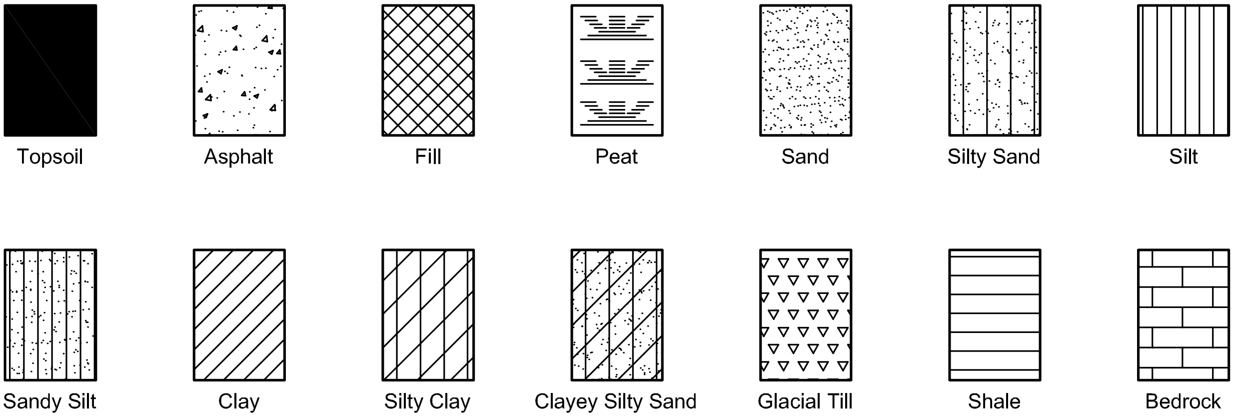
OC Ratio Overconsolidaton ratio = p'_c / p'_o
Void Ratio Initial sample void ratio = volume of voids / volume of solids
Wo - Initial water content (at start of consolidation test)

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.

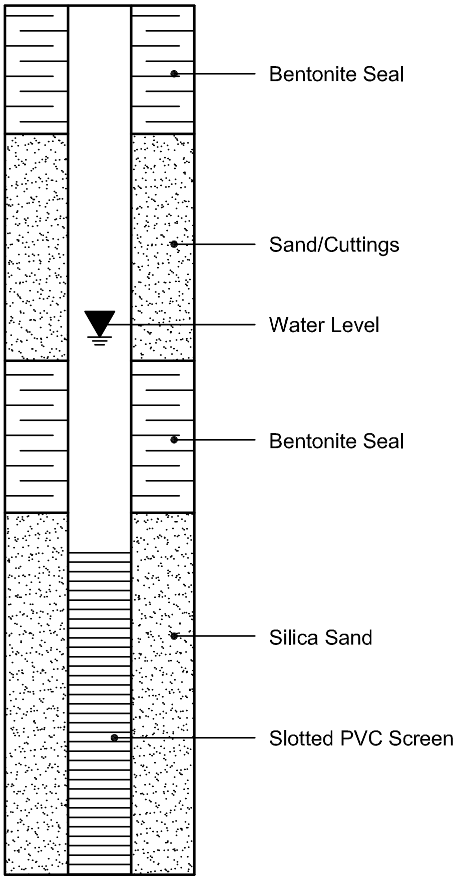
SYMBOLS AND TERMS (continued)

STRATA PLOT

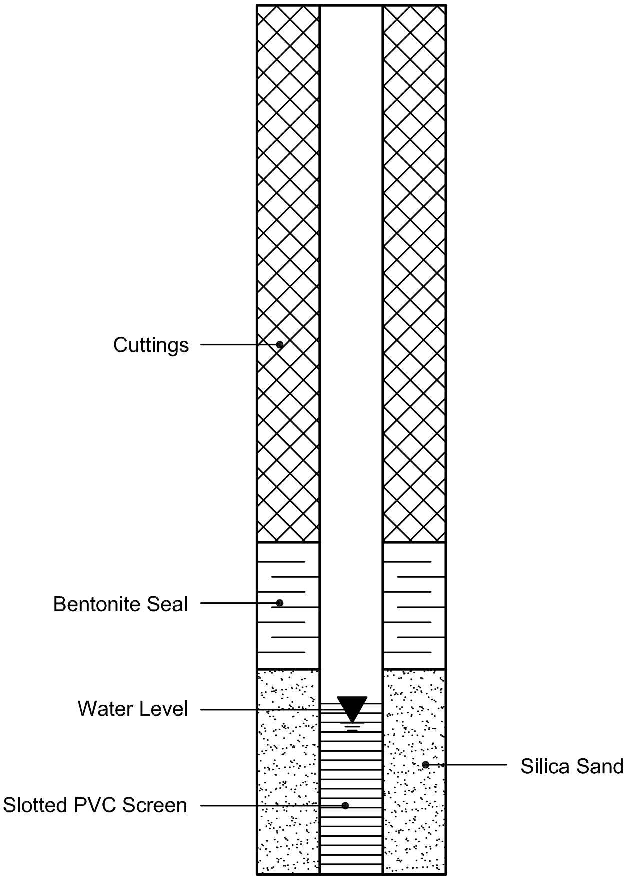


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



PROJECT: 11-1121-0259-1000

RECORD OF BOREHOLE: 11-1

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: December 7, 2011

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80 SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} WATER CONTENT PERCENT Wp ⊢ ○W ⊣ Wl 20 40 60 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m				
		GROUND SURFACE									
0	Power Auger 200 mm Diam. (Hollow Stem)	TOPSOIL		0.00							
		Very stiff grey brown SILTY CLAY (Weathered Crust)		0.15							
1					1	50 DO	8				
		Compact to very dense grey brown to grey SILTY SAND, some gravel, trace clay, with cobbles and boulders (GLACIAL TILL)		1.45	2	50 DO	40				
2					3	50 DO	25				
3					4	50 DO	28				
4					5	50 DO	>50				
5		End of Borehole Auger Refusal		5.00							
6											
7											
8											
9											
10											

DEPTH SCALE

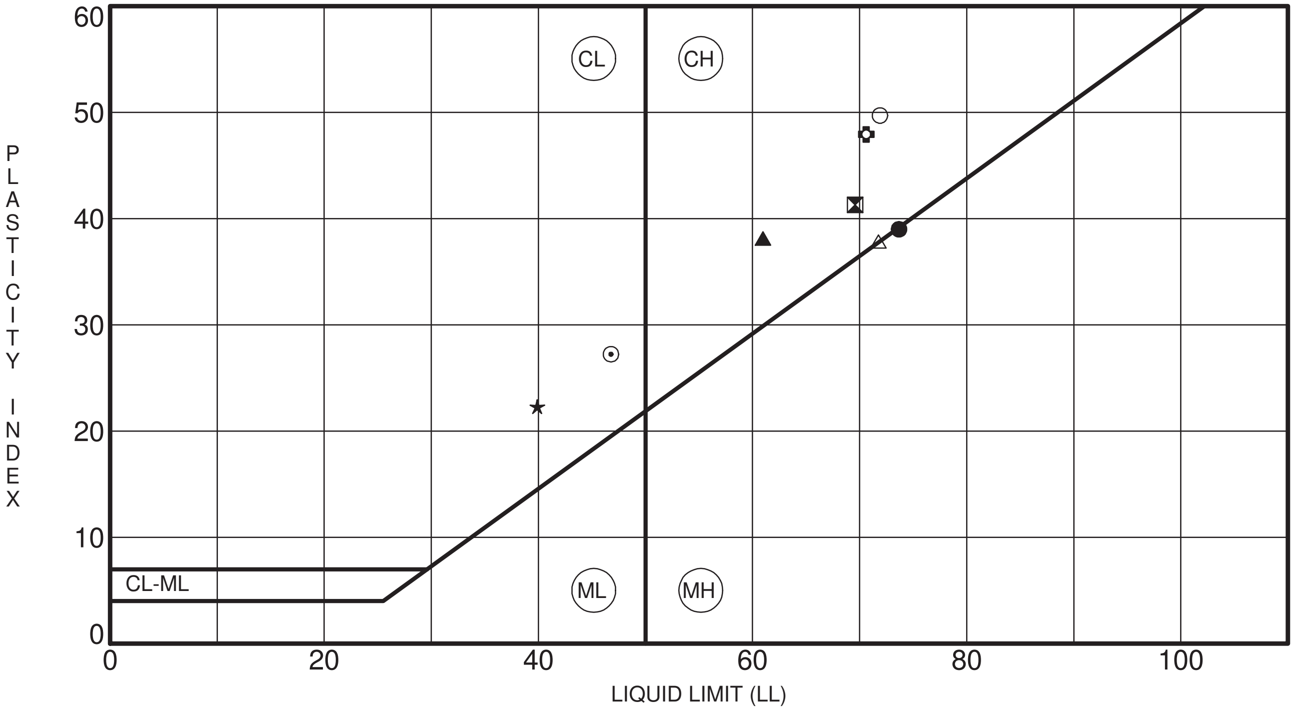
1 : 50

Golder Associates

LOGGED: H.C.

CHECKED: C.K.

MIS-BHS 001 1111210259.GPJ GAL-MIS.GDT 12/19/11 P.G.



Specimen Identification			LL	PL	PI	Fines	Classification
●	**TP 1**	**G 1**	**74**	**35**	**39**		**CH - Inorganic clays of high plasticity**
⧗	**TP 2**	**G 3**	**70**	**28**	**41**		**CH - Inorganic clays of high plasticity**
▲	**TP 3**	**G 3**	**61**	**23**	**38**		**CH - Inorganic clays of high plasticity**
★	**TP 4**	**G 2**	**40**	**18**	**22**		**CL - Inorganic clays of low plasticity**
⊙	**TP 5**	**G 2**	**47**	**20**	**27**		**CL - Inorganic clays of low plasticity**
✿	**TP 6**	**G 3**	**71**	**23**	**48**		**CH - Inorganic clays of high plasticity**
○	**TP 7**	**G 3**	**72**	**22**	**50**		**CH - Inorganic clays of high plasticity**
△	**TP 8**	**G 2**	**72**	**34**	**38**		**CH - Inorganic clays of high plasticity**

CLIENT **Caivan Communities**

FILE NO. **PG2743**

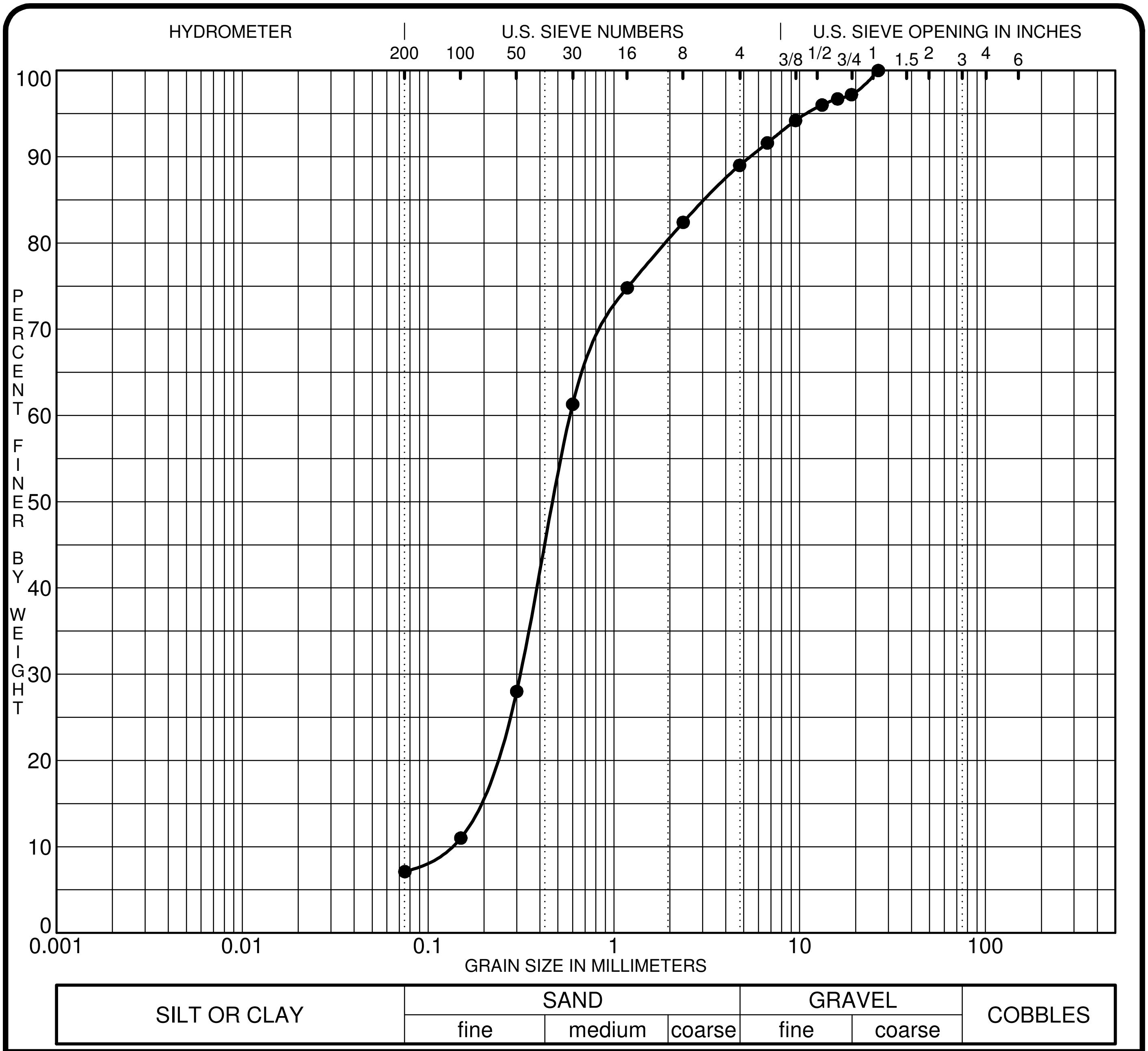
PROJECT **Geotechnical Investigation - Proposed Residential Develop. - 3288 Greenbank**

DATE **19 Feb 19**

patersongroup **Consulting Engineers**

9 Auriga Drive, Ottawa, Ontario, K2E 7T9

ATTERBERG LIMITS' RESULTS



	Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH 1-20 SS8,SS9**	**SAND-GRAVEL, trace Silt and Clay**					**1.33**	**4.7**

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 1-20 SS8,SS9**	**26.50**	**0.58**	**0.313**	**0.1256**	**11.0**	**81.9**	**7.1**	

CLIENT **Mattamy Homes**

FILE NO. **PG5608**

PROJECT **Geotechnical Investigation**

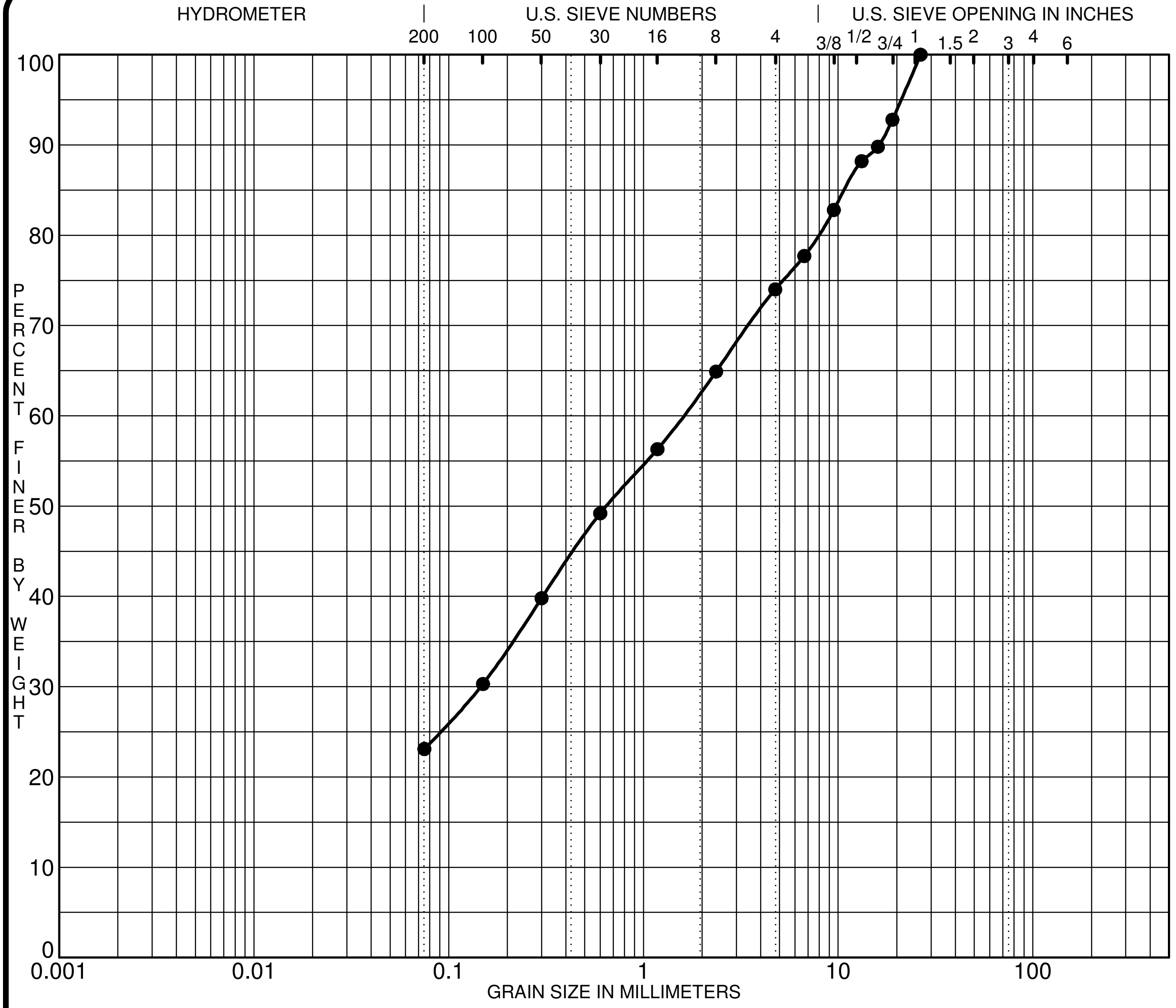
Proposed Residential Development - Block 3 - SNTC

DATE **19 Oct 20**

patersongroup **Consulting Engineers**

9 Auriga Drive, Ottawa, Ontario, K2E 7T9

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH 2-20**	**SS 6**	**CLAYEY SILTY SAND-GRAVEL**						

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 2-20**	**SS 6**	**26.50**	**1.59**	**0.146**		**26.0**	**50.9**	**23.1**	

CLIENT **Mattamy Homes**

FILE NO. **PG5608**

PROJECT **Geotechnical Investigation**

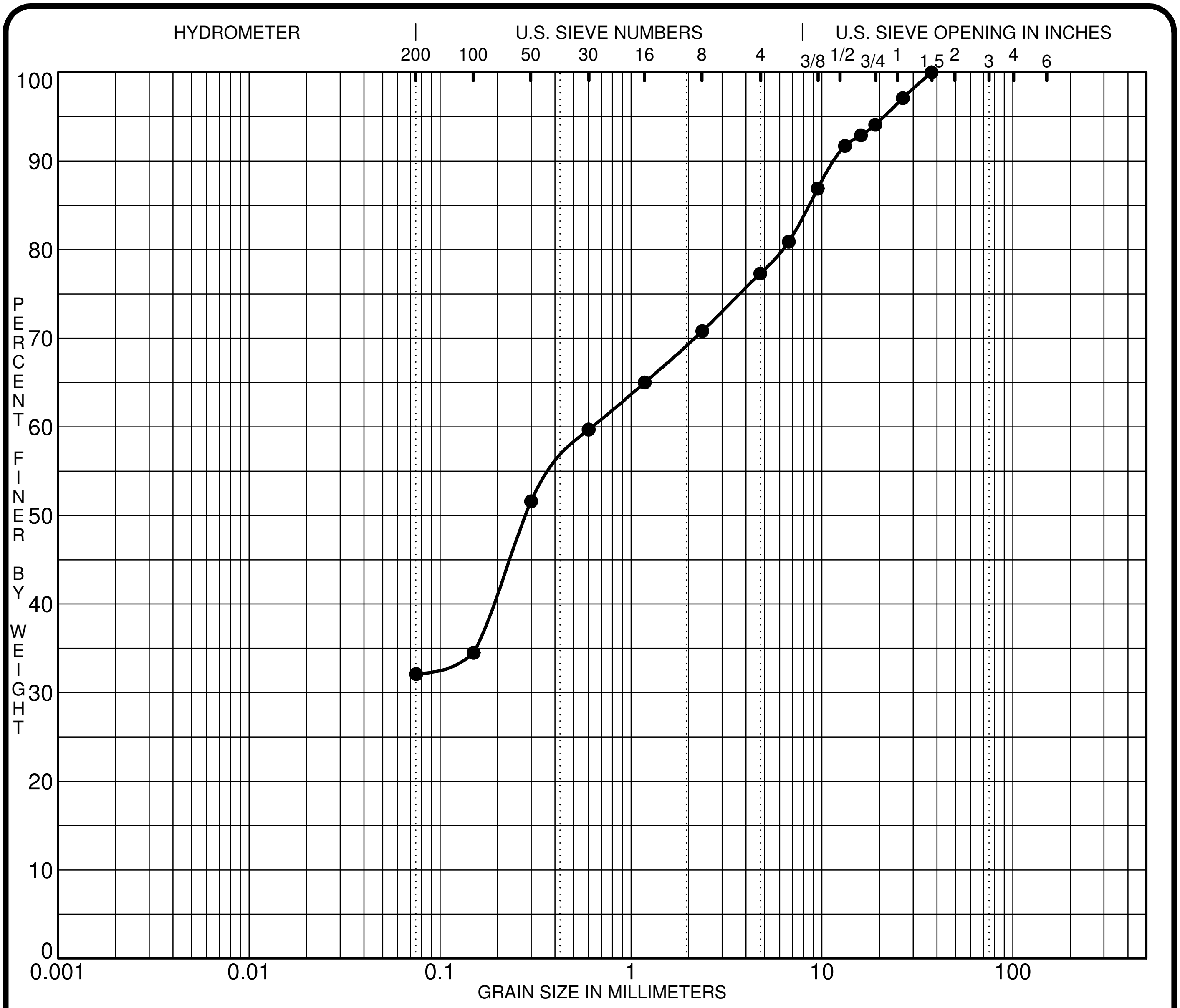
DATE **20 Oct 20**

Proposed Residential Development - Block 3 - SNTC

patersongroup **Consulting Engineers**

9 Auriga Drive, Ottawa, Ontario, K2E 7T9

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

	Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH 3-20 SS4,SS5**	**CLAYEY SILTY SAND-GRAVEL**						

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 3-20 SS4,SS5**	**37.50**	**0.62**			**22.7**	**45.2**	**32.1**	

CLIENT **Mattamy Homes**

FILE NO. **PG5608**

PROJECT **Geotechnical Investigation**

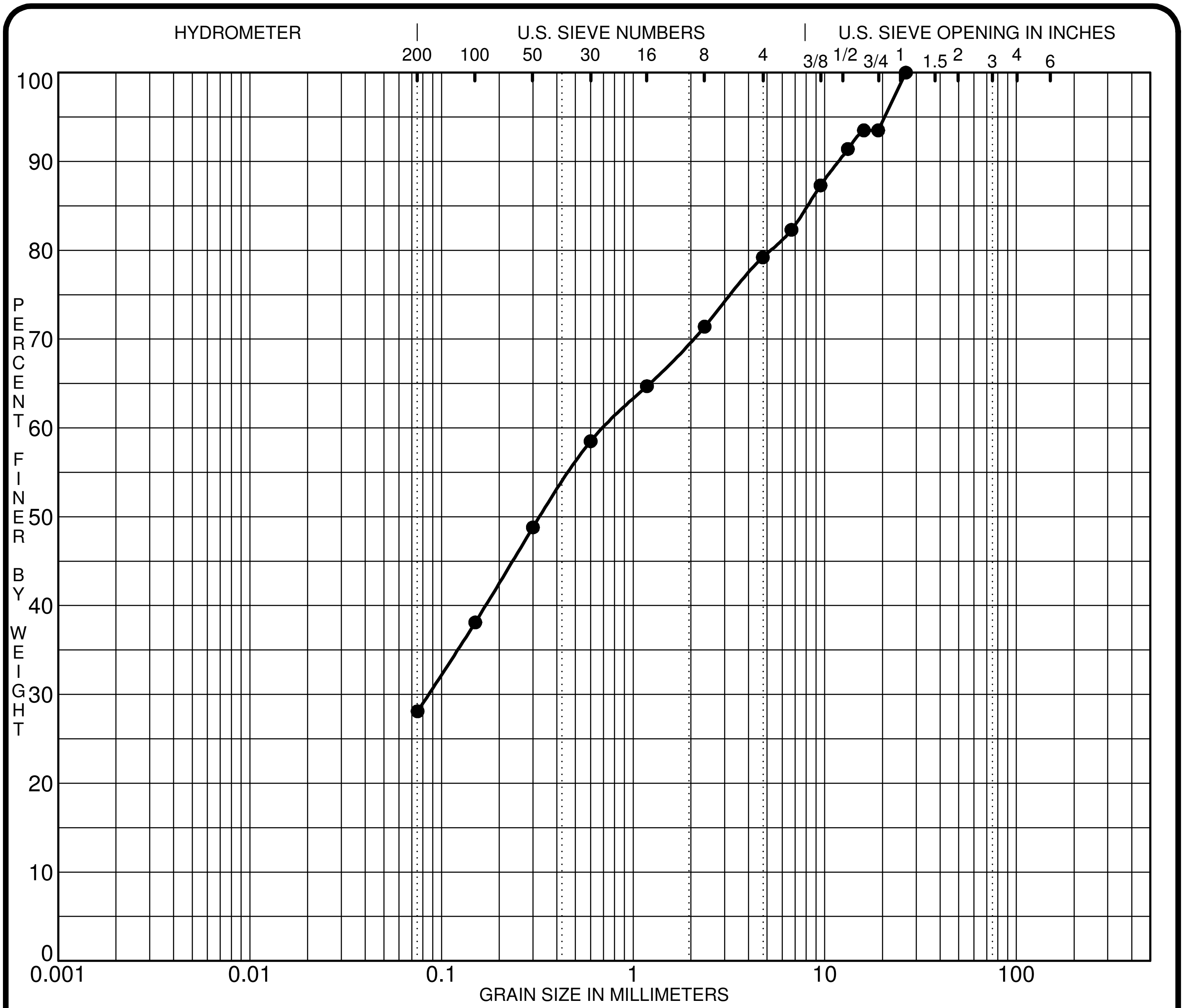
DATE **21 Oct 20**

Proposed Residential Development - Block 3 - SNTC

patersongroup **Consulting Engineers**

9 Auriga Drive, Ottawa, Ontario, K2E 7T9

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

	Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH 5-20 SS4,SS5**	**CLAYEY SILTY SAND-GRAVEL**						

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 5-20 SS4,SS5**	**26.50**	**0.71**	**0.086**		**20.8**	**51.1**	**28.1**	

CLIENT **Mattamy Homes**

FILE NO. **PG5608**

PROJECT **Geotechnical Investigation**

DATE **22 Oct 20**

Proposed Residential Development - Block 3 - SNTC

patersongroup **Consulting Engineers**

9 Auriga Drive, Ottawa, Ontario, K2E 7T9

GRAIN SIZE DISTRIBUTION

APPENDIX 2

FIGURE 1 – KEY PLAN

DRAWING PG5608-1 - TEST HOLE LOCATION PLAN

DRAWING PG5608-2 – PERMISSIBLE GRADE RAISE RESTRICTION PLAN

DRAWING PG5608-3 – TREE PLANTING SETBACK RESTRICTIONS PLAN

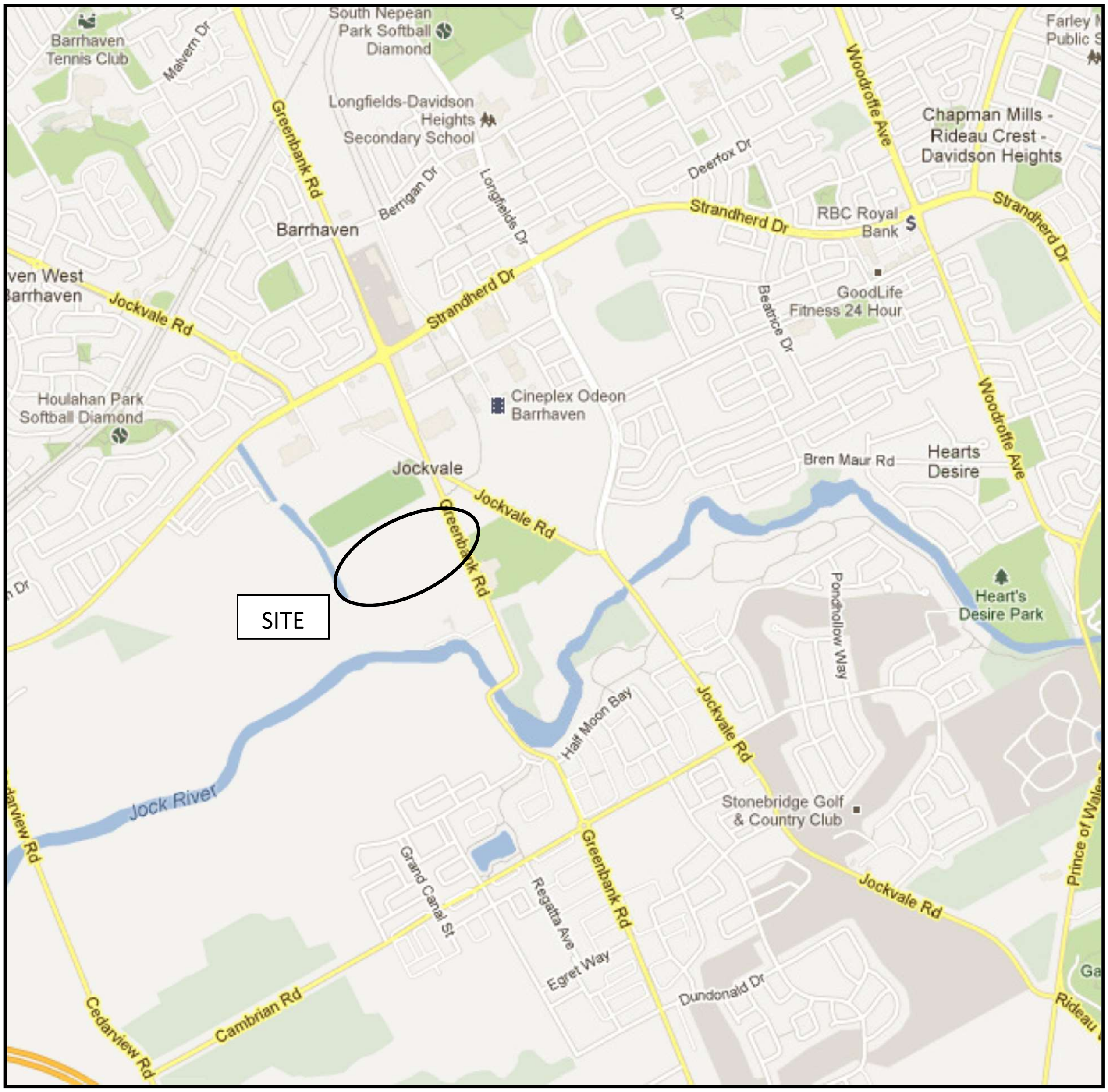
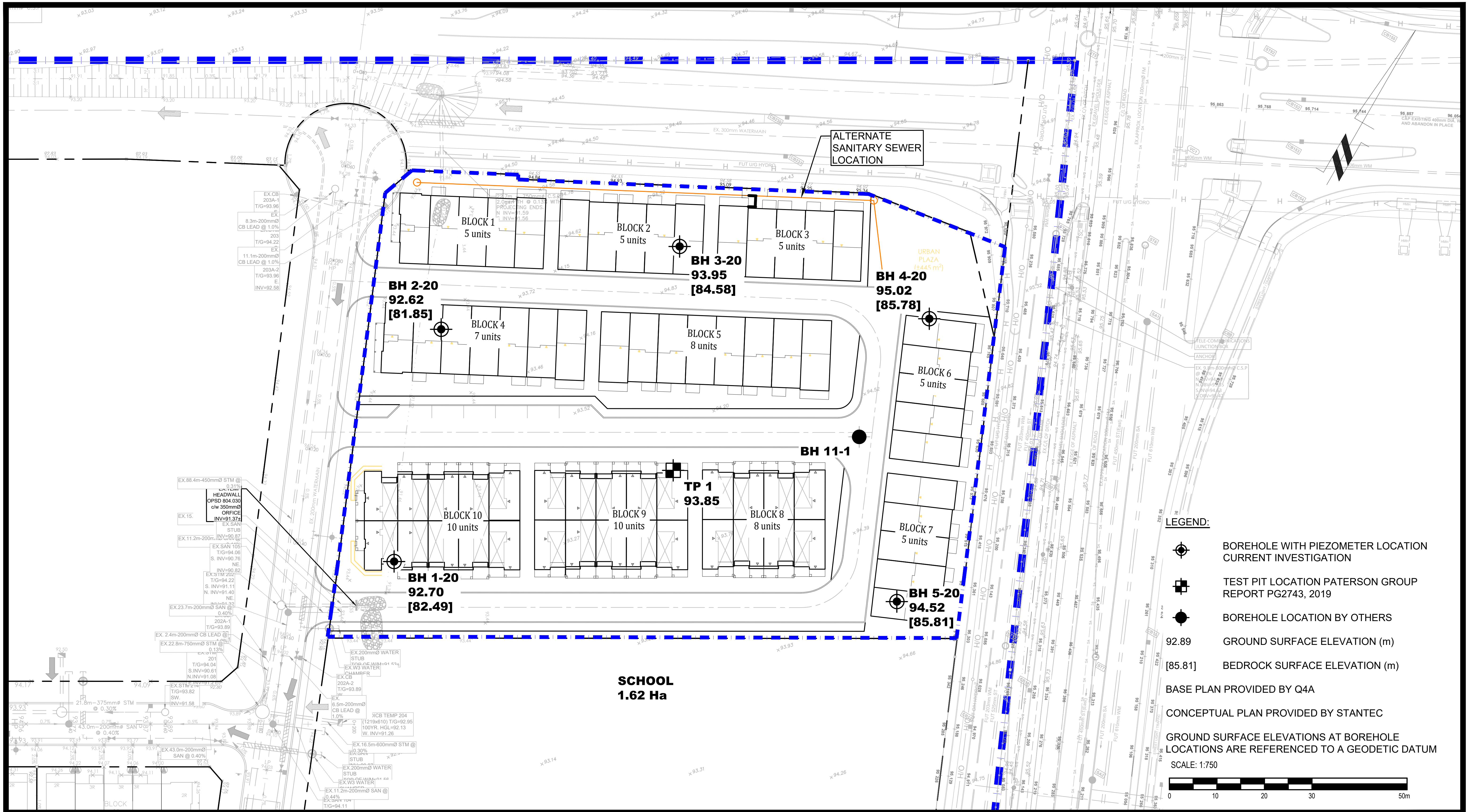


FIGURE 1

KEY PLAN



LEGEND:

⌖	BOREHOLE WITH PIEZOMETER LOCATION CURRENT INVESTIGATION
⊞	TEST PIT LOCATION PATERSON GROUP REPORT PG2743, 2019
●	BOREHOLE LOCATION BY OTHERS
92.89	GROUND SURFACE ELEVATION (m)
[85.81]	BEDROCK SURFACE ELEVATION (m)

BASE PLAN PROVIDED BY Q4A

CONCEPTUAL PLAN PROVIDED BY STANTEC

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	DATE	INITIAL
1.	UPDATED CONCEPTUAL PLAN	12/07/2023	GA

MATTAMY HOMES
GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
3288 GREENBANK ROAD

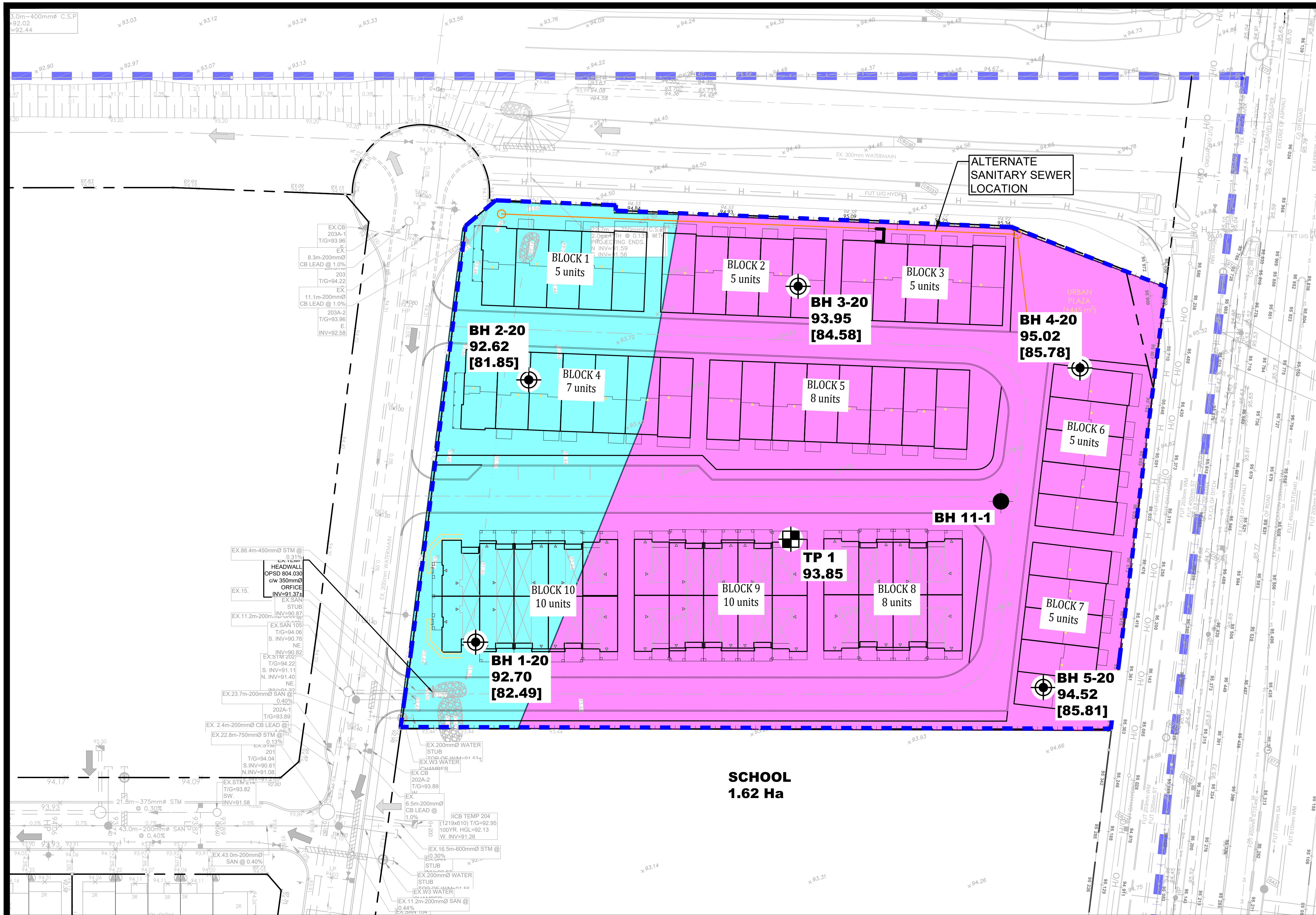
OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:750
Date: 11/2020
Drawn by: MPG
Report No.: PG5608-1
Checked by: MS
Dwg. No.: PG5608-1
Approved by: DJG
Revision No.: 1

p:\autocad drawings\geotechnical\pg56xx\pg5608\pg5608-1 thlp w bedrock contour plan (rev.01).dwg



LEGEND:

⌖	BOREHOLE WITH PIEZOMETER LOCATION CURRENT INVESTIGATION
▣	TEST PIT LOCATION PATERSON GROUP REPORT PG2743, 2019
●	BOREHOLE LOCATION BY OTHERS
92.89	GROUND SURFACE ELEVATION (m)
[85.81]	BEDROCK SURFACE ELEVATION (m)

BASE PLAN PROVIDED BY Q4A.

CONCEPTUAL PLAN PROVIDED BY STANTEC.

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

PERMISSIBLE GRADE RAISE

🟪	UP TO 3.0 m
🟦	UP TO 2.3 m

SCALE: 1:750

0 10 20 30 50m

PATERSON GROUP

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

NO.	REVISIONS	DATE	INITIAL

MATTAMY HOMES
GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
3288 GREENBANK ROAD

OTTAWA, ONTARIO

Title:

PERMISSIBLE GRADE RAISE PLAN

Scale: 1:750	Date: 08/2023
Drawn by: GK	Report No.: PG5608-1
Checked by: MS	Dwg. No.: PG5608-2
Approved by: DJG	Revision No.:

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LEGEND:

⌖	BOREHOLE WITH PIEZOMETER LOCATION CURRENT INVESTIGATION
▣	TEST PIT LOCATION PATERSON GROUP REPORT PG2743, 2019
●	BOREHOLE LOCATION BY OTHERS
92.89	GROUND SURFACE ELEVATION (m)
[85.81]	BEDROCK SURFACE ELEVATION (m)

BASE PLAN PROVIDED BY Q4A.

CONCEPTUAL PLAN PROVIDED BY STANTEC.

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

TREE PLANTING SETBACK AREA

🟩 LOW / MEDIUM PLASTICITY

SCALE: 1:750

0 10 20 30 50m

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

NO.	REVISIONS	DATE	INITIAL

MATTAMY HOMES
GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
3288 GREENBANK ROAD

OTTAWA, ONTARIO

Title:

TREE PLANTING SETBACK PLAN

Scale: 1:750
Date: 08/2023
Drawn by: GK
Report No.: PG5608-1
Checked by: MS
Dwg. No.: PG5608-3
Approved by: DJG
Revision No.:

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