Geotechnical Engineering

Environmental Engineering

Hydrogeology

Geological Engineering

Materials Testing

Building Science

Archaeological Services

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Hydrogeological Assessment

Proposed Mixed-Use Development
936 March Road
Ottawa, Ontario

Prepared For

Minto Communities
2559688 Ontario Inc.

December 6, 2018

Report PG4554-2

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APPENDICES

1.0 INTRODUCTION

Paterson Group (Paterson) was commissioned by Minto Communities and 2559688 Ontario Inc. to prepare a hydrogeological assessment for the proposed mixed-used development to be located at 936 March Road in Ottawa, Ontario (refer to Figure 1 - Key Plan within Appendix 1).

Subsurface information was obtained from the geotechnical investigation carried out to determine the subsoil and groundwater conditions at the site by means of test holes.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains the investigation findings and includes hydrogeological assessments pertaining to the proposed program as understood at the time of writing this report.

1.1 Proposed Project

It is our understanding that the proposed mixed-use development, to be located on the east side of March Road and north of Maxwell Bridge Road, consists of the municipal address 936 March Road.

The subject site consists of an approximate 60 hectare mostly undeveloped property consisting of agricultural fields with some brush covered areas and mature treed areas. A farmstead with associated outbuildings is present within the southwest corner of the property. The site is trisected in an approximate northwest-southeast orientation by an existing railway track through the eastern portion of the site and an unnamed tributary of Shirley's Brook through the western portion of the site. The property generally slopes downward from southwest to northeast and is bordered to the north, east and west by a mixture of treed areas and agricultural fields and to the south by residential developments and March Road.

2.0 SITE CONDITIONS

Physical Setting

As previously noted, the subject site is located on the east side of March Road and contains a mixture of agricultural lands and densely treed areas. Site topography is relatively flat to gently rolling, with average elevations of 80 m above sea level (asl) along the southwest portion of the property and average elevations of 65 m asl along the northeast portion. Elevations provided for the unnamed tributary of Shirley's Brook that crosses the property indicates a northwest to southeast drainage direction, with elevations of approximately 78 m asl at the western side of the property and 76 m asl at the eastern side. There were no named water bodies known to exist on the subject site.

According to available mapping, the subject site is located in the Ottawa Valley Clay Plains physiographic region. The region is characterized by relatively flat clay plains interrupted by rock ridges, which is generally consistent with field observations at the subject site.

2.1 Geology

Surficial Geology

The field program for the geotechnical investigation was carried out between June and July 2018. A total of 41 boreholes were advanced to a maximum depth of 7.5 m below ground surface (bgs). The borehole locations were distributed in a manner to provide general coverage of the subject site. The approximate locations of the boreholes are shown on Drawing PG4554-1 - Test Hole Location Plan included in Appendix 2

Overburden soils identified during the geotechnical field investigation were generally consistent with available mapping for the area. Soils typically consisted of topsoil underlain by hard to firm brown silty clay that became grey with depth, which was further underlain by a glacial till deposit comprised of a silty sand/silty clay matrix with gravel, cobbles and boulders. A deposit of silty sand was noted above the silty clay layer at borehole locations within the central portion of the site. Where encountered, the silty sand deposit was typically 0.5 to 1.5 m in thickness.

Practical refusal to augering was encountered on the inferred bedrock surface at depths ranging from approximately 1.3 m bgs on the western portion of the site to approximately 7.8 m bgs on the eastern boundary of the site.

Specific details of the soil profile at each test hole location are presented on the Soil Profile and Test Data sheets included in Appendix 2.

Bedrock

Based on available geological mapping, the subject site is located in an area where the bedrock in the western portion of the site consists of interbedded sandstone and dolomite of the March formation, while the bedrock in the eastern portion of the site consists of dolomite of the Oxford formation. Overburden thickness in the area is estimated to range from 3 to 10 m.

Karst Features

The term “karst” refers to a geologic formation characterized by the dissolution of carbonate bedrock, such as limestone or dolostone. In order for karstification to occur, precipitation must be allowed to infiltrate the top of the bedrock to dissolutionally enlarge previously existing joints and bedding planes. Based on visual inspection of rock core samples taken from the subject site, and given the composition of surficial soils typically overlying the dolomite/limestone bedrock that are non-conducive to groundwater infiltration, it is unlikely that karstification is occurring.

2.2 Hydrogeology

Existing Aquifer Systems

Aquifer systems may be defined as geological media, either overburden soils or fractured bedrock, which permit the movement of groundwater under hydraulic gradients. In general, aquifer systems may be present in overburden soils or bedrock. Although groundwater has been observed within the overburden soils at the subject site, the composition of materials does not allow for the development of significant water supply wells. Water supply wells in the vicinity are instead likely found in bedrock aquifers.

Bedrock aquifer mapping, provided by Natural Resources Canada Urban Geology of the National Capital Region mapping, as well as the MECP water well record database, were reviewed as part of this assessment. Using these tools, two water supply aquifer systems were found to exist in the vicinity of the study area.

The March/Nepean formation aquifer system is located within the western portion of the study area. Because water well records do not differentiate between March and Nepean formation sandstone, the two units are considered as one for the purposes of

this assessment. Wells utilizing this aquifer system generally encountered water at depths ranging between 12 and 20 m bgs.

The Oxford formation aquifer system is typically encountered within the eastern portion of the study area. Water wells completed in this formation encountered water at depths of over 30 m bgs. Based on the limited stratigraphic information provided in the water well records, wells advanced through the Oxford formation to depths exceeding 30 m could have penetrated the formation and are potentially accessing water from the underlying March/Nepean formations.

Groundwater Levels

Groundwater was observed in the piezometers installed in the overburden at the borehole locations. Groundwater was also observed in the monitoring well installed in the bedrock where overburden thickness was minimal.

Groundwater levels at the subject site were observed to vary from 0.8 to 4.4 m bgs at the time of the geotechnical field investigation. It should be noted that groundwater levels may have been influenced by surface water infiltrating the backfilled boreholes. Subsequent groundwater level readings within the piezometers can be influenced by perched water in the backfill material within the borehole. Groundwater levels are also influenced by seasonal variations in temperature and precipitation. As such, long-term groundwater levels are also estimated based on other factors such as colour and consistency of the recovered soil samples. Based on these observations, the long-term groundwater level at the subject site is expected to range from 2.5 to 4.5 m bgs. The measured groundwater levels are summarized in Table 1 below and presented on the Soil Profile and Test Data sheets included in Appendix 1.

Table 1 - Summary of Groundwater Level Readings

Test Hole Number	Ground Surface Elevation (m)	Groundwater Depth (m)	Groundwater Elevation (m)	Date
BH 1	79.44	1.36	78.08	July 12, 2018
BH 2	78.59	0.93	77.66	July 12, 2018
BH 3	78.88	2.31	76.57	July 12, 2018
BH 4	75.89	1.85	74.04	July 12, 2018
BH 5	79.16	1.65	77.51	July 12, 2018
BH 6	77.99	1.04	76.95	July 12, 2018
BH 7	79.20	3.09	76.11	July 12, 2018

Table 1 - Summary of Groundwater Level Readings (Continued)				
Test Hole Number	**Ground Surface Elevation (m)**	**Groundwater Depth (m)**	**Groundwater Elevation (m)**	**Date**
BH 8	72.56	0.79	71.77	July 12, 2018
BH 11	69.43	1.51	67.92	July 12, 2018
BH 12	67.58	1.20	66.38	July 12, 2018
BH 13	65.95	1.09	64.86	July 12, 2018
BH 14	78.85	1.27	77.58	July 12, 2018
BH 15	77.56	1.43	76.13	July 12, 2018
BH 16	74.85	2.80	72.05	July 12, 2018
BH 18	69.78	1.11	68.67	July 12, 2018
BH 20	69.37	1.51	67.86	July 12, 2018
BH 21	66.25	0.85	65.40	July 12, 2018
BH 22	65.61	1.10	64.51	July 12, 2018
BH 23	78.70	1.35	77.35	July 12, 2018
BH 24	77.03	1.06	75.97	July 12, 2018
BH 25	74.86	2.49	72.37	July 12, 2018
BH 29	68.94	1.47	67.47	July 12, 2018
BH 30	66.95	1.07	65.88	July 12, 2018
BH 31	66.06	0.92	65.14	July 12, 2018
BH 32	76.95	Dry	-	July 12, 2018
BH 33	71.39	Dry	-	July 12, 2018
BH 37	68.89	1.26	67.63	July 12, 2018
BH 38	67.01	1.15	65.95	July 12, 2018
BH 40*	79.19	4.44	74.75	July 12, 2018
BH 41*	78.67	4.28	74.39	July 12, 2018
BH 42*	73.50	4.04	69.46	July 12, 2018

Note: - * Denotes borehole instrumented with a 51 mm diameter monitoring well.
- The ground surface at the test hole locations is referenced to an assumed geodetic datum.

Hydraulic Gradients

Vertical hydraulic gradients were not measured at the subject site as the previous studies completed did not warrant the installation of monitoring well nests.

With respect to horizontal hydraulic gradients, due to the nature of the water levels obtained from field work conducted at the site (piezometers), the absolute direction of horizontal hydraulic gradients was not determined. However, using the available data, it was possible to approximate the horizontal hydraulic gradients in the overburden material given that the horizontal hydraulic gradient between any 2 points is the slope of the hydraulic head between those points:

$$i = \frac{h_2 - h_1}{L}$$

Where: i = horizontal hydraulic gradient
h = water level (m bgs)
L = horizontal distance between test hole locations

Using the above noted formula, the horizontal hydraulic gradient was observed to have an approximate northeast orientation and a magnitude ranging from approximately 0.01 to 0.002. Shallow groundwater flow in the vicinity of the subject site is expected to reflect local topography. Regional groundwater flow is considered to be in an easterly direction, towards the Ottawa River.

Hydraulic Conductivity

The hydraulic conductivity values were conservatively estimated based upon previous experience at similar sites in the area, information obtained from the results of the geotechnical field program and typical published values for similar stratigraphy. The values are interpreted to be approximately 1×10^{-7} to 1×10^{-10} m/sec for silty clay and 1×10^{-6} to 1×10^{-12} m/sec for limestone/dolomite bedrock.

Groundwater Recharge and Discharge

In general, groundwater will follow the path of least resistance from areas of higher hydraulic head to areas of lower hydraulic head. While upward and downward hydraulic gradients may be indicative of discharge and recharge, respectively, other factors must be considered.

Based on the hydraulic conductivity estimates obtained from previous studies and published literature, the silty clay overburden is generally considered to act as a confining layer. It is our interpretation that groundwater will generally flow laterally through the upper layer of silty sand/weathered brown silty clay, as opposed to vertically upwards or downwards through overburden soils with lower hydraulic conductivity such as the grey silty clay. While small amounts of groundwater recharge and discharge could potentially take place on a localized scale where overburden thickness is minimal, neither the topographical or geological conditions are suitable for recharge or discharge to be occurring on a large scale at the subject site.

3.0 POTENTIAL IMPACTS

3.1 Adverse Effects on Adjacent Structures

The overburden in the area generally consists of topsoil overlying a silty clay layer which is further underlain by a glacial till deposit comprised of a silty sand/silty clay matrix with gravel, cobbles and boulders. A deposit of silty sand was noted above the silty clay layer at boreholes located within the central portion of the site. The potential dewatering volumes required to accommodate the proposed development are anticipated to be low to moderate depending on the volume of perched water encountered within the silty sand overlying the silty clay. Additionally, given the nature of the development (low lying residential housing, commercial and institutional buildings, associated servicing, and a stormwater management facility), the duration of excavations at the site are expected to be short term in duration. As such, any effects related to ground surface settlement due to the water taking activities during construction are expected to be negligible.

3.2 Adverse Effects on Neighbouring Water Wells

A review of the MECP Water Well Records online mapping database indicates there are greater than 20 wells within 500 m of the subject site as depicted on Drawing PG4554-3 - MECP Water Well Location Plan included in Appendix 1. However, upon investigation it was determined that a number of the wells in the area are monitoring wells and not for water supply. Additionally, the water supply wells noted to potentially remain in use were extended to the bedrock aquifer, well beyond the maximum expected depth of any excavation that may take place as part of the proposed development. Construction activities at the site are therefore not expected to cause any interference to the water supply of surrounding properties or other negative impacts.

A series of calculations were carried out on theoretical radii of influence for a typical servicing trench excavation withdrawing water from the upper 3 to 5 m of the saturated zone. These calculations were completed based on Sichardt (1992) using the equation:

$$R = r_e + 3000 \times \Delta h(k^{0.5})$$

Where:
- R = radius of influence (m)
- r_e = equivalent radius of excavation (m)
- Δh = thickness of drawdown within the aquifer (m)
- k = hydraulic conductivity (m/sec)

For the purposes of completing the calculations, the following assumptions were made:

- ❑ r_e = 7.96 m
- ❑ k = 1 x 10^{-7} m/sec, based upon our experience in the area and published values
- ❑ Δh = 3 to 5 m, to review potential minimum/maximum variable conditions

Using the above equation and assumptions, a radius of influence of approximately 3 to 5 m will develop as a steady state condition, extending from the edge of the excavation, in the area of the subject site. It should be noted that details regarding the stormwater management facility and the commercial and institutional developments were not known at the time of report preparation. However given the prevalence of low permeability soils on site and an expected maximum excavation depth of approximately 5 m bgs, the radius of influence resulting from dewatering related to these excavation footprints are expected to be similar to that of the residential development.

Given the hydrogeological characteristics of the subject site, the theoretical radii of influence for the potential excavations related to the development and the depth of the water supply wells within 500 m, a long-term groundwater monitoring program is not required to be implemented based on our review.

In the interest of public perception, consideration may be given to undertaking a baseline subdivision sampling program. The premise of the program is to obtain groundwater quality information from the water supply wells in the vicinity of the proposed development prior to the project commencing. This ensures that all parties involved (developer, homeowner and City of Ottawa) are protected should a concern arise during or after construction.

3.3 Soil and Groundwater

A review of the MECP Brownfields Environmental Site Registry was conducted as part of the assessment of the site, neighbouring properties and the general area surrounding the site. A total of one recorded Brownfield site was located within 1 km of the subject site and has been identified as Record of Site Condition (RSC) registration number 63910. The Brownfield site and its respective registration number indicates there are no groundwater controls under the RSC, nor were there any groundwater remediations performed as part of a cleanup process. No concerns were identified in the review of the MECP Brownfields database.

It is anticipated that the material on site will be disposed of or re-used as per the MECP policy, *Management of Excess Soil - A Guide for Best Management Practices* dated January, 2014.

The groundwater that is pumped from site excavations must be managed in an appropriate manner. The contractor will be required to implement a water management program to dispose of the pumped water.

4.0 STATEMENT OF LIMITATIONS

The recommendations provided in this report are in accordance with our present understanding of the project.

A hydrogeological review of this nature is a limited sampling of a site. The recommendations are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around the test locations. Should any conditions at the site be encountered which differ from those at the test locations, we request notification immediately in order to permit reassessment of our recommendations.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than Minto Communities, 2559688 Ontario Inc. 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.

Michael Laflamme, P.Geo.

David J. Gilbert, P.Eng.

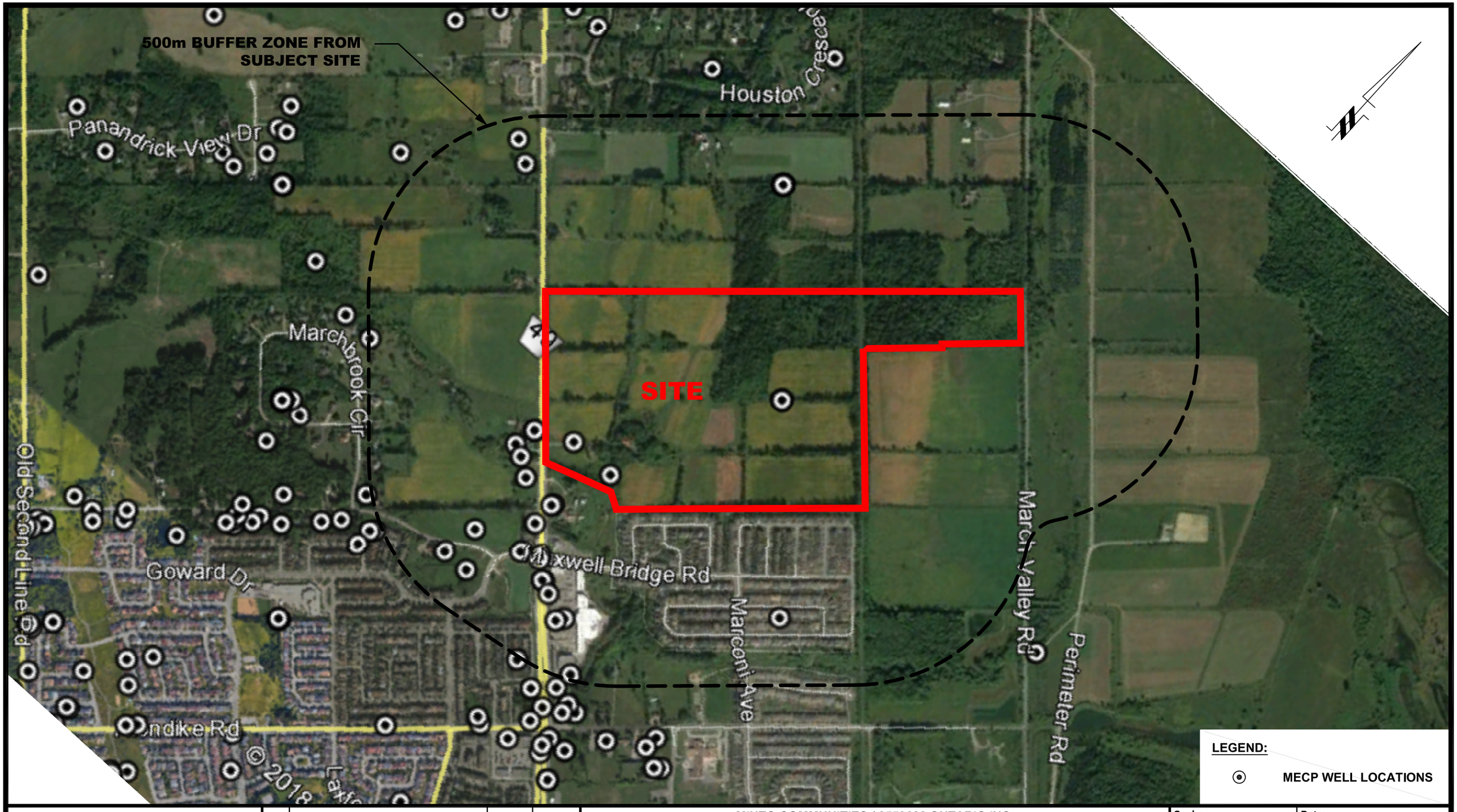
APPENDIX 1

Figure 1 - Key Plan

Drawing PG4554-3 - MECP Water Well Location Plan

FIGURE 1

KEY PLAN



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NO.	REVISIONS	DATE	INITIAL
0			

MINTO COMMUNITIES / 2559688 ONTARIO INC.

HYDROGEOLOGICAL ASSESSMENT
PROPOSED MIXED-USE DEVELOPMENT - 936 MARCH ROAD

OTTAWA, ONTARIO

Title:

MECP WATER WELL LOCATION PLAN

Scale: 1:10000	Date: 12/2018
Drawn by: MPG	Report No.: PG4554-2
Checked by: ML	Dwg. No.: PG4554-3
Approved by: CDS	Revision No.: 0

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APPENDIX 2

Soil Profile and Test Data

Drawing PG4554-1 - Test Hole Location Plan

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

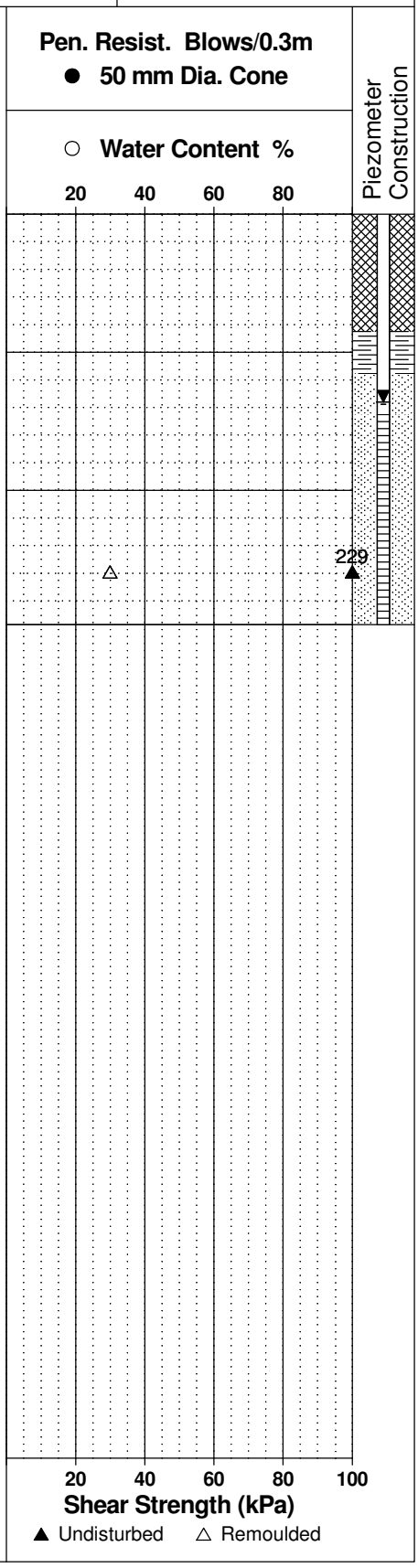
FILE NO. PG4554

REMARKS

HOLE NO. BH 1

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

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	79.44
TOPSOIL 0.28		AU	1				
		SS	2	100	10	1	78.44
Hard, grey **SILTY CLAY**		SS		1003	5	2	77.44
2.97							
End of Borehole							
Practical refusal to augering at 2.97m depth							
(GWL @ 1.36m - July 12, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PG4554

REMARKS

HOLE NO. BH 2

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

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	78.59
TOPSOIL 0.28		AU	1				
		SS	2	96	7	1	77.59
Very stiff to stiff, grey **SILTY CLAY**		SS	3	100	4	2	76.59
3.81						3	75.59
GLACIAL TILL: Grey silty clay, some sand, gravel, cobbles, boulders		SS	4	79	5	4	74.59
4.80		SS	5	71	50+		
End of Borehole							
Practical refusal to augering at 4.80m depth							
(GWL @ 0.93m - July 12, 2018)							

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

○ Water Content %

20 40 60 80

Piezometer Construction

110

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PG4554

REMARKS

HOLE NO. BH 3

BORINGS BY CME 55 Power Auger **DATE** June 27, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	78.88
TOPSOIL 0.25		AU	1				
Loose, brown **SILTY SAND**						1	77.88
1.07		SS	2	100	8		
		SS	3	100	9	2	76.88
Stiff to firm, brown **SILTY CLAY**							
- grey by 2.3m depth		SS	4	100	4	3	75.88
						4	74.88
						5	73.88
5.33							
GLACIAL TILL: Grey silty clay, some sand, gravel, cobbles, boulders						6	72.88
		SS	5	79	2		
6.70							
End of Borehole							
(GWL @ 2.31m - July 12, 2018)							

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

20 40 60 80

Piezometer Construction

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

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PG4554

REMARKS

HOLE NO. BH 4

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

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	75.89
TOPSOIL 0.23		AU	1				
Loose, brown **SAND,** trace silt		SS	2	83	7	1	74.89
1.22							
Stiff to firm, brown **SILTY CLAY**		SS	3	100	4	2	73.89
2.29							
GLACIAL TILL: Brown silty clay, some sand, gravel, cobbles, boulders		SS	4	80	10		
2.82							
End of Borehole							
Practical refusal to augering at 2.82m depth							
(GWL @ 1.85m - July 12, 2018)							

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

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

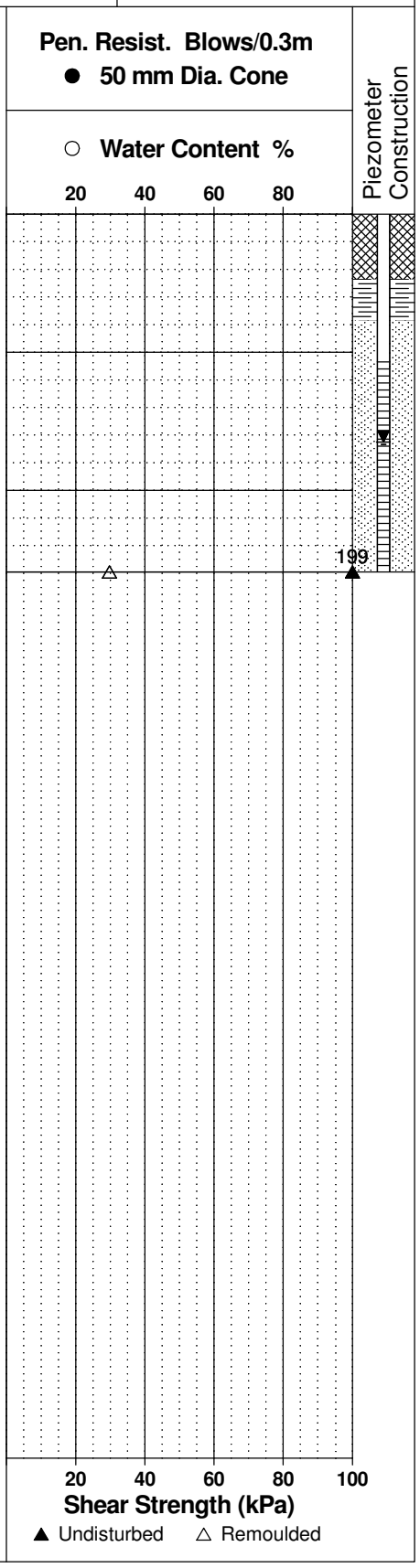
FILE NO. PG4554

REMARKS

HOLE NO. BH 5

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

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
TOPSOIL 0.25		AU	1			0	79.16
Very stiff, grey **SILTY CLAY**		SS	2	100	10	1	78.16
		SS	3	100	6	2	77.16
2.59							
End of Borehole							
Practical refusal to augering at 2.59m depth							
(GWL @ 1.65m - July 12, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PG4554

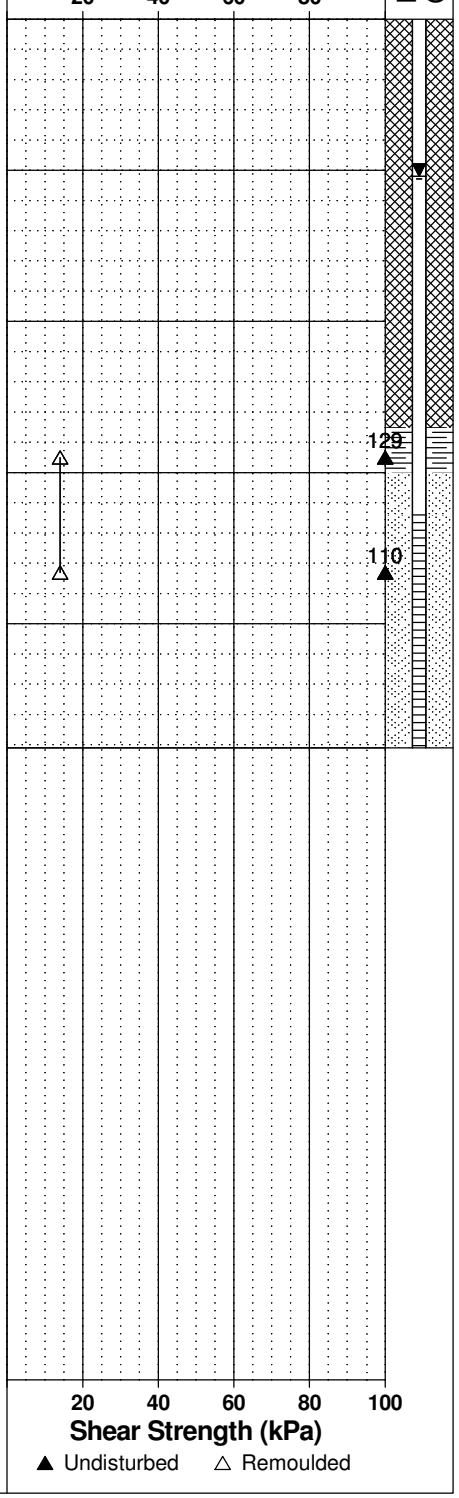
REMARKS

HOLE NO. BH 6

BORINGS BY CME 55 Power Auger **DATE** June 1, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	77.99
TOPSOIL		AU	1				
0.66							
		SS	2	92	4	1	76.99
		SS	3	54	6	2	75.99
Very stiff to stiff, grey **SILTY CLAY**						3	74.99
		SS	4	42	22	4	73.99
4.42							
GLACIAL TILL: Brown silty sand, some gravel, cobbles, boulders		SS	5		50+		
4.82							
End of Borehole							
Practical refusal to augering at 4.82m depth							
(GWL @ 1.04m - July 12, 2018)							

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



Piezometer Construction

patersongroup Consulting Engineers

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

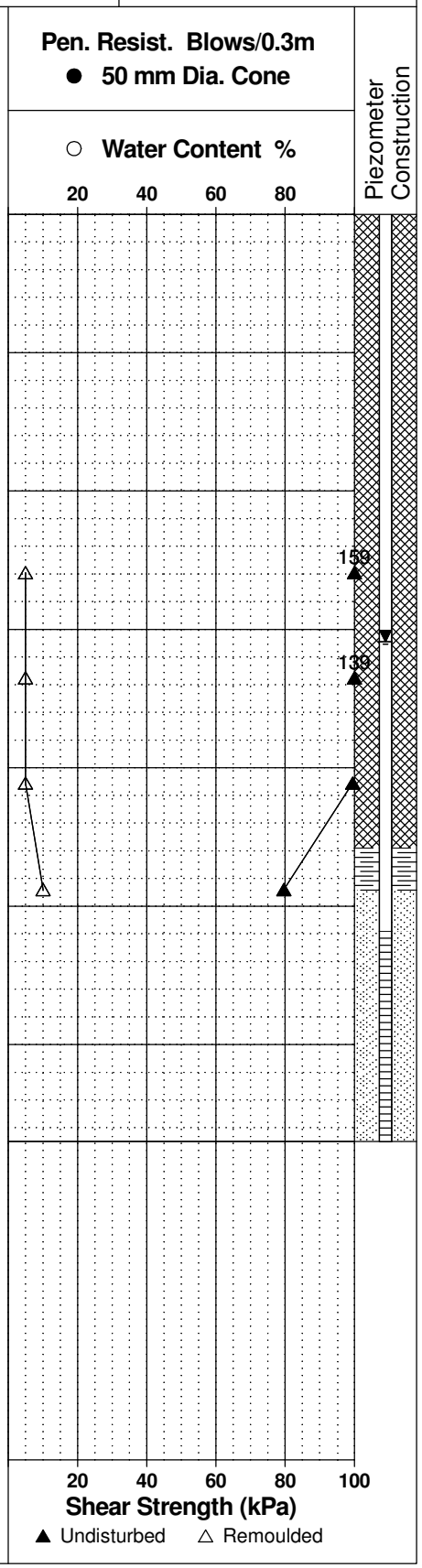
FILE NO. PG4554

REMARKS

HOLE NO. BH 7

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

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	79.20
TOPSOIL 0.25		AU	1				
Loose, brown **SAND,** some silt		SS	2	100	7	1	78.20
1.52		SS	3	100	7	2	77.20
Very stiff to stiff, grey **SILTY CLAY**						3	76.20
						4	75.20
5.33						5	74.20
GLACIAL TILL: Grey silty clay, some sand, gravel, cobbles, boulders		SS	4	71	8	6	73.20
6.70							
End of Borehole							
(GWL @ 3.09m - July 12, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
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DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

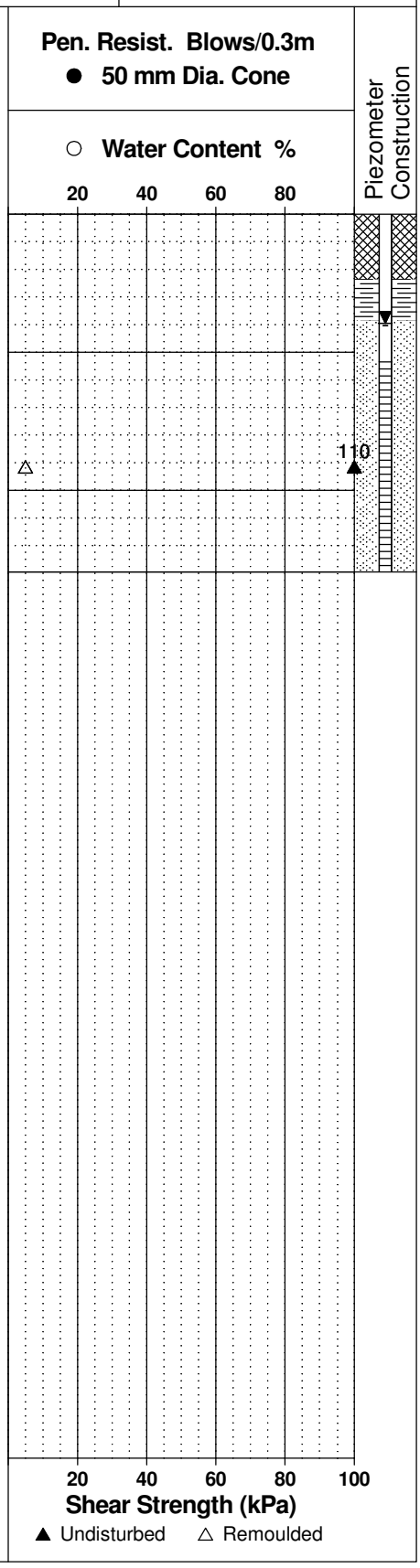
FILE NO. PG4554

REMARKS

HOLE NO. BH 8

BORINGS BY CME 55 Power Auger **DATE** June 27, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	72.56
TOPSOIL 0.30		AU	1				
Very stiff, grey **SILTY CLAY**		SS	2	83	5	1	71.56
2.29						2	70.56
GLACIAL TILL: Brown silty sand with gravel, cobbles, boulders 2.59		SS	3	85	50+		
End of Borehole							
Practical refusal to augering at 2.59m depth							
(GWL @ 0.79m - July 12, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

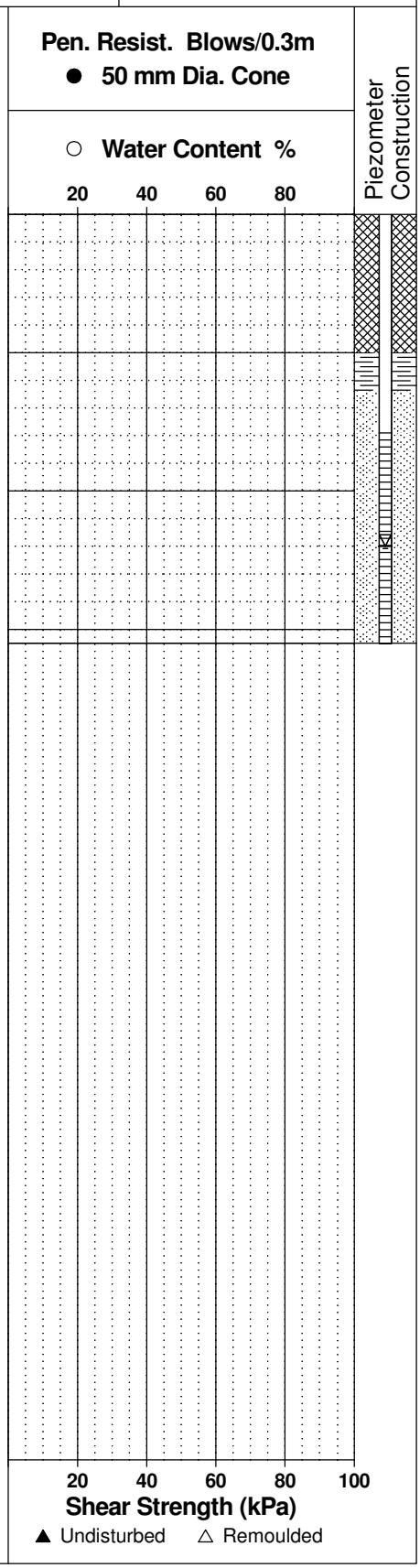
FILE NO. PG4554

REMARKS

HOLE NO. BH 9

BORINGS BY CME 55 Power Auger **DATE** June 28, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.71
TOPSOIL 0.15		AU	1				
Loose, brown **SILTY SAND,** trace clay 0.76		AU	2				
Firm, grey **SILTY CLAY**		SS	3	100	3	1	68.71
1.68		SS	4	58	3	2	67.71
GLACIAL TILL: Grey silty clay, some sand, gravel, cobbles, boulders		SS	5	62	14		
3.10		SS	6	100	50+	3	66.71
End of Borehole							
Practical refusal to augering at 3.10m depth							
(GWL @ 2.4m depth based on field observations)							



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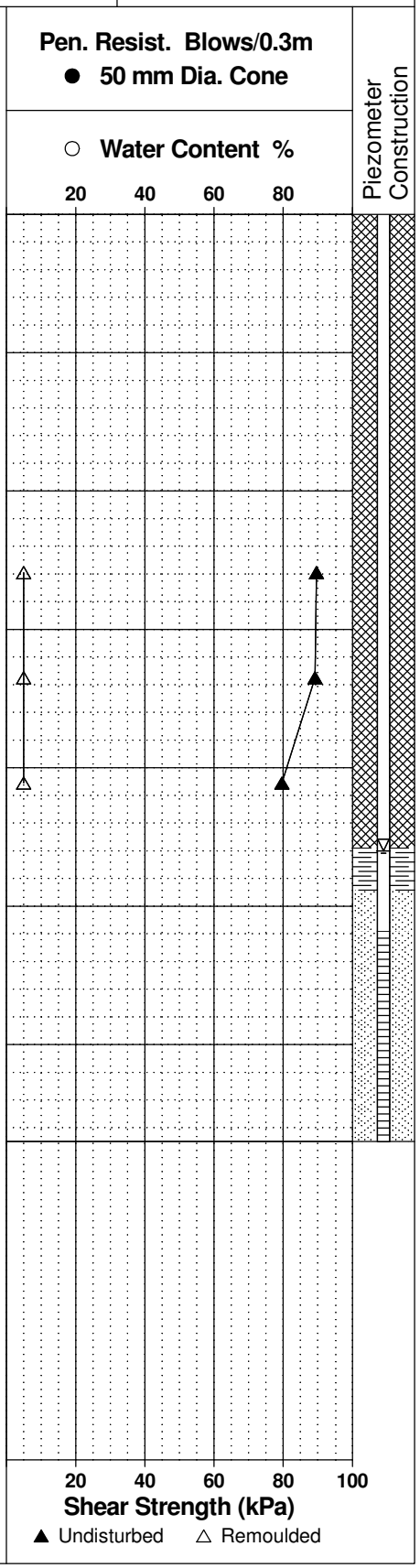
FILE NO. PG4554

REMARKS

HOLE NO. BH10

BORINGS BY CME 55 Power Auger **DATE** June 28, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.60
TOPSOIL 0.15		AU	1				
Brown **SILTY SAND,** trace clay 0.71		AU	2				
		SS	3	100	6	1	68.60
		SS	4	100	2	2	67.60
Stiff, grey **SILTY CLAY**						3	66.60
4.57						4	65.60
		SS	5	75	11	5	64.60
GLACIAL TILL: Grey silty clay, some sand, gravel, cobbles, boulders		SS	6	79	20	6	63.60
		SS	7	71	68		
6.70							
End of Borehole							
(GWL @ 4.6m depth based on field observations)							



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Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

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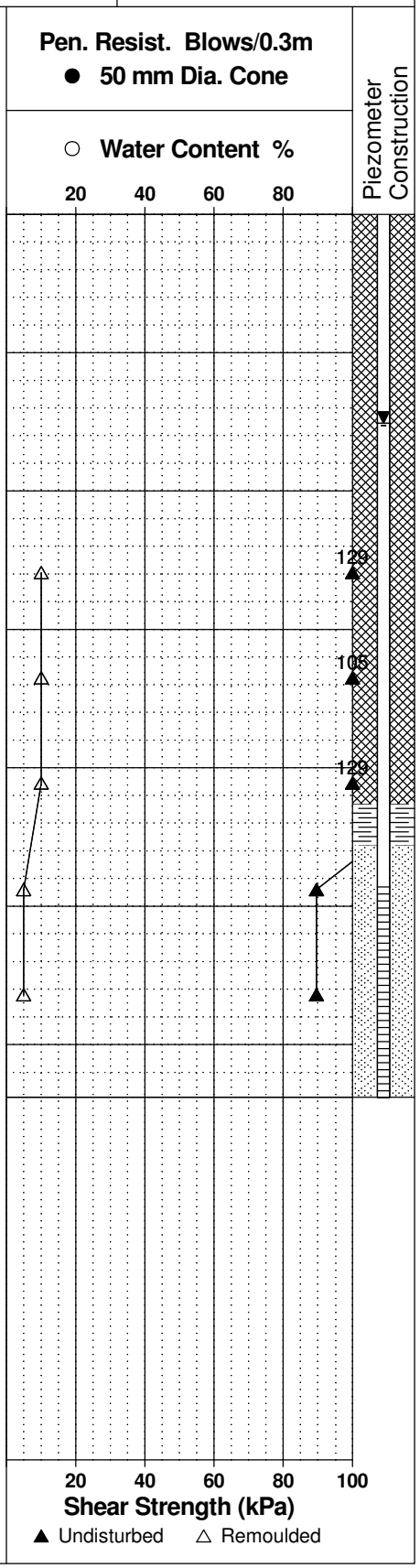
FILE NO. PG4554

REMARKS

HOLE NO. BH11

BORINGS BY CME 55 Power Auger **DATE** July 3, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.43
TOPSOIL		AU	1				
0.60							
		SS	2	96	7	1	68.43
		SS	3	92	2	2	67.43
Very stiff to stiff, brown **SILTY CLAY**						3	66.43
- grey by 3.8m depth						4	65.43
						5	64.43
6.10						6	63.43
GLACIAL TILL: Grey silty sand, some gravel, cobbles, boulders, trace clay 6.38		SS	4	73	50+		
End of Borehole							
Practical refusal to augering at 6.38m depth							
(GWL @ 1.51m - July 12, 2018)							



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FILE NO. PG4554

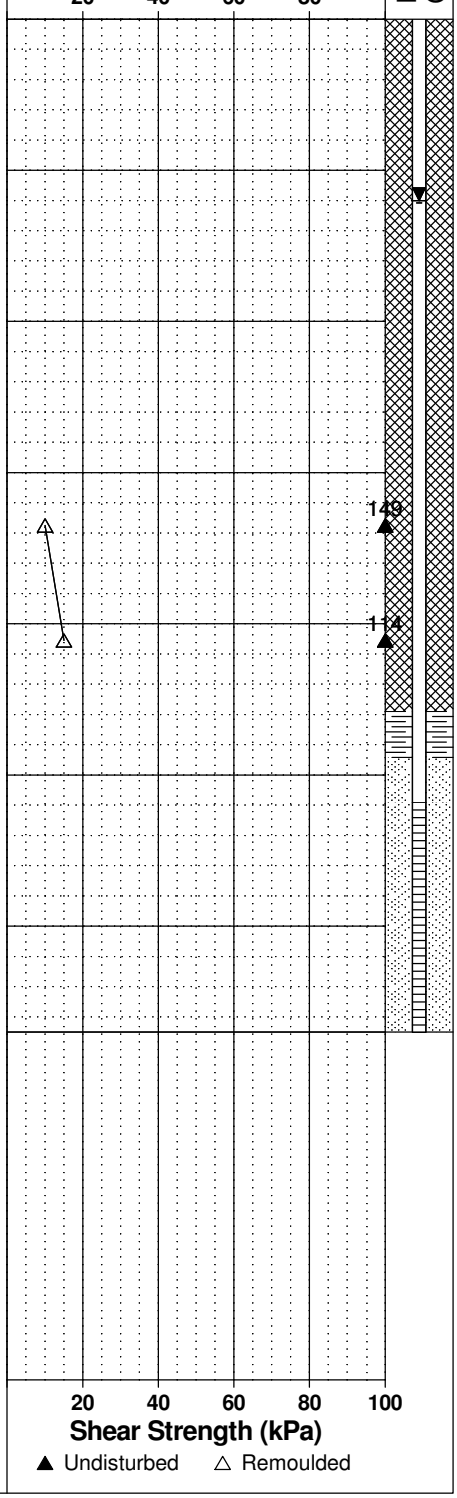
REMARKS

HOLE NO. BH12

BORINGS BY CME 55 Power Auger **DATE** July 3, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	67.58
TOPSOIL 0.28		AU	1				
Loose, brown **SILTY SAND** 0.76		SS	2	96	7	1	66.58
Very stiff, brown **SILTY CLAY**		SS	3	96	7	2	65.58
- grey by 2.3m depth		SS	4		6	3	64.58
4.57						4	63.58
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles, boulders		SS	5	12	10	5	62.58
		SS	6	75	25	6	61.58
6.70							
End of Borehole							
(GWL @ 1.20m - July 12, 2018)							

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



Piezometer Construction

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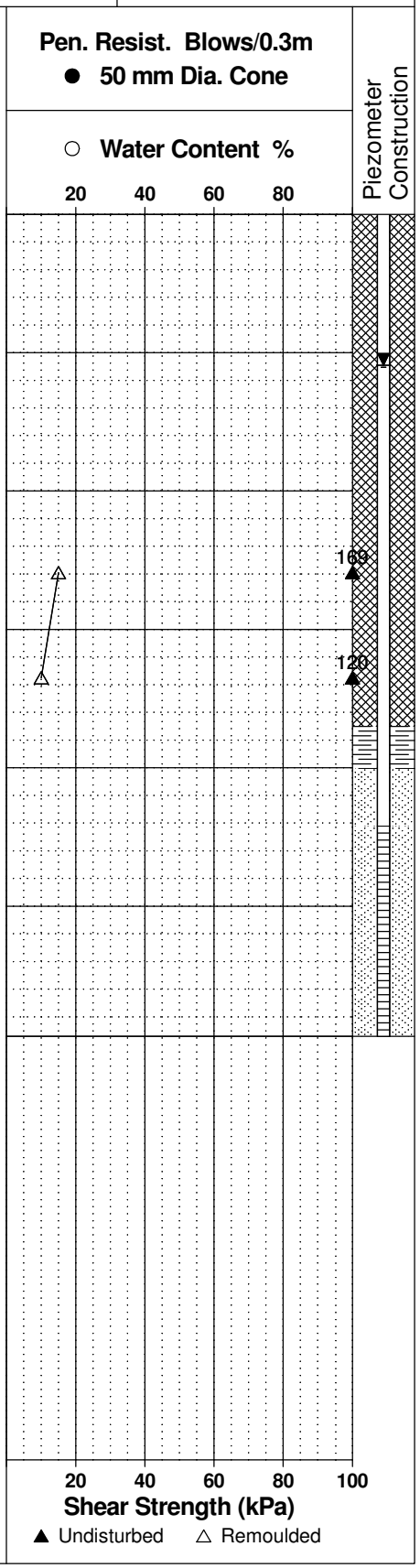
FILE NO. PG4554

REMARKS

HOLE NO. BH13

BORINGS BY CME 55 Power Auger **DATE** July 2, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	65.95
TOPSOIL 0.15		AU	1				
		SS	2	88	8	1	64.95
Very stiff, brown **SILTY CLAY**							
- grey by 1.8m depth		SS	3	96	4	2	63.95
3.81						3	62.95
		SS	4	69	9	4	61.95
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles and boulders		SS	5	88	12	5	60.95
		SS	6	62	18		
5.94							
End of Borehole							
(GWL @ 1.09m - July 12, 2018)							



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FILE NO. PG4554

REMARKS

HOLE NO. BH14

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

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
TOPSOIL 0.28		AU	1			0	78.85
Very stiff, grey **SILTY CLAY**		SS	2	100	10	1	77.85
1.85		SS	3	100	50+		
End of Borehole							
Practical refusal to augering at 1.85m depth							
(GWL @ 1.27m - July 12, 2018)							

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

20 40 60 80

Piezometer Construction

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

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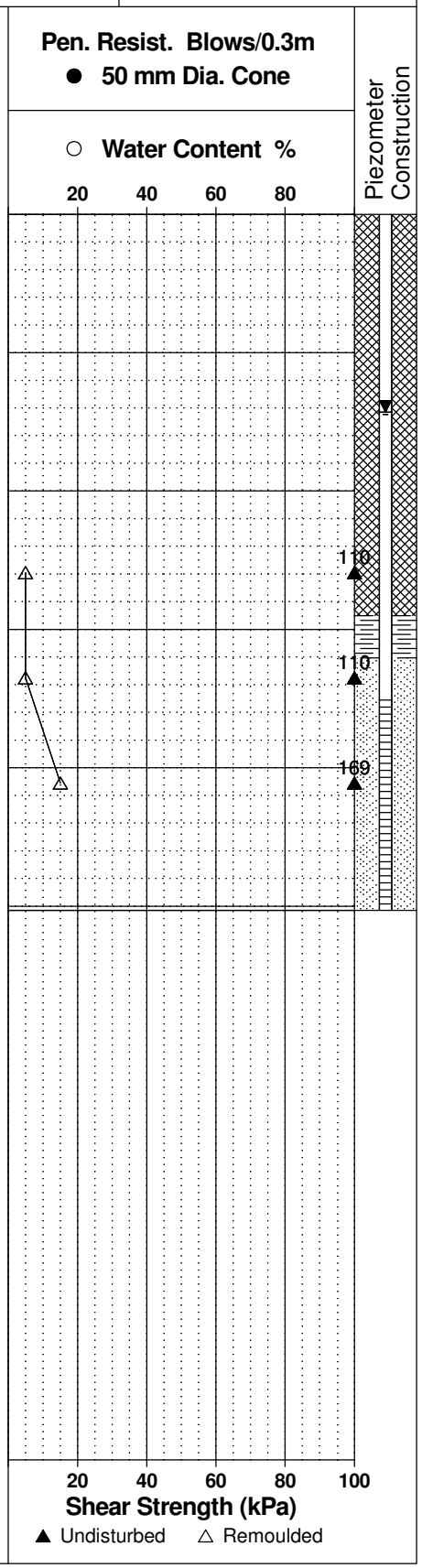
FILE NO. PG4554

REMARKS

HOLE NO. BH15

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

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	77.56
TOPSOIL 0.15		AU	1				
Very stiff, brown **SILTY CLAY**		SS	2	100	11	1	76.56
- grey by 1.5m depth		SS	3	100	4	2	75.56
						3	74.56
						4	73.56
4.57 **GLACIAL TILL:** Grey sandy silt, some gravel, trace clay, cobbles, boulders 5.03		SS	4	85	50+	5	72.56
End of Borehole							
Practical refusal to augering at 5.03m depth							
(GWL @ 1.43m - July 12, 2018)							



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FILE NO. PG4554

REMARKS

HOLE NO. BH16

BORINGS BY CME 55 Power Auger **DATE** June 27, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	74.85
TOPSOIL 0.53		AU	1				
		SS	2	100	8	1	73.85
		SS	3	100	12	2	72.85
Very stiff, grey **SILTY CLAY**		SS	4	100	10	3	71.85
		SS	5	100	8		
4.11		SS	6	100	50+	4	70.85
End of Borehole							
Practical refusal to augering at 4.11m depth							
(GWL @ 2.80m - July 12, 2018)							

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

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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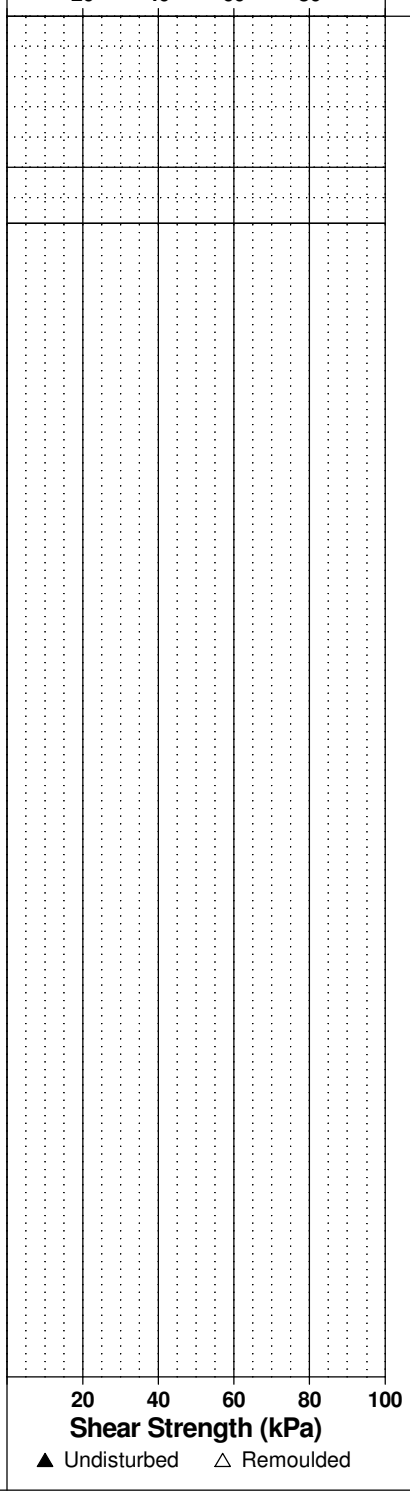
FILE NO. PG4554

REMARKS

HOLE NO. BH17

BORINGS BY CME 55 Power Auger **DATE** June 27, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.30		AU	1			0	69.99		
GLACIAL TILL: Grey silty clay, some sand, gravel, cobbles, boulders		SS	2	100	5	1	68.99		
1.37 End of Borehole									
Practical refusal to augering at 1.37m depth									
(BH dry upon completion)									



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FILE NO. PG4554

REMARKS

HOLE NO. BH18

BORINGS BY CME 55 Power Auger **DATE** June 27, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.78
TOPSOIL 0.28		AU	1				
Very stiff, grey **SILTY CLAY**		SS	2	100	2	1	68.78
1.52							
GLACIAL TILL: Grey clayey silt, some sand, trace gravel, cobbles, boulders		SS	3	100	50+	2	67.78
2.74							
End of Borehole							
Practical refusal to augering at 2.74m depth							
(GWL @ 1.11m - July 12, 2018)							

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

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

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FILE NO. PG4554

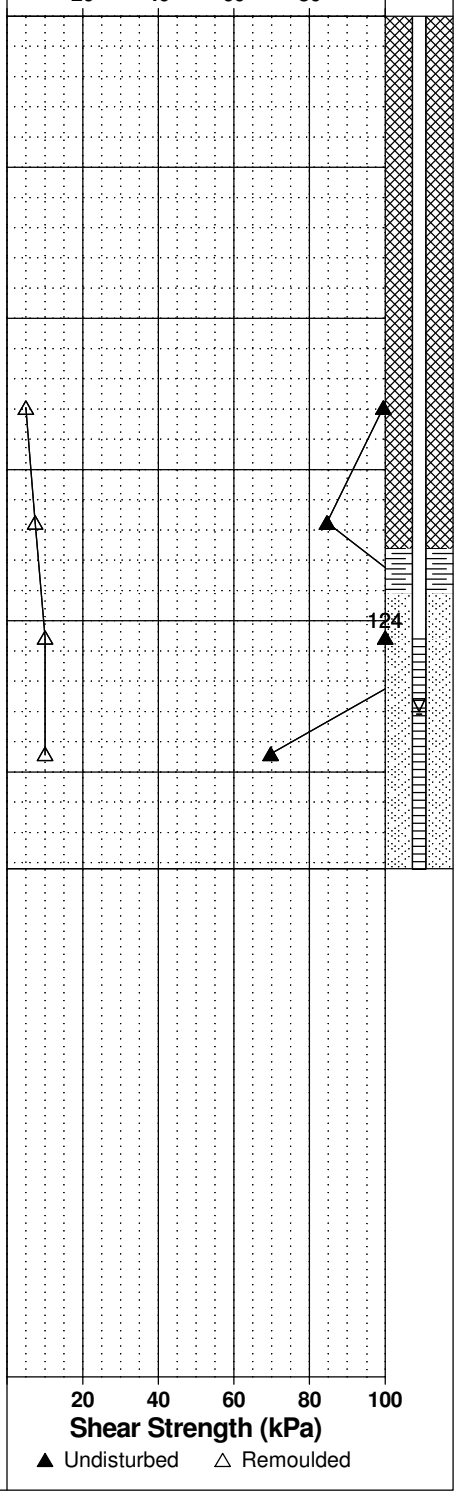
REMARKS

HOLE NO. BH19

BORINGS BY CME 55 Power Auger **DATE** June 28, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.39
TOPSOIL 0.15		AU	1				
Loose, brown **SILTY SAND,** trace clay 0.76		AU	2				
		SS	3	0	6	1	68.39
		SS	4	100	4	2	67.39
Very stiff to stiff, grey **SILTY CLAY**						3	66.39
						4	65.39
						5	64.39
5.33							
GLACIAL TILL: Grey silty clay, trace sand, gravel, cobbles,boulders 5.64							
End of Borehole							
Practical refusal to augering at 5.64m depth							
(GWL @ 4.6m depth based on field observations)							

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



Piezometer Construction

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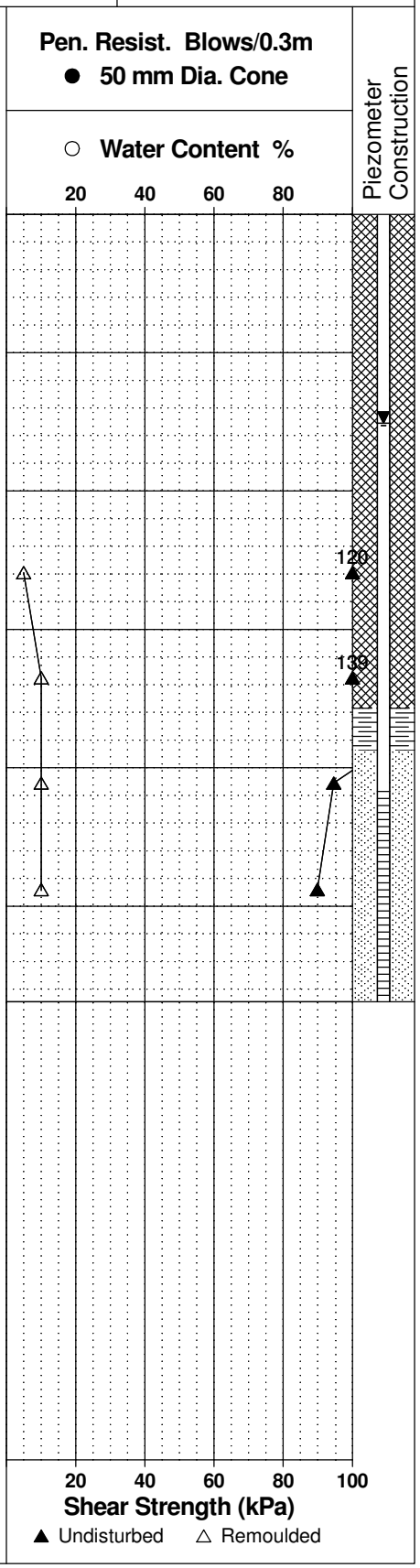
FILE NO. PG4554

REMARKS

HOLE NO. BH20

BORINGS BY CME 55 Power Auger **DATE** July 3, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.37
TOPSOIL 0.28		AU	1				
Compact, brown **SILTY SAND,** trace clay		SS	2	79	11	1	68.37
1.37							
Very stiff to stiff, brown **SILTY CLAY**		SS	3	96	3	2	67.37
- grey by 2.3m depth						3	66.37
5.18						4	65.37
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles, boulders 5.69		SS	4	100	50+	5	64.37
End of Borehole							
Practical refusal to augering at 5.69m depth							
(GWL @ 1.51m - July 12, 2018)							



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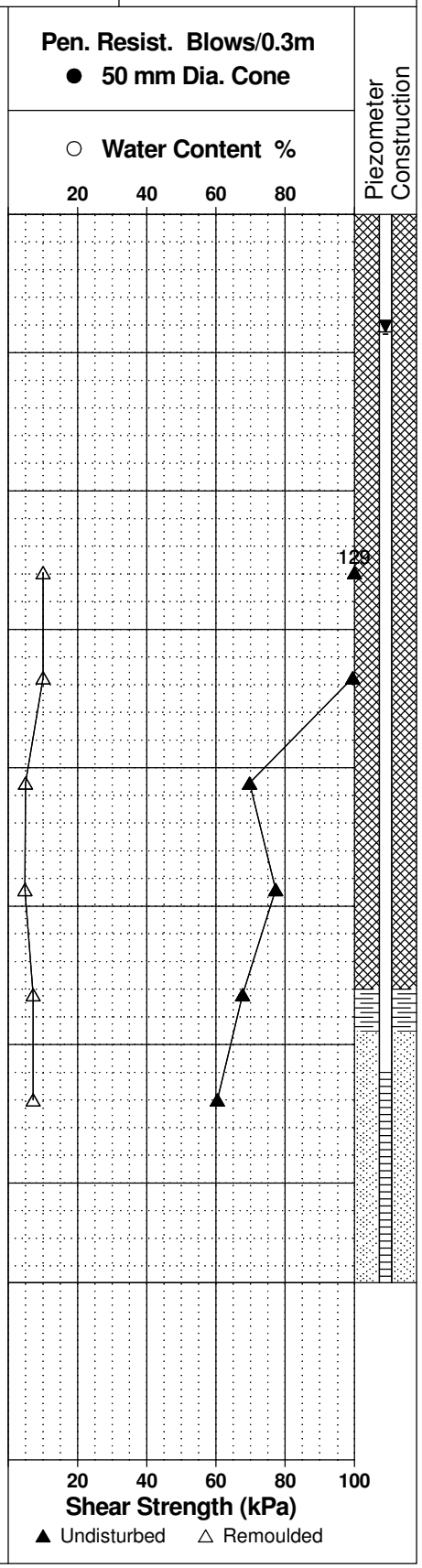
REMARKS

HOLE NO. BH21

BORINGS BY CME 55 Power Auger **DATE** June 29, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	66.25
TOPSOIL 0.23		AU	1				
		SS	2	100	10	1	65.25
		SS	3	100	4	2	64.25
Very stiff to stiff, grey **SILTY CLAY**						3	63.25
						4	62.25
						5	61.25
						6	60.25
6.86							
GLACIAL TILL: Grey silty clay, some sand, gravel, cobbles, boulders						7	59.25
7.72		SS	4	100	50+		
End of Borehole							
Practical refusal to augering at 7.72m depth							
(GWL @ 0.85m - July 12, 2018)							



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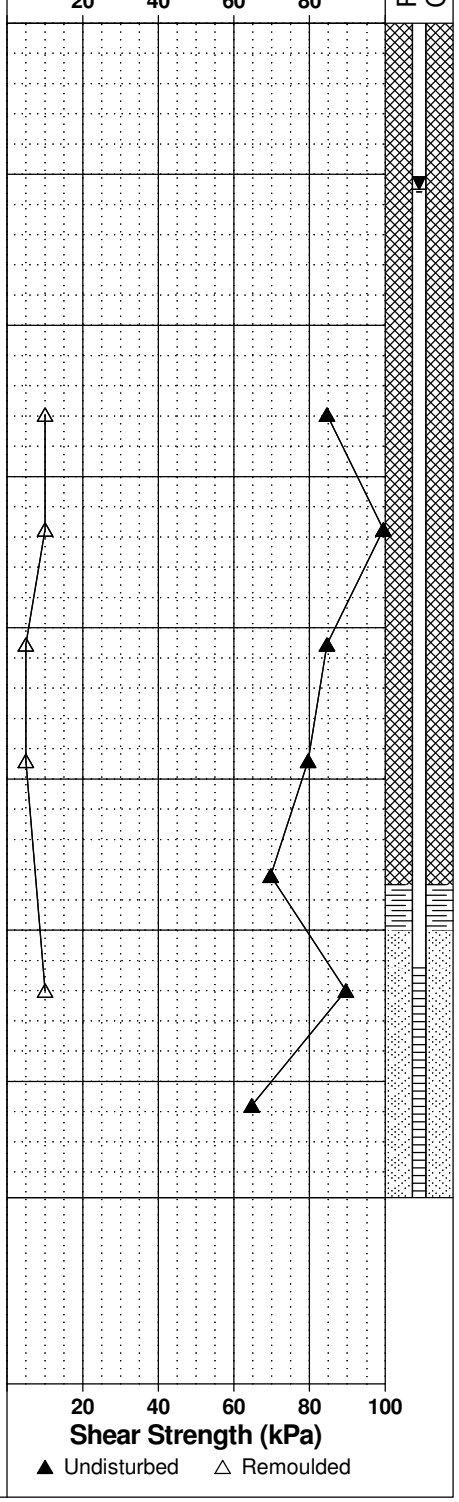
FILE NO. PG4554

REMARKS

HOLE NO. BH22

BORINGS BY CME 55 Power Auger **DATE** July 3, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	65.61
TOPSOIL 0.25		AU	1				
Very stiff to stiff, brown **SILTY CLAY**		SS	2	96	10	1	64.61
- grey by 1.4m depth		SS	3	96	5	2	63.61
						3	62.61
						4	61.61
						5	60.61
						6	59.61
						7	58.61
7.77		SS	4	83	50+		
End of Borehole Practical refusal to augering at 7.77m depth (GWL @ 1.10m - July 12, 2018)							



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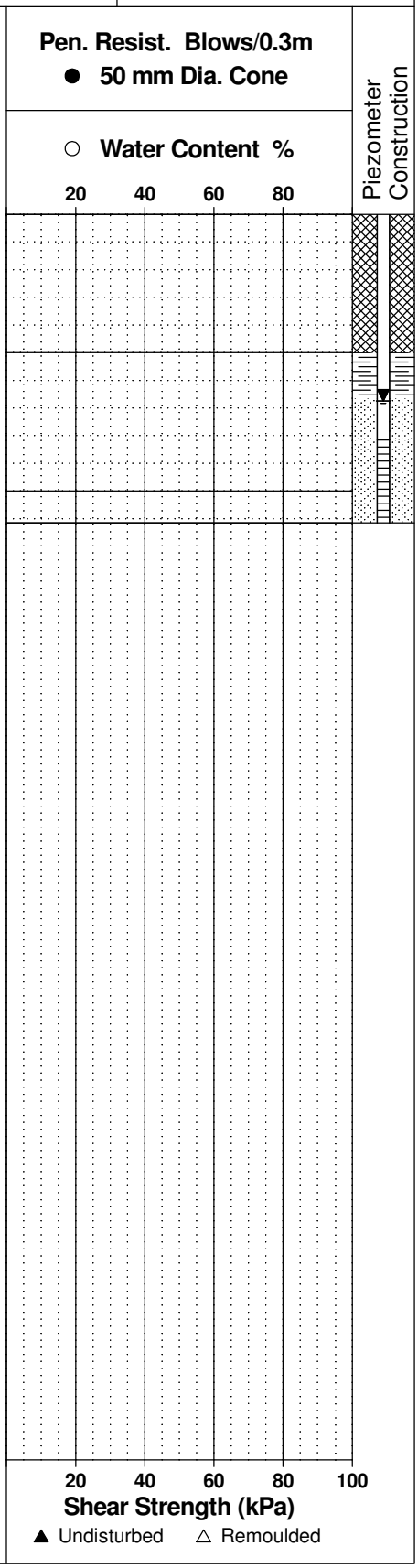
REMARKS

HOLE NO. BH23

BORINGS BY CME 55 Power Auger **DATE** July 3, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	78.70
TOPSOIL 0.20		AU	1				
Very stiff, brown **SILTY CLAY**		SS	2	69	11	1	77.70
1.52							
GLACIAL TILL: Brown silty clay with gravel, sand, cobbles, boulders		SS	3	50	11	2	76.70
2.23							
End of Borehole							
Practical refusal to augering at 2.23m depth							
(GWL @ 1.35m - July 12, 2018)							



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FILE NO. PG4554

REMARKS

HOLE NO. BH24

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

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	77.03
TOPSOIL 0.30		AU	1				
Very stiff, brown **SILTY CLAY**		SS	2		6	1	76.03
1.27 End of Borehole							
Practical refusal to augering at 1.27m depth							
(GWL @ 1.06m - July 12, 2018)							

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

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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FILE NO. PG4554

REMARKS

HOLE NO. BH25

BORINGS BY CME 55 Power Auger **DATE** June 27, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	74.86
TOPSOIL 0.53		AU	1				
		SS	2	100	12	1	73.86
Very stiff to stiff, grey **SILTY CLAY**		SS	3	100	10	2	72.86
		SS	4	100	8		
3.00						3	71.86
End of Borehole							
Practical refusal to augering at 3.00m depth							
(GWL @ 2.49m - July 12, 2018)							

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

20 40 60 80

Piezometer Construction

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

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

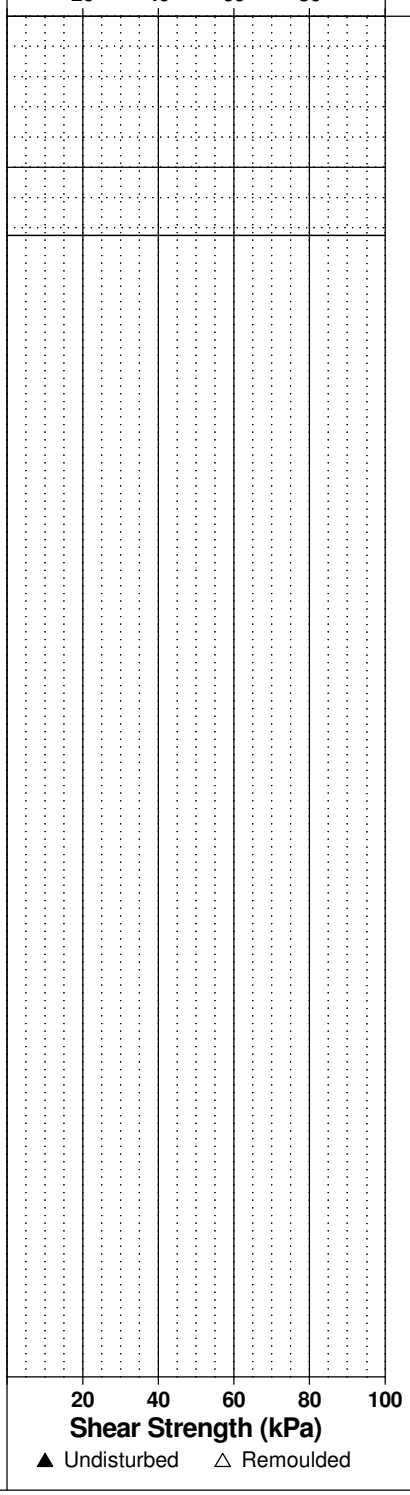
FILE NO. PG4554

REMARKS

HOLE NO. BH26

BORINGS BY CME 55 Power Auger **DATE** June 27, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.28		AU	1			0	70.45		
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles, boulders		SS	2	100	50+	1	69.45		
1.45									
End of Borehole									
Practical refusal to augering at 1.45m depth									
(BH dry upon completion)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

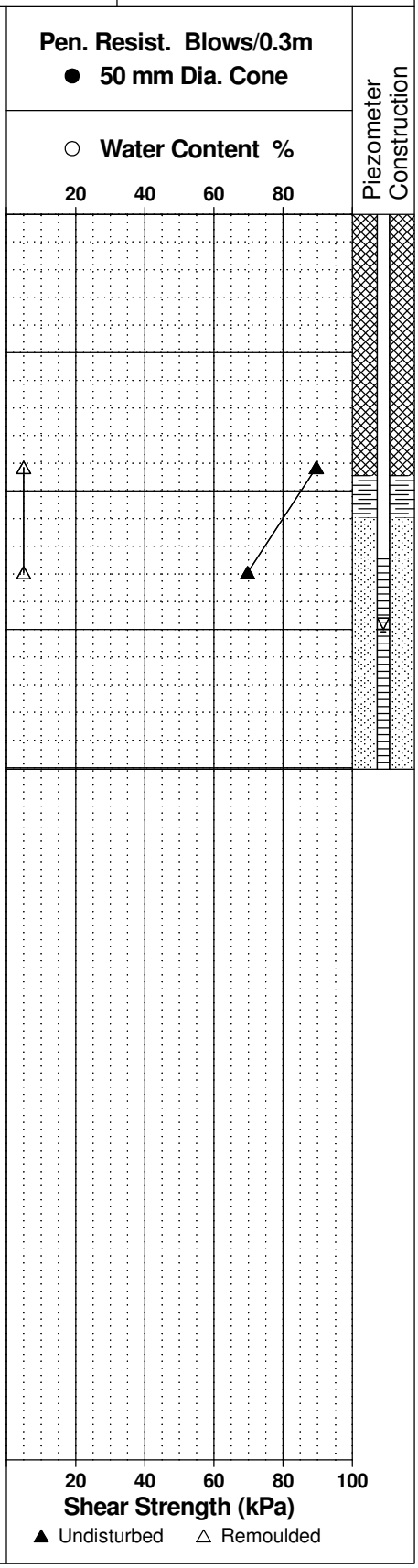
FILE NO. PG4554

REMARKS

HOLE NO. BH27

BORINGS BY CME 55 Power Auger **DATE** June 28, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.66
TOPSOIL 0.18		AU	1				
Loose, brown **SILTY SAND,** trace clay		AU	2				
0.76							
		SS	3	100	2	1	68.66
Stiff, grey **SILTY CLAY**						2	67.66
3.05						3	66.66
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles, boulders		SS	4	83	17		
4.01		SS	5	86	50+	4	65.66
End of Borehole							
Practical refusal to augering at 4.01m depth							
(GWL @ 3.0m depth based on field observations)							



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Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

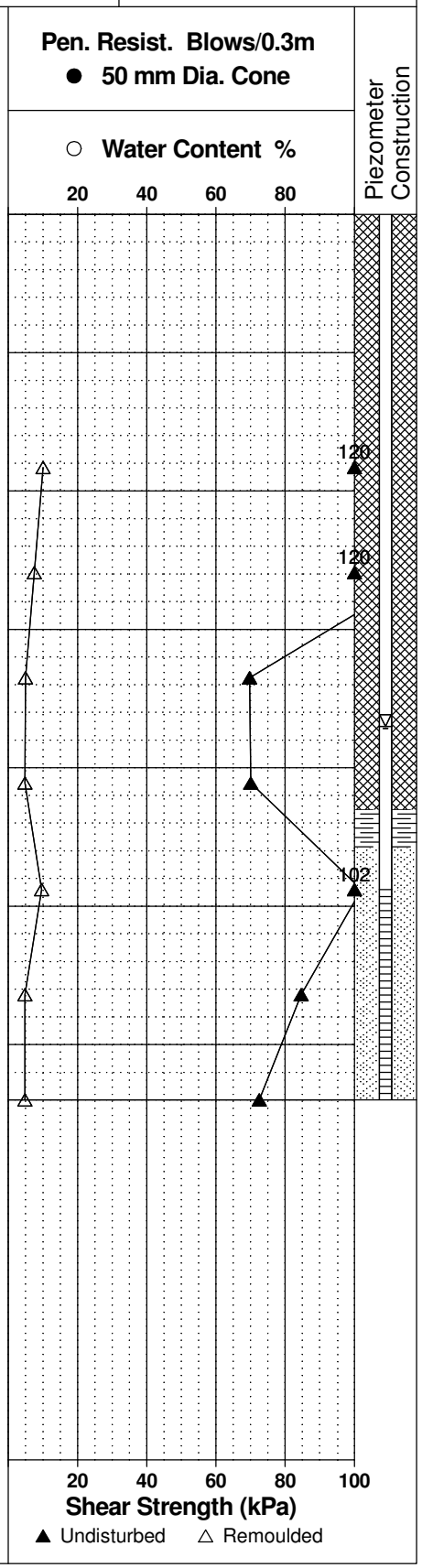
FILE NO. PG4554

REMARKS

HOLE NO. BH28

BORINGS BY CME 55 Power Auger **DATE** June 28, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.44
TOPSOIL 0.05		AU	1				
Loose, brown **SILTY SAND,** trace clay		AU	2				
0.76		SS	3	100	5	1	68.44
						2	67.44
						3	66.44
Very stiff to stiff, brown **SILTY CLAY**						4	65.44
						5	64.44
						6	63.44
6.40							
End of Borehole							
(GWL @ 3.7m depth based on field observations)							



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SOIL PROFILE AND TEST DATA

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Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

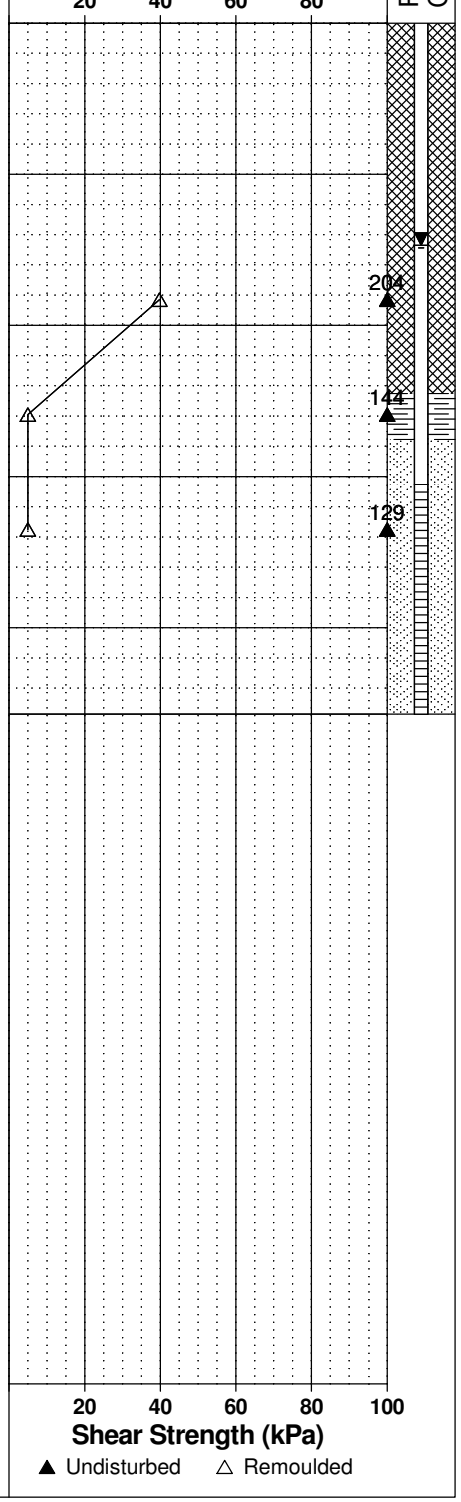
FILE NO. PG4554

REMARKS

HOLE NO. BH29

BORINGS BY CME 55 Power Auger **DATE** June 29, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	68.94
TOPSOIL 0.20		AU	1				
Loose, brown **SILTY SAND**		AU	2				
0.91		SS	3	100	8	1	67.94
Hard to very stiff, grey **SILTY CLAY**						2	66.94
3.35						3	65.94
GLACIAL TILL: Grey silty clay, some sand, gravel, cobbles, boulders		SS	4	100	4	4	64.94
4.57							
End of Borehole							
Practical refusal to augering at 4.57m depth							
(GWL @ 1.47m - July 12, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PG4554

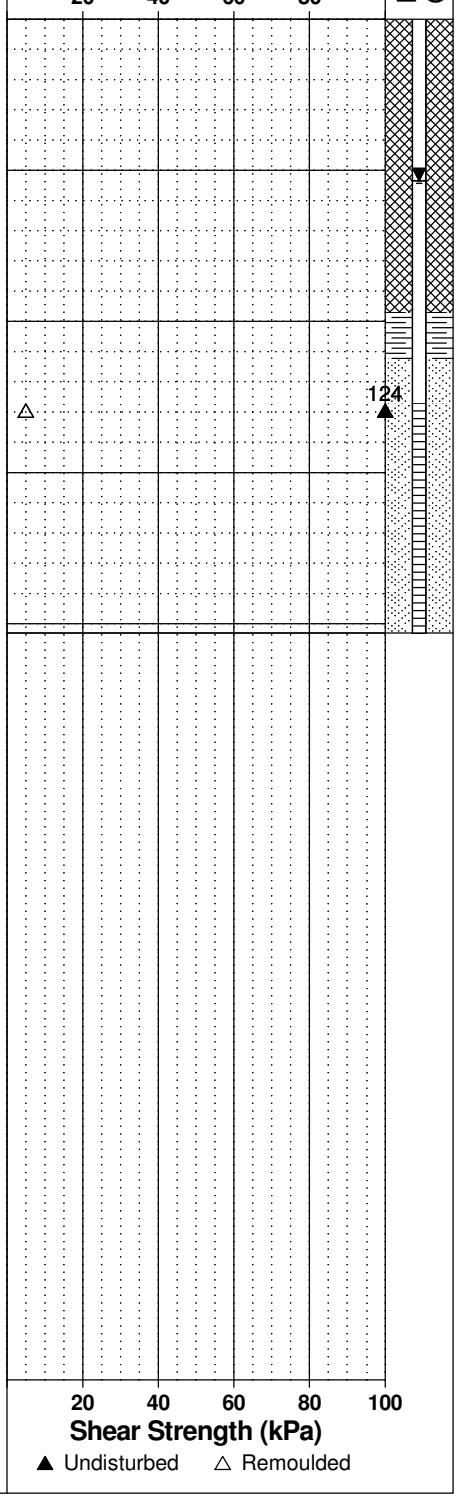
REMARKS

HOLE NO. BH30

BORINGS BY CME 55 Power Auger **DATE** June 29, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	66.95
TOPSOIL 0.23		AU	1				
Very stiff, grey **SILTY CLAY**		SS	2	100	7	1	65.95
		SS	3	100	4	2	64.95
2.74							
GLACIAL TILL: Grey silty sand, trace clay, gravel, cobbles, boulders		SS	4	100	19	3	63.95
4.06		SS	5	100	50+	4	62.95
End of Borehole							
Practical refusal to augering at 4.06m depth							
(GWL @ 1.07m - July 12, 2018)							

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



Piezometer Construction

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

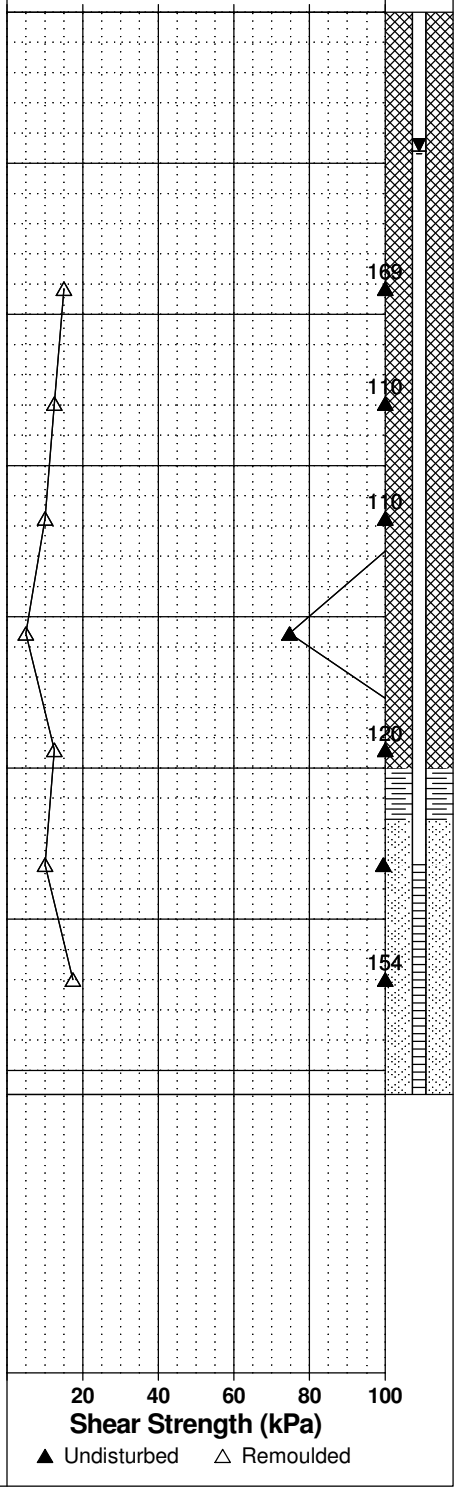
FILE NO. PG4554

REMARKS

HOLE NO. BH31

BORINGS BY CME 55 Power Auger **DATE** June 29, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	66.06
TOPSOIL 0.25		AU	1				
		SS	2	100	7	1	65.06
						2	64.06
Very stiff to stiff, grey **SILTY CLAY**						3	63.06
						4	62.06
						5	61.06
6.10						6	60.06
GLACIAL TILL: Grey silty clay, some sand, gravel, cobbles, boulders							
7.16		SS	3	100	50+	7	59.06
End of Borehole							
Practical refusal to augering at 7.16m depth							
(GWL @ 0.92m - July 12, 2018)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PG4554

REMARKS

HOLE NO. BH32

BORINGS BY CME 55 Power Auger **DATE** June 27, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	76.95
TOPSOILB 0.30		AU	1				
		SS	2	100	10	1	75.95
Very stiff, grey **SILTY CLAY**		SS	3	100	8	2	74.95
2.74		SS	4	100	8		
GLACIAL TILL: Grey silty clay, trace sand, gravel, cobbles, boulders		SS	5	71	50+	3	73.95
4.14						4	72.95
End of Borehole							
Practical refusal to augering at 4.14m depth							
(BH dry - July 12, 2018)							

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

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

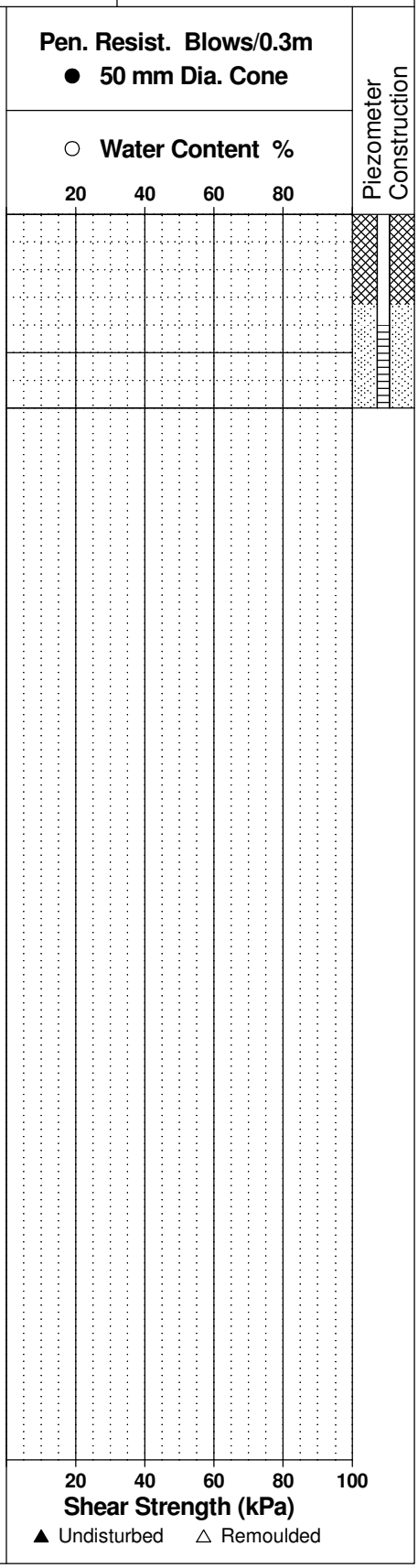
FILE NO. PG4554

REMARKS

HOLE NO. BH33

BORINGS BY CME 55 Power Auger **DATE** June 27, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	71.39
TOPSOIL 0.28		AU	1				
Very stiff, grey **SILTY CLAY** 0.91						1	70.39
GLACIAL TILL: Grey silty clay, trace sand, gravel, cobbles, boulders 1.40		SS	2	100	23		
End of Borehole							
Practical refusal to augering at 1.40m depth							
(BH dry - July 12, 2018)							



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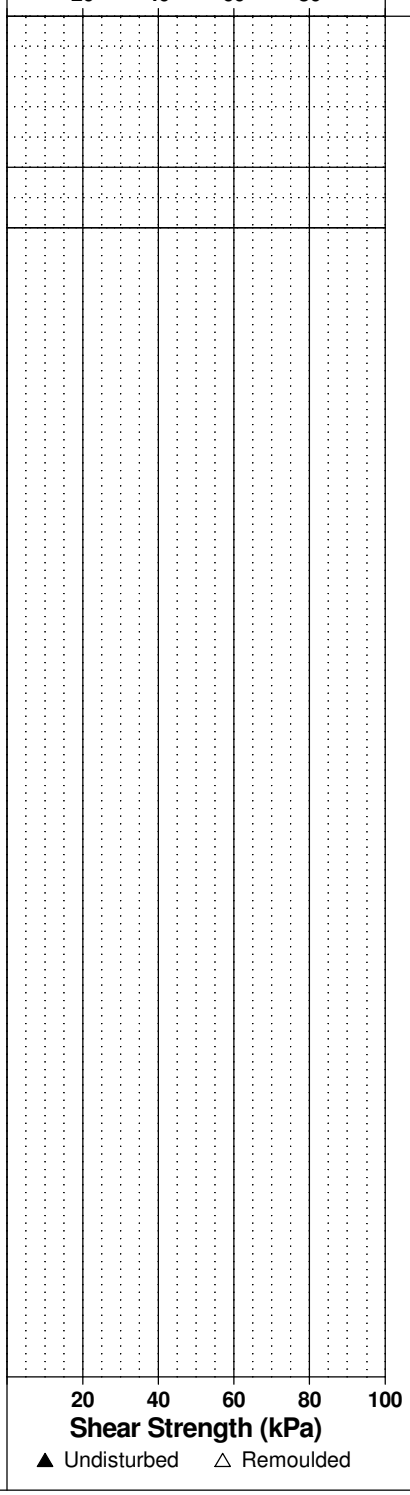
FILE NO. PG4554

REMARKS

HOLE NO. BH34

BORINGS BY CME 55 Power Auger **DATE** June 27, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.28						0	69.83		
Very stiff, grey **SILTY CLAY**		AU	1						
0.76									
GLACIAL TILL: Grey silty clay, trace sand, gravel, cobbles, boulders		SS	2		10	1	68.83		
1.40									
End of Borehole									
Practical refusal to augering at 1.40m depth									
(BH dry upon completion)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PG4554

REMARKS

HOLE NO. BH35

BORINGS BY CME 55 Power Auger **DATE** June 28, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.58
TOPSOIL 0.28		AU	1				
Loose, brown **SILTY SAND,** trace clay 0.76		AU	2				
		SS	3	100	3	1	68.58
Stiff, grey **SILTY CLAY** 2.29						2	67.58
GLACIAL TILL: Grey silty clay, trace sand, gravel, cobbles, boulders		SS	4	75	4	3	66.58
		SS	5	88	20	4	65.58
4.78		SS	6	100	50+		
End of Borehole							
Practical refusal to augering at 4.78m depth							

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

Piezometer Construction

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

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PG4554

REMARKS

HOLE NO. BH36

BORINGS BY CME 55 Power Auger **DATE** June 28, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.60
TOPSOIL 0.23		AU	1				
Loose, brown **SILTY SAND,** trace clay		AU	2				
0.84							
Stiff, grey **SILTY CLAY**		SS	3	100	5	1	68.60
1.83		SS	4	100	7	2	67.60
		SS	5	29	4		
GLACIAL TILL: Grey silty clay, some sand, gravel, cobbles, boulders		SS	6	83	15	3	66.60
		SS	7	33	22	4	65.60
		SS	8	100	11		
5.13						5	64.60
End of Borehole							
Practical refusal to augering at 5.13m depth							

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

Piezometer Construction

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

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PG4554

REMARKS

HOLE NO. BH37

BORINGS BY CME 55 Power Auger **DATE** June 29, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	68.89
TOPSOIL 0.18		AU	1				
		AU	2				
Loose, brown **SAND,** some silt 0.91		SS	3	96	6	1	67.89
Stiff to firm, grey **SILTY CLAY**		SS	4	100	4	2	66.89
3.05		SS	5	100	6	3	65.89
GLACIAL TILL: Grey silty clay, trace sand, gravel, cobbles, boulders		SS	6	100	5	4	64.89
		SS	7	100	9	5	63.89
5.31 End of Borehole							
Practical refusal to augering at 5.31m depth							
(GWL @ 1.26m - July 12, 2018)							

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

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

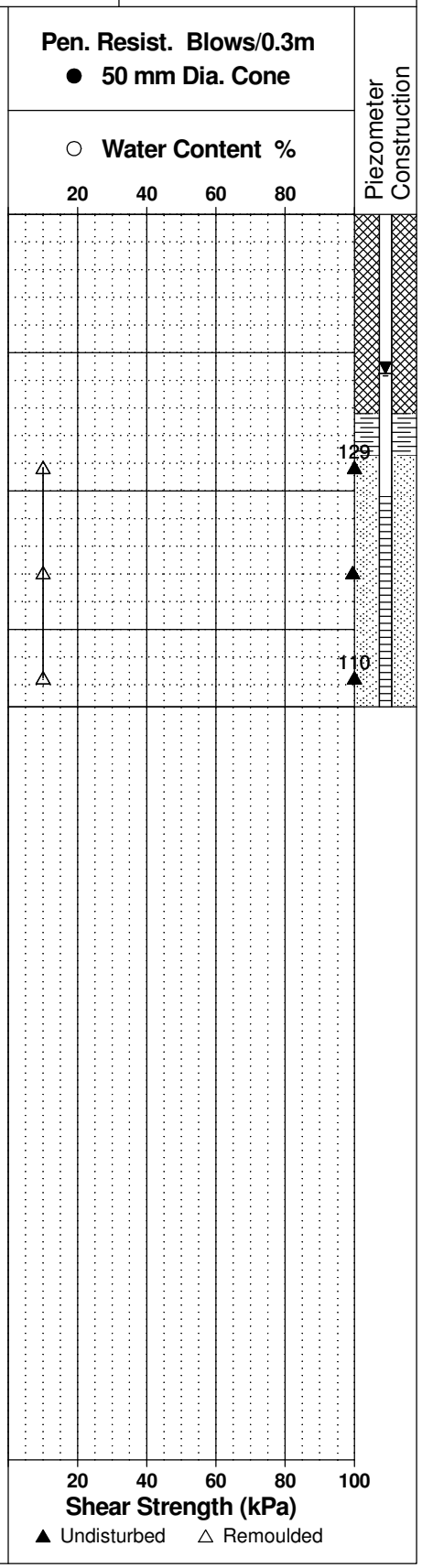
FILE NO. PG4554

REMARKS

HOLE NO. BH38

BORINGS BY CME 55 Power Auger **DATE** June 29, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	67.01
TOPSOIL 0.23		AU	1				
		SS	2	100	6	1	66.01
Very stiff, grey **SILTY CLAY**						2	65.01
						3	64.01
3.56							
End of Borehole							
Practical refusal to augering at 3.56m depth							
(GWL @ 1.15m - July 12, 2018)							



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SOIL PROFILE AND TEST DATA

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Prop. Residential Development - 936 March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

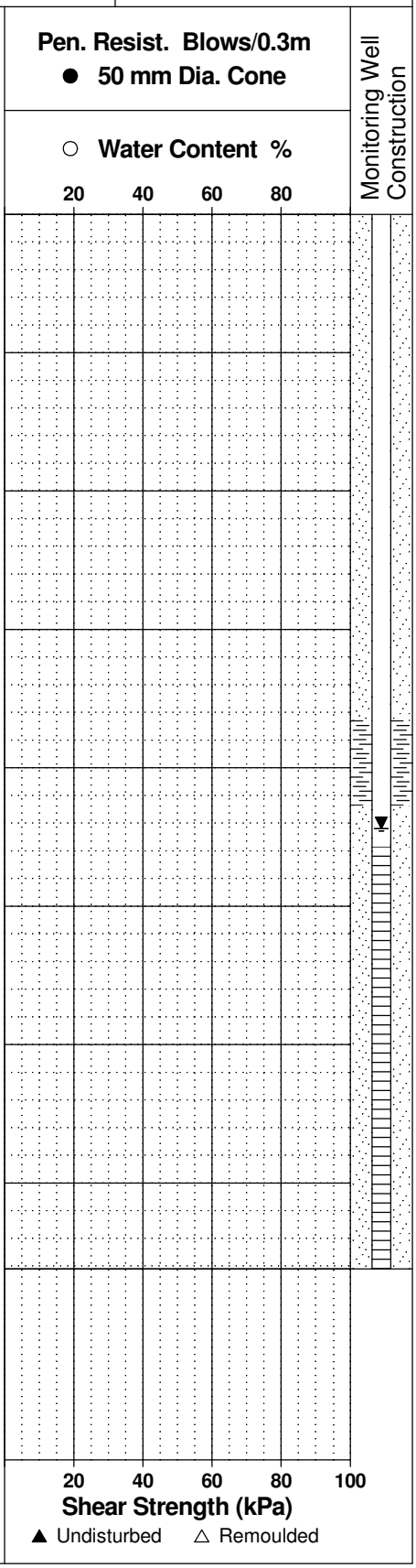
FILE NO. PG4554

REMARKS

HOLE NO. BH40

BORINGS BY CME 55 Power Auger **DATE** July 4, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	79.19
TOPSOIL 0.25		AU	1				
Compact, brown **SILTY SAND,** trace clay		SS	2	71	11	1	78.19
1.52		SS	3	96	8	2	77.19
Stiff, brown **SILTY CLAY,** trace sand		SS	4	96	7		
		SS	5	96	7	3	76.19
- grey by 3.8m depth		SS	6	94	6	4	75.19
		SS	7	96	5	5	74.19
		SS	8	96	4	6	73.19
		SS	9	96	W		
6.86 **GLACIAL TILL:** Grey silty clay with sand, gravel, cobbles, boulders		SS	10	96	2	7	72.19
7.62 End of Borehole							
(GWL @ 4.44m - July 13, 2018)							



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SOIL PROFILE AND TEST DATA

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Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

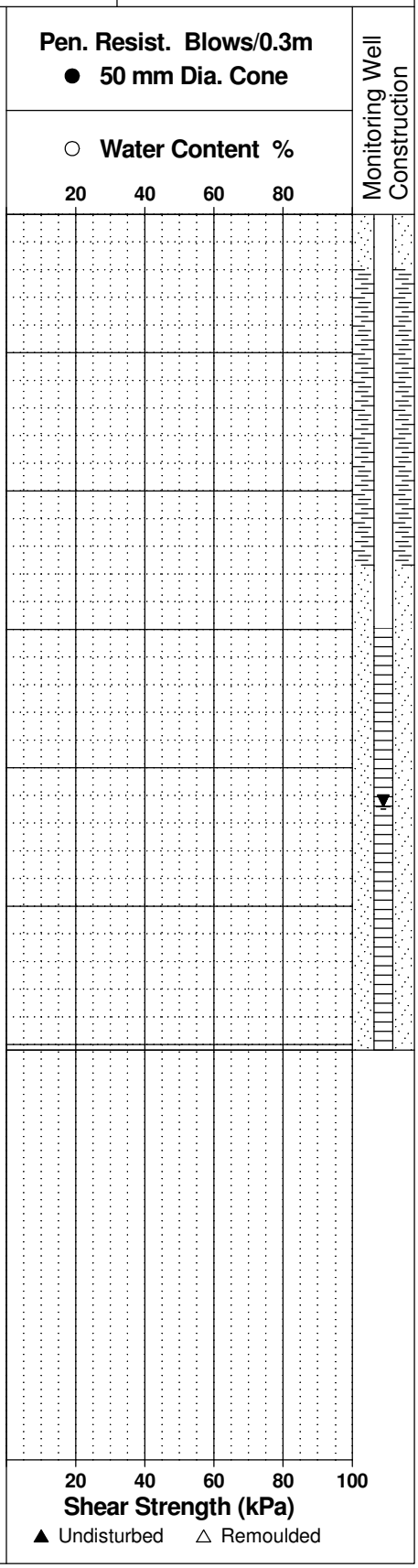
FILE NO. PG4554

REMARKS

HOLE NO. BH41

BORINGS BY CME 55 Power Auger **DATE** July 4, 2018

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	78.67
TOPSOILB 0.25		AU	1				
Compact, brown **SILTY SAND,** trace clay		SS	2	75	12	1	77.67
1.52		SS	3	21	6	2	76.67
Stiff to firm, brown **SILTY CLAY,** trace sand		SS	4	54	8		
- grey by 2.3m depth		SS	5	62	8	3	75.67
		SS	6	88	3	4	74.67
		SS	7	96	1	5	73.67
		SS	8	88	W		
6.04						6	72.67
End of Borehole							
Practical refusal to augering at 6.04m depth							
(GWL @ 4.28m - July 13, 2018)							



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DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PG4554

REMARKS

HOLE NO. BH42

BORINGS BY CME 55 Power Auger **DATE** July 4, 2018

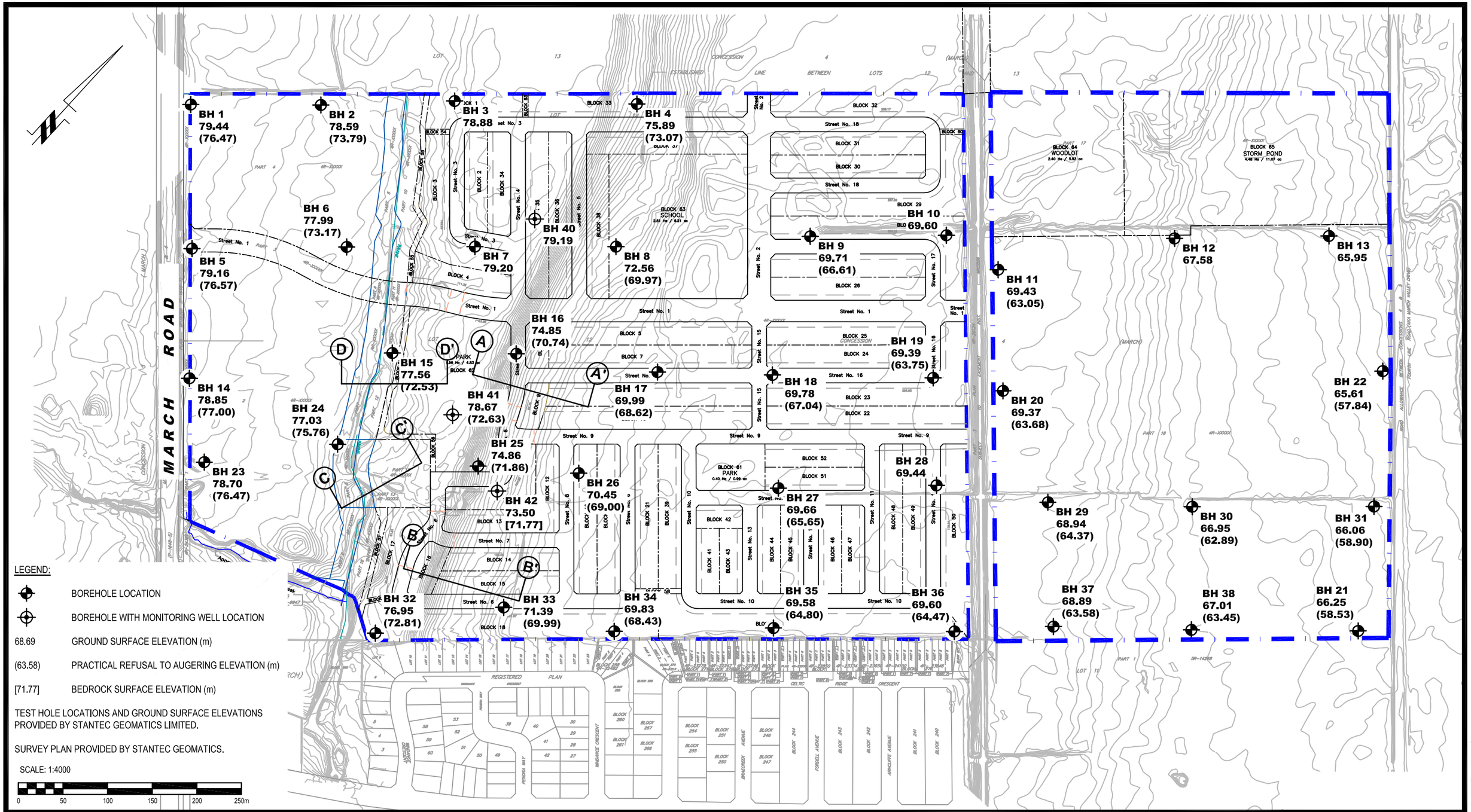
SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	73.50
TOPSOIL 0.18		AU	1				
Compact, brown **SILTY SAND,** trace clay		SS	2	21	10	1	72.50
1.52							
GLACIAL TILL: Brown silty sand with gravel, cobbles, boulders 1.73		SS	3	20	50+	2	71.50
		RC	1	98	98		
						3	70.50
		RC	2	98	79		
BEDROCK: Grey limestone with shale seams						4	69.50
		RC	3	100	93	5	68.50
						6	67.50
		RC	4	100	81		
7.21						7	66.50
End of Borehole							
(GWL @ 4.04m - July 13, 2018)							

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

20 40 60 80

Monitoring Well Construction

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



LEGEND:

- BOREHOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION
- 68.69 GROUND SURFACE ELEVATION (m)
- (63.58) PRACTICAL REFUSAL TO AUGERING ELEVATION (m)
- [71.77] BEDROCK SURFACE ELEVATION (m)

TEST HOLE LOCATIONS AND GROUND SURFACE ELEVATIONS PROVIDED BY STANTEC GEOMATICS LIMITED.

SURVEY PLAN PROVIDED BY STANTEC GEOMATICS.

SCALE: 1:4000

0 50 100 150 200 250m

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
2	BASE PLAN UPDATED	23/11/2018	SD
1	BASE PLAN UPDATED	30/08/2018	SD

MINTO COMMUNITIES / 2559688 ONTARIO INC.

GEOTECHNICAL INVESTIGATION
PROPOSED DEVELOPMENT - 936 MARCH ROAD

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

1:4000	07/2018
Drawn by: RCG	Report No.: PG4554-1
Checked by: SD	Dwg. No.: PG4554-1
Approved by: SD	Revision No.: 2

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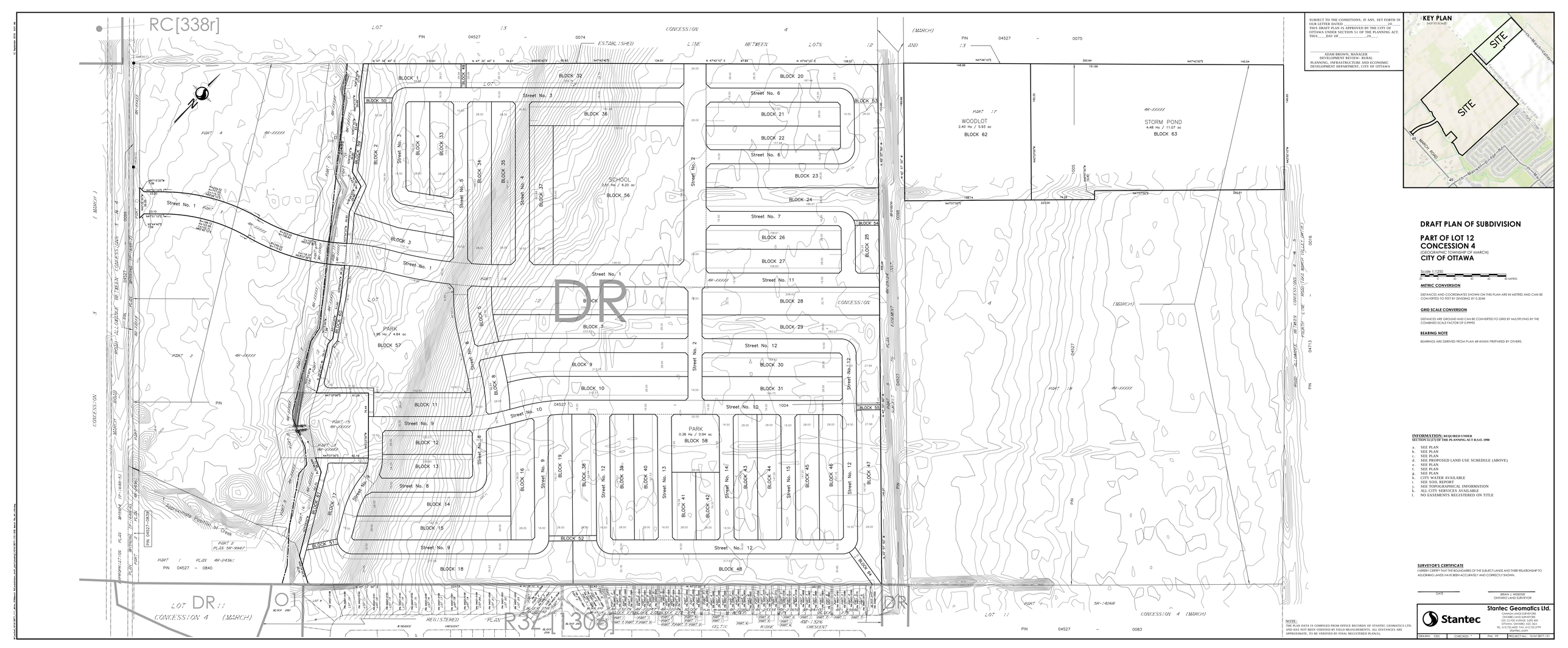
APPENDIX 3

Stantec Geomatics Limited - Draft Plan of Subdivision With Contours



SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED _____20____.
THIS DRAFT PLAN IS APPROVED BY THE CITY OF OTTAWA UNDER SECTION 51 OF THE PLANNING ACT, THIS____DAY OF_____20____.

ADAM BROWN, MANAGER
DEVELOPMENT REVIEW- RURAL
PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

KEY PLAN
NOT TO SCALE

DRAFT PLAN OF SUBDIVISION

PART OF LOT 12
CONCESSION 4
[GEOGRAPHIC TOWNSHIP OF MARCH]
CITY OF OTTAWA

Scale 1:1250
0 5 10 20 30 40 50 METRES

METRIC CONVERSION

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

GRID SCALE CONVERSION

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.9999

BEARING NOTE

BEARINGS ARE DERIVED FROM PLAN 4R-XXXXX PREPARED BY OTHERS.

INFORMATION; REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT R.S.O. 1990

a. SEE PLAN
b. SEE PLAN
c. SEE PLAN
d. SEE PROPOSED LAND USE SCHEDULE (ABOVE)
e. SEE PLAN
f. SEE PLAN
g. SEE PLAN
h. CITY WATER AVAILABLE
i. SEE SOIL REPORT
j. SEE TOPOGRAPHICAL INFORMATION
k. ALL CITY SERVICES AVAILABLE
l. NO EASEMENTS REGISTERED ON TITLE

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE SUBJECT LANDS AND THEIR RELATIONSHIP TO ADJOINING LANDS HAVE BEEN ACCURATELY AND CORRECTLY SHOWN.

DATE

BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

NOTE:
THE PLAN DATA IS COMPILED FROM OFFICE RECORDS OF STANTEC GEOMATICS LTD. AND HAS NOT BEEN VERIFIED BY FIELD MEASUREMENTS. ALL DISTANCES ARE APPROXIMATE, TO BE VERIFIED BY FINAL REGISTERED PLAN(S).

Stantec Geomatics Ltd.
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ONTARIO LAND SURVEYORS
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OTTAWA, ONTARIO K2C 3G4
TEL: 613.722.4420 FAX: 613.722.2799
stantec.com

DRAWN: CJC | CHECKED: * | PM: FP | PROJECT NO.: 161613077-131