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August 14, 2020
PH4087-LET.01

Riverside South Development Corporation
2193 Arch Street
Ottawa, ON
K1G 2H5

Attention: Christa Jones

Subject: **Groundwater Impact Assessment**
Proposed Residential Development
Riverside South - Phase 17
Spratt Road - Ottawa

Dear Christa Jones,

Paterson Group (Paterson) was commissioned by Riverside South Development Corporation to complete a groundwater impact assessment for Phase 17 of the Riverside South residential development to be located along Spratt Road in the City of Ottawa, Ontario (Refer to Drawing PH4087-1 - Site Plan attached to the current report).

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains a hydrogeological review and assessments pertaining to the proposed works as they are understood at the time of writing this report.

1.0 Proposed Development

It is our understanding that Phase 17 of the proposed development, to be located on the east side of Spratt Road and north of Rideau Road, consists of part of Lot 23 and Lot 24, Concession 1. The proposed phase will be comprised of single and townhouse style residential dwellings with paved parking areas and local roadways, as well as landscaped areas. It is anticipated that the site will be serviced by future municipal services.

2.0 Background Information

The field program for the subsoil investigation was carried out between January 27 and February 4, 2020. A total of 28 boreholes were advanced to a maximum depth of 5.9 m below ground surface (bgs). The borehole locations were distributed in a manner to provide general coverage of the proposed phase. The approximate locations of the boreholes are shown on Drawing PG5131-1 - Test Hole Location Plan attached to the current report.

3.0 Site Conditions

Physical Setting

The subject site consists mostly of undeveloped land with grass and tree covered areas. Heavily treed areas have been identified within the west central and northeast portion of the site. The ground surface gradually slopes down from the southeast to the northwest across the site with an approximate elevation difference of 8 m. The subject site is bordered to the north by undeveloped land, residential dwellings and a residential development currently under construction, to the east by undeveloped land followed by the Thomas Gamble Municipal Drain, to the south by agricultural land and associated buildings, and to the west by Spratt Road followed by undeveloped land.

According to available mapping, the northwest portion of the subject site is located in the Ottawa Valley Clay Plains physiographic region, while the remaining portion of the site has been identified as Till Plains (Drumlinized). The region is characterized by relatively flat plains, which is generally consistent with field observations at the subject site.

3.1 Geology

Surficial Geology

Overburden soils identified during the geotechnical field investigation were generally consistent with available mapping for the area. Soils typically consisted of topsoil underlain by a glacial till deposit. The glacial till was generally comprised of silty sand to sandy silt matrix with varying amounts of clay, gravel, cobbles and boulders.

A stiff silty clay deposit and/or compact silty sand layer was encountered at surface or underlying the topsoil in the northern half of the subject site. The above noted layers were underlain by the glacial till deposit. Practical refusal by dynamic cone penetration testing was observed at depths ranging between 6.6 and 7.1 m bgs.

Specific details of the soil profile at each test hole location are presented on the Soil Profile and Test Data sheets attached to the current report.

Based on surficial mapping prepared by the Ontario Geological Survey (OGS), the subject site is located in an area where surficial geology consists of a stone-poor, sandy silt to silty sand-textured till.

Bedrock

Based on available geological mapping, the subject site is located in an area where the bedrock consists of interbedded sandstone and dolostone of the March formation with an overburden drift thickness of 0 to 15 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 karst mapping prepared by the OGS, there is no potential, inferred or known karsts within the subject site.

3.2 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. 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, was reviewed as part of this assessment. Using this tool, the March and Oxford formation aquifer systems were identified as the water supply aquifer systems in the vicinity of the study area, with the majority of the domestic wells extending into the bedrock aquifer.

Groundwater Levels

Groundwater was observed in the piezometers installed in the overburden at the borehole locations. Based on a review of water well records, groundwater is also present in the bedrock at depth.

Groundwater levels in the overburden at the subject site were observed to vary from 1.4 to 4.1 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. It should also be noted that groundwater levels can fluctuate both seasonally and in conjunction with precipitation events. As such, long-term groundwater levels can

also be 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 between 3 and 4 m bgs.

Hydraulic Gradients

Vertical hydraulic gradients were not measured at the subject site as the geotechnical investigation 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:

$$i=(h_2-h_1)/L$$

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

Using the above noted formula, the horizontal hydraulic gradient has been calculated to be approximately 0.008 in a northwest direction. Shallow groundwater flow in the vicinity of the subject site is expected to reflect local topography. Regional groundwater flow in the overburden and bedrock is considered to be in a westerly direction, towards the Rideau 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 in the order of 1×10^{-7} to 1×10^{-9} m/sec for brown silty clay, 1×10^{-6} to 1×10^{-10} m/sec for glacial till, and 1×10^{-6} to 1×10^{-10} m/sec for bedrock. Based on the subsurface profile at the subject site and anticipated excavation depths for the proposed development, a maximum of 6 m of saturated material could be encountered within the servicing excavations located at the connection points along Spratt Road.

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 across the northern portion of the subject site. It is our interpretation that groundwater will generally flow laterally through the glacial till material and bedrock, as opposed to vertically through soils with lower hydraulic conductivity such as the silty clay. As such, the volume of recharge occurring within the northern portion of the subject site is expected to be minimal. The volume of recharge occurring where the glacial till is encountered within the southern portion of the subject site is expected to be low to moderate.

Groundwater will generally flow laterally through the glacial till and bedrock towards topographically low areas. Given the topographical and geological conditions within the boundaries of the subject site, it is our interpretation that the property is not considered suitable for discharge to be occurring.

4.0 Potential Impacts

4.1 Adverse Effects on Adjacent Structures

The overburden in the area generally consists of topsoil underlain by silty clay and/or a glacial till deposit. Practical refusal to DCPT was encountered at depths ranging from 6.6 to 7.1 m bgs. The majority of the expected groundwater infiltration will be encountered within the glacial till and bedrock. The potential dewatering volumes due to groundwater infiltration into the excavation footprints are anticipated to be low to high, depending on the excavation locations across the site. It is anticipated that pumping from open sumps will be sufficient to control the groundwater influx through the sides of the excavations. However, if significant groundwater is encountered, a series of well points may be required during the excavation work. Due to the lack of compressibility of the glacial till and bedrock as well as the short term nature of the construction, adverse effects on adjacent structures related to dewatering activities at the subject site are expected to be negligible.

4.2 Adverse Effects on Neighbouring Water Wells

A search of the Ontario Water Well Records online mapping database indicates there are approximately 16 water wells within 500 m of the site as depicted on Drawing PH4087-2 - MECP Water Well Location Plan attached to the current report. The majority of the wells located in the vicinity were noted to be primarily private water supply wells. Based on recent water service locations provided by the City of Ottawa, a total of 7 private water supply wells could remain in use within 500 m of the subject site. Well records have documented the above noted wells to be accessing the bedrock aquifer between 15.2 and 68.0 m depth with bedrock encountered between 5.5 and 11.0 m depth. Municipal water supplies are available north of the subject site where some domestic wells may remain in use. Recent water service locations provided by the City of Ottawa has been attached to the current report.

A series of calculations were carried out on theoretical radii of influence for a typical servicing trench excavation withdrawing water from the upper 5 to 7 m of the saturated zone. These calculations were completed based on Sichardt (1992) using the equation:

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

- 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 = 9.55 m
- ❑ k = 1 x 10^{-6} m/sec, based upon our experience in the area and published values.
- ❑ Δh = 5 to 7 m, to review potential minimum/maximum variable conditions.

Using the above equation and assumptions, a radius of influence of approximately 15 to 21 m will develop as a steady state condition, extending from the edge of the excavation, in the area of the subject site.

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.

However, in the interest of public perception, a baseline water sampling program is recommended to be completed prior to commencing construction on site. 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 any concerns arise during or after construction.

Based on the proximity of the existing wells, it is recommended that civic address 4661 Spratt Road, 4729 Spratt Road, 4975 Spratt Road, and 805 Rideau Road, be subject to sampling. The remaining wells are greater than 350 m of the proposed phase, well outside the theoretical radius of influence, or the associated dwellings have been decommissioned as a result of the development. The parameters that will be analysed as part of the sampling program will consist of the “Subdivision Water Quality Package” offered by Paracel Laboratories Ltd.This package includes; alkalinity, bacteria, colour, conductivity, pH, hardness, IC anions, NH3, TKN, DOC, phenols, sulphide, metals, Tannin & Lignin, TDS and turbidity.

Details regarding the sampling program and residential well survey letter will be discussed and reviewed by the City of Ottawa prior to commencing construction on site.

4.3 Soil, Surface Water and Groundwater

A search of the MECP Brownfields Environmental Site Registry was conducted as part of the assessment of the site, neighbouring properties and the general area of the site. Using a search radius of 500 m provided no recorded Brownfield sites in that area. 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.

With respect to nearby surface water bodies, the Thomas Gamble Drain is located approximately 200 m east of the property, well outside the theoretical radius of influence for the subject site. As such, adverse effects to surface water features resulting from dewatering activities at the subject site are expected to be negligible.

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.

4.4 Adjacent Permits to Take Water

A search of the MECP Permit to Take Water database provided 2 active PTTW within 500 m of the subject site and is in use for the subject development/previous phases. PTTW 3410-AGTQG6 is located north of the subject site and contains 2 source with a maximum water taking of 1,219,200 L/day. PTTW 2403-BPXL3D is located west of the subject site and contains 1 source with a maximum water taking of 8,000,000 L/day. The locations of the existing permits places them outside the radius of influence of the subject site and it is not anticipated that there will be any negative effects related to potential takings.

A search of the MECP Environmental Activity and Sector Registry (EASR) database provided 1 registered water taking permit within 500 m radius of the subject site. Registration Number R-009-1110170558 is registered to a previous phase of the development and is located northeast of the subject site. The active registry is for water taking activities related to construction dewatering between 50,000 and 400,000 L/day. The location of the existing permit places it outside the radius of influence of the subject site and it is not anticipated that there will be any negative effects related to potential takings.

4.5 Existing Servicing

All existing wells at the subject site, that are not maintained in accordance with the regulations and guidelines, should be properly decommissioned by a licensed well contractor as per O.Reg. 903.

5.0 Recommendations

Further testing and site preparation is recommended for the detailed Hydrogeological Assessment. The following aspects of the program should be performed prior to commencing construction for the proposed residential development:

- ❑ All existing wells within the proposed residential development should be properly decommissioned as per *O.Reg. 903.*

- ❑ In the interest of public perception, a baseline water sampling program is recommended prior to commencing construction on site. Based on the proximity of existing wells, it is recommended that civic address 4661 Spratt Road, 4729 Spratt Road, 4975 Spratt Road, and 805 Rideau Road, be subject to sampling.

- ❑ Prior to and during site development, it is recommended that construction best management practices with respect to fuels and chemical handling, spill prevention, and erosion and sediment control be followed.

- ❑ For any water taking of greater than 50,000 L/day, either an Environmental Activity and Sector Registration (EASR) or a Permit To Take Water (PTTW) is required from the MECP, dependant on dewatering requirements.

6.0 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 Riverside South Development Corporation 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.

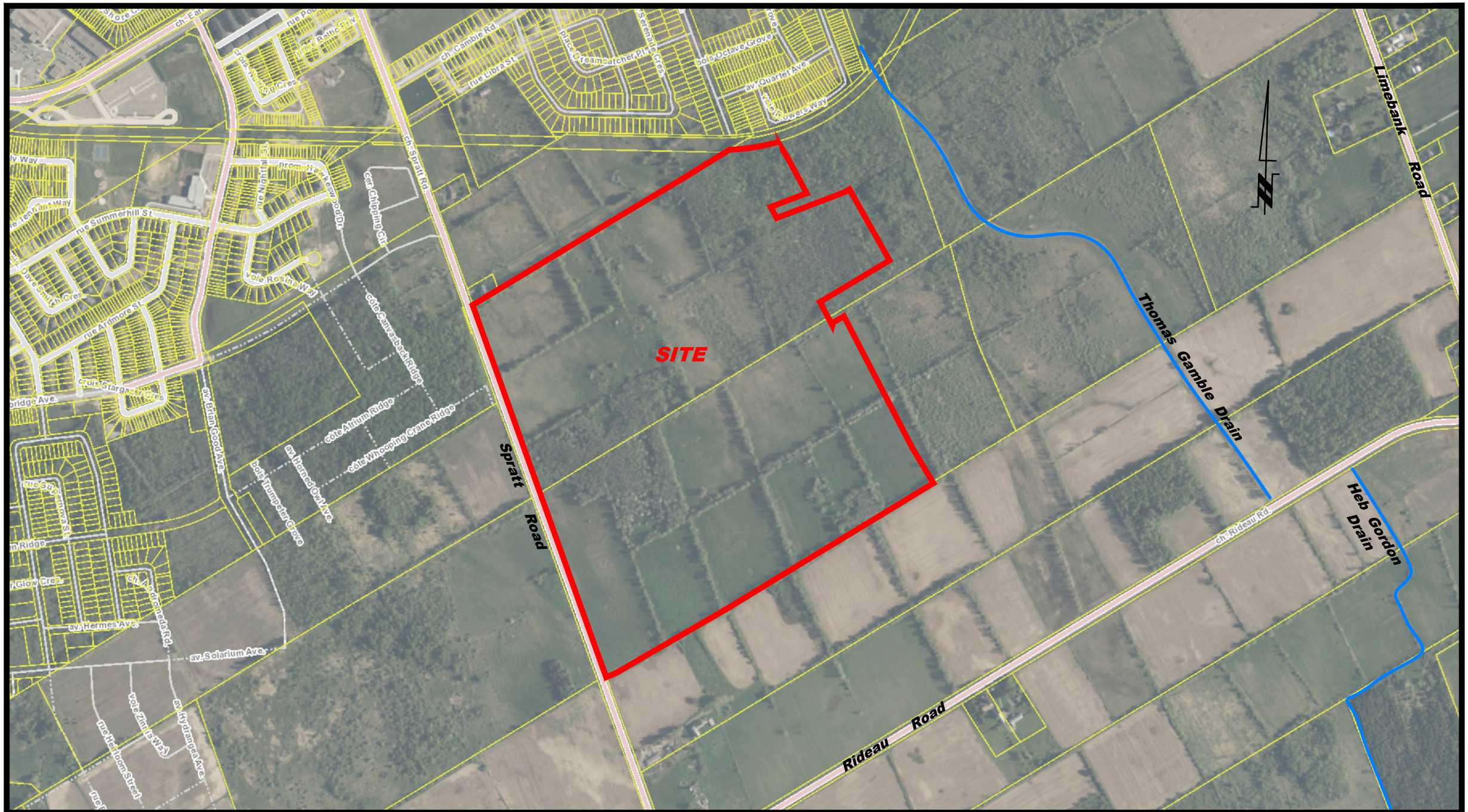
Paterson Group Inc.

Nicholas Zulinski, P.Geo., géo.

Michael Killam, P.Eng.

Attachments

- ❏ Drawing PH4087-1 - Site Plan
- ❏ Drawing PH4087-2 - MECP Well Location Plan
- ❏ Water Service Location Map - City of Ottawa
- ❏ Soil Profile and Test Data Sheets
- ❏ Drawing PG5131-1 - Test Hole Location Plan



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NO.	REVISIONS	DATE	INITIAL
0			

RIVERSIDE SOUTH DEVELOPMENT CORP.

GROUNDWATER IMPACT ASSESSMENT
RIVERSIDE SOUTH - PHASE 17 - SPRATT ROAD

OTTAWA, ONTARIO

Title:

SITE PLAN

Scale: 1:7500	Date: 08/2020
Drawn by: MPG	Report No.: PH4087-1
Checked by: NZ	Dwg. No.: PH4087-1
Approved by: MK	Revision No.:

11x17

p:\autocad drawings\hydrogeology\ph40xx\ph4087 pttw\ph4087-1 site plan.dwg

500m BUFFER ZONE FROM SUBJECT SITE

SITE

Thomas Gamble Drain

Heb Gordon Drain

Limebank Road

Spratt Road

Rideau Road

Schooner Cr

Poplin St

Mattingly Way

Southbridge St

Vision St

Ardmore St

Rosim Way

Ottawa County Road 19

19

LEGEND:

MECP WELL LOCATIONS

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0			

RIVERSIDE SOUTH DEVELOPMENT CORP.

GROUNDWATER IMPACT ASSESSMENT
RIVERSIDE SOUTH - PHASE 17 - SPRATT ROAD

OTTAWA, ONTARIO

Title:

MECP WATER WELL LOCATION PLAN

Scale: 1:10000	Date: 08/2020
Drawn by: MPG	Report No.: PH4087-1
Checked by: NZ	Dwg. No.: PH4087-2
Approved by: MK	Revision No.:

11x17

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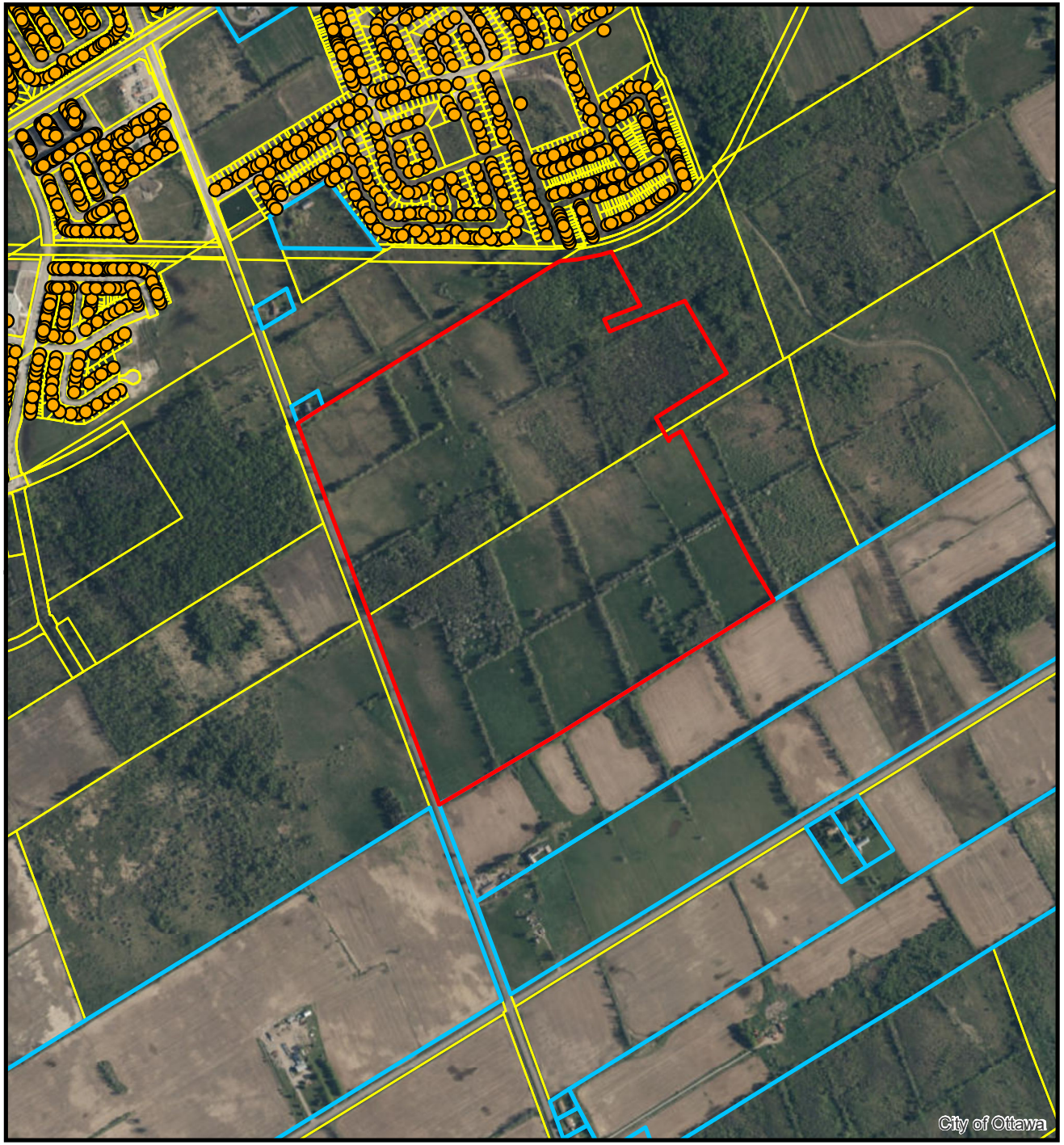

Spratt Rd Site
Water Service Locations within 500m

Legend

- w_Service_Location
- Spratt Road Site
- Possible Unserviced Lots
- Property Parcels

N

0 125 250 500 750

Meters

Prepared by: Colin Matassa
Date: August 12, 2020

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Riverside South Development - Phase 17
Ottawa, Ontario

DATUM Geodetic

FILE NO. PG5131

REMARKS

HOLE NO. BH 1

BORINGS BY CME 55 Power Auger **DATE** January 27, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	98.37	20 40 60 80	
TOPSOIL 0.40		AU	1						
		SS	2	75	69	1	97.37		
GLACIAL TILL: Very dense, brown sand, trace silt, gravel and cobbles		SS	3	62	42	2	96.37		
		SS	4	71	27				
3.20		SS	5	100	50+	3	95.37		
End of Borehole									
Practical refusal to augering at 3.20m depth.									

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
Riverside South Development - Phase 17
Ottawa, Ontario

DATUM Geodetic

FILE NO. PG5131

REMARKS

HOLE NO. BH 1A

BORINGS BY CME 55 Power Auger **DATE** January 27, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	98.37
TOPSOIL 0.40							
GLACIAL TILL: Very dense, brown sand, trace silt, gravel and cobbles						1	97.37
						2	96.37
3.18		SS	1	100	50+	3	95.37
End of Borehole							
Practical refusal to augering at 3.18m depth.							
(Piezometer dry/blocked at 2.76m depth - Feb. 11, 2020)							

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
Riverside South Development - Phase 17
Ottawa, Ontario

DATUM Geodetic

FILE NO. PG5131

REMARKS

HOLE NO. BH 2

BORINGS BY CME 55 Power Auger **DATE** January 27, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	99.16
TOPSOIL 0.33		AU	1				
GLACIAL TILL: Brown silty clay, some sand, trace gravel		SS	2	50	14	1	98.16
		SS	3	38	50+	2	97.16
2.29							
GLACIAL TILL: Compact to very dense, brown sandy silt, trace clay, gravel and cobbles		SS	4	79	41	3	96.16
		SS	5	67	24		
		SS	6	67	26	4	95.16
		SS	7	100	50+	5	94.16
5.33							
GLACIAL TILL: Brown silty clay with sand, trace gravel and cobbles		SS	8	67	46		
5.94							
End of Borehole							
(GWL @ 3.35m - Feb. 11, 2020)							

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
Riverside South Development - Phase 17
Ottawa, Ontario

DATUM Geodetic

FILE NO. PG5131

REMARKS

HOLE NO. BH 3

BORINGS BY CME 55 Power Auger **DATE** January 27, 2020

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 0.36		AU	1			0	99.95		
		SS	2	76	33	1	98.95		
GLACIAL TILL: Dense, brown sand, some gravel and cobbles		SS	3	67	41	2	97.95		
		SS	4	71	28				
		SS	5	60	50+	3	96.95		
		SS	6	0	50+				
4.17						4	95.95		
End of Borehole									
Practical refusal to augering at 4.17m depth.									
(GWL @ 3.25m - Feb. 11, 2020)									

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

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Riverside South Development - Phase 17
Ottawa, Ontario

DATUM Geodetic

FILE NO. PG5131

REMARKS

HOLE NO. BH 3A

BORINGS BY CME 55 Power Auger **DATE** January 28, 2020

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 0.36						0	99.95		
Inferred **GLACIAL TILL:** Dense, brown sand, some gravel and cobbles						1	98.95		
						2	97.95		
2.62 End of Borehole Practical refusal to augering at 2.62m depth.									

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

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

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Riverside South Development - Phase 17
Ottawa, Ontario

DATUM Geodetic

FILE NO. PG5131

REMARKS

HOLE NO. BH 4

BORINGS BY CME 55 Power Auger **DATE** January 27, 2020

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 0.33		AU	1			0	99.55		
GLACIAL TILL: Dense to very dense, brown silty sand with gravel, trace cobbles and boulders		SS	2	62	32	1	98.55		
		SS	3	54	20	2	97.55		
2.49		SS	4	100	50+				
End of Borehole Practical refusal to augering at 2.49m depth.									

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

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Riverside South Development - Phase 17
Ottawa, Ontario

DATUM Geodetic

FILE NO. PG5131

REMARKS

HOLE NO. BH 4A

BORINGS BY CME 55 Power Auger **DATE** January 27, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	99.55		
TOPSOIL 0.33									
Inferred **GLACIAL TILL:** Dense to very dense, brown silty sand with gravel, trace cobbles and boulders						1	98.55		
						2	97.55		
3.05						3	96.55		
GLACIAL TILL: Brown clayey silt with sand, trace gravel 3.45		SS	1	100	26				
GLACIAL TILL: Brown silty clay, trace sand 3.81		SS	2	71	31	4	95.55		
GLACIAL TILL: Dense to compact, brown sand, trace silt, gravel and cobbles		SS	3	100	45	5	94.55		
		SS	4	54	23				
5.94									
End of Borehole									
(GWL @ 3.58m - Feb. 11, 2020)									

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

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Riverside South Development - Phase 17
Ottawa, Ontario

DATUM Geodetic

FILE NO. PG5131

REMARKS

HOLE NO. BH 5

BORINGS BY CME 55 Power Auger **DATE** January 28, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.20		AU	1			0	99.08		
FILL: Brown silty sand, trace clay and gravel		SS	2	54	34	1	98.08		
1.37 **GLACIAL TILL:** Brown silty sand, trace gravel		SS	3	50	38	2	97.08		
2.13 **GLACIAL TILL:** Brown sandy silt, trace clay, gravel and cobbles		SS	4	67	43				
		SS	5	67	50+	3	96.08		
3.76 End of Borehole									
Practical refusal to augering at 3.76m depth.									

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

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

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FILE NO. PG5131

REMARKS

HOLE NO. BH 5A

BORINGS BY CME 55 Power Auger **DATE** January 28, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	99.08
TOPSOIL 0.20							
Inferred **FILL:** Brown silty sand, trace clay and gravel 1.37						1	98.08
Inferred **GLACIAL TILL:** Brown silty sand, trace gravel 2.13						2	97.08
GLACIAL TILL: Brown sandy silt, trace clay, gravel and cobbles		SS	1	100	50+	3	96.08
		SS	2	29	30	4	95.08
4.57							
GLACIAL TILL: Brown clayey silt to silty clay, trace sand		SS	3	83	4	5	94.08
		SS	4	79	9		
5.79							
Running sand encountered at 5.79m depth, borehole terminated.							
(GWL @ 2.56m - Feb. 11, 2020)							

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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REMARKS

HOLE NO. BH 6

BORINGS BY CME 55 Power Auger **DATE** January 28, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	98.68
TOPSOIL 0.30		AU	1				
		SS	2	83	29	1	97.68
		SS	6	91	52		
		SS	3	62	85	2	96.68
GLACIAL TILL: Compact to very dense, brown silty sand, some gravel, trace clay							
		SS	4	62	65	3	95.68
- trace cobbles and boulders by 1.5m depth							
		SS	5	71	50+	4	94.68
		SS	7	88	50+		
4.88 End of Borehole							
Practical refusal to augering at 4.88m depth							
(GWL @ 2.74m - Feb. 11, 2020)							

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. PG5131

REMARKS

HOLE NO. BH 7

BORINGS BY CME 55 Power Auger **DATE** January 28, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	102.53	20 40 60 80	
TOPSOIL 0.28		AU	1						
		SS	2	100	42	1	101.53		
		SS	3	93	50+				
						2	100.53		
GLACIAL TILL: Dense to very dense, brown silty sand, some gravel, trace cobbles and boulders		SS	4	100	50+				
		SS	5	100	50+	3	99.53		
		SS	6	79	49	4	98.53		
		SS	7	67	36	5	97.53		
		SS	8	50	71				
5.94						6	96.53		
Dynamic Cone Penetration Test commenced at 5.94m depth.									
Inferred **GLACIAL TILL** 6.61									
End of Borehole									
Practical DCPT refusal at 6.61m depth									
(Piezometer dry/blocked at 4.34m depth - Feb. 11, 2020)									

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

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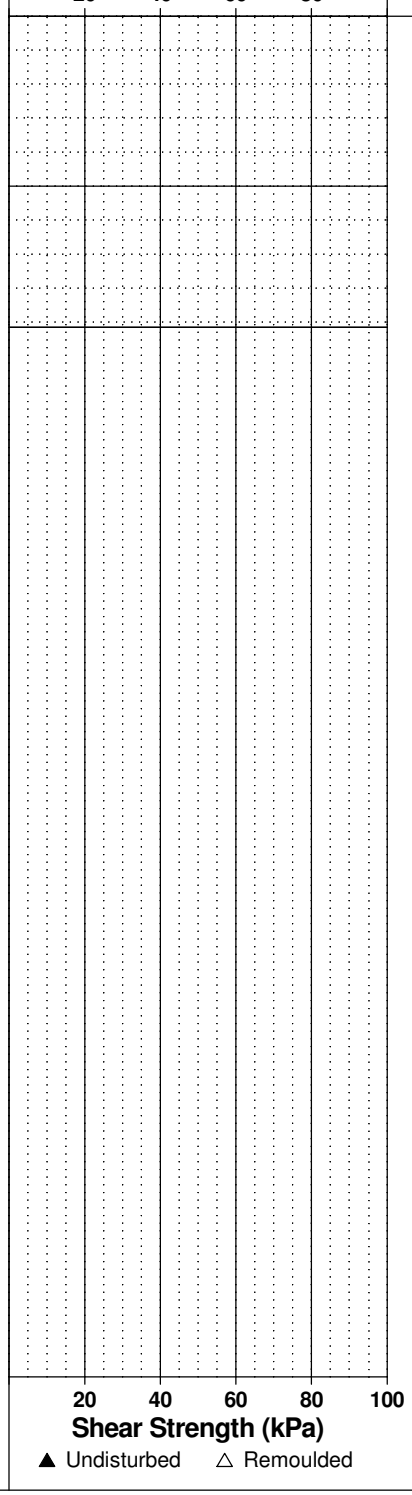
REMARKS

HOLE NO. BH 8

BORINGS BY CME 55 Power Auger **DATE** January 28, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	96.97		
TOPSOIL 0.41		AU	1						
GLACIAL TILL: Very dense, brown sandy silt, some gravel, trace cobbles and boulders		SS	2	56	50+	1	95.97		
1.83		SS	3	67	50+				
End of Borehole Practical refusal to augering at 1.83m depth									



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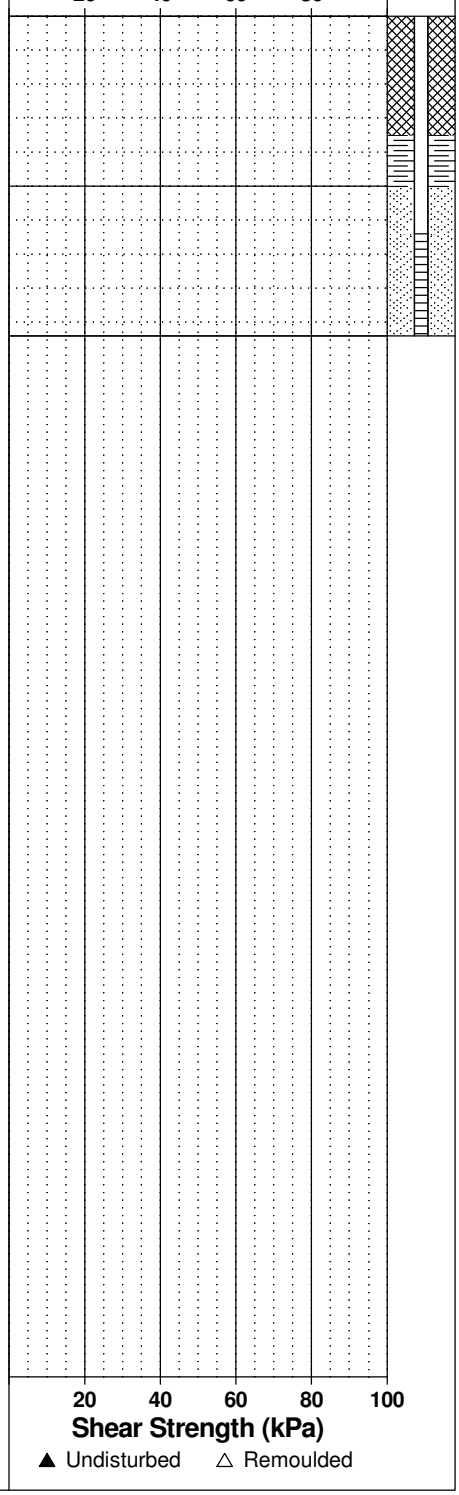
HOLE NO. BH 8A

BORINGS BY CME 55 Power Auger **DATE** January 28, 2020

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 0.41						0	96.97		
Inferred **GLACIAL TILL:** Very dense, brown sandy silt, some gravel, trace cobbles and boulders						1	95.97		
1.88									
End of Borehole									
Practical refusal to augering at 1.88m depth									
(Piezometer dry/blocked at 0.98m depth - Feb. 11, 2020)									



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REMARKS

HOLE NO. BH 9

BORINGS BY CME 55 Power Auger **DATE** January 29, 2020

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	97.97		
GLACIAL TILL: Dense to very dense, brown sandy silt, some gravel		SS	2	58	38	1	96.97		
		SS	3	78	69	2	95.97		
2.51		SS	4	100	50+				
End of Borehole Practical refusal to augering at 2.51m depth									

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

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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REMARKS

HOLE NO. BH 9A

BORINGS BY CME 55 Power Auger **DATE** January 29, 2020

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						0	97.97		
Inferred **GLACIAL TILL:** Dense to very dense, brown sandy silt, some gravel						1	96.97		
						2	95.97		
2.29									
GLACIAL TILL: Very dense, brown sand with silt, some gravel 2.54		SS	1	100	50+				
End of Borehole									
Practical refusal to augering at 2.54m depth									
(Piezometer dry/blocked at 1.13m depth - Feb. 11, 2020)									

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

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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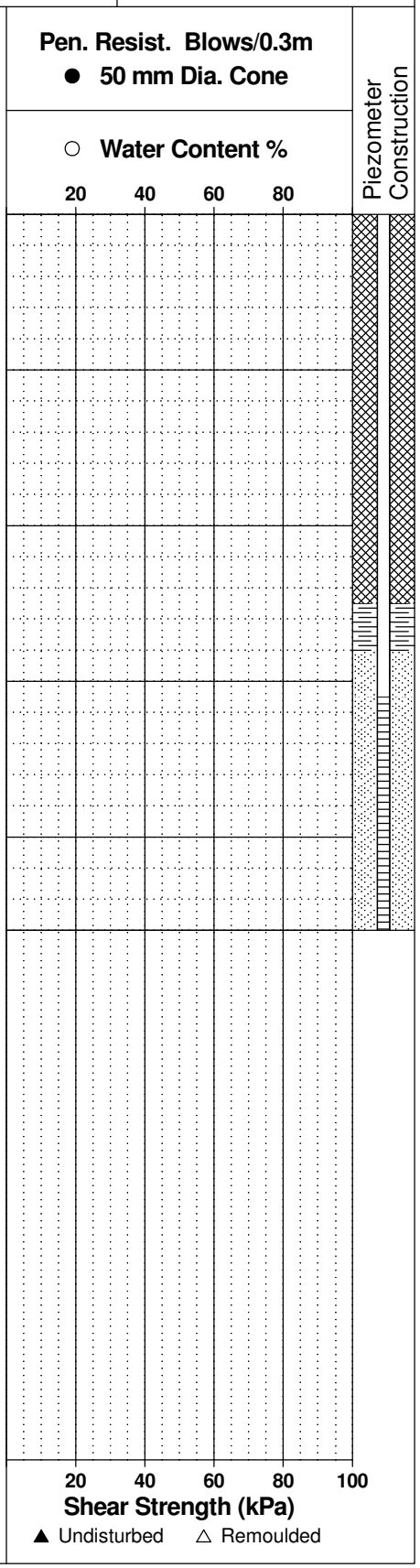
REMARKS

HOLE NO. BH10

BORINGS BY CME 55 Power Auger **DATE** January 29, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	98.70
TOPSOIL 0.28		AU	1				
		SS	2	71	38	1	97.70
		SS	3	82	50+		
GLACIAL TILL: Dense to very dense, brown silty sand, some gravel						2	96.70
		SS	4	67	65		
		SS	5	58	64	3	95.70
- grey by 3.7m depth							
		SS	6	50	75	4	94.70
4.60		SS	7	100	50+		
End of Borehole							
(Piezometer dry/blocked at 0.69m depth - Feb. 11, 2020)							



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REMARKS

HOLE NO. BH10A

BORINGS BY CME 55 Power Auger **DATE** January 29, 2020

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	98.70		
Inferred **GLACIAL TILL:** Dense to very dense, brown silty sand, some gravel						1	97.70		
						2	96.70		
						3	95.70		
4.57						4	94.70		
End of Borehole Practical refusal to augering at 4.57m depth.									

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

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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REMARKS

HOLE NO. BH11

BORINGS BY CME 55 Power Auger **DATE** January 29, 2020

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 0.23		AU	1			0	99.45		
GLACIAL TILL: Very dense, brown silty sand with gravel and cobbles		SS	2	29	50+	1	98.45		
1.52									
GLACIAL TILL: Very dense, brown sand with gravel and cobbles		SS	3	67	83	2	97.45		
		SS	4	100	50+				
2.59									
End of Borehole Practical refusal to augering at 2.59m depth									

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

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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FILE NO. PG5131

REMARKS

HOLE NO. BH11A

BORINGS BY CME 55 Power Auger **DATE** January 29, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
TOPSOIL 0.23						0	99.45
Inferred **GLACIAL TILL:** Very dense, brown silty sand with gravel and cobbles 1.52						1	98.45
Inferred **GLACIAL TILL:** Very dense, brown sand with gravel and cobbles 2.64						2	97.45
End of Borehole Practical refusal to augering at 2.64m depth (Piezometer blocked at ground surface - Feb. 11, 2020)							

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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REMARKS

HOLE NO. BH12

BORINGS BY CME 55 Power Auger **DATE** January 29, 2020

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 0.23		AU	1			0	100.35		
		SS	2	92	57	1	99.35		
		SS	3	100	50+	2	98.35		
GLACIAL TILL: Very dense to dense, brown silty sand, some gravel, cobbles and boulders		SS	4	75	50+	3	97.35		
		SS	5	81	50+	4	96.35		
		SS	6	17	67	5	95.35		
		SS	7	58	46	6	94.35		
		SS	8	42	40				
5.94									
Dynamic Cone Penetration Test commenced at 5.94m depth.									
Inferred **GLACIAL TILL**									
6.88									
End of Borehole									
Practical DCPT refusal at 6.88m depth.									
(Piezometer dry/blocked at 4.06m depth - Feb. 11, 2020)									

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

Water Content %: 20 40 60 80

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Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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REMARKS

HOLE NO. BH13

BORINGS BY CME 55 Power Auger **DATE** January 30, 2020

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 0.18		AU	1			0	99.99		
		SS	2	80	50+	1	98.99		
GLACIAL TILL: Very dense, brown silty sand, some gravel, trace clay, cobbles and boulders		SS	3	100	50+	2	97.99		
		SS	4	87	73				
		SS	5	0	50+	3	96.99		
3.83		SS	6	0	50+				
End of Borehole									
Practical refusal to augering at 3.83m depth.									
(Piezometer dry/blocked at 2.44m depth - Feb. 11, 2020)									

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

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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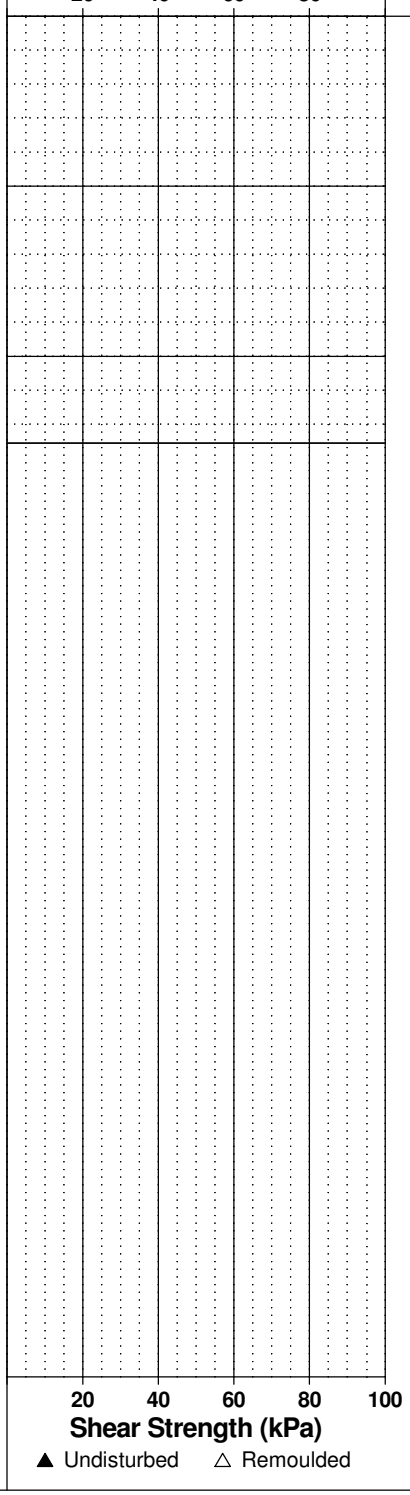
HOLE NO. BH13A

BORINGS BY CME 55 Power Auger **DATE** January 30, 2020

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 0.18						0	99.99		
Inferred **GLACIAL TILL:** Very dense, brown silty sand, some gravel, trace clay, cobbles and boulders						1	98.99		
						2	97.99		
2.51 End of Borehole Practical refusal to augering at 2.51m depth.									



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REMARKS

HOLE NO. BH14

BORINGS BY CME 55 Power Auger **DATE** January 30, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	97.48		
TOPSOIL		AU	1						
0.60									
GLACIAL TILL: Compact, brown silty sand, trave gravel		SS	2	67	16	1	96.48		
1.40									
End of Borehole									
Practical refusal to augering at 1.40m depth.									

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

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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HOLE NO. BH14A

BORINGS BY CME 55 Power Auger **DATE** January 30, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	97.48		
TOPSOIL 0.60									
Inferred **GLACIAL TILL:** Compact, brown silty sand, trave gravel		SS	1		50+	1	96.48		
1.85									
End of Borehole									
Practical refusal to augering at 1.85m depth.									
(Piezometer dry/blocked at 1.17m depth - Feb. 11, 2020)									

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

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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REMARKS

HOLE NO. BH15

BORINGS BY CME 55 Power Auger **DATE** January 30, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	98.55
TOPSOIL		AU	1				
0.60							
		SS	2	75	39	1	97.55
		SS	3	0	50+		
GLACIAL TILL: Dense to very dense, brown silty sand, trace gravel, cobbles and boulders						2	96.55
		SS	4	100	50+		
						3	95.55
3.73							
End of Borehole							
Practical refusal to augering at 3.73m depth							
(Piezometer dry/blocked at 2.15m depth - Feb. 11, 2020)							

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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HOLE NO. BH15A

BORINGS BY CME 55 Power Auger **DATE** January 30, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	98.55	20 40 60 80	
TOPSOIL 0.60									
Inferred **GLACIAL TILL:** Dense to very dense, brown silty sand, trace gravel, cobbles and boulders						1	97.55		
1.93									
End of Borehole									
Practical refusal to augering at 1.93m depth									

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

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REMARKS

HOLE NO. BH16

BORINGS BY CME 55 Power Auger **DATE** January 30, 2020

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	97.28		
0.33		AU	1						
GLACIAL TILL: Compact to very dense, brown sandy silt with clay, trace gravel and cobbles		SS	2	92	25	1	96.28		
		SS	3	46	65	2	95.28		
		SS	4	92	50+				
2.74									
End of Borehole									
Practical refusal to augering at 2.74m depth.									

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

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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FILE NO. PG5131

REMARKS

HOLE NO. BH16A

BORINGS BY CME 55 Power Auger **DATE** January 30, 2020

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 0.33						0	97.28		
Inferred **GLACIAL TILL:** Compact to very dense, brown sandy silt with clay, trace gravel and cobbles						1	96.28		
						2	95.28		
2.59									
End of Borehole Practical refusal to augering at 2.59m depth. (GWL @ 1.77m - Feb. 11, 2020)									

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

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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FILE NO. PG5131

REMARKS

HOLE NO. BH17

BORINGS BY CME 55 Power Auger **DATE** January 30, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
TOPSOIL 0.25		SS	1			0	98.09
		SS	2	33	33	1	97.09
GLACIAL TILL: Dense to compact, brown silty sand, trace clay, gravel and cobbles		SS	3	71	40	2	96.09
		SS	4	50	50+		
		SS	5	62	16	3	95.09
4.20		SS	6	58	15	4	94.09
GLACIAL TILL: Compact to very dense, brown silty sand with gravel		SS	7	17	42	5	93.09
5.69		SS	8	57	50+		
End of Borehole Practical refusal to augering at 5.69m depth. (Piezometer dry/blocked at 2.30m depth - Feb. 11, 2020)							

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. PG5131

REMARKS

HOLE NO. BH18

BORINGS BY CME 55 Power Auger **DATE** January 31, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	96.41		
Brown **SILTY CLAY,** trace organics		AU	1						
1.07		SS	2	96	8	1	95.41		
GLACIAL TILL: Brown clayey silt with sand and gravel		SS	3	33	13	2	94.41		
2.30									
GLACIAL TILL: Compact, brown silty sand, trace clay		SS	4	62	27	3	93.41		
3.00									
GLACIAL TILL: Compact, brown sand, trace silt and gravel		SS	5	54	14				
3.81									
Running sand encountered at 3.81m depth, borehole terminated.									

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

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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REMARKS

HOLE NO. BH18A

BORINGS BY CME 55 Power Auger **DATE** January 31, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	96.41
Brown **SILTY CLAY,** trace organics							
1.07						1	95.41
Inferred **GLACIAL TILL:** Brown clayey silt with sand and gravel							
2.30						2	94.41
Inferred **GLACIAL TILL:** Compact, brown silty sand, trace clay							
3.00						3	93.41
GLACIAL TILL: Compact to dense, brown sand, trace silt and gravel		SS	1	33	32	4	92.41
4.47							
End of Borehole							
Practical refusal to augering at 4.47m depth.							
(GWL @ 1.78m - Feb. 11, 2020)							

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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REMARKS

HOLE NO. BH19

BORINGS BY CME 55 Power Auger **DATE** January 31, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	95.95
TOPSOIL		AU	1				
0.60							
Brown **SILTY CLAY**		SS	2	100	6	1	94.95
1.52							
GLACIAL TILL: Brown silty clay, trace sand and gravel		SS	3	46	13	2	93.95
2.30							
GLACIAL TILL: Dense, brown silty sand, trace gravel and cobbles		SS	4	54	32		
2.95							
End of Borehole							
Practical refusal to augering at 2.95m depth.							
(GWL @ 1.49m - Feb. 11, 2020)							

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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REMARKS

HOLE NO. BH19A

BORINGS BY CME 55 Power Auger **DATE** January 31, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	95.95		
TOPSOIL									
0.60									
Inferred brown **SILTY CLAY**						1	94.95		
1.52									
Inferred **GLACIAL TILL:** Brown silty clay, trace sand and gravel						2	93.95		
2.30									
GLACIAL TILL: Very dense, brown silty sand, trace gravel and cobbles		SS	1	0	50+	3	92.95		
3.07									
End of Borehole									
Practical refusal to augering at 3.07m depth.									

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

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

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REMARKS

HOLE NO. BH20

BORINGS BY CME 55 Power Auger **DATE** January 31, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.25		AU	1			0	96.34		
GLACIAL TILL: Dense, brown sandy silt, trace clay and gravel		SS	2	92	30	1	95.34		
		SS	3	0	50+	2	94.34		
2.30 **GLACIAL TILL:** Brown clayey silt, some sand, trace gravel and cobbles		SS	4	83	36				
3.05 **GLACIAL TILL:** Dense, brown sandy silt, trace clay, gravel and cobbles		SS	5	8	17	3	93.34		
3.80 **GLACIAL TILL:** Compact to very dense, grey silty sand to sandy silt, trace gravel and cobbles		SS	6	62	28	4	92.34		
		SS	7	50	36	5	91.34		
		SS	8	50	50+				
5.74 End of Borehole									
Practical refusal to augering at 5.74m depth									
(GWL @ 2.30m - Feb. 11, 2020)									

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

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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REMARKS

HOLE NO. BH21

BORINGS BY CME 55 Power Auger **DATE** January 31, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	96.93		
Brown **SILTY CLAY,** some sand		AU	1						
		SS	2	62	11	1	95.93		
1.52									
		SS	3	62	20	2	94.93		
		SS	4	92	20				
GLACIAL TILL: Brown silty clay, some sand, trace gravel and cobbles		SS	5	38	10	3	93.93		
		SS	6	71	9	4	92.93		
		SS	7	67	9				
		SS	8	100	50+	5	91.93		
5.94									
Dynamic Cone Penetration Test commenced at 5.94m depth.						6	90.93		
Inferred **GLACIAL TILL**									
7.09						7	89.93		
End of Borehole Practical DCPT refusal at 7.09m depth									
(GWL @ 3.93m - Feb. 11, 2020)									

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

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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HOLE NO. BH22

BORINGS BY CME 55 Power Auger **DATE** February 3, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	95.53
FILL: Brown sand with gravel		AU	1				
0.41							
FILL: Brown silty clay, trace sand and gravel		SS	2	67	23	1	94.53
1.85		SS	3	96	8		
Brown **SILTY CLAY,** trace sand						2	93.53
2.62		SS	3	90	19		
GLACIAL TILL: Brown sand with silt, gravel, some clay 2.80							
End of Borehole							
Practical refusal to augering at 2.80m depth							
(GWL @ 2.65m - Feb. 11, 2020)							

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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HOLE NO. BH22A

BORINGS BY CME 55 Power Auger **DATE** February 3, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	95.53		
FILL: Brown sand with gravel									
0.41									
Inferred **FILL:** Brown silty clay, trace sand and gravel						1	94.53		
1.85									
Inferrred brown **SILTY CLAY,** trace sand						2	93.53		
2.62									
Inferred **GLACIAL TILL:** Brown sand with silt, gravel, some clay 2.84									
End of Borehole									
Practical refusal to augering at 2.84m depth									

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

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

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HOLE NO. BH23

BORINGS BY CME 55 Power Auger **DATE** February 3, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	98.15
TOPSOIL 0.38		AU	1				
Very loose, brown **SILTY SAND** with clay 1.24		SS	2	58	3	1	97.15
		SS	3	59	50+	2	96.15
GLACIAL TILL: Very dense, brown sand, some silt and gravel, trace cobbles and boulders		SS	4	92	54	3	95.15
		SS	5	54	75		
		SS	6	0	50+	4	94.15
4.57							
GLACIAL TILL: Grey clayey silt with gravel and sand, trace cobbles and boulders 4.80		SS	7	100	50+		
End of Borehole							
Practical refusal to augering at 4.80m depth							
(GWL @ 1.44m - Feb. 11, 2020)							

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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REMARKS

HOLE NO. BH24

BORINGS BY CME 55 Power Auger **DATE** February 3, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	96.53		
Loose, brown **SAND,** some silt and clay, trace gravel and organics		AU	1						
0.84									
GLACIAL TILL: Very dense, brown silty sand with clay, trace gravel, cobbles and boulders		SS	2	54	8	1	95.53		
		SS	3	12	50+	2	94.53		
2.39		SS	4	0	50+				
End of Borehole Practical refusal to augering at 2.39m depth									

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

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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HOLE NO. BH24A

BORINGS BY CME 55 Power Auger **DATE** February 3, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	96.53		
Loose, brown **SAND,** some silt and clay, trace gravel and organics									
0.84						1	95.53		
Inferred **GLACIAL TILL:** Very dense, brown silty sand with clay, trace gravel, cobbles and boulders						2	94.53		
2.44									
End of Borehole									
Practical refusal to augering at 2.44m depth									
(GWL @ 1.97m - Feb. 11, 2020)									

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

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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REMARKS

HOLE NO. BH25

BORINGS BY CME 55 Power Auger **DATE** February 3, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	95.59
Brown **SILTY CLAY**		AU	1				
0.60							
GLACIAL TILL: Loose to compact, brown sandy silt to silty sand, trace clay and gravel		SS	2	50	16	1	94.59
		SS	3	88	26	2	93.59
		SS	4	75	25		
2.77						3	92.59
GLACIAL TILL: Compact to very dense, brown sand, trace clay, silt and gravel		SS	5	58	20		
- grey by 3.2m depth		SS	6	50	24	4	91.59
4.70		SS	7	100	50+		
End of Borehole							
Practical refusal to augering at 4.70m depth.							
(GWL @ 1.35m - Feb. 11, 2020)							

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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REMARKS

HOLE NO. BH26

BORINGS BY CME 55 Power Auger **DATE** February 3, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	96.82
TOPSOIL 0.28		AU	1				
Compact, brown **SILTY SAND,** some clay 1.12		SS	2	67	24	1	95.82
GLACIAL TILL: Compact to very dense, brown sand, some silt and gravel, trace cobbles and boulders 2.29		SS	3	71	55	2	94.82
GLACIAL TILL: Dense to very dense, grey silty sand, some gravel and cobbles		SS	4	62	34	3	93.82
3.43		SS	5	60	50+		
End of Borehole							
Practical refusal to augering at 3.43m depth.							
(GWL @ 3.07m - Feb. 11, 2020)							

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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REMARKS

HOLE NO. BH26A

BORINGS BY CME 55 Power Auger **DATE** February 3, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	96.82		
TOPSOIL 0.28									
Inferred compact, brown **SILTY SAND,** some clay 1.12						1	95.82		
Inferred **GLACIAL TILL:** Compact to very dense, brown sand, some silt and gravel, trace cobbles and boulders 2.29						2	94.82		
Inferred **GLACIAL TILL:** Dense to very dense, grey silty sand, some gravel and cobbles 3.48						3	93.82		
End of Borehole Practical refusal to augering at 3.48m depth.									

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

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

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REMARKS

HOLE NO. BH27

BORINGS BY CME 55 Power Auger **DATE** February 4, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	94.96
TOPSOIL 0.25		AU	1				
Brown **SILTY CLAY,** trace sand		SS	2	96	6	1	93.96
						2	92.96
2.39 **GLACIAL TILL:** Brown sandy silt to silty sand with clay, some gravel, trace cobbles and boulders		SS	4	62	4		
		SS	5	26	50+	3	91.96
3.53 End of Borehole							

Practical refusal to augering at 3.53m depth.

(GWL @ 2.42m - Feb. 11, 2020)

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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REMARKS

HOLE NO. BH27A

BORINGS BY CME 55 Power Auger **DATE** February 4, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.25						0	94.96		
Inferred brown **SILTY CLAY,** trace sand 2.39						1	93.96		
						2	92.96		
Inferrred **GLACIAL TILL:** Brown sandy silt to silty sand with clay, some gravel, trace cobbles and boulders 3.56						3	91.96		
End of Borehole									
Practical refusal to augering at 3.56m depth.									

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

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

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REMARKS

HOLE NO. BH28

BORINGS BY CME 55 Power Auger **DATE** February 4, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	93.75
TOPSOIL		AU	1				
0.46							
Brown **CLAYEY SILT** with sand		SS	2	79	5	1	92.75
1.70		SS	3	79	2	2	91.75
Stiff, brown **SILTY CLAY**		SS	4	100	2		
- grey by 2.8m depth						3	90.75
						4	89.75
5.18						5	88.75
GLACIAL TILL: Grey clayey silt with sand and gravel 5.36		SS	5	100	50+		
End of Borehole							
Practical refusal to augering at 5.36m depth.							
(GWL @ 4.10m - Feb. 11, 2020)							

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

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

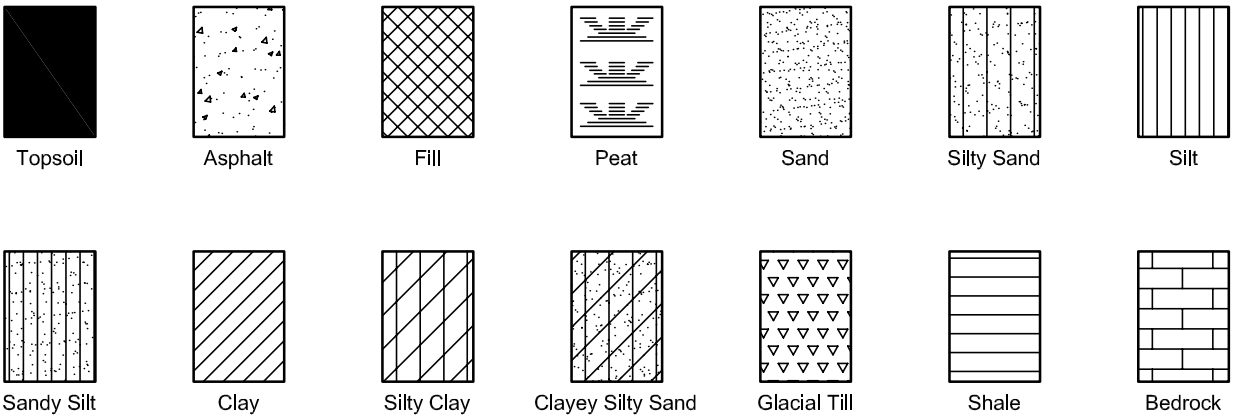
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void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

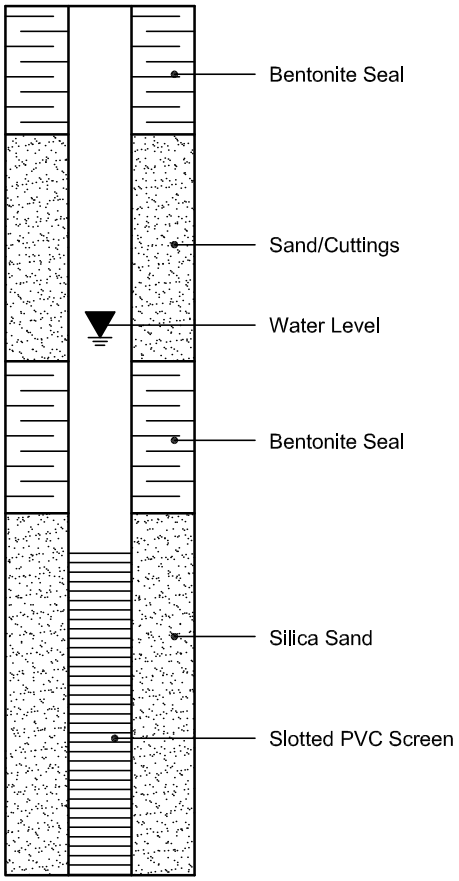
SYMBOLS AND TERMS (continued)

STRATA PLOT

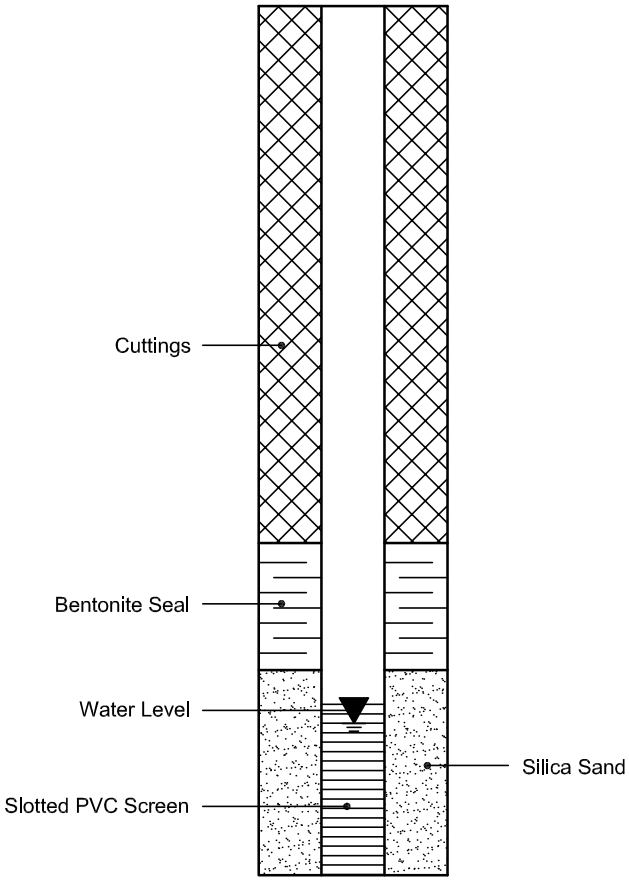


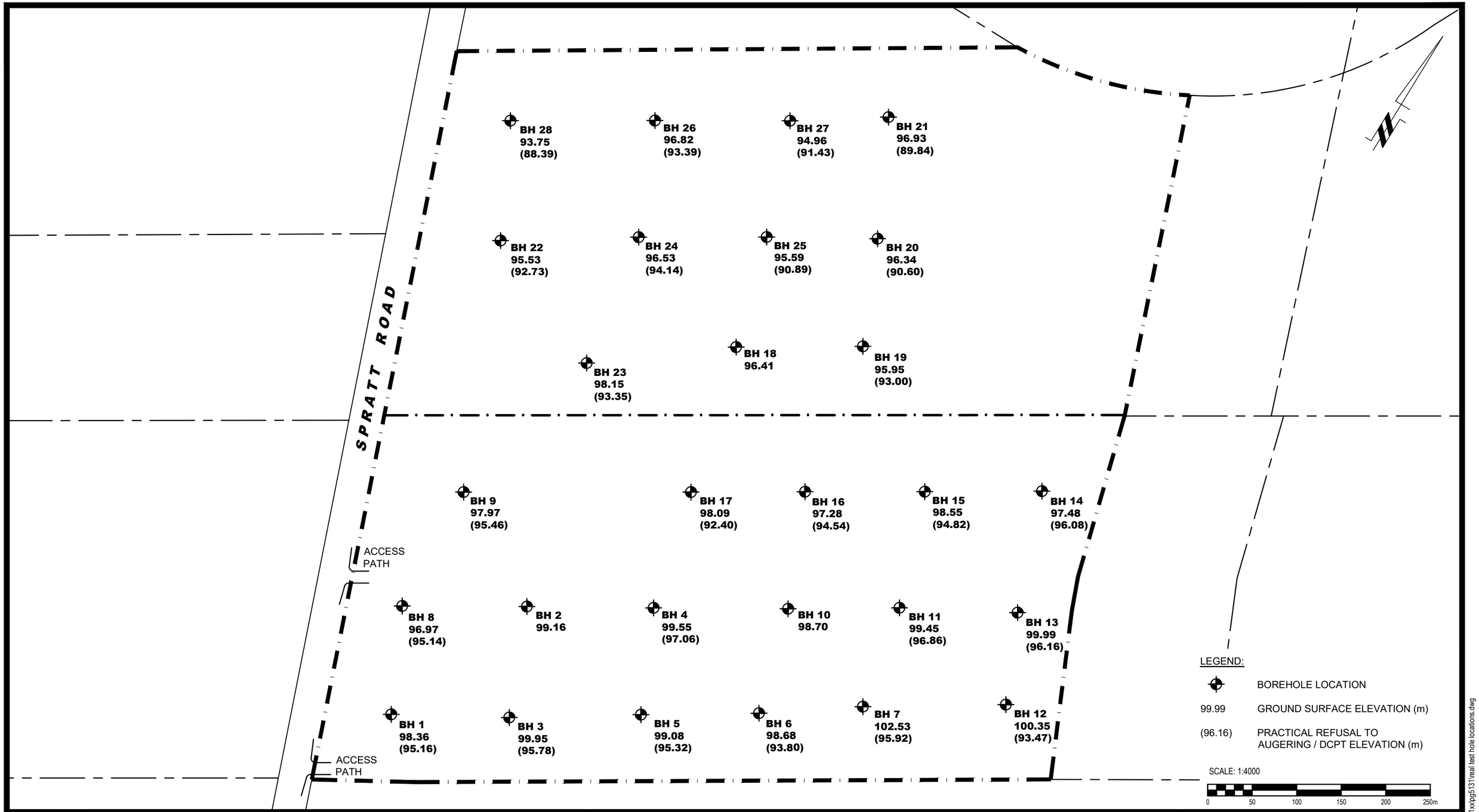
MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION





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NO.	REVISIONS	DATE	INITIAL

RIVERSIDE SOUTH DEVELOPMENTS

GEOTECHNICAL INVESTIGATION
PHASE 17-RIVERSIDE SOUTH RESIDENTIAL DEVELOPMENT-SPRATT ROAD
OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:4000	Date: 04/2020
Drawn by: YA	Report No.: PG5131-1
Checked by: KP	Dwg. No.: PG5131-1
Approved by: DJG	Revision No.:

p:\autocad drawings\geotechnical\pg51xx\pg5131\real test hole locations.dwg