V.A. WOOD ASSOCIATES LIMITED
CONSULTING GEOTECHNICAL ENGINEERS
330 Byron Street South, Upper Unit, Whitby, Ontario L1N 4P8
Telephone : (905) 430-9778

PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED CONDOMINIUM
136 BAYFIELD STREET AND 14 SOPHIA STREET WEST
BARRIE, ONTARIO

Ref. No. 7601-19-4

October 2022
(Final Report)

Prepared for:

Rockap Holdings
c/o PGL Environmental Consultants
102-250 Water Street
Whitby, Ontario
L1N 0G5

C O N T E N T S

A P P E N D I C E S

E N C L O S U R E S

*1.0 **INTRODUCTION***

V.A. Wood Associates Limited was retained by PGL Environmental Consultants to carry out a preliminary geotechnical investigation for the proposed condominium located at 136 Bayfield Street and 14 Sophia Street West in Barrie. Ontario.

The8 ,853± m^2 property is presently occupied by a commercial building on Bayfield St. and a one storey dwelling on Sophia St. West. These Structures will be removed and the Site will be redeveloped with a 12-storey condominium tower, two 9-storey and one 3-storey podiums and two rows of 3-storey townhouses. There are no underground levels.

The purpose of the investigation was to reveal the subsurface conditions and to determine the relevant soil properties for the preliminary design and construction of the foundations of the buildings, the associated site services and the paved areas.

*2.0 **FIELD WORK***

The field work was carried out on May 3 to 7, 2019 and consisted of five boreholes at the locations shown on Enclosure 1. The boreholes were advanced to the sampling depths by means of an auger machine equipped for soil sampling. Standard Penetration tests were carried out at frequent intervals of depth and the results are shown on the Borehole Logs as N-values.

A monitoring well was installed in each of the five boreholes.

The field work was supervised by our field technician and the soil samples were transported to our laboratory for further examination, classification and testing. The ground elevation at each borehole location was provided by the Client.

*3.0 **SUBSURFACE CONDITIONS***

Full details of the soils encountered in each borehole are given on the Borehole Logs, Enclosures 2 to 6 inclusive, and the following notes are intended to summarize this data.

*Boreholes 1, 2 and 3 encountered a **pavement** consisting of 90± mm thick asphalt on a 100± mm thick granular base.*

Boreholes 4 and 5 were augered to a depth of 3± m.

*The pavement in Boreholes 1, 2 and 3 was underlain by **gravelly sand** which extended to a depth of between 0.7 and 1.4± m below grade. This material contained some topsoil in Borehole 3 and is likely to be backfill material. Standard Penetration tests in this deposit gave N-values between 9 and 41 blows/300mm, and its moisture content varied between 5 and 12%.*

Based on the test results, the gravelly sand is considered to be in a generally compact to dense condition.

*The gravelly sand in Borehole 1 was underlain by a deposit of **sand** which extended to a depth of 2.5± m below grade. A Standard Penetration test in this deposit gave an N-value of 11 blows/300mm, and its moisture content was of the order of 20%.*

Based on the test results, the sand is considered to have a compact relative density.

From a depth of 3± m in Boreholes 4 and 5, and below the gravelly sand in Boreholes 2 and 3 and the sand in Borehole 1, the boreholes encountered a native deposit of ***silty sand till*** *which extended to a depth of between 4 and more than 15.4 m below grade. This glacial deposit is comprised of a silty sand matrix which contained traces to some fine gravel. Standard Penetration tests in this deposit gave N-values between 12 and more than 100 blows/300mm, and its natural moisture content varied between 7 and 15%.*

Based on the test results, the sandy silt till is considered to have a compact to very dense relative density. The grain size distribution curves of three representative samples of the silty sand till are shown in Enclosures 7, 8 and 9.

The silty sand till in Boreholes 1, 2 and 4 were underlain by a deposit of ***sandy silt till*** *which extended to a depth of between 7 and 11.5± m below grade. This glacial deposit is comprised of a sandy silt matrix which contained traces of fine to medium gravel. Standard Penetration tests in this deposit gave N-values of more than 100 blows/300mm, and its natural moisture content varied between 9 and 12%.*

Based on the test results, the sandy silt till is considered to have a very dense relative density. The grain size distribution curve of a representative sample of the sandy silt till is

shown in Enclosure 10.

The sandy silt till in Boreholes 2 and 4 was underlain by a lower deposit of ***silty sand till*** *which extended to a depth of between 9.5 and more than 12.6 m below grade (maximum depth investigated). This deposit is comprised of a silty sand matrix which contained traces to some fine to medium gravel. Standard Penetration tests in this deposit gave N-values between 75 and more than 100 blows/300mm, and its natural moisture content varied between 7 and 8%.*

Based on the test results, the lower silty sand till is considered to have a very dense relative density.

The sandy silt till in Borehole 1 was underlain by a deposit of ***silt*** *which extended to a depth of more than 15.5 m below grade (maximum depth investigated). This silt deposit contained occasional thin seams of fine sand. Standard Penetration tests in this deposit gave N-values of more than 100 blows/300mm, and its natural moisture content was of the order of 15%.*

Based on the test results, together with a visual and tactile examination, the silt is considered to have a hard consistency. The grain size distribution curve of a representative sample of the silt deposit is shown in Enclosure 11.

*4.0 **GROUNDWATER CONDITIONS***

A free water surface was encountered in Boreholes 1, 2 and 5 at a depth of between 1.8 and 3 m below grade. The water level measurement was carried out immediately after drilling and it is likely that the ground water had not yet stabilized in the boreholes.

An examination of the soil samples revealed that the native till deposit was moist to wet, and changed in colour from brown to grey at a depth of between 3 and 5 m below grade.

Monitoring wells, comprised of 50 mm diameter PVC pipe with screen and sand at the bottom 3 m and bentonite plug were installed in the boreholes. Details of the well construction are shown on the Monitoring Well Logs in Appendix 'A'. The water levels were measured by the Client and the findings are as follows:

Well No.	*Location of Ground Water*		
	Date	*Depth*	*Elevation*
MW1	*May 10, 2019*	*2.060*	*233.67*
	May 16, 2019	*2.11*	*233.61*
MW2	*May 10, 2019*	*0.916*	*235.62*
	May 16, 2019	*0.88*	*235.66*
MW3	*May 10, 2019*	*0.952*	*237.02*
	May 16, 2019	*0.94*	*237.03*
MW4	*May 10, 2019*	*1.528*	*238.31*
	May 16, 2019	*1.53*	*238.31*
MW5	*May 10, 2019*	*1.46*	*234.53*

Based on the foregoing, the groundwater table is located between Elev. 234.5 and 238 from south to north. Muddy water flowed out from Borehole 5 during drilling, and this indicates that a sub-artesian ground water condition exists in the area.

*5.0 **DISCUSSION AND RECOMMENDATIONS***

5.1 General

The boreholes encountered a pavement 190± mm thick, followed by 0.5 to 2.3 m of compact to dense sand/gravelly sand, then competent deposits of silty sand/sand silt till and silt. The groundwater table is located between Elev. 234.5 and 238 from south to north, and it is possible that an artesian water condition exists at the site.

The proposed development consists of a 12-storey condominium tower with two 9-storey and one 3-storey podium, and two 3-storey townhouses. There are no underground levels. It is anticipated that the condominium will have reinforced concrete shear walls and foundation walls supported on strip and isolated footings or caissons. The existing commercial buildings at the site will be removed as part of site redevelopment.

Full details of the proposed structures were not available at the time of this report and, therefore, the following recommendations should be reviewed when these details are available.

5.2 Foundations

The footings of the condominium building should extend to the dense to very dense silty sand till which was encountered in the boreholes at a depth of between 2.3 m and 3.0 m below

existing grade. This stratum is considered capable of supporting normal footings designed to an SLS bearing pressure of up to 400 kPa (600 kPa in ULS). The footings should extend below the old footings of the existing building and house (to be removed), and onto undisturbed and dense to very dense silty sand till subgrade.

The footings of the townhouses should extend to the compact sand or silty sand till which were encountered in boreholes BH-1 and BH-2 at a depth of 1.5 m from existing grade. This stratum is considered capable of supporting normal footings designed to an SLS bearing pressure of at least 100 kPa (150 kPa in ULS). This will likely be sufficient for the proposed townhouses and allow the use of conventional shallow foundation construction.

It is estimated that the total and differential settlements of footings designed to the above SLS bearing pressures will be less than 25 and 20 mm respectively. These are normally considered to be acceptable for the proposed structure.

All exterior footings or footings in unheated areas should be located at least 1.2 m below finished grade for adequate frost protection. The minimum footing sizes should not be less than those specified in the Ontario Building Code. The slopes between footings should be inclined such that elevation differences between adjacent footings are not more than one half of the horizontal distance between them.

All foundation excavations should be inspected by geotechnical personnel from V.A. Wood

Associates Limited to ensure that the founding soils are similar to those identified in the Borehole Logs and that they are capable of supporting the design loads.

Subject to noise and vibration restrictions, an alternative foundation solution for the condominium building would be the use of steel piles driven to refusal into the dense to very dense glacial till deposits. Closed end tube piles, filled with concrete after being placed, may be used. The piles may be designed using allowable stress (SLS stress) of 69 MPa over the steel cross sectional area. If a combined section is adopted, then the allowable stress of the concrete can be taken as 5 MPa in SLS.

Alternatively, steel H-piles may also be used using an allowable stress of 69 MPa over the steel cross sectional area. In this case, we would recommend that a steel plate having an area of at least 150mm x 250mm be welded to the toe in order to achieve the required set within a reasonable depth into the bearing stratum.

Prior to foundation design, we recommend that three deep geotechnical boreholes, extending to at least 12 m depth, be put down on the northeast corner, east and south sides of the proposed building location to confirm the subsoils conditions and the validity of the recommended bearing pressures, and to determine the anticipated pile depths for driven piles.

The final bearing capacity of each pile should be determined during driving, based on a

suitable dynamic formula. All pile installations should be inspected by geotechnical personnel from V.A. Wood Associates Limited.

Owing to the prevalence of wet sands, the use of caissons is not recommended.

Based on the Ontario Building Code of 2012, the classification of soils for seismic site response should be based on the average soil properties of the top 30 m of the soil profile. The deepest boreholes were just over 15 m deep and were terminated in very dense till or hard silt. The very dense or hard deposits are expected to extend to depth and, in this case, the site soils may be classified as seismic Site Class 'C'.

For the design members resisting lateral loads the recommended soil parameters are as follows:

Soil Parameters	*Compact Gravelly Sand, Sand and Silty Sand Till*	*Dense to Very Dense Silty Sand Till and Sandy Silt Till*
Unit Weight	*21 kN/m^3*	*21 kN/m^3*
Friction Angle	*32^o*	*38^o*
Cohesion	*0*	*0*
Coefficient of Earth Pressure At Rest	*0.47*	*0.38*
Coefficient of Active Earth Pressure	*0.31*	*0.28*
Coefficient of Passive Earth Pressure	*3.2*	*4.2*
Coefficient of Friction	*0.45*	*0.45*

5.3 Elevator Pits and Storm Water Management Tank

The walls of the elevator pits, storm water management tank and other earth retaining structures should be designed to resist lateral earth pressures, the magnitude of which can be determined from:

$$p = K(\gamma d + q)$$

where

p	=	*earth pressure, kN/m^2*
K	=	*earth pressure coefficient, 0.5 for sand fill*
γ	=	*unit weight of backfill, 20 kN/m^3 for sand*
d	=	*depth below finished grade, metres*
q	=	*surcharge on backfill, kN/m^2*

Water will tend to collect around and under the elevator pit and a perimeter drainage system should be installed. Water collected in this system should be connected to the local storm drainage system either by gravity or by permanent sump pump(s). The storm water management tank should be designed against hydrostatic water pressure.

5.4 Slab on Grade

The existing pavement, and any topsoil, fill and other deleterious materials should be removed from within the footprint of the buildings. The excavation of the existing building and house (including the foundations) should be backfilled with engineered fill. The exposed subgrade should be inspected, and any loose or wet soils identified should be removed and replaced with compacted approved fill. Any backfill required should be comprised of

approved on-site or imported fill, preferably granular soil, placed in not more than 200 mm thick horizontal loose lifts and compacted to at least 98% Standard Proctor maximum dry density (SPMDD).

A layer of well-graded free-draining granular material, at least 150 mm thick and compacted to 98% SPMDD, should be placed under the floor slab to provide a uniform bearing surface and to act as a vapour barrier.

5.5 Service Trenches

It is anticipated that the service trenches will be located at approximately 3 m from existing grade. Reference to the Borehole Logs indicates that the subgrade of the pipes will likely be composed of compact to very dense silty sand till or sand, which will generally provide adequate support for the pipes and allow the use of normal Class 'B' bedding using Granular 'A' material.

Clear crushed stone should not be used as bedding, otherwise the fines from the surrounding subsoils may migrate into the voids of the stone and cause undesirable settlements.

If there is local softening of the trench grade, then the bedding thickness may have to be increased. The backfill around manholes should consist of well compacted granular materials.

5.6 Excavation and Groundwater Control

No significant groundwater problems are anticipated during the excavation of the foundations. Provision should, however, be made for the control of any ground water seepages in the excavation and in the service trenches , which will likely be controlled by pumping from local sumps.

Excavations of more than 1.2 m in depth should be cut back to a side slope of 1:1. Alternatively, the excavation may be supported using adequately braced sheeting.

To minimize potential problems, backfilling operations should follow closely after excavation so that only a minimal length of trench slope is exposed. Should construction be carried out in the winter season, particular attention should be given to make sure frozen material is not used as backfill.

5.7 Pavements

All loose and wet soil, any topsoil, organics, and any deleterious materials should be removed from the areas to be paved. The exposed subgrade should be proof-rolled and any soft or wet areas identified should be sub-excavated and replaced with approved well compacted fill. Where the backfilling will be required to raise the grade, the backfill should be comprised of engineered fill.

Considering the traffic requirements and subsoil conditions, the recommended pavement designs are as follows:

	Medium Duty Asphalt (mm)	*Heavy Duty Asphalt (mm)*
HL-3 Asphaltic Concrete	*40*	*40*
HL-8 Asphaltic Concrete	*50*	*75*
Granular 'A' or 20 mm crusher run limestone	*150*	*150*
Granular 'B' or 50 mm crusher run limestone	*300*	*300*

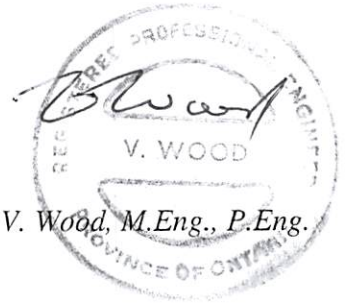
The base and sub-base granular materials should be compacted to at least 98% SPMDD and the asphaltic concrete to 96% Marshall density. The thicknesses shown above are compacted thicknesses of the layers.

Frequent inspection by geotechnical personnel from V.A. Wood Associates Limited should be carried out during construction to verify the compaction of the subgrade, base courses and asphaltic concrete by in-situ density testing using nuclear gauges.

6.0 STATEMENT OF LIMITATIONS

The Statement of Limitations presented on Appendix 'B' is an integral part of this report.

V.A. WOOD ASSOCIATES LIMITED



V. Wood, M.Eng., P.Eng.

APPENDICES

APPENDIX 'A'

Monitoring Well Logs

Project No: 7601-19-4

Project: Proposed Condominium

Client: PGL Environmental Consultants

Location: 136 Bayfield Street, Barrie, ON

Monitoring Well No.: 1

Enclosure:

Engineer: VAWood Assoc.

Depth	Description	Elev.	Number	Type	Blows/ft	Recovery	Standard Penetration Test blows/ft (20 40 60 80)	Well Data	Remarks
0	Ground Surface	0							
0	Asphalt 90 mm Granular Base 100 mm GRAVELLY SAND Dense, some cobbles	235.73	1	SS	41				50 mm diameter PVC pipe
1.4		234.33	2	AS	38				
2	***SAND*** Compact to dense, brown, saturated		3	SS	11				
2.5		233.23	4	SS	38				
3	brown ***SILTY SAND TILL*** Dense to very dense, trace to some fine to medium gravel, brown then grey, wet		5	SS	58				
5			6	SS	100+				
5.5		230.23							
6			7	SS	100+				
7	***SANDY SILT TILL*** Very dense, trace fine to medium gravel, grey, moist to wet		8	SS	100+				
9			9	SS	100+				
10			10	SS	100+				
11.5		224.23							
12			11	SS	100+				
13	***SILT*** Hard, occasional thin seams of fine sand, grey, moist		12	SS	100+				
15.6			13	SS	100+				
16	End of Borehole	220.13							
17									

Drilled By: Walker Drilling Ltd.

Drill Method: Auger

Drill Date: May 2, 2019

V A WOOD ASSOCIATES LTD.
1080 Tapscott Road, Unit 24
Scarborough, ON
M1X 1E7

Hole Size: 110 mm

Datum: Geodetic

Sheet: 1 of 1

Project No: 7601-19-4

Project: Proposed Condominium

Client: PGL Environmental Consultants

Location: 136 Bayfield Street, Barrie, ON

Monitoring Well No.: 2

Enclosure:

Engineer: VAWood Assoc.

Depth	Description	Elev.	Number	Type	Blows/ft	Recovery	Standard Penetration Test blows/ft (20 40 60 80)	Well Data	Remarks
0	Ground Surface	0							
	Asphalt 90 mm Granular Base 100 mm GRAVELLY SAND Compact, wet at the bottom	236.54	1	SS	21				50 mm diameter PVC pipe
1		1.2	2	SS	12				
		235.34							
2	***SILTY SAND TILL*** Compact to dense, trace to some fine to medium gravel, brown then grey, wet		3	SS	13				
	brown / grey		4	SS	22				
3			5	SS	31				
4		4							
		232.54							
5	***SANDY SILT TILL*** Very dense, trace fine to medium gravel, grey, moist		6	SS	100+				
6			7	NR	100+				
7		7							
		229.54							
8	***SILTY SAND TILL*** Very dense, trace to some fine to medium gravel, grey, moist		8	SS	75				
9		9.5	9	SS	100+				
	End of Borehole	227.04							
10									
11									
12									

Drilled By: Walker Drilling Ltd.

Drill Method: Auger

Drill Date: May 3, 2019

V A WOOD ASSOCIATES LTD.
1080 Tapscott Road, Unit 24
Scarborough, ON
M1X 1E7

Hole Size: 110 mm

Datum: Geodetic

Sheet: 1 of 1

Project No: 7601-19-4

Project: Proposed Condominium

Client: PGL Environmental Consultants

Location: 136 Bayfield Street, Barrie, ON

Monitoring Well No.: 3

Enclosure:

Engineer: VAWood Assoc.

SUBSURFACE PROFILE				SAMPLE				Standard Penetration Test blows/ft		Remarks
Depth	Symbol	Description	Elev.	Number	Type	Blows/ft	Recovery	20 40 60 80	Well Data	
0		Ground Surface	0							
		Asphalt 90 mm Granular Base 100 mm GRAVELLY SAND Compact, some topsoil, moist	237.97 0.7 237.27	1	SS	9				50 mm diameter PVC pipe
1				2	SS	17				
				3	SS	21				
2		***SILTY SAND TILL*** Compact, then dense to very dense, trace to some fine to medium gravel, brown then grey, moist to wet		4	SS	38				
3				5	SS	43				
		brown / grey								
4										
				6	SS	57				
5			5.15							
		End of Borehole	232.82							
6										
7										
8										

Drilled By: Walker Drilling Ltd.

Drill Method: Auger

Drill Date: May 6, 2019

V A WOOD ASSOCIATES LTD.
1080 Tapscott Road, Unit 24
Scarborough, ON
M1X 1E7

Hole Size: 110 mm

Datum: Geodetic

Sheet: 1 of 1

Project No: 7601-19-4

Project: Proposed Condominium

Client: PGL Environmental Consultants

Location: 136 Bayfield Street, Barrie, ON

Monitoring Well No.: 4

Enclosure:

Engineer: VAWood Assoc.

Depth	Description	Elev.	Number	Type	Blows/ft	Recovery	Standard Penetration Test blows/ft (20 40 60 80)	Well Data	Remarks
0	Ground Surface	0							
	Augered to 3.5 m	239.84							50 mm diameter PVC pipe
3	saturated	3.05 236.79	1	SS	100+				
	SILTY SAND TILL grey Very dense, trace to some fine to medium gravel, brown then grey, saturated at the top, then moist		2	SS	100+				
8		8 231.84							
	SANDY SILT TILL Very dense, trace fine to medium gravel, grey, wet		3	SS	100+				
10.5		229.34							
	SILTY SAND TILL Very dense, trace fine to medium gravel, grey, wet		4	SS	100+				
12.6	End of Borehole	227.24							
14									

Drilled By: Walker Drilling Ltd.

Drill Method: Auger

Drill Date: May 7, 2019

V A WOOD ASSOCIATES LTD.
1080 Tapscott Road, Unit 24
Scarborough, ON
M1X 1E7

Hole Size: 110 mm

Datum: Geodetic

Sheet: 1 of 1

Project No: 7601-19-4

Project: Proposed Condominium

Client: PGL Environmental Consultants

Location: 136 Bayfield Street, Barrie, ON

Monitoring Well No.: 5

Enclosure:

Engineer: VAWood Assoc.

Depth	Description	Elev.	Number	Type	Blows/ft	Recovery	Standard Penetration Test blows/ft (20 40 60 80)	Well Data	Remarks
0	Ground Surface	0							50 mm diameter PVC pipe
1	Augered to 3.5 m	236							
2									
3		3.05							
4	brown / grey	232.95	1	SS	58				
5									
6			2	SS	100+				
7									
8	*SILTY SAND TILL*								
9	Very dense, trace to some fine to medium gravel, brown then grey, moist, to wet, saturated at the bottom		3	SS	100+				
10									
11									
12			4	SS	100+				
13									
14									
15	saturated	15.4	5	SS	100+				
16	End of Borehole	220.6							
17									

Drilled By: Walker Drilling Ltd.

Drill Method: Hollow Stem Auger

Drill Date: May 7, 2019

V A WOOD ASSOCIATES LTD.
1080 Tapscott Road, Unit 24
Scarborough, ON
M1X 1E7

Hole Size: 110 mm

Datum: Geodetic

Sheet: 1 of 1

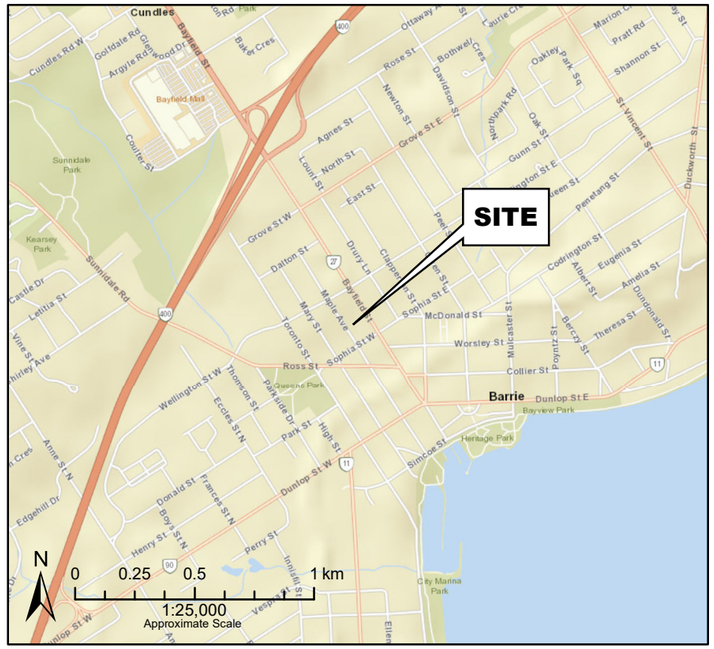
STATEMENT OF LIMITATIONS

The conclusions and recommendations in this report are based on information determined at the borehole locations and on geological data of a general nature which may be available for the area investigated. Soil and groundwater conditions between and beyond the boreholes may differ from those encountered at the borehole locations and conditions may become apparent during construction which would not be detected or anticipated at the time of the soil investigation.

We recommend that we be retained to ensure that all necessary stripping, subgrade preparation and compaction requirements are met, and to confirm that the soil conditions do not deviate materially from those encountered in the boreholes. In cases where this recommendation is not followed, the company's responsibility is limited to interpreting accurately the information encountered at the borehole locations.

This report is applicable only to the project described in the introduction, constructed substantially in accordance with details of alignment and elevations quoted in the text.

ENCLOSURES



Site Boundary (Approximate)

Monitoring Well

N 0 10 20 40 m
1:800
Approximate Scale

Parcel: *Approximate* **Image:** *ESRI Base Imagery*

SITE LOCATION

136 Bayfield Street and 14 Sophia Street West, Barrie, ON

ROCKAP HOLDINGS INC.

PGL ENVIRONMENTAL CONSULTANTS

File No.:	Date:	Dwg No.:	Drawn by:	FIGURE
5689-02.01	FEB 2020	56890201-11	DPL	1

\\PGLONFILE1\ON Project Files\5600-5699\5689 - Rockap Holdings Inc\02-01\Graphics\56890201-11.mxd

Original in colour

Reference No : 7601-19-4

Borehole No : 1

Enclosure No : 2

Client : PGL Environmental Consultants

Project : Proposed Condominium

Method : Auger

Location : 136 Bayfield Street, Barrie, ON

Diameter : 110 mm

Datum Elevation : Geodetic

Date : May 2, 2019

Elevation m	Depth m	Description	Symbol	Water	Sample Number	Sample Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 30 50)	Remarks
235.73	0	Ground Surface								
		Asphalt 90 mm Granular Base 100 mm GRAVELLY SAND Dense, some cobbles			1	SS	41			monitoring well installed to 6.1m
234.33	1				2	AS	38			
		SAND Compact to dense, brown, saturated			3	SS	11			
233.23	2				4	SS	38			
	3	brown / grey ***SILTY SAND TILL*** Dense to very dense, trace to some fine to medium gravel, brown then grey, wet			5	SS	58			
	4									
230.23	5				6	SS	100+			
	6				7	SS	100+			
	7									
	8	***SANDY SILT TILL*** Very dense, trace fine to medium gravel, grey, moist to wet			8	SS	100+			
	9				9	SS	100+			
	10									
224.23	11				10	SS	100+			
	12				11	SS	100+			
	13	***SILT*** Hard, occasional thin seams of fine sand, grey, moist								
	14				12	SS	100+			
220.13	15				13	SS	100+			
	16	End of Borehole								
	17									

V.A. WOOD ASSOCIATES LIMITED

Disk :

Sheet : 1 of 1

Reference No : 7601-19-4

Borehole No : 2

Enclosure No : 3

Client : PGL Environmental Consultants

Project : Proposed Condominium

Method : Auger

Location : 136 Bayfield Street, Barrie, ON

Diameter : 110 mm

Datum Elevation : Geodetic

Date : May 3, 2019

Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 30 50)	Remarks
236.54	0	Ground Surface								
		Asphalt 90 mm Granular Base 100 mm GRAVELLY SAND Compact, wet at the bottom			1	SS	21	○		monitoring well installed to 9.1m
235.34	1				2	SS	12	○	●	
	2	***SILTY SAND TILL*** Compact to dense, trace to some fine to medium gravel, brown then grey, wet		▼	3	SS	13	○		
	3	brown / grey			4	SS	22	○	●	
					5	SS	31	○		
232.54	4									
	5	***SANDY SILT TILL*** Very dense, trace fine to medium gravel, grey, moist			6	SS	100+	○	●	
	6				7	NR	100+	○		no recovery at 6.1m
229.54	7									
	8	***SILTY SAND TILL*** Very dense, trace to some fine to medium gravel, grey, moist			8	SS	75	○	●	
	9				9	SS	100+	○		
227.04		End of Borehole								
	10									
	11									
	12									

V.A. WOOD ASSOCIATES LIMITED

Disk :

Sheet : 1 of 1

Reference No : 7601-19-4

Borehole No : 3

Enclosure No : 4

Client : PGL Environmental Consultants

Project : Proposed Condominium

Method : Auger

Location : 136 Bayfield Street, Barrie, ON

Diameter : 110 mm

Datum Elevation : Geodetic

Date : May 6, 2019

Elevation m	Depth m	Description	Symbol	Water	SAMPLE Number	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 30 50)	Remarks
237.97	0	Ground Surface								
		Asphalt 90 mm Granular Base 100 mm GRAVELLY SAND Compact, some topsoil, moist			1	SS	9	○	●	monitoring well installed to 6.1m
237.27					2	SS	17	○		
	1				3	SS	21	○	●	
	2	***SILTY SAND TILL*** Compact, then dense to very dense, trace to some fine to medium gravel, brown then grey, moist to wet			4	SS	38	○		
	3				5	SS	43	○	●	
	4	brown / grey								
232.82	5				6	SS	57	○		
		End of Borehole								
	6									
	7									
	8									

V.A. WOOD ASSOCIATES LIMITED

Disk :

Sheet : 1 of 1

Reference No : 7601-19-4

Borehole No : 4

Enclosure No : 5

Client : PGL Environmental Consultants

Project : Proposed Condominium

Method : Auger

Location : 136 Bayfield Street, Barrie, ON

Diameter : 110 mm

Datum Elevation : Geodetic

Date : May 7, 2019

Elevation m	Depth m	Description	Symbol	Water	SAMPLE Number	SAMPLE Type	SAMPLE N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 30 50)	Remarks
239.84	0	Ground Surface								
	1	Augered to 3.05 m								monitoring well installed to 9.1m
	2									
236.79	3	saturated			1	SS	100+	○	○	
	4	*SILTY SAND TILL* brown / grey								
	5	Very dense, trace to some fine to medium gravel, brown then grey, saturated at the top, then moist								
	6				2	SS	100+	○ ●	○ ●	
	7									
231.84	8									
	9	*SANDY SILT TILL*								
	10	Very dense, trace fine to medium gravel, grey, wet			3	SS	100+	○	○	
229.34	11									
	12	*SILTY SAND TILL*								
227.24	13	Very dense, trace fine to medium gravel, grey, wet			4	SS	100+	○ ●	○ ●	
	14	End of Borehole								

V.A. WOOD ASSOCIATES LIMITED

Disk :

Sheet : 1 of 1

Reference No : 7601-19-4

Borehole No : 5

Enclosure No : 6

Client : PGL Environmental Consultants

Project : Proposed Condominium

Method : Auger

Location : 136 Bayfield Street, Barrie, ON

Diameter : 110 mm

Datum Elevation : Geodetic

Date : May 7, 2019

Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value	Standard Penetration Test blows/300mm (20 40 60 80)	Moisture Content, % (10 30 50)	Remarks
236	0	Ground Surface								monitoring well installed to 14 m
	1	Augered to 3.05 m								
	2									
232.95	3				1	SS	58	○	●	
	4	brown								
	5	grey								
	6				2	SS	100+		○	
	7									
	8	*SILTY SAND TILL*								
	9	Very dense, trace to some fine to medium gravel, brown then grey, moist to wet, saturated at the bottom			3	SS	100+		○●	
	10									
	11									
	12				4	SS	100+		○	
	13									
	14									
220.6	15	saturated			5	SS	100+		○	
	16	End of Borehole								
	17									

V.A. WOOD ASSOCIATES LIMITED

Disk :

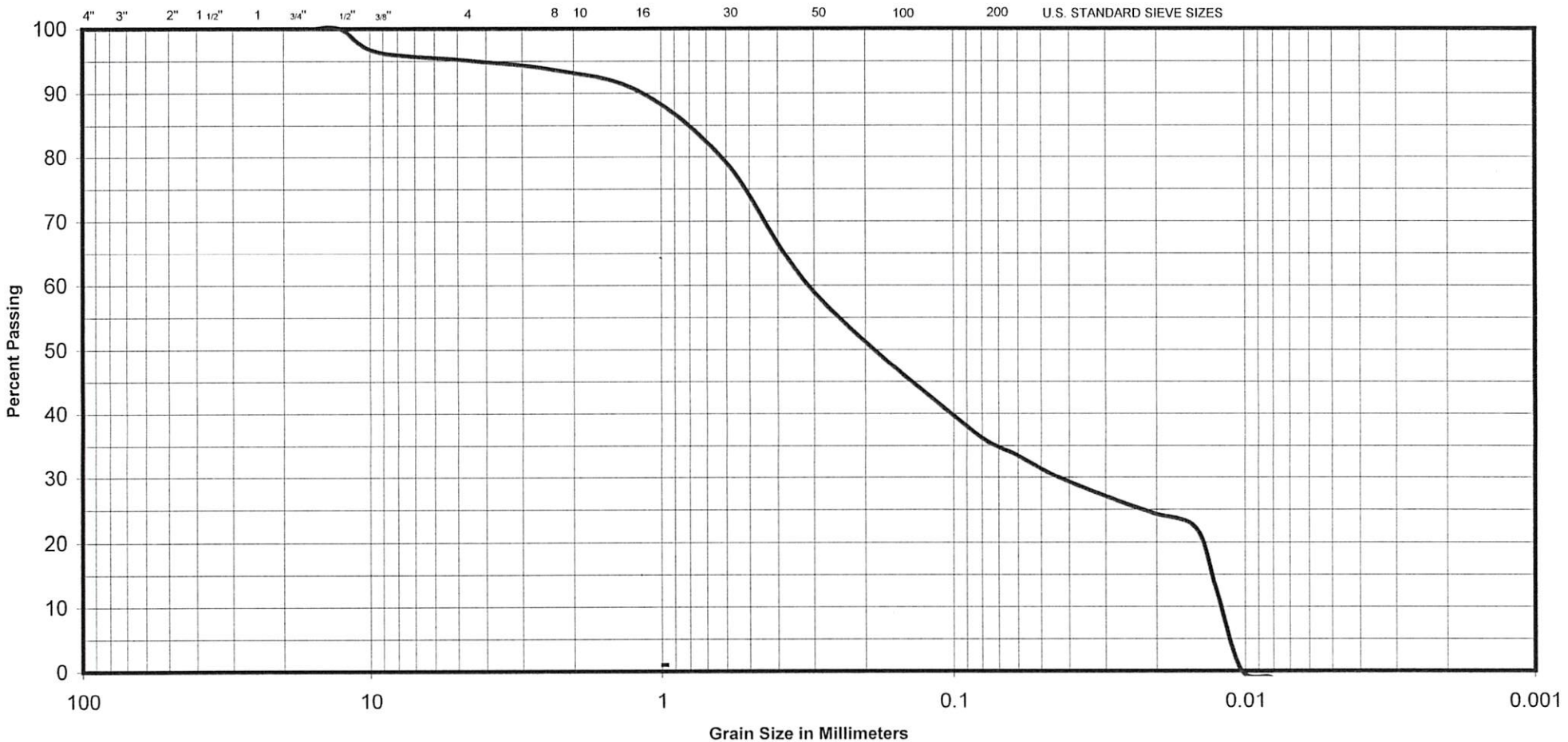
Sheet : 1 of 1

GRAIN SIZE DISTRIBUTION

OUR REFERENCE No.: 7601-19-4

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM



PROJECT: Proposed Condominium
LOCATION: 136 Bayfield Street, Barrie, ON
BOREHOLE NO.: 2
SAMPLE NO.: 5
DEPTH: 3.4 m
DATE: May 2019

Silty Fine to medium SAND (SM)
TILL

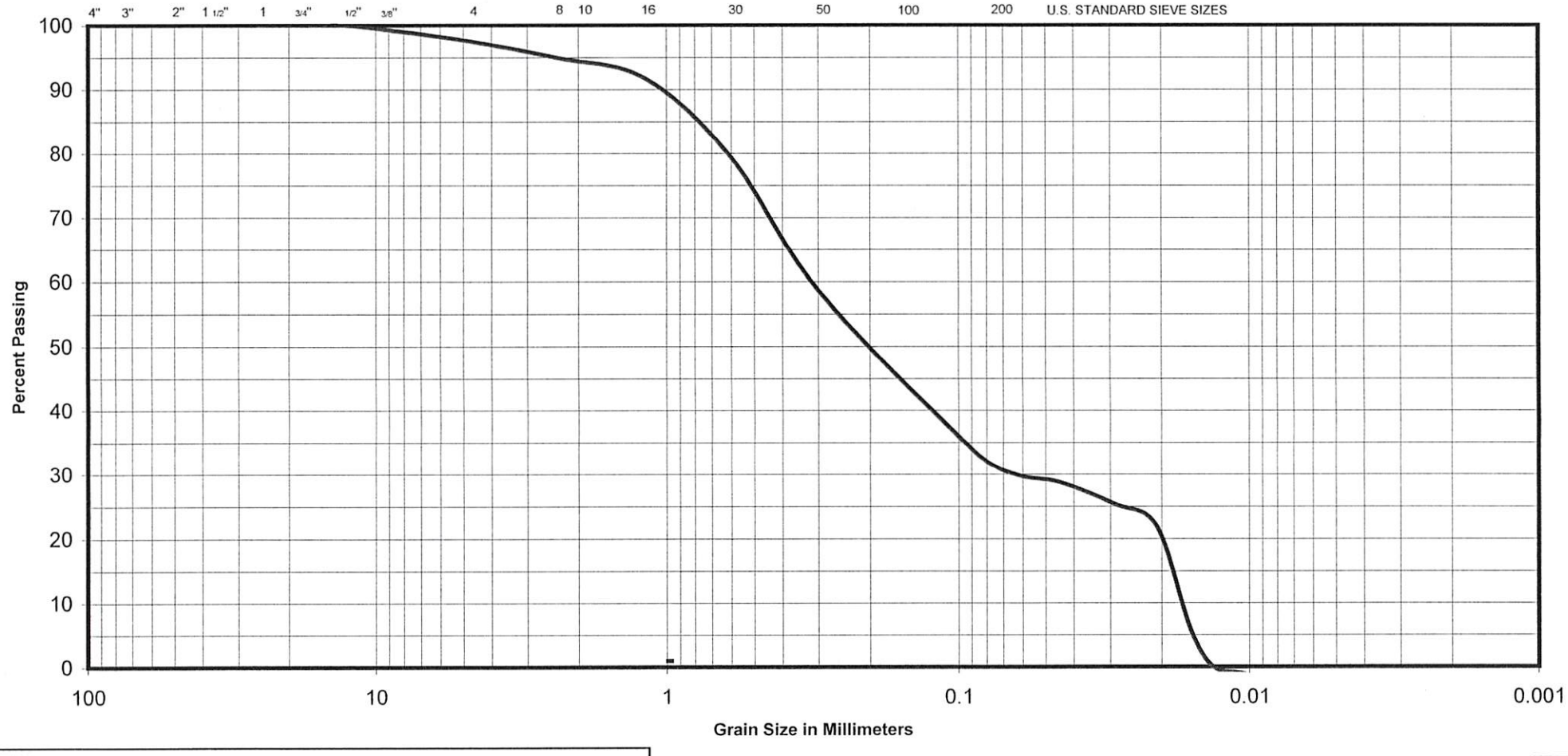
ENCLOSURE No. 7

GRAIN SIZE DISTRIBUTION

OUR REFERENCE No.: 7601-19-4

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM



PROJECT: Proposed Condominium
LOCATION: 136 Bayfield Street, Barrie, ON
BOREHOLE NO.: 3
SAMPLE NO.: 6
DEPTH: 4.9 m
DATE: May 2019

Silty Fine to medium SAND (SM)
TILL

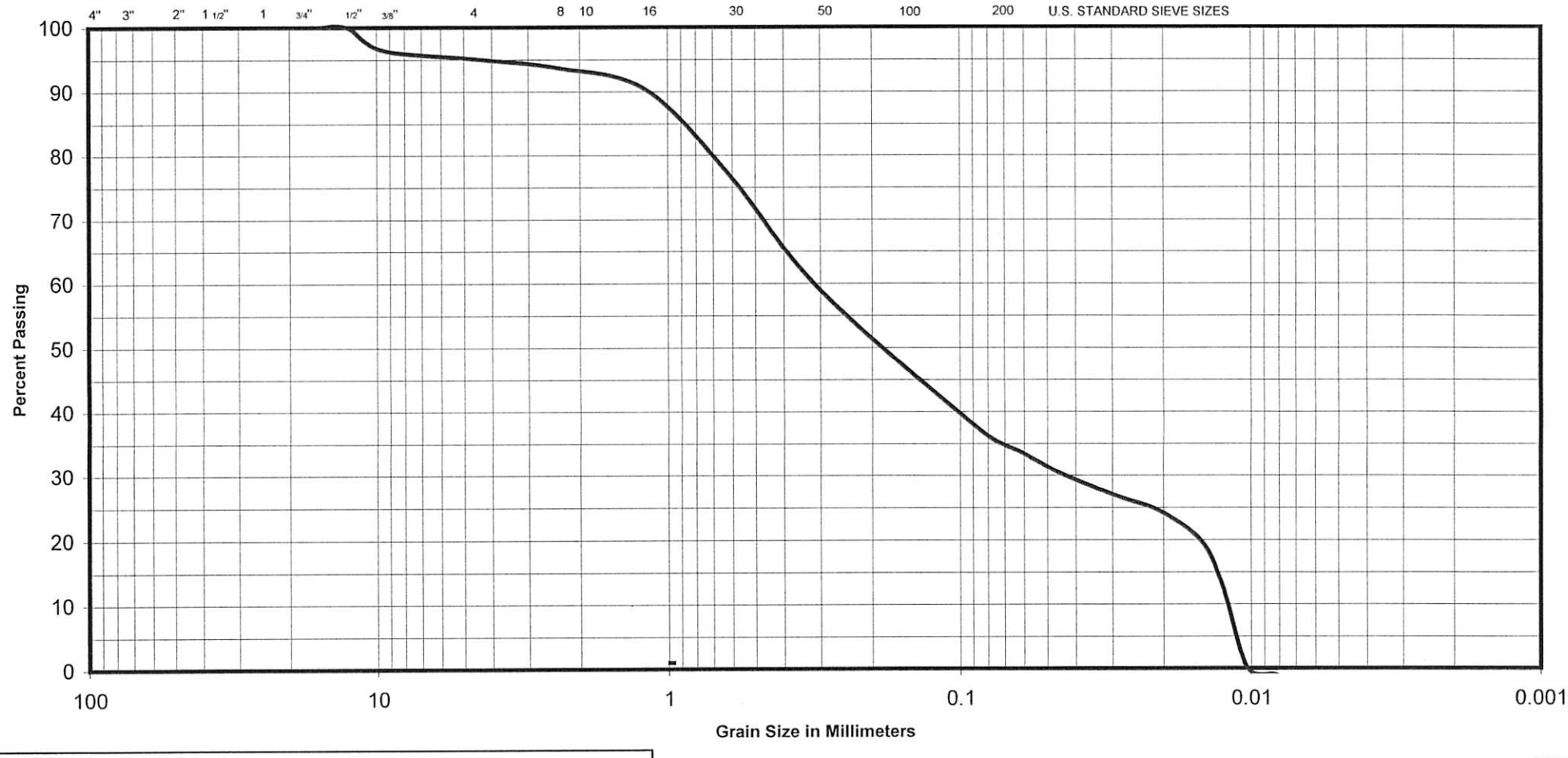
ENCLOSURE No. 8

GRAIN SIZE DISTRIBUTION

OUR REFERENCE No.: 7601-19-4

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM



PROJECT: Proposed Condominium
LOCATION: 136 Bayfield Street, Barrie, ON
BOREHOLE NO.: 5
SAMPLE NO.: 2
DEPTH: 6.4 m
DATE: May 2019

Silty Fine to medium SAND (SM)
TILL

ENCLOSURE No. 9

GRAIN SIZE DISTRIBUTION

OUR REFERENCE No.: 7601-19-4

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM

PROJECT: Proposed Condominium
LOCATION: 136 Bayfield Street, Barrie, ON
BOREHOLE NO.: 1
SAMPLE NO.: 9
DEPTH: 9.3 m
DATE: May 2019

SILT and Fine to medium SAND (SM)
TILL

ENCLOSURE No. 10

GRAIN SIZE DISTRIBUTION

OUR REFERENCE No.: 7601-19-4

GRAVEL		SAND			SILT & CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM

PROJECT: Proposed Condominium
LOCATION: 136 Bayfield Street, Barrie, ON
BOREHOLE NO.: 1
SAMPLE NO.: 11
DEPTH: 12.4 m
DATE: May 2019

SILT, some fine sand (ML)

ENCLOSURE No. 11