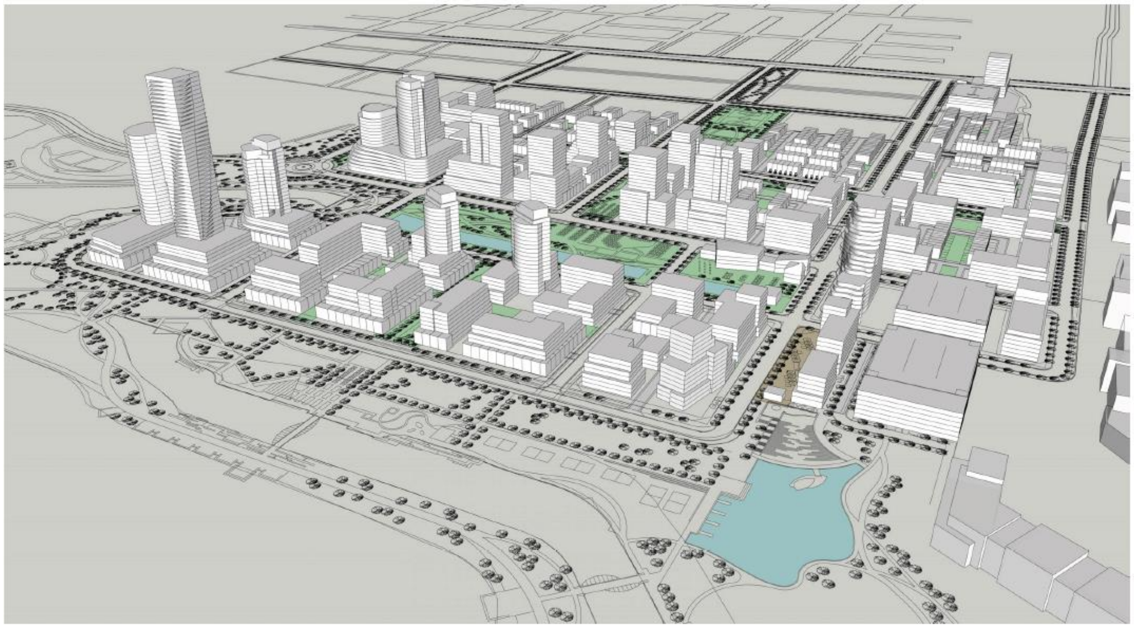
REPORT ON
Preliminary Geotechnical Investigation
Proposed Residential & Commercial Development
800 Hydro Road
Mississauga, Ontario



PREPARED FOR:

Lakeview Community Partners Limited

PREPARED BY:

DS Consultants Ltd.

Project No: 18-519-10 R2
Date: June 9, 2020

DS CONSULTANTS LTD.
6221 Highway 7, Unit 16
Vaughan, Ontario, L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Table of Contents

DRAWINGS

APPENDIX B: LOGS AND LOCATION PLAN OF EXP BOREHOLES

APPENDIX C: GEOPHYSICAL SURVEY REPORT BY GEOPHYSICS GPR INTERNATIONAL INC.

1. INTRODUCTION

DS Consultants Ltd. (DS) was retained by the ARGO Development Corporation on behalf of Lakeview Community Partners Limited to carry out preliminary geotechnical and hydrogeological investigations for the proposed Lakeview Village on the lands of the former Lakeview Power Generation Station located at 800 Hydro Road in Mississauga, Ontario.

It is understood that the proposed 71.6-hectare Lakeview Village will include 5,000 to 7,000 new homes in a variety of housing options, including townhouses, mid-rise and high-rise buildings. There will be more than 600,000 square feet of employment and institutional use and another 200,000 square feet of cultural space. Lakeview Village will include a Serson Square, a year-round central gathering space with retail offices and homes that can be used as an arts and cultural hub.

The proposed high-rise structures will entail up to 3-levels of basement. The finished basement floor elevations are not available to us at the time of writing this report.

exp Services Inc (exp.) conducted a preliminary geotechnical investigation at the subject site in December 2017 and drilled nine (9) boreholes as a part of their field work. The logs and location plan of exp. boreholes (BH1 to BH9) are attached in **Appendix B** of this report.

The purpose of this geotechnical investigation was to determine the subsurface conditions at the borehole locations and make preliminary engineering recommendations for the following:

1. Foundations
2. Floor slabs and permanent drainage
3. Earth pressures
4. Excavations and backfill
5. Earthquake considerations
6. Pavements
7. Underground utilities

This report deals with geotechnical issues only. Preliminary hydrogeological findings by DS will be presented in a separate report. Environmental testing was not part of our scope of work.

This report is provided on the basis of the assumption that the design will be in accordance with the applicable codes and standards. If there are any changes in the design features relevant to the geotechnical analyses, or if any questions arise concerning the geotechnical aspects of the codes and standards, this office should be contacted to review the design. It may then be necessary to carry out additional borings and reporting before the recommendations of this office can be relied upon.

The site investigation and recommendations follow generally accepted practice for geotechnical consultants in Ontario, Canada. The format and contents are guided by client specific needs and economics and conform to generalized standards for services. Laboratory testing for most part follows ASTM or CSA Standards or modifications of these standards that have become standard practice.

The foundation recommendations made in this report are based on the subsoil conditions found during the field investigation. The comments made in this report on potential construction problems and possible construction options intended only for guidance of the designer.

This report has been prepared for Lakeview Community Partners Limited and its architects and designers. Third party use of this report without DS Consultants Ltd. consent is prohibited.

2. FIELD WORK & LAB TESTING

Forty-five (45) boreholes (BH18-1 to BH18-49, except BH18-22 to BH18-24 and BH18-26, see Drawing 1 and 1A for location plan) were drilled at the site to depths varying from 1.7 m to 48.3m below the existing grade.

Four boreholes (BH18-22 to BH18-24 and BH18-26) were not be drilled due to the on-going construction work related to removal of buried concrete slabs associated with the former powerhouse.

Boreholes were drilled with solid stem and hollow stem continuous flight auger equipment by a drilling sub-contractor under the direction and supervision of DS Consultants Ltd personnel. Mud rotary was used in the drilling of some deep boreholes. Samples were retrieved at regular intervals with a 50 mm O.D. split-barrel sampler driven with a hammer weighing 624 N and dropping 760 mm in accordance with the Standard Penetration Test (SPT) method. The samples were logged in the field and returned to the DS Consultants Ltd laboratory for detailed examination by the project engineer and for laboratory testing.

Shale bedrock was cored at five (5) borehole locations (BH18-19, BH18-29, BH18-32, BH18-37 and BH18-45), with HQ double tube wireline equipment providing 63.5mm diameter rock core samples. The coring was carried out under the full-time supervision of a representative from DS who identified and described the rock samples, noting and recording the percentages of total and solid rock core recovery, RQD values, fracture index and the percentage and thicknesses of hard layers.

As well as visual examination in the laboratory, majority of the soil samples were tested for moisture contents. Selected fourteen (14) soil samples were subjected to grain size analyses and gradation curves are presented on Drawings 58 & 59. Atterberg's Limits tests were conducted on selected five (5) soil samples and results are presented on the respective borehole logs.

Water level observations were made during drilling and in the open boreholes at the completion of the drilling operations. Monitoring wells were installed in overburden and bedrock at seven (7) borehole locations for the longer-term groundwater level monitoring.

Methane gas measurements were taken in boreholes during drilling and upon completion of drilling, using a portable multi-gas detector RKI Eagle 2 instrument.

The ground surface elevations at the borehole locations was undertaken by DS personnel, using the differential GPS unit, leased from Sokkia Inc.

Geophysical survey was carried out at the subject site by the sub-contractor, Geophysics GPR International Inc. and their report is attached in **Appendix C** of this report.

3. SITE AND SUBSURFACE CONDITIONS

The subject site is located at 800 Hydro Road in Mississauga, approximately three kilometers east of Port Credit, on Mississauga's waterfront. The subject property primarily consists of former OPG Lakeview Coal plant that was decommissioned between 2006 & 2008 and the City own lands that is currently being used as playing fields and parking lot. The topography of the site has gentle slope towards south towards Lake Ontario, with elevations decreasing from 84m to 77m. At the time of our field work, the existing concrete slabs associated with the former OPG powerhouse were being removed by the contractor.

The borehole location plan is shown on Drawings 1 and 1A. Notes on samples description are provided on Drawing 1B. The subsurface conditions in the boreholes are presented in the individual borehole log on Drawings 2 to 46. Generalized sub-surface profiles are provided on Drawing 47 to 57.

Based on the borehole information, there is a significant variation in the bedrock depths at site along the north-south and east-west directions. There is a bedrock valley within the site, with the bedrock surface depths varying from 1.5m to at or below 48.3m. To delineate the bedrock valley and for the ease of describing the geotechnical conditions, the site is sub-divided into three areas (Area A, Area B & Area C, see Drawing 1 for areas & respective borehole locations). The subsurface conditions in the boreholes, area wise, are summarized in the following paragraphs.

3.1 Soil Conditions in Area ‘A’

Seventeen boreholes (BH18-14, BH18-19, BH18-21, BH18-25, BH27 to BH18-38 and BH18-49) were drilled within Area ‘A’. All boreholes were drilled to shale bedrock.

Topsoil, Pavement Structure & Fill Materials: A surficial topsoil layer, ranging in thickness from 125 to 350mm, was encountered at BH18-21, BH18-33 to BH18-38 & BH18-49. Two boreholes (BH18-28 & BH18-30) drilled on the paved areas encountered 70mm of asphalt at the surface, overlying granular base/subbase. Fill materials were found in all boreholes, extending to depths varying from 0.8 to 4.2m below the existing grade. Fill material was heterogeneous and consisted of sand & gravel, crusher run limestone, silty sand, sandy silt and clayey silt to silty clay, with inclusions of organics/topsoil, wood, concrete, asphalt and shale fragments. The SPT 'N' values recorded in fill materials ranged from 5 to over 50 blows per 300mm of spoon penetration, indicating loose to very dense state of relative density.

Clayey Silt to Silty Clay Till: Below the fill materials, clayey silt to silty clay till deposits were encountered in BH18-14, BH18-19, BH18-29, and BH18-34 to BH18-38 (except BH18-35), overlying shale bedrock or silty clay. Clayey silt till was present in a stiff to hard consistency, with measured SPT 'N' values ranging from 8 to over 50 blows per 300mm of spoon penetration. Occasional cobble/boulders and sand seams were encountered within this deposit.

Grain size analysis of one soil sample (BH18-33/SS3) was conducted. The results are shown on Drawing 59, with the following fractions:

Clay: 29%
Silt: 46%
Sand: 23%
Gravel: 2%

Atterberg limits testing of one soil sample (BH18-33/SS3) was conducted. The results are shown on the borehole log and are summarized as follows:

Liquid limit (W_L): 34%
Plastic limit (W_P): 21%
Plasticity index (PI): 13

Silty Clay: A silty clay deposit was encountered in BH18-25, BH18-27, BH18-30 and BH18-36, below the fill material, or cohesionless soils or clayey silt till, and overlying shale bedrock. Silty clay was present in a firm to hard, generally hard consistency, with measured SPT 'N' values ranging from 6 to more than 50 blows for 300 mm penetration.

Grain size analysis of one soil sample (BH18-36/SS4) was conducted. The results are shown on Drawing 59 with the following fractions:

Clay: 32%
Silt: 57%
Sand: 11%

Atterberg limits testing of same soil sample (BH18-36/SS7) was conducted. The results are shown on the borehole log and are summarized as follows:

Liquid limit (W_L): 37%
Plastic limit (W_P): 23%
Plasticity index (PI): 14

Cohesionless Soils (Sand & Gravel, Sand): Cohesionless soils consisting of sand and gravel and sand were encountered in boreholes BH18-25, to BH18-28, BH18-32 below the fill material. These cohesionless soils were water bearing and present in a very loose to very dense state, as indicated by the measured SPT 'N' values of nil to over 50 blows per 300mm of spoon penetration.

Sandy Silt Till: A sandy silt till deposit was encountered in BH18-49 below the fill material, extending to a depth of 4.5m, overlying shale bedrock. Sandy silt till was present in a compact to dense state, as indicated by the measured SPT 'N' values of 29 to 31 blows per 300mm of spoon penetration. Occasional cobble/boulders and sand seams were encountered within this deposit.

Shale Bedrock:

In Area 'A', shale bedrock of Georgian Bay Formation was found at all borehole locations, at depths ranging from 1.5 to 6.3m below the existing grade, corresponding to elevations ranging from 71.2 to 80.1m. The approximate depth and elevation of the shale bedrock surface at the borehole locations are listed on Table 3.1 below.

Table 3.1: Approximate Depth and Elevation of Shale Bedrock Surface in Area 'A'

Borehole No.	Depth of Shale Bedrock Surface below Existing Ground (m)	Approximate Elevation of Shale Bedrock Surface (m)	Notes
BH18-14	2.3	78.1	Augered
BH18-19	4.5	76.2	CORED
BH18-21	1.5	78.2	Augered
BH18-25	4.2	73.3	Augered
BH18-27 (30a)	3.8	73.5	Augered
BH18-28	3.3	79.5	Auger refusal
BH18-29A	6.3	71.2	cored
BH18-30	1.5	75.7	Augered
BH18-31	3.8	73.5	Augered
BH18-32	4.3	72.9	CORED
BH18-33	3.8	75.7	Augered
BH18-34	3.1	77.0	Augered
BH18-35	4.2	73.7	Augered
BH18-36	4.6	75.7	Augered
BH18-37	3.1	78.2	CORED
BH18-38	4.6	75.7	Augered
BH18-49	4.5	76.3	Augered
BH3*	**3.2**	**74.1**	**CORED**
BH5*	**3.5**	**76.8**	**Augered**
BH6*	**1.3**	**75.8**	**Augered**
BH9*	**4.4**	**74.6**	**CORED**

*exp. boreholes

Detailed description of shale bedrock is provided in Section 3.4.

3.2 Soil Conditions in Area 'B'

Twenty-two (22) boreholes (BH18-1 to BH18-13, BH18-15 to BH18-18, BH18-20, BH18-39, BH18-40, BH18-46 & BH18-48) were drilled within Area 'B', to depths ranging from 11.1 to 48.3m.

Topsoil, Pavement Structure & Fill Materials: A surficial topsoil layer, ranging in thickness from 100 to 350mm, was encountered at BH18-1, BH18-3 to BH18-6, BH18-10 to BH18-12, BH18-16, BH18-39, BH18-40 and BH18-48). Three boreholes (BH18-2, BH18-17 and BH18-20) drilled on the paved areas encountered 70 to 100mm of asphalt at the surface, overlying granular base/subbase. Fill materials were found in all boreholes, extending to depths varying from 0.8 to 3.1m below the existing grade. Fill material was heterogeneous and consisted of clayey silt, silty clay, silty sand, sandy silt, silt and sand and gravel, with inclusions of organics/topsoil in varying proportions and trace asphalt & shale fragments. The SPT 'N' values recorded in fill materials ranged from 4 to 50 blows per 300mm of spoon penetration, indicating loose to very dense state of relative density.

Clayey Silt to Silty Clay Till: Clayey silt to silty clay till deposits of varying thicknesses were encountered in boreholes at varying depths. Clayey silt to silty clay till was present in a stiff to hard consistency, with measured SPT 'N' values ranging from 14 to over 50 blows per 300mm of spoon penetration. Occasional cobble/boulders and sand seams were encountered within this deposit.

Grain size analysis of four soil samples from clayey silt to silty clay till (BH18-1/SS5, BH18-2/SS6, BH18-7/SS12 & BH18-15/SS3) were conducted. The results are shown on Drawings 58 & 59, with the following fractions:

Clay:	16 to 37%
Silt:	33 to 48%
Sand:	15 to 49%
Gravel:	1 to 9%

Atterberg limits testing of two soil samples (BH18-2/SS6 & BH18-3/SS15) were conducted. The results are shown on the borehole logs and are summarized as follows:

Liquid limit (W_L):	19 to 20%
Plastic limit (W_P):	11 to 12%
Plasticity index (PI):	8

Clayey Silt to Silty Clay: Clayey silt to silty clay deposit of varying thicknesses were encountered in boreholes at varying depths of the boreholes. Clayey silt o silty clay was present in a firm to hard, generally in very stiff consistency, with measured SPT 'N' values ranging from 6 to more than 50 blows for 300 mm penetration.

Grain size analysis of one soil sample (BH18-6/SS12) was conducted. The results are shown on Drawings 58 with the following fractions:

Clay:	68%
Silt:	26%
Sand:	6%

Atterberg limits testing of same soil sample (BH18-6/SS12) was conducted. The results are shown on the borehole log and are summarized as follows:

Liquid limit (W_L):	48%
Plastic limit (W_P):	23%
Plasticity index (PI):	25

Sandy Silt to Silty Sand Till: Sandy silt to silty sand till deposits of varying thicknesses were encountered in boreholes at varying depths. Sandy silt to silty sand till was generally water bearing and present in a very dense state, with measured SPT 'N' values of over 50 blows per 300mm of spoon penetration. Occasional to frequent cobble/boulders should be expected within this deposit.

Cohesionless Soils (Sand & Gravel, Sand, Silty Sand, Sandy Silt, Silt): Cohesionless soils consisting of sand & gravel, sand, silty sand, sandy silt, silt were encountered in majority of boreholes, embedded within the glacial till, at varying depths. These cohesionless soils were water bearing and present in a compact to very dense state, as indicated by the measured SPT 'N' values of 22 to over 50 blows per 300mm of spoon penetration.

Grain size analyses of seven (7) soil sample (BH18-2/SS3, BH18-3/SS10, BH18-8/SS7, BH18-8/SS8, BH18-8/SS12, BH18-9/SS5 and BH18-40/SS7) were conducted. The results are shown on Drawings 58 and 59, with the following fractions: 2

Clay:	2 to 10%
Silt:	3 to 62%
Sand:	23 to 95%
Gravel:	up to 4%

Shale Bedrock:

In Area 'B', shale bedrock Georgian Bay Formation was found at five (5) borehole locations (BH18-6, BH18-9, BH18-15, BH18-18 & BH18-20), at depths ranging from 9.1 to 48.1 below the existing grade, corresponding to elevations ranging from 34.7 to 71.3m. There is a bedrock valley in this area which was further confirmed by the geophysics testing. The approximate depth and elevation of the shale bedrock surface at the borehole locations are listed on Table 3.2 below.

Table 3.2: Approximate Depth and Elevation of Shale Bedrock Surface in Area 'B'

Borehole No.	Depth of Shale Bedrock Surface below Existing Ground (m)	Approximate Elevation of Shale Bedrock Surface (m)	Notes
BH18-6	48.1	34.7	Augered
BH18-7	>30.7		Not encountered at 30.7m
BH18-9	15.2	65.0	Augered
BH18-15	9.1	71.3	Augered
BH18-18	13.7	67.4	Augered
BH18-20	10.7	69.6	Augered
BH2*	**12.0**	**68.3**	**Augered**

*exp. boreholes

Detailed description of shale bedrock is provided in Section 3.4.

3.3 Soil Conditions in Area 'C'

Six boreholes (BH18-41 to BH18-45 and BH18-47) were drilled within Area 'C'. All boreholes were drilled to shale bedrock.

Topsoil & Fill Materials: A surficial topsoil layer, ranging in thickness from 150 to 400mm, was encountered at borehole locations. Fill materials were found in all boreholes, extending to depths varying from 0.8 to 3.4m below the existing grade. Fill material was heterogeneous and consisted of clayey silt, silty clay, sandy silt, and sand & gravel with trace inclusions of organics/topsoil, brick, concrete, asphalt and shale fragments. The SPT 'N' values recorded in fill materials ranged from 4 to 17 blows per 300mm of spoon penetration, indicating loose to compact/firm to stiff state of compactness.

Clayey Silt to Silty Clay Till: Below the fill materials or silt/sandy silt, clayey silt to silty clay till deposits were encountered in boreholes, overlying shale bedrock or silt/sandy silt. Clayey silt till was present in a stiff to hard consistency, with measured SPT 'N' values ranging from 13 to over 50 blows per 300mm of spoon penetration.

Cohesionless Soils (Silt, Sandy Silt to Silty Sand): Cohesionless soils consisting of silt and sandy silt to silty sand were encountered in all boreholes, except in BH18-43 and BH18-44 below the fill material or clayey silt till. These cohesionless soils were generally water bearing and present in a very loose to dense state, as indicated by the measured SPT 'N' values of 5 to 32 blows per 300mm of spoon penetration.

Shale Bedrock: In Area 'C', shale bedrock of Georgian Bay Formation was found at all borehole locations, at depths ranging from 3.1 to 7.6m below the existing grade, corresponding to elevations ranging from 75.7 to 80.4m. The approximate depth and elevation of the shale bedrock surface at the borehole locations are listed on Table 3.3 below.

Table 3.3: Approximate Depth and Elevation of Shale Bedrock Surface in Area ‘C’

Borehole No.	Depth of Shale Bedrock Surface below Existing Ground (m)	Approximate Elevation of Shale Bedrock Surface (m)	Notes
BH18-41	7.6	75.7	Augered
BH18-42	6.1	79.6	Augered
BH18-43	3.1	80.4	Augered
BH18-44	3.8	80.1	Augered
BH18-45	3.8	79.2	CORED
BH18-47	6.1	76.3	Augered
BH7*	3.6	79.8	CORED

*exp. boreholes

Detailed description of shale bedrock is provided in Section 3.4.

3.4 Shale Bedrock (Georgian Bay Formation)

Shale bedrock belonging to Georgian Bay Formation was encountered at this site. Because of the method of drilling and sampling, the surface elevations of the bedrock can be different than indicated on the borehole logs (Drawings 2 to 46). Commonly the till overlying the shale contains slabs of limestone which would give a false indication of the bedrock level. Similarly, the depth of weathering cannot be determined accurately due to the presence of limestone layers.

Shale bedrock was cored at five (5) borehole locations (BH18-19, BH18-29, BH18-32, BH18-37 and BH18-45) to confirm the depth and quality of bedrock.

Photographs of the bedrock cores are also presented in **Appendix A** of the report. The descriptive terms used on the record of rock cores and throughout this report are explained on the “Explanation of Terms Used in the Bedrock Core Log” sheet in Appendix A. **Appendix A** also presents more details and general comments about the shale bedrock in Toronto area.

Total Core Recovery (TCR):

The total core recovery indicates the total length of rock core recovered, expressed as a percentage of the actual length of the core run. The total core recovery for the cored runs ranged from 67 to 100%. Generally, less core recovery was experienced only near the surface of the rock, where the formation is highly to moderately weathered and was almost full as depth increased.

Solid Core Recovery (SCR):

The solid core recovery is the total length of solid, full diameter rock core that was recovered, expressed as a percentage of the length of the core run. Solid core recovery ranged from 28 to 98%, and also appears to generally improve with depth. The SCR index was generally influenced by the orientations of the fractures. SCR was low when fractures oblique to the borehole axis were intercepted.

Rock Quality Designation (RQD):

The rock quality designation index is obtained by measuring the total length of recovered rock core pieces which are longer than 100mm and expressing their sum total length as a percentage of the length of the core run. RQD is a function of the frequency of joints, bedding plane partings and fractures in the rock cores. While the use of double tube core barrels provided reasonably good protection of the core during drilling and core retrieval, the fissile nature of the shale greatly influences the RQD values of the rock cores. Consequently, it is believed that the RQD values recorded underestimate the rock quality classification of the laminated fissile shale. On the basis of the recorded RQD values which range from nil to 97%, the rock quality is estimated to be “very poor” to “excellent”, and the average value of more than 50% suggests a rock of generally “fair” quality.

Hard Layers:

Based on the visual examination of the rock cores, an attempt was made to identify and record the thickness and percentages of the relatively harder siltstone and limestone layers. The percentage of the “hard layers” per core run ranges between nil and 32%. The thickness of these layers varied but was generally varied from 50 to 380mm, but thicker layers have been observed to be as much as 750 to 900 mm at other sites. The layers are actually lenses and they can vary significantly in thickness over short distance. Encountering such thick layers should be anticipated. It is also common to encounter closely spaced groupings of thin strong limestone/siltstone layers which individually may only be 25 to 50mm thick but collectively can be 1m in thickness.

Fracture Index:

When logging the rock cores, the fracture Index (i.e. the number of fractures for each 0.3m length of core) was also recorded. The recorded values range between nil and greater than 25. Occasional fragmented and broken zones were encountered within the solid core. Bedrock was fragmented up to a depth of about 4.9m m in BH18-37, as indicated by nil solid core recovery in this zone. It was observed that the planes of weaknesses along which the cores tended to break, included planes of fissility and bedding, the contact surfaces between shale and siltstone or limestone bands and some oblique and subvertical joints.

Weathering:

In general, moderately weathered zone in the bedrock was limited to about 1.5 m from the bedrock surface. Below this, the degree of weathering ranged from slightly weathered to fresh. The siltstone and limestone layers were generally fresh with only slight surficial weathering on joint surfaces in the zone close to bedrock surface.

Methane Gas:

Methane gas under pressure was encountered in BH18-13 below a depth of about 11m, which is possibly just above the bedrock surface. The borehole was terminated at this depth and properly sealed. Although, during the rock coring there were no physical indications of the presence of gas in the coreholes, the Georgian Bay Formation is known to contain pockets of combustible gas. Therefore, appropriate care and monitoring are essential in all confined excavation work, particularly caissons and tunnels.

3.5 Groundwater Conditions

During drilling, short-term (un-stabilized) groundwater levels were found at depths ranging from 1.5 to 18.3m below the existing grade. Long-term (stabilized) groundwater levels in the monitoring wells were found at depths ranging from 2.0 to 8.0m below the existing grade, corresponding to Elevations of 74.9 to 80.2m. The results of the water level readings taken on Sept. 26, 2018 in the monitoring wells are summarized on Table 3.5.

Table 3.5: Groundwater Levels Observed in DS Monitoring Wells

Borehole	Surface Elevation (m)	Date of Observation	Water Level Depth (mbgs)	Water Level Elev. (m)	Notes
BH18-8	81.6	Sept. 26, 2018	2.8	78.8	Screened in overburden
BH18-12	83.2	Sept. 26, 2018	8.0	75.2	Screened in overburden
BH18-16	82.9	Sept. 26, 2018	2.7	80.2	Screened in overburden
BH18-19	80.7	Sept. 26, 2018	4.7	76.0	Screened in bedrock
BH18-29A*	77.5	Sept. 26, 2018	-	-	Screened in bedrock (Well not accessible)
BH18-32	77.2	Sept. 26, 2018	2.3	74.9	Screened in bedrock
BH18-37	81.3	Sept. 26, 2018	2.0	79.3	Screened in bedrock

It should be noted that the groundwater levels can vary and are subject to seasonal fluctuations in response to major weather events.

4. FOUNDATIONS

It is understood that the 71.6-hectare Lakeview Village will include 5,000 to 7,000 new homes in a variety of housing options, including townhouses, mid-rise and high-rise buildings. The proposed structures will entail up to 3-levels of basement. The finished basement floor elevations are not available to us at the time of writing this report. It is assumed that P1, P2 and P3 basement levels will approximately be at 3m, 6m and 9m depths respectively below the existing grade. Footings will be 1m to 2m below the lowest basement slab.

Based on the encountered bedrock depths, the subject site is sub-divided into three areas (Area A, Area B and Area C), as summarized in Sections 3.1 to 3.3. The foundation recommendations for these three areas are provided below:

4.1 Proposed Buildings in Area 'A'

Boreholes drilled within Area 'A' (BH18-14, BH18-19, BH18-21, BH18-25, BH27 to BH18-38 and BH18-49) reported shale bedrock at depths ranging from 1.5 to 6.3m below the existing grade, corresponding to elevations ranging from 71.2 to 80.1m. Due to the shallow bedrock depths, this area is considered more suitable for high-rise development with one or more basement levels.

Depending upon the finished lowest basement floor elevation, the proposed buildings can be supported by conventional spread and strip footings / mat foundations or short drilled piers founded on shale bedrock, at minimum 0.3 m below the shale bedrock surface, for a bearing pressure values of 2.5 MPa at the Serviceability Limit States (SLS), and for a factored geotechnical resistance of 3.75 MPa at the Ultimate Limit States (ULS).

The footings/piers founded on sound shale, at minimum 1.5 m below the shale surface can be designed for a bearing pressure of 5.0 MPa at SLS, and a factored geotechnical resistance of 7.5 MPa at ULS.

The depths and elevations of shale bedrock at the borehole locations in Area 'A' are provided in Table 3.1 of this report.

4.2 Proposed Buildings in Area 'B'

Twenty-two (22) boreholes (BH18-1 to BH18-13, BH18-15 to BH18-18, BH18-20, BH18-39, BH18-40, BH18-46 & BH18-48) were drilled within Area 'B', to depths ranging from 11.1 to 48.3m.

There is a bedrock valley within Area 'B', with bedrock depths ranging from 9.1 to 48.1m below the existing grade, corresponding to elevations ranging from 34.7 to 71.3m. Therefore, this area is more suitable for low-rise to mid-rise development to be supported by shallow foundations (footings/raft) founded on undisturbed native soil.

Depending upon the location of the building and number of basement levels, it may be possible to support the proposed development in this area on footings or deep foundations such as caissons founded on bedrock.

Additional boreholes will be required to further delineate and confirm the bedrock depths if foundations are to be supported on bedrock.

Footings and/or raft founded on undisturbed native soils can be designed for a bearing capacity values of 300 to 500 kPa at SLS (serviceability limit states) and for a factored geotechnical resistance of 450 to

750 kPa at ULS (ultimate limit states). The bearing values and the corresponding founding elevations at the borehole locations are summarized on Table 4.2.

Table 4.2: Bearing Values and Founding Levels of Spread Footings

BH No.	Material	Bearing Capacity at SLS (kPa)	Factored Geotechnical Resistance at ULS (kPa)	Minimum Depth below Existing Ground (m)	Founding Level At or Below Elevation (m)	Notes/WL Elevation (m)
BH18-1	Silty clay Till/ Sandy Silt Till	500	750	3.4	79.4	during drilling WL at 76.7m
BH18-2	Clayey Silt Till	500	750	2.6	81.2	
BH18-3	Clayey Silt Till/ sandy silt to silty sand	500	750	1.0	80.4	during drilling WL at 76.8m
BH18-4	Sandy silt to silty sand	400	600	2.1	79.0	during drilling WL at 75.1m
BH18-5	Clayey Silt Till	500	750	2.6	81.4	
BH18-6	Clayey Silt Till	500	750	1.8	81.0	
BH18-7	Clayey Silt Till	500	750	1.5	80.6	
BH18-8	Clayey Silt/sandy silt	400	600	1.1	80.5	WL at 78.8m on Sept. 26/18
BH18-9	Clayey Silt/sandy silt	300 500	450 750	2.3 6.1	77.9 74.1	during drilling WL at 77.1m
BH18-10	Clayey Silt Till/clayey silt/sandy silt till	500	750	1.8	80.5	during drilling WL at 76.5m
BH18-11	Clayey Silt Till Silty Clay	500 300	750 450	3.4 13.0	81.7 72.1	
BH18-12	Clayey Silt Till Clayey Silt	500 300	750 450	3.0 8.0	80.2 75.2	WL at 75.2m on Sept. 26/18
BH18-13	Clayey Silt Till/Clayey Silt/Sandy silt to silty sand till	300 500	450 750	1.8 4.6	78.4 75.6	during drilling WL at 75.6m; methane gas encountered at 11m
BH18-15	Silt/silty sand/silty clay	500	750	3.1	77.3	
BH18-16	Clayey silt till	500	750	2.6	80.3	WL at 80.2m on Sept. 26/18
BH18-17	Clayey Silt Till/Clayey Silt	500	750	1.8	78.5	
BH18-18	Clayey silt till Silty clay/silt	300	450	2.1	79.0	
BH18-20	Clayey silt till/silty clay/silt to clayey silt	500	750	1.0	79.3	during drilling WL at 77.2m
BH18-39	Sandy silt till/silty clay till	500	750	3.4	78.4	
BH18-40	Sandy Silt to silty sand/silty clay till	500	750	2.5	79.3	during drilling WL at 79.5m
BH18-46	Silty clay till	500	750	1.1	80.3	

BH18-48	Clayey silt till/sandy silt till	500	750	1.8	79.3	during drilling WL at 78.0m

4.3 Proposed Buildings in Area 'C'

Boreholes drilled in Area 'C' (BH18-41 to BH18-45 and BH18-47) reported shale bedrock depths ranging from 3.1 to 7.6m below the existing grade, corresponding to elevations ranging from 75.7 to 80.4m. Due to the shallow bedrock depths, this area is also suitable for high-rise development with one or more basement levels.

Depending upon the finished lowest basement floor elevation, the proposed buildings can be supported by conventional spread and strip footings / mat foundations or short drilled piers founded on shale bedrock, at minimum 0.3 m below the shale bedrock surface, for a bearing pressure values of 2.5 MPa at the Serviceability Limit States (SLS), and for a factored geotechnical resistance of 3.75 MPa at the Ultimate Limit States (ULS).

The footings/piers founded on sound shale, at minimum 1.5 m below the shale surface can be designed for a bearing pressure of 5.0 MPa at SLS, and a factored geotechnical resistance of 7.5 MPa at ULS.

The depths and elevations of shale bedrock at the borehole locations are provided in Table 3.3 of this report.

Footings and/or raft founded on undisturbed native soils can be designed for a bearing capacity values of 300 to 500 kPa at SLS (serviceability limit states) and for a factored geotechnical resistance of 450 to 750 kPa at ULS (ultimate limit states). The bearing values and the corresponding founding elevations at the borehole locations are summarized on Table 4.3.

Table 4.3: Bearing Values and Founding Levels of Spread Footings

BH No.	Material	Bearing Capacity at SLS (kPa)	Factored Geotechnical Resistance at ULS (kPa)	Minimum Depth below Existing Ground (m)	Founding Level At or Below Elevation (m)	Notes/WL Elevation (m)
BH18-41	Silty clay Till/ silt	500	750	2.6	80.7	during drilling WL at 78.7m
BH18-42	Clayey Silt Till	500	750	4.6	81.1	
BH18-43	Clayey Silt Till	500	750	1.1	82.4	
BH18-44	Clayey Silt Till	300	450	1.5	82.4	
BH18-45	Silty Clay Till	400	600	2.6	80.7	
BH18-47	Clayey Silt Till / Silt/sandy silt to silty sand	300	450	1.0	81.4	during drilling WL at 77.8m

4.4 Other Comments on Foundations

Foundations designed to the specified bearing capacity at the serviceability limit states (SLS) are expected to settle less than 25 mm total and 19 mm differential.

Where it is necessary to place footings at different levels in soil, the upper footing must be founded below an imaginary 10 horizontal to 7 vertical line drawn up from the base of the lower footing. Where it is necessary to place footings at different levels on bedrock, the upper footing must be founded below an imaginary 1 horizontal to 1 vertical line (1H:1V in bedrock) drawn up from the base of the lower footing. The lower footing must be installed first to help minimize the risk of undermining the upper footing.

All foundation bases must be inspected by this office prior to pouring concrete.

The shale bedrock weathers rapidly between wetting and drying cycles. In view of this, it is suggested that a lean concrete mat slab be placed immediately after the excavation is complete to keep the shale intact, unless the footings are cast immediately after excavating.

The inspected and approved footing base should be covered with 50 mm thick mud slab immediately in order to avoid disturbance of the founding soil due to construction activity and weathering /drying.

It should be noted that the recommended bearing capacities have been calculated by DS Consultants Limited from the borehole information for the preliminary design stage only. Additional boreholes may be required when the final building plans are available. The investigation and comments are necessarily on-going as new information of the underground conditions becomes available. For example, more specific information is available with respect to conditions between boreholes when foundation construction is underway. The interpretation between boreholes and the recommendations of this report must therefore be checked through field inspections provided by DS Consultants Limited to validate the information for use during the construction stage.

5. FROST PROTECTION

All foundations exposed to seasonal freezing conditions must have at least 1.2m of soil cover for frost protection.

There is no official rule governing the required founding depth for footings below unheated basement floors. Certainly, it will not be greater than the 1.2 m required in Southern Ontario for exterior footings. Un-monitored experience indicates that a shallower depth ranging from 0.82 to 0.9 m for interior column footings and 0.4 m for wall footings has been successful where 2 or more basement levels apply. The 0.82 m depth is believed to be close to the minimum structural requirement for interior column footings. Adjacent to air shafts and entrance and exit doors, a footing depth of 1.2 m below floor level is required or, alternatively, insulation protection must be provided.

It is also emphasized that underfloor drainage and/or an adequate free draining gravel base is required to minimize the risk of floor dampness. Floor dampness could lead to temporary icing and the risk of accidents.

6. FLOOR SLAB AND PERMANENT DRAINAGE

The floor slab can be supported on grade provided all existing fill material and disturbed soils are removed and the base thoroughly proof rolled. The fill required to raise the grade can consist of inorganic soil, placed in shallow lifts and compacted to 98 percent of Standard Proctor Maximum Dry Density (SPMDD). A moisture barrier consisting of at least 200 mm of 19 mm clear crushed stone should be installed under the floor slab.

In the area where shale bedrock is encountered at floor slab level, the floor slab can be cast as slab-on-grade, provided a 200 mm layer of clear crushed stone (19 mm maximum size) is placed between the underside of the floor slab and the exposed bedrock surface.

A perimeter and underfloor drainage system will be required for buildings with basements. Typical drainage and backfill recommendations are illustrated on Drawings 60 to 62 for the open cut and shored excavation system.

7. ELEVATOR AND SUMP PITS

If elevator/sump pits are to be installed in cohesionless soils (sandy silt, sand, silt) below the water table, drainage systems at the base level of the pits are not recommended, due to the concern of loss of fines. In this case, the pits can be designed as water-tight structures, and water pressure on the pit walls and the pit base slab should be considered.

8. EARTH, ROCK AND WATER PRESSURES

The design of basement walls can incorporate the conventional design in the overburden using the earth pressure coefficient $K_1=0.40$. In the rock, the earth pressure coefficient K can be reduced to $K_2=0.20$.

The lateral earth/rock pressure acting at any depth on basement walls can be calculated as follows:

In soil: $p = K_1 (\gamma_1 h_1 + q) + p_w$

In rock: $p = K_2 (\gamma_1 H_1 + q + \gamma_2 h_2) + p_w$

where p = lateral earth and water pressure in kPa acting at depth h_1 or h_2

K_1, K_2 = earth pressure coefficients, $K_1=0.40$ for overburden soil; $K_2=0.20$ for rock

γ_1 = unit weight of overburden soil, assuming 20.5 kN/m^3 above the water table and 11 kN/m^3 below the water table

γ_2 = unit weight of rock below water, assuming 15 kN/m^3

h_1 = Depth in overburden soil, below ground surface

H_1 = thickness of soil above rock

h_2 = Depth in rock, below rock surface

q = value of surcharge in kPa

p_w = hydrostatic water pressure

When the foundation wall is poured against the caisson wall, the foundation wall as well as the caisson wall should be designed for hydrostatic pressure, even though a drainage board is provided between the basement wall and the caisson wall.

9. EXCAVATIONS AND GROUNDWATER CONTROL

Excavations can be carried out with heavy hydraulic backhoe. Long-term (stabilized) groundwater levels in the monitoring wells were found at depths ranging from 2.0 to 8.0m below the existing grade, corresponding to Elevations of 74.9 to 80.2m. Positive dewatering will be required prior to any excavation in water bearing cohesionless soils below the groundwater table, otherwise it will result in an unstable base and flowing sides. A contractor specializing in dewatering should be retained to design the dewatering systems for excavations below the groundwater table.

Further comments on groundwater control during construction and permanent drainage are provided in our preliminary hydrogeology report.

It should be noted that the glacial till soils may contain boulders. Large obstructions in the fill material are anticipated. Provisions must be made in the excavation contract for the removal of boulders in the till and large obstructions in the fill material.

Excavation of the shale can be carried out using heaviest available single tooth ripper equipment. The limestone beds are present and may overly the shale bedrock surface at some locations. It may be necessary at some locations to utilize jackhammer type equipment to “open” the limestone layers for the ripper.

All excavations must be carried out in accordance with the most recent Occupational Health and Safety Act (OHSA). In accordance with OHSA, the fill material can be classified as Type 3 soil above the groundwater table. The very stiff to hard clayey soils can be classified as Type 2 Soil above the groundwater table and as Type 3 below the groundwater table. The cohesionless soils of sand and silty sand can be classified as Type 3 Soil above the groundwater table and Type 4 soil below the groundwater table.

The native soils free from topsoil and organics can be used as general construction backfill, provided its moisture content is within 2 percent of the optimum moisture content. Loose lifts of soil, which are to be compacted, should not exceed 200 mm. Depending on the time of construction and weather, some excavated material may be too wet to compact and will require aeration prior to its use.

Imported granular fill, which can be compacted with hand held equipment, should be used in confined areas. The excavated soils are not considered to be free draining. Where free draining backfill is required, imported granular fill such as OPSS Granular B should be used.

It should be noted that the excavated soils are subject to moisture content increase during wet weather which would make these materials too wet for adequate compaction. Stockpiles should be compacted at the surface or be covered with tarpaulins to minimize moisture uptake.

10. EARTHQUAKE CONSIDERATIONS

Based on the existing borehole information and according to Table 4.1.8.4.A of OBC 2012, the subject site for the proposed development can be classified as “Class C” for seismic site response.

In Area ‘A’ and Area ‘B’, for the proposed buildings with one or more levels of basement, founded on sound shale bedrock, it may be possible to classify the site as “Class B” for seismic site response. This should be further confirmed during the detail design stage.

11. ROADS

The proposed development will be serviced by a network of roads.

11.1 Pavement Thickness

The investigation has shown that the predominant subgrade soil, after stripping the topsoil and any other organic and otherwise unsuitable subsoil, will generally consist of clayey silt till, clayey silt, clayey silt till shale complex and shale bedrock.

Based on the above and assuming that traffic usage will be residential/commercial for local and collector road, the following minimum pavement thicknesses are recommended for roads to be constructed within the development.

Collector Road

40 mm HL3 Asphaltic Concrete
85 mm HL8 Asphaltic Concrete
200 mm Granular ‘A’
325 mm Granular ‘B’

Local/Minor Local Road

40 mm HL3 Asphaltic Concrete
85 mm HL8 Asphaltic Concrete
200 mm Granular 'A'
175 mm Granular 'B'

These values may need to be adjusted according to the City of Mississauga Standards. The site subgrade and weather conditions (i.e. if wet) at the time of construction may necessitate the placement of thicker granular sub-base layer in order to facilitate the construction. Furthermore, heavy construction equipment may have to be kept off the newly constructed roads before the placement of asphalt and/or immediately thereafter, to avoid damaging the weak subgrade by heavy truck traffic.

11.2 Stripping, Sub-excavation and Grading

The site should be stripped of all topsoil and any organic, weathered or otherwise unsuitable soils to the full depth of the roads, both in cut and fill areas. Following stripping, the site should be graded to the subgrade level and approved. The subgrade should then be proof-rolled, in the presence of the Geotechnical Engineer, by at least several passes of a heavy compactor having a rated capacity of at least 8 tonnes. Any soft spots thus exposed should be removed and replaced by select fill material, similar to the existing subgrade soil and approved by the Geotechnical Engineer. The subgrade should then be re-compacted from the surface to at least 98% of its Standard Proctor Maximum Dry Density (SPMDD). The final subgrade should be cambered or otherwise shaped properly to facilitate rapid drainage and to prevent the formation of local depressions in which water could accumulate.

Owing to the clayey (i.e. impervious) nature of some subsoils at the site, proper cambering and allowing the water to escape towards the sides (where it can be removed by means of subdrains) is considered to be beneficial for this project. Otherwise, any water collected in the granular sub-base materials could be trapped thus causing problems due to softened subgrade, differential frost heave, etc. For the same reason damaging the subgrade during and after placement of the granular materials by heavy construction traffic should be avoided. If the moisture content of the local material cannot be maintained at ±2% of the optimum moisture content, imported granular material may need to be used.

Any fill required for re-grading the site or backfill should be select, clean material, free of topsoil, organic or other foreign and unsuitable matter. The fill should be placed in thin layers and compacted to at least 95% of its SPMDD. The degree of compaction should be increased to 98% within the top 1.0 m of the subgrade, or as per City Standards. The compaction of the new fill should be checked by frequent field density tests.

11.3 Construction

Once the subgrade has been inspected and approved, the granular base and sub-base course materials should be placed in layers not exceeding 200 mm (uncompacted thickness) and should be compacted to at least 100% of their respective SPMDD. The grading of the material should conform to current OPS Specifications.

The placing, spreading and rolling of the asphalt should be in accordance with OPS Specifications or, as required by the local authorities.

Frequent field density tests should be carried out on both the asphalt and granular base and sub-base materials to ensure that the required degree of compaction is achieved.

11.4 Drainage

The City of Mississauga may require the installation of full-length subdrains on all roads. The subdrains should be properly filtered to prevent the loss of (and clogging by) soil fines.

All paved surfaces should be sloped to provide satisfactory drainage towards catch-basins. As discussed in Section 11.2, by means of good planning any water trapped in the granular sub-base materials should be drained rapidly towards subdrains or other interceptors.

12. UNDERGROUND UTILITIES

It is understood that underground services (watermains, storm and sanitary sewer) will be installed at the site to service the proposed development. Based on the preliminary servicing plans prepared by Urbantech, invert levels of the proposed utilities will be about 2 to 6m below the existing grade, with sanitary sewer at the deepest point at about 6m below the existing grade.

Trenches will be dug through fill materials followed by native soils of cohesive and cohesionless nature. Long-term (stabilized) groundwater levels in the monitoring wells were found at depths ranging from 2.0 to 8.0m below the existing grade, corresponding to Elevations of 74.9 to 80.2m. Positive dewatering will be required prior to any excavation in water bearing cohesionless soils below the groundwater table, otherwise it will result in an unstable base and flowing sides. Water table must be lowered to at least 1m below the lowest excavation level.

Detailed comments on excavation and groundwater control are provided in Section 9.

The undisturbed native soils encountered in the boreholes will provide adequate support for the service pipes and allow the use of Class B type bedding. The recommended minimum thickness of granular bedding below the invert of the pipes is 150 mm. The thickness of the bedding may, however, have to be increased depending on the pipe diameter or in accordance with local standards or if wet or weak subgrade conditions are encountered, especially when the soil at the trench base level consists of wet, dilatant silt.

The bedding material should conform to City of Mississauga bedding stone gradation requirements. Where the bedding falls below the anticipated water table, the bedding stone must be surrounded with a geotextile filter cloth.

For deep trenches, i.e. more than 2.0 m below the shale surface, a minimum 50 mm thick polystyrene etc. layer will be required at both sides of the pipe to avoid rock squeezing. The polystyrene layer should extend vertically to at least 0.3 m above the pipe. The rock trench should be wide enough so that at each side, the horizontal distance between the pipe side and the cut rock surface is at least 0.3 m.

The select inorganic fill materials or native soils free from topsoil / organics can be used as general construction backfill, provided their moisture contents at the time of construction are within 2% of their optimum moisture content.

In any case the degree of compaction of the trench backfill should be at least 95% of the material's Standard Proctor Maximum Dry Density (SPMDD). This value should be increased to at least 98% within 2 m of the road surface. The granular pavement sub-base and base materials should be compacted to at least 100% of their respective SPMDD.

13. GENERAL COMMENTS AND LIMITATIONS OF REPORT

This geotechnical report is preliminary, prepared based on the conceptual design plans. Additional boreholes will be required, once the detailed development plans are available to confirm the findings and recommendations provided in this report.

This report is intended solely for the client named. The material in it reflects our best judgment in light of the information available to DS Consultants Ltd at the time of preparation. Unless otherwise agreed in writing by DS Consultants Ltd, it shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. No portion of this report may be used as a separate entity, it is written to be read in its entirety.

The conclusions and recommendations given in this report are based on information determined at the borehole locations. The information contained herein in no way reflects on the environment aspects of the project, unless otherwise stated. Subsurface 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 could not be detected or anticipated at the time of the site investigation. The benchmark and elevations used in this report are primarily to establish relative elevation differences between the borehole locations and should not be used for other purposes, such as grading, excavating, planning, development, etc.

DS Consultants Ltd should be retained for a general review of the final design and specifications to verify that this report has been properly interpreted and implemented. If not accorded the privilege of making this review, DS Consultants Ltd will assume no responsibility for interpretation of the recommendations in the report.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. DS Consultants Ltd accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.

We trust that the information contained in this report is satisfactory. Should you have any questions, please do not hesitate to contact this office.

DS CONSULTANTS LTD

Alka Sangar, M.Eng., P.Eng.

LICENSED PROFESSIONAL ENGINEER
A. SANGAR
100141185
PROVINCE OF ONTARIO

Fanyu Zhu, Ph.D., P.Eng.

LICENSED PROFESSIONAL ENGINEER
F. ZHU
PROVINCE OF ONTARIO

Drawings

J:\-GIS\18-519-10 800 Hydro Road, Missisuaga\1-QGIS\Geotechnical\Figure 1- BH Location Plan.qgs

Image Source: Imagery @2018 Google

Legend:

Boreholes

- ● Monitoring Well
- ⊕ Borehole
- ▥ Area 'A'
  Bedrock depth 1.5 to 4.6m
- ▨ Area 'B'
  Bedrock depth 9.1 to 48.1m
- 🟧 Area 'C'
  Bedrock depth 3.1 to 76m

DS CONSULTANTS LTD.
6221 Highway 7, Unit 16
Vaughan, Ontario, L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project:
GEOTECHNICAL INVESTIGATION

Title:
BOREHOLE LOCATION PLAN

Client:
LAKEVIEW COMMUNITY PARTNERS LIMITED

Approved By: N.W	Drawn By: S.Y	Date: October 2018
Scale: As Shown	Project No.: 18-519-10	Figure No.: 1

C:\0Sharon\18-519-10 800 Hydro Road, Mississuaga\1-QGIS\Geotechnical\Figure 1- BH Location Plan-Only 2018.qgs Jun-08 17:08

Legend

▬ ▬ Approx_Site_bnd

● Monitoring Well (2018)

⊕ Borehole (2018)

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project:
PROPOSED GEOTECHNICAL INVESTIGATION - PHASE 1 AREA
Lakeview Development, 800 Hydro Road, Toronto, ON

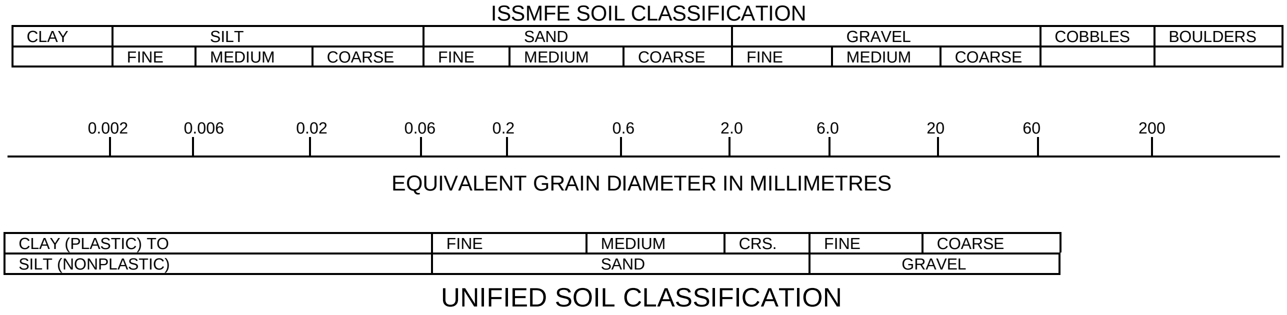
Title:
BOREHOLE LOCATION PLAN

Client:
ARGO DEVELOPMENT CORPORATION

Size: 11 x 17
Rev. 0
Approved By: N.W
Drawn By: S.Y
Date: June 2020
Scale: As Shown
Project No.: 18-519-10
Drawing No.: 1A
Image/Map Source: *CAD Drawing*

Drawing 1B: Notes On Sample Descriptions

1. All sample descriptions included in this report generally follow the Unified Soil Classification. Laboratory grain size analyses provided by DSCL also follow the same system. Different classification systems may be used by others, such as the system by the International Society for Soil Mechanics and Foundation Engineering (ISSMFE). Please note that, with the exception of those samples where a grain size analysis and/or Atterberg Limits testing have been made, all samples are classified visually. Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems.



2. Fill: Where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc., none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional preliminary geotechnical site investigation.

3. Till: The term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (60 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

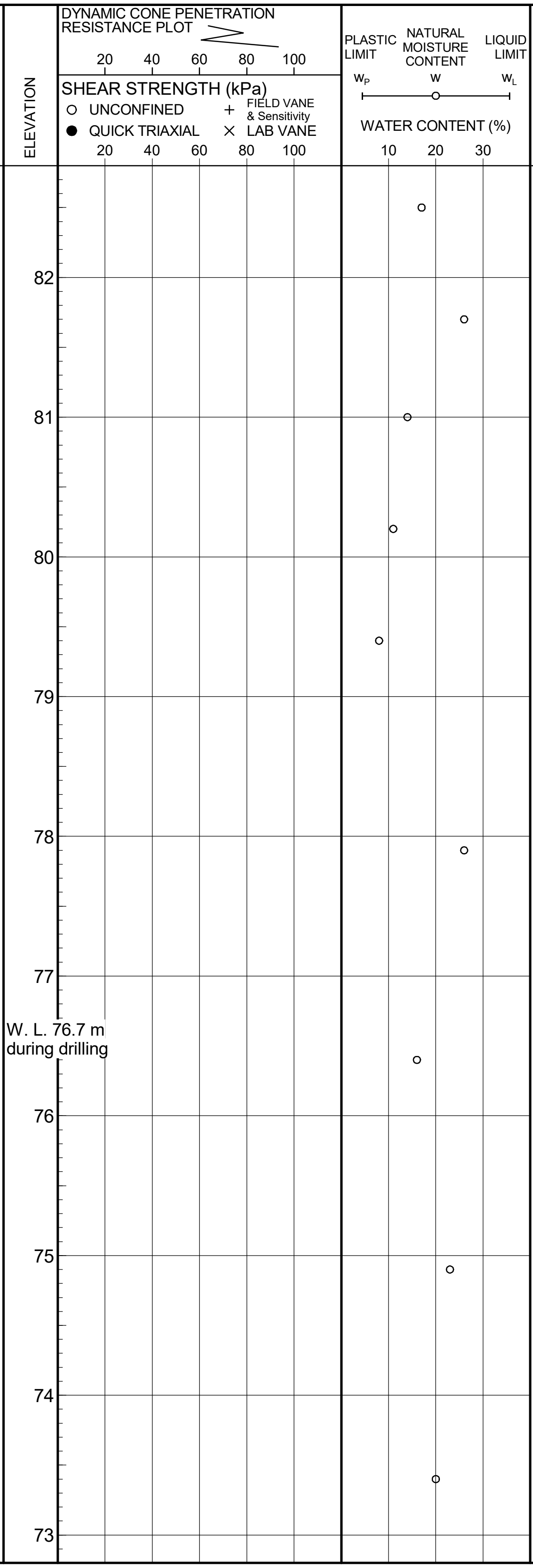
LOG OF BOREHOLE BH18-01

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-18-2018

REF. NO.: 18-519-10
ENCL NO.: 2

(m) ELEV DEPTH	DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	GR	SA	SI	CL
82.8 0.0	**TOPSOIL:**350mm	1	SS	14							
82.4 0.4	**FILL:** clayey silt, some organics, trace gravel, grey, moist, stiff	2	SS	8							
		3	SS	10							
80.5 2.3	**FILL:** sandy silt, some organics, grey, moist, loose	4	SS	8							
79.7 3.1	**SILTY CLAY TILL:** some sand, trace gravel, brown, moist, very stiff	5	SS	17		225		1	15	47	37
78.2 4.6	**SANDY SILT TILL:** trace to some clay, trace gravel, grey, moist, very dense	6	SS	50							
76.7 6.1	**SAND:** trace silt, brown, wet, dense	7	SS	45	∇ W. L. 76.7 m during drilling						
75.2 7.6	**SAND AND GRAVEL:** trace silt, brown, wet, very dense	8	SS	50							
73.7 9.1	**SILTY SAND TILL:** some gravel to gravelly, occassional cobble/boulders, trace clay, grey, moist to wet, very dense	9	SS	78							



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ∇ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + ³, × ³: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

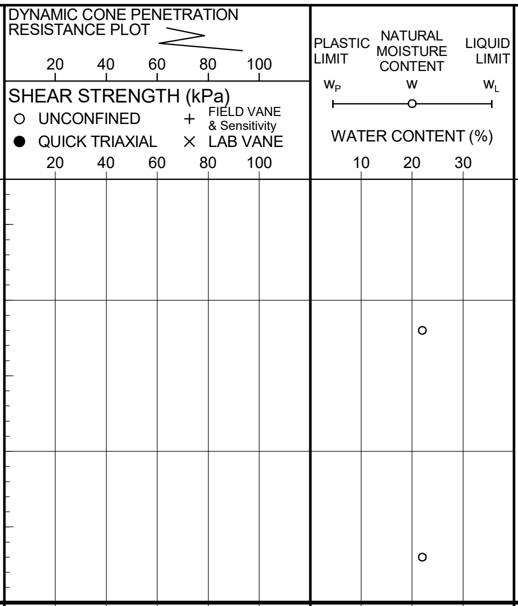
LOG OF BOREHOLE BH18-01

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-18-2018

REF. NO.: 18-519-10
ENCL NO.: 2

(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION
	SILTY SAND TILL: some gravel to gravelly, occassional cobble/boulders, trace clay, grey, moist to wet, very dense(Continued)					
11		10	SS	50		72
12						71
	wet below 12.2 m	11	SS	76		
70.0 12.8	**END OF BOREHOLE** Notes: 1) Water level at 6.1 mbgl during drilling					70



POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m^3)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

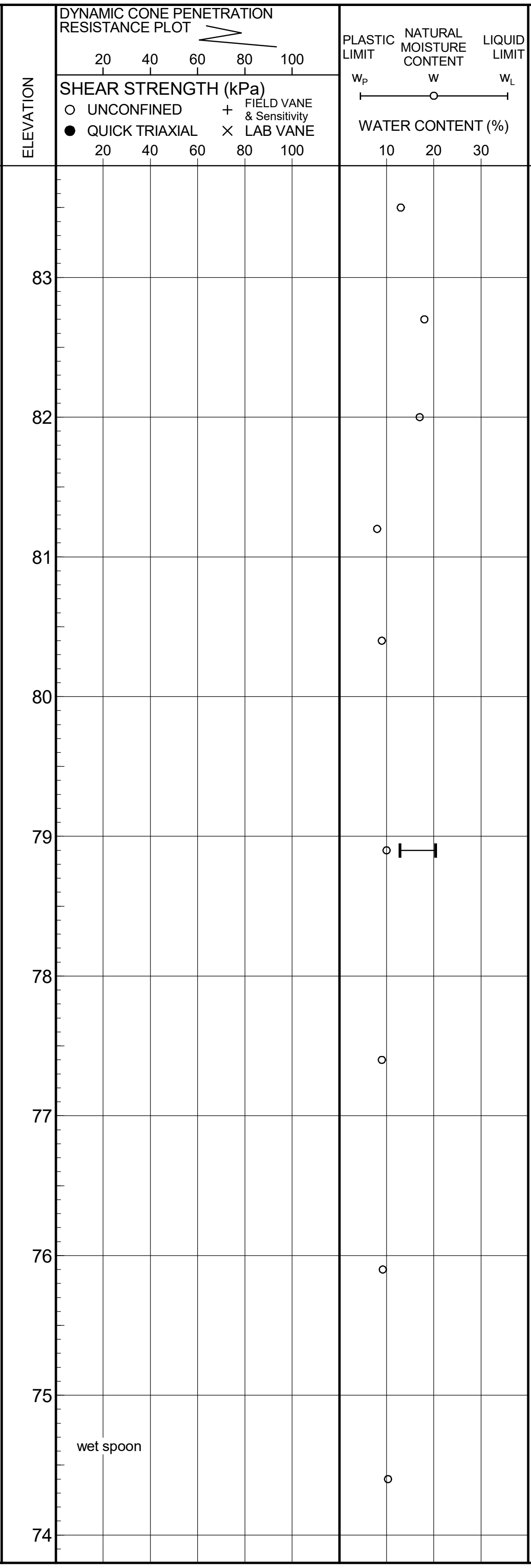
LOG OF BOREHOLE BH18-02

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-19-2018

REF. NO.: 18-519-10
ENCL NO.: 3

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)			
(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS / 0.3 m				GR	SA	SI	CL
83.8											
0.0	**ASPHALT:** 100 mm										
83.7 0.1	**SAND AND GARVEL:** 250 mm	1	AS								
83.4 0.4	**FILL:** silty sand, trace gravel, grey, wet										
83.0 0.8	**CLAYEY SILT TILL:** some sand, trace gravel, brown, moist, very stiff	2	SS	22							
82.3 1.5	**SILTY SAND:** trace clay, brown, wet, dense	3	SS	40				0	72	22	6
81.5 2.3	**CLAYEY SILT TILL:** sandy, trace gravel, occasional cobble/boulder, grey, moist, very stiff to hard	4	SS	46		225					
		5	SS	40		225					
		6	SS	28		225		1	49	33	17
		7	SS	41		225					
		8	SS	70		225					
		9	SS	44		225		July 19, 2018 -------------- July 20, 2018			



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ $^{\varepsilon}$=3% Strain at Failure

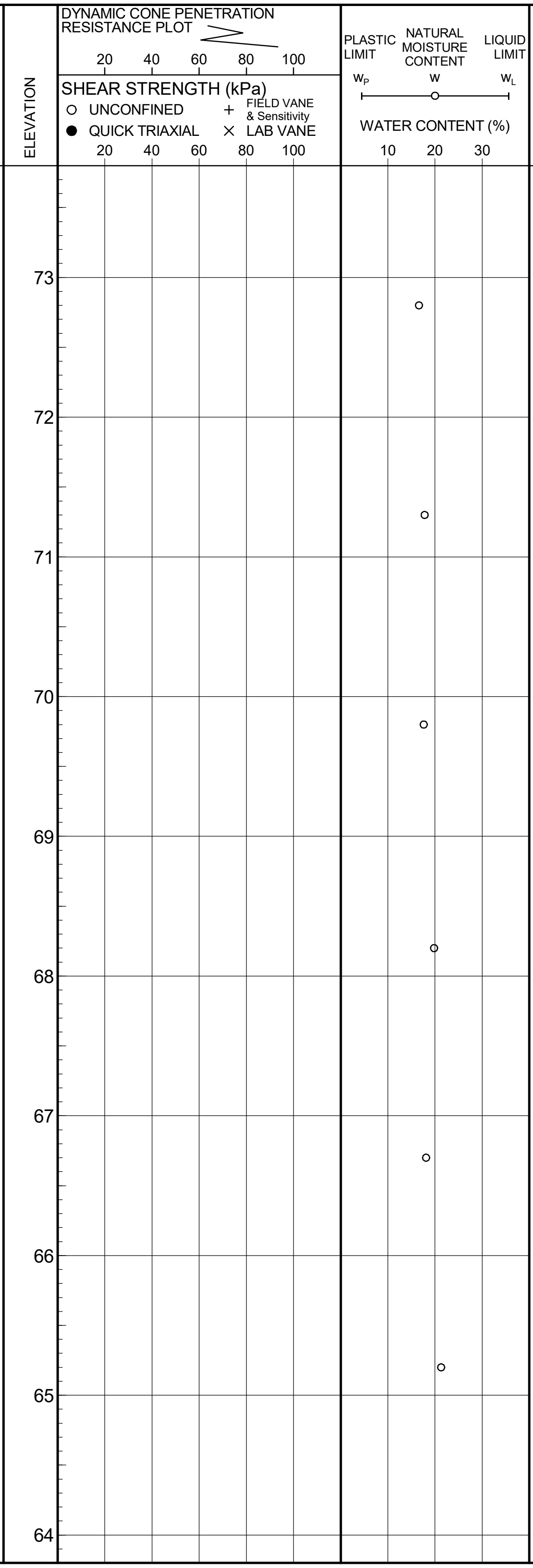
LOG OF BOREHOLE BH18-02

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-19-2018

REF. NO.: 18-519-10
ENCL NO.: 3

(m) ELEV DEPTH	DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder, grey, moist, very stiff to hard(Continued)	10	SS	21		225		
		11	SS	40				
70.1 13.7	**CLAYEY SILT:** trace sand, grey, moist, very stiff	12	SS	21		225		
		13	SS	19		225		
		14	SS	18		225		
	stiff at 18.3 m	15	SS	19		225		



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-02

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-19-2018

REF. NO.: 18-519-10
ENCL NO.: 3

SOIL PROFILE			SAMPLES									
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT: trace sand, grey, moist, very stiff(Continued)	▨	16	SS	18				○	225		
63.4 20.4	**END OF BOREHOLE** Notes: 1) Borehole dry upon completion											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3, \times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH18-03

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 4

SOIL PROFILE

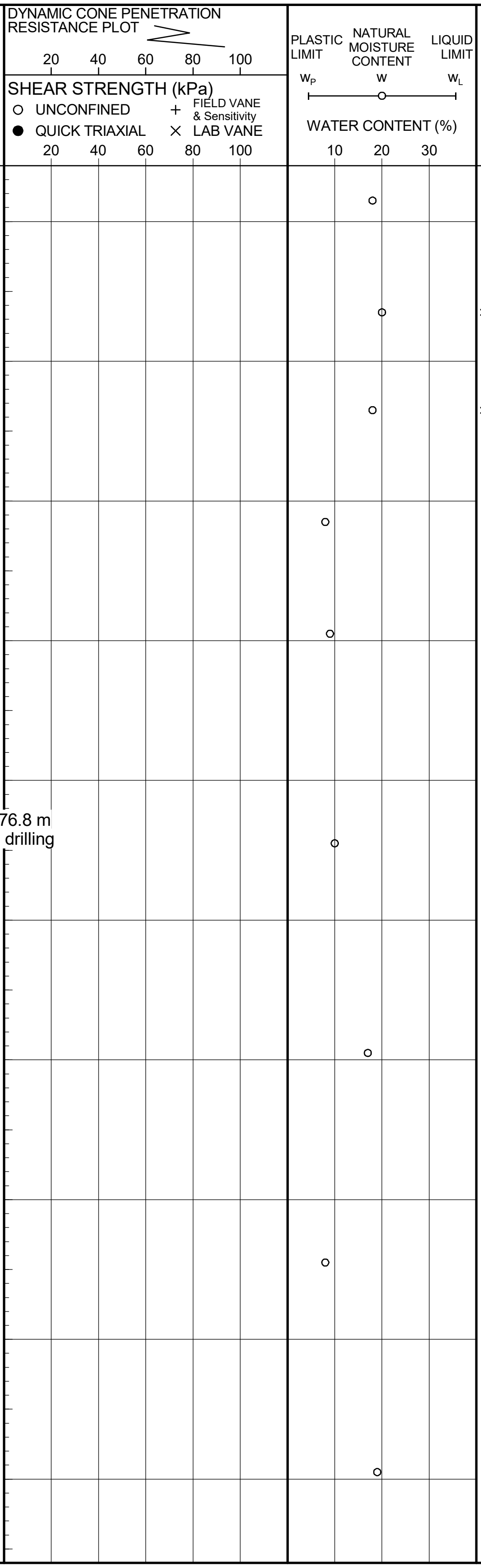
(m) ELEV / DEPTH	DESCRIPTION
81.4 / 0.0	**TOPSOIL:** 350mm
81.0 / 0.4	**POSSIBLE FILL:** clayey silt, brown, moist, stiff
80.6 / 0.8	**CLAYEY SILT:**some sand, occassional sand seams, brown, moist, very stiff to hard
79.7 / 1.7	**CLAYEY SILT TILL :** some sand, trace gravel, occassional sand seams, brown, moist, very stiff
78.3 / 3.1	**SANDY SILT TO SILTY SAND** trace clay, trace gravel, brown, moist to wet , very dense grey, wet below 4.6 m
73.8 / 7.6	**SILTY SAND TO SAND:** trace clay, grey, wet, dense
72.3 / 9.1	**SILTY SAND TILL:** trace to some clay, trace gravel, occasional cobble/boulder, grey, wet, very dense

SAMPLES

NUMBER	TYPE	"N" BLOWS / 0.3 m	POCKET PEN. (Cu) (kPa)
1	SS	13	
2	SS	22	>225
3	SS	33	>225
4	SS	24	
5	SS	50/ 100mm	
6	SS	50/ 100mm	
7	SS	80	
8	SS	46	
9	SS	50/ 150mm	

GROUND WATER CONDITIONS: ▽ W. L. 76.8 m during drilling

ELEVATION: 81, 80, 79, 78, 77, 76, 75, 74, 73, 72



NATURAL UNIT WT (kN/m^3)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES +3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

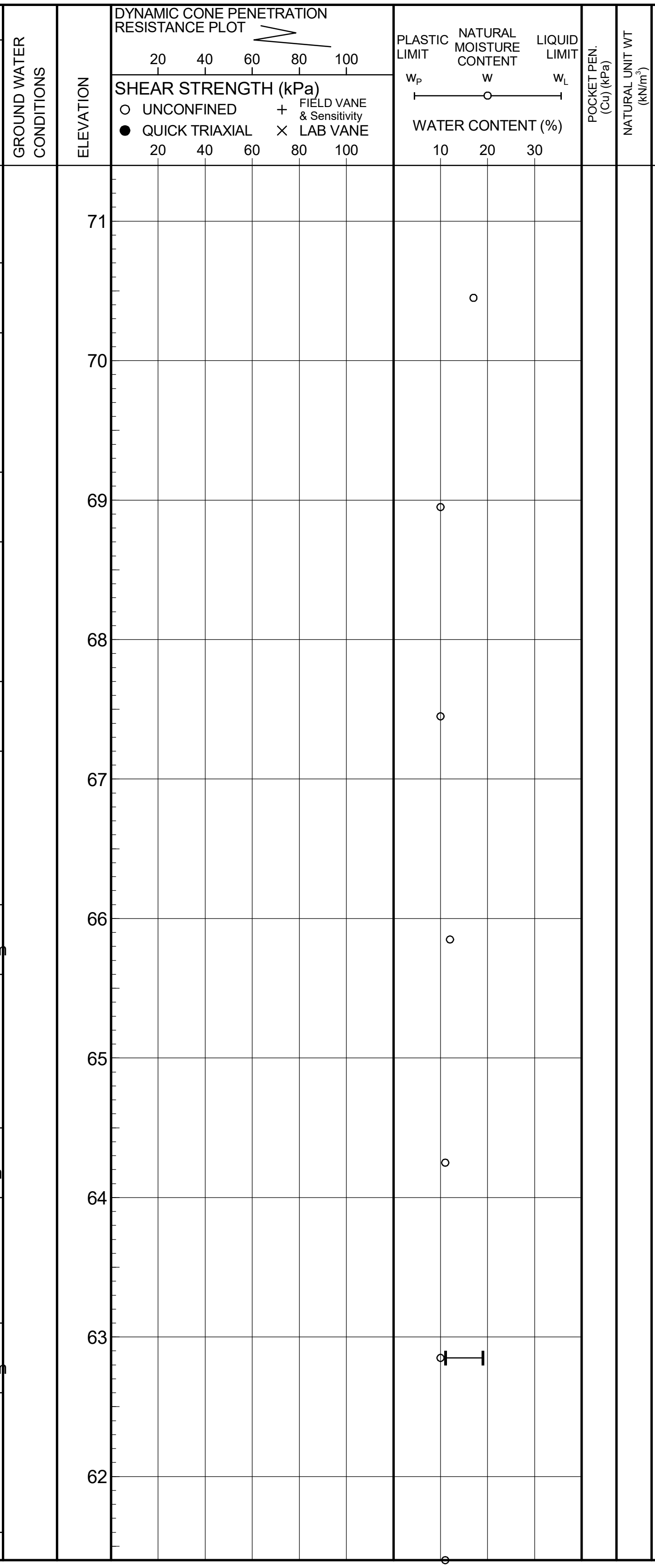
LOG OF BOREHOLE BH18-03

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 4

SOIL PROFILE		SAMPLES			METHANE AND GRAIN SIZE DISTRIBUTION (%)			
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS / 0.3 m	GR	SA	SI	CL
70.7	**SILTY SAND TILL:** trace to some clay, trace gravel, occasional cobble/boulder, grey, wet, very dense(Continued)							
10.7	**SAND:** trace silt, grey, wet, dense to very dense	10	SS	42	0	95	(5)	
		11	SS	64				
67.7 13.7	**SANDY SILT TO SILTY SAND:** trace to some clay, some gravel, grey, wet, very dense	12	SS	80				
		13	SS	50/ 150mm				
		14	SS	50/ 75mm				
63.1 18.3	**CLAYEY SILT TILL:** sandy, trace gravel, occasssional cobble/boulders, grey, moist, hard	15	SS	50/ 150mm				



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH18-03

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 4

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT W — LIQUID LIMIT W_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION					
61.2			16	SS	92					>225		
20.2	**END OF BOREHOLE** Notes: 1) Water level at 4.6 mbgl during drilling											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3$, $\times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

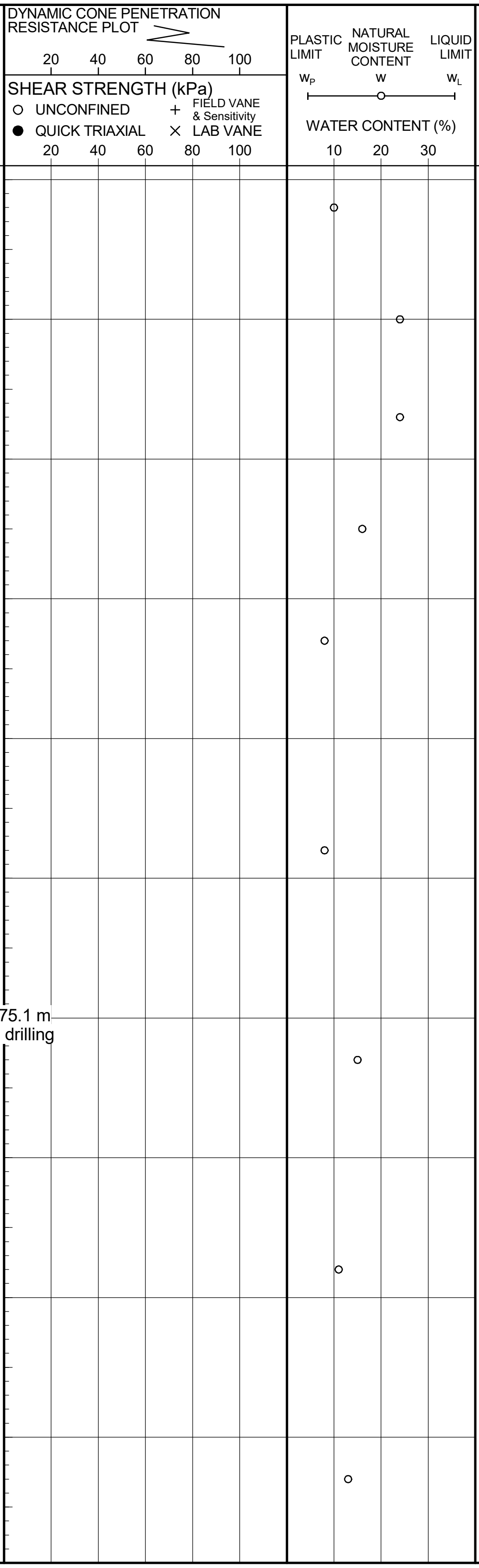
LOG OF BOREHOLE BH18-04

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-22-2018

REF. NO.: 18-519-10
ENCL NO.: 5

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS
81.1					
81.0 / 0.1	**TOPSOIL:** 150mm				
	FILL: silty sand and gravel, brown, moist, compact	1	SS	10	
80.3 / 0.8	**FILL:** silt to clayey silt, trace organics, trace gravel, grey, moist, compact	2	SS	12	
79.3 / 1.8	**CLAYEY SILT TILL:** sandy, trace gravel, trace cobble, brown, moist, very stiff	3	SS	14	
78.8 / 2.3	**SANDY SILT TO SILTY SAND:** trace clay, trace to some gravel, brown, moist to wet, very dense to compact	4	SS	29	
		5	SS	50/ 150mm	
		6	SS	50/ 50mm	
	grey and wet below 6.1 m	7	SS	25	▽ W. L. 75.1 m during drilling
73.5 / 7.6	**SILTY SAND TILL:** trace clay, some gravel, occassional cobble/boulders, grey, wet, very dense	8	SS	78	
		9	SS	64	



POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m^3) | METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

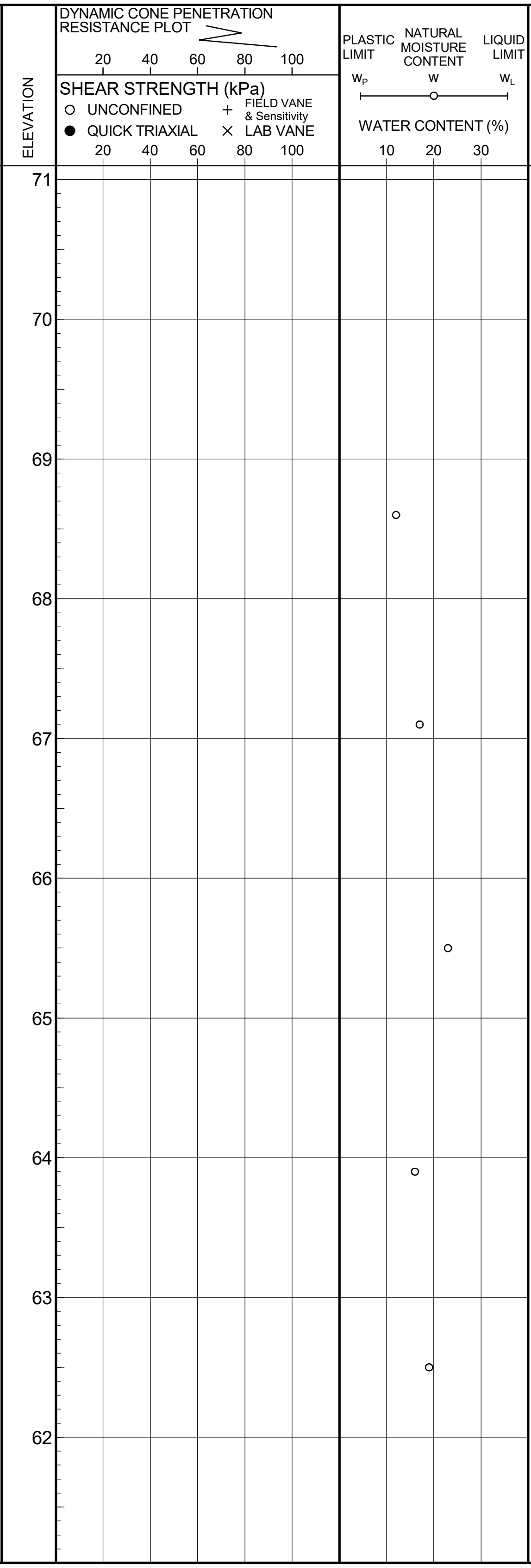
LOG OF BOREHOLE BH18-04

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-22-2018

REF. NO.: 18-519-10
ENCL NO.: 5

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS/0.3 m				
	SILTY SAND TILL: trace clay, some gravel, occassional cobble/boulders, grey, wet, very dense(Continued)							
		10	SS	hammer bounced				
		11	SS	50/ 125mm				
67.4 13.7	**SAND:** trace silt, grey, wet, very dense	12	SS	62				
	interbed of silt at 15.5 m	13	SS	53				
		14	SS	80				
62.9 18.2	**SILTY CLAY TILL:** some sand, trace gravel, grey, moist, hard	15	SS	56		>225		



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-04

PROJECT: Preliminary Geotechnical Investigation- Proposed Development	**DRILLING DATA**
CLIENT: Lakeview Community Partners Ltd.	Method: Hollow Stem Auger
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON	Diameter: 150mm
DATUM: Geodetic	Date: Jun-22-2018
BOREHOLE LOCATION: See Drawing 1	

REF. NO.: 18-519-10
ENCL NO.: 5

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT W_P NATURAL MOISTURE CONTENT W LIQUID LIMIT W_L / WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION					
60.7	**SILTY CLAY TILL:** some sand, trace gravel, grey, moist, hard(Continued)	▨	16	SS	42		61		○ 20	>225		
20.4	**END OF BOREHOLE** Notes: 1) Water level at 6.0 mbgl during drilling											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3$, $\times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

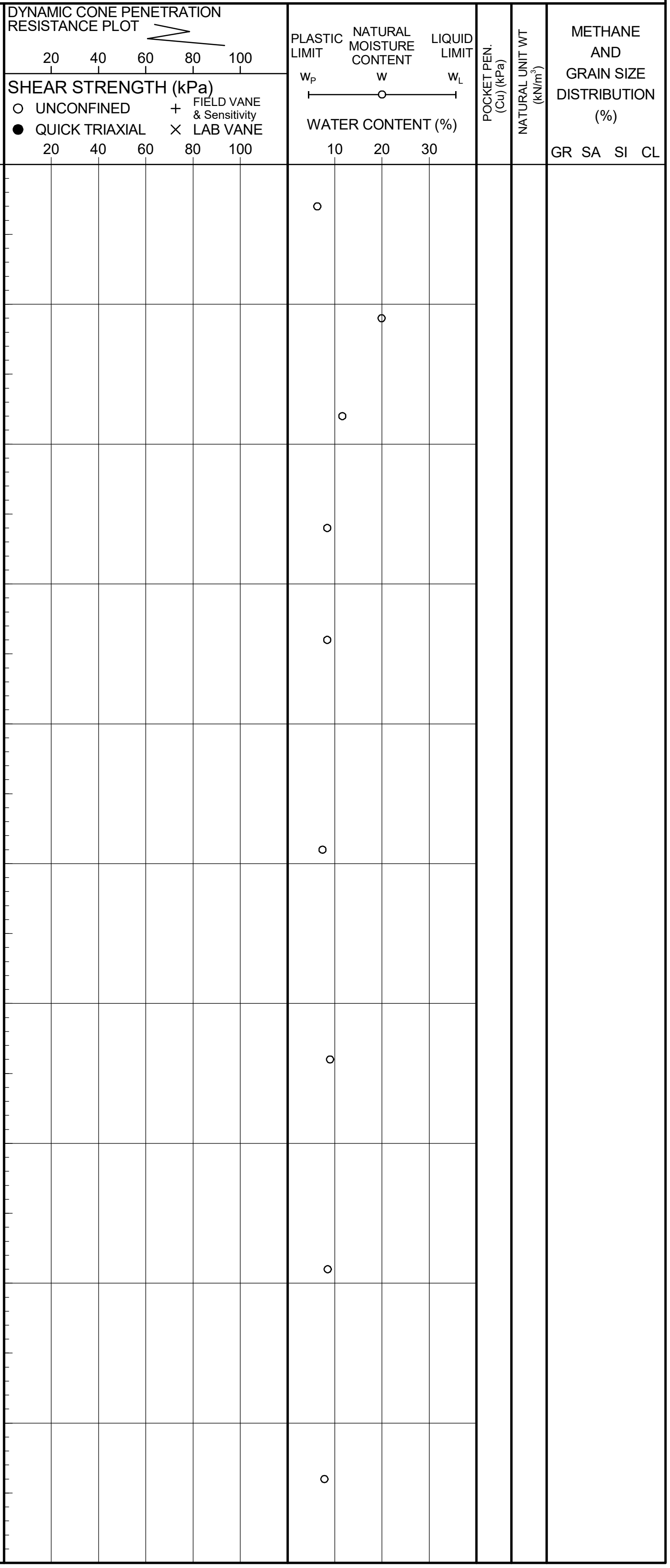
LOG OF BOREHOLE BH18-05

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-26-2018

REF. NO.: 18-519-10
ENCL NO.: 6

(m) ELEV DEPTH	SOIL PROFILE DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
84.0						
83.9 0.1	**TOPSOIL:** 127mm					
	FILL: clayey silt, trace rootlet, trace organic, brown, moist, stiff to hard	1	SS	22		
		2	SS	11		83
		3	SS	50		82
81.7 2.3	**CLAYEY SILT TILL:** some sand, trace gravel, occassional cobble/boulder, brown to grey, moist, hard	4	SS	45		
		5	SS	69		81
						80
	grey below 4.9 m	6	SS	93		79
		7	SS	58		78
						77
		8	SS	60		76
		9	SS	39		75



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+³, ×³: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-05

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-26-2018

REF. NO.: 18-519-10
ENCL NO.: 6

(m) ELEV / DEPTH	SOIL PROFILE DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION
	CLAYEY SILT TILL: some sand, trace gravel, occassional cobble/boulder, brown to grey, moist, hard(Continued)					
11		10	SS	51		73
12						72
71.8 12.2	**SILTY CLAY:** trace sand, grey, moist, hard to very stiff	11	SS	32		
13						71
14		12	SS	19		70
15						69
68.8 15.2	**CLAYEY SILT:** trace sand, grey, moist, very stiff	13	SS	21		
16						68
17		14	SS	19		67
18						66
65.7 18.3	**SILT:** trace clay, trace sand, grey, wet, compact	15	SS	26		
19						65
64.5 19.5	**SANDY SILT TO SILTY SAND TILL :** interbed of wet sand, grey, wet, very dense					
20						

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

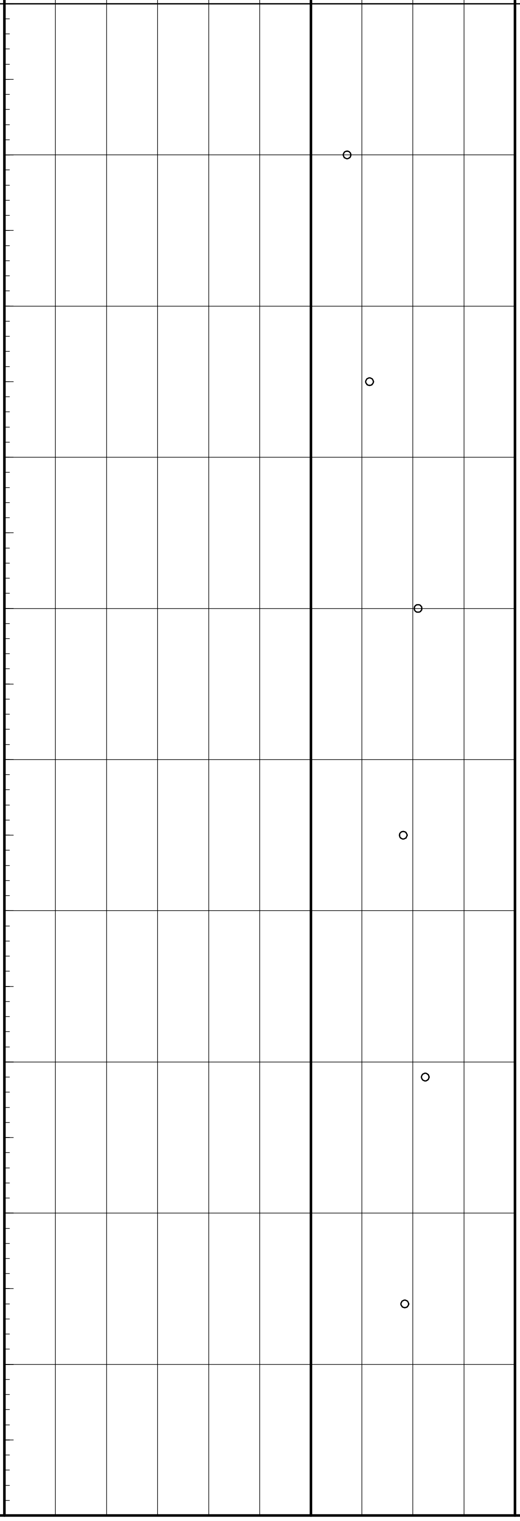
SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT W_P NATURAL MOISTURE CONTENT W LIQUID LIMIT W_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m^3)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-05

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-26-2018

REF. NO.: 18-519-10
ENCL NO.: 6

SOIL PROFILE			SAMPLES									
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT W_P NATURAL MOISTURE CONTENT W LIQUID LIMIT W_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
			16	SS	66				○			
63.6 20.4	**END OF BOREHOLE** Notes: 1) Water level at 18.3 mbgl upon completion.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3$, $\times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

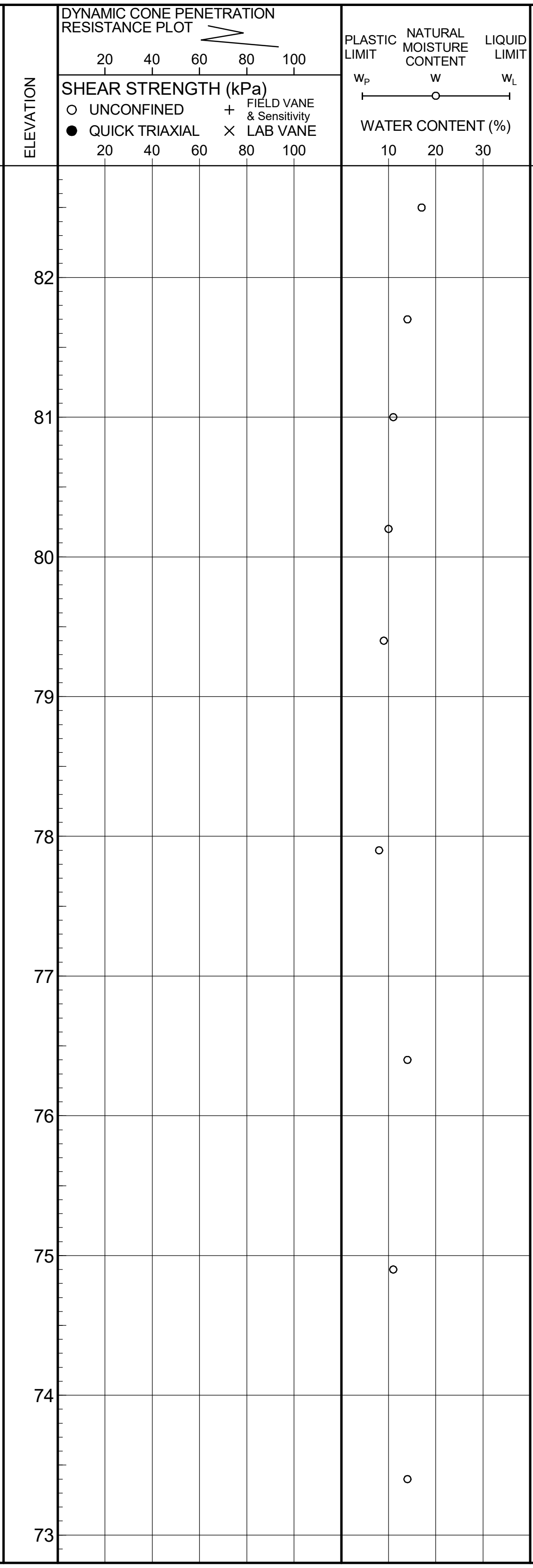
LOG OF BOREHOLE BH18-06

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-18-2018

REF. NO.: 18-519-10
ENCL NO.: 7

SOIL PROFILE (m) ELEV DEPTH	DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
82.8								
82.6 0.0	**TOPSOIL:** 230 mm							
0.2	**FILL:** sand and gravel, brown, moist, compact	1	SS	13				
82.0 0.8	**FILL:** silty clay, trace gravel, brown, moist, compact	2	SS	13				
81.3 1.5	**CLAYEY SILT TILL:** some sand to sandy trace gravel, brown, moist, hard	3	SS	28		>225		
		4	SS	44		>225		
	grey below 3.1 m	5	SS	34		>225		
		6	SS	40		>225		
		7	SS	51				
		8	SS	54		>225		
		9	SS	54		>225		



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

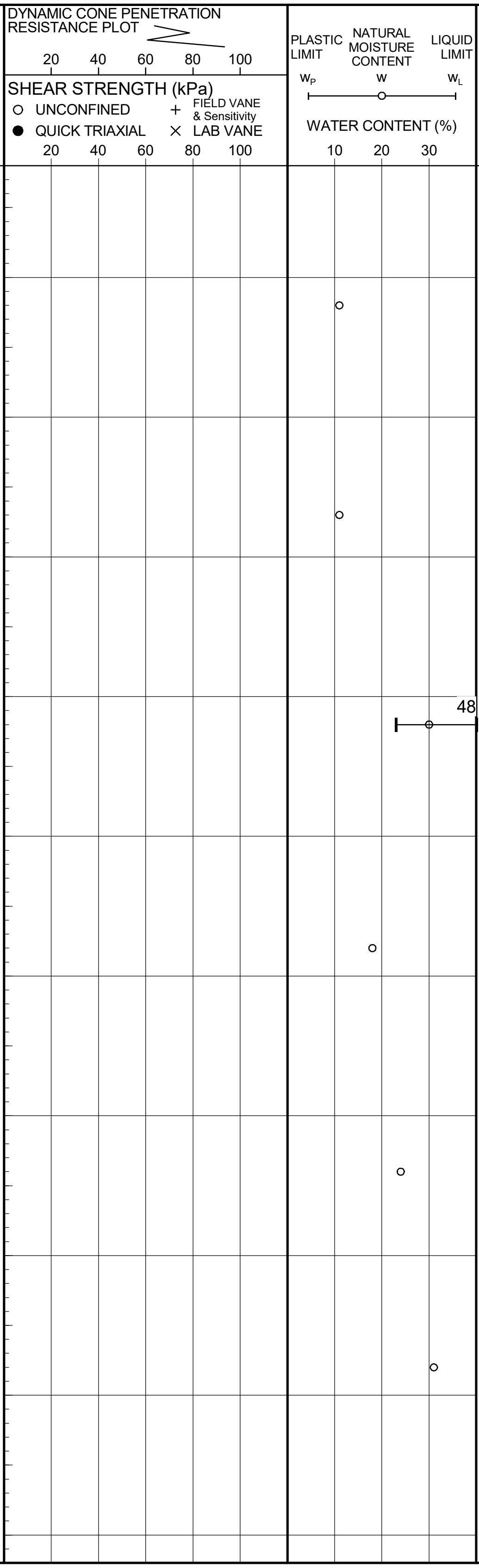
LOG OF BOREHOLE BH18-06

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-18-2018

REF. NO.: 18-519-10
ENCL NO.: 7

(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT TILL: some sand to sandy trace gravel, brown, moist, hard(Continued)					72			
		10	SS	54			>225		
						71			
		11	SS	64			>225		
						70			
69.1 13.7	**SILTY CLAY:** trace sand, occasional sand seams, grey, moist, very stiff					69			
		12	SS	16			125		0 6 26 68
						68			
		13	SS	26			200		
						67			
66.0 16.8	**CLAYEY SILT TO SILT :** some clay, trace sand, grey, moist, compact					66			
		14	SS	23			200		
						65			
		15	SS	26			>225		
						64			
						63			



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3, \times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

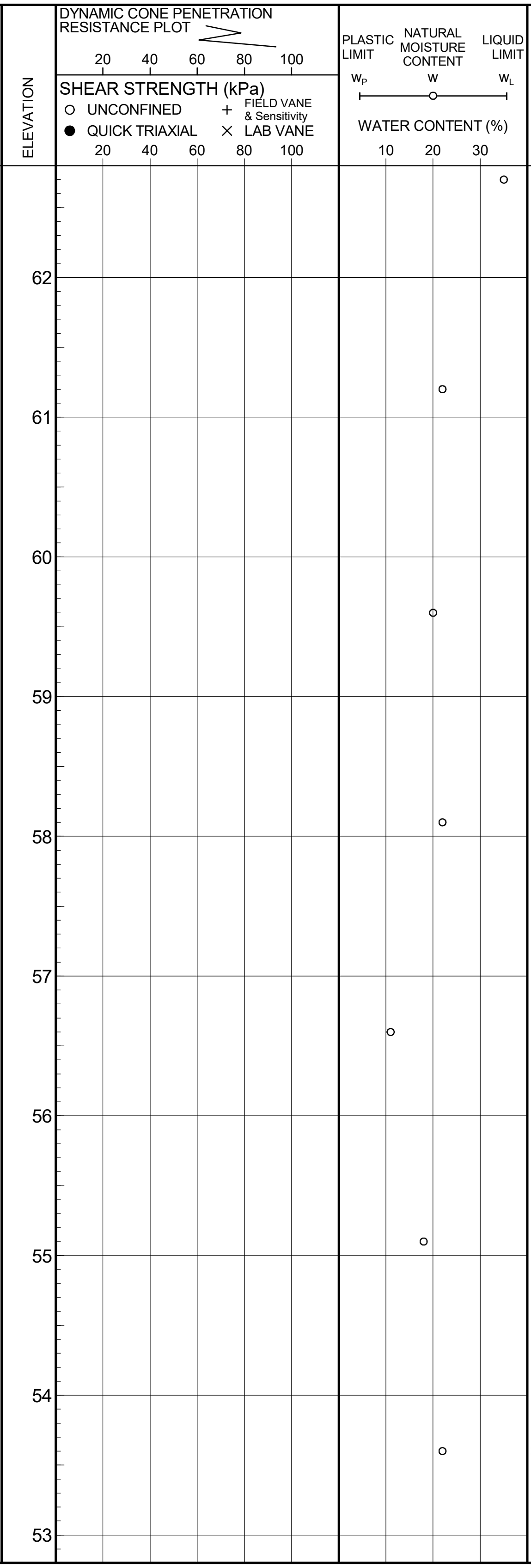
LOG OF BOREHOLE BH18-06

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-18-2018

REF. NO.: 18-519-10
ENCL NO.: 7

SOIL PROFILE			SAMPLES						
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT TO SILT : some clay, trace sand, grey, moist, compact(Continued)		16	SS	23		200		
			17	SS	28		200		
59.9 22.9	**SILT:**some clay, grey, very moist to wet, dense		18	SS	32				
58.4 24.4	**SAND:**trace silt, some gravel to gravelly, grey, wet, very dense		19	SS	81				
			20	SS	87				
55.4 27.4	**SANDY SILT TO SILTY SAND:**trace clay, grey, wet, very dense		21	SS	58				
54.8 28.0	**SILTY CLAY:**trace sand, trace gravel, grey, moist, hard		22	SS	81		>225		
52.8									



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + ^{3}, × ^{3}: Numbers refer to Sensitivity ○ $^{\varepsilon}$=3% Strain at Failure

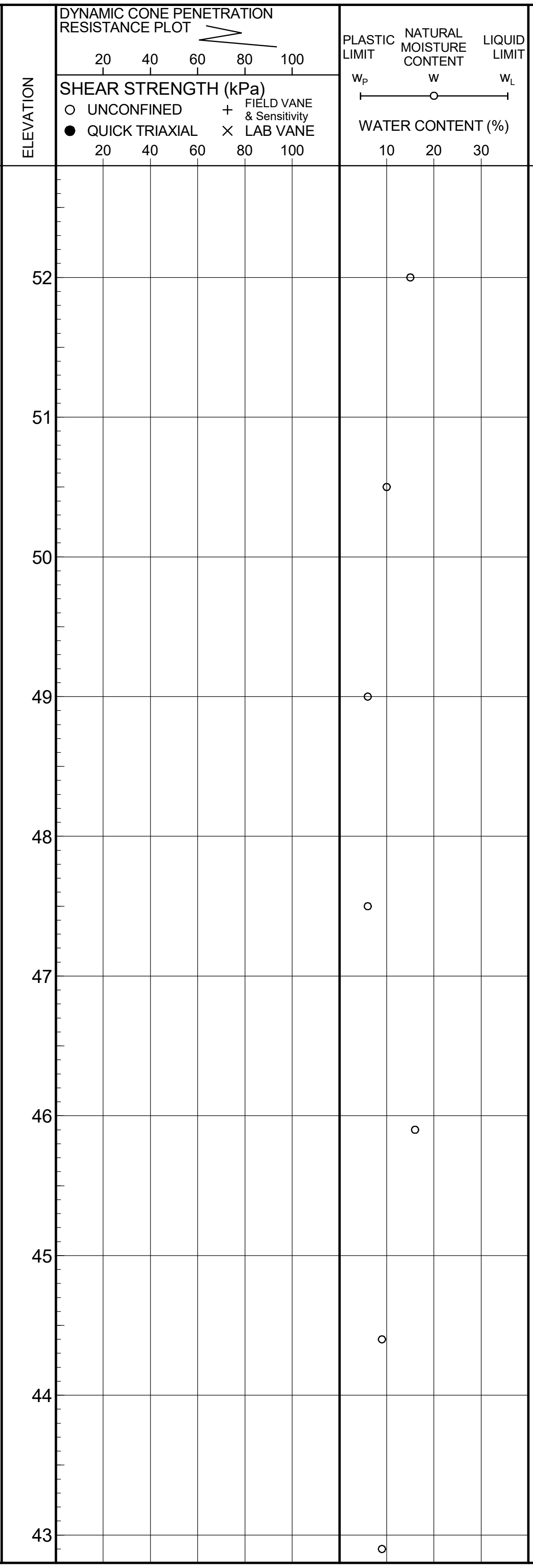
LOG OF BOREHOLE BH18-06

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-18-2018

REF. NO.: 18-519-10
ENCL NO.: 7

SOIL PROFILE (m) ELEV DEPTH	DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
30.0	**SILT:** some clay, trace sand, grey, wet, dense							
		23	SS	45				
51.8 31.0	**SAND:**trace silt, grey, wet, dense							
50.8 32.0	**SAND AND GRAVEL:**trace silt, occassional cobble/boulders, grey, wet, very dense							
		24	SS	80				
		25	SS	87				
		26	SS	50/125mm				
		27	SS	76				
		28	SS	50/150mm				
		29	SS	80				



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3$, $\times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

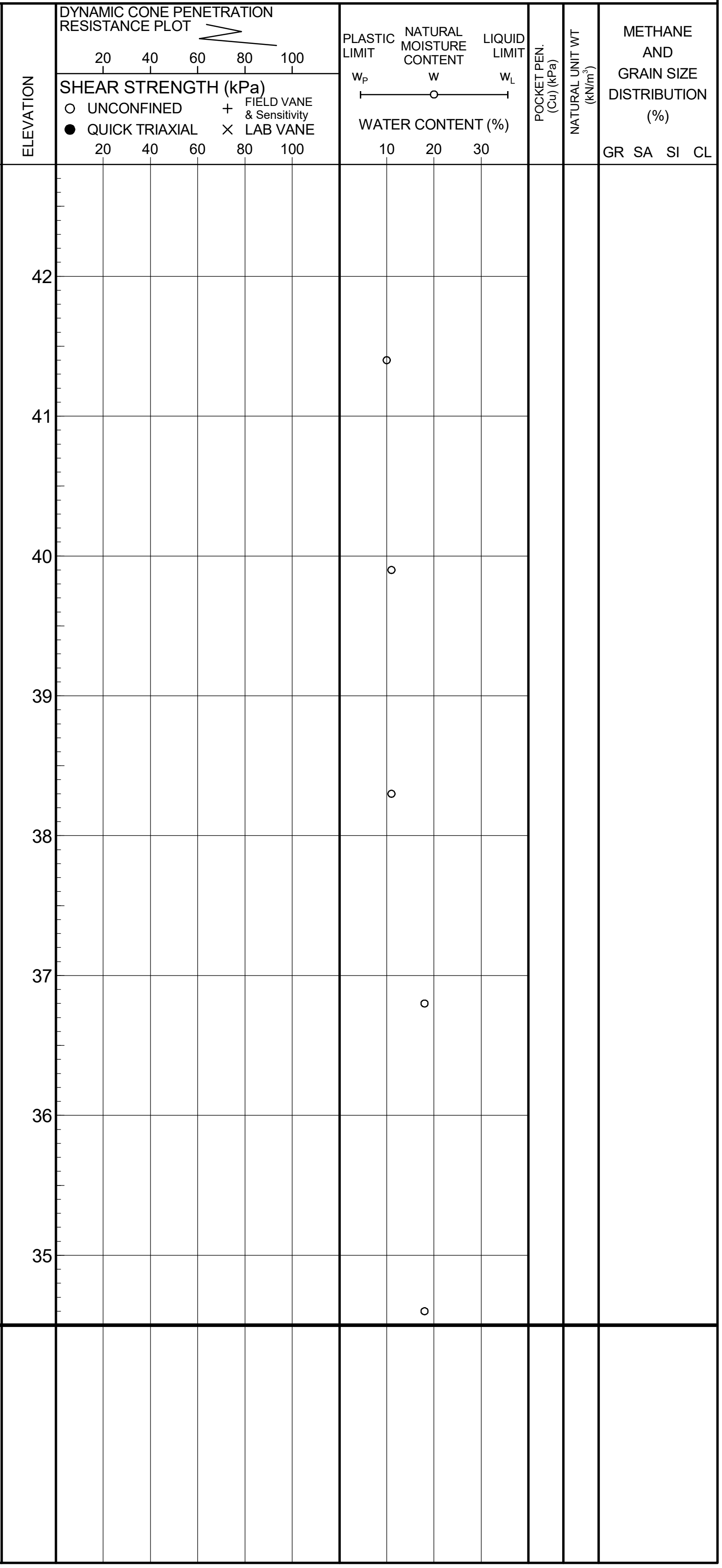
LOG OF BOREHOLE BH18-06

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-18-2018

REF. NO.: 18-519-10
ENCL NO.: 7

SOIL PROFILE			SAMPLES				
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION
	SAND AND GRAVEL: trace silt, occassional cobble/boulders, grey, wet, very dense(Continued)						
			30	SS	50/ 100mm		
			31	SS	50/ 125mm		
			32	SS	50/ 100mm		
			33	SS	50/ 100mm		
			34	SS	100/ 75mm		
34.7 48.1	**SHALE:** Georgian Bay Formation, weathered, grey		35	SS	100/ 50mm		
34.5 48.3	**END OF BOREHOLE:** Notes: 1) Water level at 16.8m during drilling.						



GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + ^{3}, × ^{3}: Numbers refer to Sensitivity
○ $^{\varepsilon}$=3% Strain at Failure

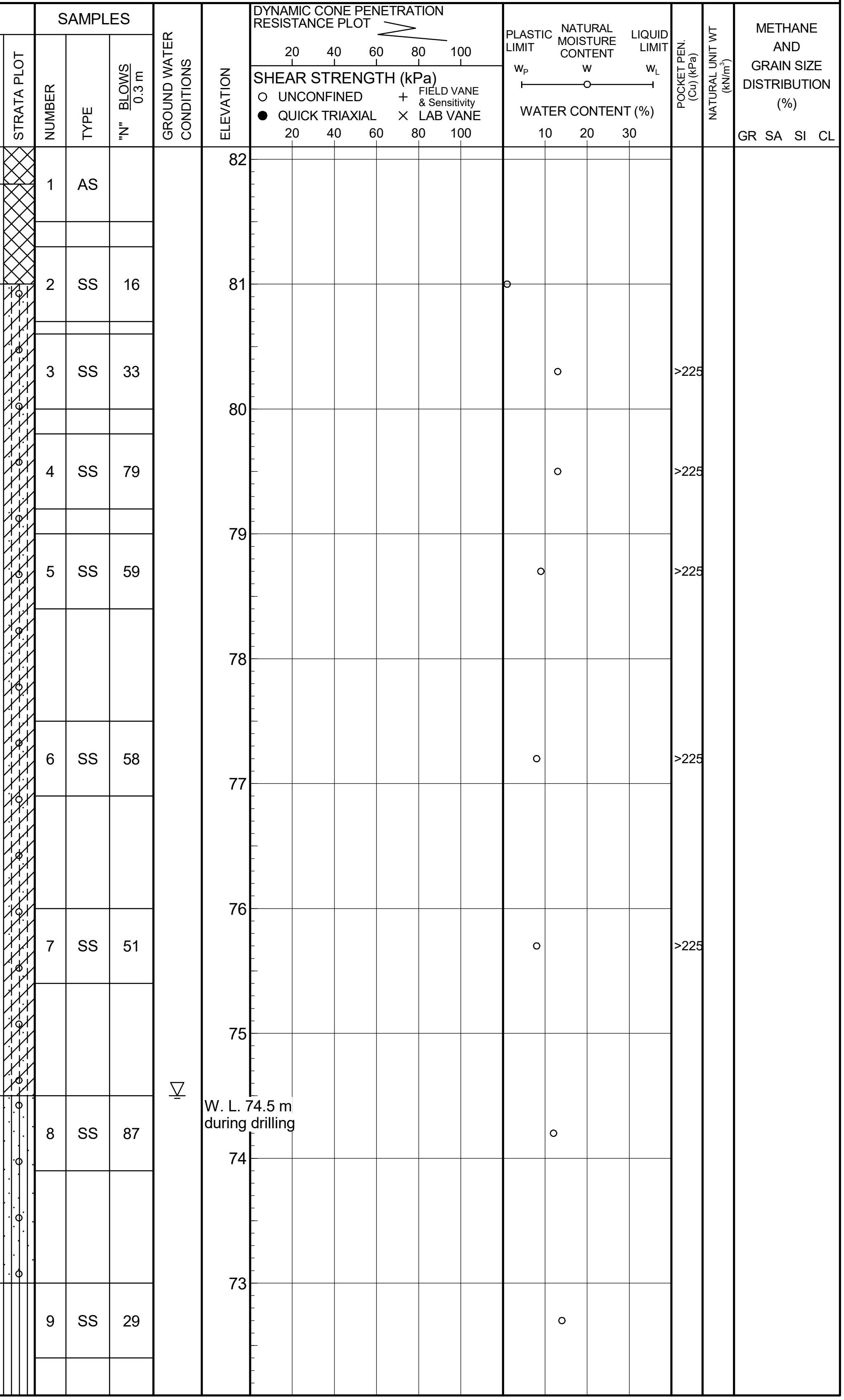
LOG OF BOREHOLE BH18-07

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-20-2018

REF. NO.: 18-519-10
ENCL NO.: 8

SOIL PROFILE		SAMPLES					
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)
82.1							
0.0	**GRANULAR BASE:** 300mm	1	AS			82	
81.8 0.3	**FILL:** sand, some gravel, grey, moist, compact						
81.0 1.1	**CLAYEY SILT TILL:** sandy, trace gravel, occasional cobble/boulder, brown to grey, moist, very stiff to hard	2	SS	16		81	
		3	SS	33			>225
		4	SS	79		80	>225
	grey below 3.1 m	5	SS	59		79	>225
		6	SS	58		78 77	>225
		7	SS	51		76 75	>225
74.5 7.6	**SANDY SILT TILL:**some clay, some gravel, occasional cobble/boulder, grey, very moist to wet, very dense	8	SS	87	▽ W. L. 74.5 m during drilling	74	
73.0 9.1	**SILT:** trace sand, grey, moist to very moist, compact	9	SS	29		73	



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ 3 =3% Strain at Failure

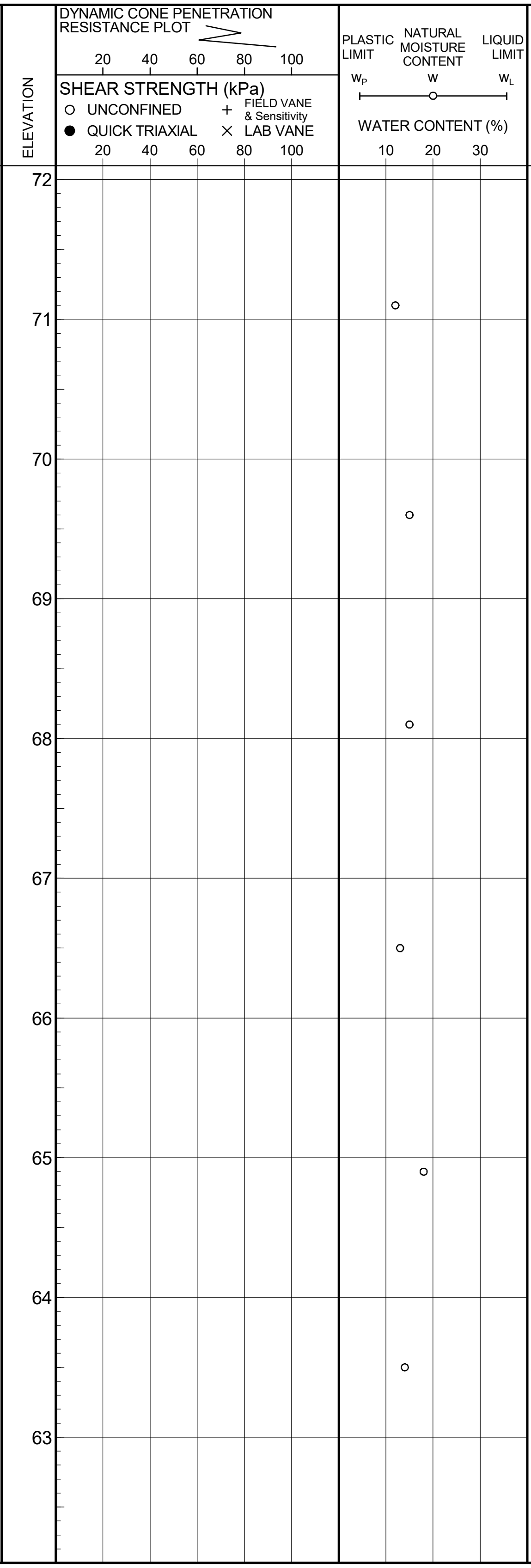
LOG OF BOREHOLE BH18-07

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-20-2018

REF. NO.: 18-519-10
ENCL NO.: 8

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	GR	SA	SI	CL
	SILT: trace sand, grey, moist to very moist, compact(Continued)										
71.4 10.7	**SANDY SILT TO SILTY SAND:** trace gravel, grey, wet, very dense	10	SS	77							
70.0 12.1	**SILTY CLAY TILL:** sandy, trace gravel, occasional cobble/boulder, grey, moist, hard	11	SS	59		>225					
		12	SS	59		>225		2	27	48	23
66.9 15.2	**SANDY SILT TO SILTY SAND:**trace clay, grey, wet, very dense	13	SS	79							
65.3 16.8	**CLAYEY SILT TILL:** some sand to sandy, trace gravel, occasional cobble/boulder, grey, moist, hard	14	SS	72		>225					
		15	SS	40		>225					
62.3 19.8											



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

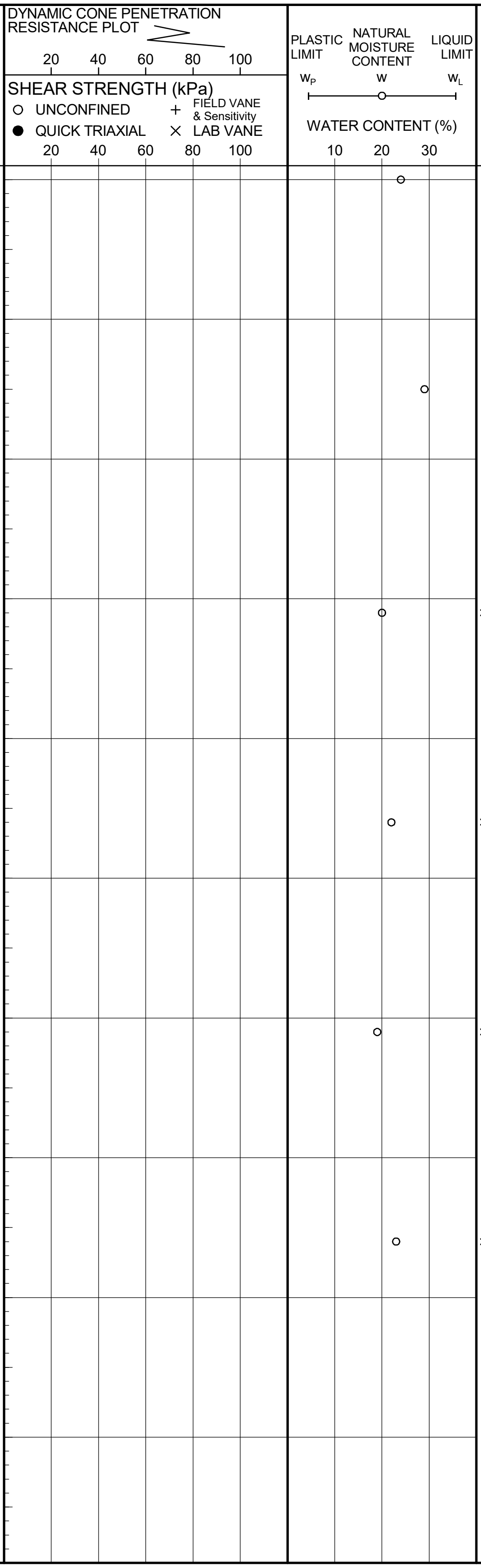
LOG OF BOREHOLE BH18-07

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-20-2018

REF. NO.: 18-519-10
ENCL NO.: 8

SOIL PROFILE			SAMPLES								
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILTY CLAY: trace sand, grey, moist, hard(Continued)		16	SS	39		62	200		
21							61			
			17	SS	34			175		
22							60			
23			18	SS	56		59	>225		
24							58			
			19	SS	52			>225		
25							57			
26			20	SS	57		56	>225		
27							55			
			21	SS	50/ 25mm			>225		
28							54			
29 53.1 29.0	**SANDY SILT TILL:** trace to some clay, trace gravel, occasional cobble/boulder, grey, wet, very dense						53			
30										



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-07

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-20-2018

REF. NO.: 18-519-10
ENCL NO.: 8

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT W_P NATURAL MOISTURE CONTENT W LIQUID LIMIT W_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m							
	SANDY SILT TILL: trace to some clay, trace gravel, occasional cobble/boulder, grey, wet, very dense(Continued)						52					
51.4			22	SS	50/ 100mm				○			
30.7	**END OF BOREHOLE** Notes: 1) Water level at 7.6m during drilling.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-08

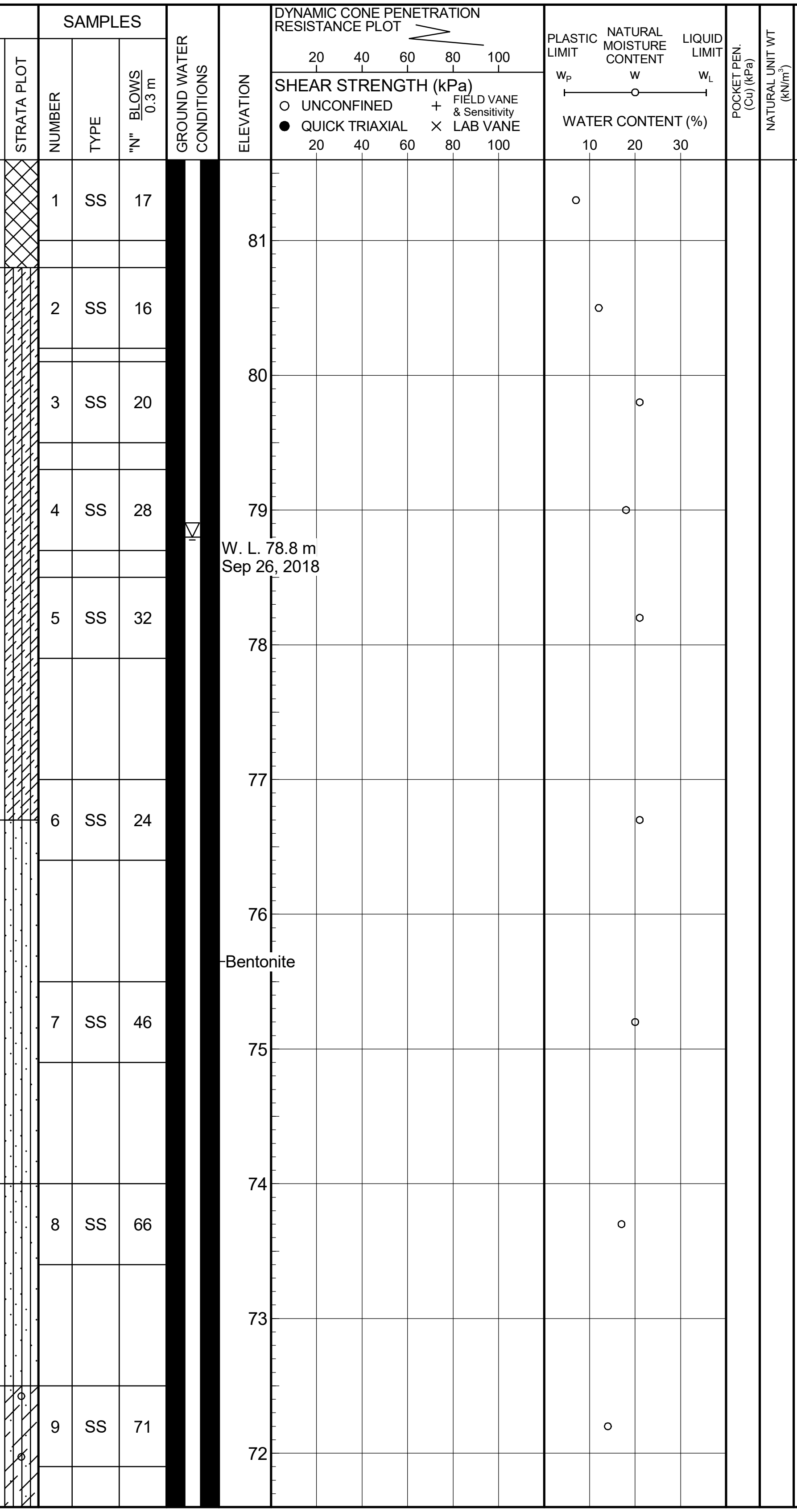
PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-28-2018

REF. NO.: 18-519-10
ENCL NO.: 9

SOIL PROFILE (m) ELEV DEPTH	DESCRIPTION
81.6 0.0	**FILL:** sand and gravel, brown, wet, compact
80.8 0.8	**CLAYEY SILT :** trace sand, brown to grey, moist, very stiff to hard grey below 2.3 m
76.7 4.9	**SAND & SILT:** trace to some clay, grey, wet, compact to dense
74.0 7.6	**SANDY SILT:** trace clay, grey, wet, very dense
72.5 9.1	**CLAYEY SILT TILL:** some sand to sandy, trace gravel, occasional cobble/boulder, grey, moist, hard

SAMPLES NUMBER	TYPE	"N" BLOWS / 0.3 m	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR	SA	SI	CL
1	SS	17				
2	SS	16				
3	SS	20				
4	SS	28				
5	SS	32				
6	SS	24				
7	SS	46	0	43	47	10
8	SS	66	0	31	62	7
9	SS	71				



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

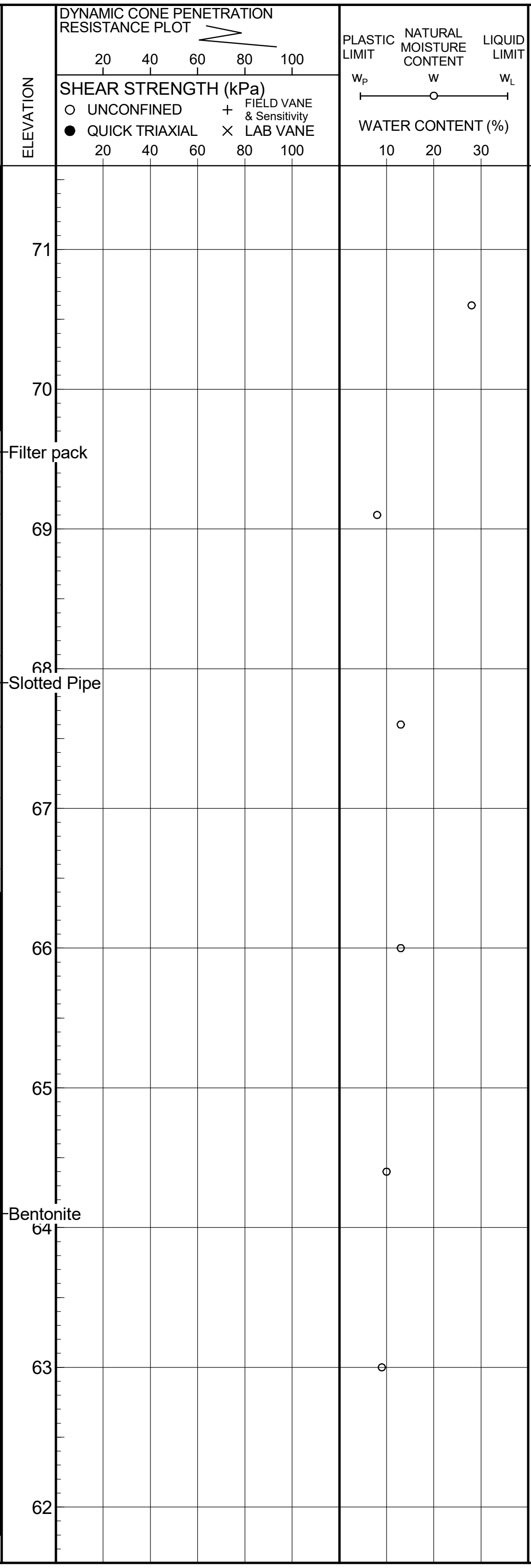
LOG OF BOREHOLE BH18-08

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-28-2018

REF. NO.: 18-519-10
ENCL NO.: 9

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)			
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS/0.3 m				GR	SA	SI	CL
	CLAYEY SILT TILL: some sand to sandy, trace gravel, occasional cobble/boulder, grey, moist, hard(Continued)										
70.9 10.7	**SILT TO CLAYEY SILT:** trace sand, grey, moist to very moist, dense	10	SS	34	Filter pack	175					
69.4 12.2	**SILTY SAND TILL:** trace clay, some gravel, grey, wet, very dense	11	SS	50/ 150mm							
68.1 13.5	**SAND:** trace silt, trace gravel, grey, wet, very dense	12	SS	74	Slotted Pipe			8	88	(4)	
66.4 15.2	**SANDY SILT TO SILTY SAND:** trace clay, grey, wet, very dense	13	SS	82							
64.5 17.1	**SILTY CLAY:** trace sand, grey, moist, hard	14	SS	71	Bentonite						
		15	SS	50		>225					



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + ³, × ³: Numbers refer to Sensitivity ○ ⁸=3% Strain at Failure

LOG OF BOREHOLE BH18-08

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-28-2018

REF. NO.: 18-519-10
ENCL NO.: 9

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT W_P NATURAL MOISTURE CONTENT W LIQUID LIMIT W_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m							
	SILTY CLAY: trace sand, grey, moist, hard(Continued)	▨	16	SS	35				○	>225		
61.2 20.4	**END OF BOREHOLE** Notes: 1) Water level at 4.9 mbgl during drilling 2) Water level in the monitoring well recorded at 2.8m on Sept. 26, 2018.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3, \times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

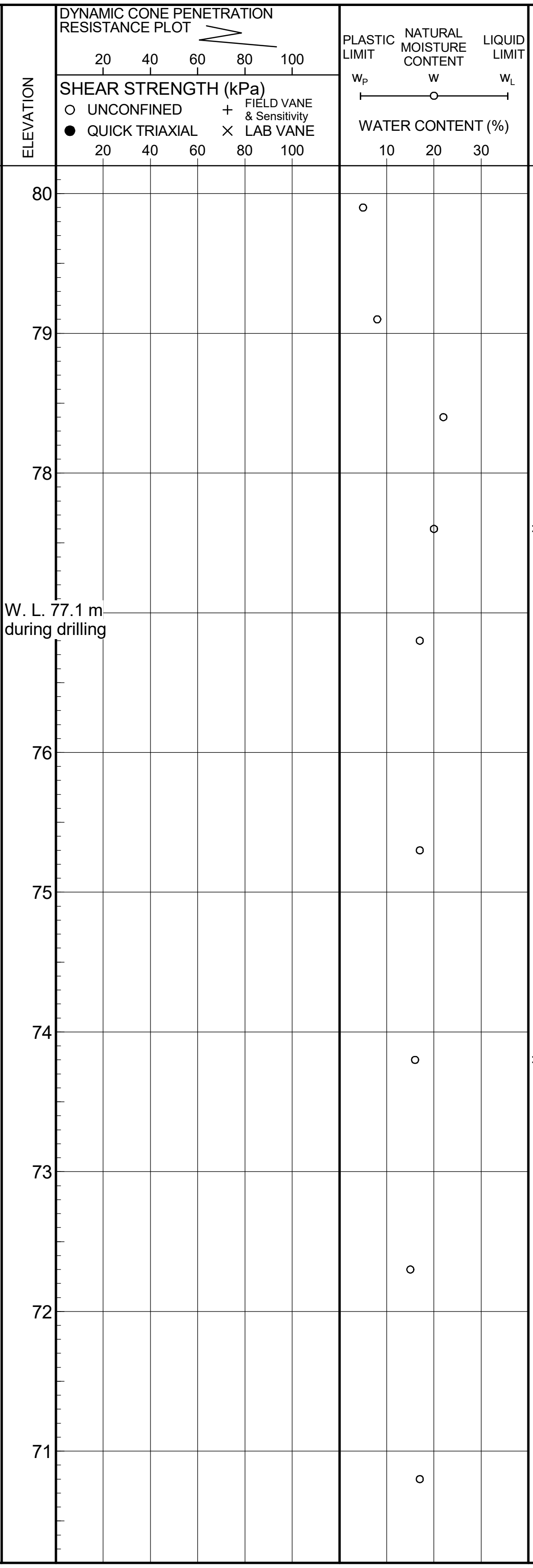
LOG OF BOREHOLE BH18-09

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-04-2018

REF. NO.: 18-519-10
ENCL NO.: 19

(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	GR	SA	SI	CL
80.2											
0.0	**FILL:** sandy silt, trace gravel, grey, moist	1	AS								
79.4 0.8	**FILL:** silty clay, trace organics, grey, moist, loose	2	SS	4							
78.7 1.5	**CLAYEY SILT:** trace sand, grey, moist, firm to very stiff	3	SS	6							
		4	SS	20		>225					
77.1 3.1	**SANDY SILT:** trace to some clay, grey, wet, compact	5	SS	22	∇ W. L. 77.1 m during drilling			4	33	53	10
		6	SS	30							
74.1 6.1	**CLAYEY SILT TILL:** sandy, trace gravel, grey, moist, hard	7	SS	75		>225					
72.6 7.6	**SILT TO SANDY SILT:** trace clay, grey, wet, very dense	8	SS	81							
		9	SS	50/ 125mm							



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ∇ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-09

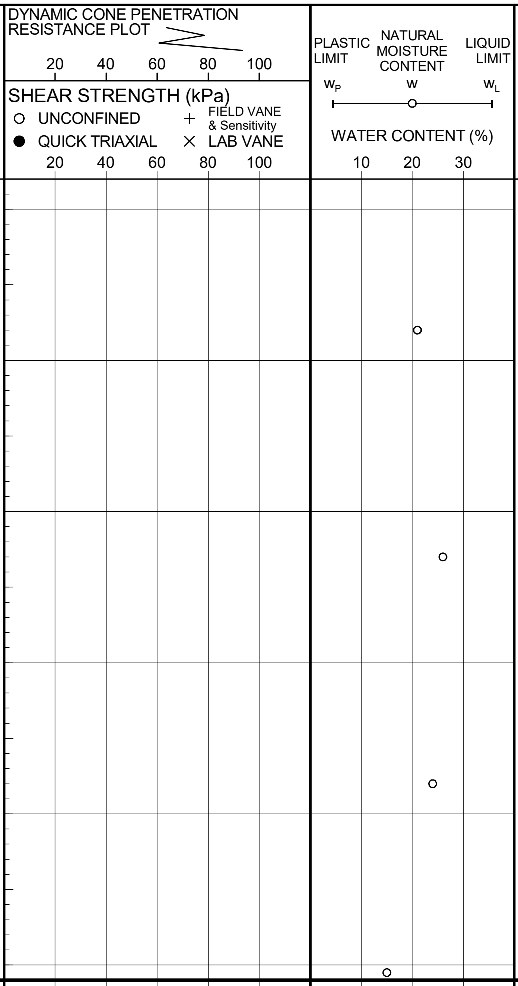
PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-04-2018

REF. NO.: 18-519-10
ENCL NO.: 19

SOIL PROFILE		SAMPLES						
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILT TO SANDY SILT: trace clay, grey, wet, very dense(Continued)					70		
69.5 10.7	**SILTY CLAY:** trace sand, trace gravel, grey, moist, hard	10	SS	32		69	>225	
		11	SS	53		68 67	>225	
66.5 13.7	**SILT:** trace to some clay, trace sand, grey, wet, dense	12	SS	34		66		
65.0 64.9 15.3	**SHALE:** Georgian Bay Formation, weathered, grey	13	SS	50/ 100mm		65		

END OF BOREHOLE
Notes:
1) Water level at 3.1 mbgl during drilling.



NATURAL UNIT WT (kN/m^3)

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ^{8}=3% Strain at Failure

LOG OF BOREHOLE BH18-10

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-25-2018

REF. NO.: 18-519-10
ENCL NO.: 11

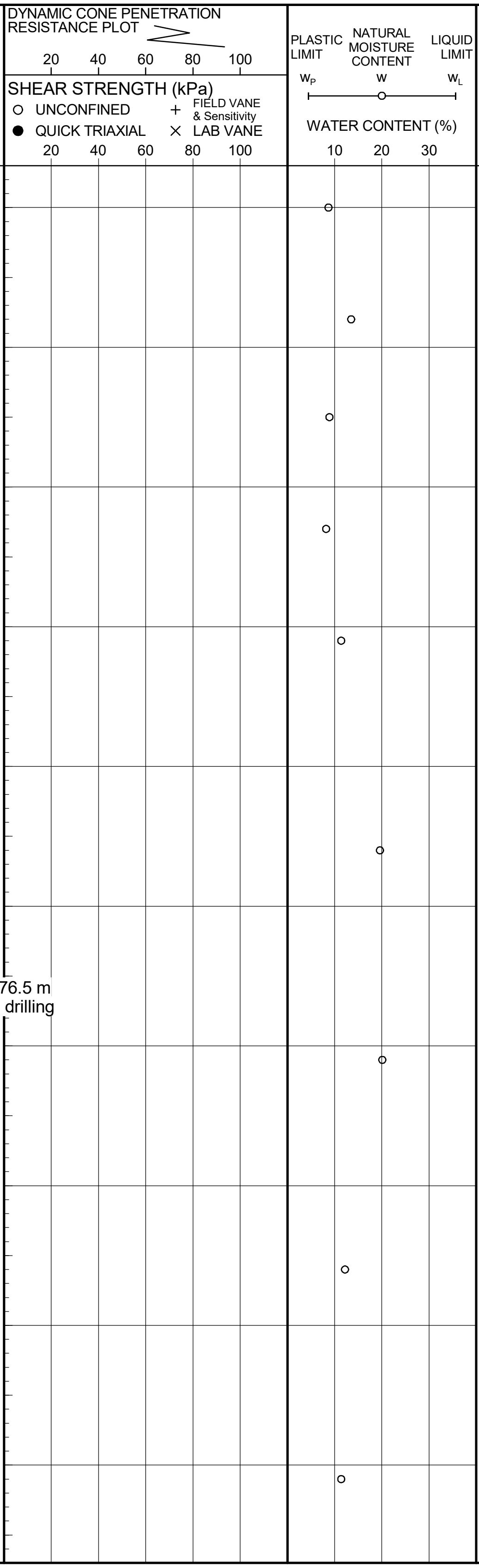
SOIL PROFILE

(m) ELEV DEPTH	DESCRIPTION
82.3	
0.0	**TOPSOIL:** 300 mm
82.0 0.3	**FILL:** silty clay, trace topsoil, trace gravel, brown, wet, stiff
81.5 0.8	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff to hard
77.7 4.6	**CLAYEY SILT:** trace sand, grey, moist, very stiff
76.2 6.1	**SILT:** trace clay, trace to some sand, grey, wet, compact
74.7 7.6	**SANDY SILT TILL:** some clay, frequent seams of wet sand, trace gravel, occassional cobbe/boulders, grey, moist, very dense

SAMPLES

NUMBER	TYPE	"N" BLOWS/0.3 m	POCKET PEN. (Cu) (kPa)
1	SS	14	
2	SS	19	200
3	SS	50	>225
4	SS	45	>225
5	SS	30	>225
6	SS	20	225
7	SS	23	
8	SS	54	
9	SS	73	

GROUND WATER CONDITIONS: W. L. 76.5 m during drilling



NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3$, $\times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

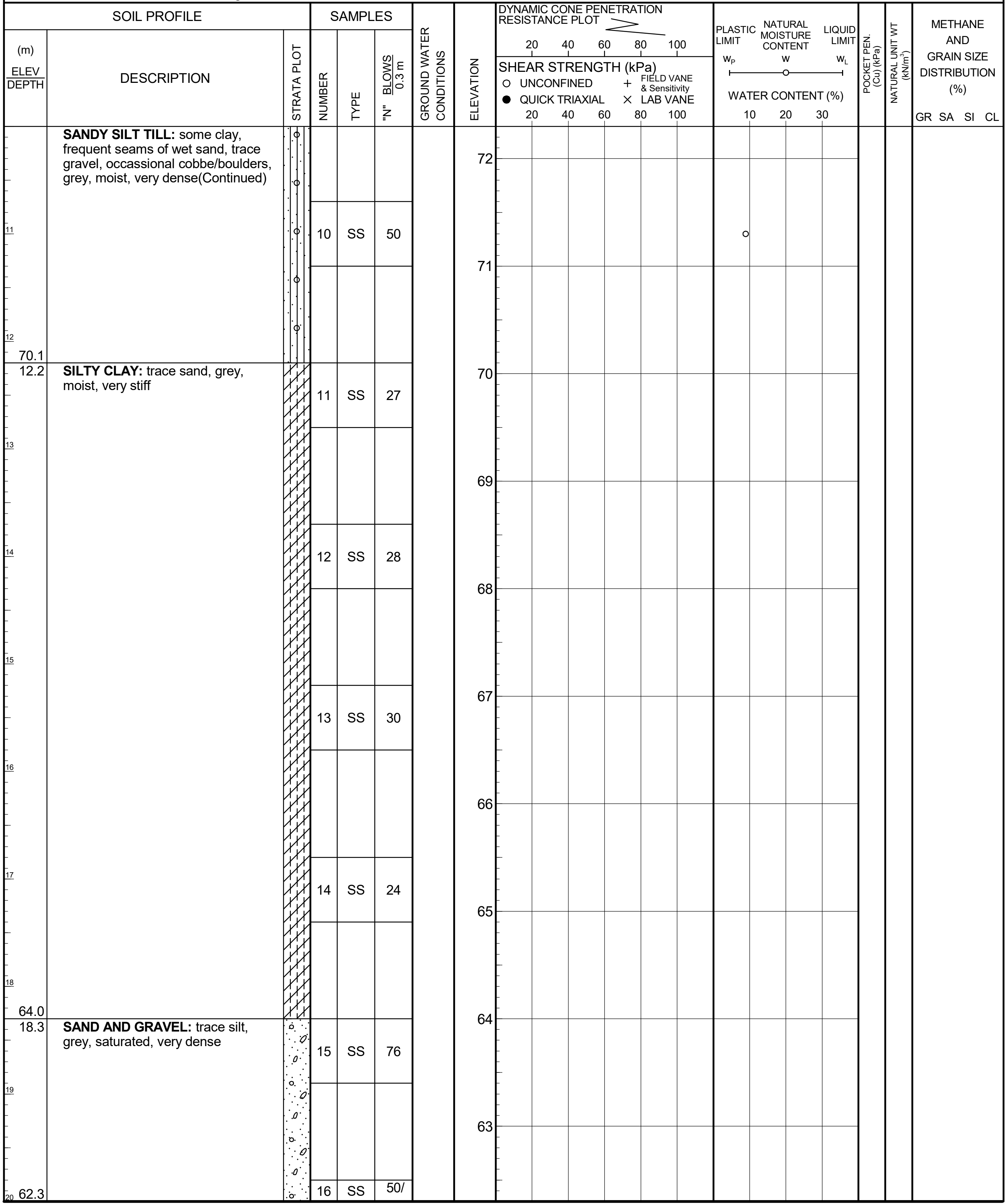
LOG OF BOREHOLE BH18-10

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-25-2018

REF. NO.: 18-519-10
ENCL NO.: 11

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS / 0.3 m
	SANDY SILT TILL: some clay, frequent seams of wet sand, trace gravel, occassional cobbe/boulders, grey, moist, very dense(Continued)	10	SS	50
70.1 12.2	**SILTY CLAY:** trace sand, grey, moist, very stiff	11	SS	27
		12	SS	28
		13	SS	30
		14	SS	24
64.0 18.3	**SAND AND GRAVEL:** trace silt, grey, saturated, very dense	15	SS	76
62.3		16	SS	50/



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3, \times^3$: Numbers refer to Sensitivity
○ 8=3% Strain at Failure

LOG OF BOREHOLE BH18-10

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-25-2018

REF. NO.: 18-519-10
ENCL NO.: 11

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION					
20.0	**END OF BOREHOLE** Notes: 1) Water level at 5.8 mbgl during drilling				150mm							

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-11

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-20-2018

REF. NO.: 18-519-10
ENCL NO.: 12

(m) ELEV DEPTH	SOIL PROFILE DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)
85.1 0.0	**TOPSOIL:** 250 mm					
84.9 0.2	**FILL:** clayey silt, mixed with topsoil, trace gravel, grey, moist, compact	1	SS	18		
84.3 0.8	**FILL:**silty clay, trace to some organics, trace gravel, grey, moist, loose to compact	2	SS	20		
		3	SS	9		
		4	SS	7		
82.0 3.1	**CLAYEY SILT TILL:** sandy, trace gravel, greyish brown, moist, very stiff to hard	5	SS	22		>225
		6	SS	58		>225
		7	SS	34		>225
		8	SS	35		>225
		9	SS	39		

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH (kPa): ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE: 20 40 60 80 100
PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT W — LIQUID LIMIT W_L
WATER CONTENT (%): 10 20 30
NATURAL UNIT WT (kN/m³)
METHANE AND GRAIN SIZE DISTRIBUTION (%): GR SA SI CL
ELEVATION: 85 84 83 82 81 80 79 78 77 76
Depth: 1 2 3 4 5 6 7 8 9 10

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity ○ ^{8}=3% Strain at Failure

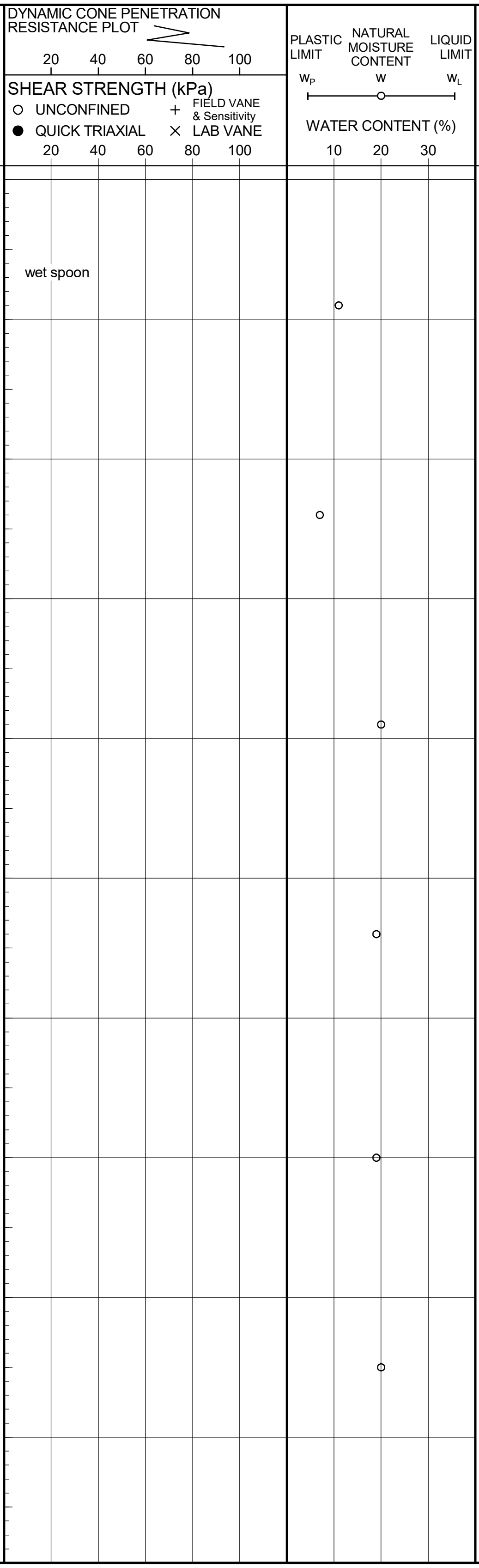
LOG OF BOREHOLE BH18-11

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-20-2018

REF. NO.: 18-519-10
ENCL NO.: 12

(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION / SHEAR STRENGTH	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT TILL: sandy, trace gravel, greyish brown, moist, very stiff to hard(Continued)					75				
	wet sand seams below 10.7 m	10	SS	50		74	wet spoon			
		11	SS	41		73		>225		
71.4 13.7	**SILT CLAY:** trace sand/silt seams, grey, moist, stiff to very stiff	12	SS	14		71		125		
		13	SS	21		70		150		
		14	SS	19		68		150		
		15	SS	23		66		175		



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-11

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-20-2018

REF. NO.: 18-519-10
ENCL NO.: 12

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L / WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION					
64.7 20.4	**SILT CLAY:** trace sand/silt seams, grey, moist, stiff to very stiff(Continued)	▨	16	SS	16		65			150		
	END OF BOREHOLE Notes: 1) Borehole dry upon completion											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES +³, ×³: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

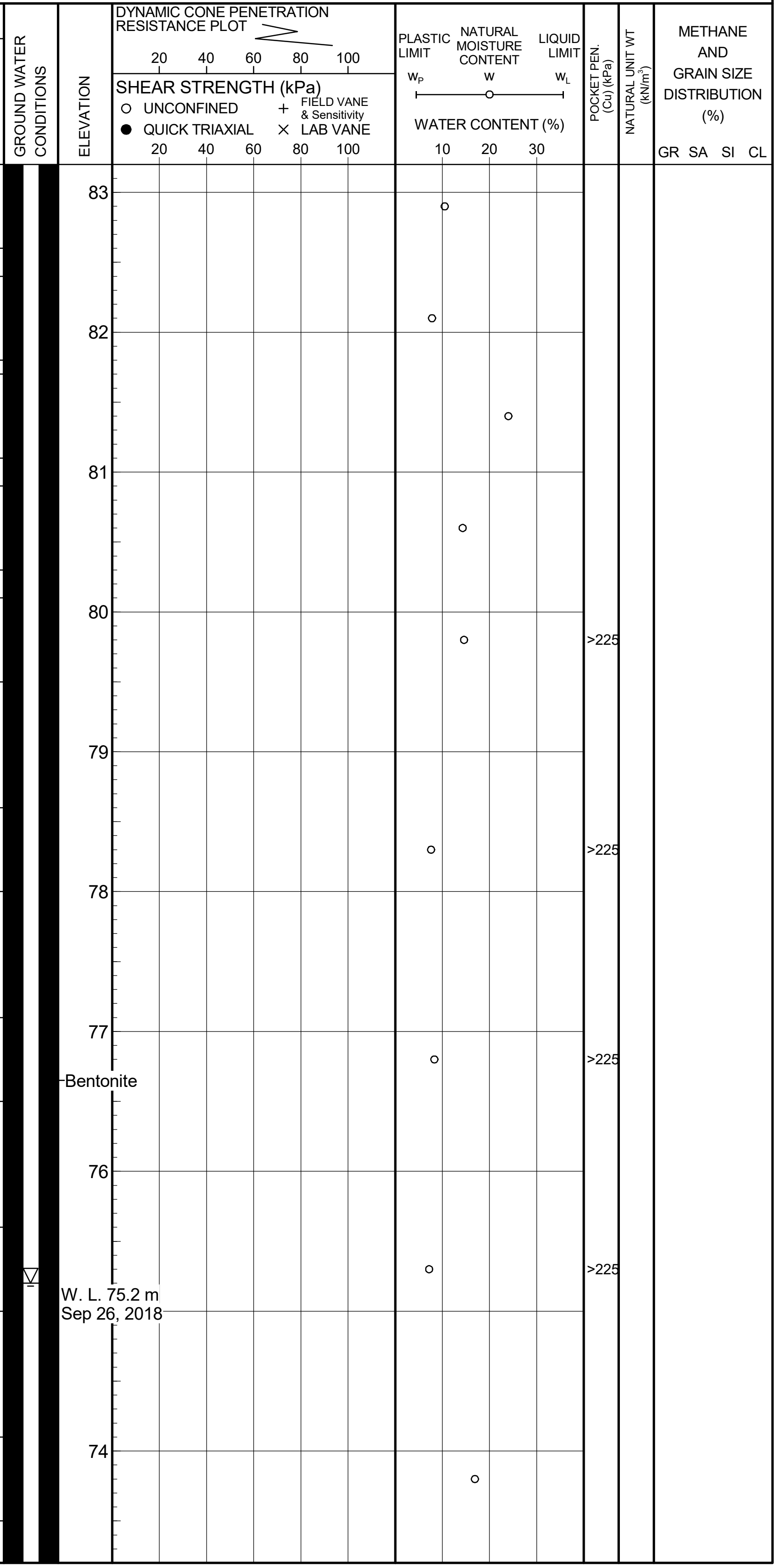
LOG OF BOREHOLE BH18-12

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-24-2018

REF. NO.: 18-519-10
ENCL NO.: 13

(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m	POCKET PEN. (Cu) (kPa)
83.2 0.0	**TOPSOIL:** 150 mm				
83.1 0.2	**FILL:** silty clay, mixed with topsoil/organics, trace gravel, brown to grey, moist, loose to compact	1	SS	23	
		2	SS	28	
		3	SS	6	
		4	SS	7	
80.5 2.7	**CLAYEY SILT TILL:** sandy, trace gravel, occassional cobble/boulders, brown, moist, very stiff to hard	5	SS	24	>225
		6	SS	50	>225
		7	SS	56	>225
		8	SS	60	>225
74.1 9.1	**CLAYEY SILT:** trace seams/partings of silt, grey, moist, very stiff	9	SS	23	



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

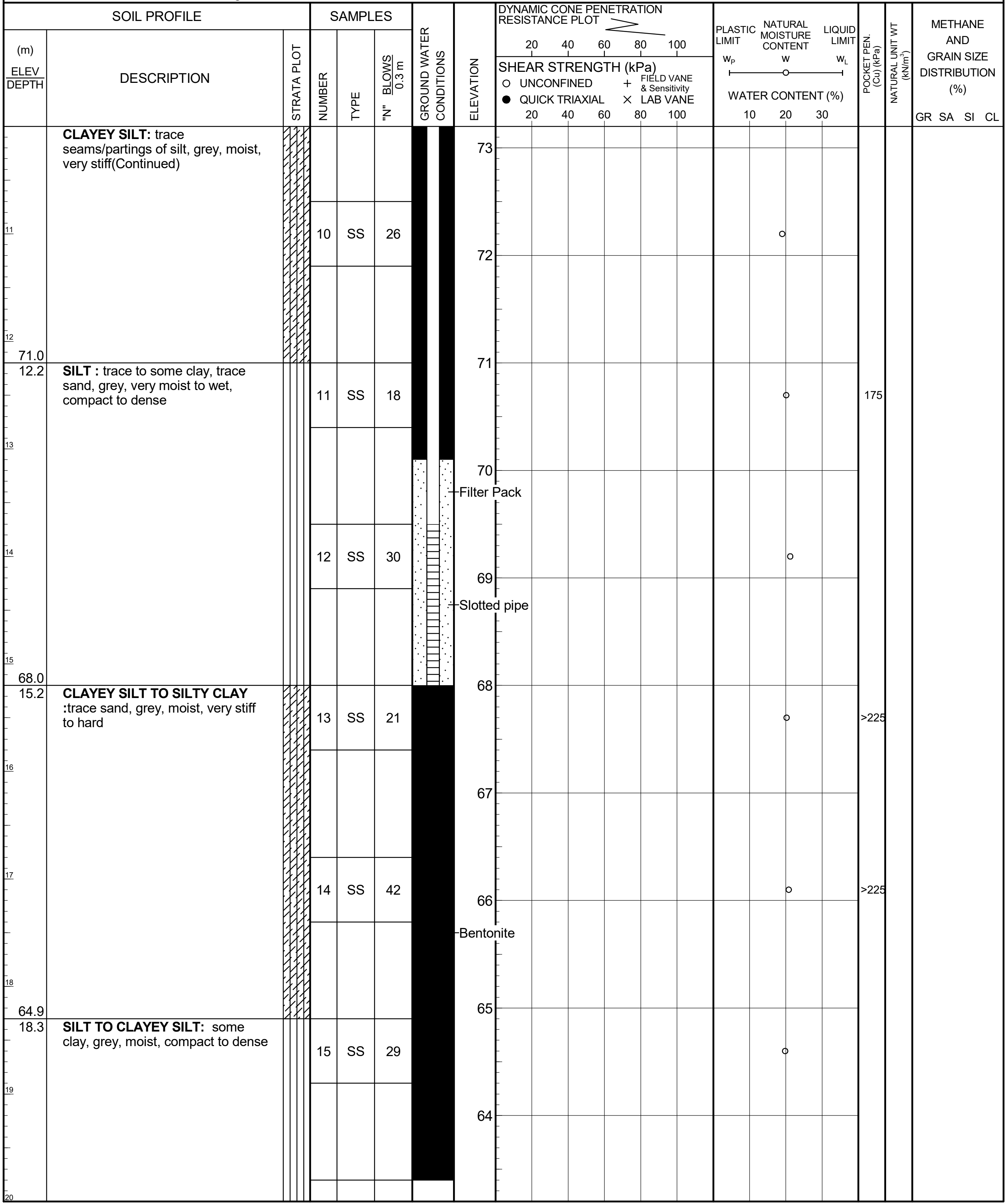
GRAPH NOTES
+^{3}, ×^{3}: Numbers refer to Sensitivity
○ ^{8}=3% Strain at Failure

LOG OF BOREHOLE BH18-12

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-24-2018

REF. NO.: 18-519-10
ENCL NO.: 13



ELEV / DEPTH (m)	DESCRIPTION	NUMBER	TYPE	"N" BLOWS / 0.3 m	POCKET PEN. (Cu) (kPa)
	CLAYEY SILT: trace seams/partings of silt, grey, moist, very stiff(Continued)	10	SS	26	
71.0 12.2	**SILT :** trace to some clay, trace sand, grey, very moist to wet, compact to dense	11	SS	18	175
		12	SS	30	
68.0 15.2	**CLAYEY SILT TO SILTY CLAY :**trace sand, grey, moist, very stiff to hard	13	SS	21	>225
		14	SS	42	>225
64.9 18.3	**SILT TO CLAYEY SILT:** some clay, grey, moist, compact to dense	15	SS	29	

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3, \times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-12

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-24-2018

REF. NO.: 18-519-10
ENCL NO.: 13

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT W_P NATURAL MOISTURE CONTENT W LIQUID LIMIT W_L / WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION					
	SILT TO CLAYEY SILT: some clay, grey, moist, compact to dense(Continued)		16	SS	34		63		○			
62.8 20.4	**END OF BOREHOLE:** Notes: 1) 50 mm dia monitoring well installed upon completion. 2) Water level in moniotring well at 8m on Sept. 26, 2018.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

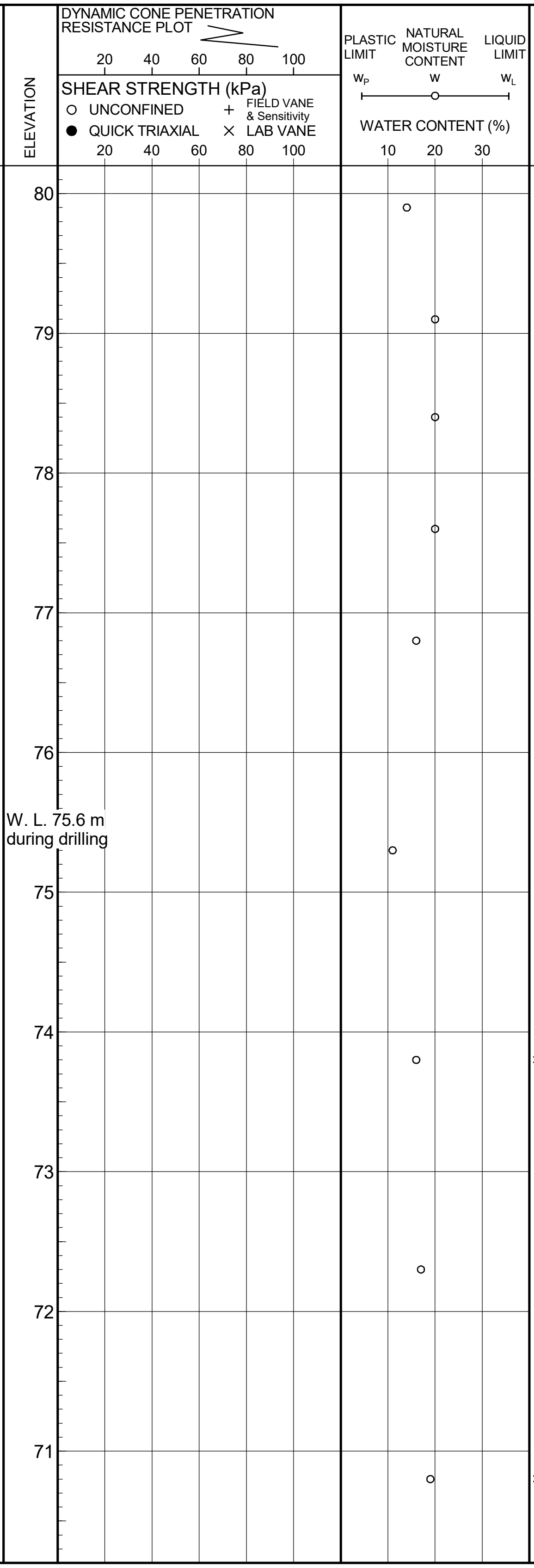
LOG OF BOREHOLE BH18-13

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-16-2018

REF. NO.: 18-519-10
ENCL NO.: 14

(m) ELEV DEPTH	SOIL PROFILE DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
80.2 0.0	**FILL:** sand & gravel, trace silt, grey, moist	1	AS					
79.4 0.8	**FILL:** silty clay, trace gravel, grey, moist, stiff	2	SS	8				
78.7 1.5	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff	3	SS	21				
77.9 2.3	**CLAYEY SILT TO SILT:** trace sand, grey, moist, very stiff	4	SS	18		200		
		5	SS	17		200		
75.6 4.6	**SANDY SILT TO SILTY SAND TILL :** trace clay, trace gravel, grey, wet, very dense	6	SS	64	▽ W. L. 75.6 m during drilling			
74.1 6.1	**CLAYEY SILT TILL :**sandy, frequent sand seams, trace gravel, grey, moist, hard	7	SS	38		>225		
72.6 7.6	**SANDY SILT:** trace to some clay, brownish grey, wet, dense	8	SS	49				
71.1 9.1	**SILTY CLAY:**frequent seams of silt, grey, moist, hard	9	SS	37		>225		



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES +³, ×³: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-13

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-16-2018

REF. NO.: 18-519-10
ENCL NO.: 14

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m							
	SILTY CLAY: frequent seams of silt, grey, moist, hard(Continued)	▨					70					
69.5 10.7	**SILT TO CLAYEY SILT:** seams of sand, trace gravel, grey, moist, very dense	▥	10	SS	70/ 279mm				○			
11 69.1 11.1	**END OF BOREHOLE:** Notes: 1) Borehole terminated due to eruption of gas with mud and water from hole. 2) Water level at 4.6 mbgl during drilling											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

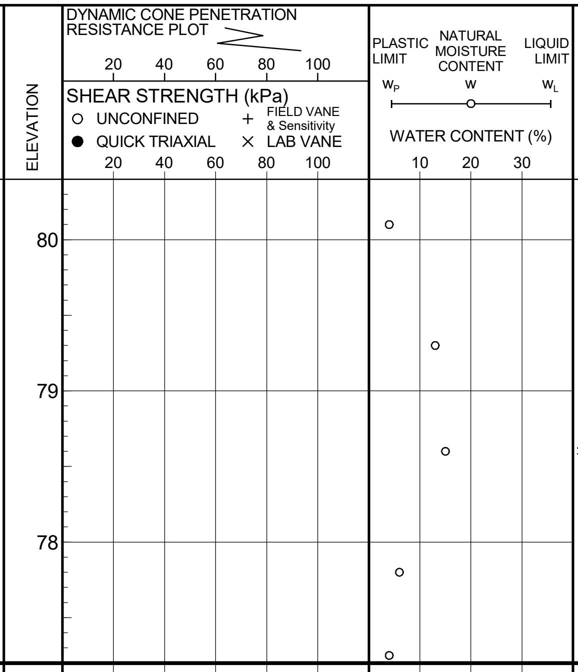
LOG OF BOREHOLE BH18-14

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-11-2018

REF. NO.: 18-519-10
ENCL NO.: 15

SOIL PROFILE			SAMPLES							
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
80.4									
0.0	**FILL:** sand and gravel, trace rootlets, grey, moist		1	AS					
79.6 0.8	**FILL:** silty clay, trace gravel, pieces of wood, grey, moist, loose		2	SS	8				
78.9 1.5	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff		3	SS	29		>225		
78.1 2.3	**SHALE:** Georgian Bay Formation, weathered, grey		4	SS	50/ 50 mm				
77.2 3.2	**END OF BOREHOLE:** Notes: 1) Borehole dry and open upon completion.		5	SS	50/ 50 mm				



GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-15

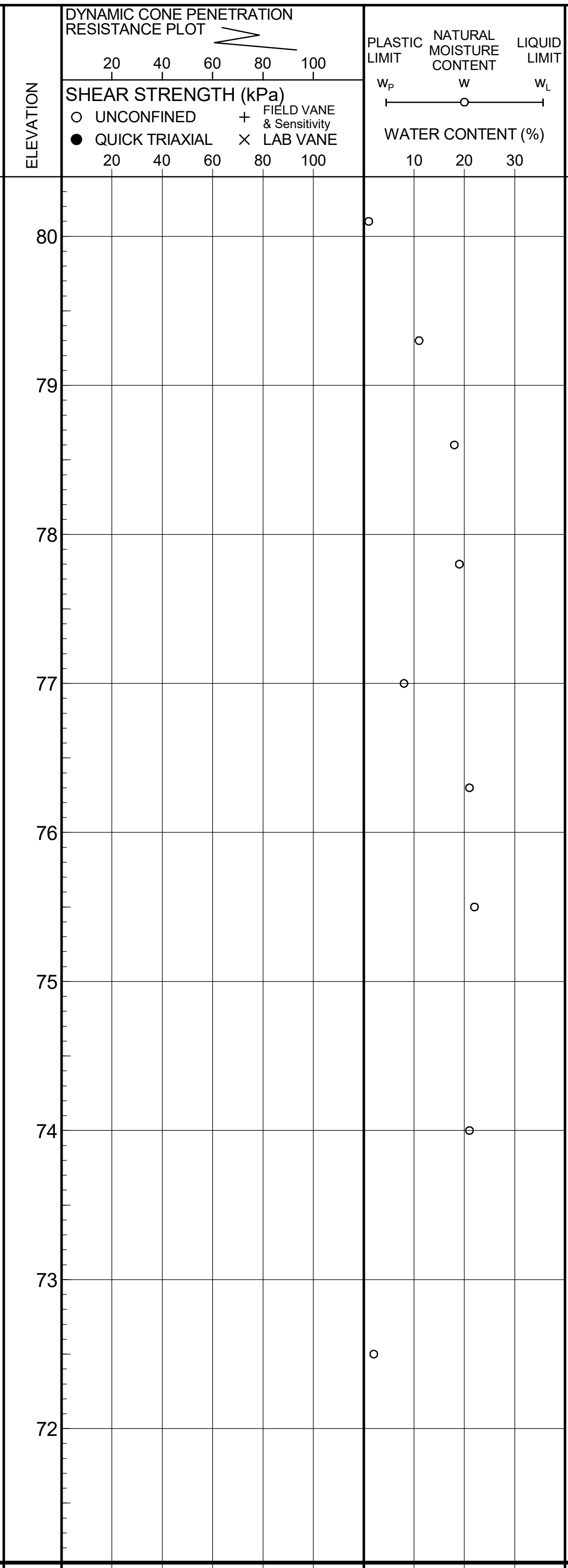
1 OF 1

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-11-2018

REF. NO.: 18-519-10
ENCL NO.: 16

SOIL PROFILE (m) ELEV DEPTH	DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
80.4 0.0	**FILL:** sand and gravel, trace rootlets, grey, moist	1	AS					
79.6 0.8	**FILL:** clayey silt, trace organics, grey, moist, compact	2	SS	18				
78.9 1.5	**CLAYEY SILT TILL:** sandy, trace gravel, grey, moist, stiff	3	SS	9		125		9 33 42 16
78.1 2.3	**SILT:** trace to some clay, trace sand, brown, moist, compact	4	SS	22		>225		
77.3 3.1	**SILTY SAND:** some gravel, brown, moist, very dense	5	SS	50/100 mm				
76.6 3.8	**SILTY CLAY:** trace sand, grey, moist, hard to very stiff	6	SS	33		>225		
		7	SS	21		>225		
74.3 6.1	**SILT TO CLAYEY SILT:** trace sand, grey, moist, compact to very dense	8	SS	22		>225		
		9	SS	50/50 mm				
71.3 9.1	**SHALE:** Georgian Bay Formation, weathered, grey	10	SS	50/50 mm				
71.1 9.3	**END OF BOREHOLE** Notes: 1) Borehole dry and open upon completion.							



GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

LOG OF BOREHOLE BH18-16

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-23-2018

REF. NO.: 18-519-10
ENCL NO.: 17

(m) ELEV / DEPTH	SOIL PROFILE DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)
82.9						
82.8 0.1	**TOPSOIL:** 100 mm					
	FILL: clayey silt, mixed with topsoil, brown, moist, compact	1	SS	19		
		2	SS	10	Bentonite	
		3	SS	15		
80.6 2.3	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff to hard	4	SS	21	W. L. 80.2 m Sep 26, 2018	>225
	frequent wet sand seams	5	SS	28		
79.4 3.5	**SAND:** trace silt, brown, wet, compact				Slotted Pipe	
78.3 4.6	**CLAYEY SILT TILL:** sandy, trace gravel, grey, moist, hard	6	SS	30		
		7	SS	36		>225
75.3 7.6	**SANDY SILT TILL:** some clay, trace gravel, sand seams, grey, very moist to wet, dense	8	SS	38		
73.8 9.1	**CLAYEY SILT TILL:** sandy, trace gravel, grey, moist, very stiff to hard	9	SS	30		>225

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH (kPa): ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE: 20 40 60 80 100
PLASTIC LIMIT W_P NATURAL MOISTURE CONTENT W LIQUID LIMIT W_L; WATER CONTENT (%): 10 20 30
NATURAL UNIT WT (kN/m³)
METHANE AND GRAIN SIZE DISTRIBUTION (%): GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3, \times^3$: Numbers refer to Sensitivity ○ ^{8}=3% Strain at Failure

LOG OF BOREHOLE BH18-16

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-23-2018

REF. NO.: 18-519-10
ENCL NO.: 17

SOIL PROFILE		SAMPLES								
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT TILL: sandy, trace gravel, grey, moist, very stiff to hard(Continued)								
11		10	SS	33		72			
12						71			
70.7 12.2	**CLAYEY SILT:** trace sand, occassional seams of silt, grey, moist, very stiff to hard	11	SS	21			>225		
13						70			
14		12	SS	29		69			
15						68			
		13	SS	30		67			
16									
	frequent seams of silt below 16.8 m					66			
17		14	SS	28					
18						65			
		15	SS	24		64			
19									
20						63			

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT W_L
WATER CONTENT (%) 10 20 30

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3, \times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-16

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-23-2018

REF. NO.: 18-519-10
ENCL NO.: 17

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION					
		▨	16	SS	25							
62.5 20.4	**END OF BOREHOLE:** Notes: 1) Monitoring well was installed beside BH18-16. 2) Water level in the monitoring well at 2.7m on Sept. 26, 2018.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-17

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-16-2018

REF. NO.: 18-519-10
ENCL NO.: 18

SOIL PROFILE

(m) ELEV DEPTH	DESCRIPTION
80.3	
80.2 0.1	**ASPHALT:** 100 mm
80.0	**GRANULAR BASE:** 250 mm
0.3	**FILL:** sandy silt, trace topsoil/organics, greyish brown, moist
79.5 0.8	**FILL:** silty clay, trace organics, trace gravel, grey, moist, loose
78.8 1.5	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff to hard
74.2 6.1	**CLAYEY SILT:** sandy, grey, moist, hard
71.2 9.1	**SILT:** some clay, trace sand, grey, moist to wet, compact

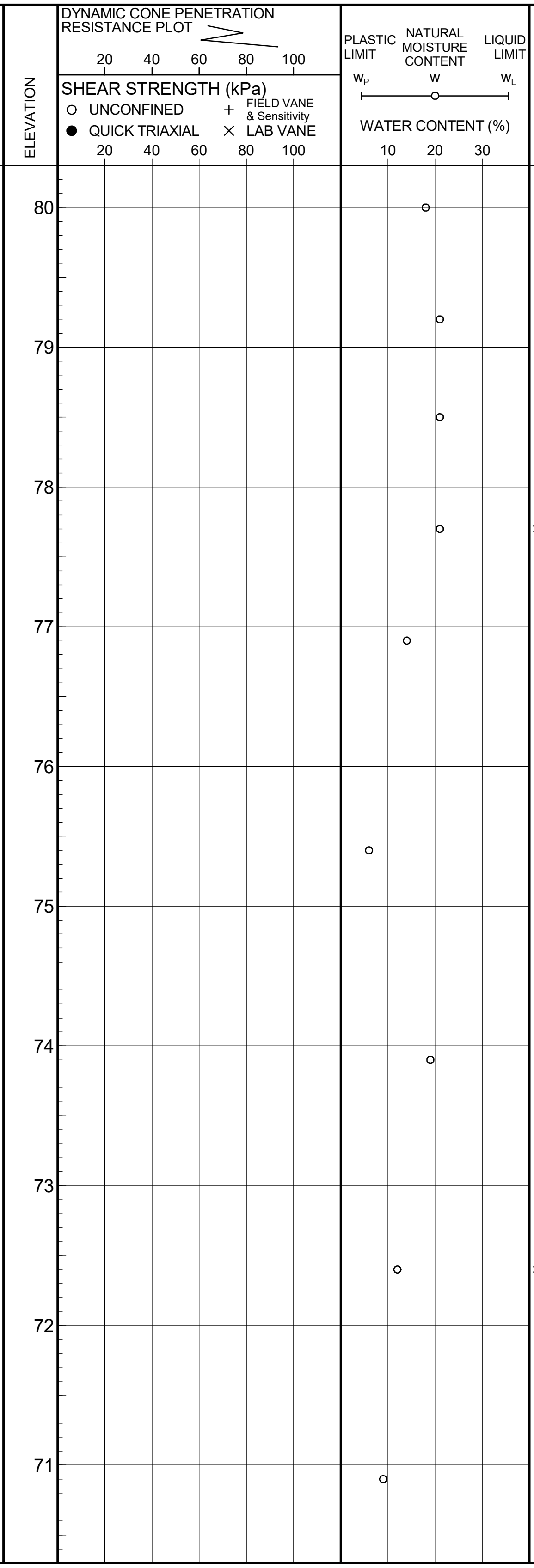
SAMPLES

NUMBER	TYPE	"N" BLOWS/0.3 m	POCKET PEN. (Cu) (kPa)
1	AS		
2	SS	7	
3	SS	18	
4	SS	50/ 25mm	>225
5	SS	82/ 280mm	
6	SS	26	
7	SS	34	
8	SS	36	>225
9	SS	26	

GROUND WATER CONDITIONS

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

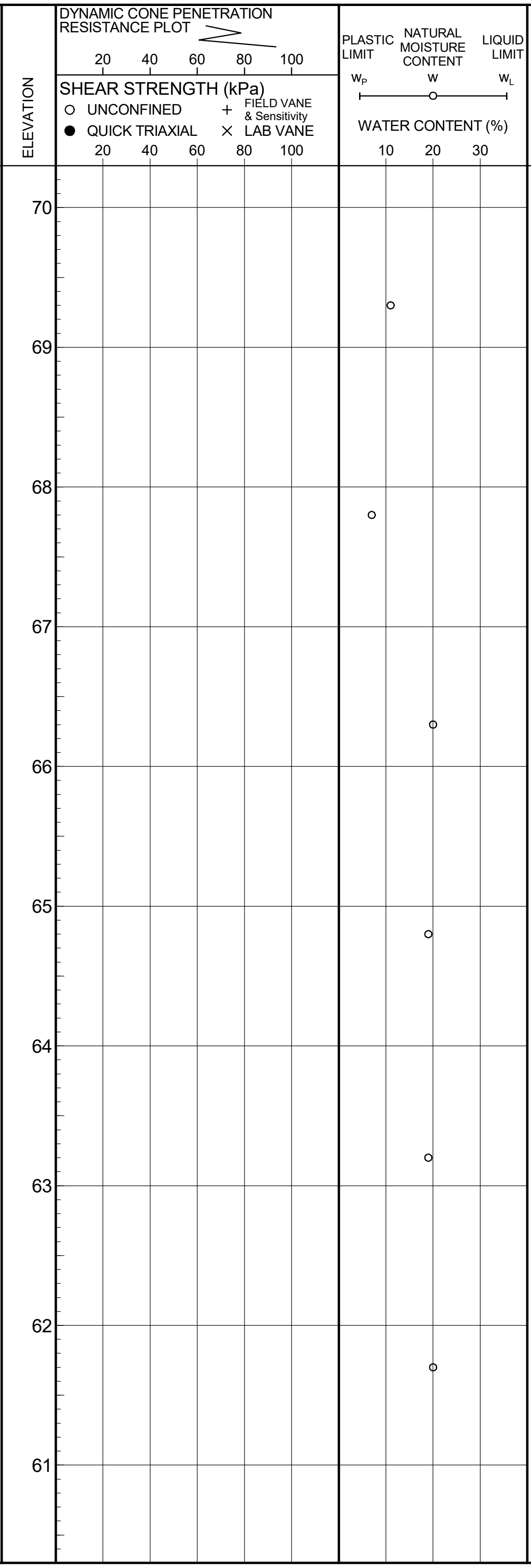
LOG OF BOREHOLE BH18-17

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-16-2018

REF. NO.: 18-519-10
ENCL NO.: 18

(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILT: some clay, trace sand, grey, moist to wet, compact(Continued)		10	SS	27				
68.1 12.2	**SILTY CLAY & SILT:** interbedded, trace sand, grey, moist, hard		11 12	SS SS	37 45				
65.1 15.2	**SILT TO SANDY SILT:** trace clay, grey, wet, very dense		13	SS	53				
63.5 16.8	**SILTY CLAY:**trace sand, grey, moist, hard		14	SS	73				
62.0 18.3	**SILT:**trace to some clay, grey, wet, very dense		15	SS	70/ 280mm				
60.8 19.5	**CLAYEY SILT TILL:**sandy, trace gravel, grey,moist, hard								



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3, \times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-17

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-16-2018

REF. NO.: 18-519-10
ENCL NO.: 18

SOIL PROFILE			SAMPLES									
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT TILL:sandy, trace gravel, grey,moist, hard(Continued)		16	SS	50/ 50mm		60		○			
59.9 20.4	**END OF BOREHOLE** Notes: 1) Water level at 9.1m during drilling.											

GROUNDWATER ELEVATIONS
Measurement 1st ∇ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

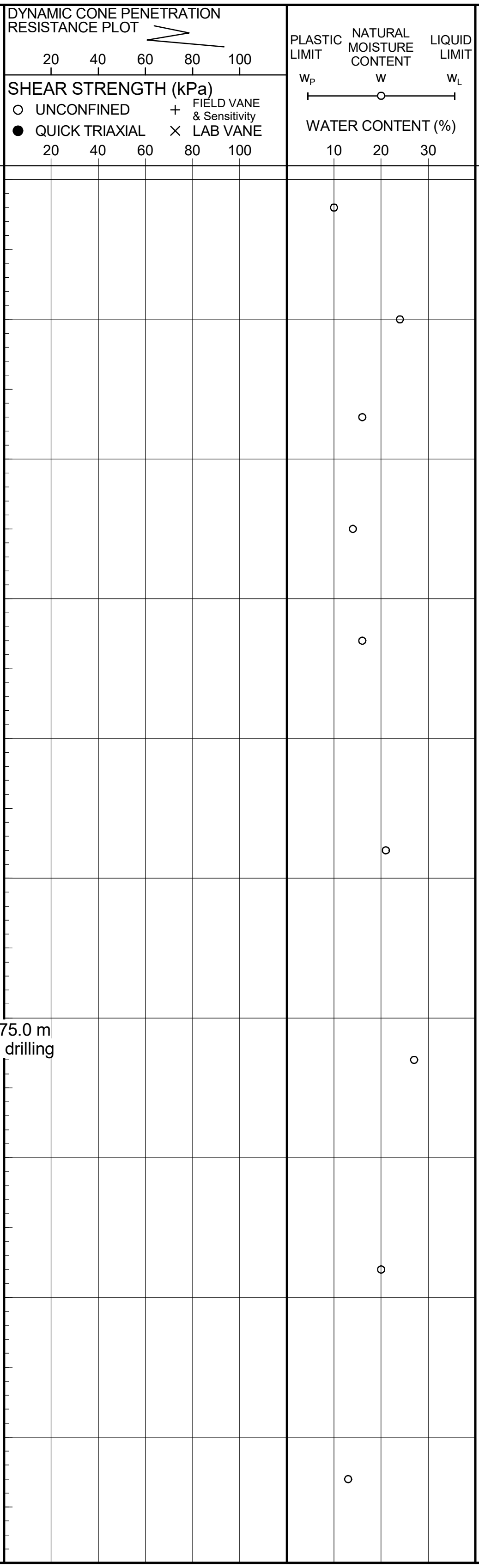
LOG OF BOREHOLE BH18-18

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-11-2018

REF. NO.: 18-519-10
ENCL NO.: 19

(m) ELEV DEPTH	SOIL PROFILE DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
81.1 0.0	**FILL:** sand and gravel, moist	1	AS					
80.3 0.8	**FILL:**clayey silt, trace to some organics, greyish brown, moist, loose	2	SS	9				
79.4 1.7	**CLAYEY SILT TILL:** sandy, trace gravel, grey, moist, stiff to hard	3	SS	11		125		
		4	SS	29		>225		
		5	SS	33		>225		
76.5 4.6	**SILTY CLAY:**seams of silt, trace sand, grey, moist, very stiff	6	SS	15		175		
75.0 6.1	**SILT:** trace to some clay, grey, wet, compact	7	SS	19	∇ W. L. 75.0 m during drilling			
		8	SS	25				
72.0 9.1	**SAND AND GRAVEL:** some silt, grey, wet, very dense	9	SS	86				



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ∇ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES +3, ×3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

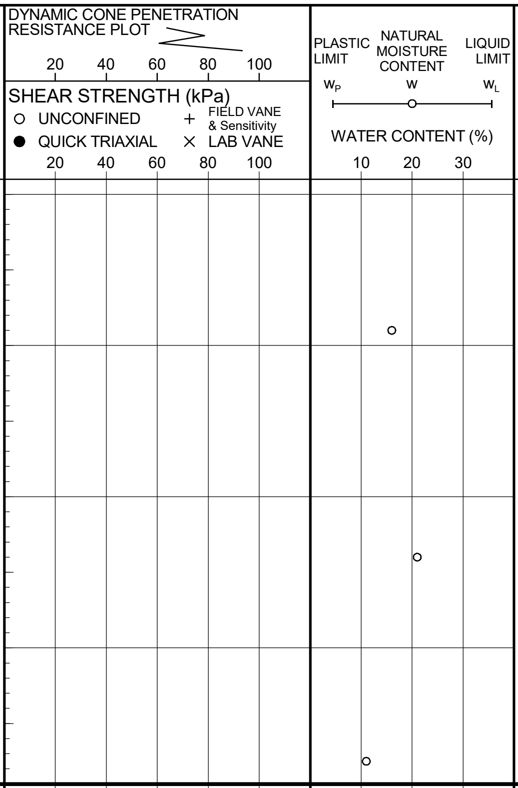
LOG OF BOREHOLE BH18-18

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-11-2018

REF. NO.: 18-519-10
ENCL NO.: 19

SOIL PROFILE		SAMPLES							
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SAND AND GRAVEL: some silt, grey, wet, very dense(Continued)					71			
70.4 10.7	**SILT:** trace to some clay, trace sand, grey, wet, very dense	10	SS	76		70			
68.9 12.2	**SILTY CLAY:** trace sand, grey, moist, hard	11	SS	51		69 68	>225		
67.4 13.7	**SHALE:** Georgian Bay Formation, weathered, grey	12	SS	50/ 50 mm					
67.1 14.0	**END OF BOREHOLE:** Notes: 1) Water level at 6.1m during drilling.								



GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-19

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-11-2018

REF. NO.: 18-519-10
ENCL NO.: 20

ELEV (m) / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)
80.7 / 0.0	**FILL:** sand and gravel, grey, moist	1	AS			
79.9 / 0.8	**FILL:** silty clay, trace organics, trace gravel, greyish brown, moist, firm	2	SS	8		
79.0 / 1.7	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, stiff to hard	3	SS	10		125
		4	SS	26		>225
		5	SS	32	Bentonite	>225
76.2						
76.1 / 4.6	**GEORGIAN BAY FORMATION:** shale interbedded with limestone/siltstone layers, grey	6	SS	50/ 100mm	W. L. 76.0 m Sep 26, 2018	
	Total Core Recovery = 83% Solid Core Recovery = 29% RQD = 17% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 50mm	1	RC			
75.5 / 5.2	Total Core Recovery = 85% Solid Core Recovery = 23% RQD = 18% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 50mm	2	RC			
74.0 / 6.7	Total Core Recovery = 100% Solid Core Recovery = 28% RQD = 19% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 50mm	3	RC		Filter Pack	
72.5 / 8.2	Total Core Recovery = 100% Solid Core Recovery = 28% RQD = 28% Hard Layer (Limestone/Siltstone)= 32% Maximum Thickness of Hard Layer = 380mm	4	RC		Slotted Pipe	
71.0 / 9.7						

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity ○ 3 =3% Strain at Failure

LOG OF BOREHOLE BH18-19

PROJECT: Preliminary Geotechnical Investigation- Proposed Development	**DRILLING DATA**	
CLIENT: Lakeview Community Partners Ltd.	Method: Hollow Stem Auger	
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON	Diameter: 200 mm	REF. NO.: 18-519-10
DATUM: Geodetic	Date: Jul-11-2018	ENCL NO.: 20
BOREHOLE LOCATION: See Drawing 1		

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT W_P NATURAL MOISTURE CONTENT W LIQUID LIMIT W_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION					
11	Total Core Recovery = 100% Solid Core Recovery = 40% RQD = 30% Hard Layer (Limestone/Siltstone)= 15% Maximum Thickness of Hard Layer = 125mm(Continued)		5	RC			70					
69.5 11.2	**END OF BOREHOLE:** Notes: 1) Monitoring well was installed in the borehole upon completion. 2) Water level in the monitoring well at 4.7m on Sept. 26, 2018.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

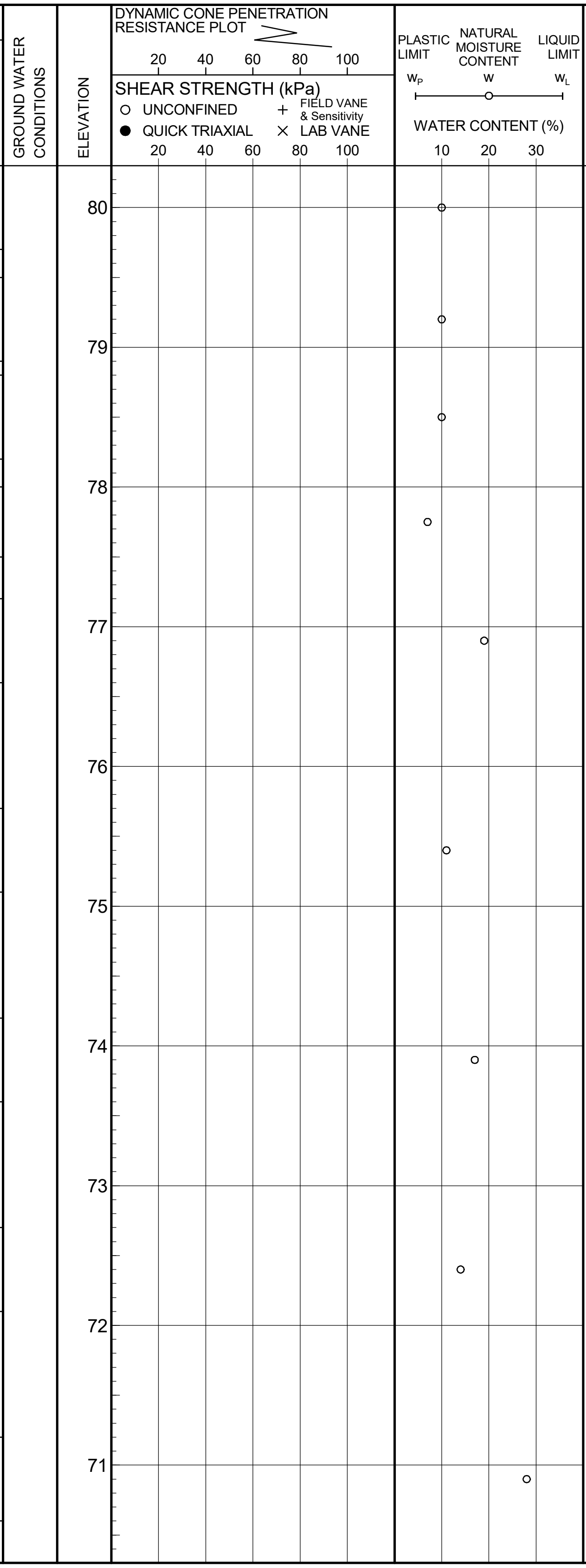
LOG OF BOREHOLE BH18-20

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jun-26-2018

REF. NO.: 18-519-10
ENCL NO.: 21

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS / 0.3 m	POCKET PEN. (Cu) (kPa)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
80.3						
80.2 / 0.1	**ASPHALT:** 70mm					
	GRANULAR BASE: 300mm	1	AS			
79.9 / 0.4	**FILL:** clayey silt, some sand, trace gravel, greyish brown, moist					
79.5 / 0.8	**CLAYEY SILT TILL:** sandy, trace gravel, grey, moist, hard	2	SS	33		
		3	SS	45		
		4	SS	83	>225	
77.2 / 3.1	**SAND:** trace silt, grey, wet, compact					
76.9 / 3.4	**SILTY CLAY :** trace sand, grey, moist, very stiff	5	SS	28		
75.7 / 4.6	**SILT TO CLAYEY SILT:**trace sand, occassional wet sand seams, grey, moist, hard	6	SS	52	>225	Wet Spoon
74.2 / 6.1	**SILT:**trace to some clay, some sand, grey, wet, dense to very dense	7	SS	57		
		8	SS	48		
71.2 / 9.1	**SILT TO CLAYEY SILT:**trace sand, grey, moist to very moist, hard	9	SS	39	>225	



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-20

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jun-26-2018

REF. NO.: 18-519-10
ENCL NO.: 21

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION					
	SILT TO CLAYEY SILT: trace sand, grey, moist to very moist, hard(Continued)						70					
69.6 10.7	**SHALE:** Georgian Bay Formation, weathered, grey		10	SS	50/ 100mm				○			
69.4 10.9	**END OF BOREHOLE** Notes: 1) Water level at 3.1m during drilling.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

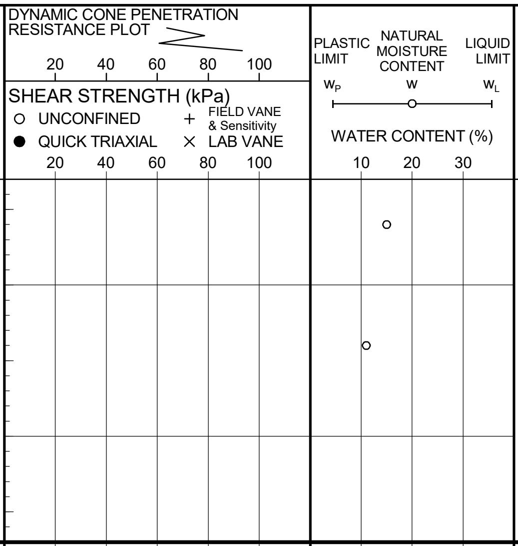
LOG OF BOREHOLE BH18-21

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jun-26-2018

REF. NO.: 18-519-10
ENCL NO.: 22

(m) ELEV DEPTH	DESCRIPTION	SAMPLE NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
79.7						
0.0	**TOPSOIL:** 350mm					
79.4 0.3	**FILL:** silty clay mixed with topsoil, trace gravel, brown, moist, loose	1	SS	8		
79.0 0.7	**FILL:** sand and gravel mixed with weathered shale, brown, moist, compact	2	SS	23		79
78.2 1.5	**SHALE:** Georgian Bay Formation, weathered, grey	3	SS	50/ 100mm		78
77.3 2.4	**END OF BOREHOLE** Notes: 1) Borehole dry and open upon completion.	4	SS	50/ 100mm		



POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³) | METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

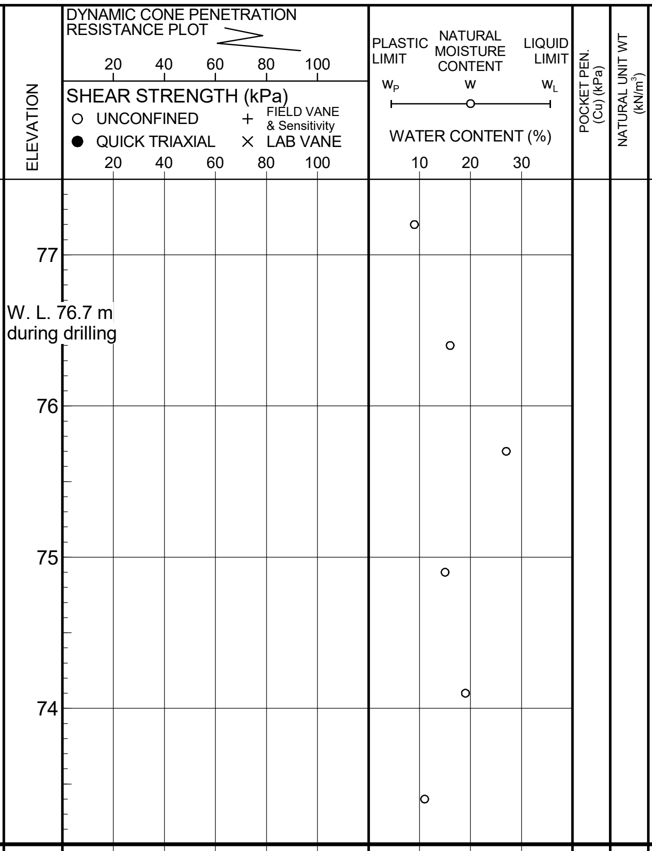
LOG OF BOREHOLE BH18-25

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-10-2018

REF. NO.: 18-519-10
ENCL NO.: 23

(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
77.5						
0.0	**FILL:** sand and gravel, cobbles	1	AS			
76.7 0.8	**FILL:** 19mm crusher run limestone, grey, wet, loose to compact	2	SS	6	∇ W. L. 76.7 m during drilling	Wet spoon
		3	SS	10		
75.2 2.3	**SAND AND GRAVEL:** trace silt, grey, wet, very dense	4	SS	50/100mm		
		5	SS	50/100mm		
73.7 3.8	**SILTY CLAY :** trace to some sand, grey, moist, hard	6	SS	39		
73.3 4.2	**SHALE:** Georgian Bay Formation, weathered, grey					
73.1 4.4	**END OF BOREHOLE:** Notes: 1) Water level at 0.8m during drilling.					



GROUNDWATER ELEVATIONS
Measurement 1st ∇ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

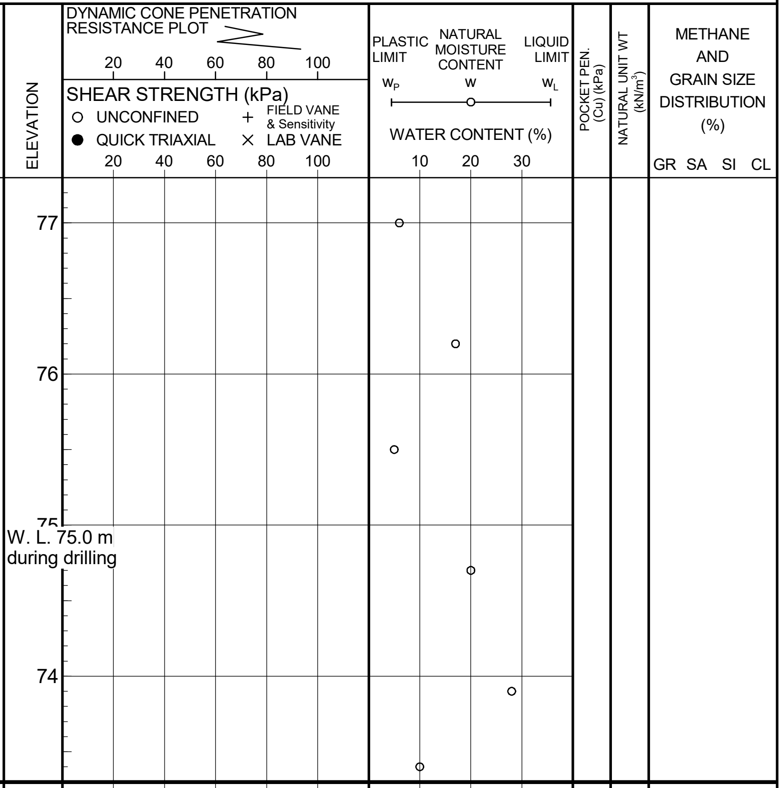
LOG OF BOREHOLE BH18-27

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-10-2018

REF. NO.: 18-519-10
ENCL NO.: 27

(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS
77.3						
0.0	**FILL:** sand and gravel, grey, moist, loose	☒	1	AS		
		☒	2	SS	7	
75.8 1.5	**FILL:** silty sand, trace gravel, brown, moist, compact	☒	3	SS	11	
75.0 2.3	**SAND:** trace silt, brown, wet, very loose		4	SS	WH	▽ W. L. 75.0 m during drilling
74.2 3.1	**SILTY CLAY:** trace sand, grey, moist, firm		5	SS	6	
73.5 3.8	**SHALE:** Georgian Bay Formation, weathered, grey	☰	6	SS	50/100mm	
73.3 4.0	**END OF BOREHOLE:** Note: 1) Water level at 2.3 m during drilling					



GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3, \times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

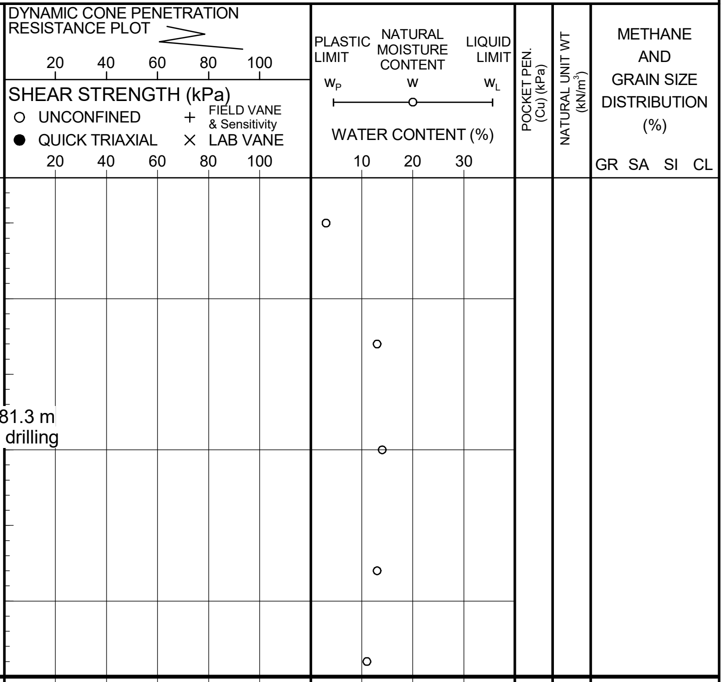
LOG OF BOREHOLE BH18-28

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jun-26-2018

REF. NO.: 18-519-10
ENCL NO.: 25

SOIL PROFILE			SAMPLES					
(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION
82.8							
82.7 0.0 0.1	**ASPHALTIC CONCRETE:** 70mm **GRANULAR BASE:** 600mm		1	AS			
82.1 0.7	**FILL:** clayey silt mixed with sand and gravel, brown, moist, very stiff to firm		2	SS	17		82
	grey and wet below 1.5 m		3	SS	15	W. L. 81.3 m during drilling	81
	fragments of Concrete		4	SS	6		80
79.7 3.1	**SAND AND GRAVEL:** cobbles, brown, wet, very dense		5	SS	57		
79.5 3.3	**END OF BOREHOLE** Notes: 1) Auger refusal at 3.3m on possible shale bedrock.						



GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+3, ×3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

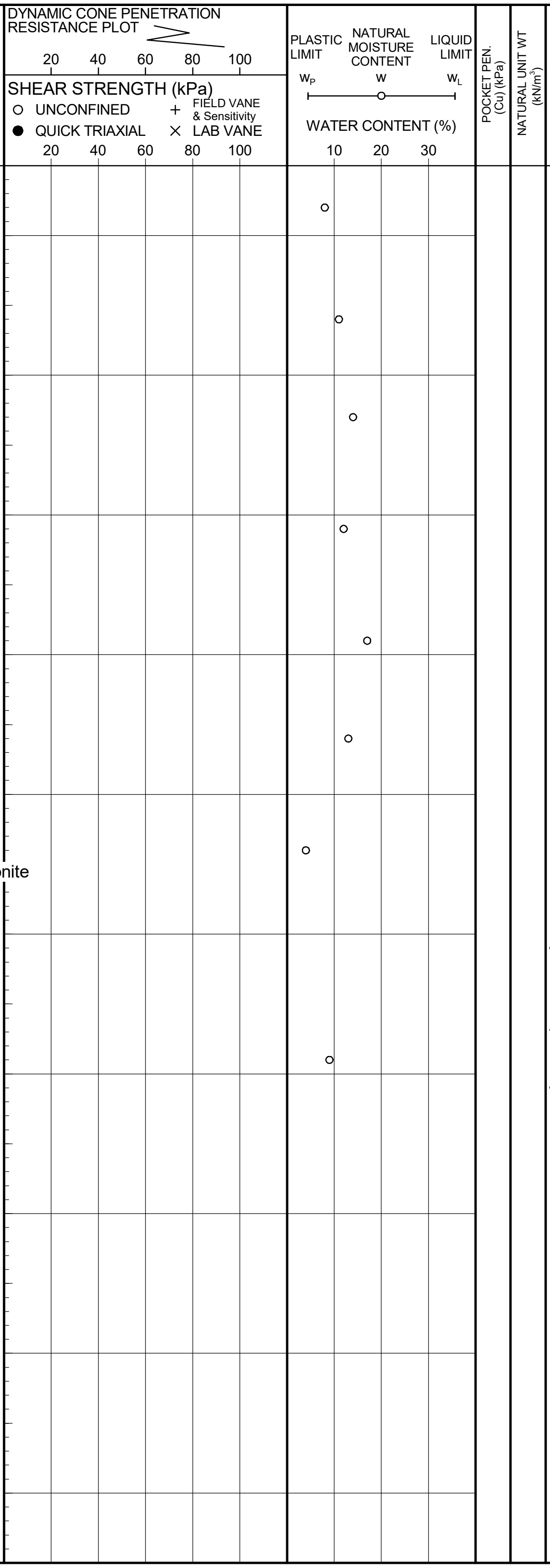
LOG OF BOREHOLE BH18-29

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger/Rock Coring
Diameter: 200 mm
Date: Jul-09-2018

REF. NO.: 18-519-10
ENCL NO.: 24

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS / 0.3 m	ELEVATION	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
77.5						
0.0	**FILL:** sand and gravel, brown, moist	1	AS		77	
76.8 0.7	**FILL:** clayey silt, some sand and gravel, greyish brown, moist, compact	2	SS	17	76	
76.0 1.5	**CLAYEY SILT TILL:** sandy, trace gravel, greyish brown to grey, moist, stiff to very stiff	3	SS	12		
	grey below 2.3 m	4	SS	8	75	
		5	SS	8	74	
		6	AS		73	
		7	SS	21	Bentonite	
					72	July 09, 2018
71.2 6.3	**GEORGIAN BAY FORMATION:**	8	SS	69		------------------
71.0 6.5	shale interbedded with limestone/siltstone layers, grey				71	July 10, 2018
	SHALE BEDROCK: Total Core Recovery = 96% Solid Core Recovery = 70% RQD = 37% Hard Layer (Limestone/Siltstone)= 27% Maximum Thickness of Hard Layer = 270mm	RUN 1	RC		70	
69.5 8.0	**SHALE BEDROCK:** Total Core Recovery = 100% Solid Core Recovery = 77% RQD = 77% Hard Layer (Limestone/Siltstone)= 27% Maximum Thickness of Hard Layer = 230mm	RUN 2	RC		69	
68.0 9.5					68	



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH18-29

2 OF 2

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger/Rock Coring
Diameter: 200 mm
Date: Jul-09-2018

REF. NO.: 18-519-10
ENCL NO.: 24

SOIL PROFILE			SAMPLES									
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT W_P NATURAL MOISTURE CONTENT W LIQUID LIMIT W_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SHALE BEDROCK: Total Core Recovery = 100% Solid Core Recovery = 93% RQD = 93% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 50mm(Continued)		RUN 3	RC		Filter Pack	67					
66.6 10.9	**SHALE BEDROCK:** Total Core Recovery = 100% Solid Core Recovery = 98% RQD = 98% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 100mm		RUN 4	RC			66					
65.2 12.3	**SHALE BEDROCK:** Total Core Recovery = 100% Solid Core Recovery = 97% RQD = 97% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 100mm		RUN 5	RC		Slotted Pipe	65 64					
63.6 13.9	**END OF BOREHOLE** Notes: 1) Monitoring well was installed in the borehole upon completion. 2) Monitoring well was not accessible on Sept. 26, 2018. Area is covered with a stock-pile.											

Depth scale: 11, 12, 13

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

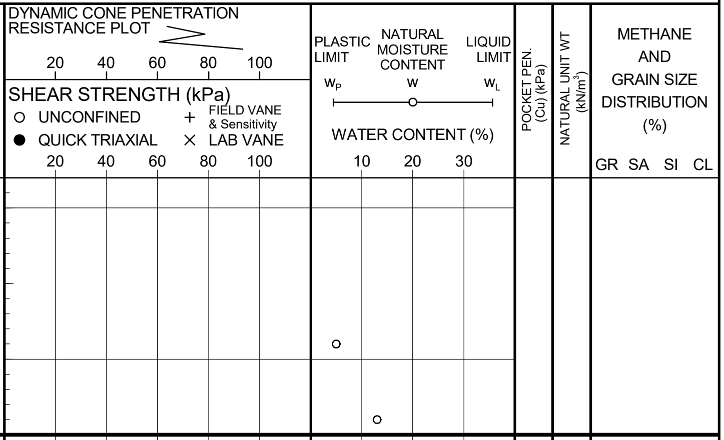
LOG OF BOREHOLE BH18-30

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jun-26-2018

REF. NO.: 18-519-10
ENCL NO.: 26

SOIL PROFILE			SAMPLES					
(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION	
77.2								
77.1 0.0 0.1	**ASPHALTIC CONCRETE:** 70mm	■						
76.8	**GRANULAR BASE:** 300mm	⊠	1	AS			77	
0.4	**SILTY CLAY:** trace sand, shale fragments, grey, moist, hard	▨	2	SS	21		76	
75.7 1.5	**SHALE:** Georgian Bay Formation, weathered, grey	☰	3	SS	50/ 75mm			
75.5 1.7	**END OF BOREHOLE** Notes: 1) Borehole dry and open upon completion.							



GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

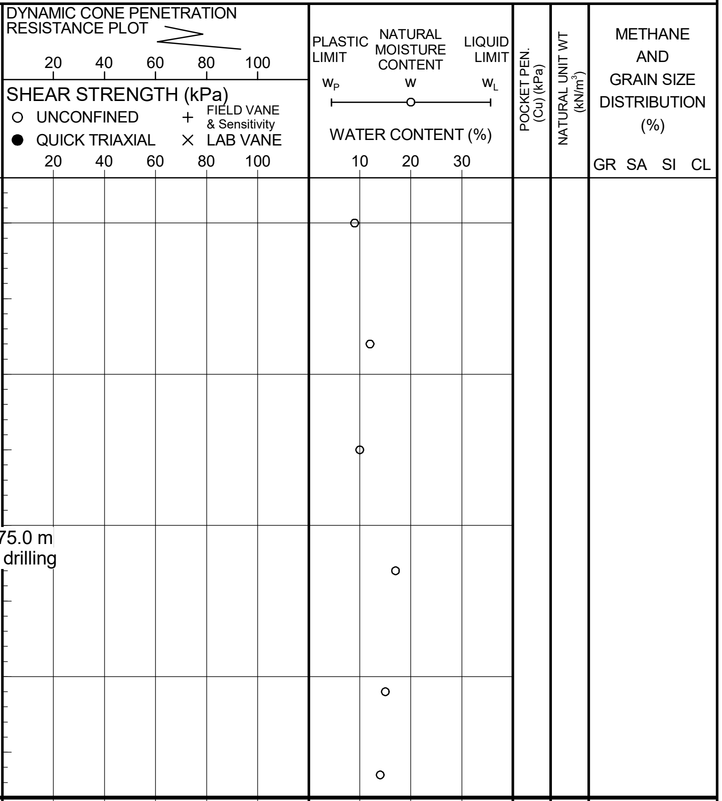
LOG OF BOREHOLE BH18-31

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-17-2018

REF. NO.: 18-519-10
ENCL NO.: 28

SOIL PROFILE			SAMPLES				
(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION
77.3							
0.0	**FILL:** silty sand and gravel, grey, moist	▨	1	AS			77
76.5 0.8	**FILL:** silty clay, trace gravel, trace organics, grey, moist to wet, stiff to firm	▨	2	SS	15		76
		▨	3	SS	7	∇ W. L. 75.0 m during drilling	75
		▨	4	SS	5		
		▨	5	SS	5		74
73.5 3.8	**SHALE:** Georgian Bay Formation, weathered, grey	☰	6	SS	50/ 125mm		
73.2 4.1	**END OF BOREHOLE:** Notes: 1) Water level at 2.3 m during drilling						



GROUNDWATER ELEVATIONS
Measurement 1st ∇ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + ³, × ³: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

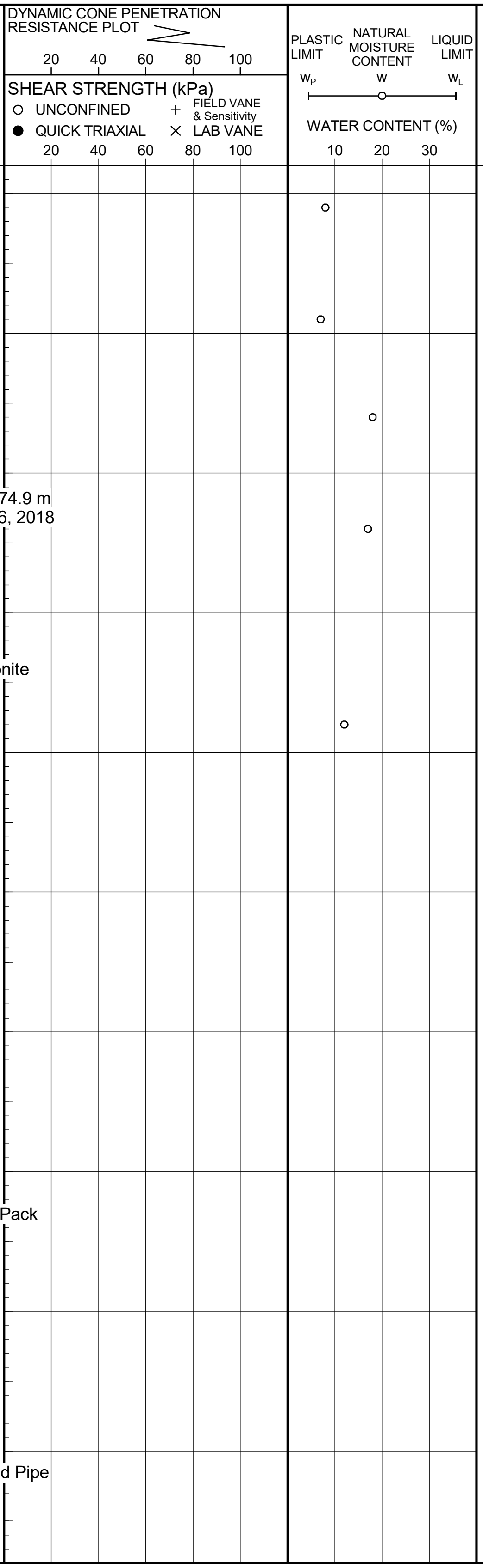
LOG OF BOREHOLE BH18-32

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger/Rock Coring
Diameter: 200 mm
Date: Jul-06-2018

REF. NO.: 18-519-10
ENCL NO.: 29

SOIL PROFILE (m) ELEV DEPTH	DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
77.2 0.0	**FILL:** sand and gravel, brown	1	AS			
76.4 0.8	**FILL:** 19mm crusher run limestone, brick/concrete fragments, grey, wet, compact	2	SS	22		
75.7 1.5	**FILL:**sandy silt mixed with gravel, trace clay, grey, wet, very dense	3	AS	50/ 25mm		
74.9 2.3	**SAND AND GRAVEL:** grey, wet, very loose	4	SS	2	W. L. 74.9 m Sep 26, 2018	
		5	SS	2	Bentonite	July 06, 2018
	cobbles below 4 m	6	SS	50/ 50mm		------------------
72.9 4.3	**GEORGIAN BAY FORMATION:** shale interbedded with limestone/siltstone layers, grey Total Core Recovery = 67% Solid Core Recovery = 33% RQD = 33% Hard Layer (Limestone/Siltstone)=15% Maximum Thickness of Hard Layer = 140mm	RUN 1	RC			July 09, 2018
72.2 5.0	Total Core Recovery = 100% Solid Core Recovery = 84% RQD = 73% Hard Layer (Limestone/Siltstone)= 15% Maximum Thickness of Hard Layer = 140mm	RUN 2	RC			
70.8 6.4	Total Core Recovery = 100% Solid Core Recovery = 94% RQD = 94% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 50mm	RUN 3	RC		Filter Pack	
69.2 8.0	Total Core Recovery = 100% Solid Core Recovery = 93% RQD = 93% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 50mm	RUN 4	RC			
67.8 9.4					Slotted Pipe	



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-32

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger/Rock Coring
Diameter: 200 mm
Date: Jul-06-2018

REF. NO.: 18-519-10
ENCL NO.: 29

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION					
	Total Core Recovery = 100% Solid Core Recovery = 93% RQD = 93% Hard Layer (Limestone/Siltstone)= 15% Maximum Thickness of Hard Layer = 100mm(Continued)		RUN 5	RC			67					
66.3 10.9	**END OF BOREHOLE:** Notes: 1) Monitoring well was installed in the borehole upon completion. 2) Water level in the monitoring well at 2.3m on Sept. 26, 2018.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH18-33

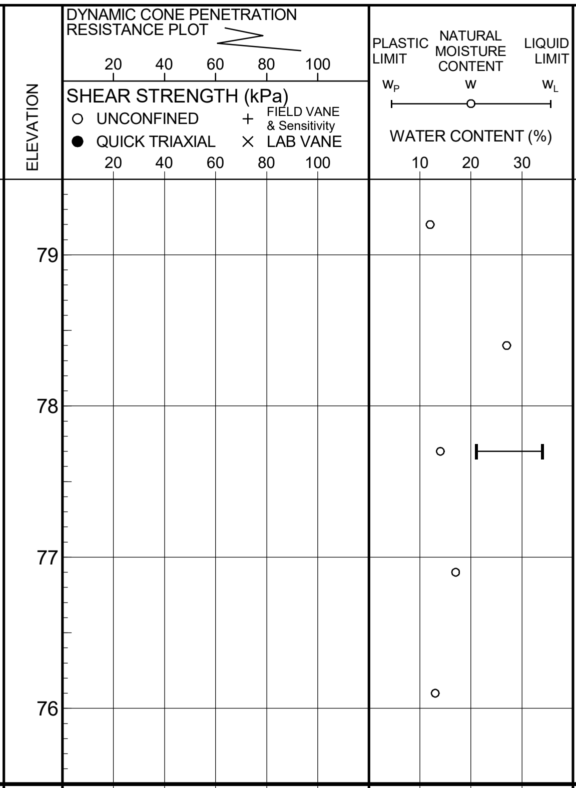
1 OF 1

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-04-2018

REF. NO.: 18-519-10
ENCL NO.: 30

(m) ELEV DEPTH	SOIL PROFILE DESCRIPTION	SAMPLES NUMBER	SAMPLES TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	GR	SA	SI	CL
79.5											
0.0	**TOPSOIL:** 300mm										
79.2 0.3	**FILL:** silty clay, trace sand, grey, moist, compact	1	SS	52							
78.4 1.1	**SILTY CLAY TILL:** sandy, trace gravel, occasional cobble/boulder, brown, moist, stiff to hard	2	SS	14		125					
		3	SS	33		>225		2	23	46	29
		4	SS	55		>225					
		5	SS	62							
75.7 3.8	**SHALE:** Georgian Bay Formation, weathered, grey	6	SS	50/100mm							
75.5 4.0	**END OF BOREHOLE** Notes: 1) Borehole dry and open upon completion.										



METHANE AND GRAIN SIZE DISTRIBUTION (%)

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH18-34

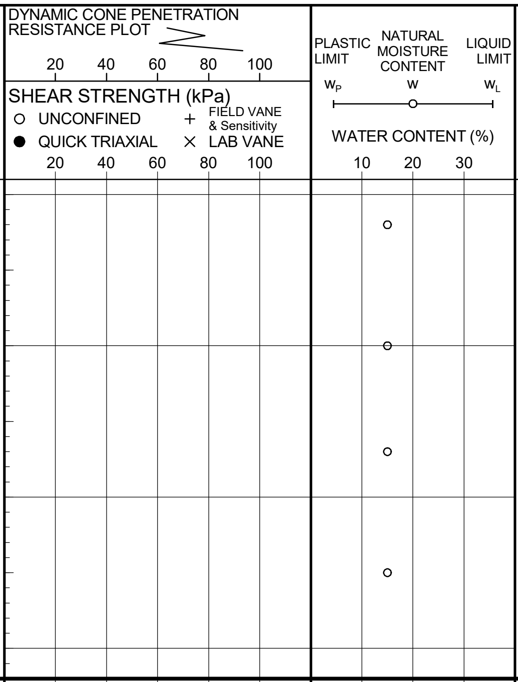
1 OF 1

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-04-2018

REF. NO.: 18-519-10
ENCL NO.: 31

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
80.1										
0.0	**TOPSOIL:** 200mm						80			
79.9 0.2	**FILL:** silty clay, trace gravel, dark grey, moist, loose		1	SS	8					
79.3 0.8	**CLAYEY SILT TILL:** trace gravel, brown, moist, very stiff to hard		2	SS	27		79	>225		
			3	SS	31		78	>225		
			4	SS	72		77			
77.0 3.1	**SHALE:** Georgian Bay Formation, weathered, grey		5	SS	50/ 100mm					
76.8 3.3	**END OF BOREHOLE** Notes: 1) Borehole dry and open upon completion.									



GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ^{8}=3% Strain at Failure

LOG OF BOREHOLE BH18-35

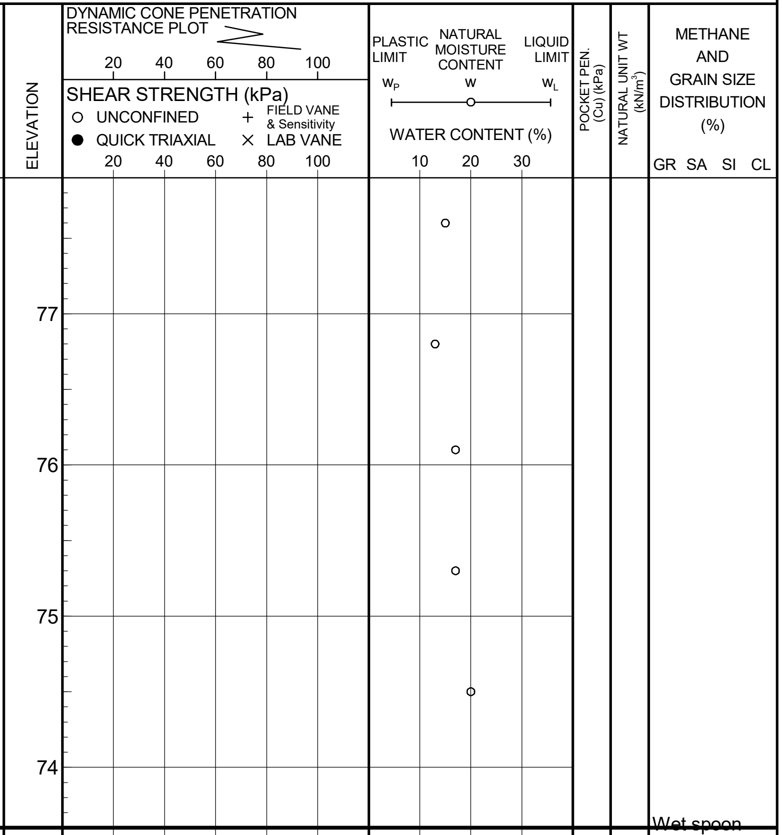
PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-27-2018

REF. NO.: 18-519-10
ENCL NO.: 32

(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
77.9						
77.8 0.1	**TOPSOIL :** 125 mm					
	FILL : clayey silt, trace gravel, trace cobbles, brown to grey, moist, loose to compact	1	SS	11		
		2	SS	20		
		3	SS	13		
		4	SS	10		
		5	SS	5		
73.7						
73.6 4.3	**SHALE:** Georgian Bay Formation, weathered, grey					Wet spoon

END OF BOREHOLE:
Notes:
1) Water level at 4.1 m upon completion of borehole.



GROUNDWATER ELEVATIONS
Measurement 1st ∇ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-36

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-27-2018

REF. NO.: 18-519-10
ENCL NO.: 33

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m		
80.3 0.0	**TOPSOIL :**150 mm						
80.2 0.2	**FILL:** clayey silt, trace asphalt/concrete fragments, trace organics, grey to dark grey, moist, compact		1	SS	18		
			2	SS	12		
78.8 1.5	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff		3	SS	25		
78.0 2.3	**SILTY CLAY:**some sand, brown, moist, hard		4	SS	44		0 11 57 32
			5	SS	50/ 100mm		
75.7 4.6	**SHALE:** Georgian Bay Formation, weathered, grey		6	SS	50/ 75mm		
75.5 4.8	**END OF BOREHOLE:** Notes: 1) Borehole dry and open upon completion.						

ELEVATION

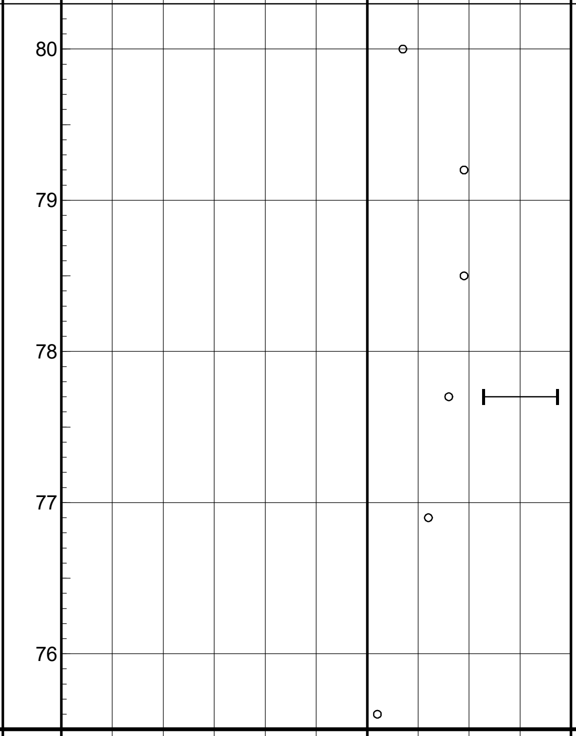
DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT W — LIQUID LIMIT W_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)



GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + ³, × ³: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

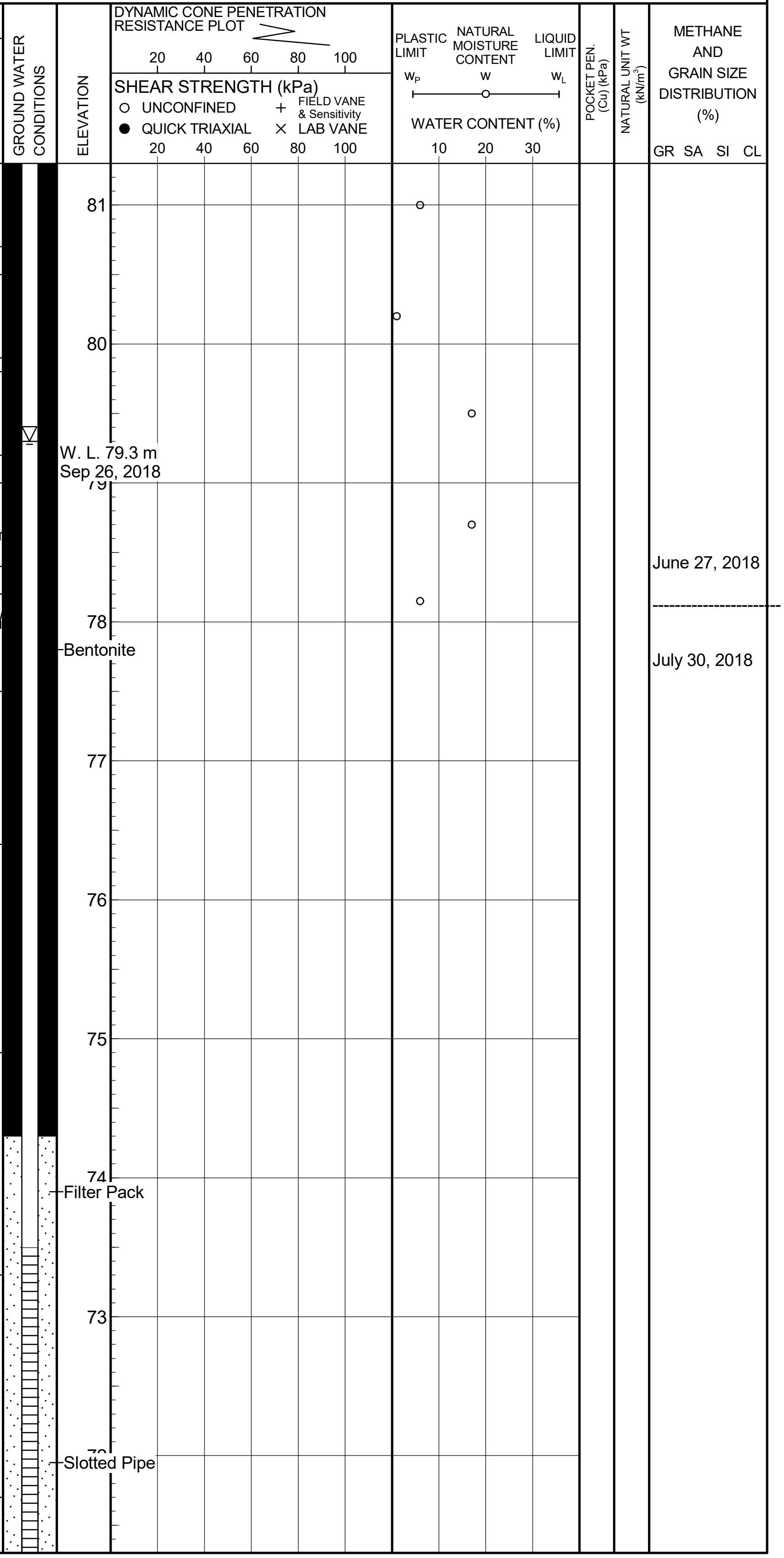
LOG OF BOREHOLE BH18-37

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger/Rock Coring
Diameter: 150mm
Date: Jun-27-2018

REF. NO.: 18-519-10
ENCL NO.: 34

SOIL PROFILE (m) ELEV DEPTH	DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m
81.3				
0.0	**TOPSOIL:** 230mm			
81.1 0.2	**FILL:** clayey silt, trace gravel, trace organics, brown, very moist, compact	1	SS	15
80.6 0.7	**FILL:** sandy gravel/cobbles, grey, moist, compact	2	SS	19
79.8 1.5	**CLAYEY SILT:** trace sand, trace gravel, brown, moist, hard	3	SS	44
		4	SS	50/125mm
78.2 3.1	**GEORGIAN BAY FORMATION:** shale interbedded with limestone/siltstone layers, grey Bedrock coring started at 3.8 m	5	SS	50/75mm
77.5 3.8	Total Core Recovery = 62% Solid Core Recovery = 0% RQD = 0% Hard Layer (Limestone/Siltstone)= less than 5% Maximum Thickness of Hard Layer = 50mm	RUN 1	RC	
76.4 4.9	Total Core Recovery = 90% Solid Core Recovery = 68% RQD = 68% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 50mm	RUN 2	RC	
74.9 6.4	Total Core Recovery = 100% Solid Core Recovery = 61% RQD = 56% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 50mm	RUN 3	RC	
73.3 8.0	Total Core Recovery = 100% Solid Core Recovery = 94% RQD = 94% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 100mm	RUN 4	RC	
71.7 9.6				



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-37

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger/Rock Coring
Diameter: 150mm
Date: Jun-27-2018

REF. NO.: 18-519-10
ENCL NO.: 34

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION					
	Total Core Recovery = 100% Solid Core Recovery = 88% RQD = 88% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 100mm(Continued)		RUN 5	RC			71					
70.4 10.9	**END OF BOREHOLE** Notes: 1) Monitoring well was installed in the borehole upon completion. 2) Water level in the monitoring well at 2.0m on Sept. 26, 2018.											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3$, $\times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

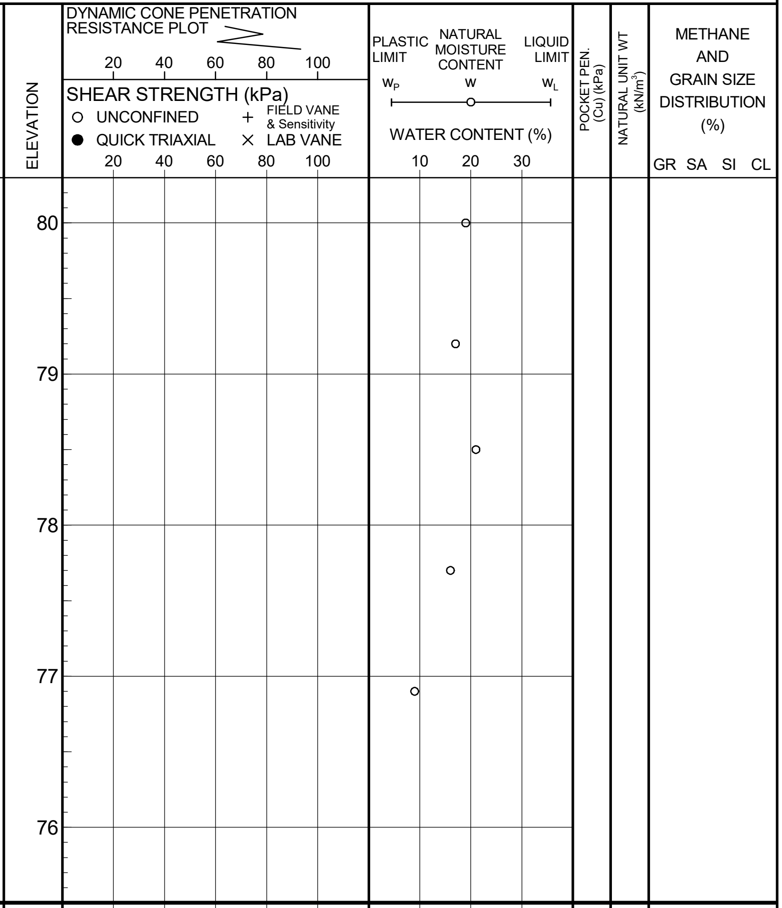
LOG OF BOREHOLE BH18-38

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-27-2018

REF. NO.: 18-519-10
ENCL NO.: 35

SOIL PROFILE		SAMPLES			
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS
80.3					
80.1 0.0	**TOPSOIL:** 230mm				
0.2	**FILL:** clayey silt, trace gravel, trace cobbles, asphalt fragments, dark brown to dark grey, very moist, compact	1	SS	11	
		2	SS	16	
78.5 1.8	**CLAYEY SILT TILL:** sandy, trace gravel, occasional cobble/boulder, brown, moist, stiff to hard	3	SS	14	
		4	SS	58	
		5	SS	50/ 100mm	
75.7 4.6	**SHALE:** Georgian Bay Formation, weathered, grey	6	SS	50/ 50mm	
75.5 4.8	**END OF BOREHOLE** Notes: 1) Borehole dry and open upon completion.				



GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

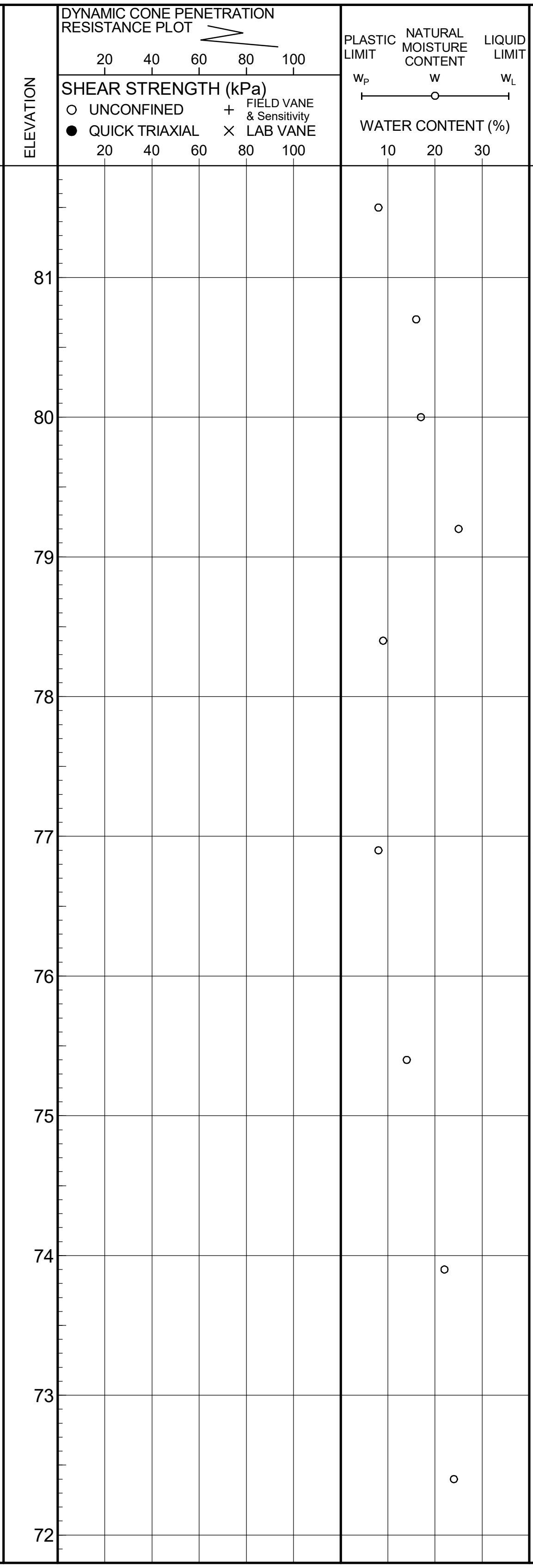
LOG OF BOREHOLE BH18-39

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-21-2018

REF. NO.: 18-519-10
ENCL NO.: 36

SOIL PROFILE		SAMPLES			POCKET PEN. (Cu) (kPa)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS / 0.3 m		
81.8						
0.0	**TOPSOIL:** 250mm					
81.6 0.3	**FILL:** sandy silt mixed with topsoil, brown, moist, compact	1	SS	14		
81.0 0.8	**FILL:** silt to clayey silt, trace gravel, trace topsoil/organics, grey, moist, compact	2	SS	12		
		3	SS	19		
		4	SS	13		
78.7 3.1	**SANDY SILT TILL :** trace to some clay, trace gravel, grey, moist, very dense	5	SS	50/ 125mm		
77.2 4.6	**SILTY CLAY TILL:** sandy, trace gravel, grey, moist, hard	6	SS	65	>225	------------------------ Mud Rotary Drilling
		7	SS	64	>225	
		8	SS	38	>225	
72.7 9.1	**SILT :** some clay, trace gravel, grey, wet, dense	9	SS	36		



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

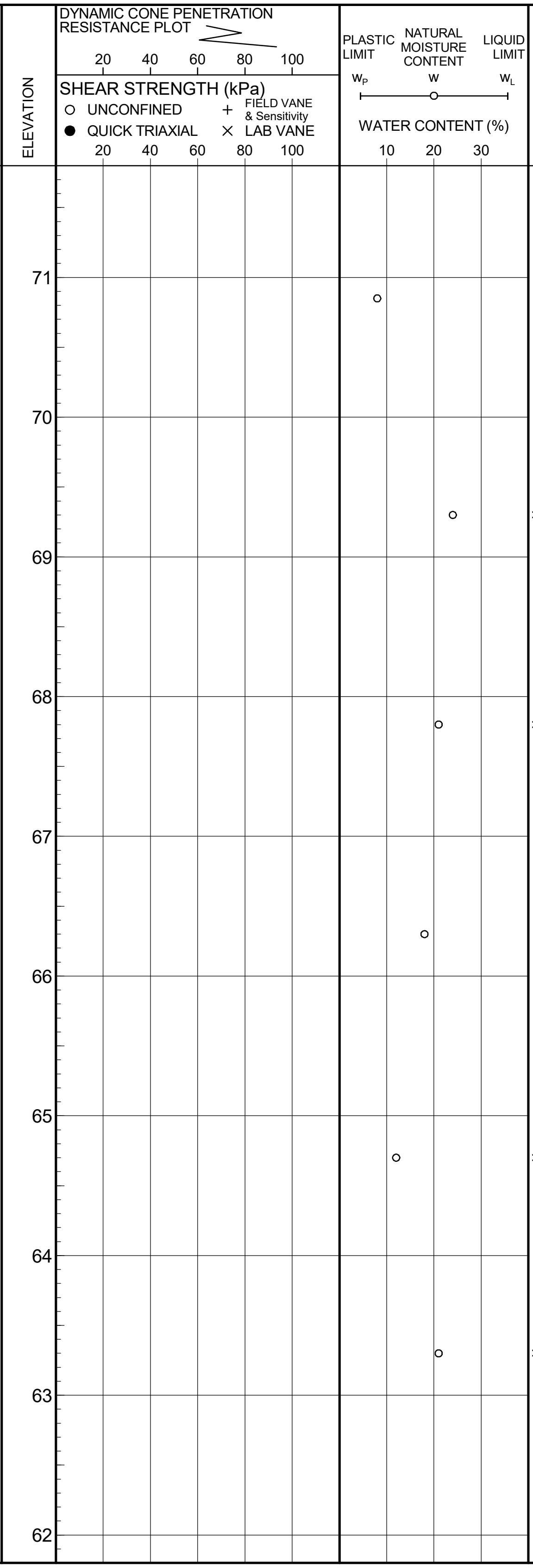
LOG OF BOREHOLE BH18-39

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-21-2018

REF. NO.: 18-519-10
ENCL NO.: 36

(m) ELEV DEPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILT : some clay, trace gravel, grey, wet, dense(Continued)								
71.1 10.7	**SILTY SAND TILL:** trace clay, trace gravel, grey, wet, very dense		10	SS	75				
69.6 12.2	**SILTY CLAY TILL:** sandy, trace gravel, grey, moist, hard		11	SS	40		>225		
	seams of sand at 13.7 m		12	SS	50/ 150mm		>225		
66.6 15.2	**SILT:**trace clay, trace sand, grey, wet, dense		13	SS	44				
65.0 16.8	**SILTY CLAY TILL:** sandy, seams of sand, trace gravel, grey, moist, hard		14	SS	84		>225		
63.5 18.3	**SILTY CLAY:**trace sand, grey, moist, hard		15	SS	64		>225		



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-39

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-21-2018

REF. NO.: 18-519-10
ENCL NO.: 36

SOIL PROFILE			SAMPLES									
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
61.4	**SILTY CLAY:** trace sand, grey, moist, hard(Continued)	▨	16	SS	52				○	>225		
20.4	**END OF BOREHOLE:** Notes: 1) Water level at 9 mbgl during drilling											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3$, $\times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

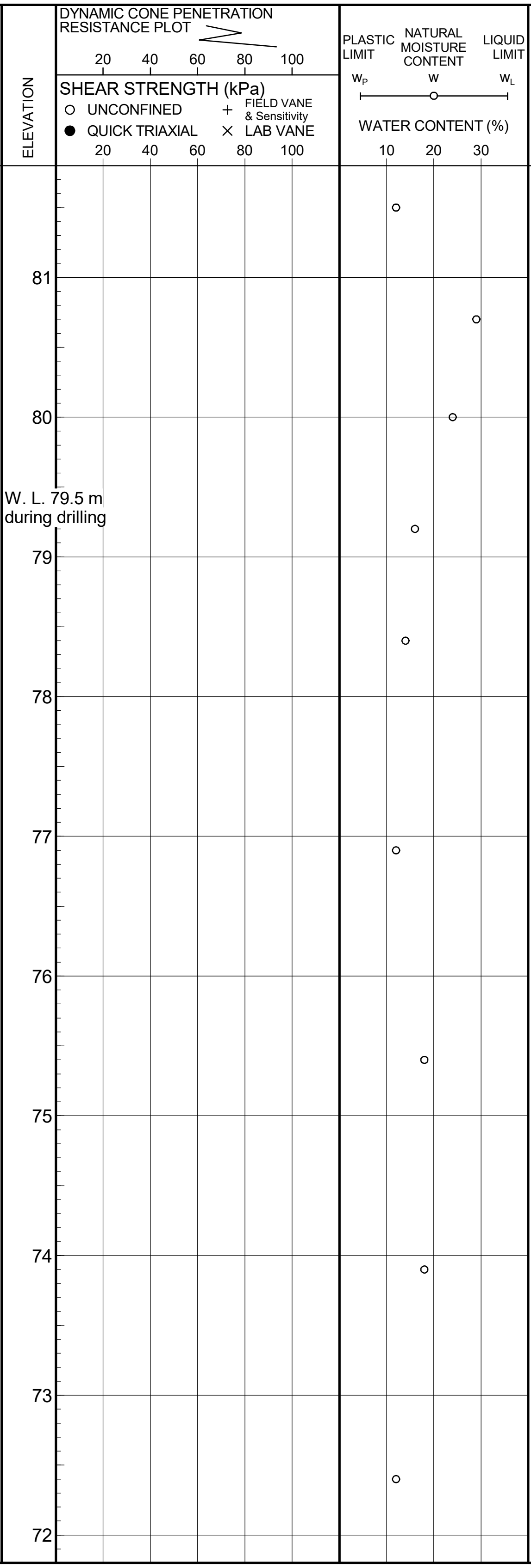
LOG OF BOREHOLE BH18-40

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 37

SOIL PROFILE		SAMPLES						
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
81.8 0.0	**TOPSOIL:** 200mm							
81.6 0.2	**FILL:** clayey silt, trace topsoil/organics, shale fragments, dark brown, moist, compact	1	SS	16				
		2	SS	12				
80.3 1.5	**CLAYEY SILT TILL :** sandy, trace gravel, brown, moist, stiff	3	SS	10		125		
79.5 2.3	**SANDY SILT TO SILTY SAND:** trace clay, brown, wet, very dense	4	SS	50/ 100mm	∇ W. L. 79.5 m during drilling			
78.7 3.1	**SAND AND GRAVEL:** trace silt, grey, wet, very dense	5	SS	52				Wet Spoon
77.2 4.6	**SILTY CLAY TILL :** sandy, trace gravel, grey, moist, hard	6	SS	34				
75.7 6.1	**SANDY SILT :** trace clay, grey, wet, very dense	7	SS	58				0 23 70 7
74.2 7.6	**SILTY CLAY TILL :** sandy, trace gravel, grey, moist, hard	8	SS	44		>225		
	interbed of sand at 9.1 m	9	SS	66		>225		



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ∇ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

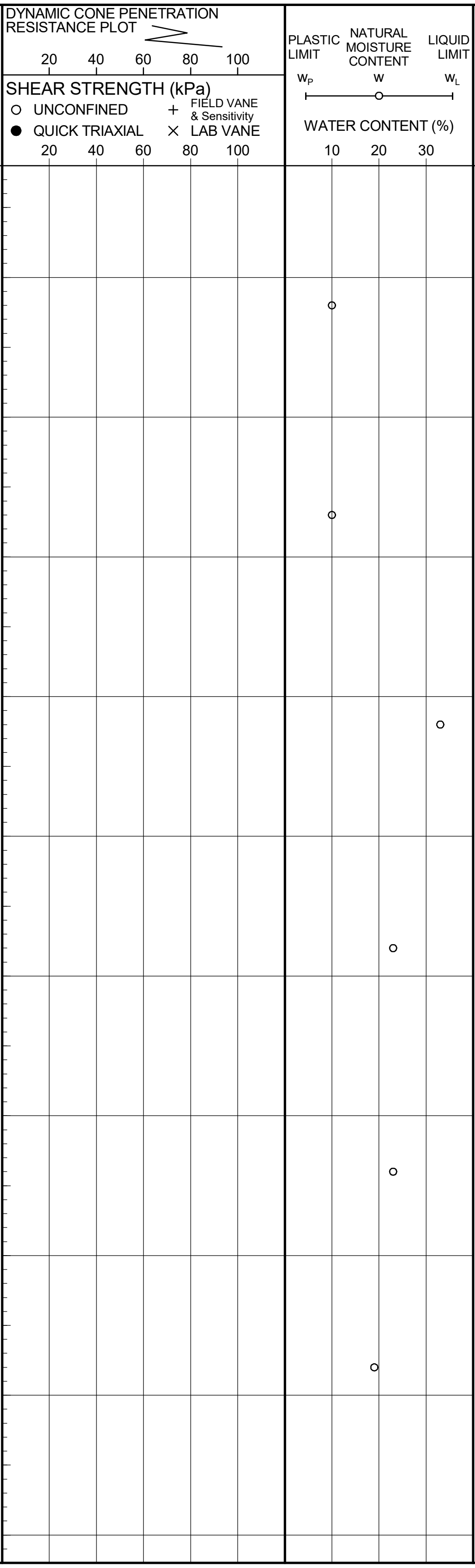
LOG OF BOREHOLE BH18-40

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 37

SOIL PROFILE		SAMPLES				
(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS / 0.3 m	ELEVATION	POCKET PEN. (Cu) (kPa)
	SILTY CLAY TILL : sandy, trace gravel, grey, moist, hard(Continued)					
11		10	SS	90	71	>225
12					70	
		11	SS	73	69	>225
13						
14		12	SS	23	68	175
15					67	
16		13	SS	31	66	>225
17					65	
		14	SS	30	64	175
18						
19		15	SS	30	63	>225
62.0 19.8					62	
20						



GROUND WATER CONDITIONS | STRATA PLOT | NATURAL UNIT WT (kN/m^3) | METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-40

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 37

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m							
	SILTY CLAY: trace sand, grey, moist, very stiff(Continued)	▨	16	SS	26				○	200		
61.4 20.4	**END OF BOREHOLE** Notes: 1) Water level at 2.3 mbgl during drilling											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3$, $\times^3$: Numbers refer to Sensitivity

○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH18-41

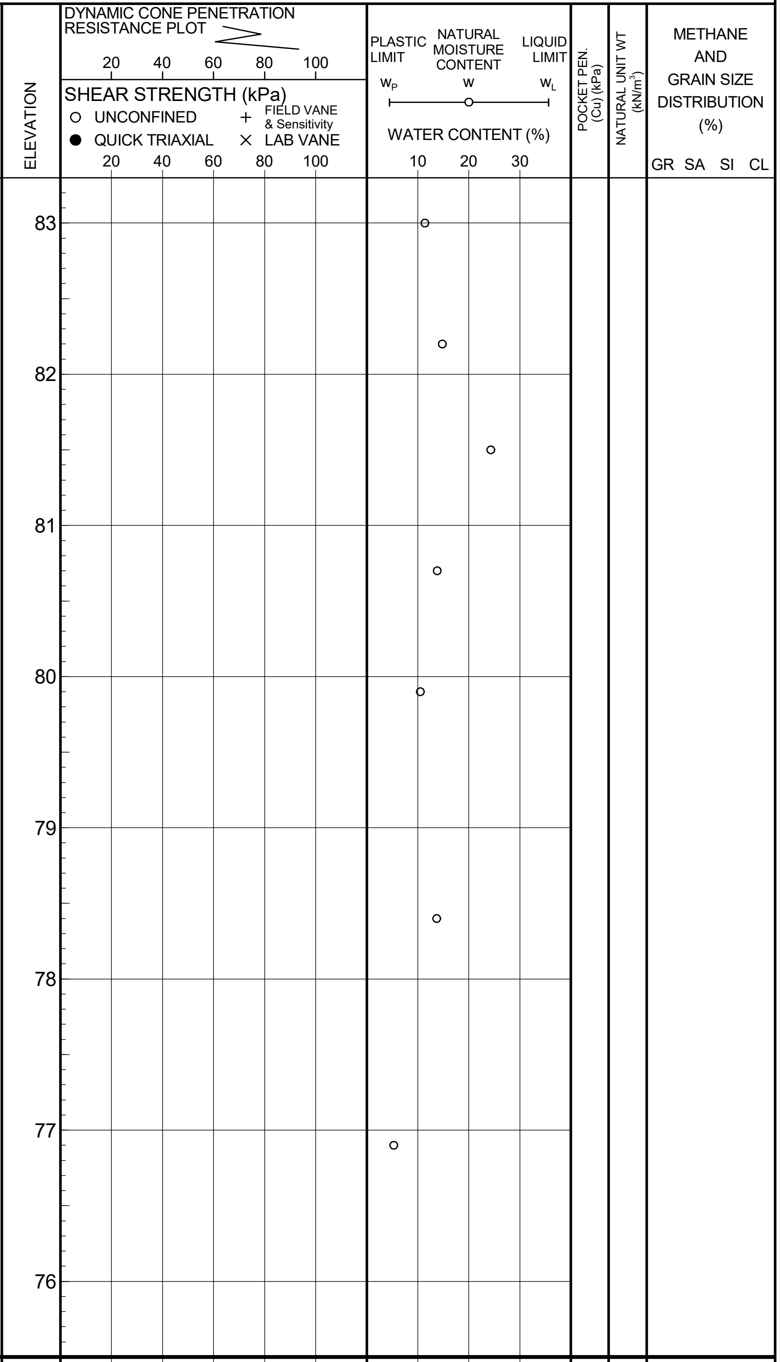
1 OF 1

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-26-2018

REF. NO.: 18-519-10
ENCL NO.: 38

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS/0.3 m	
83.3					
0.0	**TOPSOIL:** 152mm				
83.1 0.2	**FILL:** clayey silt, trace rootlet, trace asphalt, brown, moist, stiff	1	SS	12	
		2	SS	12	
81.8 1.5	**SILT :** some sand, trace clay, brown, wet, loose	3	SS	5	
81.0 2.3	**CLAYEY SILT TILL :** some sand, trace gravel, trace cobble, brown to grey, moist, very stiff to hard	4	SS	18	
		5	SS	50/127mm	
78.7 4.6	**SILT :** some sand, trace clay, grey, very moist to wet, dense	6	SS	32	
77.2 6.1	**CLAYEY SILT TILL :** some sand, trace gravel, trace cobble, grey, moist, hard	7	SS	50/127mm	
75.7 7.6	**SHALE:** Georgian Bay Formation, weathered, grey	8	SS	50/100mm	
75.5 7.8	**END OF BOREHOLE** Notes: 1) Borehole open and dry upon completion				



GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+³, ×³: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

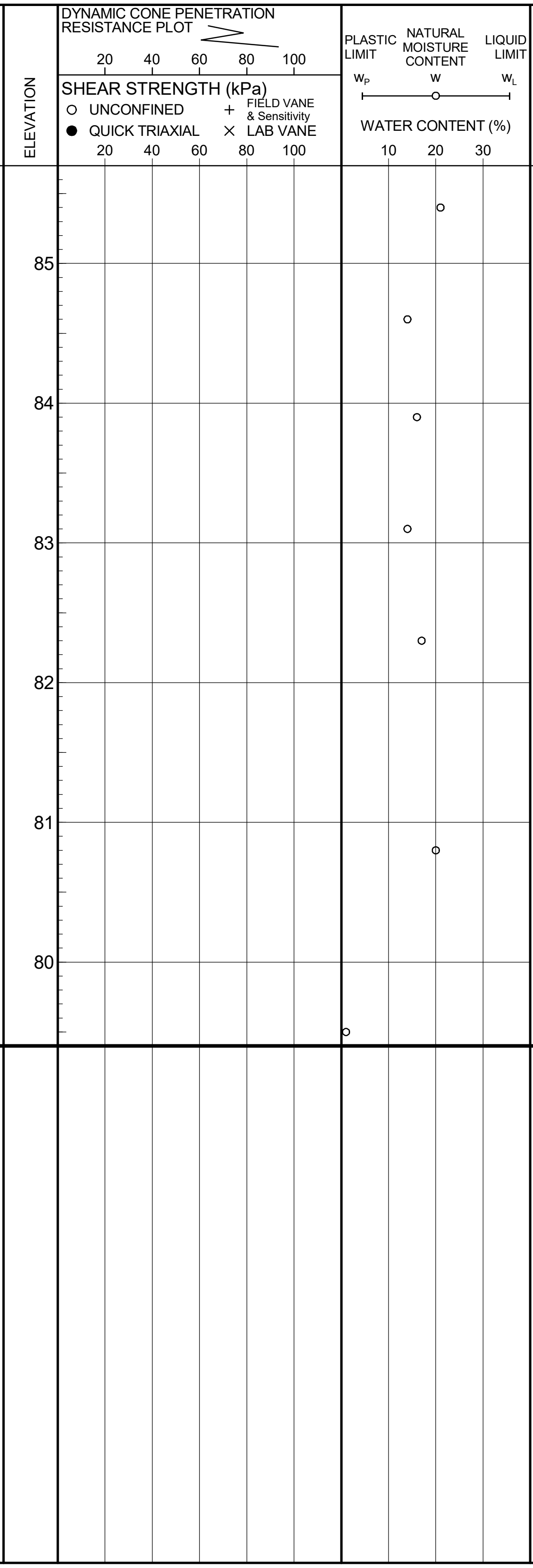
LOG OF BOREHOLE BH18-42

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-29-2018

REF. NO.: 18-519-10
ENCL NO.: 39

(m) ELEV / DEPTH	SOIL PROFILE DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
85.7								
0.0	**TOPSOIL:** 350 mm							
85.4 0.3	**FILL:** silty sand, trace topsoil/rootlets, some gravel, brown, moist, compact	1	SS	10				
84.9 0.8	**FILL:**sandy silt, trace clay, brown, wet, loose	2	SS	4				
84.2 1.5	**FILL:** clayey silt, trace organics, grey, moist, stiff	3	SS	9				
		4	SS	11				
		5	SS	10				
82.3 3.4	**SANDY SILT:** trace clay, brown, moist, compact							
81.1 4.6	**CLAYEY SILT TILL:** trace gravel, brown, moist, hard	6	SS	50/ 150mm		>225		
79.6 6.1	**SHALE:** Georgian Bay Formation, weathered, grey	7	SS	50/ 100mm				
79.4 6.3	**END OF BOREHOLE** Notes: 1) Borehole dry and open upon completion.							



GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3, \times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

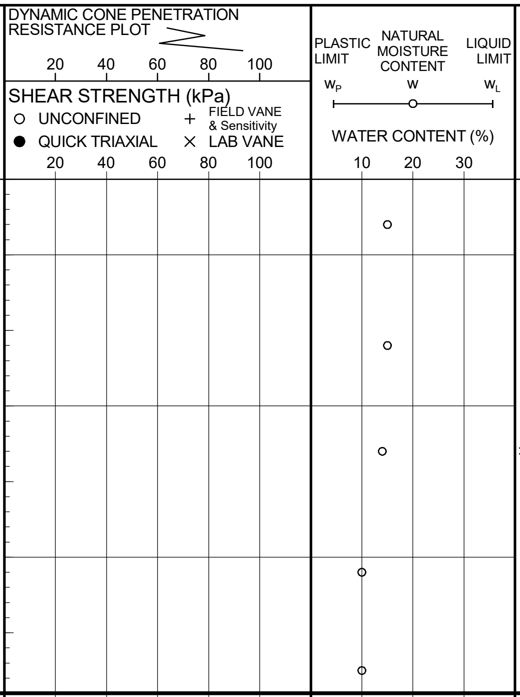
LOG OF BOREHOLE BH18-43

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-29-2018

REF. NO.: 18-519-10
ENCL NO.: 40

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
83.5									
0.0	**TOPSOIL:** 350mm								
83.2 0.3	**FILL:** clayey silt, brown, moist, stiff	1	SS	10		83			
82.7 0.8	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff to hard	2	SS	24		82			
		3	SS	28			>225		
	grey below 2.3 m	4	SS	33		81			
80.4 3.1	**SHALE:** Georgian Bay Formation, weathered, grey	5	SS	50/ 125mm					
80.1 3.4	**END OF BOREHOLE** Notes: 1) Borehole open and dry upon completion								



GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH18-44

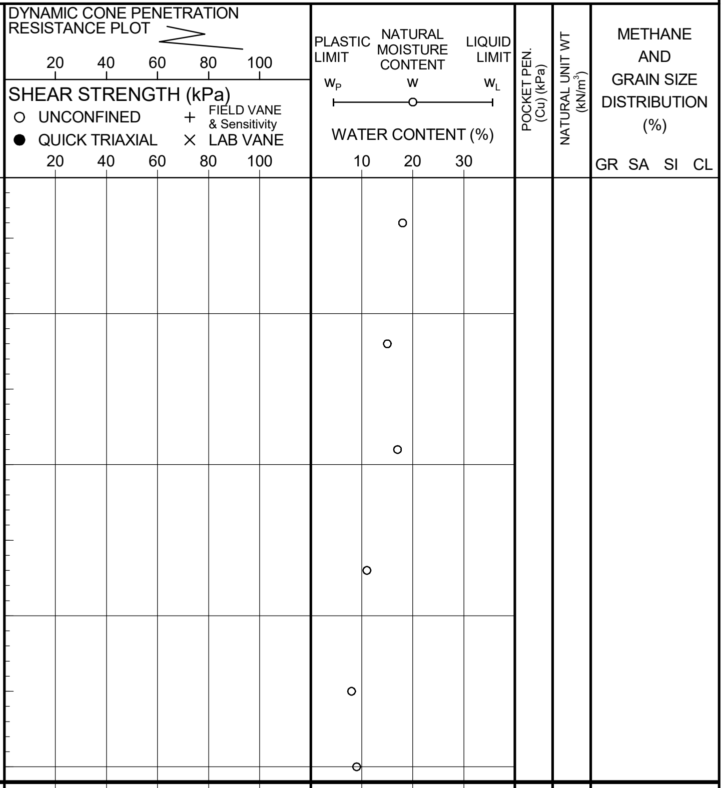
1 OF 1

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-29-2018

REF. NO.: 18-519-10
ENCL NO.: 41

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION
83.9						
0.0	**TOPSOIL:** 350mm					
83.6 0.3	**FILL:** clayey silt, trace organics, brown, moist, firm	1	SS	7		
83.1 0.8	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, stiff to hard	2	SS	14		83
		3	SS	23		82
	trace shale fragments below 2.6 m	4	SS	35		81
		5	SS	43		
80.1 3.8	**SHALE:** Georgian Bay Formation, weathered, grey	6	SS	50/ 100mm		80
79.9 4.0	**END OF BOREHOLE** Notes: 1) Borehole open and dry upon completion					



GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-45

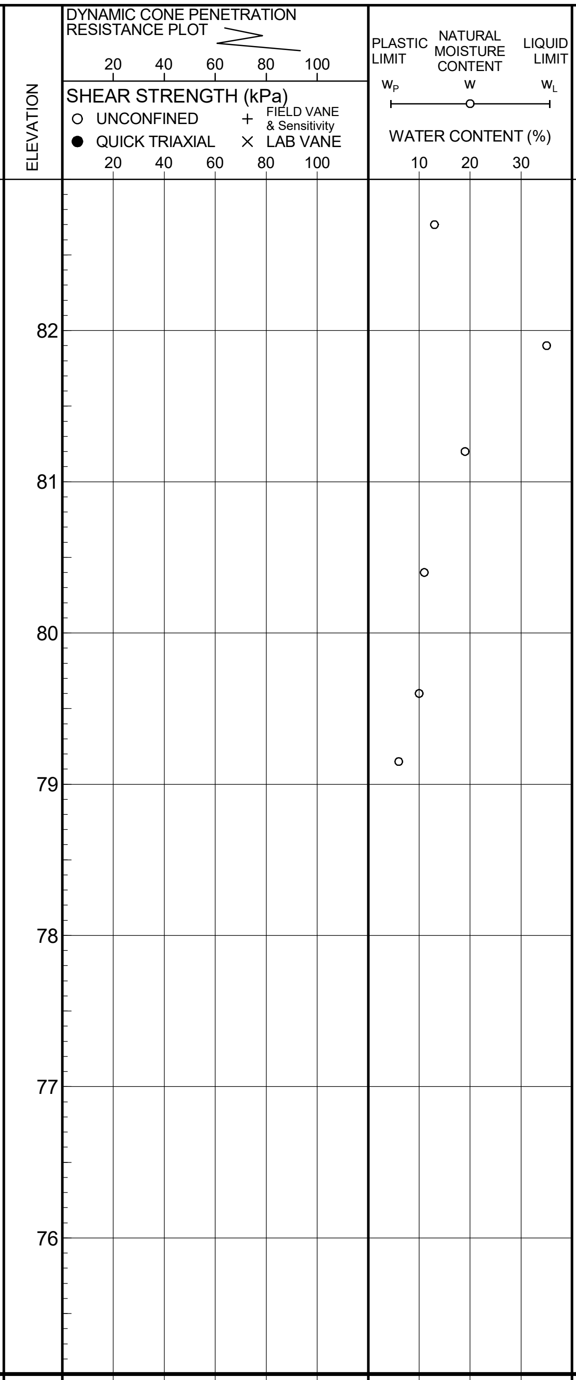
1 OF 1

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-29-2018

REF. NO.: 18-519-10
ENCL NO.: 42

SOIL PROFILE (m) ELEV DEPTH	DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	POCKET PEN. (Cu) (kPa)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
83.0 0.0	**TOPSOIL:** 400mm	1	SS	14		
82.6 0.4	**FILL:** sand and gravel, trace concrete/ brick pieces, brown, moist, compact	2	SS	17		
81.5 1.5	**SILT TO CLAYEY SILT:** brown, moist, stiff	3	SS	13	>225	
80.7 2.3	**SILTY CLAY TILL:** trace gravel, grey, moist, very stiff to hard	4 5	SS SS	25 50/ 100mm		June 29, 2018
79.2 3.8	**GEORGIAN BAY FORMATION:** shale interbedded with limestone/siltstone layers, grey Bedrock Coring started at 4.3 m	6	SS	50/ 50mm		------------------ July 27, 2018
78.7 4.3	**SHALE BEDROCK:** Total Core Recovery = 83% Solid Core Recovery = 75% RQD = 50%	RUN 1	RC			
78.1 4.9	Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 50mm Total Core Recovery = 100% Solid Core Recovery = 93% RQD = 65% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 75mm	RUN 2	RC			
76.6 6.4	**SHALE BEDROCK:** Total Core Recovery = 100% Solid Core Recovery = 57% RQD = 72% Hard Layer (Limestone/Siltstone)= less than 10% Maximum Thickness of Hard Layer = 75mm	RUN 3	RC			
75.1 7.9	**END OF BOREHOLE**					



NATURAL UNIT WT (kN/m³)

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

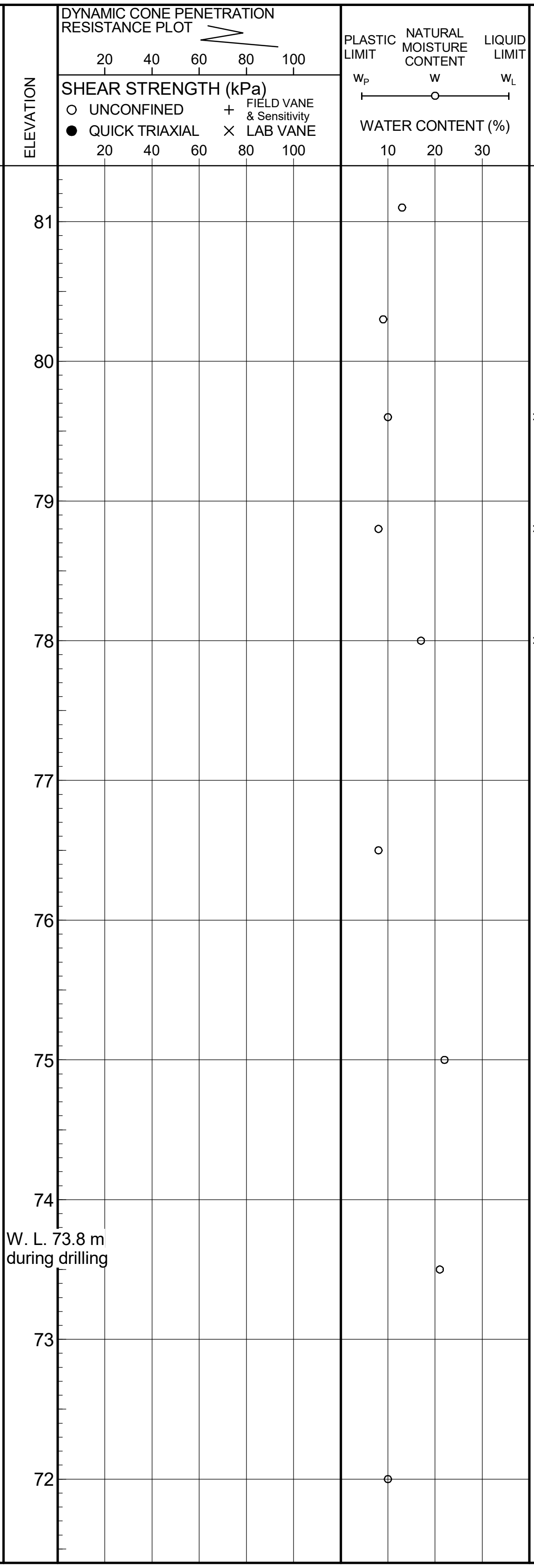
LOG OF BOREHOLE BH18-46

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-17-2018

REF. NO.: 18-519-10
ENCL NO.: 43

SOIL PROFILE (m) ELEV	DEPTH	DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
81.4									
	0.0	**FILI:** sand and gravel, grey, moist	1	AS					
80.6	0.8	**SILTY CLAY TILL :** sandy, trace gravel, brown, moist, hard to very stiff	2	SS	16				
			3	SS	48		>225		
		grey below 2.3 m	4	SS	33		>225		
			5	SS	36		>225		
			6	SS	24		200		
			7	SS	22		200		
73.8	7.6	**SANDY SILT :** trace to some clay, grey, wet, compact to very dense	8	SS	24	∇ W. L. 73.8 m during drilling			
			9	SS	94				



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ∇ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3, \times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-46

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-17-2018

REF. NO.: 18-519-10
ENCL NO.: 43

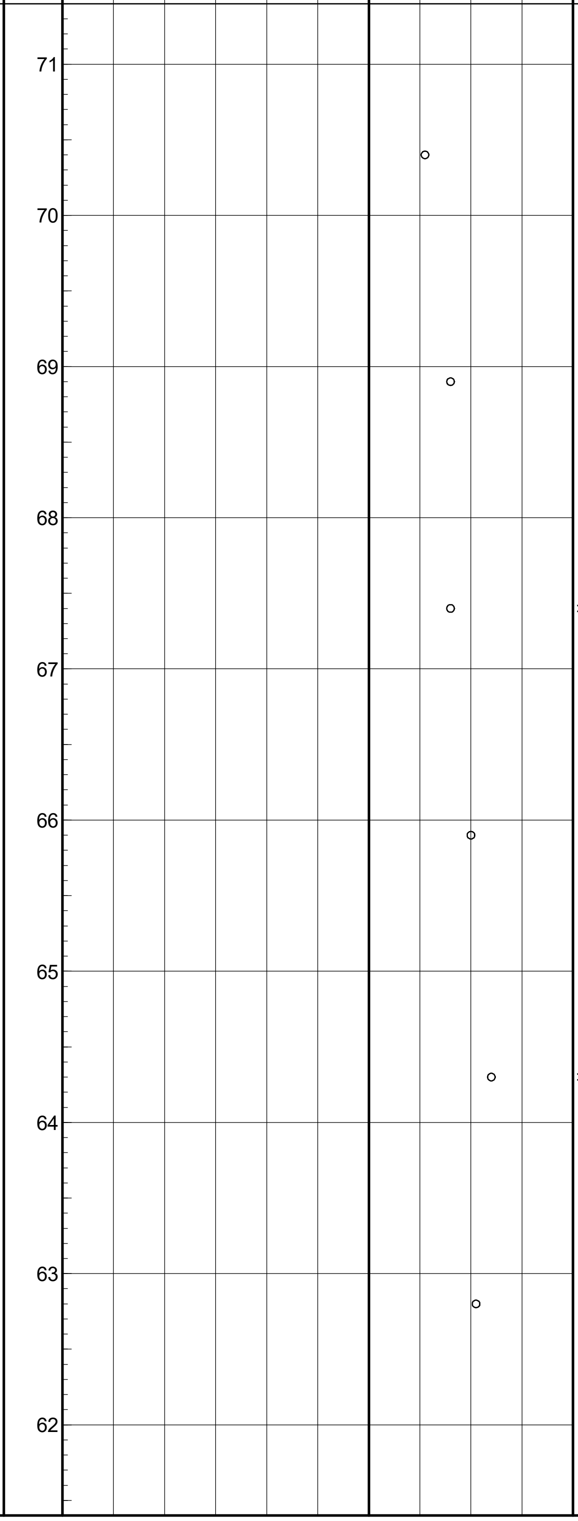
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m	POCKET PEN. (Cu) (kPa)
	SANDY SILT : trace to some clay, grey, wet, compact to very dense(Continued)				
70.7 10.7	**SILT TO SANDY SILT:** trace to some clay, grey, moist to very moist, very dense	10	SS	50	
		11	SS	50/ 127mm	
67.7 13.7	**CLAYEY SILT:** trace sand, grey, moist, hard	12	SS	77	>225
		13	SS	36	
		14	SS	31	>225
		15	SS	51	
61.6 19.8					

DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100
SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT W_P NATURAL MOISTURE CONTENT W LIQUID LIMIT W_L
WATER CONTENT (%) 10 20 30

NATURAL UNIT WT (kN/m^3)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH18-46

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: Jul-17-2018

REF. NO.: 18-519-10
ENCL NO.: 43

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION					
	SILT : some clay, grey, wet, very dense(Continued)		16	SS	62				○			
61.0 20.4	**END OF BOREHOLE:** Notes: 1) Water level at 7.6 mbgl during drilling						61					

GROUNDWATER ELEVATIONS
Measurement 1st ∇ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-47

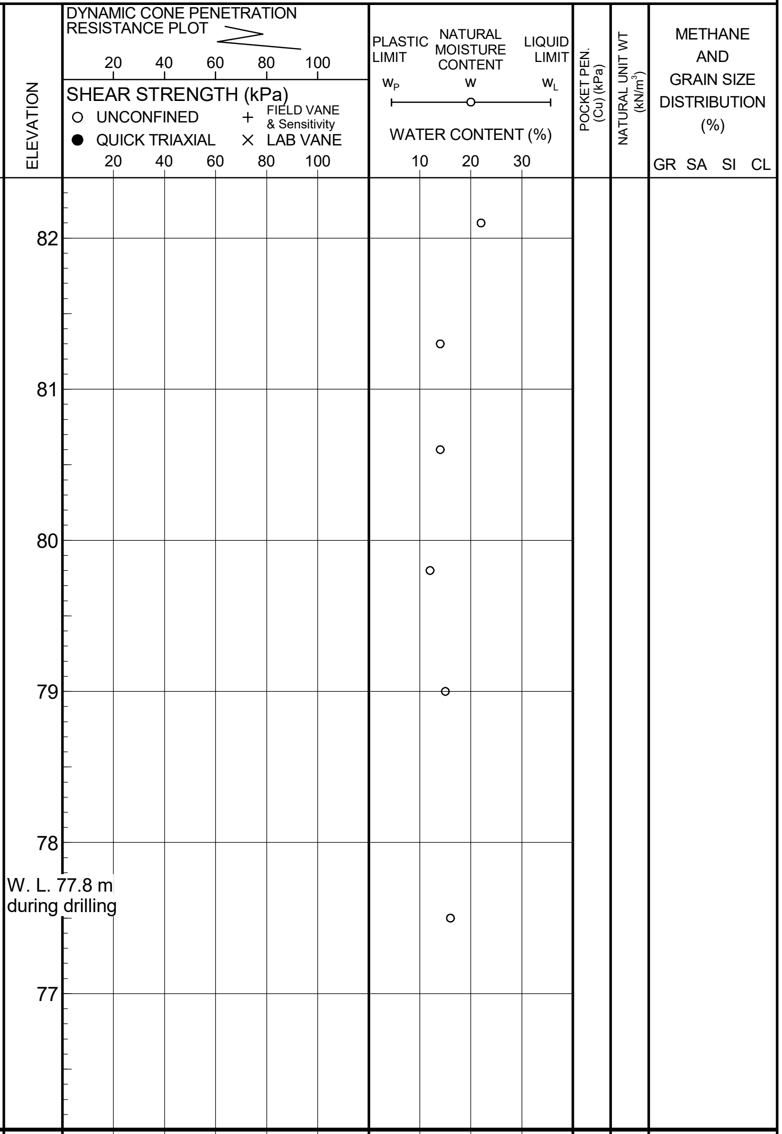
1 OF 1

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-28-2018

REF. NO.: 18-519-10
ENCL NO.: 44

SOIL PROFILE (m) ELEV DEPTH	DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS
82.4					
0.0	**TOPSOIL:** 200mm				
82.2 0.2	**FILL:** silty clay, trace gravel, brown, moist, loose	1	SS	5	
81.6 0.8	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff to stiff	2	SS	18	
		3	SS	22	
	grey below 2.3 m	4	SS	13	
79.3 3.1	**SILT:** some clay, trace sand, grey, moist, compact	5	SS	21	
77.8 4.6	**SILTY SAND TO SANDY SILT:** trace clay, trace gravel, grey, wet, dense	6	SS	32	∇ W. L. 77.8 m during drilling
76.3 6.1	**SHALE:** Georgian Bay Formation	7	SS	50/ 100mm	
76.1 6.3	**END OF BOREHOLE** Notes: 1) Water level at 4.6 mbgl during drilling				



DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

GROUNDWATER ELEVATIONS
Measurement 1st ∇ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

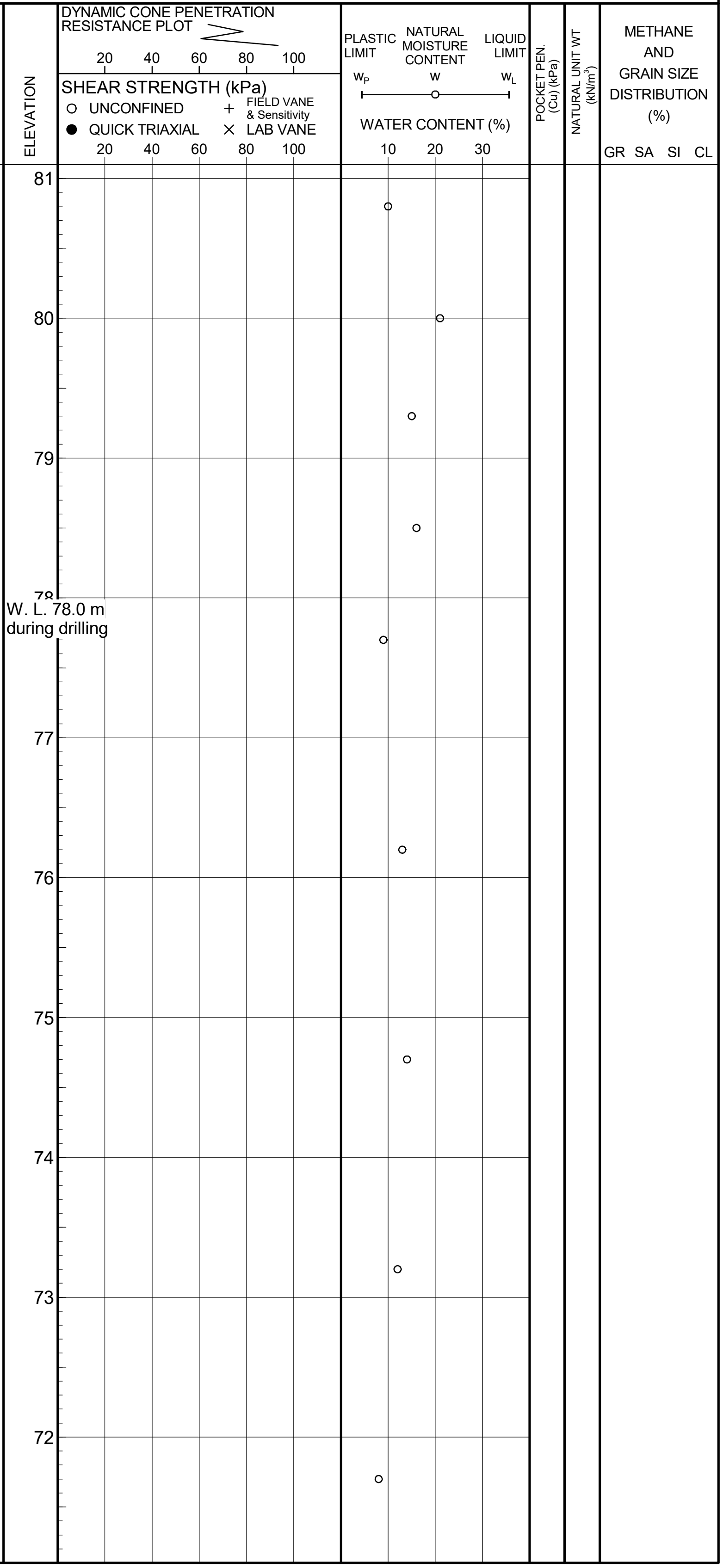
LOG OF BOREHOLE BH18-48

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-05-2018

REF. NO.: 18-519-10
ENCL NO.: 45

SOIL PROFILE (m) ELEV DEPTH	DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS
81.1 0.0	**TOPSOIL:** 200mm				
80.9 0.2	**FILL :** clayey silt mixed with asphalt, trace organics, some sand, dark grey, moist, compact	1	SS	17	
		2	SS	11	
79.6 1.5	**CLAYEY SILT TILL:** sandy, trace gravel, greyish brown, moist, very stiff	3	SS	17	
78.8 2.3	**SANDY SILT TILL :** trace to some clay, trace gravel, brown, moist, dense	4	SS	34	
78.0 3.1	**SILTY SAND :** trace clay, brown, wet, very dense	5	SS	50/ 150mm	∇ W. L. 78.0 m during drilling
76.5 4.6	**SAND:** trace silt, trace gravel, grey, wet, very dense	6	SS	66	
75.0 6.1	**SILTY SAND:** trace clay, grey, wet, very dense	7	SS	87	
		8	SS	50/ 50mm	
72.0 9.1	**SAND AND GRAVEL:** trace silt, grey, wet, very dense	9	SS	50/ 150mm	



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ∇ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
+³, ×³: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

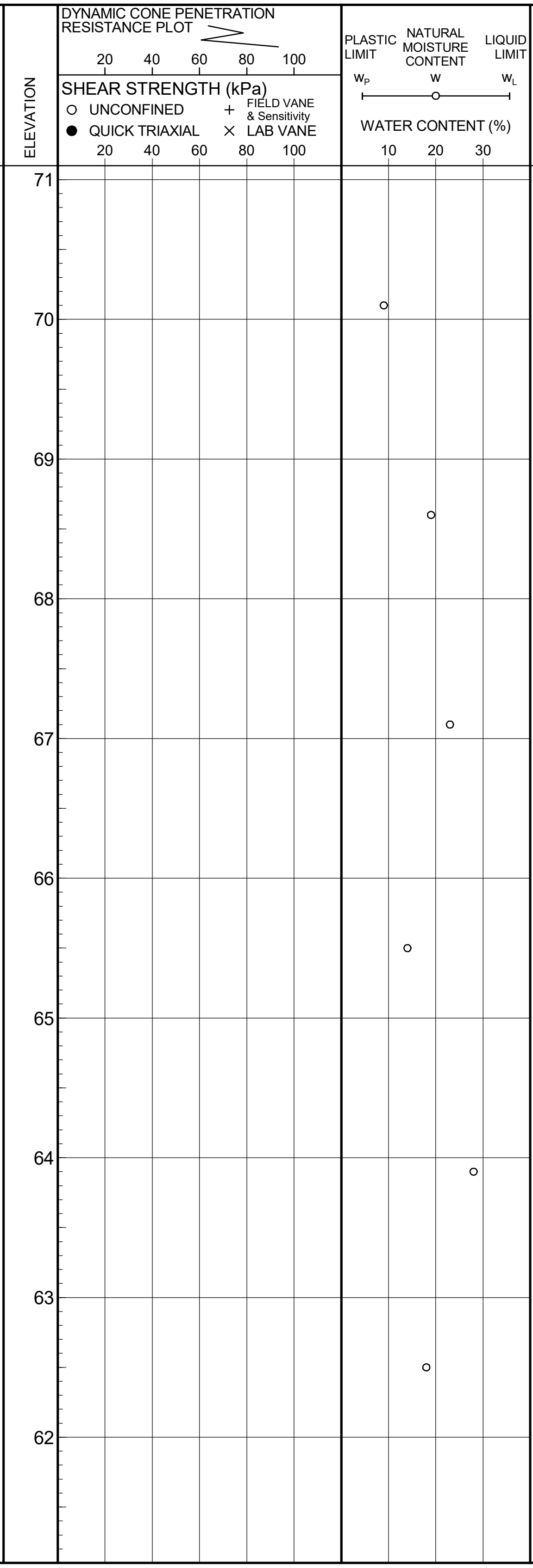
LOG OF BOREHOLE BH18-48

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-05-2018

REF. NO.: 18-519-10
ENCL NO.: 45

SOIL PROFILE		SAMPLES						
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SAND AND GRAVEL: trace silt, grey, wet, very dense(Continued)	10	SS	50/ 100mm				
68.9 12.2	**SILTY SAND:** trace clay, grey, wet, very dense	11	SS	57				
67.4 13.7	**SILT :** trace clay, grey, wet, very dense	12	SS	50/ 150mm				
65.8 15.3	**SILTY CLAY TILL :** some sand to sandy, trace gravel, grey, moist hard	13	SS	79		>225		
64.3 16.8	**SILTY CLAY:** trace sand, grey, moist, hard	14	SS	47		>225		
62.8 18.3	**SILT TO CLAYEY SILT:** trace sand, grey, very moist, very dense	15	SS	50		>225		



Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ $^{\varepsilon}$=3% Strain at Failure

LOG OF BOREHOLE BH18-48

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-05-2018

REF. NO.: 18-519-10
ENCL NO.: 45

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT W_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m							
60.7	**SILT TO CLAYEY SILT:** trace sand, grey, very moist, very dense(Continued)		16	SS	64		61		○ at approx. 19	>225		
60.7 20.4	**END OF BOREHOLE:** Notes: 1) Water level at 3.1 mbgl during drilling											

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES
$+^3, \times^3$: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-49

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

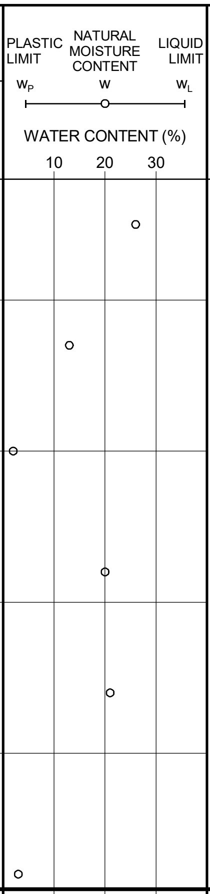
DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-04-2018

REF. NO.: 18-519-10
ENCL NO.: 46

SOIL PROFILE		SAMPLES				
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION
80.8						
80.6 0.0	**TOPSOIL:** 200 mm					
0.2	**FILL:** silty clay, trace asphalt, some gravel, dark grey, moist, firm	1	SS	5		
80.0 0.8	**FILL :** sandy silt, dark grey, moist, very dense	2	SS	50/50mm		80
		3	SS	50/75mm		79
78.5 2.3	**SANDY SILT TILL :** some clay, trace gravel, grey, moist, compact to dense	4	SS	29		78
		5	SS	31		77
76.3 4.5	**SHALE:** Georgian Bay Formation, weathered, grey	6	SS	50/125mm		
76.1 4.7	**END OF BOREHOLE:** Notes: 1) Borehole dry and open upon completion.					

DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100

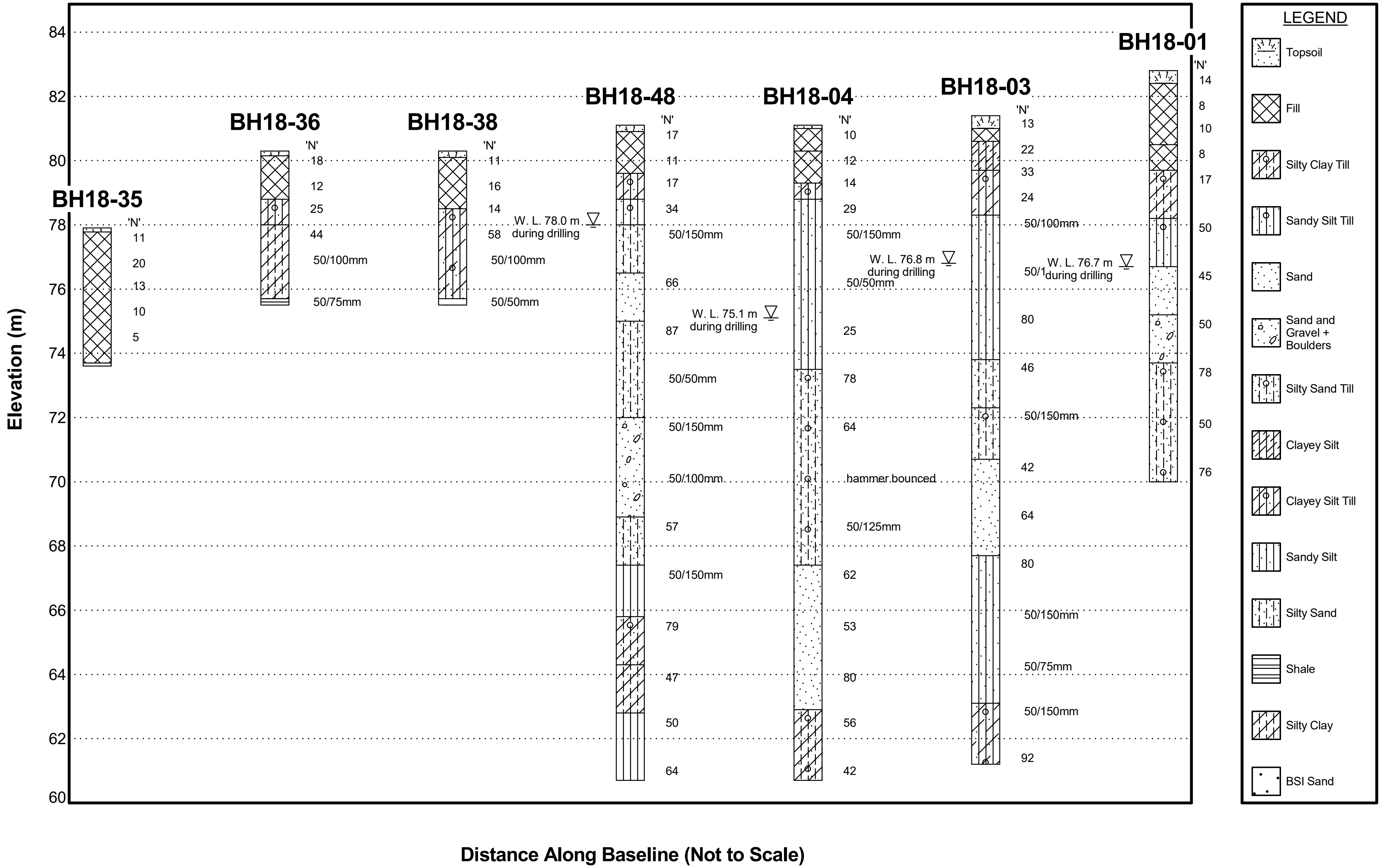
SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100



POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³) | METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES $+^3, \times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure



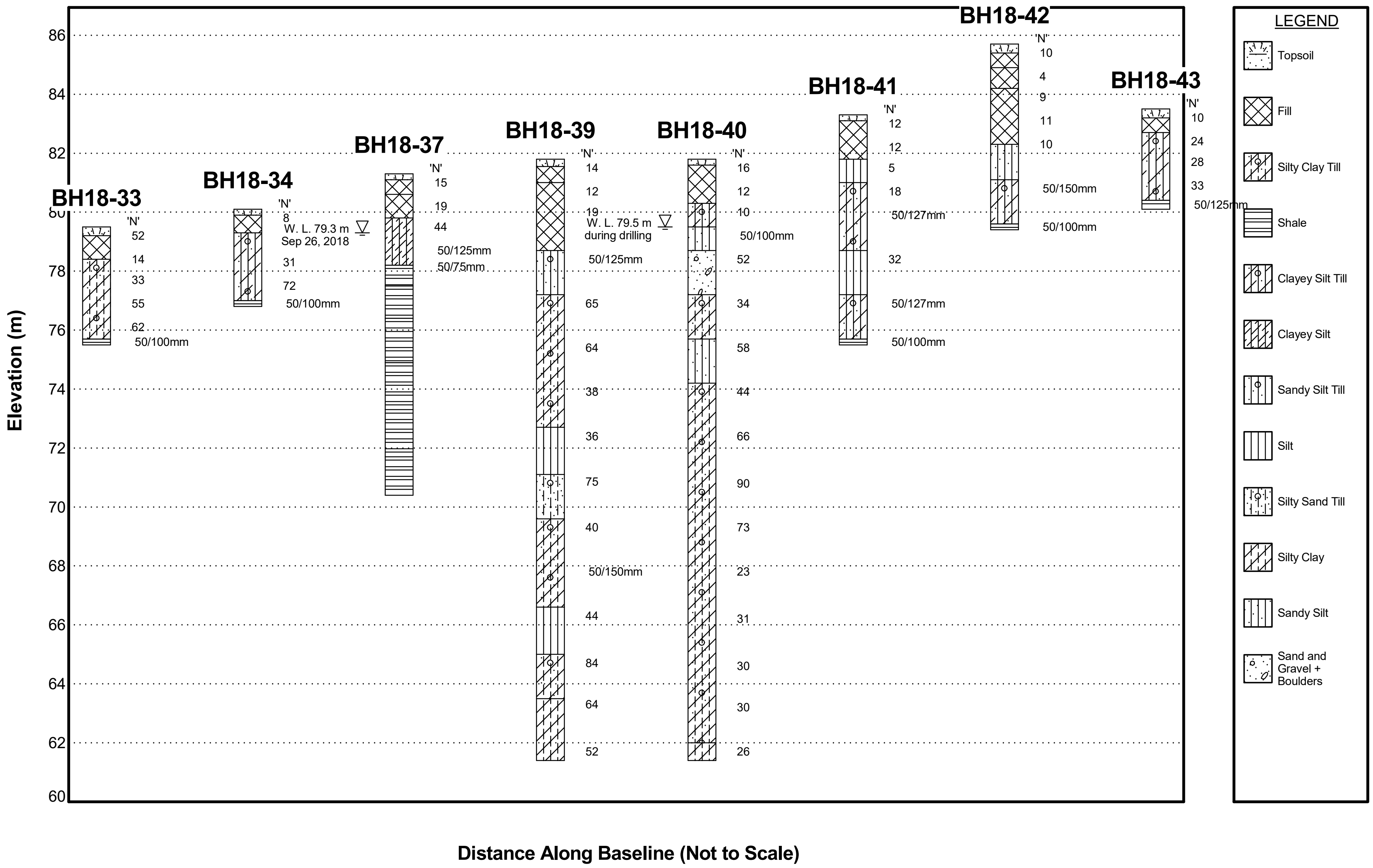
DS FENCE (M) 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-16

DS CONSULTANTS LTD.

Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

Generalized Sub-surface Profile

DRAWING NO.	47
JOB NO.	18-519-10
DATE	Sept. 2018

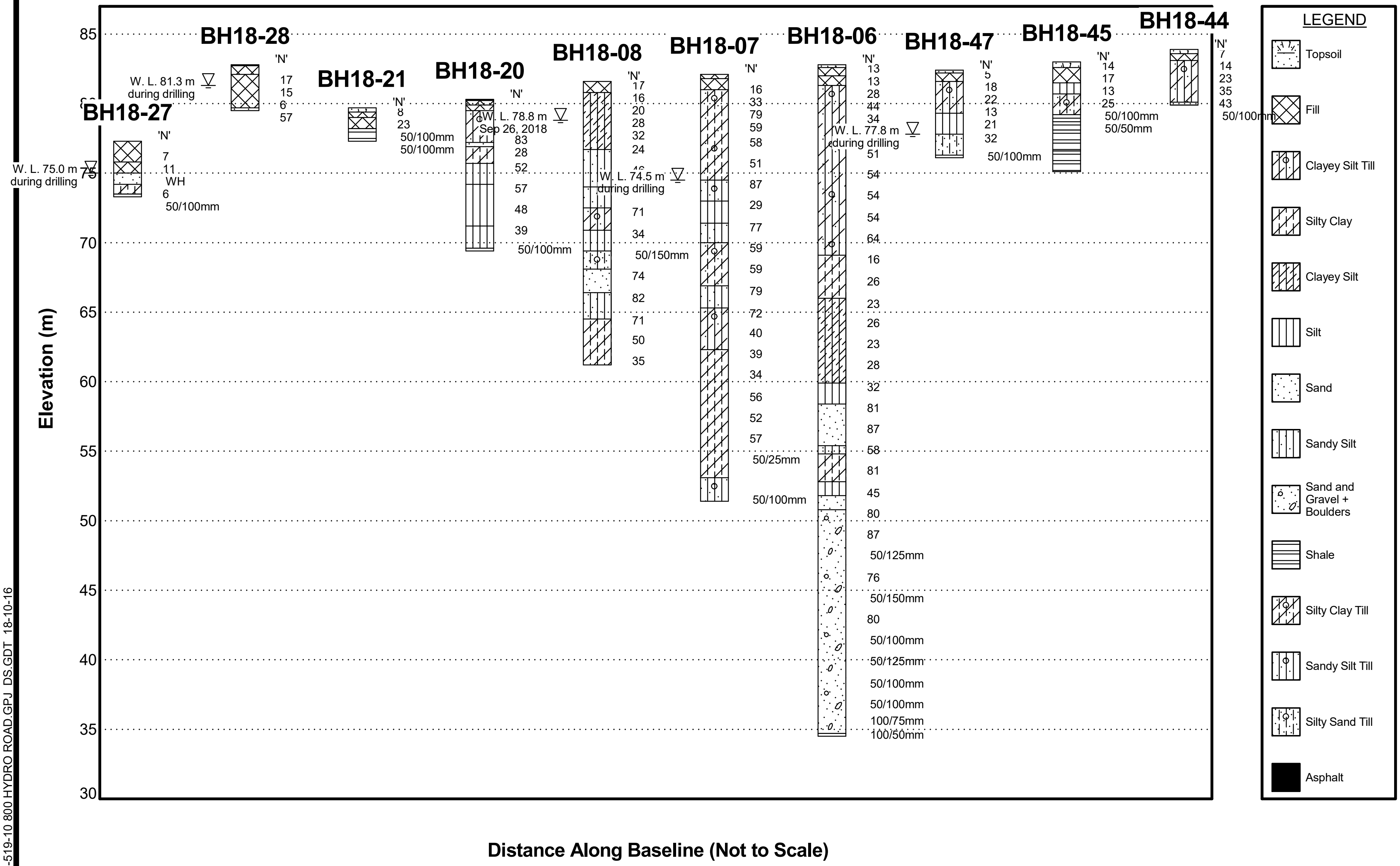


DS FENCE (M) 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-16

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

Generalized Sub-surface Profile

DRAWING NO.	48
JOB NO.	18-519-10
DATE	Sept. 2018

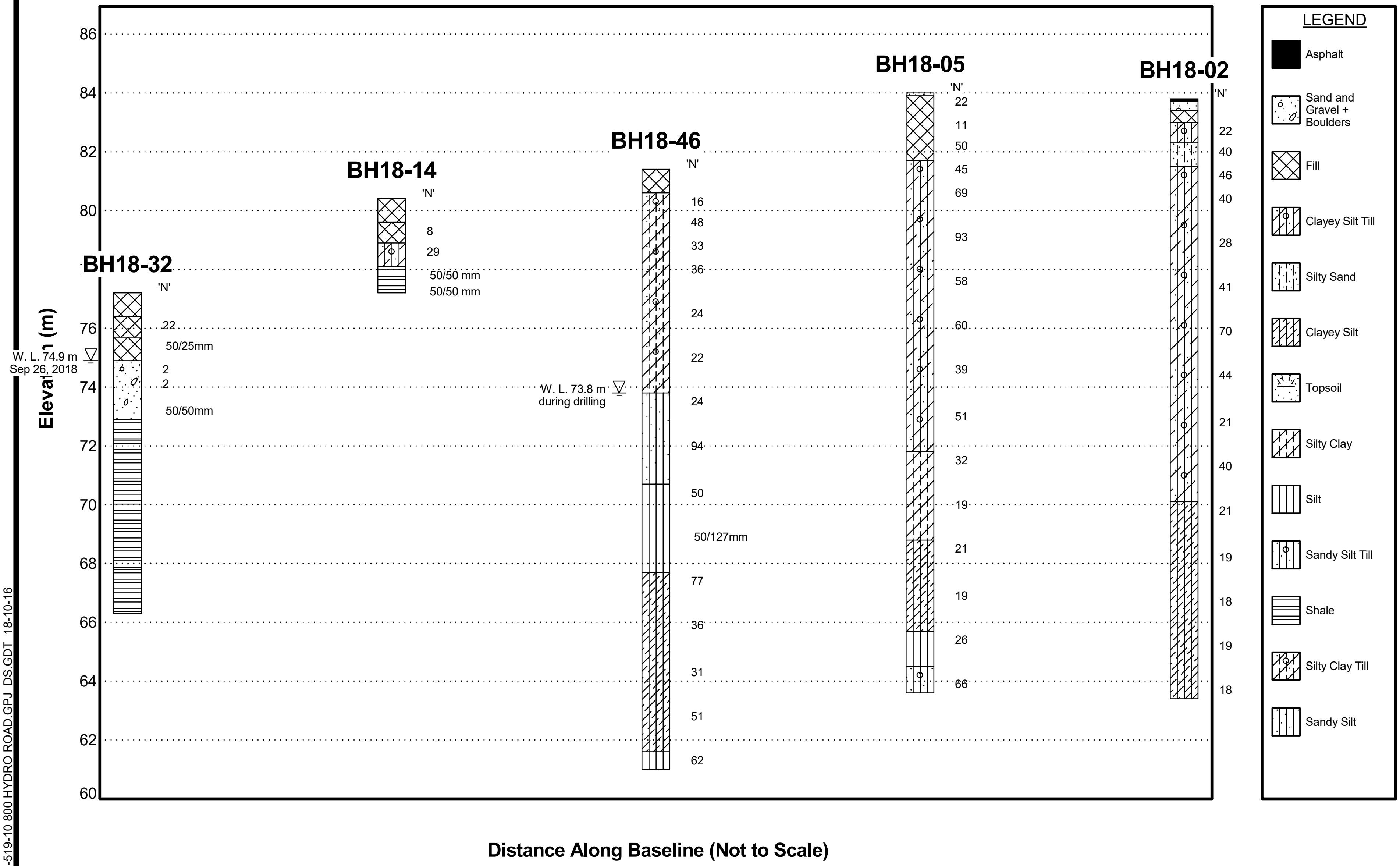


DS FENCE (M) 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-16

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

Generalized Sub-surface Profile

DRAWING NO.	49
JOB NO.	18-519-10
DATE	Sept. 2018

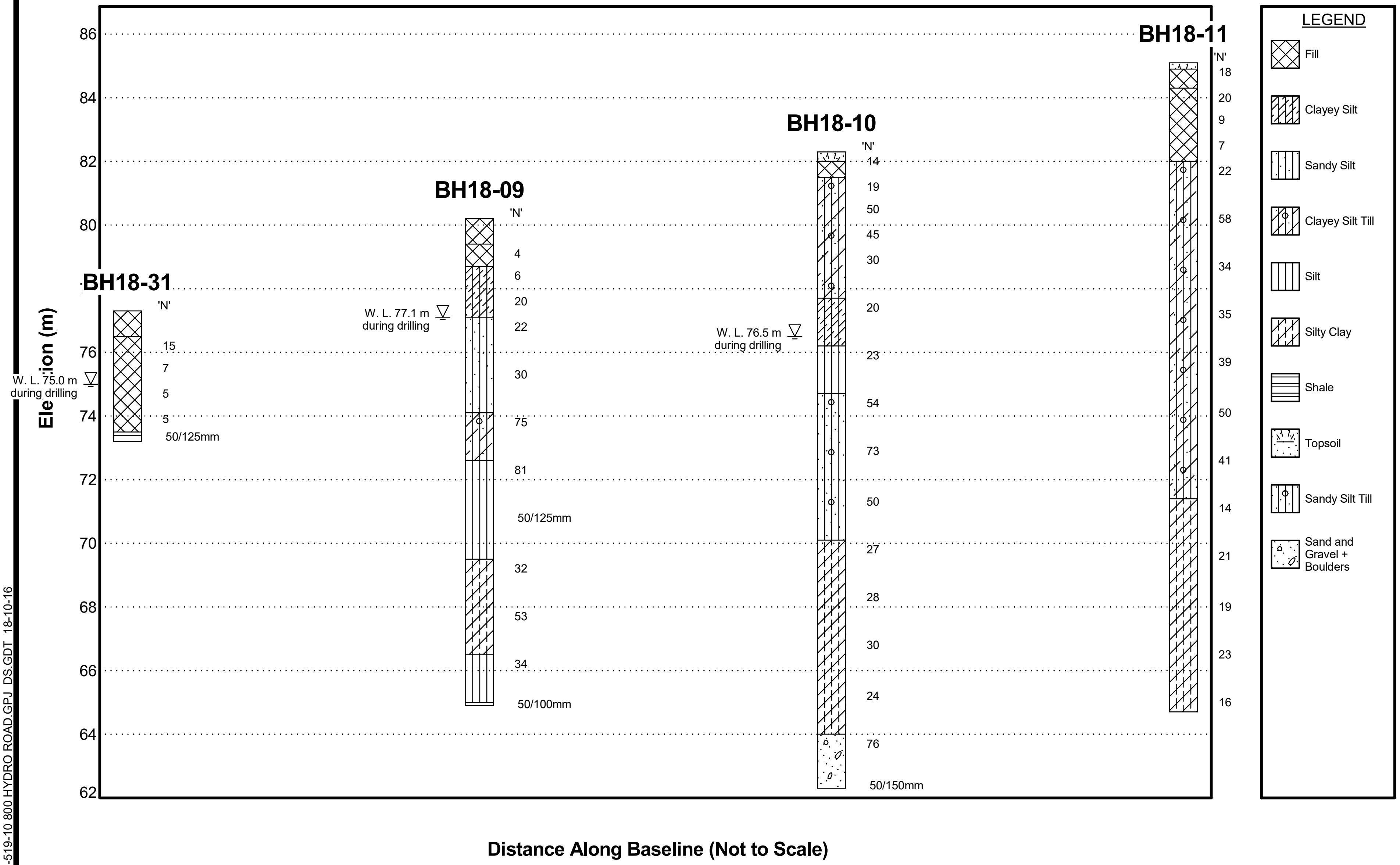


DS FENCE (M) 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-16

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

Generalized Sub-surface Profile

DRAWING NO.	50
JOB NO.	18-519-10
DATE	Sept. 2018



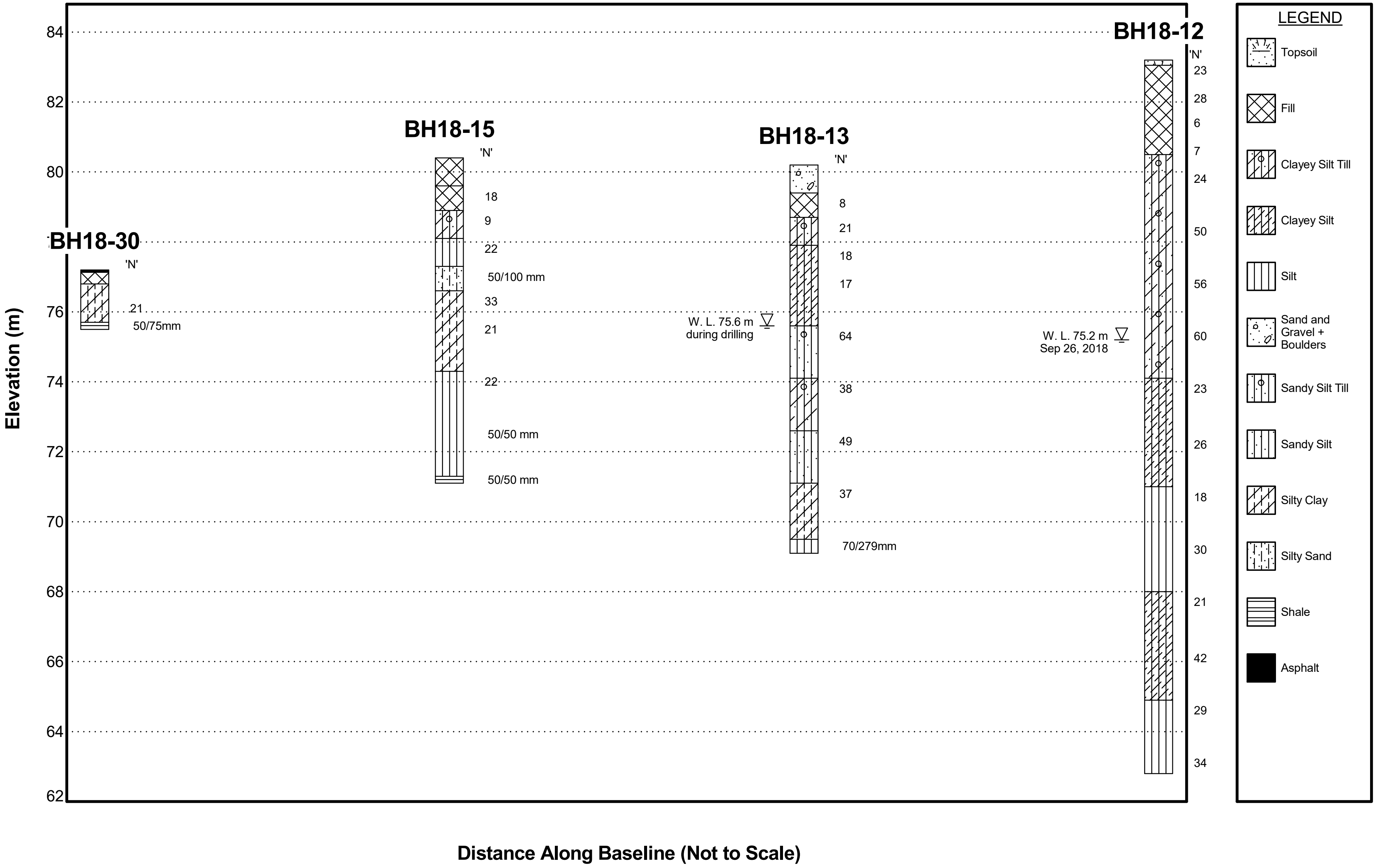
DS CONSULTANTS LTD.

Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

Generalized Sub-surface Profile

DRAWING NO.	51
JOB NO.	18-519-10
DATE	Sept. 2018

DS FENCE (M) 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-16



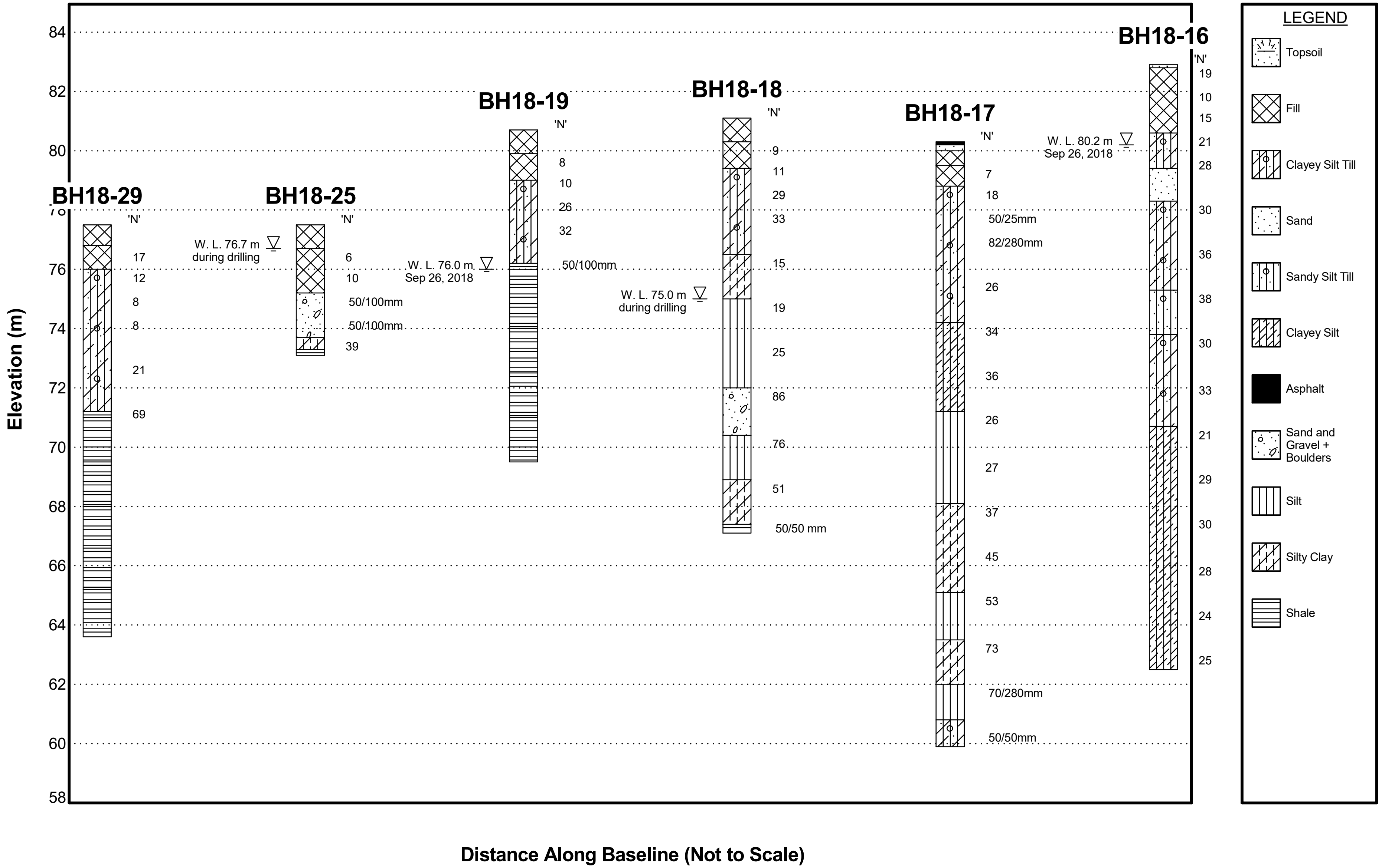
DS CONSULTANTS LTD.

Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

Generalized Sub-surface Profile

DRAWING NO.	52
JOB NO.	18-519-10
DATE	Sept. 2018

DS FENCE (M) 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-16



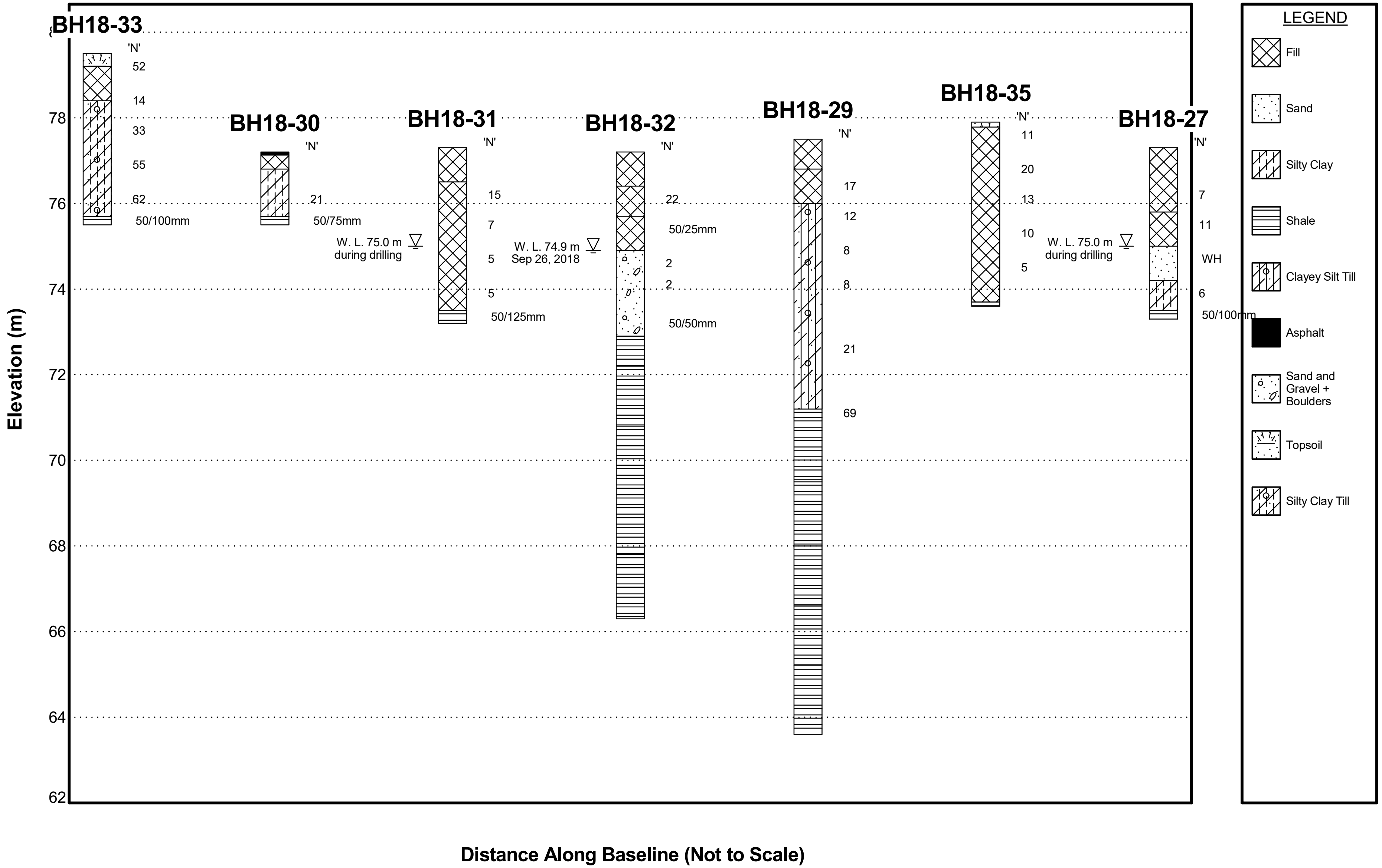
DS CONSULTANTS LTD.

Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

Generalized Sub-surface Profile

DRAWING NO.	53
JOB NO.	18-519-10
DATE	Sept. 2018

DS FENCE (M) 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-16

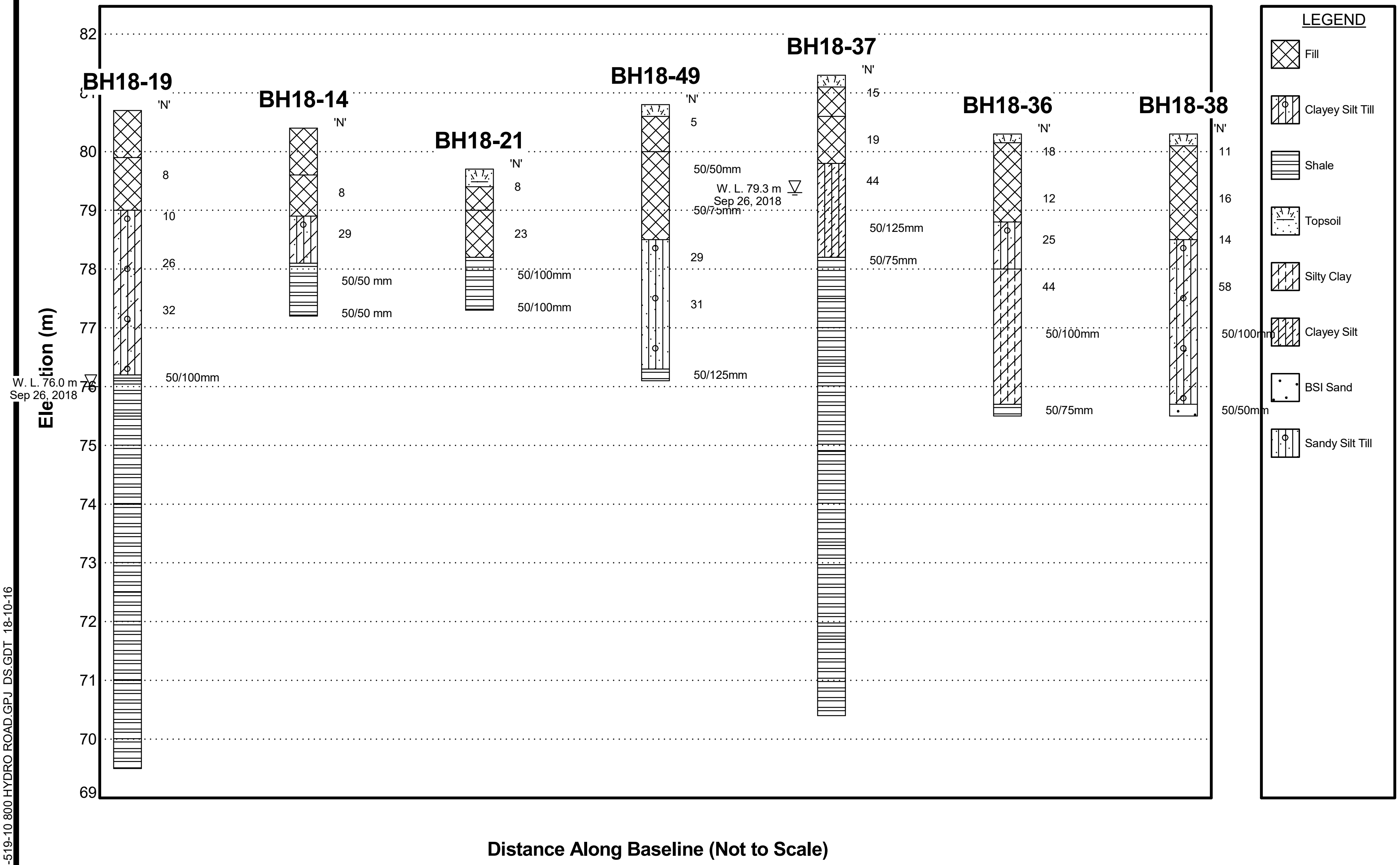


DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

Generalized Sub-surface Profile

DRAWING NO.	54
JOB NO.	18-519-10
DATE	Sept. 2018

DS FENCE (M) 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-16



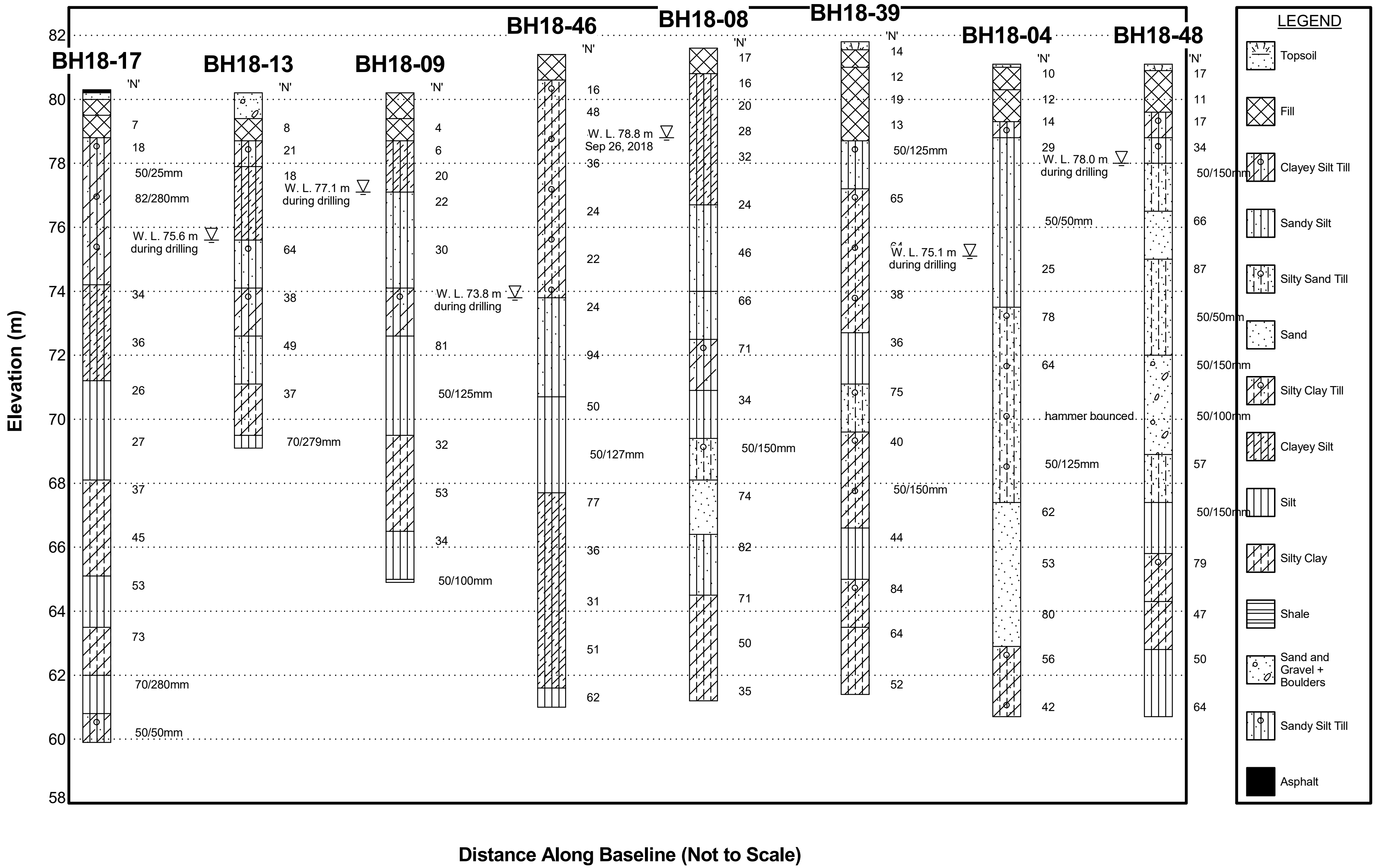
DS CONSULTANTS LTD.

Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

Generalized Sub-surface Profile

DRAWING NO.	55
JOB NO.	18-519-10
DATE	Sept. 2018

DS FENCE (M) 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-16

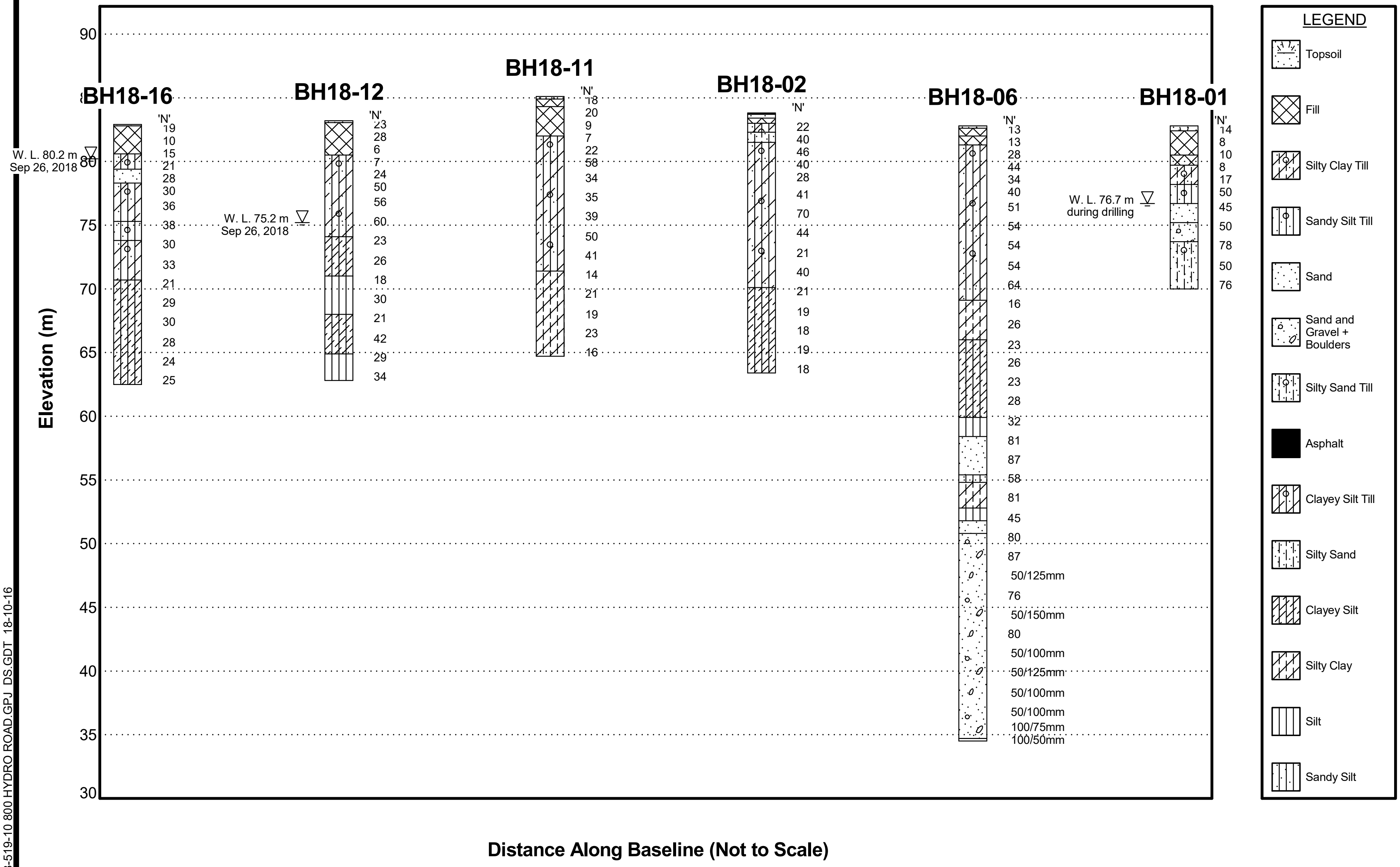


DS FENCE (M) 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-16

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

Generalized Sub-surface Profile

DRAWING NO.	56
JOB NO.	18-519-10
DATE	Sept. 2018



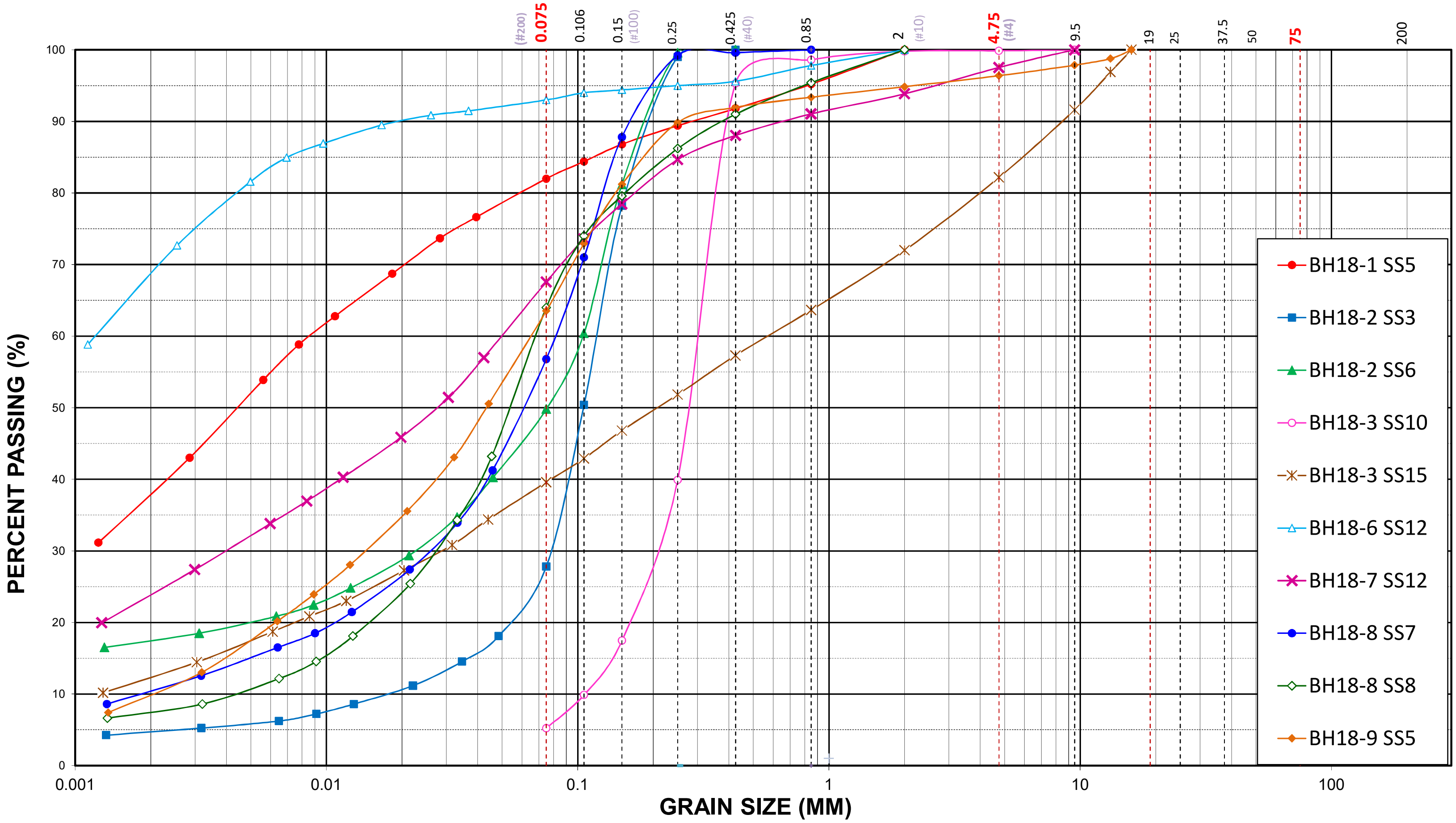
DS FENCE (M) 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-16

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

Generalized Sub-surface Profile

DRAWING NO.	57
JOB NO.	18-519-10
DATE	Sept. 2018

Particle Size Distribution (ASTM-D421/D422)



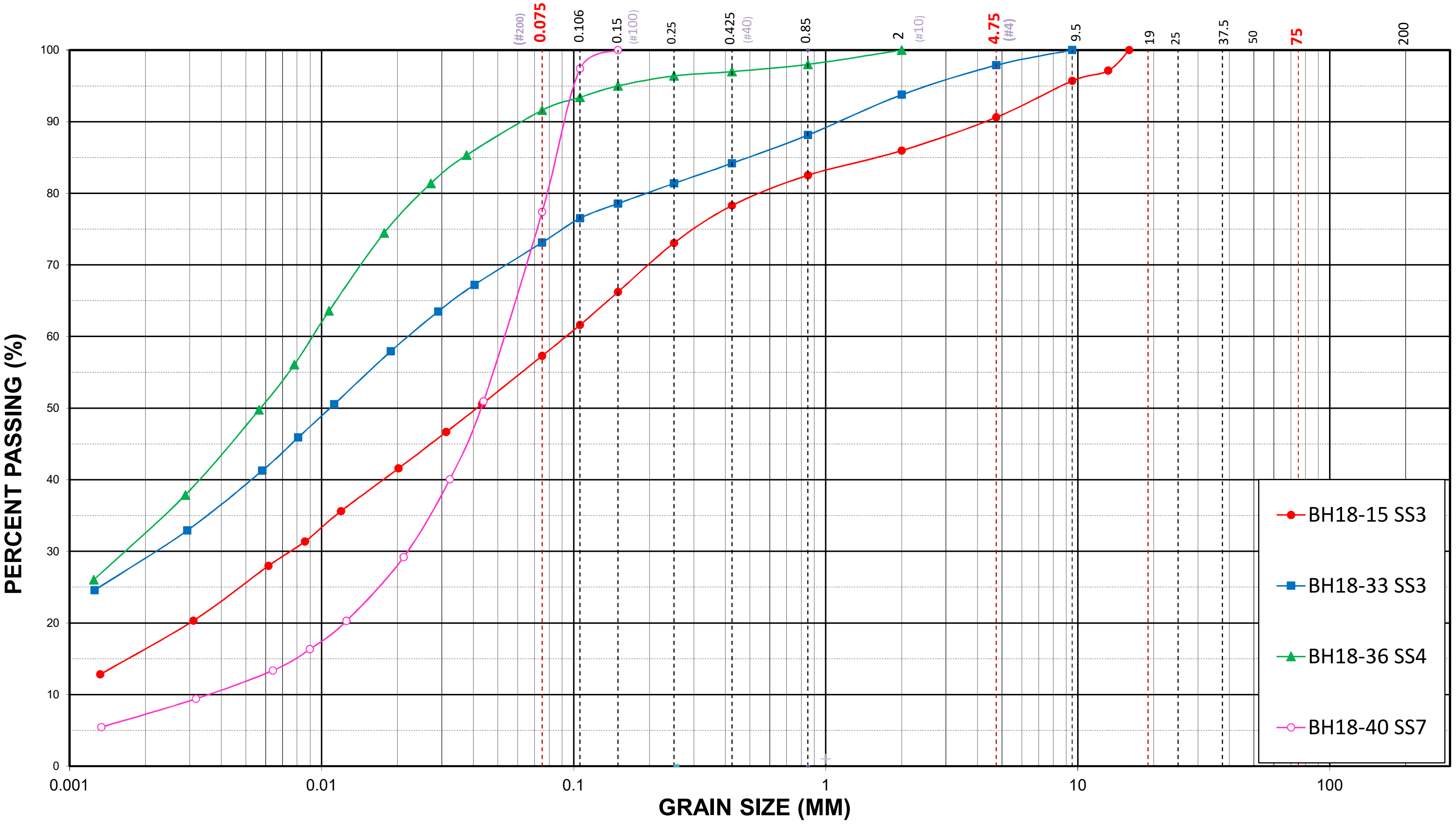
Silt and Clay		Sand			Gravel		Cobble +
Clay	Silt	Fine	Medium	Coarse	Fine	Coarse	

Specification and Comments:

DS CONSULTANTS LTD.
6221 Highway 7, Unit 16
Vaughan, Ontario, L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project:	**Proposed Lakeview Village**	Project No.:	**18-519-10**
Client:	**ARGO Development Corporation**	Date:	**Sep-18-2018**
Location:	**800 Hydro Road, Mississauga, Ontario**	Figure No.:	58

Particle Size Distribution (ASTM-D421/D422)

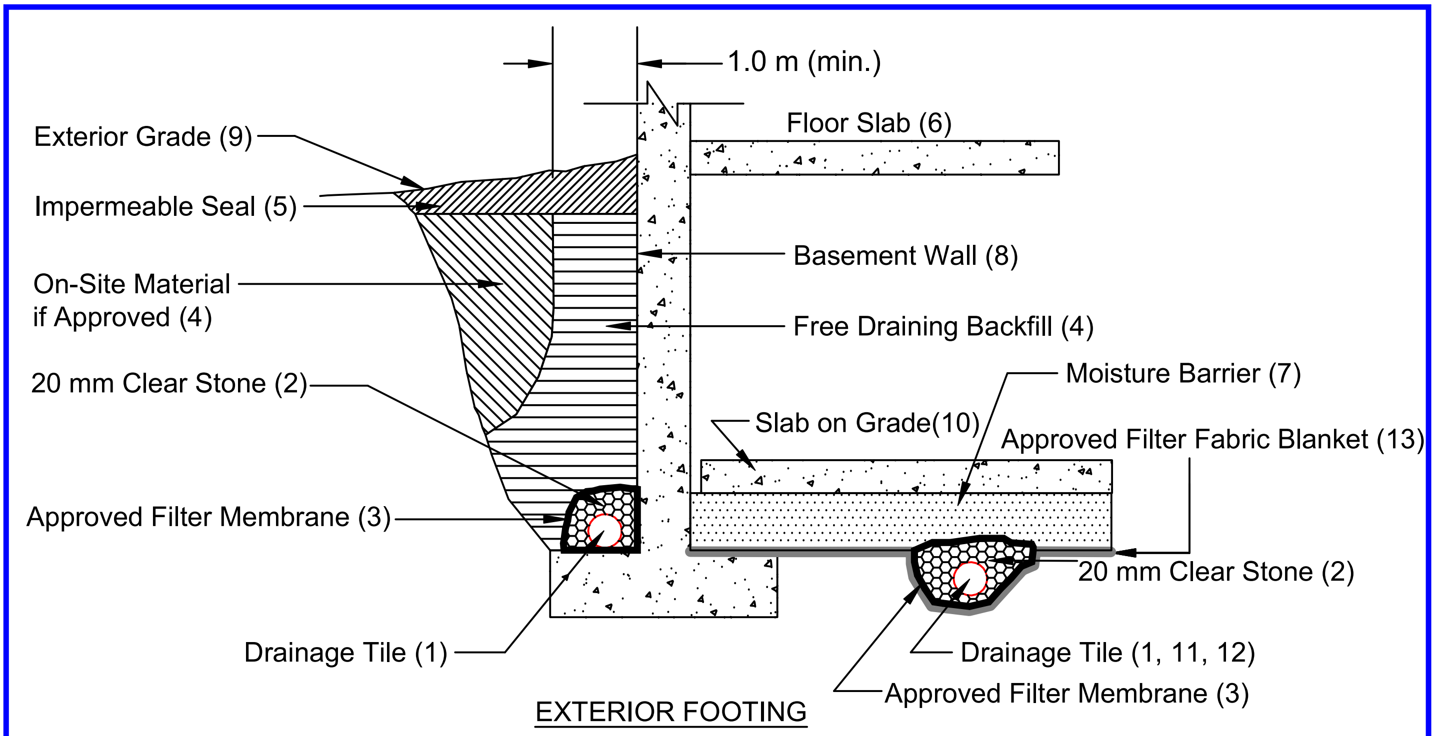


Silt and Clay		Sand			Gravel		Cobble +
Clay	Silt	Fine	Medium	Coarse	Fine	Coarse	

Specification and Comments:

DS CONSULTANTS LTD.
6221 Highway 7, Unit 16
Vaughan, Ontario, L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project:	**Proposed Lakeview Village**	Project No.:	**18-519-10**
Client:	**ARGO Development Corporation**	Date:	**Sep-18-2018**
Location:	**800 Hydro Road, Mississauga, Ontario**	Figure No.:	59

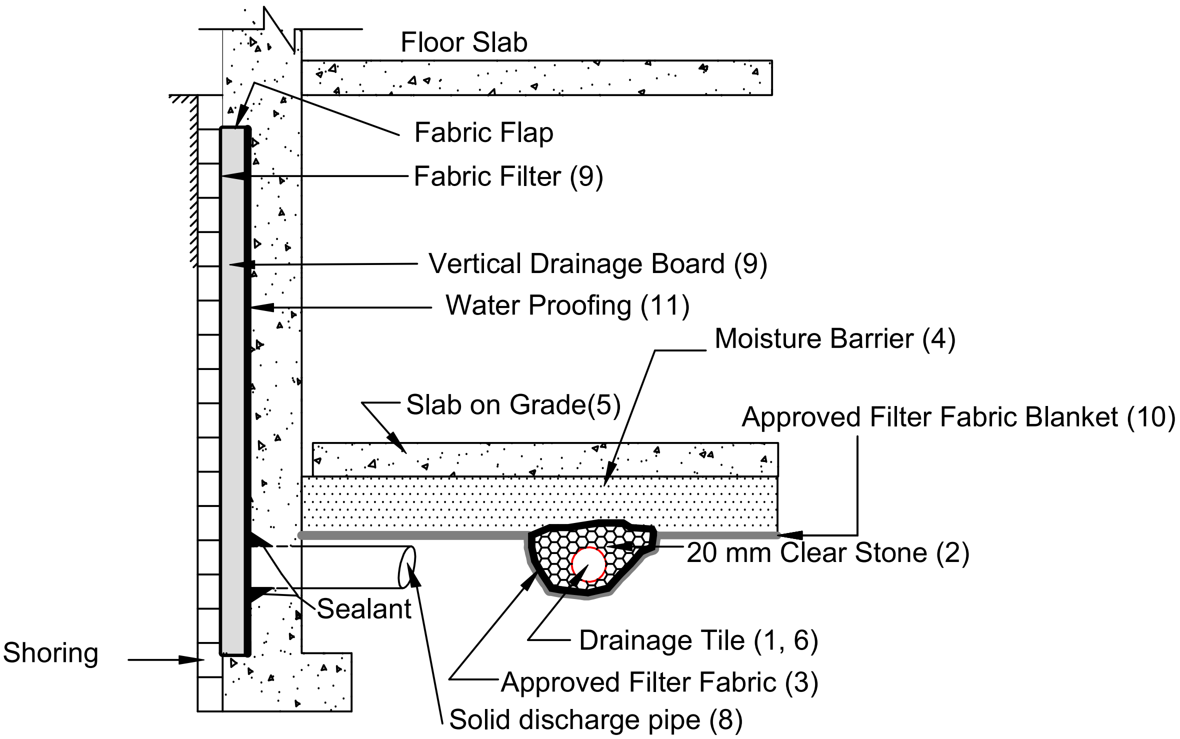


Notes

1. Drainage tile to consist of 100 mm (4") diameter weeping tile or equivalent perforated pipe leading to a positive sump or outlet.
2. 20 mm (3/4") clear stone - 150 mm (6") top and side of drain. If drain is not on footing, place100 mm (4 inches) of stone below drain .
3. Wrap the clear stone with an approved filter membrane (Terrafix 270R or equivalent).
4. Free Draining backfill - OPSS Granular B or equivalent compacted to the specified density. Do not use heavy compaction equipment within 450 mm (18") of the wall. Use hand controlled light compaction equipment within 1.8 m (6') of wall. The minimum width of the Granular 'B' backfill must be 1.0 m.
5. Impermeable backfill seal - compacted clay, clayey silt or equivalent. If original soil is free-draining, seal may be omitted. Maximum thickness of seal to be 0.5 m.
6. Do not backfill until wall is supported by basement and floor slabs or adequate bracing.
7. Moisture barrier to be at least 200 mm (8") of compacted clear 20 mm (3/4") stone or equivalent free draining material. A vapour barrier may be required for specialty floors.
8. Basement wall to be damp proofed /water proofed.
9. Exterior grade to slope away from building.
10. Slab on grade should not be structurally connected to the wall or footing.
11. Underfloor drain invert to be at least 300 mm (12") below underside of floor slab.
12. Drainage tile placed in parallel rows 6 to 8 m (20 to 25') centers one way. Place drain on 100 mm (4") clear stone with 150 mm (6") of clear stone on top and sides. Enclose stone with filter fabric as noted in (3).
13. The entire subgrade to be sealed with approved filter fabric (Terrafix 270R or equivalent) if non-cohesive (sandy) soils below ground water table encountered.
14. Do not connect the underfloor drains to perimeter drains.
15. Review the geotechnical report for specific details.

DRAINAGE AND BACKFILL RECOMMENDATIONS
Basement with Underfloor Drainage

(not to scale)



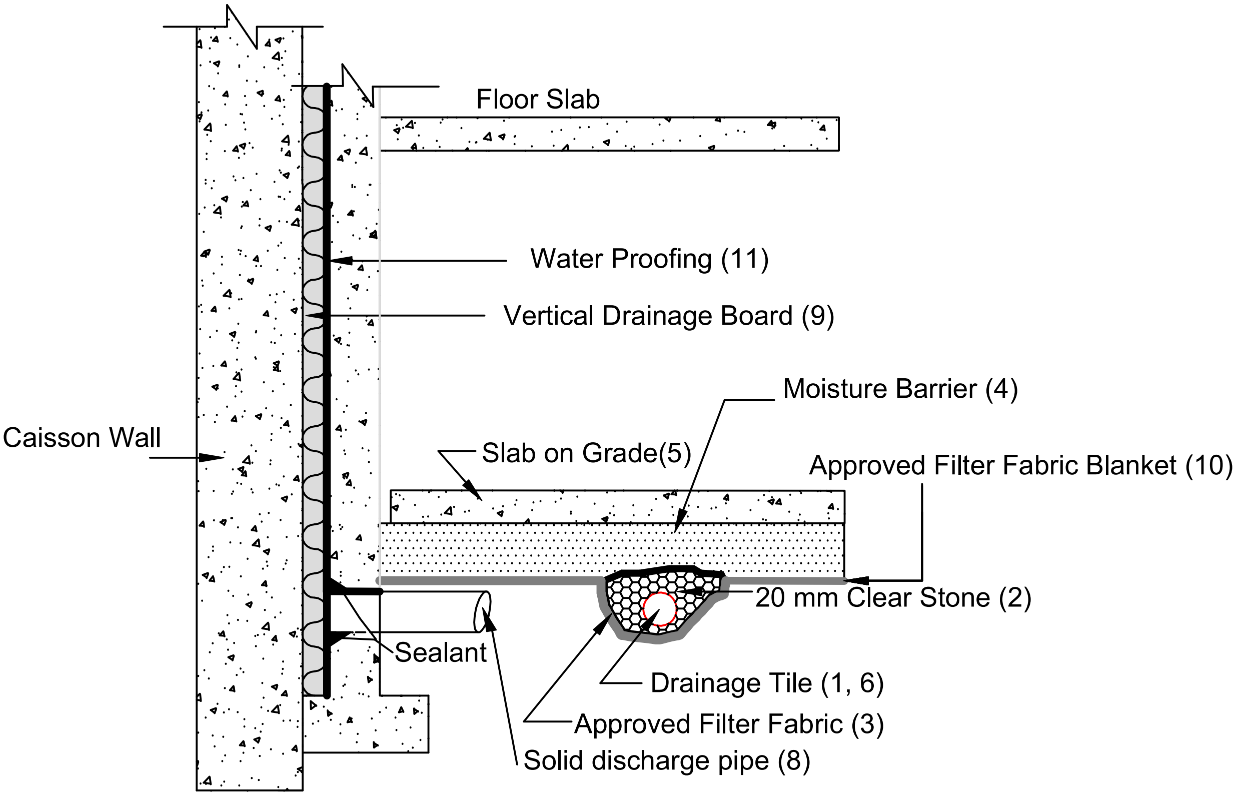
EXTERIOR FOOTING

Notes

1. Drainage tile to consist of 100 mm (4") diameter weeping tile or equivalent perforated pipe leading to a positive sump or outlet, spaced between columns.
2. 20 mm (3/4") clear stone - 150 mm (6") top and side of drain. If drain is not on footing, place100 mm (4 inches) of stone below drain .
3. Wrap the clear stone with an approved filter membrane (Terrafix 270R or equivalent).
4. Moisture barrier to be at least 200 mm (8") of compacted clear 20 mm (3/4") stone or equivalent free draining material. A vapour barrier may be required for specialty floors.
5. Slab on grade should not be structurally connected to the wall or footing.
6. Underfloor drain invert to be at least 300 mm (12") below underside of floor slab. Drainage tile placed in parallel rows 6 to 8 m (20 to 25') centers one way. Place drain on 100 mm (4") clear stone with 150 mm (6") of clear stone on top and sides. Enclose stone with filter fabric as noted in (3).
7. Do not connect the underfloor drains to perimeter drains.
8. Solid discharge pipe located at the middle of each bay between the solider piles, approximate spacing 2.5 m, outletting into a solid pipe leading to a sump.
9. Vertical drainage board with filter cloth should be kept a minium of 1.2 m below exterior finished grade.
10. The entire subgrade to be sealed with approved filter fabric (Terrafix 270R or equivalent) if non-cohesive (sandy) soils below ground water table encountered.
11. The basement walls should be water proofed using bentonite or equivalent water-proofing system.
12. Review the geotechnical report for specific details. Final detail must be approved before system is considered acceptable.

DRAINAGE RECOMMENDATIONS
Shored Basement wall with Underfloor Drainage System

(not to scale)



EXTERIOR FOOTING

Notes

1. Drainage tile to consist of 100 mm (4") diameter weeping tile or equivalent perforated pipe leading to a positive sump or outlet, spaced between columns.
2. 20 mm (3/4") clear stone - 150 mm (6") top and side of drain. If drain is not on footing, place100 mm (4 inches) of stone below drain .
3. Wrap the clear stone with an approved filter membrane (Terrafix 270R or equivalent).
4. Moisture barrier to be at least 200 mm (8") of compacted clear 20 mm (3/4") stone or equivalent free draining material. A vapour barrier may be required for specialty floors.
5. Slab on grade should not be structurally connected to the wall or footing.
6. Underfloor drain invert to be at least 300 mm (12") below underside of floor slab. Drainage tile placed in parallel rows 6 to 8 m (20 to 25') centers one way. Place drain on 100 mm (4") clear stone with 150 mm (6") of clear stone on top and sides. Enclose stone with filter fabric as noted in (3).
7. Do not connect the underfloor drains to perimeter drains.
8. Solid discharge pipe located at the middle of each bay between the solider piles, approximate spacing 2.5 m, outletting into a solid pipe leading to a sump.
9. Vertical drainage board mira-drain 6000 or eqivalent with filter cloth should be continous from bottom to 1.2 m below exterior finished grade.
10. The entire subgrade to be sealed with approved filter fabric (Terrafix 270R or equivalent) if non-cohesive (sandy) soils below ground water table encountered.
11. The basement walls must be water proofed using bentonite or equivalent water-proofing system.
12. Review the geotechnical report for specific details. Final detail must be approved before system is considered acceptable.

DRAINAGE RECOMMENDATIONS
Shored Basement wall with Underfloor Drainage System

(not to scale)

Appendix A

Photographs of Rock Cores

General Comments – Bedrock in Greater Toronto Area

The bedrock that makes spread footings or caissons a popular choice for high-rise foundation support is a shale or shale limestone composition. The highest member, the Queenston Formation, is generally found west of Toronto, while the Georgian Bay Formation underlies most of Metro Toronto, with the Collingwood and Whitby Formations east of Toronto. The Queenston is, relatively speaking, the weaker of the four formations that are likely to support caissons or footings.

The Georgian Bay as well as the Queenston and Collingwood/Whitby Formation are of Middle Ordovician Age. It is defined as the rock unit that overlies the bluish grey shales of the Collingwood Formation and is in turn overlain by the red shale of the Queenston Formation. The Georgian Bay Formation consists of bluish and grey shale with interbeds of sandstone, limestone and dolostone. Towards the west where the Georgian Bay formation underlies the Queenston Formation, the limestone content increases significantly and limestone and/or sandstone may comprise as much as 70 to 90 percent of the bedrock. The hard layers are usually less than about 100 to 150 mm thick but some layers are much thicker. The thicker layers have been observed to be as much as 750 to 900 mm at some sites. The layers are actually lenses and they can vary significantly in thickness over short distances.

The upper portion of the bedrock is commonly weathered for a depth of 600 to 1000 mm and within this weathered zone hard limestone layers or lenses are common. These hard limestone layers can result in contractual problems for augers, and can provide misleading bedrock elevations. Where the weathering is more extensive a shale till layer may be found above the bedrock. In the sound bedrock, the limestone, sandstone, dolostone is hard to very hard.

Stress relief features such as folds and faults are common in the bedrock. In these features, the rock is heavily fractured and sheared, and contains layers of shale rubble and clay. Weathering is much deeper than the surrounding rock in these features and often there is a lateral migration of the stress relief features resulting in sound unweathered bedrock overlying fractured and weather bedrock. The stress relief features are usually in the order of 4 to 6 m wide, but the depth can vary from 4 to 5 m to in excess of 10 m. These features occur randomly.

The bedrock contains significant high locked in horizontal stresses. These stresses can impose significant loads on tunnel walls but the slower rate of construction for basements allows for a relaxation of these stresses and they are not normally a problem for basement construction.

Groundwater seepage below the top 1000 mm is generally small, however, at several locations in Toronto and Mississauga large quantities have been encountered.

Bedding joints in the bedrock are very close-to-close, smooth planar in the shale and rough planar in the limestone. Significant vertical jointing is common.

Where the bedrock was cored, a detailed description of the rock core is appended to the borehole log.

Design features related to the bedrock are discussed in other sections of this report, and these general comments must be considered with these comments.

Methane gas exists in the bedrock, normally below the top 1000 mm and more concentrated with depth. Appropriate care and monitoring is essential in all confined bedrock excavations, particularly caissons and tunnels.

Explanation of Terms Used in the Bedrock Core Log

Strength (ISRM)

Term	Grade	Description	Unconfined Compressive Strength	
			(MPa)	(psi)
Extremely weak rock	RO	Indented by thumbnail	0.25-1.0	36-145
Very weak	R1	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	1.0-5.0	145-725
Weak rock	R2	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	5.0-25	725-3625
Medium Strong	R3	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer	25-50	3625-7250
Strong rock	R4	Specimen require more than one blow of geological hammer to fracture it	50-100	7250-14500
Very strong rock	R5	Specimen requires many blows of geological hammer to fracture it	100-250	14500-36250
Extremely strong rock	R6	Specimen can only be chipped with geological hammer	>250	>36250

Bedding (Geological Society Eng. Group Working Party, 1970. Q.J. of Eng. Geol. Vol. 3)

Term	Bed Thickness	
Very thickly bedded	>2 m	>6.5 ft
Thickly bedded	600 mm-2 m	2.00-6.50 ft
Medium bedded	200 mm-600 mm	0.65-2.00 ft
Thinly bedded	60 mm-200 mm	0.20-0.65 ft
Very thinly bedded	20 mm-60 mm	0.06-0.20 ft
Laminated	6 mm-20 mm	0.02-0.06 ft
Thinly laminated	<6 mm	<0.02 ft

TCR (Total Core Recovery)

Sum of lengths of rock core recovered from a core run, divided by the length of the core run and expressed as a percentage.

SCR (Solid Core Rocovery)

Sum length of solid, full diameter drill core recovered expressed as a percentage of the total length of the core run.

RQD (Rock Quality Designation, after Deere, 1968)

Sum of lengths of pieces of rock core measured along centreline of core equal to or greater than 100 mm from a core run, divided by the length of the core run and expressed as a percentage. Core fractured by drilling is considered intact. RQD normally quoted for N-size or H-size core.

RQD(%)	Rock Quality
90-100	Excellent
75-90	Good
50-75	Fair
25-50	Poor
0-25	Very poor

Weathering (ISRM)

Term	Grade	Description
Fresh	W1	No visible sign of rock material weathering
Slightly weathered	W2	Discolouration indicates weathering of rock material and discontinuity surface. All the rock material may be discoloured by weathering and may be somewhat weaker than in its fresh condition
Moderately weathered	W3	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discoloured rock is present either as a either as a continuous framework or as corestones
Highly weathered	W4	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discoloured rock is present either as a continuous framework or as corestones
Completely weathered	W5	All rock material is decomposed and/or disintegrated to a soil. The original mass structure is still largely intact
Residual soil	W6	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported

(FI) Fracture Index

Expressed as the number of discontinuities per 300mm (1 ft). Excludes drill-induced fractures and fragmented zones. Reported as ">25" if frequency exceeds 25 fractures/0.3m.

Broken Zone

Zone of full diameter core of very low RQD which may include some drill-induced fractures.

Fragmented Zone

Zone where core is less than full diameter and RQD = 0.

Discontinuity Spacing (ISRM)

Term	Average Spacing	
Extremely widely spaced	>6 m	>20.00 ft
Very widely spaced	2 m-6 m	6.50-20.00 ft
Widely spaced	600 mm-2 m	2.00-6.50 ft
Moderately spaced	200 mm-600 mm	0.65-2.00 ft
Closely spaced	60 mm-200 mm	0.20-0.65 ft
Very closely spaced	20 mm-60 mm	0.06-0.20 ft
Extremely closely spaced	<20 mm	>0.06 ft

Note: Excludes drill-induced fractures and fragmented rock.

Discontinuity Orientation

Discontinuity, fracture and bedding plane orientations are cited as the acute angle measured with respect to the core axis. Fractures perpendicular to the core axis are at 90° and those parallel to the core axis are at 0°.

BH18-19A – Rock Cores

Run 1– 15’ to 17’

Run 2– 17’ to 22’

Run 3– 22’ to 26’10”

Run 4– 26’10” to 31’10”

Run 5 – 31’10” to 36’10”

BH18-29 – Rock Cores

Run 1– 20’9” to 25’9”

RUN2 – 25’9” to 30’9”

Run 3 - 30’9” to 35’8”

Run 4 - 35’8” to 40’5”

Run 5 – 40’5” to 45’6”

BH18-32 – Rock Cores

Run 1– 14’ to 16’3”

Run 2– 16’3” to 20’10”

BH18-37 – Rock Cores

Run 1– 12.5’ to 16’

Run 2– 16’ to 21’

Run 3– 21’ to 26’2”

Run 4– 26’2” to 31’5”

Run 5 – 31’5” to 35’9”

BH18-45 – Rock Cores

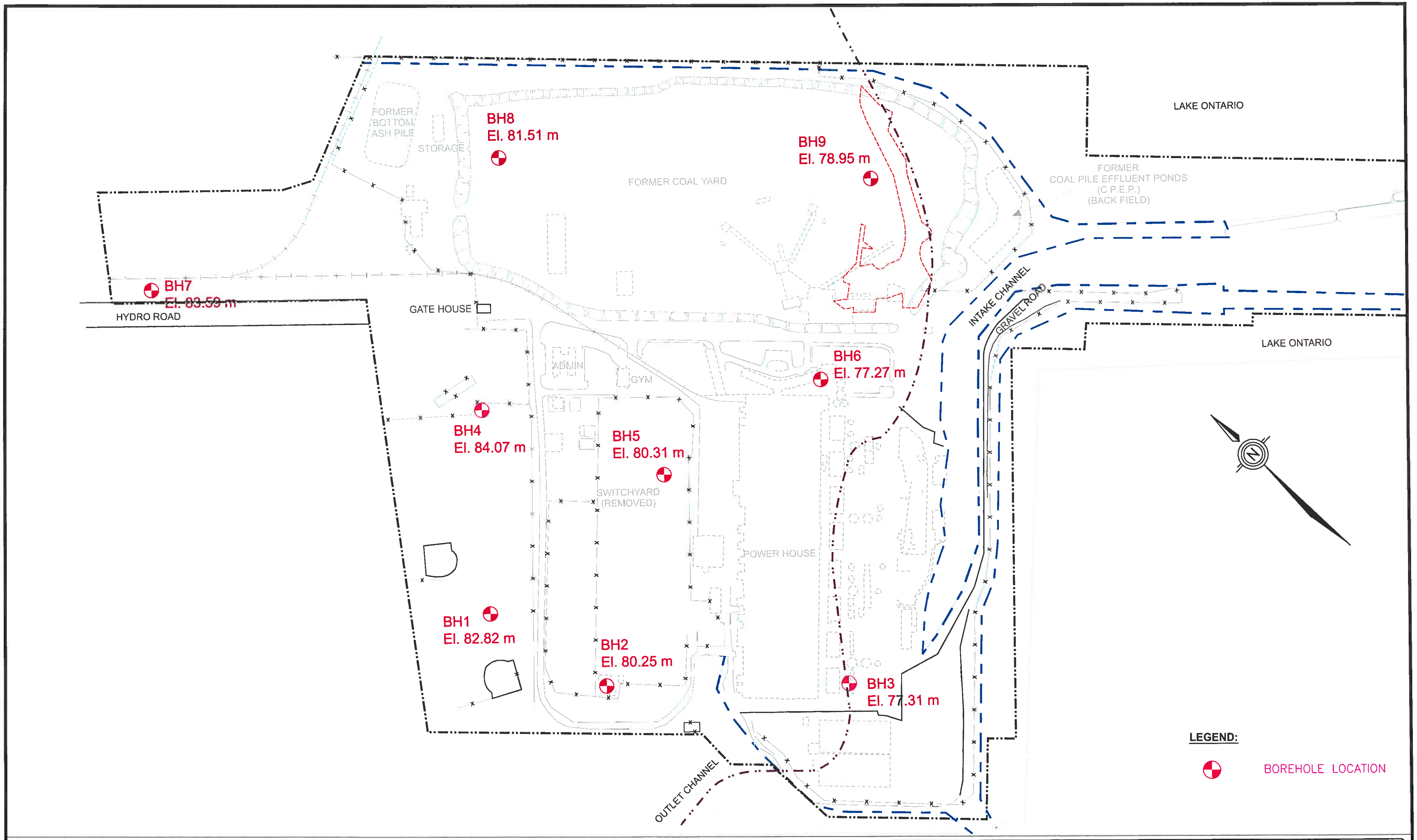
Run 1 – 13’10” to 15’10”

Run 2 – 15’10” to 20’10”

Run 3 – 20’10” to 25’10”

Appendix B:

Logs and Location Plan of EXP Boreholes



NOTES:

1. THE BOUNDARIES AND SOIL TYPES HAVE BEEN ESTABLISHED ONLY AT BOREHOLE LOCATIONS. BETWEEN BOREHOLES THEY ARE ASSUMED AND MAY BE SUBJECT TO CONSIDERABLE ERROR.
2. SOIL SAMPLES WILL BE RETAINED IN STORAGE FOR 3 MONTHS AND THEN DESTROYED UNLESS CLIENT ADVISES THAT AN EXTENDED TIME PERIOD IS REQUIRED.
3. THIS DRAWING WAS REPRODUCED FROM DRAWINGS AND INFORMATION PROVIDED BY CONESTOGA-ROVERS & ASSOCIATES AND EXP.

exp Services Inc.
t: +1.905 695 3217 | f: +1.905 695 0169
220 COMMERCE VALLEY DRIVE WEST, SUITE 500
MARKHAM, ON L3T 0A8
Canada

www.exp.com

exp.
The new identity of Trow

PROJECT TITLE AND LOCATION:
PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED COMMERCIAL/RESIDENTIAL
DEVELOPMENT
800 HYDRO ROAD
MISSISSAUGA, ONTARIO

DRAWING TITLE:
BOREHOLE LOCATION PLAN

PROJECT#:	MRK-00243747-A0	DWN.:	LC
SCALE:	1:4000	CHKD.:	CC
DATE:	DECEMBER 2017	DWG. No.:	1

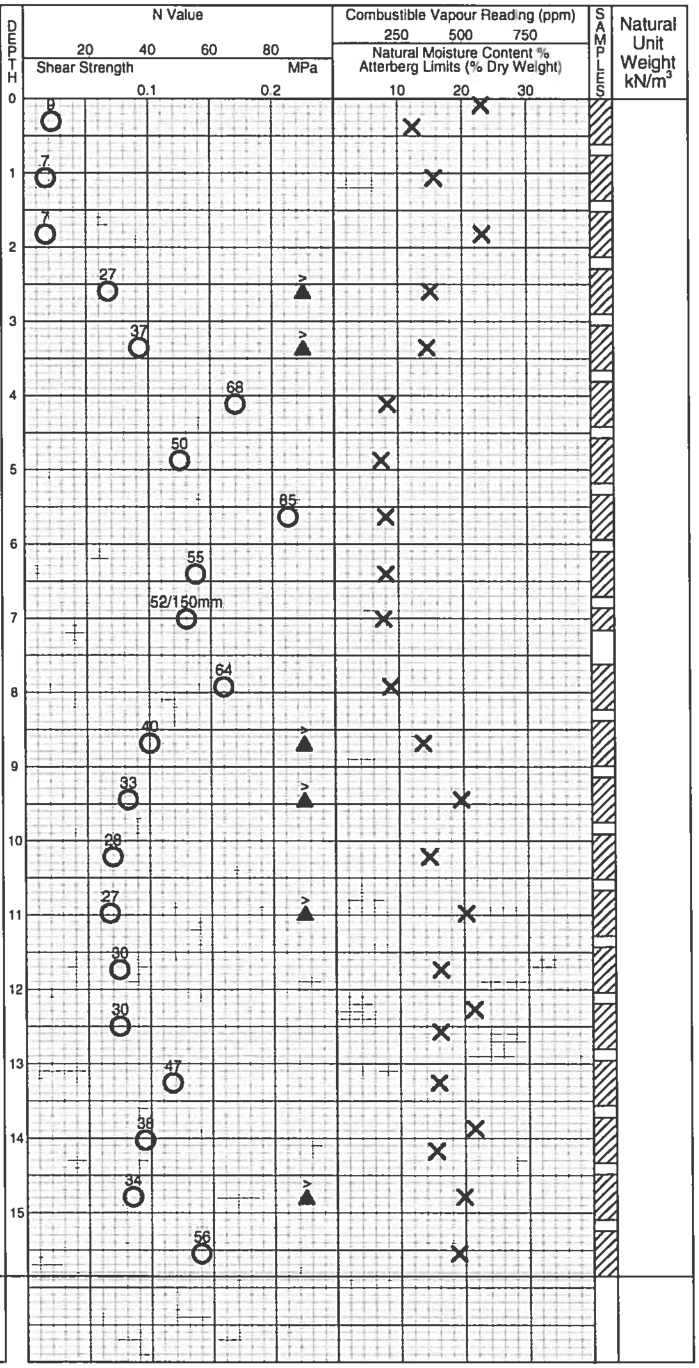
Log of Borehole 1

Project No.	MRK-00243747-AO	Drawing No.	2
Project:	Preliminary Geotechnical Investigation - Proposed Development	Sheet No.	1 of 1
Location:	Former OPG Lakeview Site, 800 Hydro Road, Mississauga, Ontario		

Date Drilled: November 8, 2017
Drill Type: CME 75
Datum: Geodetic

Auger Sample	☒	Combustible Vapour Reading	☐
SPT (N) Value	○ ▨	Natural Moisture	×
Dynamic Cone Test	—	Plastic and Liquid Limit	├—○
Shelby Tube	■	Undrained Triaxial at % Strain at Failure	⊕
Field Vane Test	S	Penetrometer	▲

GWL	SYMBOL	Soil Description	ELEV. m
			82.82
		FILL - grass/topsoil to ~0.15m followed by silt to sandy silt, some gravel, topsoil inclusions, pieces of brick; brown, moist, loose	
			81.4
		silty clay, topsoil inclusions; brown, moist, loose	
			80.6
		CLAYEY SILT TILL - some gravel; brown, moist, hard	
			79.2
		SANDY SILT TILL - scattered gravel and cobbles; grey, moist, very dense	
			74.5
		CLAYEY SILT - silt seams and layers; grey, moist, hard	
			71.5
		SILT - clayey silt seams; grey, moist to saturated, dense	
			68.4
		CLAYEY SILT - grey, moist, hard	
			67.0
		END OF BOREHOLE	



LAGWGL02 MRK00243747AO.GPJ NEW.GDT 12/20/17

exp.

Time	Water Level (m)	Depth to Cave (m)
On completion	13.72	15.24

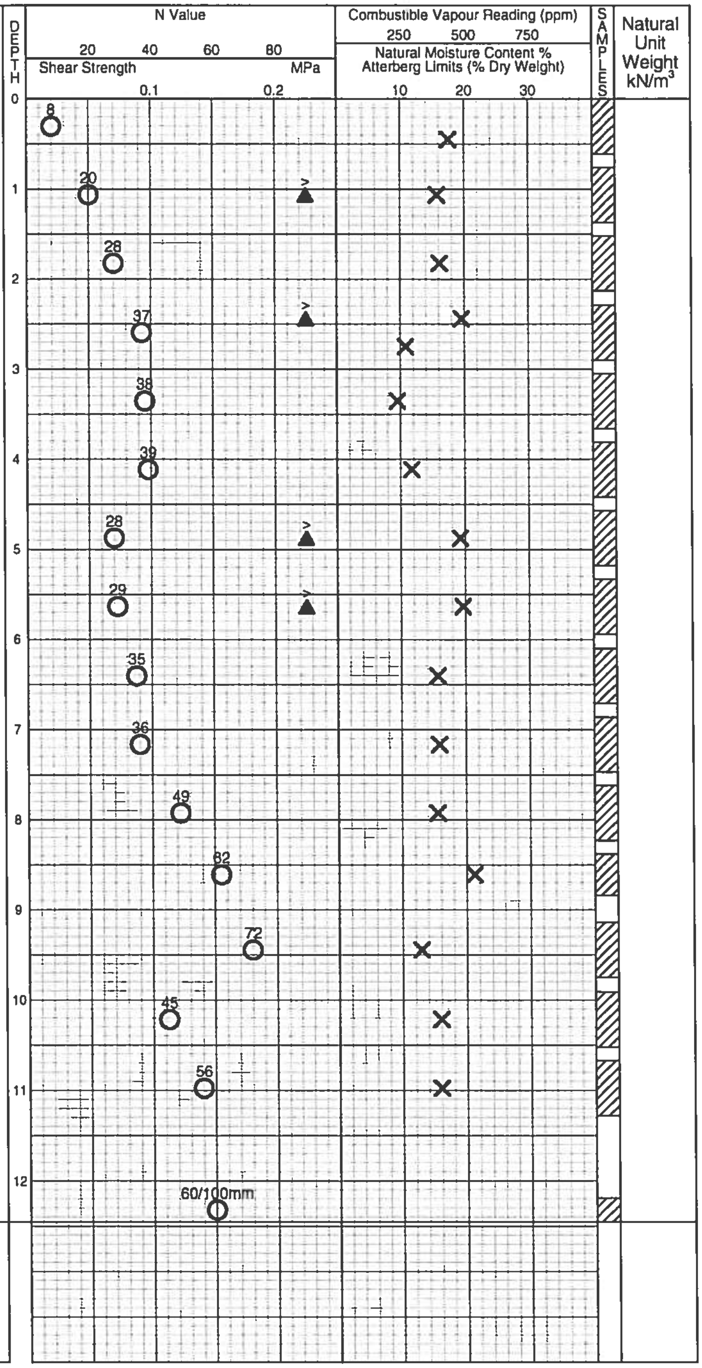
Log of Borehole 2

Project No. MRK-00243747-AO
Drawing No. 3
Project: Preliminary Geotechnical Investigation - Proposed Development
Sheet No. 1 of 1
Location: Former OPG Lakeview Site, 800 Hydro Road, Mississauga, Ontario

Date Drilled: November 6, 2017
Drill Type: CME 75
Datum: Geodetic

Auger Sample	☒
SPT (N) Value	○ ▨
Dynamic Cone Test	—
Shelby Tube	■
Field Vane Test	✚ S
Combustible Vapour Reading	☐
Natural Moisture	×
Plastic and Liquid Limit	├──○
Undrained Triaxial at % Strain at Failure	⊕
Penetrometer	▲

GWL	SYMBOL	Soil Description	ELEV. m
			80.25
		FILL - 300mm crushed limestone	80.0
		CLAYEY SILT - silt seams and layers; brown, moist, very stiff to hard	77.7
		SILT TILL - some sand and gravel; brown becoming grey at ~3m, moist, dense	75.8
		CLAYEY SILT - silt seams and layers; grey, moist, hard	74.3
		SILT - trace to some sand, clayey silt seams and layers; grey, moist to saturated, dense to very dense - gravelly zone	68.3
		SHALE BEDROCK - grey, damp, weathered	67.8
		END OF BOREHOLE	



exp.

Time	Water Level (m)	Depth to Cave (m)
On completion	8.38	12.19

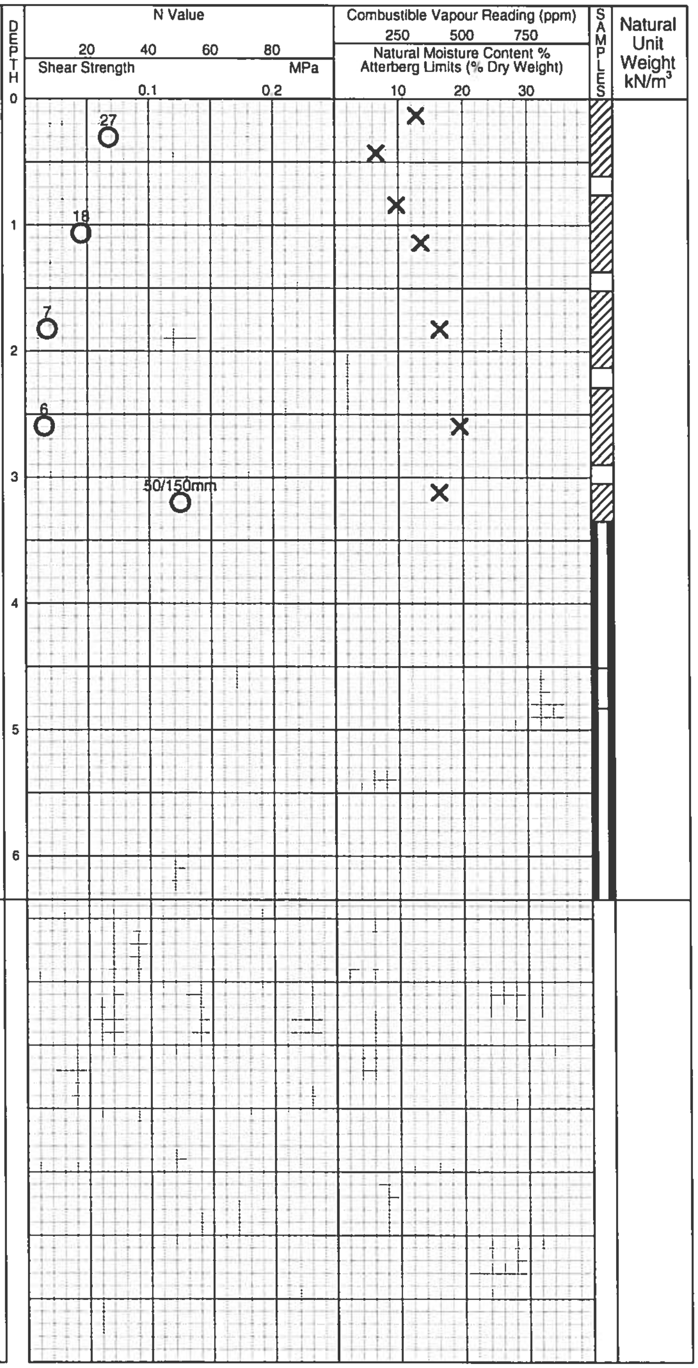
Log of Borehole 3

Project No. MRK-00243747-AO
Drawing No. 4
Project: Preliminary Geotechnical Investigation - Proposed Development
Sheet No. 1 of 1
Location: Former OPG Lakeview Site, 800 Hydro Road, Mississauga, Ontario

Date Drilled: November 6 and 7, 2017
Drill Type: CME 75
Datum: Geodetic

Auger Sample	☒	Combustible Vapour Reading	☐
SPT (N) Value	○ ▨	Natural Moisture	✕
Dynamic Cone Test	—	Plastic and Liquid Limit	├─○
Shelby Tube	■	Undrained Triaxial at % Strain at Failure	⊕
Field Vane Test	✚ S	Penetrometer	▲

GWL	SYMBOL	Soil Description	ELEV. m
			77.31
		FILL - heterogeneous mixture of sandy silt and sand and gravel, topsoil inclusions, pieces of brick; brown, moist to very moist, compact	
		silt to clayey silt, some sand and gravel; brown and grey, very moist, loose	75.9
		SHALE BEDROCK - grey, weathered to ~4.5m, sound below **(SEE ATTACHED ROCK CORE LOG)**	74.1
			71.0
		END OF BOREHOLE **NOTES:** 1. Bedrock cored from 3.35 to 6.35m in HQ size using diamond drilling equipment.	



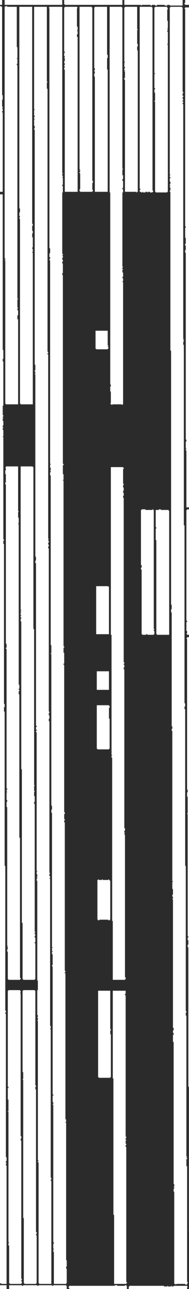
Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	3.05

ROCK CORE LOG

BH 3

PROJECT	ORIENTATION	ELEVATION (m)	DATUM	PROJECT NUMBER
Preliminary Geotechnical Investigation	Vertical	77.3	Geodetic	MRK-00243747-A
LOCATION	**DATE STARTED**	**COMPLETED**	**LOGGED BY**	**DRAWING NUMBER**
800 Hydro Road, Mississauga, Ontario	11/06/17	11/07/17	CC/AM	4
CLIENT	**DRILLER**	**DRILL TYPE**	**CORE BARREL**	**SHEET**
CCI Development Group of Companies	Pontil Drilling	CME 75	HQ	1 of 1

ELEVATION (m) 1	DEPTH (m) 2	SYMBOL 3	GENERAL DESCRIPTION 4	JOINT CHARACTERISTICS NO. OF SETS 5	JOINT TYPE 6	ORIENTATION 7	SPACING 8	ROUGHNESS 9	FILLING 10	APERTURE (mm) 11	WEATHERING 12	STRENGTH 13	FRACTURE FREQUENCY 14	RUN NUMBER 15	RECOVERY (%) 16	RQD 17	WATER RECOVERY (%) 18	WATER COLOUR 19
74.0			- Core loss due to possible shale rubble layer															
73.5			**GEORGIAN BAY FORMATION:** Shale with interbedded Limestone and Siltstone Shale (75%) Thinly bedded or laminated, dark grey, generally unweathered with moderately to heavily weathered layers, low to very low strength Limestone (25%) Fine grained to medium grained, grey, unweathered, medium strength Clay (0%) Discontinuities: Bedding joints are smooth undulating, flat and at close intervals; Vertical joints are smooth planar at 3.45m and 5.0m															
														1	61	41	-	Grey
	4																	
73.2																		
73.1				1	B	F	C	SU	T	0								
				1	C	V		SP	T	0								
72.8																		
72.6				1	B	F	C	SU	T	0				2	100	92	100	Grey
72.5																		
72.4																		
72.3																		
72.3	5																	
72.2																		
71.9																		
71.8				1	B	F	C	SU	T	0								
71.7				1	C	V		SP	T	0				3	100	83	100	Grey
71.6																		
71.4																		
	6																	
71.0			End of Borehole at 6.4 m															



exp.

Log of Borehole 4

Project No. MRK-00243747-AO

Drawing No. 5

Project: Preliminary Geotechnical Investigation - Proposed Development

Sheet No. 1 of 1

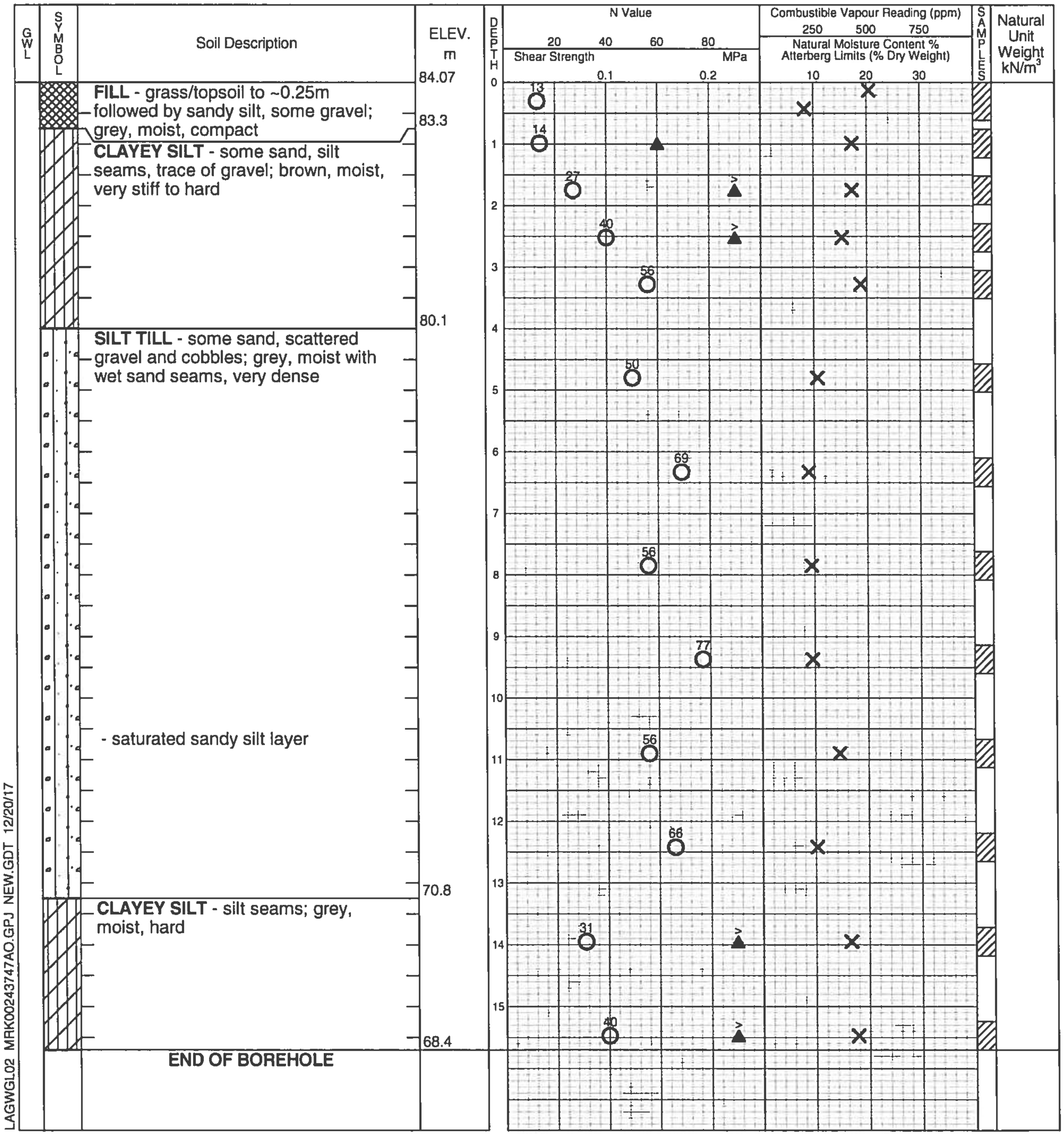
Location: Former OPG Lakeview Site, 800 Hydro Road, Mississauga, Ontario

Date Drilled: November 8 and 9, 2017

Drill Type: CME 75

Datum: Geodetic

Auger Sample	☒	Combustible Vapour Reading	☐
SPT (N) Value	○ ▨	Natural Moisture	✕
Dynamic Cone Test	—	Plastic and Liquid Limit	⊢—○
Shelby Tube	■	Undrained Triaxial at % Strain at Failure	⊕
Field Vane Test	✚ S	Penetrometer	▲



FILL - grass/topsoil to ~0.25m followed by sandy silt, some gravel; grey, moist, compact

CLAYEY SILT - some sand, silt seams, trace of gravel; brown, moist, very stiff to hard

SILT TILL - some sand, scattered gravel and cobbles; grey, moist with wet sand seams, very dense

- saturated sandy silt layer

CLAYEY SILT - silt seams; grey, moist, hard

END OF BOREHOLE

Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	15.24

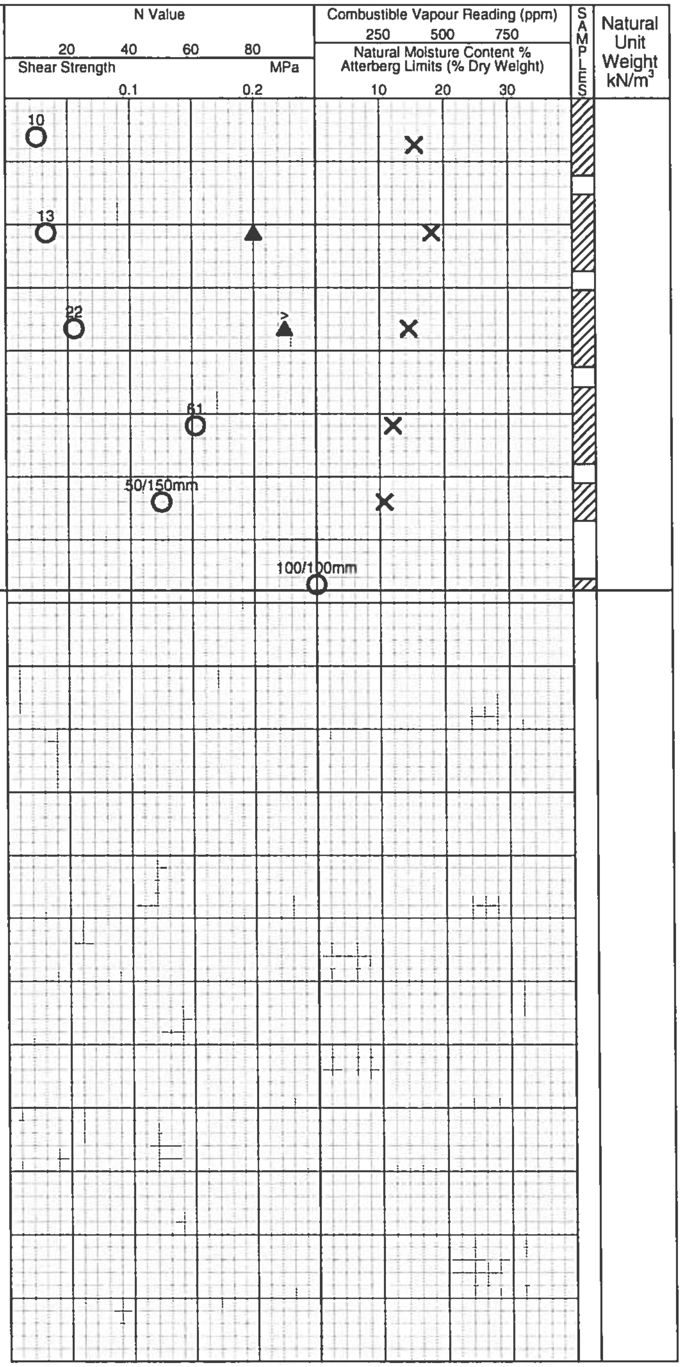
Log of Borehole 5

Project No. MRK-00243747-AO
Drawing No. 6
Project: Preliminary Geotechnical Investigation - Proposed Development
Sheet No. 1 of 1
Location: Former OPG Lakeview Site, 800 Hydro Road, Mississauga, Ontario

Date Drilled: November 10, 2017
Drill Type: CME 75
Datum: Geodetic

Auger Sample	☒
SPT (N) Value	○ ▨
Dynamic Cone Test	—
Shelby Tube	■
Field Vane Test	✚ S
Combustible Vapour Reading	☐
Natural Moisture	✕
Plastic and Liquid Limit	├─○
Undrained Triaxial at % Strain at Failure	⊕
Penetrometer	▲

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH
			80.31	0
	▩	**FILL** - 125mm sand and gravel followed by clayey silt, some gravel, pieces of brick; brown, moist, compact	79.6	
	▨	**CLAYEY SILT TILL** - some gravel; brown, moist with wet sand seams, very stiff to hard	78.1	1 2
	⁘	**SILT TILL** - some sand and gravel; brown, moist, very dense	76.8	3
	☰	**SHALE BEDROCK** - grey, weathered	76.4	
		END OF BOREHOLE		



LAGWGL02 MRK00243747AO.GPJ NEW.GDT 12/20/17

exp.

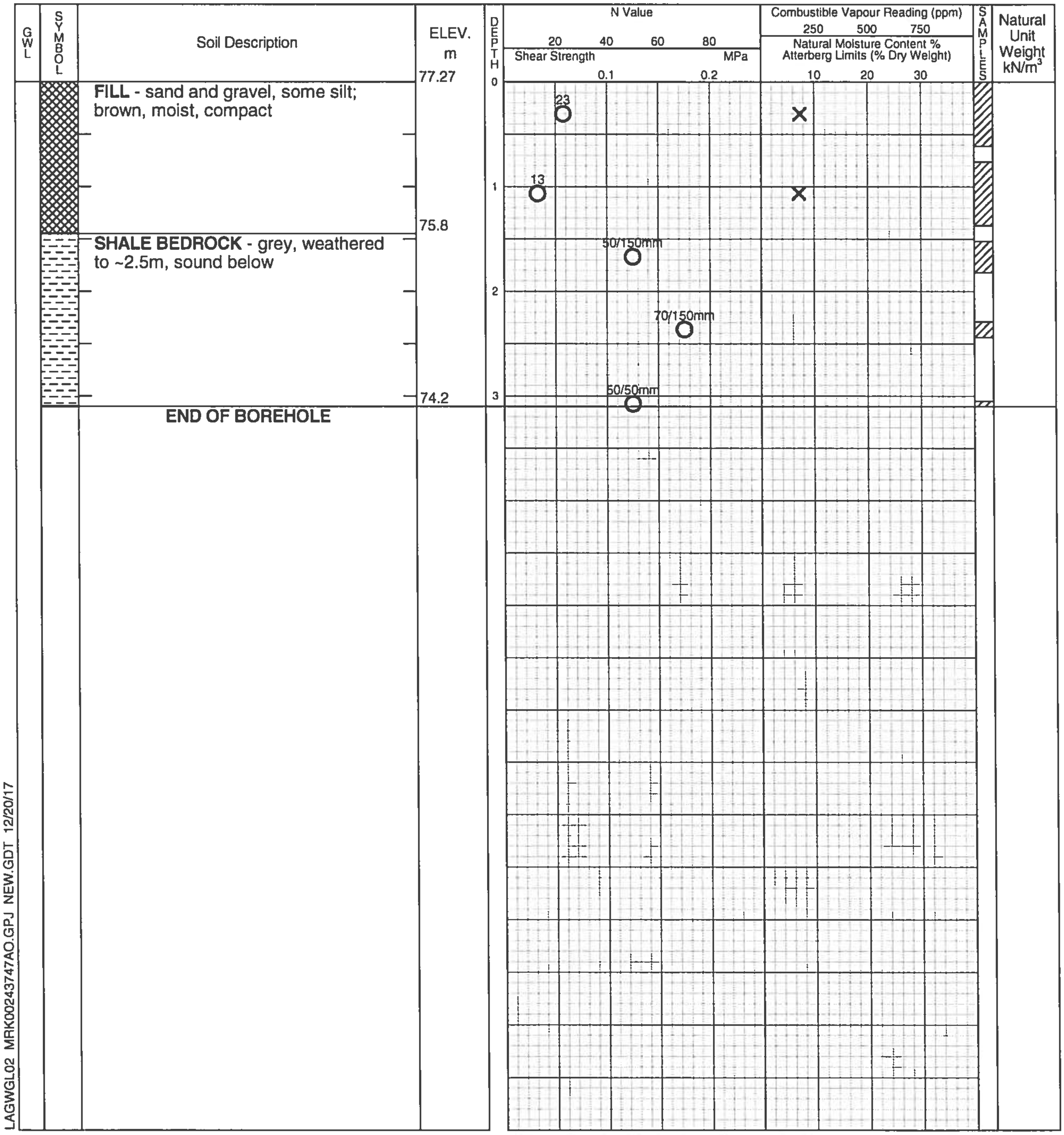
Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	3.81

Log of Borehole 6

Project No. MRK-00243747-AO
Drawing No. 7
Project: Preliminary Geotechnical Investigation - Proposed Development
Sheet No. 1 of 1
Location: Former OPG Lakeview Site, 800 Hydro Road, Mississauga, Ontario

Date Drilled: November 6, 2017
Drill Type: CME 75
Datum: Geodetic

Auger Sample	☒
SPT (N) Value	○ ▨
Dynamic Cone Test	—
Shelby Tube	■
Field Vane Test	✚ S
Combustible Vapour Reading	☐
Natural Moisture	✕
Plastic and Liquid Limit	├—○
Undrained Triaxial at % Strain at Failure	⊕
Penetrometer	▲



ELEV. m	Soil Description
77.27	**FILL** - sand and gravel, some silt; brown, moist, compact
75.8	**SHALE BEDROCK** - grey, weathered to ~2.5m, sound below
74.2	**END OF BOREHOLE**

LAGWGL02 MRK00243747AO.GPJ NEW.GDT 12/20/17

Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	3.05

Log of Borehole 7

Project No. MRK-00243747-AO

Drawing No. 8

Project: Preliminary Geotechnical Investigation - Proposed Development

Sheet No. 1 of 1

Location: Former OPG Lakeview Site, 800 Hydro Road, Mississauga, Ontario

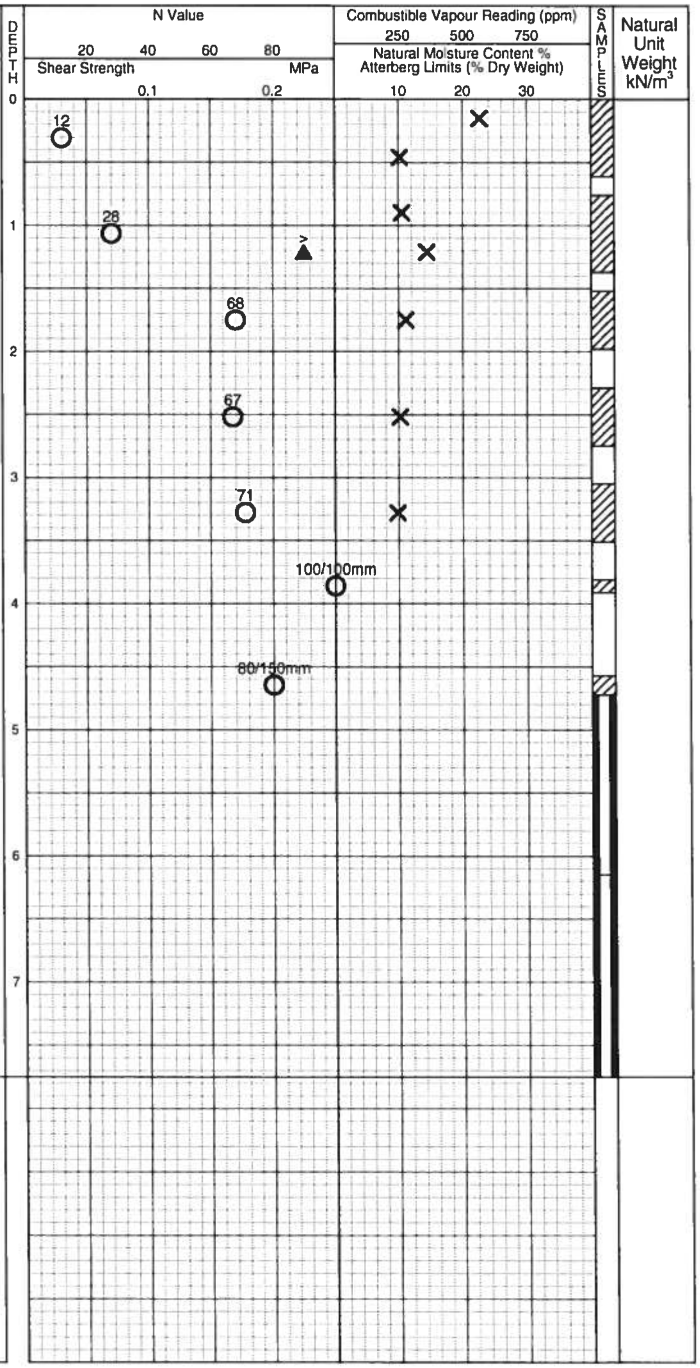
Date Drilled: November 10 and 14, 2017

Drill Type: CME 75

Datum: Geodetic

Auger Sample	☒
SPT (N) Value	○ ▨
Dynamic Cone Test	—
Shelby Tube	■
Field Vane Test	✚ S
Combustible Vapour Reading	☐
Natural Moisture	✕
Plastic and Liquid Limit	├──○
Undrained Triaxial at % Strain at Failure	⊕
Penetrometer	▲

Soil Description	ELEV. m
	83.59
TOPSOIL - silt with rootlets; dark brown, moist	83.3
SANDY SILT - brown, moist, compact	82.5
CLAYEY SILT - silt seams; brown, moist, hard	82.1
SILT TILL - some sand, scattered gravel and cobbles; brown becoming grey at ~2.5m, moist, very dense	79.8
SHALE BEDROCK - grey, weathered to ~6m, sound below **(SEE ATTACHED ROCK CORE LOG)**	75.8



END OF BOREHOLE

NOTES:

1. Bedrock cored from 4.72 to 7.75m in HQ size using diamond drilling equipment.

Time	Water Level (m)	Depth to Cave (m)
On completion	Dry	4.57

exp.

ROCK CORE LOG

BH 7

PROJECT	ORIENTATION	ELEVATION (m)	DATUM	PROJECT NUMBER
Preliminary Geotechnical Investigation	Vertical	83.6	Geodetic	MRK-00243747-A
LOCATION	**DATE STARTED**	**COMPLETED**	**LOGGED BY**	**DRAWING NUMBER**
800 Hydro Road, Mississauga, Ontario	11/14/17	11/14/17	AJ/AM	8
CLIENT	**DRILLER**	**DRILL TYPE**	**CORE BARREL**	**SHEET**
CCI Development Group of Companies	Pontil Drilling	CME 75	HQ	1 of 1

ELEVATION (m)	DEPTH (m)	SYMBOL	GENERAL DESCRIPTION	JOINT CHARACTERISTICS NO. OF SETS	JOINT TYPE	ORIENTATION	SPACING	ROUGHNESS	FILLING	APERTURE (mm)	WEATHERING	STRENGTH	FRACTURE FREQUENCY	RUN NUMBER	RECOVERY (%)	RQD	WATER RECOVERY (%)	WATER COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
78.9 78.8 78.7 78.6 78.6 77.9 77.9	5 6		**GEORGIAN BAY FORMATION:** Shale with interbedded Limestone and Siltstone Shale (82%) Thinly bedded or laminated, dark grey, generally unweathered with moderately to heavily weathered layers, low to very low strength Limestone (17%) Fine grained to medium grained, grey, unweathered, medium strength Clay (1%) Contains shale fragments, very low strength Discontinuities: Bedding joints are smooth undulating, flat and at close intervals; no vertical joints present	1	B	F	C	SU	T	0				1	100	87	100	Grey
77.5 76.4 76.3 76.3 76.0 76.0 75.9 75.8	7			1	B	F	C	SU	T	0				2	100	80	100	Grey
75.8			End of Borehole at 7.8 m															

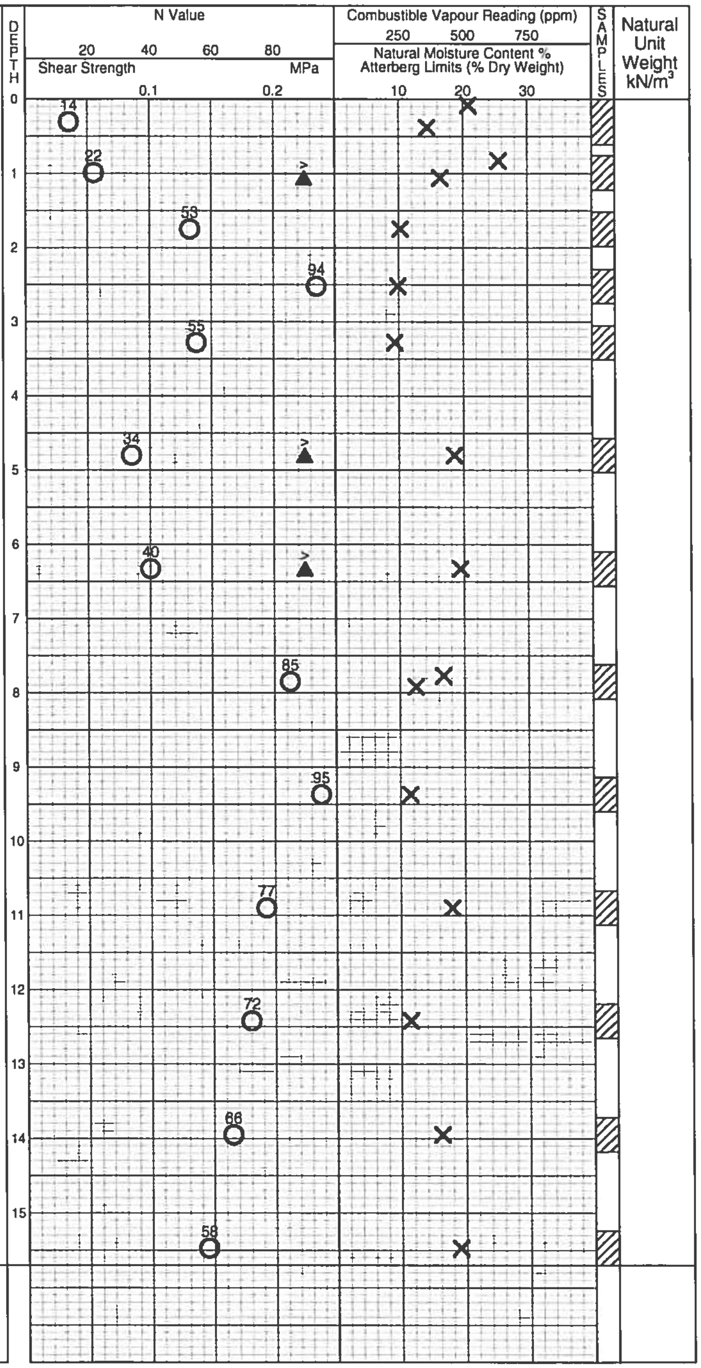
Log of Borehole 8

Project No. MRK-00243747-AO
Drawing No. 9
Project: Preliminary Geotechnical Investigation - Proposed Development
Sheet No. 1 of 1
Location: Former OPG Lakeview Site, 800 Hydro Road, Mississauga, Ontario

Date Drilled: November 7, 2017
Drill Type: CME 75
Datum: Geodetic

Auger Sample	☒
SPT (N) Value	○ ▨
Dynamic Cone Test	—
Shelby Tube	■
Field Vane Test	✚ S
Combustible Vapour Reading	☐
Natural Moisture	×
Plastic and Liquid Limit	├──○
Undrained Triaxial at % Strain at Failure	⊕
Penetrometer	▲

Soil Description	ELEV. m
	81.51
FILL - grass/topsoil to ~0.15m followed by silt, some gravel; brown, moist, compact	80.9
TOPSOIL - silt; black, moist	80.6
CLAYEY SILT - some sand; brown, moist, hard	80.1
SILT TILL - some sand, scattered gravel and cobbles; brown, moist, very dense	77.5
CLAYEY SILT - silt seams and layers; grey, moist, hard	74.5
SANDY SILT - trace to some gravel; grey, moist to saturated, very dense - till-like	68.3
CLAYEY SILT - silt seams; grey, moist, hard	65.8
END OF BOREHOLE	



Time	Water Level (m)	Depth to Cave (m)
On completion	15.09	15.24

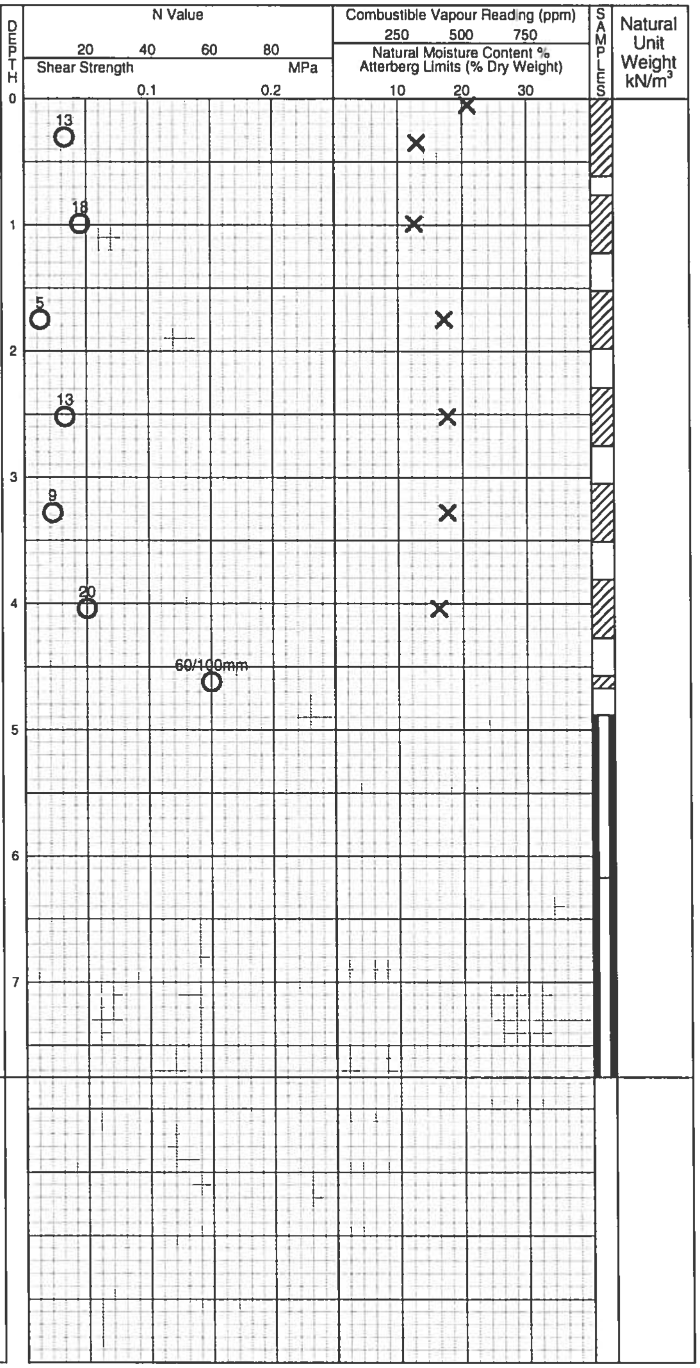
Log of Borehole 9

Project No.	MRK-00243747-AO	Drawing No.	10
Project:	Preliminary Geotechnical Investigation - Proposed Development	Sheet No.	1 of 1
Location:	Former OPG Lakeview Site, 800 Hydro Road, Mississauga, Ontario		

Date Drilled: November 7, 2017
Drill Type: CME 75
Datum: Geodetic

Auger Sample	☒	Combustible Vapour Reading	☐
SPT (N) Value	○ ▨	Natural Moisture	✕
Dynamic Cone Test	—	Plastic and Liquid Limit	├—○
Shelby Tube	■	Undrained Triaxial at % Strain at Failure	⊕
Field Vane Test	✚ S	Penetrometer	▲

GWL	SYMBOL	Soil Description	ELEV. m
	▩	**FILL** - grass/topsoil to ~0.1m followed by silt to clayey silt, some sand and gravel, topsoil inclusions, pieces of shale; brown and grey, moist to very moist, loose to compact	78.95
	☰	**SHALE BEDROCK** - grey, weathered to ~6m, sound below **(SEE ATTACHED ROCK CORE LOG)**	74.6
		END OF BOREHOLE **NOTES:** 1. Bedrock cored from 4.88 to 7.75m in HQ size using diamond drilling equipment.	71.2



exp.

Time	Water Level (m)	Depth to Cave (m)
On completion	3.81	4.57

ROCK CORE LOG

BH 9

PROJECT Preliminary Geotechnical Investigation	**ORIENTATION** Vertical	**ELEVATION (m)** 78.9	**DATUM** Geodetic	**PROJECT NUMBER** MRK-00243747-A
LOCATION 800 Hydro Road, Mississauga, Ontario	**DATE STARTED** 11/07/17	**COMPLETED** 11/07/17	**LOGGED BY** CC/AM	**DRAWING NUMBER** 10
CLIENT CCI Development Group of Companies	**DRILLER** Pontil Drilling	**DRILL TYPE** CME 75	**CORE BARREL** HQ	**SHEET** 1 of 1

				JOINT CHARACTERISTICS														
ELEVATION (m)	DEPTH (m)	SYMBOL	GENERAL DESCRIPTION	NO. OF SETS	JOINT TYPE	ORIENTATION	SPACING	ROUGHNESS	FILLING	APERTURE (mm)	WEATHERING	STRENGTH	FRACTURE FREQUENCY	RUN NUMBER	RECOVERY (%)	RQD	WATER RECOVERY (%)	WATER COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
74.1																		
	5		- Core loss due to possible shale rubble layer															
73.8			**GEORGIAN BAY FORMATION:** Shale with interbedded Limestone and Siltstone Shale (84%) Thinly bedded or laminated, dark grey, generally unweathered with moderately to heavily weathered layers, low to very low strength Limestone (16%) Fine grained to medium grained, grey, unweathered, medium strength Clay (0%) Discontinuities: Bedding joints are smooth undulating to smooth planar, flat and at close intervals; Vertical joints are smooth planar at 5.25m and 7.39m															
73.6				1	B	F	C	SP	T	0								
				1	C	V	C	SU	T	0				1	82	60	-	Grey
73.1																		
73.0																		
73.0																		
72.9	6																	
72.7																		
72.3																		
72.3																		
				1	B	F	C	SP	T	0								
	7			1	C	V	C	SP	T	0				2	100	100	100	Grey
71.2			End of Borehole at 7.7 m															

Appendix C:

Geophysical Survey Report by Geophysics GPR International Inc.

GEOPHYSICS GPR INTERNATIONAL INC.

GEOPHYSICAL SURVEY AT 800 HYDRO ROAD, MISSISSAUGA.

Presented to:

DS Consultants Ltd.

6221 HIGHWAY 7, UNIT 16
VAUGHAN, ON
L4H 0K8

Geophysics GPR International Inc.
6741 Columbus Road, Unit 14
Mississauga (Ontario) L5T 2G9
Tel. : +1 905.696.0656
info@geophysicsgpr.com

July 2018 T-18662

TABLE OF CONTENTS

Index of Figures

Index of Tables

List of Appendices

1 INTRODUCTION

Geophysics GPR International Inc. (GPR) was requested DS consultants Limited to carry out a geophysical survey at 800 Hydro Road, Mississauga. (Figure 1).

The goal of this investigation was to determine the bedrock surface profile along four profiles for the purpose of defining the shape and location of a large buried valley under mostlyformer OPG property of a former thermal power station. The most accurate geophysical method for this objective is seismic refraction. The method is not limited by depth but rather by the seismic source being used. It was anticipated that the bedrock would probably be within 30 meters of surface so a ‘buffalo gun’ was used for this survey where there was no roadway and an elastic hammer was used where there was roadway.

The geophysical fieldwork was carried out on May 28th to June 7th, 2018.

The following report describes the survey design, the principles of the applied methods, the methodology for interpreting the data and finally a culmination of the results in the form of interpreted profiles.

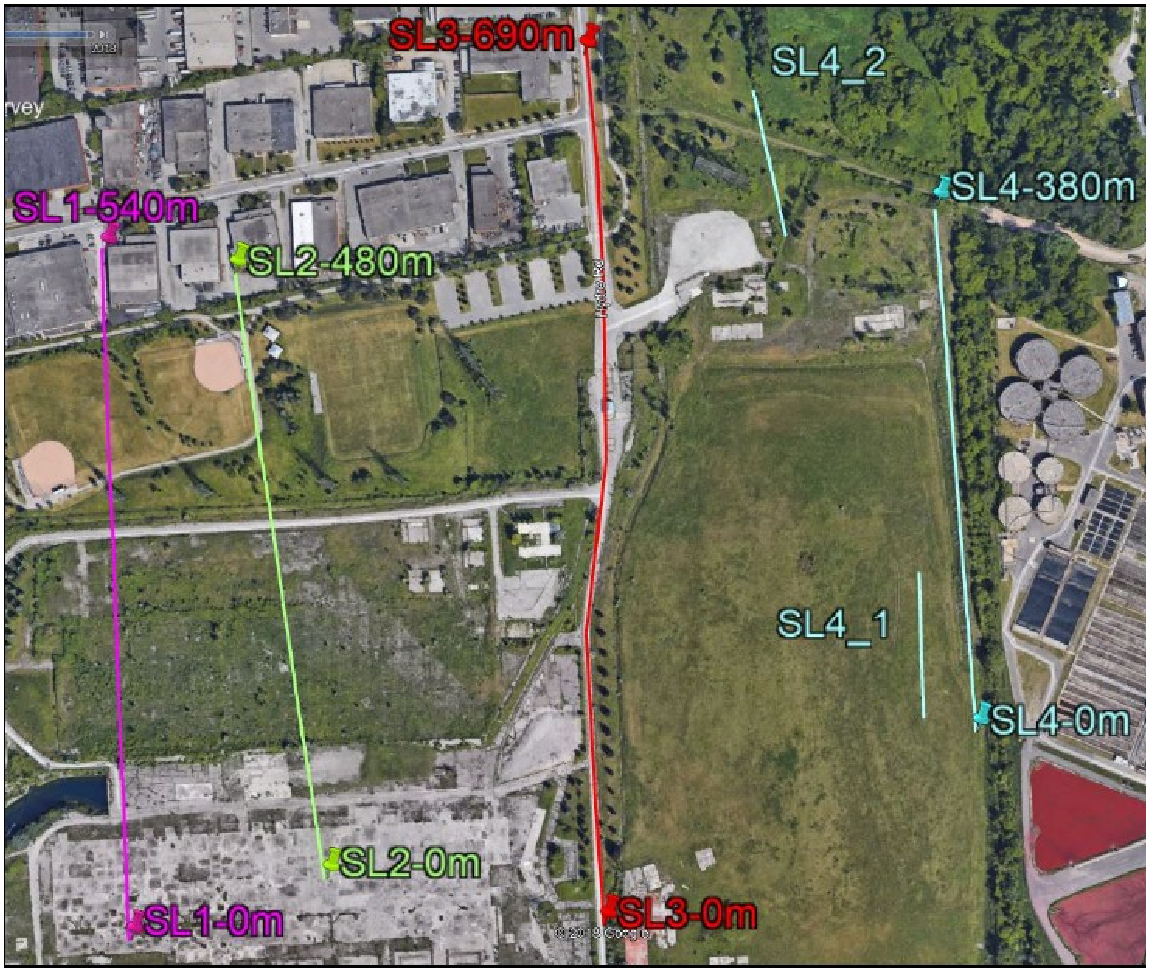


Figure 1: Survey location with Seismic Lines

2 METHODOLOGY

2.1 Personnel

The GPR field personnel involved in this project and the dates that they were on-site are outlined in Table 1, below:

Table 1: Field personnel and survey dates

Employee	Title	Dates On-Site
Cameron Coatsworth	GIT	May 28th to June 7th
Tomas Westerbloom	Technician	June 5th and 7th
Mauritz Van Zyl	Technician	June 6th
Norbert Kappa	Technician	May 28th to June 7th
Basil Khan	Technician	May 28th to June 7th
Lhoucin Taghya	Geophysicist	May 28th

2.2 Positioning, Topography and Units of Measurement

The positions are in the WGS84, UTM Zone 17N datum.

All geophysical measurements are reported in SI units.

The start and end of line coordinates are provided in Table 2.

Table 2: Seismic Line UTM Coordinates

Seismic Line	Start Easting	Northing	End Easting	Northing	Length (m)
SL-1	616842	4825202	616466	4825589	480
SL-2	616924	4825341	616553	4825644	540
SL-3	617110	4825459	616641	4825953	690
SL-4	617225	4825766	616925	4826049	380
SL-4_1	617186	4825746	617106	4825829	115
SL-4_2	616853	4825953	616758	4826020	116

2.3 Seismic Refraction

Seismic methods for geologic mapping involve measuring/recording the response of vibration sensors. Multiple techniques and methodologies are available for analysis of the data depending on the ultimate goal of the investigation. The profiles were collected using a standard stationary geophone arrangement.

Basic Theory

The seismic refraction method relies on measuring the transit time of the wave that takes the shortest time to travel from the shot-point to each geophone. The fastest seismic waves are the compressional (P) or acoustic waves, where displaced particles oscillate in the direction of wave propagation. The energy that follows this first arrival, such as reflected waves, transverse (S) waves and resonance, is not considered under routine seismic refraction interpretation. (Figure 2) illustrates the basic operating principle for refraction surveys.

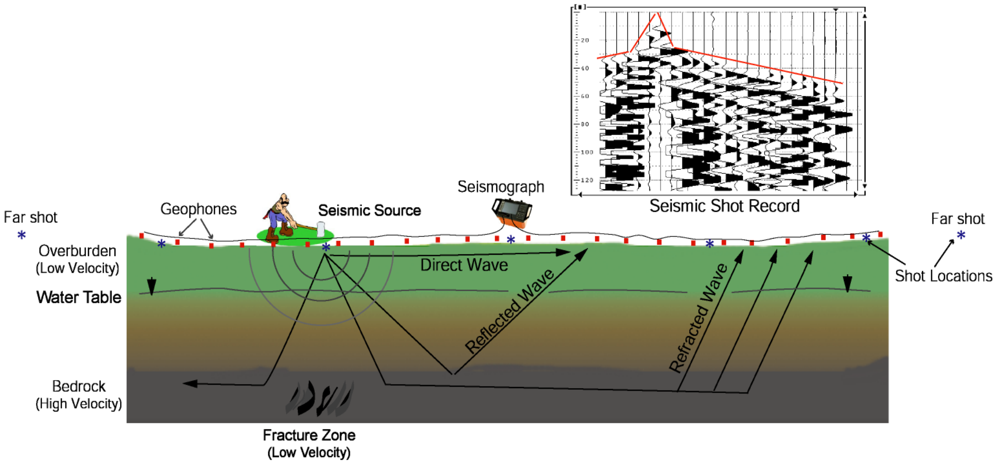


Figure 2: Seismic Refraction Operating Principle

Survey Design

This investigation used 12 to 24 – 4.5 Hz geophones with a spacing between geophones of 5 m.

Typically, seven or more shots are executed per seismic spread; three to five shots within the profile to obtain the lateral velocity variation in the overburden and two shots on either side of the spread to provide the true velocity of the bedrock surface.

Interpretation Method and Accuracy of Results

Interpretation of the seismic data was primarily done using the Hawkins' method. The Hawkins' method allows the computation of the rock depth to every geophone. This method provides information on the thickness of the various overburden layers, depth to bedrock and rock quality. It is based on the closure times of the inner shots. It can calculate the true velocities of the rock using the apparent velocities, measured with information provided by the outer shots. A full description of the strengths and limitations of the refraction seismic method is presented in Appendix A. A basic description of the Hawkins' method can also be found in the article Seismic Refraction Surveys for Civil Engineering by L. Hawkins (1961).

The standard seismic refraction method typically allows the determination of the bedrock profile with a precision of 10% or better for depths greater than 10 m and a precision of 1 m for depths less than 10 m. The precision in the determination of rock velocities is plus or minus 3%. The vertical contacts (lateral velocity change), usually associated with faults and deep valleys, are generally accurate to within 5 m in width; although, this is somewhat site specific.

The two most significant problem areas for refraction mapping are the “hidden” layer and effect of velocity inversions.

A “hidden” layer or “blind zone” is a stratigraphic layer that is not possible to discern from the arrival time data due to insufficient velocity variation or thickness. The unknown presence of a hidden layer has the effect of making the interpreted bedrock depth too shallow. The presence of a “hidden” layer is typically revealed through borehole or test-pit data and calculations can be made to compensate for the presence of such a layer.

Velocity inversions occur when the velocity does not increase with depth. The velocity inversion can result from the presence of a low or high velocity layer. Refractions from low-velocity layers cannot be determined from the arrival time data. The unknown presence of a low velocity layer has the effect of making the interpreted depths deeper than actual depths. At this particular site, the presence of a velocity inversion is unlikely.

Along with hidden layers and velocity inversions, other inherent limitations of the seismic refraction method are approached as the depth to bedrock decreases. This is especially apparent with higher velocity overburden material. Identification and interpretation of vertical and lateral velocity variations and the time spent in each layer is critical to accurate interpretations. Irregularities in the bedrock surface and weathered bedrock at shallow depths will also have a more pronounced effect on accuracy than irregularities at greater depths.

3 RESULTS

The results of the seismic surveys are presented in Figure 4 in the form of interpreted cross-sections. The data quality for the surveys were generally good, however a great deal of effort was taken to overcome the heavy construction equipment that was jack hammering concrete slabs. GPR made the additional effort to collect the data from late afternoon to dusk.

The overburden P-wave velocities ranged from 800m/s to approximately 2400 m/s. Values of 1500 m/s are simply saturated soft sediments that assume the velocity of water.

SL-1
The bedrock P-wave velocities was predominantly in the 3200 m/s range but there was a zone near the north end where 2100 m/s was measured. This weak zone may be related to heavy preferential weathering not unusual for the local shales. The depth to bedrock was shallower on the south side with depths at less than or equal to 5 m. At chainage 250 m there was a gradual increase in depth leading to the base of the valley at chainage 430 m and depth of 25 m. The north end of the profile (chainage 540) has a bedrock depth of about 5 meters.

SL-2
The bedrock P-wave velocities ranged from approximately 3600 m/s to 2600 m/s. Again the weaker rock values were found on the northern portion of the profile. The depth to bedrock was also shallower on the

south side (5 m). At chainage 220 m there was a gradual increase in depth leading to the base of the valley at chainage 350 m and depth of 25 m. Again the north edge of the valley could be seen at chainage 480 m where the depth was again 5 meters.

SL-3

The bedrock P-wave velocities ranged from approximately 3200 m/s to 3400 m/s. The depth to bedrock like SL-1 and SL-2 is 5m deep and decends at chainage 170 m to a depth of 25 m at chainage 400 m. It is not certain the northern edge of the valley was reached but it rock depth rose to 15 meters at chainage 530 m.

SL-4, SL-4-1 and SL-4-2

The bedrock P-wave velocities ranged from approximately 3200 m/s to 3400 m/s. The depth to bedrock like the other spreads were shallowest on the south side. At chainage 50 m on SL-4 there was a gradual increase in depth leading to a possible valley at chainage 260 m and depth of approximately 30 m. Spread SL-4-1 was within the southern section of the survey area and bedrock appeared to be at depth of less than or equal to 5 m. Spread SL-4-2 showed bedrock on a steep climb from a depth of 20 m to 5 meters at the north end.

Figure 3 shows a drawing of the seismic spreads with the approximate location of the possible valley. It is uncertain where the valley extends to SL-4 as the collected data between SL-4 and SL-3 did not show it's possible boundaries.

Appendix A contains a table of seismic velocities for various soil and rock types.

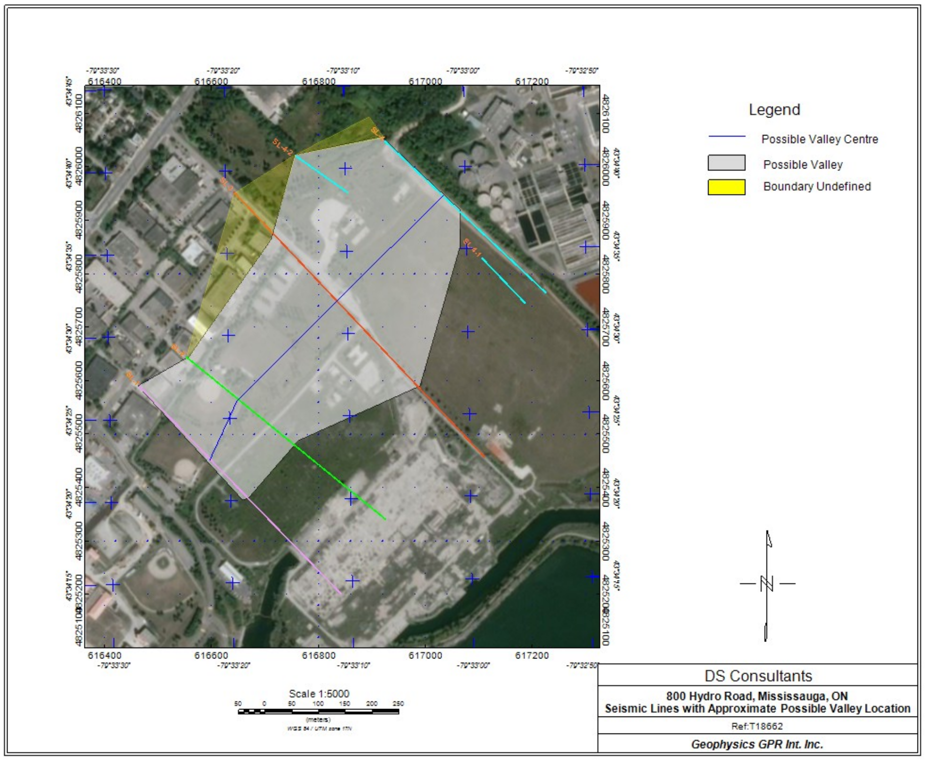
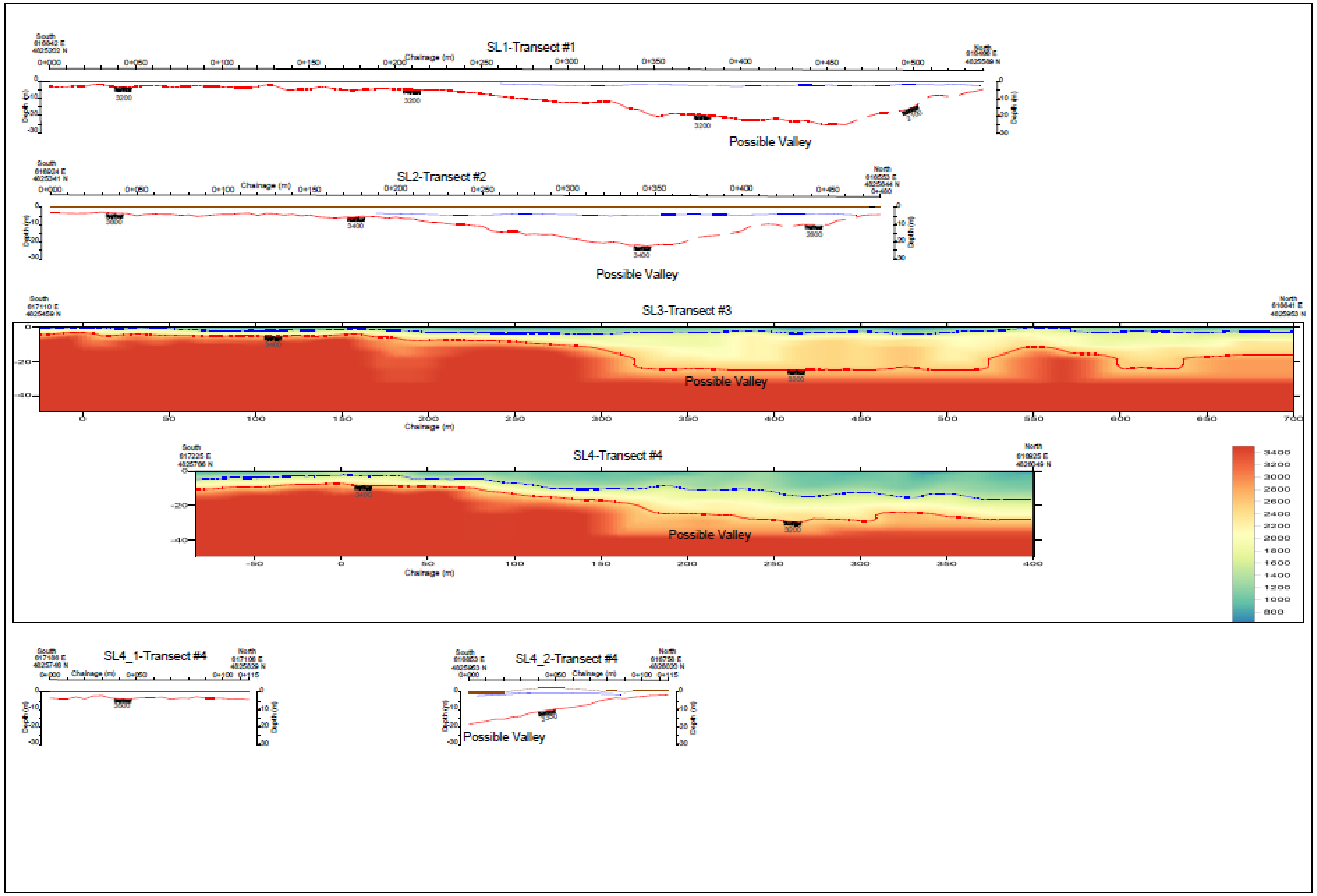


Figure 3: Seismic Lines with Possible Valley location



LEGEND

🟫	Topography profile
🟦	Water table
3200	Bedrock P-wave velocity (m/s)
🟥	Bedrock profile from seismic refraction
🟥	Interpreted Bedrock (lower confidence or Interpolated)

NOT VALID FOR CONSTRUCTION

1	THE SEISMIC SURVEY WAS EXECUTED BY GEOPHYSICS GPR INTERNATIONAL INC. May 2018				
2	COORDINATE SYSTEM: WGS84 UTM ZONE 17T				
3	REFER TO FULL REPORT FOR DISCUSSION OF METHODOLGIES, RESULTS AND LIMITATIONS				
4					
5					
6					
No	NOTES	No	DATE	MODIFICATIONS	GPR APP.

SCEAU PROFESSIONNEL

DRAFT

PROFESSIONAL SEAL

GEOPHYSICS GPR INTERNATIONAL INC.

DESSINÉ PAR DRAWN BY	L.T		
VERIFIÉ PAR CHECKED BY	M.S		
APPROUVÉ PAR APPROVED BY	M. Shum, P.Geo.		
# CONTRAT CONTRACT #	T-18662	DATE	July 2018
ÉCHELLE SCALE	AS SHOWN	# DESSIN DRAWING #	T18662_A1

CLIENT	DS Consultants	CLIENT
PROJET	800 Hydro Road Mississauga, Ontario	PROJECT
TITRE	SEISMIC SURVEY SL1 to SL4	TITLE

Figure 4: Seismic Investigation Interpreted Cross-sections

4 CONCLUSIONS

Geophysics GPR was requested by DS Consultants to carry out a geophysical survey to map bedrock trends and locate a buried valley at 800 Hydro Road, Mississauga, Ontario (Figure 1).

The results of the bedrock and overburden mapping are presented in the form of interpreted profiles in Figure 4. A total of approximately 2.3 km of seismic data were collected.

Seismic refraction was completed to aid in the interpretation of the bedrock and possible valley locating. It is uncertain where the possible valley extends between SL-3 and SL-4 as the data collected between did not show it's possible boundaries.

The interpreted bedrock depth ranged from roughly 5 meters at each end of the valley to greater than 25 m in the center (Figures 3 and 4).

Interpretation of the seismic data was performed by Lhoucin Taghya.

This report has been prepared by Carolyn Boone, P.Geo. and reviewed by Milan Situm, P.Geo.

Milan Situm, P.Geo.
Manager

PROFESSIONAL GEOSCIENTIST
MILAN SITUM
PRACTISING MEMBER
0237
ONTARIO

APPENDIX A

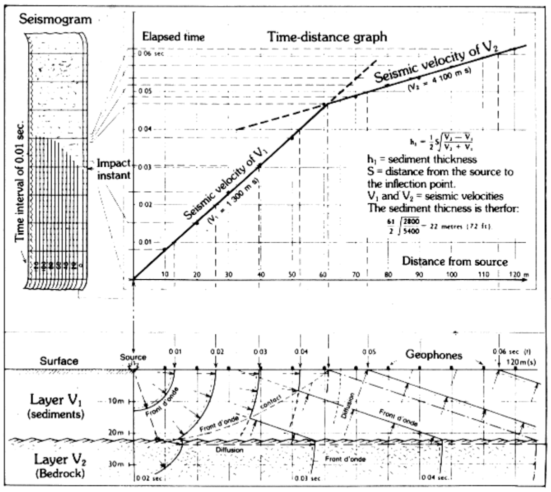
Seismic Refraction Information Fact Sheets

GEOPHYSICS G P R INTERNATIONAL INC.

SEISMIC REFRACTION

Seismic refraction consists of recording the length of time taken for an artificially provoked surface vibration to propagate through the earth. By processing the data, the seismic velocities and depths of the underlying rock layers can be determined. These velocities are characteristic of the nature and quality of the bedrock; a fissured, fractured or sheared rock will be characterized by reduced seismic velocities.

The method is generally used to obtain a better geological analysis of the sub-surface and to determine the following characteristics: the quality, profile and depth of bedrock, its nature, degree of alteration and any other physical contrasts. Seismic refraction ensures that maximum information may be gained from geological field work, and that direct investment costs (drilling, excavation), will be reduced.



PRINCIPLE OF SEISMIC REFRACTION

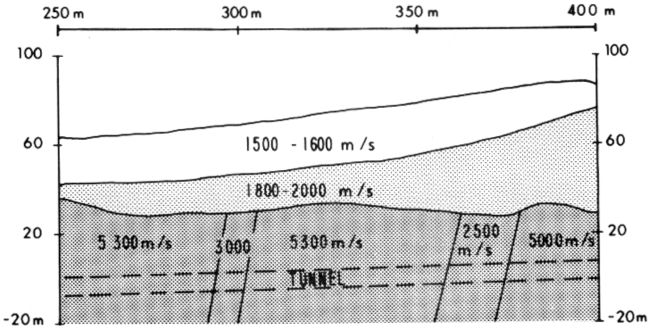
FEATURES

- Precise determination of soil thickness .
- Precise determination of the seismic velocities (rock type and quality).
- Localization and identification of geological units.
- Detailed analysis of soil.
- Year-round use.
- Sea and land surveys (above and below ground).
- Great accessibility possible to rough terrain and remote regions.

AREAS OF APPLICATION

Civil Engineering/Mining Exploration - Exploitation/Petroleum and Gas Sectors/ Geotechnology/Geology/ Hydrology.

- Identification of faults, fractures, shear zones.
- Detection of rock differences (veins, dykes, cavities, etc.).
- Determination of rock topography.
- Evaluation of volume of soil present or to be excavated.
- Excellent complement to geological mapping.
- Recognition of geophysical anomalies such as VLF, gravimetry, etc.
- Drill site selection, better target identification.
- Evaluation of the size, thickness and condition of surface shafts (mining exploitation).
- Mass Rock Quality Determination (MRQD).
- Detection of rock irregularities and breaks.
- Hydrogeology (detection of water tables, veins, reservoirs).
- Excellent complement to any geological analysis.



Interpretation results of a seismic profile

ADDITIONAL REMARKS

Geophysics GPR International Inc. has been recognized for the past fifteen years as a leader in both the application and the development of seismic methods. Seismic refraction is currently used in both civil and mining engineering; the use of lighter high-performance equipment and better tomographical interpretation of the results have contributed to its growing popularity.

GEOPHYSICS G P R INTERNATIONAL INC.

SEISMIC VELOCITIES VERSUS GEOLOGICAL MATERIALS

The seismic refraction differentiates the overburden layers from the bedrock. In general, a layer of overburden material, with associated velocities of 300 - 500 m/sec is seen followed by a second layer under the water table with a velocity corresponding to an impermeable material 1400 - 1600 m/sec.

In some cases, certain limitations may arise, such as differentiation between two different layers having approximately the same velocity. As an example:

- a contact within sand under the water table
- a contact between till and sand, under the water table (both at 1500 m/sec)

As a guideline, the following figure shows a classification of geological material by seismic velocities.

Seismic velocities in the overburden

Variations in the overburden layer can vary over a wide range as a function of its age, its depth of burial, differences in the granular state, degree of porosity, and whether water or air fills the voids (Telford 1976).

Seismic velocities in bedrock

A significant variation in seismic velocities for a particular rock mass may be caused by several factors. These factors include a change in the rock quality when the rock is weathered, sheared, faulted or fractured, a radical topographic change or a rock type change. Other features, such as the distribution of rock types, mineral content, the bonding of the minerals, joints opening, rock pressure, saturation and chemical composition of the minerals may all affect the velocities to some degree, explaining the differences of velocities in sound rock.

Rock type or change in bedrock quality

A rock type change will generally result in a different velocity because of differences in crystallization, mineralization or other physiochemical properties.

In the same way, a change in rock quality such as the presence of large open joints or several small open joints will undoubtedly bring about a velocity change for the same type of rock. Features such as a weathered, sheared, fractured or faulted rock will cause a drop in the velocity.

Faults, deep valleys

A radical topographic change in the bedrock profile may also cause a drop in the measured velocity. The cause of this is geometric and the use of specialized interpretative methods permits an estimation of the true depth of bedrock. A fault will also cause a similar velocity anomaly in the bedrock.

These anomalies may be due to either a deep valley or a cavity like feature (which may be water or sediment filled), or a physical feature in the rock such as a fault or open joints. Since the analysis of the time distance curve does not allow the differentiation of the anomalies, the two possible interpretations are presented on the drawings. In such a case, borehole data gives the best information to assess the true nature of the anomaly.

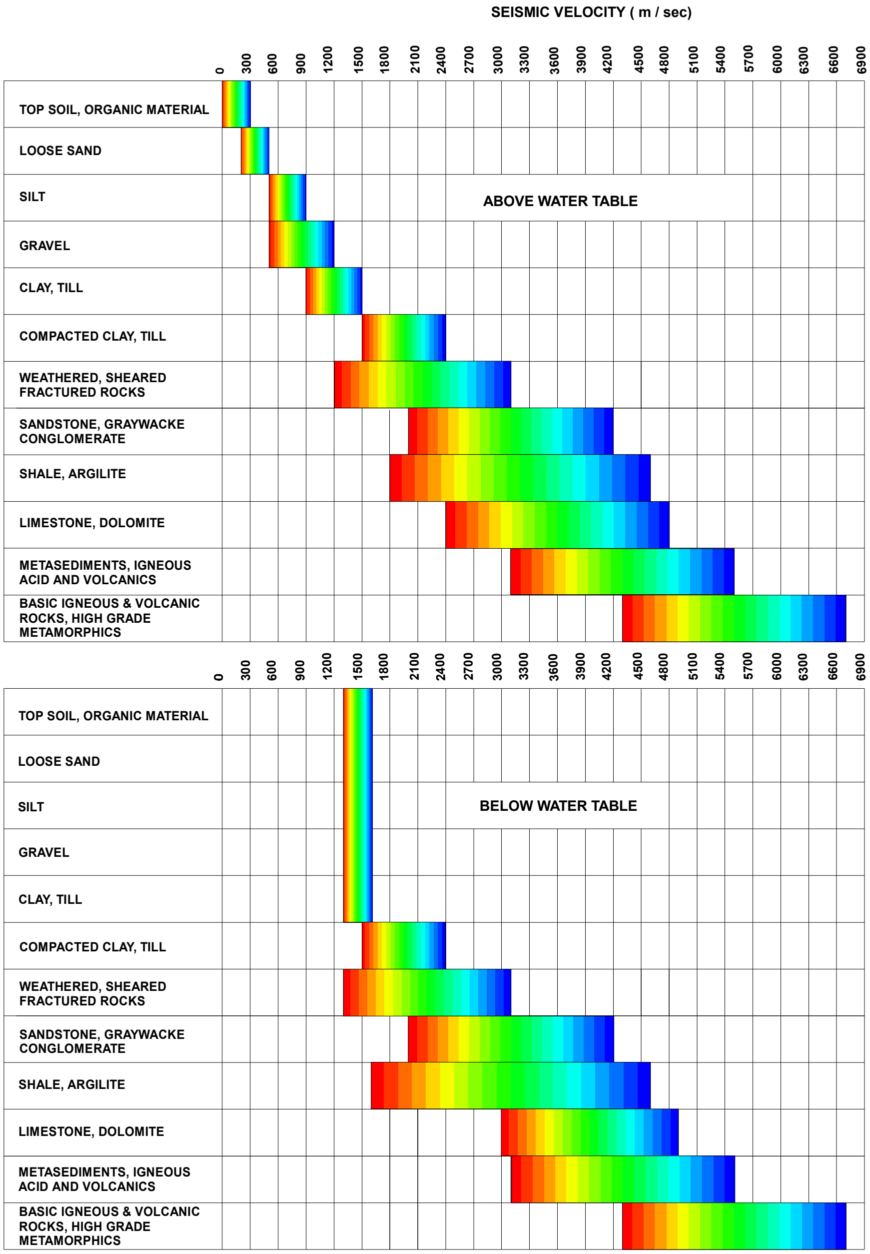


Figure 5: Classification of Geological Materials by Seismic Velocities