SOLA ENGINEERING

RE: GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
5034, 5054 AND 5080 NINTH LINE
MISSISSAUGA, ONTARIO

FOR: Your Home Development (Mississauga) Inc.
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Toronto, ON
c/o
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ATTENTION: Mr. Riyaz Punjani

REPORT NO.: 2020-14185

DATE: May 17, 2021

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Original:	(FILE No.: 10653-S0068-GEO)	

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May 17, 2021 **REPORT No.: 2020-14185**
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1.0 INTRODUCTION

Sola Engineering Inc. (Sola) was retained by S2S Environmental Inc. on behalf of Your Home Development (Mississauga) Inc. ("the Client" or "the Clients") to carry out a geotechnical investigation for the proposed residential development located at 5034, 5054 AND 5080 Ninth Line in Mississauga, Ontario (the "subject site" or "site"). The investigation was carried out in two phases with the first phase at 5080 Ninth Line and the second phase at 5034 and 5054 Ninth Line. Authorization to proceed with the investigation for the first phase was received on February 27, 2019, through the acceptance of a revision of the Sola's Proposal No. 2018-1728 and authorization to proceed with the investigation for the second phase was received on February 12, 2020, through the acceptance Sola's Proposal No. 2020-2331.

As per the scope of services detailed in Sola's proposal, the purpose of this investigation is to collect information on the soil and groundwater conditions at the subject site and based on the investigation data, provide recommendations to assist with the design of the proposed residential development. It is understood that the proposed development for phase one will consist of six (6) blocks of condominium buildings and townhome construction, which includes a maximum of two (2) basement levels. It is also understood that the proposed residential development for phase two has not been finalized and the Client is contemplating to develop the site with buildings that have a maximum of 10 storeys with two underground levels.

The Client has provided Sola with the conceptual drawing set for phase one prepared by Kirkor Architects dated October 28, 2018, showing the approximate locations of the proposed development and project statistics in order to assist Sola with the understanding of the project objectives.

The filed work of the investigation was carried out in conjunction with the Environmental and Hydrogeological studies which have been overall organized by S2S. Sola has observed the field procedures and carried out standard sampling and testing for geotechnical aspects only.

In this report, standard site investigation procedures have been adopted. The procedures including those developed by Ontario Building Code (OBC), Canadian Foundation Engineering Manual (CFEM), American Society for Testing and Materials (ASTM), Ontario Ministry of Transportation (MTO) and Toronto Transit Commission (TTC), are considered by far the most accepted methods by the local geotechnical society for the general engineering purposes. Soil Classification Systems used for developing this report have been in general conformance with those outlined in the above-mentioned procedures, with modifications where appropriate. Where in doubt, this office must be contacted for further interpretation or clarification.

This report presents the details of Sola's fieldwork and laboratory testing, outlines the subsoil and groundwater conditions at the subject site, and provides recommendations on the aforementioned items.

This report has been prepared for the Client, and their nominated engineers and designers. Third-party use or reproduction, in part or in full, of this report, is prohibited without written authorization from Sola. This report is also subject to the *Statement of Limitations* which forms an integral part of this document.

2.0 PROJECT AND SITE DESCRIPTION

2.1 SITE LOCATION AND PROPOSED DEVELOPMENT

The proposed site is located at 5034, 5054 AND 5080 Ninth Line in Mississauga, Ontario.

The study area is currently occupied by residence lots. The site is located in the west of Ninth Line and east of Highway 407. A Borehole Location Site Plan is included in this report as **Enclosures 1A and 1B**.

It is understood that the development for phase one will consist of six (6) blocks of condominium buildings and townhome construction, which includes a maximum of two (2) basement levels. At the time of preparing this report, the proposed residential development for phase two has not been finalized and it is understood that the Client is contemplating to develop the site with buildings that have a maximum of 10 storeys with two underground levels.

2.2 PUBLISHED GEOLOGY

Based on a review of an existing geological publication for the site area, Ontario Geological Survey (OGS) Map P2223: "*Quaternary Geology, Brampton Area*", the site is underlain by Late Wisconsin (Halton) Till, consisting of *red to brown, gritty to clayey silt till*. (**see Figure 1**).

Figure 1: Quaternary geology of the proposed site area and surroundings

According to the OGS Map M2544 "Bedrock Geology of Ontario", the superficial geology is underlain by the bedrock of the Upper

Ordovician Queenston Formation comprising shale, limestone, dolostone, and siltstone. The OGS database reports the anticipated depth to bedrock is more than 30 m below the ground surface. Information provided by a large number of historical Borehole records from the vicinity of the site, and held by the OGS, generally confirms the anticipated geological conditions beneath the site. Based on the data from records for Borehole ID 853495, the soil profile comprises stiff clayey silt till.

3.0 GROUND INVESTIGATION

3.1 FIELD INVESTIGATION

The fieldwork was managed by S2S. Sola has supervised the geotechnical aspects of the work. Prior to undertaking field drilling, clearance of existing public utility services to the site was obtained from all applicable agencies and companies (by S2S).

The field investigations for the first phase were carried out on March 6 through 15, 2019 and comprised the drilling of thirteen (13) boreholes, as shown in **Table 1.** The field investigation for the second phase was carried out on February 18 through 21, 2020, and comprised the drilling of ten (10) boreholes, as shown in **Table 2**. The approximate elevations are provided by S2S.

Table 1: Summary of Borehole Depths for Phase One

BH No.	Sampling Termination Depth (m)	Testing Termination Depth (m)	Approximate Elevation (m)	Remarks
1	12.65		187.28	Targeted Depth
2	11.12	12.65	187.62	Targeted Depth, DCPT
3	8.23	10.36	187.93	Targeted Depth, DCPT
4	8.08	9.91	187.33	Targeted Depth, DCPT
5	11.28	13.41	188.48	Targeted Depth, DCPT
6	8.08	8.99	186.92	Targeted Depth, DCPT
7	8.08		187.11	Targeted Depth
8	11.12	12.65	187.40	Targeted Depth, DCPT
9	8.23	10.66	189.05	Targeted Depth, DCPT
10	8.08	10.82	189.15	Targeted Depth, DCPT
11	11.12		189.61	Targeted Depth
12	15.69		190.32	Targeted depth
13	11.12	12.34	190.40	Targeted depth, DCPT

Table 2: Summary of Borehole Depths for Phase Two

BH No.	Sampling Termination Depth (m)	Testing Termination Depth (m)	Approximate Surface Elevation (m)	Remarks
301	12.6	14.5	187.654	Targeted Depth, DCPT
302	12.6	13.9	187.787	Targeted Depth, DCPT
303	13.9		187.562	Targeted Depth
304	11.1	12.3	187.582	Targeted Depth, DCPT
305	11.1	12.6	187.057	Targeted Depth, DCPT
306	11.1	12.3	186.818	Targeted Depth, DCPT
307	11.1	13.0	186.884	Targeted Depth, DCPT
308	11.1	12.3	187.205	Targeted Depth, DCPT
309	11.1	12.6	187.346	Targeted Depth, DCPT
310	11.1	12.6	187.537	Targeted Depth, DCPT

All boreholes for phase one were advanced using a Mobile B-45 drill rig and all boreholes for phase two were advanced using the track-mounted Mobile B-37 drill rigs. Standard Penetration Tests (SPTs) split spoon samples were collected from boreholes using a 50 mm outer diameter and 35 mm inner diameter split barrel sampler driven with a 63.5 kg automatic hammer dropping 760 mm.

Dynamic Cone Penetration Test (DCPT) was carried out during the intrusive drilling course in selected boreholes. From a geotechnical standpoint, the resistance characteristics determined by DCPT may be considered equivalent to those determined by the SPT.

The soil drilling equipment was supplied and operated by Profile Drilling Inc. and the geotechnical aspects of the drilling works were completed under the full-time supervision of a qualified Sola Technician.

The approximate locations of the boreholes are presented on **Enclosure 1**. It should be noted that boreholes BH14 to BH16 are for environmental purposes only and not included in this report.

All soil samples were logged in the field and returned to Sola's laboratory in Vaughan for review and subsequent laboratory testing.

The logs of all boreholes completed, together with their depths relative to their elevations, are presented on **Enclosures 2 through 24**.

Groundwater level observations were made during drilling and in the open boreholes upon completion of the drilling operations.

The scope of phase one investigation included the installation of four (4) monitoring wells, in BH4, BH9, BH11 and BH12 and the scope of phase two investigation included the installation of four (4) monitoring wells, in BH301, BH303, BH306 and BH309. The groundwater level in the monitoring well was noted during the course of the drilling works at the site.

Details pertaining to groundwater observations for each borehole are provided on the respective borehole logs presented on **Enclosures 2 through 24**. Further discussion on groundwater is provided in **Section 4.2** of this report.

3.2 GEOTECHNICAL FIELD AND LABORATORY TESTING

All soil samples were returned to Sola's laboratory for natural moisture content determination. The results of the moisture content are presented in the borehole logs on **Enclosures 2 through 24**. In addition, four (4) soil samples were submitted to particle size analysis and/or Atterberg Limits test. The results of the laboratory tests are provided on **Enclosures 27 through 30**.

4.0 SUBSURFACE CONDITIONS

The detailed descriptions of the sub-soil conditions encountered at each borehole locations are given in the Borehole Logs on **Enclosures 2 through 24**.

The borehole data collected by Sola only represents the subsurface conditions at the borehole locations. It should be pointed out that the material boundaries indicated on the Borehole Logs are approximate and based on visual observations and interpolation between successive samples. These boundaries typically represent a transition from one material type to another and should not be regarded as an exact plane of geological change. It should also be noted that the subsurface conditions may vary across the site.

A summary of the characteristics for each unit of subsoil encountered within the borehole depths is given in the following paragraphs.

4.1 SOIL CHARACTERISATION

4.1.1 Ground Cover

At the time of phase one fieldwork, the ground was frozen. A thin layer of snow and ice was found to cover the ground at a few borehole locations.

A layer of topsoil was encountered at all borehole locations. The topsoil thicknesses were measured around 75 mm to 305 mm. In Borehole 12, the topsoil was absent.

It is important to note that topsoil thicknesses may vary throughout the site area, depending upon their location. As such, these findings should not be relied upon for any estimation of topsoil quantities to be stripped prior to construction.

4.1.2 Fill Materials

Fill (or Probable Fill) materials consisting of clayey silt to silty clay and sandy silt to silty sand which include trace gravel, trace sand and trace rootlets, and occasional inferred cobbles, shale fragments and sand seams were encountered at all the borehole locations. The fill layers varied in thickness from approximately 2.1 m to 4.5 m.

Standard penetration tests (SPT) were carried out during the split spoon sampling process. SPT "N" values for fill materials were recorded between 1 and more than 50 blows per 300mm, indicating that the fill was not constructed under engineering control.

The moisture content in fill layers varied from 1.2% to more than 30% indicating moist to wet conditions. High moisture content results were obtained from soil samples from the frozen zone.

4.1.3 Till Layers

Glacial till varying from clayey silt till to silty clay till soil was encountered directly underlying the fill materials in all the boreholes. The Till contains a trace of gravel and a trace of sand with occasional sand seams and inferred cobbles.

The till deposits were not fully penetrated.

Standard penetration tests (SPT) were carried out during the split spoon sampling process. SPT "N" values recorded in the till zone ranged from 7 to more than 50 blows per 300 mm, which is firm to hard in relative consistency.

In the till deposits, the moisture content varied from 8.0% to 20.8%, indicating generally moist to wet conditions.

4.1.4 Silty Clay

A silty clay layer was encountered interfacing with the till layer in borehole BH309. The silty clay layer contains a trace of gravel and a trace of sand.

Standard penetration tests (SPT) were carried out during the split spoon sampling process. SPT "N" values recorded in the till zone ranged from 10 to 12 blows per 300 mm, which is stiff in relative consistency.

In the silty clay deposit, the moisture content varied from 12.4% to 12.9%, indicating a moist condition.

DCPTs were carried out during the intrusive drilling course in selected boreholes. The cone resistance values recorded until a competent soil stratum is reached. The testing results are shown on **Enclosures 2 through 24** of this report.

4.2 GROUNDWATER CONDITIONS

Groundwater level observations were made during drilling and in the open boreholes upon completion of the drilling operations. Cave depths were recorded on the borehole logs shown on **Enclosures 2 through 24**. Eight (8) monitoring wells were installed at the completion of the boreholes.

Groundwater monitoring visits were undertaken by S2S Environmental Inc. later on May 24, 2019, for the monitoring wells installed during phase one and the investigation results are provided in **Table 3.** Groundwater monitoring visits were undertaken by S2S Environmental Inc. later on March 5 and 17, 2020 for the monitoring wells installed during phase two and the investigation results are provided in **Table 4**.

Long term groundwater levels should refer to the hydrogeology study of the site.

Table 3: Summary of Groundwater Levels for Phase One

Borehole	Cave Depth (m)	Groundwater Measurements (mbgs)	
		Upon completion of Drilling	By S2S (May 24, 2019)
BH1	Open	Dry	-
BH2	10.4	Dry	-
BH3	8.1	7.9	-
BH4	Open	Dry	0.40
BH5	Open	Dry	-
BH6	Open	4.5	-
BH7	7.3	3.0	-
BH8	Open	4.2	-
BH9	Open	Dry	0.75
BH10	7.8	Dry	-

Borehole	Cave Depth (m)	Groundwater Measurements (mbgs)	
		Upon completion of Drilling	By S2S (May 24, 2019)
BH11	Open	Dry	0.37
BH12	Open	9.8	0.61
BH13	11.0	Dry	-

Table 4: Summary of Groundwater Levels for Phase Two

Borehole	Cave Depth (m)	Groundwater Measurements (mbgs)		
		Upon completion of Drilling	By S2S (March 5, 2020)	By S2S (March 17, 2020)
BH301	Open	Dry	0.33	0.40
BH302	Open	Dry	-	-
BH303	Open	Dry	8.72	7.75
BH304	9.4	Dry	-	-
BH305	10.1	Dry	-	-
BH306	Open	Dry	Dry	7.08
BH307	Open	Dry	-	-
BH308	9.8	0.9	-	-
BH309	Open	Dry	0.24	0.23
BH310	10.1	Dry	-	-

It should be noted that water levels can vary in response to seasonal fluctuations and major weather. In addition, a perched water condition can occur due to the accumulation of surface water in the more pervious fill overlying less pervious deposits, especially during seasonally wetter periods.

Long term groundwater levels should be determined by the Project Hydrogeologist.

5.0 DISCUSSIONS AND RECOMMENDATIONS

The investigation and comments should be considered on-going as new information about the underground conditions will continue to become available, for example, when more specific information is available with respect to conditions between boreholes during foundation construction. The interpretation between boreholes and the recommendations of this report must be checked through field inspections carried out by a Geotechnical Engineer to validate the information for use during construction.

For phase one investigation, it is understood that the site located at 5080 Ninth Line will be redeveloped with multi-story residential condominium or townhomes which include up to two (2) basement levels.

For phase two investigation, at the time of preparing this report, the proposed residential development has not been finalized and it is understood that the Client is contemplating developing the site located at 5034 and 5054 Ninth Line with buildings that have a maximum of 10 storeys with two underground levels. Based on the ground conditions found at the site, our recommendations are presented in the following sections.

The recommendations given below are based on that only minimal grade change, no more than 1 m, will be allowed to facilitate the site development.

5.1 FROST PROTECTION

All footings and structural elements exposed to seasonal freezing conditions must have at least 1.2 m of soil cover, or equivalent artificial insulation, for frost protection in the GTA areas.

5.2 CONVENTIONAL SPREAD OR STRIP FOUNDATIONS

Phase One at 5080 Ninth Line, Mississauga

The following discussions are provided to advance the design phase of the proposed residential buildings at 5080 Ninth Line with a maximum of two (2) levels of basement construction. For geotechnical design purposes, it is recommended that the footings will be positioned over the undisturbed native stratum. At the borehole locations, for basement level construction (one or two levels), the founding stratum at these depths was found to be clayey silt till or silty clay till deposits.

Based on the soil resistance values, the proposed building with one or two level(s) basement construction supported by spread and strip footings founded on the native deposit can be designed based on geotechnical parameters as outlined in **Table 5.**

It is assumed that the dimensions of the strip footing units are not greater than 1.0 m. For spread footings, the size will not be greater than 2.4 x 2.4 m. Larger footings will yield large settlement and must be reviewed by the Geotechnical Engineer during the detailed structural design.

Table 5: Bearing Capacity and Foundation Level for Phase One

Building Block No.	BH ID	One Level bsmt Minimum Depth below existing ground level (m)	Bearing Capacities		Two Level bsmt Minimum Depth below existing ground level (m)	Bearing Capacities	
			Serviceability Limit State (SLS)	Factored Ultimate Limit State (ULS)		Serviceability Limit State (SLS)	Factored Ultimate Limit State (ULS)
1	1 3 4	Contact Native (lower than 3 m)	80	120	6.0 to 6.5	80	120
2	2 3 5	Contact Native (lower than 3 m)	90	130	6.0 to 6.5	90	130
3	6 7 8	Contact Native (lower than 3 m)	150	230	6.0 to 6.5	120	180
4A & 4B	11 12 13	Contact Native (lower than 3 m)	100	150	6.0 to 6.5	120	180
5	7 9 10	Contact Native (lower than 3 m)	100	150	6.0 to 6.5	100	150
6A & 6B	8 10 13	Contact Native (lower than 3 m)	100	150	6.0 to 6.5	100	150

Phase Two at 5034 and 5054 Ninth Line, Mississauga

The following discussions are provided to advance the design phase of the proposed residential buildings at 5034 and 5054 Ninth Line with two (2) underground levels. For geotechnical design purposes, it is recommended that the footings will be positioned over the undisturbed native stratum. At the borehole locations, for two basement level construction, the founding stratum at these depths was found to be clayey silt till or silty clay till deposits.

Based on the soil resistance values, the proposed building with two levels of basement construction supported by spread and strip footings founded on the native deposit can be designed based on geotechnical parameters as outlined in **Table 6.**

It is assumed that the dimensions of the strip footing units are not greater than 1.0 m. For spread footings, the size will not be greater than 2.4 x 2.4 m. Larger footings will yield large settlement and must be reviewed by the Geotechnical Engineer during the detailed structural design.

Table 6: Bearing Capacity and Foundation Level for Phase Two

BH ID	Two Level bsmt Minimum Depth below existing ground level (m)	Bearing Capacities	
		Serviceability Limit State (SLS)	Factored Ultimate Limit State (ULS)
BH301	6.0 to 6.5	120	180
BH302	6.0 to 6.5	120	180
BH303	6.0 to 6.5	120	180
BH304	6.0 to 6.5	120	180
BH305	6.0 to 6.5	150	225
BH306	6.0 to 6.5	120	180
BH307	6.0 to 6.5	150	225
BH308	6.0 to 6.5	150	225
BH309	6.0 to 6.5	100	150
BH310	6.0 to 6.5	150	225

General Notes for Both Phases

The base of all footing excavations must be inspected by the Geotechnical Engineer prior to placing concrete to confirm the design pressures and to ensure that there is no disturbance of the founding soils.

The design values provided above are based on the presumption that the allowable bearing pressure at SLS is governed by total and differential settlements of 25 mm and 19 mm respectively, and the structure will tolerate an angular distortion of 1 in 300.

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

5.3 CAISSON FOUNDATION (IF LARGER BEARING CAPACITY REQUIRED)

The proposed structures may be founded on a caisson plus grade beam foundation system.

Caisson foundations will have to be extended at least a depth of 12 m below the ground surface. Accordingly, a net geotechnical reaction of 900 kPa at SLS and a factored geotechnical resistance of 1100 kPa at ULS may be used for caisson design.

The caissons are end bearing units and will require base inspection and cleaning of the base prior to concrete placement. The caissons should have a minimum diameter of 915 mm. Caisson foundations at different elevations must be designed such that the higher caissons are set below a line drawn up at 10H: 7V from the closest edge of the lower caisson. Grade beam and pile cap units subjected to freezing temperatures must be provided with a minimum soil cover of 1.2 m for adequate frost protection. Cleaning of the end bearing caissons base is critical and must be done prior to concrete placement. Excavation and installation of the caissons must conform to all applicable sections of the Occupational Health and Safety Act. The caissons will need to be provided with a temporary steel liner. The caisson contract must stipulate that the caisson contractor will be responsible for the provision of all necessary equipment (including steel liner of adequate strength) and monitoring devices (as needed) for safe access of the inspection and base cleaning personnel into the caissons, in accordance with the Occupational Health and Safety Act requirements.

Prior to pouring concrete, the base of each caisson should be inspected by a Geotechnical Engineer.

5.4 HELICAL PIER OPTION

Alternatively, the proposed building may be supported on foundations such as helical piles. In many circumstances, the overall cost may be considerably reduced comparing to the conventional caissons. If field pile load tests are carried out, the numbers of piers can be even more reduced. The helical anchors are generally designed as end bearing and the friction from the existing fill should be conservatively ignored. The helical pile plates must be embedded at least 3 m into the competent native soils (or torque refusal). Full-time monitoring by a geotechnical consultant will be required

during the installation of piles, to monitor the applied torque depth of piles and confirm the design load capacity. A specialized contractor must be retained to design and install the helical piles (such as EBS Engineering Construction who are a Chance Master Distributor and HCM who are an ECP Master Distributor).

It should be noted that the fill and native soils may contain cobbles or boulders. Possible large obstructions can be anticipated in the fill material. The contractor should carry out their own investigation to confirm the suitability of the site and be prepared for such conditions during construction.

5.5 FLOOR SLABS

The floor slab for the basement level can be adequately supported at the exposed subgrade. Any exposed soil subgrade must be proof-rolled to detect any soft or unstable areas, which must be removed and replaced with suitably compacted engineered fill, as defined in **Section 5.10** of this report.

Once the required subgrade has been developed, Sola recommends that the exposed subgrade be inspected and approved by a Geotechnical Engineer prior to the placement of any granular fill or concrete.

A granular layer consisting of at least 200 mm thick layer of 19 mm Crusher Run Limestone (CRL) or OPSS Granular A should be installed under the floor slab as a bedding layer, as well to enhance under slab moisture condition.

Such a layer has been proven to be an effective moisture barrier for conventional floor surfaces. However, if special floor coverings such as sheet PVC with heat-sealed seams are considered, either a high-efficiency vapour barrier or venting may be added to the granular layer to prevent moisture accumulating between the concrete floor and the PVC flooring.

It is considered by Sola that completed excavations for floor slabs should not be left open before pouring concrete for any period longer than 24 hours, particularly if the floor construction works are being completed during the winter months or wet weather periods. The base of any floor slab excavation that is to be left exposed for longer than 24 hours should be suitably covered and protected from water ponding, and/or protected to prevent degradation of the exposed founding stratum with the construction of a mud mat.

The design of the concrete slabs on native soils may be based on a value of modulus of subgrade reaction of 20 MPa/m on the surface of the granular moisture barrier.

The floor slab should be structurally independent of any load-bearing structural elements. The long-term groundwater level should be determined by the project hydrogeologist.

Should the lowest construction element extend below the site permanent water table, proper permanent water control provisions, i.e. watertight structure considerations, positive pumping plus backup systems, waterproofing, etc., must be included in the basement design and construction.

5.6 SITE PREPARATORY WORKS

The site preparation work may include stripping of the topsoil, pavement and existing fill in order to develop the required construction or engineered fill subgrades. Depending on the final grading plan, stripping depths will likely vary locally and should be adjusted to remove all unsuitable material.

It is recommended that the Geotechnical Engineer monitors the stripping operations to ensure that unsuitable materials have been fully removed prior to construction works or the placement of engineered fill. Unacceptable areas identified are to be remediated as soon as practicable. The procedures would be dependent upon the conditions encountered.

5.7 EXCAVATABILITY AND SITE EXCAVATIONS

It is assumed that all excavations for the building and utilities will be open cut. In order to enable entry into excavations during the construction process, all excavations must comply with the definitions prescribed by the *"Occupational Health and Safety Act"* (OHSA), Ontario Regulation 213/91 *"Construction Projects".*

The borehole data indicates that the native and fill should present as a Type 3 soil as defined in the OHSA and Regulations for Construction Projects (Part III Excavations, Section 226). Excavations in these materials should be constructed in conformance with the regulations. It is noted that the above soil classifications have been estimated based on small, discontinuous samples from boreholes. The excavation conditions must be confirmed and/or modified on the basis of field inspections during the construction stage when large-scale observations can be made with ease.

As defined by the OHSA, excavation walls within the Type 3 soil will require battering back at slopes no steeper than 1H (horizontal):1V (vertical).

Depending on the construction feasibility the excavation walls can be supported by temporary shoring systems. During excavations, adjacent existing structures, if present, must be protected by proper shoring or sloping.

Based on the findings of the investigation, it is considered that excavation of the overburden native soils at the site can be carried out using a conventional backhoe excavator.

It is important to note that the above discussion about the excavation is for information purposes only. Contractor bidding on the projects must make their own assessment based on the real site conditions.

Cobbles and Boulders are expected to be in the fill and native deposits. The contractor carrying out the excavation work should account for removing cobbles and boulders in their site excavation work.

It is assumed that the groundwater will be lowered to 1.0 m below the required excavation so construction can be carried out in the 'dry' condition. It is expected that the perched water can be controlled by a conventional sump and pump methodology. If more aggressive dewatering methods are required, a dewatering specialist should be consulted.

Long term groundwater conditions should refer to the project hydrogeology study.

5.8 TEMPORARY SHORING DESIGN CONSIDERATIONS (WHERE APPLICABLE)

The recommendations in this subsection may be ignored if the construction can be carried out using open-cut techniques.

If the proposed building will take up a large portion of the property, it may be expected that shoring is required to facilitate the construction of the proposed building. It should be noted that, if shoring is required, a specialist shoring contractor should be consulted to establish the most appropriate design and seating depths for the construction shoring solution.

The shoring system may be designed in accordance with the Canadian Foundation Engineering Manual (CFEM), the 4th Edition. Though not a design code, the CFEM design manual provides a comprehensive guide for shoring and anchor design and still considered the most widely used and accepted design approach in the Greater Toronto Area (herein "GTA").

Shoring subject to unbalanced earth pressures must be designed to resist a pressure distribution that can be calculated as follows:

$$p = K[\gamma (h-h_w) + \gamma' h_w + q] + \gamma_w h_w$$

where: p = Lateral earth pressure in kPa acting at depth h

K = parameters are provided below
h = the depth below the ground surface (m)
h_w = the depth below the ground water level (m)
γ = the bulk unit weight of soil, (kN/m^3) use 20.0

γ' = the submerged unit weight of the exterior soil, (γ - 9.8 kN/m^3)
q = equivalent value of surcharge on the ground surface in kPa (min 12 kPa)

Where the backfill against the buried structure can be drained effectively to eliminate hydrostatic pressures on the wall, this equation can be simplified to:

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

The soil parameters estimated to be applicable for this design are as follows in **Table 7**:

Table 7: Soil Parameters for Shoring Design

Material	Effective Friction Angle Ø' (deg)	Unit Weight γ (kN/m^3)	Coeff. Of Lateral Earth Pressure		
			Active, Ka	Passive, Kp	At-rest, Ko
OPSS Granular A or B	34	22	0.28	3.6	0.44
Fill	28	19	0.37	2.7	0.53
Native	30	20	0.33	3.0	0.50

For a global stability check:

ϕ = 30°
γ = 20 kN/m^3

Wall friction should be considered negligible.

The design groundwater table should be assumed at a depth of approximately 3.0 m below the ground surface. The long-term groundwater level should be determined by the project hydrogeologist.

The surcharge needs should be determined by the Structural Engineer but should not be less than 12 kPa.

The design calculations should be submitted to Sola for geotechnical review.

Movement of the shoring system is considered inevitable. The magnitude of this movement can be controlled by sound construction practices, and it is anticipated that the horizontal movement will be in the range of 0.1 % H to 0.25 % H. Vertical movements increase the horizontal movements because of the reduced stress in the inclined anchors. For this reason, the shoring design must be carried out to minimize the vertical movement of the shoring system.

To ensure that movements of the shoring are within an acceptable range, monitoring must be undertaken throughout the site development process. Vertical and horizontal targets must be located and surveyed before excavation begins. Weekly readings during excavation should show that the movements will be within those predicted; if not, the monitoring results should enable directions to be given to improving the shoring.

5.9 CONSTRUCTION DEWATERING

The borehole data has indicated that no unusual groundwater seepage problems should be expected during excavation for single-level basement construction. The seepage volume due to bleeding of wet pockets in the fill or water-bearing silt/sand seams are expected to be nominal and can be controlled by conventional sump pumping. However, it should be determined by the Project Hydrogeologist.

If a two (2) level basement is contemplated, more aggressive dewatering techniques may be required. In this regard, the construction dewatering requirements should be dictated by a hydrogeologist.

5.10 ENGINEERED FILL

On-site excavated, clean inorganic earth (native and/or fill) may be reused as engineered fill material, provided that the moisture contents are strictly controlled.

If imported inorganic mineral soils are used for engineered fill construction, they must meet the applicable environmental guidelines, and their moisture contents should preferably be close to their respective optimum water content values.

For the on-site excavated clean fill/native soils or similar imported soils, heavy compaction equipment should be employed to achieve the specified degree of field density.

Consideration may also be given to backfilling excavations with a well-graded, compacted granular soil such as Granular B as it, if thoroughly compacted, would reduce the post-construction settlements to an acceptable level and may also expedite the compaction process.

Fill materials required for replacing locally softened soils or raising grades within the footprint of the structures are to comprise suitably organic free materials approved for use by the Geotechnical Engineer. Fill materials are to be placed in lifts of a maximum thickness of 300 mm and compacted, using appropriate compaction equipment, to 98 % of its SPMDD.

Fill located in areas outside of the footprint of any proposed structure or driveway should be compacted to at least 95 % of the material's SPMDD below 1.0 m of the subgrade level, and then to 98 % of its SPMDD up to the required grade. Imported granular fill used in confined areas should be compacted using only hand-held compaction equipment only.

Sola recommends that any and all engineered subgrades beneath the proposed structures are to be inspected and/or proof rolled prior to construction.

5.11 EARTHQUAKE CONSIDERATIONS

Using the information provided by the site investigation, the general soil profile comprises *"Stiff Soil – Site Class D"* as defined by Table 4.1.8.4.A *"Site Classification for Seismic Site Response"* of the Ontario Building Code.

For a mid-to-high rise building construction, considerable cost savings may be achieved if the Site Classification can be upgraded through a shear wave velocity testing. This testing can be carried out by a specialist geophysics firm.

5.12 PAVEMENT

5.12.1 Pavement Thickness Design

For new pavement construction, if contemplated, the existing subgrade soils, when compacted and proof rolled, will be competent to support a conventional pavement structural thickness. Any unsuitable soils, such as topsoil/organic mixed soil and other spongy materials, if found, should be sub-excavated and replaced with approved materials and the profiled subgrade compacted to 98% of its SPMDD.

The pavement construction may consist of upfilling (if applicable) from the prepared subgrade surface to the underside of the granular base layer using well-graded granular subbase material (OPSS Granular B-Type I) up to a maximum thickness of 500 mm. The material should be laid and compacted in thin lifts to at least 100% of its SPMDD. For a local industrial and residential application, the pavement thickness design should conform to the City of Mississauga's Standard No. 2220.010 as shown in **Table 8**.

Table 8: Recommended Pavement Design

Pavement Component	Local Industrial and residential (mm)	Compaction Requirements
OPSS Asphaltic Concrete Surface Course (HL-3)	40	Minimum of 92.0% of Maximum Relative

Pavement Component	Local Industrial and residential (mm)	Compaction Requirements
OPSS Asphaltic Concrete Binder Course (HL-8)	100	Density (MRD)
Granular Base (OPSS Granular A)	200	100% SPMDD
Granular Sub-Base (OPSS Granular B Type I)	325	

All pavement component materials should be produced and laid in accordance with current OPSS requirements. Asphaltic concrete materials would be compacted to 92% of their Maximum Relative Density (MRD) or higher. Granular materials would be compacted to at least 100% of its SPMDD.

The recommended pavement structure should be considered for preliminary design purposes only. The functional design life of eight (8) to ten (10) years has been used to establish the pavement recommendations. This represents the number of years to the first rehabilitation, assuming regular maintenance is carried out.

If required, a more refined pavement structure design can be performed based on specific design life requirements. Such further analysis will also involve specific laboratory tests to determine frost susceptibility and strength characteristics of the subgrade soils, as well as specific traffic loading data input from the Client.

Pavement Drainage: The ability of the soils to provide adequate subgrade support is reduced if allowed to become too wet. Therefore, in order to intercept infiltrating water and provide drainage of the subgrade and pavement material, it is recommended that 100 mm diameter sub-drains, wrapped in filter cloth, be provided along both sides of the driveways; in addition, similar sub-drains should be installed in four (4) directions from the catch basins and at strategic locations under the parking lot pavement. Furthermore, the subgrade should be graded to promote the flow of water towards the subdrains.

5.12.2 Pavement Construction Considerations

For pavement construction, the subgrade must be compacted to at least 98% SPMDD, for at least the upper 300 mm, unless an alternative is approved by Sola.

The long-term performance of the pavement structure is highly dependent upon the subgrade support conditions. Stringent construction control procedures should be maintained to ensure uniform subgrade moisture and density conditions are achieved. Additional comments on the construction of pavement areas are as follows:

- The subgrade preparation should include stripping of any objectionable materials, e.g. loose fill with organics. The base should be properly shaped and thoroughly proof rolled using a loaded truck. Soft and/or unstable subgrade areas should be further sub-excavated and backfilled to the design subgrade level using an approved material, placed in thin lifts and compacted to 98% of its SPMDD;
- The locations and extent of sub-drainage required within the paved areas should be reviewed by this office in conjunction with the proposed grading. Assuming that satisfactory crossfalls in the order of 3.0% have been provided, subdrains extending from and between catch basins may be satisfactory. In the event that flatter crossfalls are considered, a more extensive system of sub-drainage may be necessary and should be reviewed by Sola; and,
- The most severe loading conditions on the pavement areas and subgrade may occur during construction. Consequently, special provisions such as restricted access routes, half-loads during paving, etc., may be required, especially if construction is carried out during unfavourable weather.

It is recommended that Sola be retained to review the final pavement structure designs and drainage plans prior to construction to ensure that they are consistent with the recommendations in this report.

5.13 SERVICE INSTALLATION CONSIDERATIONS (WHERE APPLICABLE)

5.13.1 General

The materials found in the boreholes at the expected elevations of the proposed servicing trench generally consist of competent soils. In general, the site materials are suitable for pipeline support. Localized loose/soft subgrade conditions, if encountered during construction, should be sub excavated to a depth of at least 300 mm or to a firm base, if shallower, and backfilled with clean, compactable materials and stabilized as per the project specifications.

Prior to placement of bedding, the exposed subgrade at the bottom of each servicing trench excavation should be inspected by the Geotechnical Engineer to identify any soft, lose or disturbed base conditions. All disturbed soils resulting from construction activities should be removed and replaced as noted above.

Design and construction consideration for both flexible (PVC) and rigid (concrete) pipes are included in the following sections.

5.13.2 Excavations and Health and Safety Considerations

The same recommendations as given in **Section 5.7** will generally apply for the excavations for laying of the underground services. The excavated soils should not be placed closer than the depth of the trenches from the trench edge.

5.13.3 Bedding

The native subgrade in an undisturbed state will provide adequate support for the proposed service pipes and will allow the use of normal Class B type bedding. The bedding should conform to the current Ontario Provincial Standard Specifications (OPSS 1010) and/or the City of Mississauga standards for bedding stone gradation requirements. The pipes should be placed with a minimum bedding thickness in conformance with Ontario Provincial Standard Drawing OPSD 802.010 (for flexible pipes) or OPSD 802.031 (for rigid pipes), though the bedding thickness will be subject to variation and ultimately be based on the proposed pipe diameter, bedding specifications used, etc.

On completion of the servicing pipe installation, a granular surround of the same bedding material should be placed around the pipe to cover it to at least 300 mm above the pipe obvert.

Backfill above the bedding and cover materials may consist of a clean, compactable fill that possesses similar properties to the existing subgrade soil. Based on the borehole data it is anticipated that the local soil material may be reused as trench backfill. Some moisture conditioning of the soil may be required to facilitate soil compaction. In the event that imported soil is used as a trench backfill, it must be ensured that the drainage properties of the subgrade are maintained and that there is no differential frost movement. Trench backfill should be compacted to at least 95% of the material's SPMDD, or City of Mississauga standards, whichever is more stringent.

5.13.4 Trench Backfill

Backfilling During Dry-Weather Conditions

The excavated inorganic subgrade soils are considered suitable for re-use as fill material to backfill wider service trenches, provided that heavy compaction equipment can be used to compact the fill material. In confined areas, consideration may be also given to backfilling the areas with a well-graded, compacted granular soil such as Granular B material, as such material, if thoroughly compacted, would reduce the post-construction settlements to an acceptable level and may also expedite the compaction process.

Each lift should be no greater than 300 mm thick and compacted using an appropriate heavy compaction machine to at least 95 % of the material's SPMDD to within 1 m of the top of the subgrade, and then to 98 % SPMDD up to the required grade.

Exposed, excavated soil stockpiles that are to be reused as fill on-site should be compacted at the surface or temporarily covered during wet weather to help maintain their original moisture content. Such stockpiles are prone to wet weather exposure and the increased moisture contents will make these materials too wet to achieve the required levels of compaction.

Conversely, if the excavated native soils are too dry to achieve the required levels of compaction, some moisture addition/conditioning by means of water hosing or misting should be expected if the trench excavation works are to be undertaken during the dry seasons.

We recommend the subgrade be observed and approved by the Geotechnical Engineer prior to the placement of the bedding material to confirm that the subgrade conditions are consistent with the recommendations given in this report. Where unsuitable subgrade conditions are observed, remedial procedures can be established in the field to avoid construction delays.

Backfilling During Winter Months

Should this project proceed during the winter months, the following additional recommendations will apply to avoid any detrimental effects of frost.

In this situation, it is imperative that the excavation and backfilling operations follow simultaneously. This procedure is required to avoid time gaps between the two construction stages, as prolonged exposure to frost may lead to the inclusion of frozen material during backfilling. It is recommended that before resuming backfilling over the frozen surface, all frost should be removed to achieve a satisfactory bond between the current and previously laid fills. Also, this procedure would prevent leaving frozen layers of soils that could long term settlements while undergoing slow thawing.

It is further recommended that any accumulation of water or ice in the small Sheepsfoot footprint overnight or weekends should be prevented by adequately shaping up and back blading the compacted grades before leaving the site.

To ensure that no frozen material is being backfilled in the trenches, it is recommended that the backfilling and compaction operations should be supervised and closely monitored by Sola continuously.

For the construction of the road/parking lot, the final subgrade should be prepared during 'dry weather' conditions to achieve a satisfactory end product.

5.14 GENERAL CONSTRUCTION CONSIDERATIONS

Load bearing soils are susceptible to disturbance from environmental factors (temperature, moisture change, etc.) and construction activity. Therefore, due care should be given to minimizing the trafficking of such areas during periods of excavation and the construction of the floor slab and footings to minimize disturbance of the bearing soils.

Any excessive disturbances of the load-bearing and underlying soils affected during construction works could influence the long-term settlement of the structures and will, therefore, require further excavation and replacement of such impacted soils with suitable engineered fill.

During winter seasons, foundations and slab-on-grade construction should be carried out to avoid pouring concrete on frozen soil. Foundations must be adequately protected at all times from cold weather and freezing conditions.

A Geotechnical Engineer should evaluate all subgrade surfaces to confirm that the subgrade and founding conditions are consistent with the recommendations given by this report.

6.0 MATERIAL TESTING AND INSPECTION

It is recommended that Sola be appointed to carry out field inspection and materials testing during construction to ensure that the construction complies with the design recommendations.

7.0 DRAWING REVIEW

It is recommended that, once the final design drawings for this project are prepared, one (1) set of the drawings should be submitted to Sola for review to make any amendments to our recommendations that may be required, prior to starting construction.

Sola should also 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, Sola will assume no responsibility for the interpretation of the recommendations in this report.

The comments given in this report are preliminary and intended only for the guidance of design engineers. Contractors bidding on or undertaking the works should make their own interpretations of the factual borehole results, so that they may draw their own conclusions on how the subsurface conditions may affect them.

The information in this report in no way reflects on the environmental aspects of the soil conditions at the site and has not been addressed in this report since this aspect was beyond the scope and terms of reference.

8.0 CLOSURE

This report is subject to the Statement of Limitations which forms an integral part of this document. The Statement of Limitations is not intended to reduce the level of responsibility accepted by Sola, but rather to ensure that all parties who have been given reliance for this report are aware of the responsibilities each assumes in so doing.

We trust that this report meets your needs. Should you have any queries, please contact the Sola office.

Sincerely
SOLA ENGINEERING INC.

George Hao, P. Eng.

LICENSED PROFESSIONAL ENGINEER
B. FENG
100050651
May 17, 2021
PROVINCE OF ONTARIO

Bill Feng P. Eng.
Chief Engineer

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STATEMENT OF LIMITATIONS

Standard of Care and Basis of this Report
Sola Engineering Inc. ("Sola Engineering") has prepared this report in a manner consistent with generally accepted engineering and/or environmental practices in the jurisdiction in which the specified services were provided. The information and conclusions set out in this report reflects Sola Engineering's best professional judgment in light of the information available to Sola Engineering at the time of preparation. Sola Engineering disclaims any and all warranties, express or implied, including without limitation any warranty of merchantability and/or fitness for a particular purpose, and makes no representations concerning the legal effect, interpretation or significance of this report or the information, conclusions or recommendations contained in it.

The conclusions and recommendations provided in this report have been prepared in relation to the specified site (the "Site") and the proposed project (the "Project"), as described by the Client to Sola Engineering. Given the nature of the work undertaken by Sola Engineering as part of this report, the Client acknowledges that ground conditions may vary over distances and may change over time. Should there arise any changes to the conditions of the Site or the Project (as to purpose or design), Sola Engineering is to be notified within a reasonable period of time, and in any event within 24 hours of the Client's learning of such changes, so as to give Sola Engineering an opportunity to review and revise this report in light of such changes. Sola Engineering accepts no liability or responsibility for any use of this report or reliance on this report following any changes to the conditions of the Site or the Project.

The scope of professional services provided by Sola Engineering for the Project are as set out in this report. Should such services be limited to those of a geotechnical nature, Sola Engineering shall not be held liable or responsible for any environmental services that may be required, nor shall this report be interpreted to reflect any environmental aspects of the Project. Alternatively, should such services be limited to those of an environmental nature, Sola Engineering shall not be held liable or responsible for any geotechnical services that may be required, nor shall this report be interpreted to reflect any geotechnical aspects of the Project.

This report is not intended to provide recommendations for possible future conditions or use of the Site or adjoining properties. Should the need arise for such recommendations Sola Engineering may need to conduct further investigations.

Use of this Report
This report is intended to be read and used in its entirety. No reliance may be made upon any individual portion or section of this report without reference to the entire report as a whole. In preparing this report, Sola Engineering has relied on information, instructions and communications given by the Client to Sola Engineering, the applicability, truth and accuracy of which is the sole responsibility of the Client.

This report with the information, sampling data, analysis, conclusions and recommendations contained in it (if any), has been prepared for and may only be used by the Client and only for the specific purpose as specified by the Client to Sola Engineering in connection with the Project. Without prior written consent from Sola Engineering, use of this report or any portion thereof by any person or entity other than the Client, or for any purpose other than as communicated by the Client to Sola Engineering, is strictly prohibited. Sola Engineering accepts no liability or responsibility for the unauthorized use of this report. This report and all documents that form part of it are the sole property of Sola Engineering. Sola Engineering relies on and retains any and all intellectual property rights it has in this report, including any copyright to which it is entitled. The Client shall not give, lend or sell this report, or any portion thereof, to any entity, person or association without the express prior written consent of Sola Engineering. This report and the information contained herein shall be treated as strictly confidential.

The contents of this report, inclusive of Sola Engineering's conclusions and recommendations in relation to the Project, are intended only for the guidance of the Client in carrying out the specified services for the Project, as described by the Client to Sola Engineering. Accordingly, Sola Engineering does not accept any liability or responsibility for any inaccuracy contained in this report arising as a result of or in any way connected with any exclusion, oversight or falsification of the information provided to Sola Engineering by the Client. This report, including the effect of the subsurface conditions as described in this report, is to be interpreted at the risk and discretion of the Client and any contractors or others bidding on or undertaking contractual work to be performed as part of the Project who may come into possession of or learn of this report or its contents. It is exigent that all contractors bidding or undertaking the work are to rely on their own interpretations of the data contained in this report in addition to their own investigations and conclusions. Sola Engineering shall not be held liable or responsible for any interpretation of or conclusions that may be drawn from the data or information contained in this report.

The information, recommendations and conclusions presented in this report are based on Sola Engineering's interpretation of conditions revealed through the limited investigation conducted within a defined scope of services. In no event will Sola Engineering be held responsible or liable to the Client or any other person or entity for any special, indirect, incidental, punitive or consequential loss or damage (including, loss of use, lost profits or expenses incurred) resulting from or in any way related to the independent interpretations, interpolations, conclusions or decisions of the Client or any other person or entity, based on the information contained in this report. The restriction of liability includes but is not limited to decisions made to develop, purchase or sell land.

Notwithstanding the exclusions of liability contained herein but without in any way limiting their effect or generality, if there is found to be any finding of liability or responsibility whatsoever on the part of Sola Engineering which in any way relates to or arises from this report, or the information, conclusions or recommendations contained in it, such liability and/or responsibility shall cease and forever be extinguished from and after the date which is two (2) years from the date of this report. In no event shall any liability or responsibility of Sola Engineering exceed the fees charged by Sola Engineering to the Client for the preparation of this report (excluding any arms' length disbursements or expenditures made or incurred by Sola Engineering as a result thereof and reimbursed by the Client).

Site Conditions
The material conditions, classifications, conclusions and recommendations contained in this report were based on the site conditions observed or tested by Sola Engineering or otherwise communicated to Sola Engineering by the Client. The description, identification and classification of soils, rocks, chemical contamination and other materials have been made based on limited investigations, sampling and testing of materials performed by Sola Engineering and its qualified representatives in reliance on the use of relevant or applicable equipment, all in accordance with commonly acceptable standards in the geotechnical and/or environmental disciplines. Accordingly, this report may include assumptions of conditions which are based on discrete sample locations and thus some conditions may not have been detected. The Client accepts all liability and risk for the use of this report and the information and data contained in it. Sola Engineering shall not be held liable or responsible for any conditions beyond the scope of tests conducted on samples of the subsurface and soil conditions of the subject property as set out in this report.

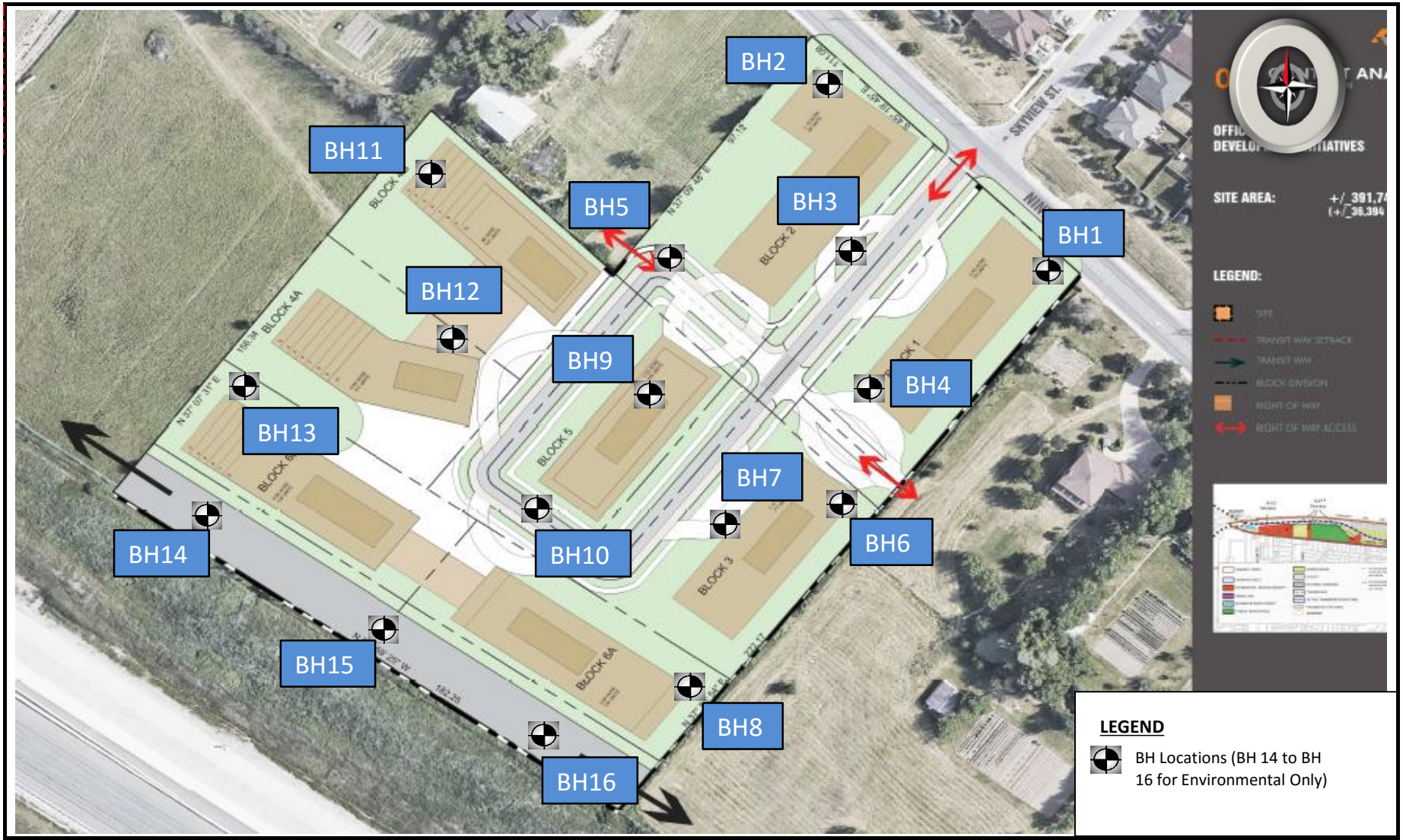
For clarity, the Client acknowledges and accepts that unique risks exist whenever engineering or related disciplines are applied to identify subsurface conditions and even a comprehensive sampling and testing program may fail to detect certain conditions. The environmental, geological, geotechnical, geochemical and hydrogeological conditions that Sola Engineering interprets to exist between sampling points may differ from those that actually exist. As a result, the Client acknowledges and accepts that because of the inherent uncertainties in subsurface evaluations, unanticipated underground conditions may occur or become known subsequent to Sola Engineering's investigation that could affect conclusions, recommendations, total Project cost and/or execution.

Indemnification of Risk
Though Sola Engineering adheres to the highest degree of integrity and employs due diligence in limiting the potential release of toxins and hazardous substances, the risk of accidental release of such substances is a possibility when providing geotechnical and environmental services.

In consideration of the provision of services by Sola Engineering, the Client agrees to defend, indemnify and hold Sola Engineering and its employees and agents harmless from and against any and all claims, liabilities, damages, causes of action, judgments, costs or expenses (including reasonable legal fees and disbursements), resulting from or arising by reason of the death or bodily injury to persons, damage to property, or other loss, whether related to an accidental release of pollutants or hazardous substances occurring as a result of carrying out this Project or otherwise, and whether or not resulting from Sola Engineering's negligent actions or omissions. This indemnification shall include and extend to any and all third party claims brought or threatened against Sola Engineering under any federal or provincial law or statute as a result of Sola Engineering conducting work on the Project. In addition to and notwithstanding the foregoing, the Client further agrees to unconditionally and irrevocably release Sola Engineering from, and not to bring any claims against Sola Engineering in connection with, any of the aforementioned claims or causes.

Subconsultants and Contractor Services
In conjunction with the services provided by Sola Engineering's own employees, external services provided by other persons or entities that are specializing in services other than those offered by Sola Engineering, such as drilling, excavation and laboratory testing, are often employed in order to carry out the defined scope of work. If such external services have been employed for this Project, the Client acknowledges that Sola Engineering is not in any way liable or responsible for any costs, claims or damages in relation to the services rendered by such other persons or entities or payment therefor, nor shall Sola Engineering be liable or responsible for damages for errors, omissions or negligence caused by such other persons or entities while providing such external services.

Work and Job Site Safety
Sola Engineering shall be responsible only for its activities and that of its employees on the Site. Sola Engineering shall not direct any of the fieldwork nor the work of any other person or entity on the Project. The presence of Sola Engineering staff on the Site does not relieve the Client or any contractor on the Site from their responsibilities pertaining to site safety. The Client at all times retains any and all responsibility for the safety of those individuals present on the Site and/or working on the Project, including Sola Engineering's employees.



SOLA ENGINEERING	File No.: 10653-S0068-GEO	**BH Location Plan**	The figure provided is for the intended purpose of presenting the approximate borehole locations. This figure should not be used for any other purposes including construction, architecture or for accuracy of dimensions and orientation of objects.	Enclosure No.: **1A**
	Report No. 2020-14185	**Proposed Residential Development 5034, 5054 and 5080 Ninth Line, Mississauga, Ontario**		
	Date: April 15, 2020	**Your Home Development (Mississauga) Inc. c/o S2S**		Not to Scale

SOLA ENGINEERING	File No.: 10653-S0068-GEO	**BH Location Plan**	The figure provided is for the intended purpose of presenting the approximate borehole locations. This figure should not be used for any other purposes including construction, architecture or for accuracy of dimensions and orientation of objects.	Enclosure No.: **1B**
	Report Number: 2020-14185	**Proposed Residential Development**		
		5034, 5054 and 5080 Ninth Line, Mississauga		
	Date: April 15, 2020	**Your Home Development (Mississauga) Inc. c/o S2S**		Not to Scale

ENCLOSURE 2
PAGE 1 **OF** 2

BOREHOLE LOG

BOREHOLE NO.: 1

SOLA ENGINEERING

PROJECT NO.: 10653 **DATE:** March 6, 2019
PROJECT: Proposed Residential Development

CLIENT: Your Home Development (Mississauga) Inc. c/o S2S Environmental Inc.
LOCATION: 5034, 5054 and 5080 Ninth Line, Mississauga, Ontario
ELEVATION (M): 187.28 **CAVED AT DEPTH (M):** Open
WATER LEVEL DEPTH (M): Dry **DRILLING METHOD:** Hollow Stem Auger
DRILLER: Profile Drilling Inc. **DRILL RIG:** Mobile B-45
LOGGED BY: Baljot **REVIEWED BY:** Dimple

LEGEND:

	SS - SPLIT SPOON
	AS - AUGER SAMPLE
	ST - SHELBY TUBE
	CS - CORE SAMPLE
	WATER LEVEL
	CAVED AT
"N"	BLOWS / 0.3 M
M.C.	NATURAL MOISTURE CONTENT (%)
O.V.M	ORGANIC VAPOUR MONITOR
P.L.	PLASTIC LIMIT (%)
L.L.	LIQUID LIMIT (%)

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE
187 (0)		1A	TOPSOIL- 200 mm thick			
		1B	FILL- Clayey Silt, trace root lets, dark brown, very moist	34.7	4-4-3-8	7
186 (1)		2	- some sand, trace gravel, brown, moist	12.8	5-7-8	15
		3	PROBABLE FILL- Clayey Silt, some sand, trace gravel, brown, moist	11.6	6-8-10	18
185 (2)		4		12.6	6-10-16	26
184 (3)		5	- greyish brown	12.7	6-7-9	16
183 (4)		6	CLAYEY SILT TILL- trace gravel, trace sand, firm, grey, moist	12.9	1-3-4	7
182 (5)						
181 (6)		7		11.9	3-3-4	7
180 (7)						

ELEV./ DEPTH (m) — P.L.-L.L. △ M.C. ● "N" Value 20 40 60 80

Notes:

BOREHOLE LOG

BOREHOLE NO.: 1

SOLA ENGINEERING

ENCLOSURE 2
PAGE 2 **OF** 2
PROJECT: Proposed Residential Development
PROJECT NO.: 10653

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE	ELEV./ DEPTH (m)	P.L.-L.L. △ M.C. ● "N" Value 20 40 60 80
179 – 8		8	- stiff	13.0	4-5-6	11	179 – 8	
178 – 9		9		10.6	14-8-7	15	178 – 9	
177 – 10							177 – 10	
176 – 11		10		12.8	2-4-7	11	176 – 11	
175 – 12		11	SILTY CLAY TILL- trace gravel, trace sand, firm, grey, moist - Auger Grinding	14.0	3-2-5	7	175 – 12	
174 – 13			Borehole Ends at Targeted Depth; Borehole Open and Dry Upon Completion of Drilling.				174 – 13	
173 – 14							173 – 14	
172 – 15							172 – 15	
171 – 16							171 – 16	
170 – 17							170 – 17	
169 – 18							169 – 18	

ENCLOSURE 3
PAGE 1 OF 2

BOREHOLE LOG

BOREHOLE NO.: 2

SOLA ENGINEERING

PROJECT NO.: 10653 **DATE:** March 8, 2019
PROJECT: Proposed Residential Development

CLIENT: Your Home Development (Mississauga) Inc. c/o S2S Environmental Inc.
LOCATION: 5034, 5054 and 5080 Ninth Line, Mississauga, Ontario
ELEVATION (M): 187.62 **CAVED AT DEPTH (M):** 10.4
WATER LEVEL DEPTH (M): Dry **DRILLING METHOD:** Hollow Stem Auger
DRILLER: Profile Drilling Inc. **DRILL RIG:** Mobile B-45
LOGGED BY: Baljot **REVIEWED BY:** Dimple

LEGEND:

	SS - SPLIT SPOON
	AS - AUGER SAMPLE
	ST - SHELBY TUBE
	CS - CORE SAMPLE
	WATER LEVEL
	CAVED AT
"N"	BLOWS / 0.3 M
M.C.	NATURAL MOISTURE CONTENT (%)
O.V.M	ORGANIC VAPOUR MONITOR
P.L.	PLASTIC LIMIT (%)
L.L.	LIQUID LIMIT (%)

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE
187.62		1A	ICE AND SNOW COVER- 180 mm thick			
		1B	TOPSOIL- 150 mm thick			
		1C		35.1	3-1-2-4	3
			FILL- Clayey Silt, trace root lets, brown, moist - wet spoon			
		2	- trace gravel, trace sand, inferred cobble	14.4	3-7-10	17
		3		13.7	5-9-12	21
		4	PROBABLE FILL- Clayey Silt, trace gravel trace sand, brown, moist	12.5	6-10-11	21
		5		17.6	8-15-14	29
		6	CLAYEY SILT TILL- some sand, trace gravel, stiff, greyish brown, moist	14.6	4-6-8	14
		7		13.3	3-4-5	9
180.62						

ELEV./ DEPTH (m): 0, 1, 2, 3, 4, 5, 6, 7 / 187, 186, 185, 184, 183, 182, 181, 180

P.L.-L.L.
M.C.
"N" Value
20 40 60 80

Notes:

This information pertains only to this borehole and should not be interpreted as being indicative of the site.

BOREHOLE LOG

BOREHOLE NO.: 2

SOLA ENGINEERING

ENCLOSURE 3
PAGE 2 **OF** 2
PROJECT: Proposed Residential Development
PROJECT NO.: 10653

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE	ELEV./ DEPTH (m)	P.L.-L.L. / M.C. / "N" Value 20 40 60 80
180							180	
8		8	- some sand, grey	11.3	3-4-5	9	8	
179							179	
9		9		11.5	2-5-6	11	9	
178							178	
10		1					10	
177			- wet spoon				177	
11		10		11.9	4-6-7	13	11	
			DCPT Begins			13		
176						21	176	
12						29	12	
						40		
175						56	175	
13			DCPT Ends; Borehole Ends at Targeted Depth; Borehole Dry and Caved at 10.4 m Below Ground Surface Upon Completion of Sampling.				13	
174							174	
14							14	
173							173	
15							15	
172							172	
16							16	
171							171	
17							17	
170							170	
18							18	
169							169	

ENCLOSURE 4
PAGE 1 OF 2

BOREHOLE LOG

BOREHOLE NO.: 3

SOLA ENGINEERING

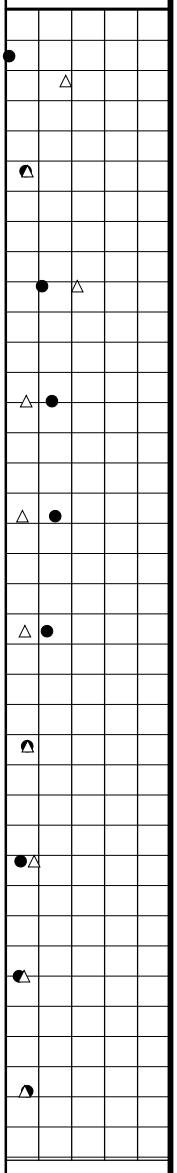
PROJECT NO.: 10653 **DATE:** March 8, 2019
PROJECT: Proposed Residential Development

CLIENT: Your Home Development (Mississauga) Inc. c/o S2S Environmental Inc.
LOCATION: 5034, 5054 and 5080 Ninth Line, Mississauga, Ontario
ELEVATION (M): 187.93 **CAVED AT DEPTH (M):** 8.1
WATER LEVEL DEPTH (M): 7.9 **DRILLING METHOD:** Hollow Stem Augers
DRILLER: Profile Drilling Inc. **DRILL RIG:** Mobile B-45
LOGGED BY: Baljot **REVIEWED BY:** Dimple

LEGEND:

	SS - SPLIT SPOON
	AS - AUGER SAMPLE
	ST - SHELBY TUBE
	CS - CORE SAMPLE
	WATER LEVEL
	CAVED AT
"N"	BLOWS / 0.3 M
M.C.	NATURAL MOISTURE CONTENT (%)
O.V.M	ORGANIC VAPOUR MONITOR
P.L.	PLASTIC LIMIT (%)
L.L.	LIQUID LIMIT (%)

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	"N" VALUE
0		1A	ICE AND SNOW COVER- 150 mm thick			
		1B	TOPSOIL- 180 mm thick		7-1-1-2	2
		1C		36.4		
187 1		2	FILL- Clayey Silt, trace sand, dark brown, moist - trace gravel, brown	13.1	3-5-7-8	12
186 2		3		43.4	8-10-12-13	22
		4	- some sand	12.4	5-13-15-16	28
185 3		5	PROBABLE FILL- Clayey Silt, trace gravel, trace sand, brown, moist	10.1	8-14-16-20	30
184 4		6	CLAYEY SILT TILL- trace gravel, trace sand, very stiff, grey, moist	11.6	8-12-13-17	25
183 5		7	- stiff	13.3	4-6-7-11	13
		8	SILTY CLAY TILL- trace gravel, trace sand, stiff, grey, moist	17.2	3-4-5-6	9
182 6		9		11.1	2-3-5-13	8
181 7		10	CLAYEY SILT TILL- some sand, trace gravel, stiff, grey, moist	11.5	5-6-7-10	13



Notes:

BOREHOLE LOG

BOREHOLE NO.: 3

SOLA ENGINEERING

ENCLOSURE 4
PAGE 2 **OF** 2
PROJECT: Proposed Residential Development **PROJECT NO.:** 10653

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE	ELEV./ DEPTH (m)	P.L.-L.L. / M.C. / "N" Value 20 40 60 80
180 – 8		1 — 11		11.5	3-4-6-9	10	180 – 8	
			DCPT Begins			2		
179 – 9						11	179 – 9	
						17		
						22		
178 – 10						30	178 – 10	
						64		
						53		
177 – 11			DCPT Ends; Borehole Ends at Targeted Depth; Water at 7.9 m Below Ground Surface; and, Caved at 8.1 m Below Ground Surface Upon Completion of Sampling				177 – 11	
176 – 12							176 – 12	
175 – 13							175 – 13	
174 – 14							174 – 14	
173 – 15							173 – 15	
172 – 16							172 – 16	
171 – 17							171 – 17	
170 – 18							170 – 18	

ENCLOSURE 5
PAGE 1 OF 2

BOREHOLE LOG

BOREHOLE NO.: 4

SOLA ENGINEERING

PROJECT NO.: 10653 **DATE:** March 7, 2019
PROJECT: Proposed Residential Development

CLIENT: Your Home Development (Mississauga) Inc. c/o S2S Environmental Inc.
LOCATION: 5034, 5054 and 5080 Ninth Line, Mississauga, Ontario
ELEVATION (M): 187.33 **CAVED AT DEPTH (M):** Open
WATER LEVEL DEPTH (M): Dry **DRILLING METHOD:** Hollow Stem Auger
DRILLER: Profile Drilling Inc. **DRILL RIG:** Mobile B-45
LOGGED BY: Baljot **REVIEWED BY:** Dimple

LEGEND:

	SS - SPLIT SPOON
	AS - AUGER SAMPLE
	ST - SHELBY TUBE
	CS - CORE SAMPLE
	WATER LEVEL
	CAVED AT
"N"	BLOWS / 0.3 M
M.C.	NATURAL MOISTURE CONTENT (%)
O.V.M	ORGANIC VAPOUR MONITOR
P.L.	PLASTIC LIMIT (%)
L.L.	LIQUID LIMIT (%)

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE
187 / 0		1A	ICE AND SNOW COVER- 180 mm thick			
		1B	TOPSOIL- 200 mm thick			
		1C	FILL- Silty Clay, trace root lets, brown, very moist	36.2	6-1-3-1	4
186 / 1		2	- becoming Clayey Silt, trace gravel, trace sand, brown, moist	31.8	5-8-11	19
185 / 2		3		11.9	7-9-11	20
		4		12.5	5-9-14	23
184 / 3		5	PROBABLE FILL- Clayey Silt, trace gravel, trace sand, brown, moist	11.0	7-10-14	24
183 / 4			- wet spoon			
182 / 5		6	CLAYEY SILT TILL- some sand, trace gravel, stiff, grey, moist	11.5	3-5-6	11
181 / 6		7		11.3	3-4-6	10
7						

P.L.-L.L. △ M.C. ● "N" Value 20 40 60 80

Notes:

This information pertains only to this borehole and should not be interpreted as being indicative of the site.

BOREHOLE LOG

BOREHOLE NO.: 4

SOLA ENGINEERING

ENCLOSURE 5
PAGE 2 **OF** 2
PROJECT: Proposed Residential Development
PROJECT NO.: 10653

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS		ELEV./ DEPTH (m)	P.L.-L.L. △ M.C. ● "N" Value 20 40 60 80
					BLOW COUNTS	"N" VALUE		
180							180	
8		8		10.3	4-6-7	13	8	
179			DCPT Begins			11	179	
						20		
9						21	9	
178						26	178	
						39		
10						47	10	
177			DCPT Ends; Borehole Ends at Targeted Depth; Borehole Open and Dry Upon Completion of Sampling.				177	
11							11	
176							176	
12							12	
175							175	
13							13	
174							174	
14							14	
173							173	
15							15	
172							172	
16							16	
171							171	
17							17	
170							170	
18							18	

ENCLOSURE 6
PAGE 1 **OF** 2

BOREHOLE LOG

BOREHOLE NO.: 5

SOLA ENGINEERING

PROJECT NO.: 10653 **DATE:** March 7, 2019
PROJECT: Proposed Residential Development

CLIENT: Your Home Development (Mississauga) Inc. c/o S2S Environmental Inc.
LOCATION: 5034, 5054 and 5080 Ninth Line, Mississauga, Ontario
ELEVATION (M): 188.48 **CAVED AT DEPTH (M):** Open
WATER LEVEL DEPTH (M): Dry **DRILLING METHOD:** Hollow Stem Augers
DRILLER: Profile Drilling Inc. **DRILL RIG:** Mobile B-45
LOGGED BY: Baljot **REVIEWED BY:** Dimple

LEGEND:

	SS - SPLIT SPOON
	AS - AUGER SAMPLE
	ST - SHELBY TUBE
	CS - CORE SAMPLE
	WATER LEVEL
	CAVED AT
"N"	BLOWS / 0.3 M
M.C.	NATURAL MOISTURE CONTENT (%)
O.V.M	ORGANIC VAPOUR MONITOR
P.L.	PLASTIC LIMIT (%)
L.L.	LIQUID LIMIT (%)

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE
0		1A	ICE AND SNOW COVER- 200 mm thick			
		1B	TOPSOIL- 200 mm thick		5-4-5-6	9
188		1C		19.8		
			FILL- Clayey Silt, trace gravel, trace sand, brown, very moist			
1		2		30.6	3-4-6	10
			- some sand, moist			
187						
		3		34.1	5-7-16-15	23
2						
186			PROBABLE FILL- Clayey Silt, trace gravel, trace sand, brown, moist			
		4		1.2	6-10-12-14	22
3						
		5		13.5	6-8-11-15	19
185						
4			CLAYEY SILT TILL- some sand, trace gravel, very stiff, brown, moist			
		6		14.1	7-9-8-11	17
184			- stiff, grey			
5		7		13.5	4-4-6-7	10
183						
		8		12.6	5-5-5-7	10
6						
182			SILTY CLAY TILL- trace gravel, trace sand, stiff, grey, moist			
		9		11.8	2-4-6-7	10
7						
181						

P.L.-L.L. M.C. "N" Value 20 40 60 80

Notes:

This information pertains only to this borehole and should not be interpreted as being indicative of the site.

BOREHOLE LOG

BOREHOLE NO.: 5

SOLA ENGINEERING

ENCLOSURE 6
PAGE 2 **OF** 2
PROJECT: Proposed Residential Development
PROJECT NO.: 10653

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE	ELEV./ DEPTH (m)	P.L.-L.L. / M.C. / "N" Value 20 40 60 80
8		10		10.8	3-4-6-6	10	8	
180							180	
9							9	
179		11	CLAYEY SILT TILL- some sand, trace gravel, very stiff, grey, moist	12.0	7-6-9-9	15	179	
10							10	
178			- stiff				178	
11		12		13.2	3-5-7-10	12	11	
177			DCPT Begins			8	177	
12						17	12	
						18		
176						26	176	
						31		
13						40	13	
175						57	175	
			DCPT Ends; Borehole Ends at Targeted Depth; Borehole Open and Dry Upon Completion of Sampling					
14							14	
174							174	
15							15	
173							173	
16							16	
172							172	
17							17	
171							171	
18							18	
170							170	

ENCLOSURE 7
PAGE 1 OF 2

BOREHOLE LOG

BOREHOLE NO.: 6

SOLA ENGINEERING

PROJECT NO.: 10653 **DATE:** March 14, 2019
PROJECT: Proposed Residential Development

CLIENT: Your Home Development (Mississauga) Inc. c/o S2S Environmental Inc.
LOCATION: 5034, 5054 and 5080 Ninth Line, Mississauga, Ontario
ELEVATION (M): 186.92 **CAVED AT DEPTH (M):** Open
WATER LEVEL DEPTH (M): 4.5 **DRILLING METHOD:** Hollow Stem Auger
DRILLER: Profile Drilling Inc. **DRILL RIG:** Diedrich D-50
LOGGED BY: Baljot **REVIEWED BY:** Dimple

LEGEND:

	SS - SPLIT SPOON
	AS - AUGER SAMPLE
	ST - SHELBY TUBE
	CS - CORE SAMPLE
	WATER LEVEL
	CAVED AT
"N"	BLOWS / 0.3 M
M.C.	NATURAL MOISTURE CONTENT (%)
O.V.M	ORGANIC VAPOUR MONITOR
P.L.	PLASTIC LIMIT (%)
L.L.	LIQUID LIMIT (%)

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	"N" VALUE
186.92 / 0.0		1A	TOPSOIL- 200 mm thick			
		1B	FILL- Clayey Silt, trace gravel, trace root lets, dark brown, very moist	45.8	3-1-1-4	2
186 / 1		2	- some sand, brown, moist	14.1	5-10-12	22
		3	PROBABLE FILL- Clayey Silt, trace gravel, trace sand, brown, moist	13.1	8-12-16	28
185 / 2		4		6.5	14-25-37	62
184 / 3		5		11.0	11-21-26	47
183 / 4						
182 / 5		6	CLAYEY SILT TILL- some sand, trace gravel, very stiff, grey, moist - wet spoon	13.7	6-11-14	25
181 / 6		7		12.0	9-10-13	23
180 / 7						

ELEV./ DEPTH (m) — P.L.-L.L. — M.C. — "N" Value 20 40 60 80

Notes:

This information pertains only to this borehole and should not be interpreted as being indicative of the site.

BOREHOLE LOG

BOREHOLE NO.: 6

SOLA ENGINEERING

ENCLOSURE 7
PAGE 2 **OF** 2
PROJECT: Proposed Residential Development
PROJECT NO.: 10653

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS		ELEV./ DEPTH (m)	P.L.-L.L. △ M.C. ● "N" Value 20 40 60 80
					BLOW COUNTS	"N" VALUE		
179 – 8		8	DCPT Begins	11.8	6-8-10	18	179 – 8	△ ●
						15		●
						31		●
178 – 9						54	178 – 9	●
			DCPT Ends; Borehole Ends at Targeted Depth; Borehole Open and Water at 4.5 m Below Ground Surface Upon Completion of Sampling.					
177 – 10							177 – 10	
176 – 11							176 – 11	
175 – 12							175 – 12	
174 – 13							174 – 13	
173 – 14							173 – 14	
172 – 15							172 – 15	
171 – 16							171 – 16	
170 – 17							170 – 17	
169 – 18							169 – 18	

BOREHOLE LOG

ENCLOSURE 8
PAGE 1 **OF** 2

BOREHOLE NO.: 7

SOLA ENGINEERING

PROJECT NO.: 10653 **DATE:** March 11, 2019
PROJECT: Proposed Residential Development

CLIENT: Your Home Development (Mississauga) Inc. c/o S2S Environmental Inc.
LOCATION: 5034, 5054 and 5080 Ninth Line, Mississauga, Ontario
ELEVATION (M): 187.11 **CAVED AT DEPTH (M):** 7.3
WATER LEVEL DEPTH (M): 3.0 **DRILLING METHOD:** Hollow Stem Auger
DRILLER: Profile Drilling Inc. **DRILL RIG:** Mobile B-45
LOGGED BY: Baljot **REVIEWED BY:** Dimple

LEGEND:

	SS - SPLIT SPOON
	AS - AUGER SAMPLE
	ST - SHELBY TUBE
	CS - CORE SAMPLE
	WATER LEVEL
	CAVED AT
"N"	BLOWS / 0.3 M
M.C.	NATURAL MOISTURE CONTENT (%)
O.V.M	ORGANIC VAPOUR MONITOR
P.L.	PLASTIC LIMIT (%)
L.L.	LIQUID LIMIT (%)

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE	ELEV./ DEPTH (m)	P.L.-L.L. / M.C. / "N" Value 20 40 60 80
187 / 0		1A	ICE AND SNOW COVER- 180 mm thick				187 / 0	
		1B	TOPSOIL- 230 mm thick		4-3-2-2	5		
		1C		52.6				
		2	FILL- Clayey Silt, trace sand, brown, very moist - some sand, brown - wet spoon	14.4	5-8-10	18		
186 / 1		3	PROBABLE FILL- Clayey Silt, trace gravel, trace sand, brown, moist - wet spoon	13.8	6-10-13	23	186 / 1	
185 / 2		4	- wet spoon	14.3	6-13-24	37	185 / 2	
184 / 3	▽	5		11.1	11-16-21	37	184 / 3	
183 / 4		6	CLAYEY SILT TILL- some sand, trace gravel, very stiff, grey, moist - ingress	10.2	3-6-10	16	183 / 4	
182 / 5							182 / 5	
181 / 6		7	- stiff - ingress	13.6	4-5-10	15	181 / 6	
180 / 7	1						180 / 7	

Notes:

This information pertains only to this borehole and should not be interpreted as being indicative of the site.

BOREHOLE LOG

ENCLOSURE 8
PAGE 2 **OF** 2

BOREHOLE NO.: 7

PROJECT: Proposed Residential Development

PROJECT NO.: 10653

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE	ELEV./ DEPTH (m)	P.L.-L.L. △ M.C. ● "N" Value 20 40 60 80
179 – 8		8	- stiff	13.9	2-7-8	11	179 – 8	
			Borehole Ends at Targeted Depth; Water at 3.0 m Below Ground Surface; and, Caved at 7.3 m Below Ground Surface Upon Completion of Drilling.					
178 – 9							178 – 9	
177 – 10							177 – 10	
176 – 11							176 – 11	
175 – 12							175 – 12	
174 – 13							174 – 13	
173 – 14							173 – 14	
172 – 15							172 – 15	
171 – 16							171 – 16	
170 – 17							170 – 17	
169 – 18							169 – 18	

BOREHOLE LOG

BOREHOLE NO.: 8

SOLA ENGINEERING

ENCLOSURE 9
PAGE 1 **OF** 2

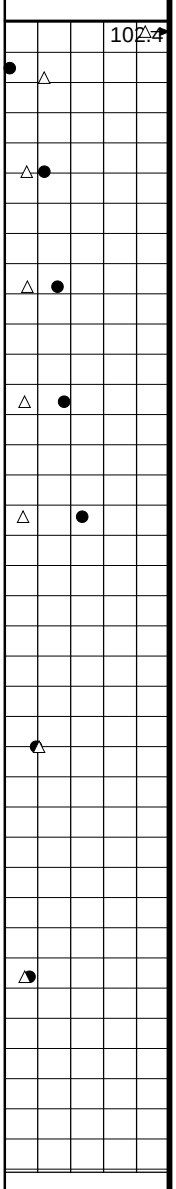
PROJECT NO.: 10653 **DATE:** March 14, 2019
PROJECT: Proposed Residential Development

CLIENT: Your Home Development (Mississauga) Inc. c/o S2S Environmental Inc.
LOCATION: 5034, 5054 and 5080 Ninth Line, Mississauga, Ontario
ELEVATION (M): 187.40 **CAVED AT DEPTH (M):** Open
WATER LEVEL DEPTH (M): 4.2 **DRILLING METHOD:** Hollow Stem Auger
DRILLER: Profile Drilling Inc. **DRILL RIG:** Diedrich D-50
LOGGED BY: Baljot **REVIEWED BY:** Dimple

LEGEND:

	SS - SPLIT SPOON
	AS - AUGER SAMPLE
	ST - SHELBY TUBE
	CS - CORE SAMPLE
	WATER LEVEL
	CAVED AT
"N"	BLOWS / 0.3 M
M.C.	NATURAL MOISTURE CONTENT (%)
O.V.M	ORGANIC VAPOUR MONITOR
P.L.	PLASTIC LIMIT (%)
L.L.	LIQUID LIMIT (%)

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA		DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE
0 / 187.40			1A	TOPSOIL- 130 mm thick	102.4		
			1B	FILL- Clayey Silt, trace gravel, trace sand, brown, moist	23.9	4-1-2-4	3
1 / 186.40			2	- some sand	13.3	3-10-14	24
			3	PROBABLE FILL- Clayey Silt, trace gravel, trace sand, brown, moist	13.7	10-15-17	32
2 / 185.40			4		12.0	7-15-21	36
3 / 184.40			5	CLAYEY SILT TILL- trace gravel, trace sand, hard, brown, moist	11.1	13-21-26	47
4 / 183.40			6	- some sand, very stiff, grey	20.8	4-8-11	19
5 / 182.40							
6 / 181.40			7	SILTY CLAY TILL- trace gravel, trace sand, stiff, grey, moist	12.1	6-6-9	15
7 / 180.40							



Notes:

This information pertains only to this borehole and should not be interpreted as being indicative of the site.

BOREHOLE LOG

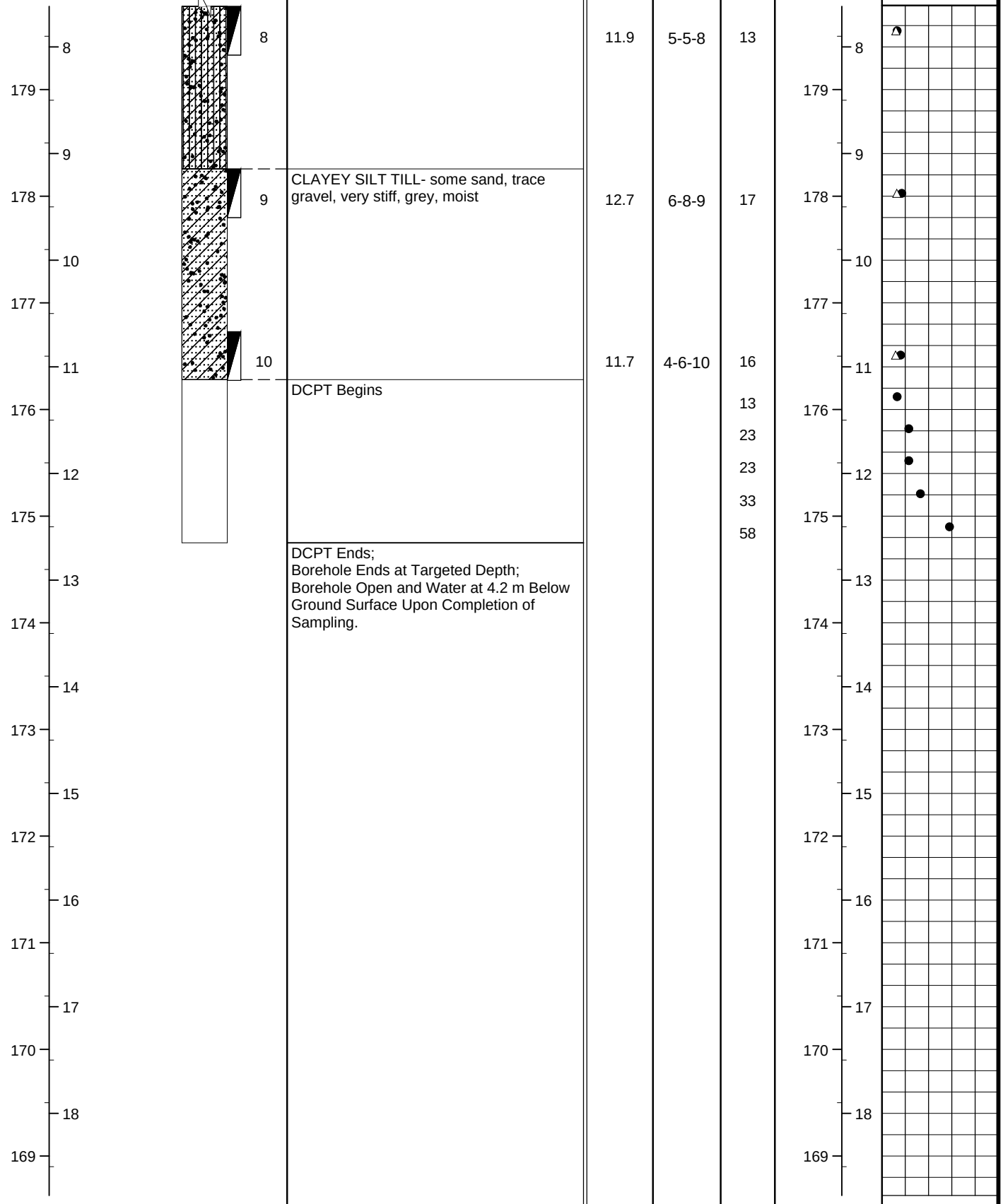
BOREHOLE NO.: 8

SOLA ENGINEERING

ENCLOSURE 9
PAGE 2 **OF** 2
PROJECT: Proposed Residential Development **PROJECT NO.:** 10653

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE	ELEV./ DEPTH (m)
		8		11.9	5-5-8	13	
		9	CLAYEY SILT TILL- some sand, trace gravel, very stiff, grey, moist	12.7	6-8-9	17	
		10		11.7	4-6-10	16	
			DCPT Begins			13	
						23	
						23	
						33	
						58	
			DCPT Ends; Borehole Ends at Targeted Depth; Borehole Open and Water at 4.2 m Below Ground Surface Upon Completion of Sampling.				

P.L.-L.L.
△ M.C.
● "N" Value
20 40 60 80



ENCLOSURE 10
PAGE 1 OF 2

BOREHOLE LOG

BOREHOLE NO.: 9

SOLA ENGINEERING

PROJECT NO.: 10653 **DATE:** March 11, 2019
PROJECT: Proposed Residential Development

CLIENT: Your Home Development (Mississauga) Inc. c/o S2S Environmental Inc.
LOCATION: 5034, 5054 and 5080 Ninth Line, Mississauga, Ontario
ELEVATION (M): 189.05 **CAVED AT DEPTH (M):** Open
WATER LEVEL DEPTH (M): Dry **DRILLING METHOD:** Hollow Stem Augers
DRILLER: Profile Drilling Inc. **DRILL RIG:** Mobile B-45
LOGGED BY: Baljot **REVIEWED BY:** Dimple

LEGEND:

	SS - SPLIT SPOON
	AS - AUGER SAMPLE
	ST - SHELBY TUBE
	CS - CORE SAMPLE
	WATER LEVEL
	CAVED AT
"N"	BLOWS / 0.3 M
M.C.	NATURAL MOISTURE CONTENT (%)
O.V.M	ORGANIC VAPOUR MONITOR
P.L.	PLASTIC LIMIT (%)
L.L.	LIQUID LIMIT (%)

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE	ELEV./ DEPTH (m)	P.L.-L.L. / M.C. / "N" Value 20 40 60 80
189		1A	ICE AND SNOW COVER- 150 mm thick				189	
		1B	TOPSOIL- 130 mm thick	26.1	4-3-2-2	5		
188		2	FILL- Clayey Silt, trace gravel, trace sand, trace root lets, brown, moist	27.7	0-0-5-6	5	188	
			- becoming Silty Clay, trace gravel, trace sand, brown, very moist					
187		3	- becoming Clayey Silt, some sand, trace gravel, brown, moist	13.1	5-8-13-16	21	187	
		4	PROBABLE FILL- Clayey Silt, some sand, trace gravel, brown, moist	12.2	7-12-14-20	26		
186		5	CLAYEY SILT TILL- trace gravel, trace sand, stiff, brown, moist	11.3	6-11-13-13	12	186	
185		6	- grey	11.7	3-5-7-7	12	185	
184		7	- some sand	11.6	3-5-7-7	12	184	
183		8		14.0	2-4-6-5	10	183	
		9		10.9	3-5-7-8	12		
182							182	

Notes:

This information pertains only to this borehole and should not be interpreted as being indicative of the site.

BOREHOLE LOG

BOREHOLE NO.: 9

SOLA ENGINEERING

ENCLOSURE 10
PAGE 2 **OF** 2
PROJECT: Proposed Residential Development
PROJECT NO.: 10653

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE	ELEV./ DEPTH (m)	P.L.-L.L. △ M.C. ● "N" Value 20 40 60 80
181 8		10		12.2	2-4-6-8	10	181 8	
		11		11.6	3-5-5-6	10		
			DCPT Begins			4		
180 9						11	180 9	
						13		
						17		
179 10						29	179 10	
						36		
						40		
						50		
178 11			DCPT Ends; Borehole Ends at Targeted Depth; Borehole Open and Dry Upon Completion of Sampling.				178 11	
177 12							177 12	
176 13							176 13	
175 14							175 14	
174 15							174 15	
173 16							173 16	
172 17							172 17	
171 18							171 18	

ENCLOSURE 11
PAGE 1 **OF** 2

BOREHOLE LOG

BOREHOLE NO.: 10

SOLA ENGINEERING

PROJECT NO.: 10653 **DATE:** March 14, 2019
PROJECT: Proposed Residential Development

CLIENT: Your Home Development (Mississauga) Inc. c/o S2S Environmental Inc.
LOCATION: 5034, 5054 and 5080 Ninth Line, Mississauga, Ontario
ELEVATION (M): 189.15 **CAVED AT DEPTH (M):** 7.8
WATER LEVEL DEPTH (M): Dry **DRILLING METHOD:** Hollow Stem Auger
DRILLER: Profile Drilling Inc. **DRILL RIG:** Diedrich D-50
LOGGED BY: Baljot **REVIEWED BY:** Dimple

LEGEND:

	SS - SPLIT SPOON
	AS - AUGER SAMPLE
	ST - SHELBY TUBE
	CS - CORE SAMPLE
	WATER LEVEL
	CAVED AT
"N"	BLOWS / 0.3 M
M.C.	NATURAL MOISTURE CONTENT (%)
O.V.M	ORGANIC VAPOUR MONITOR
P.L.	PLASTIC LIMIT (%)
L.L.	LIQUID LIMIT (%)

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE	ELEV./ DEPTH (m)
189 / 0		1A	TOPSOIL- 130 mm thick	84.1			189 / 0
		1B	FILL- Clayey Silt, trace sand, dark brown, moist	19.5	8-4-4-7	8	
188 / 1		2	- brown	14.5	3-15-21	36	188 / 1
		3	- some sand	14.1	16-19-24	43	
187 / 2		4		12.2	6-13-20	33	187 / 2
186 / 3		5		11.1	9-18-23	41	186 / 3
185 / 4							185 / 4
		6	CLAYEY SILT TILL- some sand, trace gravel, stiff, grey, moist	12.0	4-6-8	14	
184 / 5							184 / 5
183 / 6		7		12.1	5-6-8	14	183 / 6
182 / 7							182 / 7

P.L.-L.L. △ M.C. ● "N" Value 20 40 60 80

Notes:

BOREHOLE LOG

BOREHOLE NO.: 10

SOLA ENGINEERING

ENCLOSURE 11
PAGE 2 **OF** 2
PROJECT: Proposed Residential Development
PROJECT NO.: 10653

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE	ELEV./ DEPTH (m)	P.L.-L.L. / M.C. / "N" Value 20 40 60 80
181 8		1	- very stiff		8-11-15	26	181 8	
			DCPT Begins			3		
						6		
						11		
180 9						12	180 9	
						16		
						21		
179 10						27	179 10	
						53		
						56		
178 11			DCPT Ends; Borehole Ends at Targeted Depth; Borehole Dry and Caved at 7.8 m Below Ground Surface Upon Completion of Sampling.				178 11	
177 12							177 12	
176 13							176 13	
175 14							175 14	
174 15							174 15	
173 16							173 16	
172 17							172 17	
171 18							171 18	

ENCLOSURE 12
PAGE 1 **OF** 2

BOREHOLE LOG

BOREHOLE NO.: 11

SOLA ENGINEERING

PROJECT NO.: 10653 **DATE:** March 15, 2019
PROJECT: Proposed Residential Development

CLIENT: Your Home Development (Mississauga) Inc. c/o S2S Environmental Inc.
LOCATION: 5034, 5054 and 5080 Ninth Line, Mississauga, Ontario
ELEVATION (M): 189.61 **CAVED AT DEPTH (M):** Open
WATER LEVEL DEPTH (M): Dry **DRILLING METHOD:** Hollow Stem Auger
DRILLER: Profile Drilling Inc. **DRILL RIG:** Diedrich D-50
LOGGED BY: Baljot **REVIEWED BY:** Dimple

LEGEND:

	SS - SPLIT SPOON
	AS - AUGER SAMPLE
	ST - SHELBY TUBE
	CS - CORE SAMPLE
	WATER LEVEL
	CAVED AT
"N"	BLOWS / 0.3 M
M.C.	NATURAL MOISTURE CONTENT (%)
O.V.M	ORGANIC VAPOUR MONITOR
P.L.	PLASTIC LIMIT (%)
L.L.	LIQUID LIMIT (%)

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE
		1A	TOPSOIL- 130 mm thick			
		1B	FILL- Clayey Silt, some sand, trace gravel, brown, moist		7-14-10-12	24
		2		14.7	7-11-17-25	28
		3		15.4	8-16-23	39
		4	PROBABLE FILL- Clayey Silt, trace gravel, trace sand, brown, moist	14.1	10-15-24	39
		5	CLAYEY SILT TILL- trace gravel, trace sand, very stiff, grey, moist	12.3	7-11-14	25
		6	SILTY CLAY TILL- trace gravel, trace sand, firm, grey, moist	14.6	2-3-5	8
		7	- stiff	12.4	4-5-8	13

ELEV./ DEPTH (m): 190 (0), 189 (1), 188 (2), 187 (3), 186 (4), 185 (5), 184 (6), 183 (7)

P.L.-L.L. | M.C. | "N" Value 20 40 60 80

Notes:

This information pertains only to this borehole and should not be interpreted as being indicative of the site.

BOREHOLE LOG

BOREHOLE NO.: 11

SOLA ENGINEERING

ENCLOSURE 12
PAGE 2 **OF** 2
PROJECT: Proposed Residential Development
PROJECT NO.: 10653

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE	ELEV./ DEPTH (m)	P.L.-L.L. △ M.C. ● "N" Value 20 40 60 80
182 – 8		8	CLAYEY SILT TILL- some sand, trace gravel, stiff, grey, moist	12.0	4-6-8	14	182 – 8	△
181 – 9		9	- very stiff	12.4	5-7-9	16	181 – 9	△
180 – 10							180 – 10	
179 – 11		10		12.2	6-9-12	21	179 – 11	△ ●
178 – 12			Borehole Ends at Targeted Depth; Borehole Open and Dry Upon Completion of Drilling.				178 – 12	
177 – 13							177 – 13	
176 – 14							176 – 14	
175 – 15							175 – 15	
174 – 16							174 – 16	
173 – 17							173 – 17	
172 – 18							172 – 18	

ENCLOSURE 13
PAGE 1 **OF** 2

BOREHOLE LOG

BOREHOLE NO.: 12

SOLA ENGINEERING

PROJECT NO.: 10653 **DATE:** March 12, 2019
PROJECT: Proposed Residential Development

CLIENT: Your Home Development (Mississauga) Inc. c/o S2S Environmental Inc.
LOCATION: 5034, 5054 and 5080 Ninth Line, Mississauga, Ontario
ELEVATION (M): 190.32 **CAVED AT DEPTH (M):** Open
WATER LEVEL DEPTH (M): 9.8 **DRILLING METHOD:** Hollow Stem Auger
DRILLER: Profile Drilling Inc. **DRILL RIG:** Diedrich D-50
LOGGED BY: Ken **REVIEWED BY:** Dimple

LEGEND:

	SS - SPLIT SPOON
	AS - AUGER SAMPLE
	ST - SHELBY TUBE
	CS - CORE SAMPLE
	WATER LEVEL
	CAVED AT
"N"	BLOWS / 0.3 M
M.C.	NATURAL MOISTURE CONTENT (%)
O.V.M	ORGANIC VAPOUR MONITOR
P.L.	PLASTIC LIMIT (%)
L.L.	LIQUID LIMIT (%)

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE
190 / 0		1	FILL- Clayey Silt, brown, very moist	32.3	6-2-2-1	4
189 / 1		2		13.3	5-6-12	18
		3	- some sand	12.9	7-11-16	27
188 / 2		4	CLAYEY SILT TILL- trace gravel, trace sand, very stiff, brown, moist	13.9	5-12-16	28
187 / 3		5		9.6	8-12-16	28
186 / 4		6	- some sand, grey	11.3	4-8-10	18
185 / 5						
184 / 6		7	- Stiff	10.8	3-6-9	15
7						

P.L.-L.L. △ M.C. ● "N" Value 20 40 60 80

Notes:

This information pertains only to this borehole and should not be interpreted as being indicative of the site.

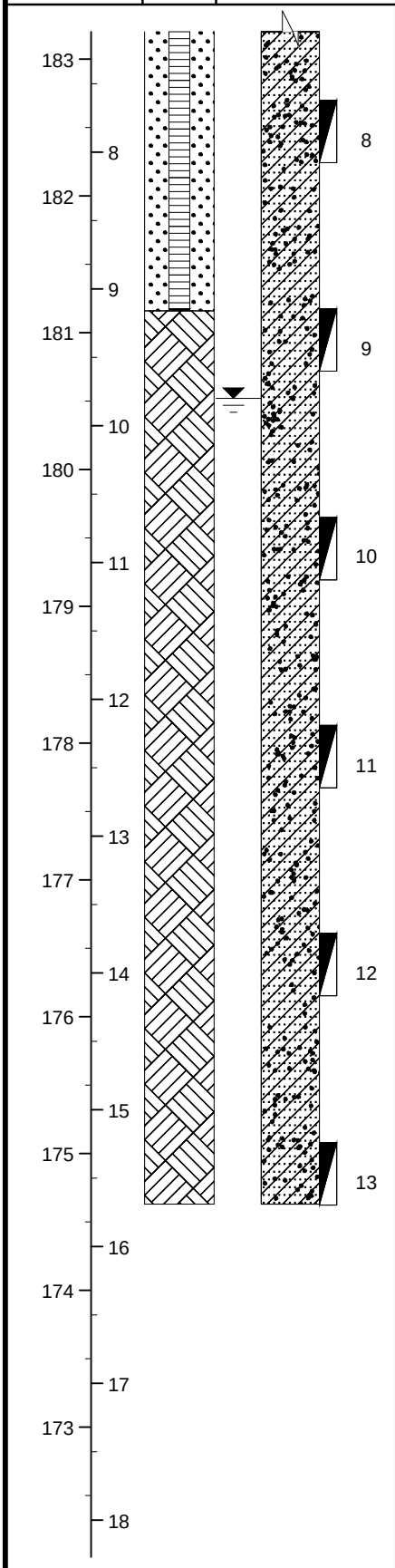
ENCLOSURE 13
PAGE 2 OF 2
PROJECT: Proposed Residential Development

BOREHOLE LOG

BOREHOLE NO.: 12

SOLA ENGINEERING

PROJECT NO.: 10653



ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE	ELEV./ DEPTH (m)	P.L.-L.L. △ M.C. ● "N" Value 20 40 60 80
				10.3	5-6-8	14		
				12.2	4-5-8	13		
				12.8	2-5-5	10		
			- very stiff	14.6	4-8-11	19		
			- hard	13.7	5-8-11	19		
			Borehole Ends at Targeted Depth; Borehole Open and Water at 9.8 m Below Ground Surface Upon Completion of Drilling.	10.0	13-26-31	57		

ENCLOSURE 14
PAGE 1 **OF** 2

BOREHOLE LOG

BOREHOLE NO.: 13

SOLA ENGINEERING

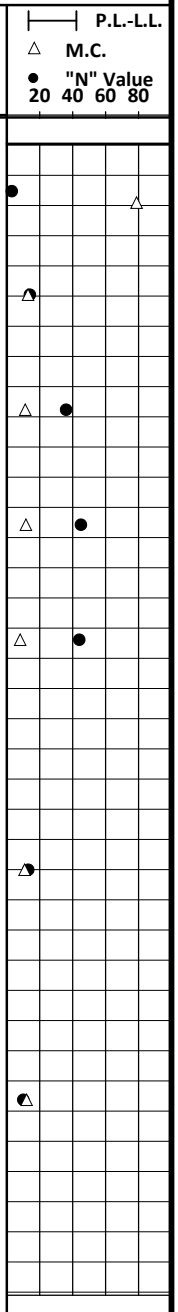
PROJECT NO.: 10653 **DATE:** March 15, 2019
PROJECT: Proposed Residential Development

CLIENT: Your Home Development (Mississauga) Inc. c/o S2S Environmental Inc.
LOCATION: 5034, 5054 and 5080 Ninth Line, Mississauga, Ontario
ELEVATION (M): 190.40 **CAVED AT DEPTH (M):** 11.0
WATER LEVEL DEPTH (M): Dry **DRILLING METHOD:** Hollow Stem Auger
DRILLER: Profile Drilling Inc. **DRILL RIG:** Diedrich D-50
LOGGED BY: Baljot **REVIEWED BY:** Dimple

LEGEND:

	SS - SPLIT SPOON
	AS - AUGER SAMPLE
	ST - SHELBY TUBE
	CS - CORE SAMPLE
	WATER LEVEL
	CAVED AT
"N"	BLOWS / 0.3 M
M.C.	NATURAL MOISTURE CONTENT (%)
O.V.M	ORGANIC VAPOUR MONITOR
P.L.	PLASTIC LIMIT (%)
L.L.	LIQUID LIMIT (%)

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE
190.40		1A	TOPSOIL- 150 mm thick			
		1B	FILL- Clayey Silt, dark brown, very moist	78.8	4-1-2-3	3
			- some sand, trace gravel, brown, moist			
		2		12.9	5-10-14	14
		3		11.2	7-15-21	36
		4		11.6	10-21-24	45
		5	CLAYEY SILT TILL- trace gravel, trace sand, hard, brown, mottled, moist	8.1	11-12-32	44
		6	SILTY CLAY TILL- trace gravel, trace sand, stiff, grey, moist	10.8	3-5-8	13
		7		12.0	5-4-6	10



Notes:

BOREHOLE LOG

BOREHOLE NO.: 13

SOLA ENGINEERING

ENCLOSURE 14
PAGE 2 **OF** 2
PROJECT: Proposed Residential Development
PROJECT NO.: 10653

ELEV./ DEPTH (m)	WELL/ PIEZO. DETAIL	SYMBOLS, SAMPLERS TEST DATA	DESCRIPTION	Moisture Content	STD PENETRATION TESTS BLOW COUNTS	STD PENETRATION TESTS "N" VALUE	ELEV./ DEPTH (m)	P.L.-L.L. △ M.C. ● "N" Value 20 40 60 80
182 8		8	CLAYEY SILT TILL- some sand, trace gravel, very stiff, grey, moist	11.9	5-7-10	17	182 8	△ ●
181 9		9	SILTY CLAY TILL- trace gravel, trace sand, very stiff, grey, moist	11.2	6-8-11	19	181 9	△ ●
180 10		10					180 10	
179 11		1		11.5	5-6-11	17	179 11	●
12			DCPT Begins			23	12	●
178						34	178	●
13						41	13	●
177						49	177	
14			DCPT Ends; Borehole Ends at Targeted Depth; Borehole Dry and Caved at 11.0 m Below Ground Surface Upon Completion of Sampling.				14	
176							176	
15							15	
175							175	
16							16	
174							174	
17							17	
173							173	
18							18	
172							172	

SOLA ENGINEERING

ENCLOSURE No. 15

RECORD OF BOREHOLE No. BH301 1 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Hollow Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.19 - 2020.02.19 LATITUDE ____ LONGITUDE ____ CHECKED BY GH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
187.7	Topsoil										
187.6 / 0.1	TOPSOIL - 75 mm thick		1A								
	FILL - clayey silt, trace gravel, trace sand, dark brown to brown, moist		1B	SS	5				○		
	- occasional inferred cobbles and shale fragments		2	SS	16		187		○		
	- trace rootlets		3	SS	26		186		○		
184.6			4	SS	24		185		○		
3.0	CLAYEY SILT TILL - trace gravel, trace sand, occasional sand seams, brown to grey, stiff to hard, moist		5	SS	32		184		○		
			6	SS	20		183		○		
			7	SS	14		182		○		
180.0							181				
7.6	SILTY CLAY TILL - trace gravel, trace sand, grey, stiff, moist		8	SS	12		180				
178.5							179				
9.1	CLAYEY SILT TILL - trace gravel, trace sand, grey, stiff, moist		9	SS	13		178		○		

Continued Next Page

$+^3, \times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 15

RECORD OF BOREHOLE No. BH301 2 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST HWY BOREHOLE TYPE Hollow Stem Auger COMPILED BY BS

DATUM DATE 2020.02.19 - 2020.02.19 LATITUDE LONGITUDE CHECKED BY GH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (20 40 60 80 100): ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT TILL - trace gravel, trace sand, grey, stiff, moist *(continued)*										
177.0											
10.7	SILTY CLAY TILL - trace gravel, trace sand, grey, stiff, moist		10	SS	13		177				
							176				
	- occasional inferred cobbles		11	SS	14						
175.0							175				
12.6	End of Spoon Sampling at Targeted Depth and DCPT starts; Borehole Open and Dry upon Completion of Drilling.										
173.2							174				
14.5	End of DCPT.										

$+^3, \times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 16

RECORD OF BOREHOLE No. BH302 1 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Hollow Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.18 - 2020.02.18 LATITUDE ____ LONGITUDE ____ CHECKED BY GH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
187.8	Topsoil										
0.0 / 187.6	TOPSOIL - 200 mm thick		1A	SS	3		187		○		
0.2	FILL - clayey silt, trace gravel, trace sand, dark brown to brown, moist		1B								
			2	SS	19		186		○		
185.5			3	SS	22				○		
2.3	PROBABLE FILL - clayey silt, trace gravel, trace sand, brown, moist		4	SS	37		185		○		
			5	SS	40				○		- Auger Grinding
183.2							184				
4.6	CLAYEY SILT TILL - trace gravel, trace sand, grey, stiff to very stiff, moist		6	SS	15		183		○		
			7	SS	16		182		○		
180.2							181				
7.6	SILTY CLAY TILL - trace gravel, trace sand, grey, stiff, moist		8	SS	11		180		○		
178.6							179				
9.1	CLAYEY SILT TILL - trace gravel, trace sand, grey, stiff to very stiff, moist to wet		9	SS	13		178		○		

Continued Next Page

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 16

RECORD OF BOREHOLE No. BH302 2 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Hollow Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.18 - 2020.02.18 LATITUDE ____ LONGITUDE ____ CHECKED BY GH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT TILL - trace gravel, trace sand, grey, stiff to very stiff, moist to wet *(continued)*						177				
			10	SS	27		176				
175.1			11	SS	22				○		
12.6	End of Spoon Sampling at Targeted Depth and DCPT starts; Borehole Open and Dry upon Completion of Drilling.						175				
173.9							174				
13.9	End of DCPT.										

$+^3, \times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 17

RECORD OF BOREHOLE No. BH303 1 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Hollow Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.18 - 2020.02.18 LATITUDE ____ LONGITUDE ____ CHECKED BY GH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa: ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
187.6	Topsoil										
187.4 / 0.0	TOPSOIL - 150 mm thick		1A	SS	7		187	○	○		
0.2	FILL - silty clay, trace gravel, trace sand, brown, wet		1B								
186.8											
0.8	FILL - clayey silt, trace gravel, trace sand, dark brown to brown, moist		2	SS	23			○	○		
			3	SS	25		186	○	○		- Spoon Wet
185.3											
2.3	PROBABLE FILL - clayey silt, trace gravel, trace sand, brown, moist		4	SS	40		185	○	○		
	- occasional inferred cobbles		5	SS	41			○	○		
183.0							184				
4.6	CLAYEY SILT TILL - trace gravel, trace sand, grey, stiff to very stiff, moist		6	SS	24		183	○	○		
			7	SS	11		182	○	○		
			8	SS	13		181	○	○		
			9	SS	16		180	○	○		
							179				
							178				

Continued Next Page

$+^{3}, \times^{3}$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 17

RECORD OF BOREHOLE No. BH303 2 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Hollow Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.18 - 2020.02.18 LATITUDE ____ LONGITUDE ____ CHECKED BY GH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (20 40 60 80 100): ○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT TILL - trace gravel, trace sand, grey, stiff to very stiff, moist *(continued)*									
	- occasional inferred cobbles		10	SS	13		177		○	
175.4							176			
12.2	SILTY CLAY TILL - trace gravel, trace sand, occasional inferred cobbles, grey, stiff to hard, moist		11	SS	8		175		○	
173.6			12	SS	50/ 8cm		174		○	
13.9	End of Borehole at Targeted Depth; Borehole Open and Dry upon Completion of Drilling.									

+ ³, × ³: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 18

RECORD OF BOREHOLE No. BH304 1 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Solid Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.19 - 2020.02.19 LATITUDE ____ LONGITUDE ____ CHECKED BY GH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
187.6	Topsoil										
187.5	TOPSOIL - 75 mm thick		1A								
0.1	FILL - silty sand, brown, wet		1B	SS	3						
186.8							187				
0.8	FILL - clayey silt, trace gravel, trace sand, trace rootlets, dark brown to brown, moist		2	SS	7				○		
			3	SS	20		186		○		
			4	SS	24		185		○		
184.5											
3.0	PROBABLE FILL - clayey silt, some sand, trace gravel, occasional sand seams, brown, moist		5	SS	47		184		○		
183.0							183				
4.6	CLAYEY SILT TILL - trace gravel, trace sand, brown to grey, very stiff, moist		6	SS	27				○		
			7	SS	17		182		○		
180.0							181				
7.6	SILTY CLAY TILL - trace gravel, trace sand, grey, stiff to very stiff, moist to very moist		8	SS	12		180		○		
			9	SS	17		179		○		
							178				

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+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 18

RECORD OF BOREHOLE No. BH304 2 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST HWY BOREHOLE TYPE Solid Stem Auger COMPILED BY BS

DATUM DATE 2020.02.19 - 2020.02.19 LATITUDE LONGITUDE CHECKED BY GH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILTY CLAY TILL - trace gravel, trace sand, grey, stiff to very stiff, moist to very moist *(continued)*						177				
176.5			10	SS	21				○		
11.1	End of Spoon Sampling at Targeted Depth and DCPT starts; Borehole Dry and Caved at approximately 9.4 m below Ground Surface upon Completion of Drilling.						176				
175.3											
12.3	End of DCPT.										

$+^3, \times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 19

RECORD OF BOREHOLE No. BH305 1 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST _____ HWY _____ BOREHOLE TYPE Solid Stem Auger COMPILED BY BS

DATUM _____ DATE 2020.02.20 - 2020.02.20 LATITUDE _____ LONGITUDE _____ CHECKED BY VG

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
187.1	Topsoil						187				
186.9 / 0.0	TOPSOIL - 125 mm thick		1A								
0.1	FILL - clayey silt, trace gravel, trace sand, trace rootlets, brown, moist		1B	SS	3						
			2	SS	20		186		○		
185.5											
1.5	PROBABLE FILL - clayey silt, some sand, trace gravel, brown, moist		3	SS	26		185		○		
184.8											
2.3	CLAYEY SILT TILL - trace gravel, trace sand, occasional inferred cobbles, brown to grey, very stiff to hard, moist		4	SS	42		184		○		
			5	SS	50				○		
			6	SS	29		183		○		
			7	SS	17		182		○		
			8	SS	18		181		○		
			9	SS	19		180		○		
							179		○		
							178				

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$+^3, \times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 19

RECORD OF BOREHOLE No. BH305 2 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST HWY BOREHOLE TYPE Solid Stem Auger COMPILED BY BS

DATUM DATE 2020.02.20 - 2020.02.20 LATITUDE LONGITUDE CHECKED BY VG

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT TILL - trace gravel, trace sand, occasional inferred cobbles, brown to grey, very stiff to hard, moist *(continued)*						177				
175.9			10	SS	15				○		
11.1	End of Spoon Sampling at Targeted Depth and DCPT starts; Borehole Dry and Caved at approximately 10.1 m below Ground Surface upon Completion of Drilling.						176				
							175				
174.4											
12.6	End of DCPT.										

$+^3, \times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 20

RECORD OF BOREHOLE No. BH306 1 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Hollow Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.20 - 2020.02.20 LATITUDE ____ LONGITUDE ____ CHECKED BY VG

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
186.8	Topsoil										
0.0 / 186.6	TOPSOIL - 200 mm thick		1A	SS	3		186				
0.2	FILL - clayey silt, trace gravel, trace rootlets, brown, moist		1B								
			2	SS	18				○		
	- some sand		3	SS	22		185		○		
184.5											
2.3	CLAYEY SILT TILL - trace gravel, brown, very stiff to hard, moist		4	SS	33		184		○		
			5	SS	41				○		
							183				
			6	SS	21		182				
180.7											
6.1	SILTY CLAY TILL - trace gravel, brown to grey, stiff to very stiff, moist		7	SS	13		181		○		
							180				
			8	SS	14		179		○		
							178				
	- occasional inferred cobbles		9	SS	14				○		
							177				

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+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 20

RECORD OF BOREHOLE No. BH306 2 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Hollow Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.20 - 2020.02.20 LATITUDE ____ LONGITUDE ____ CHECKED BY VG

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILTY CLAY TILL - trace gravel, brown to grey, stiff to very stiff, moist *(continued)*										
			10	SS	16		176		○		
175.7											
11.1	End of Spoon Sampling at Targeted Depth and DCPT starts; Borehole Open and Dry upon Completion of Drilling.						175				
174.5											
12.3	End of DCPT.										

$+^3, \times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 21

RECORD OF BOREHOLE No. BH307 1 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Solid Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.21 - 2020.02.21 LATITUDE ____ LONGITUDE ____ CHECKED BY VG

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
186.9	Topsoil										
0.0 / 186.7	TOPSOIL - 200 mm thick		1A	SS	4		186		○		
0.2 / 186.1	FILL - sandy silt, yellowish brown, moist		1B								
0.8 / 185.4	FILL - clayey silt, trace gravel, trace sand, brown, moist		2	SS	20		185		○		
1.5 / 184.6	PROBABLE FILL - clayey silt, trace gravel, trace sand, brown, moist		3	SS	29		184		○		
2.3	CLAYEY SILT TILL - trace gravel, trace sand, brown, very stiff to hard, moist		4	SS	30		183		○		
	- occasional inferred cobbles		5	SS	35		182		○		
180.8			6	SS	22		181		○		
6.1	SILTY CLAY TILL - trace gravel, brown to grey, stiff to very stiff, moist		7	SS	21		180		○		
			8	SS	14		179		○		
			9	SS	14		178		○		
							177				

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+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 21

RECORD OF BOREHOLE No. BH307 2 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Solid Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.21 - 2020.02.21 LATITUDE ____ LONGITUDE ____ CHECKED BY VG

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (20 40 60 80 100): ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILTY CLAY TILL - trace gravel, brown to grey, stiff to very stiff, moist *(continued)*									
	- occasional inferred cobbles		10	SS	18		176		○	
175.8 / 11.1	End of Spoon Sampling at Targeted Depth and DCPT starts; Borehole Open and Dry upon Completion of Drilling.						175			
173.9							174			
13.0	End of DCPT.									

$+^3, \times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 22

RECORD OF BOREHOLE No. BH308 1 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Solid Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.20 - 2020.02.20 LATITUDE ____ LONGITUDE ____ CHECKED BY VG

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
187.2	Topsoil							
0.0 / 187.0	TOPSOIL - 200 mm thick		1A	SS	2		187	
0.2	FILL - silty clay, trace gravel, trace rootlets, brown, very moist		1B					
			2	SS	5		186	
185.7								
1.5	PROBABLE FILL - clayey silt, trace gravel, trace sand, brown, very moist		3	SS	14		185	
184.9								
2.3	SILTY CLAY TILL - trace gravel, brown to grey, very stiff, very moist		4	SS	23			- Auger Wet
			5	SS	16		184	- Spoon Wet
	- trace sand		6	SS	22		183	
			7	SS	18		182	
			8	SS	16		181	
			9	SS	17		180	
							179	
							178	

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa: ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L

WATER CONTENT (%): 20 40 60

UNIT WEIGHT γ kN/m³

Continued Next Page

$+^3, \times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 22

RECORD OF BOREHOLE No. BH308 2 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Solid Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.20 - 2020.02.20 LATITUDE ____ LONGITUDE ____ CHECKED BY VG

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILTY CLAY TILL - trace gravel, brown to grey, very stiff, very moist *(continued)*						177				
176.1			10	SS	20				○		
11.1	End of Spoon Sampling at Targeted Depth and DCPT starts; Borehole Caved at approximately 9.8 m and Water at approximately 0.9 m below Ground Surface upon Completion of Drilling.						176				
174.9							175				
12.3	End of DCPT.										

$+^3, \times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 23

RECORD OF BOREHOLE No. BH309 1 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Hollow Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.21 - 2020.02.21 LATITUDE ____ LONGITUDE ____ CHECKED BY GH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa: ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
187.3	Topsoil										
0.0 / 187.0	TOPSOIL - 305 mm thick		1A	SS	3		187				
0.3	FILL - silty clay, trace gravel, trace sand, trace rootlets, dark brown to brown, moist		1B								
			2	SS	9		186				
185.8											
1.5	FILL - clayey silt, trace gravel, trace sand, occasioanl sand seams, brown, moist		3	SS	28		185				
			4	SS	33						
184.3											
3.0	CLAYEY SILT TILL - trace gravel, trace sand, brown to grey, stiff to hard, moist		5	SS	42		184				
			6	SS	13		183				
181.3							182				
6.1	SILTY CLAY - trace gravel, trace sand, grey, stiff, moist		7	SS	10		181				
			8	SS	12		180				
178.2							179				
9.1	CLAYEY SILT TILL - trace gravel, trace sand, grey, stiff to very stiff, wet		9	SS	12		178				

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+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 23

RECORD OF BOREHOLE No. BH309 2 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Hollow Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.21 - 2020.02.21 LATITUDE ____ LONGITUDE ____ CHECKED BY GH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (20 40 60 80 100): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	CLAYEY SILT TILL - trace gravel, trace sand, grey, stiff to very stiff, wet *(continued)*						177				
176.2			10	SS	16				○		
11.1	End of Spoon Sampling at Targeted Depth and DCPT starts; Borehole Open and Dry upon Completion of Drilling.						176				
174.7							175				
12.6	End of DCPT.										

$+^3, \times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 24

RECORD OF BOREHOLE No. BH310 1 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST HWY BOREHOLE TYPE Solid Stem Auger COMPILED BY BS

DATUM DATE 2020.02.20 - 2020.02.21 LATITUDE LONGITUDE CHECKED BY GH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
187.5	Topsoil										
187.4 / 0.0	TOPSOIL - 150 mm thick		1A								
0.2	FILL - clayey silt, trace gravel, trace sand, trace rootlets, dark brown to brown, moist		1B	SS	1		187		○		
			2	SS	16				○		
	- occasional inferred cobbles		3	SS	28		186		○		
185.3											
2.3	CLAYEY SILT TILL - trace gravel, trace sand, occasional sand seams, brown to grey, stiff to hard, moist		4	SS	31		185		○		
			5	SS	24				○		
							184				
			6	SS	13		183		○		
181.4											
6.1	SILTY CLAY TILL - trace gravel, trace sand, grey, very stiff, wet		7	SS	15		182		○		
			8	SS	19		181		○		
							180				
	- occasional inferred cobbles		9	SS	16		179		○		
							178				

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+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SOLA ENGINEERING

ENCLOSURE No. 24

RECORD OF BOREHOLE No. BH310 2 OF 2 METRIC

PROJECT NUMBER 10653 LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga ORIGINATED BY GH

DIST ____ HWY ____ BOREHOLE TYPE Solid Stem Auger COMPILED BY BS

DATUM ____ DATE 2020.02.20 - 2020.02.21 LATITUDE ____ LONGITUDE ____ CHECKED BY GH

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILTY CLAY TILL - trace gravel, trace sand, grey, very stiff, wet *(continued)*										
	- occasional inferred cobbles		10	SS	17				○		
176.4							177				
11.1	End of Spoon Sampling at Targeted Depth and DCPT starts; Borehole Dry and Caved at approximately 10.1 m below Ground Surface upon Completion of Drilling.						176				
174.9							175				
12.6	End of DCPT.										

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

KEY TO SYMBOLS BH1-BH13

Enclosure 25A
Report No. : 2020-14185
File No. : 10653-S0068-GEO

Symbol **Description**

Strata symbols

- **Topsoil**
- **Fill**
- **Probable fill**
- **Clayey silt till**
- **Silty clay till**
- **Ice and Snow**
- **Blank**

Symbol **Description**

Misc. Symbols

- **Borehole Continues**
- **Natural Moisture Content**
- **Borehole Caved At**
- **Water Level**

Soil Samplers

- **Split Spoon**

Monitor Well Details

- **Covered Riser**

Notes:

Terms describing RELATIVE DENSITY, based on Standard Penetration Test "N"-Value for COURSE GRAINED soils (major portion retained on No. 200 sieve).

DESCRIPTIVE TERM ["N"-Value (blows/0.3m), Relative Density (%)]

- **Very Loose [less than 4, less than 15]**
- **Loose [4 to 10, 15 to 35]**
- **Compact or Medium [10 to 30, 35 to 65]**
- **Dense [30 to 50, 65 to 85]**
- **Very Dense [greater than 50, greater than 85]**

Terms describing CONSISTENCY, based on Standard Penetration Test "N"-Value for FINE GRAINED soils (major portion passing No. 200 sieve)

DESCRIPTIVE TERM [Unconfined Compressive Strength (kPa), "N"-Value (blows/0.3m)]

Very Soft [less than 25, less than 2]
Soft [25 to 50, 2 to 4]
Firm [50 to 100, 4 to 8]
Stiff [100 to 200, 8 to 15]
Very Stiff [200 to 400, 15 to 30]
Hard [greater than 400, greater than 30]

KEY TO SYMBOLS BH1-BH13

Enclosure 25B
Report No. : 2020-14185
File No. : 10653-S0068-GEO

Symbol **Description**

Monitor Well Details

Protective Casing Set in Concrete

Bentonite Slurry

Silica sand, Blank PVC

Slotted Pipe w/ Sand

Endcap on Pipe Packed in Sand

No Pipe, Filler Material

Riser With Cover and Protective Casing

Silica Sand, No Pipe (End Plug)

BH301-BH310 KEY TO SYMBOLS

Enclosure No.: 25C

PROJECT NUMBER 10653

PROJECT NAME Proposed Residential Development

LOCATION 5034, 5054 and 5080 Ninth Line, Mississauga

CLIENT Your Home Development (Mississauga) Inc. c/o S2S

LITHOLOGIC SYMBOLS (Unified Soil Classification System)


CL-SL-TL: clayey silt till


FILL: TTC Fill (made ground)


SL-CL: silty clay


TILLSTCL: TTC Silty Clay Till


TOPSOIL: Topsoil/peat/organics

SAMPLER SYMBOLS


Split Spoon Sample

WELL CONSTRUCTION SYMBOLS


Bentonite Seal: 1 pipe group, 1 pipe


Bentonite: Bottom of hole


Concrete: 1 pipe group, 1 pipe


Filter Pack: 1 pipe group, 1 pipe


Slotted Pipe: 1 pipe group, 1 pipe

Notes:

Terms describing RELATIVE DENSITY, based on Standard Penetration Test "N"-Value for COURSE GRAINED soils (major portion retained on No. 200 seive):

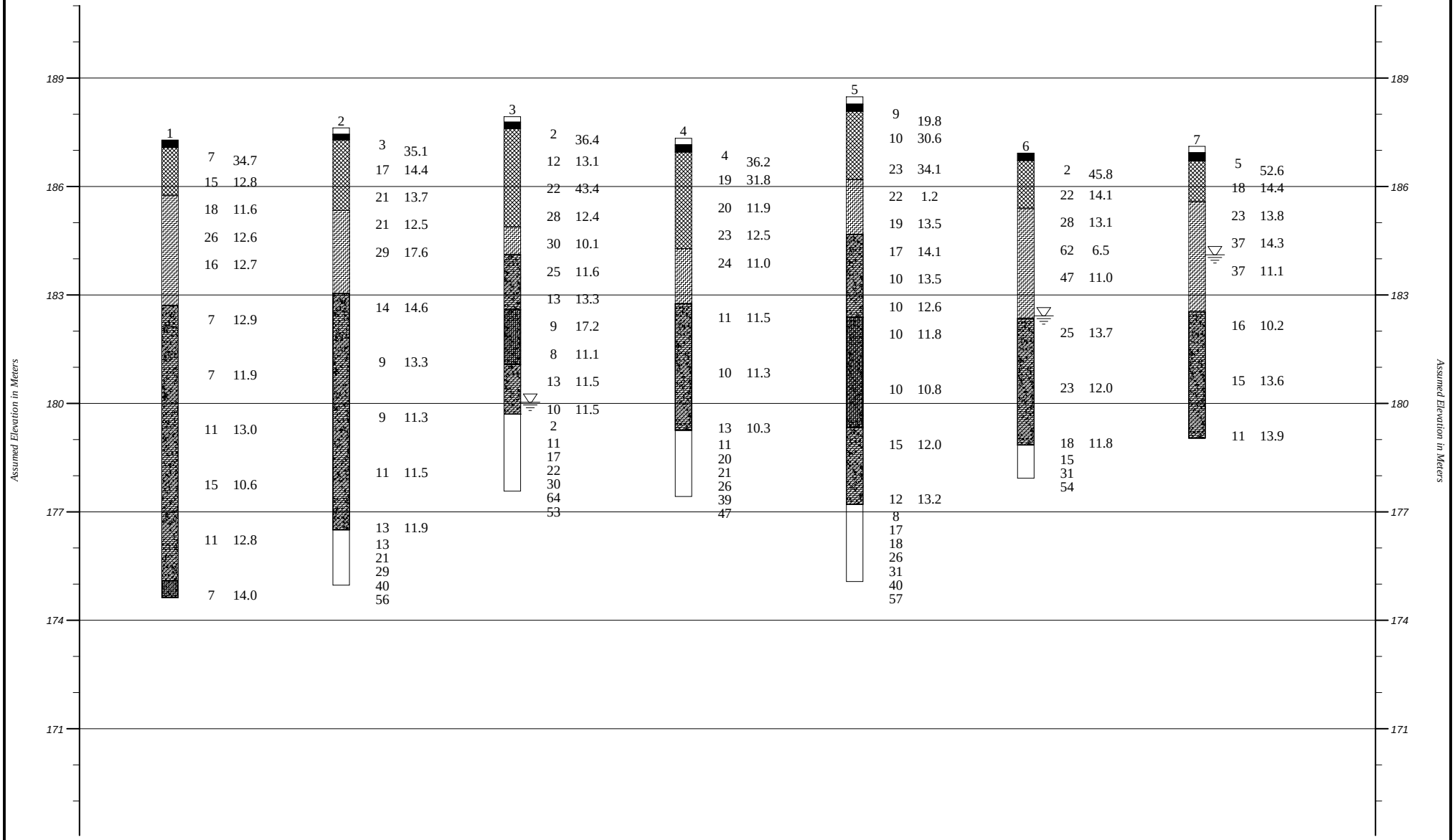
DESCRIPTIVE TERM ["N"-Value (blows/0.3m), Relative Density (%)]

- **Very Loose [less than 4, less than 15]**
- **Loose [4 to 10, 15 to 35]**
- **Compact or Medium [10 to 30, 35 to 65]**
- **Dense [30 to 50, 65 to 85]**
- **Very Dense [greater than 50, greater than 85]**

Terms describing CONSISTENCY, based on Standard Penetration Test "N"-Value for FINE GRAINED soils (major portion passing No. 200 sieve):

DESCRIPTIVE TERM [Unconfined Compressive Strength (kPa), "N"-Value (blows/0.3m)]

- **Very Soft [less than 25, less than 2]**
- **Soft [25 to 50, 2 to 4]**
- **Firm [50 to 100, 4 to 8]**
- **Stiff [100 to 200, 8 to 15]**
- **Very Stiff [200 to 400, 15 to 30]**
- **Hard [greater than 400, greater than 30]**



Plan View

Strata symbols

- Topsoil
- Fill
- Probable fill
- Clayey silt till
- Silty clay till
- Blank

SOLA ENGINEERING INC.

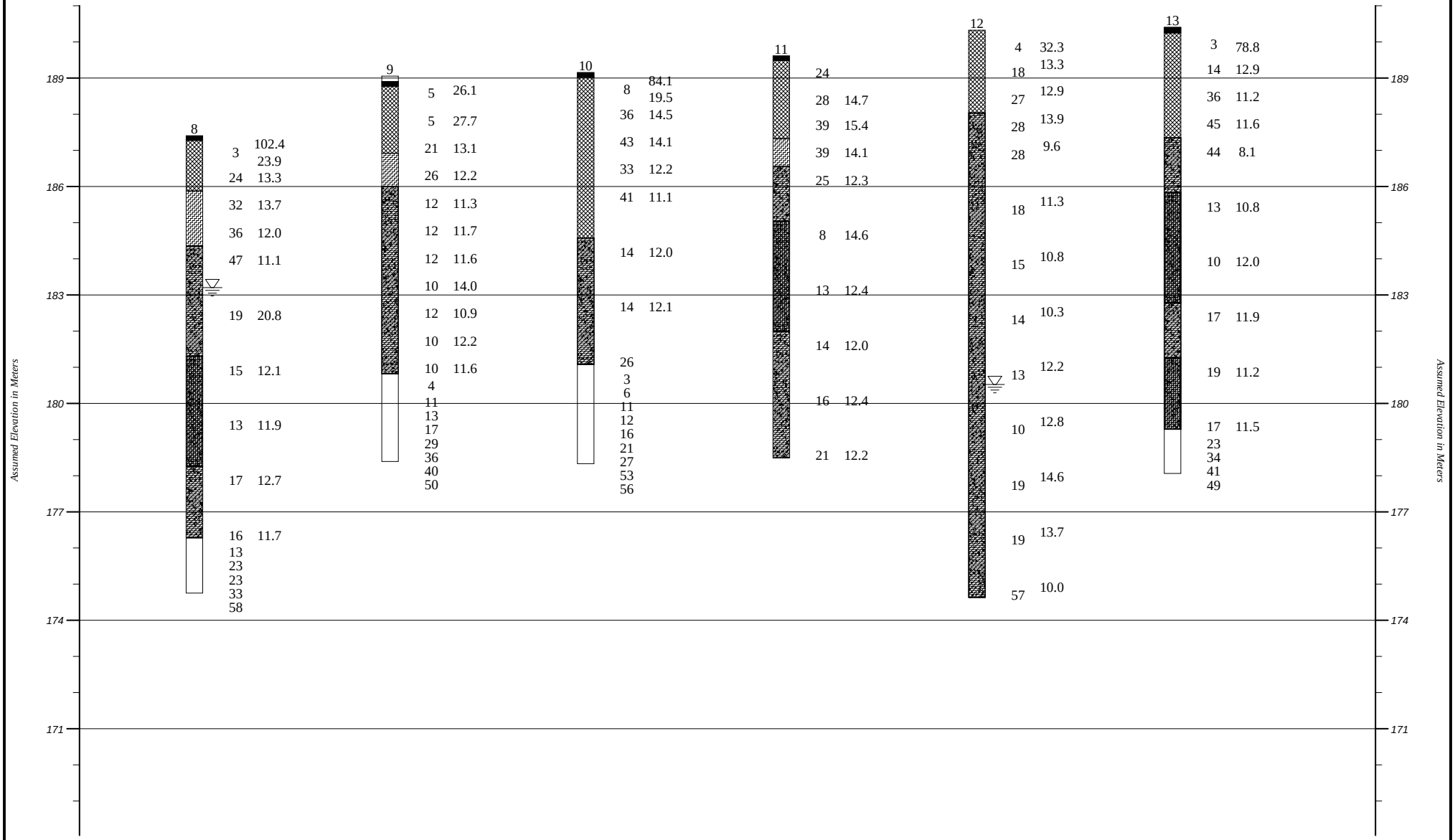
CONCEPTUAL SOIL PROFILE

HORIZONTAL SCALE:	DRAWN BY/APPROVED BY	
VERTICAL SCALE: 1"=150'		

5034, 5054 and 5080 Ninth Line, Mississauga

PROJECT NO. 10653

Enclosure 26A



Plan View

Strata symbols

- Topsoil
- Fill
- Probable fill
- Clayey silt till
- Silty clay till
- Blank

SOLA ENGINEERING INC.

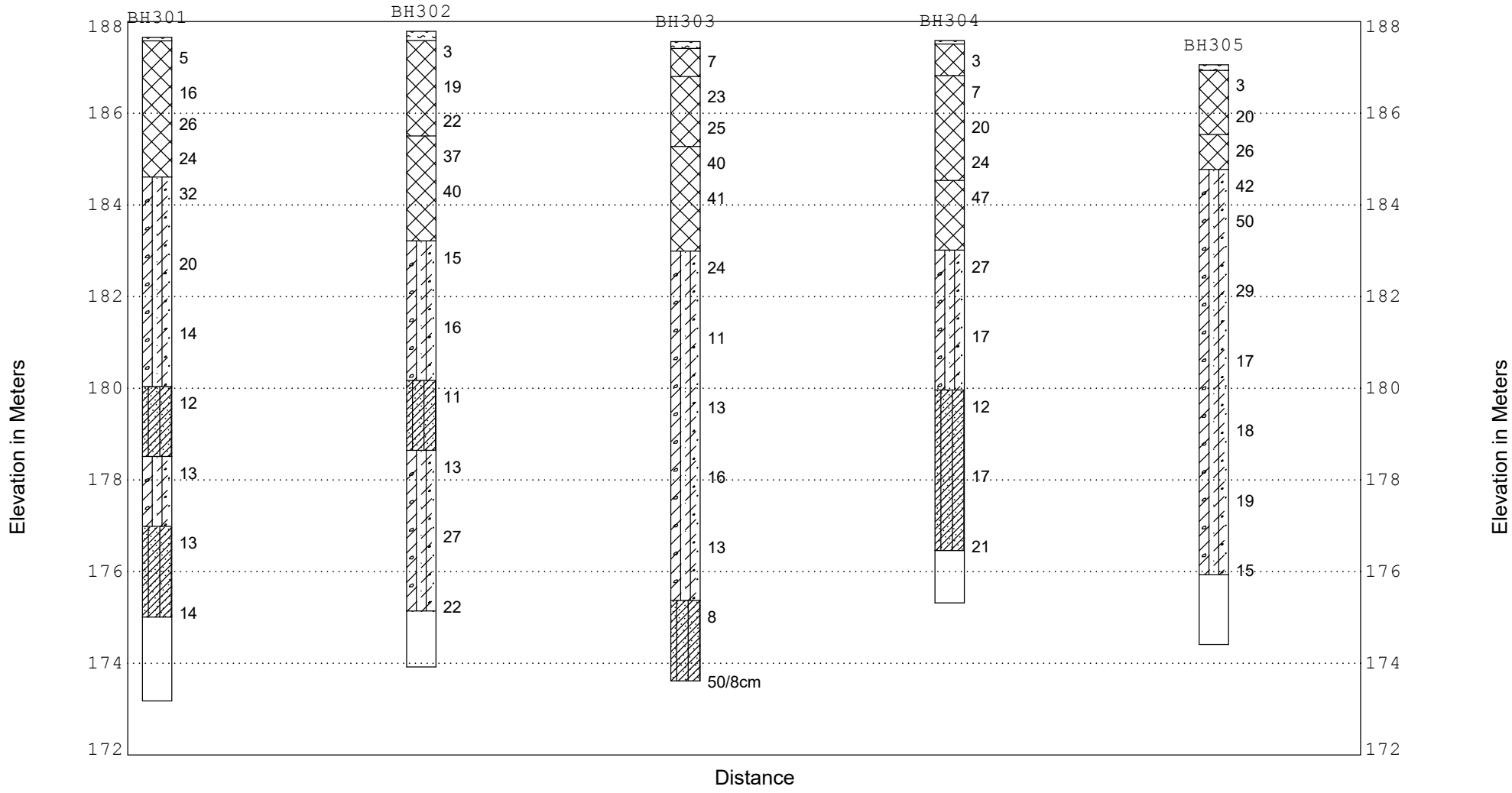
CONCEPTUAL SOIL PROFILE

HORIZONTAL SCALE:	DRAWN BY/APPROVED BY	
VERTICAL SCALE: 1"=150'		

5034, 5054 and 5080 Ninth Line, Mississauga

PROJECT NO. 10653

Enclosure 26B



Plan View

SOLA ENGINEERING

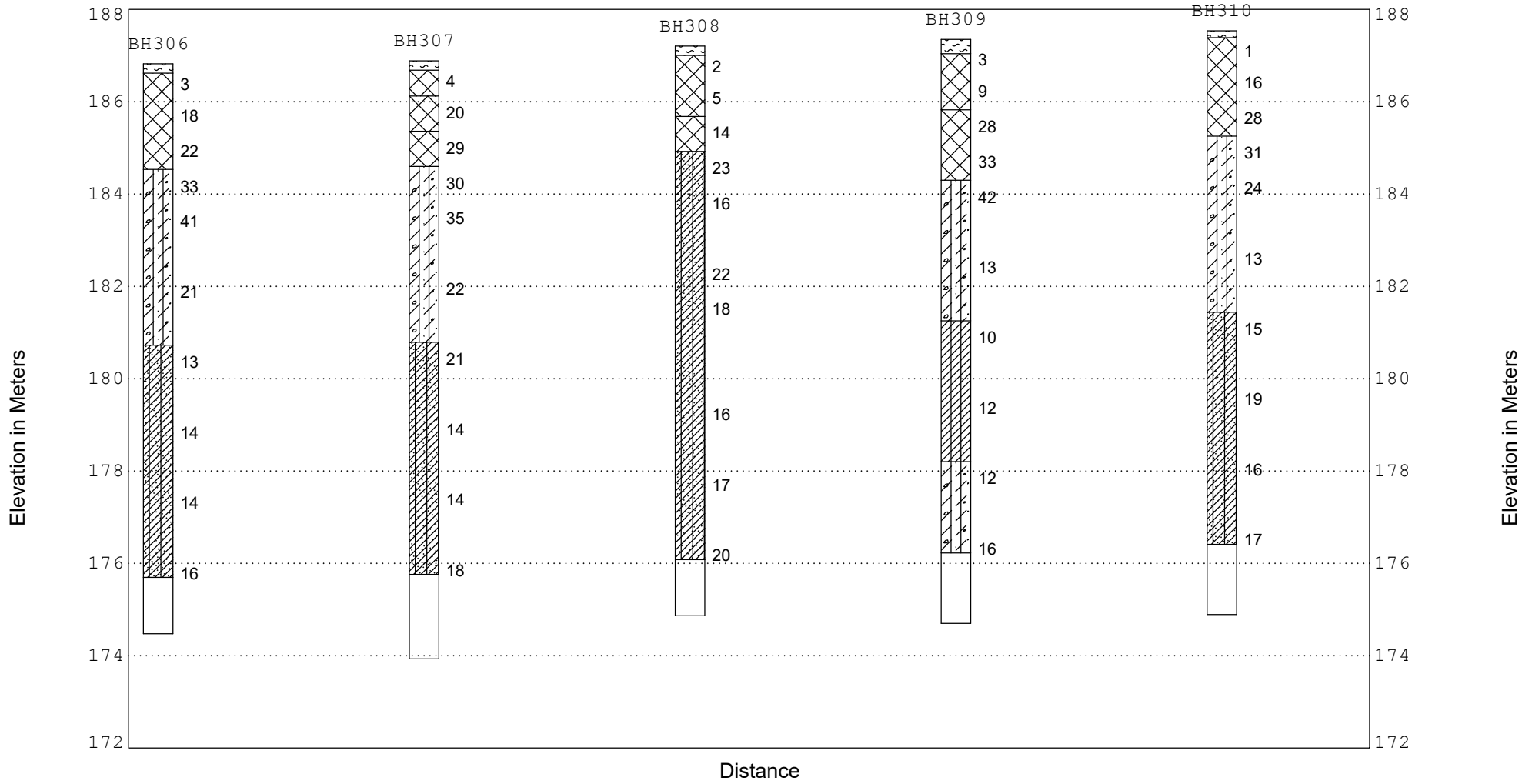
SOLA ENGINEERING INC.
CONCEPTUAL SOIL PROFILE

Horizontal Scale:	Drawn By:	
Vertical Scale:	Approved By:	

Proposed Residential Development
5034, 5054 and 5080 Ninth Line, Mississauga

Project Number: 10653

Enclosure No.: 26C



Plan View

SOLA ENGINEERING

SOLA ENGINEERING INC.

CONCEPTUAL SOIL PROFILE

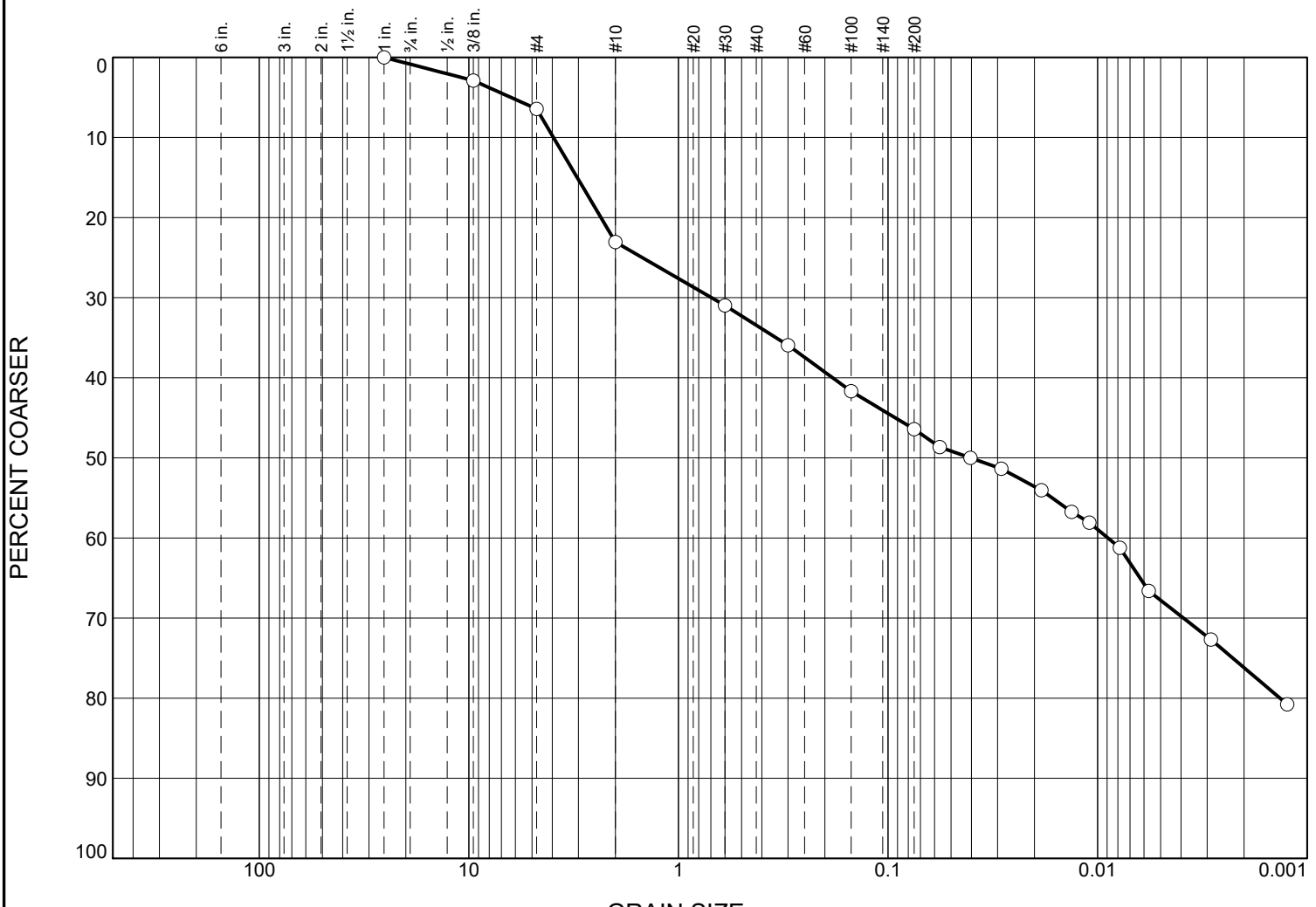
Horizontal Scale:	Drawn By:	
Vertical Scale:	Approved By:	

Proposed Residential Development
5034, 5054 and 5080 Ninth Line, Mississauga

Project Number: 10653

Enclosure No.: 26D

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0	1	5	17	10	13	54

	Colloids	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○				3.0416	0.1837	0.0404	0.0039				

Material Description	USCS	AASHTO
○ CLAYEY SILT TILL (VISUAL MANUAL) SANDY CLAYEY SILT (LAB)		

Project No. 10653 **Client:** Your Home Development (Mississauga) Inc. c/o S2S

Project: Proposed Residential Development

○ **Location:** BH2 **Depth:** 15'-16.5' **Sample Number:** 19-144

Date: ○

Remarks:

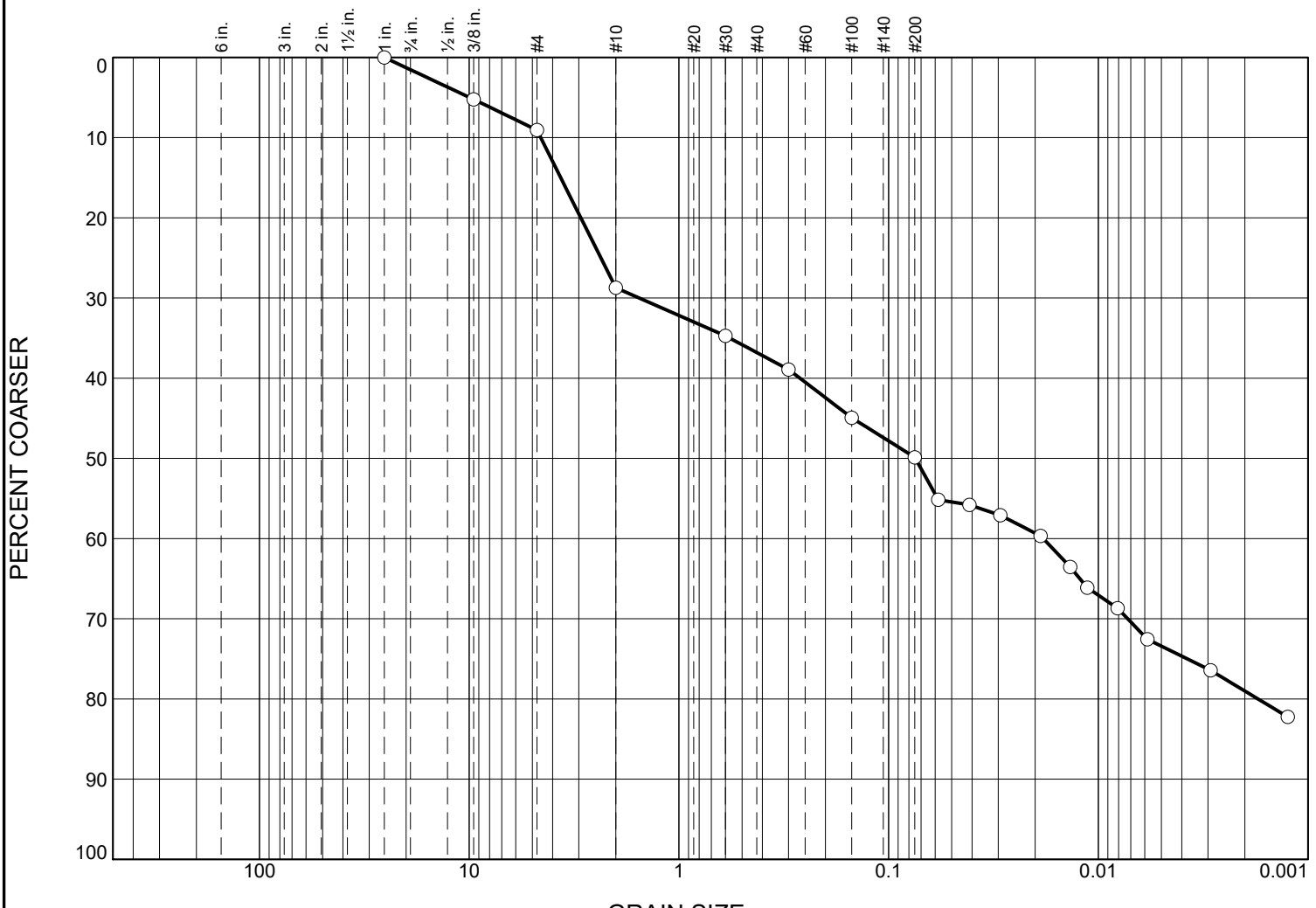
○ Sampled By: Baljot

Date: March 8, 2019

SOLA ENGINEERING INC.

Enclosure 27

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0	2	7	20	8	13	50

	Colloids	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○				3.6573	0.2648	0.0745	0.0072				

Material Description	USCS	AASHTO
○ CLAYEY SILT TILL (VISUAL MANUAL) SANDY CLAYEY SILT (LAB)		

Project No. 10653 **Client:** Your Home Development (Mississauga) Inc. c/o S2S

Project: Proposed Residential Development

○ **Location:** BH11 **Depth:** 10'-11.5' **Sample Number:** 19-145

Date: ○

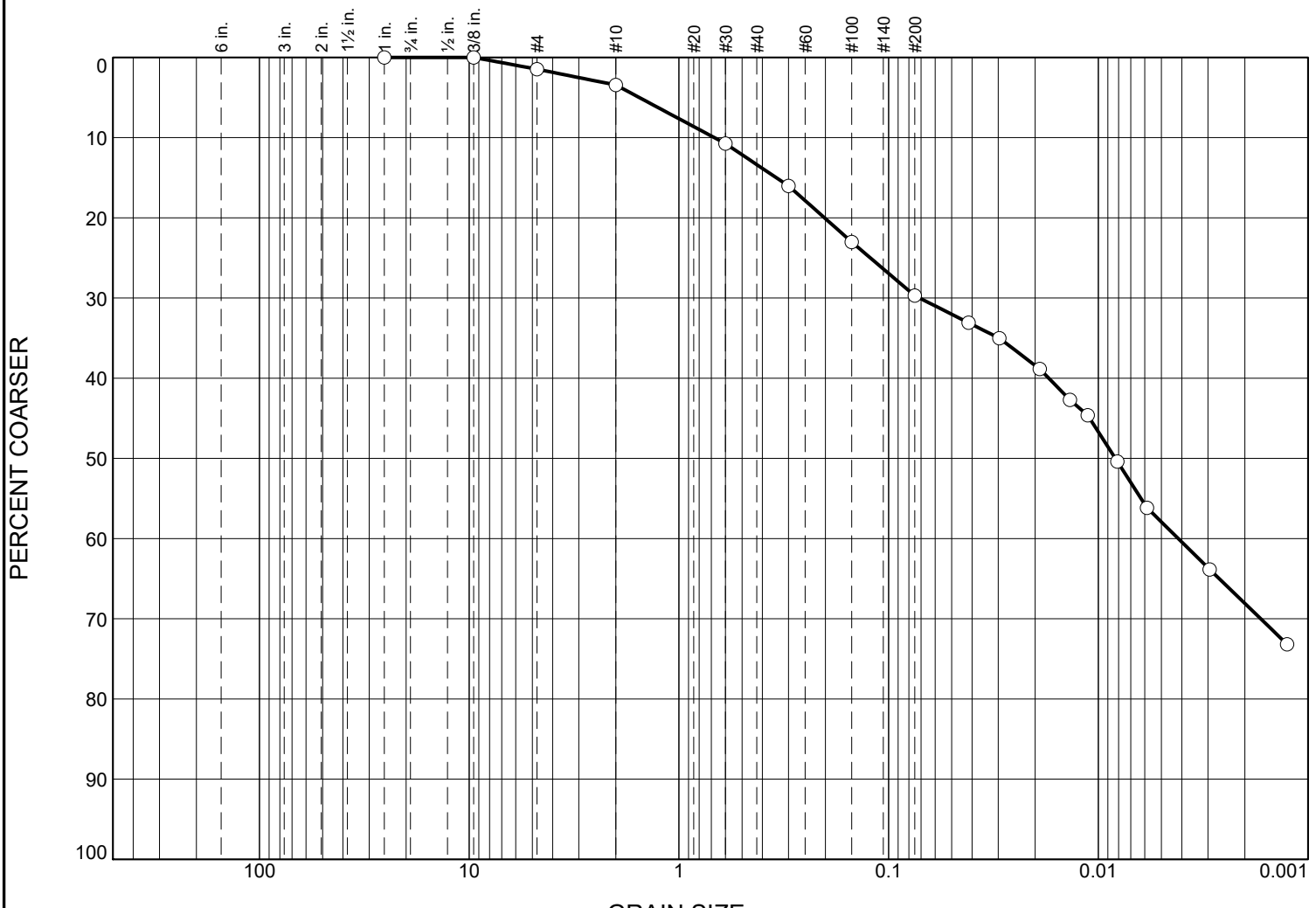
Remarks:

○ Sampled By: Baljot

Date: March 15, 2019

SOLA ENGINEERING INC.

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0	0	1	2	10	17	70

	Colloids	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○				0.3429	0.0172	0.0083	0.0017				

Material Description	USCS	AASHTO
○ CLAYEY SILT TILL (VISUAL/MANUAL) CLAYEY SILT WITH SAND (LAB)		

Project No. 10653 **Client:** Your Home Development (Mississauga) Inc.

Project: Proposed Residential Development

○ **Location:** BH301 **Depth:** 10'00"-11'6" **Sample Number:** 20-111

Date: ○

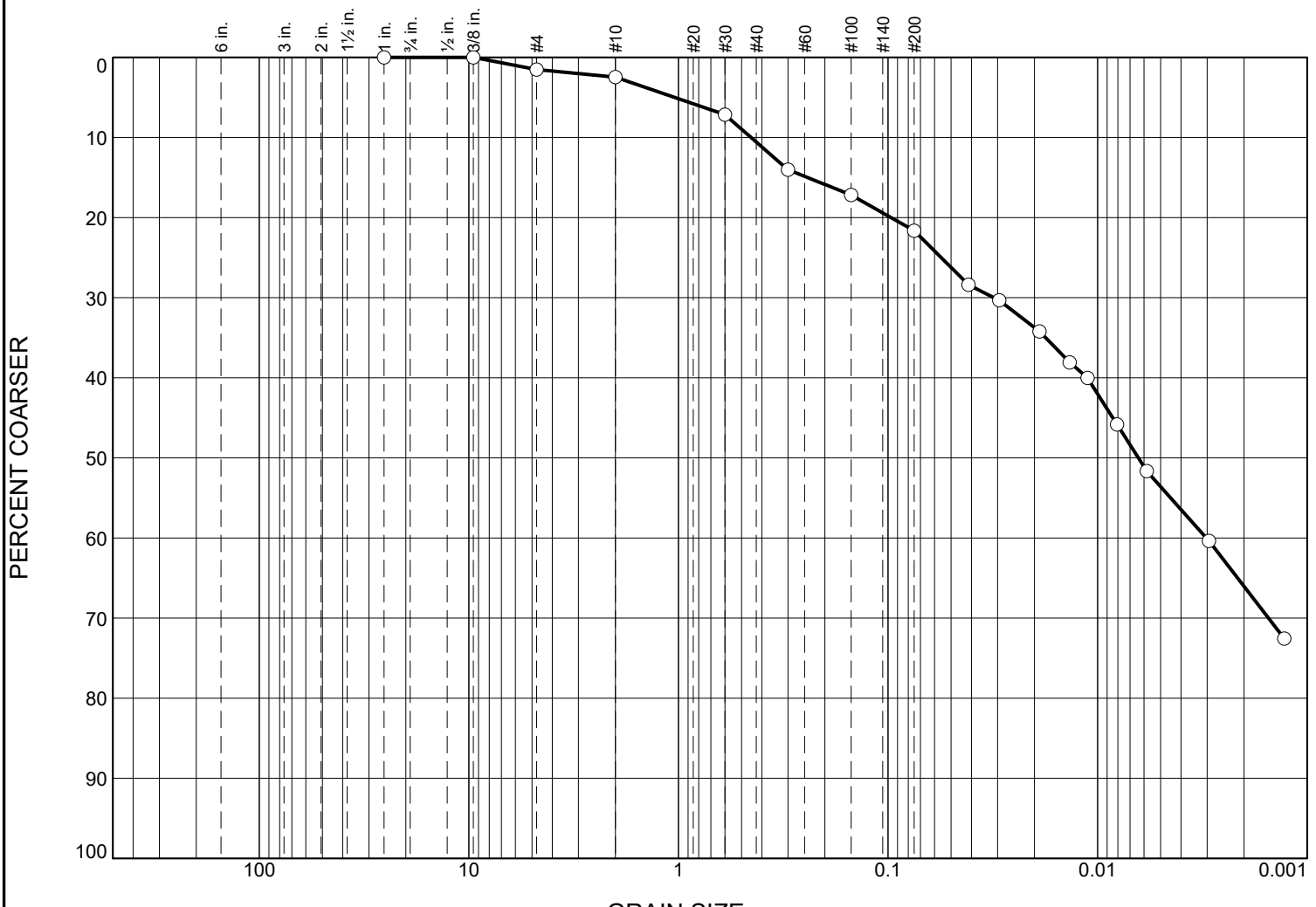
Remarks:

○ Sampled By: Baljot

Date: February 19, 2020

SOLA ENGINEERING INC.

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0	0	2	0	9	11	78

	Colloids	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○				0.2422	0.0112	0.0064	0.0015				

Material Description	USCS	AASHTO
○ SILTY CLAY (VISUAL/MANUAL) SILTY CLAY WITH SAND (LAB)		

Project No. 10653 **Client:** Your Home Development (Mississauga) Inc.

Project: Proposed Residential Development

○ **Location:** BH309 **Depth:** 20'00"-21'6" **Sample Number:** 20-112

Date: ○

Remarks:

○ Sampled By: Baljot

Date: February 21, 2020

SOLA ENGINEERING INC.

Enclosure 30