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Geotechnical Investigation
Proposed Commercial Development

839 and 869 Hurontario Street, Collingwood, Ontario
G2S21366C

Charis Developments Ltd.
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Collingwood, Ontario
L9Y 4T4
Attention: Steve Assaff, President

March 2022

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Appendices

1. Introduction

G2S Consulting Inc. (G2S) was retained by Charis Developments Ltd. (the Client) to complete a Geotechnical Investigation at 839 and 869 Hurontario Street in Collingwood, Ontario, hereinafter referred to as the 'Site'. Authorization to proceed with the Geotechnical Investigation was provided by Mr. Steve Assaff of Charis Developments Ltd.

It is understood that the proposed development will include the construction of a commercial development (the Gateway Centre – Option A-7), which will feature a gas station and five (5) slab-on-grade, single storey commercial buildings. The proposed development will also contain the associated parking areas and underground utilities. Copy of the current development plan is included in Drawing No. 1A in Appendix A.

The general location of the Site is shown on the Site Key Plan included on Drawing No. 1B in Appendix A. This geotechnical investigation was carried out as outlined in G2S' Proposal No. G2S21366, dated September 2, 2021.

2. Site and Project Overview

2.1 Site Description

The Site is an irregular shaped property (near square), comprising an approximate plan area of 2.7 hectares (6.75 acres) in size and is located on the northeast corner of Poplar Sideroad and Hurontario Street in Collingwood, Ontario. The Site is bound by Poplar Sideroad to the south, Hurontario Street to the west, residential development to the east, and a tributary to Pretty River to the north, followed by residential and commercial developments.

At the time of the investigation, the Site was vacant, undeveloped land. A gravel fill pad was noted in the centre portion of the Site. We understand that the granular pad was constructed of imported fill around December 2007/January 2008.

2.2 Proposed Development

It is understood that consideration is being given to constructing a commercial development consisting of two phases (Phase 1 & 2). Phase 1 comprises a gas bar at the southwest corner of the Site, and a total number of three (3) commercial buildings, Buildings A, B, and E, with building footprints of approximately 446 m^2 (4,800 ft^2), 446 m^2 (4,800 ft^2), and 204 m^2 (2200 ft^2), respectively. All three buildings in Phase 1 will feature a single storey slab on grade structure. Phase 2 of the project will contain a 2 storey office building (Building C) with building footprint of approximately 2,044 m^2 (22,000 ft^2), and a single storey slab on grade building (Building D) with building footprint of approximately 2,880 m^2 (31,000 ft^2). It is further understood that the proposed development will also contain the associated parking areas, access road and underground utilities.

The purpose of this geotechnical investigation was to determine the subsurface conditions at twenty-three (23) borehole locations and to interpret these findings with respect to the design and construction of the underground services, foundations, and related earthworks for this project from a geotechnical point-of-view.

This report is based on the above summarized project description, and on the assumption that the design and construction will be performed in accordance with applicable codes and standards. Any significant deviations from the proposed project design may void the recommendations given in this report. If significant changes are made to the proposed design, then this office must be consulted to review the new design with respect to the results of this investigation. The information contained in this report does not reflect upon the environmental aspects of the Site and therefore it has not been addressed in this document.

3. Investigation Methodology

A total of twenty-three (23) sampled boreholes were advanced at the locations illustrated in the attached Drawing No. 1, Borehole and Monitoring Well Location Plan, in Appendix A. The borings were put down uncased using solid stem continuous flight auger equipment. The drilling and sampling operations were carried out under the direction and supervision of a G2S staff member. The boreholes were advanced to depths of between approximately 2.1 to 8.2 m below the existing grade. On completion of drilling, the boreholes were backfilled in general accordance with Ontario Regulation 903.

Representative samples of the subsoils were recovered from the borings at selected depth intervals using split barrel sampling equipment driven in accordance with the requirements of Standard Penetration Resistance Testing. After undergoing a general field examination, the soil samples were preserved in plastic bags and transported to the soil laboratory for visual, tactile, and olfactory classifications. Routine moisture content tests were performed on the recovered samples as well as grain size analysis and Atterberg Limits tests, which were performed on selective soil samples.

Details of the conditions encountered in the boreholes, together with the results of the field and laboratory tests, are presented in Borehole (BH) Logs BH101 to BH123, inclusive, included in Appendix B. It is noted that the boundaries of soil types indicated on the borehole logs are inferred from non-continuous soil sampling and observations made during drilling. These boundaries are intended to reflect transition zones for the purpose of geotechnical design and therefore should not be construed as the exact plans of geological change.

Elevations at the ground surface of the borehole locations were interpolated from the provided Topographic Survey Plan entitled “Plans of Survey of Part of Lot 40 Concession 8 Geographic Township of Nottawasaga Now in the Town of Collingwood County of Simcoe”, by J.D. Barnes, dated September 14, 2021. This topographic survey plan was later utilized to produce the Borehole and Monitoring Well Location Plan.

4. Subsurface Conditions

The subsurface soil conditions have been evaluated in the twenty-three (23) boreholes investigated by G2S at the Site for the purpose of this report. It should be considered that the subsurface conditions may not be consistent between and beyond the locations investigated at the Site. The soil descriptions outlined in the following stratigraphic summary are based on our interpretation of non-continuous samples of soil obtained from the boreholes.

The subsurface conditions encountered at the borehole locations are summarized as follows:

4.1 Topsoil

A surficial veneer of topsoil and organic material with thicknesses ranging between approximately 75 and 360 mm, was encountered in BH101, BH103 to BH108, BH113 to BH115, BH117, BH118, BH121, and BH122.

It should be noted that the depth of topsoil must be expected to vary across the Site, particularly in areas of mature trees, from the depths encountered at the borehole locations. If required, a more detailed analysis such as test pits can be carried out to accurately quantify the amount of topsoil to be removed for construction purposes. In this report the term “topsoil” has been used from a geotechnical point of view and does not necessarily reflect the suitability of the material to support plant growth. If it is to be used for landscaping or agricultural purposes, its suitability should be confirmed by tests on representative samples for organic and nutrient content and therefore its ability to support plant growth.

4.2 Fill

Fill material was encountered below the topsoil in BH101, BH103, BH104, BH106 to BH108, BH115, and BH118, and extended to depths ranging from approximately 0.8 and 1.2 mbeg (~Elev. 194.6 to 193.3 m). This layer of fill consisted generally of clayey silt and contained traces to interbedded layers of sand.

Granular fill material (sand and gravel) was contacted at the surface in BH102, BH109 to BH112, BH119, BH120, and BH123. The granular fill extended to depths ranged between 0.9 and 1.6 mbeg (~Elev. 194.9 and 194.0 m). The granular fill was generally brown in color and contained some cobble and boulder size particles. The lower portion of the granular fill was mixed with clayey silt in BH102 and BH109.

With moisture content ranging between 4.0 and 26%, the fill layer was found to be in moist to wet condition.

4.3 Upper Clayey Silt

Clayey silt was found beneath the fill in BH101 to BH104, BH106 to BH109, BH111, BH115, BH116, BH118 to BH120, BH122, and BH123, below the topsoil in BH105, BH113, BH114, BH117, BH121. The clayey silt deposit was found underlaying a silt deposit in BH110. The clayey silt extended to depths ranging between approximately 1.5 and 4.6 mbeg (~Elev. 193.9 and 191.3 m). BH116 to BH121, and BH123 were terminated in this deposit. The upper clayey silt was brown to grey in color and contained traces of sand. With “N” values ranging from 1 to 18 blows per 300 mm of penetration, the clayey silt deposit was classified as very soft to very stiff in consistency. The moisture content for the clayey silt ranged between 18 and 29%, indicating moist conditions. Based on a single grain size analyses test, the clayey silt contained 34% clay, 64% silt, and 2% sand. Based on the laboratory results for one clayey silt sample, the liquid limit and the plastic limit for the clayey silt was in the order of 28 and 17%, respectively, indicating low

plasticity. The results of the grain size analysis and the Atterberg Limits are indicated on the borehole logs and the grain size distribution graphs, as well as the plasticity index chart are included in Appendix B

4.4 Silt

Silt deposit was encountered below the clayey silt in BH101 to BH106, BH108, BH109, BH111, BH113 to BH115, and below the fill in BH110 and BH112. In BH110 the silt was found interbedded by the native clayey silt deposit with a thickness of approximately 1.3 m. The silt extended to depths ranging from 3.1 and 6.1 mbeg (~Elev. 192.0 and Elev. 189.6 m). The silt deposit was generally greyish brown in color and contained traces of gravel and some clay. With "N" values ranging between 0 and 17 blows per 300 mm of penetration, the native silt deposit was classified as very loose to compact in compactness. The moisture content for the silt ranged between 5 and 30%, indicating moist to wet conditions. Grain size analysis and Atterberg limits determination testing were carried out on selected soil samples of the silt deposit. Based on the laboratory testing, the silt consisted of 0 to 2% gravel, 6 to 9% sand, 68 to 77% silt, and 15 to 24% clay. Based on the laboratory results for two silt samples, the liquid limit for the silt ranged between 20 and 22%, and the plastic limit was ranging between 15 and 16%, indicating low plasticity. The results of the grain size analysis and the Atterberg limits are indicated on the borehole logs and the grain size distribution graphs, as well as the plasticity index chart are included in Appendix B

4.5 Lower Clayey Silt

Lower clayey silt deposit was encountered beneath the silt in BH113 and BH122, below (~Elev. 191.8 – 190.5 m) and extending to depths ranging between 4.6 and 6.1 mbeg (~Elev.190.3 and 189.0 m). The lower clayey silt was brown to grey in color and contained traces of gravel and sand. With the hammer dropping under its own weight during the Standard Penetration Test and undrained shear strength in the order of 12 kPa, as determined by the field shear vane testing, the lower clayey silt deposit was classified as very soft in consistency. The moisture content for the clayey silt ranged between 21 and 23%, indicating moist conditions. Grain size analysis and Atterberg Limits determination testing were carried out on selected soil samples of the clayey silt deposit. Based on a two grain size analyses tests, the clayey silt contained 28 to 32% clay, 60 to 68% silt, 3% sand, and 1 to 5% gravel. Based on the laboratory results for two clayey silt samples, the liquid limit for ranged from 21 to 22%. and the plastic limit was in the order of 15%, indicating low plasticity. The results of the grain size analysis and the Atterberg Limits are indicated on the borehole logs and the grain size distribution graphs, as well as the plasticity index chart are included in Appendix B**.**

4.6 Silty Sand Till/Sandy Silt Till

Silty sand till/sandy silt till was encountered below the silt in BH101 to BH106, BH108 to BH112, BH114, and BH115, and below the clayey silt in BH107, BH113 and BH122. The silty sand till/sandy silt till extended to depths ranging between 5.2 and 8.2 mbeg. Borehole Nos. BH101 to BH115, and BH122 were terminated in this deposit. With "N" values ranging between 3 and in excess of 50 blows per 300 mm of penetration, the silty sand till/sandy silt till deposit was classified as very loose to very dense in compactness. The moisture content for the till deposit ranged between 6 to 18% indicating moist to very moist conditions. Grain size analysis and Atterberg limits determination testing were carried out on selected soil samples of the silt deposit. Based on the laboratory testing, the silty sand till/sandy silt till deposit consisted of 10 to 33% gravel, 36 to 60% sand, 7 to 35% silt, and 0 to 19% clay. The results of the grain size analysis are indicated

on the borehole logs and the grain size distribution graphs, as well as the plasticity index chart are included in Appendix B

4.7 Groundwater Observations

The groundwater level observations during the drilling operation have been recorded as footnotes on the borehole logs. Groundwater monitoring wells were installed in Borehole Nos. BH105, BH110, and BH122 to facilitate the prolonged groundwater monitoring. Further, four (4) additional monitoring wells were installed on January 7, 2022 in the immediate vicinity of BH101, BH103, BH106, and BH115 to provide relevant information for the hydrogeology study at the Site. Those monitoring wells were identified as BH101A, BH103A, BH106A, and BH115A, respectively. The results of our field observations and groundwater monitoring to date are summarized in Table No. 1 below:

Table 1: Groundwater Observations

BH/MW ID	BH/MW Depth from Ground Surface (m)	GWL Observations in the Boreholes		GWL Observations in the Monitoring Wells					
		Sept. 30, Oct. 21, 22, 2021		Oct. 13, 2021		Nov. 1, 2021		Jan. 21, 2022	
		Cave Depth (m)	Free Water Depth (m)	GWL (m)	Elev. (m)	GWL (m)	Elev. (m)	GWL (m)	Elev. (m)
BH101	5.2	-	3.9						
BH/MW101A	4.6	-	-	-	-	-	-	1.1	193.4
BH102	5.8	4.6	0.7						
BH103	5.2	4.3	4.1						
BH/MW103A	4.6	-	-	-	-	-	-	0.7	193.7
BH104	5.2	-	4.4						
BH/MW105	5.2	-	-	(-0.1)	194.7	(-0.3)	195.9	*	*
BH106	5.2	4.3	2.1						
BH/MW106A	4.6	-	-	-	-	-	-	*	*
BH107	5.2	-	0.3						
BH108	5.2	4.4	3.4						
BH109	5.2	-	-						
BH/MW110	5.9	-	-	2.0	193.9	0.9	195.0	1.4	194.5
BH111	6.6	5.8	1.2						
BH112	5.9	3.0	3.1						
BH113	6.7	-	2.3						

BH/MW ID	BH/MW Depth from Ground Surface (m)	GWL Observations in the Boreholes		GWL Observations in the Monitoring Wells					
		Sept. 30, Oct. 21, 22, 2021		Oct. 13, 2021		Nov. 1, 2021		Jan. 21, 2022	
		Cave Depth (m)	Free Water Depth (m)	GWL (m)	Elev. (m)	GWL (m)	Elev. (m)	GWL (m)	Elev. (m)
BH114	5.2	-	3.7						
BH115	5.2	3.9	4.0						
BH/MW115A	4.6	-	-	-	-	-	-	0.6	194.7
BH116	2.1	-	-						
BH117	2.1	-	-						
BH118	2.1	-	-						
BH119	2.1	-	-						
BH120	2.1	-	-						
BH121	2.1	-	-						
BH122	8.2	-	-	0.4	194.7	0.1	195.0	(-0.6)	195.7
BH123	2.1	-	-						

*****The monitoring well was frozen likely due to the shallow depth of the groundwater level

Insufficient time has passed for the groundwater to infiltrate into the monitoring well for the present levels to be considered stabilized. Therefore, we would recommend that additional monitoring of the wells be conducted prior to construction. Some infiltration of groundwater through the more permeable seams of the native soils and from surface runoff should be anticipated during the excavation operations. Surface water should be directed away from the excavations. It is noted that the static groundwater level fluctuates based on seasonal conditions experienced and may at times be slightly shallower than noted above during the 'wet' periods of the year (i.e., spring melt). Refer to Appendix B for the list of abbreviations and borehole logs.

5. Geotechnical Considerations

5.1 Site Preparation

Based on the Site Grading Plan No. SG01, which was forwarded to us by the Client, and the present ground surface, it is likely that engineered fill, may be utilized to accommodate the design grades for the proposed buildings. Prior to any earthwork, it will be necessary to remove some or most of the vegetation and topsoil from the Site. All topsoil and any near-surficial soil containing high amounts of topsoil and/or organic material should be removed in areas that are to be developed.

Any engineered fill must be placed and uniformly compacted in maximum lift thicknesses of 300 mm for earth fill and 200 mm for commercially sourced granular material. Each lift of the engineered fill must be uniformly compacted to at least 100 percent of Standard Proctor Maximum Dry Density (SPMDD). The placement water content of the engineered fill material should be maintained within ± 3 percent of the laboratory optimum water content in order to achieve an acceptable degree of compaction.

The limits of any engineered fill placed during this operation can best be determined by the geotechnical engineer at the time of construction. If engineered fill will be used to support foundations or pavements, it must extend laterally at sufficient distance to develop adequate lateral resistance.

All aspects of engineered fill construction including final excavation, material selection, placement and compaction must be tested by the geotechnical engineer at the time of placement and compaction. In-situ density (compaction) testing is required during construction for any and all engineered fill placement.

5.2 Foundation Recommendations

5.2.1 Methodology

The shallow foundations are to be designed applying the Limit State Design (LSD) methodology described in Chapter 8 of the Canadian Foundation Engineering Manual (CFEM) (2006). Both Ultimate Limit State (ULS) and Serviceability Limit State (SLS) were considered.

For design purposes to address the ULS, the ultimate (unfactored) bearing capacity of the foundation soil (R_n) was calculated. The allowable (factored) bearing capacity ($\Phi\ R_n$) was computed by multiplying R_n with a reduction factor Φ=0.5, in accordance with National Building Code of Canada (NBCC) (2015) and CFEM (2006).

The foundation designer needs to ensure that the factored bearing capacity is greater than the factored applied pressure at foundation level ($\alpha_i\ S_{ni}$). Hence, the following formula applies:

$$\Phi\ R_n \geq \sum \alpha_i\ S_{ni}$$

If the foundation is subjected to vertical forces that act eccentric to the centroid of the foundation, the size of the foundation used in the bearing capacity equation is reduced to the following:

$$B' \times L' = (B-2e_B) \times (L-2e_L)$$

where:

B, L: actual foundation dimensions

B', L': reduced dimensions to be used in the bearing capacity equation

e_B, e_L: eccentricities due to applied forces (loading) from the centroid in dimensions B and L respectively

Foundations subject to moments M_B and M_L in the B and L directions and vertical load V acting through the centroid are equivalent to a loading system with V acting at eccentricities $e_B=M_B/V$ and $e_L=M_L/V$.

CFEM (2006) emphasizes that this equation is an approximate but reasonable approach provided that the eccentricity acts within the middle third of the foundation, i.e., eccentricity, e <B/6. In addition, in case of inclined loading, appropriate factors need to be considered in accordance with CFEM (2006).

The serviceability limit state (SLS) bearing pressure is considered by calculating the settlements (immediate, consolidation and total) due to foundation load. It is expected that the structural team will compare the settlements due to foundation and fill loads against allowable foundation settlement values.

It is noted that the overall settlement and/or heave experienced by the foundations may depend on other factors such as the quality of subgrade preparation and weather conditions at the time of construction, ground freeze and thaw, dynamic loading, among other factors.

5.2.2 Strip and Spread Footing

The proposed structures can be supported on conventional spread and strip footings founded on the native clayey silt/silt deposits below any fill or disturbed soils. Bearing resistance of 120 to 180 kPa at SLS and 240 to 360 kPa at ULS could be utilized for the foundation design. The geotechnical resistance of a sustained load at Serviceability Limit State (SLS) should be within the normally tolerated limits of total and differential settlement of 25, and 19mm, respectively, and a maximum footing size of 1.5 m. Should a different footing size being used, G2S should be contacted to provide an update for the bearing resistance and the associated settlement.

Prior to placement of foundation concrete, all existing fill, organics, and any other deleterious material must be removed down to the undisturbed native soils. The exposed footing base is to be inspected by G2S.

Based on the provided grading plan, the Finished Floor Elevations (FFE) for the slab-on-grade for the proposed buildings are ranging between approximately Elev. 196.7 to 196.0 m. Given that the average existing ground surface elevation at the proposed building locations are ranging between approximate Elev. 195.7 and 194.7 m, engineered fill will likely be utilized for the construction of the proposed building pads. The proposed structures can be supported on conventional spread and strip footings founded on engineered fill, utilizing a design bearing resistance ranging between 100 and 150 kPa at SLS and 150 to 225 kPa at ULS.

The available bearing resistance and the relevant approximate founding elevations are presented in Table No. 2 below:

Table 2: Bearing Resistance for Conventional Spread Footing

Building Location	Borehole ID	Material	Bearing Resistance (kPa)	Recommended Founding Depth (m)	Approximate Founding Elevation (m)
Building A & Gas Station	BH111	Clayey Silt	150 SLS/300 ULS	1.7	194.0
	BH112	Silt	150 SLS/300 ULS	1.7	194.2
	BH122	Clayey Silt	150 SLS/300 ULS	1.0	194.1
	BH111, BH112, BH122, BH123	Engineered Fill	150 SLS/225 ULS	-	195.2
Building B	BH105	Clayey Silt	120 SLS/240 ULS	0.8	193.8
	BH118	Clayey Silt	120 SLS/240 ULS	1.0	193.7
	BH105, BH109, BH121	Engineered Fill	120 SLS/180 ULS	-	194.9
Building C	BH101	Clayey Silt	150 SLS/300 ULS	1.4	193.1
	BH102	Clayey Silt	150 SLS/300 ULS	1.7	193.8
	BH101, BH102, BH118, BH116	Engineered Fill	150 SLS/225 ULS	-	194.5
Building D	BH106	Clayey Silt	180 SLS/360 ULS	1.0	193.8
	BH107	Clayey Silt	180 SLS/360 ULS	1.0	194.4
	BH106, BH107, BH119	Engineered Fill	150 SLS/225 ULS	-	194.8
Building E	BH113	Clayey Silt	180 SLS/360 ULS	0.8	194.1
	BH114	Clayey Silt	180 SLS/360 ULS	0.8	194.2
	BH115	Clayey Silt	180 SLS/360 ULS	1.0	194.3
	BH113, BH114, BH115	Engineered Fill	150 SLS/225 ULS	-	194.8

It should be noted that a weaker zone within the silt deposit was encountered in some boreholes and this layer was typically found below approximate elevations 192.8 to 191.0 m.

Settlement is expected to occur within the weaker deposit following the fill placement. Settlement analysis was carried out for the area below each building pad to explore the consolidation characteristics of the weak silt deposit based on the thickness of the engineered fill material, which is anticipated to be placed. The results of the settlement analysis are summarized in Table No. 3 below:

Table 3: Estimated Settlement Following Engineered Fill Placement

Building Location	Borehole ID	Engineered Fill Thickness (m)	Estimated Settlement (mm)		
			Im.	Cons.	T
Building A & Gas Station	BH111, BH112, BH122	1.2	4	21	25
Building B	BH105	1.7	6	37	43
Building C	BH101, BH102	1.0	3	17	20
Building D	BH106, BH107	1.75	5	25	30
Building E	BH114, BH115	1.7	5	29	34

Im: Immediate Settlement
Cons.: Consolidation Settlement
T: Total Settlement

The weaker deposit is predominantly silt and most of the consolidation is expected to occur within six months to one year from the time of fill placement. However, preloading is expected to accelerate the consolidation process. Engineered fill with an average thickness of 1.7 m is expected to be placed in the area of Building B, D, and E, and based on the settlement analysis results, the total settlement within the weaker silt deposit in these areas, was estimated as 43, 30, and 34 mm, respectively. Therefore, it is our recommendation to preload these areas with a minimum of 1.0 m of additional fill. It is also recommended that the start of construction of foundations be prolonged as much as possible after placement of the fill. Furthermore, we would recommend that settlement monitors be installed to monitor the rate of settlement and to determine if and when the majority of the settlement (90%) has taken place. Due to the relatively higher load in the area of Building C, it is recommended to delay the building construction as long as possible to make sure that the majority of the settlement/soil consolidation has occurred prior to the footing construction. The majority of the settlement is expected to occur within 2 to 3 months of the fill placement.

In addition to the preloading, wick drains can also be used to accelerate the consolidation process and significantly reduce the consolidation time for loose cohesive soils to shorten the drainage path for the pore water and hence accelerate consolidation process. Wick Drain is a special purpose strip drain used for consolidation of soft, compressible soils. The wick drain has two components, a core which serves as a water conduit for the pore water and a geotextile filter fabric, which allows water to pass into the core while restricting the movement of soil particles which might clog the core. The drain is fed down through a hollow mandrel mounted on an excavator or crane, which is connected at the bottom to an expendable anchor plate. A vibratory hammer or static method is used to drive the mandrel to design depth. It's then removed, leaving the wick drain in place. The wick drain is then cut at the ground surface. The vertical wick drains are installed in a pattern to provide short drainage paths for pore water, which accelerates the consolidation process and consequently shorten the construction schedule.

5.2.3 Helical Piles (Building C & Building D)

If higher bearing resistance is required at the location of Building C and Building D, or the project schedule wouldn't allow the pre-loading, Helical piles could be an option to support the proposed structures below the weaker silt zone and into the native silty sand till/sandy silt till.

The actual allowable bearing load available from the helical pile plates on the soil, however, would have to be determined by the pile designer and it will depend on the proposed pile load, as determined by the Client. The use of grouted columns may also be recommended to increase the pile capacity. Pile installation monitoring and inspection by qualified geotechnical personnel is required during the installation of all helical pile foundations.

It is also recommended that a field load test be carried out in order to determine the piles' actual load capacity, confirm the theoretical design foundation, and allow site specific correlation between capacity and installation torque. The test pile should be loaded to at least two times the design load. Piles that have been tested to their ultimate capacity should not be used as production piles. Pile test methods and apparatus should conform to ASTM D1143-81.

5.3 Foundation Construction

The footing beds in the clayey silt/silt will be prone to disturbance from construction, foot traffic and precipitation. It would be prudent to consider the placement of a 50 mm concrete 'mud' slab over the footing bases once evaluated. This will protect the footing beds from disturbance and provide a clean working surface for the placement of formwork and reinforcing steel.

In areas where it will be necessary to provide adjacent footings at different founding elevations, the lower footing should be constructed before the higher footing, if possible. To limit stress transfer from higher footings to lower footings, the higher footing should be set below a line drawn up from the edge of the lower footing at 10 horizontal to 7 vertical. The footings to be constructed adjacent the existing structure should 'match' the level of the existing foundations.

All footings exposed to the environment must be provided with a minimum of 1.5 m of earth cover or equivalent insulation to protect against frost damage. This frost protection would also be required if construction were undertaken during the winter months. All footings and foundations should be designed and constructed in accordance with the current Ontario Building Code. We would recommend the placement of a 50 mm thick high-density sheet of Styrofoam insulation against the exterior of the foundation walls, followed by the placement of a 10-mil sheet of 'double' polyethylene ('fold' placed at 'top') to prevent frost heaving/adfreezing action.

It is imperative that a soils engineer be retained from this office to provide geotechnical engineering services during the excavation and foundation construction phases of the project. This is to observe compliance with the design concepts and recommendations of this report and to allow changes to be made if subsurface conditions differ from the conditions identified at the borehole locations.

5.4 Seismic Design Parameters

The structure shall be designed according to Section 4.1.8 of the current Ontario Building Code, Ontario Regulation 332/12. Based on the subsurface soil conditions encountered at the Site and due to the limited depth of the investigation the applicable Site Classification for the seismic design is Site Class D. The conducting of site specific shear wave velocity testing may allow for the upgrade of the site class.

The seismic data as per the 2015 National Building Code interpolated seismic hazard values, based on the acceleration and velocity-based site coefficients, F_a and F_v, are as follows:

S_a[0.2]	S_a[0.5]	S_a[1.0]	S_a[2.0]	S_a[5.0]	S_a[10.0]	PGA	PGV
0.125	0.092	0.062	0.030	0.008	0.004	0.078	0.081

It should be noted that the F_a and F_v values are determined from Tables 4.1.8.4.B. and 4.1.8.4.C of the Building Code, respectively. The structural engineer responsible for the project should review the earthquake loads and effects.

5.5 Floor Slab Considerations

The floor slab may be constructed using conventional slab-on-grade techniques on a prepared subgrade. The exposed subgrade surface should then be well compacted (proofrolled) in the presence of a representative of G2S. Any soft 'spots' delineated during this work must be sub-excavated and replaced with quality backfill material compacted to 100 percent of its Standard Proctor Maximum Dry Density (SPMDD). Imported granular fill is preferred due to its relative insensitivity to weather conditions, its relative ease in achieving the required degree of compaction, and its quick response to applied stresses.

As with all concrete floor slabs, there is a tendency for the floor slabs to crack. The slab thickness, concrete mix design, amount of steel and/or fibre reinforcement and/or wire mesh placed into the concrete slab, if any, will therefore be a function of the owner's tolerance for cracks in, and movements of, the slabs-on-grade, etc. The 'saw-cuts' in the concrete floors, for crack control, should extend a minimum of 1/3 the thickness of the slab.

A moisture barrier will be required under the floor slabs, such as the placement of at least 200 mm of well-compacted 19 mm clear crushed stone. At a minimum, the moisture barrier material should contain no more than 10 percent passing the No. 4 sieve

Curing of the slab-on-grade must be carefully specified to ensure that slab curl is minimized. This is especially critical during the hot summer months of the year when the surface of the slab tends to dry out quickly while high moisture conditions in the moisture barrier or water trapped on top of any 'poly' sheet at the saw cut joints and cracks, and at the edges of the slabs, maintains the underside of the slab in moist conditions.

It is also important that excess free water not be added to the concrete during its placement as this could increase the potential for shrinkage cracking and curling of the slab. Based on the

conditions encountered in the boreholes, backfill recommendations, and the floor slab considerations, a modulus of sub-grade reaction, k_{v1}, of 25 MPa/m (based on a loaded area of 300 mm x 300 mm) can be used for the design of the slab-on-grade floor slab.

5.6 Perimeter Drainage

We would recommend that the perimeter drainage system extend in all areas where the floor slab level is less than 0.3 m above the final exterior grade. As a minimum, it is recommended that the perimeter weeping tile consist of a 150 mm diameter perforated pipe with a geofabric 'sock', surrounded with 200 mm of 20 mm clear stone, with the stone in turn encased by a heavy geotextile filter fabric. The suppliers of the geotextile filter fabric should be consulted as to the type best suited for this project. The perimeter drainage system should outlet to a gravity drainage connection, fitted with a suitable back-flow prevention valve.

This office should examine the installation of the perimeter drains. Even a small break in the filtering materials could result in loss of 'fines' into the drains with attendant performance difficulties, including settlements of the ground surface. The exterior grade around the structure should be sloped away from the structure to prevent the ponding of water against the foundation walls.

Additional well graded granular material should be placed and compacted in exterior sidewalk and accessibility ramp areas to reduce the effects of frost heaving. Alternatively, insulation could be placed in these areas, or a structural 'frost' slab should be constructed at the doorways.

5.7 Excavations and Groundwater Control

It is anticipated that the excavations for the proposed foundations, sewers and other underground services may extend to depths of approximately 3.0 to 4.0 m below the present grade through the fill and into the native very soft to very stiff clayey silt and the very loose to compact silt. All excavations must comply with the current Occupations Health and Safety Act and Regulations for Construction Projects.

For guidance, the fill, the firm to stiff clayey silt, the loose to compact silt/silty sand above the groundwater table may be classified as Type 3 soil. All soils below the groundwater table can be classified as Type 4 soil. In accordance with the OHSA regulations, if the excavation contains more than one type of soil, the soil shall be classified as the type with the highest number. Excavations slopes steeper than those required in the Safety Act must be supported or a trench box must be provided, and a senior Geotechnical Engineer from this office should supervise the work. We note that the rate of excavation may be slowed when existing buried services are encountered by the contractor. In this regard it is recommended that a number of test excavations be conducted to allow tendering contractors to observe the groundwater conditions firsthand to assess how they will affect their operations.

Based on the borehole information, a water bearing silt was encountered at various locations across the Site and was found at depths ranging between 1.5 and 3.8 mbeg ~ (Elev. 194.4and Elev. 191.5). As such, significant infiltration of groundwater from surface runoff and the water bearing stratum should be anticipated and localized dewatering will likely be required to facilitate the excavation. Filtered sumps, trenches, and oversized excavations, can be used to mitigate this issue. However, if these techniques failed to control the groundwater seepage, an adequate dewatering technique, which should be carried out by a specialized contractor, should be considered. G2S will be pleased to review and comment on the contractor's proposed dewatering system. It should be noted that G2S is carrying out a hydrogeological investigation at the Site

and based on the results of this investigation, recommendations pertinent to the type and extent of the groundwater control will be issued under separate cover.

For underground services installation, no bearing capacity issues are anticipated for pipes founded in dewatered native soils. A minimum 150 mm bedding thickness of OPSS Granular 'A' crusher-run limestone is recommended under the pipes. The bedding material should be compacted to 98 percent SPMDD. For pipes founded in wet native soils, the pipe bedding should consist of 19 mm clear stone completely wrapped in geotextile filter fabric to prevent the migration of fines into the void spaces of the bedding material. High performance aggregate can also be used in excessively wet areas.

Granular material should be extended upward as trench backfill for at least 300 mm above the obvert of the pipe. The remaining trench to final subgrade level should be backfilled in 300 mm thick lifts with approved excavated material compacted to at least 98 percent SPMDD.

Frequent inspection by G2S geotechnical personnel should be carried out to examine and approve backfill materials, to carefully inspect placement, and to verify the specified degree of compaction has been obtained.

To minimize potential problems, backfilling operations should follow closely after excavation so only a minimal length of trench is exposed. This will minimize wetting of the subgrade and backfill materials. Should construction extend to the winter season, care should be taken to ensure frozen material is not used as backfill.

5.8 Backfill Considerations

The majority of the excavated material will consist of the native clayey silt and silt material, which is considered to be suitable for use as service trench backfill and as engineered fill provided that the moisture content can be controlled to within 3 percent of the standard Proctor optimum value. Some moisture content conditioning of the excavated material may be required, depending upon the weather conditions experienced at the time of construction to achieve acceptable compaction densities and minimize long-term settlements. A granular pad was encountered in the area of BH102, BH109 to BH112, BH119, BH120, and BH123. The material consisted of sand and gravel and was noted to contain cobbles and boulders size material. In addition, the granular material was also found contaminated with clayey silt in the area of BH102 and BH109. The granular material apart from the oversize particles should be suitable for use as service trenches and engineered fill backfill, provided adequate sorting is carried out. The granular backfill could remain in place at the pavement areas subject to proofrolling and evaluation at the time of construction.

We note that where backfill material is placed near or slightly above its optimum content, the potential for long-term settlements due to the ingress of groundwater and collapse of the fill structure is reduced. Correspondingly, the shear strength of 'wet' backfill material is also lowered, thereby reducing its ability to support construction traffic, and therefore impacting roadway construction. If the soil is well 'dry' of its optimum value, it will appear to be very strong when compacted, but will tend to settle with time as the moisture content in the fill increases to equilibrium condition. The soils may require high compaction energy to achieve acceptable densities if the moisture content is not close to their standard Proctor optimum value. It is therefore very important that the placement moisture content of the backfill soils be within 3 percent of its standard proctor optimum moisture content during placement and compaction.

Any imported fill required in service trenches or to raise the subgrade elevation should have its moisture content within 3 percent of its optimum moisture content and meet the necessary environmental guidelines.

The backfilling and compaction operations should be monitored by a representative of G2S to monitor uniform compaction of the backfill material to project specification requirements. Close supervision is prudent in areas that are not readily accessible to compaction equipment, for instance near the end of compaction 'runs', and around the foundation walls. Any engineered fill should be compacted to 100 percent SPMDD. A method should be developed to assess compaction efficiency employing the on-Site compaction equipment and backfill materials during construction.

5.9 Underground Fuel Storage Tanks

It is understood that the proposed development will include the construction of a gasoline service station at the southwest corner of the Site, which will incorporate the installation of fuel Underground Storage Tanks (USTs). The excavation for the UST installation is expected to extend to depths of approximately 4.0 to 5.0 mbeg. Very loose to loose silt and very soft clayey silt deposits were encountered at the tank installation area between depths of approximately 2.3 and 6.1 mbeg. The fuel tanks can be founded on concrete slab or engineered fill constructed as per Sections 5.1 and 5.2 of this report, supported on the native sand till. Bearing resistance of 150 kPa at SLS and 300 kPa at ULS could be utilized for the foundation design. The settlements of the tanks are expected to be within the normally tolerated limits of 25 mm total and 19 mm differential movements. The excavation must be completed in accordance with the current OHSA regulations and should be carried out as per Section 5.7 of this report.

The temporary shoring method will depend on the settlement tolerance for adjacent structure(s) and buried utilities. We would recommend an active earth pressure coefficient Ka = 0.45 and using a unit weight of retained soil of 22 kN/m3. The shoring wall must be designed and constructed as a rigid shoring system. The shoring system may be constructed with walers supported by rakers or soil anchors. The shoring design should be based on the procedure detailed in the latest edition of the Canadian Foundation Engineering Manual. The shoring system must be design by a professional engineer experienced in shoring design and the shoring system constructed by an experienced contractor. Any surcharge loads must be incorporated into the shoring design. The structural member stiffness and stability is the responsibility of the shoring design engineer and the shoring contractor. We would recommend that a detailed condition survey for the nearby structures and roadways be conducted prior to the commencement of the excavation operation. In addition, the shoring system must be monitored for any vertical or horizontal movements during the course of construction. The excavation must provide 'space' for the construction of footings and foundation walls, with an allowance for access by workers. We would recommend that this office be retained to review the selected design and provide monitoring during installation.

The groundwater table as prevailed by the investigation is located at approximately 0.6 to 1.4 mbeg across the Site. At some locations, groundwater was found at-grade. The groundwater levels are expected to show seasonal fluctuations and vary in response to prevailing weather conditions. The underground tanks should be designed to resist uplift from hydrostatic pressure.

The hydraulic uplift pressure, P, below the structure can be calculated using the following formula:

$P = \gamma_w h_w$

Where:

γ_w = unit weight of water (10 kN/m^3)

h_w = depth in metres below the water table; and

The groundwater table may be assumed to be at the ground surface when designing for uplift.

Typical techniques to resist uplift pressure are as follows:

- Deadman anchors with straps that go over the top of the tanks. The deadman anchors are typically 0.3 to 0.6 m^2 reinforced concrete beams which run the full length of the tanks.
- The deadweight of the empty tanks plus the deadweight of the backfill material above the units exceeds the maximum factored hydrostatic uplift pressure that will act on the tanks.
- Concrete slab to extend below the entire footprint of the tanks and protrudes about 0.3 to 0.6 m beyond either side of the tanks. The tanks can be tied to the concrete slab by straps

Groundwater control and dewatering considerations for construction at the Site will be provided in the hydrogeological report, issued under a separate cover.

5.10 Stormwater Underground Storage Facility

It is understood that a stormwater storage facility (SWSF) will be constructed beneath the proposed parking lot, which is located north of Building A and southeast of Building B. The proposed storage facility will consist of a Stormtech Mc-3500 system with a footprint of approximately 2359 m^2. Based on Drawing No. DE02, dated February 2022, the proposed system is anticipated to extend to approximately 1.5 m below the proposed finished grade elevation (~Elev. 193.7 m). As per the borehole information at the area of proposed facility (BH109, BH110, BH120), the soil at the proposed founding level consisted of clayey silt in BH109 and BH120, and silt overlaying clayey silt material in BH110. The clayey silt is considered suitable to support the proposed storage facility. Therefore, it is recommended to subexcavate the subgrade to the native clayey silt deposit and backfill the area, if required, with suitable material as per Sections 5.1 and 5.8 of this report. Bearing resistance of 120 kPa at SLS and 240 kPa at ULS could be utilized for the foundation design on the native clayey silt or properly placed fill material. Installation of the underground storage facility will remove soil and replace the soil with hollow structures, which likely be filled completely with water. If the facility is set at a depth of approximately 1.5 m below grade, unloading due to soil removal will be about 30 kPa. If the load of the facility plus stored water will be less than 30 kPa, settlement is not expected to be an issue. The infiltration rate for the clayey silt material was estimated based on the grain size analysis and borehole permeability testing, which was carried out for a soil sample obtained from BH109 at depth of approximately 1.5 mbeg (~Elev. 194.3). The results of the grain size analysis are summarized in Section 4.3 of this report and the grain size distribution graph is included in Appendix B. The infiltration rate was estimated as 10^{-7} cm/sec., which is considered suitable to be utilized as a liner.

The proposed storage facility will be placed on a 300 mm thick layer of Granular 'A' (OPSS.MUNI 1010) compacted to a minimum of 98% Standard Proctor Maximum Dry Density. For weak or excessively wet subgrade, 19 mm clear stone completely wrapped in geotextile filter fabric to prevent the migration of fines into the void spaces of the bedding material, can be used beneath the proposed storage facility. Bedding and cover requirements for the system installation should follow the designer and the proprietary system specifications. Discussion and recommendations regarding the buoyant uplift pressure due to the anticipated high groundwater level and its effect on the underground storage system are include in Section 5.9 of this report.

5.11 Pavement Considerations

The pavement areas should be stripped of all topsoil, organic and other unsuitable materials. The exposed subgrade should be proofrolled with 3 to 4 passes of a loaded tandem truck in the presence of a representative of G2S, immediately prior to the placement of the sub-base material. Any areas of distress revealed by this, or any other means must be subexcavated and replaced with suitable backfill material. Alternatively, the soft areas may be repaired by the placement of coarse aggregate, such as 50 mm clear crushed stone. The need for subexcavations of a softened subgrade will be reduced if construction is undertaken during periods of dry weather and careful attention is paid to the compaction operations. At areas of weak subgrade, suitable geogrid product such as Tensar TriAx (TX) geogrid or equivalent can be used to stabilize the subgrade. The fill placed over shallow utilities that cuts into or across the paved areas must also be compacted to 100 percent of its SPMDD.

Good drainage provisions will optimize the long-term performance of the pavement structure. The subgrade must be properly crowned and shaped to promote drainage to the subdrain system. Subdrains should be installed to intercept excess subsurface water and to prevent softening of the subgrade material. Surface water should not be allowed to pond adjacent to the outer limits of the paved area.

The most severe loading conditions on the subgrade typically occur during the course of construction, therefore, precautionary measures may have to be taken to ensure that the subgrade is not unduly disturbed by construction traffic. These measures would include minimizing the amount of heavy traffic travelling over the subgrade, such as during the placement of granular base layers.

If construction is conducted under adverse weather conditions, additional subgrade preparation may be required. During wet weather conditions, such as typically experienced during the fall and spring months, additional subgrade preparation, such as the provision of an additional depth of Granular B sub-base coarse material would be required. It is also important that the sub-base and base coarse granular layers of the pavement structure be placed as soon after exposure and preparation of the subgrade level as practical.

The suggested pavement structures, for the pavement areas, outlined in Table 4 below are based on subgrade parameters estimated on the basis of visual and tactile examinations of the on-Site soils and past experience. The outlined pavement structures may be expected to have an approximate 15 to 20 years of design life, assuming that regular maintenance is performed. Should a more detailed pavement structure design be required, Site specific traffic information would be needed, together with detailed laboratory testing of the subgrade soils.

Table 4: Suggested Pavement Structure

LAYER DESCRIPTION	COMPACTION REQUIREMENTS	LIGHT DUTY SECTIONS	HEAVY DUTY (TRUCK ROUTE)
Asphaltic Concrete Wearing course OPSS HL 3 or HL 3A	Min 92.0 % *MRD	40 millimetres	40 millimetres
Binder Course OPSS HL 8	Min 92.0 % *MRD	60 millimetres	80 millimetres
Base Course OPSS Granular A	100% **SPMDD	150 millimetres	150 millimetres
Sub-base Course OPSS Granular B Type II	100% **SPMDD	300 millimetres	450 millimetres

* MRD denotes maximum relative density, MTO LS-264

** SPMDD denotes Standard Proctor Maximum Dry Density, ASTM-D698.

6. General Comments

The comments provided in this document are intended only for the guidance of the design team. The subsoil descriptions and borehole information are only intended to describe conditions at the borehole locations. Contractors placing bids of undertaking this project should carry out due diligence to verify the results of this investigation and to determine how the subsurface conditions will affect their operations. The action of stripping topsoil and unsuitable near-surficial soils as well as the selection and placement of engineered fill should be tested by the geotechnical engineer at the time of construction. In-situ density testing should be carried out on any engineered fill placed at the Site.

All foundations should be reviewed on Site by the geotechnical engineer as they are constructed, as required by Section 4.2.2.2 of the Ontario Building Code (2012). If G2S is not retained to review the foundation bearing conditions or the construction of the foundations in the field, then G2S assumes no responsibility for the performance of the foundations as constructed.

The long-term performance of slabs on grade is dependent on the subgrade support conditions. Subgrades to support slabs on grade should be inspected by the geotechnical engineer prior to final construction. It is important that any engineered fill constructed beneath slabs on grade is carried out as outlined in this report.

7. Limitations

The geotechnical engineering advice and recommendations provided in this report are considered preliminary and were based on the factual information obtained during this investigation.

It may be possible that the subsurface conditions vary between and beyond the investigated borehole locations. For the purpose of this report, it is assumed that the conditions outside of and between the exact borehole locations are similar to the conditions observed in the boreholes. The change in subsurface stratigraphy reported on the borehole logs has also been interpreted based on non-continuous sampling, therefore, changes in stratigraphy as shown on the borehole logs and as discussed in this report should not be regarded as exact lines of geological change. The subsurface conditions at the Site may change with the passage of time and/or by human intervention.

The findings along with the geotechnical engineering advice and recommendations provided in this report are limited to the conditions at the Site at the time of this investigation as described herein. Conclusions presented in this report should not be construed as legal advice. If Site conditions or applicable standards change or if any additional information becomes available at a future date, changes to the findings, conclusions and recommendations in this report may be necessary.

Through any subsurface investigation by boreholes, it may not be possible to identify all aspects of the subsurface conditions at the Site that could affect construction costs, techniques, equipment, and scheduling. Contractors bidding on or undertaking work on the project must be directed to draw their own conclusions as to how the subsurface conditions may affect them, based on their interpretation of the subsurface conditions and/or their own investigations.

This report has been prepared for the sole benefit of the Client (Charis Developments Ltd.) and is intended to provide geotechnical engineering advice and recommendations based on the subsurface conditions investigated at the subject Site. This report is the copyright of G2S Consulting Inc. (G2S) and may not be used by any other person or entity without the expressed written consent of the Client and G2S. Any use which a third party makes of this report, or any reliance on decisions made based on it, is the responsibility of such third parties. G2S accepts no responsibility for damages, if any suffered by any third party as a result of decisions made or actions based on this report. It is recognized that The Town of Collingwood in their capacity as the planning and building authority under Provincial statues, may make use of and rely upon this report cognizant of the limitations thereof, both as are expressed and implied.

Secondary review of this report was completed for general QA/QC and adherence to company standards and does not include a technical review of engineering conclusions and recommendations. This report does not address any environmental conditions such as soil and ground water chemical quality and suitability of excess soils for off-site re-use.

8. Closing Remarks

We trust this report is satisfactory for your present purposes. Should you have any questions, please do not hesitate to contact this office.

Yours truly,

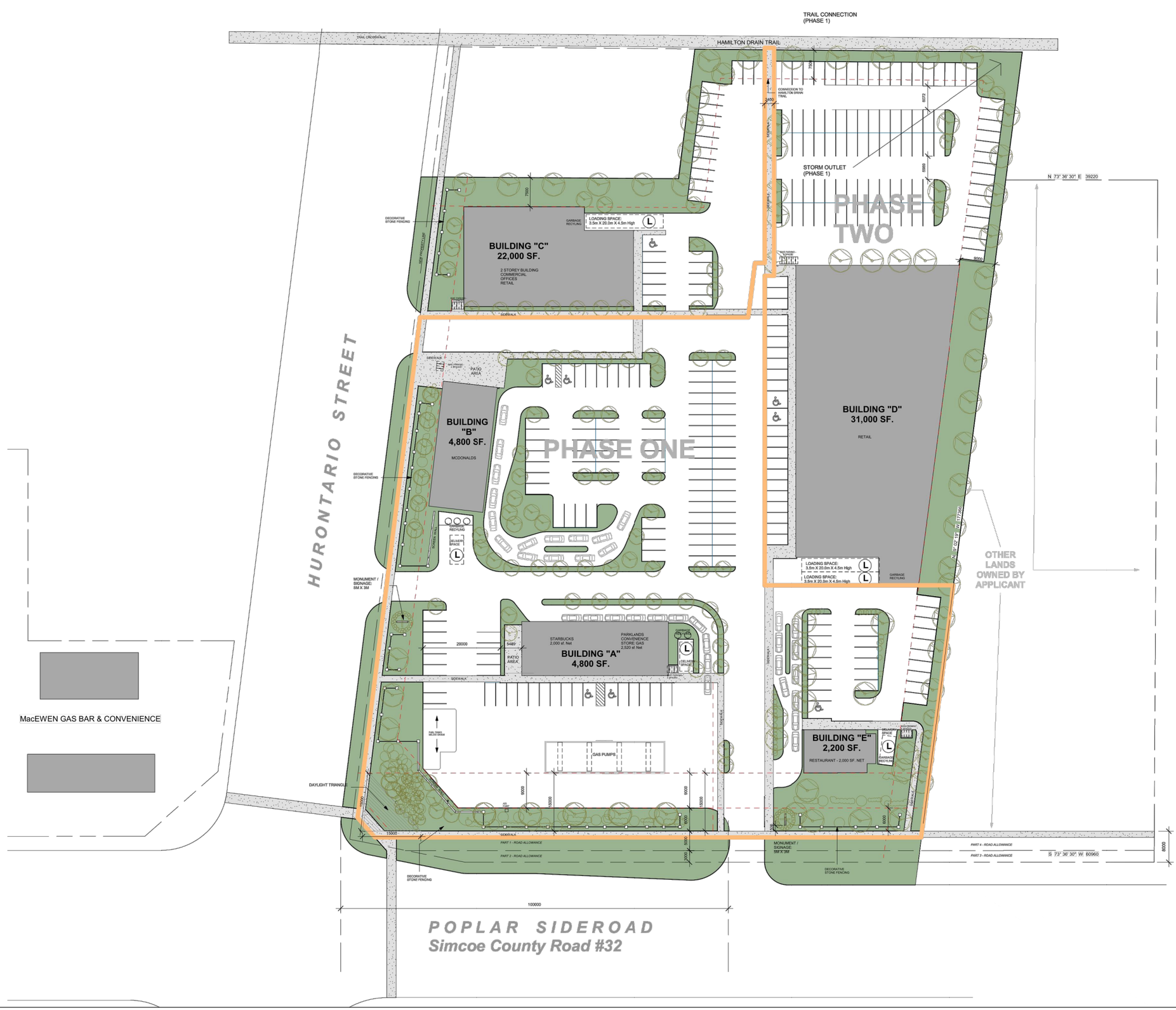
G2S Consulting Inc.

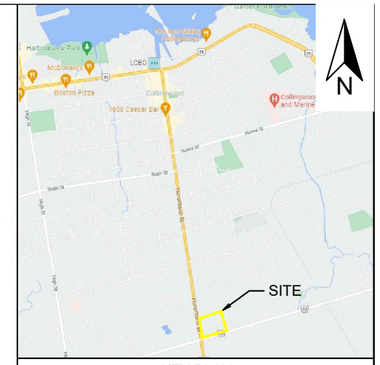
LICENSED PROFESSIONAL ENGINEER
A. ABASS
100071816
Mar 17/2022
PROVINCE OF ONTARIO

Ashraf Abass, P. Eng.
Senior Project Engineer

Steve Campbell, P.Geo.
Principal

Appendix A:
Drawings





KEY PLAN

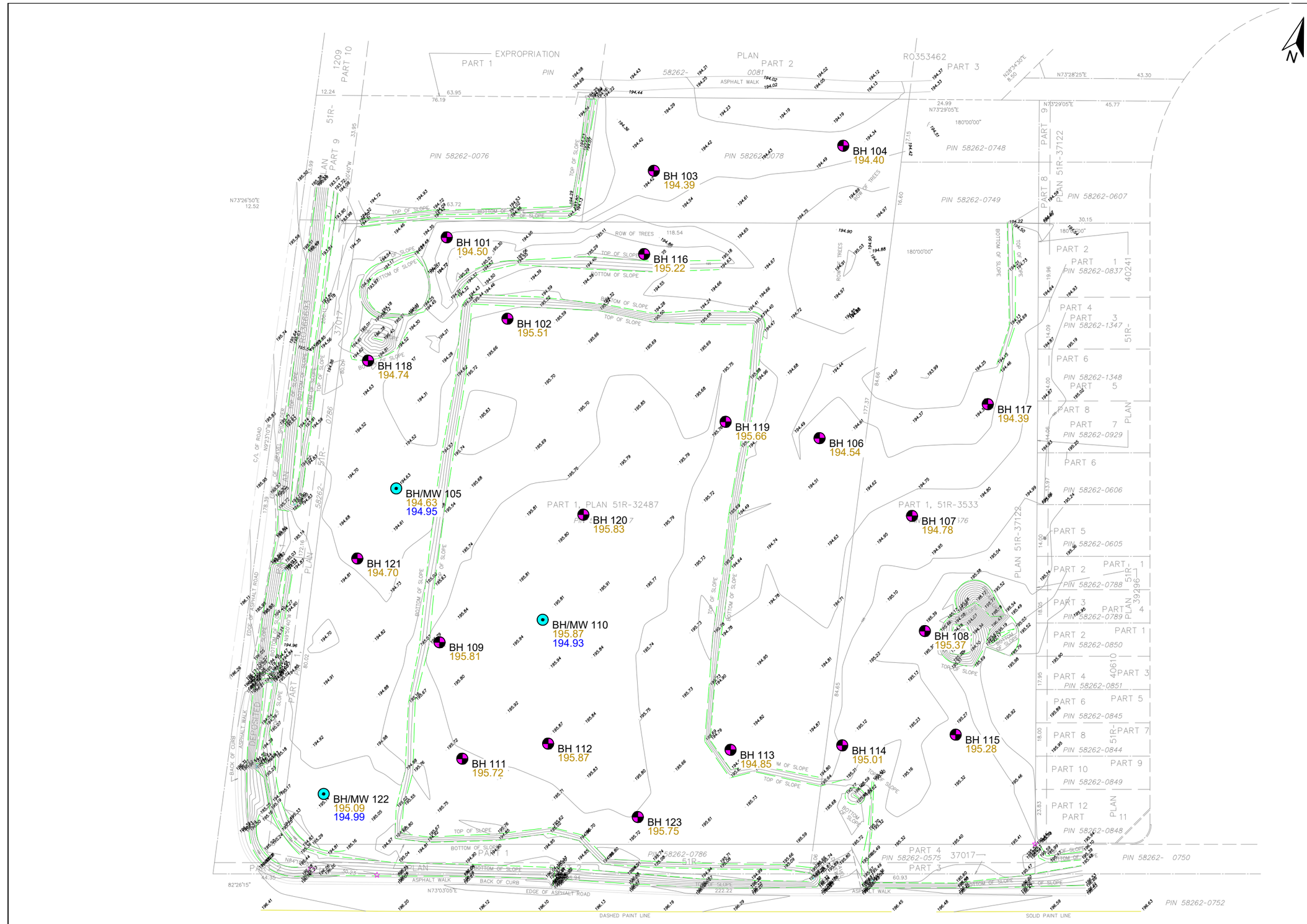
TITLE:
DESIGN OPTION A

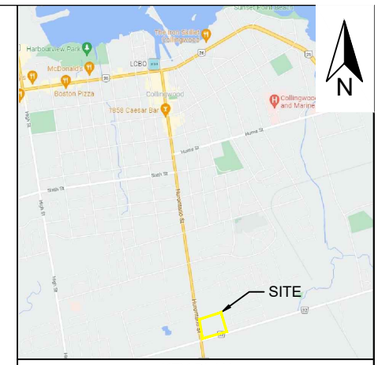
CLIENT:
CHARIS DEVELOPMENTS LTD.

LOCATION:
839, 869 HURONTARIO STREET & 7564 POPLAR SIDEROAD
COLLINGWOOD, ONTARIO

PROJECT:
G2S21366

Drawing:	1A
Scale:	AS SHOWN
Date:	MARCH 2022
Drawn by:	DB
File name:	G2S21366 BH Location Plan





KEY PLAN

LEGEND

- BOREHOLE LOCATION
- MONITORING WELL LOCATION
- 195.87 GROUND SURFACE ELEVATION (m)
- 194.93 GROUNDWATER ELEVATION (NOV. 3, 2021)

TITLE: BOREHOLE AND MONITORING WELL LOCATION PLAN

CLIENT: CHARIS DEVELOPMENTS LTD.

LOCATION: 839, 869 HURONTARIO STREET & 7564 POPLAR SIDEROAD COLLINGWOOD, ONTARIO

PROJECT: G2S21366

Drawing:	1B
Scale:	AS SHOWN
Date:	MARCH 2022
Drawn by:	DB
File name:	G2S21366 BH Location Plan

Appendix B:
Borehole Logs and
Grain Size Analysis Graphs
Plasticity Chart

G2S Consulting Inc.

LIST OF ABBREVIATIONS

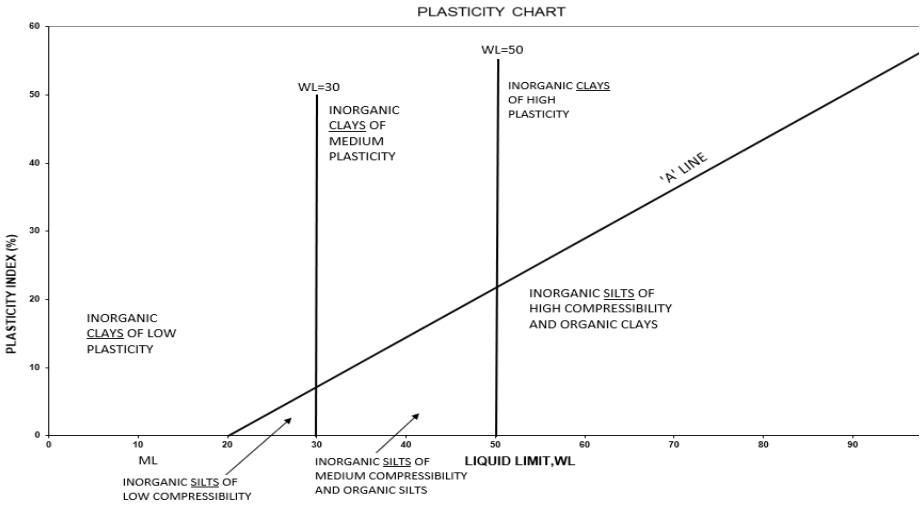
Description of Soil

The consistency of cohesive soils and the relative density or compactness of cohesionless soils are described in the following terms:

COHESIVE SOIL			COHESIONLESS SOIL	
CONSISTENCY	N (blows/0.3 m)	C (kPa)	DENSENESS	N (blows/0.3 m)
Very Soft	0 – 2	0 – 12	Very Loose	0 – 4
Soft	2 – 4	12 – 25	Loose	4 – 10
Firm	4 – 8	25 – 50	Compact	10 – 30
Stiff	8 – 15	50 – 100	Dense	30 – 50
Very Stiff	15 – 30	100 – 200	Very Dense	>50
Hard	>30	>200		
Moisture conditions				
Moist: dark or greyish color, may feel cool upon				
Wet: same as moist with free water seepage when handled				

Abbreviations

SS	Split Spoon Sample
AS	Auger Sample
GS	Grab Sample
DP	Direct Push
S	Sample
RC	Rock Core
SPT	Standard Penetration Test
N	Blow counts per 300mm of penetration. (ASTMD1586)
MC	Moisture Content
PL	Plastic Limits
LL	Liquid Limits
PI	Plasticity Index



Penetration Resistance

Standard Penetration Resistance N: The number of blows required to advance a standard split spoon sampler 0.3 m into the subsoil. Driven by means of a 63.5 kg hammer falling freely a distance of 0.76 m. The value reported are as noted in the field without corrections.

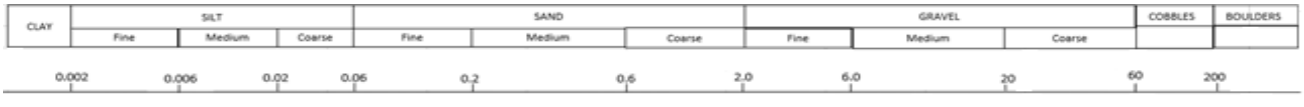
Soil Classification Dynamic Penetration Resistance: The number of blows required to advance a 51 mm, 60-degree cone, fitted to the end of drill rods, 0.3 m into the subsoil. The driving energy being 475 J per blow. Soils descriptions are made in accordance with the Canadian Foundations Engineering Manual (CFEM), following the International Society for Soil Mechanics and Foundation Engineering. (ISSMFE)

Notes

Soil samples will be discarded after three months unless directed otherwise by the Client.

Unless the grain size analysis is performed in our lab, soil samples are classified based on visual, tactile, and olfactory examinations, which may not be sufficient for accurate classification or precise grain sizing.

ISSMFE SOIL CLASSIFICATION



BOREHOLE NUMBER 101

G2S Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 21-10-22 **COMPLETED** 21-10-22 **GROUND ELEVATION** 194.50 m

DRILLING CONTRACTOR LST **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD Diedrich D50 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
	TOPSOIL: ~360 mm	194.14	SS1	SPT	5					
0.36										
1	FILL: Sand, brown to dark brown, some silt, some clay, moist, debris		SS2	SPT	11					
1.2		193.28								
2	CLAYEY SILT: Brown to grey, occasional sand seams, some clay, moist to very moist, stiff		SS3	SPT	14					
			SS4	SPT	10					
3										
3.1		191.45								
4	SILT: Grey, some gravel, very moist, very loose to loose		SS5	SPT	3					
			SS6	SPT	8					
4.6		189.90								
5	SANDY SILT TILL: Grey, some gravel, moist, dense		SS7	SPT	55	>>				
5.2		189.32								

Borehole terminated at 5.2 m.

Upon completion of augering
No cave
Free water at 3.9 m

BOREHOLE NUMBER 102

G2S Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 21-10-21 **COMPLETED** 21-10-21 **GROUND ELEVATION** 195.51 m

DRILLING CONTRACTOR LST **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD Diedrich D50 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY (PL MC LL)	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
0.65	FILL: Sand and gravel, brown, some silt, cobble and boulder size material on the surface, moist	194.86	SS1	SPT	3			20/0		
1	becoming clayey silt, brown, some gravel, some silt, moist		SS2	SPT	22			30/0		
1.5		193.99								
2	CLAYEY SILT: Brown to grey, some sand, stiff		SS3	SPT	10			25/0		
2.3		193.22								
3	SILT: Grey, layered, trace sand, trace gravel, some clay, very moist to wet, loose to compact		SS4	SPT	16			10/0		
			SS5	SPT	12			15/0		2 6 77 15
4			SS6	SPT	4			0/0		
5				VANE		7.0 / 80				
5.2		190.33								
5.8	SANDY SILT TILL: Grey, some gravel, trace clay, moist, compact	189.72	SS7	SPT	19			5/0		

Borehole terminated at 5.8 m.

Upon completion of augering
Wet cave at 4.6 m
Free water at 0.65 m after 24 hours

BOREHOLE NUMBER 103

Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 21-10-22 **COMPLETED** 21-10-22 **GROUND ELEVATION** 194.39 m

DRILLING CONTRACTOR LST **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD Diedrich D50 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
	0.13 TOPSOIL: ~125 mm	194.27					N values ▲ 10 20 30 CPT values △ 40				
	FILL: Clayey silt, brown to grey, some sand, moist			SS1	SPT	7	Pocket Penetrometer × Vane ✚ 40 80 120 160	PL MC LL 10 20 30			
1	1.00	193.39		SS2	SPT	12					
	CLAYEY SILT: Brown, trace sand, rootlets, moist, stiff, reworked appearance at the upper section										
	1.5	192.89									
	SILT: Grey, layered, trace sand, trace gravel, some clay, very moist to wet, very loose to compact			SS3	SPT	6					
2											
				SS4	SPT	2					2 6 68 24
3											
				SS5	SPT	16					
4	4.0	190.39									
	SANDY SILT TILL: Grey, some gravel, moist, compact			SS6	SPT	20					
				SS7	SPT	27					
5	5.2	189.21									

Borehole terminated at 5.2 m.

Upon completion of augering
Cave at 4.3m
Free water at 4.1 m

BOREHOLE NUMBER 104

G2S Consulting Inc.

CLIENT Charis Developments Ltd.
PROJECT NAME 839 & 869 Hurontario St & 7564 Poplar Side Rd
PROJECT NUMBER G2S21366B
PROJECT LOCATION Collingwood, Ontario
DATE STARTED 21-10-22 **COMPLETED** 21-10-22
GROUND ELEVATION 194.40 m
DRILLING CONTRACTOR LST
LOGGED BY DB **CHECKED BY** AA
DRILLING METHOD Diedrich D50 Track
NOTES

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY (PL MC LL)	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
	0.10 TOPSOIL: ~100 mm	194.30								
	FILL: Clayey silt, brown and grey mottled, some sand, moist		SS1	SPT	11			0/0		
	0.78	193.62								
1	CLAYEY SILT: Brown to grey, some sand, reworked appearance at top, moist, stiff		SS2	SPT	8			0/0		
	1.5	192.90								
2	SILT: Grey, layered, trace sand, trace gravel, some clay, very moist to wet, compact		SS3	SPT	10			0/0		
			SS4	SPT	13			0/0		
3			SS5	SPT	10			0/0		
	3.8	190.59								
4	SANDY SILT TILL: Grey, some gravel, moist, dense		SS6	SPT	33			0/0		
			SS7	SPT	43			0/0		
5	5.2	189.22								

Borehole terminated at 5.2 m.

Upon completion of augering
No cave
Free water at 4.4 m

BOREHOLE NUMBER 105

G2S Consulting Inc.

CLIENT Charis Developments Ltd.
PROJECT NAME 839 & 869 Hurontario St & 7564 Poplar Side Rd
PROJECT NUMBER G2S21366B
PROJECT LOCATION Collingwood, Ontario
DATE STARTED 21-10-1 **COMPLETED** 21-10-1
GROUND ELEVATION 194.63 m
DRILLING CONTRACTOR Davis
LOGGED BY DB **CHECKED BY** AA
DRILLING METHOD CME 45 Track
NOTES

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY (PL MC LL)	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
0.20	TOPSOIL: ~200 mm	194.43								
1	CLAYEY SILT: Brown, trace sand, stiff, very moist, occasional sand seams, moist, firm to stiff, reworked appearance at the top portion		SS1	SPT	1			25/0		
			SS2	SPT	11	225		25/0		
1.5		193.11								
2	becoming greyish, layered, numerous sand seams, very moist		SS3	SPT	8			20/0		
2.3		192.34								
3	SILT: Grey, layered, trace sand, some clay, very moist to wet, very loose to loose		SS4	SPT	6			20/0		0 9 72 19
			SS5	SPT	0	WH		30/0		
4				VA		3.0 .50				
4.6		190.06								
5	SILTY SAND TILL: Grey, some gravel, trace clay, compact, wet		SS6	SPT	14			10/0		
5.2		189.45								

Borehole terminated at 5.2 m.

Refer to report for groundwater elevation data

BOREHOLE NUMBER 106

Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 21-10-22 **COMPLETED** 21-10-22 **GROUND ELEVATION** 194.54 m

DRILLING CONTRACTOR LST **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD Diedrich D50 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
	0.08 TOPSOIL: ~75 mm	194.47		SS1	SPT	4					
	FILL: Clayey silt, brown and grey mottled, some sand, very moist, reworked native										
	0.76	193.78									
1	CLAYEY SILT: Brown, occasional sand seams, moist, stiff			SS2	SPT	10					
2				SS3	SPT	13					
	2.3	192.25									
	SILT: Grey, layered, trace sand, trace gravel, some clay, very moist to wet, very loose to loose			SS4	SPT	5					
3	3.1	191.49									
	trace gravel, occasional sand seams			SS5	SPT	3					
4				SS6	SPT	6					
	4.6	189.97									
	SILTY SAND TILL: Grey, some gravel, very moist, compact			SS7	SPT	26					
5	5.2	189.36									

Borehole terminated at 5.2 m.

Upon completion of augering
Cave at 4.3 m
Free water at 2.1 m

BOREHOLE NUMBER 107

Consulting Inc.

CLIENT Charis Developments Ltd.
PROJECT NAME 839 & 869 Hurontario St & 7564 Poplar Side Rd
PROJECT NUMBER G2S21366B
PROJECT LOCATION Collingwood, Ontario
DATE STARTED 21-10-21 **COMPLETED** 21-10-21
GROUND ELEVATION 194.78 m
DRILLING CONTRACTOR LST
LOGGED BY DB **CHECKED BY** AA
DRILLING METHOD Diedrich D50 Track
NOTES

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
0.25	TOPSOIL: ~250 mm	194.53									
	FILL: Sand, brown, some silt, very moist			SS1	SPT	2					
0.76		194.02									
1	CLAYEY SILT: Brown, some sand, moist, very stiff			SS2	SPT	16					
2				SS3	SPT	14					
2.3		192.49									
	SILTY SAND TILL/SANDY SILT TILL: Grey, some gravel, some clay, moist to very moist, very loose to compact			SS4	SPT	7					
3											
				SS5	SPT	3					10 36 35 19
4											
				SS6	SPT	15					
5											
5.2		189.60									

Borehole terminated at 5.2 m.

Upon completion of augering
No cave
Free water at 3.0 m
Free water at 0.3 m after 24 hours

BOREHOLE NUMBER 108

Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 21-10-21 **COMPLETED** 21-10-21 **GROUND ELEVATION** 195.37 m

DRILLING CONTRACTOR LST **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD Diedrich D50 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	NUMBER	TYPE	N VALUE	SOIL GAS READINGS HEX/IBL (ppm)
	0.10 TOPSOIL: ~100 mm	195.27				
	FILL: Clayey silt, brown to dark brown, some sand, very moist		SS1	SPT	4	10/0
	0.76	194.61				
1	CLAYEY SILT: Brown and grey mottled, some sand seams, moist, very stiff		SS2	SPT	16	0/0
	1.5	193.87				
2	SILT: Grey, layered, trace sand, trace gravel, some clay, very moist to very moist, compact		SS3	SPT	17	0/0
			SS4	SPT	11	10/0
3			SS5	SPT	11	5/0
	3.8	191.56				
4	SANDY SILT TILL: Grey, some gravel, moist, compact,		SS6	SPT	11	0/0
5			SS7	SPT	21	0/0
	5.2	190.19				

SPT N VALUES (N values ▲ 10 20 30 40 CPT values △)

Undrained Shear Strength (kPa) — Pocket Penetrometer × Vane ✚ — 40 80 120 160

MOISTURE / PLASTICITY — PL MC LL — 10 20 30

WELL CONSTRUCTION

GRAIN SIZE DISTRIBUTION % GR SA SI & CL

Borehole terminated at 5.2 m.

Upon completion of augering
Cave at 4.4 m
Free water at 3.4 m

BOREHOLE NUMBER 109

G2S Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 21-10-21 **COMPLETED** 21-10-21 **GROUND ELEVATION** 195.81 m

DRILLING CONTRACTOR LST **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD Diedrich D50 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
	FILL: Sand and gravel, brown, some silt to silty, possible cobble and boulder size material at the surface, moist			SS1	SPT	8			25/0		
1	0.95	194.86									
	becoming clayey silt, brown and grey, some sand, some gravel, moist			SS2	SPT	11			25/0		
	1.5	194.29									
	CLAYEY SILT: Brown to grey mottled, trace sand, moist, stiff to very stiff			SS3	SPT	14			30/0		0 2 64 34
2											
				SS4	SPT	16			35/0		
3	3.1	192.76									
	becoming layered with trace gravel			SS5	SPT	15			20/0		
	3.8	192.00									
4	SILT: Grey, layered, trace sand, trace gravel, some clay, very moist, compact			SS6	SPT	15			15/0		
	4.6	191.24									
	SANDY SILT TILL: Grey, some gravel, wet, loose			SS7	SPT	9			15/0		
5	5.2	190.63									

Borehole terminated at 5.2 m.

Upon completion of augering
No cave
No free water

BH/MW NUMBER 110

G2S Consulting Inc.

CLIENT Charis Developments Ltd.
PROJECT NAME 839 & 869 Hurontario St & 7564 Poplar Side Rd
PROJECT NUMBER G2S21366B
PROJECT LOCATION Collingwood, Ontario
DATE STARTED 21-10-1 **COMPLETED** 21-10-1
GROUND ELEVATION 195.87 m
DRILLING CONTRACTOR Davis
LOGGED BY DB **CHECKED BY** AA
DRILLING METHOD CME 45 Track
NOTES

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	NUMBER	TYPE	N VALUE	SOIL GAS READINGS HEX/IBL (ppm)
0	FILL: Sand and gravel, brown, trace to some silt, possible cobble and boulder size material at the surface, moist		SS1	AU		25/0
1			SS2	SPT	52	25/0
1.6		194.24				
2	SILT: Brown to grey, trace sand, some gravel, very moist, compact, reworked appearance at top portion		SS3	SPT	11	25/0
2.3		193.58				
3	CLAYEY SILT: Brown to grey mottled, trace sand, trace gravel, moist, stiff		SS4	SPT	14	45/0
			SS5	SPT	11	25/0
4						
4.6		191.30				
5	SILT: Grey, occasional sand pockets, some clay, moist, loose		SS6	SPT	6	30/0
5.3		190.54				
	SANDY SILT TILL: Grey, some gravel, trace clay, very moist, compact		SS7	SPT	19	30/0
5.9		189.93				

SPT N VALUES (N values ▲ 10 20 30 40 CPT values △)
Undrained Shear Strength (kPa) — Pocket Penetrometer × 40 80 120 160 — Vane ✚
MOISTURE / PLASTICITY — PL MC LL 10 20 30

>> 225 225

WELL CONSTRUCTION

GRAIN SIZE DISTRIBUTION % GR SA SI & CL

Borehole terminated at 5.9 m.

Water Level Readings:

Date	Depth (m)	Elev. (m)
2022-01-21	1.4	194.4
2021-11-03	0.9	194.9
2021-10-13	2.0	193.9

BOREHOLE NUMBER 111

CLIENT Charis Developments Ltd.
PROJECT NAME 839 & 869 Hurontario St & 7564 Poplar Side Rd
PROJECT NUMBER G2S21366B
PROJECT LOCATION Collingwood, Ontario
DATE STARTED 21-9-30 **COMPLETED** 21-9-30
GROUND ELEVATION 195.72 m
DRILLING CONTRACTOR Davis
LOGGED BY DB **CHECKED BY** AA
DRILLING METHOD CME 45 Track
NOTES

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
							N values ▲ 10 20 30 CPT values △ 40; Pocket Penetrometer ×; Vane ✚; 40 80 120 160	PL MC LL; 10 20 30			
1	FILL: Sand and gravel, brown, some silt, cobble and boulder size material at the surface, moist			SS1	SPT	32	▲	●			
				SS2	SPT	36	▲	●			
1.5		194.22									
2	CLAYEY SILT: Brown to grey, trace sand, some gravel, moist to very moist, stiff to very stiff, reworked appearance at top portion			SS3	SPT	16	▲	●			
				SS4	SPT	12	▲	●			
3											
3.1		192.67									
4	SILT: Grey, layered, trace sand, trace gravel, some clay, wet, very loose			SS5	SPT	4	▲	●			
					VANE		✚ 2.8 / 80				
5				SS6	SPT	1	▲	●			
					VANE						
6											
6.1		189.62									
	SILTY SAND TILL: Grey, some gravel, trace clay, compact, wet			SS7	SPT	25	▲	●			
6.6		189.17									

Borehole terminated at 6.6 m.

Upon completion of augering
Cave at 5.8 m
Free water at 1.2 m

BOREHOLE NUMBER 112

G2S Consulting Inc.

CLIENT Charis Developments Ltd.
PROJECT NAME 839 & 869 Hurontario St & 7564 Poplar Side Rd
PROJECT NUMBER G2S21366B
PROJECT LOCATION Collingwood, Ontario
DATE STARTED 21-9-30 **COMPLETED** 21-10-1
GROUND ELEVATION 195.87 m
DRILLING CONTRACTOR Davis
LOGGED BY DB **CHECKED BY** AA
DRILLING METHOD CME 45 Track
NOTES

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY (PL MC LL)	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
0	FILL: Sand and gravel, brown, some silt, possible cobble and boulder sized material at surface, moist		SS1	AU				15/0		
1			SS2	SPT	23			20/0		
1.5		194.37								
2	SILT: Greyish brown, layered, trace sand, trace gravel, some clay moist to wet, very loose to loose		SS3	SPT	7			10/0		
3			SS4	SPT	10			20/0		
4			SS5	SPT	4			15/0		
5			SS6	SPT	2			20/0		
5.3		190.54	SS7	SPT	6			20/0		
5.9	SANDY SILT TILL: Grey, some gravel, very moist, compact	189.93	SS8	SPT	12			15/0		

Borehole terminated at 5.9 m.

Upon completion of augering
Cave at 3.0 m
Free water at 3.1 m

BOREHOLE NUMBER 113

G2S Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 21-9-30 **COMPLETED** 21-9-30 **GROUND ELEVATION** 194.85 m

DRILLING CONTRACTOR Davis **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD CME 45 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
0.20	TOPSOIL: ~200 mm	194.65									
1	CLAYEY SILT: Brown to grey, trace sand, trace organics, moist, firm to very stiff, reworked appearance at the top portion			SS1	SPT	6					
				SS2	SPT	17					
2				SS3	SPT	12					
2.3		192.56									
3	SILT: Greyish brown, layered, trace sand, trace gravel, some clay moist to wet, very loose to loose			SS4	SPT	6					
3.1		191.80									
4	CLAYEY SILT: Brown to grey, trace sand, trace gravel, moist, very soft			SS5	SPT	0 WH					1 3 68 28
					VANE	20 / 12					
4.6		190.28									
5	SILTY SAND TILL/SANDY SILT TILL: Grey, some gravel, some clay, very moist, loose to very dense			SS6	SPT	4					16 38 28 18
6				SS7	SPT	34					
				SS8	SPT	50	50/125 mm				
6.7		188.14									

Borehole terminated at 6.7 m.

Upon completion of augering
No cave
Free water at 2.3 m

BOREHOLE NUMBER 114

Consulting Inc.

CLIENT Charis Developments Ltd.
PROJECT NAME 839 & 869 Hurontario St & 7564 Poplar Side Rd
PROJECT NUMBER G2S21366B
PROJECT LOCATION Collingwood, Ontario
DATE STARTED 21-9-30 **COMPLETED** 21-9-30
GROUND ELEVATION 195.01 m
DRILLING CONTRACTOR Davis
LOGGED BY DB **CHECKED BY** AA
DRILLING METHOD CME 45 Track
NOTES

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY (PL MC LL)	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
0.10	TOPSOIL: ~100 mm	194.91								
1	CLAYEY SILT: Brown to grey, some sand, trace organics, occasional sand seams, moist, firm to very stiff, reworked appearance at the top portion		SS1	SPT	5					
			SS2	SPT	18					
2			SS3	SPT	6					
2.3		192.72								
3	SILT: Grey, layered, trace sand, trace gravel, some clay, moist, soft		SS4	SPT	4					
3.1		191.96								
4	SANDY SILT TILL: Grey, trace to some gravel, trace clay, compact, wet		SS5	SPT	11					
5			SS6	SPT	11					
5.2		189.83								

Borehole terminated at 5.2 m.

Upon completion of augering
No cave
Free water at 3.7 m

BOREHOLE NUMBER 115

G2S Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 21-10-1 **COMPLETED** 21-10-1 **GROUND ELEVATION** 195.28 m

DRILLING CONTRACTOR Davis **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD CME 45 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
	0.25 TOPSOIL: ~250 mm	195.03									
	FILL: Clayey silt, brown, some sand, trace gravel, moist			SS1	SPT	2					
	0.76	194.52									
1	CLAYEY SILT: Brown to grey, trace sand, trace organics, very moist, stiff, reworked appearance at the top portion			SS2	SPT	12					
2				SS3	SPT	11					
	2.3	192.99									
	SILT: Greyish brown, layered, trace sand, trace gravel, some clay, very moist to wet, very loose to loose			SS4	SPT	7					
3				SS5	SPT	1					
4					VANE		5.0 29				
	4.6	190.71									
	SANDY SILT TILL: Grey, some gravel, trace clay, very dense, wet			SS6	SPT	50	50/100 mm				
5	5.2	190.10									

Borehole terminated at 5.2 m.

Upon completion of augering
Cave at 3.9 m
Free water at 4.0 m

BOREHOLE NUMBER 116

Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 21-10-22 **COMPLETED** 21-10-22 **GROUND ELEVATION** 195.22 m

DRILLING CONTRACTOR LST **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD Diedrich D50 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
1	FILL: Sandy silt, dark brown to brown, trace clay, trace gravel, trace organics, moist	194.15		SS1	SPT	5					
1.1				SS2	SPT	7					
2	CLAYEY SILT: Brown, some sand, reworked appearance at top portion, moist, stiff	193.09		SS3	SPT	11					
2.1	Borehole terminated at 2.1 m.										

SPT N values: N values ▲ 10 20 30 40 CPT values △

Undrained Shear Strength (kPa): Pocket Penetrometer × 40 80 120 160 Vane ✚

MOISTURE / PLASTICITY: PL MC LL 10 20 30

Upon completion of augering
No cave
No free water

2021 G2S GEOTECH BOREHOLE LOG G2S21366 BOREHOLE LOGS.GPJ G2S 2021 BH DATA TEMPLATE.GDT 22-2-4

BOREHOLE NUMBER 117

G2S Consulting Inc.

CLIENT Charis Developments Ltd.
PROJECT NAME 839 & 869 Hurontario St & 7564 Poplar Side Rd
PROJECT NUMBER G2S21366B
PROJECT LOCATION Collingwood, Ontario
DATE STARTED 21-10-22 **COMPLETED** 21-10-22
GROUND ELEVATION 194.39 m
DRILLING CONTRACTOR LST
LOGGED BY DB **CHECKED BY** AA
DRILLING METHOD Diedrich D50 Track
NOTES

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
	0.08 TOPSOIL: ~75 mm	194.32									
1	CLAYEY SILT: Brown to grey, occasional sand seams, moist to very moist, firm to stiff, reworked appearance at top portion			SS1	SPT	5			0/0		
				SS2	SPT	9	225		0/0		
2	2.1	192.26		SS3	SPT	9	225		0/0		

SPT N VALUES: N values ▲ 10 20 30 40 CPT values △
Undrained Shear Strength (kPa): Pocket Penetrometer × 40 80 120 160 Vane ✚
MOISTURE / PLASTICITY: PL MC LL 10 20 30

Borehole terminated at 2.1 m.

Upon completion of augering
No cave
No free water

BOREHOLE NUMBER 118

Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 21-10-1 **COMPLETED** 21-10-1 **GROUND ELEVATION** 194.74 m

DRILLING CONTRACTOR Davis **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD CME 45 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
	0.20 TOPSOIL: ~200 mm	194.54									
	FILL: Silty sand, brown, trace gravel, moist, contains brick debris			SS1	SPT	3					
	0.76	193.98									
1	CLAYEY SILT: Brown to grey mottled, trace sand, moist to very moist stiff to very stiff			SS2	SPT	16					
2				SS3	SPT	13					
	2.1	192.61									

SPT N VALUES: N values ▲ 10 20 30 40 CPT values △

Undrained Shear Strength (kPa): Pocket Penetrometer × 40 80 120 160 Vane ✚

MOISTURE / PLASTICITY: PL MC LL 10 20 30

Borehole terminated at 2.1 m.

Upon completion of augering
No cave
No free water

BOREHOLE NUMBER 119

Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 21-10-21 **COMPLETED** 21-10-21 **GROUND ELEVATION** 195.66 m

DRILLING CONTRACTOR LST **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD Diedrich D50 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
1	FILL: Sand and gravel, brown, some silt, cobble and boulder size material on the surface, moist			SS1	SPT	28					
				SS2	SPT	16					
1.2		194.46									
2	CLAYEY SILT: Brown to grey mottled, trace sand, moist to very moist, very stiff			SS3.	SPT	17					
2.1		193.53									

Borehole terminated at 2.1 m.

Upon completion of augering
No cave
No free water

BOREHOLE NUMBER 120

Consulting Inc.

CLIENT Charis Developments Ltd.
PROJECT NAME 839 & 869 Hurontario St & 7564 Poplar Side Rd
PROJECT NUMBER G2S21366B
PROJECT LOCATION Collingwood, Ontario
DATE STARTED 21-10-21 **COMPLETED** 21-10-21
GROUND ELEVATION 195.83 m
DRILLING CONTRACTOR LST
LOGGED BY DB **CHECKED BY** AA
DRILLING METHOD Diedrich D50 Track
NOTES

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
							N values ▲ 10 20 30 40 CPT values △ / Pocket Penetrometer × Vane ✚ 40 80 120 160	PL MC LL 10 20 30			
1	FILL: Sand and gravel, brown, some silt, cobble and boulder size material on the surface, moist			SS1	SPT	22	▲	●			
				SS2	SPT	29	▲	●			
	1.4	194.48									
2	CLAYEY SILT: Brown to grey mottled, trace sand, moist to very moist, very stiff			SS3	SPT	18	▲	●			
	2.1	193.70									

Borehole terminated at 2.1 m.

Upon completion of augering
No cave
No free water

BOREHOLE NUMBER 121

Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 21-10-1 **COMPLETED** 21-10-1 **GROUND ELEVATION** 194.70 m

DRILLING CONTRACTOR Davis **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD CME 45 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
	0.15 TOPSOIL: ~150 mm	194.55					N values ▲ 10 20 30 40; CPT values △; Pocket Penetrometer ×; Vane ✚; 40 80 120 160	PL MC LL; 10 20 30			
1	CLAYEY SILT: Brown to grey mottled, trace sand, moist to very moist, stiff to very stiff			SS1	SPT	3	▲	●			
				SS2	SPT	15	▲	●			
2	2.1	192.57		SS3	SPT	16	▲	●			

Borehole terminated at 2.1 m.

Upon completion of augering
No cave
No free water

BH/MW NUMBER 122

G2S Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 21-9-30 **COMPLETED** 21-9-30 **GROUND ELEVATION** 195.09 m

DRILLING CONTRACTOR Davis **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD CME 45 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
0.25	TOPSOIL: ~250 mm	194.84								
0.76	FILL: Clayey silt, brown to dark brown, mixed with organics, some sand, some gravel, moist	194.33	SS1	SPT	3					
1	CLAYEY SILT: Brown to grey, occasional sand seams, trace gravel, moist to very moist, stiff to very stiff		SS2	SPT	16					
2			SS3	SPT	11					
2.3		192.80								
3	SILT: Greyish brown, layered, trace sand, trace gravel, some clay, very moist to wet, very loose to loose		SS4	SPT	7					
			SS5	SPT	0	WH				
4				VANE		3.0 / 50				
4.6		190.52								
5	CLAYEY SILT: Brown to grey, trace sand, trace gravel, moist, very soft		SS6	SPT	0	WH				5 3 60 32
6										
6.1		188.99								
7	SAND TILL: Grey, medium to coarse, mixed with gravel, trace silt, wet, compact to very dense		SS7	SPT	17					33 60 7 0
8			SS8	SPT	64	>>				
8.2		186.86								

Borehole terminated at 8.2 m.

Water Level Readings:

Date	Depth (m)	Elev. (m)
2022-01-21	0.0	195.1
2021-11-03	0.1	195.0
2021-10-13	0.4	194.7

2021 G2S GEOTECH BOREHOLE LOG G2S21366 BOREHOLE LOGS.GPJ G2S 2021 BH DATA TEMPLATE.GDT 22-2-4

BOREHOLE NUMBER 123

Consulting Inc.

CLIENT Charis Developments Ltd.
PROJECT NAME 839 & 869 Hurontario St & 7564 Poplar Side Rd
PROJECT NUMBER G2S21366B
PROJECT LOCATION Collingwood, Ontario
DATE STARTED 21-10-21 **COMPLETED** 21-10-21
GROUND ELEVATION 195.75 m
DRILLING CONTRACTOR LST
LOGGED BY DB **CHECKED BY** AA
DRILLING METHOD Diedrich D50 Track
NOTES

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
	FILL: Sand and gravel, brown, some silt, cobble and boulder size material on the surface, moist			SS1	SPT	25					
1	0.93	194.83									
	CLAYEY SILT: Greyish brown, mottled, trace sand, trace gravel, moist, stiff to very stiff			SS2	SPT	14					
2	2.1	193.62		SS3	SPT	15					

SPT N values: N values ▲ 10 20 30 40; CPT values △
Undrained Shear Strength (kPa): Pocket Penetrometer × 40 80 120 160; Vane ✚
MOISTURE / PLASTICITY: PL MC LL; 10 20 30

Borehole terminated at 2.1 m.

Upon completion of augering
No cave
No free water

BH/MW NUMBER 101A

Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 22-1-7 **COMPLETED** 22-1-7 **GROUND ELEVATION** 194.50 m

DRILLING CONTRACTOR Davis **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD CME 45 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES N values ▲ 10 20 30 CPT values △ 40 / Undrained Shear Strength (kPa) Pocket Penetrometer × Vane ✚ 40 80 120 160	MOISTURE / PLASTICITY PL MC LL 10 20 30	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
0	Straight auger to 3.05 m for sampling and 4.57 m for monitoring well installation									Stickup	
1											
2										Bentonite seal	
3										Filter sand	
				1	ST						
4										Slotted screen	
	4.6	189.93									

Borehole terminated at 4.6 m.

Water Level Readings:

Date	Depth (m)	Elev. (m)
2022-01-21	1.1	193.4

BH/MW NUMBER 103A

Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 22-1-7 **COMPLETED** 22-1-7 **GROUND ELEVATION** 194.39 m

DRILLING CONTRACTOR Davis **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD CME 45 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES N values ▲ 10 20 30 CPT values △ 40 / Undrained Shear Strength (kPa) Pocket Penetrometer × Vane ✚ 40 80 120 160	MOISTURE / PLASTICITY PL MC LL 10 20 30	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
0	Straight auger to 2.29 m for sampling and 4.57 m for monitoring well installation									Stickup	
1											
2										Bentonite seal	
3				1	ST					Filter sand	
4										Slotted screen	
4.6		189.82									

Borehole terminated at 4.6 m.

Water Level Readings:

Date	Depth (m)	Elev. (m)
2022-01-21	0.7	193.7

BOREHOLE NUMBER 106A

G2S Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 22-1-7 **COMPLETED** 22-1-7 **GROUND ELEVATION** 194.54 m

DRILLING CONTRACTOR Davis **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD CME 45 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES N values ▲ 10 20 30 CPT values △ 40 / Undrained Shear Strength (kPa) Pocket Penetrometer × Vane ✚ 40 80 120 160	MOISTURE / PLASTICITY PL MC LL 10 20 30	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
1	Straight auger to 3.05 m for sampling and 4.57 m for monitoring well installation									Stickup	
2										Bentonite seal	
3	3.1	191.49								Filter sand	
4	SILT: Grey, some sand, some clay, trace gravel, wet, loose			SS1	SPT	6	▲			Slotted screen	
				SS2	SPT	6	▲				
	4.4	190.12									

Borehole terminated at 4.6 m.

Refer to report for groundwater elevation data

BH/MW NUMBER 115A

Consulting Inc.

CLIENT Charis Developments Ltd. **PROJECT NAME** 839 & 869 Hurontario St & 7564 Poplar Side Rd

PROJECT NUMBER G2S21366B **PROJECT LOCATION** Collingwood, Ontario

DATE STARTED 22-1-7 **COMPLETED** 22-1-7 **GROUND ELEVATION** 195.28 m

DRILLING CONTRACTOR Davis **LOGGED BY** DB **CHECKED BY** AA

DRILLING METHOD CME 45 Track **NOTES**

DEPTH (m)	MATERIAL DESCRIPTION	ELEVATION (m)	GRAPHIC LOG	NUMBER	TYPE	N VALUE	SPT N VALUES / Undrained Shear Strength (kPa)	MOISTURE / PLASTICITY	SOIL GAS READINGS HEX/IBL (ppm)	WELL CONSTRUCTION	GRAIN SIZE DISTRIBUTION % GR SA SI & CL
	Straight auger to 3.05 m for sampling and 4.57 m for monitoring well installation						N values ▲ 10 20 30 CPT values △ 40; Pocket Penetrometer × Vane ✚ 40 80 120 160	PL MC LL 10 20 30		Stickup; Bentonite seal; Filter sand; Slotted screen	
3.1	SILT: Grey, some sand, some clay, wet, loose	192.23		SS1	SPT	4	▲				
4.3		190.98		SS2	SPT	0	▲				
4.4	GRAVELLY SILT TILL: Grey, some sand, moist	190.88									
	Borehole terminated at 4.6 m.										

Water Level Readings:

Date	Depth (m)	Elev. (m)
2022-01-21	0.6	194.7

Consulting Inc.
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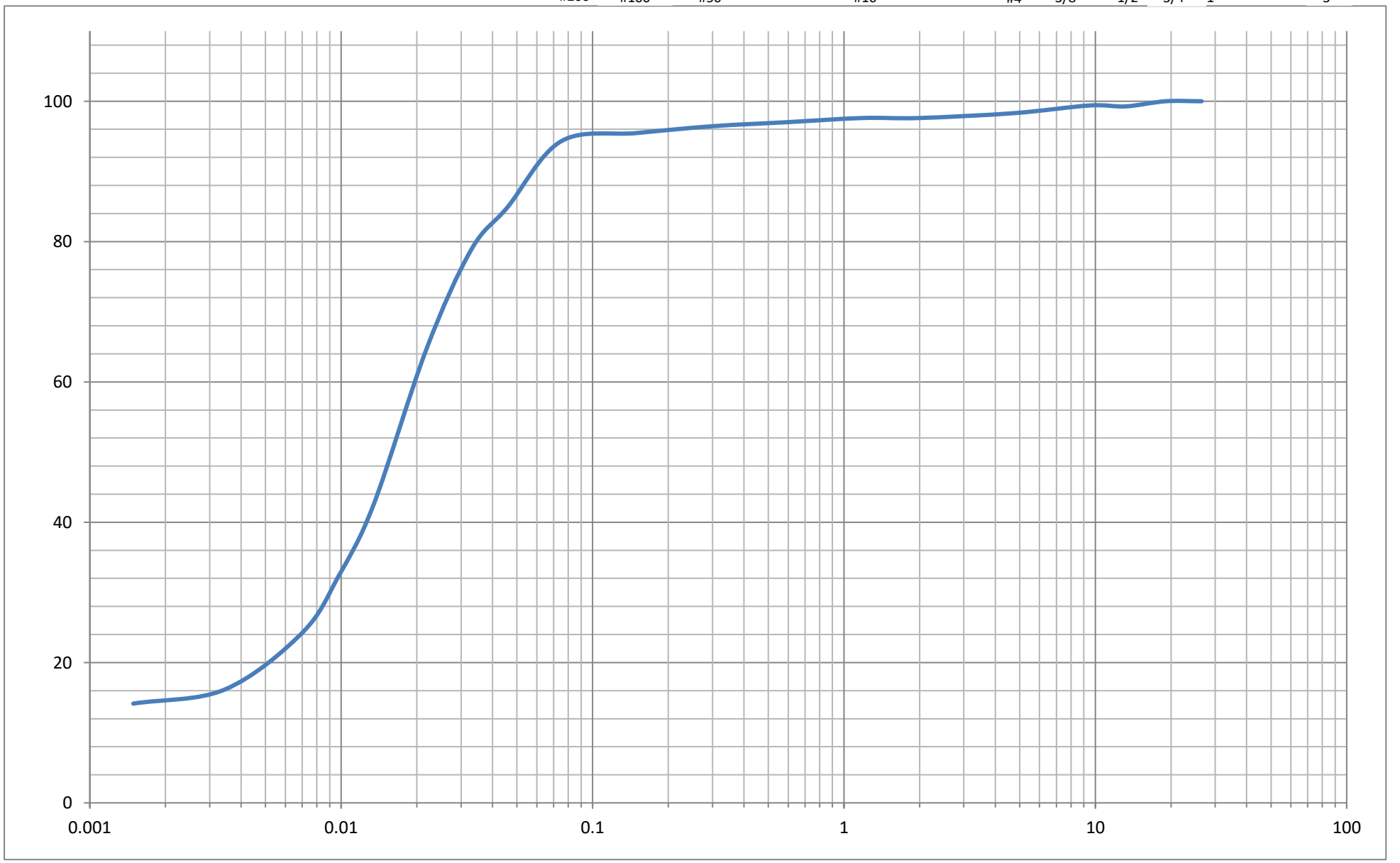
Project No.: G2S21366B
Project Name: 839 & 869 Hurontario St.&7564 Poplar St.

Lab No.: # 21031A
Borehole/Sample No.: BH102-SS5

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL		
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse

1 2 6 20 60 #200 #100 #50 #16 #4 3/8" 1/2" 3/4" 1" 3"



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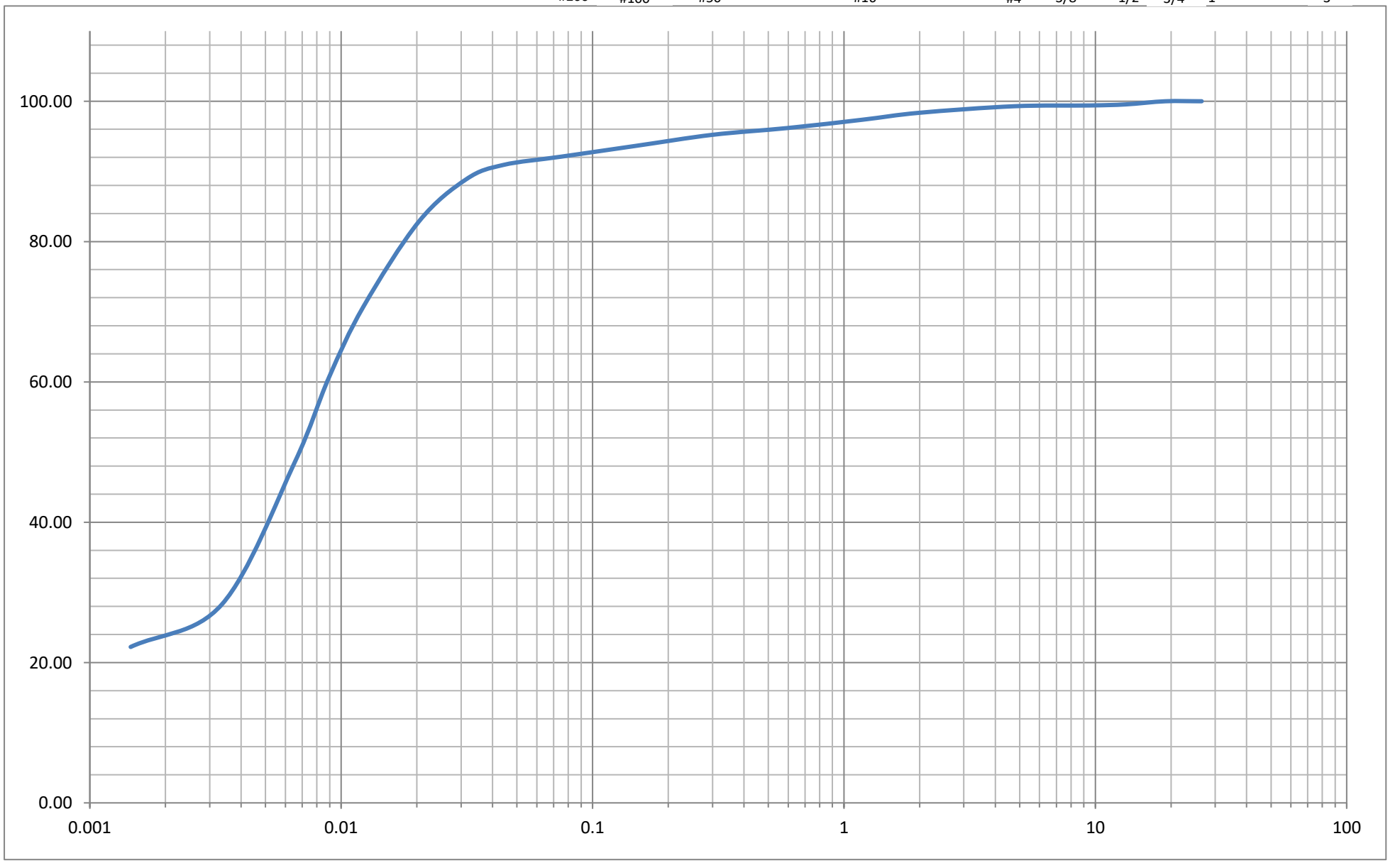
Project No.: G2S21366B
Project Name: 839 & 869 Hurontario St.&7564 Poplar St.

Lab No.: # 21031B
Borehole/Sample No.: BH103-SS4

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL		
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse

1 2 6 20 60 #200 #100 #50 #16 #4 3/8" 1/2" 3/4" 1" 3"



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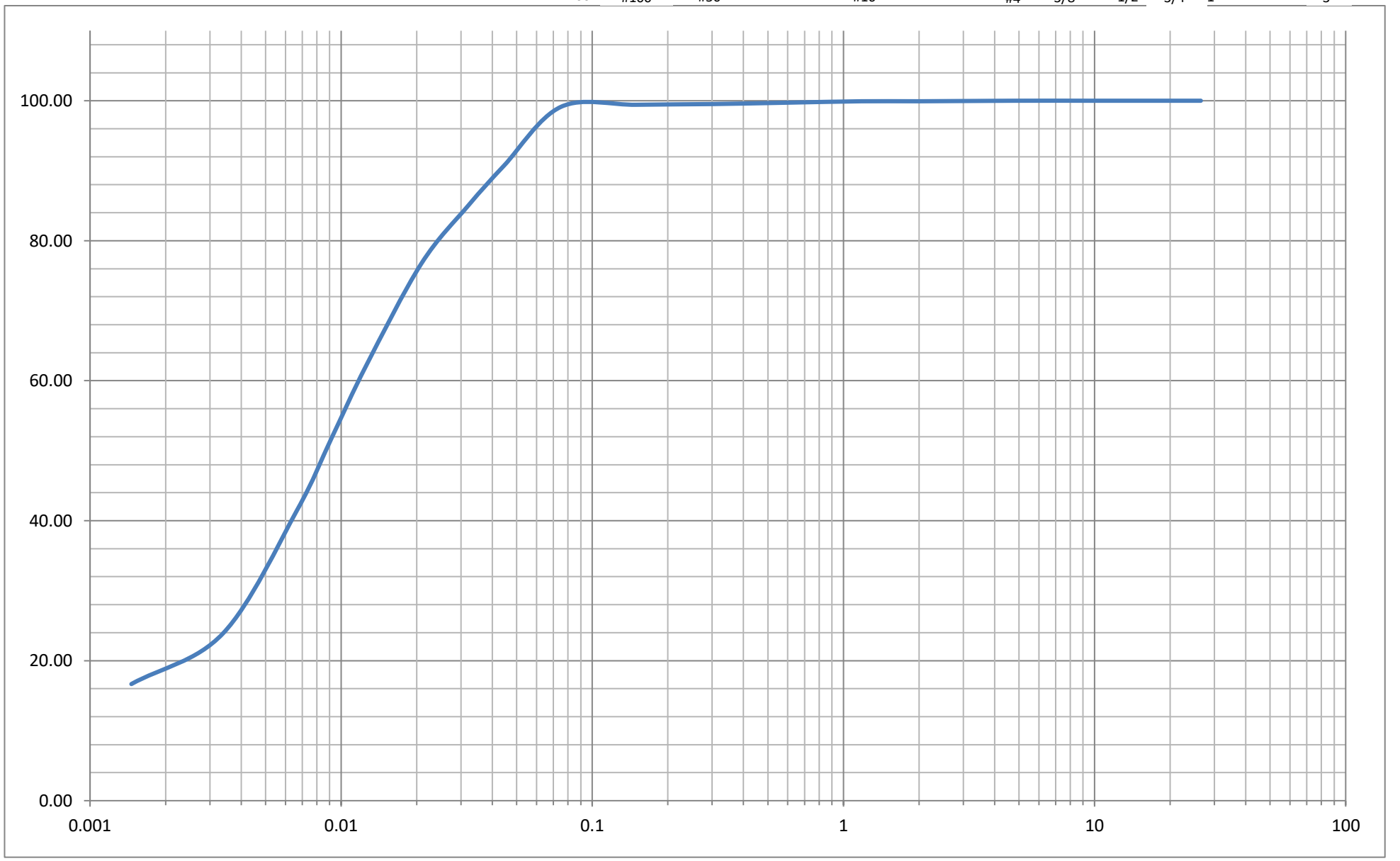
Project No.: G2S21366B
Project Name: 839 & 869 Hurontario St.&7564 Poplar St.

Lab No.: # 21031C
Borehole/Sample No.: BH105-SS4

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL		
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse

1 2 6 20 60 #200 #100 #50 #16 #4 3/8" 1/2" 3/4" 1" 3"



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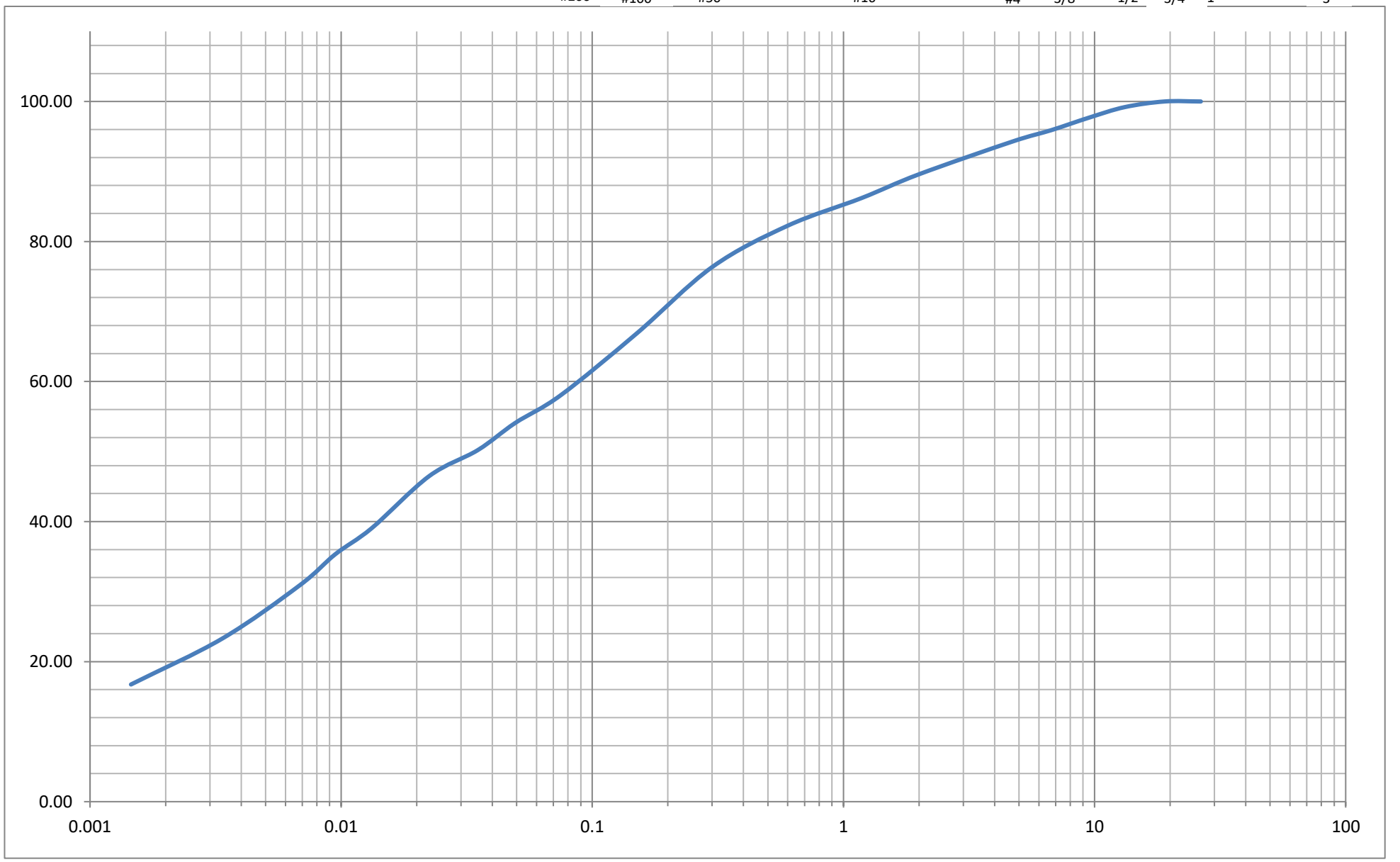
Project No.: G2S21366B
Project Name: 839 & 869 Hurontario St.&7564 Poplar St.

Lab No.: # 21031D
Borehole/Sample No.: BH107-SS5

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL		
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse

1 2 6 20 60 #200 #100 #50 #16 #4 3/8" 1/2" 3/4" 1" 3"



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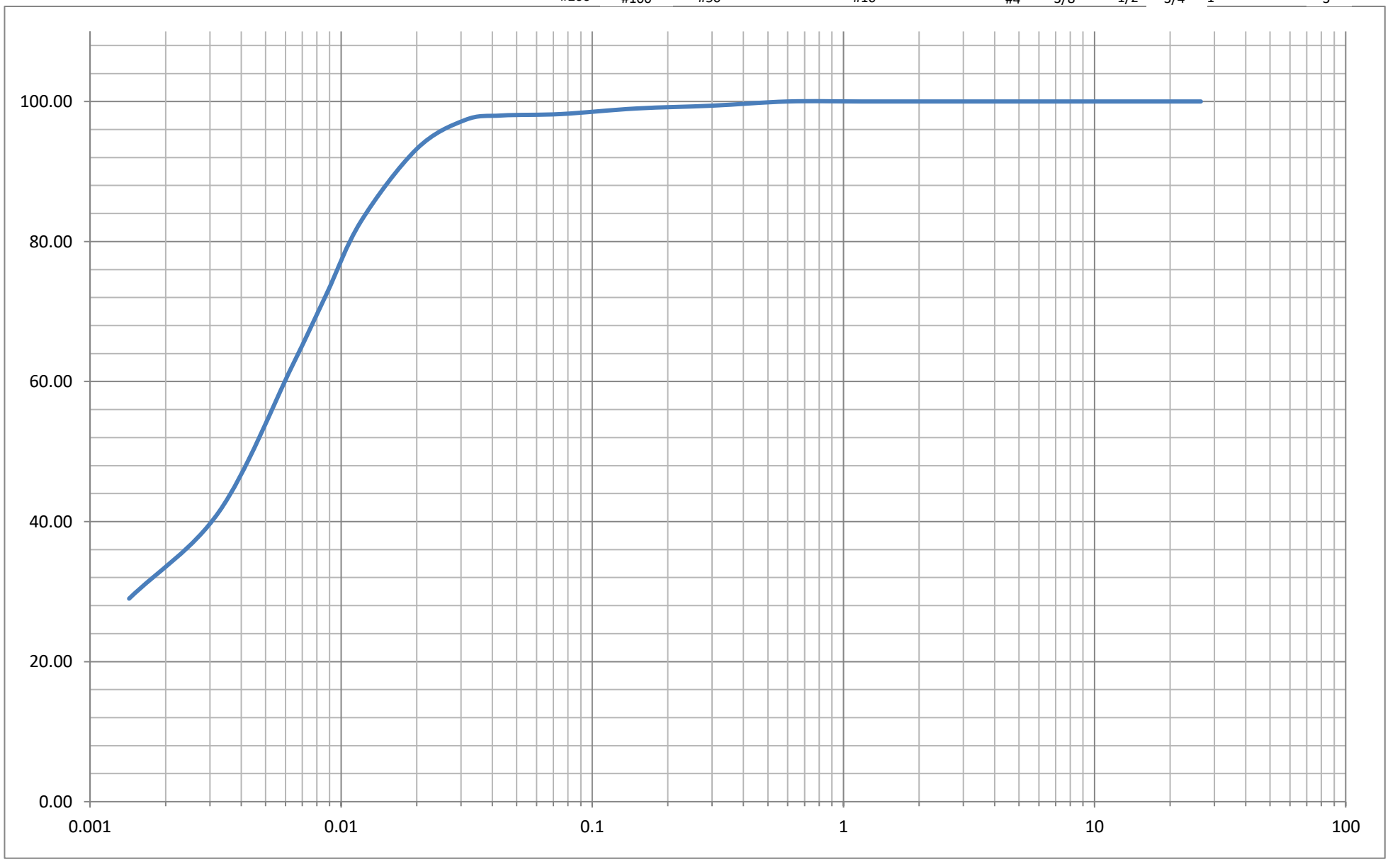
Project No.: G2S21366B
Project Name: 839 & 869 Hurontario St.&7564 Poplar St.

Lab No.: # 21031E
Borehole/Sample No.: BH109-SS3

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL		
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse

1 2 6 20 60 #200 #100 #50 #16 #4 3/8" 1/2" 3/4" 1" 3"



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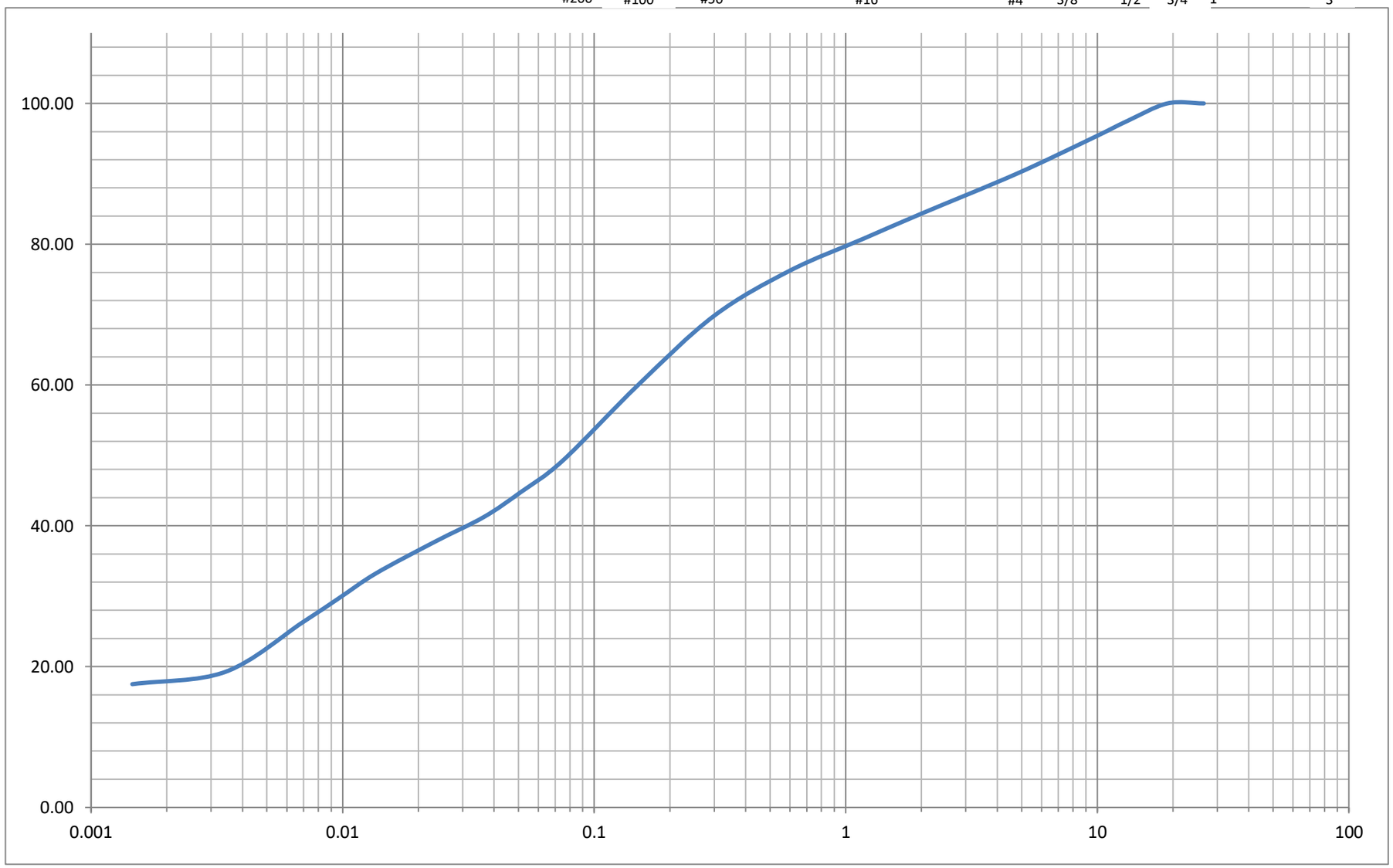
Project No.: G2S21366B
Project Name: 839 & 869 Hurontario St.&7564 Poplar St.

Lab No.: # 21031F
Borehole/Sample No.: BH113-SS6

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL		
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse

1 2 6 20 60 #200 #100 #50 #16 #4 3/8" 1/2" 3/4" 1" 3"



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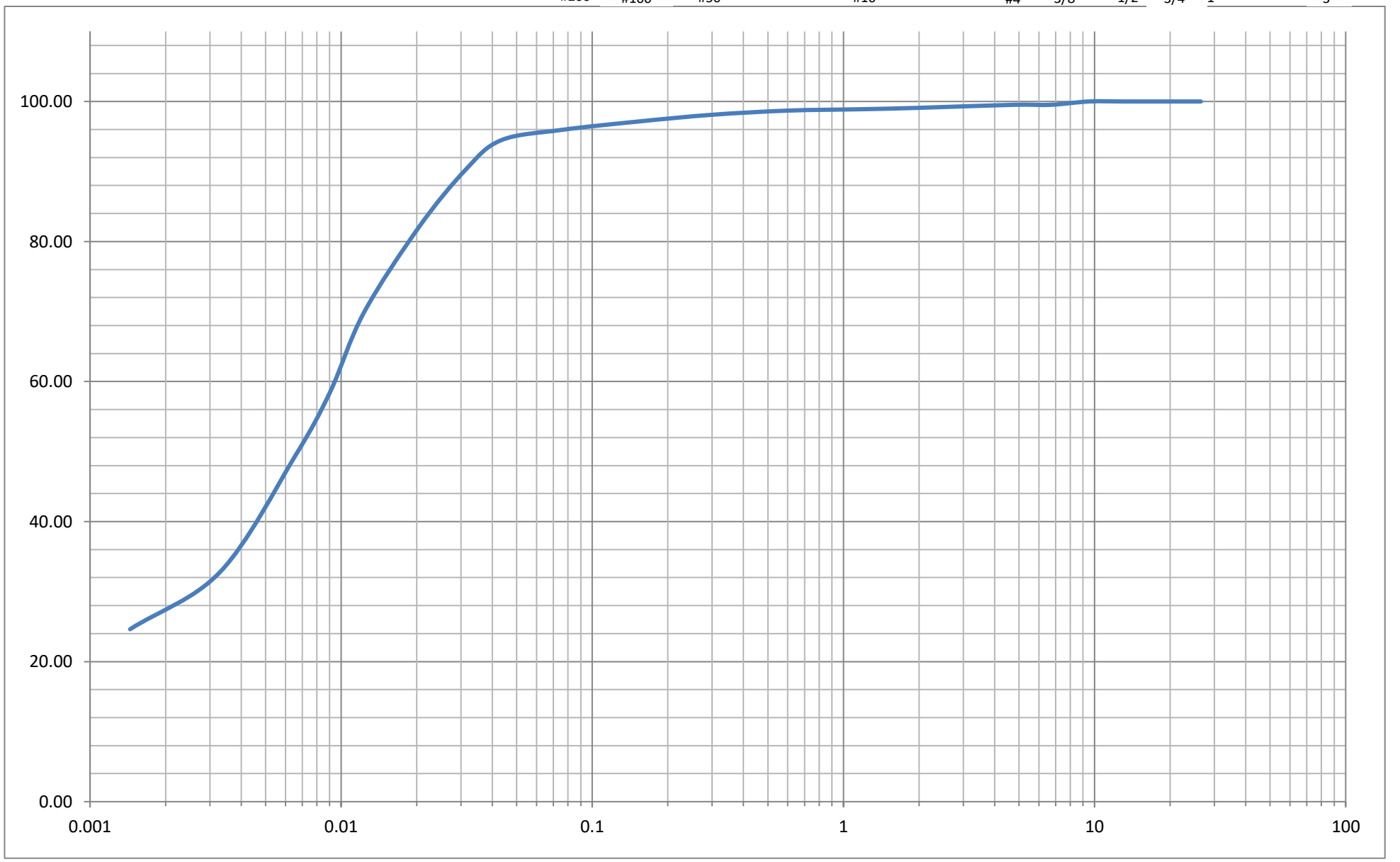
Project No.: G2S21366B
Project Name: 839 & 869 Hurontario St.&7564 Poplar St.

Lab No.: # 21031G
Borehole/Sample No.: BH113-SS5

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL		
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse

1 2 6 20 60 #200 #100 #50 #16 #4 3/8" 1/2" 3/4" 1" 3"



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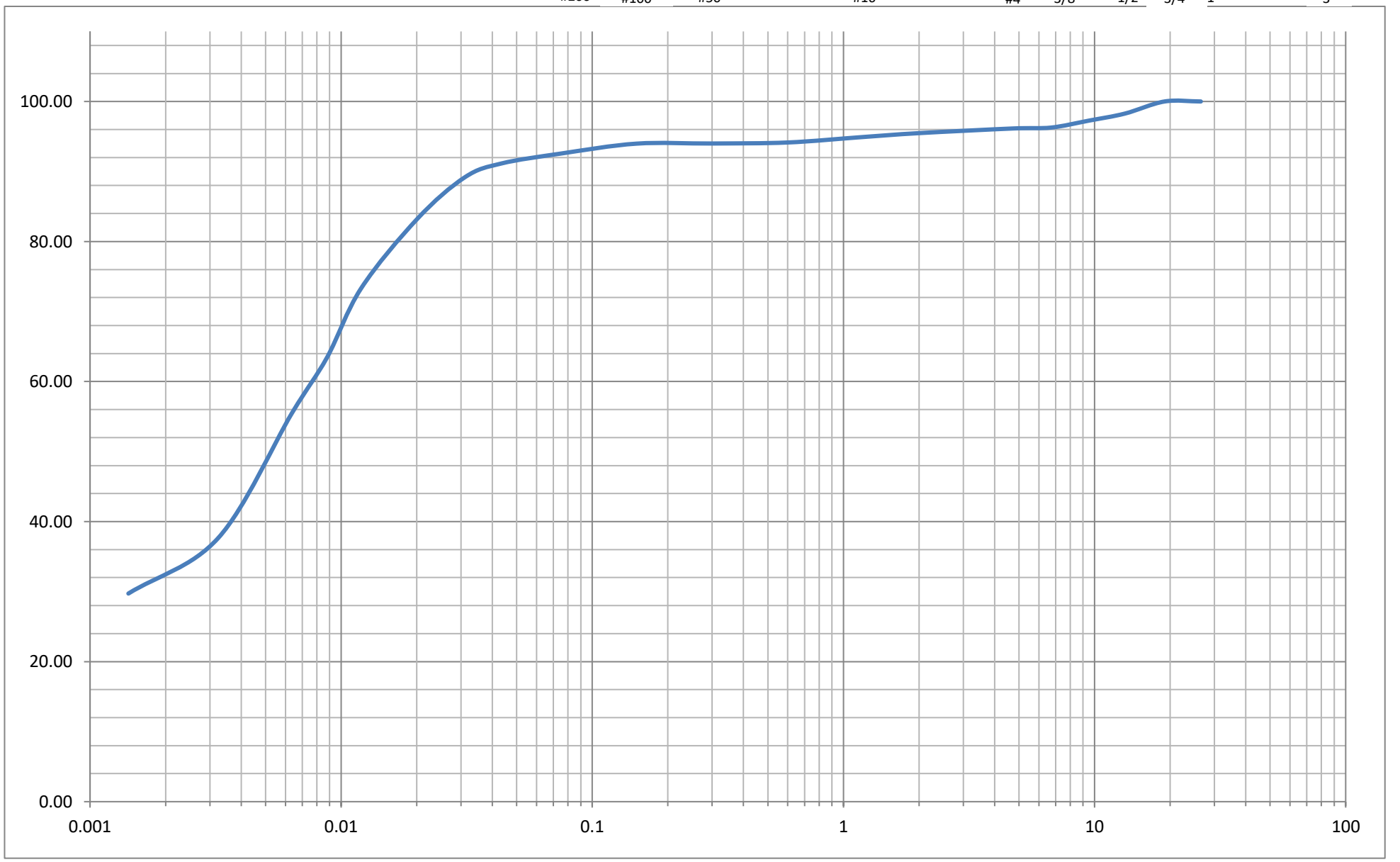
Project No.: G2S21366B
Project Name: 839 & 869 Hurontario St.&7564 Poplar St.

Lab No.: # 21031H
Borehole/Sample No.: BH122-SS6

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL		
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse

1 2 6 20 60 #200 #100 #50 #16 #4 3/8" 1/2" 3/4" 1" 3"



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Project No.: G2S21366 **Lab No.:** 21031

Project Name 839 & 869 Hurontario St. & 7564 Poplar Side Rd. **Borehole/Sample No.:**

PLASTICITY CHART