



Geotechnical Investigation Report

Cassie Campbell Community Centre

January 11, 2024

Prepared for:
Landscape Planning Ltd.

Cambium Reference: 19060-001

CAMBIUM INC.

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1.0 Introduction

Cambium Inc. (Cambium) was retained by Landscape Planning Ltd. (Client) to complete a geotechnical investigation in support of the proposed field hockey dome to be constructed at Cassie Campbell Community Centre Park.

Cassie Campbell Community Centre Park is located at the western corner of Sandalwood Parkway West and Chinguacousy Road in Brampton Ontario. A Site Location Plan is appended to this report as Figure 1. The study area of this investigation is on the northwest side of site on the existing cricket and soccer fields. The project includes a field hockey dome structure, pedestrian pathways, associated servicing, and potential reinstatement of some existing parking lot asphalt. The purpose of the geotechnical investigation was to obtain information about the subsurface conditions by means of a number of boreholes and based on the findings provide geotechnical recommendations for the design of the proposed field hockey dome.



2.0 Methodology

2.1 Borehole Investigation

Cambium completed a borehole investigation at the Site on November 14 and 15, 2023. A total of 18 boreholes, designated as BH101-23 through BH118-23, were advanced into the subsurface at predetermined locations throughout the Site. Seven boreholes were terminated at a depth of 5.0 metres below ground surface (mbgs), and the remaining 11 boreholes were terminated at 2.0 mbgs. The boreholes were surveyed using a Topcon Real-time Kinematic (RTK) unit and the elevation of the boreholes was tied to geodetic datum. A Borehole Location Plan, with borehole and benchmark locations is appended as Figure 2 of this report.

Drilling and sampling was completed using a track-mounted drill rig operating under the supervision of a Cambium technician. The boreholes were advanced to the sampling depths by means of continuous flight solid stem augers with 50 mm O.D. split spoon samplers. Standard Penetration Test (SPT) N values were recorded for the sampled intervals as the number of blows required to drive a split spoon sampler 305 mm into the soil, using a 63.5 kg drop hammer falling 750 mm, as per ASTM D1586 procedures. The SPT N values are used in this report to assess consistency of cohesive soils and relative density of non-cohesive materials. Soil samples were collected at approximately 0.75 m intervals. The encountered soil units were logged in the field using visual and tactile methods, and samples were placed in labelled plastic bags for transport, future reference, possible laboratory testing, and storage.

Open boreholes were checked for groundwater and general stability prior to backfilling. All boreholes were backfilled and sealed in accordance with Ontario Regulation (O.Reg.) 903, as amended, and the property was reinstated to pre-existing conditions.

Borehole logs are provided in Appendix A. Site soil and groundwater conditions are described and geotechnical recommendations are discussed in the following sections of this report.

2.2 Laboratory Testing

Physical laboratory testing, including three particle size distribution analyses (LS-702,705), was completed on selected soil samples to confirm textural classification and to assess



geotechnical parameters. Moisture content testing was completed on all soil samples. Testing results are presented in Appendix B and are discussed in Section 3.0.

2.3 Chemical Laboratory Testing

Representative samples collected from the investigation were returned to our laboratory for detailed visual examination. Chemical laboratory soil testing was completed on various soil samples taken for excess soil characterization in accordance with O.Reg. 406/19. Results of the excess soil characterization are compiled in a report under separate cover.



3.0 Subsurface Conditions

The detailed soil profiles encountered in the boreholes are indicated on the attached borehole logs in Appendix A. It should be noted that the conditions indicated on the borehole logs are for specific locations only and can vary between and beyond the borehole locations.

Based on the results of the borehole investigation, subsurface conditions at the Site generally consist of a layer of topsoil and / or fill overlaying silty sand, sand and silt or sandy silt deposits.

3.1 Pavement Structure

BH111-23 was advanced on the south side of site through the existing asphalt pathway. 115 mm of asphalt was observed at the surface. Underlying the asphalt was approximately 150 mm of sand and gravel granular fill material. The fill was described as moist at the time of the investigation. SPT N value of 6 observed in the granular fill indicates a loose relative density.

3.2 Topsoil

A layer of topsoil was observed at the surface of all borehole locations except BH111-23. The topsoil layer ranged in thickness from 130 to 200 mm and was approximately 150 mm thick on average. The topsoil was dark brown with some organic inclusions.

3.3 Earth Fill

In all boreholes, a cohesive clayey silt to clayey sandy silt fill was observed underlying the topsoil and extending to depths of 1.3 to 2.3 mbgs. This soil appeared to be reworked native material, was brown to grey in colour, and contained trace gravel and sand as well as trace organics. SPT N values in the cohesive fill range from 8 to 23 which indicates a stiff to very stiff consistency. Moisture contents in the cohesive fill ranged from 11% to 22%.

A laboratory particle size distribution analysis was completed for one sample of the fill material taken from a depth of between 1.5 and 2.1 mbgs. The analysis results are summarized in Table 1 with details provided in Appendix B.



Table 1 Particle Size Distribution Analysis – Earth Fill

Borehole	Depth (mbgs)	Soil	% Gravel	% Sand	% Silt	% Clay	% Moisture Content
BH116-23 SS2	0.8 – 1.2	Clayey Silt some Sand trace Gravel	1	16	50	33	16.4

3.4 Clayey Silt

In BH102-23 through BH107-23 and BH116-23, a layer of native cohesive clayey silt was observed underlying the above discussed earth fill. The clayey silt was brown to grey in colour and extended to depths of approximately 4.0 mbgs in BH102-23 through BH107-23, and to termination depth of 2.0 mbgs in BH116-23. The clayey silt contained trace to some sand and gravel. Trace organics were observed in BH102-23, BH104-23, and BH106-23. The clayey silt was generally described as drier than plastic limit at the time of the investigation, with moisture contents ranging from 16% to 26%. SPT N values in the sandy silt ranged from 8 to 23 which indicates a loose to compact relative density, however on average the SPT N values were greater than 10 which indicates a compact relative density.

3.5 Till

The predominant native deposit on site at depth consisted of a till textured non-cohesive silt. The silt till soil contained varying matrices of clay and sand and was described as clayey silt and clayey sandy silt. This soil was observed in boreholes BH101-23 through BH107-23 and extended to termination depths of 5.0 mbgs in each of these boreholes. The clayey silt to clayey sandy silt till was brown in colour and contained trace to some gravel. The till was described as drier than plastic limit at the time of the investigation. SPT N values in the silt till soil ranged from 13 to 45 indicating a stiff to hard consistency. Laboratory derived moisture contents ranged from 12% to 16%.

A laboratory particle size distribution analysis was completed for two samples of the till taken from a depth of between 2.3 and 5.0 mbgs. The analysis results are summarized in Table 2 with details provided in Appendix B.



Table 2 Particle Size Distribution Analysis – Till

Borehole	Depth (mbgs)	Soil	% Gravel	% Sand	% Silt	% Clay	% Moisture Content
BH101-23 SS4	2.3 – 2.7	Clayey Silt some Sand some Gravel	10	19	43	28	13.4
BH106-23 SS6	4.6 – 5.0	Clayey Sandy Silt trace gravel	9	20	48	23	12.2

3.6 Groundwater

Upon completion of drilling, all boreholes were observed to be open and dry. Native soils observed were typically brown in colour and described as moist at the time of the investigation. No wet or saturated soils were observed during the drilling investigation. It should be noted that groundwater levels at the site may fluctuate seasonally and in response to climatic events.



4.0 Geotechnical Design Considerations

The following recommendations are based on the borehole information and are intended to assist the client. Recommendations should not be construed as providing instructions to contractors, who should form their own opinions about site conditions. It is possible that subsurface conditions beyond the borehole locations may vary from those observed. If significant variations are found before or during construction, Cambium should be contacted so that we can reassess our findings, if necessary.

4.1 General Site Preparation

All topsoil, organics, loose earth fill and deleterious material should be removed from below the development areas prior to construction. For site grading, in areas of cut or minor fill where the proof roll and/ or inspection has identified unsuitable subgrade conditions, whether too soft or too wet, material is to be removed and replaced with an approved OPSS 1010 Granular 'B' Type I compacted material, under guidance of Geotechnical Engineer.

4.2 Excavations

Temporary excavations must be carried out in accordance with the latest edition of the Occupational Health and Safety Act (OHSA). The soils at this site would generally be classified as Type 3 soils in accordance with OHSA, with unsupported side slopes no steeper than 1H:1V to the bottom of the excavation. Excavation side slopes should be protected from exposure to precipitation and associated ground surface runoff and should be inspected regularly for signs of instability. If localized instability is noted during excavations or if wet conditions are encountered, the side slopes should be flattened as required to maintain safe working conditions or excavation sidewalls must be fully supported (shored).

4.3 Dewatering

As discussed in Section 3.6, groundwater was not observed in any boreholes upon completion of drilling. Based on these observations, it is anticipated that any groundwater will be below typical excavation depths, and any perched water or surface runoff that may be encountered should be controllable with filtered sumps and pumps.



4.4 Frost Penetration

Based on the Ontario Provincial Standard Drawing (OPSD) 3090.101, the typical frost penetration depth is expected to be approximately 1.2 mbgs. Footings for any proposed structure or underground services should be situated at or below this depth for frost penetration or should be insulated.

4.5 Foundation Design

From a geotechnical perspective, conventional shallow footings placed on competent native soils may be used to transfer loads from the proposed structures to the soils below. The native sub-soils are competent to support lightly loaded structures on conventional spread footings. These native sandy silt and clayey silt to clayey sandy silt till soils are considered competent to directly support loads from shallow footings. Based on the borehole investigation, the depth to competent native soils across the site is approximately 2.1 mbgs. It should be noted that this depth may vary between borehole locations.

Should incompetent (loose, soft and/or deleterious) soils or undocumented earth fill be encountered at the proposed footing depths following excavation, these soils are to be sub-excavated down to competent soils under the guidance of a qualified geotechnical engineer and replaced with competent engineered fill as detailed in Section 4.6.1. The recommendations and bearing capacities provided in this report assume that any incompetent materials and undocumented earth fill encountered at underside of footing depths will be sub-excavated and replaced in this manner.

Provided that footings are constructed according to the recommendations provided above, bearing directly on competent native soils with any localized incompetent soils removed and replaced with competent engineered fill material, footings situated at or below depths of 2.1 mbgs may be designed for geotechnical resistance at Ultimate Limit States (ULS) of 225 kPa and a geotechnical resistance at Serviceability Limit States (SLS) of 150 kPa (assuming 25 mm total and 19 mm differential of settlement). If a higher allowable bearing capacity than that outlined above is required, it may be achievable at a greater depth, this should be assessed on a specific basis once the loading conditions and location(s) are known.



The quality of the subgrade should be inspected by Cambium during construction, prior to constructing the footings, to confirm bearing capacity estimates.

4.5.1 Foundations on Engineered Fill

Alternatively, in areas where the proposed founding levels are above the level of competent native soil, or where sub excavation is required, footings may be made to bear directly on a pad of engineered fill constructed per the recommendations in Section 4.6.1. From a preliminary perspective, footings placed on approved engineered fill and appropriately protected from frost may be designed for a preliminary allowable bearing capacity of 100 kPa at SLS and 150 kPa at ULS. Cambium should be retained to review the final grading plan, as the preliminary engineered fill bearing capacity values will change depending on grade raises, engineered fill thickness, material and the native subgrade soil the engineered fill pad is constructed on.

Settlement potential at the above-noted SLS loadings is less than 25 mm and differential settlement should be less than 20 mm.

4.6 Backfill and Compaction

Engineered fill, if required for foundations, should consist of free-draining granular material meeting the specifications of OPSS 1010 Granular B or an approved equivalent and should be placed in maximum 200 mm thick lifts compacted to 100% of SPMDD, as confirmed by nuclear densometer testing.

Imported material for engineered fill should consist of clean, no-organic, soils, free of chemical contamination or deleterious material. The moisture content of the engineered fill will need to be close enough to optimum at the time of placement to allow for adequate compaction.

Foundation wall and any buried utility backfill material should consist of free draining imported granular material. Excavated materials with a high silt and/or clay content may not be suitable for re-use as backfill for foundation walls and for grading purposes. Geotechnical testing of the material will be required to confirm suitability and compaction parameters (i.e., Proctor testing to confirm optimum moisture content). The fines (silt and clay) content of materials utilized as



backfill for foundation walls/grading should not exceed 35%, which will need to be confirmed by sampling from stockpiled material and conducting confirmatory grain size analyses.

Typically, backfill should be placed in maximum 300 mm thick lifts and should be compacted to a minimum of 98% of SPMDD. Backfill adjacent to the structural elements (i.e., foundation walls) should be compacted to 95% of SPMDD taking care not to damage the adjacent structures. The backfill material in the upper 300 mm below the pavement subgrade elevation should be compacted to 100% of SPMDD in all areas.

All existing vegetation, topsoil, organic and non-organic fills, and any loose soils shall be removed down to a competent base. Backfill areas must be approved by a qualified geotechnical engineer prior to placement of any new fill, to ensure the suitability of subgrade conditions.

4.6.1 Engineered Fill

Where the existing fill is treated as an engineered fill to support structural elements such as foundations and/or floor slabs the following is recommended for the construction of engineered fill:

- I. Remove any and all existing vegetation, surficial topsoil / organics, organic fills or fills and any loose/disturbed soils to a competent subgrade for a suitable envelope.
- II. The area of the engineered fill should extend horizontally 1 m beyond the outside edge of the foundations then extend downward at an imaginary 1H:1V slope to the competent approved native soil. The exposed edges of the engineered fill should be sloped at a maximum of 3H:1V to avoid weakening of the engineered fill edges due to slope movement. If fill is required adjacent to sloped banks (i.e., slope steeper than 3H:1V), the fill shall be placed in stepped planes to avoid a plane weakness.
- III. The subgrade or base of the engineered fill area must be approved by Cambium prior to placement of any new fill, to ensure that suitability of subgrade condition.
- IV. Place approved OPSS 1010.MUNI SSM or Granular 'B' Type I material at a moisture content at or near optimum moisture in suitable maximum 200 mm thick lifts, compacted to 98% of SPMDD. If native soils from the site are not used as engineered fill, imported



material for engineered fill should consist of clean, non-organic soils, free of chemical contamination or deleterious material. Any frost penetration into the fill material must be removed prior to placement of subsequent lifts of fill and reviewed by Cambium.

- V. The engineered fill should be placed at least 600 mm above the elevation of the proposed underside of footing.
- VI. Due to the potential negative effects of differential settlement between the engineered fill and the native soils, in any block where footings are to be placed partly on engineered fill and partly on native soils, reinforcing steel bars should be included and placed within the footings and the top of the foundation walls. All tie reinforcing steel bars should be included and placed within the top of the foundation walls. All tie reinforcing steel bars should have at least 600 mm of overlap. The actual steel reinforcement design should be confirmed / designed by the project structural engineer.
- VII. Full time testing and inspection of the engineered fill will be required for it to be used as a founding material, as outlined in Section 4.2.2.2 of the Ontario Building Code.
- VIII. The final surface of the engineered fill should be protected as necessary from construction traffic, ponded water and freezing, and should be sloped to provide positive drainage for surface water during and following the construction period. During periods of freezing weather, additional soil cover should be placed above final subgrade to provide frost protection.

4.7 Pavement Design

It is understood that the construction may include installation of a fire route as well as reinstatement of areas of the parking lot that may be affected during construction. The recommended pavement structure design has been developed for two traffic loading scenarios, Medium-Duty, and Heavy-Duty. The heavy-duty design is appropriate for areas if heavy trucks and maintenance vehicles are anticipated to drive, while the medium duty design is appropriate for areas where no heavy traffic is anticipated. The recommended pavement structure is provided in Table 3.



Table 3 Pavement Structure

Pavement Layer	Compaction Requirements	Heavy Duty	Medium Duty
Surface Course Asphalt	OPSS 310	40 mm HL3	40 mm HL3
Binder Course Asphalt	OPSS 310	90 mm HL8 (2 lifts)	50 mm HL8
Granular Base	100% SPMDD	150 mm OPSS 1010 Granular A	150 mm OPSS 1010 Granular A
Granular Subbase	100% SPMDD	350 mm OPSS 1010 Granular B	300 mm OPSS 1010 Granular B

Material and thickness substitutions must be approved by the Design Engineer. Compaction of the subgrade should be verified by the Engineer prior to placing the granular base. Granular layers should be placed in 150 mm maximum loose lifts and compacted to specified density. The granular materials should conform to OPSS standards, as confirmed by appropriate materials testing.

A step joint should be formed between the patch and the adjacent existing pavement to a depth of the top lift (40 mm surface course). The exposed surface should be cleaned and tacked in accordance with OPSS 308, Construction Specification for Tack Coating and Joint Painting.

The long-term performance of the pavement structure is highly dependent upon the subgrade support and drainage conditions. Stringent construction control procedures should be maintained to ensure that uniform subgrade moisture and density conditions are achieved. The finished pavement surface and underlying subgrade should be free of depressions and should be sloped (preferably at a minimum grade of 2% for asphalt surface and 3% at subgrade surface) to provide effective surface drainage toward subdrains and/or catch basins. Surface water should not be allowed to pond adjacent to the outside edges of pavement areas.

4.8 Concrete Sidewalks

The performance of the concrete pavement is dependent upon proper subgrade preparation. All topsoil and organic materials should be removed down to native material and backfilled with approved engineered fill or native material, compacted to 95% SPMDD. The subgrade should be proof rolled and inspected by a Geotechnical Engineer. Any areas where rutting or



appreciable deflection is noted should be subexcavated and replaced with suitable fill. The fill should be compacted to at least 95% SPMDD.

The recommended concrete pavement for light duty loading condition is provided in Table 4 in accordance with City of Brampton Standard Drawing 227.

Table 4 Concrete Pavement – Light Duty

Pavement Layer	Requirement	Material /Thickness
Concrete Surface	30 MPa at 28 days	150 mm Hydraulic Cement Concrete (HCC)
Granular Subbase	98% SPMDD	150 mm OPSS 1010 Granular A

4.9 Site Servicing

Trench excavations above the groundwater table should generally consider Type 3 soil conditions, which require side slopes no steeper than 1H:1V.

Bedding and cover material for any services should consist of OPSS 1010 Granular A or B Type II, placed in accordance with the Region of Peel standards. The bedding and cover material shall be placed in maximum 200 mm thick lifts and should be compacted to at least 100% of SPMDD. The cover material shall be a minimum of 300 mm over the top of the pipe and compacted to 100 % of SPMDD.

4.10 Design Review and Inspections

Cambium should be provided the opportunity to review the design drawings, prior to next stage tendering and construction, to ensure that all pertinent geotechnical-related factors have been addressed.

Cambium should also be retained to complete testing and inspections during construction operations to examine and approve subgrade conditions, placement, and compaction of fill materials.




5.0 Closing


Please note that this work program and report are governed by the attached Qualifications and Limitations. If you have questions or comments regarding this document, please do not hesitate to contact the undersigned.

Respectfully submitted,

Cambium Inc.

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Signed by:



2024-11-12

KL/zi



6.0 Standard Limitations

Limited Warranty

In performing work on behalf of a client, Cambium relies on its client to provide instructions on the scope of its retainer, and, on that basis, Cambium determines the precise nature of the work to be performed. Cambium undertakes all work in accordance with applicable accepted industry practices and standards. Unless required under local laws, other than as expressly stated herein, no other warranties or conditions, either expressed or implied, are made regarding the services, work or reports provided.

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A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work or report considers any locations or times other than those from which information, sample results and data was specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those extrapolations.

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The client expressly agrees that Cambium employees shall have no personal liability to the client with respect to a claim, whether in contract, tort and/or other cause of action in law. Furthermore, the client agrees that it will bring no proceedings nor take any action in any court of law against Cambium employees in their personal capacity.



Appended Figures

**GEOTECHNICAL
INVESTIGATION**
LANDSCAPE PLANNING LTD
1050 Sandalwood Parkway West
Brampton, Ontario

LEGEND

-  Highway
-  Major Road
-  Minor Road
-  Railway
-  Watercourse
-  Water Area
-  First Nations Reserve
-  Provincial Park
-  Wooded Area
-  Built Up Area

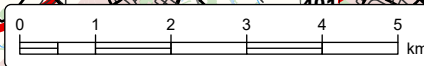
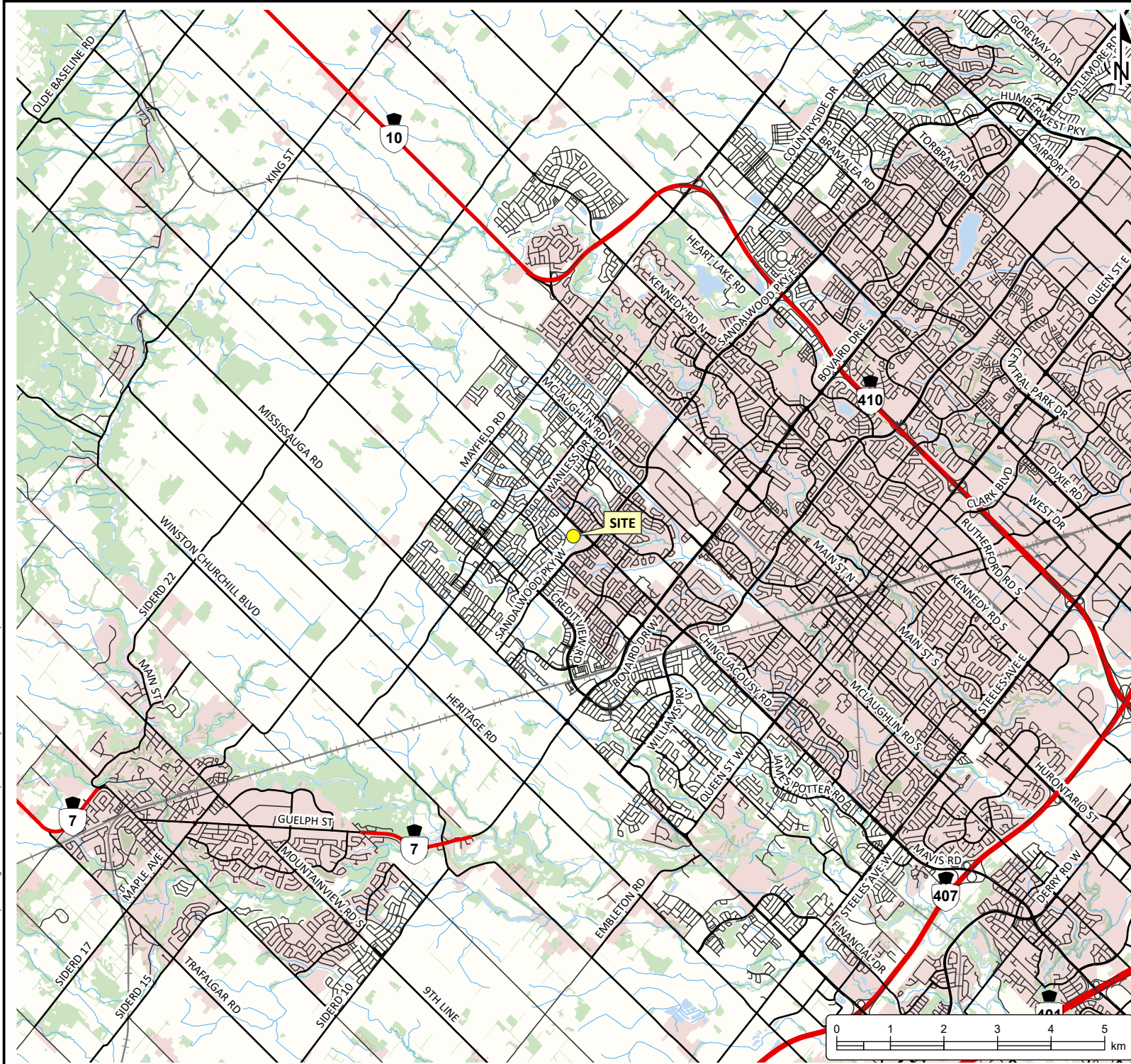
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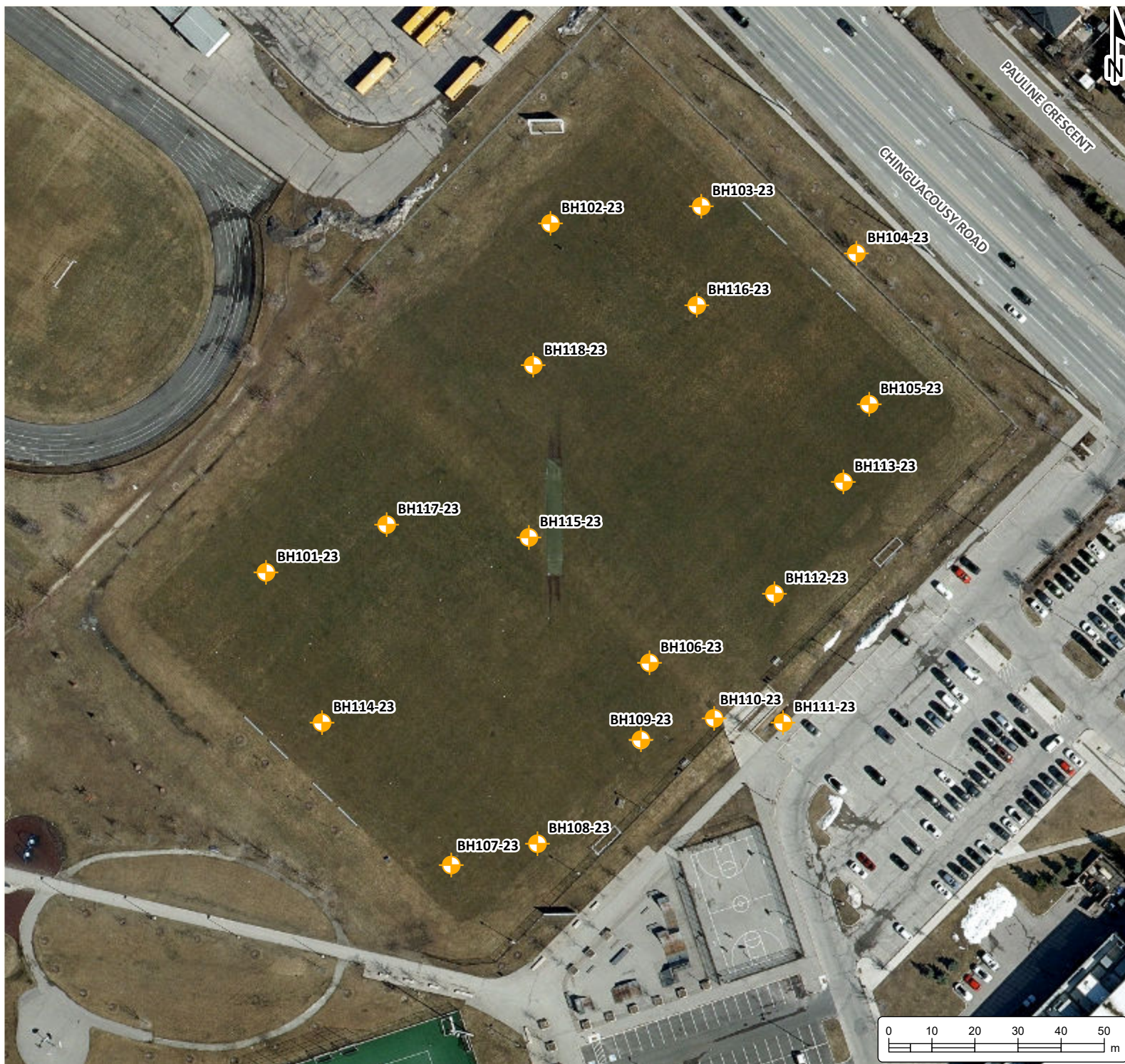


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SITE LOCATION PLAN

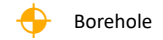
Project No.: 19060-001	Date: January 2024
Scale: 1:100,000	Rev.: NAD 1983 UTM Zone 17N
Created by: DBB	Checked by: ZL
Figure: 1	





GEOTECHNICAL INVESTIGATION
LANDSCAPE PLANNING LTD
 1050 Sandalwood Parkway West
 Brampton, Ontario

LEGEND



Borehole

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BOREHOLE LOCATION PLAN

Project No.: 19060-001	Date: January 2024
Scale: 1:1,250	Rev.: NAD 1983 UTM Zone 17N
Created by: DBB	Checked by: ZL
Figure: 2	



Appendix A
Borehole Logs



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 244.3 mASL
UTM: 17T N: 4839012 E: 594474

Log of Borehole: BH101-23
Page: 1 of 1
Date Completed: November 14, 2023

SUBSURFACE PROFILE				SAMPLE								Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)					Shear Strength Cu, kPa		
									LL	PL	PI			nat V.	rem V.	nat V.
									% Moisture			SPT (N)				
									25	50	75	20	40	60	80	
244.3	0		TOPSOIL: ~130 mm thick	244.17												
			FILL: (ML) CLAYEY SILT, some sand, trace gravel, trace sand; brown (FILL); cohesive, W<PL, very stiff to stiff. Becomes grey, trace organics	0.13	1	SS	75	23	11.7%					23		
243.8	0.5															
243.3	1				2	SS	100	11	19.1%					11		
242.8	1.5															
242.3	2		(ML) CLAYEY SILT: (ML) CLAYEY SILT, some sand, some gravel; brown (TILL); non-cohesive, W<PL, very stiff to hard	1.83												
241.8	2.5				4	SS	100	21	13.4%					21		
241.3	3															
240.8	3.5				5	SS	100	17	13.4%					17		
240.3	4															
239.8	4.5															
239.3	5				6	SS	100	45	11.6%					45		
238.8	5.5		Borehole terminated @ 5 mbgs due to target depth achieved.	5.03												
238.3	6															
237.8	6.5															
237.3	7															
236.8																

GRAINSIZE DISTRIBUTION	SAMPLE	GRAVEL	SAND	SILT	CLAY
	SS4	10	19	43	28

Borehole open and dry upon completion of drilling.



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 244.3 mASL
UTM: 17T N: 4839093 E: 594540

Log of Borehole: BH102-23
Page: 1 of 1
Date Completed: November 14, 2023

SUBSURFACE PROFILE				SAMPLE								Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)					Shear Strength Cu, kPa		
									LL	PL	PI	nat V. rem V.	80			
244.3	0		TOPSOIL: ~150 mm thick	244.15												
			FILL: (ML) CLAYEY SILT, some sand, trace gravel; brown (reworked native); cohesive, W<PL, stiff to very stiff Trace organics	0.15	1	SS	100	12	12.1%				12			
243.8	0.5															
243.3	1				2	SS	100	15	14.7%				15			
242.8	1.5		Becomes grey													
242.3	2															
241.8	2.5		(ML) CLAYEY SILT: (ML) CLAYEY SILT, some sand, trace gravel; grey; cohesive, W<PL, stiff	2.13	4	SS	100	14	24.6%				14			
241.3	3		Trace organics													
240.8	3.5															
240.3	4															
239.8	4.5		(ML) sandy SILT: (ML) Clayey Sandy SILT, trace clay, trace gravel; brown (TILL); non-cohesive, moist, compact	4.04												
239.3	5				6	SS	100	24	11.8%				24			
238.8	5.5		Borehole terminated @ 5 mbgs due to target depth achieved.	5.03												
238.3	6															
237.8	6.5															
237.3	7															
236.8																

Borehole open and dry upon completion of drilling.

GRAINSIZE [SAMPLE] GRAVEL SAND SILT CLAY DISTRIBUTION

1m = 24 units



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 243.9 mASL
UTM: 17T N: 4839097 E: 594575

Log of Borehole: BH103-23
Page: 1 of 1
Date Completed: November 14, 2-23

SUBSURFACE PROFILE				SAMPLE								Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)					Shear Strength Cu, kPa		
									LL	PL	PI	nat V.	rem V.			
243.9	0		TOPSOIL: ~150 mm thick	243.75												
			FILL: (ML) CLAYEY SILT, some sand, trace gravel, trace clay; brown (reworked native); cohesive, W<PL, stiff to very stiff	0.15	1	SS	75	12	12.1%			12				
243.4	0.5															
242.9	1				2	SS	100	16	14.5%			16				
242.4	1.5		Becomes grey, trace organics													
241.9	2				3	SS	100	16				16				
241.4	2.5		(ML) CLAYEY SILT: (ML) CLAYEY SILT, some sand, trace gravel; grey; cohesive, W<PL, stiff to very stiff	2.13												
241.4	2.5				4	SS	100	13	22.4%			13				
240.9	3															
240.4	3.5				5	SS	100	16	20.4%			16				
239.9	4															
239.4	4.5		(ML) sandy SILT: (ML) Clayey Sandy SILT, some sand, trace gravel; brown (TILL); non-cohesive, moist, dense	4.04												
239.4	4.5				6	SS	100	35	12.2%			35				
238.9	5		Borehole terminated @ 5 mbgs due to target depth achieved.	5.03												
238.4	5.5															
237.9	6															
237.4	6.5															
236.9	7															
236.4																

Borehole open and dry upon completion of drilling.

GRAINSIZE [SAMPLE] GRAVEL SAND SILT CLAY DISTRIBUTION

1m = 24 units

Logged By: EC

Input By: EC

Peterborough, Barrie, Oshawa, Kingston, Ottawa



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 243.8 mASL
UTM: 17T N: 4839086 E: 594611

Log of Borehole: BH104-23
Page: 1 of 1
Date Completed: November 15, 2023

SUBSURFACE PROFILE				SAMPLE								Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)					Shear Strength Cu, kPa		
									LL	PL	PI	nat V.	rem V.			
243.8	0		TOPSOIL: ~130 mm thick	243.67												
			FILL: (ML) CLAYEY SILT, some sand, trace gravel; brown (reworked native); cohesive, W<PL, stiff to very stiff	0.13	1	SS	100	14	13.2%			14				
243.3	0.5															
242.8	1				2	SS	100	20	14%			20				
242.3	1.5		(ML) CLAYEY SILT: (ML) CLAYEY SILT, some sand, trace gravel; grey, trace organics; cohesive, W<PL, very stiff to stiff	1.37												
241.8	2															
241.3	2.5				4	SS	100	14	20.1%			14				
240.8	3															
240.3	3.5				5	SS	100	12	26.9%			12				
239.8	4		(ML) sandy SILT: (ML) Clayey Sandy SILT, trace gravel, some clay; brown (TILL); non-cohesive, moist, compact	4.04												
239.3	4.5															
238.8	5				6	SS	100	13	15.8%			13				
238.3	5.5		Borehole terminated @ 5 mbgs due to target depth achieved.	5.03												
237.8	6															
237.3	6.5															
236.8	7															
236.3																

Borehole open and dry upon completion of drilling.

GRAINSIZE DISTRIBUTION [SAMPLE] GRAVEL SAND SILT CLAY

1m = 24 units



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 244.1 mASL
UTM: 17T N: 4839051 E: 594614

Log of Borehole: BH105-23
Page: 1 of 1
Date Completed: November 15, 2023

SUBSURFACE PROFILE				SAMPLE								Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)					Shear Strength Cu, kPa		
									LL	PL	PI	nat V.	rem V.			
244.1	0		TOPSOIL: ~150 mm thick	243.95												
			FILL: (ML) CLAYEY SILT, some sand, trace gravel; brown (reworked native); cohesive, W<PL, stiff Trace organics	0.15	1	SS	100	9	22.9%			9				
243.6	0.5															
243.1	1				2	SS	100	14	17.4%			14				
242.6	1.5															
242.1	2															
241.6	2.5		(ML) CLAYEY SILT: (ML) CLAYEY SILT, some sand, trace gravel; grey; cohesive, W<PL, stiff to very stiff	241.97												
241.1	3															
240.6	3.5															
240.1	4															
239.6	4.5		(ML) sandy SILT: (ML) Clayey Sandy SILT, trace gravel, trace clay; brown (TILL); non-cohesive, moist, compact	240.06												
239.1	5															
238.6	5.5		Borehole terminated @ 5 mbgs due to target depth achieved.	239.07												
238.1	6															
237.6	6.5															
237.1	7															
236.6																

Borehole open and dry upon completion of drilling.

GRAINSIZE [SAMPLE] GRAVEL SAND SILT CLAY DISTRIBUTION

1m = 24 units

Logged By: EC

Input By: EC

Peterborough, Barrie, Oshawa, Kingston, Ottawa



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 244.3 mASL
UTM: 17T N: 4838991 E: 594563

Log of Borehole: BH106-23
Page: 1 of 1
Date Completed: November 15, 2023

SUBSURFACE PROFILE				SAMPLE								Well Installation	Log Notes				
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)					Shear Strength Cu, kPa			
									LL	PL	PI			nat V.	rem V.		
									% Moisture			SPT (N)					
									25	50	75	20	40	60	80		
244.3	0		TOPSOIL: ~165 mm thick	244.13													
			FILL: (ML) CLAYEY SILT, some sand, trace gravel, trace clay; brown (reworked native); cohesive, W<PL, stiff to very stiff	0.17	1	SS	100	12	9.6%				12				
243.8	0.5																
243.3	1				2	SS	100	16	14.2%				16				
242.8	1.5		Trace organics														
242.3	2																
241.8	2.5		(ML) CLAYEY SILT: (ML) CLAYEY SILT, some sand, trace gravel; grey, trace organics; cohesive, W<PL, stiff	2.13	4	SS	100	14	23.5%				14				
241.3	3																
240.8	3.5																
240.3	4																
239.8	4.5		(ML) sandy SILT: (ML) Clayey Sandy SILT, trace gravel; brown (TILL); non-cohesive, moist, dense	4.04													
239.3	5				6	SS	100	38	12.2%				38				
238.8	5.5		Borehole terminated @ 5 mbgs due to target depth achieved.	5.03													
238.3	6																
237.8	6.5																
237.3	7																
236.8																	

Borehole open and dry upon completion of drilling.

GRAINSIZE DISTRIBUTION	SAMPLE	GRAVEL	SAND	SILT	CLAY
	SS6	9	20	48	23

1m = 24 units

Logged By: EC

Input By: EC

Peterborough, Barrie, Oshawa, Kingston, Ottawa



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 244 mASL
UTM: 17T N: 4838944 E: 594517

Log of Borehole: BH107-23
Page: 1 of 1
Date Completed: November 14, 2023

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes						
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)			Shear Strength Cu, kPa					
									25	50	75	20	40	60	80		
244	0		TOPSOIL: ~200 mm thick	243.8													
243.5	0.5	[Hatched pattern]	FILL: (ML) CLAYEY SILT, some sand, trace gravel; brown (reworked native); cohesive, W<PL, very stiff Trace organics Becomes grey	0.2	1	SS	80	23	10.3%				23				
243	1				2	SS	100	15	20%				15				
242.5	1.5				3	SS	100	16	22.2%				16				
242	2				4	SS	100	14	26.4%				14				
241.5	2.5				5	SS	100	23	16.4%				23				
241	3				6	SS	100	35	12%				35				
240.5	3.5																
240	4		(ML) CLAYEY SILT: (ML) CLAYEY SILT, some sand, trace gravel; mottled brown-grey; cohesive, W<PL, very stiff	2.13													
239.5	4.5		(ML) sandy SILT: (ML) Clayey Sandy SILT, trace gravel; brown (TILL); non-cohesive, moist, dense	4.04													
239	5			239.96													
238.5	5.5		Borehole terminated @ 5 mbgs due to target depth achieved.	5.03													
238	6																
237.5	6.5																
237	7																
236.5																	

Borehole open and dry upon completion of drilling.

GRAINSIZE [SAMPLE] GRAVEL SAND SILT CLAY
 DISTRIBUTION

1m = 24 units



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 243.9 mASL
UTM: 17T N: 4838949 E: 594537

Log of Borehole: BH108-23
Page: 1 of 1
Date Completed: November 15, 2023

SUBSURFACE PROFILE				SAMPLE								Well Installation	Log Notes		
Elevation (m) Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)			Shear Strength Cu, kPa				
								LL	PL	PI	nat V.	rem V.	80		
243.9	0	TOPSOIL: ~130 mm thick	243.77												
243.4	0.5	FILL: (ML) CLAYEY SILT, trace gravel; brown (reworked native); cohesive, W<PL, stiff to very stiff Becomes grey, some organics	0.13	1	SS	100	12								
242.9	1			2	SS	100	16								
242.4	1.5			3	SS	100	18								
241.9	2	Borehole terminated @ 2 mbgs due to target depth achieved.	241.92												
241.4	2.5														
240.9	3														
240.4	3.5														
239.9	4														
239.4	4.5														
238.9	5														
238.4	5.5														
237.9	6														
237.4	6.5														
236.9	7														
236.4															

Borehole open and dry upon completion of drilling.

GRAINSIZE DISTRIBUTION [SAMPLE] GRAVEL SAND SILT CLAY

1m = 24 units



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 244.9 mASL
UTM: 17T N: 4838973 E: 594561

Log of Borehole: BH109-23
Page: 1 of 1
Date Completed: November 14, 2023

SUBSURFACE PROFILE				SAMPLE							Well Installation	Log Notes				
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)				Shear Strength Cu, kPa			
									LL	PL	PI	nat V.	rem V.			
244.9	0		TOPSOIL: ~150 mm thick	244.77												
			FILL: (ML) CLAYEY SILT, some sand, trace gravel, brown (reworked native); cohesive, W<PL, firm to stiff	0.13	1	SS	100	9	14.2%			9				
244.4	0.5															
243.9	1				2	SS	100	12	14.7%			12				
243.4	1.5		Becomes grey, trace organics													
242.9	2				3	SS	100	14	23.1%			14				
242.9	2		Borehole terminated @ 2 mbgs due to target depth achieved.	1.98												
242.4	2.5															
241.9	3															
241.4	3.5															
240.9	4															
240.4	4.5															
239.9	5															
239.4	5.5															
238.9	6															
238.4	6.5															
237.9	7															
237.4																

Borehole open and dry upon completion of drilling.

GRAINSIZE DISTRIBUTION [SAMPLE] GRAVEL SAND SILT CLAY

1m = 24 units

Logged By: EC

Input By: EC

Peterborough, Barrie, Oshawa, Kingston, Ottawa



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 244.2 mASL
UTM: 17T N: 4838978 E: 594578

Log of Borehole: BH110-23
Page: 1 of 1
Date Completed: November 15, 2023

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes				
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)				Shear Strength Cu, kPa			
								LL	PL	PI	nat V.	rem V.	nat V.	rem V.	
244.2	0		TOPSOIL: ~150 mm thick												
			FILL: (ML) CLAYEY SILT, some sand, trace gravel; brown (reworked native); cohesive, W<PL, stiff Trace organics, becomes grey	1	SS	100	10	13.6%					10		
243.7	0.5														
243.2	1			2	SS	100	10	20.7%					10		
242.7	1.5														
242.2	2			3	SS	100	14	20.8%					14		
242.2	2		Borehole terminated @ 2 mbgs due to target depth achieved.												
241.7	2.5														
241.2	3														
240.7	3.5														
240.2	4														
239.7	4.5														
239.2	5														
238.7	5.5														
238.2	6														
237.7	6.5														
237.2	7														
236.7															

Borehole open and dry upon completion of drilling.

GRAINSIZE DISTRIBUTION [SAMPLE] GRAVEL SAND SILT CLAY

1m = 24 units

Logged By: EC

Input By: EC

Peterborough, Barrie, Oshawa, Kingston, Ottawa



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 243 mASL
UTM: 17T N: 4838977 E: 594594

Log of Borehole: BH111-23
Page: 1 of 1
Date Completed: November 14, 2023

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)				Shear Strength Cu, kPa		
								LL	PL	PI	nat V.	rem V.	nat V.	rem V.
243.0	0		ASPHALT: ~115 mm thick											
242.5	0.5	[Hatched Lithology]	FILL: (SP/GP) SAND and GRAVEL; brown (Granular FILL); non-cohesive, moist, loose	1	SS	50	6	19.7%			6			Borehole open and dry upon completion of drilling.
242.0	1.0		FILL: (ML) CLAYEY SILT, some sand, trace gravel; brown (reworked native); cohesive, W<PL, stiff	2	SS	100	10	15.2%			10			
241.5	1.5													
241.0	2.0			3	SS	100	10	12.6%			10			
241.02	2.02		Borehole terminated @ 2 mbgs due to target depth achieved.											
240.5	2.5													
240.0	3.0													
239.5	3.5													
239.0	4.0													
238.5	4.5													
238.0	5.0													
237.5	5.5													
237.0	6.0													
236.5	6.5													
236.0	7.0													
235.5	7.5													

GRAINSIZE DISTRIBUTION [SAMPLE] GRAVEL SAND SILT CLAY

1m = 24 units

Logged By: EC

Input By: EC

Peterborough, Barrie, Oshawa, Kingston, Ottawa



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 244.2 mASL
UTM: 17T N: 4839007 E: 594592

Log of Borehole: BH112-23
Page: 1 of 1
Date Completed: November 15, 2023

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes				
Elevation (m) Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)				Shear Strength Cu, kPa			
								LL	PL	PI	nat V.	rem V.	nat V.	rem V.	
244.2	0	TOPSOIL: ~150 mm thick	244.05												
243.7	0.5	FILL: (ML) CLAYEY SILT, some sand, trace gravel; brown to grey (reworked native); cohesive, W<PL, stiff to very stiff some organics	0.15	1	SS	80	9	16%				9			
243.2	1			2	SS	100	16	17.4%				16			
242.7	1.5			3	SS	100	15	20.1%				15			
242.2	2	Borehole terminated @ 2 mbgs due to target depth achieved.	1.98												
241.7	2.5														
241.2	3														
240.7	3.5														
240.2	4														
239.7	4.5														
239.2	5														
238.7	5.5														
238.2	6														
237.7	6.5														
237.2	7														
236.7															

Borehole open and dry upon completion of drilling.

GRAINSIZE DISTRIBUTION [SAMPLE] GRAVEL SAND SILT CLAY

1m = 24 units



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 244.2 mASL
UTM: 17T N: 4839033 E: 594608

Log of Borehole: BH113-23
Page: 1 of 1
Date Completed: November 15, 2023

SUBSURFACE PROFILE				SAMPLE								Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)					Shear Strength Cu, kPa		
									LL	PL	PI	nat V.	rem V.	8		
244.2	0		TOPSOIL: ~150 mm thick	244.05												
			FILL: (ML) CLAYEY SILT, some sand, trace gravel; brown to grey (reworked native); cohesive, W<PL, stiff to very stiff Trace organics	0.15	1	SS	100	10	16.3%			10				
243.7	0.5															
243.2	1				2	SS	100	15	17.8%			15				
242.7	1.5															
242.2	2				3	SS	100	18	19.9%			18				
242.2	2		Borehole terminated @ 2 mbgs due to target depth achieved.	1.98												
241.7	2.5															
241.2	3															
240.7	3.5															
240.2	4															
239.7	4.5															
239.2	5															
238.7	5.5															
238.2	6															
237.7	6.5															
237.2	7															
236.7																

Borehole open and dry upon completion of drilling.

GRAINSIZE DISTRIBUTION [SAMPLE] GRAVEL SAND SILT CLAY

1m = 24 units



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 244.2 mASL
UTM: 17T N: 4838977 E: 594487

Log of Borehole: BH114-23
Page: 1 of 1
Date Completed: November 14, 2023

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes				
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)				Shear Strength Cu, kPa			
								LL	PL	PI	nat V.	rem V.	80	20	40
244.2	0		TOPSOIL: ~150 mm thick												
			FILL: (ML) Clayey Sandy SILT, trace gravel; brown (reworked native); non-cohesive, moist, compact Trace organics	1	SS	100	18	11.6%					18		
243.7	0.5														
243.2	1			2	SS	100	23	21.9%					23		
242.7	1.5		Becomes grey												
242.2	2			3	SS	100	19	24.2%					19		
242.2	2		Borehole terminated @ 2 mbgs due to target depth achieved.												
241.7	2.5														
241.2	3														
240.7	3.5														
240.2	4														
239.7	4.5														
239.2	5														
238.7	5.5														
238.2	6														
237.7	6.5														
237.2	7														
236.7															

Borehole open and dry upon completion of drilling.

GRAINSIZE DISTRIBUTION [SAMPLE] GRAVEL SAND SILT CLAY

1m = 24 units



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 244.9 mASL
UTM: 17T N: 4839020 E: 594535

Log of Borehole: BH115-23
Page: 1 of 1
Date Completed: November 14, 2023

SUBSURFACE PROFILE				SAMPLE								Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)					Shear Strength Cu, kPa		
									LL	PL	PI	nat V.	rem V.			
244.9	0		TOPSOIL: ~150 mm thick	244.75												
			FILL: (ML) CLAYEY SILT, some sand, trace gravel; brown (reworked native); cohesive, W<PL, stiff to very stiff	0.15	1	SS	40	8	17.1%			8				
244.4	0.5															
243.9	1				2	SS	100	16	16.7%			16				
243.4	1.5		Trace organics													
242.9	2				3	SS	100	19	18%			19				
242.9	2		Borehole terminated @ 2 mbgs due to target depth achieved.	1.98												
242.4	2.5															
241.9	3															
241.4	3.5															
240.9	4															
240.4	4.5															
239.9	5															
239.4	5.5															
238.9	6															
238.4	6.5															
237.9	7															
237.4																

Borehole open and dry upon completion of drilling.

GRAINSIZE DISTRIBUTION [SAMPLE] GRAVEL SAND SILT CLAY

1m = 24 units



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 244.3 mASL
UTM: 17T N: 4839074 E: 594574

Log of Borehole: BH116-23
Page: 1 of 1
Date Completed: November 15, 2023

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes				
Elevation (m) Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)				Shear Strength Cu, kPa			
								LL	PL	PI	nat V.	rem V.	nat V.	rem V.	
244.3	0	TOPSOIL: ~175 mm thick	244.12												
243.8	0.5	FILL: (ML) CLAYEY SILT, some sand, trace gravel; brown (reworked native); cohesive, W<PL, very stiff	0.18	1	SS	100	15	12.6%				15			
243.3	1			2	SS	100	22	16.4%				22			
242.8	1.5	(ML) CLAYEY SILT: (ML) CLAYEY SILT, some sand; grey, trace organics; cohesive, W<PL, very stiff	1.37	3	SS	100	21	18%				21			
242.3	2	Borehole terminated @ 2 mbgs due to target depth achieved.	1.98												
241.8	2.5														
241.3	3														
240.8	3.5														
240.3	4														
239.8	4.5														
239.3	5														
238.8	5.5														
238.3	6														
237.8	6.5														
237.3	7														
236.8															

Borehole open and dry upon completion of drilling.

GRAINSIZE DISTRIBUTION	SAMPLE	GRAVEL	SAND	SILT	CLAY
	SS2	1	16	50	33

1m = 24 units

Logged By: EC

Input By: EC

Peterborough, Barrie, Oshawa, Kingston, Ottawa



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 244.7 mASL
UTM: 17T N: 4839023 E: 594502

Log of Borehole: BH117-23
Page: 1 of 1
Date Completed: November 14, 2023

SUBSURFACE PROFILE				SAMPLE							Well Installation	Log Notes			
Elevation (m) Depth	Lithology	Description	Elevation Depth	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)					Shear Strength Cu, kPa		
								LL	PL	PI	20	40	60	80	
244.7	0	TOPSOIL: ~130 mm thick	244.57												
244.2	0.5	FILL: (ML) CLAYEY SILT, some sand, trace gravel; brown (reworked native); cohesive, W<PL, stiff to very stiff	0.13	1	SS	100	13	12.9%					13		
243.7	1			2	SS	100	14	14.1%					14		
243.2	1.5	Becomes grey													
242.7	2		242.72	3	SS	100	22	18.6%					22		
242.7	2	Borehole terminated @ 2 mbgs due to target depth achieved.	1.98												
242.2	2.5														
241.7	3														
241.2	3.5														
240.7	4														
240.2	4.5														
239.7	5														
239.2	5.5														
238.7	6														
238.2	6.5														
237.7	7														
237.2															

Borehole open and dry upon completion of drilling.

GRAINSIZE [SAMPLE] GRAVEL SAND SILT CLAY DISTRIBUTION

1m = 24 units



Client:
Contractor: DrillTech Drilling
Project No.: 19060-001
Location: 1050 Sandalwood Pkwy, Brampton ON

Project Name: Cassie Campbell Community Centre
Method: Track Mounted Solid Stem Auger
Elevation: 244.8 mASL
UTM: 17T N: 4839060 E: 594536

Log of Borehole: BH118-23
Page: 1 of 1
Date Completed: November 14, 2023

SUBSURFACE PROFILE				SAMPLE						Well Installation	Log Notes			
Elevation (m)	Depth	Lithology	Description	Number	Type	% Recovery	SPT (N)	Atterberg Limits (%)				Shear Strength Cu, kPa		
								LL	PL	PI	nat V.	rem V.	nat V.	rem V.
244.8	0		TOPSOIL: ~150 mm thick											
			FILL: (ML) CLAYEY SILT, some silt, trace gravel; brown (reworked native); cohesive, W<PL, stiff Trace organics	1	SS	100	12	11.7%					12	
244.3	0.5													
243.8	1			2	SS	100	10	17%					10	
243.3	1.5		Some clay											
242.8	2			3	SS	100	10	16%					10	
242.8	2		Borehole terminated @ 2 mbgs due to target depth achieved.											
242.3	2.5													
241.8	3													
241.3	3.5													
240.8	4													
240.3	4.5													
239.8	5													
239.3	5.5													
238.8	6													
238.3	6.5													
237.8	7													
237.3														

Borehole open and dry upon completion of drilling.

GRAINSIZE DISTRIBUTION [SAMPLE] GRAVEL SAND SILT CLAY

1m = 24 units



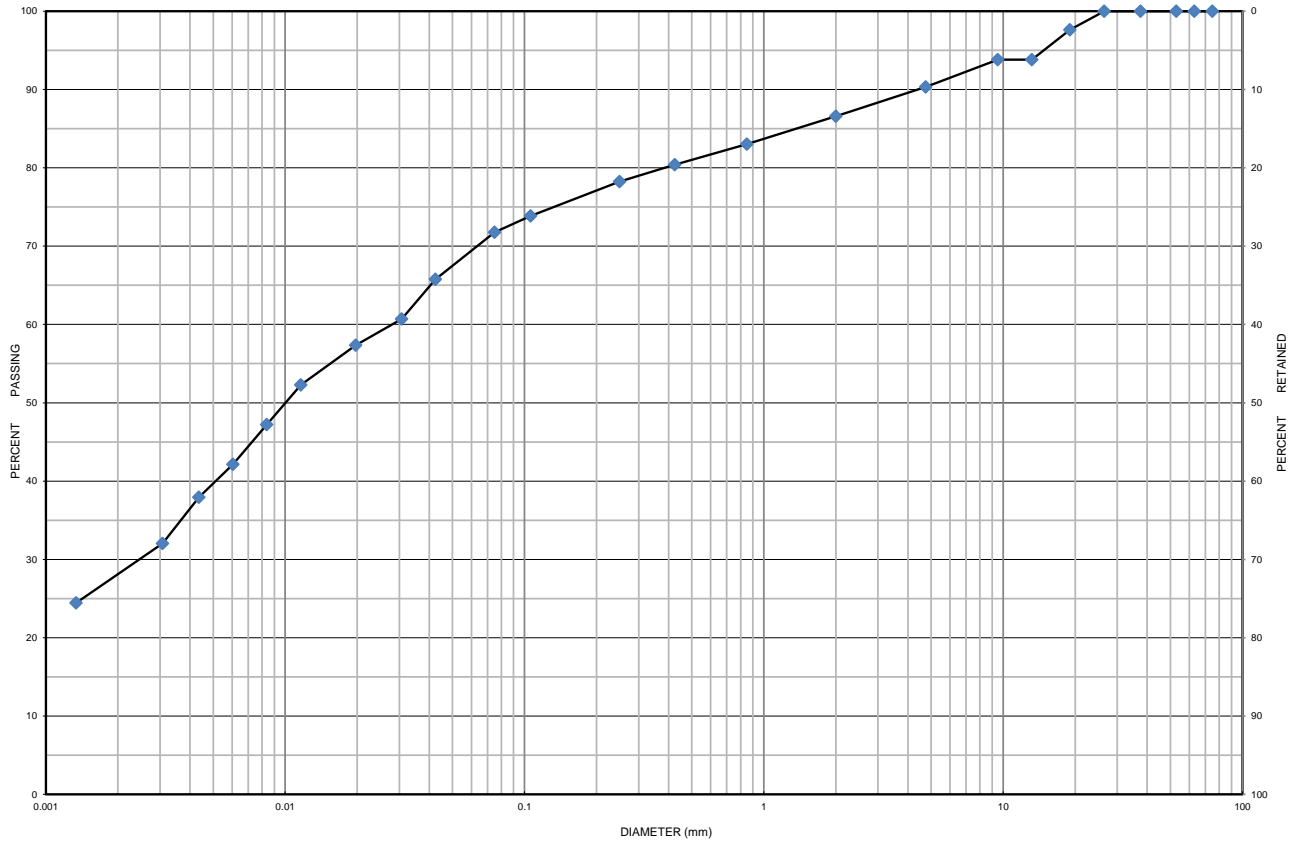
Appendix B
Soil Laboratory Testing Results



Grain Size Distribution Chart

Project Number: 19060-001 **Client:** Landscape Planning Ltd
Project Name: Cassie Campbell Community Centre
Sample Date: November 14-15, 2023 **Sampled By:** Emily Couperthwaite - Cambium Inc.
Location: BH 101-23 SS 4 **Depth:** 2.3 m to 2.7 m **Lab Sample No:** S-23-1993

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM									
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS	
		SAND			GRAVEL				

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
BH 101-23	SS 4	2.3 m to 2.7 m	10	19	43	28	13.4
Description		Classification	D ₆₀	D ₃₀	D ₁₀	C _u	C _c
Clayey Silt some Sand some Gravel		ML	0.0280	0.0025	-	-	-

Additional information available upon request

Issued By: *John Baird*
 (Senior Project Manager)

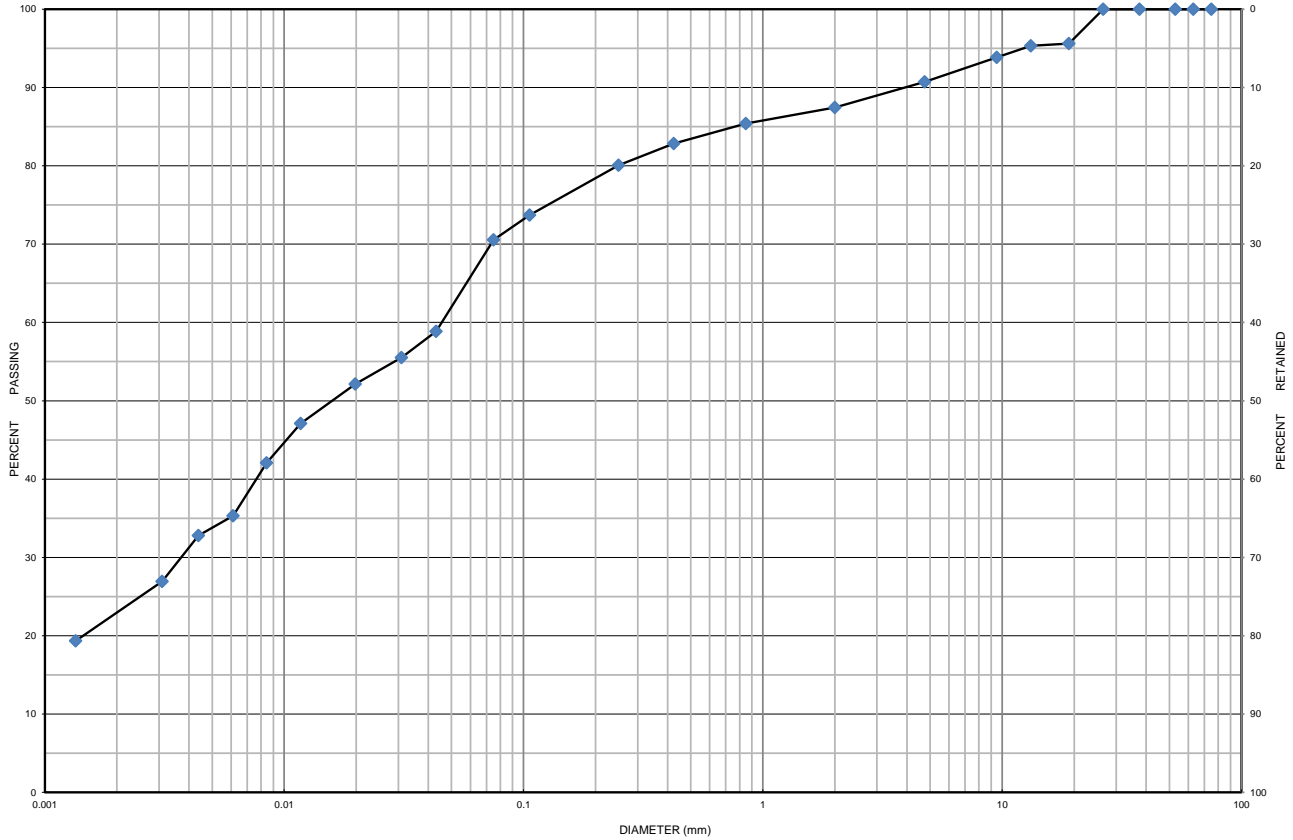
Date Issued: November 26, 2023



Grain Size Distribution Chart

Project Number: 19060-001 **Client:** Landscape Planning Ltd
Project Name: Cassie Campbell Community Centre
Sample Date: November 14-15, 2023 **Sampled By:** Emily Couperthwaite - Cambium Inc.
Location: BH 106-23 SS 6 **Depth:** 4.6 m to 5 m **Lab Sample No:** S-23-1994

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM									
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS	
		SAND			GRAVEL				

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
BH 106-23	SS 6	4.6 m to 5 m	9	20	48	23	12.2
Description		Classification	D ₆₀	D ₃₀	D ₁₀	C _u	C _c
Clayey Sandy Silt trace Gravel		ML	0.0460	0.0037	-	-	-

Additional information available upon request

Issued By: *John Baird*
 (Senior Project Manager)

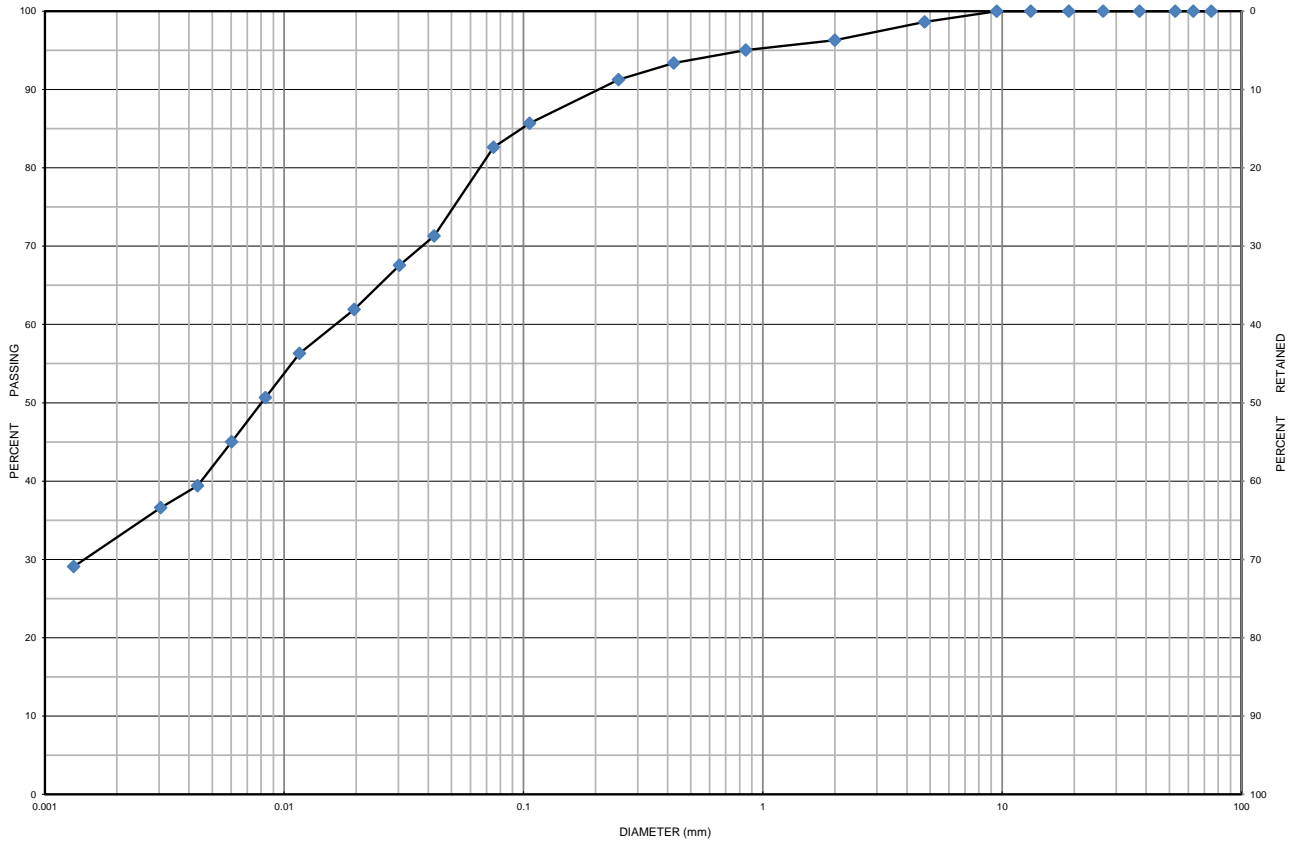
Date Issued: November 26, 2023



Grain Size Distribution Chart

Project Number: 19060-001 **Client:** Landscape Planning Ltd
Project Name: Cassie Campbell Community Centre
Sample Date: November 14-15, 2023 **Sampled By:** Emily Couperthwaite - Cambium Inc.
Location: BH 116-23 SS 2 **Depth:** 0.8 m to 1.2 m **Lab Sample No:** S-23-1995

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM									
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS	
		SAND			GRAVEL				

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
BH 116-23	SS 2	0.8 m to 1.2 m	1	16	50	33	16.4
Description		Classification	D ₆₀	D ₃₀	D ₁₀	C _u	C _c
Clayey Silt some Sand trace Gravel		ML	0.0160	0.0015	-	-	-

Additional information available upon request

Issued By: *John Baird*
 (Senior Project Manager)

Date Issued: November 26, 2023



Moisture Content



Project Number:	19060-001	Lab Number:	S-23-1992
Project Name:	Cassie Campbell Community Centre	Date Tested:	2023-11-21
Client:	Landscape Planning Ltd	Tested By:	K. Dickson
Date Taken:	2023-11-14		

Borehole Number	Sample Number	Sample Depth (m)	Water Weight (g)	Water Content (%)	Additional Observations
101	1A	0.00-0.15	42.9	23.1	NR,1
101	1B	0.13-0.61	25.0	11.7	
101	2	0.76-1.22	30.5	19.1	
101	3	1.52-1.98	35.2	20.4	
101	4	2.29-2.74	92.9	13.4	NR
101	5	3.05-3.51	26.4	13.4	
101	6	4.57-5.03	34.2	11.6	
102	1A	0.00-0.15	54.4	28.2	
102	1B	0.15-0.61	29.3	12.1	
102	2	0.76-1.22	35.6	14.7	
102	3	1.52-1.98	39.4	19.5	
102	4	2.29-2.74	57.2	24.6	
102	5	3.05-3.51	40.0	21.7	
102	6	4.57-5.03	27.1	11.8	
103	1A	0.00-0.15	52.0	21.0	NR,1
103	1B	0.15-0.61	29.0	12.1	
103	2	0.76-1.22	31.1	14.5	
103	4	2.29-2.74	48.6	22.4	
103	5	3.05-3.51	42.2	20.4	
103	6	4.57-5.03	25.4	12.2	
104	1A	0.00-0.13	36.1	30.7	NR,1
104	1B	0.13-0.61	32.2	13.2	
104	2	0.76-1.22	34.8	14.0	
104	3	1.52-1.98	33.4	17.8	
104	4	2.29-2.74	42.6	20.1	
104	5	3.05-3.51	44.9	26.9	
104	6	4.57-5.03	43.0	15.8	

- | | |
|------------------------------------|--|
| 1 – Contains organics | 6 – Very moist – near optimum moisture content |
| 2 – Contains rubble | 7 – Moist – below optimum moisture |
| 3 – Hydrocarbon Odour | 8 – Dry – dry texture – powdery |
| 4 – Unknown Chemical Odour | 9 – Very small – caution may not be representative |
| 5 – Saturated – free water visible | 10 – Hold sample for gradation analysis |



Moisture Content



Project Number:	19060-001	Lab Number:	S-23-1992
Project Name:	Cassie Campbell Community Centre	Date Tested:	2023-11-21
Client:	Landscape Planning Ltd	Tested By:	K. Dickson
Date Taken:	2023-11-14		

Borehole Number	Sample Number	Sample Depth (m)	Water Weight (g)	Water Content (%)	Additional Observations
105	1A	0.00-0.15	54.2	21.7	NR,1
105	1B	0.15-0.61	43.8	22.9	
105	2	0.76-1.22	37.1	17.4	
105	3	1.52-1.98	32.6	16.5	
105	4	2.29-2.74	48.2	22.2	
105	5	3.05-3.51	46.4	20.6	
105	6	4.57-5.03	29.8	14.1	
106	1A	0.00-0.18	49.9	27.2	NR,1
106	1B	0.18-0.61	19.4	9.6	1
106	2	0.76-1.22	29.1	14.2	
106	4	2.29-2.74	43.7	23.5	
106	5	3.05-3.51	40.2	23.3	
106	6	4.57-5.03	104.6	12.2	NR
107	1A	0.00-0.20	54.6	24.7	NR,1
107	1B	0.20-0.61	27.1	10.3	
107	2	0.76-1.22	45.5	20.0	
107	3	1.52-1.98	43.2	22.2	
107	4	2.29-2.74	46.4	26.4	
107	5	3.05-3.51	36.3	16.4	
107	6	4.57-5.03	35.3	12.0	
108	1A	0.00-0.13	45.9	24.0	NR,1
108	1B	0.13-0.61	34.1	13.9	
108	2	0.76-1.22	51.0	20.8	
108	3	1.52-1.98	41.5	19.4	
109	1A	0.00-0.13	48.1	27.1	NR,1
109	1B	0.13-0.61	35.3	14.2	
109	2	0.76-1.22	28.8	14.7	

- | | |
|------------------------------------|--|
| 1 – Contains organics | 6 – Very moist – near optimum moisture content |
| 2 – Contains rubble | 7 – Moist – below optimum moisture |
| 3 – Hydrocarbon Odour | 8 – Dry – dry texture – powdery |
| 4 – Unknown Chemical Odour | 9 – Very small – caution may not be representative |
| 5 – Saturated – free water visible | 10 – Hold sample for gradation analysis |



Moisture Content



Project Number:	19060-001	Lab Number:	S-23-1992
Project Name:	Cassie Campbell Community Centre	Date Tested:	2023-11-21
Client:	Landscape Planning Ltd	Tested By:	K. Dickson
Date Taken:	2023-11-14		

Borehole Number	Sample Number	Sample Depth (m)	Water Weight (g)	Water Content (%)	Additional Observations
109	3	1.52-1.98	49.5	23.1	
110	1A	0.00-0.15	39.0	21.3	NR,1
110	1B	0.15-0.61	33.3	13.6	
110	2	0.76-1.22	46.4	20.7	
110	3	1.52-1.98	41.4	20.8	
111	1A	0.00-0.15	22.2	9.5	
111	1B	0.15-0.61	43.9	19.7	
111	2	0.76-1.22	28.7	15.2	
111	3	1.52-1.98	25.0	12.6	
112	1A	0.00-0.15	60.4	27.4	NR,1
112	1B	0.15-0.61	37.7	16.0	
112	2	0.76-1.22	30.1	17.4	
112	3	1.52-1.98	38.9	20.1	
113	1A	0.00-0.15	47.3	25.0	NR,1
113	1B	0.15-0.61	33.4	16.3	
113	2	0.76-1.22	34.4	17.8	
113	3	1.52-1.98	45.1	19.9	
114	1A	0.00-0.15	38.7	34.8	NR,1
114	1B	0.15-0.61	23.2	11.6	
114	2	0.76-1.22	37.4	21.9	
114	3	1.52-1.98	42.7	24.2	
115	1A	0.00-0.15	53.4	31.4	NR,1
115	1B	0.15-0.61	26.0	17.1	NR,1
115	2	0.76-1.22	42.7	16.7	
115	3	1.52-1.98	34.1	18.0	
116	1A	0.00-0.18	47.5	25.4	NR,1
116	1B	0.18-0.61	21.9	12.6	

- | | |
|------------------------------------|--|
| 1 – Contains organics | 6 – Very moist – near optimum moisture content |
| 2 – Contains rubble | 7 – Moist – below optimum moisture |
| 3 – Hydrocarbon Odour | 8 – Dry – dry texture – powdery |
| 4 – Unknown Chemical Odour | 9 – Very small – caution may not be representative |
| 5 – Saturated – free water visible | 10 – Hold sample for gradation analysis |



Moisture Content



Project Number:	19060-001	Lab Number:	S-23-1992
Project Name:	Cassie Campbell Community Centre	Date Tested:	2023-11-21
Client:	Landscape Planning Ltd	Tested By:	K. Dickson
Date Taken:	2023-11-14		

Borehole Number	Sample Number	Sample Depth (m)	Water Weight (g)	Water Content (%)	Additional Observations
116	2	0.76-1.22	84.9	16.4	NR
116	3	1.52-1.98	34.6	18.8	
117	1A	0.00-0.13	49.8	27.8	NR,1
117	1B	0.13-0.61	32.7	12.9	
117	2	0.76-1.22	32.5	14.1	
117	3	1.52-1.98	36.2	18.6	
118	1A	0.00-0.15	49.1	27.8	
118	1B	0.15-0.61	27.8	11.7	
118	2	0.76-1.22	35.5	17.0	
118	3	1.52-1.98	37.2	16.0	

- | | |
|------------------------------------|--|
| 1 – Contains organics | 6 – Very moist – near optimum moisture content |
| 2 – Contains rubble | 7 – Moist – below optimum moisture |
| 3 – Hydrocarbon Odour | 8 – Dry – dry texture – powdery |
| 4 – Unknown Chemical Odour | 9 – Very small – caution may not be representative |
| 5 – Saturated – free water visible | 10 – Hold sample for gradation analysis |