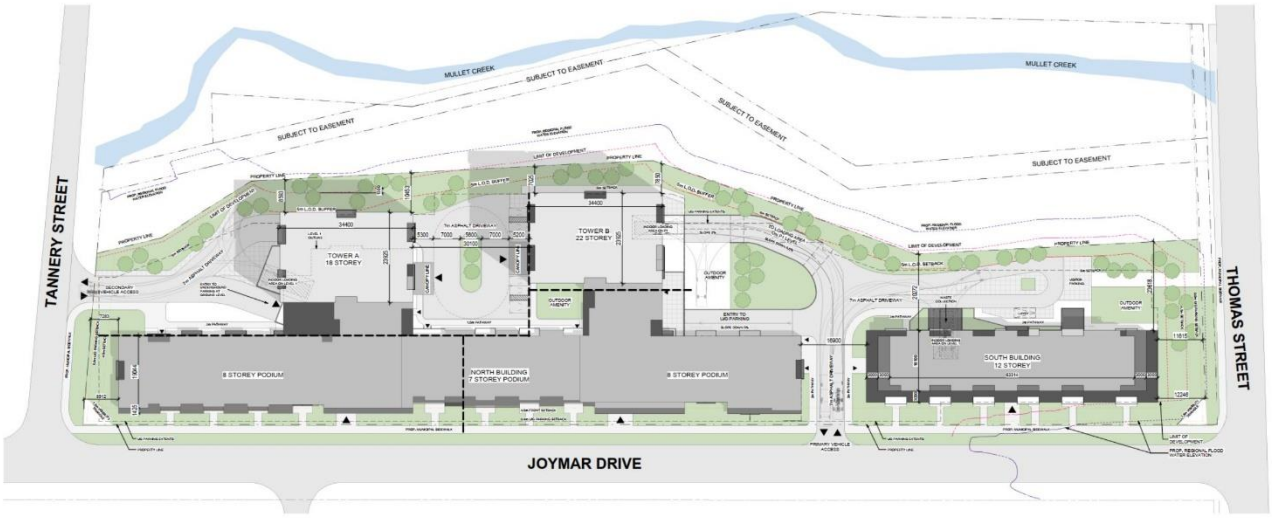
FINAL REPORT- R1
SUPPLEMENTARY GEOTECHNICAL INVESTIGATIONS
PROPOSED DEVELOPMENT
66 THOMAS STREET
MISSISSAUGA, ONTARIO



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1. INTRODUCTION

Sirati & Partners Consultants Limited (SIRATI) was retained by De Zen Realty Company Ltd. to undertake an additional supplementary geotechnical investigation at the property located at 66 Thomas Street in Mississauga, Ontario (the "Site").

The property is bounded by Tannery Street from the North, Joymar Drive from the West, Thomas Street from the West and Mullet Creek from the East. There is a slope located along the eastern boundary of the property. The property is currently occupied by several industrial buildings.

Since 2018, SIRATI has conducted various geotechnical, environmental and hydrogeological investigations at the property.

In preparation of this report consultation is made with the following previous geotechnical investigations and Architectural Drawings:

[Ref. 1] – Geotechnical and Slope Stability Investigations Report-REV. 02, Proposed Townhouses, 66 Thomas Street, Mississauga, Ontario, prepared and submitted by SIRATI (Report# SP18-0306-10-REV. 02, Jan. 31, 2023).
[Ref. 2] – Final Geotechnical Supplementary Investigation Report, 66 Thomas Street, Mississauga, Ontario (Report #SP23-0177-00, August 2023).
[Ref.3] – Architectural Drawing Package Prepared by SRM Architects + urban * designers dated January 9, 2024, Drawing Nos. D1.1, D1.3, D2.1 to D2.17, D3.1 to D3.5, and D4.1 to D4.2.

A total of twenty-two (22) boreholes were drilled for geotechnical, slope stability assessment, and environmental site assessment purposes. Relevant geotechnical findings from the 2018 investigation are summarized in Section 2 of this report, under "Available Information".

In 2023, SIRATI conducted a supplementary geotechnical investigation as well as a hydrogeological investigation to incorporate design changes, prepared by 4 Architecture Inc., including additional carpark levels with the lowest finished floor elevation at Elev.147.60 m ASL for Level 3 Parking.

As part of the 2023 supplementary geotechnical investigation a total of five (5) additional boreholes (designated BBH/MW-101, BH/MW-102, BH/MW-103, BH/MW104, and BH/MW-107) were drilled at selected locations to determine the subsurface conditions with particular emphasis to the quality of the bedrock at the subject Site. Detailed description of the findings from field laboratory works are presented in Sections 3 and 4 of this reoport.

The findings of the Environmental Site Assessment (Phase One ESA & Phase Two ESA) and Hydrogeological Investigation were reported under separate report covers.

Since 2018 the architectural concept for the proposed development has been subjected to several revisions. The most recent revision was communicated to SIRATI on February 01, 2024 [Ref.3]. The latest set of drawings were

prepared by SRM Architects. Based on the new information the proposed development will consist of the followings:

- Tower A – 18 Storey building with three levels of parking below the grade.
- Tower B – 22 Storey building with three and four levels parking below the grade.
- 8 Storey Podium (North) - with three levels of parking below the grade.
- North Building – 7 Story Podium with three and four levels of parking below the grade.
- 8 Story Podium (South) with four levels of carpark below the grade.
- South Building – 12 Storey Building with 4 levels of parking below the grade.

The revised drawings show that the lowest finished floor elevation is at Elev.144.7 m ASL.
No additional borehole investigation was conducted for the preparation of this revised report to cater for the latest design modifications.

The site investigation and recommendations follow generally accepted practice for geotechnical consultants in Ontario. The format and contents are guided by client specific needs and economics and do not conform to generalized standards for services. Laboratory testing for the most part follows ASTM or CSA Standards or modifications of these standards that have become standard practice.

If there are any changes in the design features relevant to the geotechnical analyses or if any questions arise concerning the geotechnical aspects of the codes and standards, this office should be contacted to review the design. It may then be necessary to carry out additional boring and reporting before the recommendations of this office can be relied upon.

This report has been prepared for De Zen Realty Company Ltd. and its architect and designers. Third party use of this report without Sirati & Partners Consultants Limited (SIRATI) consent is prohibited. The limitation conditions presented in Appendix E form an integral part of the report and they must be considered in conjunction with this report.

2. AVAILABLE INFORMATION

As part of the 2018 Geotechnical Investigation program a total of seven (7) boreholes (designated BH1 to BH7, Borehole Location Plan available in Appendix C) were drilled [Ref. 1] for geotechnical, slope stability investigation purposes. The boreholes were advanced to depths ranging between 4.0 m to 6.3 m below the existing ground surface. Boreholes BH2, BH4, BH6, and BH7 were equipped with monitoring wells. It should be noted that boreholes BH2, BH3, and BH 4 were primarily drilled for slope stability analysis and were not located within the footprint of the proposed development.

Fifteen (15) additional boreholes (designate BH-E1 to BH-E15, Borehole Location Plan able in Appendix C) were drilled at the site for Phase II Environmental Assessment purposes. Environmental boreholes were advanced to depths ranging between 2.4 m to 5.8 m below the existing ground surface.

The subsurface condition in the boreholes is summarized below. The subsurface conditions in the boreholes are also presented in borehole logs available in Appendix C.

Ground Cover – A 75 mm to 150 mm layer of asphalt was encountered in BH3, BH4, BH-E1, BH-E2, BH-E4, BH-E5, and BH-E8 to BH-E11. The asphalt layer was found to be underlain by 75 mm to 180 mm of granular material.
Boreholes BH2, BH-E3, and BH-E7 were advanced through 100 mm to 180 mm thick concrete slabs underlain by 100 mm granular material.

Topsoil/ Fill Material – A layer of Fill material consisting of sand and gravel, clayey silt, construction debris, and sandy silt with trace to some topsoil was observed in all boreholes. Fill layer was encountered extending between 0.2 m to 4.6 m below the existing ground surface. Buried layers of topsoil was encountered locally in BH-E5 at depths ranging between 0.8 m to 1.5 m below the existing ground surface, and in BH-E15 from 2.3 m to 3.0 m below the existing ground surface. The measured SPT 'N' values in the fill layer ranged from 2 to more than 50 blows for 300 mm penetration, but, more generally between 5 to 10 blows per 300 mm penetration, indicating its loosely compacted state.

Glacial Till Deposits – A layer of native glacial till deposits was encountered below the fill material in all borehole locations expect BH1, BH9, and BH-E10. Native glacial till deposits comprised of sandy silt till to clayey silt till was encountered in all boreholes, except BH1, BH-9, and BH-E10. The SPT 'N' values in this layer range from 19 to more than 50 blows per 300 mm penetration, indication compact/very stiff to very dense/hard condition/ consistency.

Residual Soil/ Weathered Shale – A deposit of residual soil was encountered in BH1, BH2, and BH7. The layer was encountered below the fill material in BH1. In BH2, BH7, BH-E4, and BH-E13 residual soil was encountered below the glacial till deposits. The residual soil deposit consists of clayey silt with till-like texture and contains varying amounts of siltstone/ limestone, and shale fragments. The stratum was found to be in hard consistency with SPT 'N' values of more than 50 blows per 300 mm penetration.

Shale Bedrock (Georgian Bay Formation) – The presence of bedrock was inferred from auger/ sampler refusal or confirmation by split spoon sampler sampling in all boreholes at depths, generally varying between 4.0 m to 6.1 m below the existing grade corresponding to elevations between Elev.148.5 m ASL and Elev.152.3 m ASL below the existing ground surface (see Table 1). No bedrock coring was carried out as part of this investigation.

Table 1 – Depth and Elevation of Inferred Bedrock

BH No.	Depth of Inferred Bedrock (mbgs*)	Elevation of Inferred Bedrock (mASL**)	Notes
BH1	6.1	150.0	Spoon Refusal
BH2	6.1	148.9	Spoon Refusal

BH No.	Depth of Inferred Bedrock (mbgs*)	Elevation of Inferred Bedrock (mASL**)	Notes
BH3	6.1	148.9	Spoon Refusal
BH4	6.1	148.0	Spoon Refusal
BH5	6.1	150.7	Spoon Refusal
BH6	6.1	150.6	Auger Refusal
BH7	6.1	148.5	Spoon refusal
BH-E1	5.6	149.0	Auger Refusal
BH-E2	5.5	148.5	Auger Refusal
BH-E3	-	-	Bedrock Not Encountered
BH-E4	5.5	148.8	Auger Refusal
BH-E5	5.8	149.5	Spoon Refusal
BH-E6	4.9	149.6	Auger Refusal
BH-E7	2.4	152.4	Auger Refusal
BH-E8	5.2	150.0	Auger Refusal
BH-E9	4.3	151.4	Auger Refusal
BH-E10	4.7	151.0	Auger Refusal
BH-E11	5.8	149.5	Auger Refusal
BH-E12	5.3	152.3	Auger Refusal
BH-E13	5.0	152.0	Auger Refusal
BH-E14	-	-	Bedrock Not Encountered
BH-E15	-	-	Bedrock Not Encountered

* meters below ground surface

** meters Above Sea Level

Groundwater Conditions – During drilling and upon completion of drilling the short-term (un-stabilized) groundwater was observed at depths ranging from 1.8 m to 5.8 m below the existing ground surface. The long-term (stabilized) groundwater level in the monitoring wells was observed at elevations ranging from 151.0 m to 154.7 m above sea level.

In 2018, it was understood that the property was proposed to be redeveloped with townhouses. As such, geotechnical recommendations pertinent to utility services installation, network access roads, storm, sanitary sewers, and watermain was provided. The recommendations also included geotechnical instructions on sub-excavation, site grading and engineered fill, relevant construction considerations, and foundation considerations. Subsequent to design adjustments and modifications, SIRATI conducted a supplementary geotechnical investigation and recommendations as well as Hydrogeological Investigation. The following sections present the findings from 2023 geotechnical investigation and provide corresponding recommendations.

3. FIELD AND LABORATORY WORK

A total of five boreholes (BH/MW-101, 102, 103, 104 and 107, see Drawing 1 for location plan) were drilled at the site for geotechnical and hydrogeological investigation purposes, to depths ranging from 5.0 m to 9.6 m. Boreholes were drilled with solid stem continuous flight auger equipment by a drilling sub-contractor under the direction and supervision of SIRATI personnel. Samples were retrieved at regular intervals with a 50 mm O.D. split-barrel sampler driven with a hammer weighing 624 N and dropping 760 mm in accordance with the Standard Penetration Test (SPT) method. The samples were logged in the field and returned to the SIRATI laboratory for detailed examination by the project engineer and for laboratory testing.
Bedrock coring was carried out in selected boreholes (BH/MW-107 and BH/MW-103), in accordance with the ASTM D 2113 test method.

As well as visual examination in the laboratory, all the soil samples were tested for moisture content. Selected eleven (11) soil samples were subjected to grain size analyses and five (5) soil samples were subjected to Atterberg Limits testing.

Additionally, five rock core samples were subjected to Unconfined Compression Strength test (UCS) and Point Load tests to determine the strength of the recovered rock samples.
Water level observations were made during drilling and in the open boreholes upon the completion of the drilling operations. Monitoring wells were installed at all borehole locations for long-term (stabilized) groundwater level monitoring.

The elevations at the borehole locations were surveyed by SIRATI personnel using differential GPS system, ranging between 153.8 m ASL and 157.7 m ASL.

4. SUBSURFACE CONDITIONS

The borehole location plan is shown in **Drawing 1**. Notes on soil descriptions are presented in **Drawing 1A**. The subsurface conditions in the boreholes are presented in the individual borehole logs (Encl. 2 to 6 inclusive). The subsurface conditions in the boreholes are summarized in the following paragraphs.

4.1 SOIL CONDITIONS

Asphalt:
A surficial layer of asphalt pavement was encountered at the location of boreholes BH/MW-102, BH/MW-103 and BH/MW-104. The thickness of asphalt pavement layer was observed to vary between 50 mm to 150 mm.

Granular Fill:
A surficial layer of granular fill was encountered at the location of boreholes BH/MW-101 and BH/MW-107. The thickness of granular fill was observed to vary between 455 mm to 460 mm at the location of the above-mentioned boreholes. A sub surficial granular fill was observed underlying the asphalt layer at the location of boreholes BH/MW-102, BH/MW-103 and BH/MW-104. The thickness of the sub surficial granular fill was observed to vary

between 150 mm to 255 mm, under the asphalt layer at the location of boreholes BH/MW-102, BH/MW-103 and BH/MW-104.

Two (2) representative granular fill material samples (BH/MW-101/SS1 and BH/MW-107/SS1) were subjected to sieve grain analyses and results are presented in Figures 9 to 12, with the following fractions:

Silt and Clay: 14% to 22%

Sand: 32% to 43%

Gravel: 36% to 54%

Fill Material:

A layer of fill material was encountered at the location of boreholes BH/MW-101, BH/MW-103, BH/MW-104, and BH/MW-107, beneath the granular fill layer and extending to approximate depths ranging between 0.8 m and 3.1 m below existing ground surface. The fill material was comprised of brown to dark brown clayey silt, some sand to sandy, trace to some gravel, trace cobbles, trace construction debris.

The measured SPT 'N' values in the fill material ranged from 2 to 36 blows for 300 mm penetration, indicating a soft to hard state, with an average SPT 'N' value of 15, indicating stiff state. Soil moisture content of the fill deposit ranged from between 12% to 30% by weight, moist to very moist at depth (average 21%).

Two (2) representative fill material samples (BH/MW-103/SS2 and BH/MW-104/SS4) were subjected to sieve grain analyses and results are presented in Figures 7 and 8, with the following fractions:

Clay: 19% to 25%
Silt: 39% to 52%
Sand: 19% to 31%
Gravel: 4% to 11%

Atterberg limits testing was completed on two (2) representative Clayey Silt samples (BH/MW-103/SS2 and BH/MW-104/SS4). The liquid limit was found to be ranging between 32% and 38%, the plastic limit was found to be ranging between 19% to 23%. The soil has a plasticity index ranging between 13% to 15% indicating an inorganic low plastic clay (cohesive). The results are presented in Figures 13 and 14. The soil moisture content in above mentioned samples ranges between 22% and 30% by weight, which is below the liquid limit.

Cohesive Soil Deposit:

A layer of clayey silt was observed at the location of boreholes BH/MW-102 and BH/MW-107 underlying the granular fill and fill layers. The cohesive materials comprised of brown clayey silt, trace to some gravel, trace to some sand, trace cobbles which were found to extend between 0.8 m and 1.5 m below existing ground surface.

The measured SPT 'N' values in the cohesive materials ranged from 9 to 36 blows per 300 mm penetration, indicating a stiff to hard state, with an average of 22 blows. Soil moisture content of the cohesive soil deposit ranged from between 19% to 22% by weight, moist to very moist at depth (average 21%).

Glacial Till Deposit:

A layer of glacial till deposit, comprising clayey silt to sandy silt (brown to grey), was encountered in all boreholes underlying the granular fill, fill and clayey silt material. The glacial till deposit extended to the depths ranging between 4.6 m and 6.1 m below existing ground. Soil moisture content of the glacial till deposit ranged from between 5% to 23% by weight, moist to very moist at depth (average 14%).

The SPT 'N' values were found ranging from 13 to over 50 blows per 300 mm penetration, indicating a stiff (compact) to hard (very dense) consistency.

Grain size analysis of three clayey silt samples (BH/MW-101/SS2, BH/MW-102/SS3 and BH/MW-107/SS2) and four sandy silt samples (BH/MW-101/SS4, BH/MW-102/SS4, BH/MW-103/SS5 and BH/MW-107/SS5) were conducted and the results are presented in **Figures 7 and 8**, with the following fractions:

Clayey silt samples:	Sandy silt samples:
Clay: 19% to 35%	Clay: 8% to 20%
Silt: 41% to 57%	Silt: 42% to 71%
Sand: 17% to 31%	Sand: 20% to 30%
Gravel: 1% to 9%	Gravel:1% to 13%

Atterberg limits testing was completed on two (3) representative Clayey Silt samples (BH/MW-101/SS2, BH/MW-102/SS3 and BH/MW-107/SS2). The liquid limit was found to be ranging between 32% and 38%, the plastic limit was found to be ranging between 18% to 22%. The soil has a plasticity index ranging between 14% to 19% indicating an inorganic low plastic clay (cohesive). The results are presented in Figures 13 and 14. The moisture content in above mentioned samples ranges between 11% and 23% by weight, which is below the liquid limit.

Residual Soil/Weathered Shale:

A deposit of residual soil was encountered in borehole BH/MW-102, underlying the glacial till material. The deposit consists of sandy silt with till-like texture and contains varying amounts of shale fragments. Residual soil is derived from weathering of the underlying shale bedrock.

The stratum was found to be in a hard consistency with SPT 'N' values of 50 blows for less than 300 mm penetration.

Shale Bedrock (Georgian Bay Formation):

The presence of bedrock was inferred from auger/sampler refusal or confirmed by split spoon sampling in all boreholes at depths, generally varying between 4.6 m and 6.1 m below existing ground surface. SPT tests carried out in this sub-unit of the weathered shale bedrock measured N-values of more than 50 blows for less than 300 mm sampler penetration.

The shale bedrock is of the Georgian Bay Formation. The upper portion of the bedrock is typically highly weathered, becomes less weathered with depth. Bedrock coring was carried out in borehole BH/MW-103 at depths between 4.8 and 9.5 m and in borehole BH/MW-107 at depths between 7.1 and 9.6 m below existing ground.

Table 2- Depth and Elevation of Inferred Bedrock

BH No.	Depth of Inferred Bedrock (m)	Elevation of Inferred Bedrock (m ASL)	Notes
BH/MW-101	4.6	151.3	Auger Refusal
BH/MW-102	6.1	151.6	Auger Refusal
BH/MW-103	4.8	149.1	Auger Refusal
BH/MW-104	4.6	149.3	Auger Refusal
BH/MW-107	4.6	151.8	Auger Refusal

The properties of bedrock encountered in the boreholes as well as the results of laboratory testing are described in the following sections. The photographs of the rock cores are provided in Appendix B of this report.

Rock Quality Designation (RQD):
The rock quality designation index is defined as the percentage of the total intact recovered core pieces in lengths of 10 cm or more to the total length of the drilled run. The R.Q.D. values ranged from 16.7% to 72.2% in borehole BH/MW-103 and 13.5% to 50% in borehole BH/MW-107 indicating very poor to fair quality rock. Approximate depths, lengths and Rock Quality Designation (R. Q. D.) of coring samples are presented in respective borehole logs.

Total Core Recovery (TCR):
The total core recovery (TCR) is defined as the percentage of rock core recovered to the total length of the drilled run. The total core recovery was generally good, which ranged from 70% to 100% with an average value of 85%.

Solid Core Recovery (SCR):
Solid core recovery (SCR) is defined as the percentage of solid, cylindrical (full diameter), rock core recovered to the total length of the drilled run. The SCR value was found to range from 48.6% to 80.9%, increasing with depth, with an average SCR of 65%.

3.2 LABORATORY TEST RESULTS

Selected rock samples were subjected to laboratory tests. The laboratory report is provided in Appendix B. The test results are discussed in the following sections.

Unconfined Compressive Strength:

A total of five (5) rock samples of suitable length were selected from runs 1, 2 and 3 of borehole BH/MW-103 and runs 1 and 2 of borehole BH/MW-107 between the depths of 5.99 m and 8.25 m below existing ground surface and to identify the unconfined compressive strength (UCS) of the intact rock.

The UCS of five samples of shale ranged from 12.93 MPa and 25.47 MPa with an average value of 19.2 MPa, indicating a "Weak Rock" (R2) rock under the ISRM strength standard.

The summary of test results is provided in Table 3 and laboratory test results are presented in Appendix B.

Table 3 - Uniaxial Compression Test Results

BH No./Run No.	Average Depth (m)	Elevation (m)	Lithology	UCS (MPa)
BH/MW-103, Run 1	6.05	147.85	Shale	25.47
BH/MW-103, Run 2	7.30	146.60	Shale	12.93
BH/MW-103, Run 3	8.75	145.15	Shale	20.18
BH/MW-107, Run 1	7.55	148.85	Shale	19.01
BH/MW-107, Run 2	8.80	147.60	Shale	18.21

Point Load Index Strength:
A total of five (5) point load tests were performed on samples selected from runs 1 and 2 of borehole BH/MW-107 as well as runs 1, 2, and 3 of borehole BH/MW-103. The depth of the samples ranged from 7.64 m to 8.56 m in borehole BH/MW-107, from 6.15 m to 9.49 m in borehole BH/MW-103. The results of point load tests are presented in Table 3.

The following approximate empirical equation by Franklin and Hoek correlates the unconfined compressive strength (UCS) with point load index strength:

$UCS\ (MPa) \approx 24\ I_{S\ (50)}$

where, $I_{S\ (50)}$: point index strength in MPa for a 50 mm equivalent diameter core.

It should be noted that this correlation should be used with caution since it may overestimate the unconfined compressive strength shale rock. Also, the low UCS values obtained in the diametral direction (less than 5 MPa) are not representative due to the fissile nature of the rock, considering that the shale could often be broken by hand in the diametral direction, indicating considerable strength anisotropy along bedding planes.

The equivalent unconfined compressive strength derived from the Point-Load test results of the Shale samples ranged from 11.52 MPa to 67.44 MPa in the axial direction with an average value of 41.2 MPa, indicating a "medium strong" (R3) rock under ISRM strength convent

Table 4 - Results of Point Load Index Strength Tests

BH No./ Run No.	Average Depth (m)	Elevation (m)	Lithology	Point Load Index $I_{S(50)}$ (MPa)		Approximate Uniaxial Compressive Strength (MPa)
				Axial	Diametral	
BH/MW-103, Run 1	6.17	147.73	Shale	2.81	-	67.44
BH/MW-103, Run 2	7.59	146.31	Shale	1.64	-	39.36
BH/MW-103, Run 3	9.47	144.43	Shale	0.48	-	11.52
BH/MW-107, Run 1	7.67	148.73	Shale	2.56	-	61.44
BH/MW-107, Run 2	8.52	147.88	Shale	1.08	-	25.92

3.2 GROUNDWATER CONDITIONS

During drilling and upon completion of drilling, no groundwater (unstabilized) was observed at the location of all boreholes with the exception of BH/MW-104 which was 3.0 m below the existing grade. The long-term (stabilized) groundwater levels observed in the monitoring wells are as listed on Table 5.

Table 5 - Groundwater Levels Observed in Monitoring Wells

BH No.	Date of Drilling	Date of Observation	Depth of Groundwater below existing ground (m)	Elevation of Groundwater (m)
BH/MW-101	May 18, 2023	May 30, 2023	3.0	152.9
BH/MW-102	May 18, 2023	May 30, 2023	3.54	154.1
BH/MW-103	May 23, 2023	May 30, 2023	1.97	151.9
BH/MW-104	May 18, 2023	May 30, 2023	1.92	151.9
BH/MW-107	May 19, 2023	May 30, 2023	3.64	152.7

It should be noted that the groundwater level may vary and is subject to seasonal fluctuations in response to major weather events. For further discussion on groundwater level please refer to the Hydrogeological Investigation Report which is presented under a separate cover.

5. DISCUSSION AND RECOMMENDATIONS

Based on the information the architectural drawings prepare by SRM Architects in February 2024, it is understood that the proposed development will comprise of the following buildings:

- Tower A – 18 Storey building with three levels of parking below the grade.
- Tower B – 22 Storey building with three and four levels parking below the grade.
- 8 Storey Podium (North) - with three levels of parking below the grade.
- North Building – 7 Story Podium with three and four levels of parking below the grade.
- 8 Story Podium (South) with four levels of carpark below the grade.
- South Building – 12 Storey Building with 4 levels of parking below the grade.

The proposed development will be served by a network of access roads, stormwater and sanitary sewers, and watermains.

It should be noted that the latest revision of the proposed development incorporates significant changes, including additional underground parking spaces, extra stories for each building among other things. Consequently, the overall depth of the proposed development has undergone modifications that would potentially impact the geotechnical recommendations that is provided in the following sections. As such, it is highly recommended to conduct additional ground investigation and acquire subsurface information for foundation requirements that cater for the proposed modifications.

Based on the borehole investigations conducted during 2018 and 2023 geotechnical investigation programs, the subsurface conditions at the Site consist of ground cover consisting of asphalt with a thickness ranging from 50 mm to 150 mm underlain by a 75 mm to 255 mm thick layer of granular fill consisting of sand and gravel. Topsoil/ Fill material comprised of sand and gravel, clayey silt, construction debris, sandy silt with trace to some topsoil with maximum thickness of approximately 4.6 m thick was present across the site. The relatively thick layer of fill material generally increases in thickness predominantly from Joymar Drive towards the creek. The thickness of fill is highly variable throughout the site and linear interpolation between the boreholes does not necessarily depict the actual stratigraphy pertinent to the fill layer at the site. A buried layer of topsoil was also found in two borehole locations in the west portion of the site. Native compact/ stiff to very dense/ hard layers of glacial till deposits consisting of sandy silt till to clayey silt till was encountered below the fill material ranging between 0.7 m to 4.5 m in thickness. Glacial Till deposits layer was generally underlain by thin layers of residual soil/ highly weather shale covering the top of the bedrock, Georgian bay formation. To improve correlation, a detailed profile of the subsurface conditions at the site was developed by integrating data from all boreholes drilled by SIRATI to date (see Appendix D for the corresponding drawings, labeled as D1 through D3).

As shown in borehole profile drawings (Appendix D, D1-D3) across the site, the top of the bedrock was estimated between borehole locations by extrapolating data obtained from each borehole drilled onsite. As such, based on the geological evidence, the top of the bedrock is approximated to be encountered at elevations ranging from 149.0 mASL to 151.8 mASL across the property. The Rock Quality Designation (RQD) of the rock core samples retrieved at site varies from 16.7 % to 72.2 % indicating very poor to fair rock quality.

Furthermore, long-term (stabilized) groundwater level was observed at elevations ranging between Elev.151.6 m to Elev. 154.1 m ASL. For further details on groundwater conditions please consult the Hydrogeological Investigation Report which is presented under a separate cover.

As shown in Drawing D-4, in Appendix D, the subsurface information obtained from the boreholes extend to maximum elevation of ELev.144.4 mASL and do not encompass the full depth of the proposed buildings.

Furthermore, as illustrated in Drawing D-1, although some boreholes were drilled within the proposed buildings' footprint, the majority do not reach adequate depths to provide comprehensive information for the entire depth of the proposed development. Therefore, upon completion of the demolition, it is essential to conduct additional boreholes within the footprint of the proposed buildings, ensuring they are advanced to sufficient depths to gather comprehensive subsurface data.

5.1 ROADS

The investigation has shown that the predominant subgrade soil at the site, after stripping the topsoil and any other organic and otherwise unsuitable material will mainly consist of fill material extending between 0.2 m to 4.6 m depth.

Based on the above and assuming that traffic usage will be residential minor local or local, the following minimum pavement thickness is recommended:

40 mm HL3 Asphaltic Concrete
80 mm HL8 Asphaltic Concrete
150 mm Granular 'A'
350 mm Granular 'B'

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

4.1.1 Stripping, Sub-excavation and Grading

The site should be stripped of all topsoil and any organic or otherwise unsuitable soils to the full depth of the roads, both in cut and fill areas.

Following stripping, the site should be graded to the subgrade level and approved. The subgrade should then be proof-rolled, in the presence of the Geotechnical Engineer, by at least several passes of a heavy compactor having a rated capacity of at least 10 tonnes. Any soft spots thus exposed should be removed and replaced by select fill material, similar to the existing subgrade soil and approved by the Geotechnical Engineer. The subgrade should then be recompacted from the surface to at least 98% of its Standard Proctor Maximum Dry Density (SPMDD). The final subgrade should be cambered or otherwise shaped properly to facilitate rapid drainage and to prevent the formation of local depressions in which water could accumulate.

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

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

4.1.2 Construction

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

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

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

4.1.3 Drainage

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

All paved surfaces should be sloped to provide satisfactory drainage towards catch basins. As discussed in Section 4.1.1, by means of good planning any water trapped in the granular sub-base materials should be drained rapidly towards subdrains or other interceptors.

4.2 SEWERS

As part of the site development, a network of new storm and sanitary sewers is to be constructed.

4.2.1 Trenching

It is expected that the trenches will be dug through fill and till deposits. Groundwater table observed in the monitoring wells on May 30, 2023, was at depths ranging from 1.92 to 3.64 m bgs, corresponding to elevations ranging from 151.9 m to 152.7 m. Positive dewatering such as well points may be required prior to any trenching/excavation in cohesionless fill soils below the groundwater table, otherwise it will result into flowing sides and unstable base. In such conditions, water table must be lowered to 1 m below the lowest excavation level. It is expected that a conventional pumping method should be sufficient to keep any perched water out of the trenches.

For further discussion on the groundwater level and required dewatering please refer to the Hydrogeological Investigation Report which is presented under a separate cover.

All excavations must be carried out in accordance with the most recent Occupational Health and Safety Act (OHSA). In accordance with OHSA, the fill material can be classified as Type 3 Soil above the groundwater table and Type 4 Soil below the groundwater table, and the cohesive soil, glacial till and residual soils can be classified as Type 2 Soil above the groundwater table and Type 3 below the groundwater table.

4.2.2 Bedding

The boreholes show that, in their undisturbed state, native deposits will provide adequate support for the sewer pipes and allow the use of normal Class B type bedding. It is assumed that the groundwater will be lowered to at least 1.0 m below the lowest invert level of the pipe.

The recommended minimum thickness of granular bedding below the invert of the pipes is 150 mm. The thickness of the bedding may, however, have to be increased depending on the pipe diameter. The bedding material should consist of well graded granular material such as Granular 'A' or equivalent. After installing the pipe on the bedding, a granular surround of approved bedding material, which extends at least 300 mm above the obvert of the pipe, or as set out by the local Authority, should be placed.

To avoid the loss of soil fines from the subgrade, uniformly graded clear stone should not be used unless, below the granular bedding material, a suitable, approved filter fabric (geotextile) is placed. The geotextile should extend along the sides of the trench and should be wrapped all around the poorly graded bedding material.

4.2.3 Backfilling of Trenches

Based on visual and tactile examination, and the measured moisture contents of the soil samples, the onsite excavated soils from above the groundwater table will generally need to be brought to ±2% of the optimum moisture content whether by adding water or aerating. Soils excavated from below the groundwater table will be too wet to compact and will require significant aeration prior to their use as backfill material.

Unless the materials are properly pulverized and compacted in sufficiently thin lifts, post-construction settlements could occur. The backfill should be placed in maximum 200 mm thick layers at or near (±2%) their optimum moisture content, and each layer should be compacted to at last 95% SPMDD. Unsuitable materials such as organic soils, boulders, cobbles, frozen soils, etc. should not be used for backfilling. Otherwise imported selected inorganic fill will be required for backfilling at this site.

The onsite excavated soils should not be used in confined areas (e.g. around catch basins and laterals under roadways) where heavy compaction equipment cannot be operated. The use of imported granular fill together with an appropriate frost taper would be preferable in confined areas and around structures, such as catch basins.

4.3 SITE GRADING AND ENGINEERED FILL

In the areas where earth fill is required for site grading purposes, an engineered fill may be constructed below house/building foundations, roads, boulevards, etc.

Prior to the construction of engineered fill, all topsoil, fill material, weak weathered/ disturbed and any other unsuitable materials must be removed in this area. After the removal of all unsuitable materials, the excavation base consisting of native soil deposits must be inspected and approved by a qualified geotechnical engineer prior to any placement of engineered fill. The base of the excavation should be compacted and proof rolled with heavy compactors (minimum 10,000 kg). During proof rolling, spongy, wet or soft/loose spots should be sub-excavated to stable subgrade and replaced with approved soil, compatible with subgrade conditions, as directed by the geotechnical engineer.

The material for engineered fill should consist of approved inorganic soil, compacted to 100 percent of Standard Proctor Maximum Dry Density (SPMDD). Recommendations regarding engineered fill placement are provided in Appendix A of this report.

To reduce the risk of improperly placed engineered compacted fill, full-time supervision of the contractor is essential by SIRATI to certify the engineered fill. Despite full time supervision, it has been found that contractors frequently bulldoze loose fill into areas and compact only the surface. The inspector, either busy on other portions of the site or absent during "off hours" will be unaware of this condition. This potential problem must be recognized and discussed at a pre-construction meeting.

Depending upon the amount of grade raise, there will be consolidation settlement of the underlying soils. Additionally, there will be settlement of the engineered fill under its own weight, approximately 0.5% of the fill height. A waiting period of 3 to 6 months may be required prior to the construction of any structures on engineered fill. This should be confirmed during the detailed design stage, once the grading plans for the proposed development are available.

4.4 FOUNDATION CONDITIONS

Based on available information the proposed development will consist of the following buildings:
Tower A – 18 Storey building with three levels of parking below the grade.

- Tower B – 22 Storey building with three and four levels parking below the grade.
- 8 Storey Podium (North) - with three levels of parking below the grade.
- North Building – 7 Story Podium with three and four levels of parking below the grade.
- 8 Story Podium (South) with four levels of carpark below the grade.
- South Building – 12 Storey Building with 4 levels of parking below the grade.

Deep boreholes and rock coring was conducted during 2023 supplementary geotechnical investigation. Table 5 provides an overall comparison of the ground information deduced from 2023 supplementary geotechnical investigation against the lowest elevation of the proposed underground parking according to the latest drawings provided by the Client [Ref.3].

Table 5 - Overall Comparison of the Available Data for Foundation Recommendations

BH ID	Depth of borehole and the corresponding Elevation		No. of Rock Core Runs	Relevant Building	Lowest Proposed Elevation of Nearby Building(mASL)
	mbgs*	mASL**			
BH/MW23-101	6.2	149.7	-	Tower A	147.6
BH/MW23-102	6.2	151.5	-	-	147.6
BH/MW23-103	9.5	144.4	3	-	144.7
BH/MW23-104	5.0	148.8	-	-	144.7
BH/MW23-107	9.6	146.8	2	-	144.7

*mbgs: meters below ground surface
**mASL: meters Above Sea Level

The latest revision of the proposed development incorporates significant changes, including additional underground parking spaces, extra stories for each building among other things. Consequently, the overall depth of the proposed development has undergone alterations impacting the geotechnical recommendations that is provided in the following sections. As such, additional ground investigation within the footprint of the proposed development is necessary to acquire subsurface information for foundation requirements to cater for the proposed modifications.

The total of five (5) boreholes BH/MW-101, 102, 103, 104 and 107 and findings presented in previous reports prepared by SIRATI have been considered to estimate the bearing capacities of the shallow and deep foundations presented in this section.

Based on the borehole information obtained from ground investigations in 2018 and 2023, the proposed buildings can be supported by conventional spread and strip footings at or below the minimum depths provided in Table 6.

Table 6 - Bearing Values and Founding Levels of Spread Footings

Building ID	BH No.	Material	Bearing Capacity at SLS (kPa)	Factored Geotechnical Resistance at ULS (kPa)	Minimum Depth Below Existing Ground (m)	Founding Level at or Below Elevation (m)
Tower A	BH/MW-101	Weathered Bedrock	200	300	5.4	147.6
8 Story Podium	BH/MW-102	Weathered Bedrock	200	300	7.2	144.7
South Building	BH/MW-103	Weathered Bedrock	200	300	6.3	144.7
South Building	BH/MW-104	Weathered Bedrock	200	300	6.2	144.7

Building ID	BH No.	Material	Bearing Capacity at SLS (kPa)	Factored Geotechnical Resistance at ULS (kPa)	Minimum Depth Below Existing Ground (m)	Founding Level at or Below Elevation (m)
7 Storey Buiding	BH/MW-107	Weathered Bedrock	200	300	5.9	144.7

All footings must be found below a frost depth of 1.2 m.

Provided that the founding soil is undisturbed during construction, total and differential settlements of foundations designed and constructed in accordance with the specified design bearing values should not exceed 25 mm and 19 mm, respectively.

Variations in the soil conditions are expected in between the borehole locations, and during construction, the soil bearing pressures should be confirmed by the Geotechnical Engineer.

Where the grade needs to be raised, the proposed structures can be supported by spread and strip footings founded on engineered fill for an allowable bearing pressure of 150 kPa. The engineered fill supporting footings should be constructed in accordance with the guidelines presented in **Appendix A**. Other requirements of engineered fill are given in Section 4.

The proposed buildings can be supported by drilled piers founded on sound shale bedrock for a bearing pressure of 2,500 kPa at the serviceability limit states (SLS), and for a factored geotechnical resistance of 3,750 kPa at the ultimate limit states (ULS). The piers should be constructed at least three (3) meters into sound bedrock at approximate elevation of 145 m ASL.

Piers designed to the specified bearing capacity values at the serviceability limit states (SLS) are expected to settle less than 10 mm.

The piers will require temporary liners for installation to help prevent the soil from caving and to help control water seepage into the caisson hole.

All piers/caisson bases must be cleaned and must be proven to be founded in dry sound bedrock. All caissons bases must be inspected by this office. Concrete should be poured immediately after the caisson hole is complete and inspected. The caisson liners should be carefully withdrawn after the inspection and approval of the base material, while pouring the concrete.

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

In designing the foundation elements, the following should be considered:

-To avoid intolerable differential or total settlement, it is recommended that the foundations element to be design as pier foundation/caissons, with the minim embedment provided above into sound bedrock.

-If the foundation system designed for the proposed buildings Towers A, B, and 8 Storey podium is different than the foundation system for the other buildings (North Building, , the foundation designer should ensure that the foundations elements to be working independently to avoid any differential settlement.

5. FLOOR SLAB AND PERMANENT DRAINAGE

The floor slabs can be supported on grade provided the existing fill materials are removed to at least 1.0 m below the floor slab. Any soft or unstable areas must be removed and replaced with suitably compacted soils, as defined in Section 4.1.1 of this report. A granular layer consisting of at least 200 mm of 19 mm Crusher Run Limestone (CRL) or OPSS Granular A should be installed under the floor slab as a bedding layer. The CRL or the OPSS Granular A should be compacted to 100% of its SPMDD.

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

The perimeter drainage system shown on Drawings 15 and 16 are recommended for the basement walls with open cut or shored excavations, respectively. Underfloor drainages should be installed.

6. EARTH PRESSURE

The lateral earth and water pressure acting at any depth on the basement walls can be calculated by the following formula:

In soils above the groundwater table ($z < dw$):

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

In soils below the groundwater table ($z \geq dw$):

$p = K \{\gamma dw + \gamma 1 (z - dw) + q\} + pw$

In which, $pw = \gamma w (z - dw)$

where p	=	lateral earth and water pressure in kPa acting at a depth of z below ground surface
K	=	earth pressure coefficient
γ	=	unit weight of soil above groundwater table
$\gamma 1$	=	submerged unit weight of soil below groundwater table
γw	=	unit weight of water, assuming $\gamma w = 9.8$ kN/m3
z	=	depth below ground surface to point of interest, in meters
dw	=	depth of groundwater table below ground surface, in meters
q	=	value of surcharge in kPa
pw	=	hydrostatic water pressure in kPa

When the basement wall is poured against the shoring caisson wall, the basement wall as well as the shoring caisson wall should be designed for hydrostatic pressure, even though a drainage board is provided between the basement wall and the caisson wall. For the design of the basement walls and shoring caisson wall, the groundwater table at the site can be considered at Elev. 151.9 m, this needs to be confirmed with the hydrogeological study report for this site. The lateral earth pressure parameters are presented in Table 7:

Table 7- Lateral Earth Pressure Parameters

Parameter	Clayey Silt Till	Sandy Silt Till
Unit Weight, γ, kN/m^3	21	22
Submerged Unit Weight, γ_1, kN/m^3	11.2	12.2
Effective Friction Angle, ϕ, degrees (for undrained conditions of temporary shoring system)	30	34
Effective Cohesion, c', kPa	5	-
Undrained Shear Strength, S_u, kPa	100	-
Active Earth Pressure Coefficient, K_a	0.33	0.28
Passive Earth Pressure Coefficient, K_p	3.00	3.54
Earth Pressure at rest Coefficient, K_0	0.5	0.44
Modulus of Subgrade Reaction, K, MN/m^3	5	8

7. TEMPORARY SHORING

It is understood that the proposed excavations will be supported by a temporary shoring system consisting of timber lagging and soldier piles. A tightly braced caisson wall may also be required to support adjacent structures. The requirement for caisson walls supporting adjacent structures is given on Drawing 17.

The presence of groundwater table in the native soil will make the construction of the shoring caissons difficult and therefore appropriate protection must be provided to prevent the soil from caving and thus minimize the possible formation of voids below the floor slab and adjacent foundations.

The shoring system must be designed in accordance with the Fourth Edition of the Canadian Foundation Engineering Manual. The soil parameters estimated to be applicable for this design are as follows:

1) Earth Pressure Coefficients
    a) where movement must be minimal K=0.50
    b) where minor movement (.002H) can be tolerated, K=0.33
    c) passive earth pressure for soldier piles (unfactored)
2) For stability check
    ϕ= See Table 4

c= See Table 4

γ = See table 4

Surcharge is to be determined by shoring contractor.

3) For earth anchors

Bond value of 50 kPa is suggested; this value depends on anchor installation methods and grouting procedures. Gravity poured concrete can result in low bond values while pressure grouted anchors will give higher values and produce a more satisfactory anchor.

Safe net bearing value for soldier pile caissons base assuming clean dry hole is q = 800 kPa. Assuming a slurry procedure and tremie concrete, then q = 400 kPa

Casing will be required during the construction of the tiebacks to prevent caving of soils. The soldier piles should be installed in pre-augured holes taken below the deepest excavation. The holes should be filled with concrete below the excavation level and half bag mix above the base of the excavation. The concrete strength must be specified by the shoring designer. Temporary liners will be required to help prevent the sandy soils from caving during the installation period. Positive measures will be required to prevent the loss of soil through the spaces between the lagging boards (if used). This could be achieved by installing a geotextile filter cloth behind the lagging boards.

Soil anchors will be required to support the shoring. The anchors must be of a length that meets the Canadian Foundation Manual recommendations. It is important to note that the minimum length lies beyond the 45 - ϕ/2 + .15H line drawn from the base of the soldier pile and the overall stability of the system must be checked at each anchor level.

The top anchor must not be placed lower than 3.0 metres below the top of level ground surface. Anchors will require casing when penetrating through wet sand and silt layers. The suggested bond value of 50 KPa is arbitrary since the contractor's installation procedures will determine the actual soil to concrete bond value. Hence, the contractor must decide on a capacity and confirm its availability. All anchors must be tested as indicated in the Foundation Manual, 4th edition.

Adhesion on the buried caisson shaft or behind the shoring system must be neglected when designing this shoring system.

Movement of the shoring system is inevitable. Vertical movements will result from the vertical load on the soldier piles resulting from the inclined tiebacks and inward horizontal movement results from earth and water pressures. The magnitude of this movement can be controlled by sound construction practices, and it is anticipated that the horizontal movement will be in the range of 0.1 to 0.25%H.

To ensure that movements of the shoring are within an acceptable range, monitoring must be carried out. Vertical and horizontal targets on the soldier piles must be located and surveyed before excavation begins. Weekly readings during excavation should show that the movements will be within those predicted; if not, the monitoring results will enable directions to be given to improve the shoring.

8. EARTHQUAKE CONSIDERATIONS

Based on the borehole information and according to Table 4.1.8.4.A of OBC 2012, the subject site for the proposed building can be classified as "Class D" for the seismic site response.

9. GENERAL COMMENTS ON REPORT

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

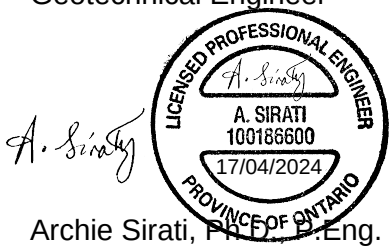
The comments given in this report are intended only for the guidance of design engineers. The number of boreholes required to determine the localized underground conditions between boreholes affecting construction costs, techniques, sequencing, equipment, scheduling, etc., would be much greater than has been carried out for design purposes. Contractors bidding on or undertaking the works should, in this light, decide on their own investigations, as well as their own interpretations of the factual borehole results, so that they may draw their own conclusions as to how the subsurface conditions may affect them.

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

Yours truly,

SIRATI & PARTNERS CONSULTANTS LIMITED

Sarah Zahedie, M.Eng., E.I.T
Geotechnical Engineer



Archie Sirati, PH.D., P.Eng.
Principal Geotechnical Engineer

Drawings

Source: Google Earth Map

0 40 m

SIRATI & PARTNERS
160 Konrad Crescent
Markham, ON. L3R 9T9
Phone# 905 940 1582, Fax# 905 940 2440

North:

Legend:

Approximate Property Boundary

Borehole/ Monitoring Well

Project Title:
Geotechnical Investigation

Site Location:
66 Thomas Street,
Mississauga, Ontario.

Figure Title:
Borehole/ Monitoring Well Location Plan

Scale:	Project Number:
As Shown	SP23-01177-00
Date:	**Figure Number:**
June, 2023	1

Drawing 1A: Notes on Sample Descriptions

1. All sample descriptions included in this report follow the Canadian Foundations Engineering Manual soil classification system. This system follows the standard proposed by the International Society for Soil Mechanics and Foundation Engineering. Laboratory grain size analyses provided by Sirati & Partners Consultants Limited also follow the same system. Different classification systems may be used by others; one such system is the Unified Soil Classification. Please note that, with the exception of those samples where a grain size analysis has been made, all samples are classified visually. Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems.

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE		

0.002 0.006 0.02 0.06 0.2 0.6 2.0 6.0 20 60 200

EQUIVALENT GRAIN DIAMETER IN MILLIMETRES

CLAY (PLASTIC) TO	FINE	MEDIUM	CRS.	FINE	COARSE
SILT (NONPLASTIC)	SAND			GRAVEL	

UNIFIED SOIL CLASSIFICATION

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

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

SIRATI & PARTNERS

LOG OF BOREHOLE BH/MW-101

PROJECT: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

CLIENT: De Zen Realty Company Ltd.

PROJECT LOCATION: 66 THOMAS STREET, MISSISSAUGA, ONTARIO

DATUM: Geodetic

BH LOCATION: See Drawing 1 N 4825920.035 E 603602.904

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150 mm

Date: May-18-2023

REF. NO.: SP23-01177-00

ENCL NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
155.9												
0.0 / 155.5	**GRANULAR FILL:** sand and gravel, 460 mm		1	SS	64							36 43 (22)
0.5 / 155.1	**FILL:** clayey silt, trace to some gravel, some sand, trace cobbles, brown, moist											
0.8	trace cobbles, very stiff		2	SS	26		155					9 31 41 19
	CLAYEY SILT TILL: some sand to sandy, trace to some gravel, brown, moist, hard											
	hard		3	SS	41		154					
153.6												
2.3	**SANDY SILT TILL:** trace clay, trace gravel, grey, very moist, dense		4	SS	34							1 20 71 8
						▽	153					
	trace cobbles, moist, very dense		5	SS	62		W. L. 152.9 m May 30, 2023					
151.3							152					
4.6	**INFERRED BEDROCK: GEORGIAN BAY FORMATION** Highly weathered (W4), grey		6	SS	50/ 50mm							
149.7			7	SS	50/ 125mm		151					
6.2	**END OF BOREHOLE:**						150					

1. Borehole was open and dry upon completion of drilling.
2. Auger refusal at 4.6 mbgs.
3. Monitoring well installed at the BH/MW-101 with screening from 3.05 to 6.1 mbgs.
4. Groundwater level mesurements:

Date	Depth (mbgs)
May 30, 2023	3.00

GROUNDWATER ELEVATIONS

Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

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

SPCL SOIL LOG /DRAFT SP23-01177-00.GPJ SPCL.GDT 23-6-13

LOG OF BOREHOLE BH/MW-102

PROJECT: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION
CLIENT: De Zen Realty Company Ltd.
PROJECT LOCATION: 66 THOMAS STREET, MISSISSAUGA, ONTARIO
DATUM: Geodetic
BH LOCATION: See Drawing 1 N 4825928.806 E 603533.82

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: May-18-2023

REF. NO.: SP23-01177-00
ENCL NO.: 3

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
157.7												
157.6	**ASPHALT:** 50 mm											
157.4 / 0.3	**GRANULAR FILL:** sand and gravel, 255 mm		1	SS	9		157					
	CLAYEY SILT: some sand, trace to some gravel, brown, very moist, stiff		2	SS	12							
156.2												
1.5	**CLAYEY SILT TILL:** some sand, trace gravel, brown, very moist, stiff		3	SS	13		156					1 18 57 24
155.4												
2.3	**SANDY SILT TILL:** some clay, trace to some gravel, trace cobbles, greyish brown, moist, dense		4	SS	39		155					8 30 42 20
	trace cobbles and boulders, very dense		5	SS	50/ 75mm							
						W. L. 154.1 m May 30, 2023						
153.1												
4.6	**RESIDUAL SOIL/ HIGHLY WEATHERED SHALE BEDROCK:** grey, moist, very dense		6	SS	50/ 75mm		153					
151.6							152					
151.5 / 6.2	**INFERRED BEDROCK: GEORGIAN BAY FORMATION** Highly weathered (W4), grey		7	SS	50/ 100mm							
	END OF BOREHOLE:											

1. Borehole was open and dry upon completion of drilling.
2. Auger Refusal at 6.1 mbgs.
3. Monitoring well installed at the BH/MW-102 with screening from 3.05 to 6.1 mbgs.
4. Groundwater level mesurements:

Date	Depth (mbgs)
May 30, 2023	3.54

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

SPCL SOIL LOG /DRAFT SP23-01177-00.GPJ SPCL.GDT 23-6-13

SIRATI & PARTNERS

LOG OF BOREHOLE BH/MW-103

PROJECT: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

CLIENT: De Zen Realty Company Ltd.

PROJECT LOCATION: 66 THOMAS STREET, MISSISSAUGA, ONTARIO

DATUM: Geodetic

BH LOCATION: See Drawing 1 N 4825752.335 E 603741.782

DRILLING DATA

Method: Hollow Stem Auger Rock Coring

Diameter: 200 mm

Date: May-23-2023

REF. NO.: SP23-01177-00

ENCL NO.: 4

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS 0.3 m "N"	ELEVATION	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
153.9						
153.7 0.2	**ASPHALT:** 150mm					
153.5 0.4	**GRANULAR FILL:** sand and gravel, 255mm	1	SS	27		
	FILL: clayey silt, some sand, trace gravel, dark brown, very moist, very stiff	2	SS	8	153	4 19 52 25
1	stiff					
	moist to very moist, firm	3	SS	5		
2					152	
	trace cobbles, moist, hard	4	SS	36		
150.8 3					151	
3.1	**SANDY SILT TILL:** some clay, trace cobbles, trace gravel, grey, moist, dense	5	SS	42		8 30 44 18
4		6	SS	40	150	
149.1	very dense	7	SS	50/ 50mm		
5 4.8	**INFERRED BEDROCK: GEORGIAN BAY FORMATION** Highly weathered (W4), grey				149	
148.4		8	SS	50/ 50mm		
5.5	Rock coring started at 5.54m					
6	**RUN 1:** Highly weathered (W4) to Moderately (W3), grey TCR: 87.5% SCR: 77.7%	1	CORE		148	
147.3 6.6	RQD: 72.2%					
7	**RUN 2:** Moderately weathered (W3) to Slightly (W2), grey TCR: 100% SCR: 76.4% RQD: 43.7%	2	CORE		147	
145.9 8					146	
8.0	**RUN 3:** Moderately weathered (W3) to Slightly (W2), grey TCR: 100% SCR: 64.3% RQD: 16.7%	3	CORE			
9					145	
144.4 9.5	**END OF BOREHOLE:**					

1. Borehole was open upon completion of drilling.
2. Auger refusal at 4.8 mbgs.
3. Monitoring well installed at the BH/MW-103 with screening from 6.1 to 9.1 mbgs.
4. Groundwater level mesurements:

Date	Depth (mbgs)
May 30, 2023	1.97

W. L. 151.9 m May 30, 2023

SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE

DYNAMIC CONE PENETRATION RESISTANCE PLOT

PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%)

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

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

SPCL SOIL LOG /DRAFT SP23-01177-00.GPJ SPCL.GDT 23-6-13

LOG OF BOREHOLE BH/MW-104

PROJECT: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

CLIENT: De Zen Realty Company Ltd.

PROJECT LOCATION: 66 THOMAS STREET, MISSISSAUGA, ONTARIO

DATUM: Geodetic

BH LOCATION: See Drawing 1 N 4825780.562 E 603763.349

DRILLING DATA

Method: Solid Stem Auger

Diameter: 150 mm

Date: May-18-2023

REF. NO.: SP23-01177-00

ENCL NO.: 5

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	TYPE	BLOWS/0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa): ○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE & Sensitivity, × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
153.8											
153.7	**ASPHALT:** 125 mm										
153.6 0.3	**GRANULAR FILL:** sand and gravel, 150 mm		1	SS	31						
1	**FILL:** clayey silt, some sand, trace gravel, trace construction debris, brown, moist, hard		2	SS	11		153				
	grey, very moist, stiff										
	firm		3	SS	4		152				
2						▽		W. L. 151.9 m May 30, 2023			
	clayey silt, sandy, some gravel, soft		4	SS	2						11 31 39 19
3 150.8							151				
3.1	**CLAYEY SILT TILL:** some sand, trace to some gravel, trace cobbles, grey, moist to very moist, hard		5	SS	50/125mm						
4							150				
149.3											
4.6	**INFERRED BEDROCK: GEORGIAN BAY FORMATION** Highly weathered (W4), grey		6	SS	50/150mm		149				
5 148.8											
5.0	**END OF BOREHOLE:**										

1. Borehole was open upon completion of drilling.
2. Auger refusal at 4.6 mbgs.
3. Water level was encountered at 3.05 mbgs upon completion of drilling.
4. Monitoring well installed at the BH/MW-104 with screening from 1.98 to 5.03 mbgs.
5. Groundwater level mesurements:

Date	Depth (mbgs)
May 30, 2023	1.92

GROUNDWATER ELEVATIONS

Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

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

SPCL SOIL LOG /DRAFT SP23-01177-00.GPJ SPCL.GDT 23-6-13

LOG OF BOREHOLE BH/MW-107

PROJECT: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

CLIENT: De Zen Realty Company Ltd.

PROJECT LOCATION: 66 THOMAS STREET, MISSISSAUGA, ONTARIO

DATUM: Geodetic

BH LOCATION: See Drawing 1 N 4825887.157 E 603603.014

DRILLING DATA

Method: Hollow Stem Auger Rock Coring

Diameter: 200 mm

Date: May-19-2023

REF. NO.: SP23-01177-00

ENCL NO.: 6

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
156.4												
0.0 / 155.9	**GRANULAR FILL:** sand and gravel, 455 mm		1	SS	36		156					54 32 (14)
0.5 / 154.9	**FILL:** clayey silt, some sand, trace cobbles, trace gravel, trace construction debris, brown, very moist, hard		2	SS	20		155					1 17 47 35
1.5 / 153.1	**CLAYEY SILT TILL:** some sand, trace gravel, brown, moist, very stiff hard		3	SS	30		154					
			4	SS	50/ 50mm							
3.3 / 151.8	**SANDY SILT TILL:** some gravel, trace to some clay, trace cobbles, grey, moist, dense trace cobbles and boulders, very dense		5	SS	44		153					13 25 52 10
			6	SS	50/ 50mm	W. L. 152.7 m May 30, 2023	152					
4.6 / 149.3	**INFERRED BEDROCK: GEORGIAN BAY FORMATION** Highly weathered (W4), grey		7	SS	50/ 125mm		151					
			8	SS	50/ 100mm		150					
			9	SS	50/ 100mm							
7.1 / 148.4	Rock coring started at 7.1m **RUN 1:** Highly weathered (W4) to Moderately (W3), grey TCR: 100% SCR: 48.6% RQD: 13.5%		1	CORE			149					
8.0	**RUN 2:** Moderately weathered (W3) to Slightly (W2), grey TCR: 70% SCR: 80.9% RQD: 50%		2	CORE			148					
9.6 / 146.8	**END OF BOREHOLE:** 1. Borehole was open upon completion of drilling. 2. Auger refusal at 4.6 mbgs. 3. Monitoring well installed at the BH/MW-107 with screening from 6.1 to 9.1 mbgs. 4. Groundwater level mesurements: Date / Depth (mbgs) May 30, 2023 / 3.64						147					

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

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

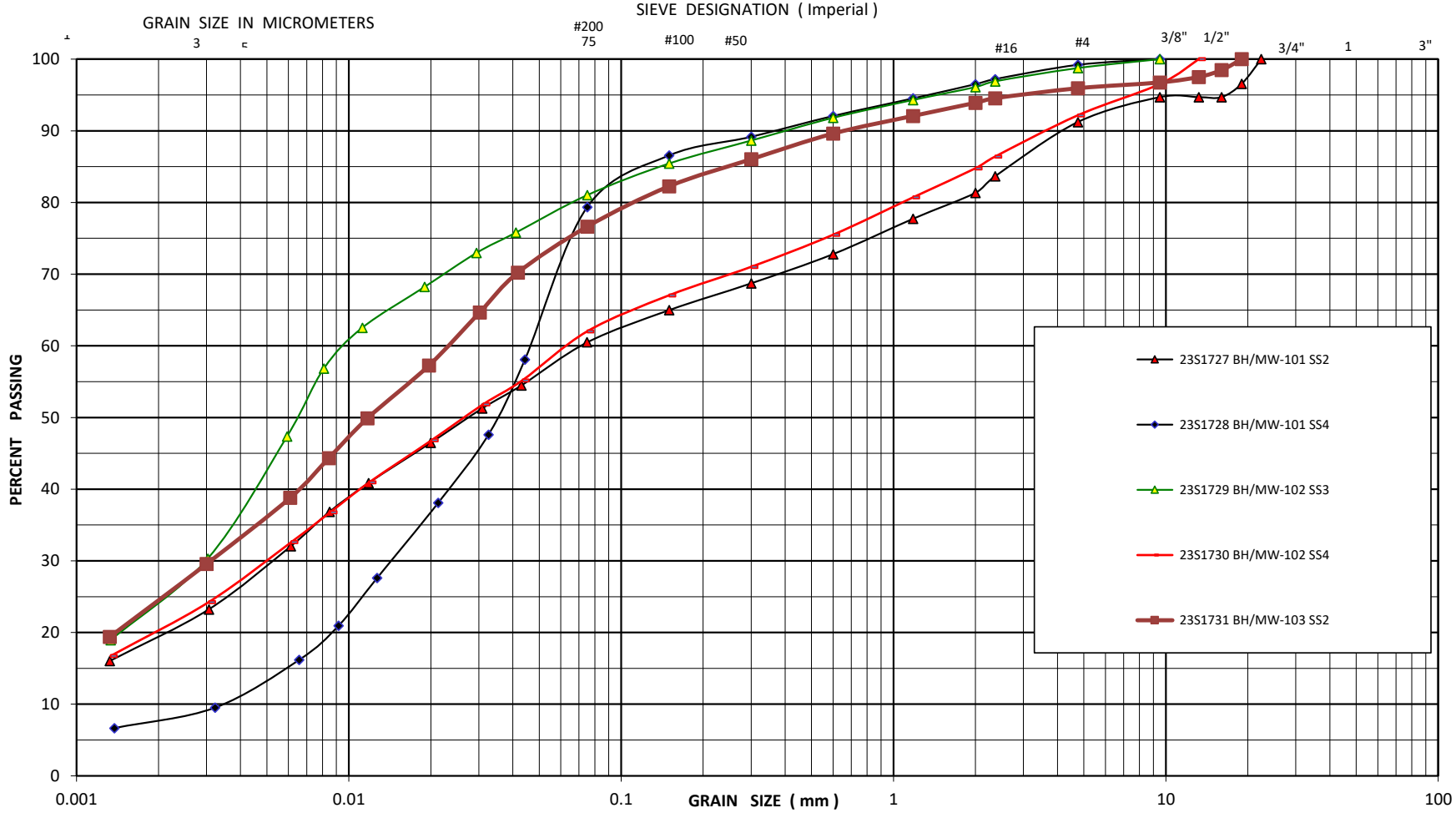
SPCL SOIL LOG /DRAFT SP23-01177-00.GPJ SPCL.GDT 23-6-13

SIRATI & PARTNERS

GRAIN SIZE DISTRIBUTION

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse



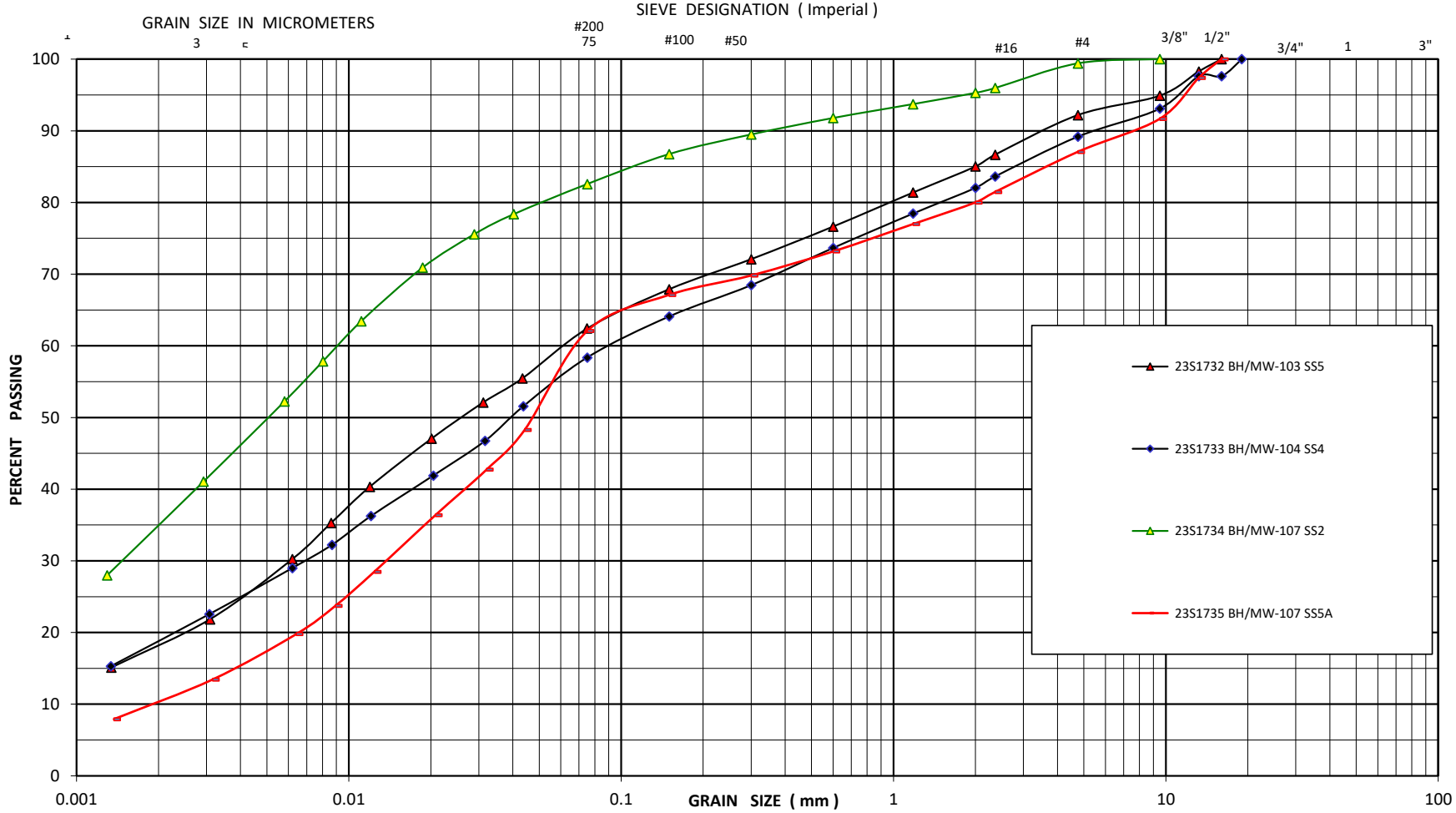
Project No.	:	SP23-01177-00
Date	:	01 June 2023
Figure No.	:	7

SIRATI & PARTNERS

GRAIN SIZE DISTRIBUTION

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse



Project No.	:	SP23-01177-00
Date	:	01 June 2023
Figure No.	:	8

SIRATI & PARTNERS
Geotechnical Hydrogeological & Environmental Solutions

Grain Size Analysis

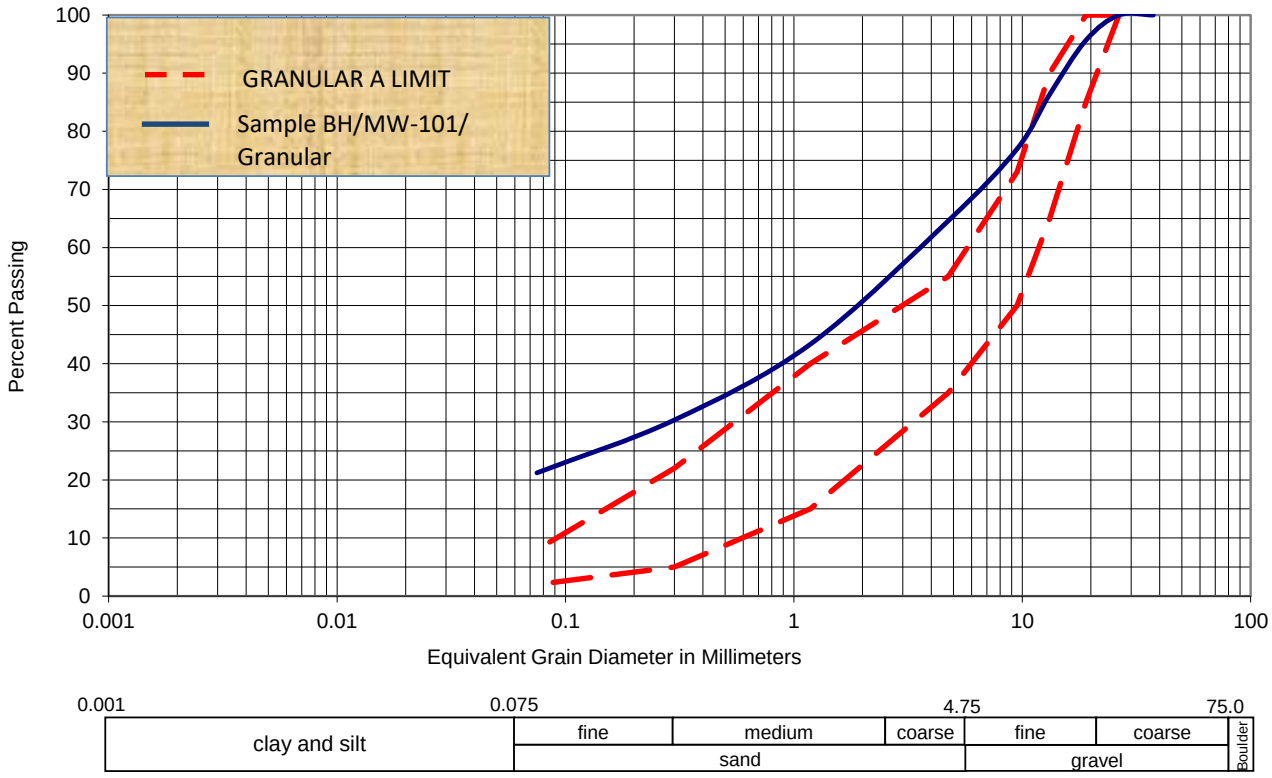
(Granular Material)

MTO LS-602

FIGURE NUMBER:
SAMPLE NUMBER: 23S1726 **Date Tested:** 26 May 2023
PROJECT NUMBER: SP23-1177-00
PROJECT NAME: 66 Thomas Street, Mississauga
CLIENT:
PROJECT LOCATION:
SAMPLED BY:
DATE SAMPLED:
SUPPLIER:
SAMPLE LOCATION:
DESCRIPTION: BH/MW-101/ Granular
SPECIFICATION: OPSS 1010 Granular A
COMMENTS:

SIEVE SIZE	PERCENT PASSING	SPECIFICATIONS
37.5 mm	100.00	Upper limit
26.5 mm	100.00	100
19.0 mm	95.65	85-100
13.2 mm	86.38	65-90
9.5 mm	76.98	50-73
4.75 mm	64.61	35-55
1.18 mm	43.34	15-40
300 µm	30.31	5-22
75 µm	21.21	2-8

		Percentage of		
Sample No.	BH-SS	Gravel	Sand	Fines(Silt and Clay)
23S1726	BH/MW-101/ Granular	35	43	22



SIRATI & PARTNERS
Geotechnical Hydrogeological & Environmental Solutions

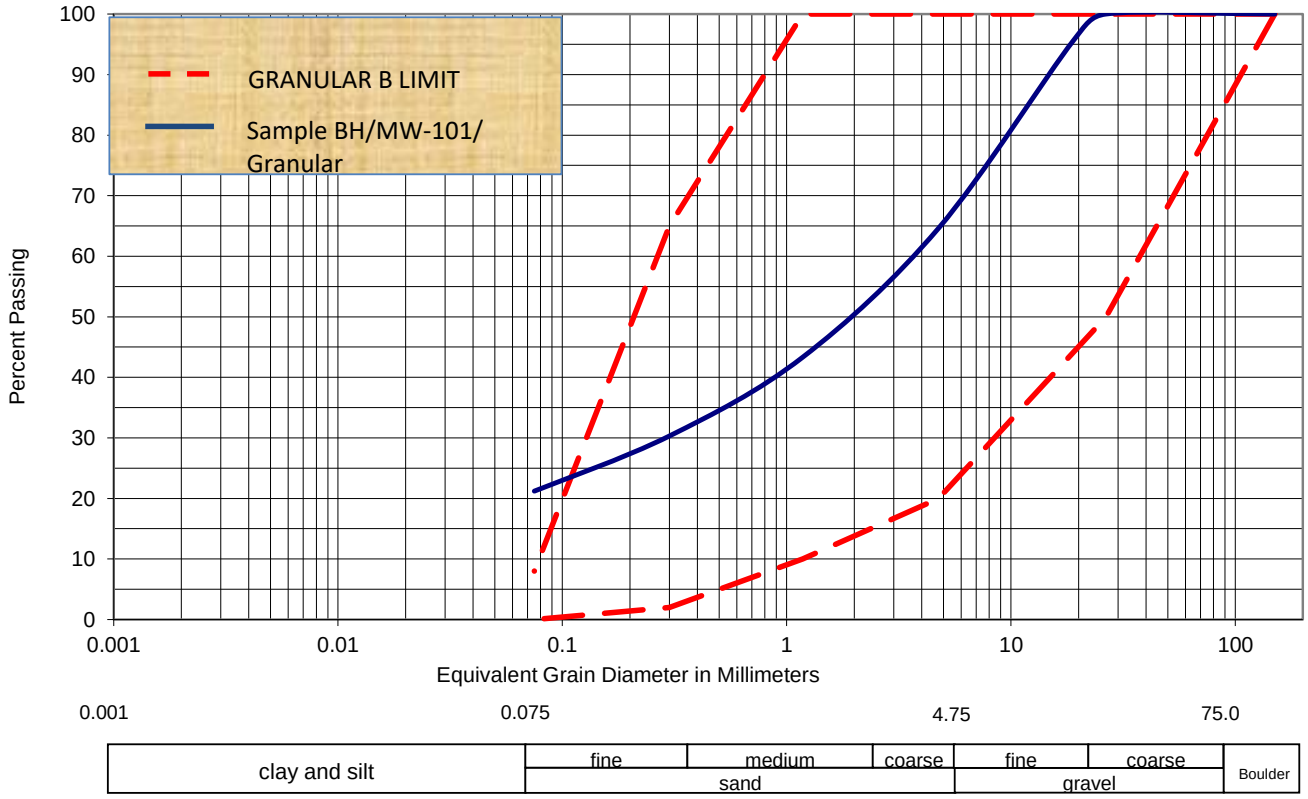
Grain Size Analysis

(Granular Material)

MTO LS-602

FIGURE NUMBER:
SAMPLE NUMBER: 23S1726 **Date Tested:** 26 May 2023
PROJECT NUMBER: SP23-1177-00
PROJECT NAME: 66 Thomas Street, Mississauga
CLIENT:
PROJECT LOCATION:
SAMPLED BY:
DATE SAMPLED:
SUPPLIER:
SAMPLE LOCATION:
DESCRIPTION: BH/MW-101/ Granular
SPECIFICATION: OPSS 1010 Granular A
COMMENTS:

SIEVE SIZE	PERCENT PASSING	SPECIFICATIONS
150 mm	100.00	100
26.5 mm	100.00	50-100
19.0 mm	95.65	Sieve for proctor
4.75 mm	64.61	20-100
1.18 mm	43.34	10-100
300 µm	30.31	2-65
75 µm	21.21	0-8



SIRATI & PARTNERS
Geotechnical Hydrogeological & Environmental Solutions

Grain Size Analysis

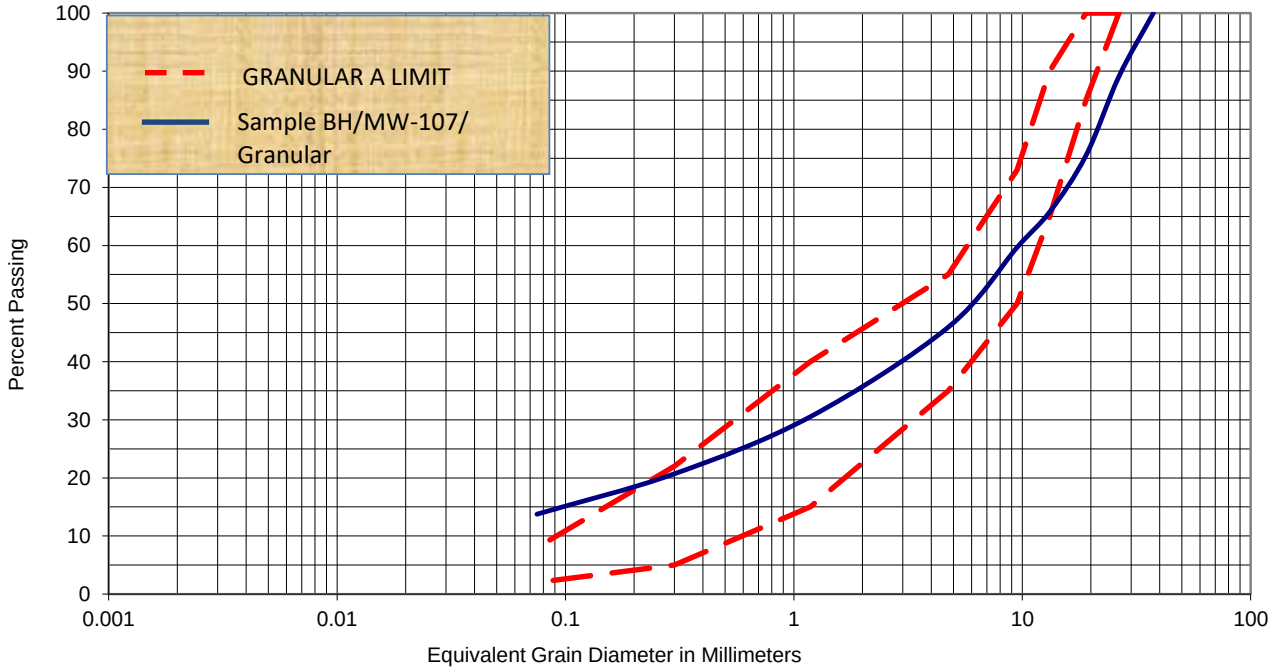
(Granular Material)

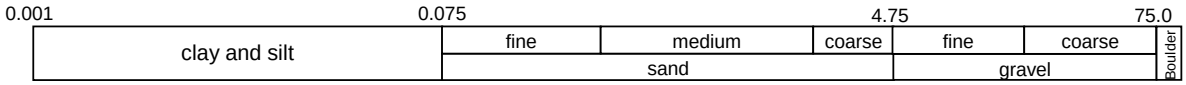
MTO LS-602

FIGURE NUMBER:
SAMPLE NUMBER: 23S1736 **Date Tested:** 26 May 2023
PROJECT NUMBER: SP23-1177-00
PROJECT NAME: 66 Thomas Street, Mississauga
CLIENT:
PROJECT LOCATION:
SAMPLED BY:
DATE SAMPLED:
SUPPLIER:
SAMPLE LOCATION:
DESCRIPTION: BH/MW-107/ Granular
SPECIFICATION: OPSS 1010 Granular A
COMMENTS:

SIEVE SIZE	PERCENT PASSING	SPECIFICATIONS
37.5 mm	100.00	Upper limit
26.5 mm	89.07	100
19.0 mm	75.45	85-100
13.2 mm	65.80	65-90
9.5 mm	59.68	50-73
4.75 mm	45.96	35-55
1.18 mm	30.52	15-40
300 µm	20.71	5-22
75 µm	13.75	2-8

		Percentage of		
Sample No.	BH-SS	Gravel	Sand	Fines(Silt and Clay)
23S1736	BH/MW-107/ Granular	54	32	14





SIRATI & PARTNERS
Geotechnical Hydrogeological & Environmental Solutions

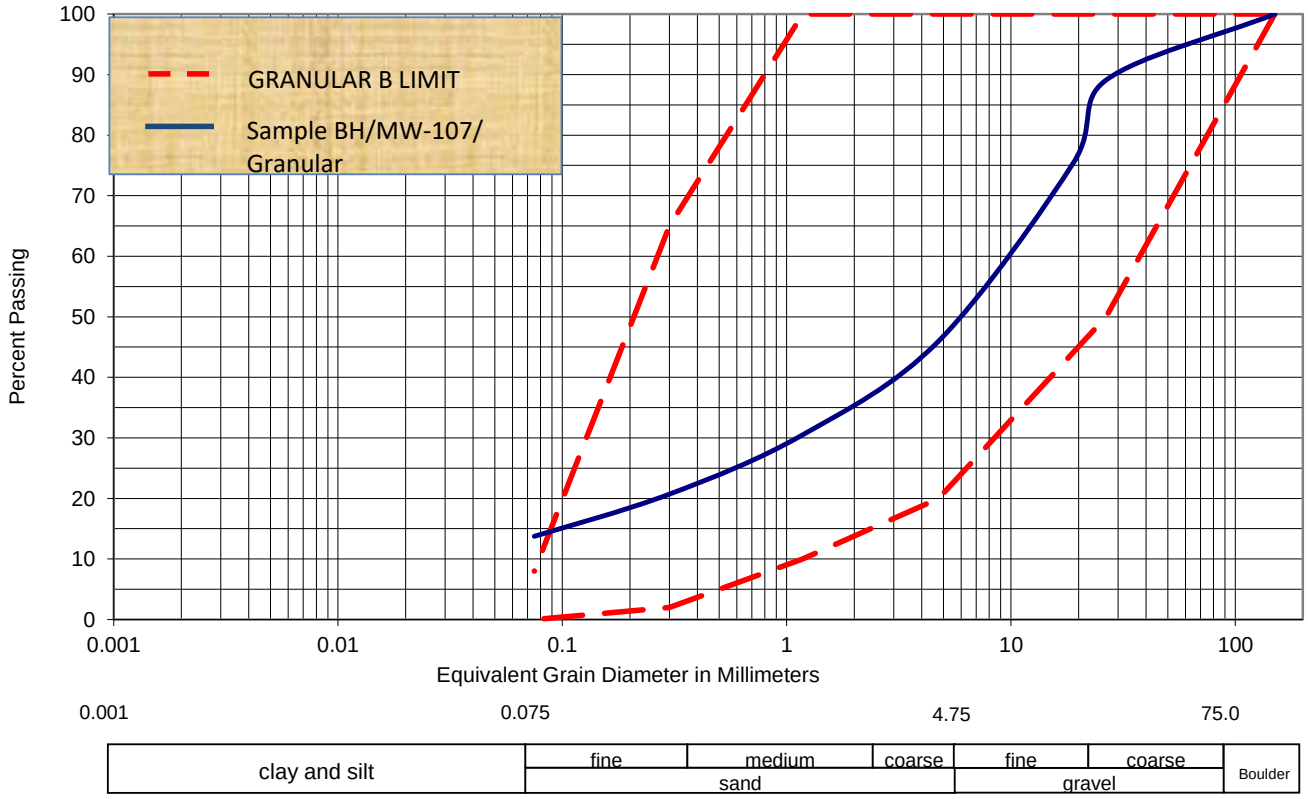
Grain Size Analysis

(Granular Material)

MTO LS-602

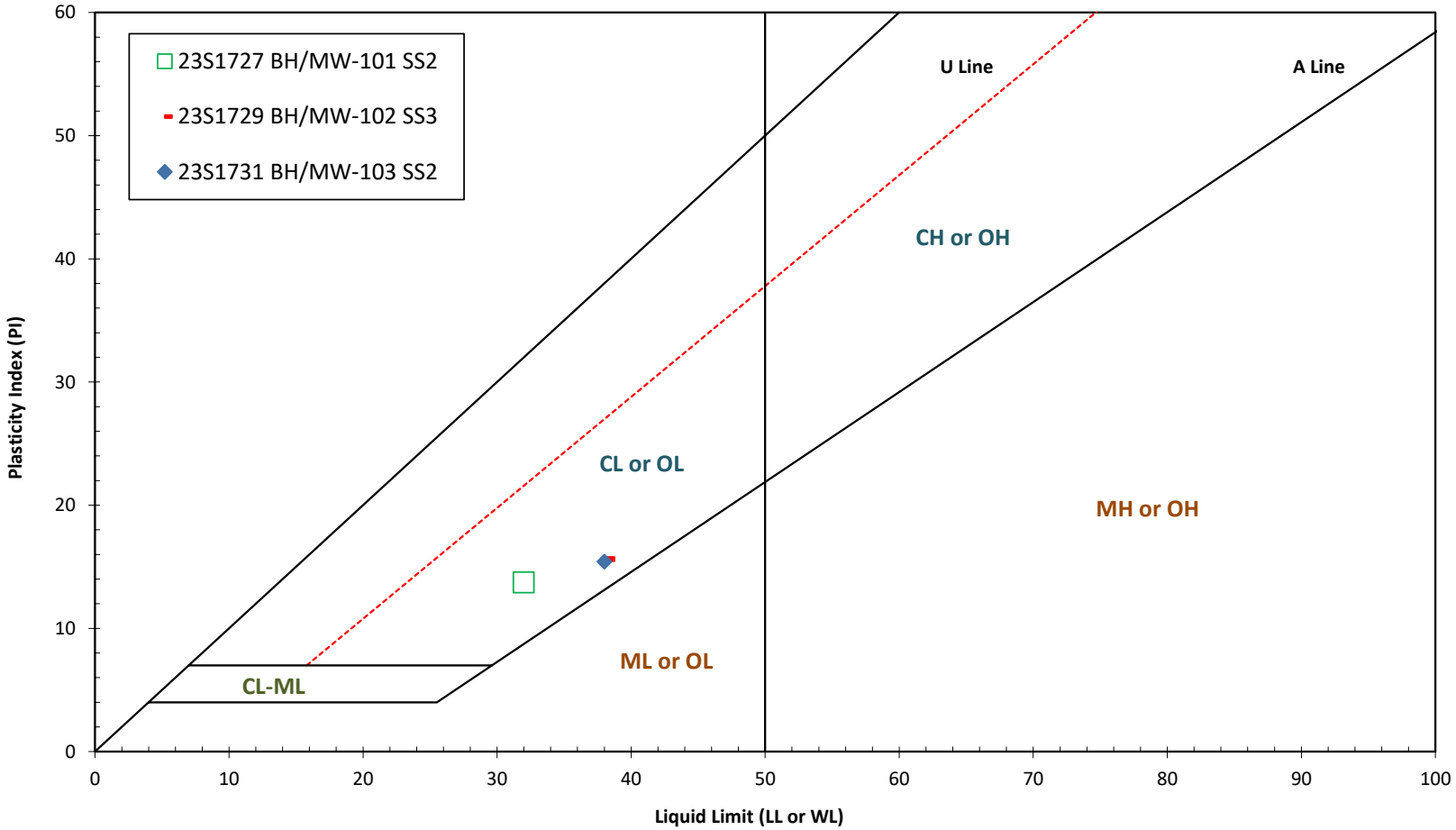
FIGURE NUMBER:
SAMPLE NUMBER: 23S1736 **Date Tested:** 26 May 2023
PROJECT NUMBER: SP23-1177-00
PROJECT NAME: 66 Thomas Street, Mississauga
CLIENT:
PROJECT LOCATION:
SAMPLED BY:
DATE SAMPLED:
SUPPLIER:
SAMPLE LOCATION:
DESCRIPTION: BH/MW-107/ Granular
SPECIFICATION: OPSS 1010 Granular A
COMMENTS:

SIEVE SIZE	PERCENT PASSING	SPECIFICATIONS
150 mm	100.00	100
26.5 mm	89.07	50-100
19.0 mm	75.45	Sieve for proctor
4.75 mm	45.96	20-100
1.18 mm	30.52	10-100
300 µm	20.71	2-65
75 µm	13.75	0-8



Atterberg's Limits Test Report

ASTM D4318-10



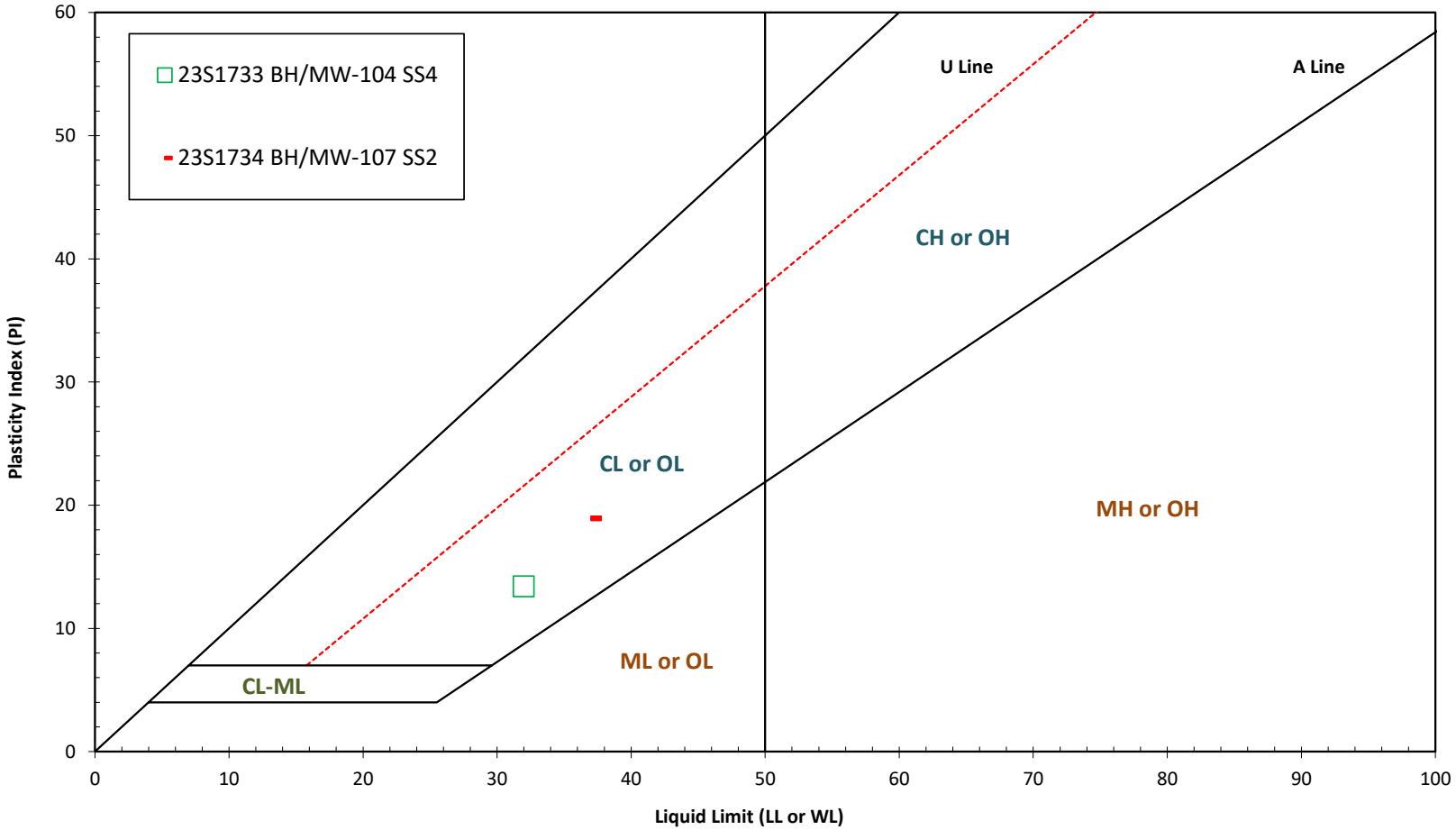
SIRATI & PARTNERS

Geotechnical Hydrogeological & Environmental Solutions

Date	:	01 June 2023
Project No.	:	SP23-01177-00
Figure No.	:	13

Atterberg's Limits Test Report

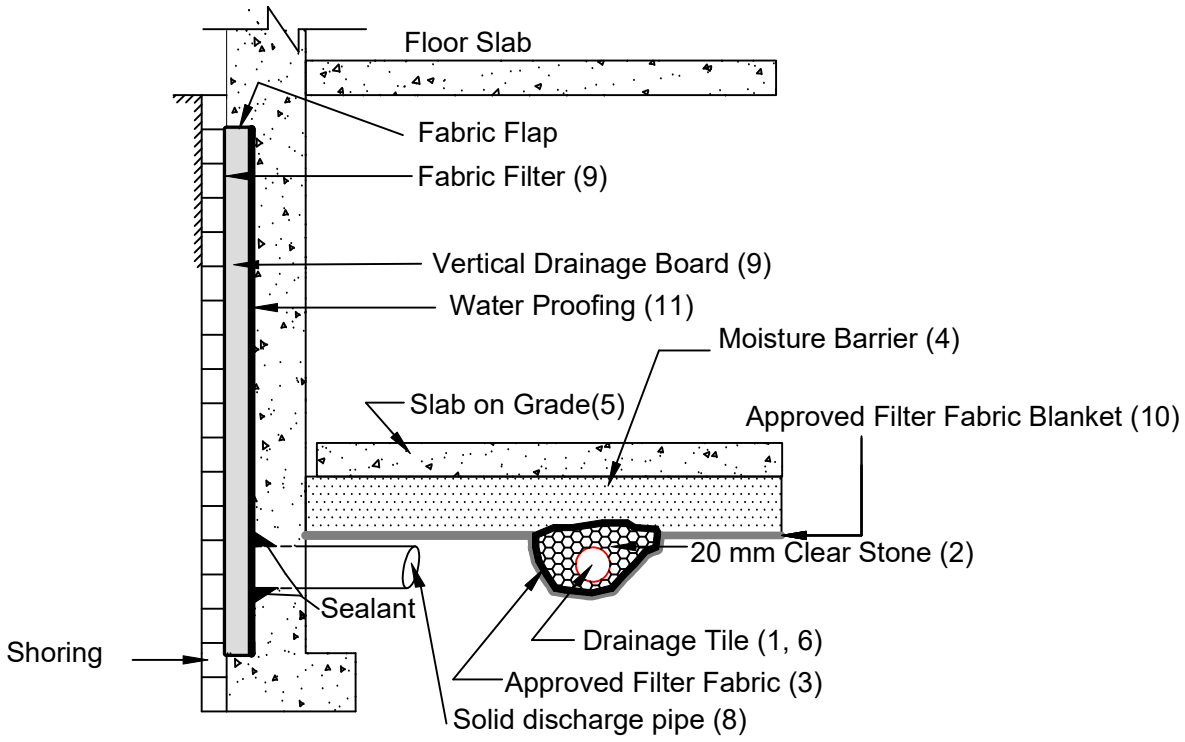
ASTM D4318-10



SIRATI & PARTNERS

Geotechnical Hydrogeological & Environmental Solutions

Date	:	01 June 2023
Project No.	:	SP23-01177-00
Figure No.	:	14

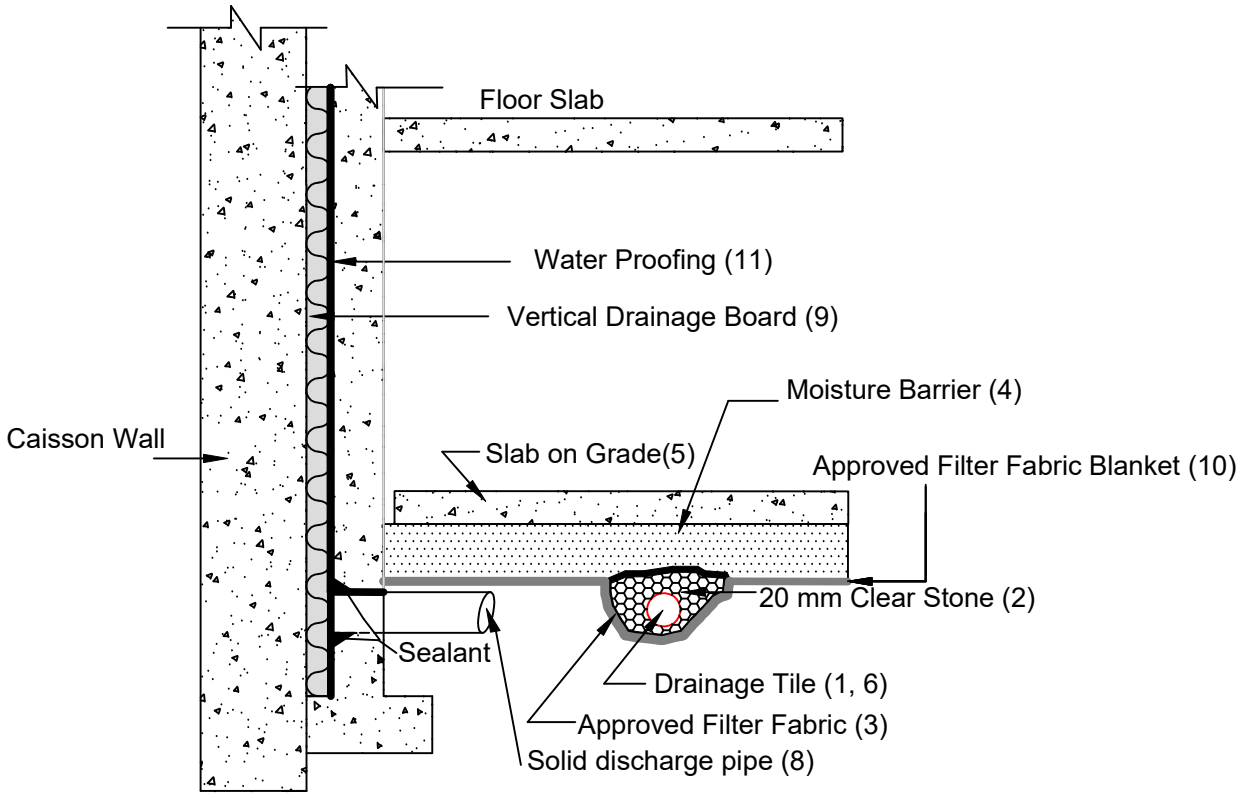


EXTERIOR FOOTING

Notes

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

DRAINAGE RECOMMENDATIONS
Shored Basement wall with Underfloor Drainage System
(not to scale)



EXTERIOR FOOTING

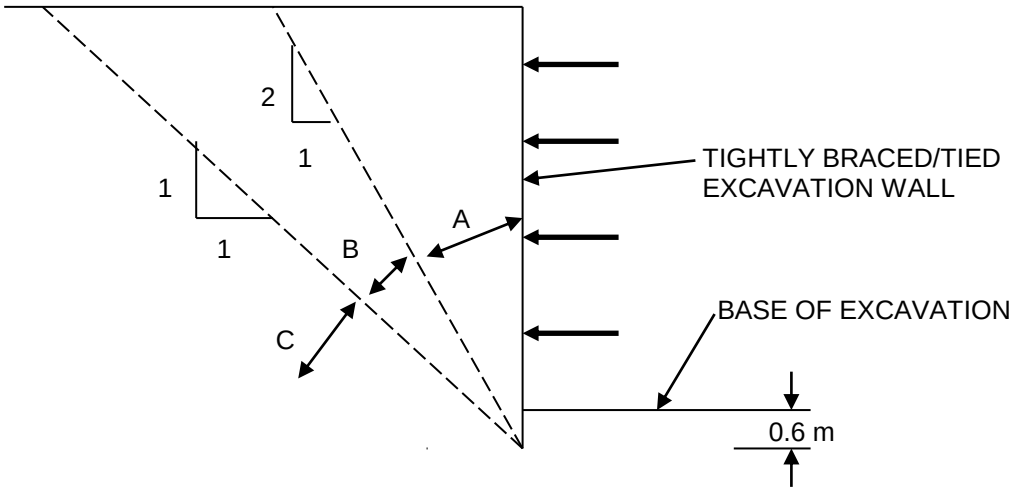
Notes

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

DRAINAGE RECOMMENDATIONS
Shored Basement wall with Underfloor Drainage System
(not to scale)

Guidelines for Underpinning in Soil and Excavation Support

Existing foundations located within Zone A normally require underpinning, especially for heavy structures. For some foundations in Zone A, it may be possible to eliminate underpinning and control foundation movement by tightly braced excavation walls, such as caisson walls.



Zone A Foundations located within this zone normally require underpinning. Horizontal and vertical pressures on the excavation wall of non underpinned foundations must be considered

Zone B Foundations located within this zone normally do not require underpinning. Horizontal and vertical pressures on the excavation wall of non underpinned foundations must be considered

Zone C Underpinning to structures is normally founded in this zone. Lateral pressure from underpinning is not normally considered

(Reference: Figure 26.27 from Canadian Foundation Engineering Manual, 4th Edition)

Appendix A:

General Requirements for Engineered Fill

GENERAL REQUIREMENTS FOR ENGINEERED FILL

Compacted imported soil that meets specific engineering requirements and is free of organics and debris and that has been continually monitored on a full-time basis by a qualified geotechnical representative is classified as engineered fill. Engineered fill that meets these requirements and is bearing on suitable native subsoil can be used for the support of foundations.

Imported soil used as engineered fill can be removed from other portions of a site or can be brought in from other sites. In general, most of Ontario soils are too wet to achieve the 100% Standard Proctor Maximum Dry Density (SPMDD) and will require drying and careful site management if they are to be considered for engineered fill. Imported non-cohesive granular soil is preferred for all engineered fill. For engineered fill, we recommend use of OPSS Granular 'B' sand and gravel fill material.

Adverse weather conditions such as rain make the placement of engineered fill to the required degree of density difficult or impossible; engineered fill cannot be placed during freezing conditions, i.e. normally not between December 15 and April 1 of each year.

The location of the foundations on the engineered fill pad is critical and certification by a qualified surveyor that the foundations are within the stipulated boundaries is mandatory. Since layout stakes are often damaged or removed during fill placement, offset stakes must be installed and maintained by the surveyors during the course of fill placement so that the contractor and engineering staff are continually aware of where the engineered fill limits lie. Excavations within the engineered fill pad must be backfilled with the same conditions and quality control as the original pad.

To perform satisfactorily, engineered fill requires the cooperation of the designers, engineers, contractors and all parties must be aware of the requirements. The minimum requirements are as follows; however, the geotechnical report must be reviewed for specific information and requirements.

1. Prior to site work involving engineered fill, a site meeting to discuss all aspects must be convened. The surveyor, contractor, design engineer and geotechnical engineer must attend the meeting. At this meeting, the limits of the engineered fill will be defined. The contractor must make known where all fill material will be obtained from and samples must be provided to the geotechnical engineer for review, and approval before filling begins.

2. Detailed drawings indicating the lower boundaries as well as the upper boundaries of the engineered fill must be available at the site meeting and be approved by the geotechnical engineer.

3. The building footprint and base of the pad, including basements, garages, etc. must be defined by offset stakes that remain in place until the footings and service connections are all constructed. Confirmation that the footings are within the pad, service lines are in place, and that the grade conforms to drawings, must be obtained by the owner in writing from the surveyor and Sirati & Partners Consultants Limited. Without this confirmation, no responsibility for the performance of the structure can be accepted by Sirati & Partners Consultants Limited (SIRATI). Survey drawing of the pre-and post-fill location and elevations will also be required.

4. The area must be stripped of all topsoil and fill materials. Subgrade must be proof-rolled. Soft spots must be dug out. The stripped native subgrade must be examined and approved by a SIRA -TI engineer prior to placement of fill.

5. The approved engineered fill material must be compacted to 100% Standard Proctor Maximum Dry Density throughout. Engineered fill should not be placed during the winter months. Engineered fill compacted to 100% SPMDD will settle under its own weight approximately 0.5% of the fill height and the structural engineer must be aware of this settlement. In addition to the settlement of the fill, additional settlement due to consolidation of the underlying soils from the structural and fill loads will occur and should be evaluated prior to placing the fill.

6. Full-time geotechnical inspection by SIRATI during placement of engineered fill is required. Workcannot commence or continue without the presence of the SIRATI representative.

7. The fill must be placed such that the specified geometry is achieved. Refer to the attached sketches for minimum requirements. Take careful note that the projection of the compacted pad beyond the footing at footing level is a minimum of 2 m. The base of the compacted pad extends 2 m plus the depth of excavation beyond the edge of the footing.

8. A bearing capacity of 150 kPa at SLS (225 kPa at ULS) can be used provided that all conditions outlined above are adhered to. A minimum footing width of 500 mm (20 inches) is suggested and footings must be provided with nominal steel reinforcement.

9. All excavations must be done in accordance with the Occupational Health and Safety Regulations of Ontario.

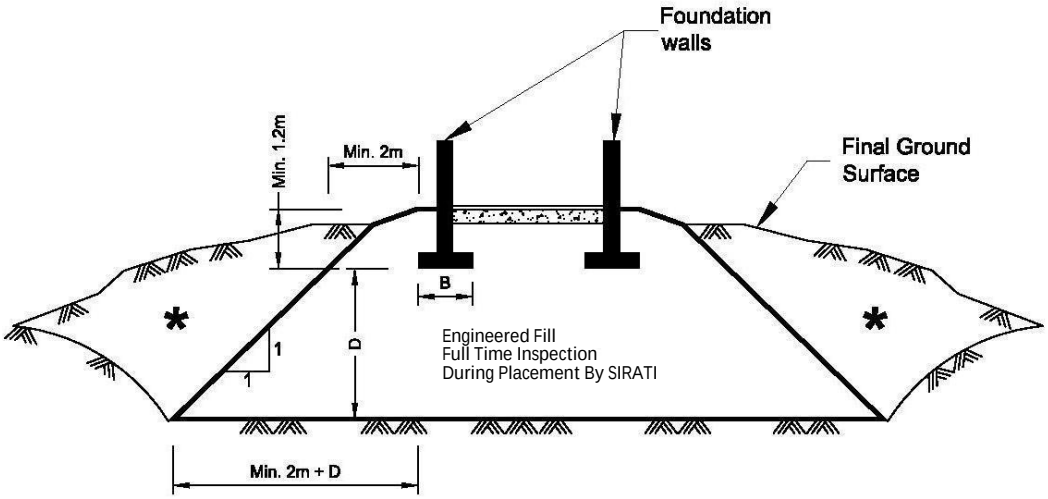
10. After completion of the engineered fill pad a second contractor may be selected to install footings. The prepared footing bases must be evaluated by engineering staff from SIRATI prior tofooting concrete placements. All excavations must be backfilled under full time supervision bySIRATI to the same degree as the engineered fill pad. Surface water cannot be allowed to pond inexcavations or to be trapped in clear stone backfill. Clear stone backfill can only be used with theapproval of SIRATI.

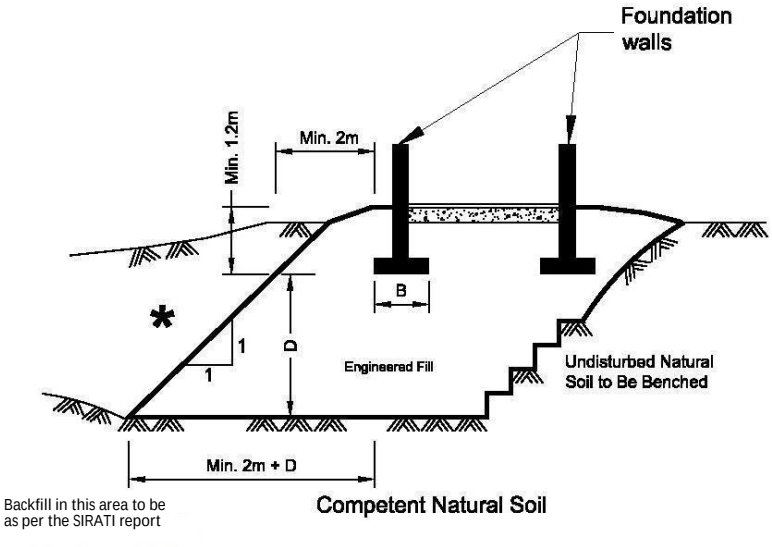
11. After completion of compaction, the surface of the engineered fill pad must be protected from disturbance from traffic, rain and frost. During the course of fill placement, the engineered fill must be smooth-graded, proof-rolled and sloped/crowned at the end of each day, prior to weekends and any stoppage in work in order to promote rapid runoff of rainwater and to avoid any ponding surface water. Any stockpiles of fill intended for use as engineered fill must also be smooth-bladed to promote runoff and/or protected from excessive moisture take up.

12. If there is a delay in construction, the engineered fill pad must be inspected and accepted by the geotechnical engineer. The location of the structure must be reconfirmed that it remains within the pad.

13. The geometry of the engineered fill as illustrated in these General Requirements is general in nature. Each project will have its own unique requirements. For example, if perimeter sidewalks are to be constructed around the building, then the projection of the engineered fill beyond the foundation wall may need to be greater.

14. These guidelines are to be read in conjunction with Sirati & Partners Consultants Limited (SIRA TI) report attached.


Foundation walls
Min. 1.2m
Min. 2m
Final Ground Surface
B
D
1
1
Engineered Fill
Full Time Inspection
During Placement By SIRATI
Min. 2m + D
Competent Natural Soil To Be Confirmed By SIRATI


Foundation walls
Min. 1.2m
Min. 2m
B
D
1
1
Engineered Fill
Undisturbed Natural Soil to Be Benched
Min. 2m + D
Backfill in this area to be as per the SIRATI report
Competent Natural Soil

Appendix B:

Rock Core Sample Photos and Laboratory Test Results


R1 → 23'3"
TOP
R2 → 25'11"
BH/MW-107
May 23
SP23-01177-...
Run1 : 23'3"-25'11"
Run2: 25'11"-26'4"
BOT


R1 → 23'3"
TOP
R2 → 25'11"
BH/MW-107
May 23
SP23-01177-...
Run1 : 23'3"-25'11"
Run2: 25'11"-26'4"
BOT


TOP
Run3: 26'4"-
BH/MW-107
SP23-01177-...
26'4"-
May 23/23
BOT


Run1 - BH 103
18'2" to 21'7"
Run2 - BH 103
21'7" - 26'2"

Point Load Test

ASTM (D5731-16)

Clinet:	Dezen Realty Company Ltd.	**Figure No.:**	1
Project Title:	66 Thomas Street, Mississauga	**Report Date:**	2023-06-02
Client Project #:		**SIRATI's Project #:**	SP23-1177-00

Test #	BH ID	Average Depth (m)	Type of Rock	D (mm) (mm)	W (mm) (mm)	P (kN)	Test Type	De (mm)	Correction Factor	Is (MPa)	$Is_{(50)}$ (MPa)
1	BH/MW-107 Run 2	8.52	Rock	63	63	4.663	Axial	70.930	1.170	0.93	1.08
2	BH/MW-107 Run 1	7.67	Rock	42	64	8.069	Axial	58.131	1.070	2.39	2.56
3	BH/MW-103 Run 1	6.17	Rock	52	64	10.594	Axial	65.188	1.127	2.49	2.81
4	BH/MW-103 Run 2	7.59	Rock	56	63	6.426	Axial	66.881	1.140	1.44	1.64
5	BH/MW-103 Run 3	9.47	Rock	40	63	1.465	Axial	56.805	1.059	0.45	0.48

D: Distance between the contical platens
W: Sample Width (sample diameter for axial testing of cylinderical samples)
P: Point Load at Failure
* The report is for the sole use of the designated client

SIRATI & PARTNERS
Geotechnical Hydrogeological & Environmental Solutions

Tested By:	**JK**		
Checked By:	**BS**	**Date:**	**2023-06-02**

UNCONFINED COMPRESSIVE STRENGTH TEST

(ASTM D7012-14E1)

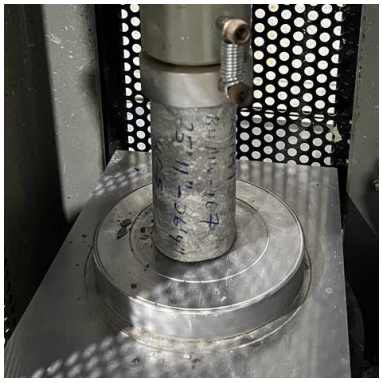
PROJECT INFORMATION			
Client:	Dezen Realty Company Ltd.	**Enclosure No.**:	2
Project Title:	66 Thomas St.	**Report Date**:	2023-06-02
Client Project #:		**SIRATI's Project #**:	SP23-1177-00

SPECIMEN INFORMATION			
Sample No.	U2	**BH ID**	BH/MW-107 Run 1
Sampling Depth	25'11"- 26'4"	**Rock Type (Specified by the Client)**	Shale
Sample Height (cm):	128.5	**Water Content (%)**	
Sample Diameter (cm):	63.6	**Unit Weight (kN/m^3)**	
Sample Area (cm^2):	31.77	**Dry Unit Weight (kN/m^3)**	
L/D	2.0		

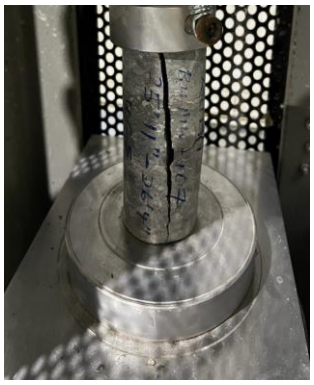
TEST CONDITIONS			
Machine Speed (mm/min):		**Duration of Test (min):**	

TEST RESULTS			
Failure Load (kN):	60.4	**Compressive Stress (MPa):**	19.01

BEFORE FAILURE



AFTER FAILURE



Remarks:
- Fracture Type 3 was identified

Tested By:	JK		
Checked By:	BS	**Date:**	2023-06-02

UNCONFINED COMPRESSIVE STRENGTH TEST

(ASTM D7012-14E1)

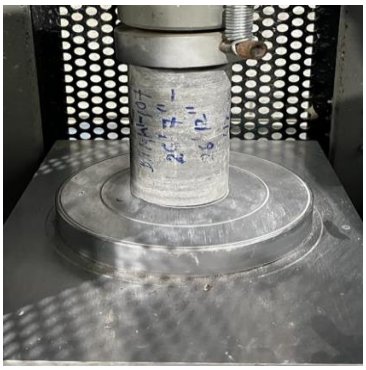
PROJECT INFORMATION			
Client:	Dezen Realty Company Ltd.	**Enclosure No.**:	1
Project Title:	66 Thomas St.	**Report Date**:	2023-06-02
Client Project #:		**SIRATI's Project #**:	SP23-1177-00

SPECIMEN INFORMATION			
Sample No.	U1	**BH ID**	BH/MW-107 Run 2
Sampling Depth	26'7"- 26'12"	**Rock Type (Specified by the Client)**	Shale
Sample Height (cm):	128	**Water Content (%)**	
Sample Diameter (cm):	62.9	**Unit Weight (kN/m^3)**	
Sample Area (cm^2):	31.07	**Dry Unit Weight (kN/m^3)**	
L/D	2.0		

TEST CONDITIONS			
Machine Speed (mm/min):		**Duration of Test (min):**	

TEST RESULTS			
Failure Load (kN):	56.6	**Compressive Stress (MPa):**	18.21

BEFORE FAILURE



AFTER FAILURE

Remarks:

- Fracture Type 2 was identified

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Tested By:	JK		
Checked By:	BS	**Date:**	2023-06-02

UNCONFINED COMPRESSIVE STRENGTH TEST

(ASTM D7012-14E1)

PROJECT INFORMATION			
Client:	Dezen Realty Company Ltd.	**Enclosure No.**:	3
Project Title:	66 Thomas St.	**Report Date**:	2023-06-02
Client Project #:		**SIRATI's Project #**:	SP23-1177-00
SPECIMEN INFORMATION			
Sample No.	U3	**BH ID**	BH/MW-103 Run 1
Sampling Depth	19'8" - 20'2"	**Rock Type (Specified by the Client)**	Limestone
Sample Height (cm):	147.5	**Water Content (%)**	
Sample Diameter (cm):	63.4	**Unit Weight (kN/m^3)**	
Sample Area (cm^2):	31.57	**Dry Unit Weight (kN/m^3)**	
L/D	2.3		
TEST CONDITIONS			
Machine Speed (mm/min):		**Duration of Test (min):**	
TEST RESULTS			
Failure Load (kN):	80.4	**Compressive Stress (MPa):**	25.47

BEFORE FAILURE

AFTER FAILURE

Remarks:
- Fracture Type 2 was identified

SIRATI & PARTNERS
Geotechnical Hydrogeological & Environmental Solutions

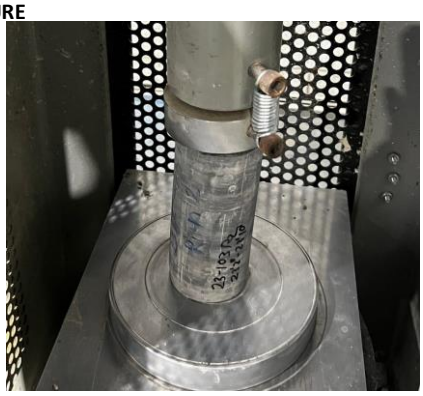
Tested By:	JK		
Checked By:	BS	**Date:**	2023-06-02

UNCONFINED COMPRESSIVE STRENGTH TEST

(ASTM D7012-14E1)

PROJECT INFORMATION			
Client:	Dezen Realty Company Ltd.	**Enclosure No.**:	4
Project Title:	66 Thomas St.	**Report Date**:	2023-06-02
Client Project #:		**SIRATI's Project #**:	SP23-1177-00
SPECIMEN INFORMATION			
Sample No.	U4	**BH ID**	BH/MW-103 Run 2
Sampling Depth	23'2" - 23'10"	**Rock Type (Specified by the Client)**	Shale
Sample Height (cm):	139	**Water Content (%)**	
Sample Diameter (cm):	63	**Unit Weight (kN/m^3)**	
Sample Area (cm^2):	31.17	**Dry Unit Weight (kN/m^3)**	
L/D	2.2		
TEST CONDITIONS			
Machine Speed (mm/min):		**Duration of Test (min):**	
TEST RESULTS			
Failure Load (kN):	40.3	**Compressive Stress (MPa):**	12.93

BEFORE FAILURE



AFTER FAILURE

Remarks:
- Fracture Type 2 was identified

SIRATI & PARTNERS
Geotechnical Hydrogeological & Environmental Solutions

Tested By:	JK		
Checked By:	BS	**Date:**	2023-06-02

UNCONFINED COMPRESSIVE STRENGTH TEST

(ASTM D7012-14E1)

PROJECT INFORMATION			
Client:	Dezen Realty Company Ltd.	**Enclosure No.**:	5
Project Title:	66 Thomas St.	**Report Date**:	2023-06-02
Client Project #:		**SIRATI's Project #**:	SP23-1177-00
SPECIMEN INFORMATION			
Sample No.	U5	**BH ID**	BH/MW-103 Run 3
Sampling Depth	26'7" - 27'1"	**Rock Type (Specified by the Client)**	Limestone
Sample Height (cm):	157.5	**Water Content (%)**	
Sample Diameter (cm):	63.4	**Unit Weight (kN/m^3)**	
Sample Area (cm^2):	31.57	**Dry Unit Weight (kN/m^3)**	
L/D	2.5		
TEST CONDITIONS			
Machine Speed (mm/min):		**Duration of Test (min):**	
TEST RESULTS			
Failure Load (kN):	63.7	**Compressive Stress (MPa):**	20.18

BEFORE FAILURE

AFTER FAILURE

Remarks:
- Fracture Type 3 was identified

SIRATI & PARTNERS
Geotechnical Hydrogeological & Environmental Solutions

Tested By:	JK		
Checked By:	BS	**Date:**	2023-06-02

Appendix C:

Borehole Logs Drilled for Geotechnical and Environmental Previous Studies

SIRATI & PARTNERS

LOG OF BOREHOLE BH1

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: Apr/30/2018
Drilling Contractor:

REF. NO.: SP18-306-10
ENCL NO.: 2

ELEV / DEPTH (m)	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION
156.7							
0.0	**FILL:** sand and gravel to clayey silt, trace construction debris and topsoil, dark brown, moist		1	SS	22		156
	becoming clayey silt , some sand, trace gravel, trace topsoil, dark brown		2	SS	12		
			3	SS	5		155
			4	SS	4		154
			5	SS	5		
	at 3.8 m, grinding noise						153
152.1							
4.6	**RESIDUAL SOIL/WEATHERED SHALE BEDROCK:** grey, moist		6	SS	96/ 228 mm	▽	152
							151
150.6							
156.6	**INFERRED BEDROCK** Shale,		7	SS	50/ 25 mm		
6.1	Georgian Bay Formation, grey						
	END OF BOREHOLE:						

Notes:
1. Borehole open upon completion of drilling.
2. Auger refusal at 6.13 m Depth.
3. Water encountered at 5.84 m upon completion of drilling.

W. L. 150.9 m
Apr 30, 2018

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

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

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

WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

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

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

SIRATI & PARTNERS

LOG OF BOREHOLE BH2

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: Apr/30/2018
Drilling Contractor:

REF. NO.: SP18-306-10
ENCL NO.: 3

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
155.0							
154.8 / 0.2	**CONCRETE SLAB:** 100 mm **GRAVEL:** 80 mm **FILL:** gravel mixed with sandy silt till, brown, moist		1	SS	17		
	becoming sandy silt, brown, moist		2	SS	6		154
	ashpalt debris		3	SS	4		153
152.5 / 2.5	becoming clayey silt, some sand, trace gravel, greyish brown, moist **SANDY SILT TILL:** trace shale fragments, trace cobbles, trace gravel, grey, moist, very dense		4	SS	19		
			5	SS	54		152
150.4 / 4.6	**RESIDUAL SOIL/WEATHERED SHALE BEDROCK:** grey, moist		6	SS	50/ 50 mm		151
							150
148.9 / 6.1	**INFERRED BEDROCK** Shale, Georgian Bay Formation, grey **END OF BOREHOLE:**		7	SS	50/ 25 mm		

W. L. 153.0 m Jun 01, 2018
W. L. 149.2 m Apr 30, 2018

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

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

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)

	GR	SA	SI	CL
	7	21	45	27

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

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

Notes:
1. Borehole open upon completion of drilling.
2. Auger refusal at 6.1 m depth.
3. Water encounetered at 5.79 m upon completion of drilling.
4. Monitoring well was installed in the borehole upon completion of drilling.
5. Groundwater level was observed at 1.98 m on June 01, 2018.

SPCL SOIL LOG SP18-306-10 - COPY.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH3

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: Apr/30/2018
Drilling Contractor:

REF. NO.: SP18-306-10
ENCL NO.: 4

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
155.0							
154.9 0.0	**ASPHALT:** 130 mm						
154.7 0.1	**GRAVEL:** 130 mm						
0.3	**FILL:** topsoil mixed with sand and gravel to sandy silt, moist		1	SS	7		
154.2							
0.8	**FILL:** clayey silt, trace topsoil, brown, moist		2	SS	9		154
	seam of sandy silt wet		3	SS	11		
	becoming very moist		4	SS	5	▽	153
	trace shale fragments, trace gravel, grey, wet		5	SS	4		W. L. 152.2 m
150.4							152
4.6	**SANDY SILT TILL:** trace shale, greyish brown, wet, very dense		6	SS	44-50/ 125 mm		151
							150
148.9							149
6.1	**END OF BOREHOLE:**		7	NR	50/ 25 mm		

Notes:
1. Borehole open upon completion of drilling.
2. Auger refusal at 6.1 m depth.
3. Water Encountered at 2.74 mbgs upon completion of drilling.

DYNAMIC CONE PENETRATION RESISTANCE PLOT — 20 40 60 80 100

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

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) — 10 20 30

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

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

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

SPCL SOIL LOG SP18-306-10 - COPY.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH4

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: Apr/30/2018
Drilling Contractor:

REF. NO.: SP18-306-10
ENCL NO.: 5

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
154.2 / 0.0	**ASPHALT:** 150 mm						154
154.0 / 0.2	**GRAVEL:** 125 mm						
153.8 / 0.3	**FILL:** clayey silt mixed with topsoil, trace gravel, reddish brown, moist		1	SS	12		
			2	SS	10		153
	trace sand, trace topsoil, trace rootlets		3	SS	9		
			4	SS	6		152
			5	SS	6		151
149.6 / 4.6	**SANDY SILT TILL:** trace shale fragments, trace gravel, grey, moist, very dense		6	SS	96/ 228 mm		150
							149
148.1 / 6.1	**INFERRED BEDROCK** Shale, Georgian Bay Formation, grey		7	SS	50/ 100 mm		148
148.0 / 6.2	**END OF BOREHOLE:**						

W. L. 151.0 m
May 28, 2018

Notes:
1. Borehole open and dry upon completion of drilling.
2. Auger Refusal at 6.2 m depth.
3. Monitoring Well was Installed in teh borehole upon completion of drilling.
4. Groundwater level was obsereved at 3.13 m in the well on May 28, 2018.

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

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

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

WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

SPCL SOIL LOG SP18-306-10 - COPY.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH5

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/01/2018
Drilling Contractor:

REF. NO.: SP18-306-10
ENCL NO.: 6

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
157.0							
0.0	**CLAYEY SILT TILL:** some sand, trace cobbles, trace gravel, brown, moist, firm to hard		1	SS	15		
			2	SS	26		156
			3	SS	36		
							155
	at 2.6 m, becoming grey		4	SS	39		
154.0							154
3.0	**SANDY SILT TILL:** some sand, trace cobbles, trace gravel, brown, moist, compact to very dense		5	SS	69		
	trace shale fragments		6	SS	82		153
							152
150.9							151
6.1	**INFERRED BEDROCK** Shale, Georgian Bay Formation, grey		7	SS	24-50/ 25 mm		
150.7							
6.3	**END OF BOREHOLE:**						

Notes:
1. Borehole open and dry upon completion of drilling.

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

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

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

SPCL SOIL LOG SP18-306-10 - COPY.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH6

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/01/2018
Drilling Contractor:

REF. NO.: SP18-306-10
ENCL NO.: 7

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
154.6							
154.6 / 0.0	**ASPHALT:** 100 mm		1	SS	15-50/125 mm		154
154.5 / 0.1	**GRAVEL:** 180 mm						
154.3 / 0.3	**SAND AND GRAVEL:** brown, moist						
153.8 / 0.8	**CLAYEY SILT TILL:** trace gravel, light brown, moist, stiff to hard		2	SS	16	W. L. 153.7 m May 28, 2018	153
	trace cobbles		3	SS	35		
			4	SS	60		152
151.6 / 3.0	**SANDY SILT TILL:** trace gravel, trace clay, trace cobbles, grey, moist, very dense		5	SS	53		151
150.6 / 4.0	**END OF BOREHOLE:**						

Notes:
1. Borehole open and dry upon completion of drilling.
2. Auger Refusal at 3.96 m depth.
3. Groundwater level was observed at 0.93 m in the well on May 28, 2018.

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

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

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

WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
7	26	44	23

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

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

SIRATI & PARTNERS

LOG OF BOREHOLE BH7

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/01/2018
Drilling Contractor:

REF. NO.: SP18-306-10
ENCL NO.: 8

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
154.7 / 0.0	**ASPHALT:** 150 mm						
154.5 / 0.2	**GRAVEL:** 125 mm						
154.4 / 0.3	**FILL:** silty sand mixed with construction debris, brown, moist		1	SS	8		
	becoming clayey silt, trace gravel,trace sand, reddish brown		2	SS	31		154
	becoming sandy silt, trace topsoil, greyish brown, moist		3	SS	36		153
152.4 / 2.3	**CLAYEY SILT TILL:** trace sand, trace cobbles, brown, moist		4	SS	53		152
151.7 / 3.0	**SANDY SILT TILL** trace gravel, trace clay, grey, very moist, dense to very dense		5	SS	38		151
150.1 / 4.6	**RESIDUAL SOIL/WEATHERED SHALE BEDROCK:** grey, moist		6	SS	50/ 150 mm		150
							149
148.6 / 6.1	**INFERRED BEDROCK** Shale, Georgian Bay Formation, Grey		7	SS	50/ 25 mm		
	END OF BOREHOLE:						

W. L. 153.0 m
May 28, 2018

W. L. 152.4 m
May 01, 2018

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

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

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Notes:
1. Borehole open upon completion of drilling.
2. Water encountered at 2.29 mbgs upon completion of drilling.
3. Monitoring well was Installed in the Borehole upon Completion of Drilling.
4. Groundwater level was observed at 1.67 m in the well on May 28, 2018.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

SPCL SOIL LOG SP18-306-10 - COPY.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E1

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/07/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
154.6							
154.3 0.3	**ASPHALT:**115 mm **GRAVEL:**150 mm **FILL:**clayey silt mixed with construction debris, trace cobbles, trace gravel, trace topsoil, brown, moist		1	SS	8		154
1	clayey silt, trace sand, becoming reddish brown		2	SS	7		153
2	silty sand, brown, very moist		3	SS	6		
152.0 2.6	**CLAYEY SILT TILL:**some sand, trace gravel, trace rootlets, yellowish grey, moist, stiff to hard		4	SS	11		152
3			5	SS	50/ 125 mm	W. L. 151.6 m May 28, 2018	151
4							
150.0 4.6	**RESIDUAL SOIL/WEATHERED SHALE BEDROCK:** grey, moist		6	SS	74/ 203 mm		150
149.6 5.0							
	END OF BOREHOLE:					W. L. 149.0 m May 07, 2018	

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

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

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
3	20	44	33

Notes:
1. Borehole Open upon Completion of Drilling.
2. Auger Refusal at 5.64 m Depth.
3. Water Encountered at 5.59 m upon Completion of Drilling.
4. Monitoring Well was Installed in the Borehole upon Completion of Drilling.
5. Groundwater Level was Observed at 2.96 m in the Well on May 28, 2018.

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

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

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E2

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/07/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 3

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
154.0 / 0.0	**ASPHALT:** 150 mm						
153.8 / 0.2	**GRAVEL:** 125 mm						
153.7 / 0.3	**FILL:** clayey silt mixed with topsoil, some sand, trace gravel, brown, moist		1	SS	6		
	trace sand, trace topsoil, becoming dark brown		2	SS	5		153
			3	SS	17	W. L. 152.4 m May 28, 2018	152
151.7 / 2.3	**CLAYEY SILT TILL:** some sand, trace gravel, light brown, moist, hard		4	SS	38		
151.0 / 3.0	**SANDY SILT TILL:** trace shale fragments, trace gravel, grey, moist, dense		5	SS	41		151
149.4 / 4.6	**INFERRED BEDROCK** Shale, Georgian Bay Formation, grey		6	SS	50/ 50 mm		150
149.3 / 4.7	**END OF BOREHOLE:**						149

Notes:
1. Borehole Open and Dry upon Completion of Drilling.
2. Auger Refusal at 5.49 m Depth.
3. Monitoring Well was Installed in the Borehole upon Completion of Drilling.
4. Groundwater Level was Observed at 1.56 m in the Well on May 28, 2018.

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

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

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

WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E3

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Pionjar
Diameter:
Date: Jun/05/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 4

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
154.7 / 0.0	**CONCRETE:** 180 mm						
154.5 / 0.2	**FILL:** silty sand to clayey silt, trace cobbles, trace gravel, brown, moist		1	DO			
	trace construction debris		2	DO			154
1	trace topsoil, brown to grey		3	DO			
152.6 / 2	becoming brown						153
152.3 / 2.1	**SANDY SILT TILL:** brown, wet, very moist		4	DO		W. L. 152.5 m Jun 07, 2018	
2.4	**CLAYEY SILT TILL:** clayey silt till to native sandy silt till, brown, wet to very moist		5	DO			152
3	at 3.04 m, layers of wet sand		6	DO			
151.0 / 3.7	**END OF BOREHOLE:**						

Notes:

1. Monitoring Well was Installed in the Borehole upon Completion of Drilling.
2. Groundwater Level was Observed at 2.16 m in the Well on June 7, 2018.

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

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

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)

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

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

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

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E4

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/08/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 5

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
154.3							
154.0 0.0	**ASPHALT:** 90 mm						
154.1 0.1	**GRAVEL:** 125 mm						
0.2	**FILL:** sand to clayey silt, reddish brown, moist		1	SS	10		154
	mixed with topsoil		2	SS	5		
1							153
	clayey silt, some sand, trace gravel, reddish brown, very moist to wet		3	SS	9	W. L. 152.6 m May 28, 2018	
2							
152.0 2.3	**CLAYEY SILT TILL:** trace gravel, light brown, moist, hard		4	SS	30		152
3 151.3 3.0	**SANDY SILT TILL:** trace shale fragments, trace gravel, grey, very moist, dense		5	SS	48		151
4							150
149.7 149.6 4.7	**RESIDUAL SOIL/WEATHERED SHALE BEDROCK:** grey, moist		6	SS	50/ 100 mm		
5							149
	END OF BOREHOLE:						

Notes:
1. Borehole Open upon Completion of Drilling.
2. Water Encountered at 1.83 m upon Completion of Drilling.
3. Auger Refusal at 5.49 m.
4. Monitoring Well was Installed in the Borehole upon completion of Drilling.
5. Groundwater Level was Observed at 1.67 m in the Well on May 28, 2018.

DYNAMIC CONE PENETRATION RESISTANCE PLOT — 20 40 60 80 100

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

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

WATER CONTENT (%) — 10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E5

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/08/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 6

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
155.3							
155.2 / 0.2	**ASPHALT:** 75 mm **GRAVEL:** 75 mm **FILL:** clayey silt mixed with topsoil, brown, moist		1	SS	6		155
154.5 / 0.8	**BURRIED TOPSOIL:** 740 mm		2	SS	6		154
153.8 / 1.5	**FILL:** clayey silt, some sand, trace gravel, light brown, very moist		3	SS	5		153
153.0 / 2.3	**CLAYEY SILT TILL:** some sand, trace gravel, light brown, very moist, hard		4	SS	36	W. L. 152.9 m May 28, 2018	
			5	SS	38		152
150.7 / 4.6	**SANDY SILT TILL:** trace shale fragments, trace gravel, grey, moist very dense		6	SS	50/ 100 mm		151
149.5							150
149.8 / 5.8	**INFERRED BEDROCK** Shale, Georgian Bay Formation, grey **END OF BOREHOLE:**		7	SS	50/ 25 mm	W. L. 149.5 m May 08, 2018	

Notes:
1. Borehole Open upon Completion of Drilling.
2. Water Encountered at 5.77 m upon Completion of Drilling.
3. Monitoring Well was Installed in the Borehole upon Completion of Drilling.
4. Groundwater Level was Observed at 2.41 m in the Well on May 28, 2018.

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

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

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)

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

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

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

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E6

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/07/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 7

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
154.5 / 0.0	**FILL:** CONSTRUCTION DEBRIS MIXED WITH TOPSOIL		1	SS	13		154
154.0 / 0.5	**FILL:** Sandy silt mixed with topsoil, moist						
153.6 / 1.0	**FILL:** clayey silt, reddish brown, moist		2	SS	14		153
			3	SS	12		
	mixed with topsoil		4	SS	6		152
151.5 / 3.0	**CLAYEY SILT TILL:** some sand, trace shale fragments, trace cobbles, trace gravel, grey, moist, very stiff to hard		5	SS	22	W. L. 151.7 m Jun 07, 2018	151
149.8 / 4.7	trace shale		6	SS	50/ 125 mm		150
	END OF BOREHOLE:						

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

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

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

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

Notes:
1. Borehole Open and Dry upon Completion of Drilling.
2. Auger Refusal at 4.9 m Depth.
3. Monitoring Well was Installed in the Borehole upon completion of Drilling.
4.Groundwater Level was Observed at 2.79 m in the well on June 7, 2018.

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

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

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E7

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Pionjar
Diameter:
Date: Jun/05/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 8

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
154.8												
154.7	**CONCRETE:** 130 mm											
0.1	**FILL:** silty sand to clayey silt, trace gravel, brown, very moist		1	DO					○			
1			2	DO			154		○			
153.6												
1.2	**CLAYEY SILT TILL:** brown, moist		3	DO		▽	W. L. 153.4 m Jun 07, 2018		○			
153.0							153					
1.8	**SANDY SILT TILL:** trace shale, brown, moist		4	DO					○			
2												
152.4												
2.4	**END OF BOREHOLE:**											

Notes:

1. Auger refusal at 2.44 m depth.
2. Monitoring Well was Installed in the Borehole upon Completion of Drilling.
3. Groundwater Level was Observed at 1.38 m in the Well on June 7, 2018.

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

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

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

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E8

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/07/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 9

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
155.2							
155.0 / 0.0	**ASPHALT:** 115 mm						
154.9 / 0.1	**GRAVEL:** 75 mm						
154.8 / 0.2	**FILL:** topsoil mixed with clayey silt, moist		1	SS	6		155
1	clayey silt, some sand, trace gravel, construction debris		2	SS	21		154
2	construction debris, wet topsoil		3	SS	14		153
3	mixed with topsoil		4	SS	7		
			5	SS	13	▼	152
4							151
150.6 / 4.6	**SANDY SILT TILL:** trace shale fragments, grey, very moist, very dense		6	SS	15-50/125 mm		
150.3 / 4.9							
5	**END OF BOREHOLE:**						

W. L. 152.1 m Jun 07, 2018
W. L. 150.8 m May 07, 2018

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

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

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)

	GR	SA	SI	CL
IBL in ppm				
6				
129				
55				
126				
119				
22				

Notes:
1. Borehole Open upon Completion of Drilling.
2. Water was Encountered at 4.42 m upon Completion of Drilling.
3. Auger Refusal at 5.18 m Depth.
4. Monitoring Well was Installed in the Borehole upon completion of Drilling.
5. Groundwater Level was Observed at 3.09 m in the well on June 7, 2018.

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

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

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E9

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/07/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 10

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
155.7							
155.5 0.2	**ASPHALT:** 75 mm **GRAVEL:** 125 mm **FILL:** sandy silt mixed with construction debris, trace topsoil, brown, moist		1	SS	10		
154.9							
0.8	**FILL:** clayey silt mixed with topsoil, trace gravel, trace sand, greyish brown, very moist		2	SS	6		
			3	SS	5		
	trace gravel		4	SS	8		
152.7							
3.0	**POSSIBLE FILL** silty sand, grey, wet		5	SS	22	W. L. 152.8 m Jun 07, 2018	
152.2							
3.5							
	END OF BOREHOLE:						

Notes:
1. Borehole Open and Dry upon Completion of Drilling.
2. Auger Refusal at 4.27 m Depth.
3. Monitoring Well was Installed in the Borehole upon completion of Drilling.
4. Groundwater Level was Observed at 2.91 m on June 7, 2018.

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

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

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

WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E10

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/07/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 11

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
155.7							
155.6 / 0.1	**ASPHALT:** 100 mm						
155.5 / 0.2	**GRAVEL:** 115 mm						
	FILL: sandy silt, trace cobbles, moist		1	SS	8		
154.9 / 0.8	**FILL:** clayey silt, some sand, trace gravel, trace topsoil, brown, moist		2	SS	10		155
			3	SS	3		154
			4	SS	6		153
152.7 / 3.0	**POSSIBLE FILL:** sandy silt, brown, moist		5	SS	8	W. L. 152.8 m Jun 07, 2018	
						W. L. 152.0 m May 07, 2018	
151.1 / 4.6			6	NR	50/ 0 mm		151
	END OF BOREHOLE:						

Notes:
1. Borehole Open upon Completion of Drilling.
2. Water Encountered at 3.66 m upon Completion of Drilling.
2. Auger Refusal at 4.72 m Depth.
3. Monitoring Well was Installed in the Borehole upon completion of Drilling.
5. Groundwater Level was Observed at 2.9 m on June 7, 2018.

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

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

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
5	26	49	20

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

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

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E11

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/07/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 12

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
155.3 / 0.0	**ASPHALT:** 90 mm						
155.2 / 0.1	**GRAVEL:** 100 mm						
155.1 / 0.2	**FILL:** sandy silt mixed with topsoil, some sand, trace gravel, trace construction debris, brown, very moist		1	SS	9		155
154.5 / 0.8	**FILL:** clayey silt mixed with topsoil, brown, very moist		2	SS	2		
			3	SS	3		154
153.0 / 2.3	**FILL:** sandy silt, trace topsoil, brown, moist		4	SS	7		153
			5	SS	25	W. L. 152.6 m Mav 07. 2018 W. L. 152.5 m Jun 07, 2018	152
150.7 / 4.6	**SANDY SILT TILL:** trace shale fragments, grey, very moist, very dene		6	SS	50/ 100 mm		151
150.6 / 4.7	**END OF BOREHOLE:**						150

Notes:
1. Borehole Open upon Completion of Drilling.
2. Water Encountered at 2.7 mbgs upon Completion of Drilling.
3. Auger Refusal at 5.79 m Depth.
4. Monitoring Well was Installed in the Borehole upon completion of drilling.
5. Groundwater Level was Observed at 2.85 m on June 7, 2018.

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

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

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E12

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/08/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 13

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
157.6												
0.0	**SAND AND GRAVEL MIXED WITH CONSTRUCTION DEBRIS:**		1	SS	6		157					
156.8												
0.8	**CLAYEY SILT TILL:** some sand, trace gravel, brown, moist, very stiff to hard		2	SS	21							
1	trace shale fragments		3	SS	40		156					7 20 43 30
2	becoming grey		4	SS	43		155					
154.6												
3.0	**SANDY SILT TILL:** trace shale fragments, trace gravel, grey, moist, compact to very dense		5	SS	28		154					
4	becoming very moist		6	SS	76		153					
5 152.5												
5.1	**END OF BOREHOLE:**											

Notes:
1. Borehole Open and Dry upon Completion of Drilling.
2. Auger Refusal at 5.33 m Depth.
3. Monitoring Well was Installed in the Borehole Upon Completion of Drilling.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E13

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/08/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 14

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
157.0 / 0.0	**SAND AND GRAVEL MIXED WITH CONSTRUCTION DEBRIS:** 200 mm		1	SS	19		
156.8 / 0.2	**CLAYEY SILT TILL:** some sand, trace gravel, light brown, moist, very stiff		2	SS	19		156
	becoming hard		3	SS	42		155
	trace cobbles, becoming grey and very stiff		4	SS	28	W. L. 154.7 m Jun 07, 2018	154
	becoming hard		5	SS	35		153
152.4 / 4.6	**RESIDUAL SOIL/WEATHERED SHALE BEDROCK:** grey, moist		6	SS	46-50 / 125mm		152
152.1 / 4.9	**END OF BOREHOLE:**						

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

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)

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

Notes:
1. Borehole Open and Dry upon Completion of Drilling.
2. Auger Refusal at 5.03 m Depth.
3. Monitoring Well was Installed in the Borehole Upon Completion of Drilling.
4. Groundwater Level was Observed at 2.33 m in the Well on June 7, 2018.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E14

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/08/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 15

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
157.6							
0.0	**SAND AND GRAVEL MIXED WITH CONSTRUCTION DEBRIS:**		1	SS	33		157
156.8							
0.8	**CLAYEY SILT TILL:** some sand, trace gravel, brown, moist, very stiff to hard		2	SS	22		
1							
			3	SS	64/ 253 mm		156
2							
155.3							
2.3	**SANDY SILT TILL:** trace shale fragments, trace gravel, moist, grey, dense		4	SS	38		155
3							
			5	SS	43		
154.1							
3.5	**END OF BOREHOLE:**						

Notes:
1. Borehole Open and Dry upon Completion of Drilling.

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

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

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

SIRATI & PARTNERS

LOG OF BOREHOLE BH-E15

PROJECT: Proposed Slope Stability & Erosion Assessment Study
CLIENT: DE SEN REALTY COMPANY LTD.
PROJECT LOCATION: 66 Thomas Street, Mississauga, ON
DATUM: Geodetic
BH LOCATION:

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: May/08/2018
Drilling Contractor:

REF. NO.: SP18-306-20
ENCL NO.: 16

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
155.7 / 0.0	**SAND AND GRAVEL MIXED WITH CONSTRUCTION DEBRIS:** 700 mm		1	SS	61		155
154.9 / 0.8	**FILL:** clayey silt, some sand, trace gravel, trace topsoil, brown, moist		2	SS	10		154
153.4 / 2.3	**BURRIED TOPSOIL:** 750 mm		3	SS	5		153
152.7 / 3.0	**POSSIBLE FILL:** sand and gravel, wet		4	SS	8		152
151.1 / 4.6	**SANDY SILT TILL:** trace gravel, grey, moist, very dense		5	SS	14		151
150.7 / 5.0	**END OF BOREHOLE:**		6	SS	67/ 278 mm		

Notes:
1. Borehole Open and Dry upon Completion of Drilling.

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

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

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

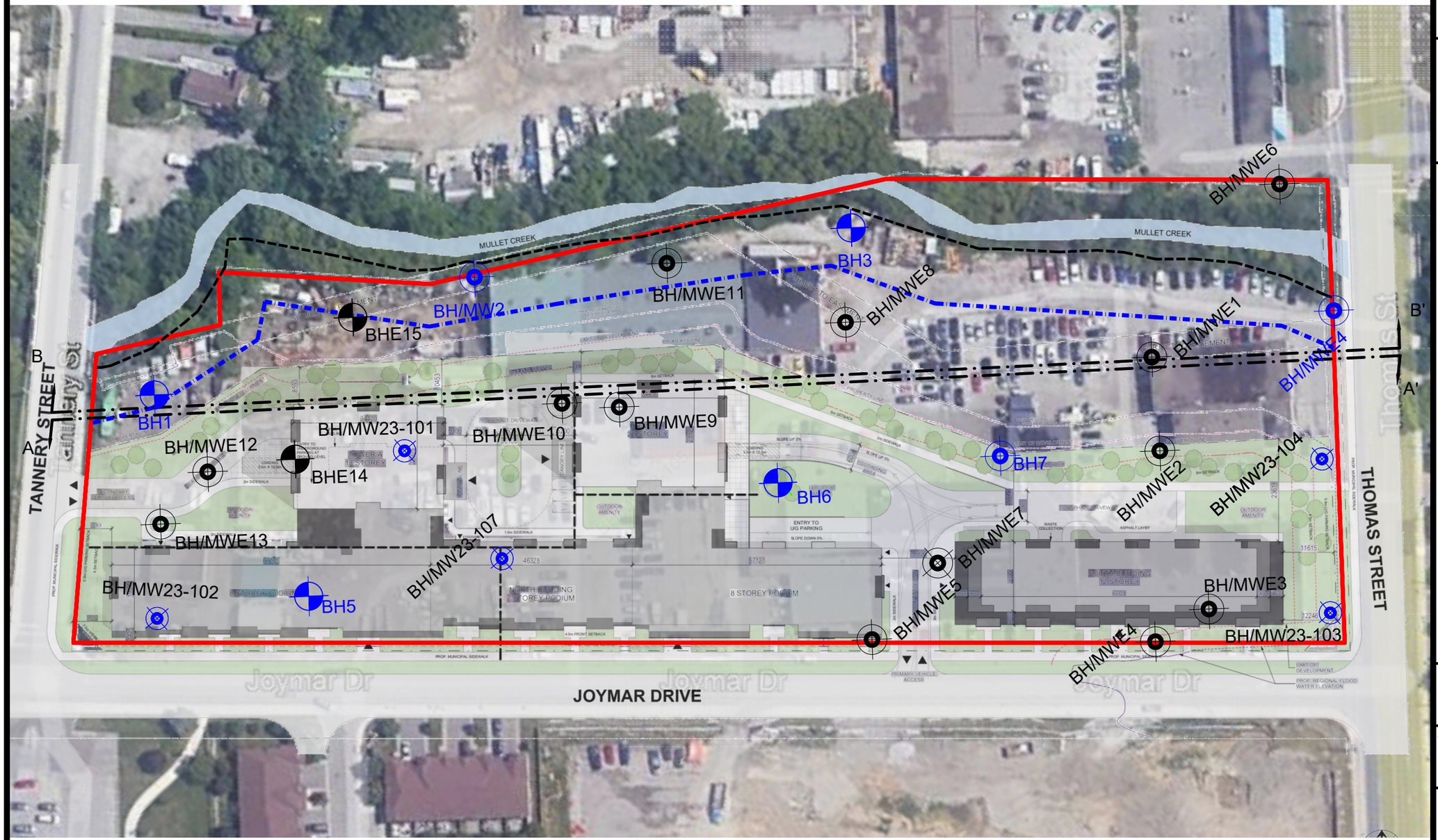
CHEMICAL ANALYSIS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

SPCL SOIL LOG SP18-306-20-WITHOUT GAS READINGS.GPJ SPCL.GDT 6/14/18

Appendix D:
Subsurface Profile



Source: Google Earth Map

0 25 m

SIRATI & PARTNERS
160 Konrad Crescent
Markham, ON. L3R 9T9
Phone# 905 940 1582, Fax# 905 940 2440

North:

Legend:

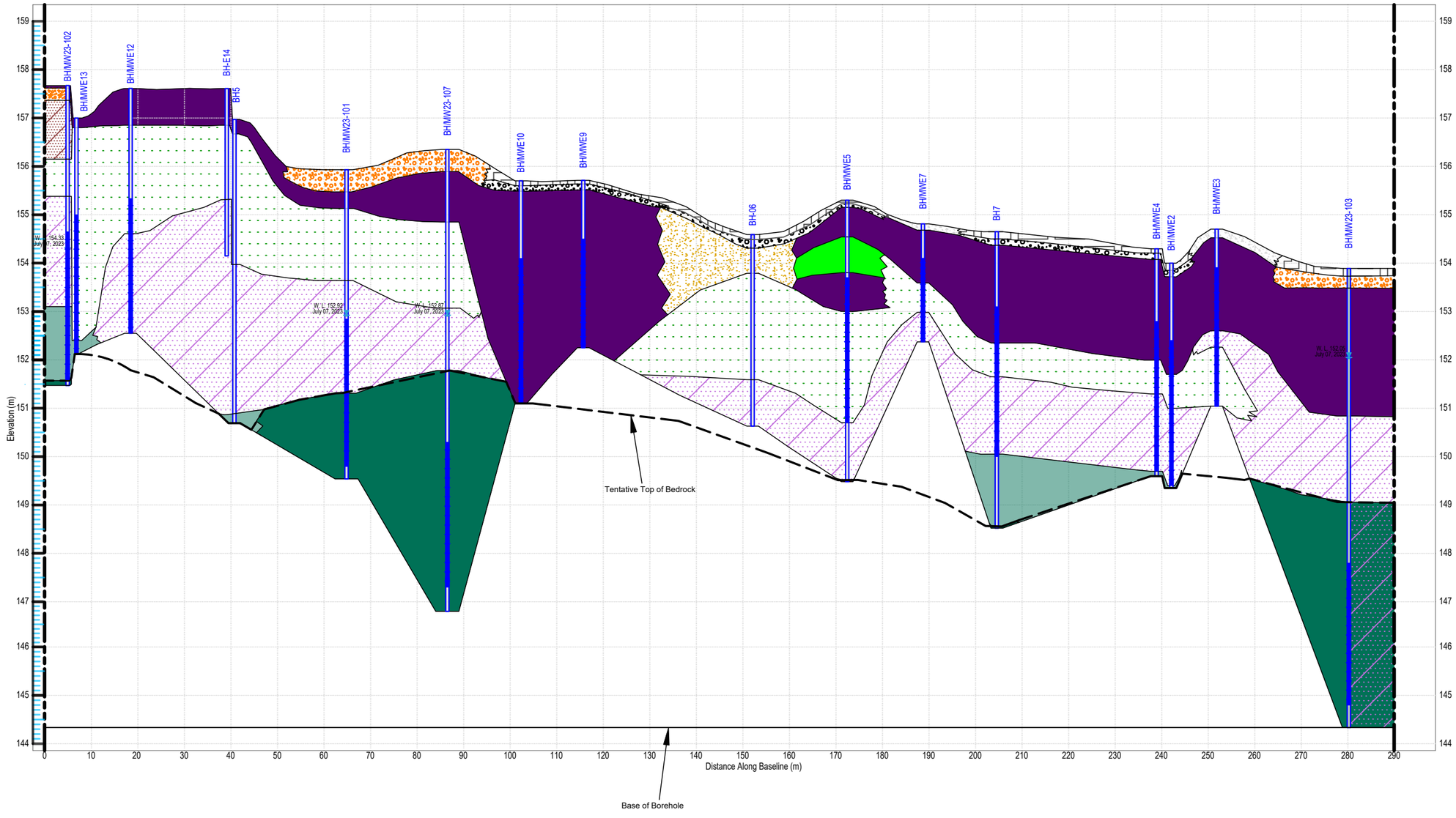
- Approximate Property Boundary
- 2023 Supplementary Borehole/ Monitoring Well
- 2018 ESA Borehole/ Monitoring Well
- 2018 ESA Borehole
- 2018 Geotechnical Borehole

Project Title:
Geotechnical Investigation

Site Location:
66 Thomas Street,
Mississauga, Ontario.

Drawing Title:
Borehole/ Monitoring Well Location Plan

Scale:	Project Number:
As Shown	SP23-01177-00
Date:	**Drawing Ref.:**
April, 2024	D-1



SIRATI & PARTNERS

160 Konrad Crescent
Markham, ON. L3R 9T9
Phone# 905 940 1582, Fax# 905 940 2440

Legend:

- Tentative Top of Bedrock
- Base of Borehole
- Asphalt
- Concrete
- Granular
- Granular Fill
- Burried Topsoil
- Fill
- Clayey Silt
- Clayey Silt till
- Sandy Silt Till
- Sand and Gravel
- Residual Soil/ Highly Weathered Shale Bedrock
- Georgian Bay Formation Bedrock
- BH/MW-XX — Borehole / Well ID
- Water Level
- Well Screen

Note: Groundwater Elevation were obtained on July 07, 2023

- The boundries between soil strata have been established only at Borehole Locations. Between Boreholes the boundries are assumed from geological evidence.
- This drawing is for subsurface information only. Surface details and features are for conceptual illustration.
- Coordinate system is UTM NAD 83 Zone 17T

Project Title:

Geotechnical Investigations

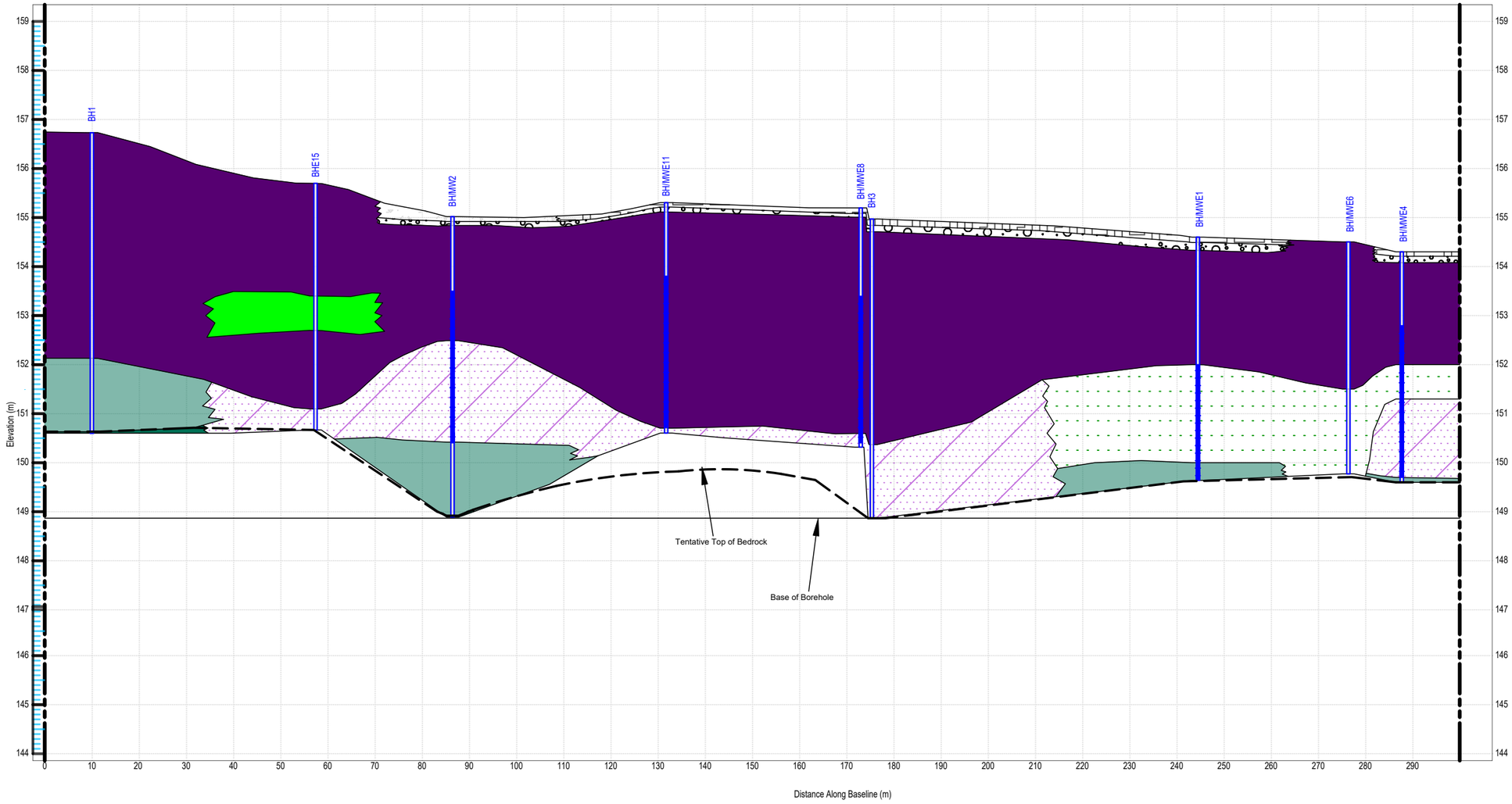
Site Location:

64, 66 Thomas Street, 95 Joymar Drive, 65 Tannery Street, Mississauga, ON.

Drawing Title:

Borehole Cross Section A - A'

Scale:	Project Number:
N.T.S	SP23-01177-00
Date:	**Drawing Ref:**
March, 2024	D-2



SIRATI & PARTNERS
160 Konrad Crescent
Markham, ON. L3R 9T9
Phone# 905 940 1582, Fax# 905 940 2440

Legend:

- Tentative Top of Bedrock
- Base of Infered Borehole
- Asphalt
- Concrete
- Granular
- Granular Fill
- Burried Topsoil
- Fill
- Clayey Silt
- Clayey Silt till
- Sandy Silt Till
- Sand and Gravel
- Residual Soil/ Highly Weathered Shale Bedrock
- Georgian Bay Formation Bedrock
- BH/MW-XX — Borehole / Well ID
- Water Level
- Well Screen

Note: Groundwater Elevation were obtained on July 07, 2023

- The boundries between soil strata have been established only at Borehole Locations. Between Boreholes the boundries are assumed from geological evidence.
- This drawing is for subsurface information only. Surface details and features are for conceptual illustration.
- Coordinate system is UTM NAD 83 Zone 17T

Project Title:

Geotechnical Investigations

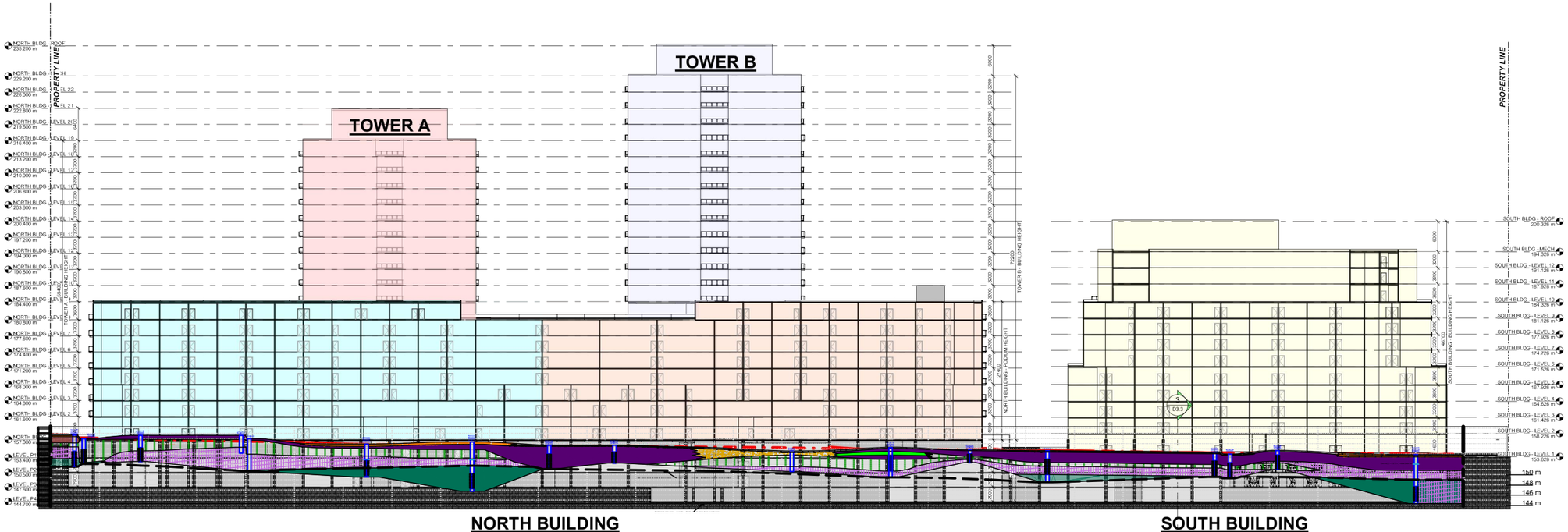
Site Location:

64, 66 Thomas Street, 95 Joymar Drive, 65 Tannery Street, Mississauga, ON.

Figure Title:

Borehole Cross Section B - B'

Scale:	Project Number:
N.T.S	SP23-01177-00
Date:	**Drawing Ref.:**
March, 2024	D-3



PHASE 1

PHASE 2A

PHASE 2B

PHASE 3

PHASE 4

DRAFT FOR
DISCUSSION ONLY

SRM↗
architects+
urban⋆designers

De Zen GROUP

BUILDING SECTIONS

D3.1

JOYMAR DRIVE & TANNERY ST, MISSISSAUGA

0 3.5 7 17.5 Scale 1 : 350 FULL SIZE Scale 1 : 700 HALF SIZE

2023-11-08

SIRATI & PARTNERS
160 Konrad Crescent
Markham, ON. L3R 9T9
Phone# 905 940 1582, Fax# 905 940 2440

Legend:

- Tentative Top of Bedrock
- Base of Borehole
- Asphalt
- Concrete
- Granular
- Granular Fill
- Burried Topsoil
- Fill
- Clayey Silt
- Clayey Silt till
- Sandy Silt Till
- Sand and Gravel
- Residual Soil/ Highly Weathered Shale Bedrock
- Georgian Bay Formation Bedrock

BH/MW-XX
Borehole / Well ID
Water Level
Well Screen

Note: Groundwater Elevation were obtained on July 07, 2023

- The boundries between soil strata have been established only at Borehole Locations. Between Boreholes the boundries are assumed from geological evidence.
- This drawing is for subsurface information only. Surface details and features are for conceptual illustration.
- Coordinate system is UTM NAD 83 Zone 17T

Project Title:

Geotechnical Investigations

Site Location:

64, 66 Thomas Street, 95 Joymar Drive,
65 Tannery Street, Mississauga, ON.

Drawing Title:

Subsurface Profile vs Building(s) Cross Sections

Scale:	Project Number:
N.T.S	SP23-01177-00
Date:	**Drawing Ref.:**
March, 2024	D-4

Appendix E: Limitations of Report

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

The conclusions and recommendations given in this report are based on information determined at the borehole locations. The information contained herein in no way reflects on the environment aspects of the project, unless otherwise stated. Subsurface and groundwater conditions between and beyond the boreholes may differ from those encountered at the borehole locations, and conditions may become apparent during construction, which could not be detected or anticipated at the time of the site investigation. The benchmark and elevations used in this report are primarily to establish relative elevation differences between the borehole locations and should not be used for other purposes, such as grading, excavating, planning, development, etc. Professional judgement was exercised in gathering and analyzing data and formulation of recommendations using current industry guidelines and standards. Similar to all professional persons rendering advice, SIRATI cannot act as absolute insurer of the conclusion we have reached. No additional warranty or representation, expressed or implied, is included or intended in this report other than stated herein the report.

The design recommendations given in this report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report.

The comments made in this report on potential construction problems and possible methods are intended only for the guidance of the designer. The number of boreholes may not be sufficient to determine all the factors that may affect construction methods and costs. For example, the thickness of surficial topsoil or fill layers may vary markedly and unpredictably. The contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the subsurface conditions may affect their work. This work has been undertaken in accordance with normally accepted geotechnical engineering practices.

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

We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time. Any user of this report specifically denies any right to claims against the Consultant, Sub-Consultants, their officers, agents and employees in excess of the fee paid for professional services.

SIRATI engagement hereunder is subject to and condition upon, that SIRATI not being required by the Client, or any other third party to provide evidence or testimony in any legal proceedings pertaining to this finding of this report, or providing litigations support services which may arise to be required in respect of the work produced herein by SIRATI. It is prohibited to publish, release or disclose to any third party the report produced by SIRATI pursuant to this engagement and such report is produced solely for the Client own internal purposes and which shall remain the confidential proprietary property of SIRATI for use by the Client, within the context of the work agreement. The Client will and does hereby remise and forever absolutely release SIRATI, its directors, officers, agents and shareholders of and from any and all claims, obligations, liabilities, expenses, costs, charges or other demands or requirements of any nature pertaining to the report produced by SIRATI hereunder. The Client will not commence any claims against any Person who may make a claim against SIRATI in respect of work produced under this engagement.