



October 5, 2021
Ref. No.: T21862

Milton Education Landowners Group
c/o David Schaeffer Engineering Limited
600 Alden Road, Suite 700
Markham, Ontario
L3R 0E7

Attention: **Mr. Tim Edmondson, P.Eng.**

Dear Sir:

**RE: SUPPLEMENTAL GEOTECHNICAL INVESTIGATION REPORT
MILTON EDUCATION VILLAGE LANDS (MEV LANDS)
WEST OF TREMAINE ROAD & NORTH OF BRITANNIA ROAD
MILTON, ONTARIO**

Please find enclosed our supplemental Geotechnical Investigation Report prepared for the above-mentioned project. We will be glad to discuss any questions arising from this work.

We thank you for giving us this opportunity to be of service to you.

Sincerely,
Shad & Associates Inc.

Houshang Shad, Ph.D., P. Eng.
Principal

**SUPPLEMENTAL GEOTECHNICAL INVESTIGATION REPORT
MILTON EDUCATION VILLAGE LANDS (MEV LANDS)
WEST OF TREMAINE ROAD & NORTH OF BRITANNIA ROAD
MILTON, ONTARIO**

Submitted to:

**Milton Education Landowners Group
c/o David Schaeffer Engineering Limited**
600 Alden Road, Suite 700
Markham, Ontario
L3R 0E7

Attention:

Mr. Tim Edmondson, P.Eng.

Submitted by:

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Supplemental Geotechnical Investigation Report

Milton Education Village Lands (MEV Lands)

West of Tremaine Road & North of Britannia Road, Milton, Ontario

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RECORD OF BOREHOLES

RECORD OF BOREHOLES (BH 101 to 121)

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Enclosure B: Previous Boreholes (Shad Report T20821, dated October 23, 2020)

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1.0 INTRODUCTION

Shad & Associates Inc. was retained by Milton Education Landowners Group ('Client') c/o of David Schaeffer Engineering Limited ('DSEL') to carry out a supplemental geotechnical investigation at the Milton Education Village lands ('MEV lands'), located west of Tremaine Road and north of Britannia Road in Milton, Ontario, as shown in Figure 1. We wish to mention that a preliminary geotechnical investigation was previously carried out for the MEV lands and the findings together with recommendations and comments were provided to the Client in Shad Report T20821 dated October 23, 2020. However, based on the DSEL conceptual grading plan showing the location of the proposed channel and the potential future ponds (DSEL Drawing 1D dated April 2021) and the landowner's group decision to obtain additional borehole information to support the Subwatershed Impact Study covering the future SWM ponds and the channel from geotechnical and hydrogeological viewpoints, as requested, a supplementary geotechnical investigation was carried at the site. Similar to the initial investigation, the fieldwork was structured in such a way to also include the requirements of the project hydrogeological consultant (i.e., R.J. Burnside & Associates Limited, 'RJB'). For the hydrogeological assessment information, reference should be made to the RJB report.

This supplemental geotechnical investigation was completed in accordance with Shad Proposal P21765-3rd Revision, dated July 16, 2021, authorized by DSEL on behalf of the Client on July 20, 2021.

The purpose of this geotechnical investigation was to obtain some additional information about the existing subsurface conditions at the site by means of a number of boreholes. Based on our interpretation of the data obtained, some preliminary recommendations are provided on the geotechnical aspects of design at the site.

This report contains the findings of our geotechnical investigation together with our recommendations and comments. These recommendations and comments are based on factual information and are intended only for use by the design engineers.

We recommend on-going liaison with Shad & Associates Inc. during the design and construction phases of the project to ensure that the recommendations in this report are applicable and/or correctly interpreted and implemented. Also, any queries concerning the geotechnical aspects of the proposed project should be directed to Shad & Associates Inc. for further elaboration and/or clarification.

2.0 INVESTIGATION PROCEDURES

The fieldwork was performed on August 31 to September 8, 2021 and consisted of drilling and sampling twenty boreholes (i.e., BH 101 to 105 and 107 to 121), extending down to depths ranging from approximately 6.5 to 9.3 m below the existing ground surface. (It should be noted that the location of Borehole 106 was inaccessible at the time of our fieldwork due to the surrounding water). All boreholes apart from Boreholes 109 and 110 were equipped with a monitoring well, and at the location of BH 117 a nest of monitoring wells was installed. The borehole locations are shown in

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Figure 2 and they were staked out and surveyed by R-PE Surveying Limited, O.L.S., who also provided us with their geodetic ground surface elevations.

The boreholes were advanced using solid stem continuous flight augers with a track-mounted power auger drilling rig, under the full-time supervision of experienced geotechnical personnel from Shad & Associates Inc. Samples were taken at 0.76 to 1.5 m intervals for the full depth of the investigation and Standard Penetration Tests (SPT) were performed in accordance with ASTM D1586. This consists of freely dropping a 63.5 kg (140 lbs) hammer a vertical distance of 0.76 m (30 inches) to drive a 51 mm (2 inches) diameter o.d. split-barrel (split spoon) sampler into the ground. The number of blows of the hammer required to drive the sampler into the relatively undisturbed ground by a vertical distance of 0.30 m (12 inches) is recorded as SPT 'N'-value of the deposit and this gives an indication of the consistency or the relative density of the deposit. Furthermore, where relatively weaker cohesive deposits were contacted, the undrained shear strength of the deposit, S_u , was measured by performing Field Vane tests.

Upon completion of boreholes, the collected samples were transported to our Soil Laboratory for further examination and laboratory testing. Soil laboratory testing consisting of moisture content determination, Gradation Analysis (Sieve and Hydrometer) and Atterberg Limits (Liquid and Plastic Limits) were performed on selected representative soil samples. The results of the in-situ and laboratory tests are presented on the corresponding Record of Borehole Sheets. The Gradation Analysis curves are shown in Enclosure A.

It should be noted that samples obtained during this investigation will be stored in our Soil Laboratory for three months and will be disposed thereafter.

3.0 SUB-SURFACE CONDITIONS

Based on the subsurface conditions encountered at the borehole locations, generally below the surficial topsoil and/or fill, the site is predominantly underlain by glacial till deposits, generally consisting of silty clay to clayey silt till and occasionally clayey sandy silt till and silty sand to sandy silt till. Occasional sand and silty sand seams/pockets/interbeddings were generally noted within the till layers. However, some non-glacial layers of silty clay to clayey silt and silty sand to sandy silt were also occasionally encountered at the site, predominantly at higher elevations at some boreholes.

The stratigraphic units and groundwater conditions are briefly summarized below. For more detailed information, reference should be made to the Record of Borehole Sheets.

3.1 Topsoil and/or Fill

Topsoil and/or fill was contacted at all boreholes, generally extending down to depths ranging from approximately 0.3 to 0.7 m below existing ground surface. However, at Boreholes 104, 108 and 116, the fill was noted to extend slightly deeper, down to about 0.9 to 1.4 m below existing grade.

It should be noted that the thickness and quality of topsoil and fill may vary significantly in between and beyond the borehole locations. Considering this as well as the limited diameter of the

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auger hole, it is recommended that allowance be made for possible variations when making construction estimates.

3.2 Non-Glacial Deposits

The surficial topsoil and/or fill at Boreholes 102, 104, 107, 108, 110, 112 and 117 were underlain by non-glacial deposits of silty sand to sandy silt and/or silty clay to clayey silt, extending down to depths ranging from approximately 0.7 to 2.1 m below existing ground surface. However, a layer of clayey silt was also contacted at a slightly lower elevation at Borehole 101 interbedded within glacial till deposits, extending from about 2.9 to 3.2 m below grade.

Standard Penetration tests were carried out at the site and the recorded 'N'-values within the silty sand to sandy silt were 5 and 6 blows/0.3 m penetration, indicating a loose relative density. Representative samples collected from this deposit were also tested for natural moisture content determination and the results were 15 and 24%. Considering these results as well as our visual and tactile examination, the silty sand to sandy silt is generally moist to wet.

The measured SPT 'N'-values within the cohesive silty clay to clayey silt generally ranged from 12 to 16 blows/0.3 m with occasional lower values of 6 blows/0.3, indicating a generally stiff to very stiff consistency. The results of moisture content tests performed on representative samples from this deposit ranged from 18 to 23%. Based on these results as well as the visual and tactile examination of the collected samples, the silty clay to clayey silt is generally moist.

3.3 Glacial Till Deposits

Below the surficial topsoil and fill as well as some non-glacial deposit at some boreholes, the site is predominantly underlain by glacial till deposits, generally consisting of silty clay to clayey silt till. However, some clayey sandy silt till and silty sand to sandy silt till were also contacted near the completion of most boreholes. Occasional sand/silty sand seams/pockets/interbeddings were generally noted within the till deposits.

The recorded 'N'-values within the silty clay to clayey silt till were found to range widely, generally from 8 to more than 30 blows/0.3 m penetration. However, occasional lower values of down to 4 blows/0.3 m were also measured at Boreholes 109, 110, 112 and 114, in the vicinity where the soil colour changed to grey. Considering these results, the silty clay to clayey silt till is generally stiff to hard and occasionally firm. The consistency of the relatively weaker clayey till deposit was further confirmed by performing Field Vane tests and the undrained shear strength of the soils, S_u , was measured to range from 55 to 80 kPa with Sensitivity Factors, S_t , ranging from 2.2 to 2.7. These results indicate a medium sensitivity to disturbance.

Selected samples from the silty clay to clayey silt till were also tested for Natural Moisture Content and the results were found to generally range from 8 to 20% with occasional higher values of up to 24%. Considering these results as well as visual and tactile examination of the recovered soil samples, the silty clay to clayey silt till is predominantly damp or damp to moist and occasionally moist especially where sand or silty sand seams/interbeddings/pockets were also encountered.

Selected samples from the silty clay to clayey silt till were tested for Gradation Analysis (Sieve Analysis and Hydrometer) as well as Atterberg Limits. The results are summarized here and

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they are presented on the Record of Boreholes and Enclosure A.

	BH 103 S6	BH 104 S7	BH 107 S3	BH 107 S8	BH 109 S5
Gravel (%)	6	6	1	8	0
Sand (%)	21	14	13	15	14
Silt (%)	47	55	46	48	66
Clay (%)	26	25	40	29	20
Liquid Limit (%)	20	22	32	23	22
Plastic Limit (%)	14	16	21	15	14
Plasticity Index (%)	6	6	11	8	8
	BH 110 S6	BH 111 S8	BH 118 S6	BH 120 S4	
Gravel (%)	2	5	6	4	
Sand (%)	18	19	20	21	
Silt (%)	51	50	52	46	
Clay (%)	29	26	22	29	
Liquid Limit (%)	27	28	22	33	
Plastic Limit (%)	19	15	17	20	
Plasticity Index (%)	8	13	5	13	

Considering the above results, the clayey till deposit has low plasticity.

A somewhat less-cohesive deposit in the form of clayey sandy silt till was also contacted near the completion of Boreholes 105, 108, 113 and 114 as well as from approximately 2.9 to 3.6 m below existing ground surface at Borehole 116. The clayey sandy silt till was noted to be hard and damp with recorded 'N'-values of more than 30 blows/0.3 m penetration and measured moisture content values ranging from 7 to 10%.

The silty sand till to sandy silt till was contacted at Borehole 101, extending from about 2.1 to 2.9 m below existing grade and below depths ranging from approximately 3.6 to 7.0 m at Boreholes 107, 110, 112, 115 to 119. The measured 'N'-values within this predominantly non-cohesive till layer were all well in excess of 50 blow/0.3 m with a lower value of 20 blows/0.3 m measured at the higher elevation at Borehole 101. Based on these results, the deposit is generally very dense. Representative samples from the silty sand till to sandy silt till were tested for moisture content and the results were found to range from 7 to 13% with a higher value of 15% measured at Borehole 101. Considering these results as well as visual and tactile examination of the recovered soil samples, the silty sand till to sandy silt till is generally damp and occasionally damp to moist.

Representative samples from the silty sand till to sandy silt till were tested for Gradation Analysis. The results are summarized here and they are presented on the Record of Boreholes and Enclosure A.

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	BH 101 S4	BH 107 S9	BH 112 S9	BH 117 S9	BH 118 S7B
Gravel (%)	2	9	8	10	12
Sand (%)	24	39	34	33	44
Silt (%)	60	47	52	51	41
Clay (%)	14	5	6	6	3

It should be noted that due to the nature of their formation, cobbles and boulders should be expected to occur within the glacial deposits.

3.4 Groundwater Conditions

Groundwater conditions were monitored during and upon the completion of drilling as well as by installing monitoring wells in most boreholes. The results are summarized below:

Table 1: Measured Groundwater Data

Borehole	Existing Ground Surface Elevation (m)	Measured Groundwater Depth / Elevation (m)		
		Upon Borehole Completion	Sept.15, 2021	Sept.22, 2021
101	184.4	Dry	3.4 / 181.0	2.1 / 182.3
102	~183.8	Dry	7.2 / 176.6	6.5 / 177.3
103	184.2	N/A	Dry	Dry
104	183.9	Dry	Dry	5.8 / 178.1
105	185.2	Dry	3.4 / 181.8	1.4 / 183.8
106	—	-	-	-
107	184.9	2.7 / 182.2	0.4 / 184.5	0.4 / 184.5
108	185.9	6.7 / 179.2	1.1 / 184.8	1.0 / 184.9
109	184.1	4.6 / 179.5	N/A	N/A
110	184.4	0.9 / 183.5	N/A	N/A
111	184.6	6.7 / 177.9	3.7 / 180.9	2.9 / 181.7
112	184.6	6.1 / 178.5	0.4 / 184.2	0.3 / 184.3
113	186.4	7.9 / 178.5	0.9 / 185.5	0.9 / 185.5
114	183.3	Dry	1.2 / 182.1	1.1 / 182.2
115	183.7	7.6 / 176.1	0.4 / 183.3	0.4 / 183.3
116	183.9	Dry	0.8 / 183.1	0.8 / 183.1
117 Shallow Deep	184.0	Dry	0.3 / 183.7 0.3 / 183.7	0.4 / 183.6 0.3 / 183.7
118	183.9	7.0 / 176.9	0.4 / 183.5	0.4 / 183.5
119	184.1	Dry	0.2 / 183.9	0.2 / 183.9
120	184.6	Dry	3.2 / 181.4	2.0 / 182.6
121	185.4	Dry	1.7 / 183.7	1.5 / 183.9

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Considering the above information and the soil color change from brown to grey, we are of the opinion that the long-term groundwater level at the site should be below a depth of at least 2.1 m below the existing ground surface. However, as noted within the boreholes, occasional sand and silty sand pockets/seams/interbeddings were generally noted within the till deposits that appear to be under some minor hydrostatic pressure, resulting in groundwater level measurements closer to surface.

It should be pointed out that the groundwater levels at the site would fluctuate seasonally and can be expected to be somewhat higher during the spring months and in response to major weather events.

4.0 DISCUSSION AND RECOMMENDATIONS

According to the conceptual grading plan provided by DSEL (Drawing 1D dated April 2021), we understand that a channel is proposed near the north end of the site, running in a northeasterly to southwesterly direction, from about the middle of the north property line to the existing culvert at Bell School Line. We also understand that two ultimate stormwater management ponds (i.e., Ponds 1 and 2) and three interim ponds (i.e., Interim Ponds 1, 2 and 3) may be constructed at the site.

Considering the above details, the following general discussion and recommendations are provided. However, these should be reviewed and finalized once the project details are finalized.

4.1 Proposed Channel

According to the DSEL Drawing 1D dated April 2021, we understand that a channel is being proposed on the north end of the site, running from about the middle of the north property line to the Bell School Line. The bottom invert of the channel varies from approximately 184 m near the northeast end to 181.80 m on the southwest end where the proposed channel meets the existing culvert. The channel side slope will vary from 0.1 to 0.4%.

Boreholes 101 to 105 and 107 are located within or close to the proposed footprint of the channel. Based on the subsurface conditions encountered at these boreholes and the proposed bottom invert elevations for the channel, below the surficial topsoil and/or fill, the excavation for the channel should predominantly occur within a damp to moist and firm to hard but generally stiff to very stiff glacial and non-glacial deposits of silty clay to clayey silt. However, some damp and compact sandy silt till as well as moist to wet and loose silty sand to sandy silt should also be expected when excavating the southwest and northeast parts of the channel.

All excavations should be carried out in accordance with the Ontario Health and Safety Regulations. The soils to be excavated can be classified as follows:

- | | |
|---|--------|
| -Loose Silty Sand/Sandy Silt (wet, below groundwater level) | Type 4 |
| -Topsoil, Silty Clay to Clayey Silt Fill, Firm to Stiff Silty Clay to Clayey Silt, Stiff Silty Clay/Clayey Silt Till, Compact Sandy Silt Till | Type 3 |
| -Very Stiff to Hard Silty Clay/Clayey Silt Till | Type 2 |

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Accordingly, a side slope of 1H:1V is required for excavations in accordance with the Ontario Health and Safety Regulations. However, in Type 2 soils, the bottom 1.2 m of excavations could be kept near vertical. Near the surface, and below the groundwater level in silty sand to sandy silt, flatter side slopes would be required. Any excavation into the wet silty sand to sandy silt, or where the deposit is below the groundwater level should only be attempted after advance dewatering.

Stockpiles of excavated materials should be kept at least 5.0 m from the edge of the excavation to avoid slope instability. Care should also be taken to avoid overloading of any existing underground services/utilities by stockpiles.

Based on the subsurface conditions encountered at the boreholes, within the proposed depth of excavation for the construction of the channel, no major dewatering problems are generally anticipated, although some dewatering may have to be carried out for excavations due to surface runoff or from any perched water within the fill layer. We are of the opinion that these should generally be minor and manageable by pumping from temporary sumps protected against erosion, if required. However, increased seepage should be expected when excavating into the wet silty sand/sandy silt, where depending on the season for earthworks, advance dewatering may be necessary.

No major excavation difficulties are foreseen but allowance should be made for boulders and cobbles which occur randomly in glacial deposits.

Considering the proposed grades for the channel corridor and the existing grades, the construction of the channel should generally be in cut. However, if any area of the channel corridor requires to be raised, we would recommend that engineered fill is used in order to provide competent subgrade. Engineered fill could be placed after stripping all topsoil, any soils containing excessive organics and otherwise unsuitable soils. The following placement procedure is recommended.

- (i) The area to receive the engineered fill should be stripped of any topsoil, fill and other compressible, weak and deleterious materials. After stripping, the entire area should be inspected and approved by the geotechnical engineer. Spongy, wet or soft/loose spots should be sub-excavated to stable subgrade and replaced with compactable approved soil, compatible with subgrade conditions, as directed by the geotechnical engineer.
- (ii) The fill material should be placed in thin layers not exceeding approximately 200 mm when loose. Oversize particles (cobbles and boulders) larger than 120 mm should be discarded, and each fill layer should be uniformly compacted with heavy compactors, suitable for the type of fill used, to at least 98% of its Standard Proctor Maximum Dry Density.

The on-site inorganic soils are generally acceptable for use as engineered fill, provided they are not contaminated with the overlying organic rich deposits and any organic inclusions are removed. Depending on the construction season, the on-site soils may require some reconditioning, wetting or drying.

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- (iii) Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill. Compaction procedures and efficiency should be controlled by a qualified geotechnical technician.
- (iv) The engineered fill should not be frozen and should be placed at a moisture content within 2% of the optimum value for compaction. The engineered fill should not be performed during winter months when freezing ambient temperatures occur persistently or intermittently.

Furthermore, any exposed subgrade should be vegetated to minimize surface erosion and gulleying.

4.2 Stormwater Management Ponds

Based on the conceptual information provided to us by DSEL, two ultimate stormwater management ponds (i.e., Ponds 1 and 2) and three interim ponds (i.e., Interim Ponds 1, 2 and 3) are proposed within the property. These are discussed separately below:

Ultimate Pond 1

Bottom Invert Elevation:	180.50 m
Permanent Pool Elevation:	183.50 m
100 YR Storm Level:	184.50 m

Boreholes 109 and 111 are located within the proposed pond. Based on the subsurface conditions encountered at these boreholes, below the surficial topsoil and fill, the proposed pond will generally be excavated in a damp and occasionally damp to moist, stiff to very stiff silty clay to clayey silt till. However, some damp to moist and firm clayey till may also be encountered near the base of the pond in general vicinity of Borehole 109. The groundwater levels were monitored during drilling as well as by installing a monitoring well in Borehole 111. Based on the measured water levels, the highest groundwater level was measured at 2.9 m below ground surface (i.e., El.181.7 m). Although this is above the base of the pond, we are of the opinion that the high groundwater level measured is due to the presence of more pervious sand/silty sand seams/interbedding/pockets that were generally noted within the till deposit.

The construction of the pond should generally occur in cut, but some engineered fill will also be required to replace the existing surficial topsoil and fill and to raise the site to the design grades.

All excavations should be carried out in accordance with the Ontario Health and Safety Regulations. The soils to be excavated can be classified as follows:

-Topsoil, Silty Clay to Clayey Silt Fill, Firm to Stiff Silty Clay to Clayey Silt Till Type 3

-Very Stiff Silty Clay/Clayey Silt Till Type 2

Accordingly, a side slope of 1H:1V is required for excavations in accordance with the Ontario Health and Safety Regulations. However, in Type 2 soils, the bottom 1.2 m of excavations could be kept near vertical. Near the surface and within the fill, occasional flatter side slopes may be

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required.

Stockpiles of excavated materials should be kept at least 5.0 m from the edge of the excavation to avoid slope instability. Care should also be taken to avoid overloading of any existing underground services/utilities by stockpiles.

Based on the subsurface conditions encountered at Boreholes 109 and 111, generally no major dewatering problems are anticipated during the excavation of the pond, although some dewatering may have to be carried out for excavations due to surface runoff, from any perched water within the fill layer as well as from any sand/silty sand seams/interbeddings/pockets within the till. We are of the opinion that these should generally be minor and manageable by pumping from temporary sumps protected against erosion, if required.

No major excavation difficulties are foreseen but allowance should be made for boulders and cobbles which occur randomly in glacial deposits.

For the construction of engineered fill, the following placement procedure is recommended.

- (i) The area to receive the engineered fill should be stripped of any topsoil, fill and other compressible, weak and deleterious materials. After stripping, the entire area should be inspected and approved by the geotechnical engineer. Spongy, wet or soft/loose spots should be sub-excavated to stable subgrade and replaced with compactable approved soil, compatible with subgrade conditions, as directed by the geotechnical engineer.
- (ii) The fill material should be placed in thin layers not exceeding approximately 200 mm when loose. Oversize particles (cobbles and boulders) larger than 120 mm should be discarded, and each fill layer should be uniformly compacted with heavy compactors, suitable for the type of fill used, to at least 98% of its Standard Proctor Maximum Dry Density.

The on-site inorganic silty clay to clayey silt deposits are generally acceptable for use as engineered fill for the pond provided they are not contaminated with the overlying organic rich deposits and any organic inclusions are removed. Depending on the construction season, the on-site soils may require some reconditioning, wetting or drying.

- (iii) Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill. Compaction procedures and efficiency should be controlled by a qualified geotechnical technician.
- (iv) The engineered fill should not be frozen and should be placed at a moisture content within 2% of the optimum value for compaction and preferably on the wet side of optimum. The engineered fill should not be performed during winter months when freezing ambient temperatures occur persistently or intermittently.

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Furthermore, the stability of the pond walls should be analyzed once its design details are confirmed.

Full-time qualified geotechnical engineering supervision should be provided during the excavation and construction of the pond to ensure that adequate protective measures are taken when necessary.

Anti-seepage collars should be installed for the outlet works that direct flow out of the SWM pond as these outlets are subject to hydraulic heads directly from the pond. The provision of anti-seepage collars would increase the seepage path along the outlet works and therefore reduce the quantity of potential seepage.

Ultimate Pond 2

Bottom Invert Elevation:	180.90 m
Permanent Pool Elevation:	183.90 m
100 YR Storm Level:	184.90 m

Boreholes 116 to 118 are located within the proposed pond. Based on the subsurface conditions encountered at these boreholes, below the surficial topsoil and/or fill, the proposed pond will generally be excavated in a damp and occasionally moist, stiff to very stiff silty clay to clayey silt till. However, some damp and hard clayey sandy silt till may also be encountered near the base of the pond in general vicinity of Borehole 116. The groundwater levels were monitored during drilling as well as by installing monitoring wells in all three boreholes. Based on the measured water levels, the highest groundwater level was measured 0.3 m below ground surface at Borehole 117 (i.e., El.183.7 m). Although this is above the base of the pond, we are of the opinion the high groundwater level measured is due to the presence of more pervious sand/silty sand seams/interbedding/pockets that were generally noted within the till.

We recommend the groundwater conditions to be further assessed by test pitting before final design.

The construction of the pond should generally occur in cut, but some engineered fill will also be required to replace the existing surficial topsoil and fill and to raise the site to the design grades.

All excavations should be carried out in accordance with the Ontario Health and Safety Regulations. The soils to be excavated can be classified as follows:

-Topsoil, Silty Clay to Clayey Silt Fill, Stiff Silty Clay to Clayey Silt Till	Type 3
-Very Stiff Silty Clay/Clayey Silt Till, Hard Clayey Sandy Silt Till	Type 2

Accordingly, a side slope of 1H:1V is required for excavations in accordance with the Ontario Health and Safety Regulations. However, in Type 2 soils, the bottom 1.2 m of excavations could be kept near vertical. Near the surface and within the fill, occasional flatter side slopes may be required.

Stockpiles of excavated materials should be kept at least 5.0 m from the edge of the excavation to avoid slope instability. Care should also be taken to avoid overloading of any existing underground services/utilities by stockpiles.

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Based on the subsurface conditions encountered at Boreholes 116 to 118, generally no major dewatering problems are anticipated during the excavation of the pond, although some dewatering may have to be carried out for excavations due to surface runoff, from any perched water within the fill layer and any sand/silty sand seams/interbeddings/pockets. We are of the opinion that these should generally be minor and manageable by pumping from temporary sumps protected against erosion, if required.

No major excavation difficulties are foreseen but allowance should be made for boulders and cobbles which occur randomly in glacial deposits.

For the construction of engineered fill, the following placement procedure is recommended.

- (i) The area to receive the engineered fill should be stripped of any topsoil, fill and other compressible, weak and deleterious materials. After stripping, the entire area should be inspected and approved by the geotechnical engineer. Spongy, wet or soft/loose spots should be sub-excavated to stable subgrade and replaced with compactable approved soil, compatible with subgrade conditions, as directed by the geotechnical engineer.
- (ii) The fill material should be placed in thin layers not exceeding approximately 200 mm when loose. Oversize particles (cobbles and boulders) larger than 120 mm should be discarded, and each fill layer should be uniformly compacted with heavy compactors, suitable for the type of fill used, to at least 98% of its Standard Proctor Maximum Dry Density.

The on-site inorganic silty clay to clayey silt deposits are generally acceptable for use as engineered fill for the pond provided they are not contaminated with the overlying organic rich deposits and any organic inclusions are removed. Depending on the construction season, the on-site soils may require some reconditioning, wetting or drying.

- (iii) Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill. Compaction procedures and efficiency should be controlled by a qualified geotechnical technician.
- (iv) The engineered fill should not be frozen and should be placed at a moisture content within 2% of the optimum value for compaction, and preferably on the wet side of optimum. The engineered fill should not be performed during winter months when freezing ambient temperatures occur persistently or intermittently.

Furthermore, the stability of the pond walls should be analyzed once its design details are confirmed.

Full-time qualified geotechnical engineering supervision should be provided during the excavation and construction of the pond to ensure that adequate protective measures are taken when necessary.

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Anti-seepage collars should be installed for the outlet works that direct flow out of the SWM pond as these outlets are subject to hydraulic heads directly from the pond. The provision of anti-seepage collars would increase the seepage path along the outlet works and therefore reduce the quantity of potential seepage.

Interim Pond 1

Bottom Invert Elevation: 180.70 m

Permanent Pool Elevation: 183.70 m

100 YR Storm Level: 186.70 m

Borehole 110 from the current investigation and Borehole 3 from the 2020 Investigation (Record of Borehole presented in Enclosure B) are located within or close to the proposed pond footprint. Based on the subsurface conditions encountered at these boreholes, below the surficial topsoil and fill and some damp to moist and loose silty sand, the proposed pond will generally be excavated in a damp to moist and firm to stiff silty clay to clayey silt and silty clay to clayey silt till. The groundwater levels were monitored during drilling as well as by installing monitoring wells in Borehole 3. Based on the measured water levels, the highest groundwater level was measured 0.9 m below ground surface (i.e., El.183.8 m). Although this is above the base of the pond, we are of the opinion the high groundwater level measured is due to the presence of more pervious sand/silty sand seams/interbedding/pockets that were generally noted within the till.

We recommend the groundwater conditions to be further assessed by test pitting before final design.

The construction of the pond should generally occur in cut, but some engineered fill will also be required to replace the existing surficial topsoil and fill and the near-surface silty sand underlying the fill and to raise the site to the design grades.

All excavations should be carried out in accordance with the Ontario Health and Safety Regulations. The soils to be excavated can be classified as follows:

-Loose Silty Sand Type 4

-Topsoil, Fill, Firm to Stiff Silty Clay to Clayey Silt,
Silty Clay to Clayey Silt Till Type 3

Accordingly, a side slope of 1H:1V is required for excavations in accordance with the Ontario Health and Safety Regulations. Near the surface as well as within the loose silty sand, flatter side slopes would be required.

Stockpiles of excavated materials should be kept at least 5.0 m from the edge of the excavation to avoid slope instability. Care should also be taken to avoid overloading of any existing underground services/utilities by stockpiles.

Based on the subsurface conditions encountered at Boreholes 3 and 110, generally no major dewatering problems are anticipated during the excavation of the pond, although some dewatering may have to be carried out for excavations due to surface runoff, from any perched water within the fill layer and any sand/silty sand seams/interbeddings. We are of the opinion that these should generally be minor and manageable by pumping from temporary sumps protected

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against erosion, if required.

No major excavation difficulties are foreseen but allowance should be made for boulders and cobbles which occur randomly in glacial deposits.

For the construction of engineered fill, the following placement procedure is recommended.

- (i) The area to receive the engineered fill should be stripped of any topsoil, fill and other compressible, weak and deleterious materials. After stripping, the entire area should be inspected and approved by the geotechnical engineer. Spongy, wet or soft/loose spots should be sub-excavated to stable subgrade and replaced with compactable approved soil, compatible with subgrade conditions, as directed by the geotechnical engineer.
- (ii) The fill material should be placed in thin layers not exceeding approximately 200 mm when loose. Oversize particles (cobbles and boulders) larger than 120 mm should be discarded, and each fill layer should be uniformly compacted with heavy compactors, suitable for the type of fill used, to at least 98% of its Standard Proctor Maximum Dry Density.

The on-site inorganic silty clay to clayey silt soils are generally acceptable for use as engineered fill, provided they are not contaminated with the overlying organic rich deposits and any organic inclusions are removed. Depending on the construction season, the on-site soils may require some reconditioning, wetting or drying.

- (iii) Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill. Compaction procedures and efficiency should be controlled by a qualified geotechnical technician.
- (iv) The engineered fill should not be frozen and should be placed at a moisture content within 2% of the optimum value for compaction and preferably on the wet side of optimum. The engineered fill should not be performed during winter months when freezing ambient temperatures occur persistently or intermittently.

Furthermore, the stability of the pond walls should be analyzed once its design details are confirmed.

Full-time qualified geotechnical engineering supervision should be provided during the excavation and construction of the pond to ensure that adequate protective measures are taken when necessary.

Anti-seepage collars should be installed for the outlet works that direct flow out of the SWM pond as these outlets are subject to hydraulic heads directly from the pond. The provision of anti-seepage collars would increase the seepage path along the outlet works and therefore reduce the quantity of potential seepage.

It should be noted that if the near-surface loose silty sand encountered at Borehole 3 is not

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removed, a liner would be recommended to cap and stabilize the sandy deposit. This liner may be constructed with clay. The clay should be inorganic and consist of a minimum 60% fines (silt and clay) by weight passing No.200 sieve (0.074 mm). A minimum of 20% of clay (0.002 mm or smaller) is required. The clay should also have a plasticity index of not less than 15%, a liquid Limit of not less than 30% and not greater than 60%, and a plastic limit of not less than 11% and not greater than 30%. The laboratory tests performed on samples collected from the on-site silty clay to clayey silt till have indicated that the clayey till deposit could potentially be used to function as the pond liner. The clay liner should be at least 0.6 m thick when compacted and extend back laterally at least 2.5 m behind the pond face. This should be further confirmed once the pond excavation is complete. The clayey fill should be placed in loose lifts (each not exceeding 125 mm thick) and compacted to at least 98% of the material's SPMDD value. Alternatively, a synthetic liner can be considered.

Interim Pond 2

Bottom Invert Elevation:	181.00 m
Permanent Pool Elevation:	184.00 m
Regional Storm Level:	187.00 m

Boreholes 6 and 9 from the 2020 Investigation (Record of Boreholes presented in Enclosure B) are located within or close to the proposed pond footprint. Based on the subsurface conditions encountered at these boreholes, below the surficial topsoil and fill extending down to approximately 3.2 and 0.7 m below existing ground surface, respectively, the excavation for the proposed pond should generally occur in a damp to moist and stiff to very stiff clayey silt till. The groundwater level was monitored during drilling as well as by installing a nest of two monitoring wells in Borehole 6. Based on the measured water levels, the highest groundwater level was measured 1.5 m below ground surface (i.e., El.185.4 m). Although this is above the base of the pond, we are of the opinion the high groundwater level measured is due to the presence of more pervious sand/silty sand seams/interbedding/pockets that were generally noted within the till.

We recommend the groundwater conditions to be further assessed by test pitting before final design.

The construction of the interim pond should generally occur in cut, but some engineered fill will also be required to replace the existing surficial topsoil and fill and to raise the site to the design grades.

All excavations should be carried out in accordance with the Ontario Health and Safety Regulations. The soils to be excavated can be classified as follows:

-Topsoil, Fill, Stiff Clayey Silt Till	Type 3
-Very Stiff Clayey Silt Till	Type 2

Accordingly, a side slope of 1H:1V is required for excavations in accordance with the Ontario Health and Safety Regulations. However, within the very stiff clayey silt till, the bottom 1.2 m could be kept close to vertical. Near the surface and within the deep fill encountered at Borehole 6 flatter side slopes may be required.

Stockpiles of excavated materials should be kept at least 6.0 m from the edge of the excavation to avoid slope instability. Care should also be taken to avoid overloading of any existing underground

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services/utilities by stockpiles.

Based on the subsurface conditions encountered at Boreholes 6 and 9, generally no major dewatering problems are anticipated during the excavation of the pond, although some dewatering may have to be carried out for excavations due to surface runoff, from any perched water within the fill layer. We are of the opinion that these should generally be minor and manageable by pumping from temporary sumps protected against erosion, if required.

No major excavation difficulties are foreseen but allowance should be made for boulders and cobbles which occur randomly in glacial deposits.

For the construction of engineered fill, the following placement procedure is recommended.

- (i) The area to receive the engineered fill should be stripped of any topsoil, fill and other compressible, weak and deleterious materials. After stripping, the entire area should be inspected and approved by the geotechnical engineer. Spongy, wet or soft/loose spots should be sub-excavated to stable subgrade and replaced with compactable approved soil, compatible with subgrade conditions, as directed by the geotechnical engineer.
- (ii) The fill material should be placed in thin layers not exceeding approximately 200 mm when loose. Oversize particles (cobbles and boulders) larger than 120 mm should be discarded, and each fill layer should be uniformly compacted with heavy compactors, suitable for the type of fill used, to at least 98% of its Standard Proctor Maximum Dry Density.

The on-site inorganic silty clay to clayey silt soils are generally acceptable for use as engineered fill, provided they are not contaminated with the overlying organic rich deposits and any organic inclusions are removed. Depending on the construction season, the on-site soils may require some reconditioning, wetting or drying.

- (iii) Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill. Compaction procedures and efficiency should be controlled by a qualified geotechnical technician.
- (iv) The engineered fill should not be frozen and should be placed at a moisture content within 2% of the optimum value for compaction and preferably on the wet side of optimum. The engineered fill should not be performed during winter months when freezing ambient temperatures occur persistently or intermittently.

Furthermore, the stability of the pond walls should be analyzed once its design details are confirmed.

Full-time qualified geotechnical engineering supervision should be provided during the excavation and construction of the pond to ensure that adequate protective measures are taken when necessary.

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Anti-seepage collars should be installed for the outlet works that direct flow out of the SWM pond as these outlets are subject to hydraulic heads directly from the pond. The provision of anti-seepage collars would increase the seepage path along the outlet works and therefore reduce the quantity of potential seepage.

Interim Pond 3

Bottom Invert Elevation: 179.50 m

Permanent Pool Elevation: 182.50 m

Regional Storm Level: 185.00 m

Borehole 120 from the current investigation and Borehole 13 from the 2020 Investigation (Record of Boreholes presented in Enclosure B) are located within the proposed pond footprint. Based on the subsurface conditions encountered at these boreholes, below the surficial topsoil and/or fill, the excavation for the proposed pond should generally occur in a damp to moist and stiff to very stiff silty clay to clayey silt till. However, some firm clayey silt till should also be expected when excavating the lower part of the pond in the general vicinity of Borehole 13. The groundwater level was monitored during drilling as well as by installing a monitoring well in Borehole 120. Based on the measured water levels, the highest groundwater level was measured 2.0 m below ground surface (i.e., El.182.6 m). Although this is above the base of the pond, we are of the opinion the high groundwater level measured is due to the presence of more pervious sand/silty sand seams/interbedding/pockets that were generally noted within the till.

The construction of the interim pond should generally occur in cut, but some engineered fill will also be required to replace the existing surficial topsoil and fill and to raise the site to the design grades.

All excavations should be carried out in accordance with the Ontario Health and Safety Regulations. The soils to be excavated can be classified as follows:

-Topsoil, Fill, Firm to Stiff Silty Clay to Clayey Silt Till	Type 3
-Very Stiff Silty Clay to Clayey Silt Till	Type 2

Accordingly, a side slope of 1H:1V is required for excavations in accordance with the Ontario Health and Safety Regulations. However, within the very stiff silty clay to clayey silt till, the bottom 1.2 m could be kept close to vertical. Near the surface and within the fill layer flatter side slopes may be required.

Stockpiles of excavated materials should be kept at least 5.0 m from the edge of the excavation to avoid slope instability. Care should also be taken to avoid overloading of any existing underground services/utilities by stockpiles.

Based on the subsurface conditions encountered at Boreholes 13 and 120, generally no major dewatering problems are anticipated during the excavation of the pond, although some dewatering may have to be carried out for excavations due to surface runoff, from any perched water within the fill layer as well as any sand/silty sand seams/interbedding/pockets within the till deposit. We are of the opinion that these should generally be minor and manageable by pumping from temporary sumps protected against erosion, if required.

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No major excavation difficulties are foreseen but allowance should be made for boulders and cobbles which occur randomly in glacial deposits.

For the construction of engineered fill, the following placement procedure is recommended.

- (i) The area to receive the engineered fill should be stripped of any topsoil, fill and other compressible, weak and deleterious materials. After stripping, the entire area should be inspected and approved by the geotechnical engineer. Spongy, wet or soft/loose spots should be sub-excavated to stable subgrade and replaced with compactable approved soil, compatible with subgrade conditions, as directed by the geotechnical engineer.
- (ii) The fill material should be placed in thin layers not exceeding approximately 200 mm when loose. Oversize particles (cobbles and boulders) larger than 120 mm should be discarded, and each fill layer should be uniformly compacted with heavy compactors, suitable for the type of fill used, to at least 98% of its Standard Proctor Maximum Dry Density.

The on-site inorganic silty clay to clayey silt soils are generally acceptable for use as engineered fill, provided they are not contaminated with the overlying organic rich deposits and any organic inclusions are removed. Depending on the construction season, the on-site soils may require some reconditioning, wetting or drying.

- (iii) Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill. Compaction procedures and efficiency should be controlled by a qualified geotechnical technician.
- (iv) The engineered fill should not be frozen and should be placed at a moisture content within 2% of the optimum value for compaction and preferably on the wet side of optimum. The engineered fill should not be performed during winter months when freezing ambient temperatures occur persistently or intermittently.

Furthermore, the stability of the pond walls should be analyzed once its design details are confirmed.

Full-time qualified geotechnical engineering supervision should be provided during the excavation and construction of the pond to ensure that adequate protective measures are taken when necessary.

Anti-seepage collars should be installed for the outlet works that direct flow out of the SWM pond as these outlets are subject to hydraulic heads directly from the pond. The provision of anti-seepage collars would increase the seepage path along the outlet works and therefore reduce the quantity of potential seepage.

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4.3 Deep Site Servicing East of Interim Pond 3

According to the preliminary information provided to us by DSEL, we understand that some deep site servicing may occur to the east of Interim Pond 3. Considering this, Borehole 121 was drilled in this general area. We have assumed that sewers will be installed within a depth of 7.0 m below existing ground surface. Considering this, the following discussion and recommended are provided.

4.3.1 Trenching

Trench excavations should be carried out as per the Safety Regulations of the Province of Ontario. The borehole show that below the existing topsoil and fill, the trenches will be predominantly dug through the stiff to very stiff silty clay to clayey silt till. In accordance with the Ontario Health and Safety Regulations, the side slope of excavations are expected to be temporarily stable at 1H:1V, although within the very stiff clayey till deposit, the bottom 1.2 m of the trench walls could be excavated close to vertical. Flatter slopes would be required in surficial layers. Trench boxes or equivalent designed for the specific site conditions may be used to limit the extent of the excavation, if required.

Groundwater seepage within the glacial deposits should be minor and manageable by gravity drainage and pumping from filtered sumps, if required. However, increased seepage may occur from sand and silty sand seams/interbedding within the glacial deposits, perched water or surface water flow, which may require a series of sumps and pumps. The groundwater level should also be lowered down to at least 1.0 below the pipe bedding level. In no case should the pipes be placed on dilated or disturbed subsoil.

Attention is called to the possible presence of cobbles and/or boulders that may be encountered during the excavation in the glacial till deposits.

Normal excavation equipment will be suitable for making trenches within soils in which the proposed underground services will be installed. The terms describing the consistency (stiff, very stiff) of soil strata give an indication of the effort needed for excavation.

4.3.2 Bedding

The boreholes showed that the sewer pipes will be predominantly laid within a stiff to very stiff silty clay to clayey silt till which is considered to be suitable to support the pipes. The recommended minimum thickness of granular bedding for normal Class 'B' Type of bedding (i.e., compacted granular bedding material – OPSD-802) below the invert is 150 mm. However, the thickness of the bedding may have to be increased depending on the pipe diameter or if wet or weak subgrade conditions are encountered.

4.3.3 Backfill

Based on the visual and tactile examination of the soil samples, the inorganic on-site excavated soils could be re-used as backfill in service trenches. The moisture contents at the time of construction should be at or near optimum. The clayey soils will likely be excavated in cohesive

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chunks and blocks and will be difficult to handle and compact. For use as backfill, the soils will have to be reduced to be smaller than 100 mm in size and placed in thin layers. The clayey soils will have to be compacted using heavy equipment suitable for these soils that may be difficult to operate in the narrow confines of the trenches. Unless the clayey materials are properly reduced in sizes, all organics and debris removed 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 ($\pm 2\%$) their optimum moisture content, and each layer should be compacted to at least 95% Standard Proctor Maximum Dry Density. This value should be increased to at least 98% within 0.6 m of the road subgrade surface.

The excavated soils may require reconditioning (e.g., wetting or drying) prior to reuse. The on-site 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 good backfill together with an appropriate frost taper would be preferable in confined areas. Unsuitable materials such as organic soils, boulders, cobbles, frozen soils, etc., should not be used for backfilling.

We recommend that frost tapers be provided at backfilled trenches to ensure gradual transition from the frost-free materials to the frost susceptible natural soil, otherwise differential frost heaving may occur. Frost taper would not be necessary if the backfill material can be matched within the frost zone (i.e. within about 1.2 m depth below the pavement surface) with subgrade-type material.

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5.0 CLOSURE

The attached Report Limitations are an integral part of this report.

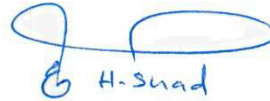
We would recommend that once the development details are known and before final design, we should be given the opportunity to review and provide any additional recommendations that may be required. Furthermore, it is recommended that a program of geotechnical/material inspection and testing be carried out during the construction phase of the project to confirm that the conditions exposed in the excavations are consistent with those encountered in the boreholes and the design assumptions, and to confirm that the various project specifications and materials requirements are being met.

Sincerely,

Shad & Associates Inc.



Stephen Chong, P. Eng.
Senior Engineer



Houshang Shad, Ph.D., P. Eng.
Principal

STATEMENT OF LIMITATION

The conclusions and recommendations given in this report are based on information obtained at the testhole locations. Subsurface and groundwater conditions between and beyond the testholes may differ from those encountered at the testhole locations, and conditions may become apparent during construction which could not be detected or foreseen at the time of the site investigation.

The information contained herein in no way reflects on the environmental aspects of the project, unless stated otherwise.

The benchmark and elevations used in this report are primarily to establish relative elevation differences between the testhole locations and should not be used for other purposes, such as planning, grading, excavating, etc.

The design recommendations given in this report are project as well as site specific and then only if constructed substantially in accordance with the details stated in this report. We recommend, therefore, that we be retained during the final design stage to review the design drawings and to verify that they are consistent with our recommendations or the assumptions made in our analysis.

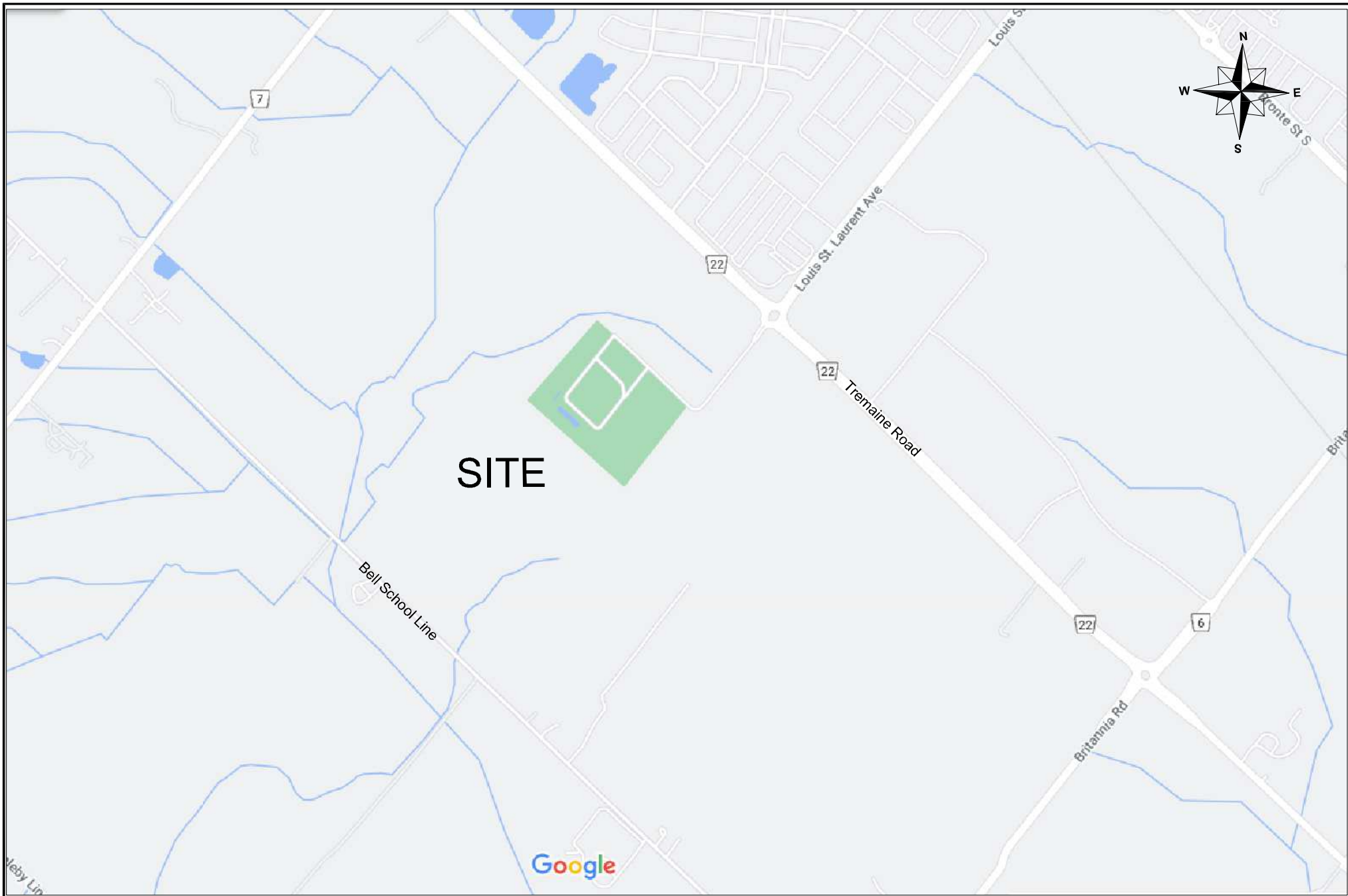
The comments given in this report on potential construction problems and possible methods are intended only for the guidance of the designer. The number of the testholes may not be sufficient to determine all the factors that may affect construction methods and costs. The contractors bidding on this project or undertaking 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.

We recommend that we be retained during construction to confirm that the subsurface conditions throughout the site do not deviate materially from those encountered in the testholes.

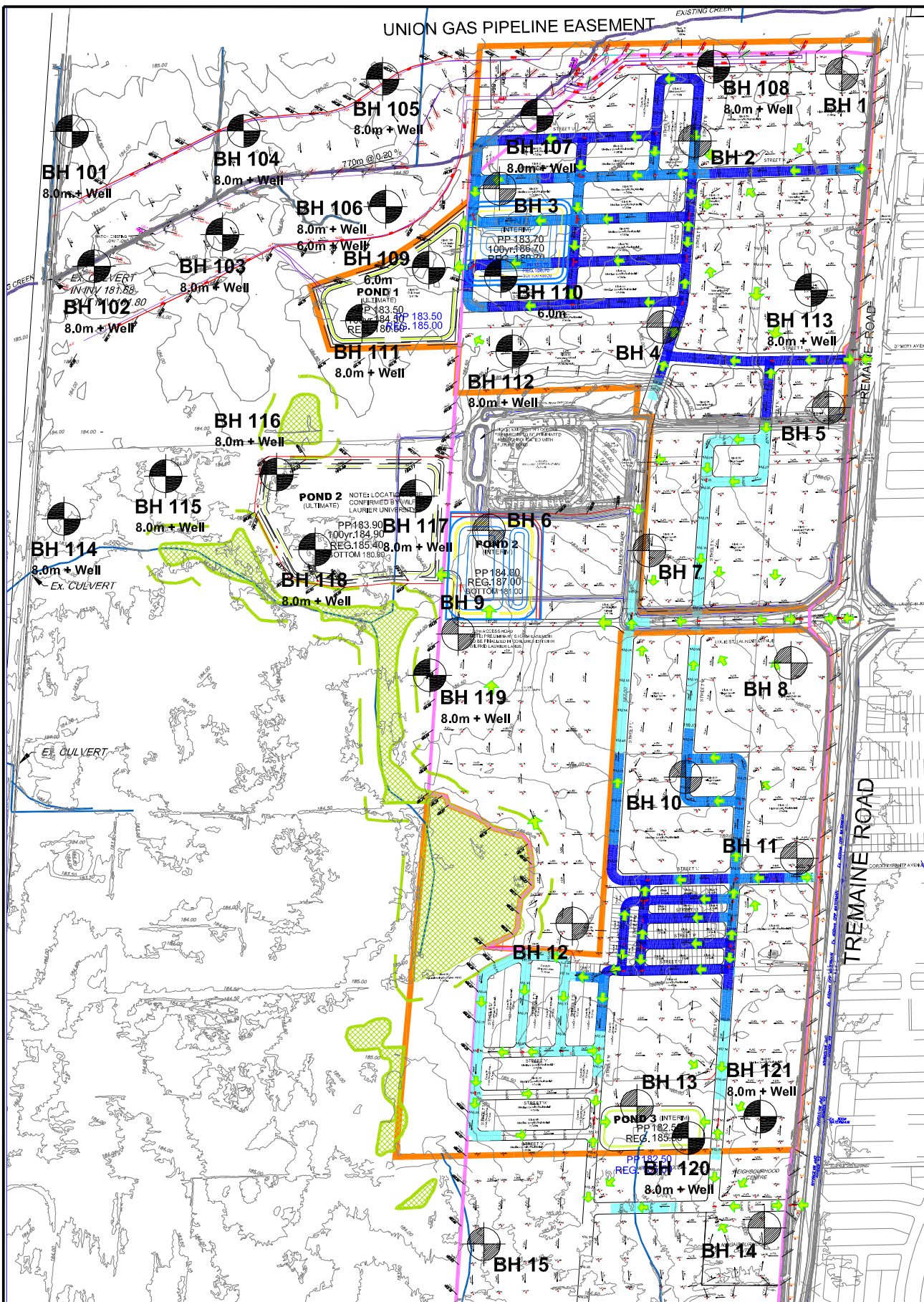
Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, is the responsibility of such third party. We accept no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

FIGURES

Figure 1: Site Location Plan
Figure 2: Borehole Location Plan



CLIENT: MEV Lands SHAD & ASSOCIATES INC. GEOTECHNICAL, ENVIRONMENTAL AND MATERIALS ENGINEERS 83 Citation Drive, Unit 9 Vaughan, Ontario, L4K 2Z6 Tel: (905) 760-5566 Fax: (905) 760-5567	Drawn By: R.H.	TITLE: SITE LOCATION PLAN PROJECT: SUPPLEMENTAL GEOTECHNICAL INVESTIGATION Milton Education Village Lands West of Tremaine Road & North of Britannia Road Milton, Ontario	Date: October, 2021
	Checked By: H.S.		Project No.: T21862
	Datum: -		Figure No.: 1
	Projection: -		
	Scale: N.T.S.		



LEGEND:

- BH 101**
-  Borehole Locations
- BH 1**
-  Previous Boreholes
(Shad Report T20821 dated Oct. 23, 2020)

NOTES:

1. Borehole locations are approximate.
2. Drawing not to scale.
3. The base plan was provided by DSEL.
4. The drawing should be read in conjunction with the associated report by Shad & Associates Inc., T21862.

CLIENT: MEV Lands	Drawn By: R.H. Checked By: H.S.	TITLE: Borehole Location Plan	Date: October 2021
SHAD & ASSOCIATES INC. GEOTECHNICAL, ENVIRONMENTAL AND MATERIALS ENGINEERS 83 Citation Drive, Unit 9 Vaughan, Ontario, L4K 2Z8 Tel: (905) 780-5598 Fax: (905) 780-5587	Datum: - Projection: - Scale: N.T.S.	PROJECT: Supplemental Geotechnical Investigation Milton Educational Village Lands West of Tremaine Road & North of Britannia Road Milton, Ontario	Project No.: T21862 Figure No.: 2



RECORD OF BOREHOLES

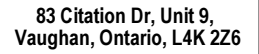
**Record of Boreholes (Boreholes 101-121)
Explanation of Borehole Logs**

Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.

[illegible]

RECORD OF BOREHOLE 101		
Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.

83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6



SOIL PROFILE					
ELEVATION (metres)	DEPTH SCALE (mètres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	" N " VALUES
	176.3	grey, occ. reddish grey		9	SS 46 11
		End of Borehole			
		Cave-in Depth on Completion: None Groundwater Depth on Completion: Dry			
		Measured Groundwater Level in Installed Monitoring Well on: September 15, 2021: 3.4m September 22, 2021: 2.1m			
DYNAMIC CONE PENETRATION RESISTANCE PLOT SHEAR STRENGTH kPa					
GROUND WATER CONDITIONS					
WATER CONTENT (%)					
MONITORING WELL					
REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL					

RECORD OF BOREHOLE 102

Project No.: T21862 CLIENT: MEV Lands ORIGINATED BY: R.H.
 DATE: Aug 31 - Sept 08, 2021 LOCATION: Tremaine Road, Milton COMPILED BY: R.H.
 DATUM: Geodetic BOREHOLE TYPE: Solid Stem CHECKED BY: H.S.



83 Citation Dr, Unit 9,
 Vaughan, Ontario, L4K 2Z6

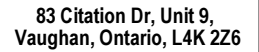
SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION		WATER CONTENT (%)	MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL				
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		RESISTANCE PLOT								
									20	40				60	80	100	
									SHEAR STRENGTH kPa		5		15	25	35		
									▲	20	40	60	80	100	▲		
~ 183.8	0	Ground Surface															
183.7		Topsoil															
183.3		brown to dark brown Silty Clay/Clayey Silt Fill some topsoil, some rootlets, damp		1	SS	30	9										
		light brown Silty Sand/Sandy Silt Fill some organic stains, damp															
182.9		brown Silty Sand moist to wet, loose		2	SS	30	5										
182.4		greyish brown Silty Clay/Clayey Silt Till trace sand, occ. oxidized fissures damp to moist, stiff		3	SS	41	11										
		reddish grey some sand, some oxidized fissures damp occ. fine sand interbeddings occ. clayey silt interbeddings very stiff		4	SS	46	15										
		stiff		5	SS	46	14										
	greyish brown																
	reddish grey damp		7	SS	41	14											
	very stiff		8	SS	46	22											
	7																

Borehole was
 moved ~ 3m north,
 2m west of stake
 due to existing
 creek.
 The grade was ~
 1m higher in
 elevation.



RECORD OF BOREHOLE 102		
Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.

83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

[illegible]

RECORD OF BOREHOLE 103

Project No.: T21862 CLIENT: MEV Lands ORIGINATED BY: R.H.
 DATE: Aug 31 - Sept 08, 2021 LOCATION: Tremaine Road, Milton COMPILED BY: R.H.
 DATUM: Geodetic BOREHOLE TYPE: Solid Stem CHECKED BY: H.S.



83 Citation Dr, Unit 9,
 Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION		WATER CONTENT (%)	MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		RESISTANCE PLOT					
									SHEAR STRENGTH kPa					
184.2		Ground Surface												
	0	Topsoil												
183.9		mottled light brown, occ. dark brown Ploughed Silty Sand/Sandy Silt Fill occ. topsoil, some rootlets some organic stains, damp		1	SS	46	10					10		
														14
183.5														
	1	greyish brown Clayey Silt Till trace sand, some oxidized fissures damp, very stiff		2	SS	46	21					15		
	2	brown some oxidized fissures		3	SS	46	30						11	
	3	brown, occ. greyish brown some gravel, hard	4	SS	20	32						10		

Gradation Analysis
 & Atterberg Limits,
 S(6):
 6 21 47 26
 LL: 20%
 PL: 14%
 PI: 6%

possible
 cobbles/boulder

RECORD OF BOREHOLE 103		
Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.

83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

[illegible]

RECORD OF BOREHOLE 104

Project No.: T21862 CLIENT: MEV Lands ORIGINATED BY: R.H.
 DATE: Aug 31 - Sept 08, 2021 LOCATION: Tremaine Road, Milton COMPILED BY: R.H.
 DATUM: Geodetic BOREHOLE TYPE: Solid Stem CHECKED BY: H.S.



83 Citation Dr, Unit 9,
 Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT		WATER CONTENT (%)	MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		20 40 60 80 100				
									SHEAR STRENGTH kPa				
183.9	0	Ground Surface											
183.6		Topsoil Mixed Fill		1	SS	41	6					31	
183.2		brown, occ. grey Silty Clay/Clayey Silt Fill some sand, occ. rootlets some organic stains, damp										22	
	1	mottled brown Silty Sand/Sandy Silt Fill some clay moist		2	SS	30	4					19	
182.5		brown, occ. grey Silty Clay/Clayey Silt moist, stiff		3	SS	41	12					22	
181.8	2	brown Clayey Silt Till trace sand, some oxidized fissures damp, very stiff		4	SS	46	22					11	
	3	greyish brown		5	SS	46	20					11	
	4	trace gravel some sand, stiff		6	SS	46	12					11	
	5			7	SS	46	17					11	
	6	grey very stiff		8	SS	46	15					11	
	7												

September 22, 2021

Gradation Analysis
& Atterberg Limits

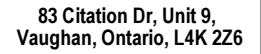
S(7):
6 14 55 25
LL: 22%
PL: 16%
PI: 6%

Gradation Analysis
 & Atterberg Limits,
 S(7):
 6 14 55 25
 LL: 22%
 PL: 16%
 PI: 6%

September 22, 2021

RECORD OF BOREHOLE 104		
Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.

83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

[illegible]

Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.

[illegible]

RECORD OF BOREHOLE 107

Project No.: T21862 CLIENT: MEV Lands ORIGINATED BY: R.H.
 DATE: Aug 31 - Sept 08, 2021 LOCATION: Tremaine Road, Milton COMPILED BY: R.H.
 DATUM: Geodetic BOREHOLE TYPE: Solid Stem CHECKED BY: H.S.



83 Citation Dr, Unit 9,
 Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION		WATER CONTENT		MONITORING WELL	REMARKS AND	
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		RESISTANCE PLOT		(%)	GRAIN SIZE DISTRIBUTION (%)			
									20	40				60	80
184.9		Ground Surface													
184.8	0	Topsoil													
		mottled brown, occ. dark brown Ploughed Silty Clay/Clayey Silt Fill occ. topsoil, occ. rootlets damp to moist		1	SS	46	7					24			
184.2		light brown to brown													
183.9	1	Silty Sand/Sandy Silt occ. rootlets, some organic stains moist, loose		2	SS	46	5					18			
183.5		brown Silty Clay/Clayey Silt damp to moist, firm													
	2	brown Silty Clay/Clayey Silt Till damp to moist, stiff		3	SS	46	13					23			
		grey, occ. greyish reddish brown some sand, damp, very stiff grey, gravelly sand interbedding, moist		4	SS	41	16					13			
	3														
		greyish reddish brown trace sand, occ. shale fragments damp		5	SS	41	20					12			
	4														
		grey		6	SS	36	22					13			
180.2															
	5	brownish grey Silty Sand Till damp to moist, very dense		7	SS	46	57					10			
179.4															
	6	brownish grey Clayey Silt Till damp, hard		8	SS	46	36					11			
177.9	7														

Gradation Analysis
 & Atterberg Limits,
 S(3):
 1 13 46 40
 LL: 32%
 PL: 21%
 PI: 11%

Gradation Analysis
 & Atterberg Limits,
 S(8):
 8 15 48 29
 LL: 23%
 PL: 15%
 PI: 8%

RECORD OF BOREHOLE 108

Project No.: T21862 CLIENT: MEV Lands ORIGINATED BY: R.H.
 DATE: Aug 31 - Sept 08, 2021 LOCATION: Tremaine Road, Milton COMPILED BY: R.H.
 DATUM: Geodetic BOREHOLE TYPE: Solid Stem CHECKED BY: H.S.



83 Citation Dr, Unit 9,
 Vaughan, Ontario, L4K 2Z6

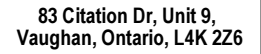
SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION		WATER CONTENT		MONITORING WELL	REMARKS AND			
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		RESISTANCE PLOT		(%)			GRAIN SIZE DISTRIBUTION (%)			
									20	40	60	80		100	5	15	25
									SHEAR STRENGTH kPa								
									▲	20	40	60	80	100	▲		
185.9	0	Ground Surface															
185.6		Topsoil		1	SS	30	13						23				
		light brown, occ. dark brown Ploughed Silty Clay/Clayey Silt Fill some sand, occ. topsoil, damp											14				
185.2	1	brown Silty Sand/Sandy Silt Fill occ. organic stains moist to wet		2	SS	30	4						24				
		brown Silty Clay/Clayey Silt moist, very stiff		3	SS	46	15						23				
184.5	2	silty sand interbedding															
		grey Silty Clay/Clayey Silt Till trace sand, occ. oxidized fissures moist, stiff		4	SS	46	11						25				
183.7	3	some sand moist		5	SS	46	11						24				
		grey, silty sand/sandy silt till interbedding occ. gravelly sand interbedding, wet											11				
	4	reddish grey damp, very stiff		6	SS	41	16						13				
					7	SS	36	19					12				
	5	occ. shale fragments occ. silty sand seams/pockets															
		grey some shale fragments occ. clayey zones hard		8	SS	36	32						10				
7																	

August 31, 2021



RECORD OF BOREHOLE 108		
Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.

83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6



SOIL PROFILE				SAMPLES			
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES
178.1	8	brown, occ. greyish brown	[Pattern]				
177.8		reddish grey Clayey Sandy Silt Till damp, hard	[Pattern]	9	SS	46	72
	9	End of Borehole Cave-in Depth on Completion: None Groundwater Depth on Completion: 6.7m Measured Groundwater Level in Installed Monitoring Well on: September 15, 2021: 1.1m September 22, 2021: 1.0m					
	10						
	11						
	12						
	13						
	14						

RECORD OF BOREHOLE 109

Project No.: T21862 CLIENT: MEV Lands ORIGINATED BY: R.H.
 DATE: Aug 31 - Sept 08, 2021 LOCATION: Tremaine Road, Milton COMPILED BY: R.H.
 DATUM: Geodetic BOREHOLE TYPE: Solid Stem CHECKED BY: H.S.



83 Citation Dr, Unit 9,
 Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION		WATER CONTENT (%)	MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL											
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		RESISTANCE PLOT															
									20	40	60			80	100	SHEAR STRENGTH kPa								
									▲	20	40	60	80	100	▲	5	15	25	35					
184.1	0	Ground Surface																						
		Topsoil																						
183.8				1	SS	46	5												24			Borehole was moved ~ 15m south of stake due to wet surface.		
		mottled brown, occ. dark brown Ploughed Silty Clay/Clayey Silt Fill some sand, occ. rootlets some organic stains moist																	20					
183.4																								
	1	brown to greyish brown Clayey Silt Till trace sand, some oxidized fissures damp to moist, stiff		2	SS	46	11												25					
				3	SS	46	22												21					
	2	greyish brown occ. silty clay/clayey silt interbeddings damp, very stiff																						
				4	SS	46	21												20					
	3																							
		grey, occ. reddish grey some sand damp to moist, firm		5	SS	41	7												15					
	4																							
		reddish grey damp, very stiff																						
	5			6	SS	30	26												12					
	6	grey, occ. reddish grey occ. oxidized fissures occ. shale fragments damp																						
				7	SS	46	19												13					
177.5																								
		End of Borehole																						
	7	Cave-in Depth on Completion: None Groundwater Depth on Completion: 4.6m																						

September 01, 2021

RECORD OF BOREHOLE 110

Project No.: T21862 CLIENT: MEV Lands ORIGINATED BY: R.H.

DATE: Aug 31 - Sept 08, 2021 LOCATION: Tremaine Road, Milton COMPILED BY: R.H.

DATUM: Geodetic BOREHOLE TYPE: Solid Stem CHECKED BY: H.S.



83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT					WATER CONTENT		MONITORING WELL	REMARKS AND	
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		20 40 60 80 100					(%)			GRAIN SIZE DISTRIBUTION (%)	
									SHEAR STRENGTH kPa					5 15 25 35			GR SA SI CL	
184.4	0	Ground Surface																
		Topsoil						September 01, 2021 										
184.1				1	SS	36	6							18		26		
		brown, occ. dark brown Ploughed Silty Sand/Sandy Silt Fill trace to some clay, occ. gravel moist																
183.8																		
	1	brown, occ. reddish brown Silty Clay/Clayey Silt occ. oxidized fissures occ. silty clay/clayey silt interbeddings damp to moist, stiff		2	SS	46	13							22				
		occ. sand																
				3	SS	46	15							21				
182.3	2																	

Gradation Analysis
& Atterberg Limits,
S(6):
2 18 51 29
LL: 27%
PL: 19%
PI: 8%

Field Vane Test
Undrained Shear
Strength,
Su: 55 kPa
Sensitivity Factor,
St: 2.5

RECORD OF BOREHOLE 111

Project No.: T21862 CLIENT: MEV Lands ORIGINATED BY: R.H.
 DATE: Aug 31 - Sept 08, 2021 LOCATION: Tremaine Road, Milton COMPILED BY: R.H.
 DATUM: Geodetic BOREHOLE TYPE: Solid Stem CHECKED BY: H.S.



83 Citation Dr, Unit 9,
 Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION		WATER CONTENT (%)	MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL				
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		RESISTANCE PLOT								
									20	40				60	80	100	
									SHEAR STRENGTH kPa		5 15 25 35						
									▲	20	40	60	80	100	▲		
184.6	0	Ground Surface															
184.5		Topsoil															
184.3		mottled brown Ploughed Silty Clay/Clayey Silt Fill occ. rootlets, damp		1	SS	46	10										
		brown, occ. grey, stiff															
		brown, occ. reddish brown Silty Clay/Clayey Silt Till occ. oxidized fissures damp, very stiff		2	SS	46	17										
			some oxidized fissures		3	SS	30	23									
			trace sand occ. oxidized fissures		4	SS	41	24									
	1																
		greyish brown some oxidized fissures damp		5	SS	46	15										
	2																
		stiff		6	SS	46	13										
	3																
		reddish grey some sand moist, very stiff		7	SS	46	17										
	4																
		reddish grey, occ. grey some sand occ. sand pockets		8	SS	46	23										
	5																
		grey															
	6																
	7																

September 01, 2021

September 15, 2021

September 22, 2021

Gradation Analysis & Atterberg Limits

S(8):

5 19 50 26

LL: 28%

PL: 15%

PI: 13%

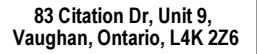
September 01, 2021



Gradation Analysis
 & Atterberg Limits,
 S(8):
 5 19 50 26
 LL: 28%
 PL: 15%
 PI: 13%

RECORD OF BOREHOLE 111		
Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.

83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

[illegible]

RECORD OF BOREHOLE 112

Project No.: T21862 CLIENT: MEV Lands ORIGINATED BY: R.H.
 DATE: Aug 31 - Sept 08, 2021 LOCATION: Tremaine Road, Milton COMPILED BY: R.H.
 DATUM: Geodetic BOREHOLE TYPE: Solid Stem CHECKED BY: H.S.



83 Citation Dr, Unit 9,
 Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT		WATER CONTENT		MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		20 40 60 80 100		(%)				
									SHEAR STRENGTH kPa		5 15 25 35				
184.6	0	Ground Surface											September 15, 2021		
184.4		Topsoil													
184.1	1	mottled light brown Clayey Silt Fill some sand, occ. rootlets, damp		1	SS	46	7					15		September 22, 2021	
		brown, occ. grey, firm													
183.5	1	Silty Clay/Clayey Silt moist, stiff to very stiff		2	SS	30	16					22			
	2	brown, occ. greyish brown Silty Clay/Clayey Silt Till occ. oxidized fissures damp, very stiff										16			
	3	greyish brown some oxidized fissures		4	SS	46	24					15			
	4	some sand occ. clayey zones moist, firm		5	SS	46	6					20			
	4	grey, gravelly sand interbedding, wet reddish grey damp, stiff		6	SS	46	14					18 19			
												9			
	5	occ. sand seams/pockets very stiff		7	SS	41	15					12			
	6	brownish grey, hard		8	SS	46	32					11			
177.6	7														

August 31, 2021

September 15, 2021
 September 22, 2021

[illegible]

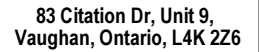
Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.



SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT		WATER CONTENT		MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%)		
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		20 40 60 80 100					(%)		GR SA SI CL
									SHEAR STRENGTH kPa							
									▲ 20 40 60 80 100 ▲				5 15 25 35			
186.4	0	Ground Surface														
186.3		Topsoil														
186.0		mottled brown Silty Clay/Clayey Silt Fill some sand, occ. rootlets, damp		1	SS	46	13						19			
		brown, stiff											17			
		brown, occ. reddish brown Silty Clay/Clayey Silt Till trace to some sand occ. oxidized fissures damp, very stiff		2	SS	46	21						16			
		some oxidized fissures occ. shale fragments		3	SS	46	23						13			
		some sand		4	SS	46	28						11			
reddish brown		5	SS	46	30						11					
	1	brown														
		grey occ. sand		6	SS	46	29					10				
		brown, occ. grey														
		brownish grey occ. sandy zones hard		7	SS	46	41						9			
	2															
	3															
	4															
	5															
	6															
	7															
	8															
	9															
	10															

RECORD OF BOREHOLE 113		
Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.

83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6



SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS August 31, 2021 	DYNAMIC CONE PENETRATION RESISTANCE PLOT		WATER CONTENT		MONITORING WELL 	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEVATION (mètres)	DEPTH SCALE (mètres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		20 40 60 80 100		(%)			
									SHEAR STRENGTH kPa					
									▲ 20 40 60 80 100 ▲	5 15 25 35				
178.7	8	brownish grey Clayey Sandy Silt Till damp, hard		9	SS	46	63					8 ○ 7 ○		
178.3		End of Borehole Cave-in Depth on Completion: None Groundwater Depth on Completion: 7.9m Measured Groundwater Level in Installed Monitoring Well on: September 15, 2021: 0.9m September 22, 2021: 0.9m												
	9													
	10													
	11													
	12													
	13													
	14													

RECORD OF BOREHOLE 114

Project No.: T21862 CLIENT: MEV Lands ORIGINATED BY: R.H.
 DATE: Aug 31 - Sept 08, 2021 LOCATION: Tremaine Road, Milton COMPILED BY: R.H.
 DATUM: Geodetic BOREHOLE TYPE: Solid Stem CHECKED BY: H.S.



83 Citation Dr, Unit 9,
 Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT					WATER CONTENT (%)				MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%)			
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		20 40 60 80 100					5 15 25 35					GR	SA	SI	CL
									SHEAR STRENGTH kPa													
183.3	0	Ground Surface																				
183.0		Topsoil Mixed Fill																				
182.6		brown Silty Clay/Clayey Silt Fill some sand damp		1	SS	46	8								20							
	1	brown, occ. grey Silty Clay/Clayey Silt Till occ. oxidized fissures damp, very stiff		2	SS	46	15								20							
		brown some oxidized fissures silty sand till interbedding, moist		3	SS	46	20								16							
	2																					
		brown, occ. greyish brown		4	SS	46	26								16							
	3																					
		brown, occ. grey damp to moist		5	SS	46	16								18							
	4	grey, occ. reddish grey occ. sand seams moist, firm		6	SS	46	5								20							
	5	greyish brown damp, stiff		7	SS	46	10								12							
	6																					
		occ. gravel		8	SS	30	9								12							
	7																					

Field Vane Test
Undrained Shear
Strength,
Su: 70 kPa
Sensitivity Factor,
St: 2.7

Field Vane Test
 Undrained Shear
 Strength,
 Su: 70 kPa
 Sensitivity Factor,
 St: 2.7

RECORD OF BOREHOLE 115		
Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.

83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

[illegible]

Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.



SOIL PROFILE				SAMPLES				GROUND WATER September 03, 2021 ▼	DYNAMIC CONE PENETRATION RESISTANCE PLOT	WATER CONTENT	MONITORING WELL	REMARKS AND
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		20 40 60 80 100	(%)		GRAIN SIZE DISTRIBUTION (%)
									SHEAR STRENGTH kPa			
175.9	8	End of Borehole Cave-in Depth on Completion: None Groundwater Depth on Completion: 7.6m Measured Groundwater Level in Installed Monitoring Well on: September 15, 2021: 0.4m September 22, 2021: 0.4m		9	SS	25	50/10cm	▲ 20 40 60 80 100 ▲	5 15 25 35	7 		
	9											
	10											
	11											
	12											
	13											
	14											

RECORD OF BOREHOLE 118

Project No.: T21862 CLIENT: MEV Lands ORIGINATED BY: R.H.
 DATE: Aug 31 - Sept 08, 2021 LOCATION: Tremaine Road, Milton COMPILED BY: R.H.
 DATUM: Geodetic BOREHOLE TYPE: Solid Stem CHECKED BY: H.S.



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 Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT		WATER CONTENT		MONITORING WELL	REMARKS AND	
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		20 40 60 80 100		(%)			GRAIN SIZE DISTRIBUTION (%)	
									SHEAR STRENGTH kPa		5 15 25 35			GR SA SI CL	
183.9	0	Ground Surface													
183.5		Topsoil Mixed Fill		1	SS	30	13					17 16			
		brown, some grey some sand, stiff													
	1			2	SS	46	25					15			
		brown Silty Clay/Clayey Silt Till some oxidized fissures occ. shale fragments damp, very stiff													
	2			3	SS	46	21					15			
		some sand occ. silty sand/sandy silt interbeddings													
	3			4	SS	46	26					15			
		greyish brown													
	4			5	SS	46	29					9			
		damp to moist some sand pockets													
179.1				A											
	5			7	SS	46	94					9 8			
		greyish brown													
	6			8	SS	10	50/10cm					8			
		grey Silty Sand/Sandy Silt Till trace clay, occ. sand seams damp, very dense													
	7														

September 15, 2021

September 22, 2021

Gradation Analysis
& Atterberg Limits,
S(6):
6 20 52 22
LL: 22%
PL: 17%
PI: 5%

possible
cobbles/boulder

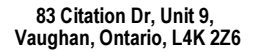
Gradation Analysis
S(7B):
12 44 41 3

Gradation Analysis
 & Atterberg Limits,
 S(6):
 6 20 52 22
 LL: 22%
 PL: 17%
 PI: 5%

possible
 cobbles/boulder

Gradation Analysis,
 S(7B):
 12 44 41 3

Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.

[illegible]

RECORD OF BOREHOLE 119

Project No.: T21862 CLIENT: MEV Lands ORIGINATED BY: R.H.
 DATE: Aug 31 - Sept 08, 2021 LOCATION: Tremaine Road, Milton COMPILED BY: R.H.
 DATUM: Geodetic BOREHOLE TYPE: Solid Stem CHECKED BY: H.S.



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 Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT		WATER CONTENT		MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		20 40 60 80 100		(%)			
									SHEAR STRENGTH kPa		5 15 25 35			
184.1	0	Ground Surface												
183.9		Topsoil												
183.6		brown Silty Clay/Clayey Silt Fill occ. rootlets, damp stiff		1	SS	46	8					18 19 16		
	1	----- brown, occ. grey Silty Clay/Clayey Silt Till occ. oxidized fissures damp, very stiff		2	SS	46	18					20		
	2	----- greyish brown, occ. reddish brown		3	SS	46	23					16		
	3	----- some oxidized fissures		4	SS	46	23					17		
	4	----- brown		5	SS	46	16					19		
	5	----- damp to moist, firm		6	SS	46	8					20		
	6	----- reddish grey		7	SS	41	19					25		
	7	----- occ. silty sand interbeddings moist, very stiff		8	SS	41	21					10		
177.1	7	----- some sand damp												
														possible cobbles/boulders

[illegible]

RECORD OF BOREHOLE 120

Project No.: T21862 CLIENT: MEV Lands ORIGINATED BY: R.H.
 DATE: Aug 31 - Sept 08, 2021 LOCATION: Tremaine Road, Milton COMPILED BY: R.H.
 DATUM: Geodetic BOREHOLE TYPE: Solid Stem CHECKED BY: H.S.



83 Citation Dr, Unit 9,
 Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION		WATER CONTENT (%)	MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL				
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		RESISTANCE PLOT								
									20	40				60	80	100	
									SHEAR STRENGTH kPa		5 15 25 35						
									▲	20	40	60	80	100	▲		
184.6		Ground Surface															
184.4	0	Topsoil															
184.1		mottled brown Silty Clay/Clayey Silt Fill occ. rootlets, trace organic stains damp to moist		1	SS	46	11							22			
		reddish brown, stiff												21			
														15			
	1	reddish brown, occ. grey Silty Clay/Clayey Silt Till some sand, occ. oxidized fissures damp, very stiff		2	SS	46	23							13			
	2	brown, occ. greyish brown some oxidized fissures		3	SS	46	22							15			
	3	brown occ. shale fragments		4	SS	46	30							14			
	4	brown, occ. reddish brown		5	SS	46	25							14			
	5	brown		6	SS	46	14							16			
		grey, occ. reddish grey stiff															
	6	grey occ. shale fragments		7	SS	46	12							16			
	7	grey, occ. reddish grey		8	SS	41	9							15			
	8																
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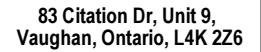
Gradation Analysis
 & Atterberg Limits,
 S(4):
 4 21 46 29
 LL: 33%
 PL: 20%
 PI: 13%

Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.

[illegible]

RECORD OF BOREHOLE 121		
Project No.: T21862	CLIENT: MEV Lands	ORIGINATED BY: R.H.
DATE: Aug 31 - Sept 08, 2021	LOCATION: Tremaine Road, Milton	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.

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Vaughan, Ontario, L4K 2Z6

[illegible]

EXPLANATION OF BOREHOLE LOG

This form describes some of the information provided on the borehole logs, which is based primarily on examination of the recovered samples, and the results of the field and laboratory tests. It should be noted that materials, boundaries and conditions have been established only at the borehole locations at the time of investigation and are not necessarily representative of subsurface conditions elsewhere across the site. Additional description of the soil/rock encountered is given in the accompanying geotechnical report.

GENERAL INFORMATION

Project details, borehole number, location coordinates and type of drilling equipment used are given at the top of the borehole log.

SOIL LITHOLOGY

Elevation and depth

This column gives the elevation and depth of inferred geologic layers. The elevation is referred to the datum shown in the Description column.

Lithology Plot

This column presents a graphic depiction of the soil and rock stratigraphy encountered within the borehole.

Description

This column gives a description of the soil strata, based on visual and tactile examination of the samples augmented with field and laboratory test results. Each stratum is described according to the following classification and terminology (Ref. Unified Soil Classification System):

The compactness condition of cohesionless soils (SPT) and the consistency of cohesive soils (undrained shear strength) are defined as follows (Ref. Canadian Foundation Engineering Manual):

Compactness of Cohesionless Soils	SPT N-Value	Consistency of Cohesive Soils	SPT N-Value	Undrained Shear Strength	
				kPa	psf
Very loose	0 to 4	Very soft	0 to 2	0 to 12	0 to 250
Loose	4 to 10	Soft	2 to 4	12 to 25	250 to 500
Compact	10 to 30	Firm	4 to 8	25 to 50	500 to 1000
Dense	30 to 50	Stiff	8 to 15	50 to 100	1000 to 2000
Very Dense	> 50	Very stiff	15 to 30	100 to 200	2000 to 4000
		Hard	> 30	Over 200	Over 4000

Soil Sampling

Sample types are abbreviated as follows:

SS	Split Spoon	TW	Thin Wall Open (Pushed)	RC	Rock Core
AS	Auger Sample	TP	Thin Wall Piston (Pushed)	WS	Washed Sample

Additional information provided in this section includes sample numbering, sample recovery and numerical testing results.

Field and Laboratory Testing

Results of field testing (e.g., SPT, pocket penetrometer, and vane testing) and laboratory testing (e.g., natural moisture content, and limits) executed on the recovered samples are plotted in this section.

Instrumentation Installation

Instrumentation installations (monitoring wells, piezometers, inclinometers, etc.) are plotted in this section. Water levels, if measured during fieldwork, are also plotted. These water levels may or may not be representative of the static groundwater level depending on the nature of soil stratum where the piezometer tips are located, the time elapsed from installation to reading and other applicable factors.

Comments

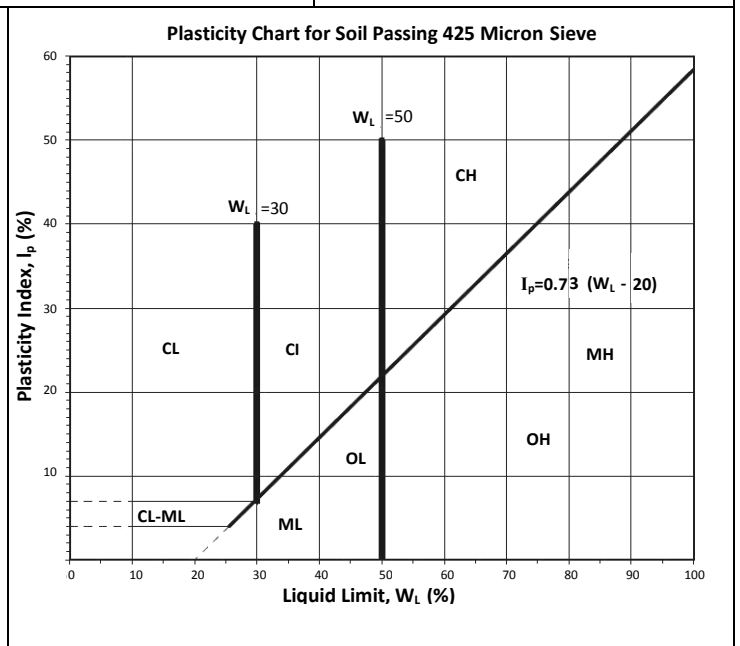
This column is used to describe non-standard situations or notes of interest.

MODIFIED * UNIFIED CLASSIFICATION SYSTEM FOR SOILS

*The soil of each stratum is described using the Unified Soil Classification System (Technical Memorandum 36-357 prepared by Waterways Experiment Station, Vicksburg, Mississippi, Corps of Engineers, U.S Army. Vol. 1 March 1953.) modified slightly so that an inorganic clay of "medium plasticity" is recognized.

MAJOR DIVISION			GROUP SYMBOL	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA
COARSE GRAINED SOILS (MORE THAN HALF BY WEIGHT LARGER THAN 75µm)	GRAVELS MORE THAN HALF THE COARSE FRACTION LARGER THAN 4.75mm	CLEAN GRAVELS (TRACE OR NO FINES)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	$C_u = \frac{D_{60}}{D_{10}} > 4$; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS
		DIRTY GRAVELS (WITH SOME OR MORE FINES)	GM	SILTY GRAVELS, GRAVEL-SAND- SILT MIXTURES	ATTERBERG LIMITS BELOW "A" LINE OR P.I. MORE THAN 4
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES	ATTERBERG LIMITS BELOW "A" LINE OR P.I. MORE THAN 7
	SANDS MORE THAN HALF THE COARSE FRACTION SMALLER THAN 4.75mm	CLEAN SANDS (TRACE OR NO FINES)	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	$C_u = \frac{D_{60}}{D_{10}} > 6$; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$
			SP	POORLY GRADED GRAVELS, GRAVEL- SAND MIXTURES, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS
		DIRTY SANDS (WITH SOME OR MORE FINES)	SM	SILTY SANDS, SAND-SILT MIXTURES	ATTERBERG LIMITS BELOW "A" LINE OR P.I MORE THAN 4
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES	ATTERBERG LIMITS BELOW "A" LINE OR P.I MORE THAN 7
FINE-GRAINED SOILS (MORE THAN HALF BY WEIGHT SMALLER THAN 75µm)	SILTS BELOW "A" LINE NEGLIGIBLE ORGANIC CONTENT	$W_L < 50\%$	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY	CLASSIFICATION IS BASED UPON PLASTICITY CHART (SEE BELOW)
		$W_L < 50\%$	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS	
	CLAY ABOVE "A" LINE NEGLIGIBLE ORGANIC CONTENT	$W_L < 30\%$	CL	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY OR SILTY CLAYS, LEAN CLAYS	
		$30\% < W_L < 50\%$	CI	INORGANIC CLAYS OF MEDIUM PLASTICITY, SILTY CLAYS	
		$W_L < 50\%$	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
	ORGANIC SILTS & CLAYS BELOW "A" LINE	$W_L < 50\%$	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	WHENEVER THE NATURE OF THE FINES CONTENT HAS NOT BEEN DETERMINED, IT IS DESIGNATED BY THE LETTER "F", E.G SF IS A MIXTURE OF SAND WITH SILT OR CLAY
		$W_L < 50\%$	OH	ORGANIC CLAYS OF HIGH PLASTICITY	
	HIGH ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

SOIL COMPONENTS					
FRACTION	U.S STANDARD SIEVE SIZE		DEFINING RANGES OF PERCENTAGE BY WEIGHT OF MINOR COMPONENTS		
GRAVEL	COARSE	PASSING	RETAINED	PERCENT	DESCRIPTOR
		76 mm	19 mm	35-50	AND
	FINE	19 mm	4.75 mm	20-35	Y/EY
				10-20	SOME
SAND	COARSE	4.75 mm	2.00 mm	1-10	TRACE
	MEDIUM	2.00 mm	425 µm		
	FINE	425 µm	75 µm		
FINES (SILT OR CLAY BASED ON PLASTICITY)		75 µm			
OVERSIZED MATERIAL					
ROUNDED OR SUBROUNDED: COBBLES 76 mm TO 200 mm BOULDERS > 200 mm				NOT ROUNDED: ROCK FRAGMENTS > 76 mm ROCKS > 0.76 CUBIC METRE IN VOLUME	



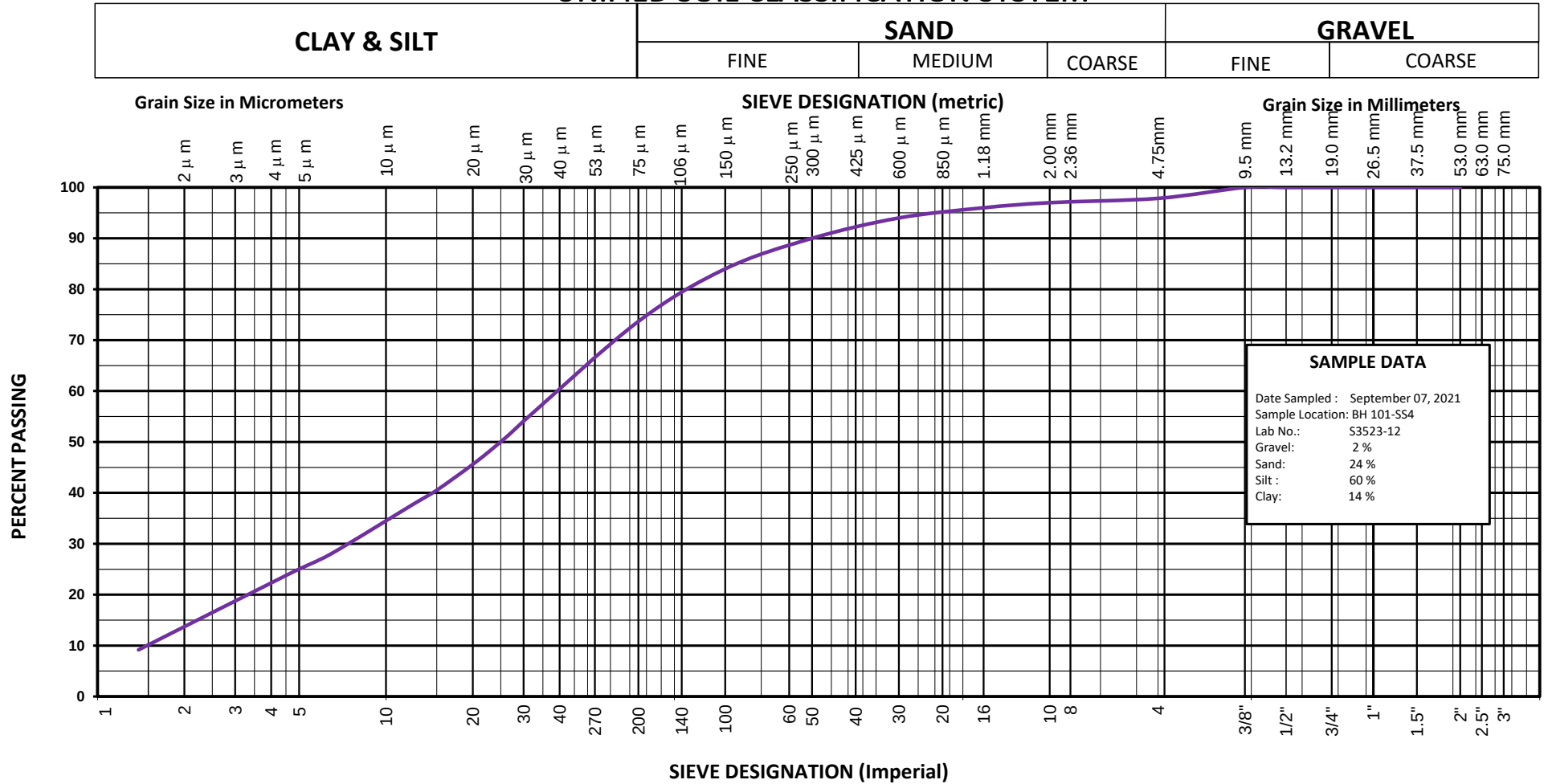
Note 1: Soils are classified and described according to their engineering properties and behavior.

Note 2: The modifying adjectives used to define the actual or estimated percentage range by weight of minor components are consistent with the Canadian Foundation Engineering Manual (3rd Edition, Canadian Geotechnical Society, 1992)

ENCLOSURES

Enclosure A: Laboratory Test Results

UNIFIED SOIL CLASSIFICATION SYSTEM



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 Fax: (905) 760-5567
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GRAIN SIZE ANALYSIS

Project :

Milton Educational Village Lands

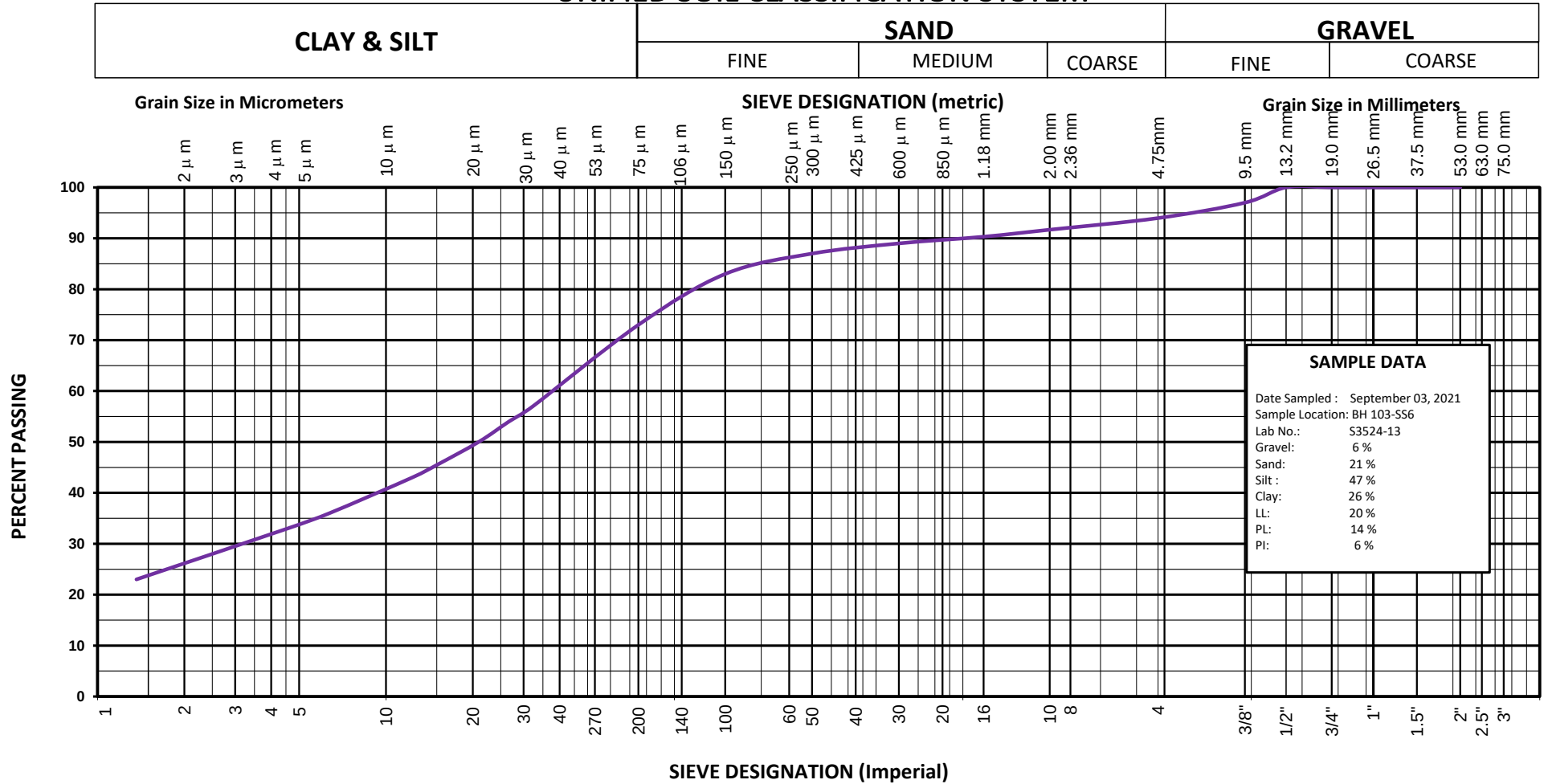
Project No.:

T21862

Client:

MEV Lands

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GRAIN SIZE ANALYSIS

Project :

Milton Educational Village Lands

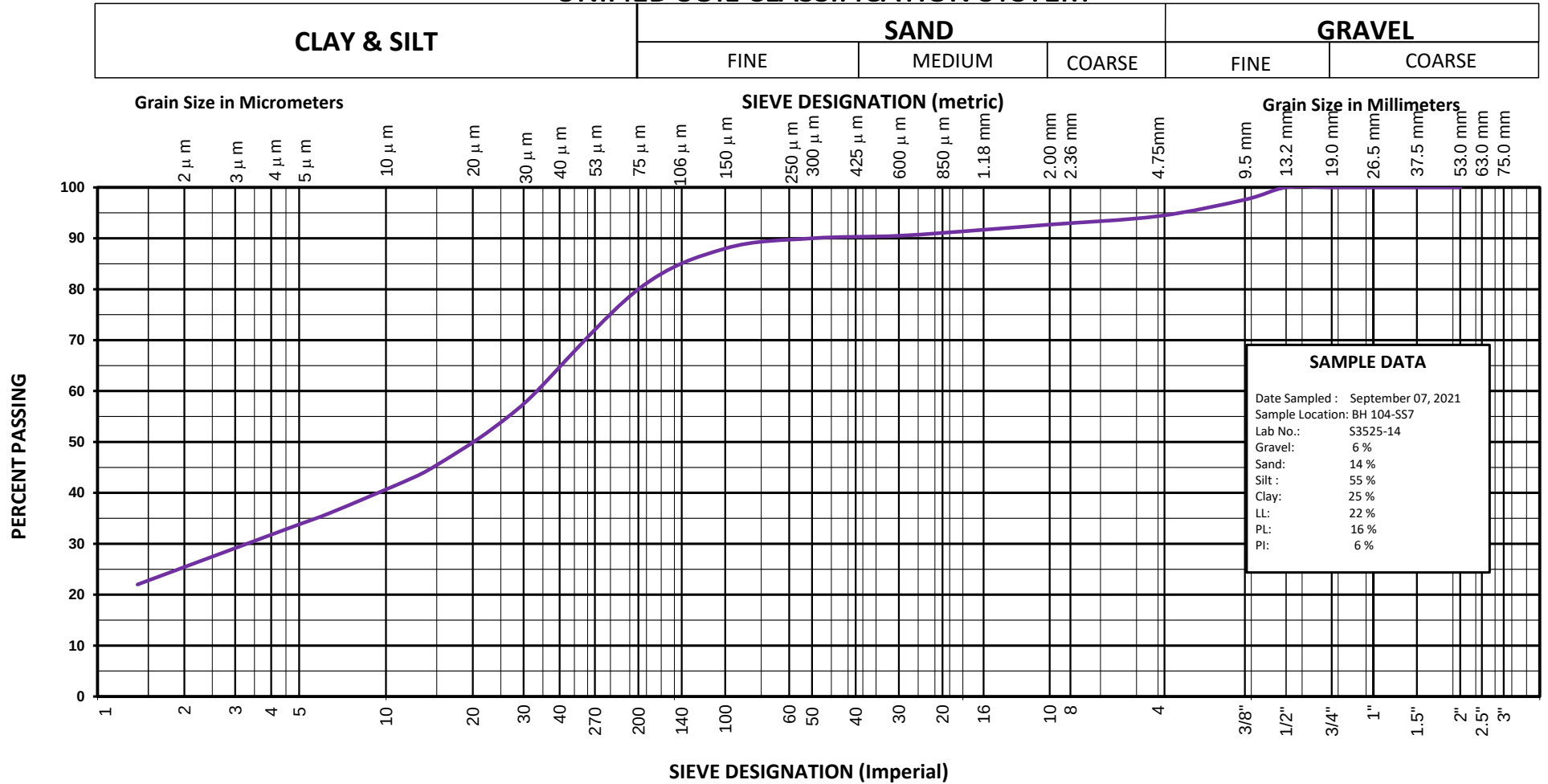
Project No.:

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Client:

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GRAIN SIZE ANALYSIS

Project :

Milton Educational Village Lands

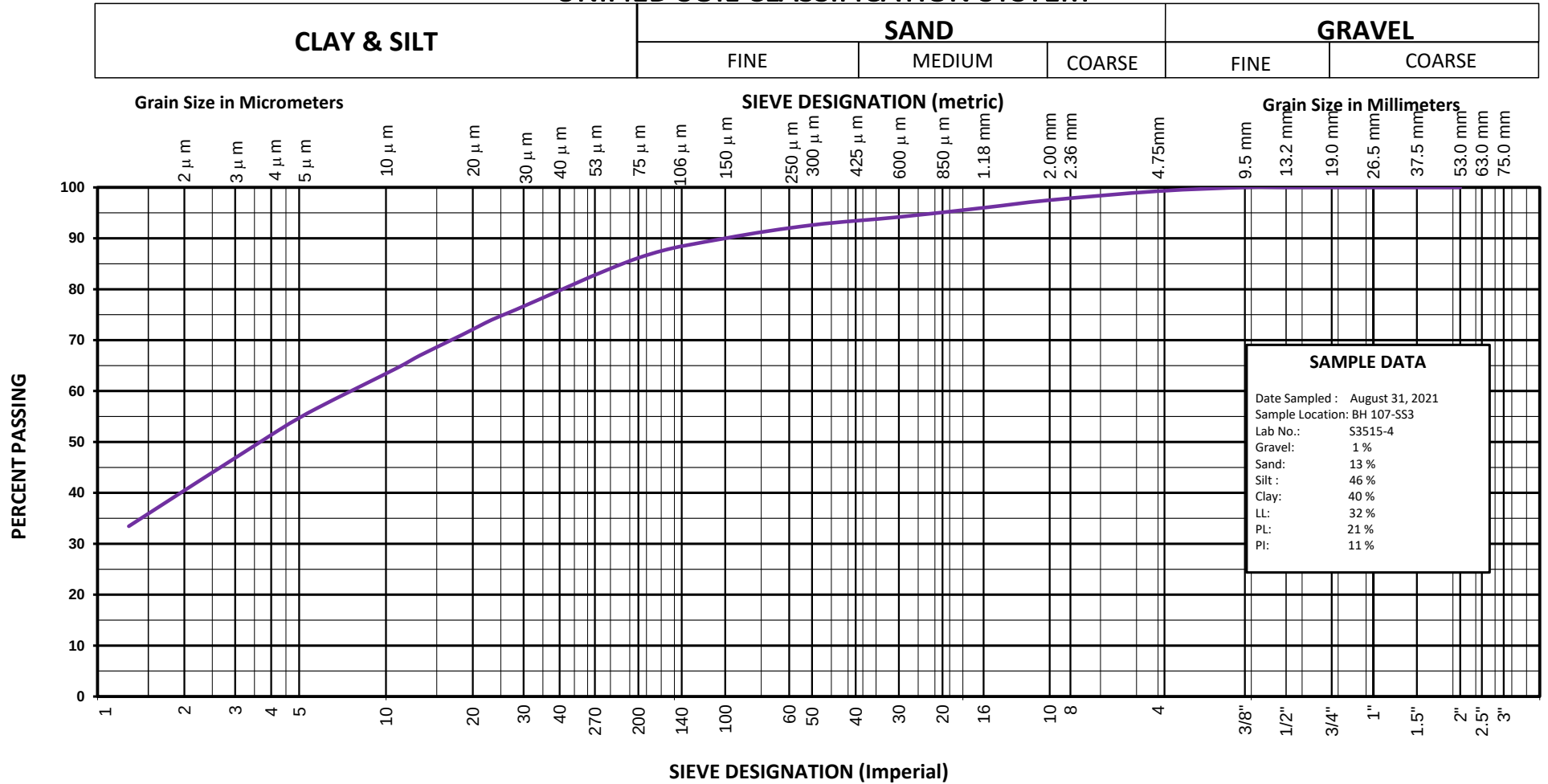
Project No.:

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Client:

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GRAIN SIZE ANALYSIS

Project :

Milton Educational Village Lands

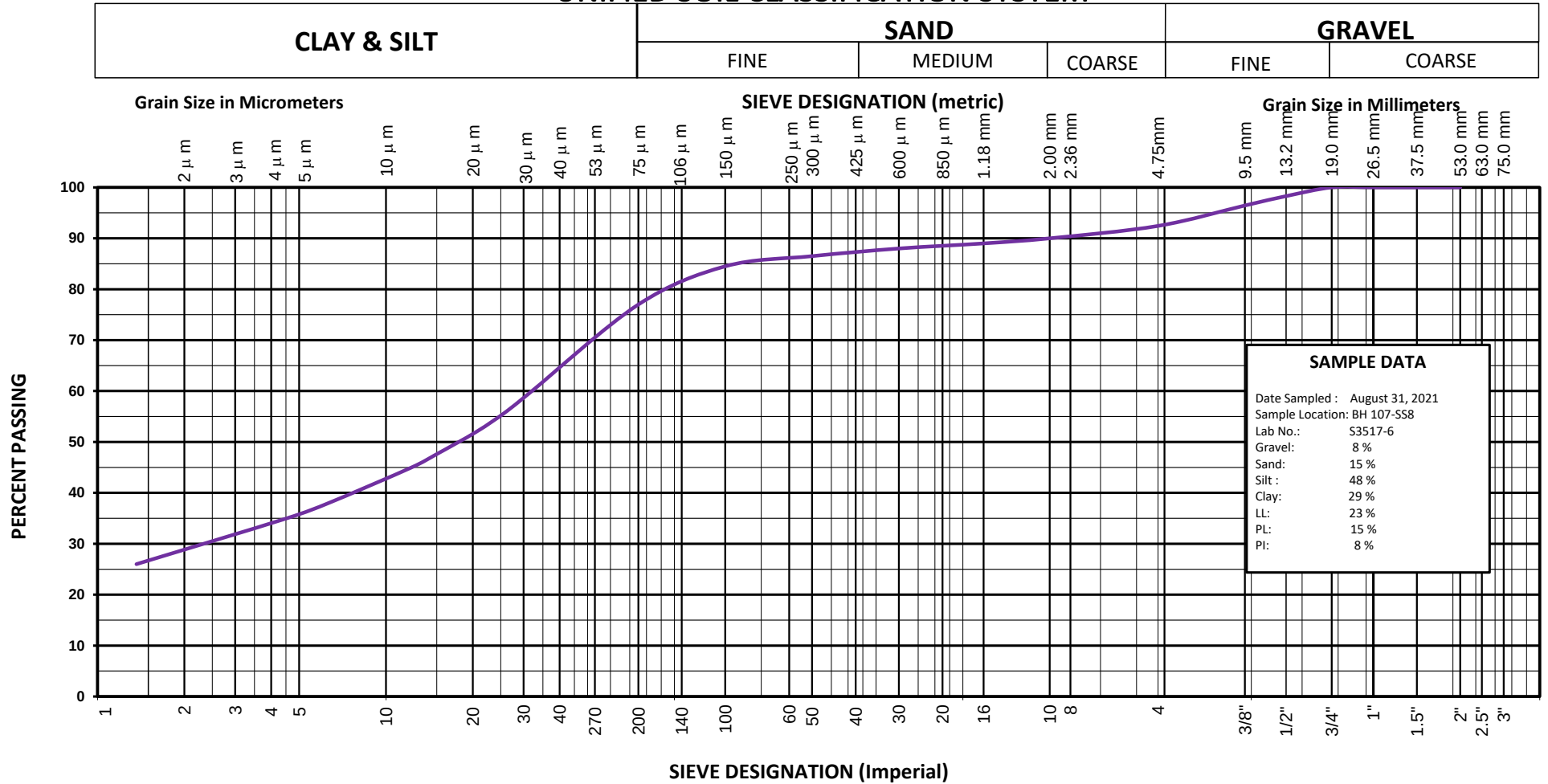
Project No.:

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Client:

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GRAIN SIZE ANALYSIS

Project :

Milton Educational Village Lands

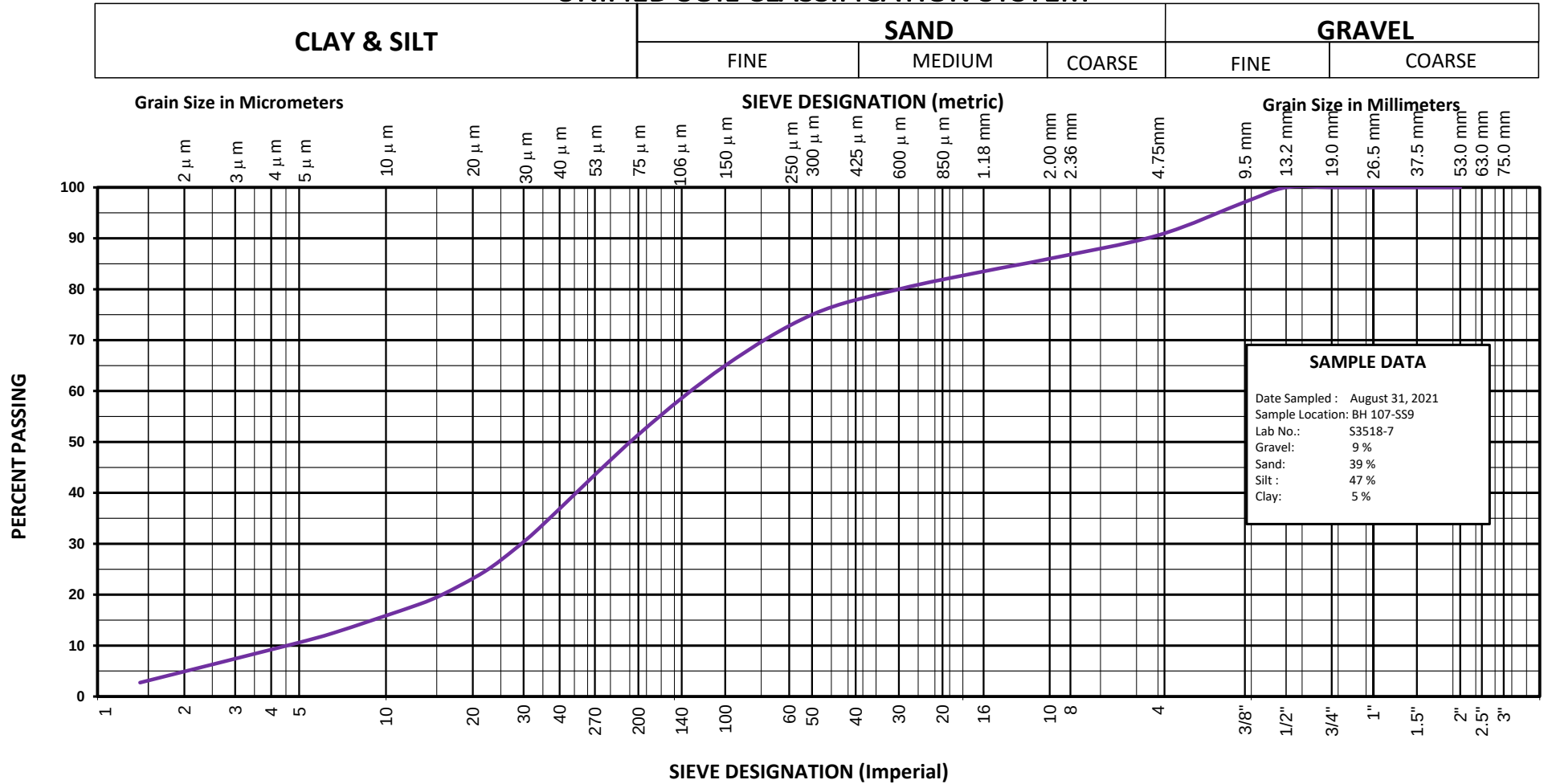
Project No.:

T21862

Client:

MEV Lands

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GRAIN SIZE ANALYSIS

Project :

Milton Educational Village Lands

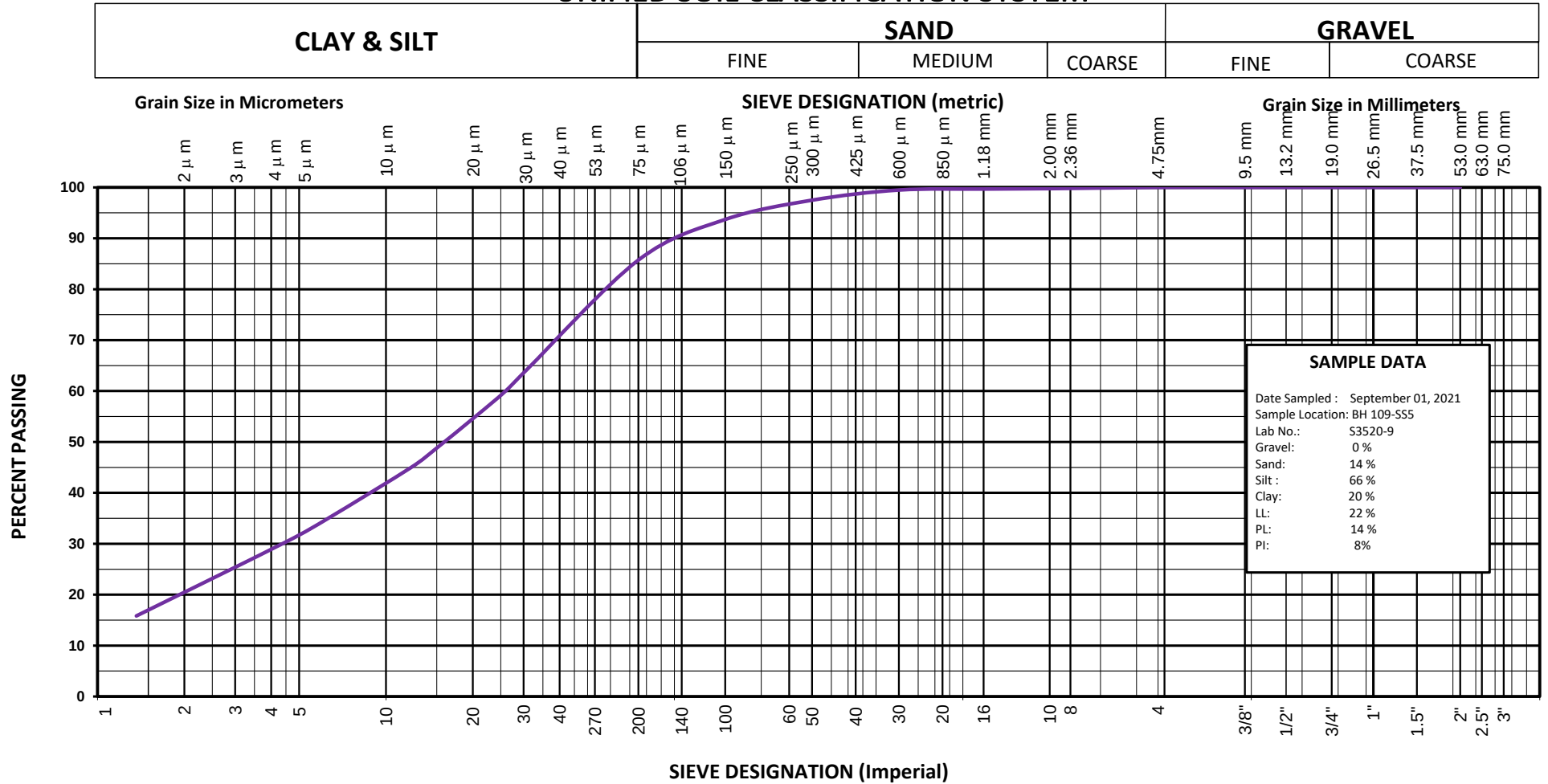
Project No.:

T21862

Client:

MEV Lands

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GRAIN SIZE ANALYSIS

Project :

Milton Educational Village Lands

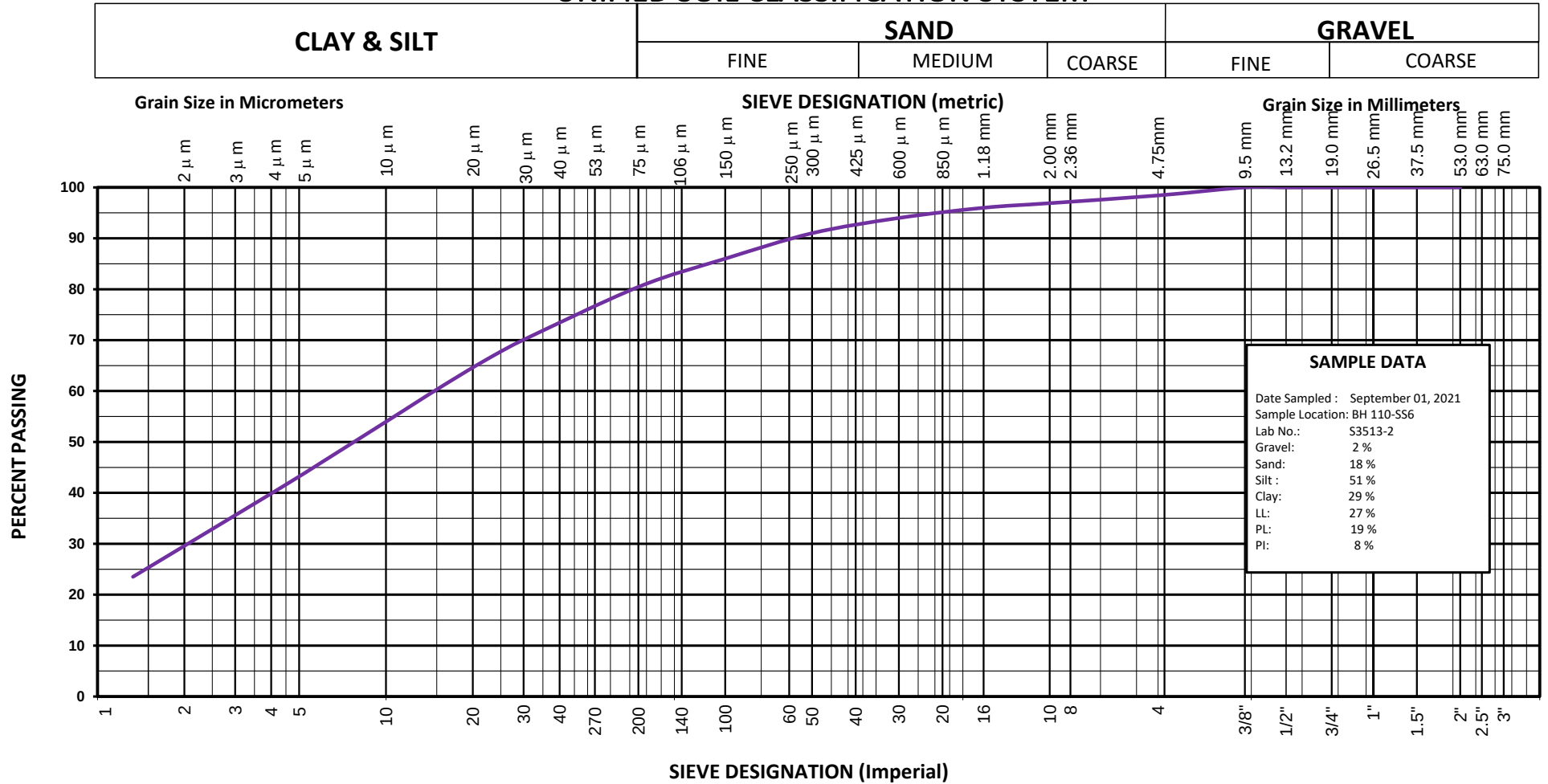
Project No.:

T21862

Client:

MEV Lands

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GRAIN SIZE ANALYSIS

Project :

Milton Educational Village Lands

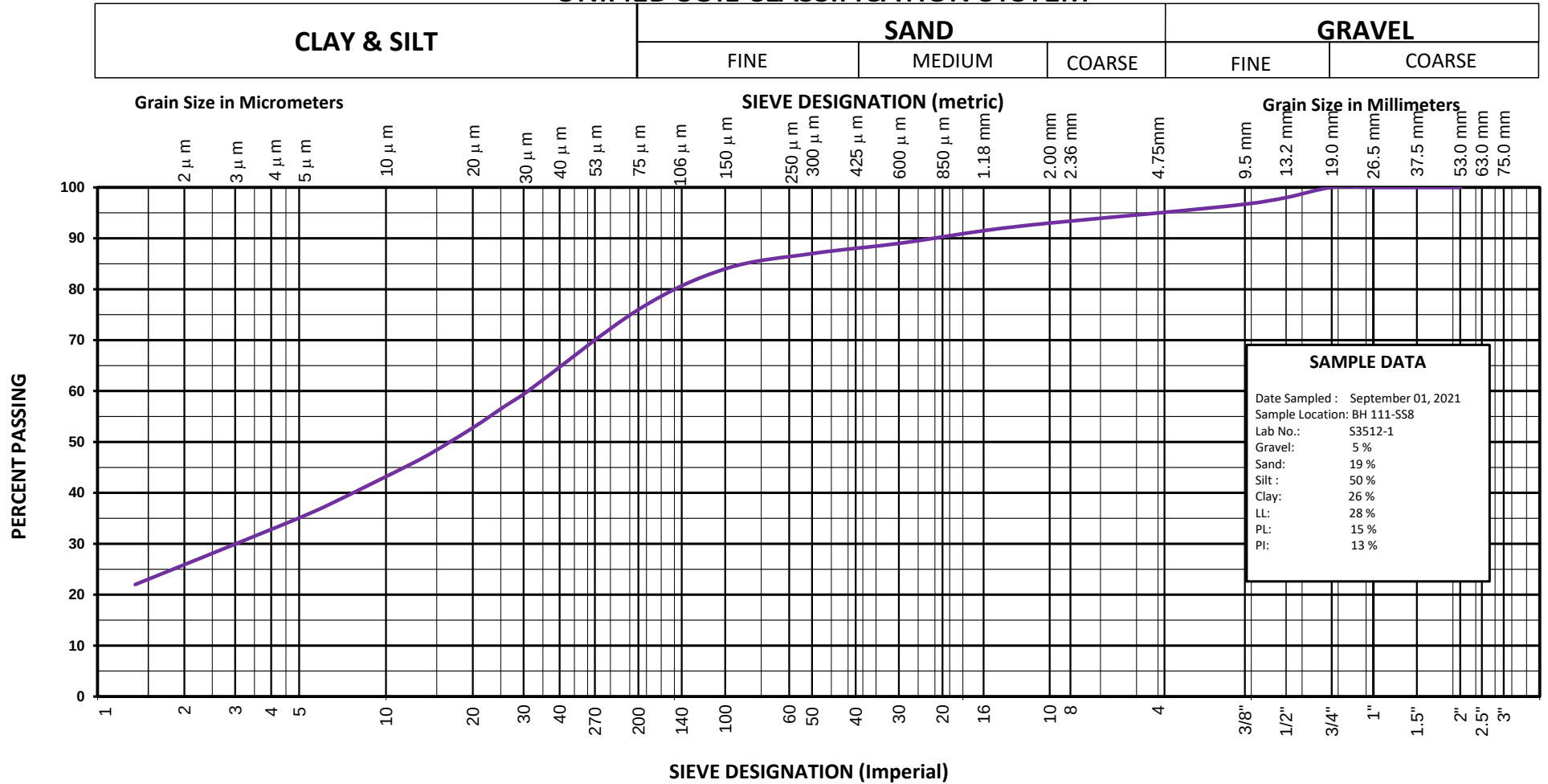
Project No.:

T21862

Client:

MEV Lands

UNIFIED SOIL CLASSIFICATION SYSTEM



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 L4K 2Z6
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 Fax: (905) 760-5567
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GRAIN SIZE ANALYSIS

Project :

Milton Educational Village Lands

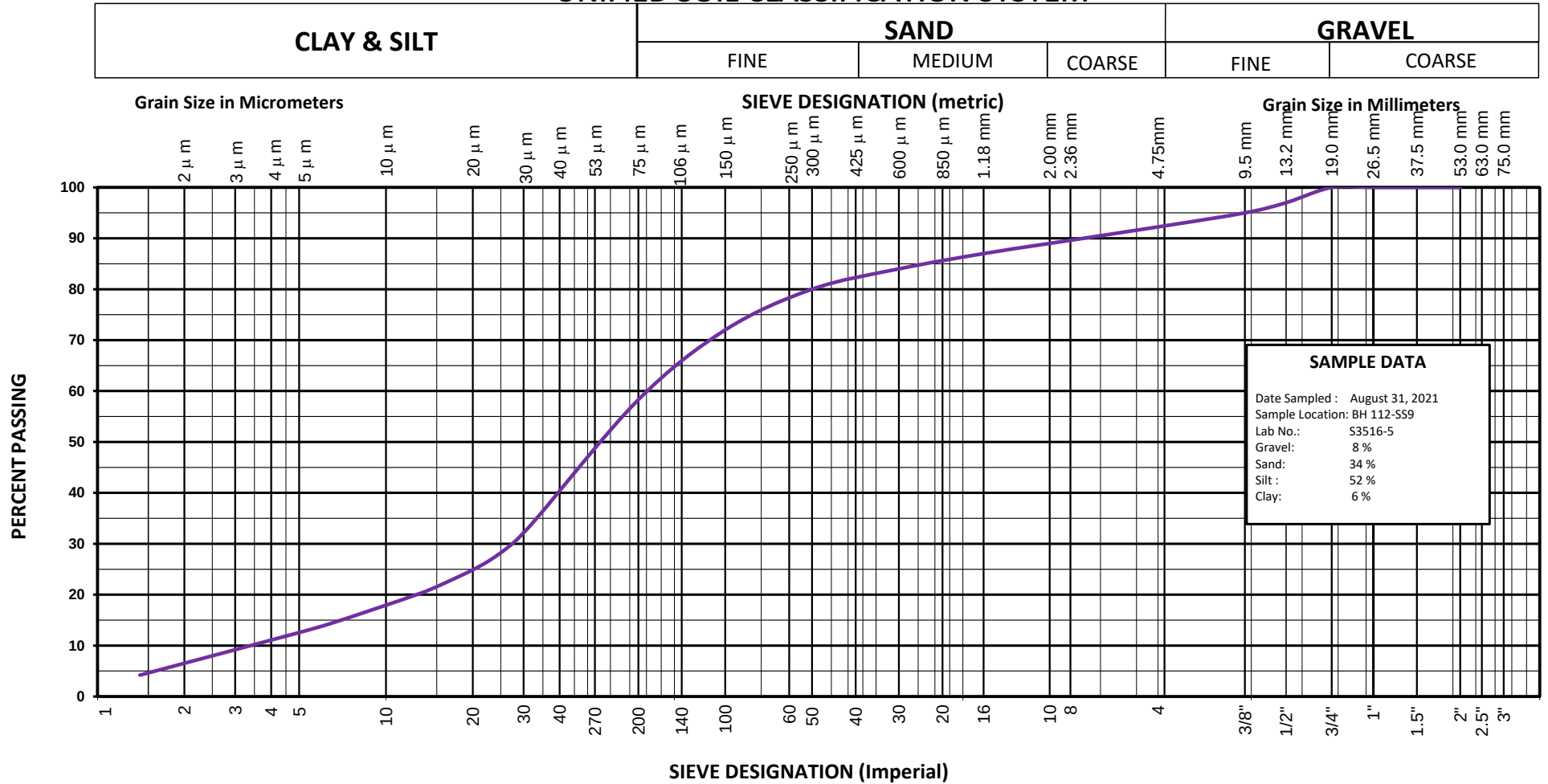
Project No.:

T21862

Client:

MEV Lands

UNIFIED SOIL CLASSIFICATION SYSTEM



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 L4K 2Z6
 Tel: (905) 760-5566
 Fax: (905) 760-5567
www.shadinc.ca



GRAIN SIZE ANALYSIS

Project :

Milton Educational Village Lands

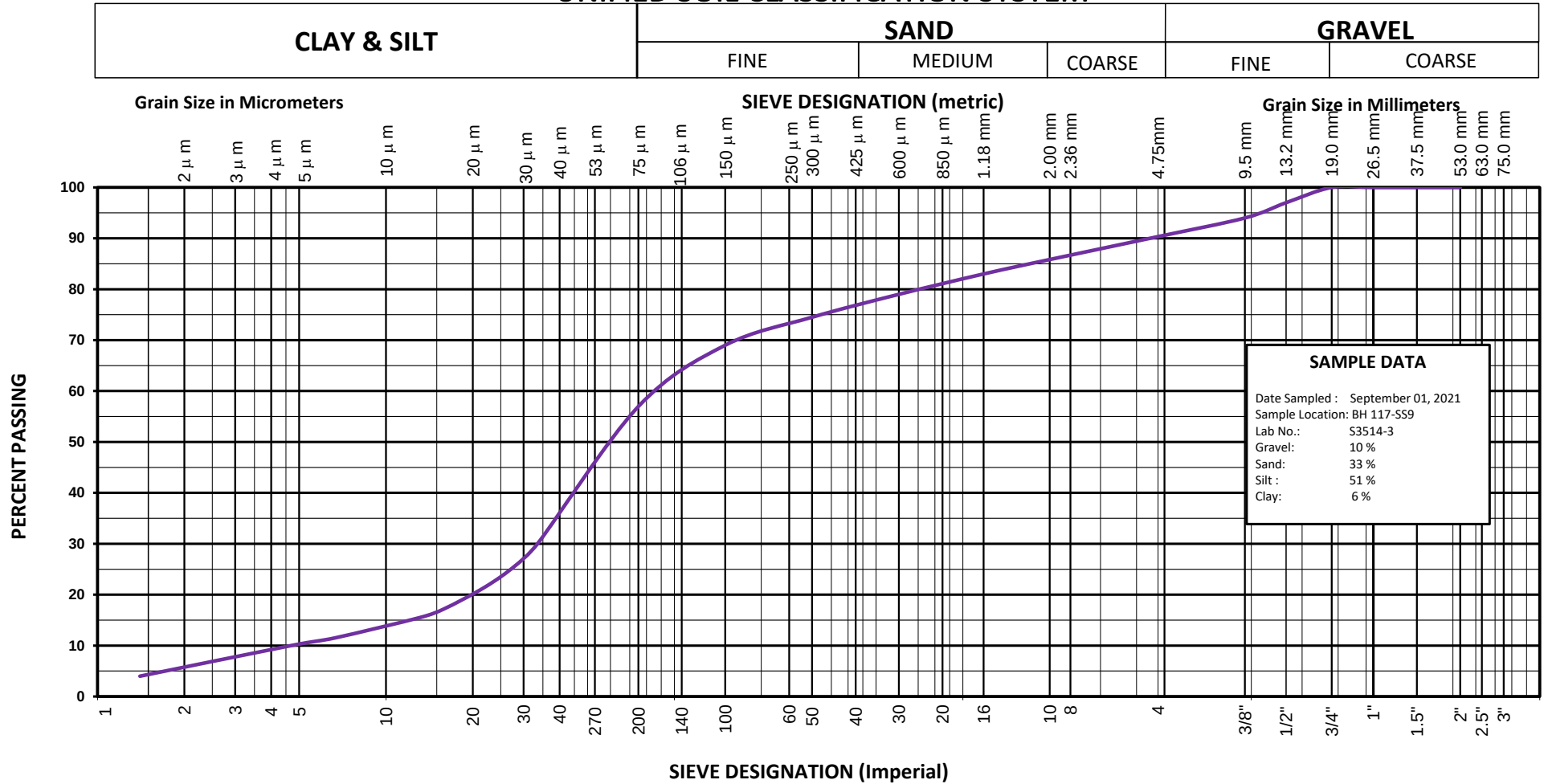
Project No.:

T21862

Client:

MEV Lands

UNIFIED SOIL CLASSIFICATION SYSTEM



SHAD & ASSOCIATES INC.

83 Citation Drive, Unit 9
 Vaughan, Ontario
 L4K 2Z6
 Tel: (905) 760-5566
 Fax: (905) 760-5567
www.shadinc.ca



GRAIN SIZE ANALYSIS

Project :

Milton Educational Village Lands

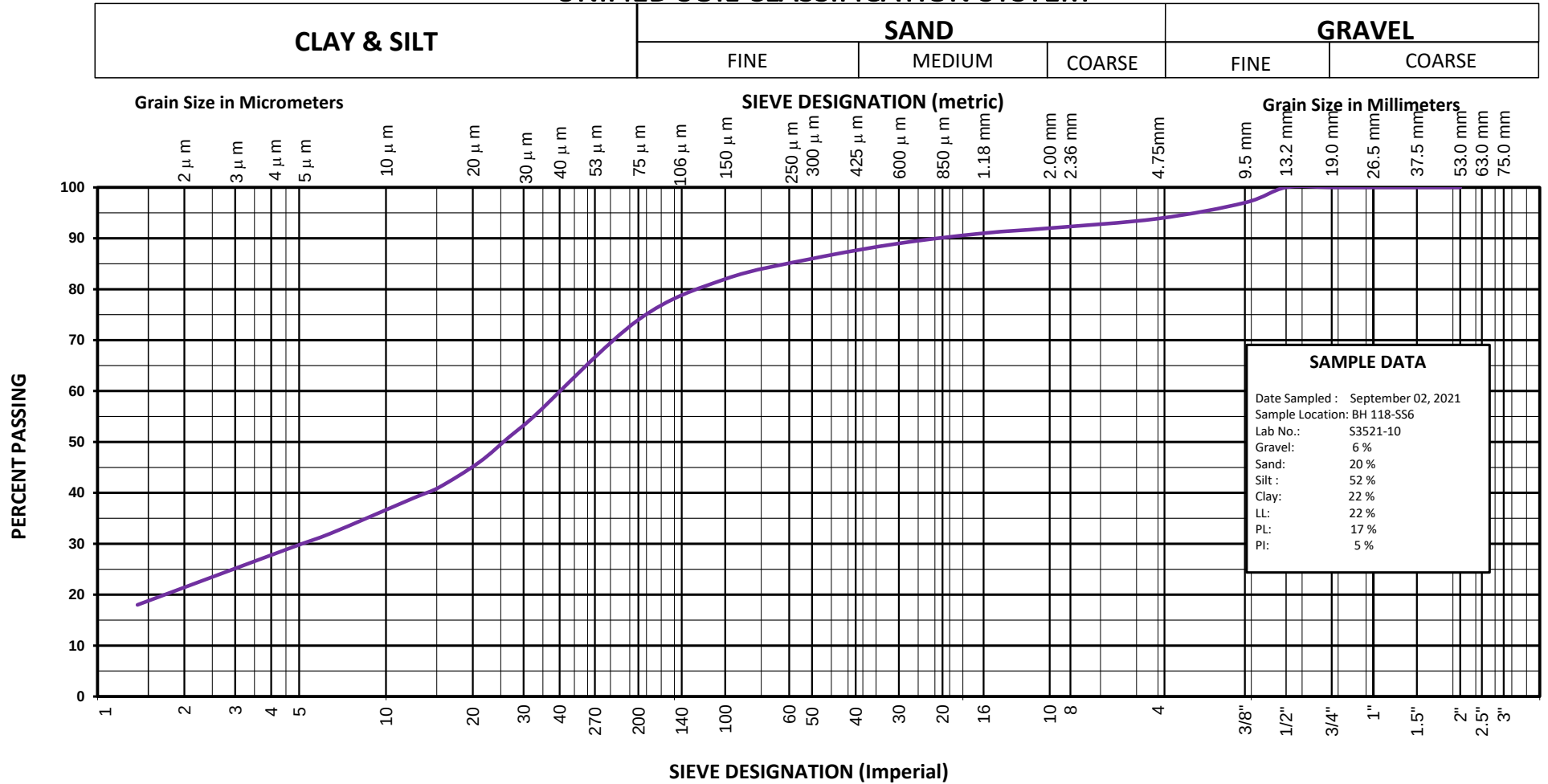
Project No.:

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Client:

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GRAIN SIZE ANALYSIS

Project :

Milton Educational Village Lands

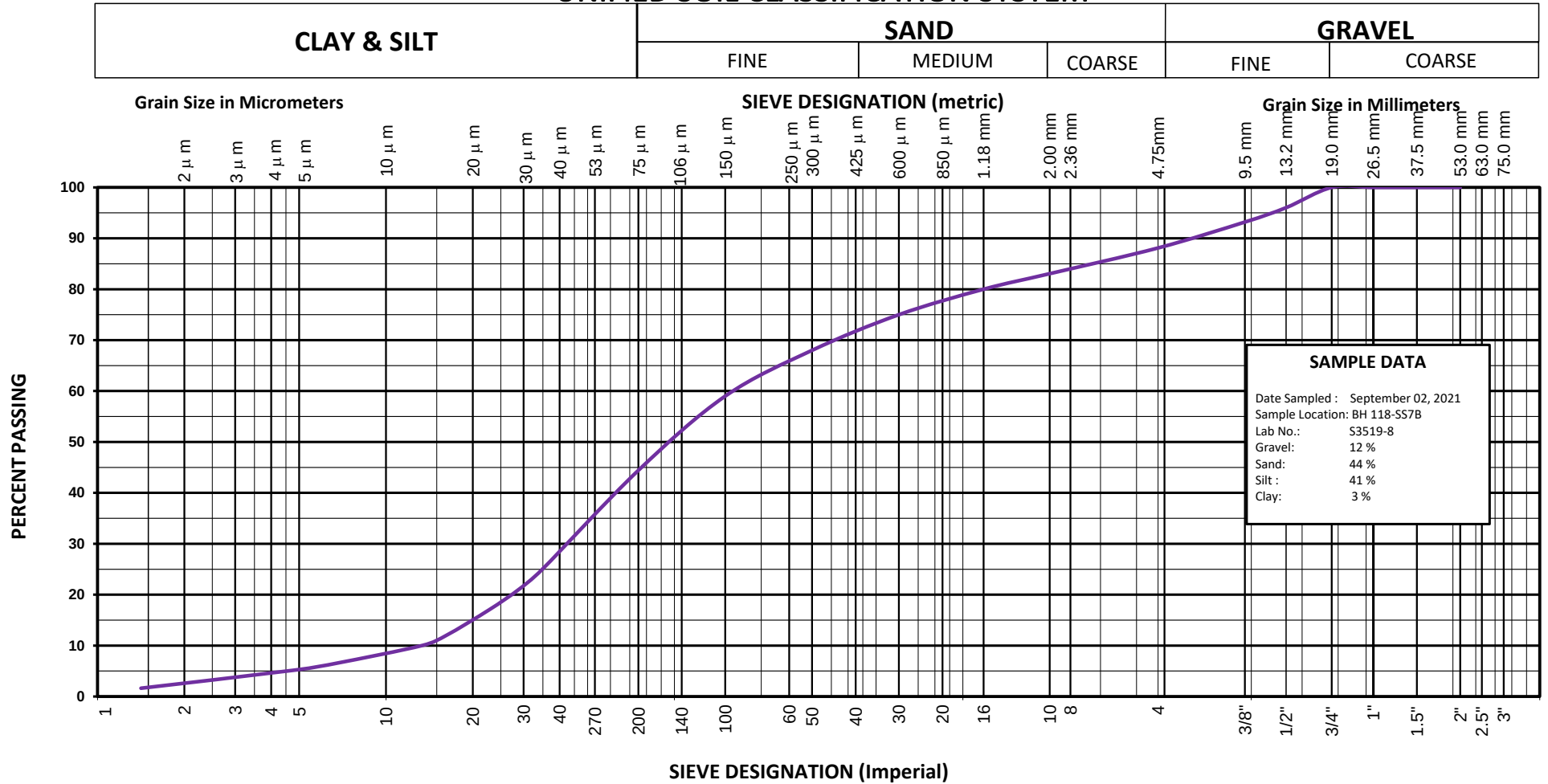
Project No.:

T21862

Client:

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GRAIN SIZE ANALYSIS

Project :

Milton Educational Village Lands

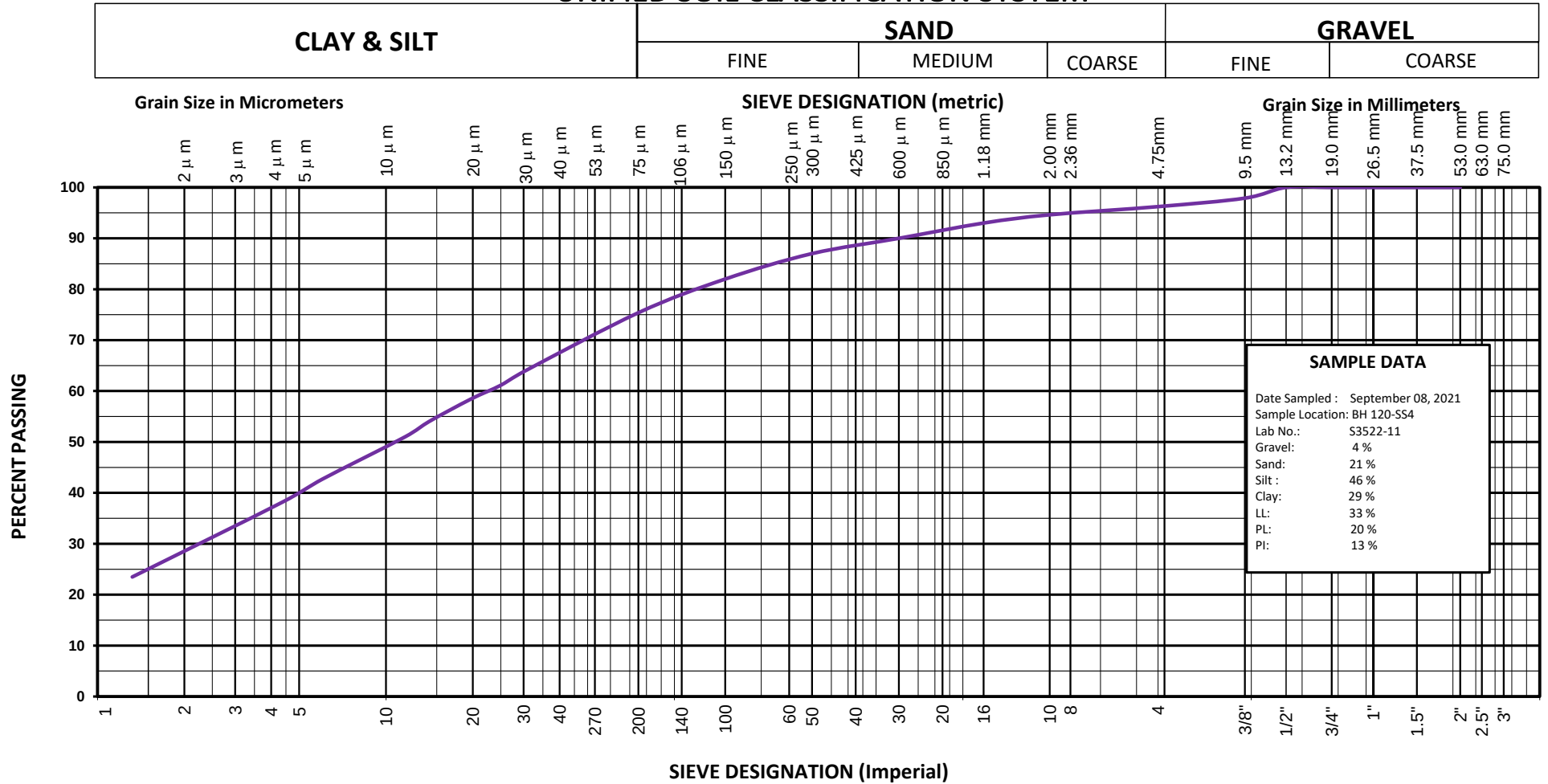
Project No.:

T21862

Client:

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GRAIN SIZE ANALYSIS

Project :

Milton Educational Village Lands

Project No.:

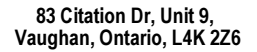
T21862

Client:

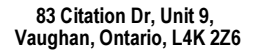
MEV Lands

Enclosure B: Previous Boreholes (Shad Report T20821, dated October 23, 2020)

Project No.: T20821	CLIENT: Milton Education Landowners Group	ORIGINATED BY: R.H.
DATE: Sept 25 - Oct 01, 2020	LOCATION: Tremaine Road, Milton, Ontario	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Hollow Stem	CHECKED BY: H.S.

[illegible]

Project No.: T20821	CLIENT: Milton Education Landowners Group	ORIGINATED BY: R.H.
DATE: Sept 25 - Oct 01, 2020	LOCATION: Tremaine Road, Milton, Ontario	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Hollow Stem	CHECKED BY: H.S.

[illegible]

RECORD OF BOREHOLE 6

Project No.: T20821 CLIENT: Milton Education Landowners Group ORIGINATED BY: R.H.
 DATE: Sept 25 - Oct 01, 2020 LOCATION: Tremaine Road, Milton, Ontario COMPILED BY: R.H.
 DATUM: Geodetic BOREHOLE TYPE: Hollow Stem CHECKED BY: H.S.

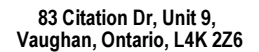


83 Citation Dr, Unit 9,
 Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION		WATER CONTENT (%)	MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL											
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		RESISTANCE PLOT															
									20	40	60			80	100	SHEAR STRENGTH kPa								
									▲	20	40	60	80	100	▲	5	15	25	35					
186.9	0	Ground Surface																						
	0 																							

Gradation Analysis
 & Atterberg Limits,
 S(7):
 4 15 55 26
 LL: 26%
 PL: 18%
 PI: 8%

Project No.: T20821	CLIENT: Milton Education Landowners Group	ORIGINATED BY: R.H.
DATE: Sept 25 - Oct 01, 2020	LOCATION: Tremaine Road, Milton, Ontario	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Hollow Stem	CHECKED BY: H.S.

[illegible]

Project No.: T20821	CLIENT: Milton Education Landowners Group	ORIGINATED BY: R.H.
DATE: Sept 25 - Oct 01, 2020	LOCATION: Tremaine Road, Milton, Ontario	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Hollow Stem	CHECKED BY: H.S.

[illegible]

RECORD OF BOREHOLE 9		
Project No.: T20821	CLIENT: Milton Education Landowners Group	ORIGINATED BY: R.H.
DATE: Sept 25 - Oct 01, 2020	LOCATION: Tremaine Road, Milton, Ontario	COMPILED BY: R.H.
DATUM: Geodetic	BOREHOLE TYPE: Solid Stem	CHECKED BY: H.S.

83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

[illegible]

RECORD OF BOREHOLE 13

Project No.: T20821 CLIENT: Milton Education Landowners Group ORIGINATED BY: R.H.

DATE: Sept 25 - Oct 01, 2020 LOCATION: Tremaine Road, Milton, Ontario COMPILED BY: R.H.

DATUM: Geodetic BOREHOLE TYPE: Solid Stem CHECKED BY: H.S.



83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES				GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT					WATER CONTENT (%)					MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES		20 40 60 80 100					5 15 25 35						GR	SA	SI	CL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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185.0	0	Ground Surface																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

Gradation Analysis
& Atterberg Limits,
S(3):
4 18 51 27
LL: 32%
PL: 20%
PI: 12%