SOIL-MAT ENGINEERS & CONSULTANTS LTD.

401 Grays Road · Hamilton, ON · L8E 2Z3

www.soil-mat.ca info@soil-mat.ca 905.318.7440 905.318.7455

PROJECT NO.: SM 220141-EG February 4, 2025

MIKMADA HOMES
PO Box 220
Burlington, Ontario
L7P 0N4

Attention: Adam Nesbitt
President

GEOTECHNICAL INVESTIGATION
PROPOSED 18-STOREY BUILDING
388 MAIN STREET EAST
MILTON, ONTARIO

Dear Mr. Nesbitt,

Further to your authorisation, SOIL-MAT ENGINEERS & CONSULTANTS LTD. has completed the fieldwork, laboratory testing and report preparation in connection with the above noted project. The scope of work was completed in general accordance with our proposal P220141, dated September 22, 2023. Our comments and recommendations, based on our findings at the thirteen [13] borehole locations, are presented herein.

1. INTRODUCTION

We understand that the proposed development will consist of two 18-storey residential towers with 6-storey podiums, and 3 underground parking levels, upon demolition of the existing structures located at the properties bounded by Main Street, Prince Street, Pearl Street, and Bruce Street in Milton, Ontario. The purpose of this geotechnical investigation work is to assess the subsurface soil and groundwater conditions, and to provide our comments and recommendations with respect to the design and construction of the proposed development, from a geotechnical point of view.

This report is based on the above summarised project description, and on the assumption that the design and construction will be performed in accordance with applicable codes and standards. Any significant deviations from the proposed project design may void the recommendations given in this report. If significant changes are made to the proposed design, such as additional storeys or basement levels, this office must be consulted to review the new design with respect to the results of this investigation.

2. PROCEDURE

A total of thirteen [13] sampled boreholes were advanced at the locations illustrated in the attached Drawing No. 1, Borehole Location Plan, identified as Borehole Nos. 1 through 6, and 8 through 14. It is noted that a planned Borehole No. 7 was inaccessible at the time of fieldwork, and as such has not been advanced at the time of preparing this report. The boreholes were advanced using continuous flight power auger equipment, to termination and/or practical auger refusal at depths of between approximately and to 18.5 metres below the existing grade between November 11 and 15, 2024. Borehole No. 6 was then advanced using HQ diamond barrel coring equipment to a total depth of approximately 21.8 metres.

Groundwater observation were made during the drilling operations. Upon completion of drilling, Borehole Nos. 1, 4, 5, 6, 8, 10, and 12 were outfitted with groundwater monitoring wells to allow for future measurement of the groundwater level, as well as conduct groundwater sampling as part of environmental assessments. The monitoring wells installed consisted of 50-millimetre diameter PVC pipe, screened in the lower 3 metres. The monitoring wells were backfilled with well filter sand up to approximately 0.3 metres above the screened portion, then with bentonite 'hole plug' to the surface and fitted with a protective steel 'flushmount' casing.

Representative samples of the subsoils were recovered from the borings at selected depth intervals using split barrel sampling equipment driven in accordance with the requirements of the ASTM test specification D1586, Standard Penetration Resistance Testing. After undergoing a general field examination, the soil samples were preserved and transported to the SOIL-MAT laboratory for visual, tactile, and olfactory classifications. Pocket penetrometer testing was performed on all cohesive samples recovered from the borings, routine moisture content tests were performed on all soil samples, and grain size analyses were performed on selected samples.

As noted above, Borehole No. 6 was advanced with HQ diamond coring equipment upon refusal on the underlying Queenston shale bedrock. The recovered bedrock cores were assessed in the field for recovery and Rock Quality Designation [RQD], with select portions of the recovered cores subjected to unconfined compressive strength testing at our laboratory. The detailed results of these tests can be found appended to the end of this report.

The boreholes were located on site by a representative of SOIL-MAT ENGINEERS & CONSULTANTS LTD., based on accessibility over the site and clearance of underground services. The ground surface elevation at the borehole locations was referenced to a site specific geodetic benchmark, described as the top of the double catch basin located

on the north end of Bruce Street, as illustrated on Drawing No. 1, Borehole Location Plan. This benchmark was noted to have a geodetic elevation of 199.38 metres on the survey provided to our office (MTE Drawing No. C1.1, dated November 5, 2024).

Details of the conditions encountered in the boreholes, together with the results of the field and laboratory tests, are presented in Log of Borehole Nos. 1 through 6, and 8 through 14, following the text of this report. It is noted that the boundaries of soil types indicated on the borehole logs are inferred from non-continuous soil sampling and observations made during drilling. These boundaries are intended to reflect transition zones for the purpose of geotechnical design and therefore should not be construed as the exact depths of geological change.

3. SITE DESCRIPTION AND SUBSURFACE CONDITIONS

The subject site is comprised of the block located between Main Street East, Bruce Street, Prince Street, and Pearl Street in Milton, Ontario. The block is currently occupied by residential dwellings on the southern half, and a multi-unit commercial building and associated parking areas on the northern half.

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

Pavement Structure

With the exception of Borehole No. 13 and 14, all of the boreholes were advanced through the pavement structure of the existing parking lot, which was found to consist of approximately 30 to 150 millimetres of asphaltic concrete overlying approximately 0 to 350 millimetres of granular base material. The pavement structure encountered at the borehole locations has been summarized as follows:

Table A – Pavement Structure

Borehole No.	1	2	3	4	5	6	8	9	10	11	12
Asphaltic Concrete (mm)	100	100	125	30	100	100	150	150	100	50	40
Granular Base (mm)	150	150	0	300	175	0	100	100	350	300	125

It is noted that the pavement structure may vary across the site and from that identified at the borehole locations.

Concrete Slab Structure

Borehole No. 13 was advanced through the concrete slab structure of the existing autobody garage and repair shop located at 17 Prince Street, and was found to consist of approximately 150 millimetres of concrete overlying approximately 150 millimetres of compact granular base.

Topsoil

A surficial veneer of topsoil approximately 250 millimetres in thickness was encountered at Borehole No. 14. It is noted that the depth of topsoil may vary across the site and from the depth encountered at the borehole location, and that a conservative approach should be taken in estimating topsoil quantities across the site. It is also noted that the term 'topsoil' has been used from a geotechnical point of view, and does not necessarily reflect its nutrient content or ability to support plant life.

Sand Fill

Sand fill material was encountered beneath the pavement structure in Borehole No. 9. The granular material was reddish brown in colour, containing traces of silt and gravel, with occasional concrete debris, and was generally found to be in a compact state. The sandy fill material was proven to a depth of approximately 0.9 metres below the existing ground surface at Borehole No. 9.

Silty Clay/Clayey Silt Fill

Silty clay/clayey silt fill material was encountered beneath the pavement or concrete slab at the majority of borehole locations. The silty clay/clayey silt fill material was brown to reddish brown and grey in colour, typically containing trace to some sand and gravel, occasional to frequent organic inclusions and staining, occasional deposits of sand, gravel, and cobbles, and was generally found to be soft to hard in terms of consistency. The fill encountered was proven to depths of between approximately 1.1 to 2.8 metres below the existing ground surface, however fill material of greater depths may be present across the site.

It is noted that the fill material encountered appeared consistent with the composition of the soils native to the area. As such, material identified as fill may be weathered/disturbed native soils. Conversely, material identified as native soils, may in fact be compacted fill material, relatively free of organics and construction debris.

Sandy Clayey Silt

Native sandy clayey silt soil was beneath the topsoil and/or fill deposits at all of the borehole locations. The sandy clayey silt was brown to reddish brown in colour, transitioning to grey in colour at depths of approximately 4 metres below the existing ground surface. The native material contained traces of to some gravel, exhibited a reworked/weathered appearance in the upper levels of Borehole No. 14, and was generally stiff to hard in consistency. The fine-grained to cohesive native soil was proven to termination/practical auger refusal at depths of between approximately 3.4 and 21.8 metres below the existing ground surface.

Sand and Gravel

A layer of native sand and gravel material was encountered within the native sandy clayey silt in Borehole No. 11. The layer was encountered at a depth of approximately 8 metres, and is estimated to be perhaps 2 to 3 metres in thickness, possibly greater. The granular material was grey in colour, containing traces of to some silt and clay, occasional cobbles, and was generally found to be in a compact to dense state. At this specific location, the native sand and gravel was encountered to a depth of approximately 9.4 metres below the existing ground surface. Regardless, similar sand and gravel deposits may be present at varying depths, and of varying thickness, across the site, and should be anticipated.

Queenston Shale

Queenston shale bedrock was encountered beneath the native sandy clayey silt in Borehole No. 6 at a depth of approximately 18.8 metres, and inferred from auger and refusal beneath the native sandy clayey silt in Borehole Nos. 2, and 14, at depths of approximately 18.3 and 18.5 metres, respectively. The Queenston shale is generally red in colour with occasional more resistant grey layers, highly weathered in the upper levels, becoming sounder with depth.

As noted above, the bedrock was cored in Borehole No. 6 using HQ size diamond core barrel equipment. The Rock Quality Designation [RQD] of the recovered rock cores was determined to range from approximately 9 to 58 per cent in the upper 3 metres. The condition of the shale bedrock generally improves with depth, however may warrant further investigation. The results of the rock coring are summarized in the following table.

Table B – Bedrock Core Summary

Depth of Core (m)	Elevation of Core (m)	Recovery	Rock Quality Designation [RQD]	Depth / Elevation of Tested Core Sample (m)	Unconfined Compressive Strength
Borehole No. 6 - Ground Surface Elevation 200.02 metres					
18.8 - 20.3	181.2 to 179.7	38%	8%	-	-
20.3 - 21.8	179.7 to 178.2	70%	58%	20.5 / 179.5 21.7 / 178.3	42.3 MPa 48.7 MPa

A review of available published information [Quaternary Geology of Ontario, Southern Sheet Map 2556] indicates the surficial geology of the subject site to consist of fine-textured glaciolacustrine deposits of silt and clay, with minor sand and gravel, consistent with our experience in the area and observations during fieldwork.

Groundwater Observations

As mentioned above, Borehole Nos. 1, 4, 5, 6, 8, 10, and 12 were fitted with monitoring wells to allow for future measurement of the groundwater level, as well as conduct groundwater sampling as part of environmental assessments. The groundwater depth was measured at the wells by SOIL-MAT ENGINEERS with the following results:

Table C – Ground Water Level Measurements

Borehole No.	Ground Surface Elev. [m]	November 27, 2024		December 5, 2024	
		Ground Water Depth (m)	Ground Water Elev. (m)	Ground Water Depth (m)	Ground Water Elev. (m)
1	199.72	3.38	196.34	3.51	196.21
4	199.93	3.44	196.49	3.13	196.80
5	199.56	5.46	194.10	5.46	194.10
6	200.02	6.71	193.31	6.79	193.23
8	199.89	4.57	195.32	4.55	195.34
10	200.00	5.07	194.93	5.25	194.75
12	199.80	3.37	196.43	3.51	196.29

Based on our observations during drilling, the available data, and our experience in the area, the static groundwater level is conservatively estimated at depths of approximately 3 to 5 an elevation of approximately 194 to 196 metres. Regardless, shallower deposits of water within permeable seams, fill deposits, etc., should be anticipated, especially during the 'wet' times of the year.

As noted above, it is understood that the proposed development will incorporate 3 to 4 underground levels, with basement levels extending well below the observed groundwater level. As such, additional studies including a Construction Dewatering assessment will likely be required to support the proposed construction. It will also likely be required to construct the building as watertight, unless consent can be obtained to continually discharge groundwater to the municipal sewer system.

4. GEOTECHNICAL LABORATORY TESTING

As noted above, six [6] selected samples of the recovered soil were subjected to grain size analyses including sieve and hydrometer tests. The results of these grain size analyses have been summarised in Table D as follows:

Table D - Grain Size Analyses Summary

Sample	Sample Depth [m]	Clay [%]	Silt [%]	Sand [%]	Gravel [%]	Estimated Permeability [cm/sec]
BH2 SS11	15.2	10	40	29	21	10^{-6}
BH4 SS5	3.0	22	46	22	10	10^{-7}
BH6 SS8	7.6	18	52	25	5	10^{-7}
BH9 SS7	6.1	18	48	26	8	10^{-7}
BH11 SS8	7.6	5	13	38	44	10^{-4}
BH12 SS4	2.3	21	49	22	8	10^{-7}
BH14 SS6	4.6	19	45	29	7	10^{-7}

The results outlined above indicate the subsurface soils to generally consist of Sandy and Clayey Silt with traces of, to some Gravel. According to the Unified Soil Classification System these soil samples are generally classified as M.L. – Inorganic silts and very fine sand, to G.M. – Gravel-sand-silt mixtures, to G.C. – Gravel-sand-clay mixtures. These results are consistent with our observations of the predominantly silty soils encountered during drilling, our visual assessment of the recovered samples, as well as our experience in the area. It is noted that there is some variation in the overall

permeability of the native soils, as a function of natural variation within the soil layers, however the dominant soils encountered would be considered of low permeability to effectively impermeable.

5. FOUNDATION CONSIDERATIONS

5.1 SHALLOW FOUNDATIONS

As noted above, it is understood that the proposed development will be an 18-storey structure, with 6-storey podiums, and 3 underground basement levels, with a lower basement floor elevation of 190.45 metres, and founding elevation perhaps 10 to 12 metres below the existing grade While such details may be subject to change, based on the observed conditions at the borehole logs, it may be feasible to support the proposed structure on spread footings or a raft slab considering the following bearing capacities:

Depth Range	Approximate Elevation Range	SLS Bearing Capacity	ULS Bearing Capacity
<7 metres	>193 metres	200 kPa	300 kPa
7 to 15 metres	193 to 185 meters	300 kPa	450 kPa
>15 metres	<185 metres	400 kPa	600 kPa

5.2 CAISSONS

Where higher capacities are required, it would be most appropriate to consider caisson foundations extending into the underlying competent Queenston shale bedrock, encountered at depths of approximately 18 to 19 metres. Such caissons should extend to the competent Queenston shale bedrock, a minimum of 1 metre or one caisson diameter length into the bedrock, whichever is greater, and may be conservatively designed considering the bearing capacity as follows:

SLS = ULS = 2,000 kPa [~40,000 psf]

Caissons extending through the upper weathered rock and into more sound bedrock as detailed above could also take advantage of skin friction within the competent layers of the bedrock, considering a conservative unit skin friction resistance of ULS = SLS = 250 kPa [~5,000 psf] may be considered. Based on the current core information, this would be reasonably available within the bedrock below an elevation of roughly 180.0 metres.

In the event that caisson foundations are considered to support the proposed structure, additional bedrock coring should be undertaken in order to verify and refine the depth and condition of the bedrock across the site. Such further assessment may also allow for the use of more aggressive available bearing capacity and skin friction values, to optimise foundation design.

5.3 GENERAL FOUNDATION CONSIDERATIONS

It is noted that the SLS value represents the Serviceability Limit State, which is governed by the tolerable deflection [settlement] based on the proposed building type, using unfactored load combinations. The ULS value represents the Ultimate Limit State and is intended to reflect an upper limit of the available bearing capacity of the founding soils in terms of geotechnical design, using factored load combinations. There is no direct relationship between ULS and SLS; rather they are a function of the soil type and the tolerable deflections for serviceability, respectively. Evidently, the bearing capacity values would be lower for very settlement sensitive structure and larger for more flexible buildings. It is noted the SLS and ULS values are the same, as in order for serviceability limits of deflection to be realised, failure of the Georgian Bay shale bedrock would have to occur.

The support conditions afforded by the founding soils are usually not uniform across the site, neither are the loads on the various foundation elements. It is therefore recommended that the footings and foundation walls be structurally reinforced to account for potential variable support and loading conditions.

In areas where it will be necessary to provide adjacent footings at different founding elevations, the lower footing should be constructed before the higher footing is constructed, if possible, and the higher footing should be set below an imaginary line drawn up from the edge of the lower footing at 10 horizontal to 7 vertical. This practice will limit stress transfer from the higher footings to lower footings.

All footings, grade beams, etc. exposed to the environment must be provided with a minimum of 1.2 metres of earth cover or equivalent insulation to protect against frost damage. This frost protection would also be required if construction were undertaken during the winter months. All footings and foundations should be designed and constructed in accordance with the current Ontario Building Code.

With foundations designed as outlined above and as required by the Building Code, and with careful attention paid to construction detail, total and differential settlements should be well within normally tolerated limits of 25 and 20 millimetres, respectively, for the type of building and occupancy expected.

It is noted that the performance of deep foundation schemes is greatly dependent on the method, equipment, and workmanship utilised during construction. It is therefore essential that installation procedures for such foundations be monitored/evaluated by SOIL-MAT ENGINEERS.

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

6. SEISMIC DESIGN CONSIDERATIONS

The structure shall be designed according to Section 4.1.8 of the Ontario Building Code, Ontario Regulation 203/24. Based on the subsurface soil conditions encountered in this investigation and understood founding depths, the applicable Site Classification for the seismic design is Site Class C – Very Dense Soil and Soft Rock, based on the average soil characteristics for the site. It is noted that site specific shear wave velocity testing may further refine the applicable seismic design values, however, on the preliminary basis considering a seismic site class of C, the applicable 2%-in-50-year seismic hazard data from the 2020 National Building Code for the subject site are as follows:

$S_a(0.2)$	$S_a(0.5)$	$S_a(1.0)$	$S_a(2.0)$	$S_a(5.0)$	$S_a(10.0)$	PGA	PGV
0.296	0.182	0.096	0.0444	0.0115	0.00391	0.16	0.118

7. LATERAL EARTH PRESSURE

The lateral earth pressures on basement walls and excavation support systems can be estimated on the basis of the following soil parameters. Any additional pressures due to surcharge loading, such as adjacent structures, roadways, parked vehicles, floor slab loading, etc. must be included in the design.

Table E – Lateral Earth Pressure Parameters

Soil Strata	Depth [m]	Soil Unit Weight, γ [kN/m^3]	Cohesion, c [kPa]	Angle of Internal Friction, θ [^{o}]	Coefficient of Active Earth Pressure, K_a	Coefficient of At Rest Earth Pressure, K_o	Coefficient of Passive Earth Pressure, K_p
Sandy Clayey Silt	<7m	20	5	32	0.31	0.47	3.25
Sandy Clayey Silt	>7m	20	5	34	0.28	0.44	3.65

As noted above, a layer of predominately sand and gravel was encountered at Borehole No. 11 at a depth of approximately 8 metres, and may be present at varying depths across the site. Such a deposit should be anticipated in the design and construction of shoring systems.

8. EXCAVATIONS AND EXCAVATION SUPPORT CONSIDERATIONS

Excavations for the installation of building foundations and underground services are expected to extend to depths of up to perhaps 10 to 12 metres below the existing grade. Excavations through any fill material and native sand and gravel soils would be expected to remain stable for the short construction period at slopes of up to 45 degrees to the horizontal while above the groundwater elevation. Excavations through the native sandy clayey silt soils above the groundwater level would be expected to remain stable for the short construction period at inclinations of up to 60 degrees to the horizontal. Where wet or sandy/gravelly seams are encountered, during periods of extended precipitation, or where excavations extend below the static groundwater level, the sides of excavations should be expected to 'slough in' to as flat as 3 horizontal to 1 vertical, or flatter. Notwithstanding the foregoing, however, all excavations must comply with the current Occupational Health and Safety Act and Regulations for Construction Projects. Excavation slopes steeper than those required in the Safety Act must be supported and a senior geotechnical engineer from this office should monitor the work.

EXCAVATION SUPPORT

It is understood that the excavations for new structure and underground levels will approach the property limits. As such it is anticipated that the excavations will require some level of excavation support/shoring systems such as 'soldier' pile and timber lagging, continuous caisson wall, or other system. It is strongly recommended that a preconstruction survey of adjacent above- and below-grade structures should be conducted to establish a baseline condition.

The caissons/soldier piles may be designed for end bearing in the overburden soils considering conservative bearing values of 300 kPa SLS and 450 kPa ULS. Where they extend to the shale bedrock, a bearing value of 1,000 kPa may be utilised. The shoring system should be provided with lateral bracing, either by using a waler beam and raker supports, or with soil anchors. From a contractor's point of view, soil anchors would be preferred, provided permission can be obtained from the neighbouring property owners to extend the anchors under their property. Anchors within the competent overburden soils may be designed considered a grout to soil skin friction of 150 kPa. Where anchors extend to the shale bedrock, a bond strength of 250 kPa is recommended. It is noted that there is a potential for significant movements of the shoring system if rakers are used to support the shores since compression of the rakers and the footings supporting the inclined raker loads must occur before the rakers can begin to carry load. If used, the rakers should be provided with a mechanism for 'jacking-in' preloads. The excavation support must be designed as required by the Occupational Health and Safety Act and Regulations for Construction Projects and the Canadian Foundation Engineering Manual.

It should be noted that excavations below the groundwater level, where wet seams are encountered, or where left exposed to the elements, may encounter localized instability when the base of the excavation is exposed to heavy construction equipment loads, due to the 'pumping' of groundwater by fine-grained soils. Heavy construction vehicles should ideally not travel on soils near the design excavation base elevation. Consideration should be given to providing a 300 millimetres thick layer of coarse crushed granular material, such as an OPSS Granular 'B' Type II (crushed limestone bedrock) on the excavation base to protect the excavation base soils from damage by construction equipment and foot traffic, and provides a clean surface for the construction of reinforcing steel cages, etc. Alternatively, a lean-mix [~5 MPa] concrete 'mud mat' 50 to 75 millimetres in thickness may be considered in lieu of a coarse crushed granular material.

GROUNDWATER CONTROL

As noted above, the static groundwater level is conservatively estimated at depths of about 3 to 5 metres below the existing grade, well above the proposed basement depths. As such, it is recommended that the structure and foundations be constructed as watertight. Such a design would also require the building foundation walls and floor slab to resist the hydrostatic uplift pressures associated with an elevated groundwater level. It may be feasible to manage groundwater via continuous dewatering systems, however approval to discharge to municipal sewer systems would be required, and may not be permitted.

Excavations to the planned depths will extend below the static groundwater level and as such, infiltration of groundwater would be expected, and potentially significant construction dewatering may be necessary. The scale of dewatering is likely to be greater than 50,000 litres per day, which would require an EASR notification, and possibly greater than 400,000 litres per day which would require a Permit to Take Water [PTTW]. A more detailed construction dewatering assessment should be conducted to evaluate the extent of construction dewatering that may be required, and support approval. A senior licenced hydrogeologist such as Terra-Dynamics Consulting Inc. [jcampbell@terra-dynamics.com], R.J Burnside & Associates Limited [Dwight.Smikle@rjburnside.com, or similar firm should be consulted regarding the completion of such a study, which would include estimated of peak dewatering rates, analytical data on the groundwater and treatment with respect to potential discharge options, etc.

The groundwater control requirements will be significantly influenced by the excavation shoring method implemented, being greatest for open cuts into the soil and much less for a continuous caisson wall. More water should be expected when connections are made with existing services. Surface water should be directed away from the excavations.

9. FLOOR SLAB AND PERMANENT DRAINAGE/WATERPROOFING CONSIDERATIONS

Depending on the final design, it is anticipated that the basement floor slab will be constructed either using conventional slab-on-grade techniques on a prepared subgrade, or on top of a raft slab foundation. As with all concrete floor slabs, there is a tendency for the slab to develop cracks. The slab thickness, concrete mix design, the amount of steel and/or fibre reinforcement and/or wire mesh placed into the concrete slab, if any, will therefore be a function of the owner's tolerance for cracks in, and

movements of, the slabs-on-grade, etc. The 'saw-cuts' in the concrete floors, for crack control, should extend to a minimum depth of 1/3 of the thickness of the slab.

A moisture barrier will be required under the floor slabs such as the placement of at least 200 millimetres of well-compacted 20-millimetre clear crushed stone. At a minimum the moisture barrier material should contain no more than 10 per cent passing the No. 4 sieve. Where a 'non-damp' floor slab is required, as for instance under sheet vinyl floor coverings, etc., extra efforts will be required to damp proof the floor slab, as with the additional provision of a heavy 'poly' sheet, damp proofing sprays/membranes, drainage board products, etc. Where 'poly' sheets are used care should be taken to prevent puncturing and tearing and/or sufficiently heavy gauge sheeting specified. Alternatively, a proprietary product such as Delta-MS Underslab or WR Meadows membrane may be considered in lieu of the 'poly' sheets.

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

It is important that the concrete mix design provide a limiting water/cement ratio and total cement content, which will mitigate moisture related problems with low permeance floor coverings, such as debonding of vinyl and ceramic tile. It is equally important that excess free water not be added to the concrete during its placement as this could increase the potential for shrinkage cracking and curling of the slab.

As noted above, the proposed basement levels will extend below the measured static groundwater level. As such it is recommended that the perimeter foundations and lowest-level basement raft slab be constructed as water-tight, making use of suitable membrane systems beneath the slab and against the exterior of foundation walls. This will likely require the use of foundation wall membrane systems intended for 'blind side' or 'single face' application. The system should also incorporate a water-stop component between the raft slab and perimeter foundation walls, and consideration should be given to using a concrete waterproofing admixture in all concrete used for the foundation walls and lowest-level slab. The foundation walls and lowest-level floor slab will also be required to be designed to resist the hydrostatic pressure associated with an elevated groundwater condition. Such a design would readily be incorporated into the design of a raft slab foundation, where utilised. Elevator pits extending below the general basement floor level should also be designed to be continuously water-tight with the surrounding structure.

While not strictly required for watertight systems, consideration may be given to addressing the potential for the build-up of groundwater beneath the basement floor slabs should any leaks in the waterproofing develop in the long-term, in addition to under-slab damp proofing measures recommended previously, through the means of under-floor drainage. Under-floor drains may consist of 150-millimetre diameter perforated pipe, with a geofabric sock, placed in the clear stone beneath the floor slabs on nominal 4 to 6 metre centres. It is noted that the under-floor and perimeter drainage systems should have separate piping, i.e. piping from perimeter system does not connect to the under-floor system, in order to prevent surcharging of the under-floor system. They may outlet into a common sump-pit, though separate systems would be preferred. The need for such under-floor drainage would be best to be further assessed based on the final design slab elevation and the established seasonal high groundwater level.

10. BACKFILL CONSIDERATIONS

It is expected that the majority of the material excavated to accommodate the basement levels will be transported off-site. Where required, select portions of the fill material and native granular soils are considered suitable for use as backfill in service trenches, etc. provided they are free of organics or any other deleterious material.

Fine-grained cohesive soils such as those encountered on site are sensitive to moisture absorption and will become practically impossible to compact using conventional compaction equipment if they become wet during the 'wet' periods of the year. After a period of heavy precipitation, any near-surface wet, or softened material, should be allowed to air-dry or be removed and discarded. These soils are not considered to be free draining and therefore should not be used where this characteristic is necessary. They should not be used in confined spaces where access for compaction is difficult.

11. PAVEMENT STRUCTURE DESIGN CONSIDERATIONS

All areas to be paved must be cleared of all organic and otherwise unsuitable materials, and the exposed subgrade proof rolled with 3 to 4 passes of a fully-loaded tandem-axle truck in the presence of a representative of SOIL-MAT ENGINEERS & CONSULTANTS LTD., immediately prior to the placement of the sub-base material. Any areas of distress revealed by this or other means should be sub-excavated and replaced with suitable backfill material. Where the subgrade condition is poorer it may be necessary to implement more aggressive stabilisation methods, such as the use of coarse aggregate [50mm clear stone, 'rip rap' stone, etc.] 'punched' into the soft areas. It may also be

prudent to consider the provision of a heavy geofabric over the subgrade to act as a separator between the subgrade and granular base materials.

The need for sub-excavations of softened subgrade materials will be reduced if construction is undertaken during dry periods of the year and careful attention is paid to the compaction operations. As noted above the on-site soils are sensitive to disturbance and moisture and may present difficulty for roadway construction during 'wet' periods of the year. Should pavement construction be undertaken during 'wet' periods of the year it should be anticipated that greater stabilisation efforts will be required and/or additional depth of OPSS Granular 'B', Type II sub-base course material may be required.

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

The most severe loading conditions on the subgrade typically occur during the course of construction, therefore precautionary measures may have to be taken to ensure that the subgrade is not unduly disturbed by construction traffic. SOIL-MAT should be given the opportunity to review the final pavement structure design and subdrain scheme prior to construction to ensure that they are consistent with the recommendations of this report.

The suggested pavement structures outlined in Table F are based on subgrade parameters estimated on the basis of visual and tactile examinations of the on-site soils and past experience. The outlined pavement structure may be expected to have an approximate fifteen to twenty-year life, assuming that regular maintenance is performed.

Table F – Typical Suggested Pavement Structures

LAYER DESCRIPTION	COMPACTION REQUIREMENTS	LIGHT DUTY SECTIONS	HEAVY DUTY [TRUCK ROUTE]
Asphaltic Concrete Wearing course OPSS HL 3 or HL 3A	92 per cent Marshall MRD	40 millimetres	40 millimetres
Binder Course OPSS HL 8	92 per cent Marshall MRD	50 millimetres	80 millimetres
Base Course OPSS Granular 'A'	100% SPMDD	150 millimetres	150 millimetres
Sub-base Course OPSS Granular 'B' Type II	100% SPMDD	300 millimetres	450 millimetres

* Marshall MRD denotes Maximum Relative Density.

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

Depending on the anticipated traffic, a reduced light duty asphalt structure consisting of 65 millimetres of HL3 surface course may also perform sufficiently. This would be reasonable in areas subjected only to light vehicles such as cars for parking. Such a structure may have a reduced lifespan if subjected to heavier vehicles, and would also not allow for 'mill and pave' type operations for future rehabilitation.

Where asphalt pavement is to be constructed above the roof deck of the below grade parking level, the granular base layers recommended for the light duty pavement structure recommended above may be considered for both light duty and heavy-duty areas. It is noted that in such cases the roof deck slab should be sufficiently sloped and/or provided with suitable subdrains, in order to promote rapid drainage of water from beneath the pavement, and the roof slab should be provided with a suitable water proofing system.

To minimise segregation of the finished asphalt mat, the asphalt temperature must be maintained uniform throughout the mat during placement and compaction. All too often, significant temperature gradients exist in the delivered and placed asphalt with the cooler portions of the mat resisting compaction and presenting a honeycomb surface. As the spreader moves forward, a responsible member of the paving crew should monitor the pavement surface, to ensure a smooth uniform surface. The contractor can mitigate the surface segregation by 'back-casting' or scattering shovels of the full mix

material over the segregated areas and raking out the coarse particles during compaction operations. Of course, the above assumes that the asphalt mix is sufficiently hot to allow the 'back-casting' to be performed.

12. SOIL EXPORT CONSIDERATIONS

With the provision of 3 underground levels, the project is anticipated to generate considerable volumes of excess soil that will require off-site disposal. Ontario Regulation 406/19 regulates the management of excess soils generated as part of construction projects, which requires specific environmental assessment and testing of the subject site and soils. SOIL-MAT ENGINEERS may be retained to conducted the necessary testing and reporting to support the off-site disposal of excess soils, however it is most efficient to conduct such testing and reporting upon completion of any other environmental assessment and testing being conducted as part of the Phase Two ESA and RSC filing, presently underway.

13. GENERAL COMMENTS

The comments provided in this document are intended only for the guidance of the design team. The material in it reflects SOIL-MAT ENGINEERS' best judgement in light of the information available at the time of preparation. The subsurface descriptions and borehole information are intended to describe conditions at the borehole locations only. It is the contractors' responsibility to determine how these conditions will affect the scheduling and methods of construction for the project. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. SOIL-MAT ENGINEERS accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that this geotechnical report is sufficient for your present requirements. Should you require any additional information or clarification as to the contents of this document, please do not hesitate to contact the undersigned.

Yours very truly,
SOIL-MAT ENGINEERS & CONSULTANTS LTD.

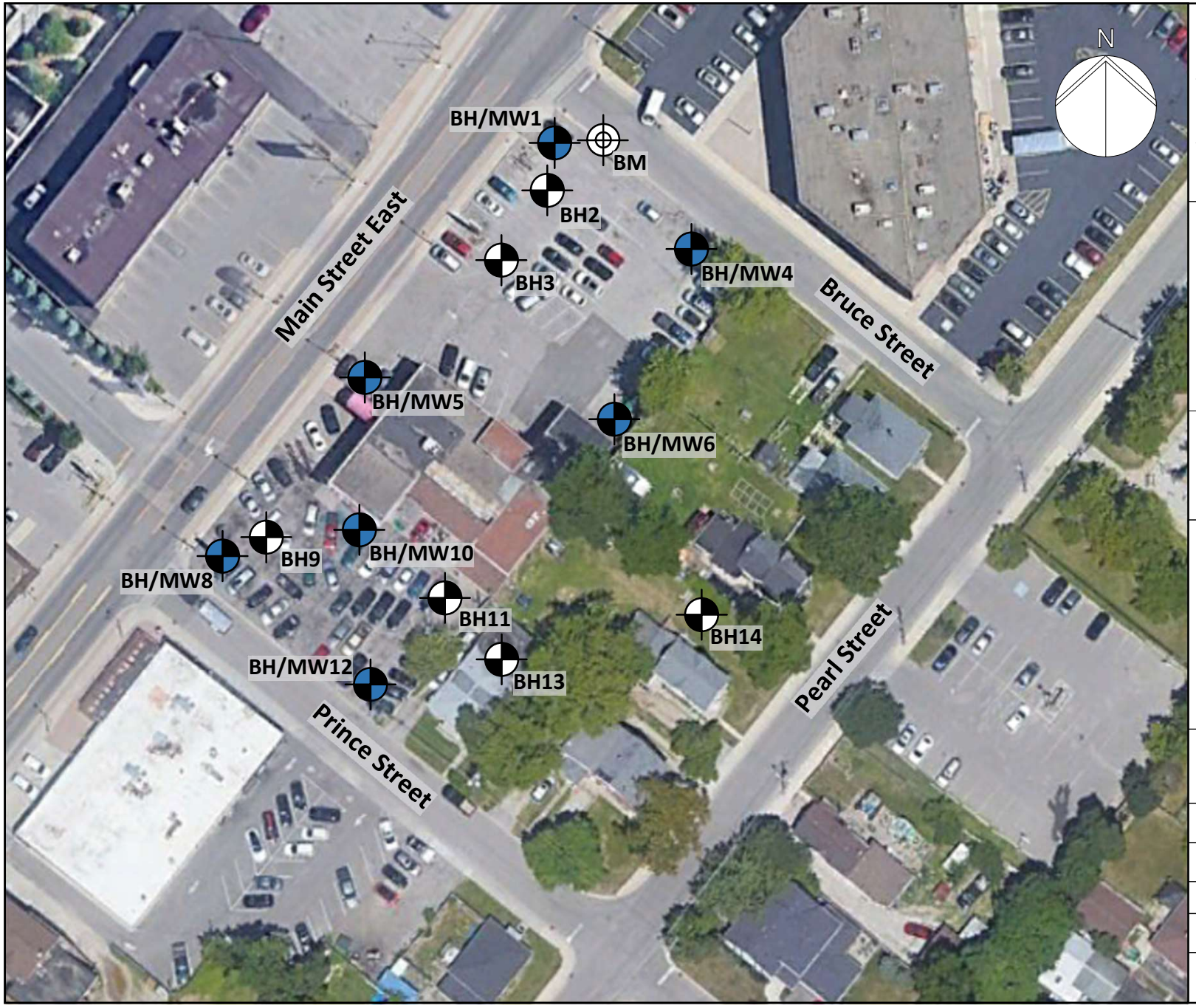
Bennett Sabourin, B.Eng.
Junior Engineer

Kyle Richardson, P. Eng., QP_{ESA}
Project Engineer

Ian Shaw, P. Eng., QP_{ESA}
Senior Engineer

Enclosures: Drawing No. 1, Borehole Location Plan
Log of Borehole Nos. 1 to 6, and 8 to 14
Compressive Strength Test Results
Grain Size Analyses

Distribution: Mikmada Homes [pdf]



LEGEND

Borehole / Monitoring Well Location
BH/MW#

Geodetic Benchmark
BM
DCB with known elevation of 199.38 metres, as shown on the MTE Drawing No. C1.1, dated November 5, 2024.

NOTES

1. This drawing should be read in conjunction with Soil-Mat Engineers & Consultants Ltd. Report No. SM 220141-G.

2. Borehole locations are approximate.

SOIL-MAT
ENGINEERS & CONSULTANTS LTD.

Geotechnical Investigation
Proposed Residential Building
Main Street East & Prince Street
Milton, Ontario

Borehole Location Plan

Project No. SM 220141-G

Date: November, 2024

Drawn: BS

Checked: IS

Drawing No. 1

Log of Borehole No. 1

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 388 Main Street East, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818873
E: 590643

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	199.72	Ground Surface							
0–3 / 0–1		**Pavement Structure** Approximately 100 millimetres of asphaltic concrete overlaying 150 millimetres of compact granular base.							
		Silty Clay/Clayey Silt Fill Grey to brown, occasional to frequent organic staining and inclusions, trace to some sand and gravel, firm.	SS	1	4,2,2,2	4			
			SS	2	2,2,3,5	5			
6–9 / 2–3	196.93		SS	3	5,8,10,14	18		>4.5	
		Sandy Clayey Silt Reddish brown, trace to some gravel, very stiff to hard.	SS	4	4,9,13,20	22		>4.5	
10–13 / 3–4	195.60		SS	5	8,17,26,32	43		>4.5	
		Transitions to grey in colour.	SS	6	6,8,12,15	20		>4.5	
			SS	7	10,17,26,34	43		>4.5	
26 / 8	191.70		SS	8	7,27,50/5"	100		>4.5	
		End of Borehole							

NOTES:

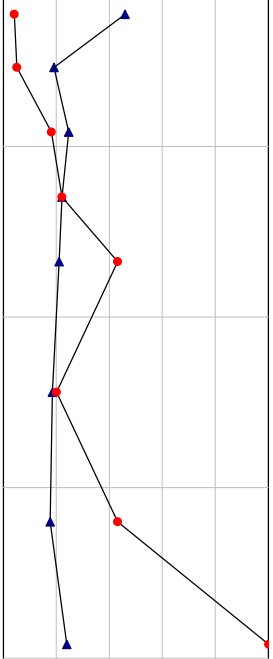
1. Borehole was advanced using hollow stem auger equipment on November 14, 2024 to termination at a depth of 8.0 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:
November 27, 2024 - 3.38 metres

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



Drill Method: Hollow Stem Augers
Drill Date: November 14,2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 1 of 1

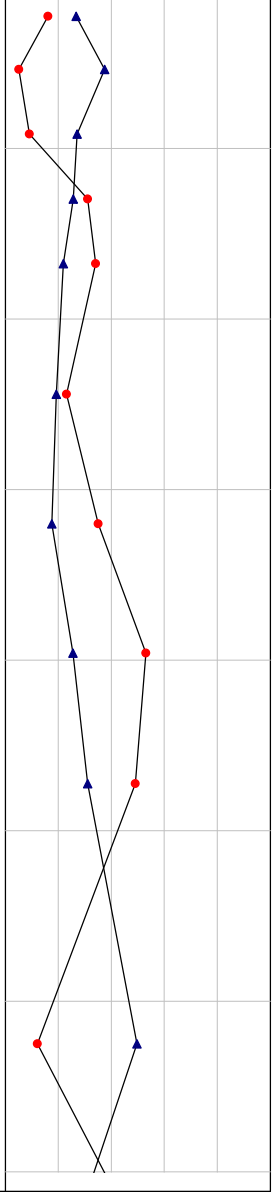
Log of Borehole No. 2

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 388 Main Street East, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818867
E: 590641

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
	199.66	Ground Surface								
0 / 0	199.40	**Pavement Structure** Approximately 100 millimetres of asphaltic concrete overlaying approximately 150 millimetres of compact granular base.		SS	1	7,8,8,10	16			
				SS	2	2,3,2,4	5			
6 / 2	197.70	**Silty Clay/Clayey Silt Fill** Brown, trace to some sand and gravel with occasional sandy and gravelly seams, moderate to frequent organic inclusions, hard to firm.		SS	3	4,4,5,10	9		>4.5	
				SS	4	7,10,21,23	31		>4.5	
10 / 3				SS	5	8,13,21,28	34		>4.5	
13 / 4	195.50	**Sandy Clayey Silt** Reddish brown, trace to some gravel, very stiff to hard. Transitions to grey in colour.								
16 / 5				SS	6	4,10,13,13	23		>4.5	
20 / 6				SS	7	6,11,24,2	35		>4.5	
23 / 7										
26 / 8				SS	8	31,25,28,24	53		>4.5	
29 / 9				SS	9	10,19,30,34	49		>4.5	
33 / 10										
36 / 11										
39 / 12										
41 /				SS	10	5,5,7,10	12		2.5	
43 / 13										
46 / 14										

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



Drill Method: Hollow Stem Augers
Drill Date: November 13, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 1 of 2

Log of Borehole No. 2

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 388 Main Street East, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818867
E: 590641

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
15					SS	11	20,31,32,35	63		>4.5	
18	181.40				SS	12	50/0"	100			
			End of Borehole Auger refusal on inferred bedrock.								

Moisture Content w% (10 20 30 40)

Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger equipment on November 13, 2024 to termination on inferred bedrock at a depth of 18.3 metres.

2. Borehole was recorded as open to a depth of 14.6 metres and 'wet' at depth of 14.0 metres upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Hollow Stem Augers
Drill Date: November 13, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 2 of 2

Log of Borehole No. 3

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 388 Main Street East, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818853
E: 590631

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	199.83	Ground Surface								
0–4 / 0–1		**Pavement Structure** Approximately 125 millimetres of asphaltic concrete.		SS	1	4,9,36,17	45			
4–5 / 1	198.40	**Silty Clay/Clayey Silt Fill** Brown, trace to some sand and gravel with occasional sandy and gravelly seams, occasional cobbles, hard to firm.		SS	2	2,2,3,7	5			
5–8 / 1–2				SS	3	4,8,12,17	20		>4.5	
8–10 / 2–3				SS	4	6,13,17,22	30		>4.5	
10–13 / 3–4		**Sandy Clayey Silt** Reddish brown, trace to some gravel, very stiff to hard.		SS	5	6,13,24,31	37		>4.5	
13 / 4	195.70	Transitions to grey in colour.								
13–16 / 4–5				SS	6	5,7,12,12	19		>4.5	
16–20 / 5–6				SS	7	9,13,14,19	27		>4.5	
20–25 / 6–7				SS	8	50/5"	100		>4.5	
25 / 8	192.10	End of Borehole								

NOTES:

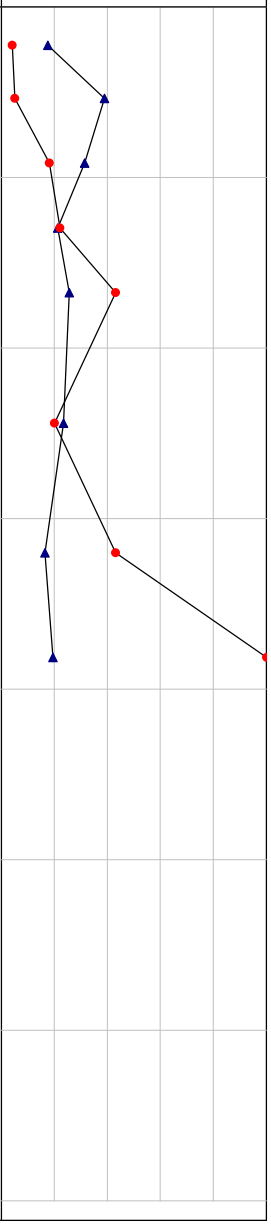
1. Borehole was advanced using hollow stem auger equipment on November 12, 2024 to termination at a depth of 7.8 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Moisture Content w% — 10 20 30 40

Standard Penetration Test blows/300mm — 20 40 60 80



Drill Method: Hollow Stem Augers
Drill Date: November 14,2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 1 of 1

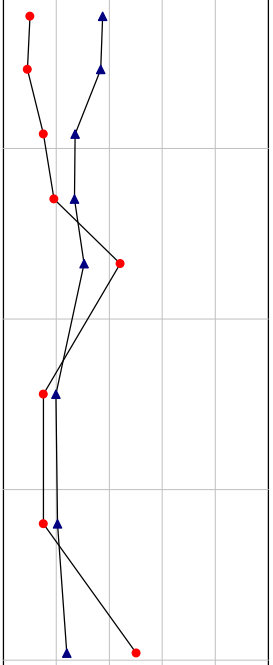
Log of Borehole No. 4

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 388 Main Street East, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818858
E: 590662

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	199.93	Ground Surface								
0 / 0	199.60	**Pavement Structure** Approximately 30 millimetres of asphaltic concrete overlaying 300 millimetres of compact granular base.								
5 / 1	198.20	**Silty Clay/Clayey Silt Fill** Grey, occasional to frequent organic staining and inclusions, trace to some sand and gravel, stiff.		SS	1	14,7,3,5	10			
				SS	2	4,3,6,8	9			
6 / 2				SS	3	4,5,10,13	15		>4.5	
8 / 2				SS	4	4,9,10,13	19		>4.5	
10 / 3		**Sandy Clayey Silt** Reddish brown, trace to some gravel, occasional cobbles in the upper levels, very stiff to hard.		SS	5	11,20,24,30	44			
13 / 4	195.80	Transitions to grey in colour.								
16 / 5				SS	6	5,6,9,10	15		>4.5	
21 / 6				SS	7	5,7,8,16	15		>4.5	
26 / 8	191.70	End of Borehole		SS	8	11,21,29,20	50		>4.5	

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



NOTES:

1. Borehole was advanced using hollow stem auger equipment on November 14, 2024 to termination at a depth of 8.2 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:
November 27, 2024 - 3.44 metres

Drill Method: Hollow Stem Augers
Drill Date: November 14, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 1 of 1

Log of Borehole No. 5

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 388 Main Street East, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818836
E: 590614

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	199.56	Ground Surface							
0 / 0	199.23	**Pavement Structure** Approximately 100 millimetres of asphaltic concrete overlaying 175 millimetres of compact granular base.							
4 / 1	198.10	**Silty Clay/Clayey Silt Fill** Dark grey to black, distinct hydrocarbon odour, trace sand and gravel, firm to stiff.	SS	1	8,4,3,5	7			
			SS	2	4,3,5,6	8			
8 / 2			SS	3	4,8,9,12	17		>4.5	
			SS	4	4,10,11,15	21		>4.5	
12 / 3		**Sandy Clayey Silt** Reddish brown, trace to some gravel, occasional cobbles, very stiff to hard.	SS	5	5,16,20,22	36		>4.5	
13 / 4	195.40	Transitions to grey in colour.							
16 / 5			SS	6	7,8,8,13	16		>4.5	
20 / 6			SS	7	4,11,14,14	25		>4.5	
26 / 8	191.40	End of Borehole	SS	8	17,26,33,25	59		>4.5	

NOTES:

1. Borehole was advanced using hollow stem auger equipment on November 15, 2024 to termination at a depth of 8.2 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:
November 27, 2024 - 5.46 metres

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

Drill Method: Hollow Stem Augers
Drill Date: November 15, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

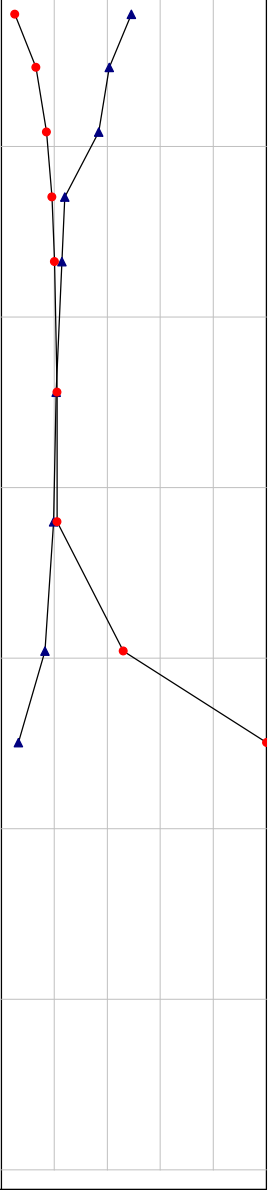
Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 1 of 1

Log of Borehole No. 6

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 388 Main Street East, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818831
E: 590650

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	200.02	Ground Surface							
0 / 0		**Pavement Structure** Approximately 100 millimetres of asphaltic concrete.	SS	1	2,2,3,4	5			
3 / 1	198.94	**Silty Clay/Clayey Silt Fill** Greyish brown, trace to some sand and gravel, occasional to moderate organic inclusions and staining, firm to stiff.	SS	2	2,5,8,11	13		>4.5	
6 / 2			SS	3	4,7,10,14	17		>4.5	
9 / 3		**Sandy Clayey Silt** Brown to reddish brown, trace to some gravel, reworked appearance in the upper levels, very stiff to hard.	SS	4	7,7,12,14	19		>4.5	
12 / 4	195.84		SS	5	6,10,10,21	20		>4.5	
15 / 5		Transitions to grey in colour.	SS	6	4,9,12,11	21		>4.5	
18 / 6			SS	7	5,9,12,14	21		>4.5	
24 / 7			SS	8	15,22,24,31	46		>4.5	
27 / 8			SS	9	50/5"	100			
30 / 9			HQ	1					
33 / 10			HQ	2					
39 / 12			HQ	3					
42 / 13			HQ	4					
46 / 14									



Drill Method: Hollow Stem Auger
Drill Date: November 13, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 1 of 2

Log of Borehole No. 6

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 388 Main Street East, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818831
E: 590650

Depth	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
15											
16				HQ	5						
17				HQ	6						
18				HQ	7						
	181.20										
19		**Queenston Shale** Red, with more resistant grey layers, highly weathered in upper levels, becoming more sound with depth, hard.		HQ	8	RQD = 9%					
20											
21				HQ	9	RQD = 58%					Compressive Strength = 42.3 MPa Compressive Strength = 48.7 MPa
	178.20										
22		End of Borehole									
23		NOTES: 1. Borehole was advanced using hollow stem auger equipment on November 13, 2024 to termination at a depth of 9.3 metres. Bedrock was cored to a depth of 21.8 metres. 2. Soil samples will be discarded after 3 months unless otherwise directed by our client. 3. A monitoring well was installed. The following free groundwater level readings have been measured: November 27, 2024 - 6.71 metres									
24											
25											
26											
27											
28											

Drill Method: Hollow Stem Auger
Drill Date: November 13, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 2 of 2

Log of Borehole No. 8

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 388 Main Street East, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818811
E: 590593

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	199.89	Ground Surface							
0 / 0	199.60	**Pavement Structure** Approximately 150 millimetres of asphaltic concrete overlaying 100 millimetres of compact granular base.							
5 / 1	198.20	**Silty Clay/Clayey Silt Fill** Reddish brown, occasional organic inclusions, trace to some sand and gravel, firm to soft.	SS	1	2,2,3,5	5			
			SS	2	1,0,2,1	2			
6 / 2			SS	3	4,9,13,29	22		>4.5	
8 / 2			SS	4	10,13,11,12	24		>4.5	
10 / 3		**Sandy Clayey Silt** Reddish brown, trace to some gravel, very stiff to hard.	SS	5	7,11,15,15	26		>4.5	
13 / 4	195.70	Transitions to grey in colour.							
15 / 5			SS	6	8,16,17,21	33		>4.5	
20 / 6			SS	7	7,12,15,36	27		>4.5	
26 / 8	191.70	End of Borehole	SS	8	34,32,29,45	61		>4.5	

NOTES:

1. Borehole was advanced using hollow stem auger equipment on November 11, 2024 to termination at a depth of 8.2 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:
November 27, 2024 - 4.57 metres

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

Drill Method: Hollow Stem Augers
Drill Date: November 11, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 1 of 1

Log of Borehole No. 9

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 388 Main Street East, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818813
E: 590597

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	199.92	Ground Surface								
0–3 / 0–1	199.00	**Pavement Structure** Approximately 150 millimetres of asphaltic concrete overlaying 100 millimetres of compact granular base.		SS	1	2,3,7,4	10			
				SS	2	5,6,4,4	10			
3–6 / 1–2	198.20	**Sand Fill** Reddish brown, trace silt and gravel, occasional concrete debris, compact.		SS	3	4,6,9,11	15		>4.5	
6–10 / 2–3		**Silty Clay/Clayey Silt Fill** Brown, trace to some sand and gravel, stiff.		SS	4	5,7,9,26	16		>4.5	
10–13 / 3–4	195.80	**Sandy Clayey Silt** Reddish brown, trace to some gravel, very stiff to hard.		SS	5	5,8,14,17	22		>4.5	
		Transitions to grey in colour.								
15–20 / 4–6				SS	6	5,9,13,13	22		>4.5	
20–23 / 6–7				SS	7	8,12,14,26	26		>4.5	
25–27 / 7–8	191.70			SS	8	13,19,20,25	39		>4.5	
27 / 8		End of Borehole								

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

NOTES:

1. Borehole was advanced using hollow stem auger equipment on November 11, 2024 to termination at a depth of 8.2 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

Drill Method: Hollow Stem Augers
Drill Date: November 11, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 1 of 1

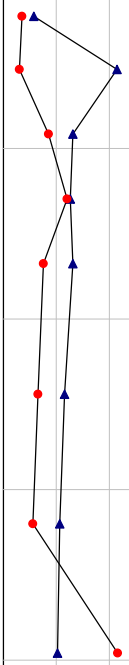
Log of Borehole No. 10

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 388 Main Street East, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818814
E: 590597

Depth (ft / m)	Elevation (m)	Description	Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	200.00	Ground Surface							
0–1 / 0	199.50	**Pavement Structure** Approximately 100 millimetres of asphaltic concrete overlaying 350 millimetres of compact granular base.							
1–4 / 1	198.50	**Silty Clay/Clayey Silt Fill** Reddish brown, trace to some sand and gravel, firm.	SS	1	6,4,3,2	7			
			SS	2	2,2,4,4	6			
4–6 / 1–2			SS	3	4,8,9,11	17		>4.5	
6–9 / 2–3		**Sandy Clayey Silt** Reddish brown, trace to some gravel, stiff to hard.	SS	4	4,10,14,17	24		>4.5	
9–13 / 3–4	195.90		SS	5	4,7,8,14	15		>4.5	
13–16 / 4–5		Transitions to grey in colour.	SS	6	1,6,7,9	13		3.0	
16–23 / 5–7			SS	7	2,4,7,8	11		3.0	
23–26 / 7–8	191.80		SS	8	12,19,24,28	43		>4.5	
26–46 / 8–14		End of Borehole							

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



NOTES:

1. Borehole was advanced using hollow stem auger equipment on November 12, 2024 to termination at a depth of 8.2 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:
November 27, 2024 - 5.07 metres

Drill Method: Hollow Stem Augers
Drill Date: November 12, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 1 of 1

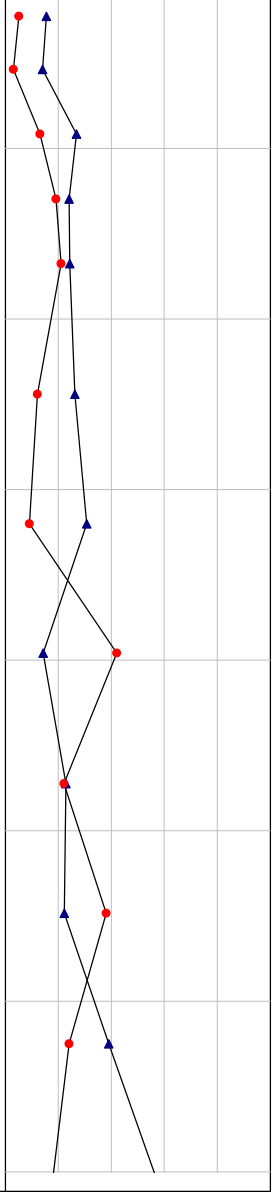
Log of Borehole No. 11

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 388 Main Street East, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818805
E: 590627

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
ft / m	199.92	Ground Surface								
0 / 0	199.60	**Pavement Structure** Approximately 50 millimetres of asphaltic concrete overlaying approximately 300 millimetres of compact granular base.		SS	1	4,3,2,1	5			
				SS	2	2,1,2,3	3			
6 / 2	198.10	**Silty Clay/Clayey Silt Fill** Brown, trace to some sand and gravel with occasional sandy and gravelly seams, soft to stiff.		SS	3	3,5,8,10	13		>4.5	
				SS	4	5,9,10,13	19		>4.5	
10 / 3		**Sandy Clayey Silt** Reddish brown, trace to some gravel, stiff to very stiff.		SS	5	5,8,13,11	21		>4.5	
13 / 4	195.80	Transitions to grey in colour.								
16 / 5				SS	6	3,5,7,8	12		4.0	
20 / 6	193.70	**Sand and Gravel** Grey, trace to some silt and clay, occasional cobbles, compact to dense.		SS	7	3,4,5,4	9			
26 / 8				SS	8	22,21,21,22	42			
30 / 9	190.50	**Sandy Clayey Silt** Grey to reddish grey, trace to some gravel, very stiff to hard.		SS	9	8,10,12,14	22		>4.5	
36 / 11				SS	10	27,19,19,29	38		>4.5	
41 / 12				SS	11	10,12,12,12	24		3.5	
46 / 14				SS	12	7,7,11,12	18		3.0	

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



Drill Method: Hollow Stem Augers
Drill Date: November 12, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 1 of 2

Log of Borehole No. 11

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 388 Main Street East, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818805
E: 590627

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
						12		18				
15	184.40				SS	13	46,50/3"	100		>4.5		
16			End of Borehole NOTES: 1. Borehole was advanced using hollow stem auger equipment on November 12, 2024 to termination at a depth of 15.5 metres. 2. Borehole was recorded as open to a depth of 14.6 metres and 'wet' at depth of 7.9 metres upon completion and backfilled as per Ontario Regulation 903. 3. Soil samples will be discarded after 3 months unless otherwise directed by our client.									
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												

Drill Method: Hollow Stem Augers
Drill Date: November 12, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 2 of 2

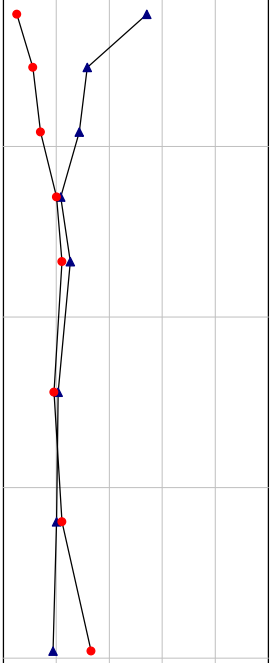
Log of Borehole No. 12

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 388 Main Street East, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818792
E: 590614

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	199.80	Ground Surface								
0 / 0		**Pavement Structure** Approximately 40 millimetres of asphaltic concrete overlaying 125 millimetres of compact granular base.								
3 / 1	198.60	**Silty Clay/Clayey Silt Fill** Brown, trace to some sand and gravel, stiff.		SS	1	2,2,3,5	5			
				SS	2	3,5,6,10	11		>4.5	
7 / 2				SS	3	5,6,8,11	14		>4.5	
10 / 3		**Sandy Clayey Silt** Reddish brown, trace to some gravel, very stiff to hard.		SS	4	5,9,11,14	20		>4.5	
13 / 4	195.70			SS	5	5,9,13,19	22		>4.5	
		Transitions to grey in colour.								
16 / 5				SS	6	5,8,11,13	19		>4.5	
20 / 6										
23 / 7				SS	7	7,10,12,15	22		>4.5	
26 / 8	191.60									
26 / 8		End of Borehole		SS	8	11,15,18,20	33		>4.5	

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



NOTES:

1. Borehole was advanced using hollow stem auger equipment on November 11, 2024 to termination at a depth of 8.2 metres.

2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:
November 27, 2024 - 3.37 metres

Drill Method: Hollow Stem Augers
Drill Date: November 12, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 1 of 1

Log of Borehole No. 13

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 17 Prince Street, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818792
E: 590614

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	199.88	Ground Surface								
0 / 0	199.60	**Concrete Slab Structure** Approximately 150 millimetres of concrete overlaying 150 millimetres of compact granular base.								
3 / 1		**Silty Clay/Clayey Silt Fill** Brown to grey, trace to some sand and gravel, occasional organic inclusions.		SS	1					
7 / 2	197.40			SS	2					
10 / 3		**Sandy Clayey Silt** Reddish brown, trace to some gravel.		SS	3					
11 / 3	196.50			SS	4					
13 / 4		End of Borehole NOTES: 1. Borehole was advanced using solid stem auger equipment on November 15, 2024 to termination at a depth of 3.4 metres. 2. Borehole was recorded as open and 'dry' upon completion and backfilled as per Ontario Regulation 903. 3. Soil samples will be discarded after 3 months unless otherwise directed by our client.								

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)

Drill Method: Solid Stem Augers
Drill Date: November 15, 2024
Hole Size: 100 millimetres
Drilling Contractor: Sonic Soil Sampling Inc.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

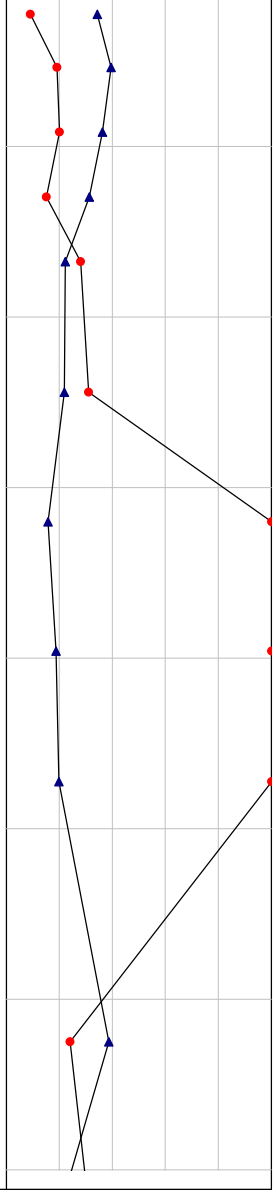
Datum: Geodetic
Field Logged by: AL
Checked by: KR
Sheet: 1 of 1

Log of Borehole No. 14

Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 395 Pearl Street, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818801
E: 590664

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
0 / 0	199.48	Ground Surface								
0 / 0	199.20	**Topsoil** Approximately 250 millimetres of topsoil.								
1 / 1		**Sandy Clayey Silt** Brown to reddish brown, trace to some gravel, reworked appearance in the upper levels, stiff to hard.		SS	1	4,4,5,5	9			
2 / 1				SS	2	6,7,12,13	19		>4.5	
3 / 2				SS	3	6,8,12,15	20		>4.5	
4 / 2				SS	4	9,5,10,14	15		>4.5	
5 / 3				SS	5	5,12,16,23	28		>4.5	
13 / 4	195.30	Transitions to grey in colour.								
16 / 5				SS	6	11,12,19,20	31		>4.5	
23 / 7				SS	7	12,50/3"	100		>4.5	
26 / 8				SS	8	23,26,50/4"	100		>4.5	
31 / 9				SS	9	22,40,50/5"	100		>4.5	
41 / 12				SS	10	11,12,12,13	24		>4.5	



Drill Method: Mud Rotary
Drill Date: November 14, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 1 of 2

Log of Borehole No. 14

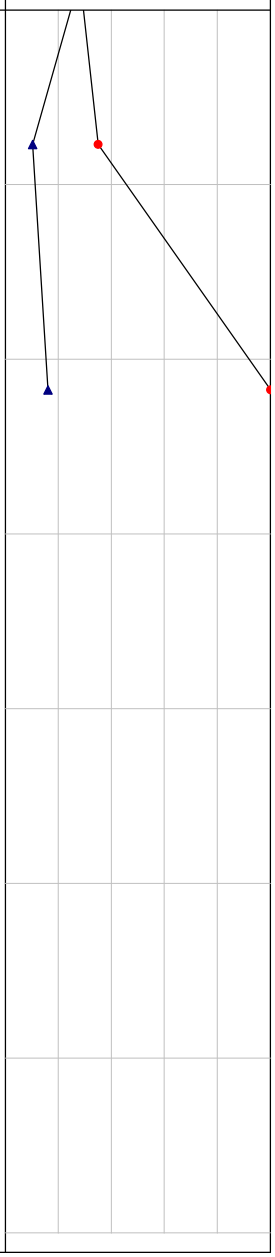
Project No: SM 220141-EG
Project: Proposed Residential Building
Location: 395 Pearl Street, Milton
Client: Mikmada Homes

Project Manager: Kyle Richardson, P. Eng.
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4818801
E: 590664

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
15											
16					SS	11	14,13,22,23	35		>4.5	
17											
18											
	181.00				SS	12	48,50/3"	100			
19			End of Borehole Auger refusal on inferred bedrock.								
20			NOTES: 1. Borehole was advanced using mud rotary equipment on November 14, 2024 to termination on inferred bedrock at a depth of 18.5 metres. 2. Soil samples will be discarded after 3 months unless otherwise directed by our client.								
21											
22											
23											
24											
25											
26											
27											
28											

Moisture Content w%
10 20 30 40

Standard Penetration Test blows/300mm
20 40 60 80



Drill Method: Mud Rotary
Drill Date: November 14, 2024
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling Ltd.

Soil-Mat Engineers & Consultants Ltd.
401 Grays Road, Hamilton, Ontario, L8E 2Z3
T: 905.318.7440, TF: 800.243.1922, F: 905.318.7455
www.soil-mat.ca E: info@soil-mat.ca

Datum: Geodetic
Field Logged by: BS
Checked by: KR
Sheet: 2 of 2

	Rock Core ID	Date Tested	Average Diameter **D** [mm]	Average Height **H** [mm]	Dry Weight (mass) [g]	Break Load Q_{ult} [lb]	Break Load Q_{ult} [N]	Aspect Ratio Factor C_F	Cross-Sectional Area **A** [m^2]	Calculated Volume **V** [m^3]	Calculated Unit Weight γ_{conc} [kN/m^3]	Calculated Density ρ_{conc} [kg/m^3]	Unconfined Compressive Strength [MPa]
A	1 @ 67'3"	Nov-20-24	63.00	115.0	933.6	29930	133128.6	0.99	0.00312	0.00036	25.5	2604.3	42.3
B	2 @ 71'3"	Nov-20-24	63.00	147.0	1198.0	34100	151676.8	1.00	0.00312	0.00046	25.6	2614.4	48.7
											Average		45.5

Date Cored: November 13, 2024

Date Received: November 20, 2024

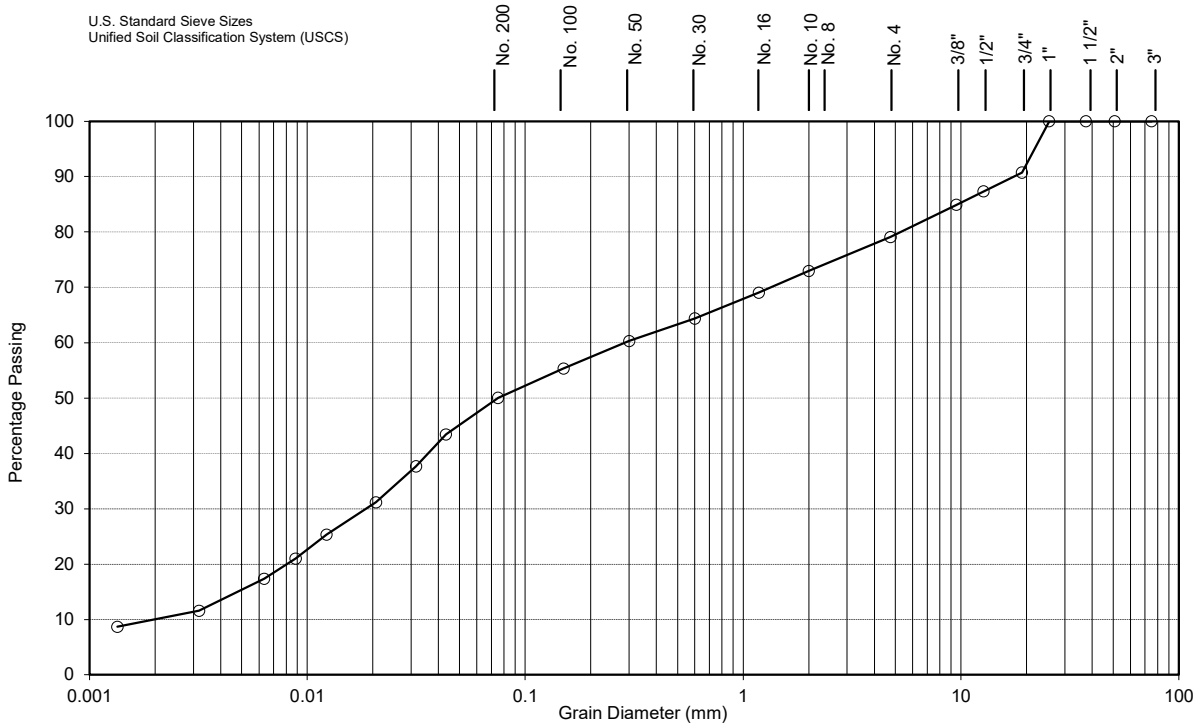
Project Name: 388 Main Street East, Milton

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

COMPRESSIVE STRENGTH TEST - BEDROCK CORE BREAK RESULTS

Project No.: 220141 **Lab Number: 24-2010**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

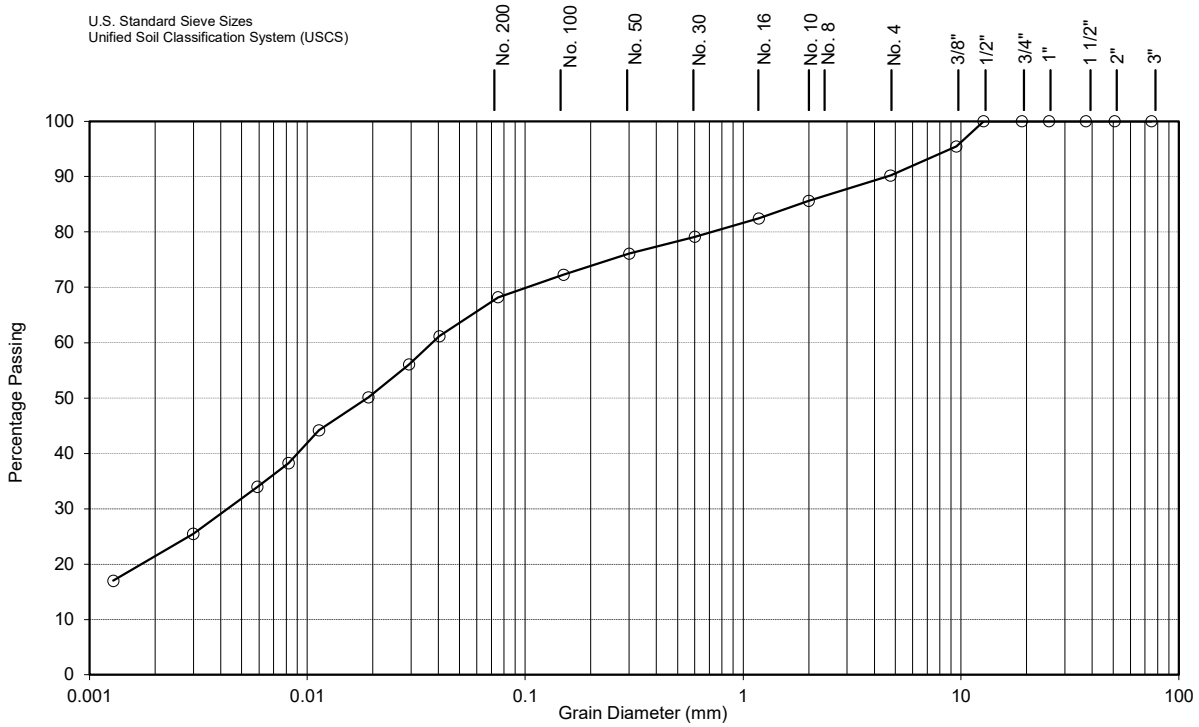
Lab No.:	**24-422**	Notes: Depth: 50'			
Borehole No.:	**2**				
Sample No.:	**11**				
CLAY [%]:	**10**	Soil Description:	**Brownish Red Sandy and Gravelly Silt w/ some Clay**		
SILT [%]:	**40**		**G.M. - Gravel-sand-silt mixtures to G.C. - Gravel-sand-clay mixtures to**		
SAND [%]:	**29**		**M.L. - Inorganic silts and very fine sands**		
GRAVEL [%]:	**21**	Estimated Infiltration Rate [mm/hr] :	**15 to 20**	Estimated Permeability, k [cm/s]:	**10^{-6}**
D_{10} (Effective Diam. in mm):	**0.0019**	Coefficient of Uniformity C_U:	**157.9**	Coefficient of Curvature C_C:	**0.6**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

388 Main Street East, Milton ON

November 2024	**Grain Size Analysis No. 1**	**Project No.: SM 220141-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

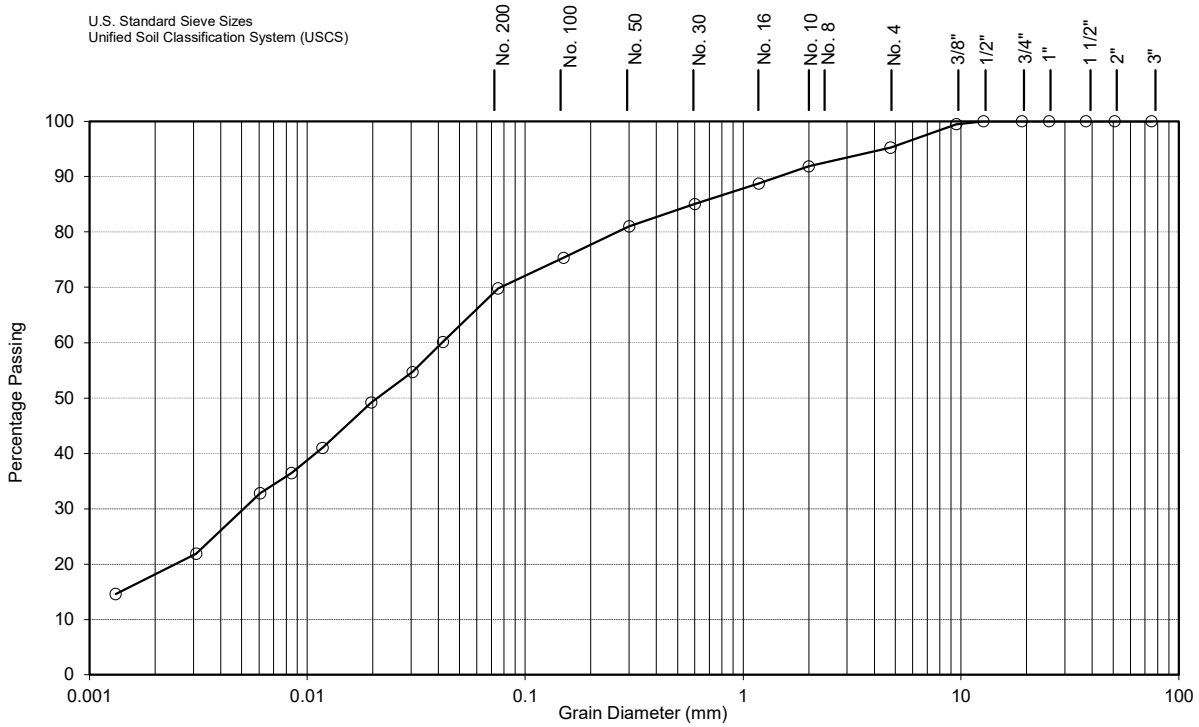
Lab No.:	**24-426**	Notes: Depth: 10'			
Borehole No.:	**4**				
Sample No.:	**5**				
CLAY [%]:	**22**	Soil Description:	**Brown Clayey and Sandy Silt w/ some Gravel**		
SILT [%]:	**46**	**M.L. - Clayey silts with slight plasticity, inorganic silts and very fine sands, clayey fine sands to G.M. - Gravel-sand-silt mixtures to G.C. - Gravel-sand-clay mixtures**			
SAND [%]:	**22**				
GRAVEL [%]:	**10**	Estimated Infiltration Rate [mm/hr] :	**< 10**	Estimated Permeability, k [cm/s]:	**10^{-7}**
D_{10} (Effective Diam. in mm):	**0.0007**	Coefficient of Uniformity C_U:	**54.3**	Coefficient of Curvature C_C:	**0.7**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

388 Main Street East, Milton ON

November 2024	**Grain Size Analysis No. 2**	**Project No.: SM 220141-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

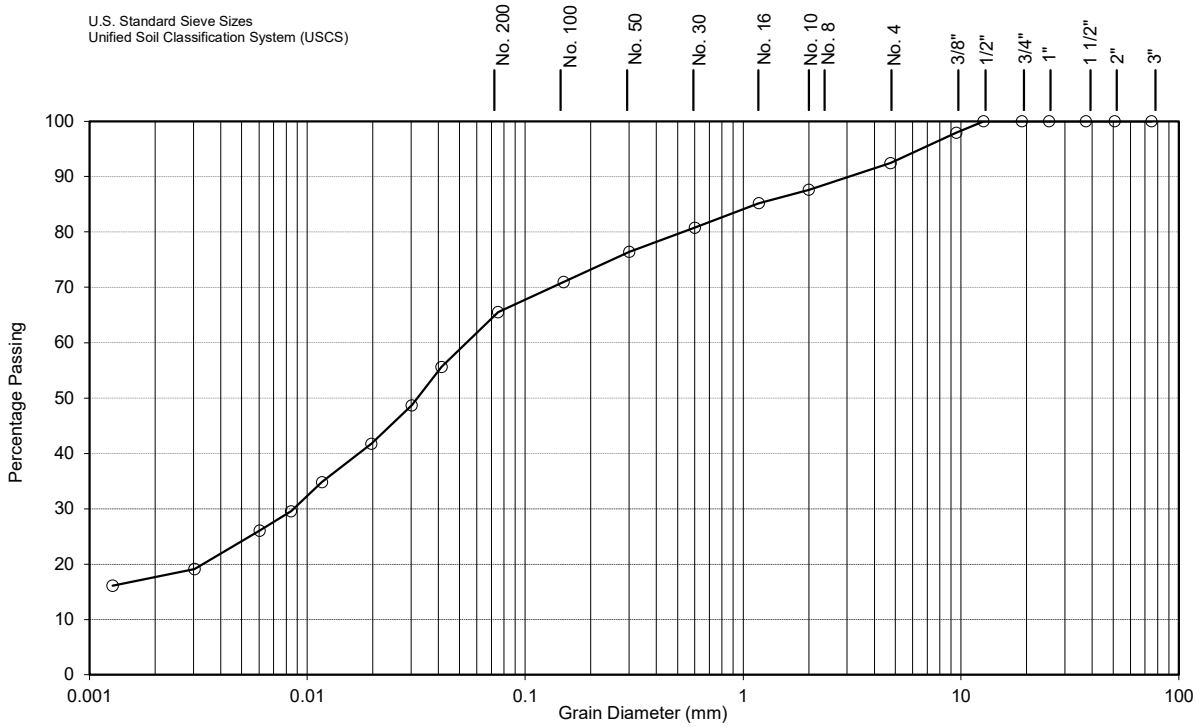
Lab No.:	**24-427**	Notes: Depth: 25'			
Borehole No.:	**6**				
Sample No.:	**8**				
CLAY [%]:	**18**	Soil Description: **Reddish Brown Sandy Silt w/ some Clay and a trace of Gravel**			
SILT [%]:	**52**	**M.L. - Inorganic silts and very fine sands, clayey fine sands, clayey silts with slight plasticity**			
SAND [%]:	**25**				
GRAVEL [%]:	**5**	Estimated Infiltration Rate [mm/hr] :	**< 10**	Estimated Permeability, k [cm/s]:	**10^{-7}**
D_{10} (Effective Diam. in mm):	**0.0007**	Coefficient of Uniformity C_U:	**60.0**	Coefficient of Curvature C_C:	**0.9**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

388 Main Street East, Milton ON

November 2024	**Grain Size Analysis No. 3**	**Project No.: SM 220141-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

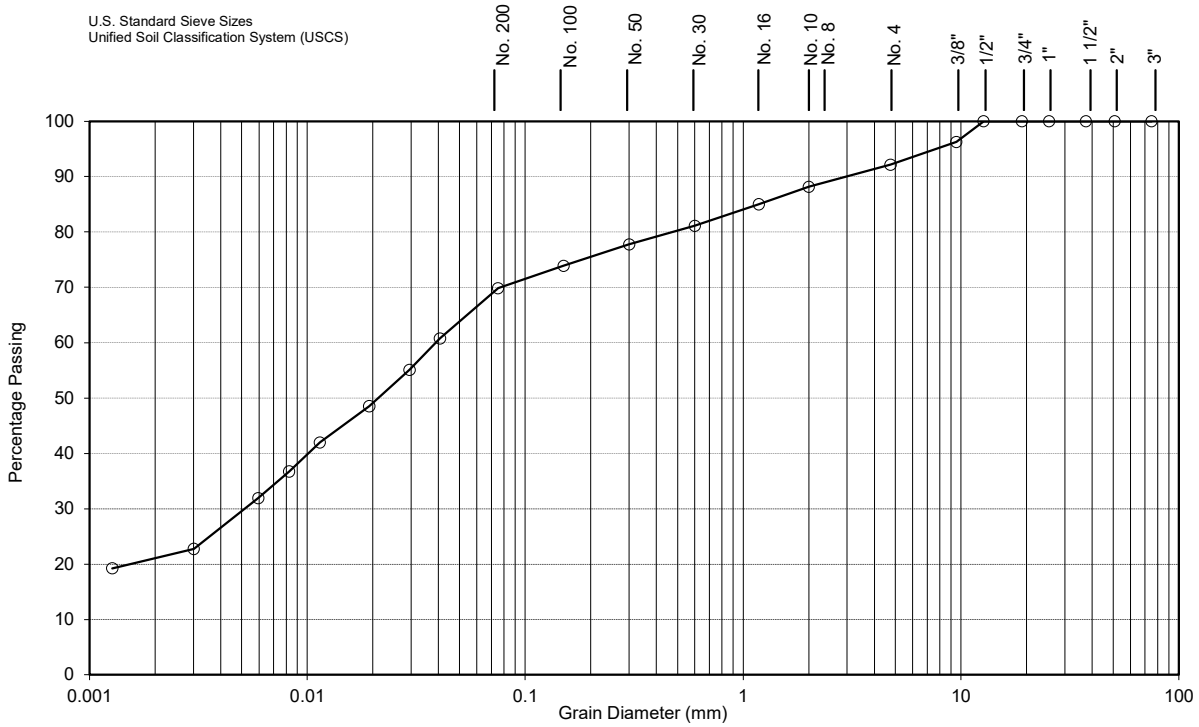
Lab No.:	**24-428**	Notes: Depth: 20'			
Borehole No.:	**9**				
Sample No.:	**7**				
CLAY [%]:	**18**	Soil Description: **Greyish Brown Sandy Silt w/ some Clay and a trace of Gravel**			
SILT [%]:	**48**	**M.L. - Inorganic silts and very fine sands, clayey fine sands, clayey silts with slight plasticity**			
SAND [%]:	**26**	**to G.M. - Gravel-sand-silt mixtures to G.C. - Gravel-sand-clay mixtures**			
GRAVEL [%]:	**8**	Estimated Infiltration Rate [mm/hr] :	**< 10**	Estimated Permeability, k [cm/s]:	**10^{-7}**
D_{10} (Effective Diam. in mm):	**0.0003**	Coefficient of Uniformity C_U:	**146.7**	Coefficient of Curvature C_C:	**5.9**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

388 Main Street East, Milton ON

November 2024	**Grain Size Analysis No. 4**	**Project No.: SM 220141-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

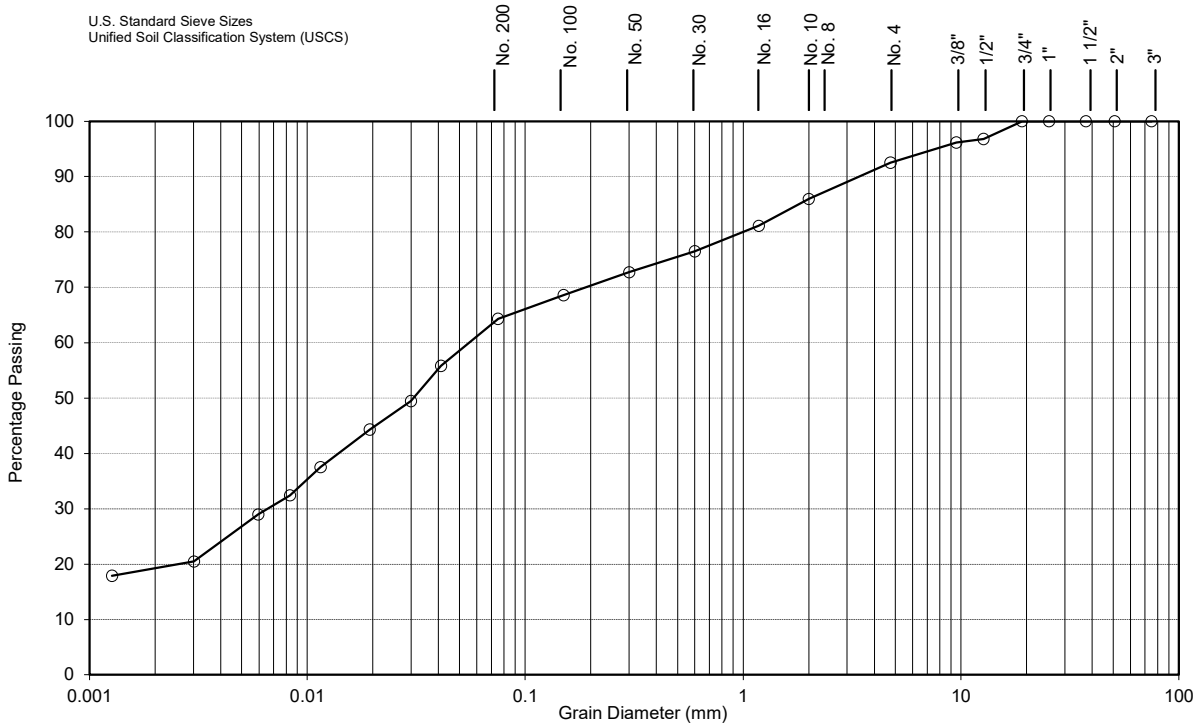
Lab No.:	**24-429**	Notes: Depth: 7.5'			
Borehole No.:	**12**				
Sample No.:	**4**				
CLAY [%]:	**21**	Soil Description: **Brown Sandy and Clayey Silt w/ a trace of Gravel**			
SILT [%]:	**49**	**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity, clayey fine sands**			
SAND [%]:	**22**	**to G.M. - Gravel-sand-silt mixtures to G.C. - Gravel-sand-clay mixtures**			
GRAVEL [%]:	**8**	Estimated Infiltration Rate [mm/hr] :	**< 10**	Estimated Permeability, k [cm/s]:	**10^{-7}**
D_{10} (Effective Diam. in mm):	**0.0002**	Coefficient of Uniformity C_U:	**190.0**	Coefficient of Curvature C_C:	**3.6**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

388 Main Street East, Milton ON

November 2024	**Grain Size Analysis No. 5**	**Project No.: SM 220141-T**

Mechanical & Hydrometer Analyses



CLAY	SILT	FINE	MEDIUM	COARSE	FINE	COARSE
		SAND			GRAVEL	

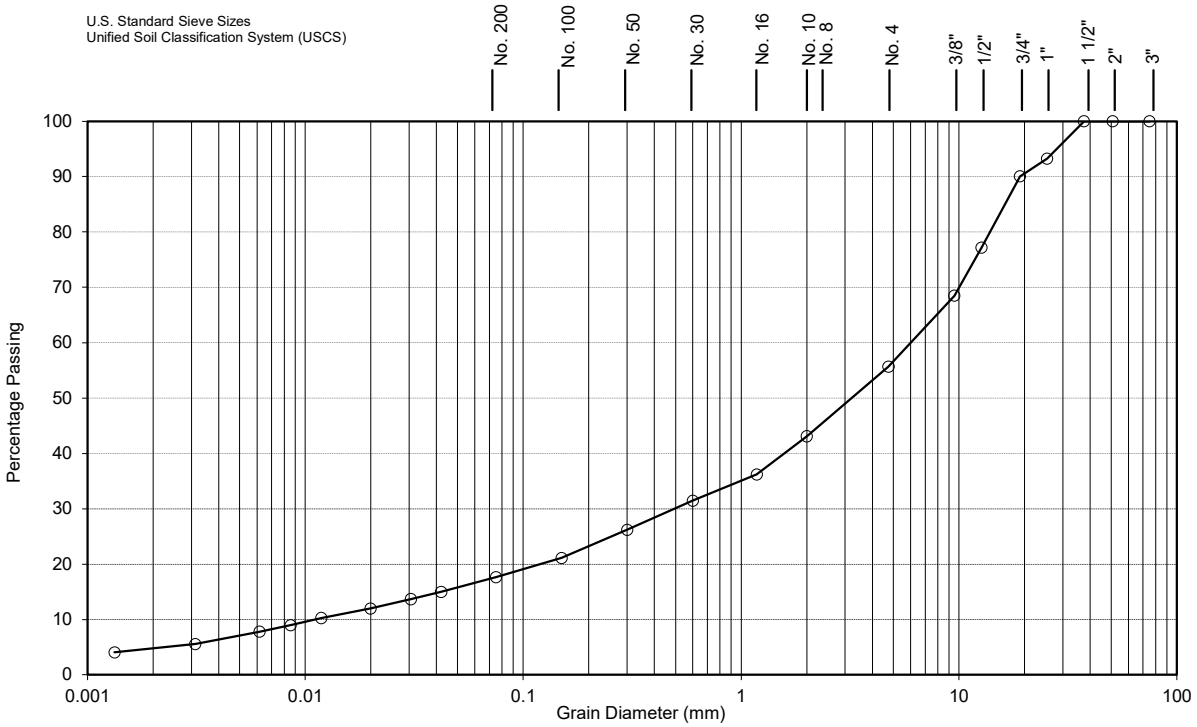
Lab No.:	**24-430**	Notes: Depth: 15'			
Borehole No.:	**14**				
Sample No.:	**6**				
CLAY [%]:	**19**	Soil Description: **Greyish Brown Sandy Silt w/ some Clay and a trace of Gravel**			
SILT [%]:	**45**	**M.L. - Inorganic silts and very fine sands, clayey silts with slight plasticity, clayey fine sands**			
SAND [%]:	**29**	**to G.M. - Gravel-sand-silt mixtures to G.C. - Gravel-sand-clay mixtures**			
GRAVEL [%]:	**7**	Estimated Infiltration Rate [mm/hr] :	**< 10**	Estimated Permeability, k [cm/s]:	**10^{-7}**
D_{10} (Effective Diam. in mm):	**0.00015**	Coefficient of Uniformity C_U:	**380.0**	Coefficient of Curvature C_C:	**5.3**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

388 Main Street East, Milton ON

November 2024	**Grain Size Analysis No. 6**	**Project No.: SM 220141-T**

Mechanical & Hydrometer Analyses



Lab No.:	**25-025**	Notes: Depth: 25'			
Borehole No.:	**11**				
Sample No.:	**8**				
CLAY [%]:	**5**	Soil Description:	**Greyish Brown Gravel and Sand w/ some Silt and a trace of Clay**		
SILT [%]:	**13**		**G.M. - Gravel-sand-silt mixtures**		
SAND [%]:	**38**				
GRAVEL [%]:	**44**	Estimated Infiltration Rate [mm/hr] :	**45 to 55**	Estimated Permeability, k [cm/s]:	**10^{-4}**
D_{10} (Effective Diam. in mm):	**0.012**	Coefficient of Uniformity C_U:	**500.0**	Coefficient of Curvature C_C:	**3.5**

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

388 Main Street East, Milton ON

Date Tested: January 29, 2025	**Grain Size Analysis No. 7**	**Project No.: SM 220141-T**