PENNSYLVANIA • NEW JERSEY • FLORIDA • ONTARIO

McCLYMONT&RAK
ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

111 ZENWAY BLVD., UNIT 4, VAUGHAN, ONTARIO, L4H 3H9
TEL: 416.675.0160 FAX: 905 851.1722
office@mccrak.com

1271 DENISON ST., UNIT 45, MARKHAM, ONTARIO, L3R 4B5
TEL: 905.470.0160 FAX: 905.475.6371
denison@mccrak.com

McMASTER INNOVATION PARK - COLABORATORY No. 110A
175 LONGWOOD RD. S., HAMILTON, ONTARIO, L8P 0A1
office@mccrak.com

WWW.MCCRAK.COM

G5820 **JULY 2023**

GEOTECHNICAL REPORT
RESIDENTIAL DEVELOPMENT
REGIONAL ROAD 25 AND BRITANNIA ROAD
MILTON, ONTARIO

DISTRIBUTION:

1 COPY (electronic)	MATTAMY (MILTON WEST) LIMITED
1 COPY	McCLYMONT & RAK ENGINEERS, INC.

PREPARED FOR:

MATTAMY HOMES CANADA
7880 KEELE STREET
VAUGHAN, ONTARIO
L4K 4G7

TABLE OF CONTENTS

Item		Page
1.0	INTRODUCTION	1
2.0	SITE CONDITION	1
3.0	PROPOSED DEVELOPMENT	1
4.0	SITE INVESTIGATION	2
5.0	SOIL AND GROUNDWATER CONDITIONS	3
6.0	FOUNDATION	6
6.1	SPREAD/STRIP FOOTINGS	7
6.2	GENERAL FOUNDATION NOTES	7
7.0	EARTHQUAKE CONSIDERATION	9
8.0	BASEMENT WALLS	9
9.0	DEWATERING	11
10.0	EXCAVATION AND BACKFILL	12
11.0	SHORING	13
12.0	SLAB ON GRADE AND PERMANENT DRAINAGE	14
13.0	PAVEMENT	15
14.0	CHEMICAL PROPERTIES OF THE SOIL	17
14.1	CORROSIVITY	17
14.2	SULPHATE ATTACK	18
15.0	GENERAL COMMENTS	18

DRAWINGS

Drawing No. 1	Borehole Location Plan
Drawing No. 2 to 5	Subsurface Profiles
Drawing No. 6	Underground Structure Vs. N.H.S
Drawing No. 7	Suggested Exterior Drainage Against Shoring
Drawing No. 8	Permanent Water Drainage System (PWDS)
Drawing No. 9	Typical Elevator Pit Waterproofing
Drawing No. 10	Suggested Approach Slab Detail
Drawing No. 11&12	Pavement above Garage Roof

TABLES

Table 1	Assumed Finished Floor Depths/Elevations
Table 2	Groundwater Level Monitoring Results
Table 3	Founding Depths/Elevations and Bearing Resistance for Spread/Strip Footings
Table 4	Typical Pavement Structure
Table 5	Typical Composite Pavement Structure
Table 6	Results of Soil Corrosivity Potential

APPENDICES

Appendix A	Proposed Redevelopment Drawings
Appendix B	Borehole Data Sheets (by MCR)
Appendix C	Borehole Data Sheets (by Others)
Appendix D	Soil Chemical Analyses Results

1.0 INTRODUCTION

MCR was retained by Mattamy (Milton West) Limited (the Client) to carry out a geotechnical investigation for the proposed residential development located at Regional Road 25 and Britannia Road Milton, Ontario (hereafter referred to as 'the Site').

The objective of the report was to determine design data required for foundations, dewatering, shoring/excavation, backfill, slab on grade and pavement. The above design and construction issues are addressed in the following report.

2.0 SITE CONDITION

The Site is located at the northwestern corner of Regional Road 25 and Britannia Road, in a mixed-use rural, residential and commercial area of the city of Milton, Ontario. The site is irregular in shape with an approximate area of 41,511 m^2.

Etheridge Avenue bisects the Site, running west to east; the southern portion is a vacant lot and the northern portion is occupied by Mattamy Homes office, a parking area and the rest is vacant.

The Site is bounded by a pond to the north, Regional Road 25 to the east, Britannia Road to the south, and a pond/channel to the west.

3.0 PROPOSED DEVELOPMENT

The latest architectural drawings (Appendix A) show the Site is proposed for residential development and will consist of:

- **South Block:** A fifteen [15] storey building (Tower 1) with eight [8] storey podiums, a fourteen [14] storey building (Tower 2) with eight [8] storey podium, a thirteen [13] storey building (Tower 3) with eight [8] storey podiums, and a fifteen [15] storey building (Tower 4) with six [6] storey podium over two [2] levels of underground parking.

- **North Block:** A thirteen [13] storey building (Tower 5) and a twelve [12] storey

building (Tower 6), with eight [8] storey podiums over two [2] levels of combined underground parking, and a fifteen [15] storey building (Tower 7) with eight [8] storey podiums over two [2] levels of underground parking.

The finished floor elevations (FFE) at ground level and P2 underground are presented in Table 1 below:

Table 1 – Assumed Finished Floor Depths/Elevations

Building	GF FFE (m)	P2 FFE (m)
Tower 1	186.95	179.00
Tower 2	185.80	178.35
Tower 3	185.60	177.70
Tower 4	184.50	177.05
Tower 5	188.15	180.70
Tower 6	188.15	180.70
Tower 7	188.25	180.80

4.0 SITE INVESTIGATION

Initially, twelve boreholes (BH 1 to BH 12), were drilled by Shad & Associates Inc., in February and March 2018 to depths of 7.80 to 8.10 m.

In addition, nine boreholes (BH 101 to BH 109), were drilled by MCR in December 2022 and January 2023 to depths of 7.30 to 21.40 m.

Due to the presence of boreholes by Shad & Associates Inc., sampling in boreholes 102, 103, 106 and 108 started at a depth of 9.15 m and continued to maximum explored depth of the boreholes.

All boreholes by Shad & Associates Inc., except boreholes 2, 6, 7 and 11, were equipped with monitoring wells for long-term groundwater monitoring and sampling.

Location of the boreholes are shown on Drawing No. 1 and Borehole logs by MCR and Shad & Associates Inc., are presented in Appendices B and C, respectively.

Soil samples were taken using the Standard Penetration Test (SPT) method and were placed in clean, sealed plastic bags in the field and transported back to our laboratory where they were further examined for soil characterization.

Moisture contents of most of soil samples and grain size analyses (soil gradation), for selected soil samples, from different boreholes, were determined and the results are presented in Appendix B.

In addition, selected samples were transported to Bureau Veritas to be tested for common corrosion parameters, including pH, resistivity, oxygen reduction potential (redox), chlorides and sulphate content. The laboratory test results are presented in Appendix D.

MCR borehole elevations, referred to in this report, are geodetic and metric and are interpolated from survey plans by R-PE Surveying Ltd. dated February and March 2018.

5.0 SOIL AND GROUNDWATER CONDITIONS

Subsurface conditions encountered at the borehole locations are shown on Borehole Log Sheets, attached in Appendices B&C, and summarized on a Soil Profile/Drawing No. 2 to 5, as follows:

Fill: Compact fill material was encountered at the surface of all boreholes. The fill material extended to depths ranging from 0.4 to 0.9 m. The fill consisted of silty sand/sandy silt/clayey silt/silty clay, sand and gravel soils. The brown/dark brown to reddish brown fill was in a moist condition and contained some to trace of organics, clay, gravel, and rootlets.

For the purpose of offsite disposal, the type/quantity and extent of the existing fill layer should be explored by further test pit investigation, prior to contract award.

Silty Sand/Sandy Silt: A dense silty sand/sandy silt till layer was encountered below the fill in boreholes 104, 105, 107 and 109. The brown silty sand/sandy silt layer was

in a moist condition and contained traces of clay. The silty sand/sandy silt layer extended to the full depth of borehole 104 and a depth of 2.30 m in boreholes 105, 107 and 109.

Clayey Silt/Silty Clay (Till): A very stiff to hard clayey silt/silty clay till layer was encountered below the fill and silty sand/sandy silt layer in all boreholes (except 102, 103, 106 and 108). The reddish brown to grey clayey silt/silty clay till layer was in a moist to wet condition and contained some to trace of sand, gravel and shale fragments. The clayey silt/silty clay till layer extended to the full depth of boreholes 2, 3, 5, 8, 11 and 109 and to depths ranging from 4.55 to 10.65 m in all other boreholes.

Sand and Gravel/Silty Sand/Sandy Silt (Till): A very dense sand and gravel/silty sand/sandy silt till deposit was observed below the clayey silt/silty clay till layer in all boreholes. The brown to reddish brown sand and gravel/silty sand/sandy silt (till) deposit was in a moist to wet condition and contained traces of clay, gravel and shale fragments. The sand and gravel/silty sand/sandy silt till layer extended to a depth of 18.30 m in borehole 101 and to the full depth of all other boreholes.

Clayey Silt Till: A hard layer of clayey silt till was detected below the sand and gravel/silty sand/sandy silt till deposit in borehole 101. The reddish brown layer was in a moist condition and contained traces of sand, gravel and shale fragments. The clayey silt till layer extended to the full depth of borehole exploration.

It should be noted that the silt/clay/sand/till soil is unsorted deposit; therefore, boulders and cobbles are anticipated.

Groundwater: Upon completion of drilling all monitoring wells by Shad and Associates Inc., were dry.

The results of water level readings are summarized on the Record of Borehole Sheets in Appendices B&C and Table 2.

Table 2 – Groundwater Level Monitoring Results

Monitoring Well Id	Ground Surface Elevation (masl)	Water Level (mbgs)	Groundwater Elevation (masl)	Date of Measurement (mm/dd/yyyy)	Depth of Well (mbgs)	Depth of Bentonite (mbgs)	Length of Screen (m)	Inside Diameter of Pipe (mm)	Top of Monitoring Well
BH 1	184.70	2.80	181.90	3/9/2018	7.70	5.70	3.05	50	Flush Mount
		2.90	181.80	3/16/2018					
		2.80	181.90	1/6/2023					
BH 3	185.80	3.70	182.10	3/9/2018	7.70	5.70	3.05	50	Flush Mount
		3.60	182.20	3/16/2018					
		3.74	182.06	1/6/2023					
BH 4	185.10	3.60	181.50	3/9/2018	7.70	5.70	3.05	50	Flush Mount
		3.50	181.60	3/16/2018					
		3.26	181.84	1/6/2023					
BH 5	186.60	4.20	182.40	3/9/2018	7.70	5.70	3.05	50	Flush Mount
		4.30	182.30	3/16/2018					
		0.74	185.86	1/6/2023					
BH 8	186.70	DRY	-	3/9/2018	7.70	5.70	3.05	50	Flush Mount
		6.40	180.30	3/16/2018					
		NF	-	1/6/2023					
BH 9	186.70	2.90	183.80	3/9/2018	7.70	5.70	3.05	50	Flush Mount
		2.90	183.80	3/16/2018					
		3.76	182.94	1/6/2023					
BH 10	186.60	2.90	183.70	3/9/2018	7.70	5.70	3.05	50	Flush Mount
		3.00	183.60	3/16/2018					
		2.94	183.66	1/6/2023					
BH 12	186.80	3.60	183.20	3/9/2018	7.70	5.70	3.05	50	Flush Mount
		3.60	183.20	3/16/2018					
		3.72	183.08	1/6/2023					
Min	184.70	0.74	180.30	-	7.70	-	-	-	-
Max	186.80	6.40	185.86	-	7.70	-	-	-	-
Average	186.13	3.40	182.67	-	7.70	-	-	-	-

It should be noted that groundwater levels are subject to seasonal fluctuations. Consequently, definitive information on the long-term groundwater levels could not be obtained during this investigation.

Subject to the owner's approval, groundwater monitoring should continue, and the

results should be presented in a separate report addressing Geohydrology/Dewatering induced Settlement issues.

A Geohydrology assessment dated January 2023 was completed by MCR and results are presented in a separate report.

6.0 FOUNDATION

The latest architectural drawings (Appendix A) show that the Site is proposed for residential development and will consist of:

- **South Block:** A fifteen [15] storey building (Tower 1) with eight [8] storey podiums, a fourteen [14] storey building (Tower 2) with eight [8] storey podium, a thirteen [13] storey building (Tower 3) with eight [8] storey podiums, and a fifteen [15] storey building (Tower 4) with six [6] storey podium over two [2] levels of underground parking.

- **North Block:** A thirteen [13] storey building (Tower 5) and a twelve [12] storey building (Tower 6), with eight [8] storey podiums over two [2] levels of combined underground parking, and a fifteen [15] storey building (Tower 7) with eight [8] storey podiums over two [2] levels of underground parking.

The P2 finished floor elevations (FFE) in Towers 1 to 7, range between 180.80 to 177.05 m.

The following recommendations are based on the current information and design. Should changes be made during the design phase or construction, this office must be informed and retained to modify recommendations accordingly or propose additional field work.

Subject to design loads/grades the proposed residential development with two [2] levels of U/G parking, can be supported by conventional spread/strip footings, founded in the competent undisturbed (by hydrostatic pressure) native soils.

6.1 SPREAD/STRIP FOOTINGS

The proposed footings could be proportioned using the following bearing resistance:

Factored Bearing Resistance at ULS = 560 kPa
Bearing Resistance at SLS = 400 kPa

When the underside of the proposed footings is founded at or below at or below Elevation of 179.90 m, subject to field inspection and confirmation during excavations.

6.2 GENERAL FOUNDATION NOTES

It is essential that the groundwater be lowered a minimum of 1.0 m below the underside of the proposed footings/elevator pit. The clayey silt/sandy silt soil encountered at the foundation level, will be subject to dilation/quick condition when saturated/subjected to hydrostatic pressure, subject to groundwater monitoring results.

We request that a preliminary foundation plan be prepared. Our office must review the foundation plan and detailed settlement analyses must be carried out for the highest column load/bearing resistance combination.

The proposed settlement analyses will quantify the anticipated amount of the “during” and “post construction’ settlement. The actual amount of settlement should be monitored during the construction of the buildings.

It should also be noted that the till, and interbedded sand soils, in southern Ontario are glacial/interglacial in origin and as such contain cobbles, boulders and other erratic rock, the precise placement and location of which cannot be determined without comprehensive excavation. Removal of cobbles, boulders and other erratic rock will usually result in extra excavation and construction cost.

It is recommended that your excavation and construction contract provisions

include unit prices for excavation into soils which may contain cobbles, boulders and erratic rock to minimize potential unexpected extra costs during excavation and foundation installations.

In case of water penetration through the exposed shoring toes (within the waterbearing sand deposit/wet silty soils), bentonite mud, tremie concrete and/or re-drillable low strength concrete may have to be used. The contractor must be prepared to deal with the situation without undue delays.

Adjacent footings, founded at different elevations, should be stepped at 10 horizontal to 7 vertical.

For frost protection requirements, all foundations in unheated underground parking P2 must have a minimum soil cover of 0.90 m.

Any water or loose materials must be removed from the footing bases prior to placing concrete.

The recommended resistance at SLS allows for up to 25 mm of total settlement. Potential differential settlements are to be evaluated after completion of the foundation drawings.

Furthermore, the recommended bearing resistance and foundation elevations have been calculated from the borehole information and, are intended for design purposes only.

More specific information with respect to soil/foundation conditions between the boreholes will be available when the proposed foundation installation is underway. Therefore, the encountered soil/foundation conditions must be verified in the field, and all foundations must be inspected and approved by our office prior to placement of concrete.

As indicated on Drawing No. 6, there is a 9 m wide buffer between the shoring line and the property boundary. Additionally, the existing slope towards the Natural Heritage System (N.H.S.), has a very gentle inclination of 4V:34H. Based on this assessment, it is anticipated that the underground parking structure will have no

discernible impact on the N.H.S.

7.0 EARTHQUAKE CONSIDERATION

The building must be designed to resist a minimum earthquake force. The National Building Code specifies that the building be designed to withstand a minimum lateral seismic force, V, which is assumed to act non-currently in any direction on the building as per the following expression:

$$V = S(T_a)\, M_v I_E W / R_d R_o$$

It should be noted that V shall not be less than:

$$S(2.0)\, M_v I_E W / R_d R_o$$

In addition, the SFRS (Seismic Force Resisting System (s)) with R_d equal to or greater than 1.5, V should not be greater than:

$$2/3\, S(0.2)\, I_E W / R_d R_o$$

Where $S(T_a)$ shall be calculated by $S_a(T_a)F_a$ or $S_a(T_a)F_v$, depending on fundamental lateral period T_a. The terms, which are relevant to the geotechnical conditions at the site, are acceleration-based site coefficient F_a and velocity-based site coefficient F_v.

For the subject site, which is classified as Class C (based on the borehole information), the applicable values of F_a and F_v are 1.0 and 1.0, respectively. A structural consultant should review all factors.

To better define/confirm the site classification a Shear Wave Velocity (SWV) test must be carried out.

8.0 BASEMENT WALLS

Underground parking walls should be designed to resist a pressure "p", at any depth, "h" below the surface, as given by the expression:

$$p = K[\gamma h + q]$$

Where: K = 0.40 is the earth pressure coefficient considered applicable

γ = 21.7 kN/m^3 is the unit weight of backfill

q = an allowance for surcharge.

The above equation assumes that perimeter drains will be provided and that the backfill against subsurface walls, where applicable, would be a free draining granular material.

However, subject to groundwater conditions and the presence of the wet sandy silt/ silty sand soils, all subject to further groundwater monitoring results, we suggest that perimeter walls below the groundwater level be designed for hydrostatic pressure to resist a pressure "p", at any depth "h" below the surface, as given by the expression:

$$p = \begin{cases} Kq + K\gamma_m h & h \leq D_w \\ Kq + K\gamma_w D_w + K(\gamma_s - \gamma_w)(h - D_w) + \gamma_w(h - D_w) & h > D_w \end{cases}$$

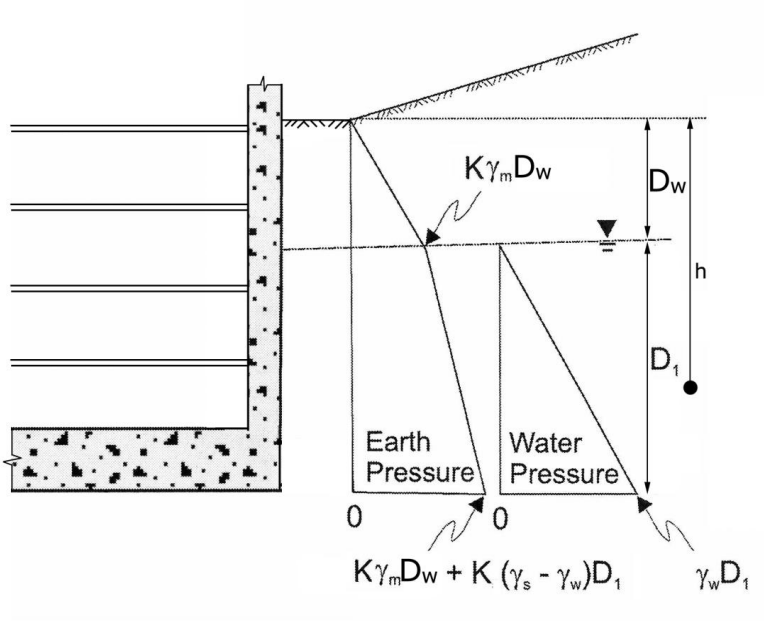
Where: K = 0.50 is the earth pressure coefficient considered applicable

γ_m = 20 kN/m^3 is moist or wet soil unit weight

γ_s = 21.7 kN/m^3 is saturated soil unit weight

γ_w = 9.80 kN/m^3 is the unit weight of water

q = an allowance for surcharge



9.0 DEWATERING

The excavation for the proposed underground parking will extend below the groundwater table.

In order to protect the bottom and sides of the excavation from being disturbed by excess groundwater pressure, i.e. to prevent quick sand/dilating silt conditions, the water table must be lowered to at least 1.0 m below the bottom of the footing/elevator excavations.

Positive dewatering, such as well points/eductors will be required for the proposed excavation, subject to long term groundwater monitoring results and depth of excavation.

The selected dewatering system, designed and installed by a specialty contractor, will be most effective if it is installed and activated at the earliest opportunity during general excavation.

The selected dewatering contract must be performance driven and the contractor must provide a performance bond. In addition, upon completion of system's installation, the contractor must produce a written statement that "The system installed is robust enough to lower and maintain groundwater at least 1.0 m below the lowest footing elevation, without impacting the integrity of shoring or foundation soils.

It is reiterated that on site soils might be subject to localized piping. Creation of piping channels might result in a substantial increase in the volume of both temporary dewatering and permanent drainage. It is critical that upon completion of general excavation **potential formation of localized piping be carefully evaluated and appropriate corrective measures implemented.**

A pre-construction survey of adjacent structures/roads should be carried out prior to the dewatering/shoring construction stage. Potential adverse effects on adjacent structures, due to the dewatering must be assessed/quantified and suitable preventive/remedial measures implemented.

10.0 EXCAVATION AND BACKFILL

Excess soils shall be managed in accordance to O. Reg. 406/19. As of January 1, 2022, the Project Leader may be required to file a notice in the registry as prescribed under Section 8 of the regulation. The notice shall contain the information set out in Schedule 1 of the regulation. Before the notice is filed the Project Leader shall ensure that a Qualified Person (Qualified Person within the meaning of Section 5 or 6 of O. Reg. 153/04) prepares the documents, as required, under Sections 11, 12, 13 of the regulation.

The Project Leader shall, if required to file a notice and before removing excess soil from the project area, develop and apply a tracking system in accordance with the Soil Rules, to track each load of excess soil during its transportation and deposit.

No major problems will be encountered for the anticipated depth of general excavations, carried out within a shoring wall enclosure.

For excavation above the water table, the anticipated water seepage, if any, into the excavations from the more permeable seams/lenses or surface run-off can be handled by conventional pumping methods.

A dewatering system such as wellpoints/eductors will be required for excavation at/below the groundwater level, subject to long term groundwater monitoring results.

The material to be used for backfilling in the service trenches should be suitable for compaction, i.e. free of organics and with natural moisture content, which is within 2% percent of the optimum moisture content. The backfill material should be compacted to at least 98% of the Standard Proctor Maximum Dry Density (SPMDD).

The backfill under floor slab and against the subsurface walls, where applicable, should be free draining granular fill, preferably conforming to the Ontario Provincial Standard Specification for granular base course, Granular B.

11.0 SHORING

A shoring system should be designed to protect adjacent structures, roads and services. The fourth edition of the Foundation Manual should be referred to for the design of the shoring system.

It should be noted that groundwater and boulders may be encountered during soldier pile/caisson construction, and the contractor must be prepared to deal with boulders and water seepage into the caisson shafts without undue delays.

Due to the groundwater and wet silty/sandy soil conditions, it will be difficult to prevent groundwater from penetrating into the excavation through gaps in timber lagging.

The geotechnical parameters, which are considered to be applicable for the design, are as follows:

Active earth pressure coefficient Ka = 0.45 for walls in areas where structures or sensitive services are being supported.

Active earth pressure coefficient Ka = 0.28 for remaining areas.

Natural unit weight of soil = 21.7 kN/m^3

Any surcharge loads must be included in the lateral pressure calculations.

Lateral movements of the shoring wall, designed using Ka = 0.28, are expected to be in order of 15 mm. They are expected to be less if Ka value of 0.45 is used. The expected movements are based on a properly constructed system.

The horizontal and vertical movements should be monitored during construction to ensure a satisfactory performance of the shoring system.

The soil anchors should be designed for 35 kPa, subject to confirmation by at least two load tests. **It is re-iterated that subsurface conditions may vary beyond the site's confines**. As a result, the design values must be confirmed by at least two load tests, carried out to twice the design load.
It is imperative that a stability analysis of the entire support system is undertaken prior to commencement of the shoring construction. Our office should review the final shoring design.

The shoring system and surrounding structures must be monitored for horizontal and vertical movements, prior to, during and after the excavation.

Again, a pre-construction survey of the surrounding structures roads is recommended prior to commencement of shoring construction.

In addition, the shoring system and surrounding structures must be monitored for horizontal and vertical movements, prior to, during and after the excavation.

12.0 SLAB ON GRADE AND PERMANENT DRAINAGE

In case of PWDS/infiltration gallery alternative is adopted and approved by the City and the MECP/ECA, the lowest garage floor slab can be constructed as slab on grade (SOG), supported by competent native undisturbed sand/silt soils.

Any soft spots revealed during proof-rolling should be sub-excavated and backfilled with suitable granular material, compacted to 98% SPMDD.

Upon completion of foundation work, the SOG should rest on a well compacted bed of size 19 mm clear stone at least 200 mm thick. The stone bed would act as a barrier and prevent capillary rise of moisture from the subgrade to the floor slab.

Subject to permits, a permanent Private Water Drainage System (PWDS), as shown on Drawing No. 7 and 8, where shoring is constructed, could be considered. Please note that MCR does not prepare working/shop drawings for the PWDS.

To minimize siltation, all drainage pipe connections must be solid slotted PVC, with elbows and Ts, no "butt" end connections should be permitted. The pipes should slope to a sump at a minimum 1% slope.

Perimeter drainage pipes, with a positive gravity outlet, should be solid and slotted PVC with a minimum of 0.5% slope. In addition, silt traps must be provided at convenient/accessible locations.

We request that PWDS drawings indicate design elevations for both perimeter and underfloor installation. MCR will provide calculations for sizing of permanent pumps, when required.

Upon completion of general excavation, scope and adequacy of the PWDS is to be re-evaluated. The installation of PWDS must be inspected by our office, prior to placement of filter stone.

Any design changes must be approved by the architect and reflected on mandatory as built drawings.*

* A copy of this page "Slab on grade and Permanent Water Drainage System" page should be posted at a site office as a permanent display.

In addition, the elevator pit should be fully waterproofed as shown on Drawing No. 9.

13.0 PAVEMENT

The critical section of pavement will be at the transition from the infinitely rigid

substructure onto soil/backfill subgrade.

As a result, we suggest that an approach type slab be considered to protect underground utilities (on the City's property) at the entrance/exit points, as shown on Drawing No. 10.

The approach slab will alleviate detrimental effects of dynamic loading/settlement/pavement depression in the backfill to the rigid substructure.

All granular materials used in the pavement construction should be compacted to 100% of the Standard Proctor Maximum Dry Density.

Asphaltic concrete layer should be compacted to the range of 92 to 96.5% of maximum relative density.

Pavement structures presented in tables 4 and 5 are typical. Subject to the anticipated road traffic volumes/AADT/axle loads, the pavement structural design matrix as per Town of Milton Standards, must be followed.

Table 4 – Typical Pavement Structure

Pavement Layer	Recommended Thickness for Light Duty Parking	Recommended Thickness for Heavy Duty Parking
Asphaltic Concrete	40 mm OPSS HL 3 40 mm OPSS HL 8	50 mm OPSS HL 3 75 mm OPSS HL 8
OPSS Granular A Base (or 19mm Crushed Limestone)	150 mm	150 mm
OPSS Granular B (or 50mm Crushed Limestone)	200 mm	350 mm

Table 5 – Typical Composite Pavement Structure

Pavement Layer	Compaction Requirements	Heavy Duty Pavement
Asphaltic Concrete	92 to 96.5% of Maximum Relative Density	50 mm OPSS HL 1 or HL 3
Portland Cement Concrete (CAN3-CSA A23.1) - Class C-2	CAN3-CSA A23.1	150 mm

Base Course: Granular A (OPSS 1010) or 19 mm Crusher Run Limestone	100% Standard Proctor Maximum Dry Density (ASTM-D698)	150 mm

A typical pavement structure above garage roof slab, please see Drawings No. 11 & 12.

14.0 CHEMICAL PROPERTIES OF THE SOIL

Two (2) samples from boreholes 102 and 106 were submitted to Bureau Veritas to be tested for common corrosion parameters, including pH, resistivity, oxygen reduction potential (redox), chlorides, sulfides and sulphate content. The laboratory test results are presented in Appendix D.

14.1 CORROSIVITY

The results regarding corrosivity of the subsurface soil and the corresponding points based on American Water Works Association (AWWA) document, "Polyethylene Encasement for Ductile-Iron Pipe Systems" ANSI/AWWA C105/A21.5-18, dated December 1, 2018, are presented in Table 6.

Table 6 – Results of Soil Corrosivity Potential

Sample ID	Depth (m)	Parameter	Measured Value	ANSI/AWWA Point Rating	Total ANSI/AWWA Points
BH102 SS10	10.70	Sulphide (%)	<0.00005	2	3
		pH	8.04	0	
		Resistivity (ohm.cm)	5000	0	
		Redox Potential (mV)	350	0	
		Moisture (%)	10	1	
BH106 SS9	9.15	Sulphide (%)	<0.00005	2	3
		pH	8.03	0	
		Resistivity (ohm.cm)	3700	0	
		Redox Potential (mV)	250	0	
		Moisture (%)	11	1	

According to AWWA a value below 10 for total points is considered non-corrosive to ductile-iron pipes and therefore no corrosion protection is recommended. It

should be noted that the analytical results only provide an indication of the potential for corrosion.

14.2 SULPHATE ATTACK

The concentration of water-soluble sulphate content of the tested samples was 0.0073% and 0.0110% which are below the CSA Standard of 0.1% water-soluble sulphate (Table 3 - Additional Requirements for Concrete Subjected to Sulphate Attack from Canadian Standard CSA A23.1). Therefore, no particular protection measure, such as special concrete mix, against sulphate attack needs to be implemented.

15.0 GENERAL COMMENTS

The comments given in this report are intended only as guidance for design engineers and are subject to field verification during construction. As more specific subsurface information, with respect to conditions between boreholes becomes available during excavations on the subject site, this report should be updated.

Contractors bidding on or undertaking the work should decide on their own investigations, as well as their own interpretations of the factual borehole results. This concern specifically applies to the classification of the subsurface soil and the potential reuse of these soils on/off site.

The contractors must draw their own conclusions as to how the near surface and subsurface conditions may affect them.

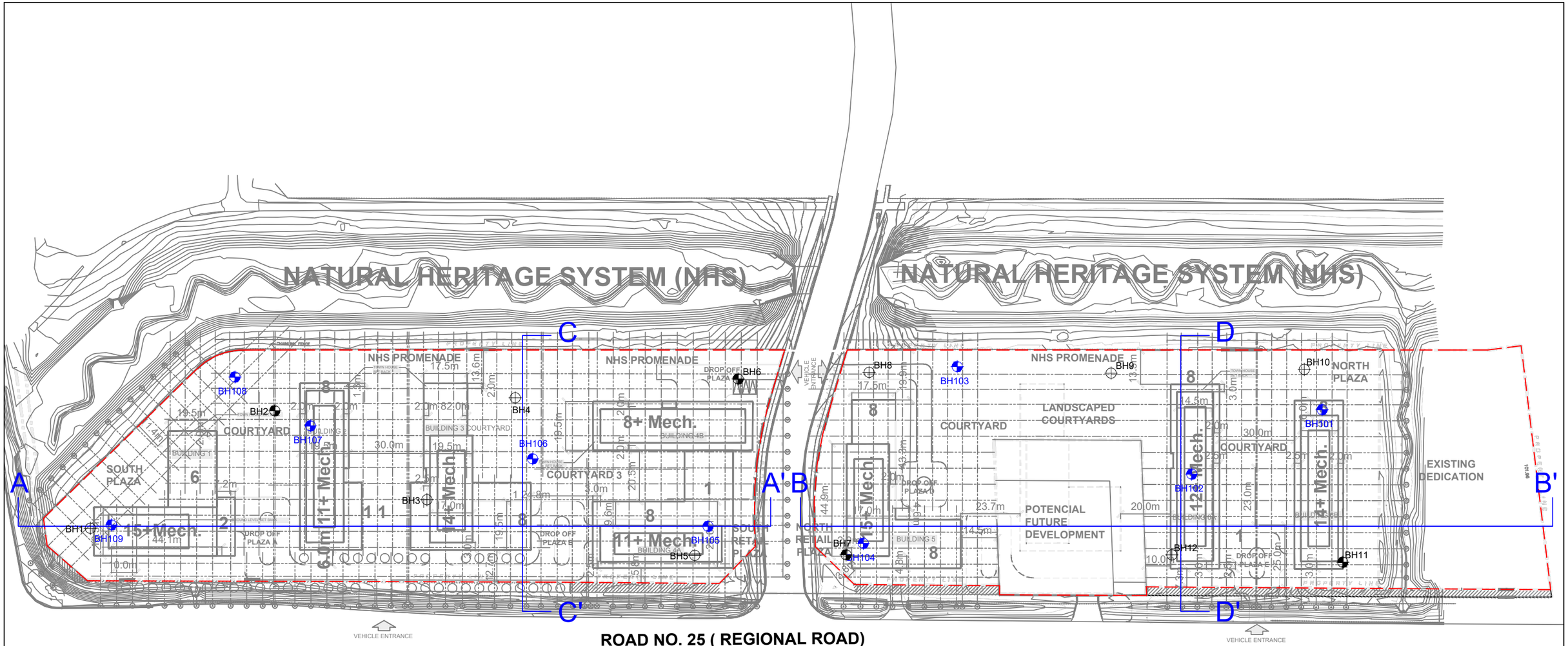
We trust this report contains information requested at this time. However, if any clarification is required or if we can be of further assistance, please call us.

Respectfully,
McCLYMONT & RAK ENGINEERS INC.

S. Tavassoli, M.Sc., E.I.T.

L.J. Rak, M.Eng., P.Eng.

DRAWINGS



LEGEND:

- PROPERTY BOUNDARY
- BOREHOLE/MONITORING WELL BY SHAD & ASSOCIATES, 2018
- MONITORING WELL INSTALLED BY MCR, JUL.-AUG. 2022

Drawing Notes: Image drafted from property survey, Toronto Maps, Google Maps, and site inspections. Not for construction purposes.

PROJECT NORTH

TRUE NORTH

0 15 30 60

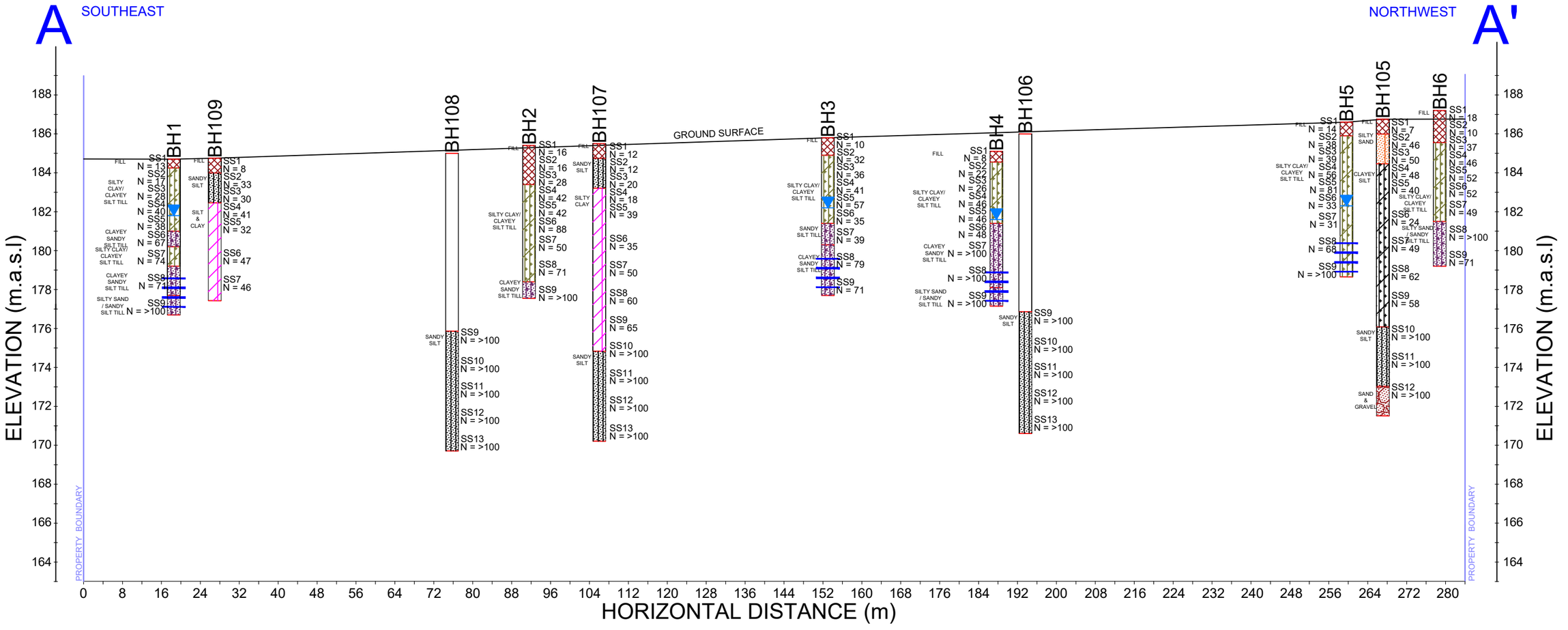
SCALE (m)

McCLYMONT&RAK ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

NORTH-WESTERN CORNER OF REGIONAL ROAD 25 & BRITANNIA ROAD, MILTON, ONTARIO

BOREHOLE LOCATION PLAN

Project No.	Date	Drawn by:	Checked by:	Drawing No.
G5820	JANUARY 2023	CM	ST	1



LEGEND:

- SCREENED INTERVALS
- ELEVATION MARK (masl)
- APPROXIMATE WATER LEVEL
- FILL
- SAND
- SILTY SAND
- SHALE
- SILT
- CLAYEY SILT
- SANDY SILT

McCLYMONT&RAK ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

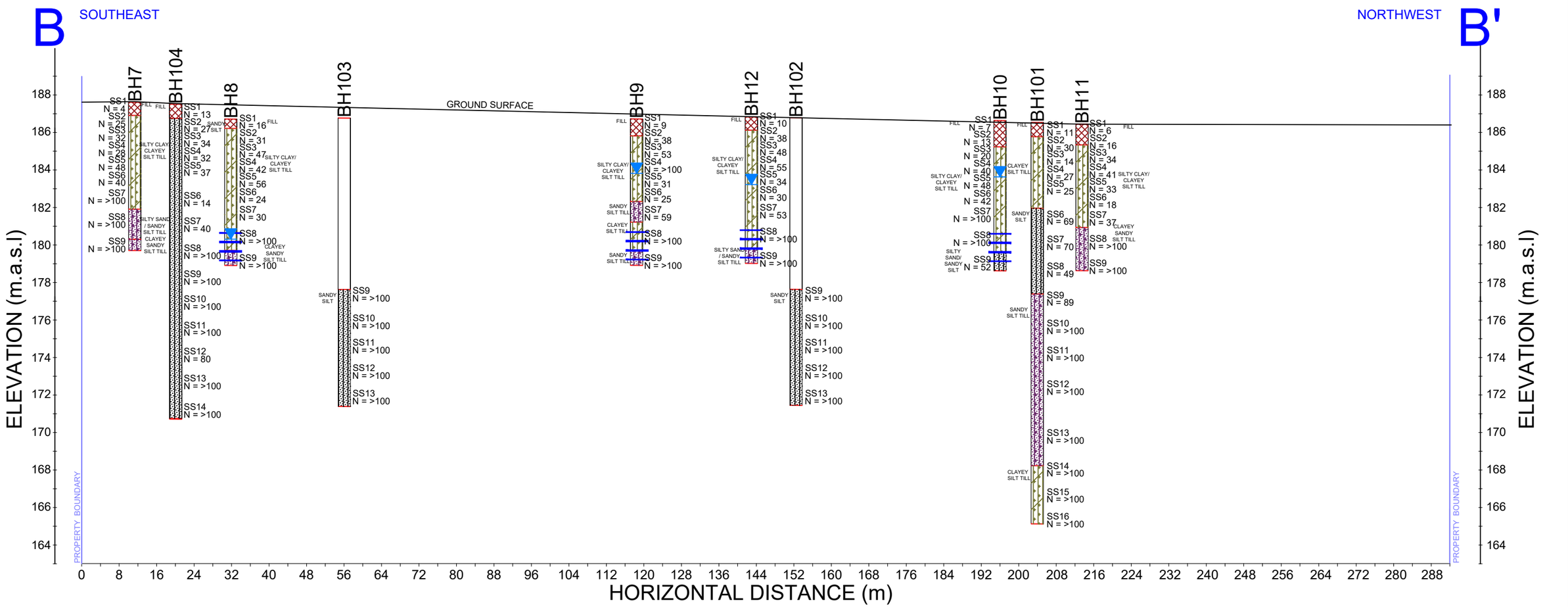
NORTH-WESTERN CORNER OF REGIONAL ROAD 25 & BRITANNIA ROAD, MILTON, ONTARIO

CROSS-SECTION A-A'

Project No.	Date	Drawn by:	Checked by:	Drawing No.
G5820	JANUARY 2023	CM	ST	2

B SOUTHEAST

NORTHWEST B'



LEGEND:

- SCREENED INTERVALS
- ELEVATION MARK (masl)
- APPROXIMATE WATER LEVEL
- FILL
- SHALE
- SANDY SILT
- SAND
- SILT
- SILTY SAND
- CLAYEY SILT

McCLYMONT&RAK ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

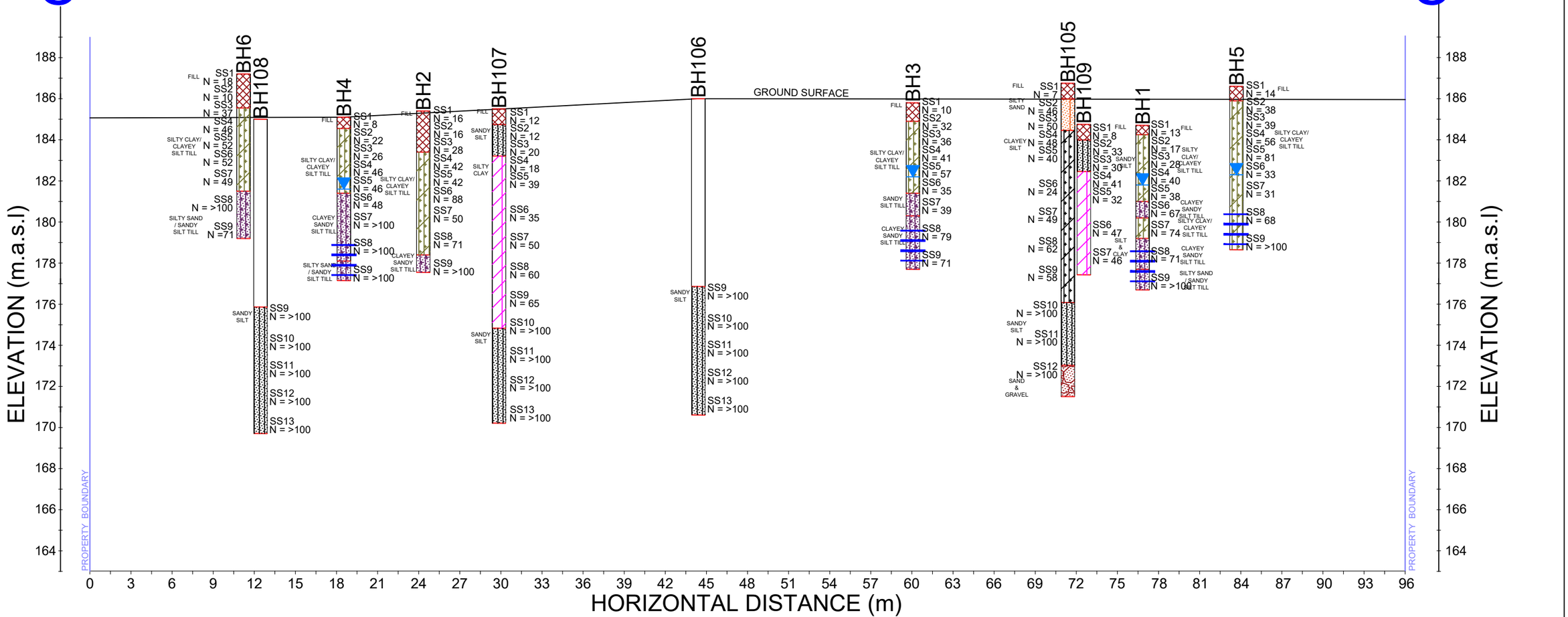
NORTH-WESTERN CORNER OF REGIONAL ROAD 25 & BRITANNIA ROAD, MILTON, ONTARIO

CROSS-SECTION B-B'

Project No.	Date	Drawn by:	Checked by:	Drawing No.
G5820	JANUARY 2023	CM	ST	3

C SOUTHWEST

NORTHEAST C'



LEGEND:

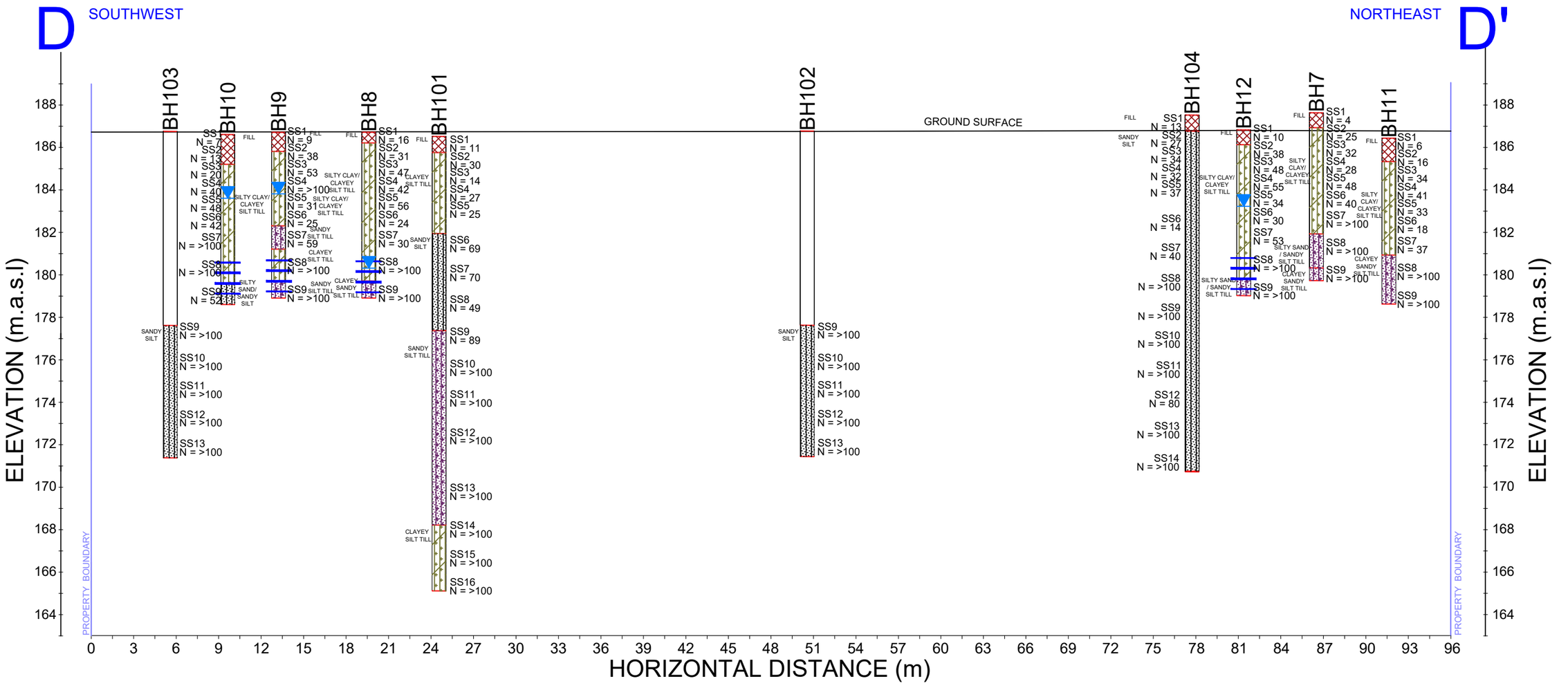
- SCREENED INTERVALS
- ELEVATION MARK (masl)
- APPROXIMATE WATER LEVEL
- FILL
- SHALE
- SANDY SILT
- SAND
- SILT
- SILTY SAND
- CLAYEY SILT

McCLYMONT&RAK ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

NORTH-WESTERN CORNER OF REGIONAL ROAD 25 & BRITANNIA ROAD, MILTON, ONTARIO

CROSS-SECTION C-C'

Project No.	Date	Drawn by:	Checked by:	Drawing No.
G5820	JANUARY 2023	CM	ST	4



LEGEND:

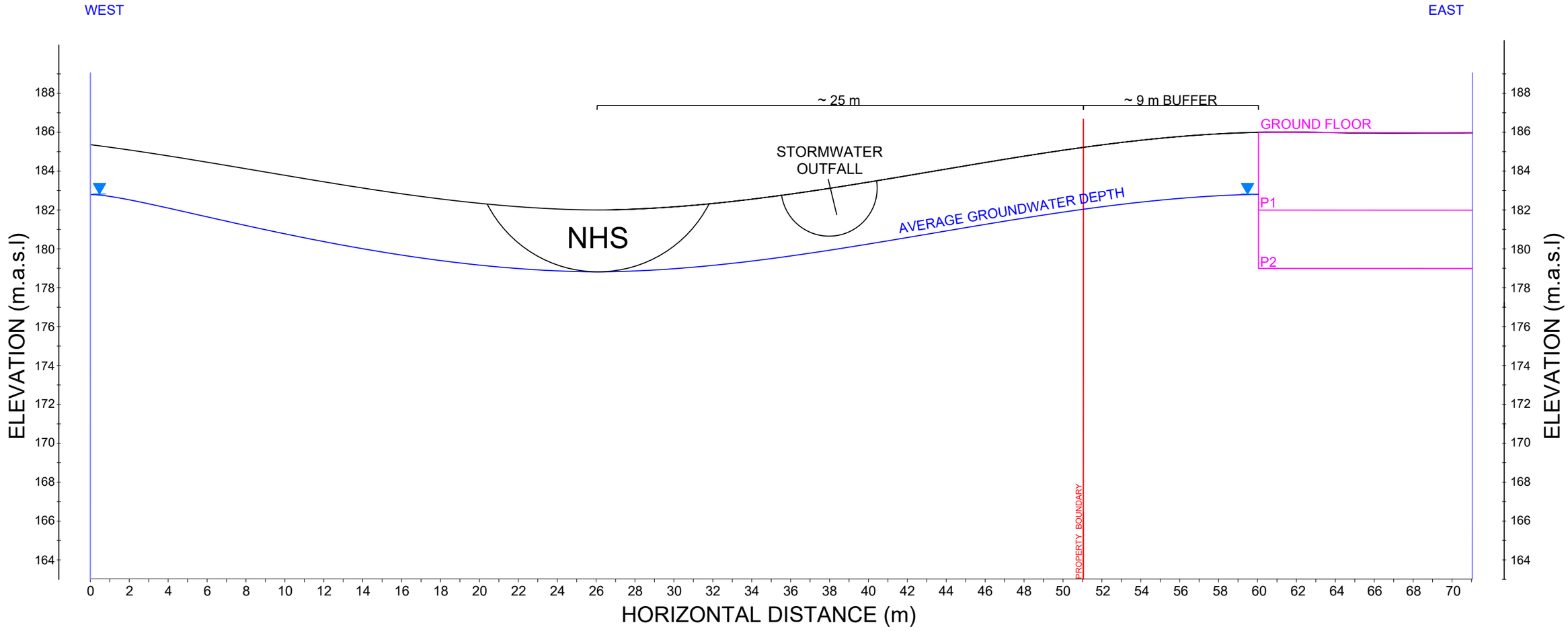
- SCREENED INTERVALS
- ELEVATION MARK (masl)
- APPROXIMATE WATER LEVEL
- FILL
- SAND
- SILTY SAND
- SHALE
- SILT
- CLAYEY SILT
- SANDY SILT

McCLYMONT&RAK ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

NORTH-WESTERN CORNER OF REGIONAL ROAD 25 & BRITANNIA ROAD, MILTON, ONTARIO

CROSS-SECTION D-D'

Project No.	Date	Drawn by:	Checked by:	Drawing No.
G5820	JANUARY 2023	CM	ST	5



LEGEND:

- UNDERGROUND EXCAVATION
- WATER LEVEL

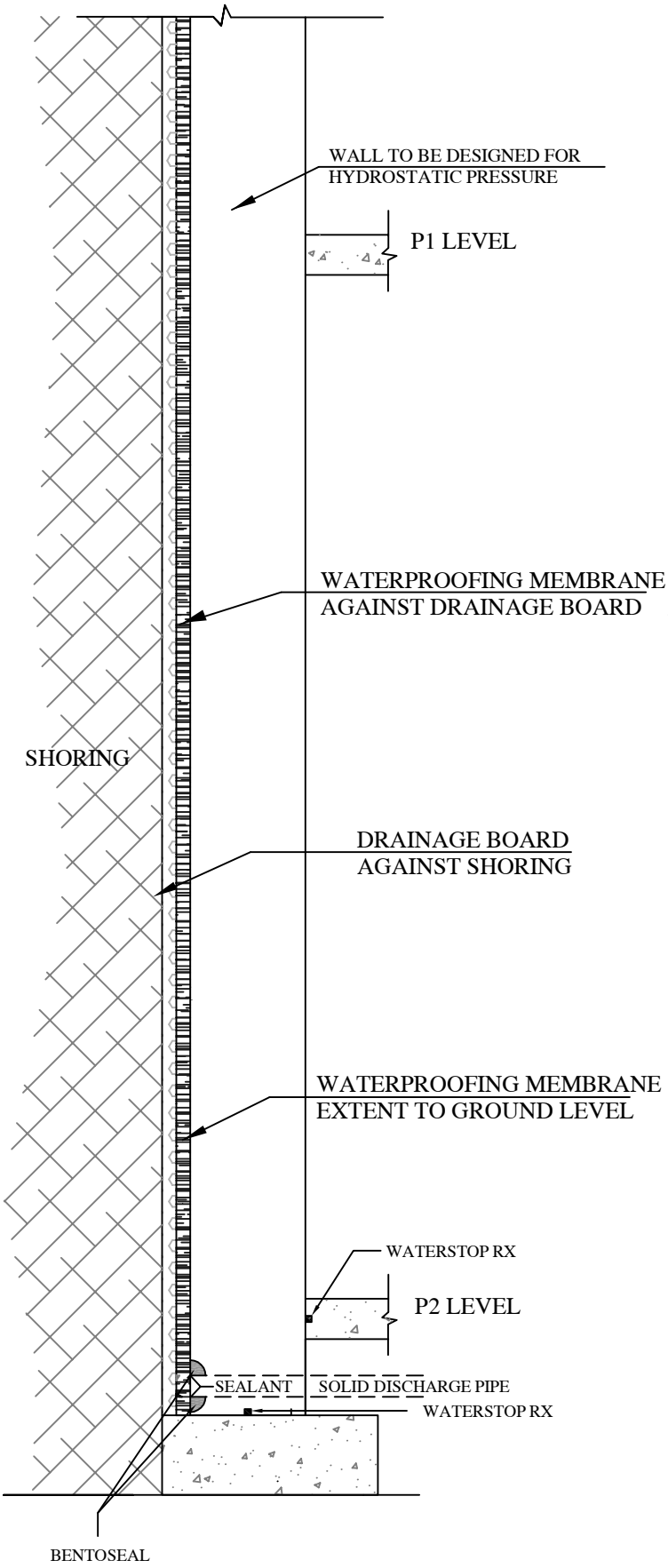
McCLYMONT&RAK ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

NORTH-WESTERN CORNER OF REGIONAL ROAD 25 & BRITANNIA ROAD, MILTON, ONTARIO

CROSS-SECTION
(SOUTH BLOCK)

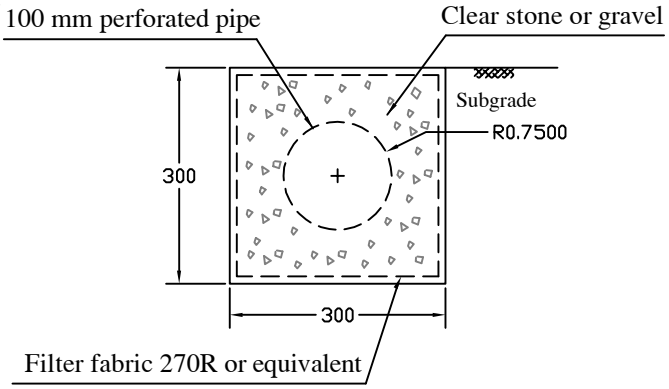
Project No.	Date	Drawing No.
5820	MARCH 2023	6

SUGGESTED EXTERIOR DRAINAGE AGAINST SHORING



NOTE:

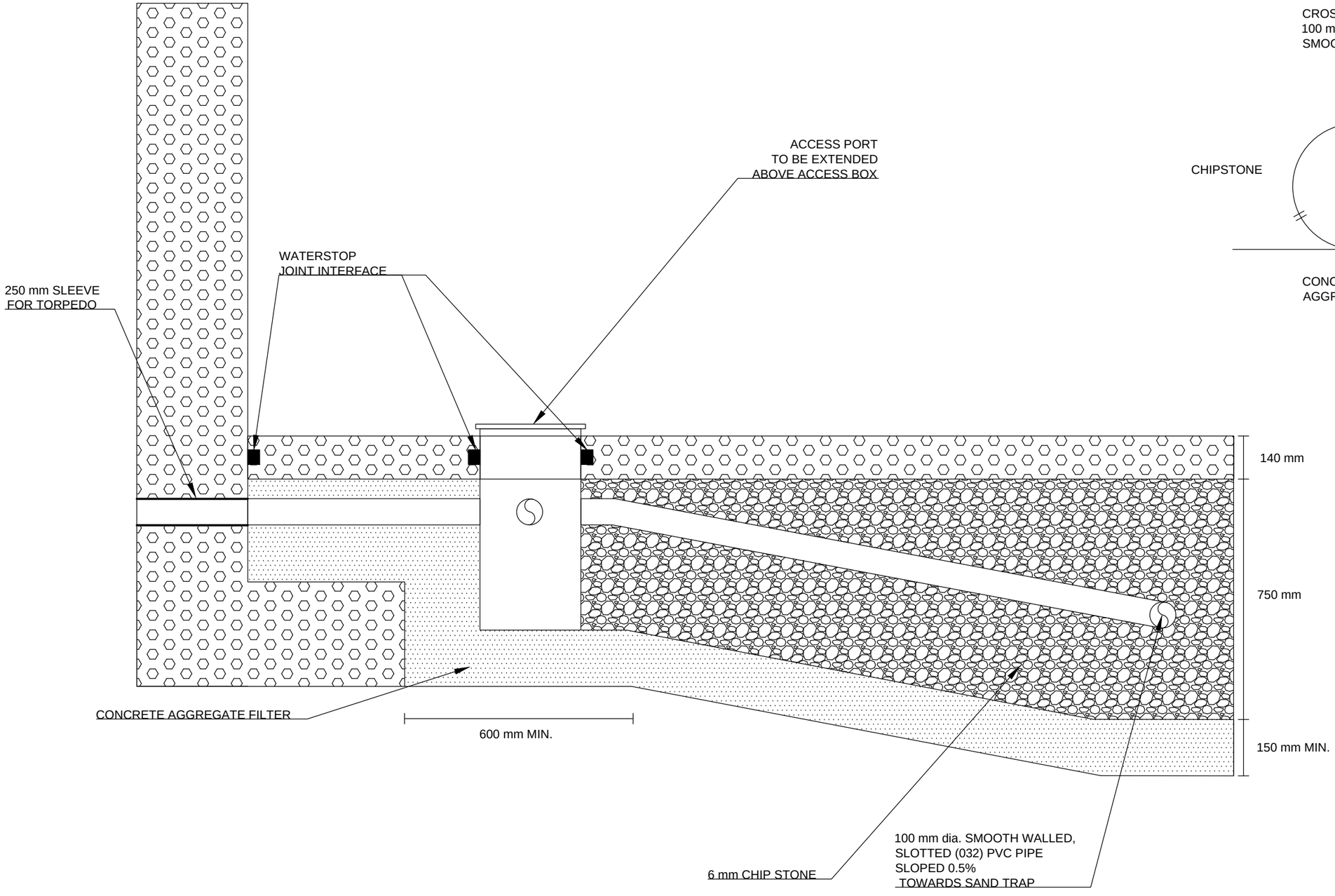
* All permanent drainage pipes must have Geotextile filter sleeve to prevent long term silting. To further minimize siltation of the drainage system, all drainage pipe connections must be solid PVC elbows and Ts, no "butt" end connections should be permitted.
* Perimeter collection pipe to be solid pipe.



DETAILS OF SUB-FLOOR DRAINS
TO BE PLACED IN PARALLEL ROWS 6- 8M (20'- 25')
CENTERLINE TO CENTERLINE.

McCLYMONT AND RAK ENGINEERS INC.
GEO-ENVIROMENTAL CONSULTANTS
1271 DENISON STREET, UNIT 45, MARKHAM, ON. TEL: 905 470 0160 FAX : 905 475 6371

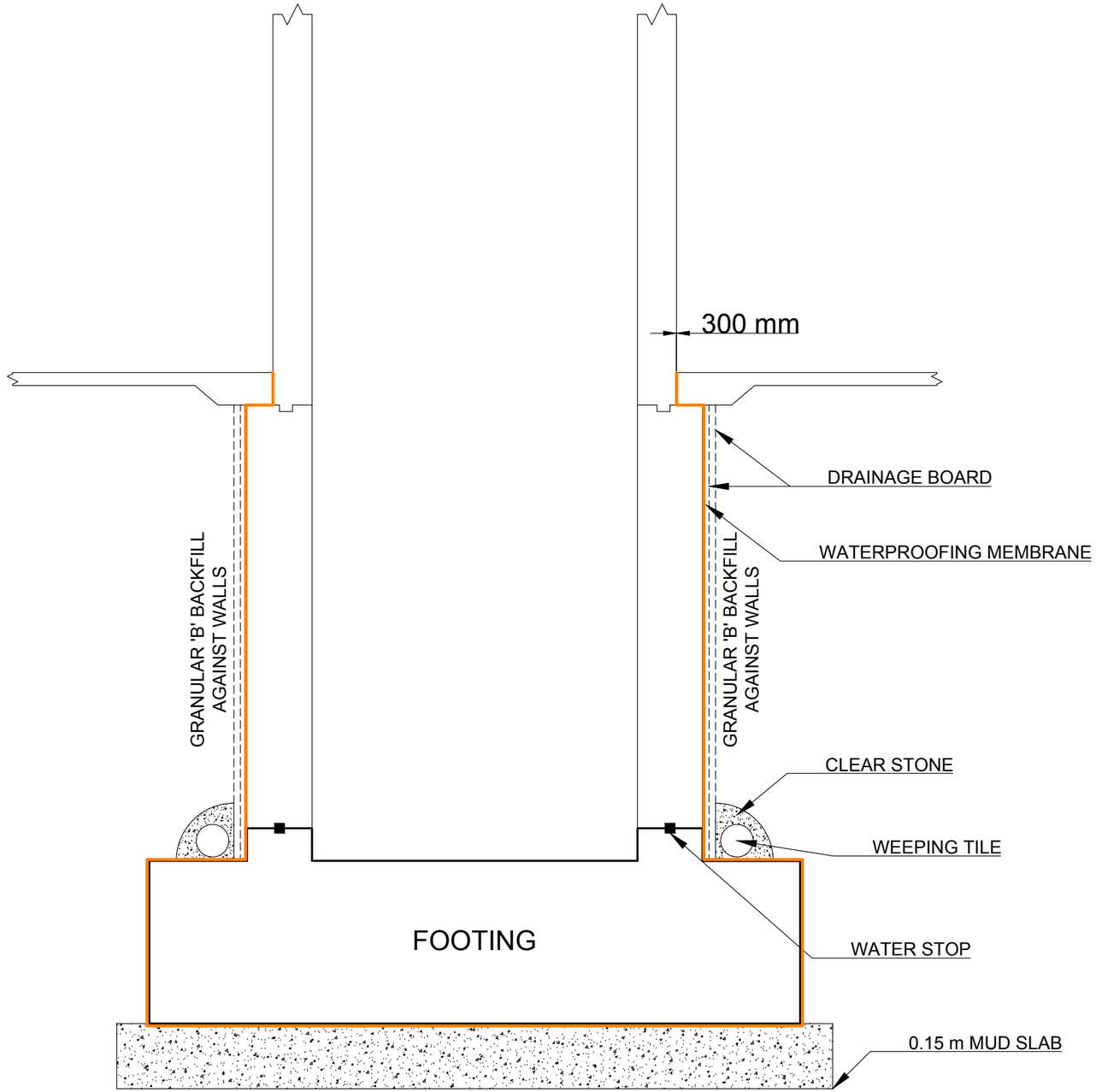
Project : PROPOSED DEVELOPMENT		
Scale : N.T.S.	Date :	Drawing No. 7



McCLYMONT&RAK
ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

PRIVATE WATER DRAINAGE SYSTEM

Scale:	Drawing No.
NTS	8

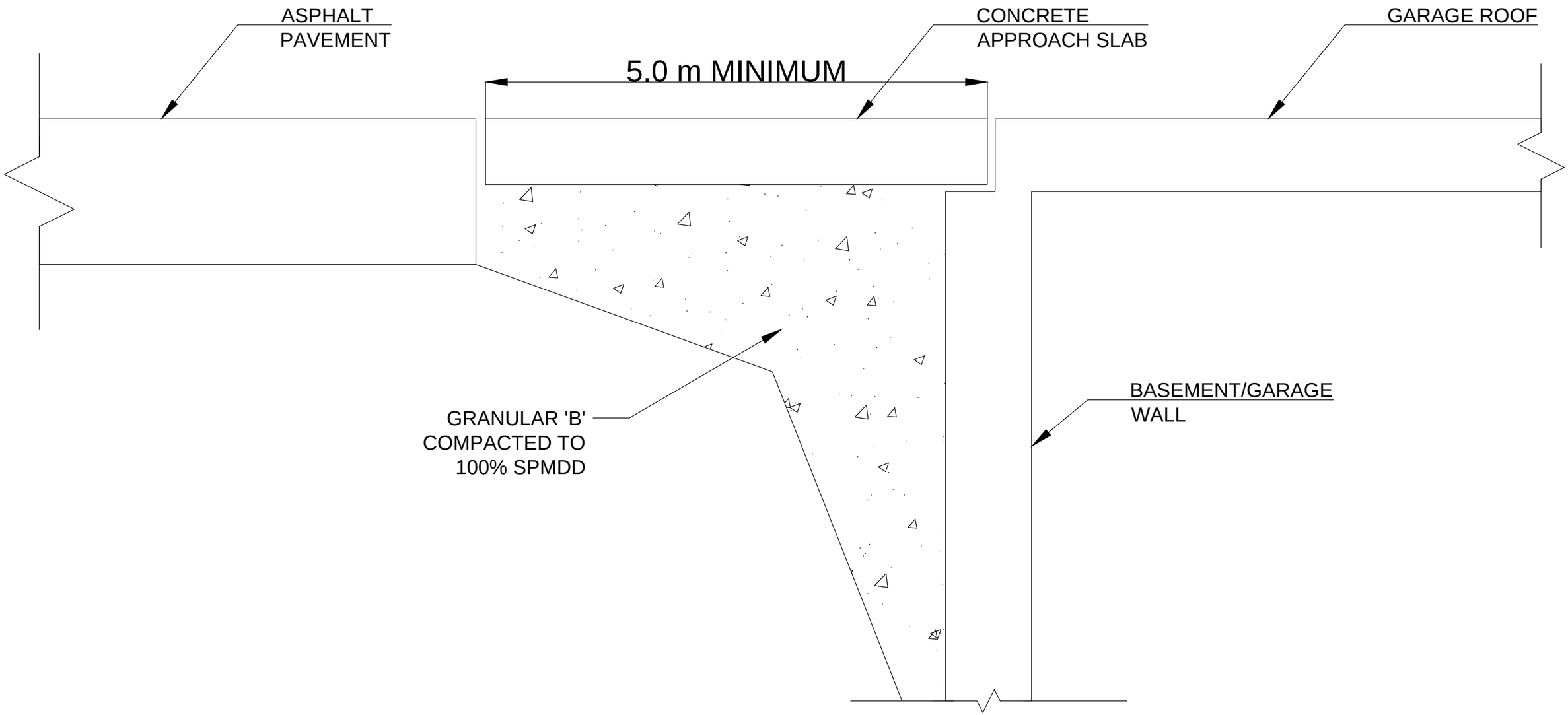


McCLYMONT&RAK ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

TYPICAL ELEVATOR PIT WATERPROOFING

Scale: NTS

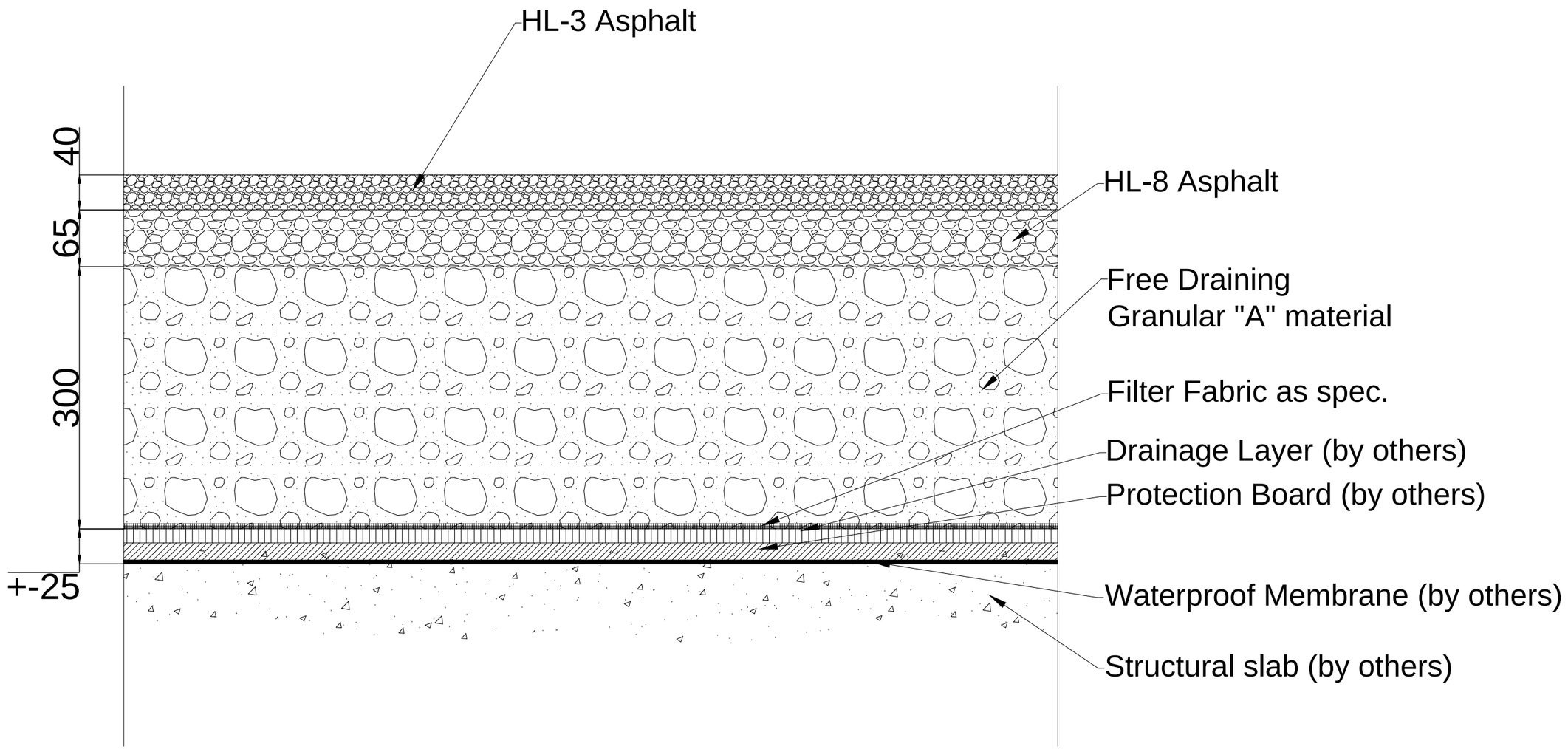
Drawing No. 9



McCLYMONT&RAK
ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

SUGGESTED APPROACH
SLAB DETAIL

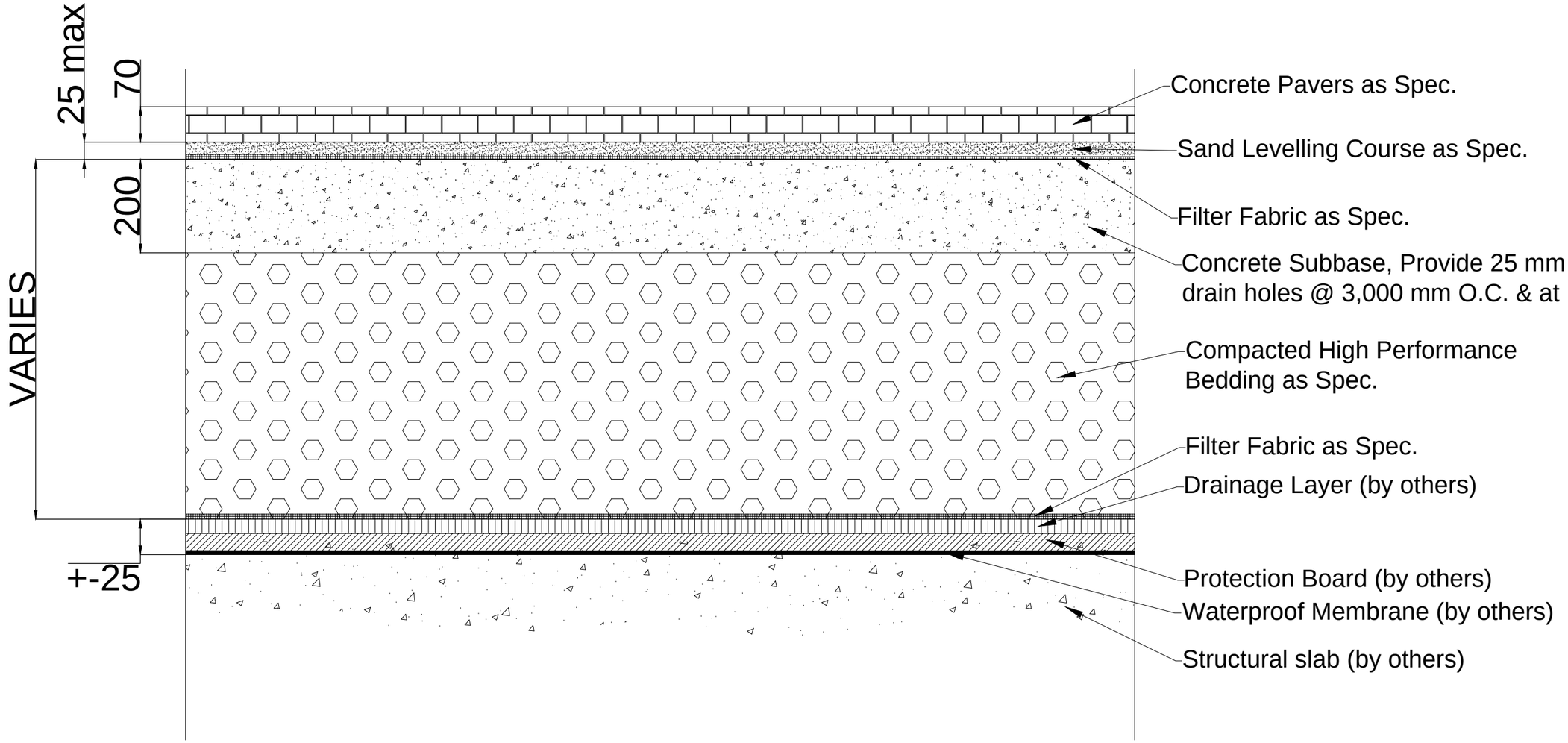
Scale:	Drawing No.
NTS	10



McCLYMONT&RAK
ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

PAVEMENT ABOVE
GARAGE ROOF SLAB

Scale:	Drawing No.
NTS	11



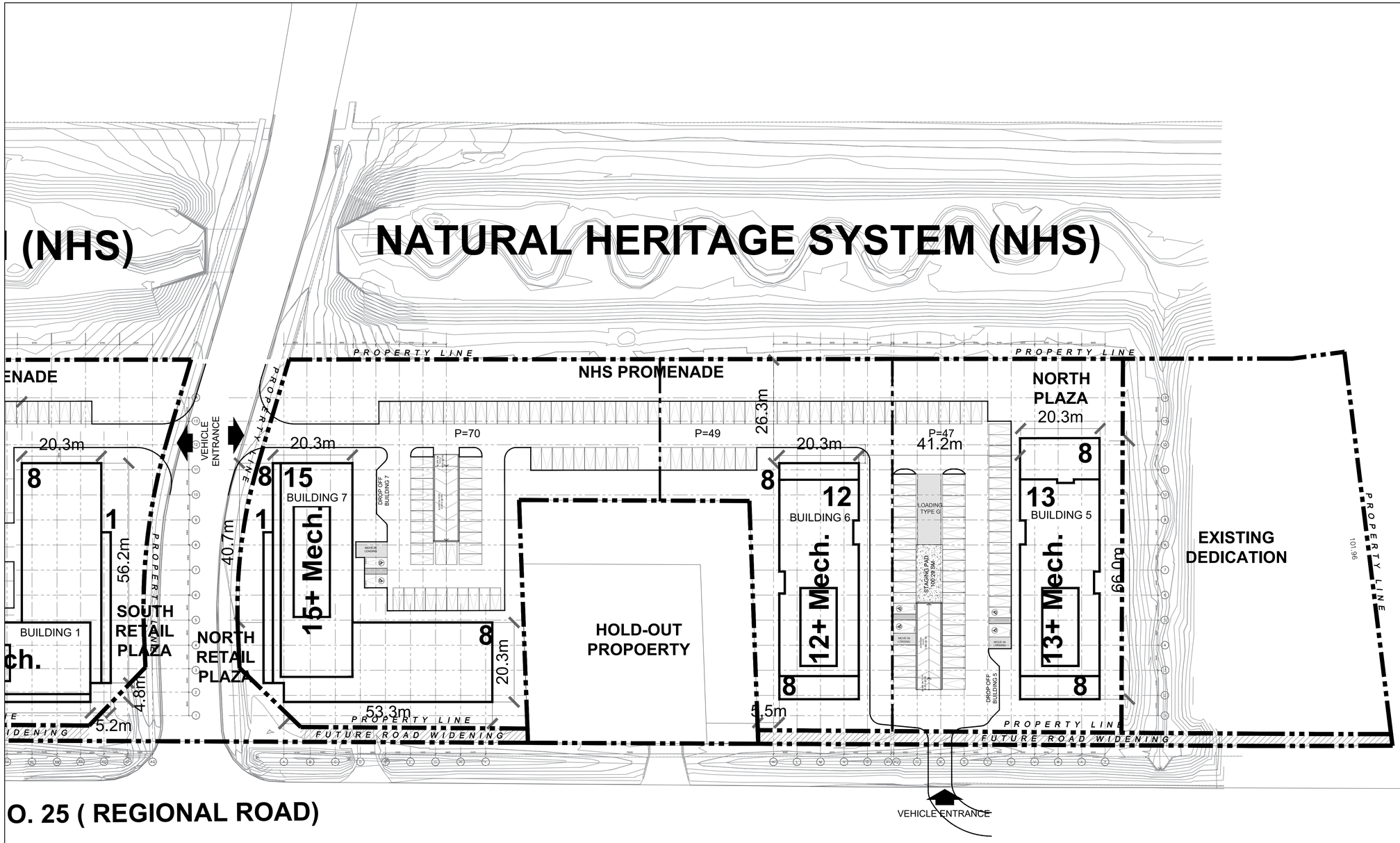
McCLYMONT&RAK
ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

PAVEMENT ABOVE
GARAGE ROOF SLAB

Scale: NTS

Drawing No. 12

APPENDIX A



O. 25 (REGIONAL ROAD)

No.	Revisions	Date

COREARCHITECTS
130 QUEENS QUAY EAST, SUITE 700, WEST TOWER
TORONTO, ON CANADA M5A 0P6
T +1 416 343 0400 • F +1 416 343 0401
INFO@COREARCHITECTS.COM
WWW.COREARCHITECTS.COM

FRAMGARD MATTAMY

MILTON WEST, ONTARIO

PN

Drawn	Scale
MK, JA	1:500
Checked	Date
BL	2023-07-12

Title
NORTH BLOCK SITE PLAN

Project No.	Drawing No.
22-210	A200

NATURAL HERITAGE SYSTEM (NHS)

CHAINLINK FENCE

PROPERTY LINE

NHS PROMENADE

NHS PROMENADE

20.3m

35.2m

20.3m

81.2m

20.3m

VEHICLE ENTRANCE

PROPERTY LINE

17.5m

19.9m

1 8

13 BUILDING 3

14 BUILDING 2

8 1

8

66.7m

13+ Mech.

14+ Mech.

66.7m

20.0m

8

1

56.2m

PROPERTY LINE

SOUTH RETAIL PLAZA

NORTH RETAIL PLAZA

44.9m

43.3m

2.5m

17.0m

15+ Mech.

3.3m

3.8m

4.8m

6 15

15+ Mech.

BUILDING 4

25.6m

8 15

15+ Mech.

BUILDING 1

18.3m

11.5m

FUTURE ROAD WIDENING

2.8m

20.3m

23.1m

37.6m

61.0m

5.2m

4.8m

55.8m

PROPERTY LINE

FUTURE ROAD WIDENING

PROPERTY LINE

FUTURE ROAD WIDENING

VEHICLE ENTRANCE

ROAD NO. 25 (REGIONAL ROAD)

No.	Revisions	Date

COREARCHITECTS
130 QUEENS QUAY EAST, SUITE 700, WEST TOWER
TORONTO, ON CANADA M5A 0P6
T +1 416 343 0400 • F +1 416 343 0401
INFO@COREARCHITECTS.COM
WWW.COREARCHITECTS.COM

FRAMGARD MATTAMY

MILTON WEST, ONTARIO

PN

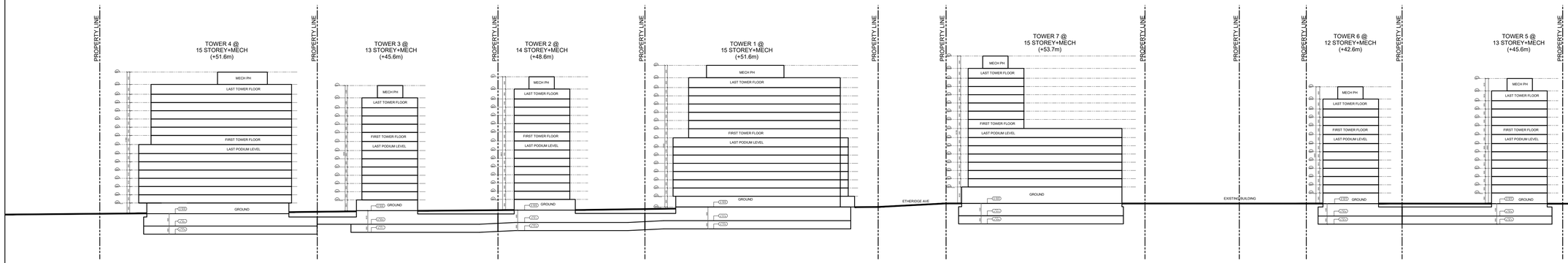
N

Drawn	Scale
MK, JA	1:500
Checked	Date
BL	2023-06-30

Title

SOUTH BLOCK SITE PLAN

Project No.	Drawing No.
22-210	A212



No. | Revisions | Date

COREARCHITECTS
130 QUEENS QUAY EAST, SUITE 700, WEST TOWER
TORONTO, ON CANADA M5A 0P6
T +1 416 343 0400 • F +1 416 343 0401
INFO@COREARCHITECTS.COM
WWW.COREARCHITECTS.COM

FRAMGARD MATTAMY

MILTON WEST, ONTARIO

Drawn: JA
Scale: 1:750
Checked:
Date: 12 JULY 23

Title: OVERALL SECTION A-A

Project No.: 22-210
Drawing No.: **A401**

APPENDIX B

RECORD OF BOREHOLE 101

PROJECT : G5820
LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
STARTED : December 20, 2022
COMPLETED : December 20, 2022

MC CLYMONT & RAK ENGINEERS, INC.

SHEET 1 OF 1
DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊗ 100 200 300 400 / % LEL - (hexane) □ 20 40 60 80	SHEAR STRENGTH: Cu, KPa nat V - ✚ rem V - ● Q - ✖ U - ▲ 20 40 60 80 / WATER CONTENT, PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		186.50							
	POWER BORING / HOLLOW STEM AUGER	FILL: clayey silt, trace of gravel, organics, topsoil inclusions, rootlets, dark brown, moist, stiff.		185.74 0.76	1	SS	11		16.9		
					2	SS	30		14.5		
		CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, very stiff.			3	SS	14		16.9		
2					4	SS	27		12.7		
					5	SS	25		14		
4				181.93 4.57							
		SANDY SILT: some clay and gravel, reddish brown, moist to wet, very dense to dense.			6	SS	69		5.4		
6					7	SS	70		5.5		
		- some clayey silt seams at 7.62 m.			8	SS	49		5.9		
8				177.36 9.14							
		SANDY SILT TILL: trace of gravel, clay, reddish brown, most to wet, very dense.			9	SS	89		14.8		
10		- moist, shale fragments from 10.67 m to 13.72 m.			10	SS	>100		6.8		
12					11	SS	>100		9.2		
		- shale fragments at 13.87 m.			12	SS	>100		13.6		
14											
16					13	SS	>100		8.3		
18				168.21 18.29	14	SS	>100		8.9		
		CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.									
20		- grey shale fragments from 19.81 m to 21.39 m.			15	SS	>100		9.3		
				165.11 21.39	16	SS	>100		14.1		
22		End of Borehole									
		Note:									
24											
26											
28											

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION
WATER LEVEL:

LOGGED : VL
CHECKED : CM

MCR LOG ENVIRONMENTAL 5820.GPJ 1-26-23

RECORD OF BOREHOLE 102

PROJECT : G5820
LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
STARTED : December 21, 2022
COMPLETED : December 21, 2022

MC CLYMONT & RAK ENGINEERS, INC.

SHEET 1 OF 1
DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊗ 100 200 300 400 / % LEL - (hexane) □ 20 40 60 80	SHEAR STRENGTH: Cu, KPa nat V - ✚ rem V - ● Q - ✖ U - ▲ 20 40 60 80 / WATER CONTENT, PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		186.75							
	POWER BORING / HOLLOW STEM AUGER	STRAIGHT DRILLING TO 9.14 m.									
2											
4											
6											
8											
10		SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense.		177.61 / 9.14	9	SS	>100		8.3		
					10	SS	>100		8.5		
12					11	SS	>100		8		
14					12	SS	>100		13.3		
				171.43 / 15.32	13	SS	>100		12		
16		End of Borehole Note:									
18											

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION
WATER LEVEL:

LOGGED : BR
CHECKED : CM

MCR LOG ENVIRONMENTAL 5820.GPJ 1-26-23

RECORD OF BOREHOLE 103

PROJECT : G5820
LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
STARTED : December 21, 2022
COMPLETED : December 21, 2022

MC CLYMONT & RAK ENGINEERS, INC.

SHEET 1 OF 1
DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊗ 100 200 300 400 / % LEL - (hexane) □ 20 40 60 80	SHEAR STRENGTH: Cu, KPa nat V - ✚ rem V - ● Q - ✖ U - ▲ 20 40 60 80 / WATER CONTENT, PERCENT wp ⊢ w ⊣ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		186.75							
	POWER BORING / HOLLOW STEM AUGER	STRAIGHT DRILLING TO 9.14 m.									
2											
4											
6											
8											
				177.61							
10		SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense.		9.14	9	SS	>100		8.5		
					10	SS	>100		8.2		
12					11	SS	>100		11.1		
14					12	SS	>100		11		
				171.38	13	SS	>100		12.7		
				15.37							
		End of Borehole									
16		Note:									
18											

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION — WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION — WATER LEVEL:

LOGGED : BR
CHECKED : CM

MCR LOG ENVIRONMENTAL 5820.GPJ 1-26-23

RECORD OF BOREHOLE 104

PROJECT : G5820
LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
STARTED : December 19, 2022
COMPLETED : December 19, 2022

MC CLYMONT & RAK ENGINEERS, INC.

SHEET 1 OF 1
DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊗ 100 200 300 400 / % LEL - (hexane) □ 20 40 60 80	SHEAR STRENGTH: Cu, KPa nat V - ✚ rem V - ● Q - ✖ U - ▲ 20 40 60 80 / WATER CONTENT, PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		187.50							
	POWER BORING / SOLID STEM AUGER	FILL: sand and gravel, reddish brown, dry, compact.			1	SS	13		12.4		
				186.74							
		SANDY SILT: trace of gravel, reddish brown, moist to wet, compact to very dense.		0.76	2	SS	27		13.4		
2					3	SS	34		12.9		
					4	SS	32		11.1		
					5	SS	37		11.7		
4		- trace of clay, compact from 4.57 m to 6.10 m.			6	SS	14		12.8		
6		- some clay, some gravel, shale fragments from 6.10 m to 16.79 m.			7	SS	40		8.2		
8					8	SS	>100		9.8		
					9	SS	>100		8.7		
10					10	SS	>100		7.2		
12					11	SS	>100		10.7		
14					12	SS	80		10.5		
					13	SS	>100		10.5		
16											
				170.71	14	SS	>100		14.2		
		End of Borehole		16.79							
		Note:									
18											

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION
WATER LEVEL:

LOGGED : BR
CHECKED : CM

MCR LOG ENVIRONMENTAL 5820.GPJ 1-26-23

RECORD OF BOREHOLE 105

PROJECT : G5820
LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
STARTED : December 22, 2022
COMPLETED : December 22, 2022

MC CLYMONT & RAK ENGINEERS, INC.

SHEET 1 OF 1
DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊗ 100 200 300 400 / % LEL - (hexane) □ 20 40 60 80	SHEAR STRENGTH: Cu, KPa nat V - ✚ rem V - ● Q - ✖ U - ▲ 20 40 60 80 / WATER CONTENT, PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		186.75							
	POWER BORING / HOLLOW STEM AUGER	FILL: sand, organics, rootlets, dark brown, moist, loose.		185.99 0.76	1	SS	7		19.2		
		SILTY SAND: brown, moist, dense.			2	SS	46		19.5		
2					3	SS	50		19.5		
		CLAYEY SILT: some sand, shale fragments, reddish brown to grey, moist to wet, hard to very stiff.		184.46 2.29	4	SS	48		11.9		
					5	SS	40		10.2		
4					6	SS	24		11.4		
6		- hard from 6.10 m to 10.67 m.			7	SS	49		7.2		
8					8	SS	62		7.4		
					9	SS	58		10.3		
10											
		SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense.		176.08 10.67	10	SS	>100		10		
12					11	SS	>100		12.3		
		SAND & GRAVEL: brown, wet, very dense.		173.03 13.72	12	SS	>100		12.4		
14											
		End of Borehole		171.51 15.24							
		Note:									
16											
18											

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION
WATER LEVEL:

LOGGED : BR
CHECKED : CM

MCR LOG ENVIRONMENTAL 5820.GPJ 1-26-23

RECORD OF BOREHOLE 106

PROJECT : G5820
LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
STARTED : January 3, 2023
COMPLETED : January 3, 2023

MC CLYMONT & RAK ENGINEERS, INC.

SHEET 1 OF 1
DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊗ 100 200 300 400 / % LEL - (hexane) □ 20 40 60 80	SHEAR STRENGTH: Cu, KPa nat V - ✚ rem V - ● Q - ✖ U - ▲ 20 40 60 80 / WATER CONTENT, PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		186.00							
	POWER BORING / HOLLOW STEM AUGER	STRAIGHT DRILLING TO 9.14 m.									
10		SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense.		176.86 / 9.14	9	SS	>100		13		
		- trace of shale, gravel from 10.67 m to 15.24 m.			10	SS	>100		9.4		
12					11	SS	>100		9.6		
14		- moist from 13.72 m to 15.24 m.			12	SS	>100		11		
				170.61 / 15.39	13	SS	>100		11.1		
		End of Borehole									
16		Note:									

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION — WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION — WATER LEVEL:

LOGGED : BR
CHECKED : CM

MCR LOG ENVIRONMENTAL 5820.GPJ 1-26-23

RECORD OF BOREHOLE 107

PROJECT : G5820
LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
STARTED : January 3, 2023
COMPLETED : January 3, 2023

MC CLYMONT & RAK ENGINEERS, INC.

SHEET 1 OF 1
DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊗ 100 200 300 400 / % LEL - (hexane) □ 20 40 60 80	SHEAR STRENGTH: Cu, KPa nat V - ✚ rem V - ● Q - ✖ U - ▲ 20 40 60 80 / WATER CONTENT, PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		185.50							
	POWER BORING / HOLLOW STEM AUGER	FILL: sand, trace of gravel, organics, brown, moist, compact.			1	SS	12				
				184.74							
		SANDY SILT: trace of clay, brown, moist, compact.		0.76	2	SS	12				
2					3	SS	20				
				183.21							
		SILTY CLAY: reddish brown, moist to wet, very stiff to hard.		2.29	4	SS	18		14.4		
					5	SS	39		12.8		
4											
					6	SS	35		12.3		
6											
					7	SS	50		17.4		
8					8	SS	60		11.4		
					9	SS	65		10.7		
10											
				174.83							
		SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense.		10.67	10	SS	>100		12.7		
12					11	SS	>100		9.9		
					12	SS	>100		9.1		
14											
				170.21	13	SS	>100		14.8		
		End of Borehole		15.29							
		Note:									
16											
18											

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION
WATER LEVEL:

LOGGED : BR
CHECKED : CM

MCR LOG ENVIRONMENTAL 5820.GPJ 1-26-23

RECORD OF BOREHOLE 108

PROJECT : G5820
LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
STARTED : January 3, 2023
COMPLETED : January 3, 2023

MC CLYMONT & RAK ENGINEERS, INC.

SHEET 1 OF 1
DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊗ 100 200 300 400 / % LEL - (hexane) □ 20 40 60 80	SHEAR STRENGTH: Cu, KPa nat V - ✚ rem V - ● Q - ✖ U - ▲ 20 40 60 80 / WATER CONTENT, PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		185.00							
	POWER BORING / HOLLOW STEM AUGER	STRAIGHT DRILLING TO 9.14 m.									
10		SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense.		175.86 / 9.14	9	SS	>100		10.9		
					10	SS	>100		12.7		
12					11	SS	>100		9.2		
14					12	SS	>100		9.2		
				169.71 / 15.29	13	SS	>100		8.6		
		End of Borehole									
16		Note:									
18											

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION — WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION — WATER LEVEL:

LOGGED : BR
CHECKED : CM

MCR LOG ENVIRONMENTAL 5820.GPJ 1-26-23

RECORD OF BOREHOLE 109

PROJECT : G5820
LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
STARTED : January 3, 2023
COMPLETED : January 3, 2023

MC CLYMONT & RAK ENGINEERS, INC.

SHEET 1 OF 1
DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊗ 100 200 300 400 / % LEL - (hexane) □ 20 40 60 80	SHEAR STRENGTH: Cu, KPa nat V - ✚ rem V - ● Q - ✖ U - ▲ 20 40 60 80 / WATER CONTENT, PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		184.75							
	POWER BORING / HOLLOW STEM AUGER	FILL: sand, trace of gravel, organics, rootlets, brown, moist, loose.			1	SS	8		13.1		
				183.99							
		SANDY SILT: trace of clay, reddish brown, moist, dense.		0.76	2	SS	33		11		
					3	SS	30		13.3		
2											
				182.46							
		SILT & CLAY: some sand, trace of gravel, shale fragments, reddish brown, moist, hard.		2.29	4	SS	41		12.4		
					5	SS	32		13.4		
4											
					6	SS	47		9.8		
6					7	SS	46		9.3		
				177.43							
		End of Borehole		7.32							
		Note:									
8											

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION
WATER LEVEL:

LOGGED : BR
CHECKED : CM

MCR LOG ENVIRONMENTAL 5820.GPJ 1-26-23

McCLYMONT&RAK ENGINEERS, INC.

GRAIN SIZE ANALYSIS - HYDROMETER TEST

Job No.:	**G5820**	**Sample No.:**	**SS 4**
Sample Location:	**BH 109**	**Sample Depth:**	**2.29 m**
Sampled by:	**B.R.**	**Tested by:**	**S.M. & A.Q.**
Date Sampled:	**January 3, 2023**	**Date Tested:**	**January 16, 2023**

EXTRACTION/GRADATION TEST RESULTS

SIEVE NO.	*SIEVE SIZE*	*WT. RETAINED*	*RETAINED*	*PASSING*
#	mm	g	%	%
3/4	19.000	0.0	0.00	100.00
0.53	13.200	0.0	0.00	100.00
3/8	9.500	0.0	0.00	100.00
4	4.750	2.3	3.08	96.92
10	2.000	4.6	6.16	93.84
16	1.180	5.7	7.63	92.37
40	0.425	7.5	10.04	89.96
50	0.300	8.3	11.11	88.89
100	0.150	9.8	13.12	86.88
200	0.075	12.3	16.46	83.54

GRAIN SIZE PROPORTIONS	*%*	*SAMPLE DESCRIPTION*
Gravel (60mm to 2.00mm)	6.16	SILT AND CLAY, SOME SAND, TRACE GRAVEL
Sand (2.0mm to 0.06mm)	12.69	
Silt (0.06mm to 0.002mm)	42.90	
Clay (<0.002 mm)	38.25	

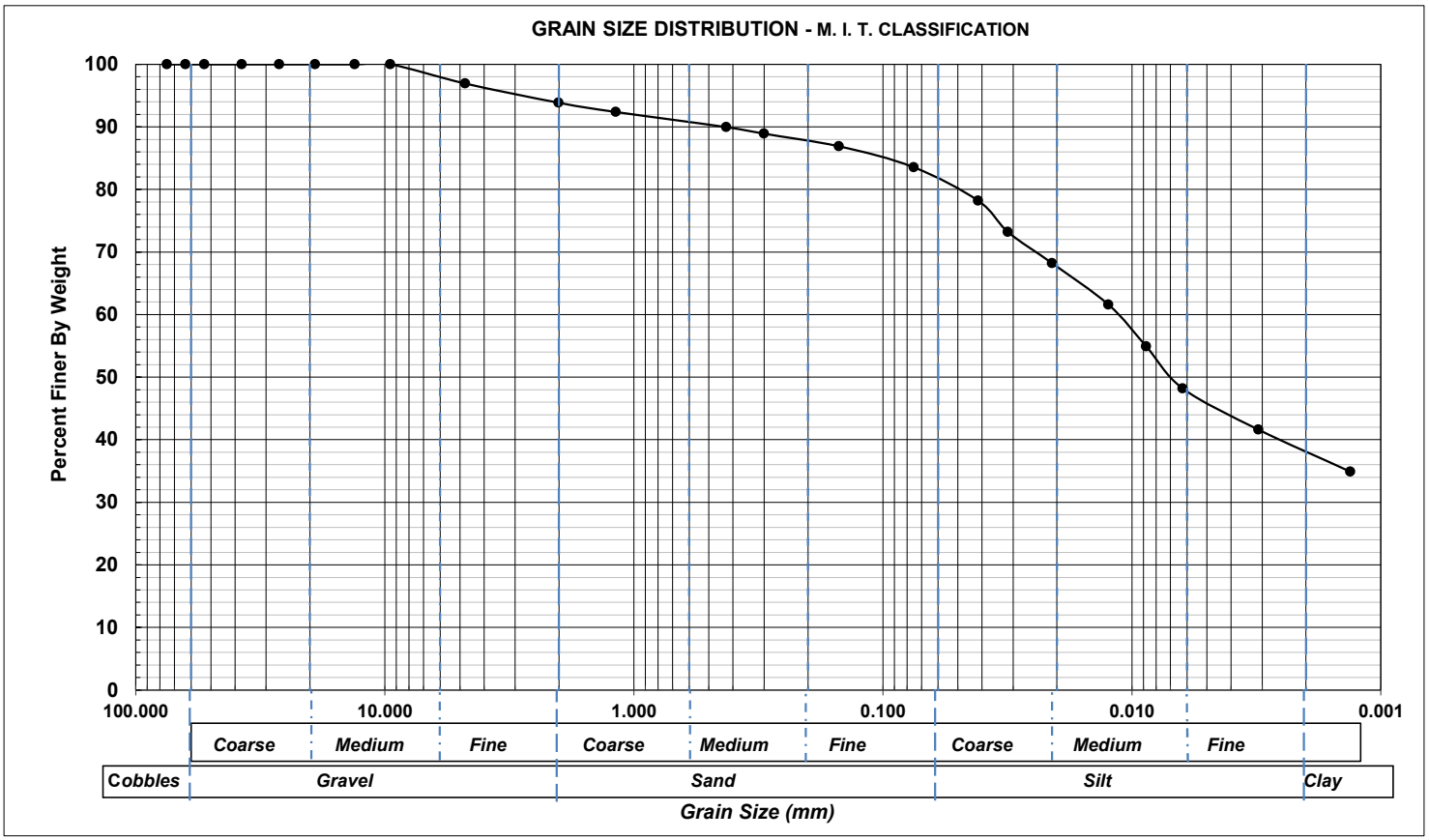
KEY COEFFICIENTS			
D90 (mm)	0.437	D85 (mm)	0.108
D60 (mm)	0.012	D50 (mm)	0.007
D30 (mm)	-	D15 (mm)	-
D10 (mm)	-		

Cu Coefficient of Uniformity

Cc Coefficient of Gradation

SIEVE NO.	*SIEVE SIZE*	*PASSING*
#	mm	%
3.0"	75.000	100.00
2.5"	63.000	100.00
2.0"	53.000	100.00
1.5"	37.500	100.00
1.0"	26.500	100.00
3/4"	19.000	100.00
0.5"	13.200	100.00
3/8"	9.500	100.00
4	4.750	96.92
10	2.000	93.84
16	1.180	92.37
40	0.425	89.96
50	0.300	88.89
100	0.150	86.88
200	0.075	83.54
	0.041	78.20
	0.031	73.20
	0.021	68.20
	0.012	61.60
	0.009	54.90
	0.006	48.20
	0.003	41.60
	0.001	34.90

Hydrometer Test Results



McCLYMONT&RAK ENGINEERS, INC.

GRAIN SIZE ANALYSIS - HYDROMETER TEST

Job No.:	**G5820**	**Sample No.:**	**SS 9**
Sample Location:	**BH 105**	**Sample Depth:**	**9.14 m**
Sampled by:	**B.R.**	**Tested by:**	**S.M. & A.Q.**
Date Sampled:	**December 22, 2022**	**Date Tested:**	**January 16, 2023**

EXTRACTION/GRADATION TEST RESULTS

SIEVE NO.	*SIEVE SIZE*	*WT. RETAINED*	*RETAINED*	*PASSING*
#	mm	g	%	%
3/4	19.000	0.0	0.00	100.00
0.53	13.200	0.0	0.00	100.00
3/8	9.500	1.3	1.65	98.35
4	4.750	2.6	3.30	96.70
10	2.000	4.7	5.96	94.04
16	1.180	5.9	7.48	92.52
40	0.425	8.6	10.90	89.10
50	0.300	9.8	12.42	87.58
100	0.150	11.9	15.08	84.92
200	0.075	14.6	18.51	81.49

GRAIN SIZE PROPORTIONS	*%*
Gravel (60mm to 2.00mm)	5.96
Sand (2.0mm to 0.06mm)	19.29
Silt (0.06mm to 0.002mm)	52.10
Clay (<0.002 mm)	22.65

SAMPLE DESCRIPTION: CLAYEY SILT, SOME SAND, TRACE GRAVEL

KEY COEFFICIENTS

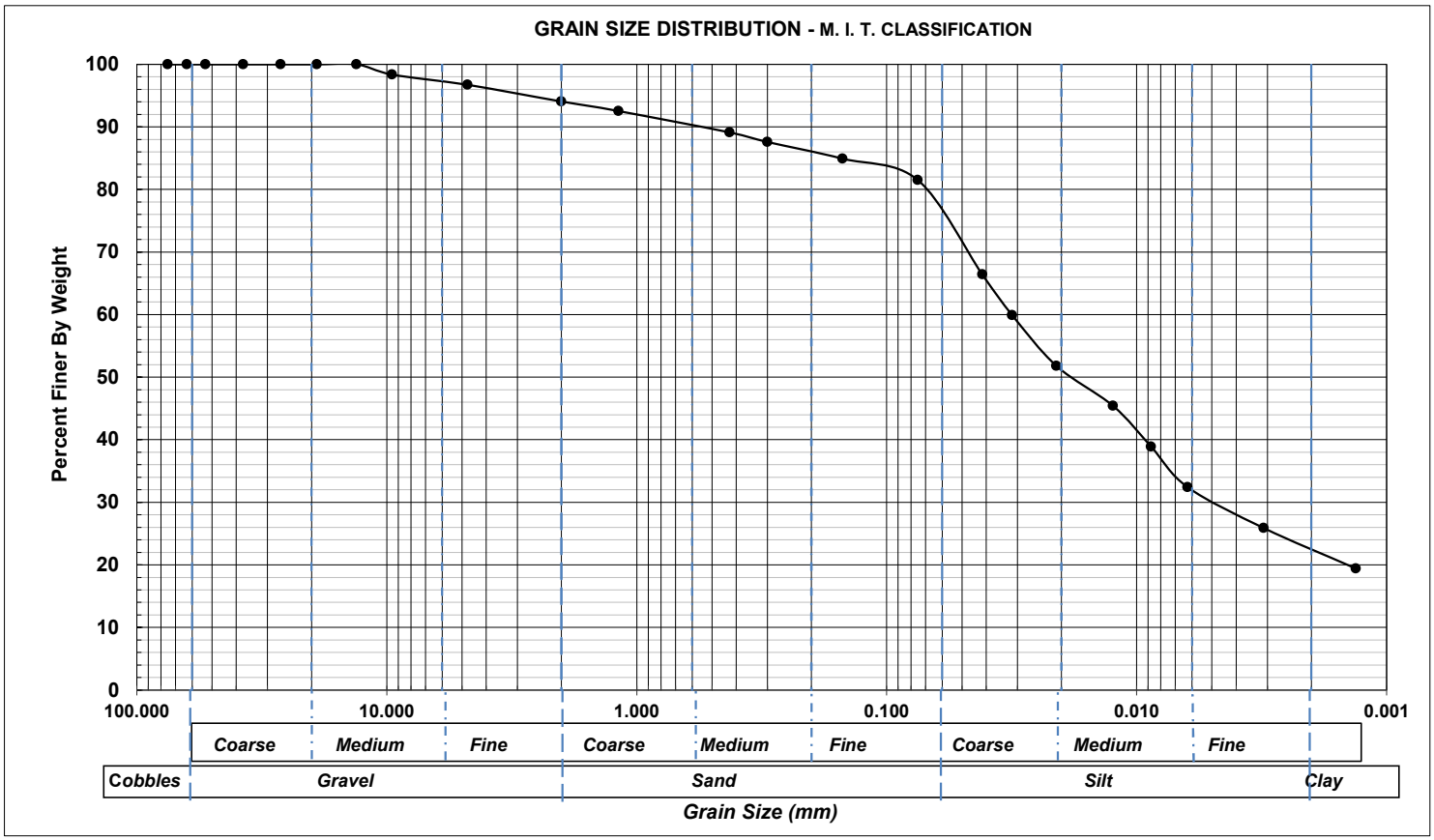
D90 (mm)	0.624	D85 (mm)	0.155
D60 (mm)	0.032	D50 (mm)	0.019
D30 (mm)	0.005	D15 (mm)	-
D10 (mm)	-		

Cu Coefficient of Uniformity

Cc Coefficient of Gradation

SIEVE NO.	*SIEVE SIZE*	*PASSING*
#	mm	%
3.0"	75.000	100.00
2.5"	63.000	100.00
2.0"	53.000	100.00
1.5"	37.500	100.00
1.0"	26.500	100.00
3/4"	19.000	100.00
0.5"	13.200	100.00
3/8"	9.500	98.35
4	4.750	96.70
10	2.000	94.04
16	1.180	92.52
40	0.425	89.10
50	0.300	87.58
100	0.150	84.92
200	0.075	81.49
	0.041	66.40
	0.031	59.90
	0.021	51.80
	0.012	45.40
	0.009	38.90
	0.006	32.40
	0.003	25.90
	0.001	19.40

Hydrometer Test Results



McCLYMONT&RAK ENGINEERS, INC.

GRAIN SIZE ANALYSIS - HYDROMETER TEST

Job No.:	**5820**	**Sample No.:**	**SS 7**
Sample Location:	**BH 104**	**Sample Depth:**	**6.10 m**
Sampled by:	**B.R.**	**Tested by:**	**S.M. & A.Q.**
Date Sampled:	**December 19, 2022**	**Date Tested:**	**January 16, 2023**

EXTRACTION/GRADATION TEST RESULTS

SIEVE NO.	*SIEVE SIZE*	*WT. RETAINED*	*RETAINED*	*PASSING*
#	mm	g	%	%
3/4	19.000	0.0	0.00	100.00
0.53	13.200	0.0	0.00	100.00
3/8	9.500	1.8	1.77	98.23
4	4.750	6.1	6.00	94.00
10	2.000	13.8	13.56	86.44
16	1.180	18.2	17.89	82.11
40	0.425	25.1	24.67	75.33
50	0.300	27.3	26.84	73.16
100	0.150	31.6	31.06	68.94
200	0.075	35.3	34.70	65.30

GRAIN SIZE PROPORTIONS	*%*
Gravel (60mm to 2.00mm)	13.56
Sand (2.0mm to 0.06mm)	28.19
Silt (0.06mm to 0.002mm)	42.59
Clay (<0.002 mm)	15.65

SAMPLE DESCRIPTION: SANDY SILT, SOME CLAY, SOME GRAVEL

KEY COEFFICIENTS

D90 (mm)	3.295	D85 (mm)	1.728
D60 (mm)	0.064	D50 (mm)	0.042
D30 (mm)	0.010	D15 (mm)	0.007
D10 (mm)	-		

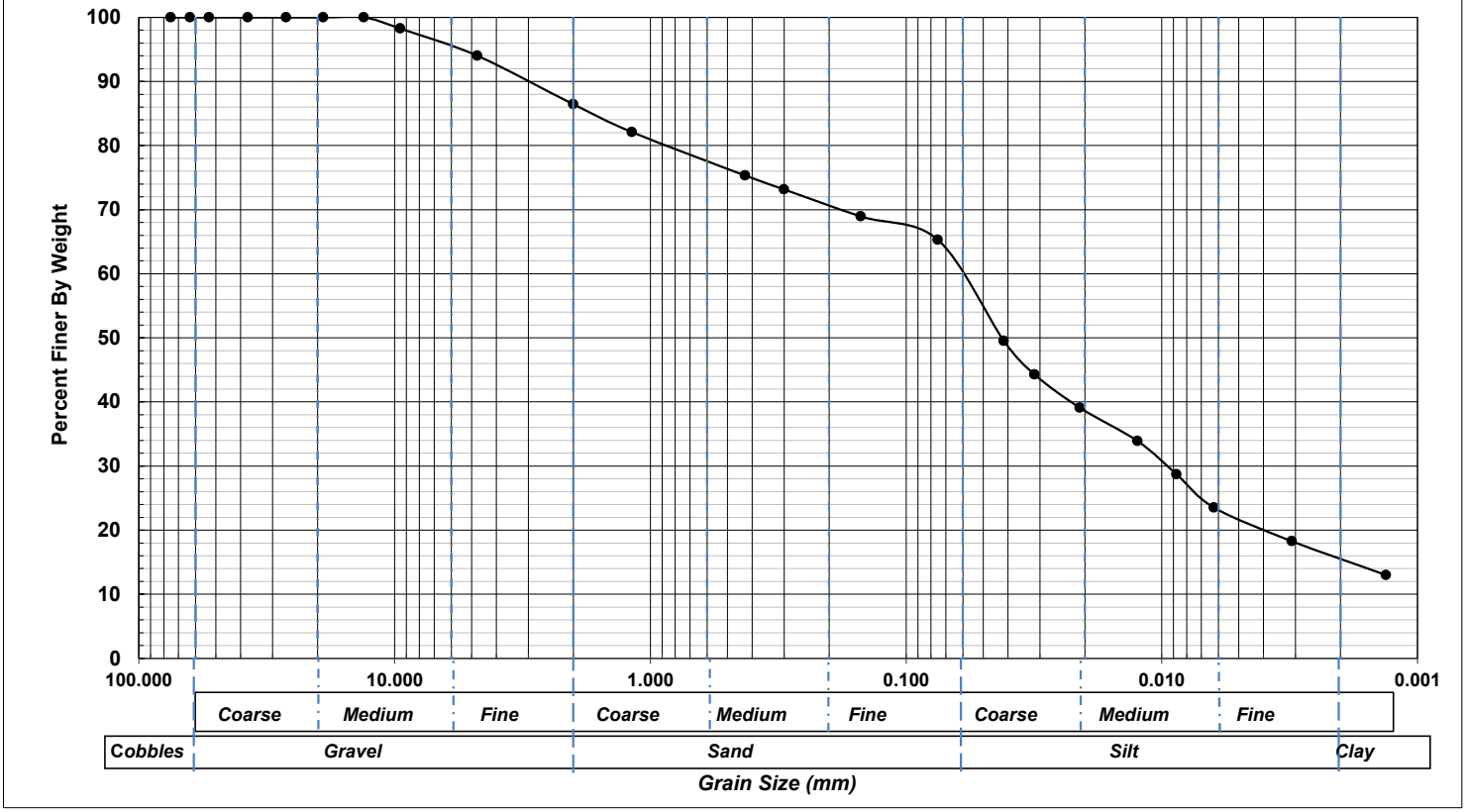
Cu Coefficient of Uniformity

Cc Coefficient of Gradation

SIEVE NO.	*SIEVE SIZE*	*PASSING*
#	mm	%
3.0"	75.000	100.00
2.5"	63.000	100.00
2.0"	53.000	100.00
1.5"	37.500	100.00
1.0"	26.500	100.00
3/4"	19.000	100.00
0.5"	13.200	100.00
3/8"	9.500	98.23
4	4.750	94.00
10	2.000	86.44
16	1.180	82.11
40	0.425	75.33
50	0.300	73.16
100	0.150	68.94
200	0.075	65.30
	0.041	49.50
	0.031	44.30
	0.021	39.10
	0.012	33.90
	0.009	28.70
	0.006	23.50
	0.003	18.30
	0.001	13.00

Hydrometer Test Results

GRAIN SIZE DISTRIBUTION - M. I. T. CLASSIFICATION



McCLYMONT&RAK ENGINEERS, INC.

GRAIN SIZE ANALYSIS - HYDROMETER TEST

Job No.:	**G5820**	**Sample No.:**	**SS 6**
Sample Location:	**BH 101**	**Sample Depth:**	**4.57 m**
Sampled by:	**B.R.**	**Tested by:**	**S.M. & A.Q.**
Date Sampled:	**December 20, 2022**	**Date Tested:**	**January 16, 2023**

EXTRACTION/GRADATION TEST RESULTS

SIEVE NO.	*SIEVE SIZE*	*WT. RETAINED*	*RETAINED*	*PASSING*
#	mm	g	%	%
3/4	19.000	0.0	0.00	100.00
0.53	13.200	0.0	0.00	100.00
3/8	9.500	3.0	2.31	97.69
4	4.750	8.9	6.85	93.15
10	2.000	19.4	14.94	85.06
16	1.180	24.4	18.79	81.21
40	0.425	32.5	25.03	74.97
50	0.300	35.4	27.26	72.74
100	0.150	41.5	31.96	68.04
200	0.075	46.6	35.89	64.11

GRAIN SIZE PROPORTIONS	*%*	*SAMPLE DESCRIPTION*
Gravel (60mm to 2.00mm)	14.94	SANDY SILT, SOME CLAY AND GRAVEL
Sand (2.0mm to 0.06mm)	26.09	
Silt (0.06mm to 0.002mm)	37.82	
Clay (<0.002 mm)	21.15	

KEY COEFFICIENTS

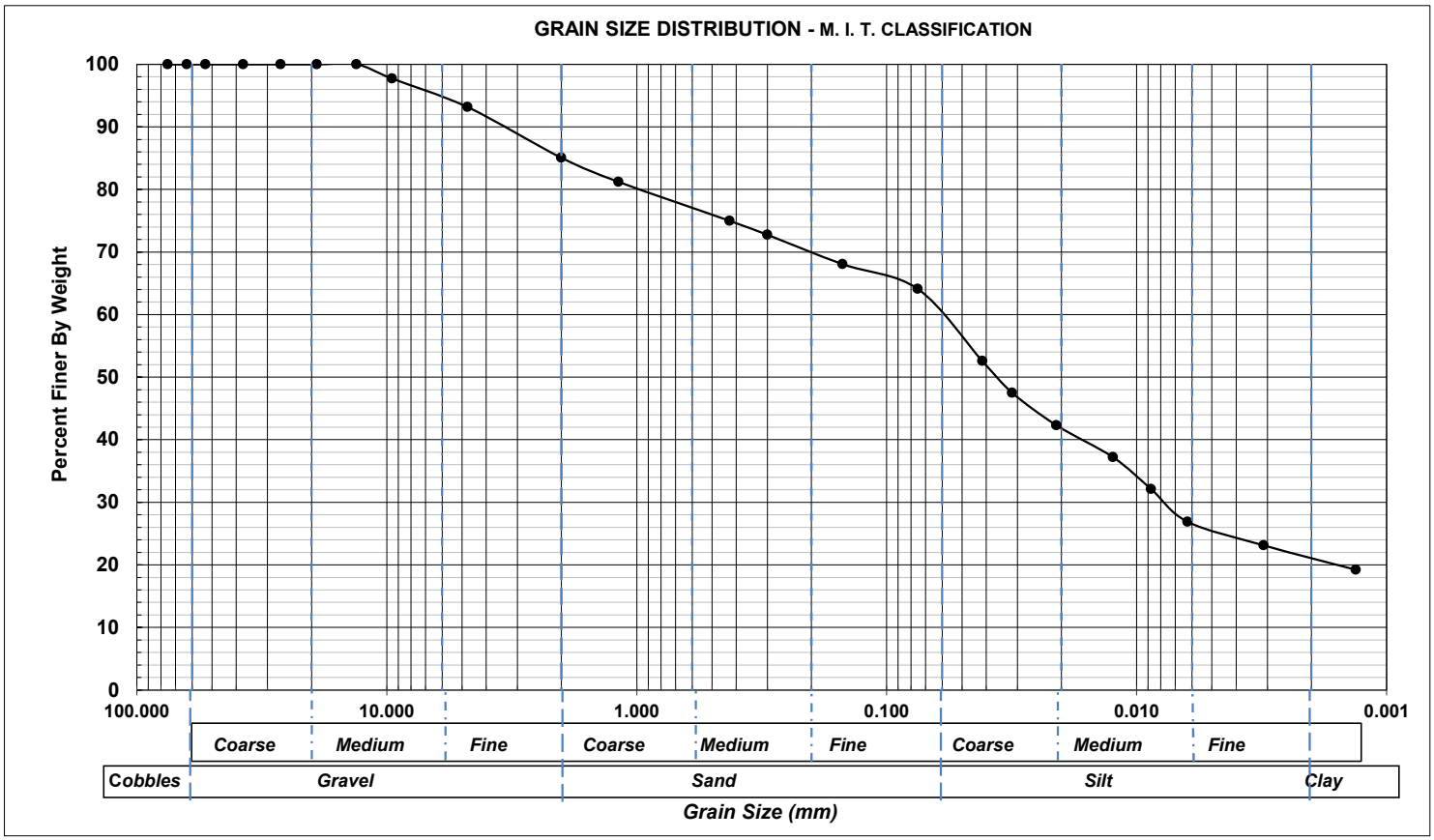
D90 (mm)	3.680	D85 (mm)	1.988
D60 (mm)	0.063	D50 (mm)	0.036
D30 (mm)	0.008	D15 (mm)	-
D10 (mm)	-		

Cu Coefficient of Uniformity

Cc Coefficient of Gradation

SIEVE NO.	*SIEVE SIZE*	*PASSING*
#	mm	%
3.0"	75.000	100.00
2.5"	63.000	100.00
2.0"	53.000	100.00
1.5"	37.500	100.00
1.0"	26.500	100.00
3/4"	19.000	100.00
0.5"	13.200	100.00
3/8"	9.500	97.69
4	4.750	93.15
10	2.000	85.06
16	1.180	81.21
40	0.425	74.97
50	0.300	72.74
100	0.150	68.04
200	0.075	64.11
	0.041	52.60
	0.031	47.50
	0.021	42.30
	0.012	37.20
	0.009	32.10
	0.006	26.90
	0.003	23.10
	0.001	19.20

Hydrometer Test Results



APPENDIX C

RECORD OF BOREHOLE 1

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 1, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	"N" VALUES	GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
184.7		Ground Surface										
	0	dark mottled brown **Silty Clay/Clayey Silt Fill** some topsoil, some organic stains some rootlets, damp		1	SS	33	13			24 13		
184.3												
	1	reddish brown **Silty Clay/Clayey Silt Till** some sand, occ. oxidized fissures damp, very stiff		2	SS	25	17			13		
				3	SS	28	28			13		
	2	occ. shale fragments hard		4	SS	25	40			13		Gradation Analysis S(4): 2 15 51 32
	3			5	SS	30	38			13		
181.0												
	4	reddish brown **Clayey Sandy Silt Till** occ. silt seams, trace sand seams occ. oxidized fissures damp, hard		6	SS	41	67			9		
180.2												
	5	reddish brown **Silty Clay/Clayey Silt Till** occ. gravel, occ. oxidized fissures damp, hard		7	SS	38	74			9		
179.2												Practical Auger Refusal @ ~5.5m due to possible cobble/boulder , borehole moved 1m to the east and re-drilled.
	6	grey **Clayey Sandy Silt Till** occ. oxidized fissures damp, hard		8	SS	25	71			10		
177.7												
	7											

March 9, 2018
March 16, 2018

RECORD OF BOREHOLE 1

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 1, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	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	GROUND WATER CONDITIONS				
176.7	8	grey **Silty Sand/Sandy Silt Till** occ. gravel, occ. shale fragments damp, very dense		9	SS	18	50/13cm			10		
		End of Borehole										
		Cave-in Depth on Completion: None Groundwater Depth on Completion: Dry										
		Measured Water Level in installed Monitoring Well on: March 9, 2018: 2.8m March 16, 2018: 2.9m										
	9											
	10											
	11											
	12											
	13											
	14											

RECORD OF BOREHOLE 2

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 1, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	"N" VALUES	GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
185.4		Ground Surface										
185.0	0	dark mottled brown **Silty Clay/Clayey Silt Fill** some topsoil, some organic stains some rootlets, damp		1	SS	41	16			30		
		mottled reddish brown **Compacted Silty Clay/Clayey Silt Fill** damp, very stiff		2	SS	28	16			8		
184.1	1									15		
		very stiff		3	SS	20	18			16		
	2	reddish brown **Silty Clay/Clayey Silt Till** trace to some sand occ. oxidized fissures damp, hard		4	SS	28	42			15		
	3	occ. gravel, occ. shale fragments		5	SS	35	42			13		
	4	trace to some sand		6	SS	35	88			10		
	5	greyish brown sandy silt till seams		7	SS	30	50			10		
	6	grey		8	SS	28	71			9		
178.4	7	occ. silty sand/sandy silt till										

RECORD OF BOREHOLE 2

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 1, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	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	GROUND WATER CONDITIONS				
		grey **Clayey Sandy Silt Till** damp, hard										
177.6				9	SS	13	50/13cm			9		
		End of Borehole										
	8	Cave-in Depth on Completion: 7.2m Groundwater Depth on Completion: Dry										
	9											
	10											
	11											
	12											
	13											
	14											

RECORD OF BOREHOLE 3

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 1, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS
185.8		Ground Surface						
	0	dark mottled brown **Silty Clay/Clayey Silt Fill** some topsoil, some organic stains some rootlets, damp		1	SS	33	10	
185.4		mottled reddish brown **Compacted Silty Clay/Clayey Silt Fill** damp, stiff		2	SS	25	32	
184.9	1	brown, occ. reddish brown **Silty Clay/Clayey Silt Till** trace to some sand occ. oxidized fissures damp, hard		3	SS	23	36	
	2			4	SS	35	41	
	3			5	SS	28	57	
	4	grey		6	SS	38	35	
181.4		grey **Sandy Silt Till** some clay, occ. oxidized fissures damp, hard		7	SS	35	39	
	5							
180.3		grey **Clayey Sandy Silt Till** trace shale fragments damp, hard		8	SS	30	79	
	6							
	7							

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100
SHEAR STRENGTH kPa
20 40 60 80 100

WATER CONTENT (%)
5 15 25 35

25
14
13
18
12
11
13
9
9

MONITORING WELL
March 9, 2018
March 16, 2018

REMARKS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

RECORD OF BOREHOLE 3

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 1, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	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	GROUND WATER CONDITIONS				
177.7	8	grey **Clayey Sandy Silt Till** damp, hard		9	SS	30	71			10		
		End of Borehole										
		Cave-in Depth on Completion: 7.3m Groundwater Depth on Completion: Dry										
		Measured Water Level in installed Monitoring Well on:										
	9	March 9, 2018: 3.7m March 16, 2018: 3.6m										
	10											
	11											
	12											
	13											
	14											

RECORD OF BOREHOLE 4

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 1, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

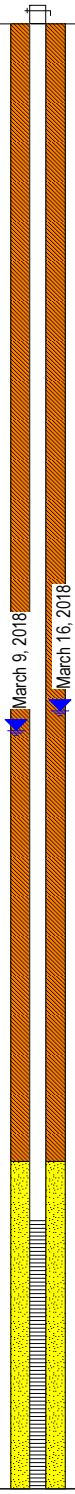
SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

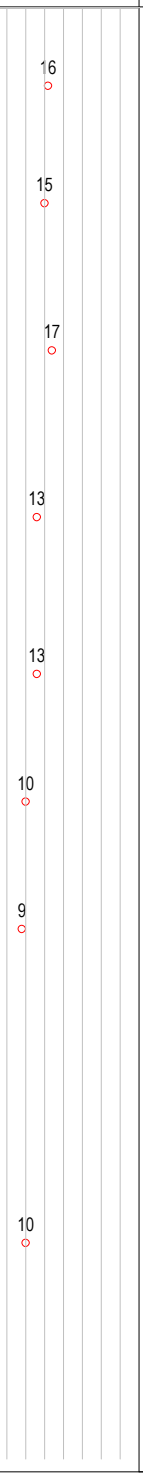
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	"N" VALUES	GROUND WATER CONDITIONS
185.1		Ground Surface						
	0	dark brown **Silty Clay/Clayey Silt Fill** some topsoil, damp		1	SS	38	8	
184.5		occ. organic stains						
	1	reddish brown **Silty Clay/Clayey Silt Till** trace to some sand occ. oxidized fissures damp, very stiff		2	SS	30	22	
				3	SS	25	26	
	2	hard		4	SS	28	46	
	3			5	SS	20	46	
181.4								
	4	reddish brown **Clayey Sandy Silt Till** occ. oxidized fissures damp, hard		6	SS	20	48	
		occ. shale fragments		7	SS	13	50/8cm	
	5							
	6			8	SS	15	78/23cm	
178.1	7							

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH kPa
20 40 60 80 100

WATER CONTENT (%)
5 15 25 35





MONITORING WELL

REMARKS AND

GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

RECORD OF BOREHOLE 4

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 1, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	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	GROUND WATER CONDITIONS				
177.1	8	grey **Silty Sand/Sandy Silt Till** damp, very dense		9	SS	18	50/10cm			9		
		End of Borehole Cave-in Depth on Completion: None Groundwater Depth on Completion: Dry Measured Water Level in installed Monitoring Well on: March 9, 2018: 3.6m March 16, 2018: 3.5m										
	9											
	10											
	11											
	12											
	13											
	14											

RECORD OF BOREHOLE 5

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 1, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	"N" VALUES	GROUND WATER CONDITIONS
186.6		Ground Surface						
	0	dark brown **Silty Clay/Clayey Silt Fill** some topsoil, some organic stains damp		1	SS	20	14	
185.9		reddish brown **Silty Clay/Clayey Silt Till** trace to some sand occ. oxidized fissures damp, hard		2	SS	23	38	
	1			3	SS	20	39	
	2			4	SS	30	56	
	3	occ. shale fragments		5	SS	35	81	
	4	greyish reddish brown occ. clayey sandy silt till seams/interbeddings		6	SS	18	33	
				7	SS	20	31	
	5							
	6			8	SS	25	68	
	7	grey						

MONITORING WELL

REMARKS AND

GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

RECORD OF BOREHOLE 5

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 1, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	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	GROUND WATER CONDITIONS				
178.7				9	SS	20	50/10cm			9		
	8	**End of Borehole** Cave-in Depth on Completion: 7.3m Groundwater Depth on Completion: Dry Measured Water Level in installed Monitoring Well on: March 9, 2018: 4.2m March 16, 2018: 4.3m										
	9											
	10											
	11											
	12											
	13											
	14											

RECORD OF BOREHOLE 6

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: February 28, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	"N" VALUES	GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
187.2		Ground Surface										
	0	dark mottled brown, occ. reddish brown **Silty Clay/Clayey Silt Fill** some topsoil, some organic stains occ. gravel, damp		1	SS	46	18			13		
				2	SS	13	10			15		
185.5	1	brown, occ. reddish brown **Silty Clay/Clayey Silt Till** some sand, occ. oxidized fissures damp, hard		3	SS	35	37			17 13		
	2	reddish brown occ.shale fragments		4	SS	15	46			13		Gradation Analysis S(4): 2 18 47 33
	3			5	SS	46	52			13		
	4			6	SS	20	52			12		
	5	grey		7	SS	35	49			12		
181.5	6	greyish reddish brown **Silty Sand/Sandy Silt Till** occ. oxidzied fissures damp, very dense		8	SS	20	79/28cm	▼ February 28, 2018		10		Gradation Analysis S(8): 12 33 46 9
	7											

RECORD OF BOREHOLE 6

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: February 28, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	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	GROUND WATER CONDITIONS				
179.2	8	**End of Borehole** Cave-in Depth on Completion: 7.5m Groundwater Depth on Completion: 6.0m		9	SS	18	71			8		
	9											
	10											
	11											
	12											
	13											
	14											

RECORD OF BOREHOLE 7

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: February 28, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	"N" VALUES	GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
187.6		Ground Surface										
187.5	0	**Granular Fill**										
		dark brown **Silty Clay/Clayey Silt Fill** some topsoil, some organic stains damp		1	SS	25	4			25 20		
186.9												
	1	brown, occ. reddish brown **Silty Clay/Clayey Silt Till** some sand, occ. oxidized fissures damp, very stiff		2	SS	35	25			14		
		hard		3	SS	25	32			14		
	2	very stiff		4	SS	30	28			13		Gradation Analysis S(4): 8 15 43 34
	3	hard		5	SS	28	48			12		
	4	grey		6	SS	38	40			11		
				7	SS	30	70/28cm			11		
181.9	5											
	6	grey **Silty Sand/Sandy Silt Till** occ. oxidzied fissures moist, very dense		8	SS	30	80/28cm			9		Gradation Analysis S(8): 8 38 46 8
180.3	7							February 28, 2018				

RECORD OF BOREHOLE 7

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: February 28, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	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	GROUND WATER CONDITIONS				
179.7		grey **Clayey Sandy Silt Till** occ. oxidized fissures damp, hard		9	SS	20	50/13cm			9		
	8	**End of Borehole**										
		Cave-in Depth on Completion: 7.5m Groundwater Depth on Completion:7.3m										
	9											
	10											
	11											
	12											
	13											
	14											

RECORD OF BOREHOLE 8

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	"N" VALUES	GROUND WATER CONDITIONS
186.7		Ground Surface						
	0	dark brown **Silty Clay/Clayey Silt Fill** some organic stains, some topsoil damp		1	SS	35	16	
186.2		reddish brown **Silty Clay/Clayey Silt Till** trace to some sand occ. oxidized fissures damp, hard		2	SS	30	31	
	1			3	SS	30	47	
	2			4	SS	35	42	
	3			5	SS	30	56	
		very stiff						
	4	grey		6	SS	30	24	
				7	SS	38	30	
	5							
	6	occ. gravel, hard		8	SS	10	50/10cm	
179.7	7							

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH kPa
20 40 60 80 100

WATER CONTENT (%)
5 15 25 35

15
7
12
12
12
12
11
14
9

MONITORING WELL

March 16, 2018

REMARKS AND GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

RECORD OF BOREHOLE 8

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	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	GROUND WATER CONDITIONS				
		grey										
		Clayey Sandy Silt Till										
178.9		damp, hard		9	SS	10	50/13cm			8		
		End of Borehole										
	8	Cave-in Depth on Completion: 7.0m Groundwater Depth on Completion: Dry										
		Measured Water Level in installed Monitoring Well on:										
		March 9, 2018: Dry March 16, 2018: 6.4m										
	9											
	10											
	11											
	12											
	13											
	14											

RECORD OF BOREHOLE 9

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	"N" VALUES	GROUND WATER CONDITIONS
186.7		Ground Surface						
	0	dark brown **Silty Clay/Clayey Silt Fill** some topsoil some organic stains, some rootlets damp		1	SS	35	9	
185.8	1	reddish brown **Silty Clay/Clayey Silt Till** trace to some sand occ. oxidized fissures damp, hard		2	SS	25	38	
				3	SS	20	53	
	2			4	SS	15	50/13cm	
	3	greyish reddish brown		5	SS	30	31	
	4	grey very stiff		6	SS	35	25	
182.3		brownish grey **Sandy Silt Till** trace to some clay damp, very dense		7	SS	28	59	
181.2	5							
	6	brownish grey **Clayey Silt Till** occ. clayey sandy silt till interbeddings damp, hard		8	SS	35	95/23cm	
179.7	7							

DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100

SHEAR STRENGTH kPa 20 40 60 80 100

WATER CONTENT (%) 5 15 25 35

WC: 25, 14, 12, 11, 12, 11, 9, 8

MONITORING WELL

March 9, 2018

March 16, 2018

REMARKS AND GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

RECORD OF BOREHOLE 9

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	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	GROUND WATER CONDITIONS				
		grey										
		Sandy Silt Till										
178.9		trace to some clay, damp, very dense		9	SS	15	50/5cm			8		
		End of Borehole										
	8	Cave-in Depth on Completion: None Groundwater Depth on Completion: Dry										
		Measured Water Level in installed Monitoring Well on:										
		March 9, 2018: 2.9m March 16, 2018: 2.9m										
	9											
	10											
	11											
	12											
	13											
	14											

RECORD OF BOREHOLE 10

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	"N" VALUES	GROUND WATER CONDITIONS
186.6		Ground Surface						
	0	dark brown **Clayey Silt Fill** some topsoil, some organic stains, some rootlets, damp to moist		1	SS	30	7	
185.9								
	1	brown **Compacted Silty Clay/Clayey Silt Fill** damp, stiff		2	SS	28	13	
185.2		trace organic stains						
		reddish brown **Silty Clay/Clayey Silt Till** trace to some sand occ. oxidized fissures damp, very stiff		3	SS	18	20	
	2	hard		4	SS	23	40	
	3			5	SS	30	48	
	4			6	SS	28	42	
		grey		7	SS	30	90/28cm	
	5							
	6	occ. sandy silt till seams		8	SS	23	50/13cm	
179.6								
	7							

DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100

SHEAR STRENGTH kPa 20 40 60 80 100

WATER CONTENT (%) 5 15 25 35

13 10 15 14 13 16 11 8

MONITORING WELL

March 9, 2018

March 16, 2018

REMARKS AND GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

RECORD OF BOREHOLE 10

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	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	GROUND WATER CONDITIONS				
		grey **Silty Sand/ Sandy Silt** moist to wet, very dense		9	SS	30	52			18		
178.6	8	**End of Borehole**										
		Cave-in Depth on Completion: 7.6m Groundwater Depth on Completion: Dry										
		Measured Water Level in installed Monitoring Well on:										
	9	March 9, 2018: 2.9m March 16, 2018: 3.0m										
	10											
	11											
	12											
	13											
	14											

RECORD OF BOREHOLE 11

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	"N" VALUES	GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	MONITORING WELL	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
186.4		Ground Surface										
185.9	0	**Topsoil**		1	SS	35	6			33		
185.7		mottled dark brown **Silty Clay/Clayey Silt Fill** some organic stains, damp								20		
185.3	1	brown **Compacted Silty Clay/Clayey Silt Fill** damp, stiff		2	SS	35	16			13		
		very stiff										
		brown, occ. reddish brown **Silty Clay/Clayey Silt Till** trace to some sand occ. oxidized fissures damp,hard		3	SS	28	34			13		
	2			4	SS	30	41			12		
	3			5	SS	30	33			14		
		grey damp to moist, very stiff		6	SS	23	18			16		
	4											
		hard		7	SS	28	37			8		
180.9	5											
		grey **Clayey Sandy Silt Till** damp, hard		8	SS	25	50/13cm			8		
	6											
	7											

RECORD OF BOREHOLE 11

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	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	GROUND WATER CONDITIONS				
		grey										
		Clayey Sandy Silt Till										
178.6		damp, hard		9	SS	13	50/13cm			8		
		End of Borehole										
	8	Cave-in Depth on Completion: None Groundwater Depth on Completion: Dry										
	9											
	10											
	11											
	12											
	13											
	14											

RECORD OF BOREHOLE 12

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	"N" VALUES	GROUND WATER CONDITIONS
186.8		Ground Surface						
	0	dark brown **Silty Clay/Clayey Silt Fill** some topsoil, some organic stains some rootlets, damp to moist		1	SS	38	10	
186.1								
	1	brown to reddish brown **Silty Clay/Clayey Silt Till** trace to some sand some topsoil, occ. oxidized fissures damp, hard		2	SS	30	38	
		occ. shale fragments		3	SS	35	48	
	2			4	SS	23	55	
	3			5	SS	30	34	
	4	greyish reddish brown		6	SS	35	30	
				7	SS	35	53	
	5	grey						
	6	occ. gravel		8	SS	20	50/13cm	
179.8	7							

DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100

SHEAR STRENGTH kPa 20 40 60 80 100

WATER CONTENT (%) 5 15 25 35

1	23
2	13
3	12
4	11
5	12
6	13
7	10
8	8

MONITORING WELL

March 9, 2018

March 16, 2018

REMARKS AND GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

RECORD OF BOREHOLE 12

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.

DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.

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

SHAD & ASSOCIATES INC.
83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

SOIL PROFILE				SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa 20 40 60 80 100	WATER CONTENT (%) 5 15 25 35	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	GROUND WATER CONDITIONS				
179.0		grey **Silty Sand/ Sandy Silt Till** damp, very dense		9	SS	10	50/13cm			6		
		End of Borehole										
	8	Cave-in Depth on Completion: 6.7m Groundwater Depth on Completion: Dry										
		Measured Water Level in installed Monitoring Well on:										
		March 9, 2018: 3.6m March 16, 2018: 3.6m										
	9											
	10											
	11											
	12											
	13											
	14											

SHAD & ASSOCIATES INC.

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 stratums, 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
Very loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	> 50

Consistency of Cohesive Soils	SPT N-Value	Undrained Shear Strength kPa	Undrained Shear Strength psf
Very soft	0 to 2	0 to 12	0 to 250
Soft	2 to 4	12 to 25	250 to 500
Firm	4 to 8	25 to 50	500 to 1000
Stiff	8 to 15	50 to 100	1000 to 2000
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

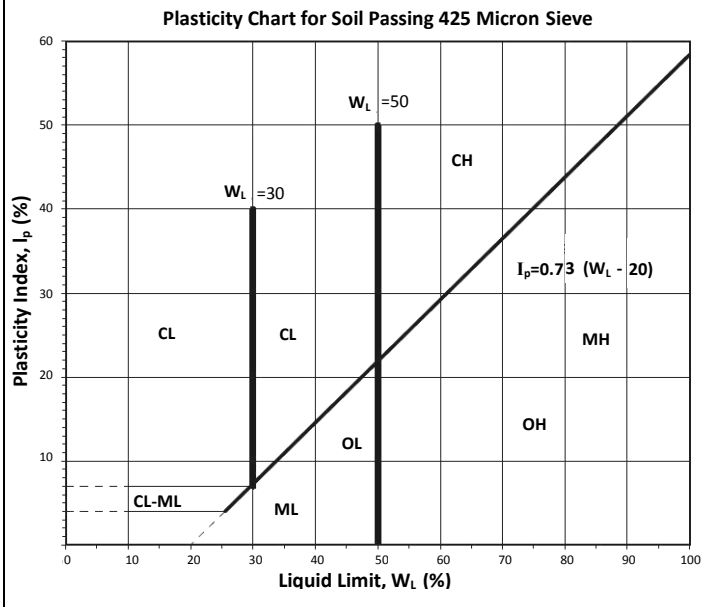
This column is used to describe non-standard situations or notes of interest.

SHAD & ASSOCIATES INC.

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
		DIRTYGRAVELS (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	STRONG COLOUR OR ODOUR, AND OFTEN FIBROUS TEXTURE

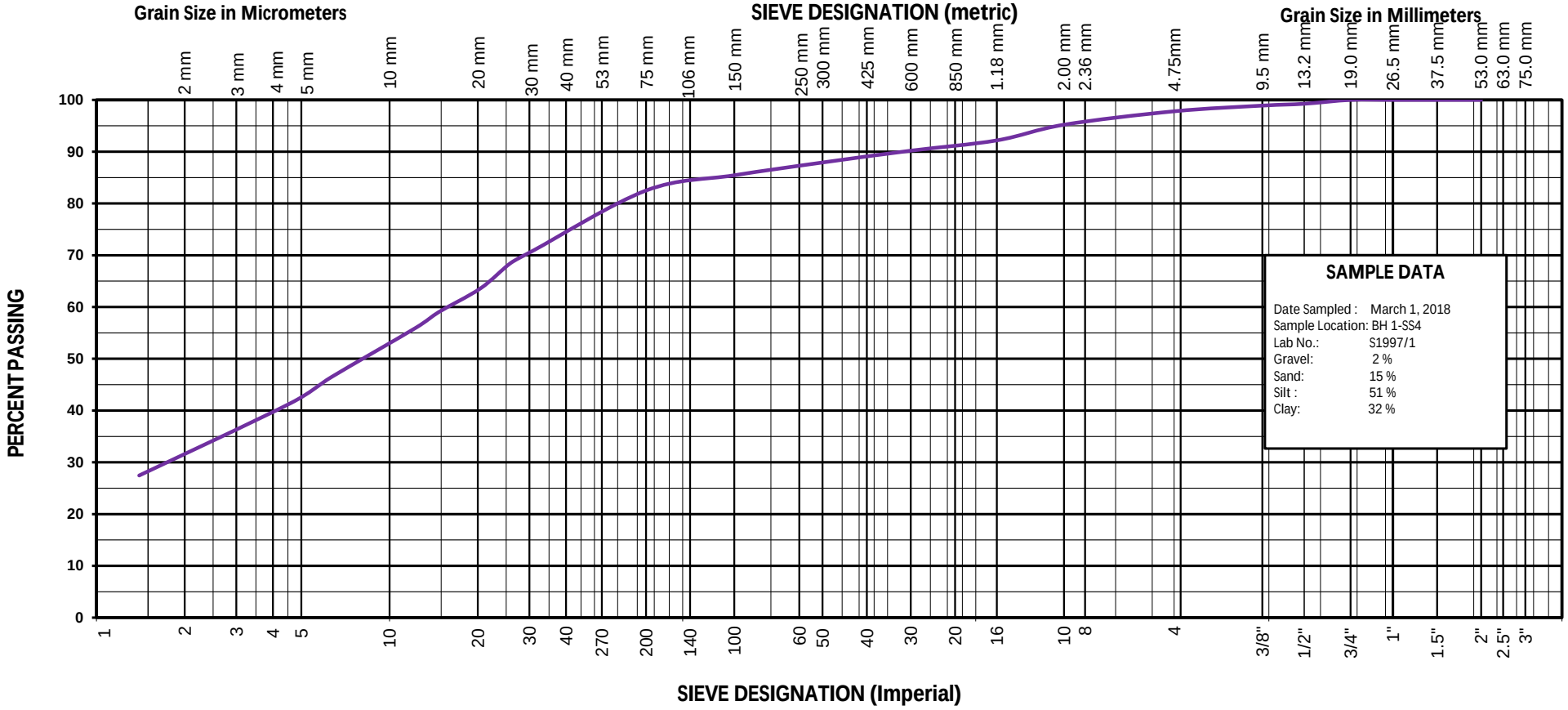
SOIL COMPONENTS					
FRACTION	U.S STANDARD SIEVE SIZE		DEFINING RANGES OF PERCENTAGE BY WEIGHT OF MINOR COMPONENTS		
GRAVEL	COARSE	PASSING	RETAINED	PERCENT	DESCRIPTOR
		76 mm	19 mm	35-50	AND
				20-35	Y/EY
	FINE	19 mm	4.75 mm	10-20	SOME
				1-10	TRACE
SAND	COARSE	4.75 mm	2.00 mm		
	MEDIUM	2.00 mm	425 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)

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT	SAND			GRAVEL	
	FINE	MEDIUM	COARSE	FINE	COARSE



SHAD & ASSOCIATES INC.

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

SHAD & ASSOCIATES INC.

GRAIN SIZE ANALYSIS

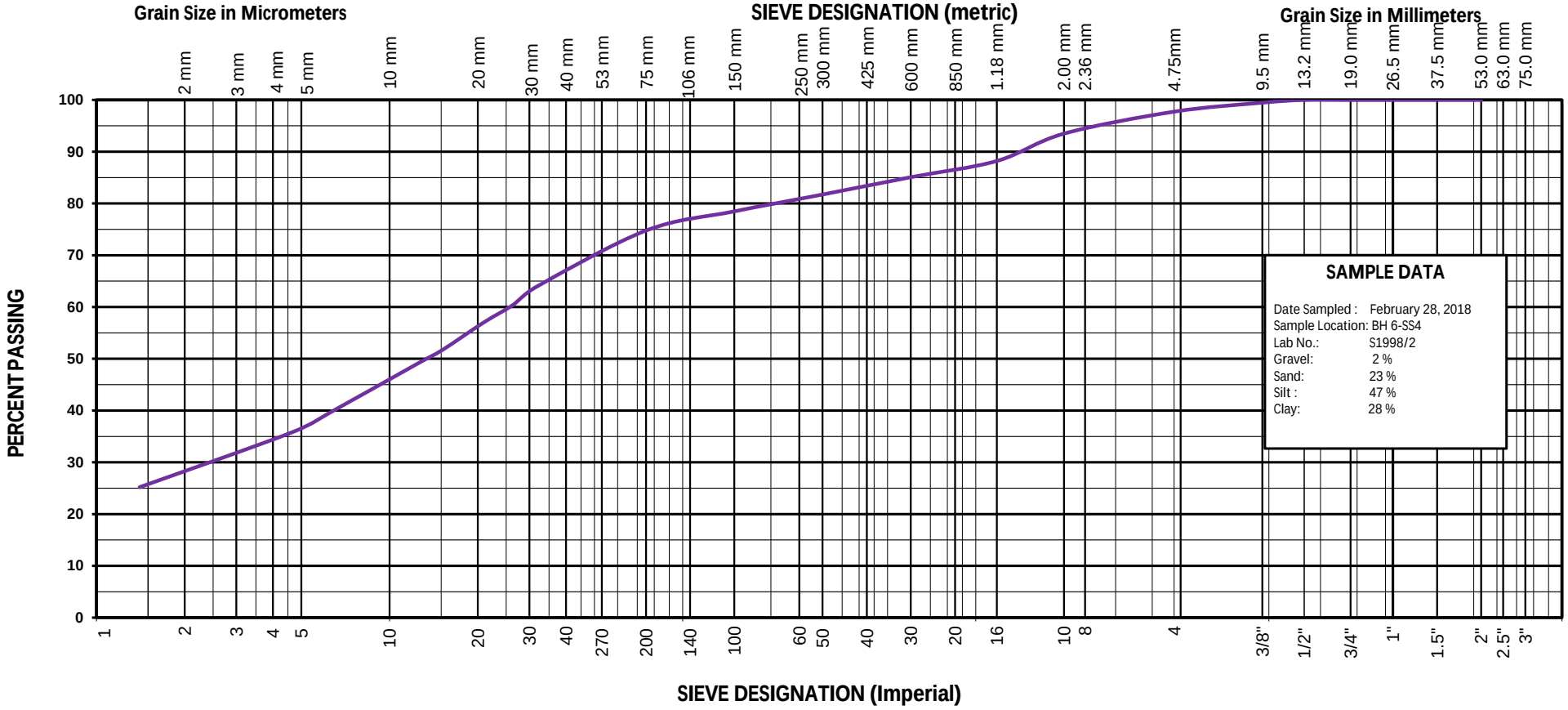
Project : Framgard Property- Major Node

Project No.: T18721

Client: Mattamy Development Corporation

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT	SAND			GRAVEL	
	FINE	MEDIUM	COARSE	FINE	COARSE



SHAD & ASSOCIATES INC.

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

SHAD & ASSOCIATES INC.

GRAIN SIZE ANALYSIS

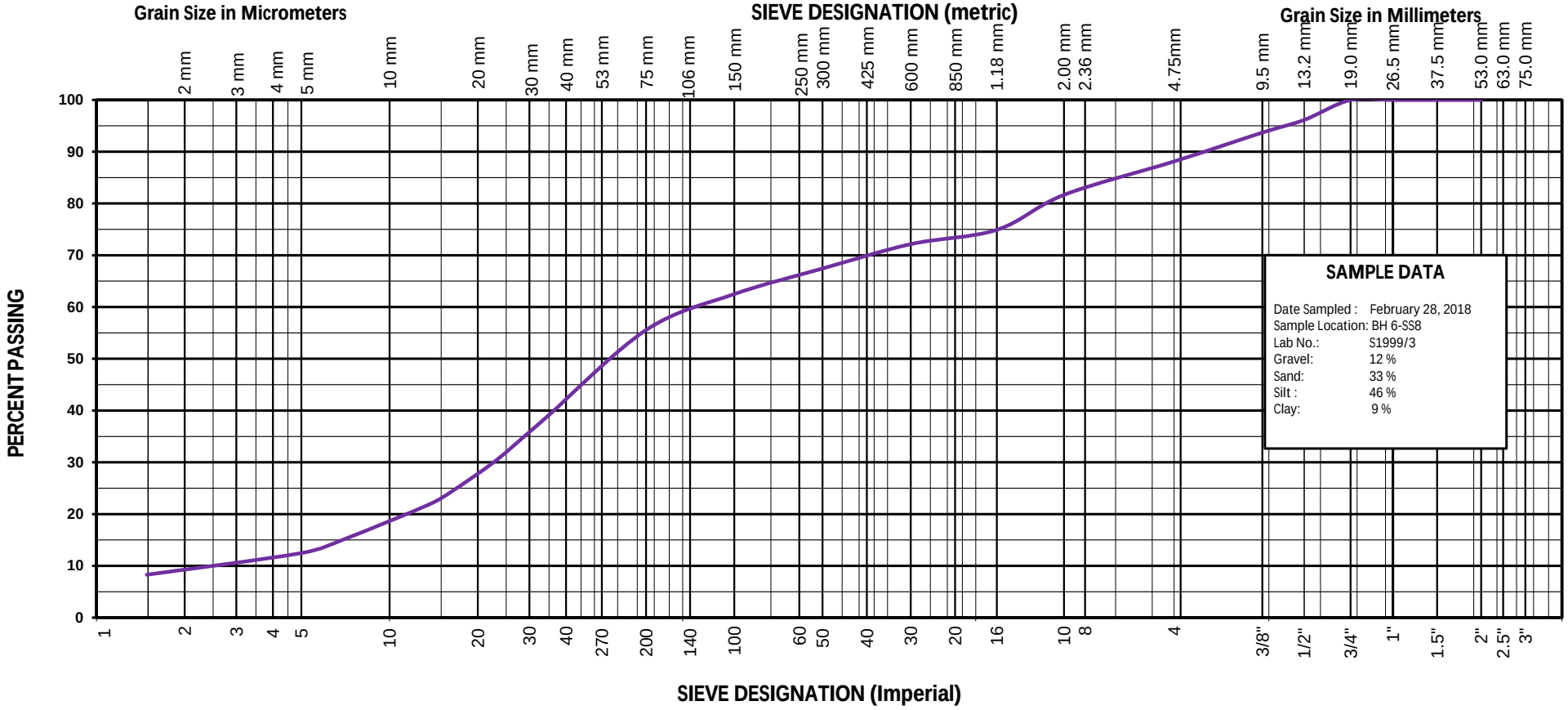
Project : Framgard Property- Major Node

Project No.: T18721

Client: Mattamy Development Corporation

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT	SAND			GRAVEL	
	FINE	MEDIUM	COARSE	FINE	COARSE



SHAD & ASSOCIATES INC.

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

SHAD & ASSOCIATES INC.

GRAIN SIZE ANALYSIS

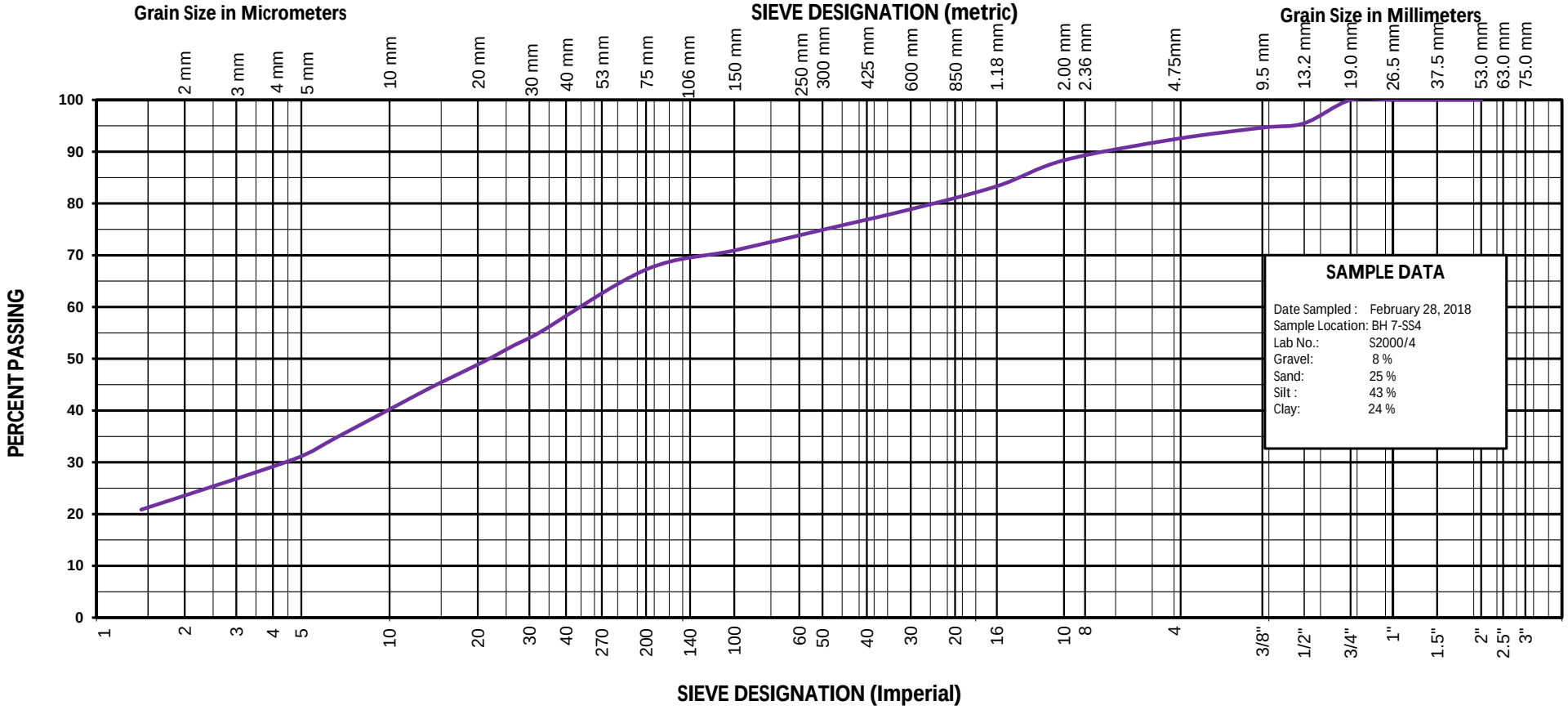
Project : Framgard Property- Major Node

Project No.: T18721

Client: Mattamy Development Corporation

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT	SAND			GRAVEL	
	FINE	MEDIUM	COARSE	FINE	COARSE



SHAD & ASSOCIATES INC.

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

SHAD & ASSOCIATES INC.

GRAIN SIZE ANALYSIS

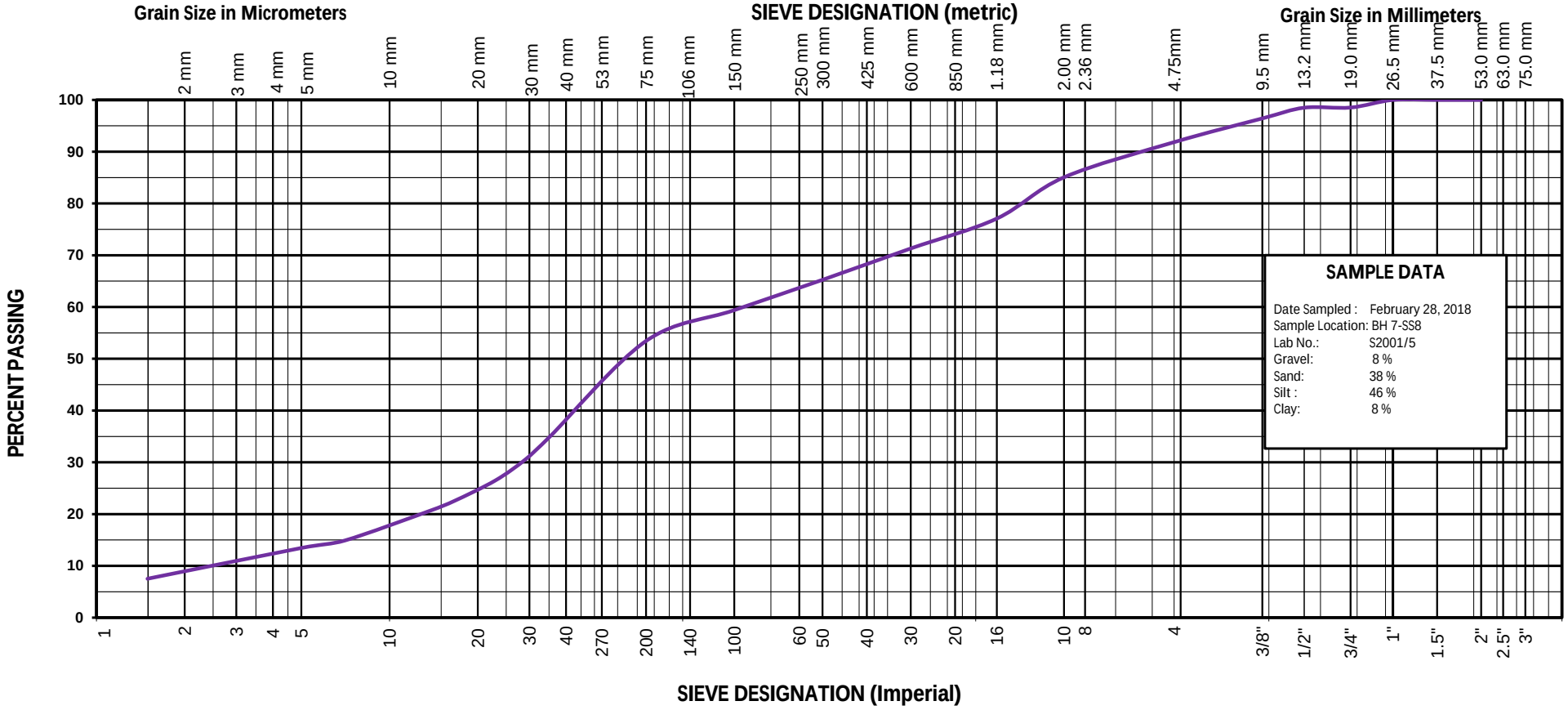
Project : Framgard Property- Major Node

Project No.: T18721

Client: Mattamy Development Corporation

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT	SAND			GRAVEL	
	FINE	MEDIUM	COARSE	FINE	COARSE



SHAD & ASSOCIATES INC.

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

SHAD & ASSOCIATES INC.

GRAIN SIZE ANALYSIS

Project : Framgard Property- Major Node

Project No.: T18721

Client: Mattamy Development Corporation

APPENDIX D

Your Project #: G5820
Site Location: MILTON
Your C.O.C. #: n/a

Attention: Salman Tavassoli

McClymont & Rak Engineers Inc
111 Zenway Blvd
Unit 4
Vaughan, ON
CANADA L4H 3H9

Report Date: 2023/01/16
Report #: R7472698
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C304825
Received: 2023/01/06, 15:30

Sample Matrix: Soil
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Chloride (20:1 extract)	2	2023/01/09	2023/01/09	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	2	2023/01/09	2023/01/09	CAM SOP-00414	OMOE E3530 v1 m
Moisture (Subcontracted) (1, 2)	2	N/A	2023/01/12	AB SOP-00002	CCME PHC-CWS m
Sulphide in Soil (1)	2	N/A	2023/01/12	AB SOP-00080	EPA9030B/SM4500S2-DF
pH CaCl2 EXTRACT	2	2023/01/09	2023/01/09	CAM SOP-00413	EPA 9045 D m
Redox Potential (3)	2	2023/01/09	2023/01/10	CAM SOP-00421	SM 2580 B
Resistivity of Soil	2	2023/01/06	2023/01/09	CAM SOP-00414	SM 23 2510 m
Sulphate (20:1 Extract)	2	2023/01/09	2023/01/11	CAM SOP-00464	EPA 375.4 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Calgary (19th), 4000 19th Street NE , Calgary, AB, T2E 6P8
(2) Offsite analysis requires that subcontracted moisture be reported.

Your Project #: G5820
Site Location: MILTON
Your C.O.C. #: n/a

Attention: Salman Tavassoli

McClymont & Rak Engineers Inc
111 Zenway Blvd
Unit 4
Vaughan, ON
CANADA L4H 3H9

Report Date: 2023/01/16
Report #: R7472698
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C304825

Received: 2023/01/06, 15:30

(3) Oxidation-Reduction Potential (ORP) values are determined using a Ag/AgCl reference electrode. The test is therefore, not SCC accredited for this matrix.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Antonella Brasil, Senior Project Manager
Email: Antonella.Brasil@bureauveritas.com
Phone# (905)817-5817

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C304825
Report Date: 2023/01/16

McClymont & Rak Engineers Inc
Client Project #: G5820
Site Location: MILTON
Sampler Initials: BR

SOIL CORROSIVITY PACKAGE (SOIL)

Bureau Veritas ID		USZ447			USZ447		USZ448		
Sampling Date		2022/12/23			2022/12/23		2023/01/03		
COC Number		n/a			n/a		n/a		
	UNITS	BH102 SS10	RDL	QC Batch	BH102 SS10 Lab-Dup	QC Batch	BH106 SS9	RDL	QC Batch
Calculated Parameters									
Resistivity	ohm-cm	5000		8436956			3700		8436956
CONVENTIONALS									
Redox Potential	mV	350	N/A	8439248	280	8439248	250	N/A	8439248
Inorganics									
Soluble (20:1) Chloride (Cl-)	ug/g	<20	20	8439032			<20	20	8439032
Conductivity	umho/cm	198	2	8438890			269	2	8438890
Available (CaCl2) pH	pH	8.04		8439238			8.03		8439238
Soluble (20:1) Sulphate (SO4)	ug/g	73	20	8439035			110	20	8439035
Sulphide	mg/kg	<0.5 (1)	0.5	8446822			<0.5 (2)	0.5	8446822
Physical Testing									
Moisture-Subcontracted	%	10	0.30	8446821			11	0.30	8446821

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Sample extracted past method-specified hold time. Sample contained greater than 10% headspace at time of extraction. Analyzed past method specified hold time
(2) Sample contained greater than 10% headspace at time of extraction.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C304825
Report Date: 2023/01/16

McClymont & Rak Engineers Inc
Client Project #: G5820
Site Location: MILTON
Sampler Initials: BR

TEST SUMMARY

Bureau Veritas ID: USZ447
Sample ID: BH102 SS10
Matrix: Soil

Collected: 2022/12/23
Shipped:
Received: 2023/01/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride (20:1 extract)	KONE/EC	8439032	2023/01/09	2023/01/09	Samuel Law
Conductivity	AT	8438890	2023/01/09	2023/01/09	Gurparteek KAUR
Moisture (Subcontracted)	BAL	8446821	N/A	2023/01/12	Salini Vidhyadharan
Sulphide in Soil	SPEC	8446822	N/A	2023/01/12	Ly Vu
pH CaCl2 EXTRACT	AT	8439238	2023/01/09	2023/01/09	Taslima Aktar
Redox Potential	COND	8439248	2023/01/09	2023/01/10	Surinder Rai
Resistivity of Soil		8436956	2023/01/09	2023/01/09	Automated Statchk
Sulphate (20:1 Extract)	KONE/EC	8439035	2023/01/09	2023/01/11	Samuel Law

Bureau Veritas ID: USZ447 Dup
Sample ID: BH102 SS10
Matrix: Soil

Collected: 2022/12/23
Shipped:
Received: 2023/01/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Redox Potential	COND	8439248	2023/01/09	2023/01/10	Surinder Rai

Bureau Veritas ID: USZ448
Sample ID: BH106 SS9
Matrix: Soil

Collected: 2023/01/03
Shipped:
Received: 2023/01/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride (20:1 extract)	KONE/EC	8439032	2023/01/09	2023/01/09	Samuel Law
Conductivity	AT	8438890	2023/01/09	2023/01/09	Gurparteek KAUR
Moisture (Subcontracted)	BAL	8446821	N/A	2023/01/12	Salini Vidhyadharan
Sulphide in Soil	SPEC	8446822	N/A	2023/01/12	Ly Vu
pH CaCl2 EXTRACT	AT	8439238	2023/01/09	2023/01/09	Taslima Aktar
Redox Potential	COND	8439248	2023/01/09	2023/01/10	Surinder Rai
Resistivity of Soil		8436956	2023/01/09	2023/01/09	Automated Statchk
Sulphate (20:1 Extract)	KONE/EC	8439035	2023/01/09	2023/01/11	Samuel Law

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	17.0°C

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C304825
Report Date: 2023/01/16

QUALITY ASSURANCE REPORT

McClymont & Rak Engineers Inc
Client Project #: G5820
Site Location: MILTON
Sampler Initials: BR

			Matrix Spike		SPIKED BLANK		Method Blank	
QC Batch	**Parameter**	**Date**	**% Recovery**	**QC Limits**	**% Recovery**	**QC Limits**	**Value**	**UNITS**
8438890	Conductivity	2023/01/09			103	90 - 110	<2	umho/cm
8439032	Soluble (20:1) Chloride (Cl-)	2023/01/09	NC	70 - 130	101	70 - 130	<20	ug/g
8439035	Soluble (20:1) Sulphate (SO4)	2023/01/11	NC	70 - 130	99	70 - 130	<20	ug/g
8439238	Available (CaCl2) pH	2023/01/09			100	97 - 103		
8439248	Redox Potential	2023/01/10			100	95 - 105		
8446821	Moisture-Subcontracted	2023/01/12					<0.30	%
8446822	Sulphide	2023/01/12	22 (1)	75 - 125	80	75 - 125	<0.5	mg/kg

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C304825
Report Date: 2023/01/16

McClymont & Rak Engineers Inc
Client Project #: G5820
Site Location: MILTON
Sampler Initials: BR

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere, Senior Scientific Specialist

Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by {0}, {1} responsible for {2} {3} laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com