TOWN OF CALEDON
PLANNING
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A REPORT TO
BOLTON SHORE HOLDINGS LTD.

A GEOTECHNICAL INVESTIGATION FOR PROPOSED 4-STOREY BUILDING WITH BASEMENT

15, 21 AND 27 SHORE STREET

TOWN OF CALEDON

REFERENCE NO. 2404-S107

JULY 2024

DISTRIBUTION

Digital copy - Bolton Shore Holdings Ltd.
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ENCLOSURES

1.0 INTRODUCTION

In accordance with a written authorization dated April 19, 2024, from Mr. Mark Cancian of Bolton Shore Holdings Ltd., a geotechnical investigation was carried out at 15, 21 and 27 Shore Street in the Town of Caledon.

The purpose of the investigation was to reveal the subsurface conditions and determine the engineering properties of the disclosed soils for the construction of a 4-storey apartment building with a basement. The geotechnical findings and recommendations for the proposed development are presented in this report.

2.0 SITE AND PROJECT DESCRIPTION

The site is situated on Halton till plain, where the drift dominates the soil stratigraphy. In places, lacustrine sand, silt, clay and drift which has been reworked by the water action of Peel Ponding (glacial lake) have modified the drift stratigraphy.

The investigation was carried out within the properties of 15, 21 and 27 Shore Street in the Town of Caledon. The combined property consists of 3 residential dwellings with associated driveway and landscape areas. The grading within the study area is relatively flat.

A review of the Site Plan prepared by Fausto Cortese Architects dated March 8, 2024, indicates that the existing dwellings will be demolished to make way for a new 4-storey building with basement. It will be provided with on-grade parking, access driveway and landscape areas.

3.0 FIELD WORK

The field work, consisted of 4 boreholes extending to depths of 8.1 and 8.5 m below grade, was completed on May 29 and 30, 2024, at the locations shown on the Borehole and Monitoring Well Location Plan, Drawing No. 1.

The boreholes were advanced at intervals to the sampling depths by a compact track-mounted drill rig equipped with solid stem augers and split spoons for soil sampling. Standard Penetration Tests, using the procedures described on the enclosed “List of Abbreviations and Terms”, were performed at the sampling depths. The results are recorded as the Standard Penetration Resistance (or ‘N’ values) of the subsoil. The relative density of the non-cohesive strata and the consistency of the cohesive strata are inferred from the 'N' values. Split-spoon samples were recovered for soil classification and laboratory testing.

Upon completion of borehole drilling, monitoring wells were installed in 3 of the 4 boreholes to facilitate a hydrogeological assessment. Details of the monitoring wells are presented in the borehole logs.

The field work was supervised and the findings were recorded by a Geotechnical Technician. The ground elevation at each of the borehole location was obtained using the Global Navigation Satellite System (GNSS).

4.0 **SUBSURFACE CONDITIONS**

Detailed descriptions of the subsurface conditions are presented on the Borehole Logs, comprising Figures 1 to 4 inclusive. The revealed stratigraphy is plotted in the Subsurface Profiles, Drawing No. 2. The engineering properties of the disclosed soils are discussed herein.

The investigation has disclosed that beneath the topsoil and a layer of earth fill, the site is generally underlain by a stratum of silty clay, with a localized deposit of silty clay till.

4.1 **Topsoil**

The revealed topsoil is approximately 8 to 10 cm in thickness. Thicker topsoil layers may be contacted beyond the borehole locations. The topsoil is void of engineering value and must be stripped for site development.

4.2 **Earth Fill**

A layer of earth fill, extending to a depth of 0.8 m below the prevailing ground surface, was encountered in all boreholes. It is dark brown in colour and consists of silty clay, with a variable amount of topsoil and rootlets.

The natural water content of the samples was determined and the results are plotted on the Borehole Logs; the values range from 23% to 33%, with a median of 28%. The high water content value indicates the presence of topsoil.

The obtained ‘N’ values range from 5 to 10, with a median of 8 blows per 30 cm of penetration, indicating that the fill was likely placed with non-uniform compaction. Due to its unknown history and non-uniform density, the earth fill is not suitable to support any structures sensitive to settlement. It must be subexcavated, sorted free of deleterious material and organics and properly recompacted in layers.

4.3 Silty Clay/Silty Clay Till

The silty clay is the predominant soil in the revealed stratigraphy. It contains traces of sand and gravel, with occasional silt seams. The silty clay till was encountered beneath the topsoil and earth fill, overlying the silty clay in Borehole 3. It consists of a random mixture of particle sizes ranging from clay to gravel, with the silt and clay being the dominant fraction. A grain size analysis was performed on a representative sample each of the silty clay and silty clay till. The results are plotted on Figures 5 and 6, respectively.

The obtained ‘N’ values range from 8 to 45 blows per 30 cm of penetration, with a median of 23 blows per 30 cm of penetration, indicating the clay/clay till is stiff to hard, being generally very stiff in consistency. The ‘N’ values of 8 and 9 were encountered near the ground surface where the soil has been weathered.

Atterberg Limits were determined on a sample each of the clay till and clay sample. The till sample has liquid limit of 34% and plastic limit of 18%, while the clay has a liquid limit of 41% and plastic limit of 21%, indicating the clay till is low in plasticity while the clay is medium in plasticity.

The natural water content of the soil samples ranges between 16% and 29%, at a median of 22%, showing a moist to very moist, generally moist condition.

The engineering properties of the clay till deposit are given below:

- High frost susceptibility and low water erodibility.
- The clay till will be stable in relatively steep slopes; however, prolonged exposure will allow the sand seams to slough, which may lead to local sliding.

5.0 GROUNDWATER CONDITION

All boreholes remained dry upon completion of the field work.

Monitoring wells were installed at Boreholes 1, 2 and 3. Two rounds of stabilized groundwater levels were recorded in the monitoring wells and are summarized in Table 1.

Table 1 - Groundwater Levels in Monitoring Wells

Borehole No.	Ground Elevation (m)	Well Depth (m)	Measured Groundwater Level					
			Jun 11, 2024		Jun 24, 2024		July 9, 2024	
			Depth (m)	El. (m)	Depth (m)	El. (m)	Depth (m)	El. (m)
1	254.1	7.6	5.5	248.6	4.6	249.5	2.6	251.5
2	254.1	7.6	1.3	252.8	1.1	253.0	1.4	252.7
3	254.5	7.6	1.8	252.7	1.8	252.7	1.9	252.6

The groundwater level recorded in the monitoring wells ranges from 1.1 to 5.5 m below the ground surface, or El. 248.6 to 253.0 m.

Additional groundwater assessment will be presented in the hydrogeological assessment report, to be presented under separate cover.

6.0 DISCUSSION AND RECOMMENDATIONS

The investigation has disclosed that beneath the topsoil and a layer of earth fill extending to a depth of 0.8 m below the prevailing ground surface, the site is underlain by a stratum of silty clay, stiff to hard consistency. A localized deposit of very stiff silty clay till was also encountered overlying the silty clay at one borehole.

All boreholes remained dry on completion of the field work. Three rounds of groundwater levels in the monitoring wells were recorded and the results range from El. 248.6 to 253.0 m. Further groundwater assessment will be presented in the hydrogeological assessment report, to be provided under separate cover.

The proposed development will consist of a 4-storey apartment building with a conventional basement. The geotechnical recommendations appropriate for the design and construction of the development are presented herein. One must be aware that the subsurface conditions may vary between boreholes. Should subsurface variances become apparent during construction, a geotechnical engineer must be consulted.

6.1 Site Preparation

The existing topsoil and earth fill must be removed for site development.

After demolition of the existing structures, the debris must be removed and disposed of off-site. The cavity must be inspected by the geotechnical engineer before building construction. Any disturbed soils and earth fill should also be removed. Where it is free of topsoil inclusions and deleterious materials, it can be stockpiled on site for reuse. It should be compacted to 98% Standard Proctor Dry Density (SPDD).

6.2 Foundation

The proposed development will consist of a 4-storey building with a conventional basement. The basement elevation will likely be approximately 3.0 m below the prevailing ground surface. The new building foundation placed on sound, natural soil with conventional spread and strip footings can be designed using the following net bearing pressures:

- Maximum Bearing Pressure at Serviceability Limit State (SLS) = 250 kPa
- Factored Bearing Pressure at Ultimate Limit State (ULS) = 400 kPa

The total and differential settlements of structures designed using the bearing pressure at SLS are estimated within 25 mm and 20 mm, respectively.

During construction, the foundation subgrade should be inspected by the geotechnical engineer or a senior geotechnical technician to ensure that the revealed conditions are compatible with the foundation design requirements.

Foundations exposed to weathering should have at least 1.2 m of earth cover for protection against frost action.

If groundwater seepage is encountered in excavation, the foundation must be poured immediately after subgrade inspection or the subgrade should be protected by a concrete mud-slab immediately after exposure. This will prevent construction disturbance and costly rectification of the bearing subsoil.

The building foundation should meet the requirements specified in the latest Ontario Building Code and the structures should be designed to resist an earthquake force using Site Classification ‘D’ (stiff soil).

6.3 **Basement Structure**

The perimeter walls should be designed to sustain a lateral earth pressure calculated using the soil parameters stated in Section 6.7. Any applicable surcharge loads adjacent to the basement must also be considered in the wall design.

Due to the low permeability of the silty clay and clay till, the basement floor of the proposed building can be dampproofed and provided with a drainage system (Drawing No. 3). If groundwater is encountered during basement excavation, floor subdrains will be required, and a vapour barrier should be placed at the crown level of the subdrain to prevent upfiltration of soil moisture that may wet the floor. All the subdrain should be encased in a fabric filter to protect them against blockage by silting. These measures can be further assessed during construction.

The subgrade should consist of sound native soils or well compacted earth fill, the floor slab should be constructed on a granular base of at least 15 cm thick, consisting of 19-mm Crusher-Run Limestone (CRL), or equivalent, compacted to 100% SPDD.

The elevator pit, which normally extends below the floor level, should be designed as a submerged ‘tank’ structure with waterproofed pit walls and pit floor.

The grading around the building structure must be such that it directs runoff away from the structure.

6.4 **Underground Services**

The underground services should be founded on sound native soil or properly compacted inorganic earth fill. Where weathered soil is encountered, it should be subexcavated and replaced with the bedding material, compacted to at least 98% SPDD.

A Class ‘B’ bedding is recommended for the underground services construction. It should consist of compacted 19-mm CRL, or equivalent, as approved by a geotechnical engineer.

The pipe joints into the manholes and catch basins must be leak-proof to prevent the migration of fines through the joints. Openings to subdrains and catch basins should be shielded with a fabric filter to prevent blockage by silting.

A soil cover having a thickness at least equal to the diameter of the pipe should be in place at all times after pipe installation, to prevent pipe floatation when the trench is deluged with water derived from precipitation.

6.5 Backfilling in Trenches and Excavated Areas

The backfill in service trenches should be compacted to at least 98% SPDD, particularly below concrete floor subgrade and in the zone within 1.0 m below the pavement. The material should be compacted with the water content at 2% to 3% drier than the optimum. The lifts must be limited to 20 cm or less (before compaction).

As a general guide, the typical water content values of the revealed soils for Standard Proctor compaction are presented in Table 2.

Table 2 - Estimated Water Content for Compaction of On-Site Material

Soil Type	**Determined Natural Water Content (%)**	**Water Content (%) for Standard Proctor Compaction**	
		100% (optimum)	**Range for 95% or +**
Earth Fill	23 to 33 (median 28)	15	13 to 20
Silty Clay Till/Silty Clay	16 to 29 (median 22)	15 to 21	13 to 25

The in-situ clay and clay till are generally suitable for use as trench backfill. Where they are too wet, they will require aeration by spreading them thinly in dry, warm weather. The till should be sorted free of oversized boulders (over 15 cm in size) before use as backfill. The existing fill must be sorted free of topsoil inclusions and deleterious materials, if any, prior to its use as structural backfill.

In normal construction practice, the problem areas of pavement settlement largely occur adjacent to manholes, catch basins, services crossings, foundation walls and columns, it is recommended that a sand backfill should be used.

The narrow trenches for services crossings should be cut at 1 vertical:2 horizontal so that the backfill in the trenches can be effectively compacted. Otherwise, soil arching in the trenches will prevent achievement of the proper compaction. In confined areas where the desired slope cannot be achieved or the operation of a proper kneading-type roller cannot be facilitated, imported sand fill, which can be appropriately compacted by using a smaller vibratory compactor, must be used.

6.6 Pavement Design

The pavement design for the parking area and fire route is presented in Table 3.

Table 3 - Pavement Design

Course	Thickness (mm)	OPS Specifications
Asphalt Surface	40	HL3
Asphalt Binder	65	HL8
Granular Base	150	Granular 'A'
Granular Sub-base Light-Duty/Parking Heavy-Duty/Fire Route	 300 450	Granular 'B'

In preparation of pavement subgrade, all compressible material should be removed. The final subgrade must be proof-rolled. Any soft spot identified must be rectified by subexcavation and replacing with selected dry inorganic material. The subgrade within 1.0 m below the underside of the granular sub-base must be compacted to at least 98% SPDD, with the water content at 2% to 3% drier than its optimum.

All the granular bases should be compacted in 150 to 200 mm lifts to 100% SPDD.

An intercept subdrain system should be installed along the perimeter of the parking area where surface runoff may drain onto the pavement. In paved areas, catch basins with stub drains in all four directions should be provided. The stub drains and subdrains should drain into the catch basin through filter-sleeved weepers. The invert of the subdrains should be at least 0.4 m beneath the underside of the granular sub-base and should be backfilled with free-draining granular material.

6.7 Soil Parameters

The recommended soil parameters for the project design are given in Table 4.

Table 4 - Soil Parameters

Unit Weight and Bulk Factor		**Estimated Bulk Factor**	
	Bulk Unit Weight γ **(kN/m^3)**	**Loose**	**Compacted**
Silty Clay Till	22.0	1.30	1.05
Earth Fill/Silty Clay	20.5	1.25	1.00
Lateral Earth Pressure Coefficients	**Active** K_a	**At Rest** K_o	**Passive** K_p
Silty Clay	0.39	0.56	2.56
Silty Clay Till	0.33	0.50	3.00
Effective Shear Strength Parameters	**Cohesion c' (kPa)**	**Angle of Internal Friction, ϕ'**	
Silty Clay	5	26°	
Silty Clay Till	5	30°	
Coefficient of Permeability (K) and Percolation Time (T)			
	K (cm/sec)	**T (min/cm)**	
Silty Clay/Silty Clay Till	10^{-7}	100	
Coefficients of Friction			
Between Concrete and Granular Base		0.50	
Between Concrete and Sound Native Soils		0.35	

6.8 Excavation

Excavation should be carried out in accordance with Ontario Regulation 213/91. The types of soils are classified in Table 4.

Table 5 - Classification of Soils for Excavation

Material	Type
Sound Silty Clay/Silty Clay Till	2
Earth Fill and Weathered Soils	3

In the silty clay and clay till, any perched groundwater yield can be collected and removed by conventional pumping from sumps. The yield is expected to be small and limited.

Excavation into the till with boulders will require extra effort and the use of properly equipped heavy-duty excavator.

Prospective contractors may be asked to asses the subsurface conditions by digging test pits to the intended depth of excavation. These test pits should be allowed to remain open for a few hours to asses the trenching conditions and the dewatering requirement for excavation.

7.0 LIMITATIONS OF REPORT

This report was prepared by Soil Engineers Ltd. for the account of Bolton Shore Holdings Ltd. and for review by the designated consultants, financial institutions, government agencies and contractors. The material in the report reflects the judgment of Kelvin Hung, P.Eng., and Bernard Lee, P.Eng., in light of the information available to it at the time of preparation.

Use of the report is subject to the conditions and limitations of the contractual agreement. Any use which a Third Party makes of this report, and/or any reliance on decisions to be made based on it is the responsibility of such Third Parties. Soil Engineers Ltd. accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

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LIST OF ABBREVIATIONS AND DESCRIPTION OF TERMS

The abbreviations and terms commonly employed on the borehole logs and figures, and in the text of the report, are as follows:

SAMPLE TYPES

AS	Auger sample
CS	Chunk sample
DO	Drive open (split spoon)
DS	Denison type sample
FS	Foil sample
RC	Rock core (with size and percentage recovery)
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample

PENETRATION RESISTANCE

Standard Penetration Resistance or 'N' Value:

The number of blows of a 63.5 kg hammer falling from a height of 76 cm required to advance a 51 mm outer diameter drive open sampler 30 cm into undisturbed soil, after an initial penetration of 15 cm.

Plotted as '○'

Dynamic Cone Penetration Resistance:

A continuous profile showing the number of blows per each 30 cm of penetration of a 51 mm diameter, 90° point cone driven by a 63.5 kg hammer falling from a height of 76 cm.

Plotted as '—●—'

WH	Sampler advanced by static weight
PH	Sampler advanced by hydraulic pressure
PM	Sampler advanced by manual pressure
NP	No penetration

SOIL DESCRIPTION

Cohesionless Soils:

'N' (blows/30 cm)	Relative Density
0 to 4	very loose
4 to 10	loose
10 to 30	compact
30 to 50	dense
>50	very dense

Cohesive Soils:

Undrained Shear Strength (kPa)	'N' (blows/30 cm)	Consistency
<12	<2	very soft
12 to <25	2 to <4	soft
25 to <50	4 to <8	firm
50 to <100	8 to <15	stiff
100 to 200	15 to 30	very stiff
>200	>30	hard

Method of Determination of Undrained Shear Strength of Cohesive Soils:

x 0.0 Field vane test in borehole; the number denotes the sensitivity to remoulding

△ Laboratory vane test

METRIC CONVERSION FACTORS

1 ft = 0.3048 m
1 inch = 25.4 mm
1 lb = 0.454 kg
1 ksf = 47.88 kPa

JOB NO.: 2404-S107

LOG OF BOREHOLE: 1

FIGURE NO.: 1

PROJECT DESCRIPTION: Proposed 4-Storey Apartment with Basement

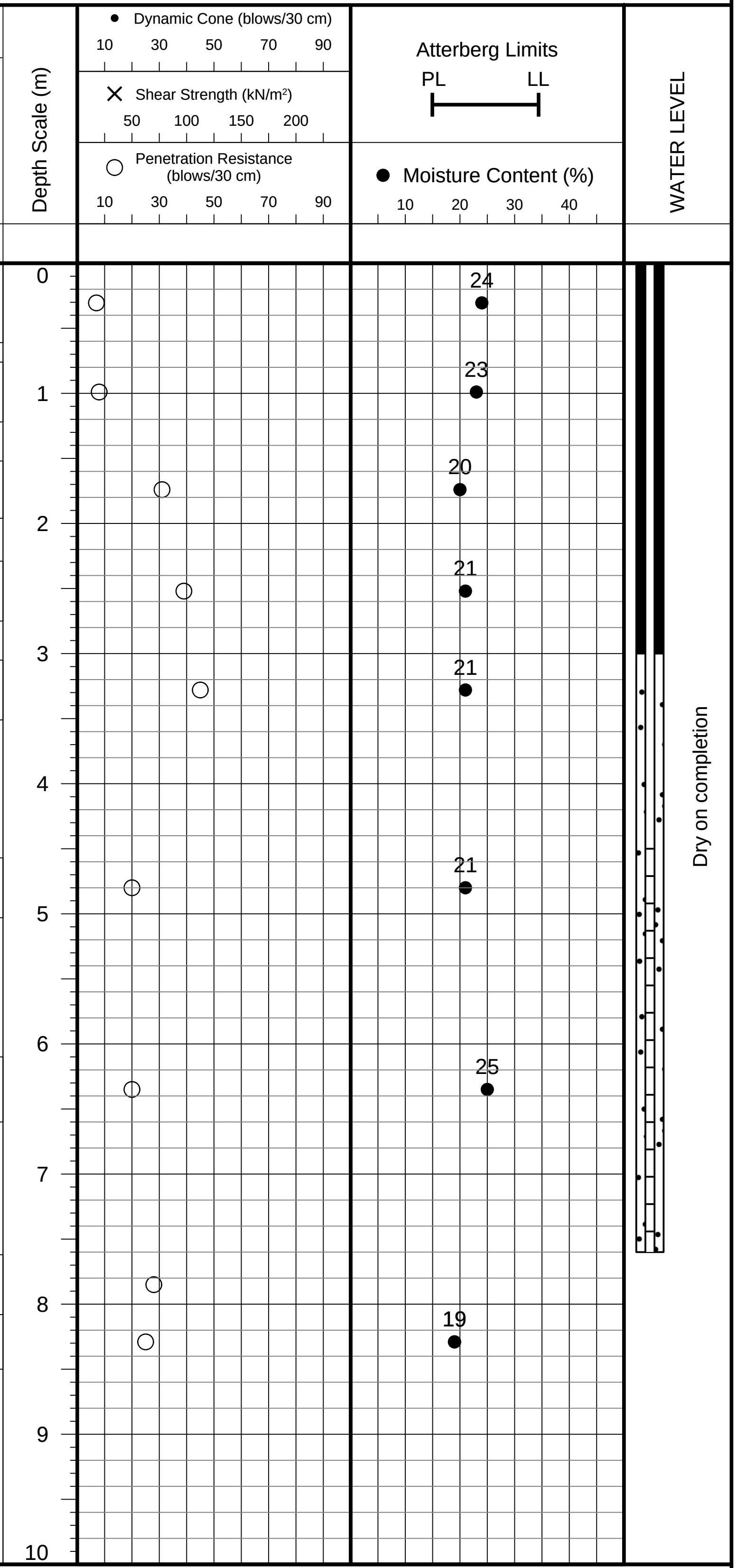
METHOD OF BORING: Solid-Stem Augers

PROJECT LOCATION: 15, 21 and 27 Shore Street, Town of Caledon

DRILLING DATE: May 30, 2024

El. (m) Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
254.1	Ground Surface			
0.0	**7.6 cm TOPSOIL** Dark brown **EARTH FILL** silty clay occ. rootlets and topsoil inclusions	1	DO	7
253.3 0.8	Stiff to hard	2	DO	8
		3	DO	31
		4	DO	39
	SILTY CLAY	5	DO	45
	brown grey	6	DO	20
	traces of sand and gravel occ. silt seams			
		7	DO	20
		8	DO	28
		9	DO	25
245.6 8.5	**END OF BOREHOLE**			

Installed 50 mm Ø monitoring well to 7.6 m
completed with 3.1 m screen
Sand backfill from 4.0 m to 7.6 m
Bentonite seal from 0.0 m to 4.0 m
Provided with a steel monument casing



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JOB NO.: 2404-S107

LOG OF BOREHOLE: 2

FIGURE NO.: 2

PROJECT DESCRIPTION: Proposed 4-Storey Apartment with Basement

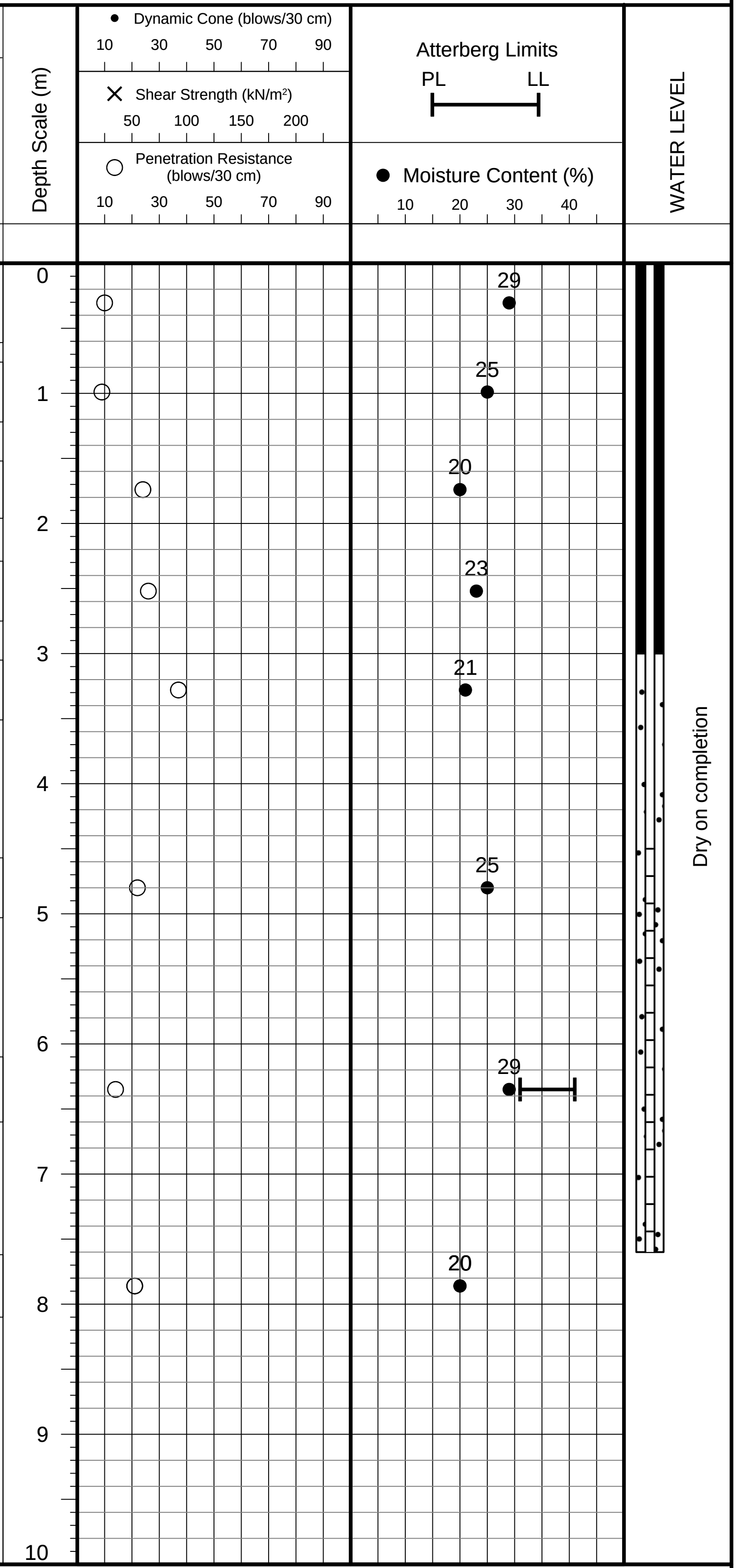
METHOD OF BORING: Solid-Stem Augers

PROJECT LOCATION: 15, 21 and 27 Shore Street, Town of Caledon

DRILLING DATE: May 29, 2024

El. (m) Depth (m)	SOIL DESCRIPTION	SAMPLES Number	SAMPLES Type	SAMPLES N-Value
254.1	Ground Surface			
0.0	**7.6 cm TOPSOIL** Dark brown **EARTH FILL** silty clay occ. rootlets and topsoil inclusions	1	DO	10
253.3 0.8	Stiff to hard **SILTY CLAY** traces of sand and gravel occ. silt seams brown grey	2	DO	9
		3	DO	24
		4	DO	26
		5	DO	37
		6	DO	22
		7	DO	14
		8	DO	21
246.0 8.1	**END OF BOREHOLE**			

Installed 50 mm Ø monitoring well to 7.6 m
completed with 3.1 m screen
Sand backfill from 4.0 m to 7.6 m
Bentonite seal from 0.0 m to 4.0 m
Provided with a steel monument casing



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JOB NO.: 2404-S107

LOG OF BOREHOLE: 3

FIGURE NO.: 3

PROJECT DESCRIPTION: Proposed 4-Storey Apartment with Basement

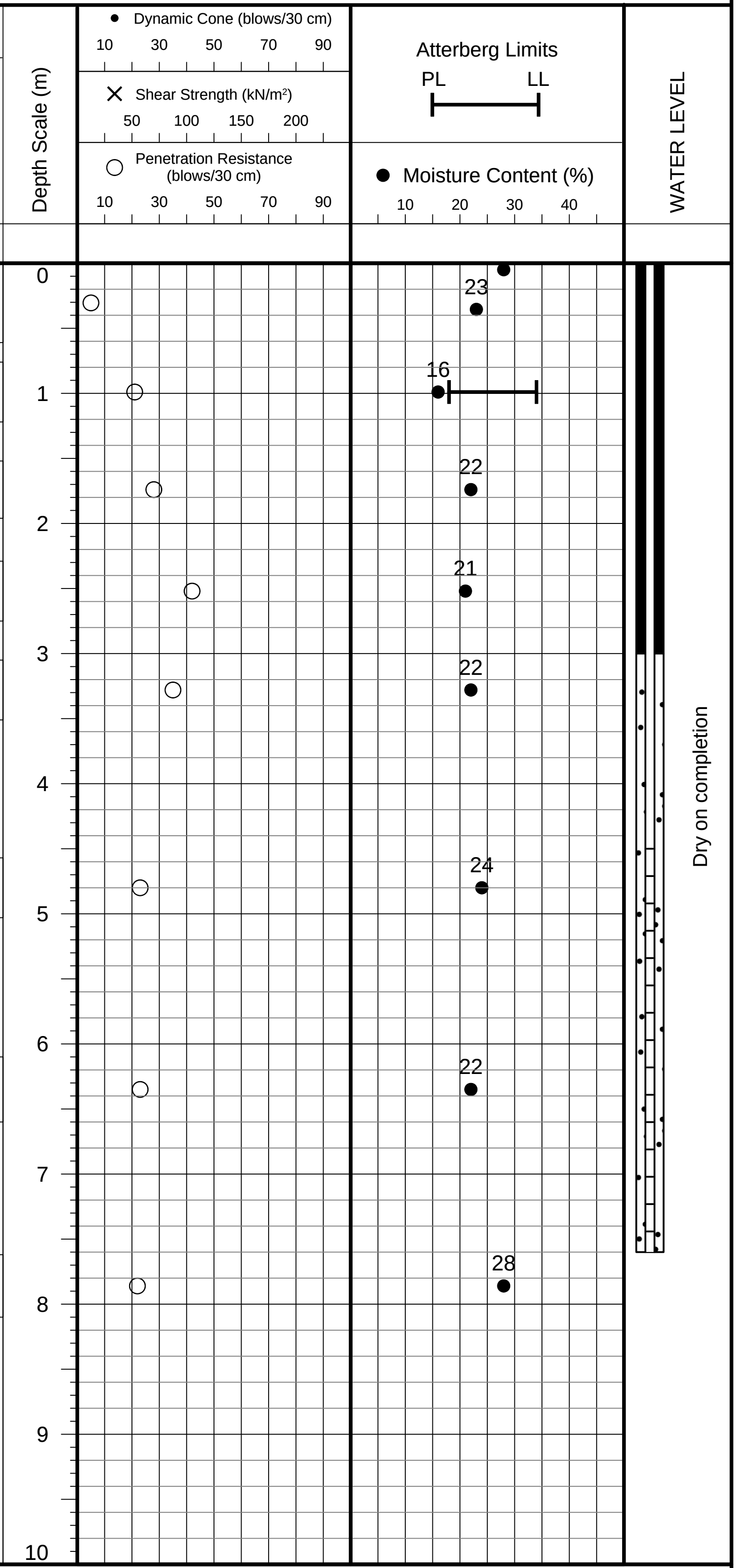
METHOD OF BORING: Solid-Stem Augers

PROJECT LOCATION: 15, 21 and 27 Shore Street, Town of Caledon

DRILLING DATE: May 29, 2024

El. (m) Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
254.5	Ground Surface			
0.0	**10 cm TOPSOIL**	1A		
	Dark brown **EARTH FILL** silty clay occ. rootlets and topsoil inclusions	1B	DO	5
253.7 0.8	Brown, very stiff **SILTY CLAY TILL** some sand, a trace of gravel	2	DO	21
253.0 0.8	Very stiff to hard	3	DO	28
		4	DO	42
		5	DO	35
	SILTY CLAY			
	brown grey	6	DO	23
	traces of sand and gravel occ. silt seams			
		7	DO	23
		8	DO	22
246.4 8.1	**END OF BOREHOLE**			

Installed 50 mm Ø monitoring well to 7.6 m
completed with 3.1 m screen
Sand backfill from 4.0 m to 7.6 m
Bentonite seal from 0.0 m to 4.0 m
Provided with a flush mounted cover



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JOB NO.: 2404-S107

LOG OF BOREHOLE: 4

FIGURE NO.: 4

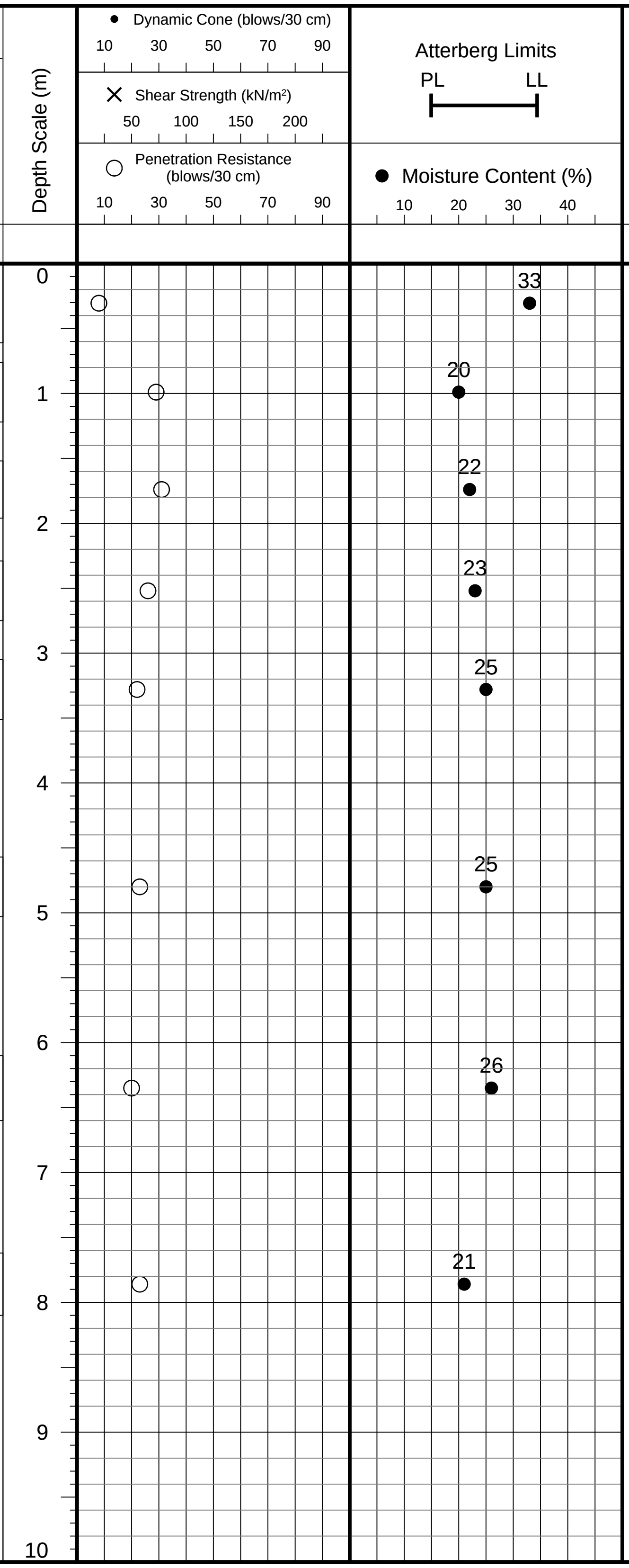
PROJECT DESCRIPTION: Proposed 4-Storey Apartment with Basement

METHOD OF BORING: Solid-Stem Augers

PROJECT LOCATION: 15, 21 and 27 Shore Street, Town of Caledon

DRILLING DATE: May 29, 2024

El. (m) Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value
254.3	Ground Surface			
0.0	**7.6 cm TOPSOIL** Dark brown **EARTH FILL** silty clay occ. rootlets and topsoil inclusions	1	DO	8
253.5 0.8	Very stiff to hard	2	DO	29
		3	DO	31
		4	DO	26
	SILTY CLAY	5	DO	22
		6	DO	23
	traces of sand and gravel occ. silt seams			
	brown grey	7	DO	20
		8	DO	23
246.2 8.1	**END OF BOREHOLE**			



WATER LEVEL

Dry on completion

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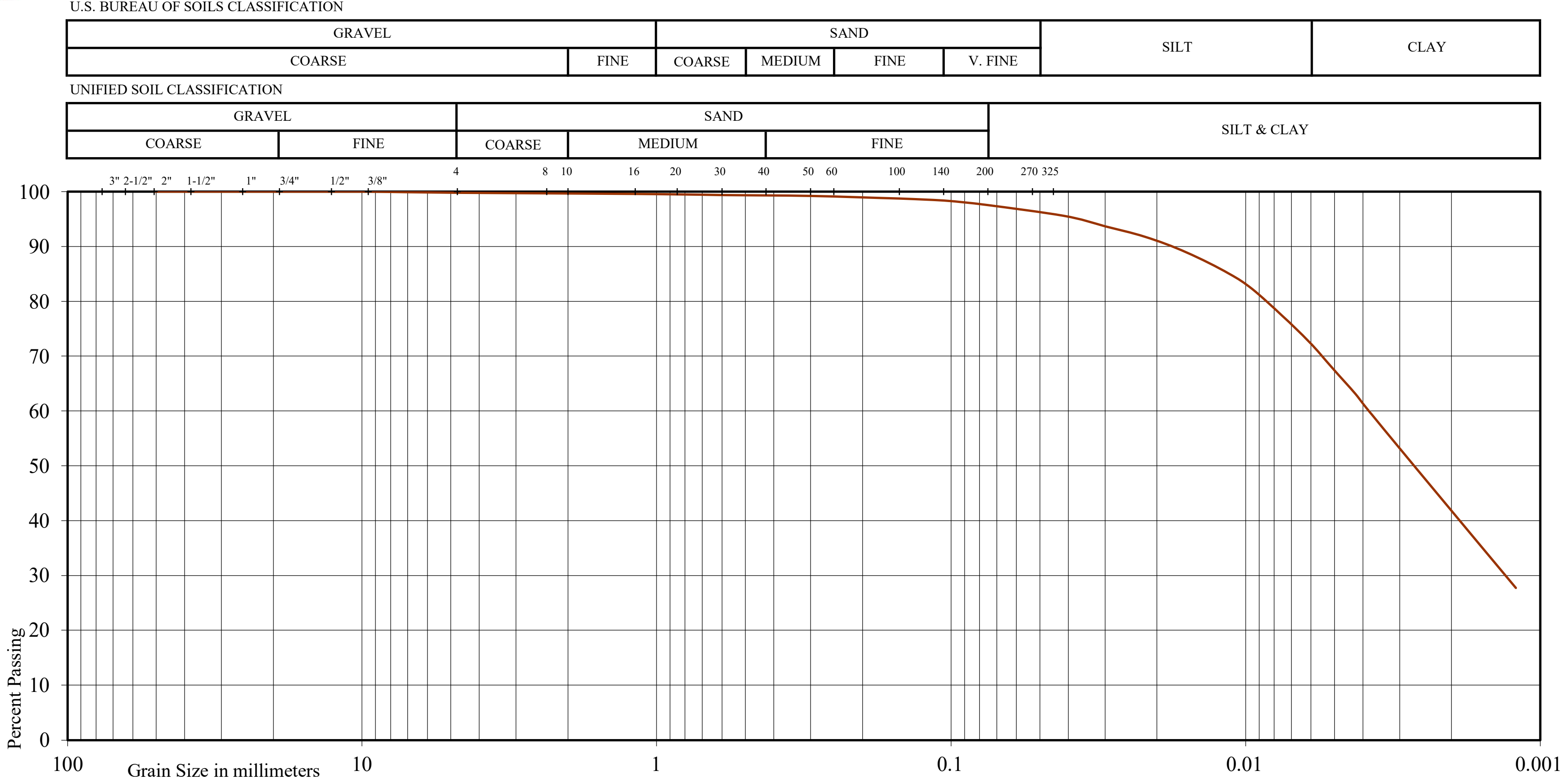
GRAIN SIZE DISTRIBUTION

Reference No: 2404-S107



Project: Proposed 4-Storey Apartment with Basement

Location: 15, 21 and 27 Shore Street, Town of Caledon

Borehole No: 2

Sample No: 7

Depth (m): 6.4

Elevation (m): 247.7

Liquid Limit (%) = 41

Plastic Limit (%) = 21

Plasticity Index (%) = 20

Moisture Content (%) = 29

Estimated Permeability (cm./sec.) = 10^{-7}

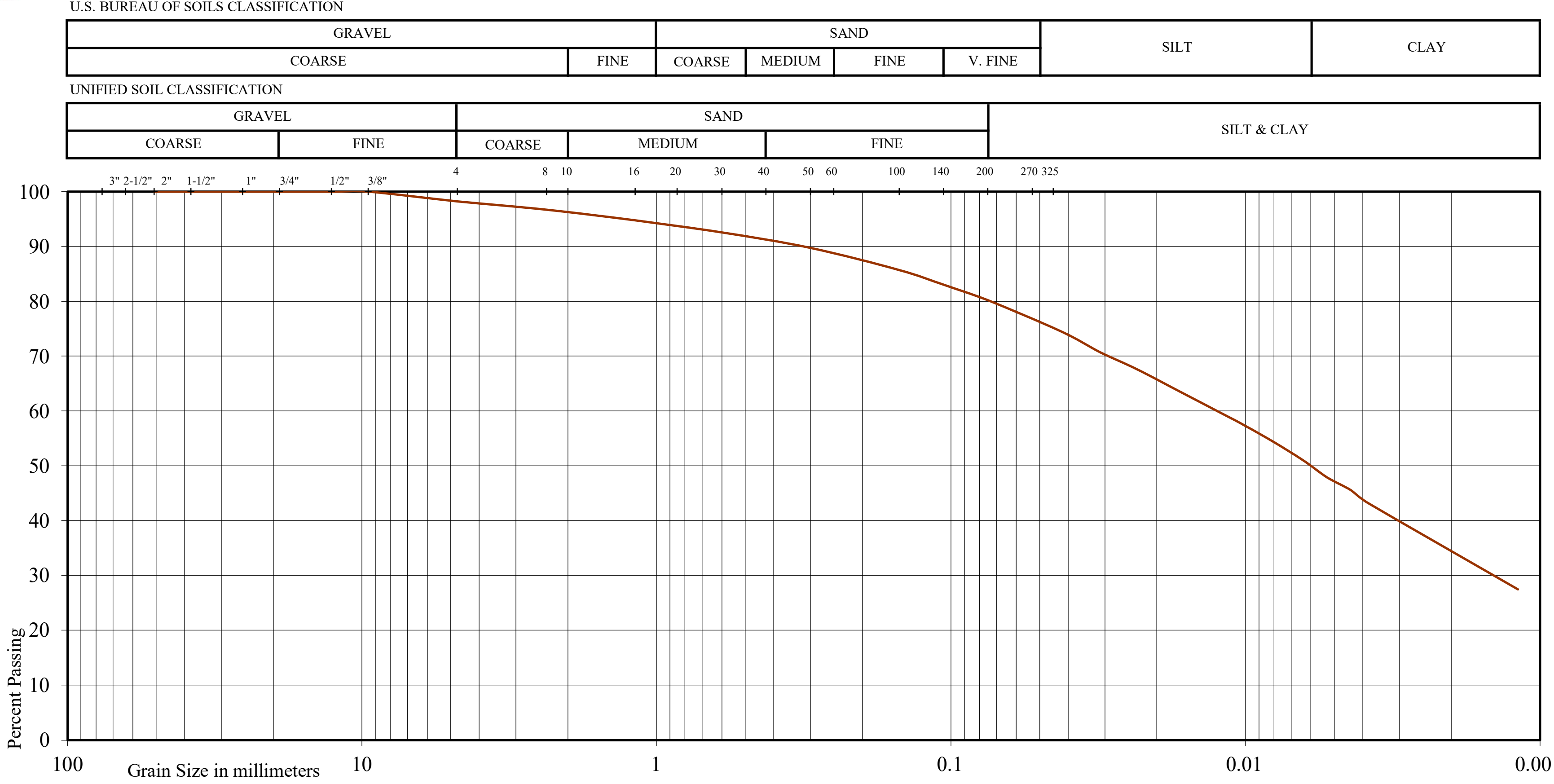
Classification of Sample [& Group Symbol]: SILTY CLAY
a trace of fine sand

Figure: 5

Soil Engineers Ltd.

GRAIN SIZE DISTRIBUTION

Reference No: 2404-S107



Project: Proposed 4-Storey Apartment with Basement

Location: 15, 21 and 27 Shore Street, Town of Caledon

Borehole No: 3

Sample No: 2

Depth (m): 1.0

Elevation (m): 253.5

Liquid Limit (%) = 34

Plastic Limit (%) = 18

Plasticity Index (%) = 16

Moisture Content (%) = 16

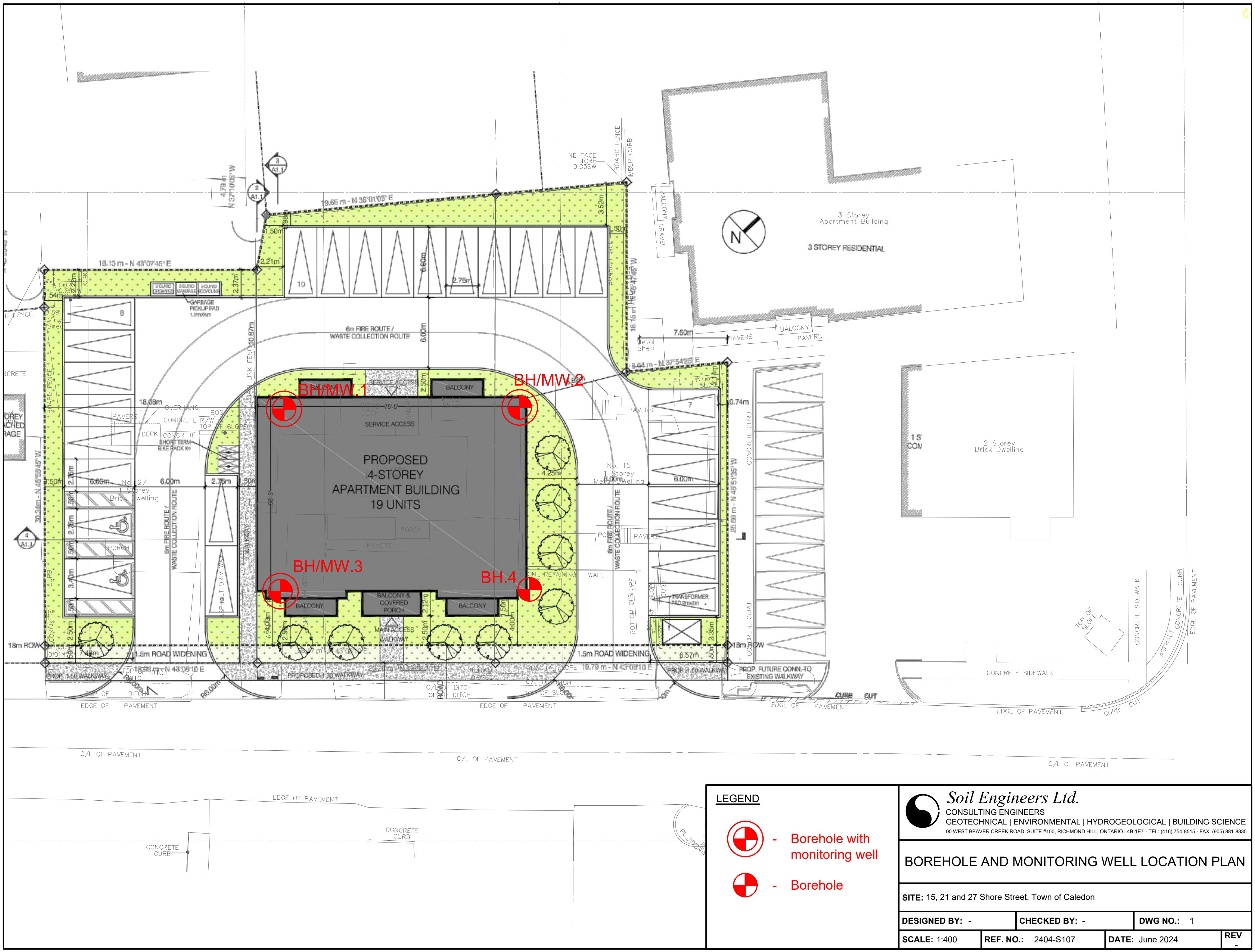
Estimated Permeability

(cm./sec.) = 10^{-7}

Classification of Sample [& Group Symbol]: SILTY CLAY TILL

some sand, a trace of gravel

Figure: 6



LEGEND

🟥 - Borehole with monitoring well

🟥 - Borehole

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90 WEST BEAVER CREEK ROAD, SUITE #100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

BOREHOLE AND MONITORING WELL LOCATION PLAN

SITE: 15, 21 and 27 Shore Street, Town of Caledon

DESIGNED BY: -	**CHECKED BY:** -	**DWG NO.:** 1
SCALE: 1:400	**REF. NO.:** 2404-S107	**DATE:** June 2024

REV -

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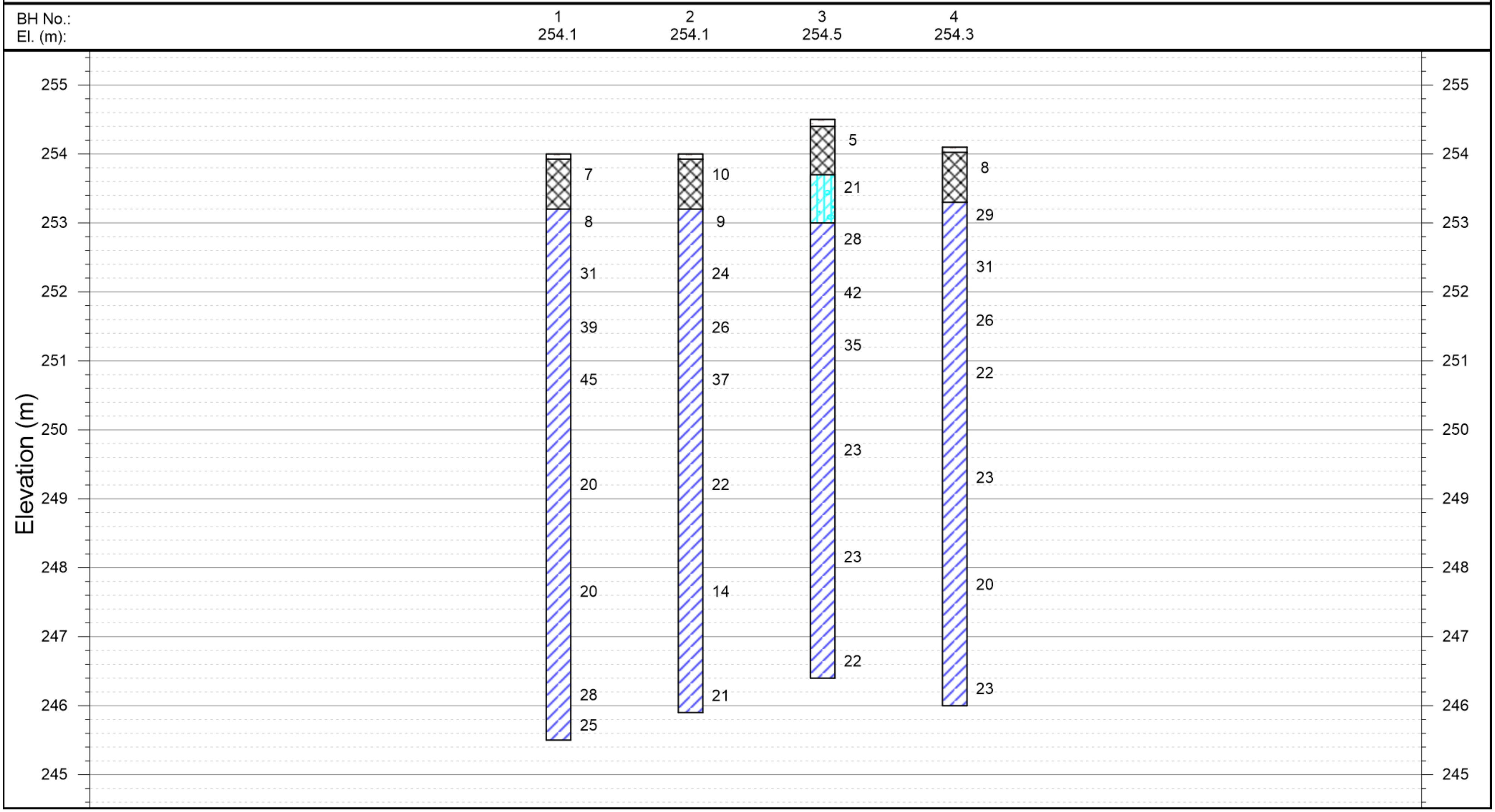
GEOTECHNICAL | ENVIRONMENTAL | HYDROGEOLOGICAL | BUILDING SCIENCE

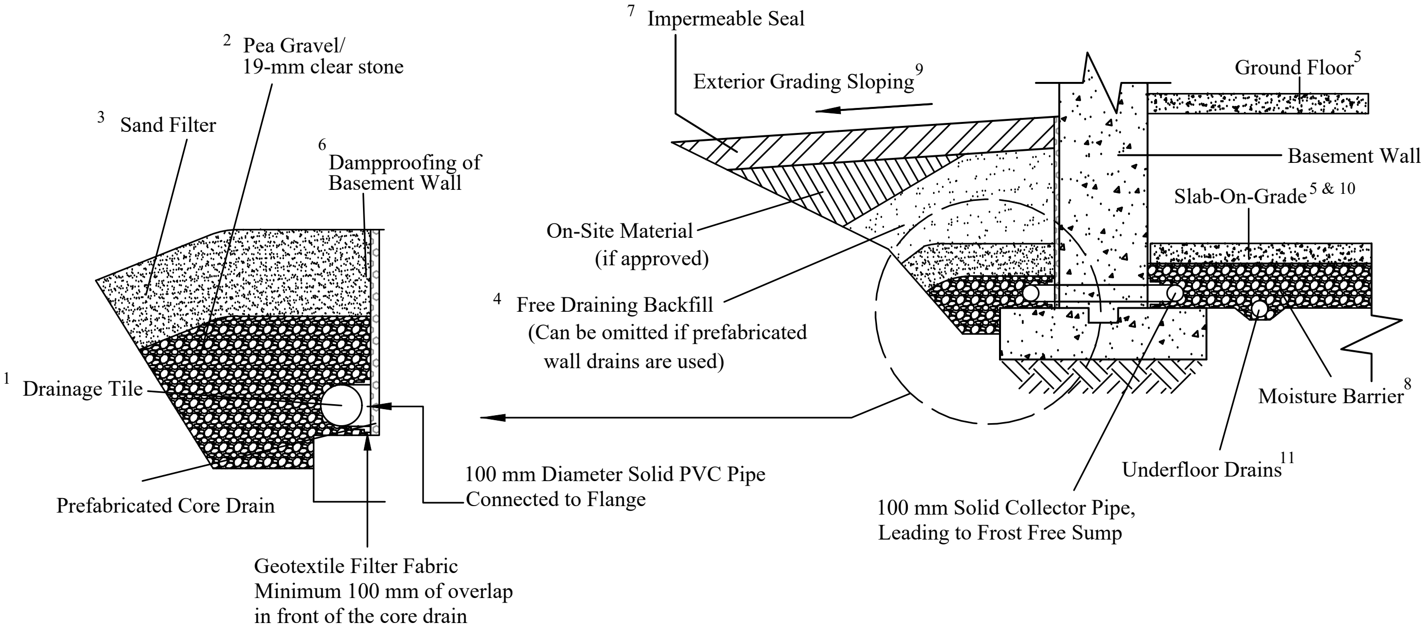
SUBSURFACE PROFILE
DRAWING NO. 2
SCALE: AS SHOWN

JOB NO.: 2404-S107
REPORT DATE: June 2024
PROJECT DESCRIPTION: Proposed 4-Storey Apartment with Basement
PROJECT LOCATION: 15, 21 and 27 Shore Street, Town of Caledon

LEGEND

▤ TOPSOIL ▦ FILL ▨ SILTY CLAY ▥ SILTY CLAY TILL





NOTES:

1. **Drainage tile**: consists of 100 mm (4") diameter weeping tile or equivalent perforated pipe leading to a positive sump or outlet. Invert to be at minimum of 150 mm (6") below underside of basement floor slab.

2. **Pea gravel**: at 150 mm (6") on the top and sides of drain. If drain is not placed on concrete footing, provide 100 mm (4") of pea gravel below drain. The pea gravel may be replaced by 19-mm clear stone provided that the drain is covered by a porous geotextile membrane of Terrafix 270R or equivalent.

3. **Filter material**: consists of C.S.A. fine concrete aggregate. A minimum of 300 mm (12") on the top and sides of gravel. This may be replaced by an approved porous geotextile membrane of Terrafix 270R or equivalent.

4. **Free-draining backfill**: OPSS Granular 'B' or equivalent, compacted to 95% to 98% (maximum) Standard Proctor dry density. Do not compact closer than 1.8 m (6') from wall with heavy equipment. This may be replaced by on-site material if prefabricated wall drains (Miradrain) extending from the finished grade to the bottom of the basement wall are used.

5. **Do not backfill** until the wall is supported by the basement floor slab and ground floor framing, or adequate bracing.

6. **Dampproofing** of the basement wall is required before backfilling

7. **Impermeable backfill seal** of compacted clay, clayey silt or equivalent. If the original soil in the vicinity is a free-draining sand, the seal may be omitted.

8. **Moisture barrier**: 19-mm CRL or equivalent. The thickness of this layer should be 150 mm (6") minimum.

9. **Exterior Grade**: slope away from basement wall on all the sides of the building.

10. **Slab-On-Grade** should not be structurally connected to walls or foundations.

11. **Underfloor drains*** should be placed in parallel rows at 6 to 8 m (20'-25') centre, on 100 mm (4") of pea gravel with 150 mm (6") of pea gravel on top and sides. The spacing should be at least 300 mm (12") between the underside of the floor slab and the top of the pipe. The drains should be connected to positive sumps or outlets. Do not connect the underfloor drains to the perimeter drains.

*Underfloor drains can be deleted where not required.

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Permanent Perimeter Drainage System

SITE: 15, 21 and 27 Shore Street, Town of Caledon
DESIGNED BY: K.L.
CHECKED BY: B.L.
DWG NO.: 3
SCALE: N.T.S.
REF. NO.: 2404-S107
DATE: June 2024
REV -