FISHER ENGINEERING

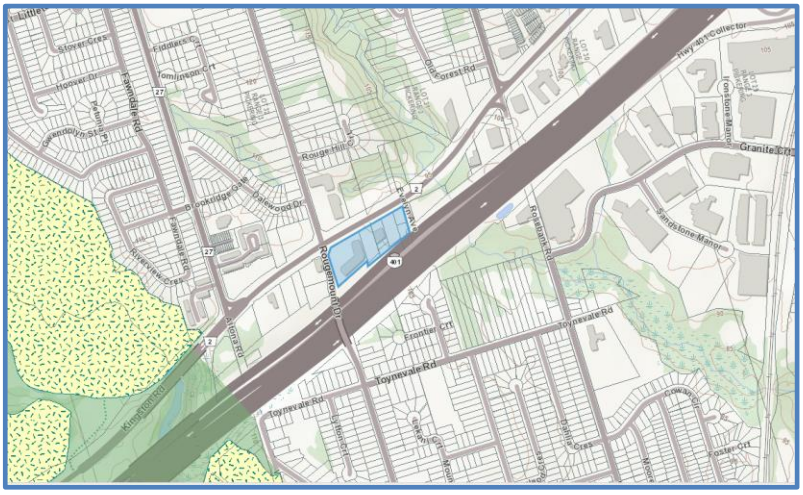
ENGINEERING

Professional Engineers Ontario

LABORATORY

CALA
Canadian Association for Laboratory Accreditation Inc.

GEOTECHNICAL INVESTIGATION



PROPOSED DEVELOPMENT
375-417 KINGSTON ROAD, PICKERING, ONTARIO, L1V 1A3

400 Esna Park Drive, Unit 15
Markham, ON
L3R 3K2

Tel: (905) 475-7755
Fax: (905) 475-7718
www.fishereng.com

Prepared for:

375 Kingston Road Corporation &

401 Kingston Road Corporation

Project No. FG24-14410_V2

March 7, 2025

Issued to:	375 Kingston Road Corporation & 401 Kingston Road Corporation
Contact:	Kirby Wilson Decade Capital 1806 Avenue Rd, Unit 2, Toronto, ON M5M 3Z1 Tel: 416-781-0623 Ext. 6 Email: kirby@decadecapital.ca
Project Name:	Geotechnical Investigation
Project Address:	375-417 Kingston Road, Pickering, Ontario, L1V 1A3
Project Number:	FG24-14410_V2
Issued on:	March 7, 2025
Report Prepared by:	Prashanta K. Saha, P. Eng. Senior Geotechnical Engineer 647.867.4571 saha@fishereng.com
Project Manager: **(Primary Contact)**	Clive Wiggan, PhD., PMP., P.Eng., Project Manager clive@fishereng.com
Reviewed By:	Dave Fisher, C. Chem., P. Eng., President dave@fishereng.com

LICENSED PROFESSIONAL ENGINEER
P. K. SAHA
100134676
PROVINCE OF ONTARIO

March 7/25

LICENSED PROFESSIONAL ENGINEER
D.A. FISHER
PROVINCE OF ONTARIO

MAR 7 25

TABLE OF CONTENTS

1. INTRODUCTION

Fisher Engineering Limited (Fisher) was commissioned by 375 Kingston Road Corporation & 401 Kingston Road Corporation, hereinafter referred to as the 'Client', to carry out a Geotechnical Investigation at the property addressed as 375-417 Kingston Road, Pickering, Ontario, hereinafter referred to as the 'Site'.

The purpose of the geotechnical investigation was to explore subsurface conditions across the site and to provide general geotechnical comments/recommendations for the design/ construction of the new development by means of ten (10) boreholes.

This report presents the results of the investigation performed in accordance with the general terms of reference outlined in the scope of work.

The report has been prepared specifically and solely for the proposed development regarding general geotechnical aspects of design and construction.

2. SITE AND PROJECT DESCRIPTION

Site Settings

The subject property is located at the southeast corner of the intersection of Rougemount Drive and Kingston Road, in the City of Pickering, Ontario and is bounded by Kingston Road to the north, beyond which is a mix of residential and commercial properties, Evelyn Avenue to the east, beyond which are houses and undeveloped land, Highway 401 to the south and Rougemount Drive to the west as shown on the Site Location Map, presented in Figure A1 of Appendix A.

The subject property, which is irregular in shape, consists of a commercial plaza at 375 Kingston Road, a vehicle servicing centre at 393 Kingston Road, a Montessori school at 405 Kingston and houses at 417 Kingston Road.

Topography

The site consists of a relatively flat portion extending from 375 Kingston Road (existing commercial plaza) towards 393 Kingston Road. Site grades then fall along 401 to 417 Kingston Road. Elevations vary generally from 106.43m at BH108, located at the southwest corner, to 102.28m asl at BH103, located at the northeast corner of the site.

Proposed Development

Based on the Draft Site Plan issued for coordination, prepared by Studio JCI, dated November 21, 2024, the proposed mixed-use development will consist of 4 separate high-rise buildings of 30, 31, 32 and 33 storeys linked by 6 levels of parkade, split between 2 below grade and 4 above grade levels. The development will consist of two phases with finished P2 top of slab at 7.5m and 6.5m below ground floor for Phase 1 and 2 respectively.

3. SCOPE OF GEOTECHNICAL WORK

The geotechnical scope of work included the following:

- Investigation of subsurface conditions at the site by advancing boreholes, soil sampling and visual evaluation.

- Preparation of a geotechnical report with general comments and recommendations regarding:

  - Appropriate foundation depth, type and bearing pressures (SLS & ULS).
  - Seismic site classification.
  - Comments regarding underground parking garage/basement construction.
  - Recommendations regarding slab-on-grade construction.
  - Comments/recommendations regarding pavement construction and
  - Excavation recommendations etc.

4. PREVIOUS INVESTIGATIONS

Fisher Environmental carried out a Phase 2 ESA and Preliminary Geotechnical Investigation on 375 Kingston Road and submitted reports under FE-P 21-11144 and FE-P 21-11145 respectively. Five (5) boreholes, BH1 to BH5, were drilled to approximate depth of 3.20m to 9.60m below prevailing grade. Three (3) of the boreholes were instrumented as monitoring wells, MW1, MW2 and MW4, with bottom of screens at depths of 6.12m to 8.42m bgs. Borehole logs from these investigations are presented in Appendix B. Locations of previously installed monitoring wells are shown on the site plan in Appendix A. Groundwater levels, measured in the previously installed monitoring wells, are also used in the report.

5. METHOD OF INVESTIGATION

Public and private utilities clearances were carried out by Ontario One-Call and Utility Marx, on behalf of Fisher Engineering, prior to drilling.

5.1Subsurface Exploration

Field work for this investigation was carried out concurrent with drilling for a hydrogeological investigation over the period December 17, 2024 to January 10, 2025 during which ten (10) boreholes were advanced generally to approximate depths of 12.32m to 30.94m below prevailing grades (elevations vary from 71.77m to 93.78m asl). Approximate locations of the boreholes and elevations are shown on the Borehole Location Plan at Appendix A.

A truck mounted drill rig (CME-55 & D-50), equipped with solid stem augers, supplied by Terra Firma Services, was used to drill the shallow boreholes (BH101 to BH103 & BH108 to BH110) under direct supervision of Fisher Engineering personnel. The deeper boreholes, BH104 to BH107 were drilled using mud rotary. Soil samples were taken at regular intervals using a split–spoon sampler advanced by means of the Standard Penetration Test (SPT) which was conducted in general accordance with ASTM Specification D1586.

All boreholes, drilled during the current investigation, were instrumented as monitoring wells on completion of drilling (MW101 to MW110) to be used for groundwater testing and sampling. The monitoring wells were installed at depths of 4.57m to 10.67m below prevailing grade and were constructed using 50mm (2”) diameter PVC pipes with 3.05m (10’) long screens. A clean silica sand pack was placed around the well screens and isolated with bentonite below prevailing grades. Previously installed monitoring wells, MW1, MW2 and MW4 were also installed with 3.05m (10’) screens.

5.2 Laboratory Analyses

All recovered soil samples were placed in clear, sealable plastic bags in the field and were taken to the Fisher Engineering accredited laboratory for final visual assessment, classification and selected moisture content testing. The samples were tested and classified in general accordance with the Unified Soil Classification System, ASTM D 2487, and Standard Practice for Classification of Soil for Engineering Purposes. Soil Description and test results are given in the borehole logs in Appendix B.

The soil samples recovered during the investigation will be stored in the Fisher Engineering laboratory for a period of 30 days after submitting the initial report and will be discarded thereafter unless instructed otherwise.

6. SUBSURFACE CONDITIONS

Surface and subsurface conditions encountered at borehole locations are shown in Appendix B - Log of Boreholes and are summarized in the following sections. The logs include stratification at borehole locations along with detailed soil descriptions. Variations in soil stratification may occur and should be expected between borehole locations and elsewhere on the site.

Asphalt/Granular Material/Fill - An approximately 75mm to 100mm thick layer of asphalt was encountered at the surface of the boreholes except BH102, BH106 & BH110. The asphalt was underlain generally by approximately 150mm to 500mm thick layer of granular material. Layers of granular material, approximately 150mm to 530mm thick, were observed at the surface of BH102, BH106 and BH110.

Fill / possibly fill soils were encountered below the granular material at borehole locations except in BH102. The fill consisted generally of dark brown / grey clayey sandy silt/silty sand with trace of gravel, roots and occasional topsoil. Layers of compact silty sand/silt/clayey silt underlying the granular material in BH101 and BH103 could not be positively identified and was classified as ‘possibly fill”. Fill/possibly fill soils extended to approximate depths below prevailing grades/elevations as shown in Table 1.

Table 1: Summary of Depth and Elevation of Fill

Borehole No.	Surface Elevation (m asl)	Depth of Borehole (m bgs)	Elevation at Bottom of Borehole (m asl)	Depth of Fill/Possible Fill (m bgs)	Elevation at Bottom of Fill (m asl)
BH101	106.03	12.32	93.71	0.61	105.42
BH102	105.59	12.47	93.12	0.15	105.44
BH103	102.28	12.62	89.66	0.69	101.59
BH104	106.07	20.10	85.97	0.69	105.38
BH105	106.36	30.94	75.42	0.91	105.45
BH106	104.66	20.27	84.39	1.68	102.98
BH107	102.71	30.61	72.10	1.68	101.03
BH108	106.43	12.24	94.19	0.69	105.74
BH109	106.18	12.45	93.73	0.53	105.65
BH110	102.30	12.62	89.68	1.73	100.57

Grey Silt: Possible fill soils in BH101 were underlain by grey, moist, compact to very dense silt, with trace of clay and sand extending to depth of 2.13m below prevailing grade.

Reddish Brown/Brown Silty Sand Till: Granular material in BH102 were underlain by reddish brown/brown, moist, dense to very dense silty sand till, with trace of clay and gravel extending to depth of 2.74m below prevailing grade.

Grey / Greyish Brown / Brown Silty Sand Till / Sandy Silt Till / Clayey Silty Sand Till / Clayey Sandy Silt Till: The fill / possible fill soils in BH103 to BH110 and silt / silty sand till in BH101 & BH102 were underlain by grey / greyish brown / brown, moist to wet, very dense / dense / sandy silt till / clayey silty sand till / clayey sandy silt till, with some/trace of clay & gravel extending to termination depths below prevailing grade of 12.24m (BH108) to 30.94m (BH105).

7. GROUNDWATER CONDITIONS

Boreholes BH101 to BH103 and BH108 to BH110 were advanced using dry solid stem auguring and were observed to be generally dry on completion of drilling, except for BH102 and BH110 in which standing water was observed at 7.62m and 4.57m below prevailing grade (97.97m and 97.73m asl) on completion of drilling. Boreholes BH104 to BH107 were drilled using mud rotary and consequently standing water on completion of drilling could not be ascertained. Monitoring wells were installed in all boreholes (BH101 - BH110) for groundwater sampling and testing. Groundwater levels will be monitored bi-weekly for three months to determine seasonal high-water levels at the site.

Groundwater depths/elevations as measured on completion of boreholes and from the monitoring wells are summarized in Table 2.

Table 2: Measured Groundwater Depths and Elevations

Monitoring Well No.	Surface Elevation, m asl	Depth of Well, m bgs	Elevation at well base, m asl	In open BH on completion		10-May-21		13-Jan-25		22-Jan-25		5-Feb-25	
				GW level, m bgs	GW Ele, m asl	GW level, m bgs	GW Ele, m asl	GW level, m bgs	GW Ele, m asl	GW level, m bgs	GW Ele, m asl	GW level, m bgs	GW Ele, m asl
MW101	106.03	6.10	99.93	dry		n/a		3.57	102.46	3.41	102.62	2.59	103.44
MW102	105.59	10.67	94.92	7.62	97.97			6.99	98.60	6.65	98.94	5.68	99.91
MW103	102.28	4.57	97.71	dry				1.44	100.84	1.45	100.83	1.53	100.75
MW104	106.07	7.62	98.45	n/a - mud rotary				0.62	105.45	1.05	105.02	2.42	103.65
MW105	106.36	9.14	97.22	n/a - mud rotary				6.85	99.51	6.73	99.63	6.33	100.03
MW106	104.66	7.62	97.04	n/a - mud rotary				1.96	102.70	2.05	102.61	1.96	102.70
MW107	102.71	9.14	93.57	n/a - mud rotary				1.75	100.96	1.79	100.92	1.98	100.73
MW108	106.43	4.57	101.86	n/a - mud rotary				1.34	105.09	1.35	105.08	1.60	104.83
MW109	106.18	9.14	97.04	dry				3.24	102.94	3.26	102.92	3.40	102.78
MW110	102.30	5.33	96.97	4.57	97.73			1.88	100.42	1.90	100.40	2.14	100.16
MW1	106.11	7.54	98.57	dry		5.68	100.43	3.78	102.33	3.79	102.32	2.02	104.09
MW2	106.05	6.12	99.93	dry		4.32	101.73	3.52	102.53	3.57	102.48	2.47	103.58
BH3	106.23	8.08	98.15	dry		n/a							
MW4	105.97	8.42	97.55	dry		4.70	101.27	3.92	102.05	3.94	102.03	2.83	103.14
BH5	106.22	3.20	103.02	dry		n/a							

Groundwater levels, measured during January and February, 2025, vary generally from 1.05m to 3.57m (100.16m to 106.45m asl) in the shallow monitoring wells (less than 9m deep). One higher water level of 0.62m bgs was observed in MW104 during January and is not considered representative of groundwater conditions on the site. Moisture content values obtained from laboratory tests on subsurface soils, within the expected excavation depths, were in the range 4.4% to 20.3% indicating moist to wet conditions.

Based on information in Table 2 and laboratory results it is expected that some amount of groundwater or seepage water may be encountered within the estimated footing depths during excavation. Perched water may also be encountered within the expected footing depths in some areas of the site.

It should be noted that Fisher also carried out a hydrogeological investigation in conjunction with this geotechnical investigation. Issues pertaining to the groundwater, such as requirements for temporary dewatering, permanent drainage, amount/quality of water for discharge etc., have been discussed/addressed separately in the hydrogeological investigation report. These reports should be read in conjunction when finalizing the subsurface structure design process.

8. GEOTECHNICAL DISCUSSIONS AND RECOMMENDATIONS

8.1 General Discussion

It was understood that the proposed development will likely consist of 30 to 33-storey residential towers with two (2) underground parking levels.

For two underground levels, top of P2 slab, as per available site plans, is 7.5m and 6.5m for phase 1 and 2 of the development respectively, with footings likely to be placed at depths of 7.0m to 8.0m below ground floor level. However, design details for the proposed building, such as finished ground floor level, type of structure, finished grades etc., were not available at the time of investigation.

It is anticipated that finished ground floor level (FGFL) may be at approximate elevation above 102.5m asl for the 30-storey tower located on the east portion of the site (Phase 1) and 106.5m asl for the 33-storey tower located at the west side (Phase 2). Footings are likely to be founded between elevations of 94.5m and 98.5m (east to west for Phase 1) & 96.0m and 100.0m (east to west for Phase 2).

The investigation showed that the predominant native stratum below the overburden soils consist of very dense sandy silt till/sand & silt till.

The following sections provide general geotechnical comments/recommendations for design and construction for the proposed development.

8.2Foundation Considerations

The proposed building(s) may be supported using conventional spread/strip footings founded on undisturbed very dense native, sandy silt till/sand & silt till soil layers.

Recommended soil bearing pressures at limit states (SLS and ULS) for footings placed over undisturbed native soils, and approximate/corresponding founding depths & elevations, based on observed variation in soil strength across the site and with depth, are presented in Table 3.

Table 3: Foundation Design for Conventional Footings

BH No.	Existing Grade/Elevation, m asl	Approximate Footing Founding Levels		Soil Bearing Pressure, kPa	
		Depth, m	Elev., m asl	SLS	ULS
BH101(MW)	106.03	7.0	99.03	500	750
BH102(MW)	105.59	7.0	98.59	500	750
BH103(MW)	102.28	7.0	95.28	500	750
BH104(MW)	106.07	7.0	99.07	500	750
BH105(MW)	106.36	7.0	99.36	500	750
BH106(MW)	104.66	7.0	97.66	500	750
BH107(MW)*	102.71	7.0	95.71	300	450
BH108(MW)	106.43	7.0	99.43	500	750
BH109(MW)	106.18	7.0	99.18	500	750
BH110(MW)	102.30	7.0	95.30	500	750

Note

* For footings below approximate depth of 7m, bearing may have to be reduced or footing size decreased.

- Footing sizes need to be restricted to no more than 4.5m x 4.5m.
- For larger footing size, than abovementioned, SLS bearing pressures may have to be reduced and a detailed settlement analyses, along with further investigation, may be required.

The following should be noted for conventional spread/strip footings:

- For footings founded at different levels in the vicinity of each other or located adjacent to excavated and backfilled areas, such as sewer trenches/other excavations etc., the slope of the imaginary line joining the bottom of two footings or the bottom of footing and excavation should not be steeper than 10H:7V for till soils & 1.5H:1V for sandy soils.
- Base conditions at the footing founding levels should be observed by geotechnical personnel from Fisher Engineering, prior to pouring concrete, to ensure that design bearing pressures are being attained.
- For frost protection, a minimum 1.2m earth cover should be provided for one underground level.
- During cold/freezing weather conditions founding bases should be adequately protected to prevent any damage due frost penetration.

8.3Earthquake Considerations

The 2024 OBC Subsection 4.1.8 stipulates that a building should be designed to meet the requirements of the Earthquake Load and Effects. Site Classification for Seismic Hazard Index (Table 4.1.8.4.A) is determined from the average Standard Penetration Resistance (N_{60}) and/or the undrained shear strength (Su) of the soils within the upper 30m.

Based on the results of standard penetration tests i.e., “N” values from the current geotechnical investigation and our experience with similar soils the site designation for seismic hazard index applicable for the proposed building is **"Class C"**.

Shear wave velocity measurements may be required/desired to confirm the site classification.

Seismic parameters and analysis requirements are detailed in Subsection 4.1.8 of the 2024 OBC.

8.4 Underground Parking Garage

The underground structure should be equipped with an efficient drainage system, which includes perimeter weeping tiles around the bottom of the garage wall footings and interior weeping tiles below the floor slab. The perimeter weepers should be surrounded by clear stone or pea gravel encased in a granular filter or filter cloth. Both weepers should be connected to independently positive frost-free sump pits from where the water is constantly removed.

Where there is insufficient space for the installation of exterior perimeter weeping tiles, the drainage system can be modified by providing vertical drainage between the garage walls and the adjacent shoring. A series of drain holes should be precast through the walls below the garage floor slab level, forming a complete drainage path to the solid interior weeping tiles placed beside the garage wall footings.

Underfloor weeping tile drainage system should be provided under the floor slab to release any potential uplift pressure on the slab-on-grade. The drains should be encased in 150mm of clear stone/pea gravel wrapped in geotextile filter & placed below the granular bedding and connected positively to sump pit. The geotextile filter should have equipment opening size of less than 60µm.

The entire drainage system should be designed by competent professionals, to ensure its capacity and effectiveness concerning the efficient transmittal of volume of water generated without any migration of fines from the surrounding soils.

In the event of power or mechanical failure, a backup system should be designed for pumping/dewatering operations. Water relief valves/plates may be installed in the garage floor slab to relieve any excess hydrostatic pressure in the event of malfunction of the drainage system. The floor slab should also be designed to accommodate the maximum allowable pressure for relief valves.

The parking garage/basement floor slab can be constructed as slab-on-grade. After excavating to the desired level, any loose or wet soil should be sub-excavated and replaced with granular material compacted to 98% of the Standard Proctor Maximum Dry Density. A 19mm clear stone granular bedding of at least 200mm in thickness should be provided.

A modulus of subgrade reaction for slab-on-grade design of 40MN/m^3 can be used provided the subgrade is undisturbed & granular bedding is well compacted.

The parking garage walls under free drainage conditions, can be designed for a lateral earth pressure P, given by the following expression:

$$P = K (\gamma h + q)$$

where K = Coefficient of earth pressure

γ = Unit weight of soil

q = Surcharge load, if any

Design parameters K, γ are suggested in Section 8.8 of this report.

If the perimeter/underfloor drainage systems are not permitted/feasible and a watertight structure design is adopted then parking garage walls & floor slabs must be designed to resist hydrostatic/uplift pressures. Highest groundwater level should be used for determining the water pressures. Parking garage walls should be waterproofed to at least 1m above the highest water level.

For a waterproofed basement, the lateral earth pressures acting on basement walls may be calculated from the following expression:

$$p = K (\gamma h_1 + \gamma' h_2 + q) + \gamma_w h_2$$

where
- p = lateral earth pressure in kPa acting at depth h
- K = earth pressure coefficient, assumed to be 0.4 for vertical walls and horizontal backfill
- γ' = submerged unit weight of backfill of 12kN/m^3 may be assumed
- γ_w = Unit weight of water, a value of 10kN/m^3 can be used
- h_1 = depth to the highest groundwater table in metre
- h_2 = depth below water table in metres
- q = surcharge on the ground surface in kPa

8.5Slab-on-Grade Construction

The existing fill appears to be free of compressible organic materials. However, we recommend that the existing fill be further evaluated from footing/service trenches at the time of construction. All loose fill and any unsuitable fill, if any, should be removed from the areas to be slabbed.

Exposed subgrade should be proof-rolled in the presence of Fisher Engineer soils personnel to detect any compressible, spongy or unstable areas. If any isolated pockets of such materials are detected, they should be sub-excavated to competent subsoils and backfilled with approved inorganic materials compacted to at least 95% of their Standard Proctor Maximum Dry Density (S.P.M.D.D.) in thin layers.

Any new fill should consist of approved compactable inorganic soils, placed in thin layers (not exceeding 300mm), and each layer should be compacted to at least 98% of its S.P.M.D.D. under dry and frost-free conditions.

For normal light duty slab-on-grade construction, a 200mm thick bedding layer consisting of granular 'A' or 20mm crusher run material should be specified under the slab-on-grade to serve

as a moisture barrier. The bedding layer should be compacted to a minimum of 98% of its S.P.M.D.D.

8.6Pavement Construction

The functional life of a pavement depends directly on subgrade conditions and the load carrying capacity of the pavement structure. The following minimum flexible pavement structure thicknesses are recommended.

Table 4: Minimum Flexible Pavement Structure Thicknesses

PAVEMENT LAYER	COMPACTED THICKNESSES	
	LIGHT DUTY PARKING	DRIVEWAYS (Heavy Duty)
Asphalt top course, HL-3	40mm	40mm
Asphalt base course, HL-8	40mm	60mm
Granular 'A' or 20mm crusher run limestone base	150mm	150mm
50mm crusher run limestone sub-base	200mm	300mm

The following should be noted:

- The pavement structure should also meet the minimum local municipal/regional design requirements, if any, for the proposed development.
- The above thicknesses are applicable for dry and stable subgrade conditions during summer season construction only. If the construction is carried out during winter and for unstable subgrade conditions, the thicknesses of granular materials may have to be increased.
- Granular base materials should conform to O.P.S.S. Form 1010 specifications and be compacted to at least 98% of their SPMDD's. Similarly, asphaltic concretes should meet the O.P.S.S. Form 1150 requirements for specified grades and be compacted to between 92% and 97% of their Marshall Densities.
- All topsoil and unsuitable/compressible/organic fill soils, if any, must be removed from the areas to be paved. In addition, any fill/backfill soils within 1m below the proposed subgrade levels should be compacted to 98% SPMDD. Exposed subgrade must be proof-rolled to ensure its stability and compactness.

- Prior to placement of granular bases, the finished sub-grade should be contoured to eliminate depressions and sloped at a minimum of 2% towards catch basins to facilitate drainage of subgrade and base materials.
- Water should not be allowed to accumulate at/near the pavement edges. The importance of sub-grade drainage and regular maintenance and repairs cannot be over emphasized.
- For drive aisles on top of underground parking structure, if sufficient vertical space is available, then pavement structure in Table 4 applies. If there is not enough vertical space for this to be done, then a composite pavement structure consisting of the concrete slab and asphalt running surface may be utilized.

8.7Shoring Requirements

Based on site conditions a support system may be required to facilitate excavation of the underground levels, particularly if there are limitations in providing suitable setbacks for slope. The shoring system should be designed in accordance with the requirements set out in the Canadian Foundation Engineering Manual, 4th Edition.

Examples of temporary shoring systems include:

- A soldier pile and timber lagging system where some deflection of the wall is permitted, and groundwater is not a concern or can be handled with conventional dewatering system, or dewatering is carried out and
- A caisson wall, formed from secant piles, where only minor deflections of the wall are permitted, and groundwater is a concern or where dewatering is prohibited.

8.8Excavation And Backfill

All excavation work must be carried out in accordance with the latest edition of the Occupational Health and Safety Act (OHSA).

- For excavations deeper than 1.2m, the sides should be sloped in accordance with the requirements of OHSA. Where this condition cannot be met, a temporary shoring system should be introduced.
- It is understood that excavation for the proposed building(s) may extend to depths of 8.0m or more. According to the Ontario Occupational Health and Safety Act, all excavations deeper than 1.2m must be adequately supported against ground collapse.

- Moist fill, silty sand and clayey sandy silt with some debris may be classified as Type 3 soil (previously excavated or disturbed). The fill/possible fill is generally underlain by compact/dense/very dense silt/silty sand till/sandy silt till silt with some/trace of clay & gravel at further depths. The compact silt/silty sand till below the fill may be classified as Type 3 soils. The dense silt/silty sand till layers may be classified as Type 2 soils and very dense silty sand till/sandy silt till/clayey sandy silt till layers may be classified as Type 1 soils.
- If the space will be limited for a safe excavation slope, a vertical shoring system would be appropriate for the overall parking garage system.
- It is understood that two stage tie backs will likely be required for soldier pile/lagging support purposes. It should be noted that encroachment agreements will be required with the adjacent property owners. If the above agreements are not feasible/achievable then raker pads may be used for the soldier pile support purposes.
- Zone of influence for excavation wall movements/displacements can be estimated as 12m or depth of excavation, whichever is greater beyond the property lines. All control network points should be located outside the above zone of influence. Reflective targets should be installed at the top of each soldier pile and for each tie-back to monitor the movement of shored walls during and after excavation. Precision targets should be installed on the neighbouring structures, if any within the zone of influence to ensure they are not being impacted by the construction activities on the subject site.
- Construction activities for the proposed development such as drilled caissons, soil compaction etc. may generate vibrations which could be perceptible to nearby residents or sensitive to the adjacent structures or infrastructure. Construction induced vibrations must be limited to the maximum peak particle velocity (PPV) as outlined/regulated by the local/regional/provincial authorities or an expert/qualified person in vibration monitoring and control. Frequency & duration of monitoring and zone of influence due to vibration should also be established by or in accordance with the recommendations by the qualified person.
- Pre and post construction surveys should be undertaken to document existing conditions of properties/infrastructure/structures prior to the start of construction and at the end of project for determining/establishing any substantial changes resulting from construction within the zones of influence.

The material to be used for backfill in service trenches should be suitable for compaction, i.e., free of organics and with moisture content within 2 percent of the optimum moisture value. The backfill material should be compacted in lifts of no more than 200mm in thickness and to at least 98 percent of Standard Proctor Maximum Dry Density (SPMDD) in the upper 1.0m from road subgrade or in settlement sensitive areas. Beyond these zones, a 95% SPMDD compaction criterion is considered acceptable.

Additionally, onsite excavated native soils may be used as backfill in service trenches, provided that the excavated materials are free of organic soils/construction debris and are of suitable moisture content.

Existing fill appears to be free of topsoil mixed soils, however it will require further evaluation at the time of construction regarding its suitability for re-use. The following should be noted:

- Native silty to sandy soils were encountered generally below the fill. It is anticipated that these materials will be suitable for reuse in site grading or engineered fill and/or backfilling service trenches, provided that these activities are not undertaken in wet or freezing weather/site conditions and that their moisture contents are within 3% of the optimum.
- Fill & native soils are likely to become unstable during wet weather/site conditions. If onsite soils become wet, moisture conditioning to reduce their moisture content may be required before compaction can be achieved with the on-site materials in trenches or excavations.
- Further review should be carried out at the time of construction and/or as & when required.
- Native soils are considered susceptible to frost; therefore, these soils should not be reused in any applications where volume change as a result of exposure to freezing conditions would be detrimental to the serviceability of the planned buildings and infrastructure.
- It should be noted also that existing site materials are not suitable for use as granular base or sub-base in the pavement structure.

Field review should be carried out at the time of construction to evaluate the impact of site/perched groundwater conditions.

The following soil parameters can be used in the evaluation of lateral earth pressures and design of the shoring system.

	FILL	**Silt/Sandy Silt Till/Silty Sand Till**
Unit weight, γ, kN/m^3	18	21.5
Coefficient of earth pressure at rest (K_0)	0.50	0.41
Coefficient of active earth pressure (Ka)	0.33	0..26

Coefficient of passive earth pressure (Kp)	3.00	3.85

The excavation sides should be protected to prevent erosion from surface water flow.

9. CHEMICAL ANALYSES

Eight (8) soil samples from BH104, BH105, BH106 and BH107 at depths of 6.10m to 6.55m, 7.62m to 8.08m and 9.14m to 9.60m were submitted to Fisher Environmental laboratories for chemical analyses related to potential sulphate attack on buried concrete, maximum chloride content which could affect the corrosion of exposed ferrous metal and the range of pH level to determine the degree of acidity or alkalinity in soils. Results of the analyses are presented in Appendix C.

- Sulphate concentration values in the soil samples tested were 49.3mg/kg (BH104SS7), 29.9mg/kg (BH104SS9), 23.2mg/kg (BH105SS7), 91.1mg/kg (BH105SS9), 204.6mg/kg (BH106SS8), 106.1mg/kg (BH106SS9), 76.2mg/kg (BH107SS7) and 58.3mg/kg (BH107SS9) or varied from 0.00232% to 0.02046%.
- According to CSA-A23. 1-09 Table 3, the above results indicate negligible degree of exposure to sulphate attack (much less than 0.10 to 0.20% for S-3 class exposure).
- The maximum chloride content in the samples was <10 to 40.3 ug/g or <0.001 to 0.00403%, indicating potential mild corrosion of exposed ferrous metals.
- pH levels range from 8.88 to 9.51 and are within the expected range for subsurface soils (5-11).

10. GENERAL CONSIDERATIONS

This report is limited in scope to those items specifically referenced in the text. No other testing and design calculations have been performed except as specifically reported.

The discussions and recommendations presented in this report are intended for the sole guidance of the client named, design consultants and regulatory/permitting bodies. It should not be relied upon for any other purpose.

The information on which these recommendations are based is subject to confirmation by engineering personnel at the time of construction.

The fact that localised variations in the subsurface conditions may be present between and beyond the boreholes and that those conditions may be significantly different from the general description provided for design purposes should be understood.

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 soils and the potential reuse of these soils on/off Site. Contractors must draw their own conclusions as to how the near surface and subsurface conditions may affect them.

It is recommended that Fisher be contacted to provide assistance in the interpretation of the borehole records by anyone undertaking work on/or below the ground surface at this site prior to this work being carried out.

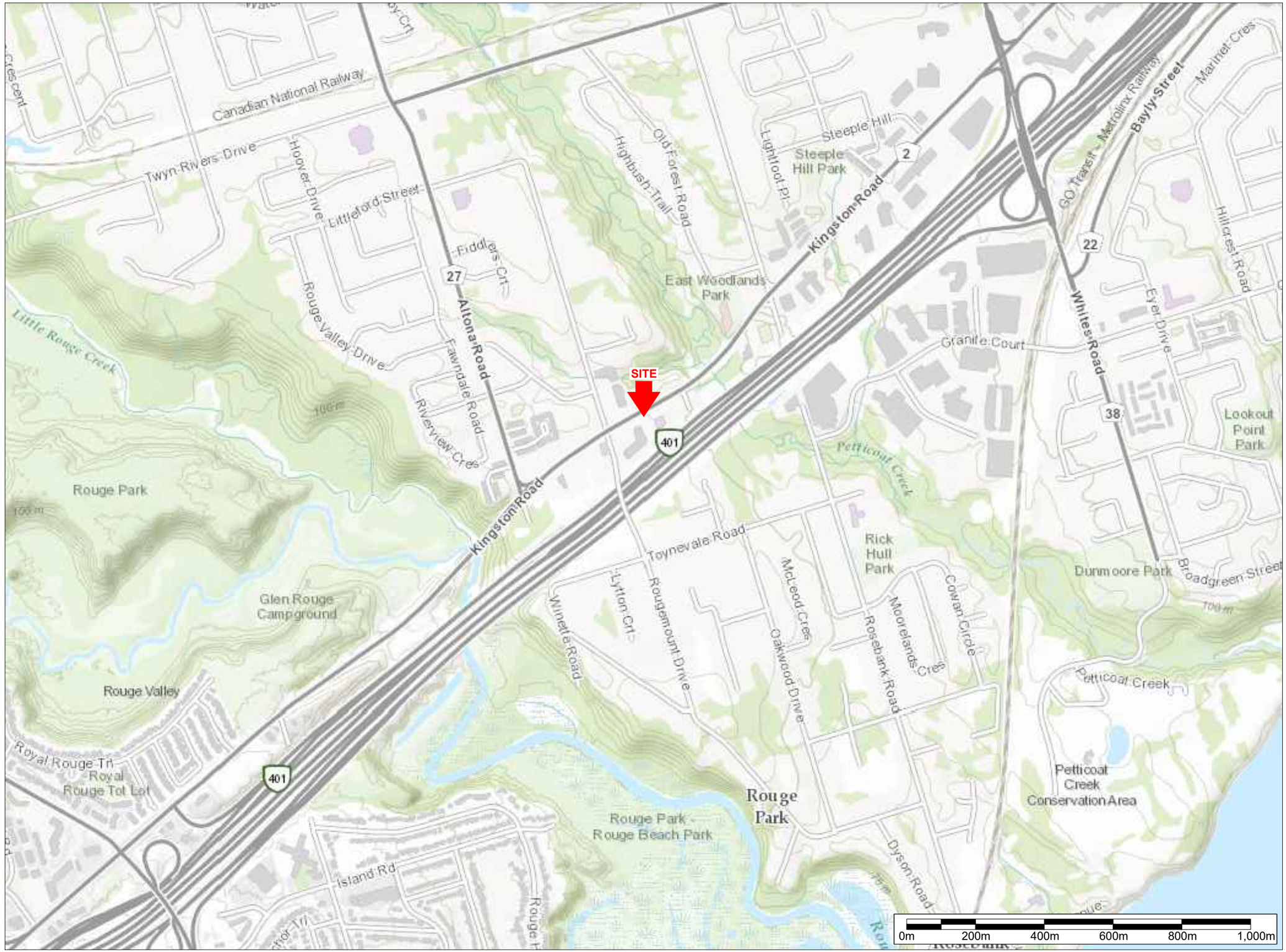
The client expressly agrees that it has entered into this agreement with Fisher, both on its own behalf and as agent on behalf of its employees and principals.

The client expressly agrees that Fisher's employees and principals shall have no personal liability to the client in respect of a claim, whether in contract, tort and/or any other cause of action in law. Accordingly, the client expressly agrees that it will bring no proceedings and take no action in any court of law against any of Fisher's employees or principals in their personal capacity.

11. CLOSING

We trust that the foregoing information is sufficient for your present needs and will be pleased to review the contents of this report in greater detail if required. Should you require any additional services or clarifications, please do not hesitate to contact our office.

APPENDIX A – SITE AND LOCATION PLANS



FISHER ENGINEERING

400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2

Tel: 905 475-7755

NORTH

N

LEGEND

SITE BOUNDARY

PROJECT NAME AND ADDRESS

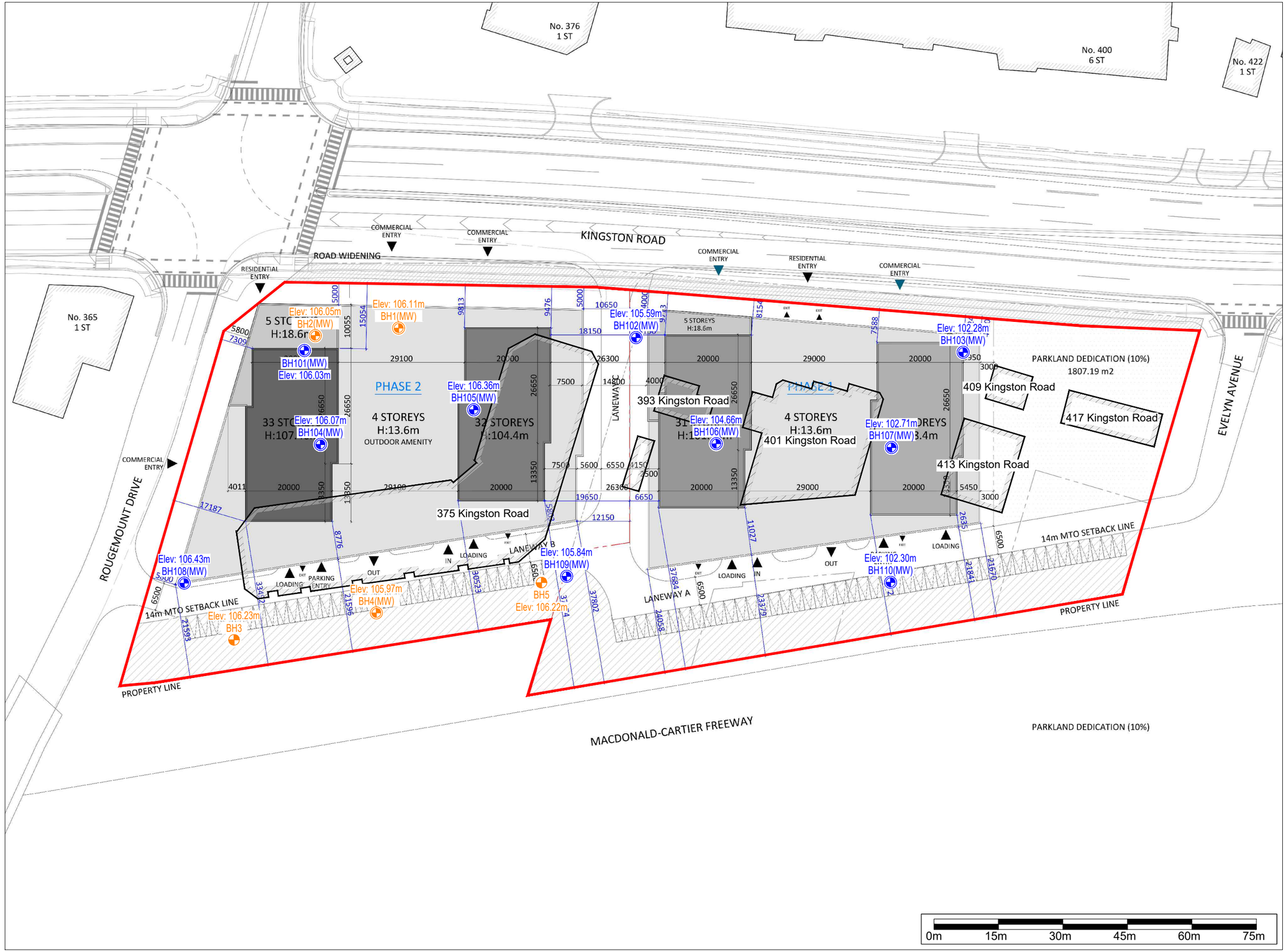
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

375-417 Kingston Road,
Pickering, ON

FIGURE A1:

SITE LOCATION MAP

PROJECT NO.	SHEET NO.
FE 24-14410/11	A1
DATE: 15 January 2025	
SCALE: AS SHOWN	



FISHER ENGINEERING
400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2
Tel: 905 475-7755

NORTH

LEGEND

- SITE BOUNDARY
- EXISTING BUILDING FOOTPRINT
- PREVIOUS BOREHOLE WITH MONITORING WELL LOCATION (FISHER, MAY 2021)
- BOREHOLE WITH MONITORING WELL LOCATION

PROJECT NAME AND ADDRESS

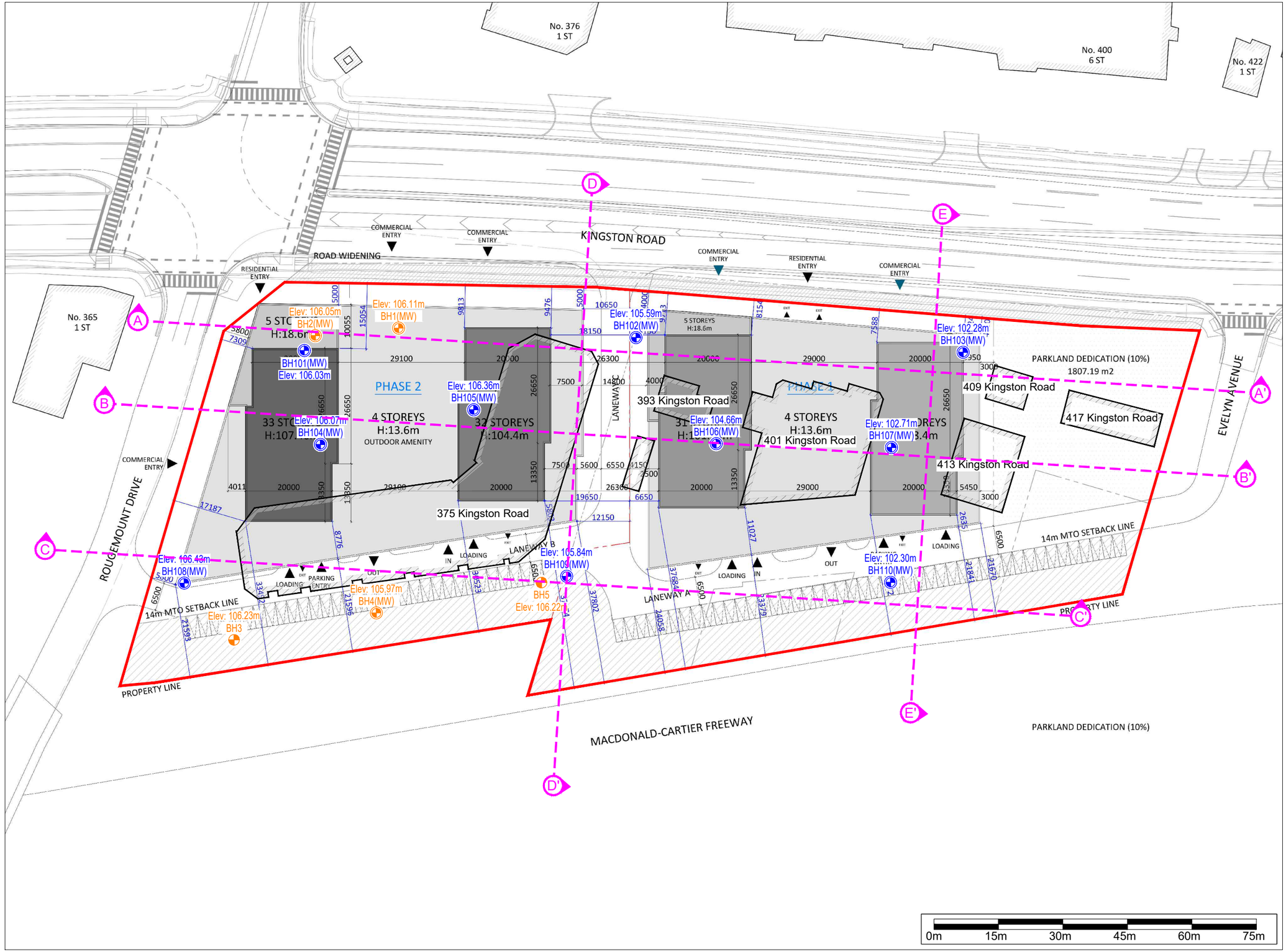
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

375-417 Kingston Road,
Pickering, ON

FIGURE A2:

SITE PLAN SHOWING EXISTING BOREHOLE / MONITORING WELL LOCATIONS

PROJECT NO.	SHEET NO.
FE 24-14410/11	A2
DATE: 15 January 2025	
SCALE: AS SHOWN	



FISHER ENGINEERING

400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2

Tel: 905 475-7755

NORTH

LEGEND

- SITE BOUNDARY
- EXISTING BUILDING FOOTPRINT
- PREVIOUS BOREHOLE WITH MONITORING WELL LOCATION (FISHER, MAY 2021)
- BOREHOLE WITH MONITORING WELL LOCATION
- A - A' CROSS SECTION MARK

PROJECT NAME AND ADDRESS

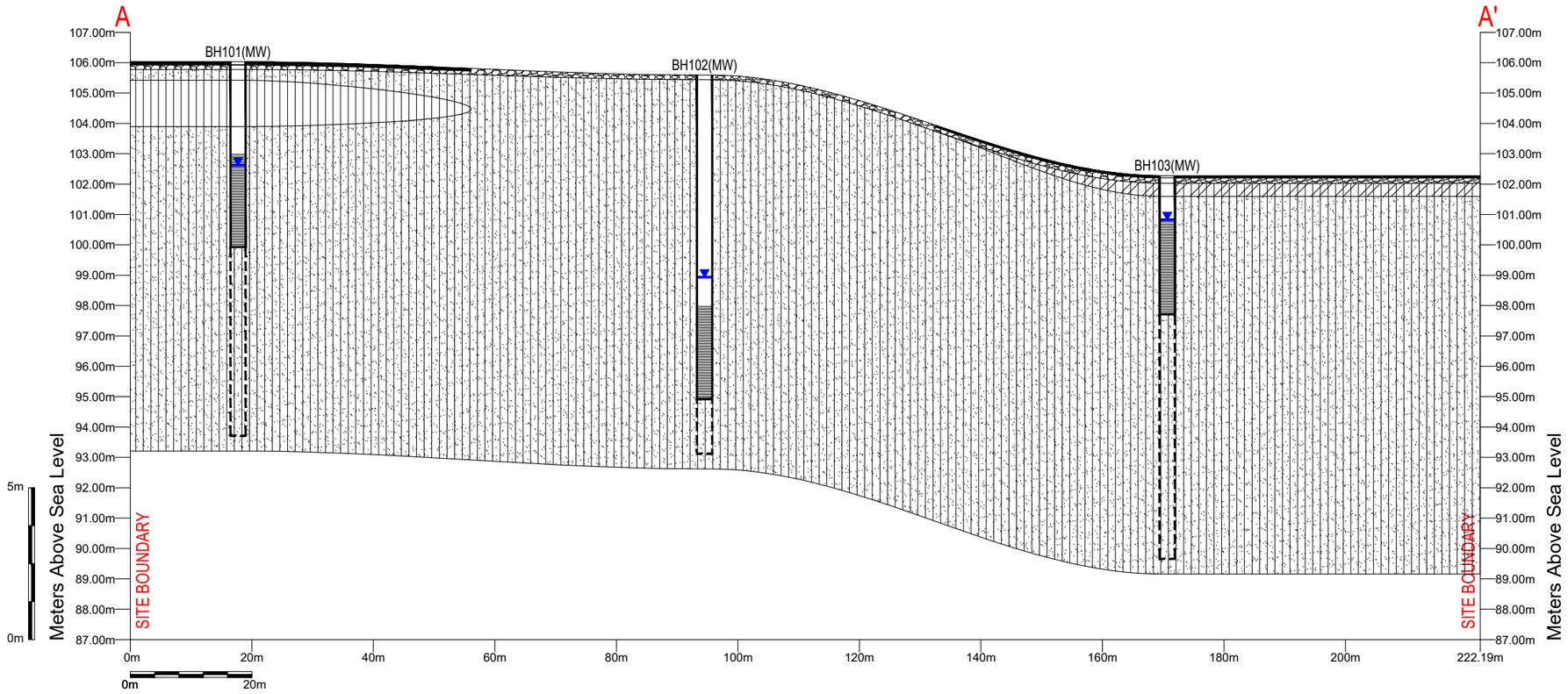
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

375-417 Kingston Road,
Pickering, ON

FIGURE A3:

SITE PLAN WITH CROSS SECTION CUT PLANES

PROJECT NO.	SHEET NO.
FE 24-14410/11	A3
DATE: 15 January 2025	
SCALE: AS SHOWN	



FISHER ENGINEERING

400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2

Tel: 905 475-7755

NORTH

LEGEND

- ASPHALT
- GRANULAR
- SAND
- SILT
- GROUNDWATER POTENTIOMETRIC LEVEL

PROJECT NAME AND ADDRESS

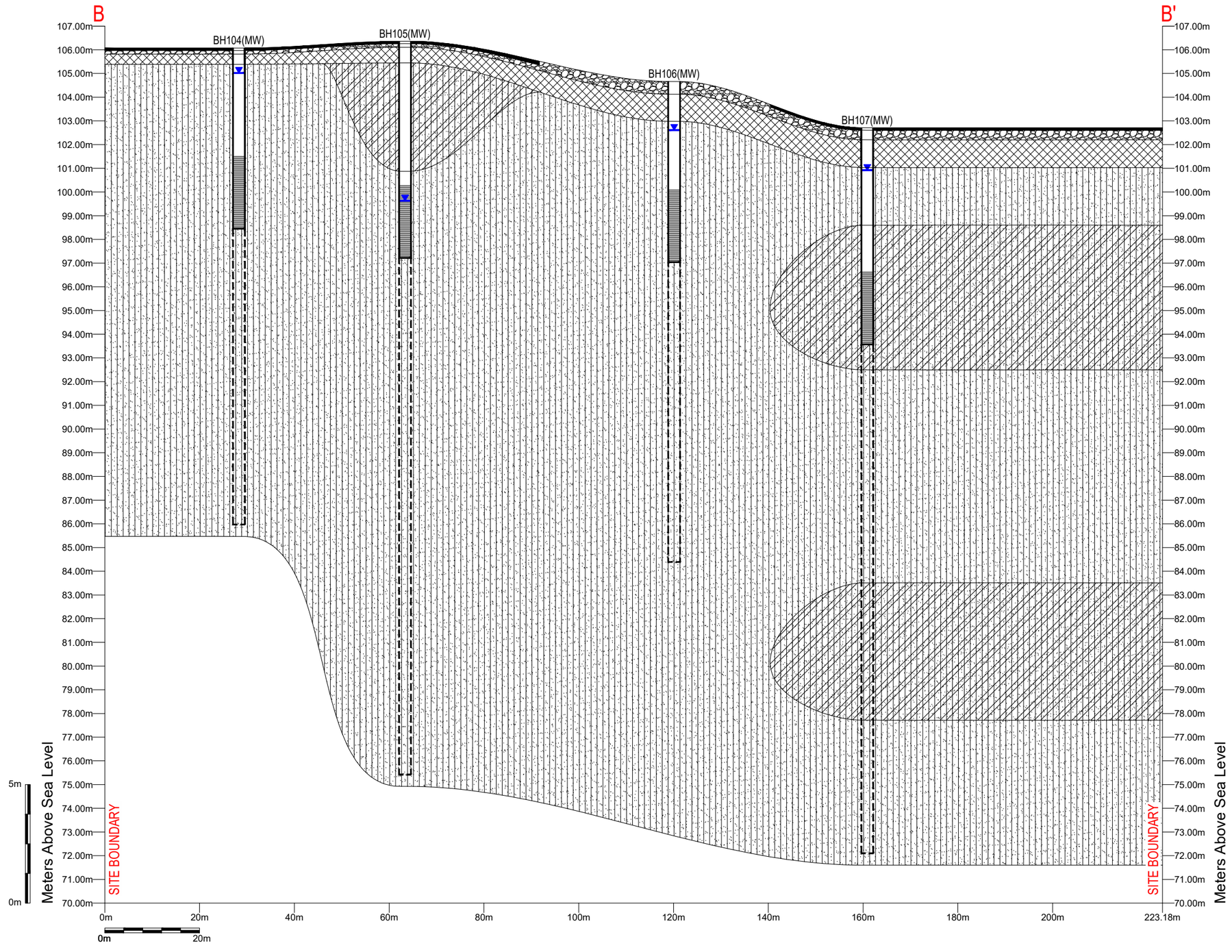
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

375-417 Kingston Road,
Pickering, ON

FIGURE A4.1:

CROSS-SECTION A - A'

PROJECT NO.	SHEET NO.
FE 24-14410/11	A4.1
DATE: 11 February 2025	
SCALE: AS SHOWN	



FISHER ENGINEERING

400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2

Tel: 905 475-7755

NORTH

LEGEND

- ASPHALT
- GRANULAR
- FILL
- SAND
- SILT
- CLAY
- GROUNDWATER POTENTIOMETRIC LEVEL

PROJECT NAME AND ADDRESS

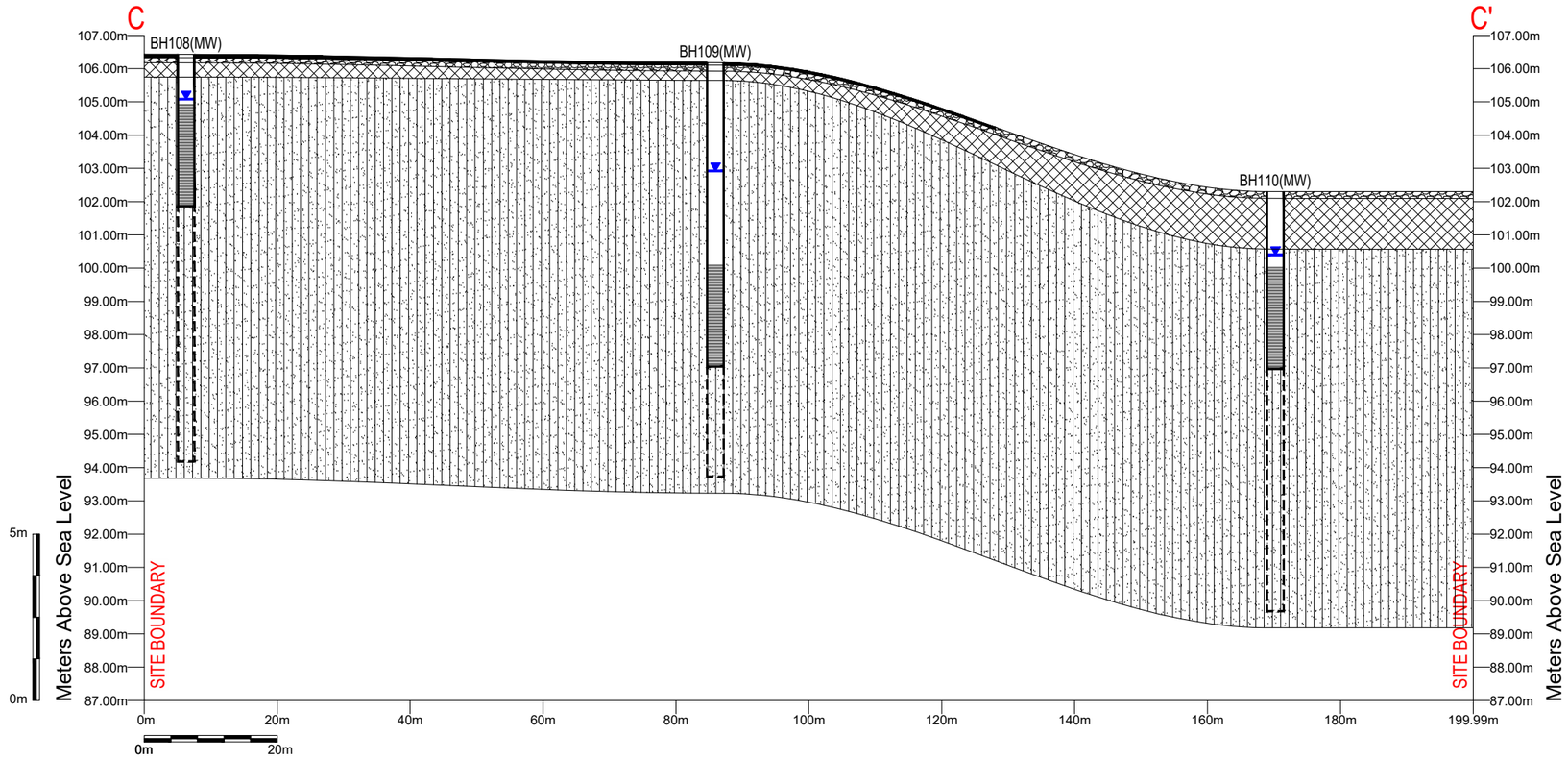
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

375-417 Kingston Road,
Pickering, ON

FIGURE A4.2:

CROSS-SECTION B - B'

PROJECT NO.	SHEET NO.
FE 24-14410/11	A4.2
DATE: 11 February 2025	
SCALE: AS SHOWN	



FISHER ENGINEERING

400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2

Tel: 905 475-7755

NORTH

LEGEND

- ASPHALT
- GRANULAR
- FILL
- SAND
- SILT
- GROUNDWATER POTENTIOMETRIC LEVEL

PROJECT NAME AND ADDRESS

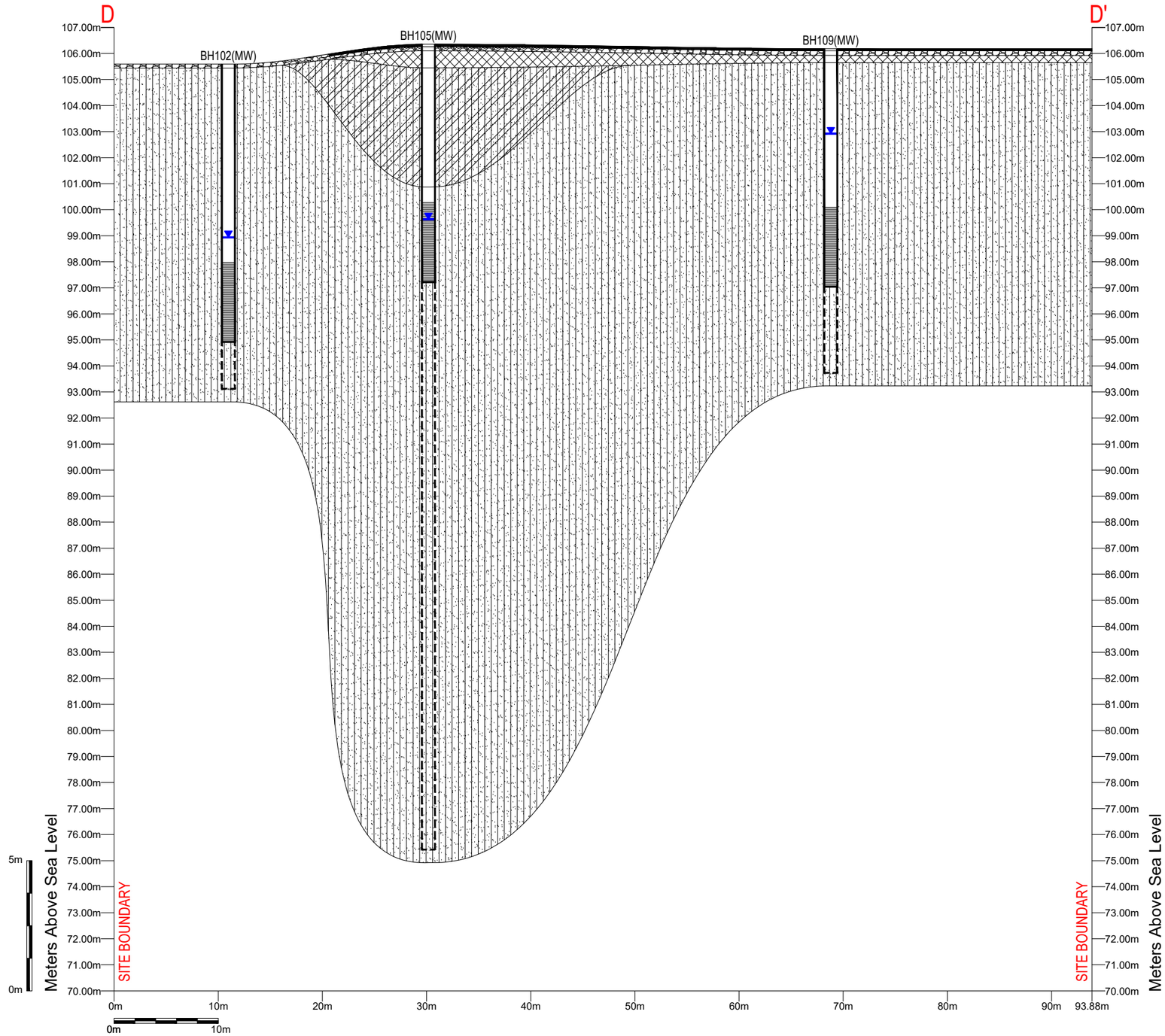
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

375-417 Kingston Road,
Pickering, ON

FIGURE A4.3:

CROSS-SECTION C - C'

PROJECT NO.	SHEET NO.
FE 24-14410/11	A4.3
DATE: 11 February 2025	
SCALE: AS SHOWN	



FISHER ENGINEERING

400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2

Tel: 905 475-7755

NORTH

LEGEND

- ASPHALT
- GRANULAR
- FILL
- SAND
- SILT
- GROUNDWATER POTENTIOMETRIC LEVEL

PROJECT NAME AND ADDRESS

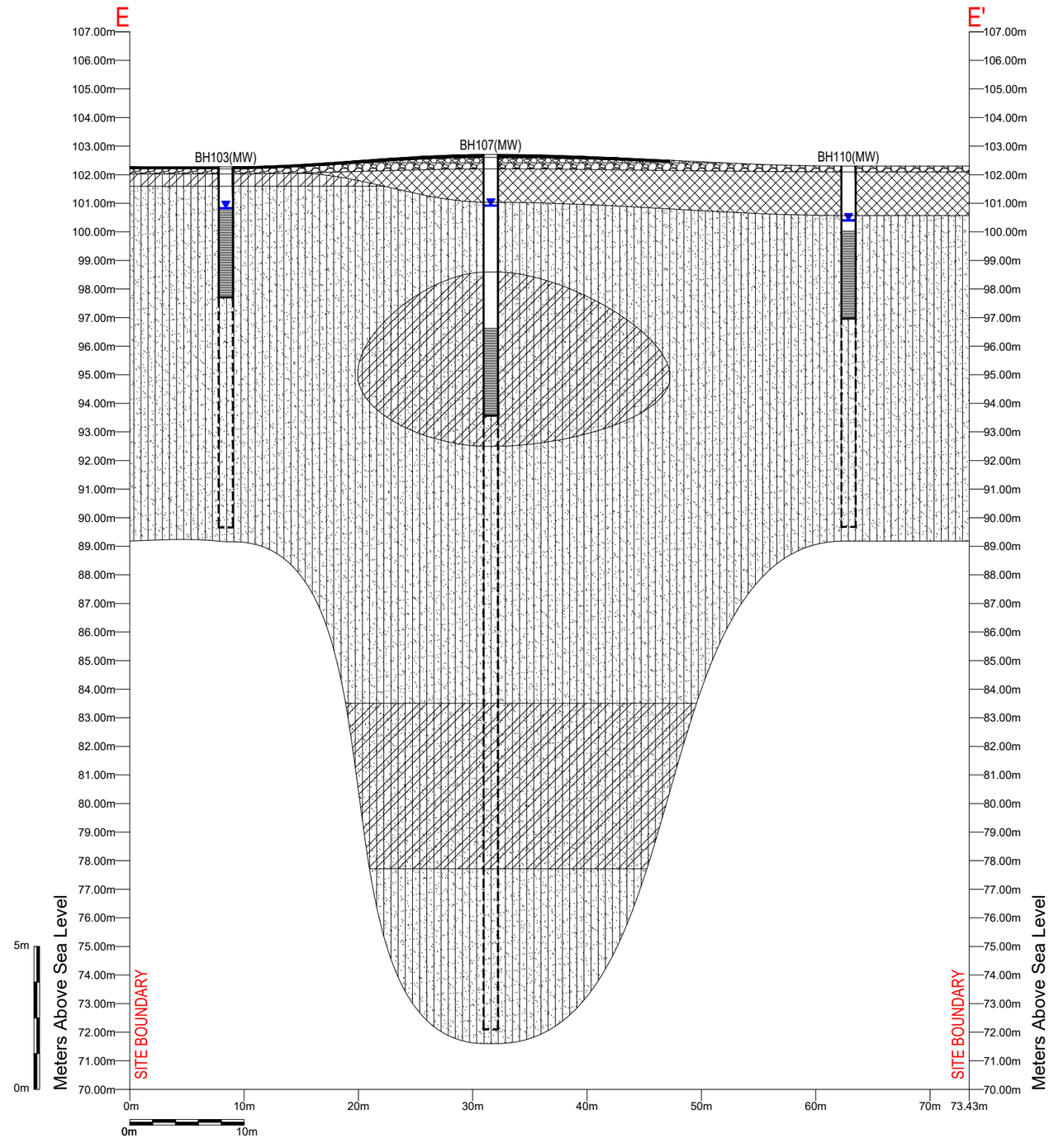
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

375-417 Kingston Road,
Pickering, ON

FIGURE A4.4:

CROSS-SECTION D - D'

PROJECT NO.	SHEET NO.
FE 24-14410/11	A4.4
DATE: 11 February 2025	
SCALE: AS SHOWN	



FISHER ENGINEERING

400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2

Tel: 905 475-7755

NORTH

LEGEND

- ASPHALT
- GRANULAR
- FILL
- SAND
- SILT
- GROUNDWATER POTENTIOMETRIC LEVEL

PROJECT NAME AND ADDRESS

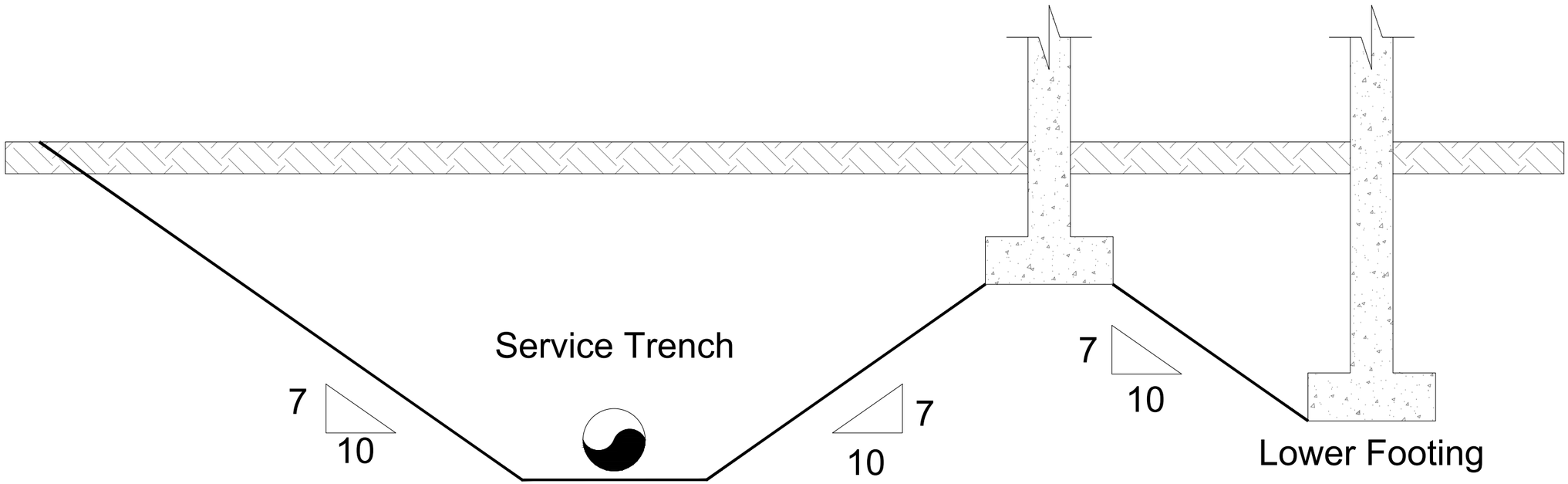
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

375-417 Kingston Road,
Pickering, ON

FIGURE A4.5:

CROSS-SECTION E - E'

PROJECT NO.	SHEET NO.
FE 24-14410/11	A4.5
DATE: 11 February 2025	
SCALE: AS SHOWN	



FISHER ENGINEERING

400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2

Tel: 905 475-7755

NORTH

LEGEND

7
10
Till soils

1
1.5
Sandy soils

PROJECT NAME AND ADDRESS

GEOTECHNICAL INVESTIGATION

375-417 Kingston Rd,
PICKERING, Ontario

FIGURE A5:

FOOTING NEAR SERVICE TRENCHES OR AT DIFFERENT ELEVATIONS

PROJECT NO.	SHEET NO.
FG24-14410	A5
DATE FEBRUARY 2025	
SCALE AS SHOWN	

APPENDIX B – LOGS OF BOREHOLES

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH101(MW) SHEET. 1 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: D-50 Truck, Solid Stem Auger

DRILLING DATE: 17 December, 2024

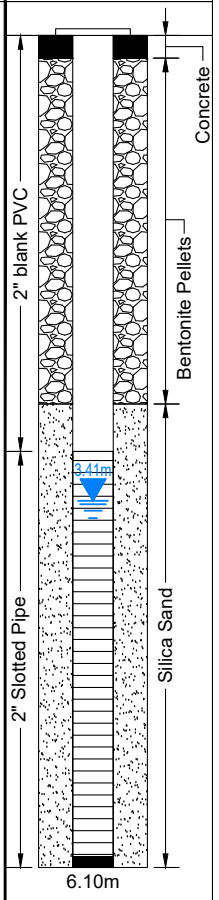
DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	SAMPLES Type NO.	"N" VALUE
				106.03			
0	0	100mm ASPHALT 150mm GRANULAR MATERIAL					
2		SILTY SAND/SILT: Grey, trace of clay, moist, compact (possible fill)		0.61 105.42		SS-1	17
4	1	SILT: Grey, trace of clay and sand, moist, compact to very dense				SS-2	29
6	2					SS-3	58
				2.13 103.90			
8		SILT & SAND TILL: Grey, some clay, some/trace of gravel, moist, very dense				SS-4	100+
10	3					SS-5	74
12	4						
14							
16	5					SS-6	100+
18							
20	6					SS-7	67
22	7						
24							
26	8					SS-8	100+
28							
30	9					SS-9	100+
32							
34	10	SANDY SILT TILL: Grey, trace of clay and gravel, moist, very dense		10.06 95.97			

PENETRATION TESTING (SPT) ▲ 20 40 60 80
SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80
MOISTURE CONTENT (%) ● 10 20 30 40

● 12.2%
● 5.1%
● 8.2%
● 6.9%
● 5.0%
● 4.6%

PIEZOMETER OR WELL CONSTRUCTION



Groundwater Depth (m): on completion: Dry; on 22 January, 2025: 3.41m

DRAWN: T.L. LOGGED: D.G. CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH101(MW) SHEET. 2 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: D-50 Truck, Solid Stem Auger

DRILLING DATE: 17 December, 2024

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	SAMPLES Type NO.	SAMPLES "N" VALUE	PENETRATION TESTING (SPT) ▲ / SHEAR STRENGTH (Kpa) ✚	VAPOUR READING (ppm) □ / MOISTURE CONTENT (%) ●	PIEZOMETER OR WELL CONSTRUCTION
		SANDY SILT TILL: Grey, trace of clay and gravel, moist, very dense				SS-10	100+		4.4%	
						SS-11	100+		5.0%	
		End of borehole at 12.32m		12.32/ 93.71						

Groundwater Depth (m): on completion: Dry; on 22 January, 2025: 3.41m

DRAWN: T.L. | LOGGED: D.G. | CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH102(MW) SHEET. 1 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Solid Stem Auger

DRILLING DATE: 6 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	SAMPLES Type NO.	"N" VALUE
				105.59			
0	0	150mm GRANULAR MATERIAL		0.15 / 105.44			
2		SILTY SAND TILL: Reddish brown/brown, trace of clay and gravel, moist, dense to very dense				SS-1	37
4	1					SS-2	47
6	2					SS-3	100+
8				2.74 / 102.85		SS-4	100+
10	3	SILT & SAND TILL: Grey, some clay, some/trace of gravel, moist, very dense				SS-5	100+
12	4						
14							
16	5					SS-6	100+
18							
20	6					SS-7	100+
22	7						
24							
26	8					SS-8	100+
28							
30	9					SS-9	100+
32							
34	10	SANDY SILT TILL: Grey, trace of clay and gravel, moist, very dense		10.06 / 95.53			

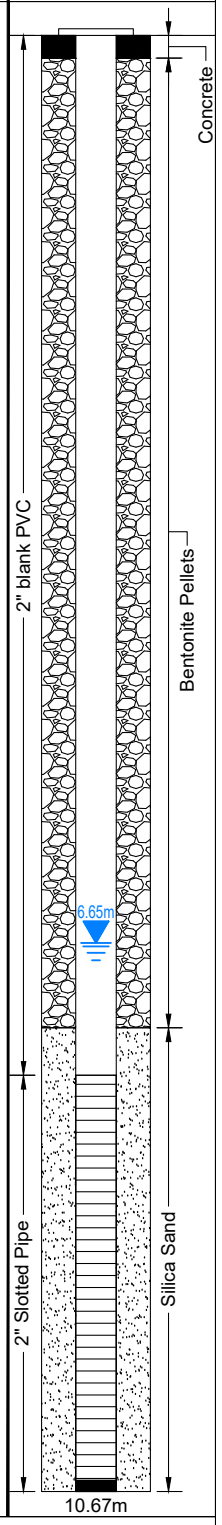
PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

PIEZOMETER OR WELL CONSTRUCTION



Groundwater Depth (m): on completion: 7.62m; on 22 January, 2025: 6.65m

DRAWN: T.L. LOGGED: D.G. CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH102(MW) SHEET. 2 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Solid Stem Auger

DRILLING DATE: 6 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	SAMPLES Type NO.	SAMPLES "N" VALUE	PENETRATION TESTING (SPT) ▲ / SHEAR STRENGTH (Kpa) ✚ (20 40 60 80 / 40 80 120 160)	VAPOUR READING (ppm) □ / MOISTURE CONTENT (%) ● (20 40 60 80 / 10 20 30 40)	PIEZOMETER OR WELL CONSTRUCTION
36	11	SANDY SILT TILL: Grey, trace of clay and gravel, moist, very dense				SS-10	100+			10.67m
40	12					SS-11	100+			
				12.47/ 93.12						
		End of borehole at 12.47m								
42	13									
44										
46	14									
48										
50	15									
52	16									
54										
56	17									
58										
60	18									
62	19									
64										
66	20									
68										
70	21									

Groundwater Depth (m): on completion: 7.62m; on 22 January, 2025: 6.65m

DRAWN: T.L. | LOGGED: D.G. | CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH103(MW) SHEET. 1 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: D-50 Truck, Solid Stem Auger

DRILLING DATE: 6 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
				102.28			
0	0	75mm ASPHALT 180mm GRANULAR MATERIAL				SS-1	14
2		CLAYEY SILT: Brown, trace of sand and gravel, moist, compact (possible fill)		0.69 101.59			
4	1	SILT & SAND TILL: Grey, some clay, some/trace of gravel, moist, compact to very dense				SS-2	26
6	2					SS-3	50
8						SS-4	100+
10	3					SS-5	100+
12	4						
14							
16	5					SS-6	100+
18							
20	6					SS-7	100+
22	7						
24							
26	8					SS-8	100+
28							
30	9					SS-9	75
32							
34	10	SANDY SILT TILL: Grey, some clay, trace of gravel, moist, very dense		10.06 92.22			

PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

10.0%

5.5%

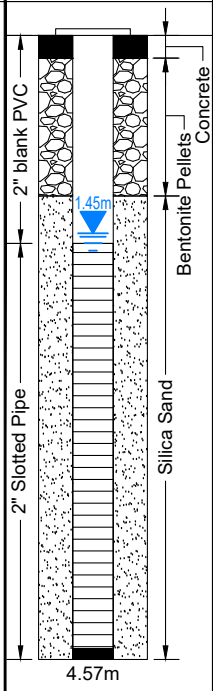
6.0%

5.8%

5.5%

6.3%

PIEZOMETER OR WELL CONSTRUCTION



Groundwater Depth (m): on completion: Dry; on 22 January, 2025: 1.45m

DRAWN: T.L. LOGGED: D.G. CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH103(MW) SHEET. 2 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: D-50 Truck, Solid Stem Auger

DRILLING DATE: 6 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE	PENETRATION TESTING (SPT) ▲ / SHEAR STRENGTH (Kpa) ✚	VAPOUR READING (ppm) □ / MOISTURE CONTENT (%) ●	PIEZOMETER OR WELL CONSTRUCTION
		SANDY SILT TILL: Grey, some clay, trace of gravel, moist, very dense				SS-10	100+		6.6%	
						SS-11	100+		7.9%	
		End of borehole at 12.62m		12.62/ 89.66						

Groundwater Depth (m): on completion: Dry; on 22 January, 2025: 1.45m

DRAWN: T.L. | LOGGED: D.G. | CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH104(MW) SHEET. 1 of 2

PROJECT NO.: FE 24-14410/11

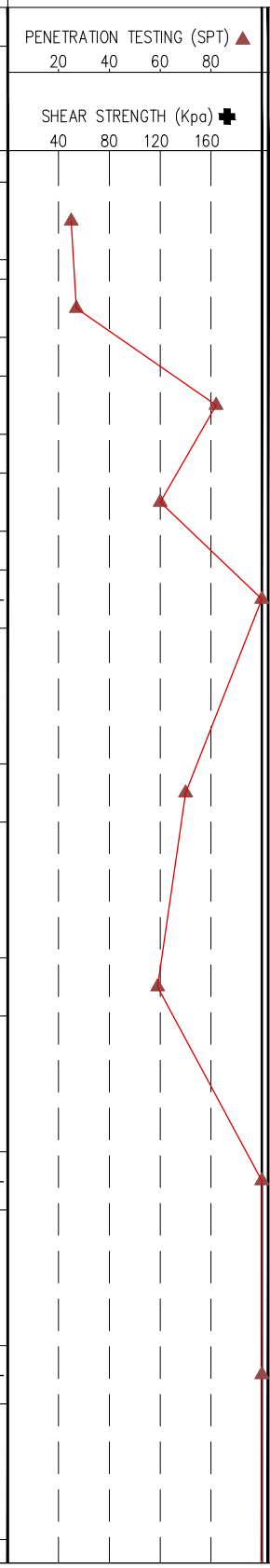
PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

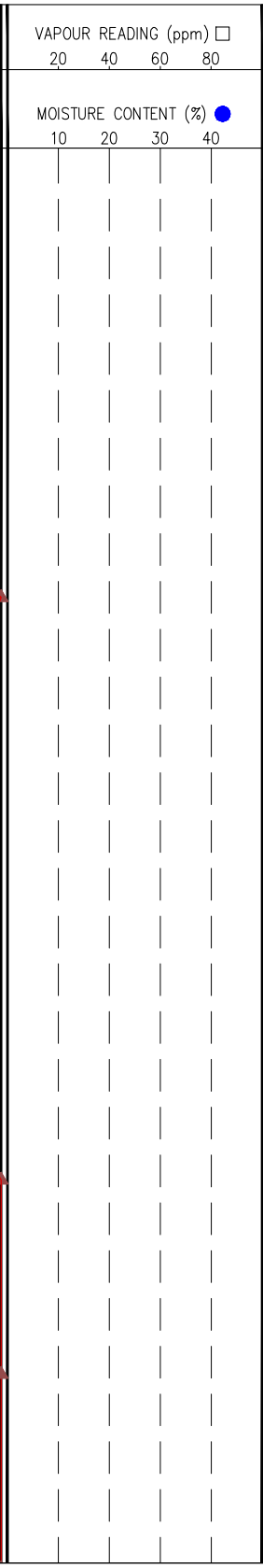
LOCATION: 375-417 Kingston Road, Pickering, ON

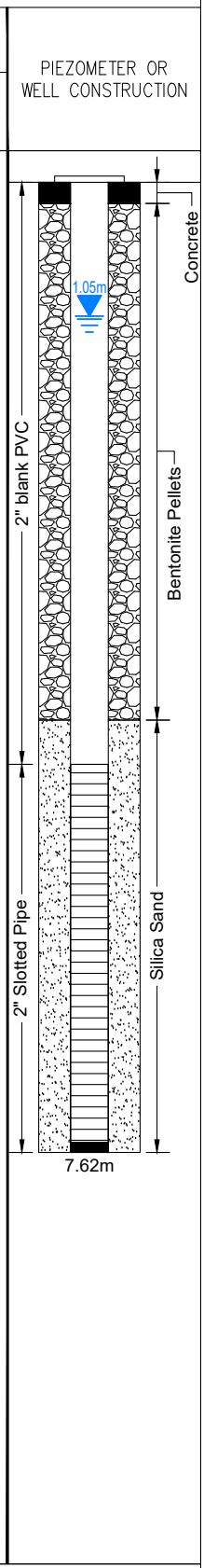
DRILLING METHOD: CME-75 Truck, Mud Rotary

DRILLING DATE: 7 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
				106.07			
0	0	100mm ASPHALT 150mm GRANULAR MATERIAL					
2		FILL: Dark brown clayey sandy silt, trace of gravel, moist		0.69 / 105.38		SS-1	25
4	1	SILTY SAND TILL: Brown/greyish brown, layers/pockets clayey silt till, trace to some clay, trace of gravel, moist, very dense				SS-2	27
6	2					SS-3	82
8						SS-4	60
10	3					SS-5	100+
12	4						
14							
16	5					SS-6	70
18							
20	6					SS-7	59
22	7						
24							
26	8					SS-8	100+
28							
30	9					SS-9	100+
32	10						
34							







Groundwater Depth (m): on completion: N/A – Mud Rotary; on 22 January, 2025: 1.05m

DRAWN: T.L. | LOGGED: D.G. | CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH104(MW) SHEET. 2 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Mud Rotary

DRILLING DATE: 7 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	SAMPLES Type NO.	SAMPLES "N" VALUE	PENETRATION TESTING (SPT) ▲ 20 40 60 80 / SHEAR STRENGTH (Kpa) ✚ 40 80 120 160	VAPOUR READING (ppm) □ 20 40 60 80 / MOISTURE CONTENT (%) ● 10 20 30 40	PIEZOMETER OR WELL CONSTRUCTION
36	11	SILTY SAND TILL: Brown/greyish brown, layers/pockets clayey silt till, trace to some clay, trace of gravel, moist, very dense				SS-10	100+			
38	12									
40	12					SS-11	100+			
42	13									
44	13									
46	14					SS-12	100+			
48	15									
50	15					SS-13	100+			
52	16			16.15/ 89.92						
54	16	SANDY SILT TILL: Grey, trace of clay and gravel, moist, very dense								
56	17					SS-14	100+			
58	18									
60	18					SS-15	100+			
62	19									
64	19									
66	20			20.10/ 85.97		SS-16	100+			
68	21	End of borehole at 20.10m								
70	21									

Groundwater Depth (m): on completion: N/A – Mud Rotary; on 22 January, 2025: 1.05m

DRAWN: T.L. LOGGED: D.G. CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH105(MW) SHEET. 1 of 3

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

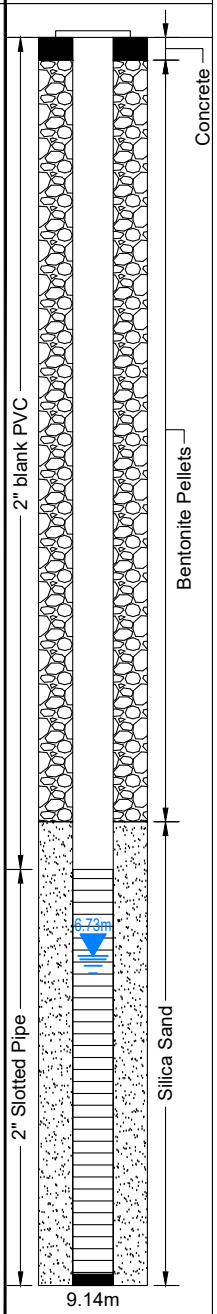
LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Mud Rotary

DRILLING DATE: 5 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE	PENETRATION TESTING (SPT) ▲ 20 40 60 80 / SHEAR STRENGTH (Kpa) ✚ 40 80 120 160	VAPOUR READING (ppm) □ 20 40 60 80 / MOISTURE CONTENT (%) ● 10 20 30 40
				106.36					
0	0	100mm ASPHALT 150mm GRANULAR MATERIAL				SS-1	22		
2		FILL: Dark grey silty sand, trace of clay, gravel and topsoil, moist		0.91 / 105.45					
4	1	CLAYEY SANDY SILT TILL: Brown, trace of gravel, moist, very dense				SS-2	52		
6	2					SS-3	100+		5.4%
8						SS-4	100+		
10	3					SS-5	100+		6.8%
12	4								
14									
16	5					SS-6	65		5.5%
18				5.49 / 100.87					
20	6	SILT & SAND TILL: Grey, some clay, trace of gravel, moist, very dense				SS-7	57		6.4%
22	7								
24									
26	8					SS-8	100+		5.4%
28									
30	9					SS-9	100+		4.9%
32	10								
34									

PIEZOMETER OR WELL CONSTRUCTION



Groundwater Depth (m): on completion: N/A – Mud Rotary; on 22 January, 2025: 6.73m

DRAWN: T.L. | LOGGED: D.G. | CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH105(MW) SHEET. 2 of 3

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Mud Rotary

DRILLING DATE: 5 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE	PENETRATION TESTING (SPT) ▲ / SHEAR STRENGTH (Kpa) ✚	VAPOUR READING (ppm) □ / MOISTURE CONTENT (%) ●	PIEZOMETER OR WELL CONSTRUCTION
		SILT & SAND TILL: Grey, some clay, trace of gravel, moist, very dense								
36	11					SS-10	100+		8.7%	
38										
	12									
40						SS-11	100+		7.9%	
42										
	13			13.11/ 93.25						
44		SANDY SILT TILL: Grey, some clay, trace of gravel, moist, very dense								
46	14					SS-12	100+		7.9%	
48										
	15									
50						SS-13	100+		13.1%	
52	16									
54										
56	17					SS-14	100+		8.5%	
58										
	18									
60						SS-15	100+		10.4%	
62	19									
64										
66	20					SS-16	100+		9.6%	
68										
	21									
70										

Groundwater Depth (m): on completion: N/A – Mud Rotary; on 22 January, 2025: 6.73m

DRAWN: T.L. | LOGGED: D.G. | CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH105(MW) SHEET. 3 of 3

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Mud Rotary

DRILLING DATE: 5 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
70		SANDY SILT TILL: Grey, some clay, trace of gravel, moist, very dense				SS-17	100+
72	22						
74							
76	23					SS-18	100+
78							
80	24					SS-19	100+
82	25						
84							
86	26					SS-20	100+
88	27						
90						SS-21	100+
92	28						
94							
96	29					SS-22	84
98	30						
100						SS-23	69
102	31	End of borehole at 30.94m		30.94 / 75.42			
104	32						

PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

10.7%

PIEZOMETER OR WELL CONSTRUCTION

Groundwater Depth (m): on completion: N/A – Mud Rotary; on 22 January, 2025: 6.73m

DRAWN: T.L. LOGGED: D.G. CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH106(MW) SHEET. 1 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Mud Rotary

DRILLING DATE: 17 December, 2024

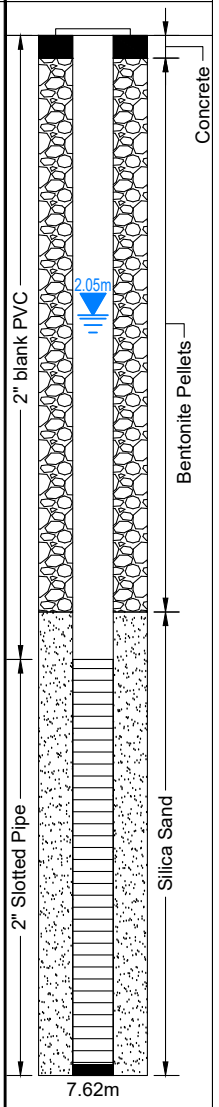
DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
				104.66			
0	0	GRANULAR MATERIAL				SS-1	34
2	1	FILL: Dark grey silty sand, trace of clay, gravel, roots and topsoil, moist		0.53 / 104.13		SS-2	52
4							
6	2	SANDY SILT TILL: Brown, some clay, trace of gravel, moist, very dense		1.68 / 102.98		SS-3	79
8						SS-4	100+
10	3					SS-5	100+
12	4			4.11 / 100.55			
14		SILT & SAND TILL: Grey, some clay, trace of gravel, moist, very dense				SS-6	100+
16	5						
18							
20	6					SS-7	100+
22	7						
24							
26	8					SS-8	100+
28							
30	9					SS-9	100+
32	10						
34							

PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40



Groundwater Depth (m): on completion: N/A – Mud Rotary; on 22 January, 2025: 2.05m

DRAWN: T.L. | LOGGED: D.G. | CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH106(MW) SHEET. 2 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Mud Rotary

DRILLING DATE: 17 December, 2024

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
36	11	SILT & SAND TILL: Grey, some clay, trace of gravel, moist, very dense				SS-10	100+
40	12					SS-11	100+
46	14					SS-12	100+
50	15					SS-13	100+
56	17					SS-14	100+
62	19					SS-15	100+
66	20					SS-15	57
		End of borehole at 20.27m		20.27/ 84.39			

PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

PIEZOMETER OR WELL CONSTRUCTION

Groundwater Depth (m): on completion: N/A – Mud Rotary; on 22 January, 2025: 2.05m

DRAWN: T.L. LOGGED: D.G. CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH107(MW) SHEET. 1 of 3

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Mud Rotary

DRILLING DATE: 2 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
				102.71			
0	0	100mm ASPHALT					
		GRANULAR MATERIAL		0.51 / 102.20		SS-1	8
2	1	FILL: Dark brown silty sand/sandy silt, some clay, trace of gravel, roots and topsoil, moist				SS-2	4
4				1.68 / 101.03		SS-3	18
6	2	SANDY SILT TILL: Grey, some clay, trace to some gravel, moist, compact to very dense					
8						SS-4	88
10	3					SS-5	100+
12							
	4			4.11 / 98.60			
14		CLAYEY SILTY SAND TILL: Grey, trace of gravel, moist, very dense					
16	5					SS-6	100+
18							
20	6					SS-7	100+
22	7						
24							
26	8					SS-8	100+
28							
30	9					SS-9	100+
32							
	10			10.21 / 92.50			
34		SANDY SILT TILL: Grey, some clay, trace of gravel, moist, very dense					

PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

18.7%

10.9%

5.5%

13.0%

7.4%

9.8%

7.7%

PIEZOMETER OR WELL CONSTRUCTION

Concrete

1.79m

2" blank PVC

Bentonite Pellets

2" Slotted Pipe

Silica Sand

9.14m

Groundwater Depth (m): on completion: N/A – Mud Rotary; on 22 January, 2025: 1.79m

DRAWN: T.L. LOGGED: D.G. CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH107(MW) SHEET. 2 of 3

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Mud Rotary

DRILLING DATE: 2 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE	PENETRATION TESTING (SPT) ▲ / SHEAR STRENGTH (Kpa) ✚	VAPOUR READING (ppm) □ / MOISTURE CONTENT (%) ●	PIEZOMETER OR WELL CONSTRUCTION
36	11	SANDY SILT TILL: Grey, some clay, trace of gravel, moist, very dense				SS-10	100+		7.7%	
38	12									
40	12					SS-11	77		7.7%	
42	13									
44	13									
46	14					SS-12	84		9.4%	
48	15									
50	15					SS-13	100+		8.9%	
52	16									
54	16									
56	17					SS-14	83		9.4%	
58	18									
60	18					SS-15	84		8.9%	
62	19			19.20/ 83.51						
64	19	CLAYEY SANDY SILT TILL: Grey, trace of gravel, wet, very dense to dense								
66	20					SS-16	67		9.0%	
68	21									
70										

PENETRATION TESTING (SPT) ▲ / SHEAR STRENGTH (Kpa) ✚: 20 40 60 80 / 40 80 120 160

VAPOUR READING (ppm) □ / MOISTURE CONTENT (%) ●: 20 40 60 80 / 10 20 30 40

Groundwater Depth (m): on completion: N/A – Mud Rotary; on 22 January, 2025: 1.79m

DRAWN: T.L. LOGGED: D.G. CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH107(MW) SHEET. 3 of 3

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Mud Rotary

DRILLING DATE: 2 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
70		CLAYEY SANDY SILT TILL: Grey, trace of gravel, wet, very dense to dense					
						SS-17	56
72	22						
74							
	23					SS-18	31
76							
78							
	24						
80						SS-19	45
82	25			24.99/ 77.72			
		SANDY SILT TILL: Grey, trace to some clay, trace of gravel, moist, very dense					
84							
	26					SS-20	100+
86							
88							
	27						
90						SS-21	100+
92	28						
94							
	29					SS-22	100+
96							
98							
	30						
100				30.61/ 72.10		SS-23	100+
		End of borehole at 30.61m					
102	31						
104							
	32						

PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

20.3%

PIEZOMETER OR WELL CONSTRUCTION

Groundwater Depth (m): on completion: N/A – Mud Rotary; on 22 January, 2025: 1.79m

DRAWN: T.L. LOGGED: D.G. CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH108(MW) SHEET. 1 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Mud Rotary

DRILLING DATE: 18 December, 2024

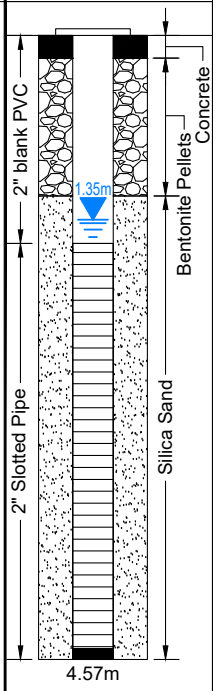
DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	SAMPLES Type NO.	"N" VALUE
				106.43			
0	0	100mm ASPHALT 150mm GRANULAR MATERIAL				SS-1	14
2		FILL: Dark brown clayey sandy silt, trace of gravel, moist		0.69 105.74			
4	1	SILT & SAND TILL: Brown to grey, trace of clay and gravel, moist, very dense				SS-2	54
6	2					SS-3	100+
8						SS-4	100+
10	3					SS-5	100+
12	4						
14							
16	5					SS-6	71
18							
20	6					SS-7	100+
22							
24	7	SANDY SILT TILL: Grey, some/trace of clay, trace of gravel, moist, very dense		7.01 99.42			
26	8					SS-8	100+
28							
30	9					SS-9	100+
32	10						
34							

PENETRATION TESTING (SPT) ▲ 20 40 60 80
SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80
MOISTURE CONTENT (%) ● 10 20 30 40

SS-3 ● 5.5%
SS-5 ● 5.7%
SS-6 ● 6.0%
SS-7 ● 4.6%
SS-8 ● 6.3%
SS-9 ● 5.4%

PIEZOMETER OR WELL CONSTRUCTION



Groundwater Depth (m): on completion: N/A – Mud Rotary; on 22 January, 2025: 1.35m

DRAWN: T.L. | LOGGED: D.G. | CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH108(MW) SHEET. 2 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Mud Rotary

DRILLING DATE: 18 December, 2024

DEPTH (feet)	DEPTH (meters)	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: LAB ID	Type NO.	"N" VALUE	PENETRATION TESTING (SPT) ▲ / SHEAR STRENGTH (Kpa) ✚	VAPOUR READING (ppm) □ / MOISTURE CONTENT (%) ●	PIEZOMETER OR WELL CONSTRUCTION
36	11	SANDY SILT TILL: Grey, some/trace of clay, trace of gravel, moist, very dense				SS-10	100+		5.1%	
38										
40	12	End of borehole at 12.24m		12.24/ 94.19		SS-11	100+		5.5%	
42	13									
44										
46	14									
48										
50	15									
52	16									
54										
56	17									
58										
60	18									
62	19									
64										
66	20									
68										
70	21									

Groundwater Depth (m): on completion: N/A – Mud Rotary; on 22 January, 2025: 1.35m

DRAWN: T.L. | LOGGED: D.G. | CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH109(MW) SHEET. 1 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Solid Stem Auger

DRILLING DATE: 10 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	SAMPLES Type NO.	SAMPLES "N" VALUE
				106.18			
0	0	100mm ASPHALT 150mm GRANULAR MATERIAL				SS-1	21
2		FILL: Dark brown silty sand, trace clay and gravel, moist		0.53 105.65			
4	1	SANDY SILT TILL: Brown to greyish brown, trace of clay and gravel, moist, dense to very dense				SS-2	48
6	2					SS-3	100+
8						SS-4	63
10	3					SS-5	74
12	4						
14							
16	5					SS-6	100+
18				5.49 100.69			
20	6	SANDY SILT TILL: Grey, trace of clay and gravel, moist, very dense				SS-7	100+
22	7						
24							
26	8					SS-8	100+
28							
30	9					SS-9	100+
32							
34	10						

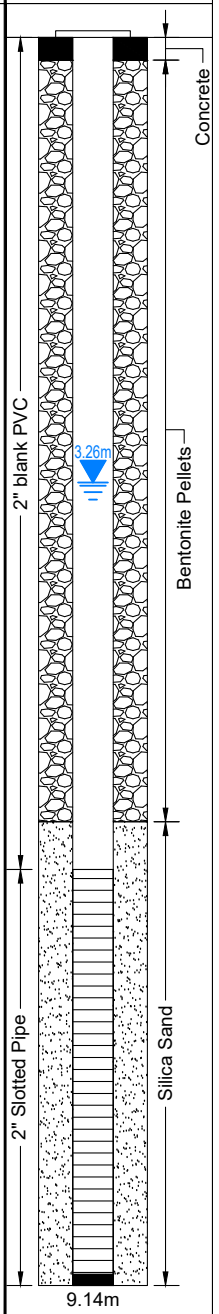
PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

PIEZOMETER OR WELL CONSTRUCTION



Groundwater Depth (m): on completion: Dry; on 22 January, 2025: 3.26m

DRAWN: T.L. | LOGGED: D.G. | CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH109(MW) SHEET. 2 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Solid Stem Auger

DRILLING DATE: 10 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	SAMPLES Type NO.	SAMPLES "N" VALUE	PENETRATION TESTING (SPT) ▲ 20 40 60 80 / SHEAR STRENGTH (Kpa) ✚ 40 80 120 160	VAPOUR READING (ppm) □ 20 40 60 80 / MOISTURE CONTENT (%) ● 10 20 30 40	PIEZOMETER OR WELL CONSTRUCTION
36	11	SANDY SILT TILL: Grey, trace of clay and gravel, moist, very dense				SS-10	100+			
38										
40	12					SS-11	100+			
				12.45/ 93.73						
		End of borehole at 12.45m								
42	13									
44										
46	14									
48										
50	15									
52	16									
54										
56	17									
58										
60	18									
62	19									
64										
66	20									
68										
70	21									

Groundwater Depth (m): on completion: Dry; on 22 January, 2025: 3.26m

DRAWN: T.L. | LOGGED: D.G. | CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH110(MW) SHEET. 1 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Solid Stem Auger

DRILLING DATE: 3 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
				102.30			
0	0	GRANULAR MATERIAL		0.20 / 102.10		SS-1	9
2	1	FILL: Dark brown sandy silt, trace to some clay, trace of gravel, roots and topsoil, moist				SS-2	14
4							
6	2	SILTY SAND TILL/SILT & SAND TILL: Brown to grey, some/trace of clay, trace of gravel, moist, very dense		1.73 / 100.57		SS-3	18
8						SS-4	100+
10	3					SS-5	100+
12	4						
14							
16	5					SS-6	100+
18							
20	6					SS-7	100+
22	7						
24							
26	8					SS-8	100+
28		SANDY SILT TILL: Grey, trace of clay and gravel, moist, very dense		8.53 / 93.77			
30	9					SS-9	100+
32							
34	10						

PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

8.8%

4.5%

5.6%

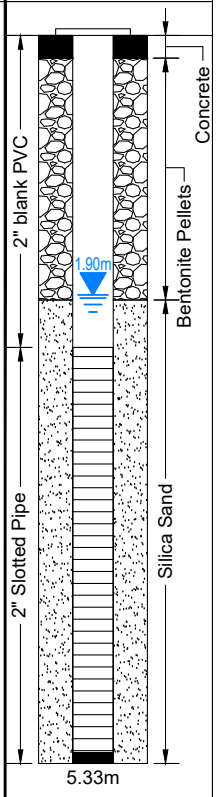
8.3%

6.2%

6.4%

6.1%

PIEZOMETER OR WELL CONSTRUCTION



Groundwater Depth (m): on completion: 4.57m; on 22 January, 2025: 1.90m

DRAWN: T.L. LOGGED: D.G. CHECKED: C.W.

FISHER ENGINEERING

LOG OF BOREHOLE

NO. BH110(MW) SHEET. 2 of 2

PROJECT NO.: FE 24-14410/11

PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Solid Stem Auger

DRILLING DATE: 3 January, 2025

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: LAB ID	SAMPLES: Type NO.	SAMPLES: "N" VALUE	PENETRATION TESTING (SPT) ▲ 20 40 60 80 / SHEAR STRENGTH (Kpa) ✚ 40 80 120 160	VAPOUR READING (ppm) □ 20 40 60 80 / MOISTURE CONTENT (%) ● 10 20 30 40	PIEZOMETER OR WELL CONSTRUCTION
36	11	SANDY SILT TILL: Grey, trace of clay and gravel, moist, very dense				SS-10	100+		7.1%	
38	12									
40						SS-11	100+			
				12.62/ 89.68						
42	13	End of borehole at 12.62m								
44										
46	14									
48										
50	15									
52										
54	16									
56	17									
58										
60	18									
62										
64	19									
66										
68	20									
70	21									

Groundwater Depth (m): on completion: 4.57m; on 22 January, 2025: 1.90m

DRAWN: T.L. LOGGED: D.G. CHECKED: C.W.

FISHER ENVIRONMENTAL LTD.

LOG OF BOREHOLE NO. BH1(MW) SHEET. 1 of 1

PROJECT NO.: FE-P 21-11144 & 21-11145

PROJECT NAME: Phase II ESA & Geotechnical Investigation

LOCATION: 375 Kingston Road, Pickering, Ontario

DRILLING METHOD: D-50, Solid Stem

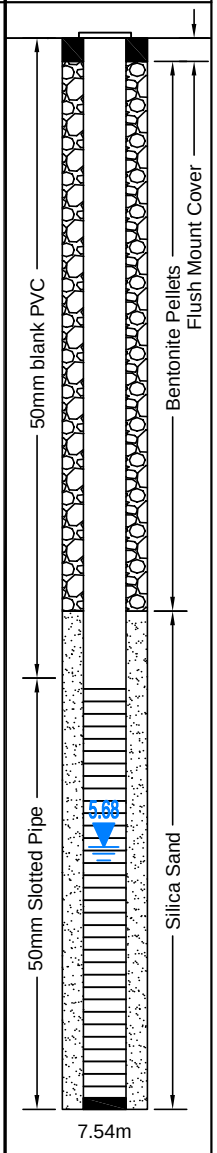
DRILLING DATE: April 28, 2021

DEPTH (feet)	DEPTH (metres)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID:	TYPE NUMBER	P.I.D. Reading	"N" VALUE
		GROUND SURFACE (m asl)		100.33				
0	0	60mm Asphalt FILL: grey silty sand, slightly moist. Petrol odour.		0.46/ 99.87	21-6436-1	SS-1		12
4	1	GREY SILT: slightly moist, very dense. Petrol odour.		1.68/ 98.65	21-6436-2	SS-2		50
6	2					SS-3		100+
8		GREY SANDY SILT TILL: trace of gravel, dry, very dense.				SS-4		100+
10	3					SS-5		100+
12	4							
14				4.72/ 95.61				
16	5					SS-6		65
18		GREY SILTY SAND TILL: trace of gravel, moist, very dense.						
20	6					SS-7		81
22								
24	7							
26	8			8.08/ 92.25		SS-8		100+
28		End of Borehole						
30	9							
32	10							

PENETRATION TESTING (SPT) ▲ 20 40 60 80
SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80
MOISTURE CONTENT (%) ● 10 20 30 40

● 13%
● 12%



Groundwater Depth: on completion: Dry; on May 10, 2021: 5.68

DRAWN: BL LOGGED: CW CHECKED: RC

FISHER ENVIRONMENTAL LTD.

LOG OF BOREHOLE NO. BH2(MW) SHEET. 1 of 1

PROJECT NO.: FE-P 21-11144 & 21-11145

PROJECT NAME: Phase II ESA & Geotechnical Investigation

LOCATION: 375 Kingston Road, Pickering, Ontario

DRILLING METHOD: D-50, Solid Stem

DRILLING DATE: April 28, 2021

DEPTH (feet)	DEPTH (metres)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: LAB ID:	TYPE NUMBER	P.I.D. Reading	"N" VALUE
		GROUND SURFACE (m asl)		100.23				
0	0	80mm Asphalt						
		FILL: grey with black spots silty sand/silt.		0.61/ 99.62		SS-1		12
4	1					SS-2		31
		GREY SILT: slightly moist, dense to very dense.						
6	2					SS-3		100+
8				2.44/ 97.79				
		GREY SANDY SILT TILL: trace of gravel, dry to moist, very dense.			21-6436-3	SS-4		100+
10	3			3.20/ 97.03				
						SS-5		58
12		GREY SILTY SAND TILL: trace of gravel, moist, very dense.						
14	4							
16	5					SS-6		64
18								
20	6					SS-7		82
				8.08/ 92.15				
22	7	End of Borehole						
24								
26	8							
28								
30	9							
32	10							

PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

5.9%

PIEZOMETER OR WELL CONSTRUCTION

50mm blank PVC

Bentonite Pellets

Flush Mount Cover

50mm Slotted Pipe

Silica Sand

4.32

6.12m

Groundwater Depth: on completion: Dry; on May 10, 2021: 4.32m

DRAWN: BL LOGGED: CW CHECKED: RC

FISHER ENVIRONMENTAL LTD.

LOG OF BOREHOLE NO. BH3 SHEET. 1 of 1

PROJECT NO.: FE-P 21-11144 & 21-11145

PROJECT NAME: Phase II ESA & Geotechnical Investigation

LOCATION: 375 Kingston Road, Pickering, Ontario

DRILLING METHOD: D-50, Solid Stem

DRILLING DATE: April 28, 2021

DEPTH (feet)	DEPTH (metres)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID:	TYPE NUMBER	P.I.D. Reading	"N" VALUE
		GROUND SURFACE (m asl)		99.20				
0	0	60mm Asphalt FILL: grey silty sand, some gravel, dry.		0.46/ 98.74		SS-1		26
2								
4	1	BROWNISH GREY SILT: slightly moist, dense to very dense.				SS-2		49
				1.68/ 97.52				
6	2	BROWNISH GREY SANDY SILT TILL: trace of gravel, dry, very dense.			21-6436-4	SS-3		100+
8						SS-4		100+
10	3			3.05/ 96.15		SS-5		100+
12	4	GREY SILTY SAND TILL: trace of gravel, slightly moist to dry, very dense.						
14								
16	5					SS-6		100+
18								
20	6					SS-7		100+
22								
24	7							
26	8			8.08/ 91.12		SS-8		100+
28		End of Borehole						
30	9							
32	10							

PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

5.7%

PIEZOMETER OR WELL CONSTRUCTION

Groundwater Depth: on completion: Dry

DRAWN: BL LOGGED: CW CHECKED: RC

FISHER ENVIRONMENTAL LTD.

LOG OF BOREHOLE NO. BH4(MW) SHEET. 1 of 1

PROJECT NO.: FE-P 21-11144 & 21-11145

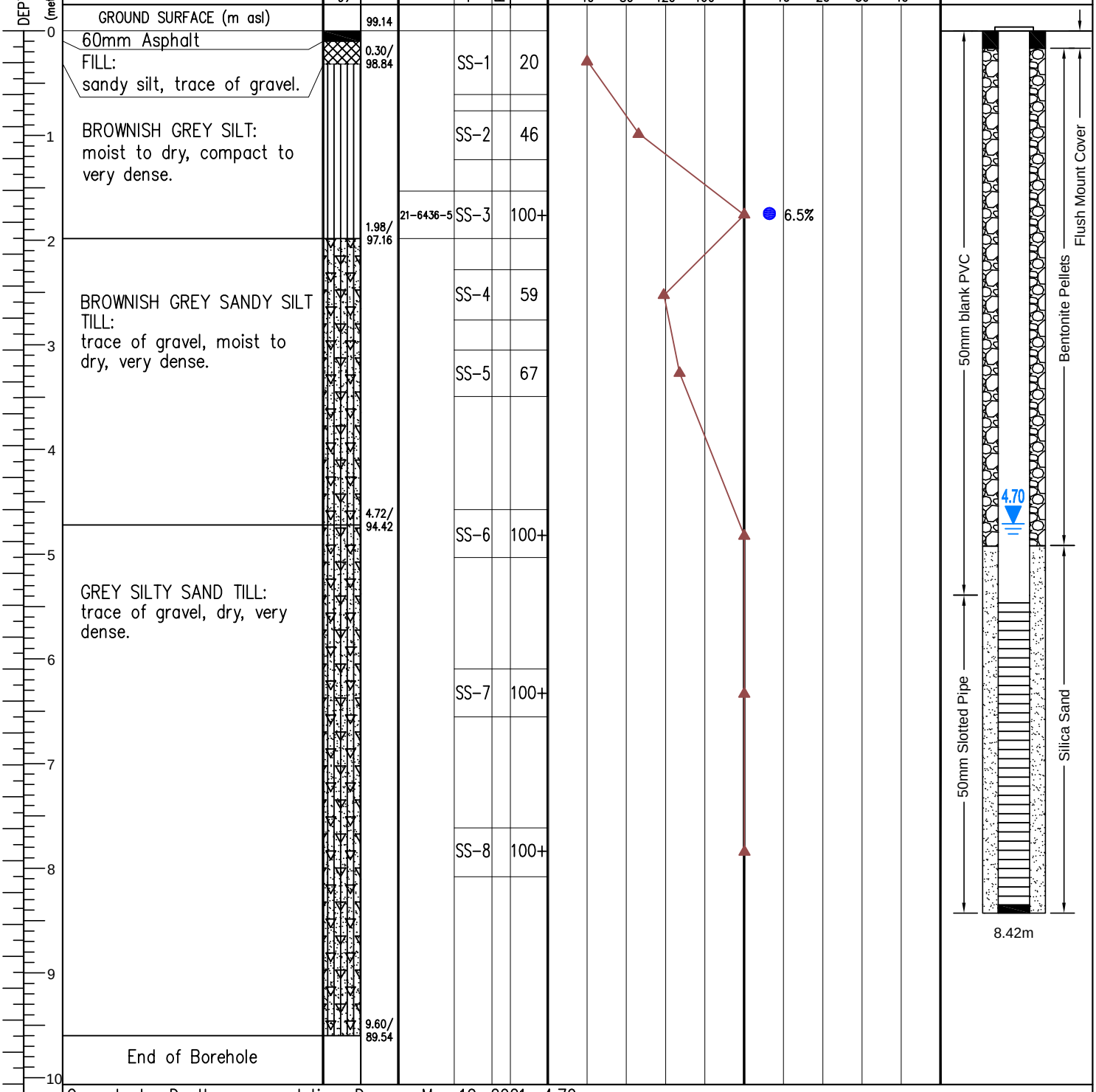
PROJECT NAME: Phase II ESA & Geotechnical Investigation

LOCATION: 375 Kingston Road, Pickering, Ontario

DRILLING METHOD: D-50, Solid Stem

DRILLING DATE: April 28, 2021

DEPTH (feet)	DEPTH (metres)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID:	TYPE NUMBER	P.I.D. Reading	"N" VALUE
		GROUND SURFACE (m asl)		99.14				
0	0	60mm Asphalt FILL: sandy silt, trace of gravel.		0.30/ 98.84		SS-1		20
2								
4	1	BROWNISH GREY SILT: moist to dry, compact to very dense.				SS-2		46
6					21-6436-5	SS-3		100+
	2			1.98/ 97.16				
8		BROWNISH GREY SANDY SILT TILL: trace of gravel, moist to dry, very dense.				SS-4		59
10	3					SS-5		67
12								
14	4							
16				4.72/ 94.42		SS-6		100+
	5	GREY SILTY SAND TILL: trace of gravel, dry, very dense.						
18								
20	6					SS-7		100+
22								
24	7							
26						SS-8		100+
28	8							
30	9							
32		End of Borehole		9.60/ 89.54				
	10							



Groundwater Depth: on completion: Dry; on May 10, 2021: 4.70m

DRAWN: BL LOGGED: CW CHECKED: RC

FISHER ENVIRONMENTAL LTD.

LOG OF BOREHOLE NO. BH5 SHEET. 1 of 1

PROJECT NO.: FE-P 21-11144 & 21-11145

PROJECT NAME: Phase II ESA & Geotechnical Investigation

LOCATION: 375 Kingston Road, Pickering, Ontario

DRILLING METHOD: D-50, Solid Stem

DRILLING DATE: April 28, 2021

DEPTH (feet)	DEPTH (metres)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID:	TYPE NUMBER	P.I.D. Reading	"N" VALUE
		GROUND SURFACE (m asl)		99.69				
0	0	80mm Asphalt FILL: brown silty sand, trace of gravel, dry.		0.46/ 99.23		SS-1		31
4	1					SS-2		36
6	2	GREYISH BROWN SANDY SILT TILL: trace of gravel, slightly moist to dry, dense to very dense.				SS-3		100+
8					21-6436-6	SS-4		100+
10	3			3.20/ 96.49		SS-5		100+
12	4	End of Borehole						
14								
16	5							
18								
20	6							
22	7							
24								
26	8							
28								
30	9							
32	10							

PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

6.5%

PIEZOMETER OR WELL CONSTRUCTION

Groundwater Depth: on completion: Dry

DRAWN: BL LOGGED: CW CHECKED: RC

APPENDIX C – MOISTURE CONTENT AND GRAIN SIZE ANALYSES RESULTS

Project Name:	Geotechnical Investigation	***F.E. Lab #:***	25-101
Client:	375 Kingston Road Corporation	***Date Sampled:***	17-Dec-2024
Project ID:	24-14410	***Date Received:***	6-Jan-2025
Location:	375-417 Kingston Road, Pickering, Ontario	***Date Reported:***	4-Mar-2025

Certificate of Analysis

Analyses	Matrix	Quantity	Testing Date	Method Reference
Moisture Content	Soil	63	13-Jan-25	ASTM D2216
Grain Size (Sieve Analysis)	Soil	21	04-Feb-25	LS-602
Grain Size (Hydrometer)	Soil	7	21-Feb-25	LS-702
Atterberg test	Soil	0	N.A.	LS-703/704

Authorized by: Behnam Sayad-Pour

Behnam Sayad Pour Zanjani
Geo-Lab Supervisor

400 Esna Park Drive, Unit 15, Markham, ON L3R 3K2
Tel:(905) 475-7755 www.fishereng.com

Certificate of Analysis

Analysis Requested:	Moisture Content	***Sample Description:***	63 Soil Sample(s)

Sample Info	BH101 SS3	BH101 SS5	BH101 SS6	BH101 SS7	BH101 SS8	BH101 SS9
Sample Depth (m)	1.53-1.98	3.05-3.51	4.58-5.03	6.1-6.56	7.63-8.08	9.15-9.61
Moisture Content (%)	12.2	5.1	8.2	6.9	5.0	4.6

Sample Info	BH101 SS10	BH101 SS11	BH103 SS3	BH103 SS5	BH103 SS6	BH103 SS7
Sample Depth (m)	10.68-11.13	12.2-12.66	1.53-1.98	3.05-3.51	4.58-5.03	6.1-6.56
Moisture Content (%)	4.4	5.0	10.0	5.5	6.0	5.8

Sample Info	BH103 SS8	BH103 SS9	BH103 SS10	BH103 SS11	BH105 SS3	BH105 SS5
Sample Depth (m)	7.63-8.08	9.15-9.61	10.68-11.13	12.2-12.66	1.53-1.98	3.05-3.51
Moisture Content (%)	5.5	6.3	6.6	7.9	5.4	6.8

Sample Info	BH105 SS6	BH105 SS7	BH105 SS8	BH105 SS9	BH105 SS10	BH105 SS11
Sample Depth (m)	4.58-5.03	6.1-6.56	7.63-8.08	9.15-9.61	10.68-11.13	12.2-12.66
Moisture Content (%)	5.5	6.4	5.4	4.9	8.7	7.9

Sample Info	BH105 SS12	BH105 SS13	BH105 SS14	BH105 SS15	BH105 SS16	BH105 SS17
Sample Depth (m)	13.73-14.18	15.25-15.71	16.78-17.23	18.3-18.76	19.83-20.28	21.35-21.81
Moisture Content (%)	7.9	13.1	8.5	10.4	9.6	10.7

Sample Info	BH106 SS5	BH106 SS6	BH107 SS3 A	BH107 SS3 B	BH107 SS5	BH107 SS6
Sample Depth (m)	3.05-3.51	4.58-5.03	1.53-1.68	1.68-1.98	3.05-3.51	4.58-5.03
Moisture Content (%)	9.5	6.8	18.7	10.9	5.5	13.0

Sample Info	BH107 SS7	BH107 SS8	BH107 SS9	BH107 SS10	BH107 SS11	BH107 SS12
Sample Depth (m)	6.1-6.56	7.63-8.08	9.15-9.61	10.68-11.13	12.2-12.66	13.73-14.18
Moisture Content (%)	7.4	9.8	7.7	7.7	7.7	9.4

Sample Info	BH107 SS13	BH107 SS14	BH107 SS15	BH107 SS16	BH107 SS17	BH108 SS3
Sample Depth (m)	15.25-15.71	16.78-17.23	18.3-18.76	19.83-20.28	21.35-21.81	1.53-1.98
Moisture Content (%)	8.9	9.4	8.9	9.0	20.3	5.5

Certificate of Analysis

Analysis Requested:	Moisture Content	***Sample Description:***	63 Soil Sample(s)

Sample Info	BH108 SS5	BH108 SS6	BH108 SS7	BH108 SS8	BH108 SS9	BH108 SS10
Sample Depth (m)	3.05-3.51	4.58-5.03	6.1-6.56	7.63-8.08	9.15-9.61	10.68-11.13
Moisture Content (%)	5.7	6.0	4.6	6.3	5.4	5.1

Sample Info	BH108 SS11	BH110 SS3	BH110 SS5	BH110 SS6	BH110 SS7	BH110 SS8
Sample Depth (m)	12.2-12.66	1.53-1.98	3.05-3.51	4.58-5.03	6.1-6.56	7.63-8.08
Moisture Content (%)	5.5	8.8	4.5	5.6	8.3	6.2

Sample Info	BH110 SS9	BH110 SS10	BH110 SS11			
Sample Depth (m)	9.15-9.61	10.68-11.13	12.2-12.66			
Moisture Content (%)	6.4	6.1	7.1			

Certificate of Analysis

Analysis Requested:	Grain Size (Sieve Analysis)	***Sample Quantity:***	21	Soil Sample(s)

Sample Info	***25-104 BH101 SS9***	***25-105 BH101 SS11***	***25-106 BH103 SS5***	***25-107 BH103 SS7***	***25-108 BH103 SS9***	***25-109 BH103 SS11***
Sample Depth (m)	***9.15-9.61***	***12.2-12.66***	***3.05-3.51***	***6.1-6.56***	***9.15-9.61***	***12.2-12.66***
Grain Size (%)						
>19mm	0.0	0.0	0.0	0.0	0.0	0.0
9.5mm-19mm	6.3	3.5	10.6	0.0	0.0	0.0
4.75mm-9.5mm	0.8	2.2	1.5	4.5	1.4	2.1
1.18mm-4.75mm	4.6	3.7	6.3	6.7	3.9	3.1
300um-1.18mm	8.9	8.7	9.9	12.1	9.1	7.1
75um-300um	25.4	25.9	23.2	30.7	27.6	23.6
<75um	54.0	55.9	48.5	46.0	58.0	64.0
Clay and Silt	**54.0**	**55.9**	**48.5**	**46.0**	**58.0**	**64.0**
Sand	**38.9**	**38.3**	**39.4**	**49.5**	**40.7**	**33.8**
Gravel	**7.0**	**5.8**	**12.1**	**4.5**	**1.4**	**2.1**

Sample Info	***25-112 BH105 SS9***	***25-113 BH105 SS11***	***25-114 BH105 SS13***	***25-116 BH107 SS7***	***25-117 BH107 SS9***	***25-118 BH107 SS11***
Sample Depth (m)	***9.15-9.61***	***12.2-12.66***	***15.25-15.71***	***6.1-6.56***	***9.15-9.61***	***12.2-12.66***
Grain Size (%)						
>19mm	0.0	0.0	0.0	0.0	0.0	3.2
9.5mm-19mm	5.0	0.0	0.0	8.4	0.0	2.3
4.75mm-9.5mm	1.8	3.2	2.6	3.8	2.4	5.5
1.18mm-4.75mm	3.5	4.3	9.7	5.5	4.6	3.0
300um-1.18mm	9.2	9.8	17.1	9.6	9.3	8.0
75um-300um	26.1	26.7	54.5	21.8	27.3	24.7
<75um	54.3	55.9	16.1	50.9	56.4	53.3
Clay and Silt	**54.3**	**55.9**	**16.1**	**50.9**	**56.4**	**53.3**
Sand	**38.8**	**40.8**	**81.3**	**36.9**	**41.2**	**35.7**
Gravel	**6.9**	**3.2**	**2.6**	**12.2**	**2.4**	**11.0**

Sample Info	***25-119 BH107 SS13***	***25-120 BH108 SS5***	***25-121 BH108 SS7***	***25-122 BH108 SS9***	***25-123 BH108 SS11***	***25-124 BH110 SS5***
Sample Depth (m)	***15.25-15.71***	***3.05-3.51***	***6.1-6.56***	***9.15-9.61***	***12.2-12.66***	***3.05-3.51***
Grain Size (%)						
>19mm	0.0	0.0	11.1	0.0	0.0	11.5
9.5mm-19mm	0.0	0.0	8.1	0.0	1.7	1.9
4.75mm-9.5mm	2.5	1.8	2.3	3.0	4.3	3.5
1.18mm-4.75mm	2.7	6.2	5.1	4.6	4.5	5.8
300um-1.18mm	6.3	13.5	8.9	9.4	8.8	9.4
75um-300um	25.5	27.5	20.2	26.6	24.8	21.7
<75um	63.0	51.1	44.2	56.4	55.9	46.1
Clay and Silt	**63.0**	**51.1**	**44.2**	**56.4**	**55.9**	**46.1**
Sand	**34.5**	**47.2**	**34.3**	**40.6**	**38.0**	**37.0**
Gravel	**2.5**	**1.8**	**21.5**	**3.0**	**6.1**	**16.9**

Certificate of Analysis

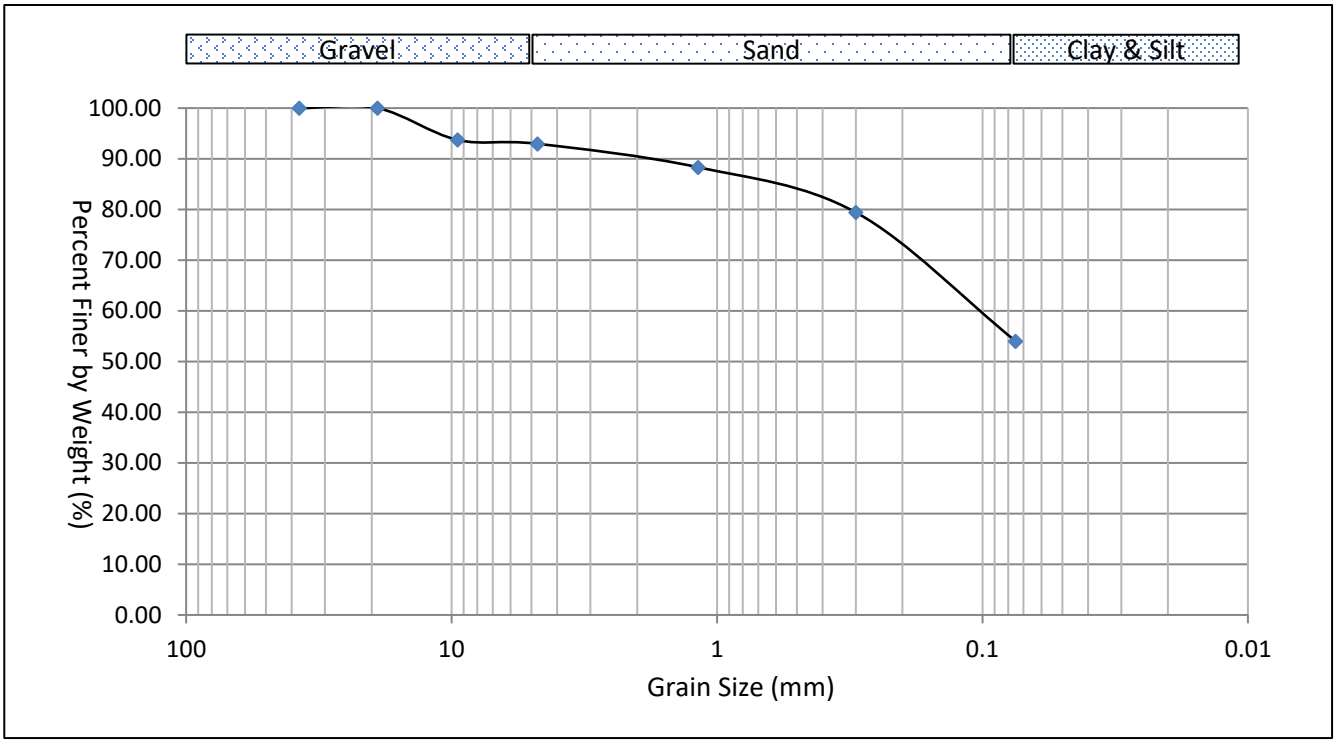
Analysis Requested:	Grain Size (Sieve Analysis)	***Sample Quantity:***	21	Soil Sample(s)

Sample Info	***25-125 BH110 SS7***	***25-126 BH110 SS9***	***25-127 BH110 SS11***			
Sample Depth (m)	***6.1-6.56***	***9.15-9.61***	***12.2-12.66***			
Grain Size (%)						
>19mm	0.0	0.0	0.0			
9.5mm-19mm	5.3	0.0	0.0			
4.75mm-9.5mm	0.3	2.3	1.6			
1.18mm-4.75mm	6.1	4.1	3.6			
300um-1.18mm	10.3	9.0	7.7			
75um-300um	22.1	26.7	25.4			
<75um	55.8	57.9	61.8			
Clay and Silt	**55.8**	**57.9**	**61.8**			
Sand	**38.5**	**39.8**	**36.6**			
Gravel	**5.6**	**2.3**	**1.6**			

Grain Size Distribution

Sample ID: 25-104 BH101 SS9 (9.15-9.61m)

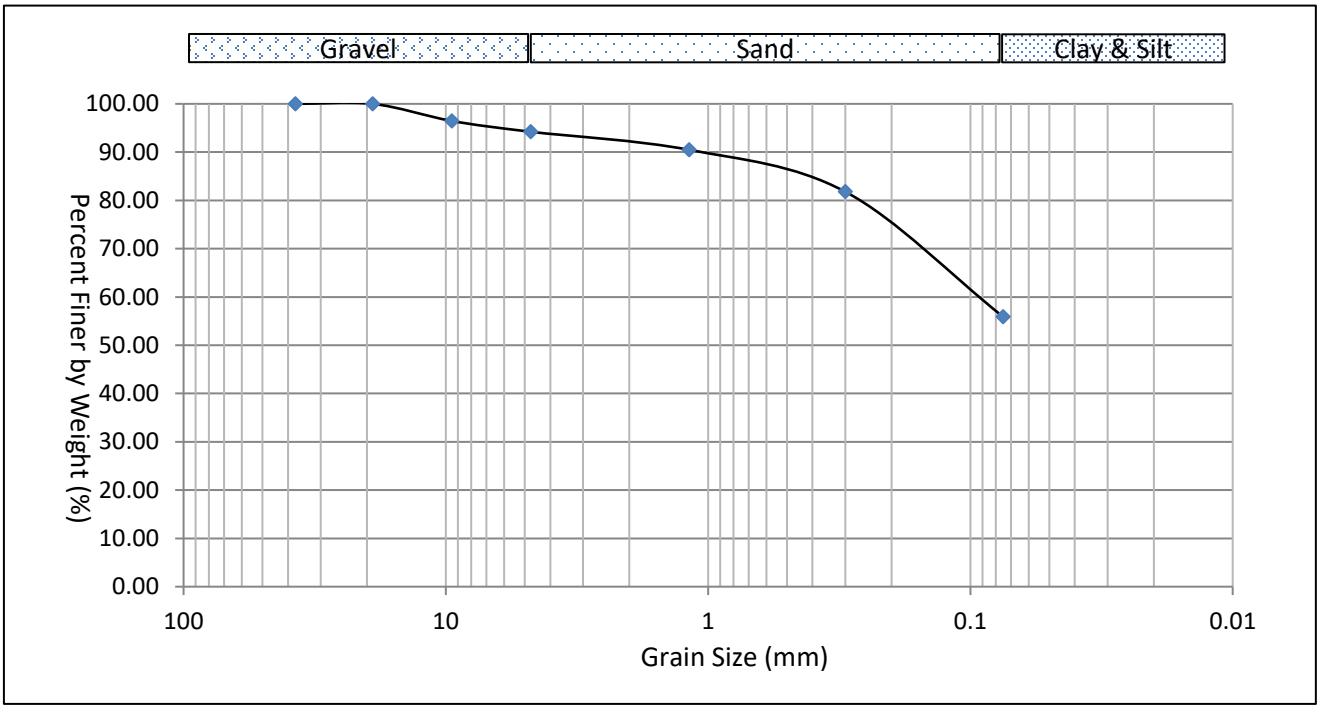
Gravel: 7% Sand: 38.9% Clay and Silt 54%



Grain Size Distribution

Sample ID: 25-105 BH101 SS11 (12.2-12.66m)

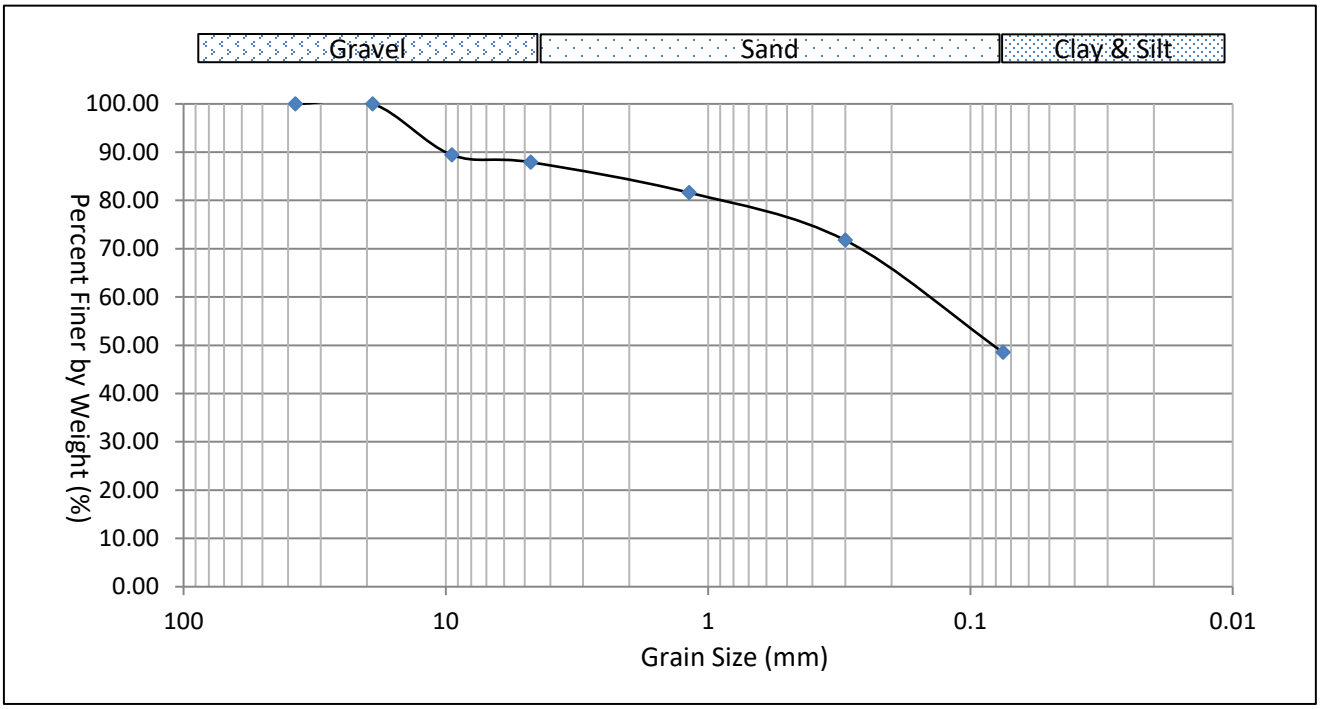
Gravel: 5.8% Sand: 38.3% Clay and Silt 55.9%



Grain Size Distribution

Sample ID: 25-106 BH103 SS5 (3.05-3.51m)

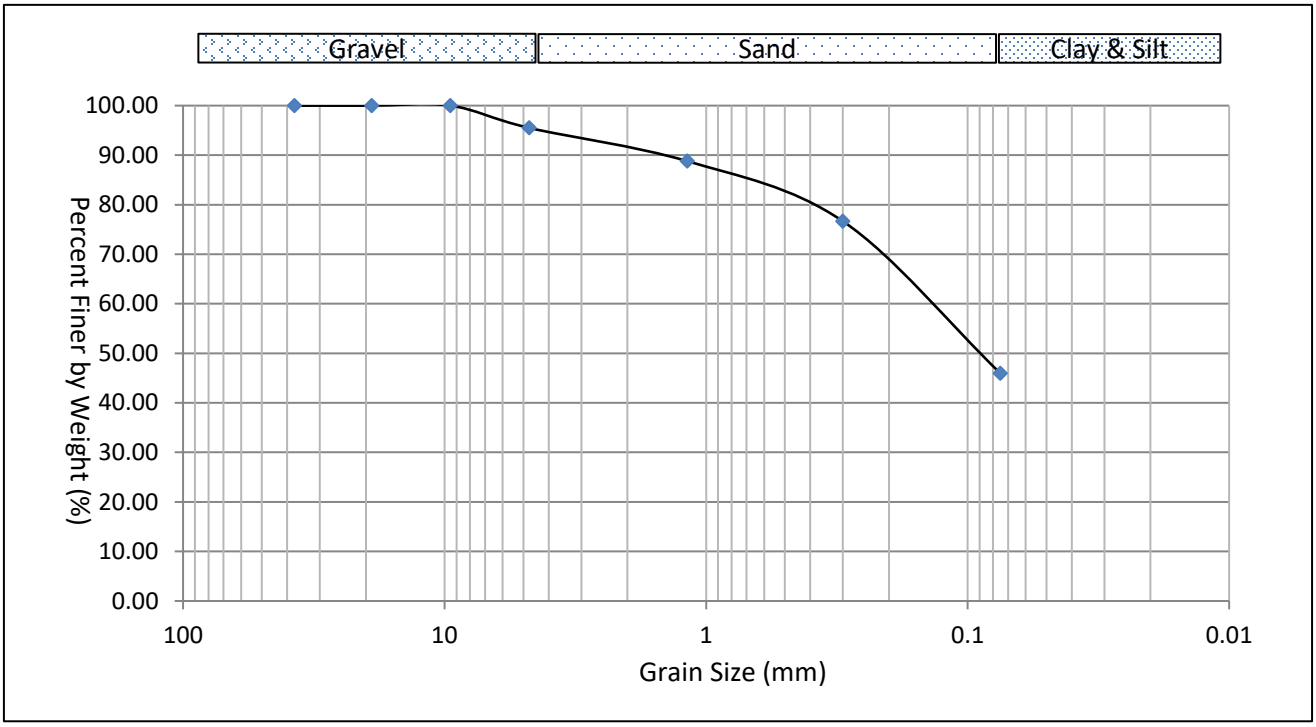
Gravel: 12.1% Sand: 39.4% Clay and Silt 48.5%



Grain Size Distribution

Sample ID: 25-107 BH103 SS7 (6.1-6.56m)

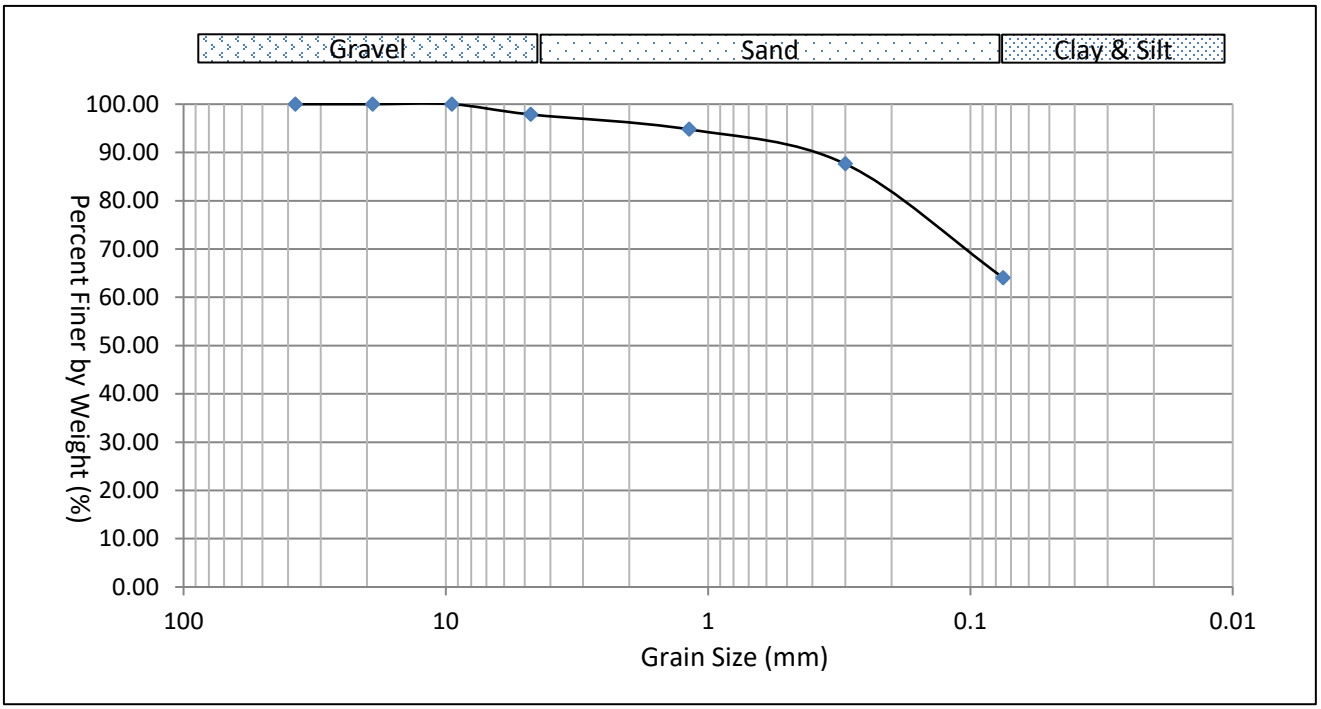
Gravel: 4.5% Sand: 49.5% Clay and Silt 46%



Grain Size Distribution

Sample ID: 25-108 BH103 SS9 (9.15-9.61m)

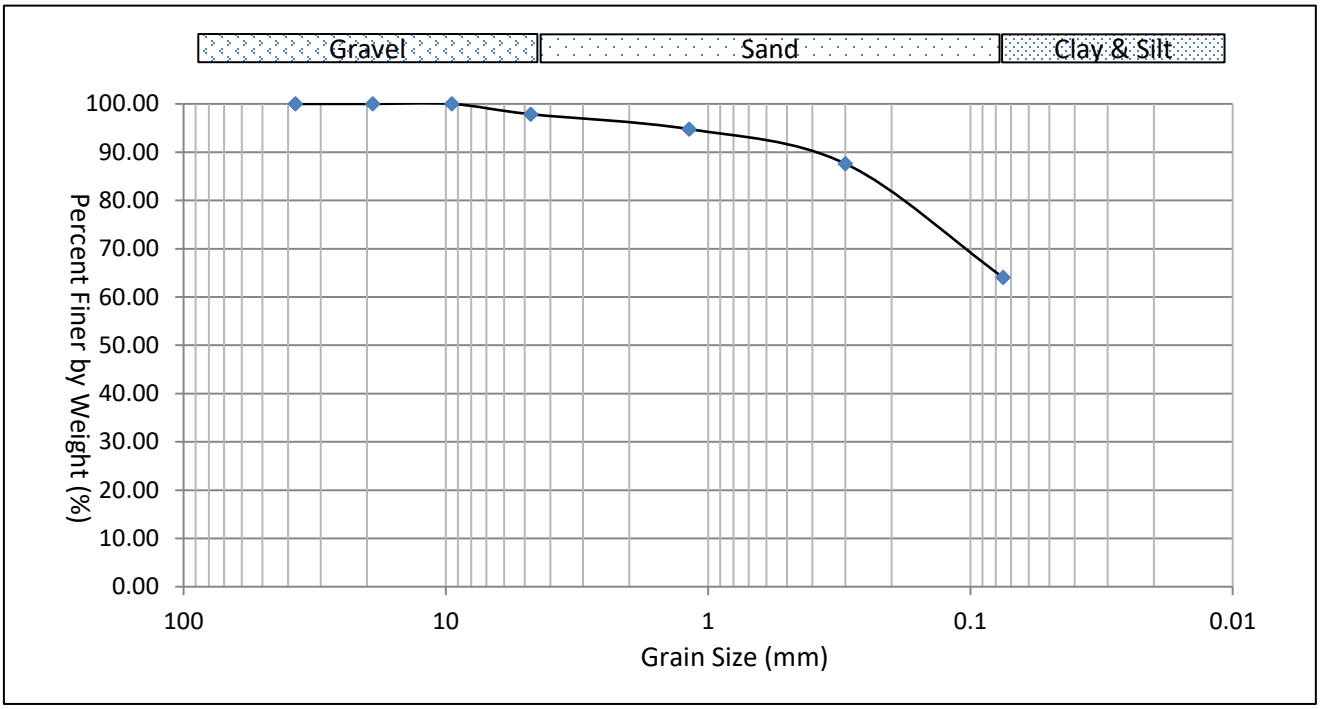
Gravel: 1.4% Sand: 40.7% Clay and Silt 58%



Grain Size Distribution

Sample ID: 25-109 BH103 SS11 (12.2-12.66m)

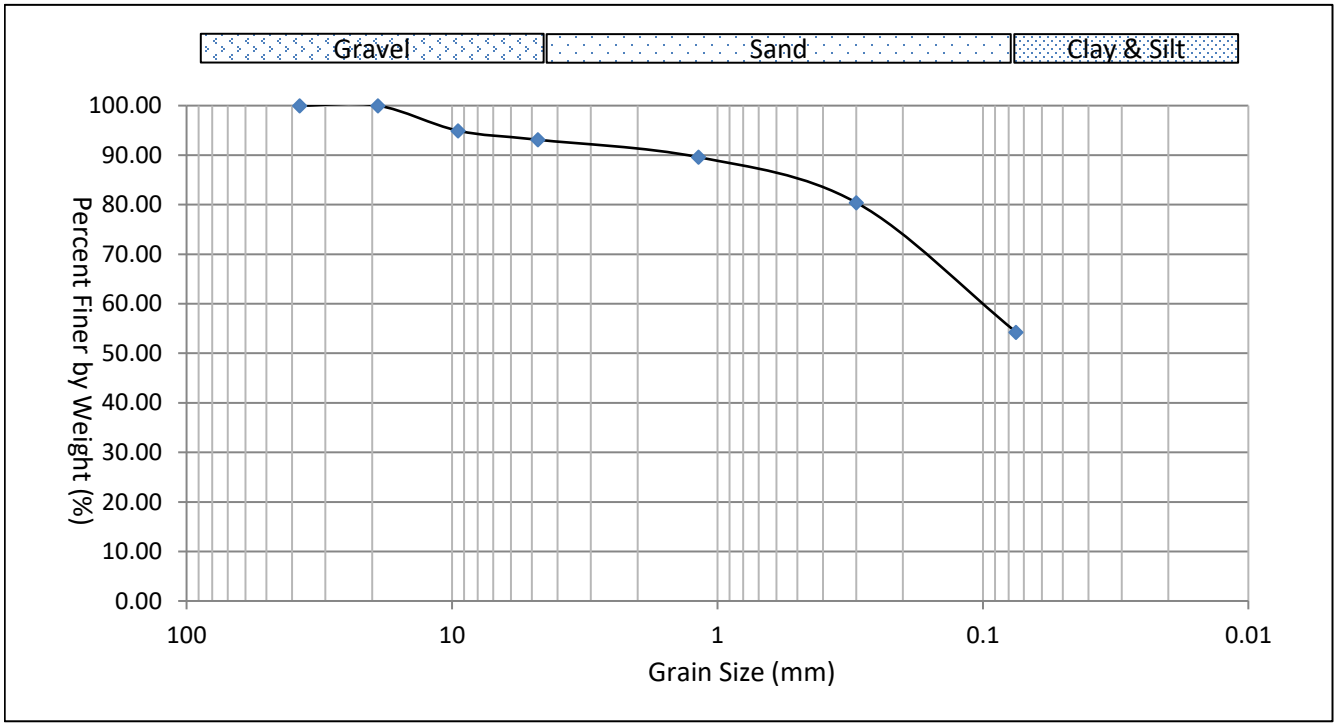
Gravel: 2.1% Sand: 33.8% Clay and Silt 64%



Grain Size Distribution

Sample ID: 25-112 BH105 SS9 (9.15-9.61m)

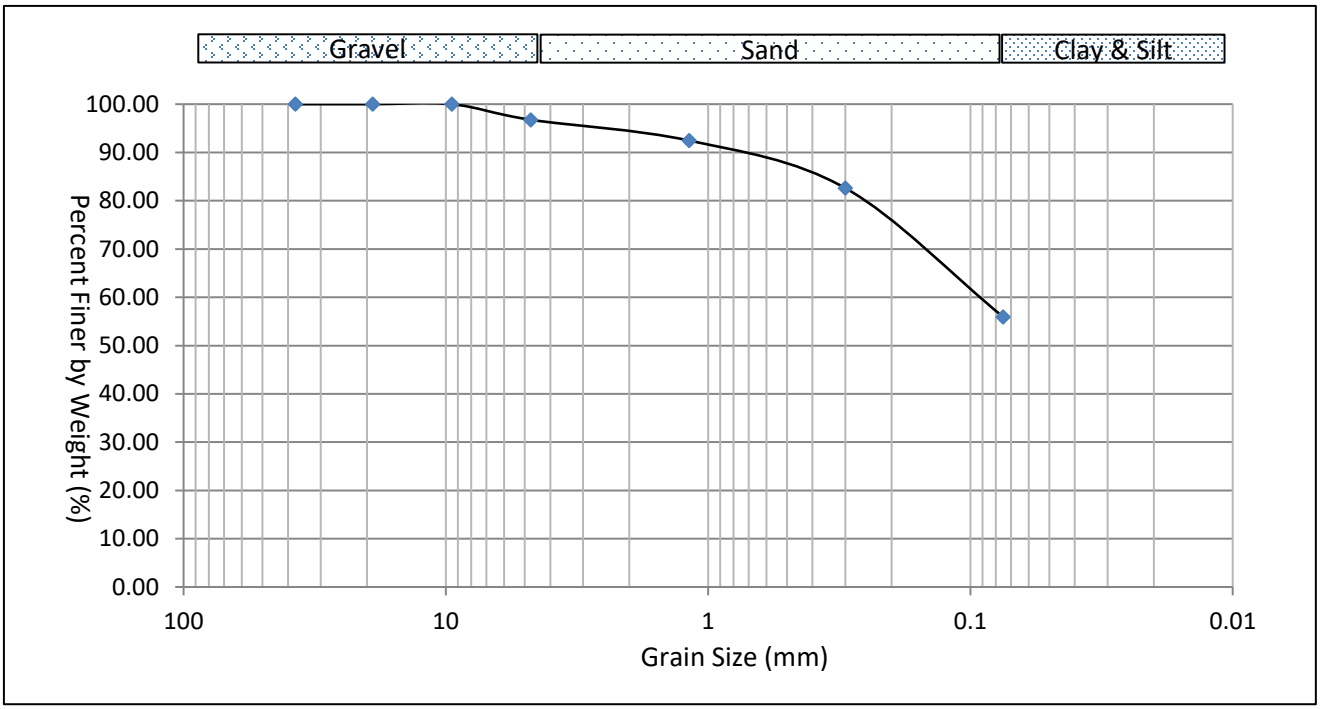
Gravel: 6.9% Sand: 38.8% Clay and Silt 54.3%



Grain Size Distribution

Sample ID: 25-113 BH105 SS11 (12.2-12.66m)

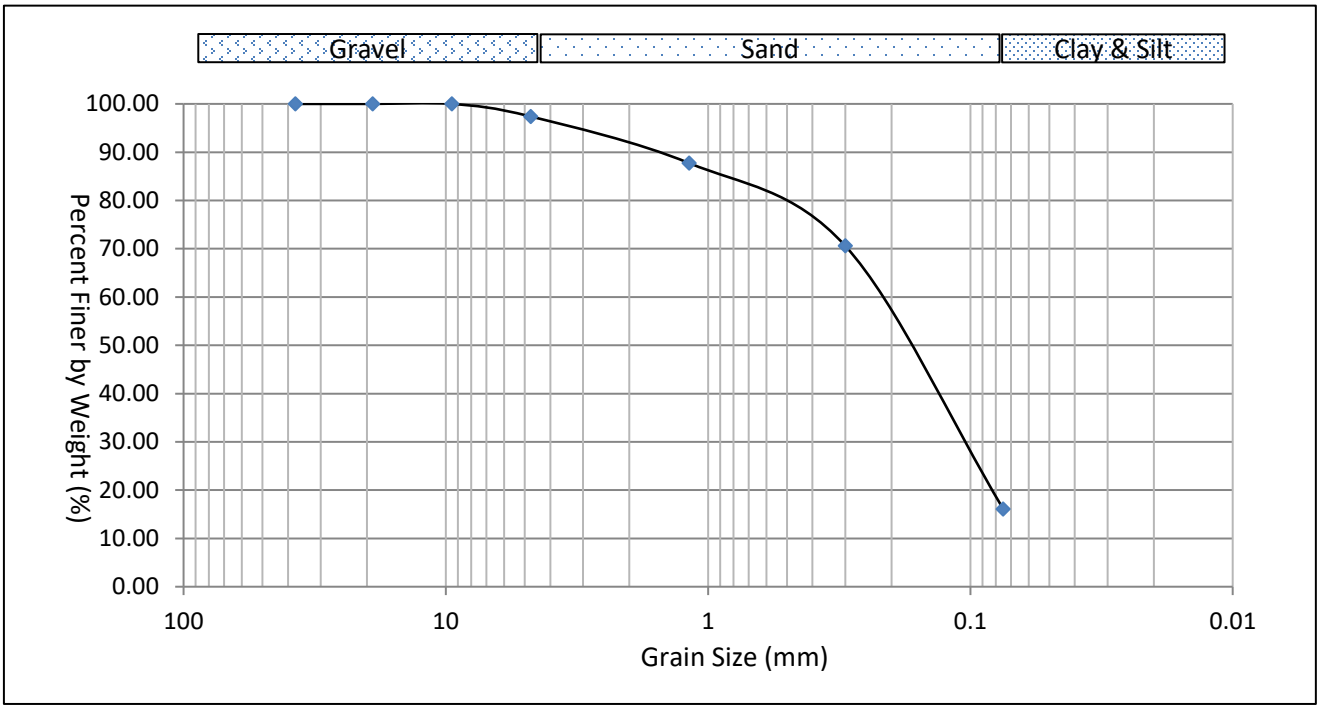
Gravel: 3.2% Sand: 40.8% Clay and Silt 55.9%



Grain Size Distribution

Sample ID: 25-114 BH105 SS13 (15.25-15.71m)

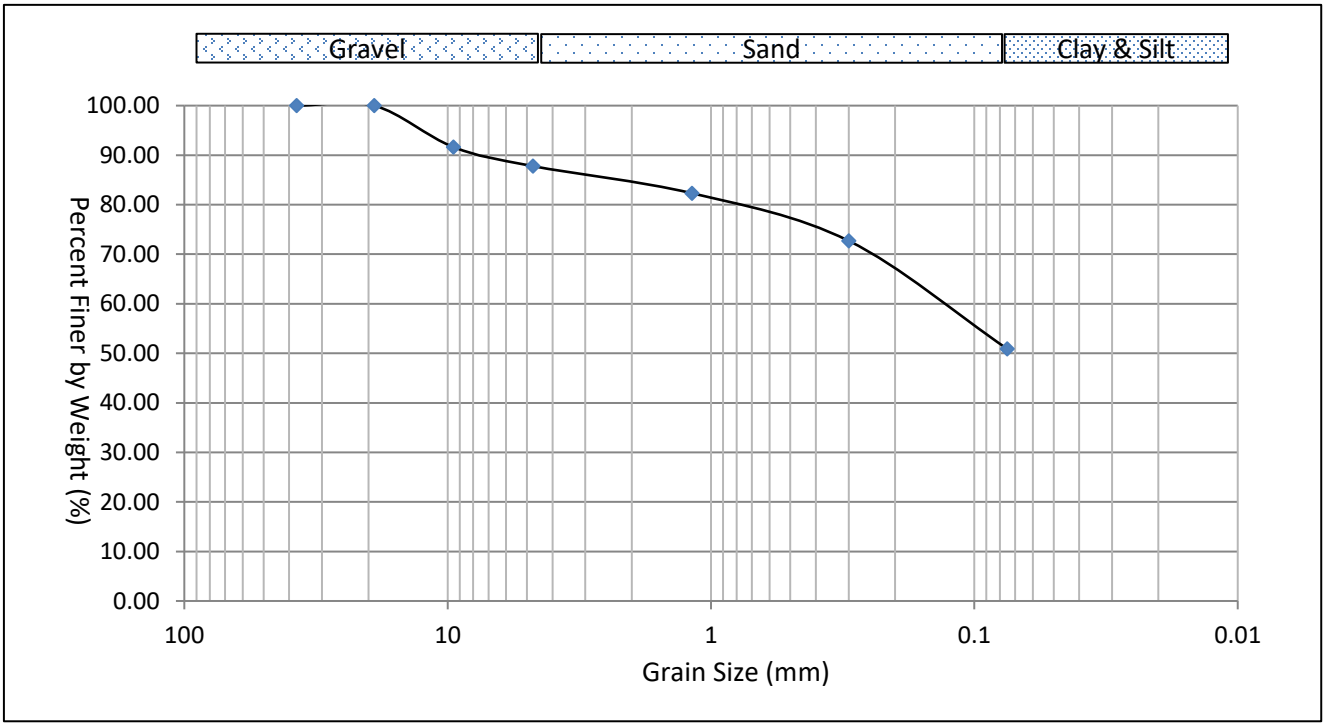
Gravel: 2.6% Sand: 81.3% Clay and Silt 16.1%



Grain Size Distribution

Sample ID: 25-116 BH107 SS7 (6.1-6.56m)

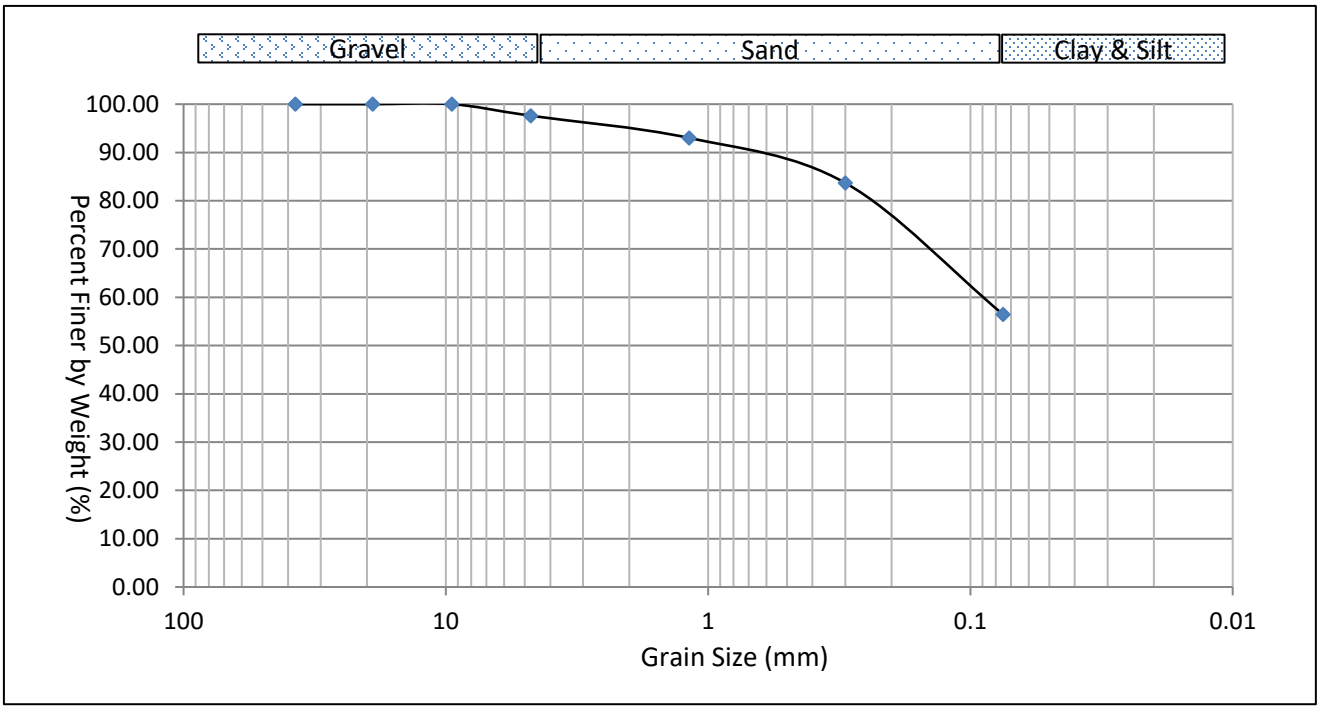
Gravel: 12.2% Sand: 36.9% Clay and Silt 50.9%



Grain Size Distribution

Sample ID: 25-117 BH107 SS9 (9.15-9.61m)

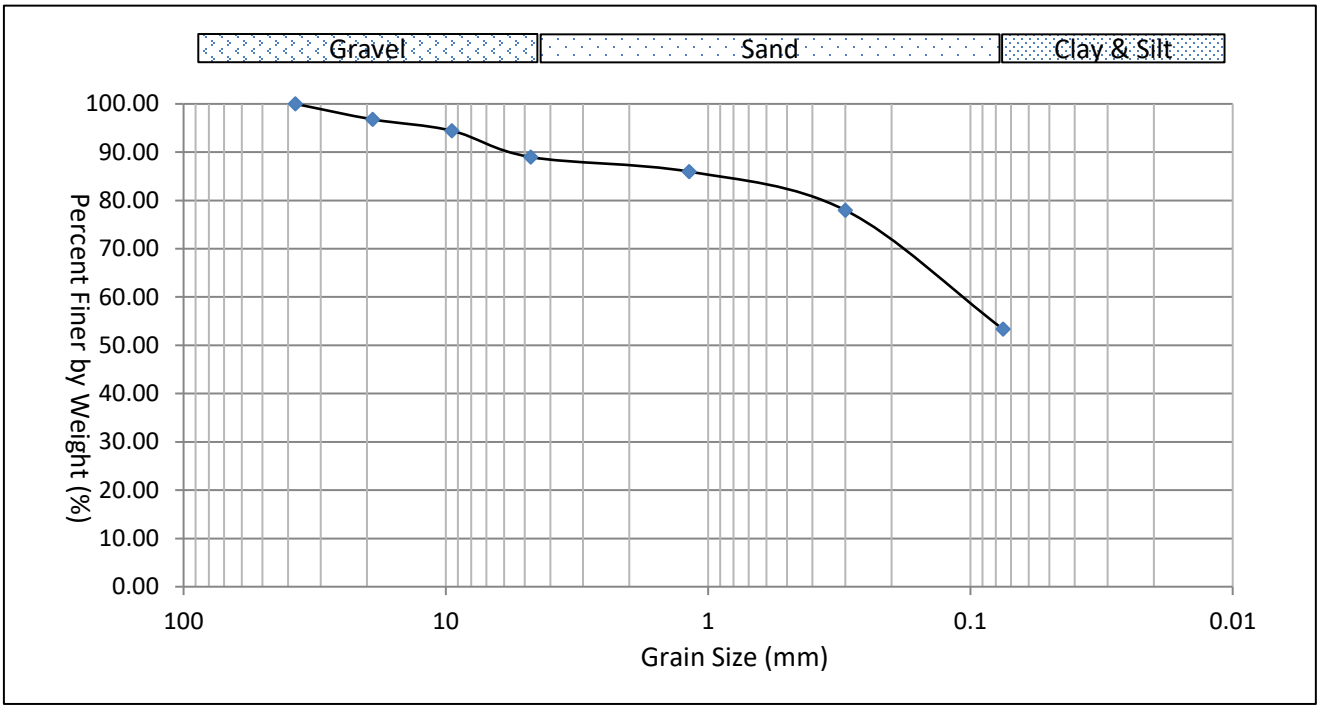
Gravel: 2.4% Sand: 41.2% Clay and Silt 56.4%



Grain Size Distribution

Sample ID: 25-118 BH107 SS11 (12.2-12.66m)

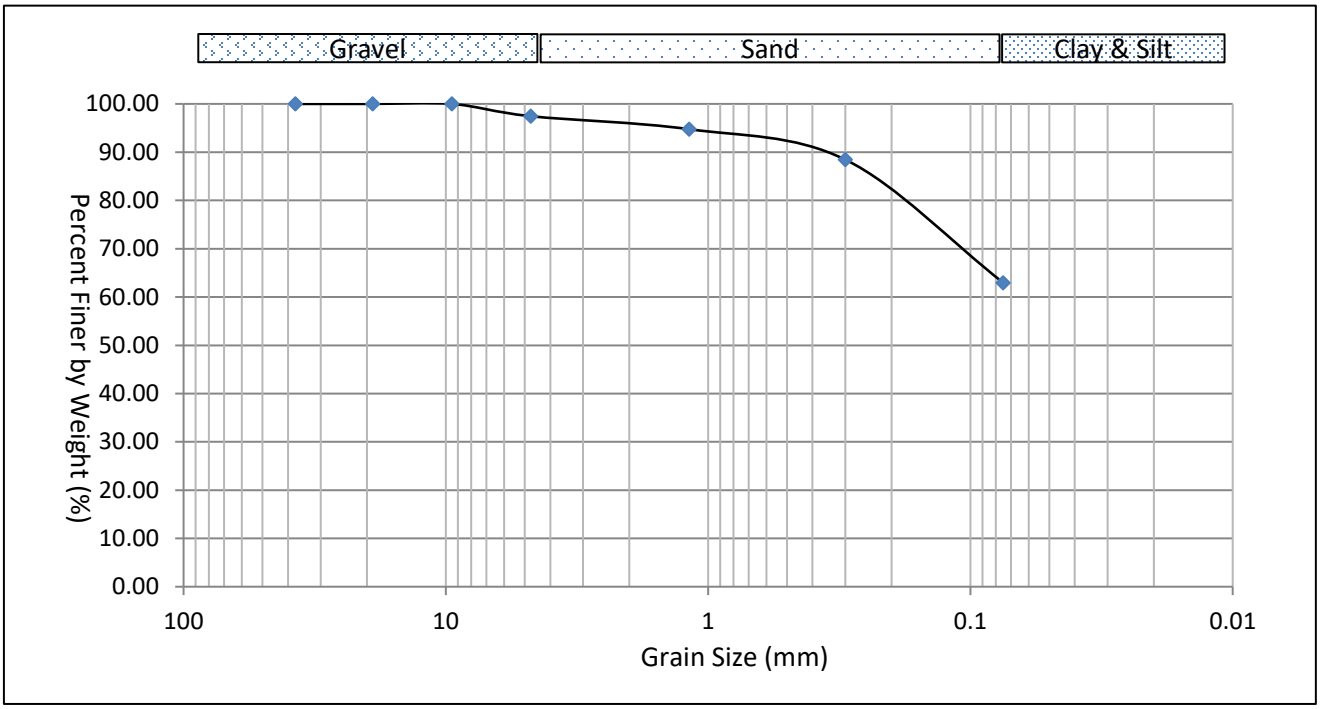
Gravel: 11% Sand: 35.7% Clay and Silt 53.3%



Grain Size Distribution

Sample ID: 25-119 BH107 SS13 (15.25-15.71m)

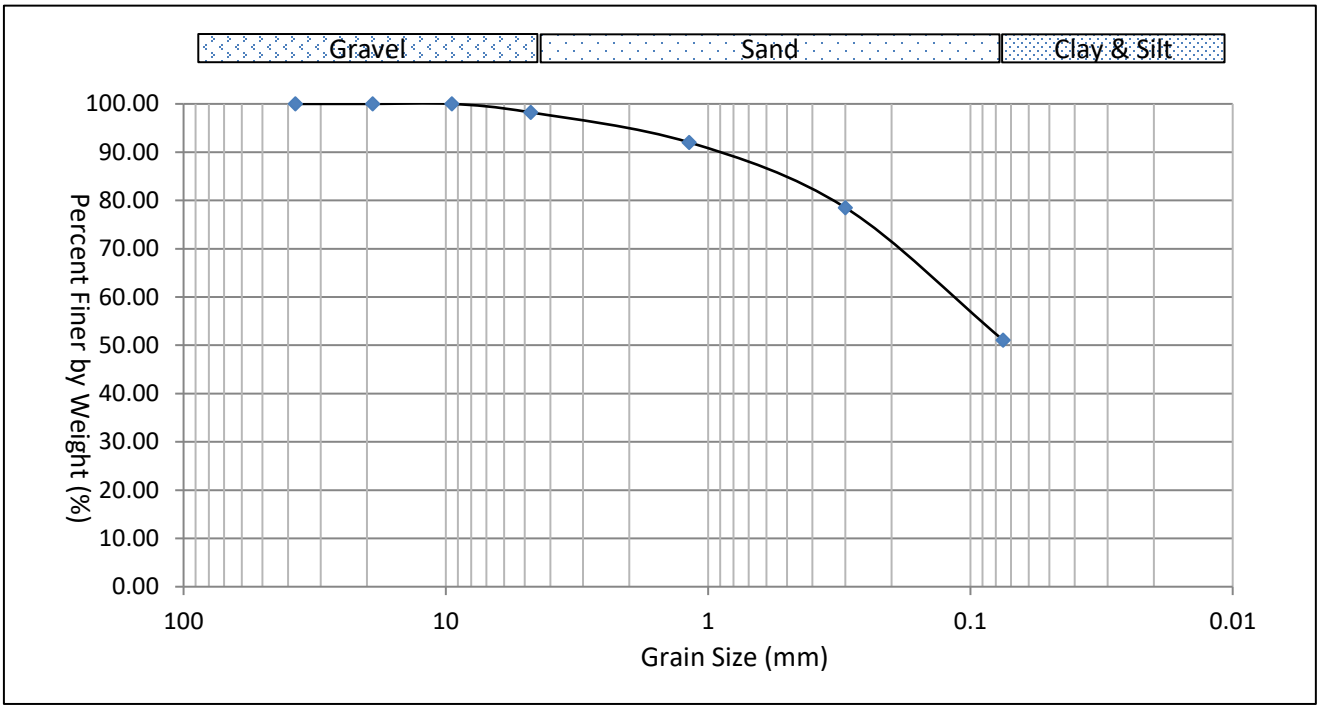
Gravel: 2.5% Sand: 34.5% Clay and Silt 63%



Grain Size Distribution

Sample ID: 25-120 BH108 SS5 (3.05-3.51m)

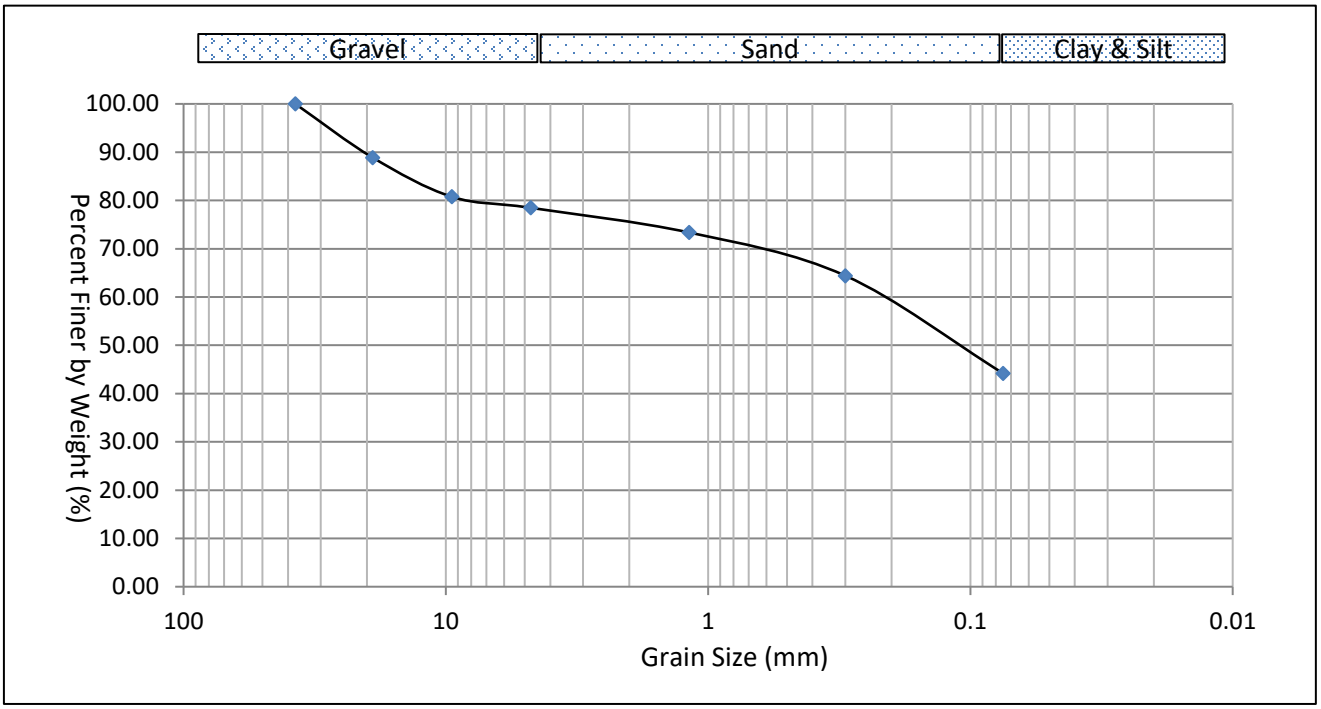
Gravel: 1.8% Sand: 47.2% Clay and Silt 51.1%



Grain Size Distribution

Sample ID: 25-121 BH108 SS7 (6.1-6.56m)

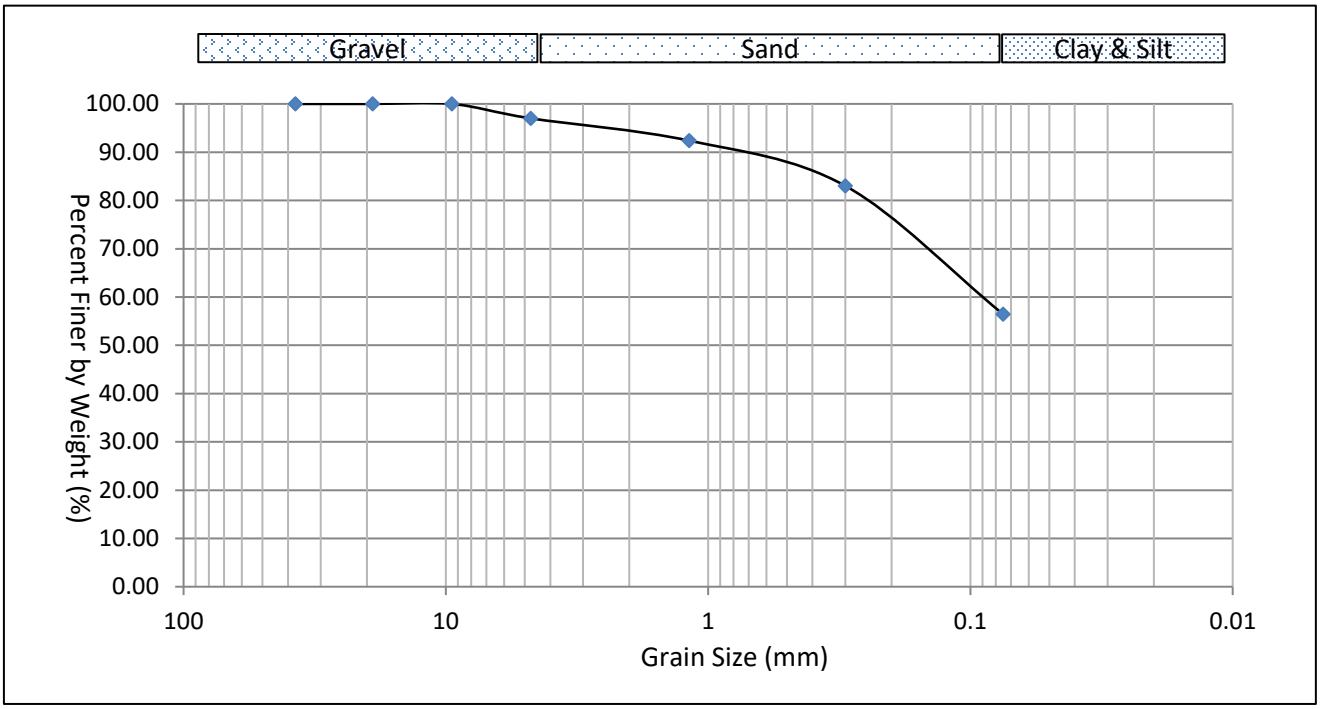
Gravel: 21.5% Sand: 34.3% Clay and Silt 44.2%



Grain Size Distribution

Sample ID: 25-122 BH108 SS9 (9.15-9.61m)

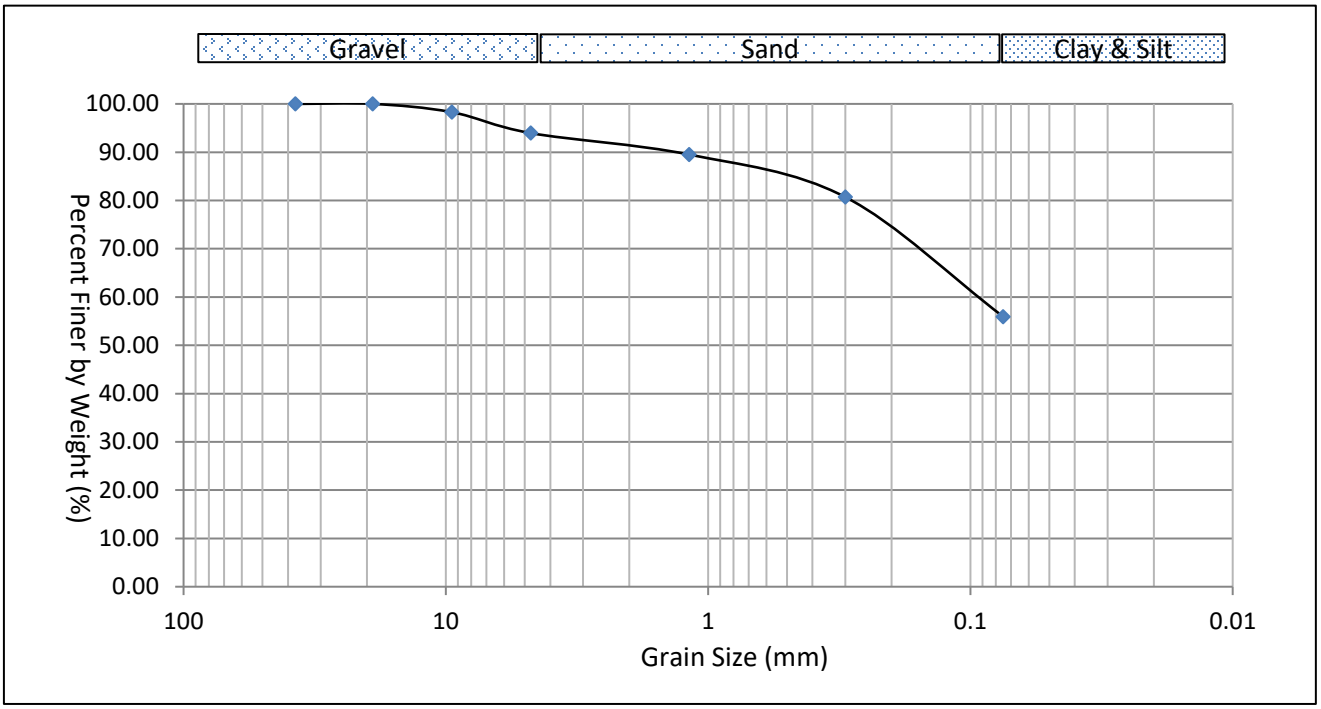
Gravel: 3% Sand: 40.6% Clay and Silt 56.4%



Grain Size Distribution

Sample ID: 25-123 BH108 SS11 (12.2-12.66m)

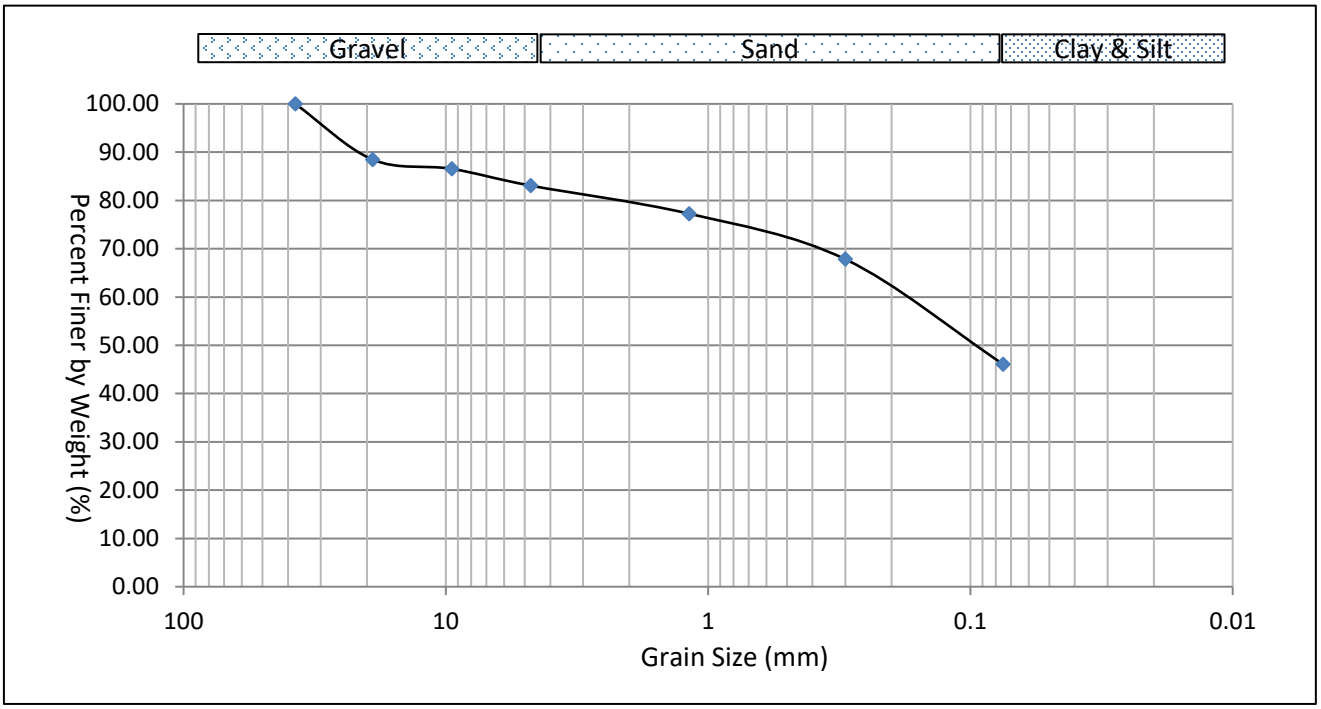
Gravel: 6.1% Sand: 38% Clay and Silt 55.9%



Grain Size Distribution

Sample ID: 25-124 BH110 SS5 (3.05-3.51m)

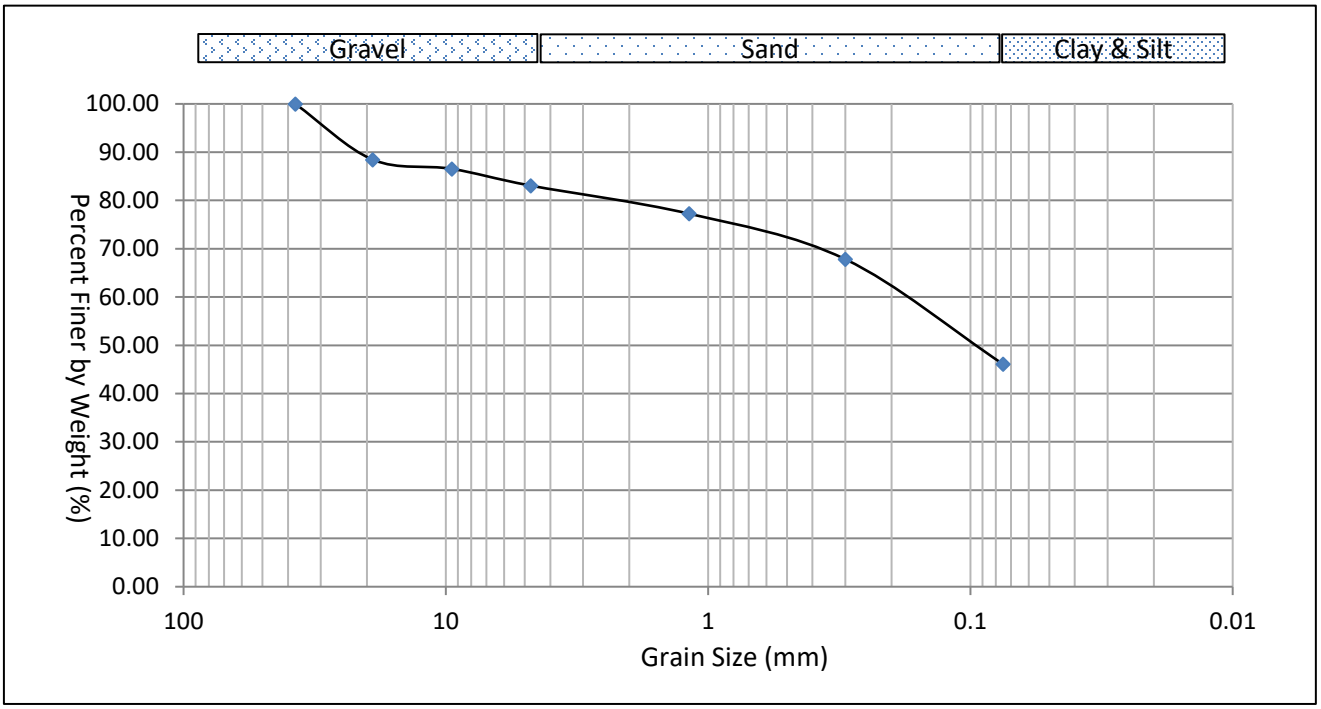
Gravel: 16.9% Sand: 37% Clay and Silt 46.1%



Grain Size Distribution

Sample ID: 25-125 BH110 SS7 (6.1-6.56m)

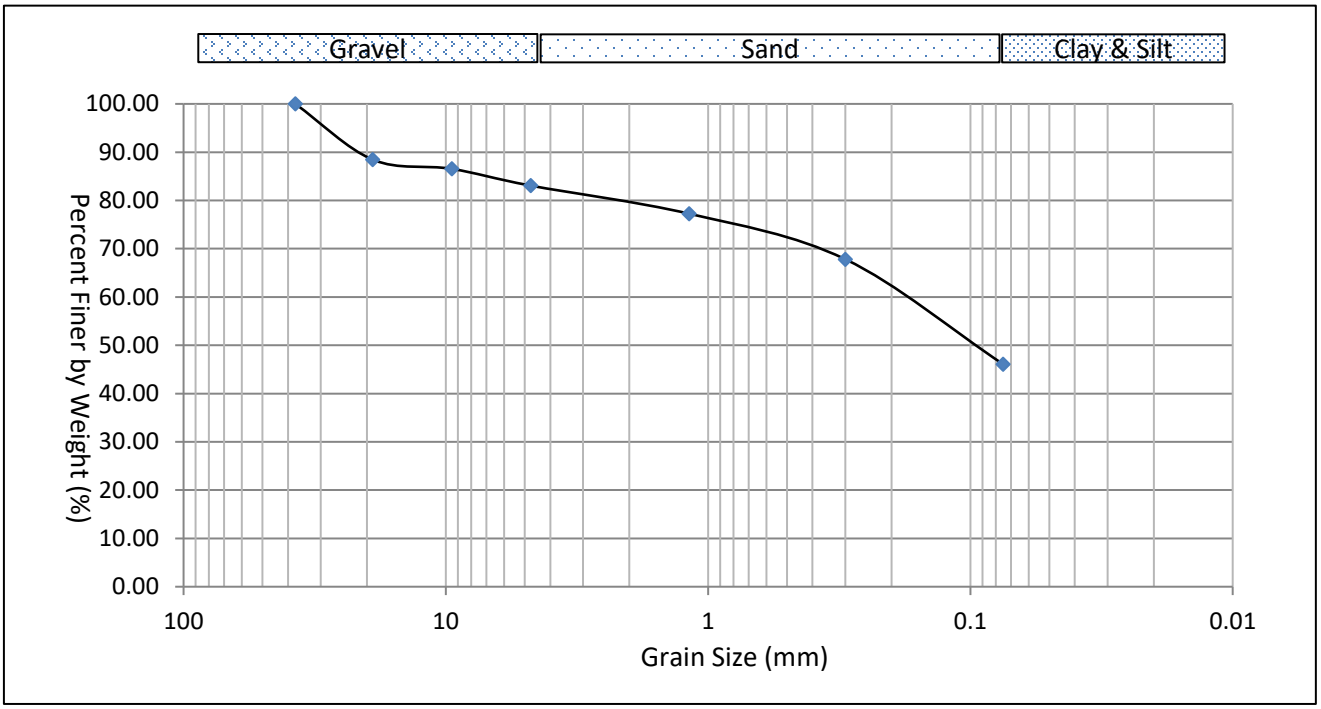
Gravel: 5.6% Sand: 38.5% Clay and Silt 55.8%



Grain Size Distribution

Sample ID: 25-126 BH110 SS9 (9.15-9.61m)

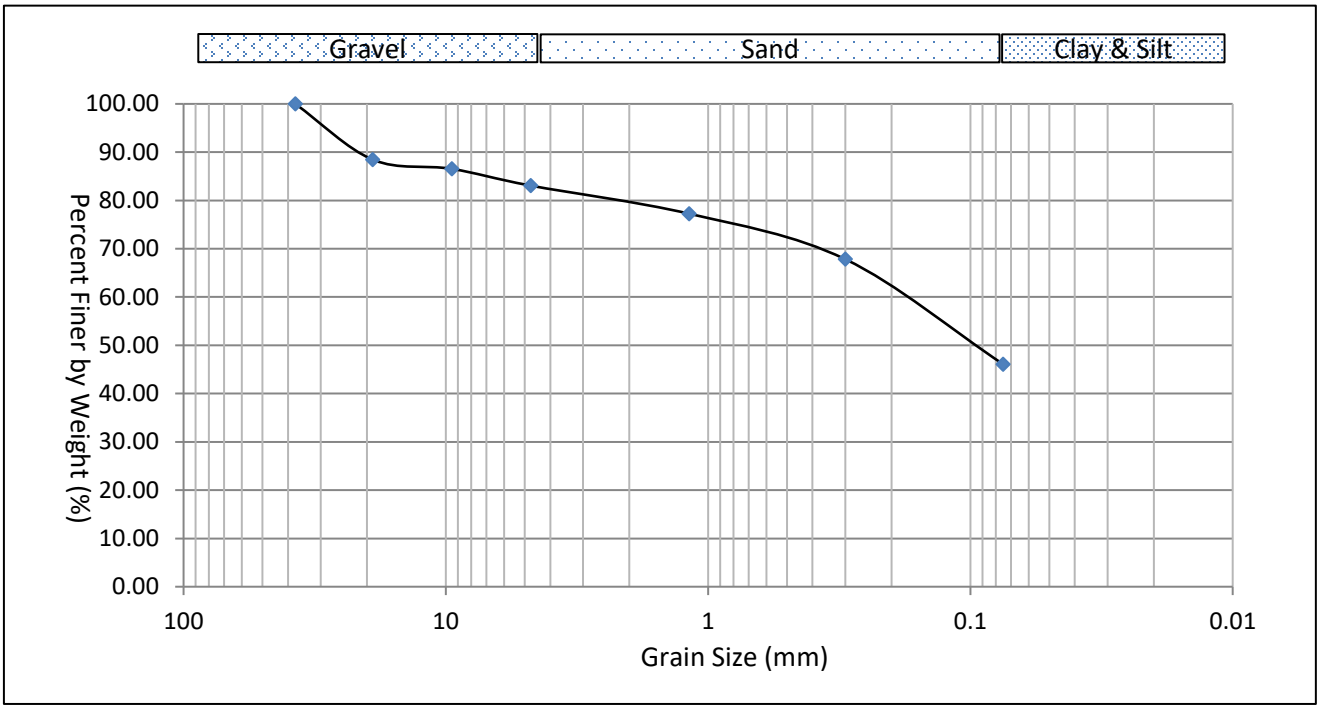
Gravel: 2.3% Sand: 39.8% Clay and Silt 57.9%



Grain Size Distribution

Sample ID: 25-127 BH110 SS11 (12.2-12.66m)

Gravel: 1.6% Sand: 36.6% Clay and Silt 61.8%



F.E. Lab #: 25-101

Certificate of Analysis

Analysis Requested:	Grain Size (Hydrometer)
Sample Description:	7 Soil Sample(s)

Sample Info	***25-102 BH101 SS5***	***25-103 BH101 SS7***	***25-110 BH105 SS5***	***25-111 BH105 SS7***	***25-154 BH106 SS5***	***25-155 BH106 SS6***
Sample Depth (m)	***3.05-3.51***	***6.1-6.56***	***3.05-3.51***	***6.1-6.56***	***3.05-3.51***	***4.58-5.03***
Grain Size (%)						
>19mm	11.3	0.0	0.0	0.0	0.0	0.0
9.5mm-19mm	0.0	4.2	1.2	3.7	0.0	0.9
4.75mm-9.5mm	2.9	1.4	3.5	4.6	0.9	4.7
1.18mm-4.75mm	6.0	3.7	6.0	4.0	1.6	6.4
300um-1.18mm	9.0	8.8	8.2	9.6	3.7	12.3
75um-300um	21.0	24.7	18.4	24.4	21.0	25.8
5um-75um	30.5	36.3	33.8	29.3	46.8	25.9
2um-5um	4.8	3.7	7.3	6.1	6.5	6.1
<2um	14.6	17.1	21.6	18.3	19.5	17.9
Clay	**14.6**	**17.1**	**21.6**	**18.3**	**19.5**	**17.9**
Silt	**35.3**	**40.0**	**41.2**	**35.5**	**53.3**	**32.0**
Sand	**36.0**	**37.2**	**32.6**	**38.0**	**26.3**	**44.5**
Gravel	**14.1**	**5.6**	**4.6**	**8.3**	**0.9**	**5.6**

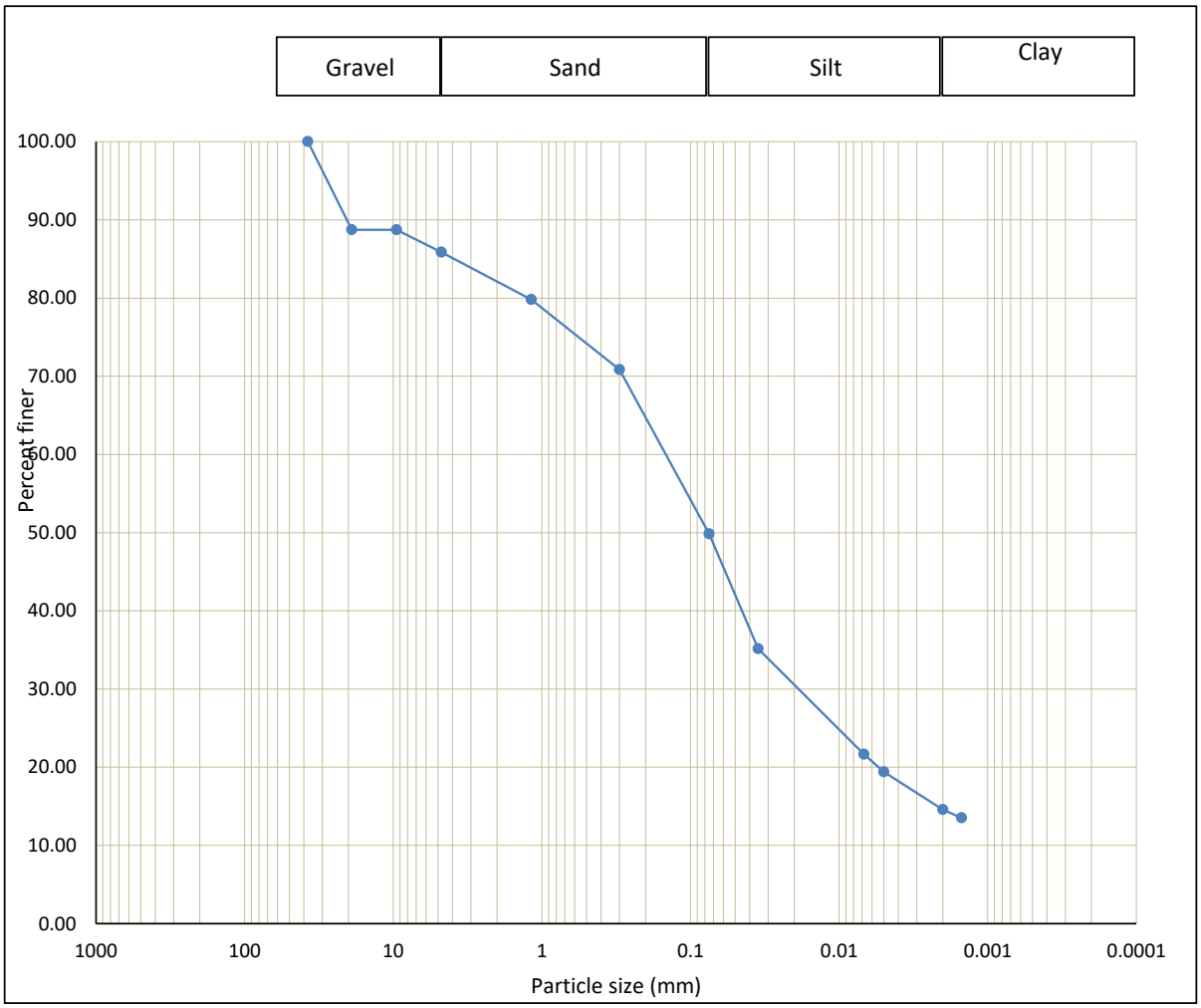
Sample Info	***25-115 BH107 SS5***					
Sample Depth (m)	***3.05-3.51***					
Grain Size (%)						
>19mm	12.2					
9.5mm-19mm	1.4					
4.75mm-9.5mm	2.2					
1.18mm-4.75mm	4.3					
300um-1.18mm	7.9					
75um-300um	18.6					
5um-75um	30.5					
2um-5um	5.6					
<2um	17.4					
Clay	**17.4**					
Silt	**36.1**					
Sand	**30.7**					
Gravel	**15.8**					

F.E. Lab #: 25-101

Grain Size Distribution

Sample ID: 25-102 BH101 SS5 (3.05-3.51m)

Gravel: 14.1% Sand: 36% Silt: 35.3% Clay: 14.6%

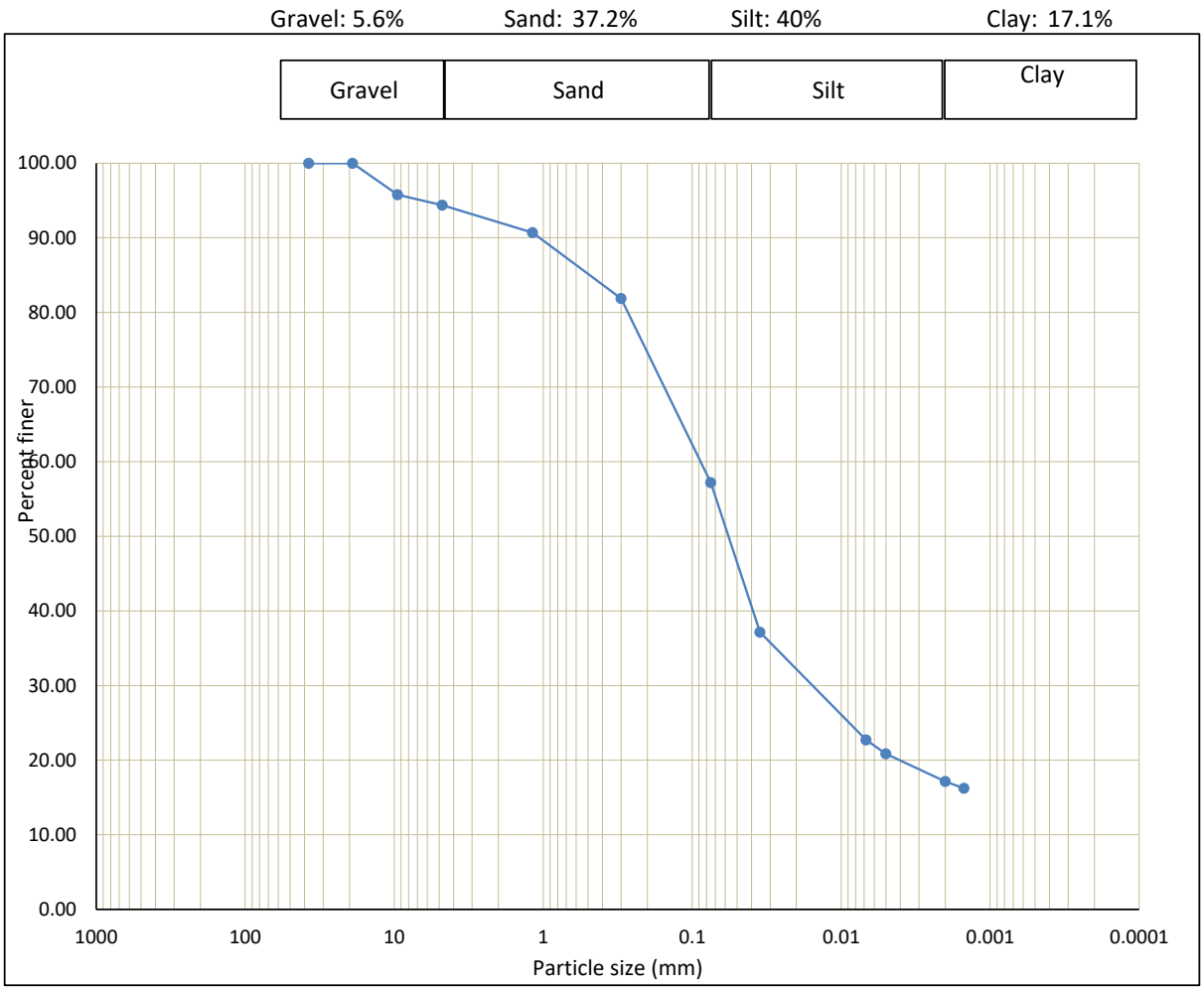


Sample ID: 25-102 BH101 SS5 (3.05-3.51m)		
Diameter	***Weight (%)***	***Grain Size***
>4.75mm	14.1	Gravel
1.18mm-4.75mm	6.0	Coarse Sand
300um-1.18mm	9.0	Medium Sand
75um-300um	21.0	Fine Sand
5um-75um	30.5	Silt
2um-5um	4.8	
<2um	14.6	Clay

F.E. Lab #: 25-101

Grain Size Distribution

Sample ID: 25-103 BH101 SS7 (6.1-6.56m)



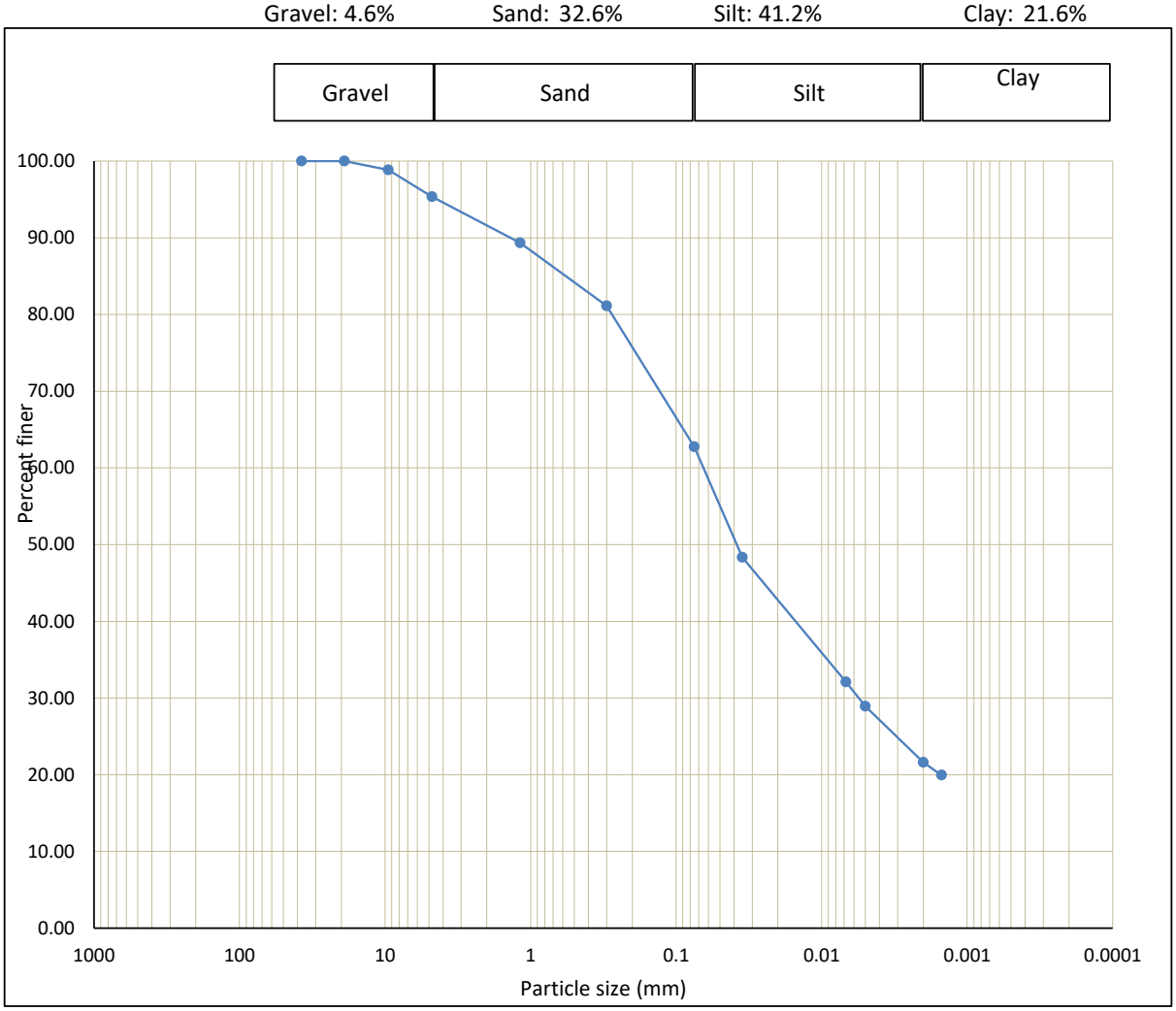
Sample ID: 25-103 BH101 SS7 (6.1-6.56m)		
Diameter	***Weight (%)***	***Grain Size***
>4.75mm	5.6	Gravel
1.18mm-4.75mm	3.7	Coarse Sand
300um-1.18mm	8.8	Medium Sand
75um-300um	24.7	Fine Sand
5um-75um	36.3	Silt
2um-5um	3.7	
<2um	17.1	Clay

F.E. Lab #: 25-101

Grain Size Distribution

Sample ID: 25-110 BH105 SS5 (3.05-3.51m)

Gravel: 4.6% Sand: 32.6% Silt: 41.2% Clay: 21.6%



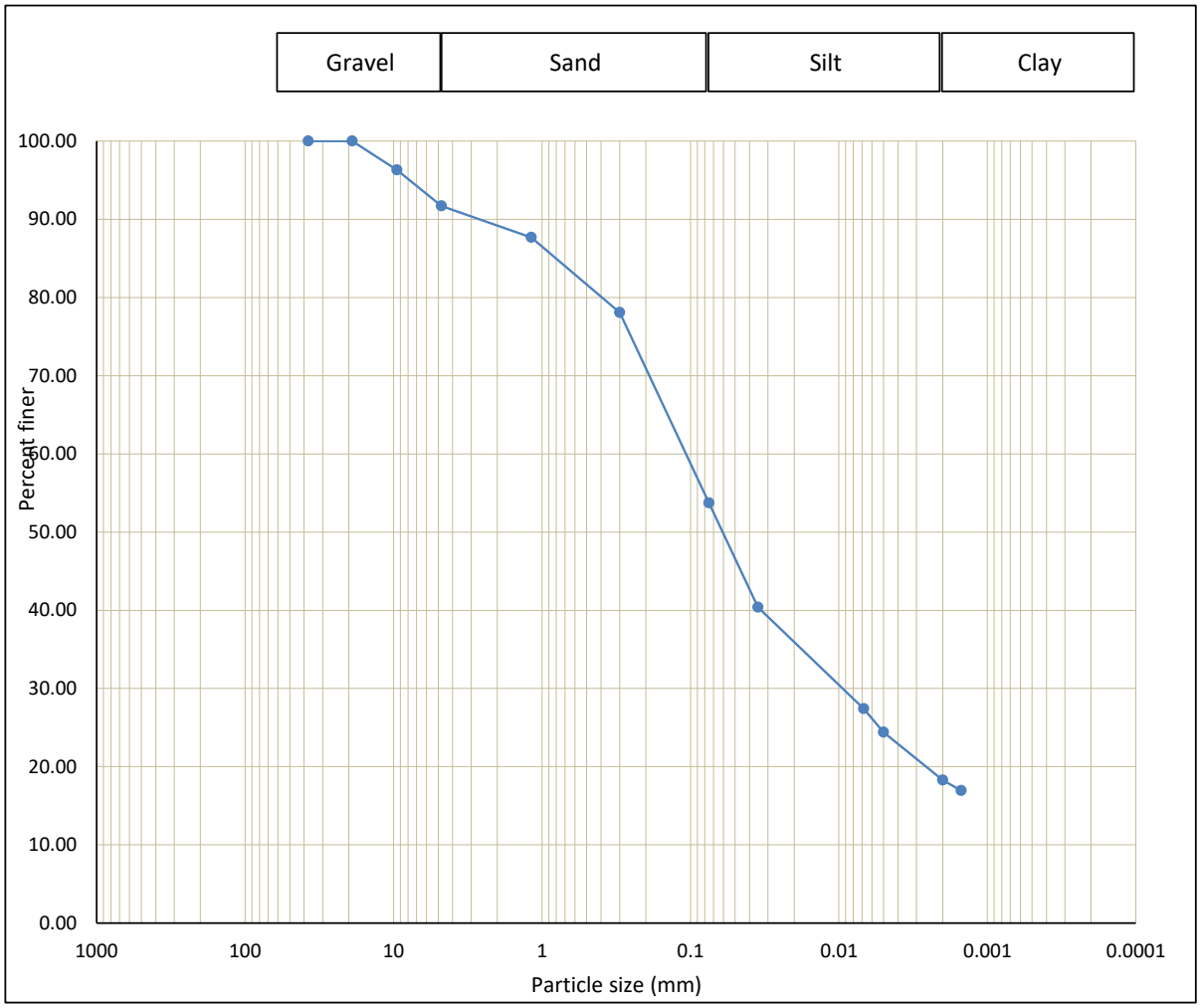
Sample ID: 25-110 BH105 SS5 (3.05-3.51m)		
Diameter	***Weight (%)***	***Grain Size***
>4.75mm	4.6	Gravel
1.18mm-4.75mm	6.0	Coarse Sand
300um-1.18mm	8.2	Medium Sand
75um-300um	18.4	Fine Sand
5um-75um	33.8	Silt
2um-5um	7.3	
<2um	21.6	Clay

F.E. Lab #: 25-101

Grain Size Distribution

Sample ID: 25-111 BH105 SS7 (6.1-6.56m)

Gravel: 8.3% Sand: 38% Silt: 35.5% Clay: 18.3%



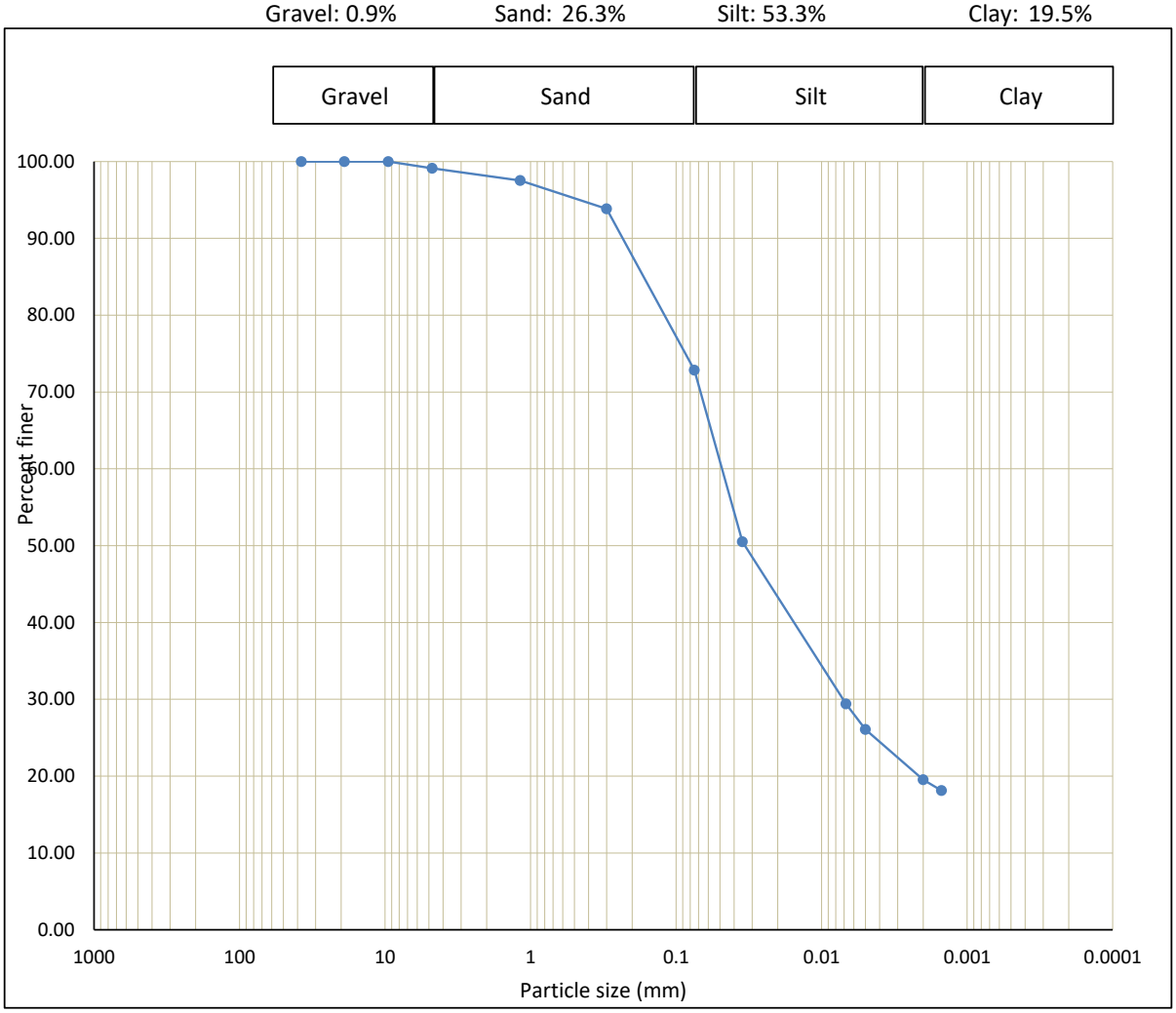
Sample ID: 25-111 BH105 SS7 (6.1-6.56m)		
Diameter	***Weight (%)***	***Grain Size***
>4.75mm	8.3	Gravel
1.18mm-4.75mm	4.0	Coarse Sand
300um-1.18mm	9.6	Medium Sand
75um-300um	24.4	Fine Sand
5um-75um	29.3	Silt
2um-5um	6.1	
<2um	18.3	Clay

F.E. Lab #: 25-101

Grain Size Distribution

Sample ID: 25-154 BH106 SS5 (3.05-3.51m)

Gravel: 0.9% Sand: 26.3% Silt: 53.3% Clay: 19.5%

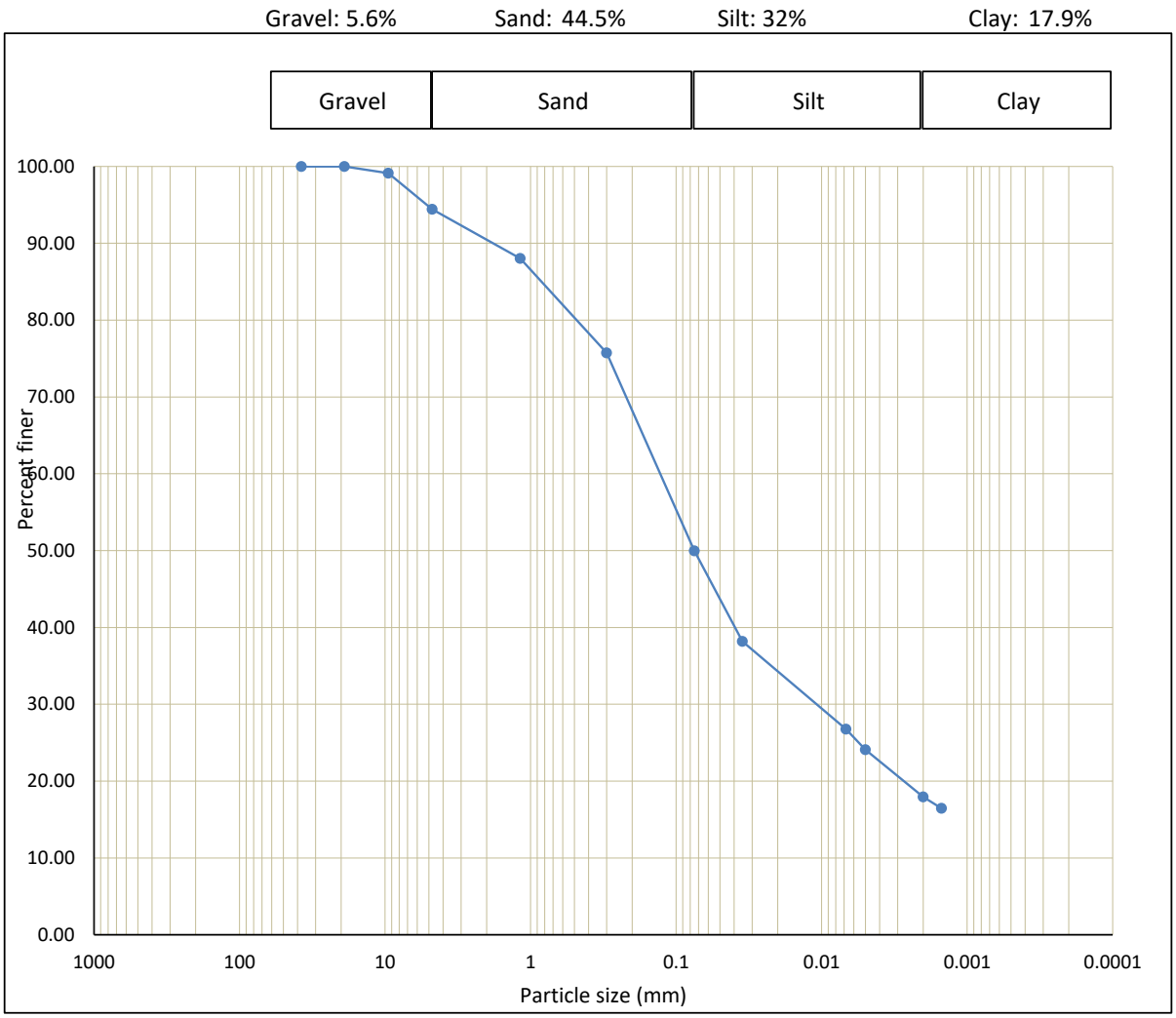


Sample ID: 25-154 BH106 SS5 (3.05-3.51m)		
Diameter	***Weight (%)***	***Grain Size***
>4.75mm	0.9	Gravel
1.18mm-4.75mm	1.6	Coarse Sand
300um-1.18mm	3.7	Medium Sand
75um-300um	21.0	Fine Sand
5um-75um	46.8	Silt
2um-5um	6.5	
<2um	19.5	Clay

F.E. Lab #: 25-101

Grain Size Distribution

Sample ID: 25-155 BH106 SS6 (4.58-5.03m)



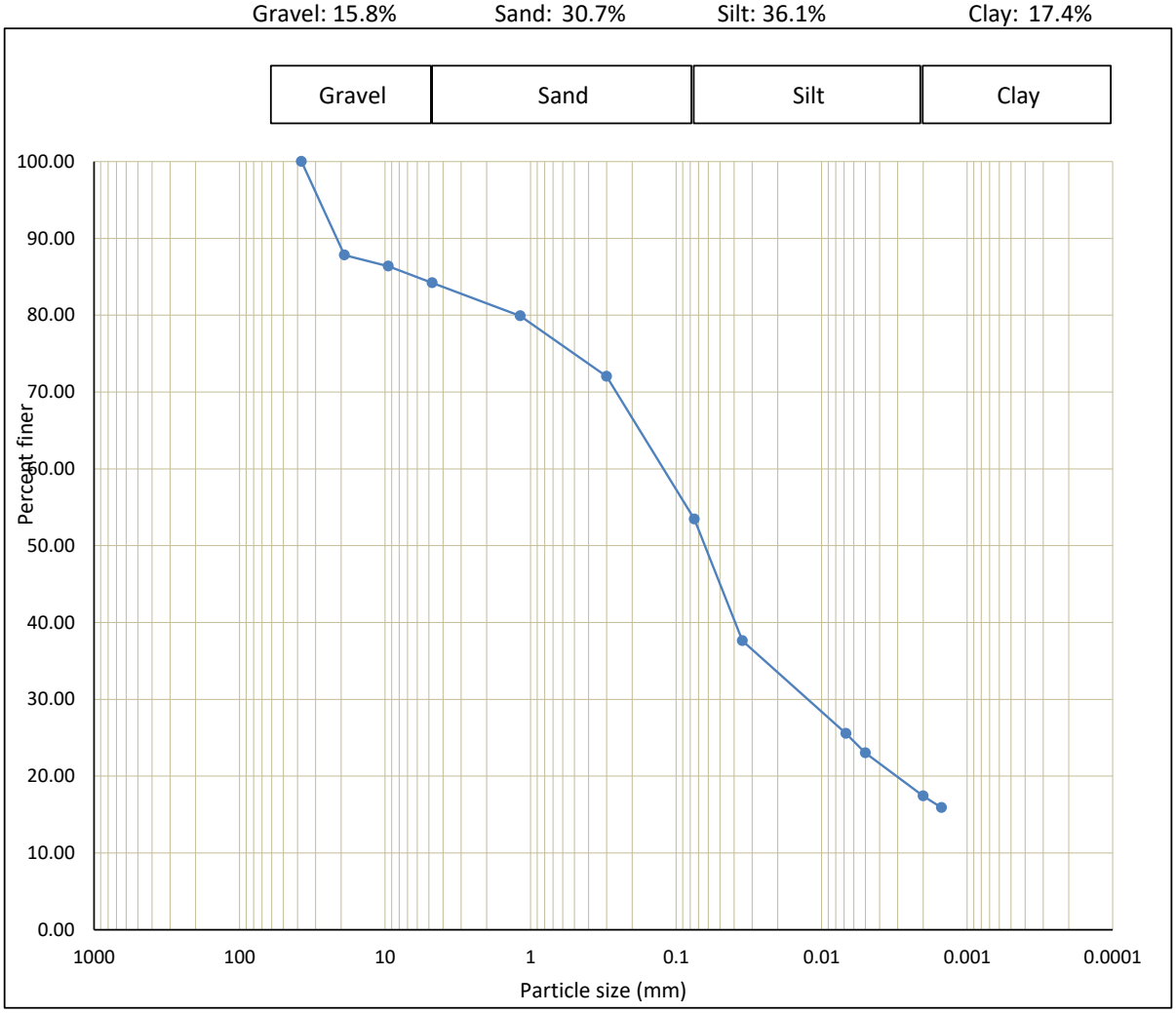
Sample ID: 25-155 BH106 SS6 (4.58-5.03m)		
Diameter	***Weight (%)***	***Grain Size***
>4.75mm	5.6	Gravel
1.18mm-4.75mm	6.4	Coarse Sand
300um-1.18mm	12.3	Medium Sand
75um-300um	25.8	Fine Sand
5um-75um	25.9	Silt
2um-5um	6.1	
<2um	17.9	Clay

F.E. Lab #: 25-101

Grain Size Distribution

Sample ID: 25-115 BH107 SS5 (3.05-3.51m)

Gravel: 15.8% Sand: 30.7% Silt: 36.1% Clay: 17.4%



Sample ID: 25-115 BH107 SS5 (3.05-3.51m)		
Diameter	***Weight (%)***	***Grain Size***
>4.75mm	15.8	Gravel
1.18mm-4.75mm	4.3	Coarse Sand
300um-1.18mm	7.9	Medium Sand
75um-300um	18.6	Fine Sand
5um-75um	30.5	Silt
2um-5um	5.6	
<2um	17.4	Clay

FISHER ENGINEERING

GEOTECHNICAL-LABORATORY

T. 905 475-7755 fisher@fishereng.com
15-400 Esna Park Drive • Markham, ON • L3R 3K2
Hours: 9AM - 5PM M-F
Call for Emergency Response

LAB JOB No: 25-101

Standard Laboratory Request Form: Chain of Custody

CLIENT INFORMATION

Name:
Contact:
Address: 375-417 Kingston Rd Pickering
Email:
Fax: Fax results ☐
Phone: Email results ☑

PROJECT INFORMATION

Project Name: Geotechnical Investigation
Project ID: 24-14410
Sampled By: David

BILLING INFORMATION

Purchase Order No:
Verbal Authorization:
Credit Card Type (e.g. MC/Visa/AMEX...):
Credit Card #:
Expiry Date:

TURNAROUND TIME (TAT) Check ONE if all samples are the same/or see below.

STD - Standard (5-7 bus. days)	✓	Standard Charge
3D - Three-Day (72 hrs.)		+25% SURCHARGES MAY APPLY Custom quotations (if applicable) will be reflected on final billing. CALL for: Emergencies, Bulk Quotes, or other Questions.

Reg. Business Hrs. 9am to 5pm. Samples received after 2pm are considered next day orders.

LAB SAMPLE ID	CLIENT'S SAMPLE ID AND DESCRIPTION	SAMPLING DATE/TIME	SAMPLE MATRIX	CONTAINER NO. and TYPE	TAT (Above)	ANALYSIS REQUESTED (Check or Specify) Moisture Content	Sieve Analysis	Hydrometer	Atterberg Limits	Proctor						NOTES
	BH1&BH3&BH5&BH7 &BH8 & BH10	Dec 17/24	Soil	Bag	STD	✓										
	(5-6.5')															
	(10-11.5')						✓									
	(15-16.5')															
	(20-21.5')						✓									
	(25-26.5')															
	(30-31.5')						✓									
	(35-36.5')															
	(40-41.5')						✓									
	(45-46.5')															
	(50-51.5')						✓									
	(55-56.5')															
	(60-61.5')															
	(65-66.5')															
	(70-71.5')					↓		✓								

Relinquished by: BH1&BH5&BH6&BH7
Name: (print)
Signature: Clive
Date & Time: Jan 6, 2025
Method of Shipment:

Client's Comments: BH7 (10-11.5') (15-16.5')

Regulatory Requirements:
✓ OPSS Reg.

Purpose for sampling:
Road Base
Road Subbase
Subgrade
Backfill
Engineering Fill
Soil Classification
Other

Received by (Internal):
Name:
Date & Time:

Arrival Temperature ° C:
Laboratory Remarks:

FISHER ENVIRONMENTAL LABORATORIES

FULL RANGE ANALYTICAL SERVICES • SOIL/WATER/AIR TESTING • ENVIRONMENTAL COMPLIANCE PACKAGES • 24 HOUR EMERGENCY RESPONSE • CALA ACCREDITED

400 ESNA PARK DRIVE #15
MARKHAM, ONT. L3R 3K2
TEL: 905 475-7755
FAX: 905 475-7718
www.fisherenvironmental.com

Client: 375 Kingston Road Corporation
Address:

Tel.:
Email:
Attn.:

F.E. Job #: 25-4025
Project Name: Geotechnical Investigation
Project ID: FG 24-14410
Date Sampled: 17-Dec-2024
Date Received: 10-Jan-2025
Date Reported: 17-Jan-2025
Location: 375 Kingston Road
Pickering, ON

Certificate of Analysis

Analyses	Matrix	Quantity	Date Extracted	Date Analyzed	Lab SOP	Method Reference
pH	Soil	8	10-Jan-25	13-Jan-25	pH-EC-SAR F-16	SW-846, 9045D
Chloride	Soil	8	N/A	14-Jan-25	Chloride F-20	SM 4500-Cl-E
Sulphate	Soil	8	10-Jan-25	14-Jan-25	Sulphate F-21	SM 4500-SO_4

Fisher Environmental Laboratories is accredited by CALA (the Canadian Association for Laboratory Accreditation Inc.) for specific parameters as required by Ontario Regulation 153/04. All analytical testing has been performed in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act published by Ontario Ministry of the Environment.

Authorized by: _____

Roger Lin, Ph. D., C. Chem.
Laboratory Manager

ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO
CHARTERED
Ronggen (Roger) Lin
CHEMIST

Results related only to the items tested

Certificate of Analysis

Analysis Requested:	pH, Chloride, Sulphate
Sample Description:	8 Soil Sample(s)

Parameter	***25-4025-1*** BH 104 SS 7 6.10-6.55m	***25-4025-2*** BH 104 SS 9 9.14-9.60m	***25-4025-3*** BH 105 SS 7 6.10-6.55m	***25-4025-4*** BH 105 SS 9 9.14-9.60m	***25-4025-5*** BH 106 SS 8 7.62-8.08m	**Soil Standards** *
pH *(pH unit)*	9.16	9.51	9.34	9.19	8.88	(5-11) 5-9

Parameter	***25-4025-6*** BH 106 SS 9 9.14-9.60m	***25-4025-7*** BH 107 SS 7 6.10-6.55m	***25-4025-8*** BH 107 SS 9 9.14-9.60m			**Soil Standards** *
pH *(pH unit)*	9.12	9.19	9.44			(5-11) 5-9

* Surface soil pH value from 5 - 9, Sub-surface soil pH value from 5-11.

QA/QC Report

Parameter	**LCS**	**AR**	**Duplicate**	**AR**		
	Absolute Difference *(pH Unit)*					
pH *(pH unit)*	7.07	6.90-7.20	0.03	<0.3		

LEGEND:
LCS - Laboratory Control Sample
AR - Acceptable Range

Certificate of Analysis

Analysis Requested:	pH, Chloride, Sulphate
Sample Description:	8 Soil Sample(s)

Parameter	***25-4025-1*** BH 104 SS 7 6.10-6.55m	***25-4025-2*** BH 104 SS 9 9.14-9.60m	***25-4025-3*** BH 105 SS 7 6.10-6.55m	***25-4025-4*** BH 105 SS 9 9.14-9.60m	***25-4025-5*** BH 106 SS 8 7.62-8.08m	***25-4025-6*** BH 106 SS 9 9.14-9.60m
	Concentration (µg/g)					
Chloride in Soil	<10	<10	<10	<10	40.3	15.1

Parameter	***25-4025-7*** BH 107 SS 7 6.10-6.55m	***25-4025-8*** BH 107 SS 9 9.14-9.60m				
	Concentration (µg/g)					
Chloride in Soil	20.1	<10				

< result obtained was below RL (Reporting Limit).

QA/QC Report

Parameter	**Blank**	**RL**	**LCS**	**AR**	**MS**	**AR**
	(µg/g)		**Recovery (%)**		**Recovery (%)**	
Chloride in Soil	<10	10	100	70-130	95	70-130

Parameter	**Duplicate**	**AR**				
	RPD (%)					
Chloride in Soil	1.7	0-20				

LEGEND:
RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range
RPD - Relative Percent Difference

Certificate of Analysis

Analysis Requested:	pH, Chloride, Sulphate
Sample Description:	8 Soil Sample(s)

Parameter	***25-4025-1*** BH 104 SS 7 6.10-6.55m	***25-4025-2*** BH 104 SS 9 9.14-9.60m	***25-4025-3*** BH 105 SS 7 6.10-6.55m	***25-4025-4*** BH 105 SS 9 9.14-9.60m	***25-4025-5*** BH 106 SS 8 7.62-8.08m	***25-4025-6*** BH 106 SS 9 9.14-9.60m
	Concentration (µg/g)					
Sulphate in Soil	49.3	29.9	23.2	91.1	204.6	106.1

Parameter	***25-4025-7*** BH 107 SS 7 6.10-6.55m	***25-4025-8*** BH 107 SS 9 9.14-9.60m				
	Concentration (µg/g)					
Sulphate in Soil	76.2	58.3				

< result obtained was below RL (Reporting Limit).

QA/QC Report

Parameter	**Blank**	**RL**	**LCS/Spike**	**AR**	**Duplicate**	**AR**
	(µg/g)		**Recovery (%)**		**RPD (%)**	
Sulphate in Soil	<10	10	121	70-130	7	0-30

LEGEND:
RL - Reporting Limit
LCS - Laboratory Control Sample
AR - Acceptable Range
RPD - Relative Percent Difference