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HYDROGEOLOGICAL INVESTIGATION

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

Prepared for:

375 Kingston Road Corporation &

401 Kingston Road Corporation

Project No. FH24-14411_V2

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1 INTRODUCTION

Fisher Engineering Limited (Fisher) was retained by 375 Kingston Road Corporation & 401 Kingston Road Corporation to carry out a hydrogeological investigation for the proposed development at the property addressed as 375-417 Kingston Road, Pickering, Ontario hereinafter referred to as the 'Site'.

The purpose of the Hydrogeological Investigation was to evaluate groundwater conditions with respect to the proposed redevelopment of the site.

The Hydrogeological Review has been prepared in accordance with the Ontario Water Resources Act, and Ontario Regulation 387/04.

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

The report was updated to include results of laboratory grain size analyses which were not available for the last report.

2 SITE CHARACTERIZATION AND PROJECT DESCRIPTION

2.1 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.

The site is located within the Toronto Source Protection Area, approximately 450m east of the Rouge River and 100m west of Petticoat Creek.

Provincially Significant Wetlands, associated with Petticoat Creek and Rouge River are located approximately 100m and 400m east and west respectively of the site.

The property is not located within a TRCA Regulated area based on the map of regulated areas shown in Appendix A (A8).

2.2 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.

Elevations within an approximate radius of 500m of the site vary generally from 110m asl at the north to 98m on HWY 401 to the south, to 73m asl in the area of Rouge River and Provincially Significant Wetlands to the west as shown on Figure A7 in Appendix A. Drainage is expected to following the general topography towards Rouge River to the west and Lake Ontario to the south.

2.3 Proposed Development

Site plans, by Studio JCI, dated November 21, 2024, show a proposed mixed-use development consisting of two phases as follows:

- Phase 1 (393 to 413 Kingston Road): Two towers, 31 & 30 storeys, linked by a 4-storey podium and shared 2 underground levels. Finished P2 elevation is 7.5m below ground floor level.
- Phase 2 (375 to Kingston Road): Two towers, 32 and 33 storeys, linked by a 4-storey podium and shared 2 underground levels. Finished P2 elevation is 6.5m below ground floor level.
- Parkland dedication (417 Kingston Road)

Site plans, with proposed development, are shown in Appendix A.

3 SCOPE OF HYDROGEOLOGICAL INVESTIGATION

The Hydrogeological Investigation works were required to:

1) Establish groundwater conditions for the design of dewatering works, if required, prior to construction of the proposed building.
2) Determine the need for construction dewatering and permanent drainage and

3) Conduct calculations/analyses of the groundwater quantity and quality to be used for the necessary applications for permits prior to proceeding with construction dewatering and design of permanent drainage, if necessary.

The scope of this work generally consisted of the following:

- **Drilling/locating Monitoring Wells:** Drilling of monitoring wells in the overburden soils and reviewing / compiling borehole logs and onsite / laboratory testing.
- **Data Evaluation:** Evaluating the results of soil types, groundwater static levels, ground surface elevation, groundwater quality, flow direction and other available hydrogeological data for the site and their potential impact on the proposed development.
- **Hydraulic Conductivity Tests:** Conduct single well response tests and record groundwater level drawdown and recovery to model/calculate hydraulic conductivity.
- **Construction Dewatering and Permanent Drainage:** Calculate construction dewatering and permanent drainage rates.
- **Groundwater Quality Analyses.** Carry out laboratory analyses on groundwater to determine compliance with the Ontario Durham Sewer Use Bylaw No. 55-2013.
- **Groundwater Level Monitoring:** Conduct long-term monitoring of the groundwater levels to determine seasonal high-water levels.
- **Well Survey:** Carry out survey of drinking water wells within a 500m radius of the property.
- **Hydrogeological Report:** Prepare and submit a report detailing the findings and recommendations of the Hydrogeological Investigation.

4 PREVIOUS INVESTIGATIONS

Fisher Environmental carried out a Phase 2 ESA and Preliminary Geotechnical Investigation on 375 Kingston Road and submit 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 FIELD AND LABORATORY WORKS

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

5.1 Subsurface Exploration

Subsurface exploration, in the overburden soils, for the hydrogeological investigation was conducted concurrent with drilling for the geotechnical investigation over the period December 17, 2024 to January 10, 2025 during which ten (10) boreholes were advanced generally to approximate depths of 12.65m 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), equipped with solid stem augers, supplied by Terra Firma Services, was used to drill the shallow boreholes under direct supervision of Fisher Engineering personnel. The deeper boreholes, BH104 to BH107 and BH108 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 recovered soil samples were placed in clear, sealable plastic bags in the field and transported to the Fisher Engineering laboratory for further examination, characterization and laboratory analyses.

A description of subsurface conditions encountered at each borehole location is presented in Appendix B - Log of Boreholes.

5.2 Installation of Monitoring Wells

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.

5.3 Laboratory Analyses

All soil samples were taken to the Fisher Engineering laboratory for further visual assessment and classification. Representative soil samples were selected and submitted to the laboratory as follows:

- Sixty-one (61) soil samples from BH101, BH103, BH105, BH107, BH108 and BH110 moisture content analyses.
- Twenty-six (26) samples for grain size analyses and
- Twelve (12) samples for hydrometer tests.

The laboratory 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. The laboratory results for overburden soils are presented in Appendix C.

One (1) groundwater sample from MW104 was submitted to ALS Environmental laboratory for analyses of water quality under the Ontario Durham Sewer Use Bylaw No. 55-2013. Laboratory results are presented in Appendix D.

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.

5.4 Site Survey

Elevations at borehole locations were interpolated / estimated from topographic survey plans, prepared as follows:

- by Aksan Piller Corporation Ltd., Association of Canada Land Surveyors & Ontario Land Surveyors, dated September 19, 2022 for 401 to 417 Kingston Road and
- by Donevan Fleischmann Petrich Ltd, dated June 15, 2021, for 375 Kingston Road.

Site survey record is presented at Appendix A.

Whilst it was assumed that no significant changes in grade have taken place since, elevations at borehole locations, based on this survey plan, should only be used for reference.

6 SUBSOIL 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 description. Variation in soil stratification may occur and should be expected between borehole locations and elsewhere on the site.

Asphalt/Granular Material/Fill – An approximately 100mm to 175mm thick layer of asphalt was encountered at the surface of all boreholes, except BH106 and BH110. The asphalt was underlain generally by 150mm to 530mm thick layer of asphalt except at BH102. Fill material, consisting of dark brown, sandy silt, with trace to some clay, gravel, topsoil and occasional cobbles was encountered below the granular material in BH106 and BH107. Fill/granular material depths and elevations are presented in Table 1.

Table 1: Fill Depths and Elevations

Borehole No.	Surface Elevation (m asl)	Depth of Borehole (m)	Elevation at Bottom of Borehole (m asl)	Depth of Fill (m)	Elevation at Bottom of Fill (m asl)
BH101	106.03	12.65	93.38	0.25	105.78
BH102	105.59	12.65	92.94	0.15	105.44
BH103	102.28	12.65	89.63	0.26	102.03
BH104	106.07	20.27	85.80	0.25	105.82
BH105	106.36	30.94	75.42	0.25	106.11
BH106	104.66	20.27	84.39	1.17	103.49
BH107	102.71	30.61	72.10	1.68	101.03
BH108	106.43	12.65	93.78	0.25	106.18
BH109	106.18	12.65	93.53	0.46	105.72
BH110	102.30	12.65	89.65	1.73	100.57
BH1	106.11	8.08	98.03	0.46	105.65
BH2	106.05	8.08	97.97	0.61	105.44
BH3	106.23	8.08	98.15	0.46	105.77
BH4	105.97	9.60	96.37	0.30	105.67
BH5	106.22	3.20	103.02	0.46	105.76

Greenish Grey Sand & Silt to Sand & Silt Till – Layers of native, greenish grey, moist, compact to very dense fine sand & silt to sand & silt till were encountered below the granular material in BH101 and fill soils in BH106, extending to depths of 1.17m (BH106) to 2.13m (BH101).

Brown to Grey Sand & Silt Till/Sandy Silt Till – Alternating layers of moist, brown becoming grey at greater depths, moist, dense to very dense sand & silt till to sandy silt till were encountered below the asphalt or granular layers extending to termination depths of 12.47m to 30.94m below prevailing grade.

Brown Clayey Silt Till/Sandy Clayey Silt Till – Layers of native, brown, moist, hard clayey silt till to very stiff sandy clayey silt till were encountered interbedded in in the sandy silt till layers depth of: 2.13m & 6.25m in BH104 and at 1.68m & 21.95m bgs in BH107.

7 HYDROGEOLOGICAL STUDY

A hydrogeological study for the subject site was conducted based on the boreholes/wells' exploration, observation and site/laboratory testing. Groundwater details from the ten (10) newly installed, and three (3) existing monitoring wells were used in the Hydrogeological Study. The monitoring wells were constructed generally with 3.05m (10') long, 51mm diameter PVC slotted screen pipes, with the bases at approximate depths below existing grade as shown in Appendix B. Clean silica sand packs were placed around each well screen which was isolated with bentonite extending to slightly below existing grade.

The boreholes were observed to be opened and generally dry on completion of drilling.

7.1 Regional Surficial and Bedrock Geology

Review of the available surficial geological and hydrogeological information for the area shows that the soils comprise generally of Ice- Age Deposits: Glacial Lake Deposits – Lake Iroquois, deeper-water deposits of silt & clay (Ontario Geological Survey). Underlying bedrock is represented by shale, limestone, dolostone and siltstone of the Georgian Bay Formation; Blue Mountain Formation; Billings Formation; Collingwood Member; Eastview Member. Bedrock in the area is generally more than 50m below prevailing grade. Surficial geology and bedrock maps are presented in Appendix A.

The subsoils and hydrogeological conditions were observed and recorded during both the geotechnical and hydrogeological investigations. Based on the boreholes/wells' exploration, the subsurface soils on the site are dominated by brown to grey sandy silt till interbedded with layers of clayey silt till to sandy clayey

silt till in some areas. The subsurface soils observed during the field investigation are generally consistent with the surficial geology of the area.

7.2 Hydrogeological Conditions

The monitoring wells were generally dry on completion of drilling, except for MW102 and MW110 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. The monitoring wells were purged and developed manually using bailers and allowed to fully recover prior to carrying out groundwater level measurements and sampling. Purging of the monitoring wells and sampling for sewer discharge analyses were carried out using standard procedures for sampling for hydrogeological investigations. Measured groundwater depths and elevations are summarized in Table 2.

Comments on Table 3:

The following general comments regarding groundwater conditions in the overburden soils at the site are based on the groundwater level data and the geotechnical investigation:

- The boreholes were observed to be open and generally dry on completion of drilling. Standing water was observed in BH102 and BH110 at depths of 7.62m and 4.57m below prevailing grade.
- Groundwater levels were measured during January and February at depths generally of 1.05m to 3.57m (100.16m to 105.45m asl) in the 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.
- The nearest bodies of surface water are Petticoat Creek and Rouge River located approximately 100m and 400m east and west respectively of the site. Provincially Significant Wetlands (PSW) associated with the creek and river valley systems are located in proximity to the site.
- Groundwater levels will be monitored approximately biweekly during the rainy season to determine highwater levels at the site.
- The site is located within the TRCA's jurisdiction but is not within a TRCA Regulated Area.

Table 2: 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							

7.3 Hydraulic Conductivity K Modeling Results

Rising Head Slug Tests

Rising head slug tests (SWRT) were carried out in MW101, MW103, MW104, MW106, MW107, MW108 and MW110 on January 15 & 22, 2025. The water bearing media mainly consisted of layers of sandy silt till, interbedded with more permeable seams, where encountered, and were assumed to be unconfined, homogenous, isotropic and of uniform thickness. It was also assumed that the wells fully penetrated the water bearing soils. Data from the rising head tests were used to calculate the hydraulic conductivity values using Luthin's method.

Calculated values for hydraulic conductivity (k) are summarized in Table 3 and are representative of the water bearing soil characteristic consisting of till soils with more permeable seams within the screened depths. Details of the hydraulic conductivity analyses are presented in Appendix E.

It should be noted that hydraulic conductivity values calculated from field investigation were obtained using the average slope of the line of best fit for each test. Further analyses were carried out which show that the slope of the line of best fit falls between that of the slope for the initial recovery (fast) and the late-stage recovery (slower) in each falling head slug test. Based on engineering judgement and knowledge of the type of soils encountered on the site, and on similar sites, the slope of the average best fit line, for each test well, was used in determining hydraulic conductivity values for dewatering calculations.

Table 3: Summary of Single Well Response Tests and Hydraulic Conductivity Results

Test Wells	Well Surface Elevation (m asl)	Groundwater Depth (m)	Screen Elevation (m asl)	Variance of water head created (m)	30 Minutes/	Hydraulic Conductivity, K (Luthin's Method)	
					Recovery Percentage	m/s	m/day
MW101	106.03	3.38	99.93 - 102.98	2.2	31 mins / 10%	9.08E-08	0.008
MW103	102.28	1.45	97.71 - 100.76	2.13	31 mins / 11%	3.03E-07	0.026
MW104	106.07	1.03	98.45 - 101.50	4.67	31 mins / 6%	6.05E-08	0.005
MW106	104.66	2.05	97.04 - 100.09	2.69	31 mins / 90%	3.03E-06	0.261
MW107	102.71	1.79	93.57 - 96.62	5.305	31 mins / 2%	3.03E-08	0.003
MW108	106.43	1.34	101.86 - 104.91	2.73	31 mins / 9%	7.57E-08	0.007
MW110	102.30	1.90	96.97 - 100.02	1.63	31 mins / 13%	1.51E-07	0.013

7.4 Grain Size Analysis for Hydraulic Conductivity K

Representative samples from BH1, BH3, BH5, BH7 and BH10 were selected from depths associated with the recommended footing locations or change in soil stratigraphy and submitted to the laboratory for grain size distribution and hydrometer analyses. The results for the grain size distribution and hydrometer analyses are presented in Appendix C and summarized in Table 4. Hydraulic conductivity values estimated from laboratory tests results are expectedly lower than those from insitu tests as the laboratory tests do not accurately represent soil conditions in the field, including the presence of more pervious seams.

Hydraulic conductivity values estimated from grain size analyses, using Hazen number in this report, are not to be used for design purposes and are merely included for comparison with field results in terms of orders of magnitude. Any inherent inaccuracies are acknowledged.

Table 4: Hydraulic Conductivity Estimated from Grain Size Analysis

Location	Depth of soil sample (m)	Soil Classification	Estimated Hydraulic Conductivity (Hazen Number)	
			m/s	m/day
BH101	3.05-3.51	Silt & Sand, some Clay and Gravel	5.00E-06	0.432
BH101	6.1-6.56	Silt & Sand, some Clay, trace Gravel	1.50E-06	0.1296
BH105	3.05-3.51	Clayey Sandy Silt, trace gravel	3.00E-06	0.2592
BH105	6.1-6.56	Sand and Silt, some Clay, trace Gravel	3.50E-06	0.3024
BH106	3.05-3.51	Sandy Silt, some Clay, trace Gravel	1.50E-06	0.1296
BH106	4.58-5.03	Silty Sand, some Clay, trace Gravel	4.00E-06	0.3456
BH107	3.05-3.51	Sandy Silt, some Clay and Gravel	5.00E-06	0.432

7.5 Estimated Infiltration Rates

Soil conditions throughout the site may generally be described as sandy silt till interbedded with sandy clayey silt till. Based on field observations and the laboratory results, presented in Appendix C, the soils at typical depths for infiltration-based facilities may be classified as sandy silt till with trace gravel (SM). Approximate coefficients of permeability, based on Table 2 of the Supplementary Guidelines to the Ontario Building Code (1997), are in the range **10^{-5} – 10^{-7} m/s, with percolation time T of 8 - 20 mins/cm, indicating medium to low permeability.**

Field percolation tests will be needed, in the location and at the invert of any proposed infiltration-based LID facility to determine infiltration rates for design purposes.

It should also be noted that a 1m separation between seasonal highwater levels and the invert of any infiltration-based LID facility is required for design. Minimum distances to various structures should also be maintained.

8 CONSTRUCTION DEWATERING & PERMANENT DRAINAGE

8.1 Construction Groundwater Dewatering

The proposed development will comprise two phases, each consisting of condominium towers with two underground levels. The following assumptions were made in estimating construction groundwater dewater rates for the new buildings with 2UG levels:

Phase 1 Development:

a. Footprint for 2 UG levels – 4,001m^2.
b. Average hydraulic conductivity value of 5.34 x 10^{-7} m/s.
c. Average groundwater levels of 101.27m asl.
d. Average finished lowest floor elevation of 96.01m asl with footings another 1.2m below.

Phase 2 Development:

a. Footprint for 2 UG levels – 4,734m^2.
b. Average hydraulic conductivity value of 5.34 x 10^{-7} m/s.
c. Average groundwater levels of 103.46m asl.
d. Average finished lowest floor elevation of 99.67m asl with footings another 1.2m below.

Based on the calculations, shown in Appendix F, construction groundwater dewatering flowrates of **22.81 and 19.34 m^3/day (22,810 and 19,340 L/day)** were estimated for Phases 1 & 2 construction respectively. Factored construction groundwater dewatering flowrates of **34,220 and 29,010 L/day are** applicable with the assumed footing elevation **(FS of 1.5).**

8.2 Seasonal High Groundwater Levels

Groundwater levels in the newly installed, and existing, monitoring wells will be measured throughout the rainy season to determine seasonal highwater levels at the site. An average of the higher groundwater elevations observed so far in the shallow monitoring wells, covering each development phase, was used

to estimate construction groundwater dewatering rates. An average groundwater level of 1.42m bgs (102.09m and 104.74m asl for Phase 1 & 2 respectively) was used to determine permanent drainage rates.

8.3 Accounting for Accumulated Precipitation

Provisions should be made to pump accumulated water from the excavation areas during construction, particularly following a period of heavy rainfall. For example, 25mm rainfall in 24 hrs may result in accumulation of approximately 100 and 118m^3 in the excavated areas for Phase 1 & 2 development respectively based on assumptions stated previously. Subsurface soils at the site are dominated by sandy silt till interbedded with sandy clayey silt till. Consequently, some ponding of rainwater may be expected. Conservative accumulated precipitation volumes of **25 m^3/day** may therefore be assumed for planning purposes for both phases of the development. Accumulated precipitation may be stored on site for subsequent disposal to an MECP-licensed facility or be discharged to the public sewer system with permission.

Maximum construction discharge rates, taking into consideration accumulated precipitation volumes, range from:

Unfactored: ***47.81 m^3/day (47,810 L/day) & 44.34 m^3/day (44,340 L/day) for Phase 1 & 2.***

Factored: ***59.22 m^3/day (59,220 L/day) & 54.01 m^3/day (54,010 L/day) for Phase 1 & 2.***

8.4 Permanent Drainage

The monitoring wells were generally dry on completion of drilling except for MW102 and MW110 in which groundwater levels were observed at depths of 7.62m and 4.57m (97.97m and 97.73m asl) in the open boreholes. Groundwater levels increased in January and are expected to be higher during the rainy season. Observed groundwater levels in the shallow monitoring wells vary from 1.05m to 3.57m below prevailing grades (100.16m to 105.45m asl). For the buildings with 2UG levels some amount of groundwater will be expected. This means that permanent under-slab and perimeter drainage will be required under groundwater conditions observed during the investigation. P**ermanent drainage rates of 18.67 m^3/day and 16.69 m^3/day** were estimated for Phase 1 and 2 developments respectively as shown in Table 5. Factored permanent drainage rates of **28.01 m^3/day (28,010 L/day) and 25.03 m^3/day (25,030 L/day)** should be used for planning purposes for Phase 1 & 2 developments with 2UG levels.

Table 5: Summary of Construction Dewatering and Permanent Drainage Rates

Construction Units		PHASE 1 - 31 & 32 Storeys with 2 UG levels	PHASE 2 - 32 & 33 Storeys with 2 UG levels
Assumed Elevation of Footings, m asl		94.81	98.47
Construction Dewatering Rates Q, (m^3/day)	**Unfactored**	22.81	19.34
	Factored	34.22	29.01
Permanent Drainage Rates Q, (m^3/day)	**Unfactored**	18.67	16.69
	Factored	28.01	25.03
Assumed Area, m^2		4001	4734
Accumulated precipitation (m^3/day)		25.00	25.00
Total Construction Dewatering (m^3/day)		59.22	54.01
Radius of Influence (m)		16.35	13.13

8.5 Permit to Take Water (PTTW)

As the calculated total construction dewatering flowrates (factored) for Phase 1 and 2 developments, including accumulated precipitation, will be more than 50 m^3/day, registration on the MECP Environmental Activity and Sector Registry (EASR) for Water Taking will be required for construction based on assumptions in the preceding.

An application for permit to take water (PTTW) will not be required for permanent drainage as the daily flowrate for each phase of the development will be less than 50,000 L/day. It should be noted however that if the two phases of the development are combined as one address, then a permit to take water will be required for permanent drainage as the combined total daily discharge rate will be more than 50,000 litres.

8.6 Groundwater Quality in Overburden Monitoring Wells

One unfiltered groundwater sample was collected from monitoring well MW104 (January 16, 2025) and submitted to ALS laboratory for analyses of parameters under the Ontario Durham Sewer, Storm and Sanitary Sewer By-Law (55-2013). The groundwater sample for sewer discharge analyses was collected using bailers after the well was purged. The results of analyses for groundwater quality, under the Ontario Durham Sewer Use By-Law, show compliance with all parameters except as listed in Table 6.

Table 6: Results from Sewer Use Bylaw tests

Parameters	Guide Limits		Results
	Table 1 (Sanitary Sewer)	Table 2 (Storm Sewer)	MW104
Total Suspended Solid, mg/L	350	15	77.7
Biochemical Oxygen Demand (BOD), mg/L	300	15	652
Chloroform, ug/L	40	2	4.98

Based on the results, presented in Table 6, pre-treatment of the groundwater will be required prior to discharging to the public storm or sanitary sewer systems. As the exceedance is not significant, this can be done by using a settlement tank or by filtration for suspended solids. Commercially available treatment systems are available to treat other exceedances.

It should be noted however that testing of groundwater at the depths observed during the investigation would not be representative of the water that might accumulate during a high rainfall event. Any accumulation of precipitation occurring in the excavation during construction, that may require offsite discharge, will have to be tested at the time of the event to determine the quality of water for discharge. It is also recommended that resampling of the groundwater be carried out closer to construction.

8.7 Groundwater Dewatering Influence Zone

Based on the field investigation, the soils to the proposed excavation depths are dominated by silty sand till interbedded with sandy clayey silt till at further depths. The estimated construction dewatering quantities are based on the worst-case groundwater conditions that might occur during the construction period for each development phase. Based on the low groundwater recharge rates observed during rising

head slug tests, it would be expected that construction groundwater dewatering may be achieve by pumping from sump pits as required. Consequently, groundwater dewatering influence zones will be less than the calculated 16.35m and 13.13m for the buildings with 2UG levels.

8.8 Hydrogeological Impact of Construction Dewatering

During the investigation, based on the conceptual drawings provide to Fisher Engineering and as outlined in the preceding, it was determined that there will not be any negative impact to the natural environment, Durham Region Sewer works nor surrounding properties due to construction dewatering because of the relatively small quantity of water, types of soils and the depth at which groundwater was encountered. No groundwater induced depression at surface level is expected for typical dewatering to facilitate construction of the buildings with 2UG levels. Consequently, it is not expected that construction dewatering will impact public infrastructure, the natural environment nor will there be any settlement issues.

9 ONTARIO MINISTRY OF ENVIRONMENT WATER WELL RECORDS

The MECP Water Well Records for private supply wells were obtained to determine characteristics of existing private wells within a 500m radius of the subject Site. A total of fifty-nine (59) well records were reviewed from the MECP online well record mapping resource. Seven (7) supply wells were observed with four (4) decommissioning records for supply wells. Other supply wells may have been decommissioned and not reported.

Five (5) of the supply wells were installed in the overburden soils, while two (2) were installed in shale/limestone. The overburden supply wells were installed at depths of 44 to 204 feet, but generally between 102 and 204 feet. The wells installed in shale were to 200 to 218 feet. A summary of the well characteristics for seven (7) water supply wells within 500m of the Site is presented in Table 7 with details in Appendix G.

The MECP Water Well records for water supply wells surrounding the subject site show that water was encountered at depths of 44 to 202 feet during installation, with an average approximate depth of 113.25 feet. Recommended pumping depths vary between 95 and 204 feet, with an average recommended depth of 149.67 feet. Recommended pumping rates vary between 0.5 and 6.7 gpm, with an average recommended rate of 2.8 gpm.

No further large-scale water takings capable of causing adverse impacts to groundwater quantity were identified within 500m of the Site boundary.

Based on the low quantity of groundwater encountered during the investigation, and the depth at which excavation for the proposed buildings will extend, construction groundwater dewatering is not expected to impact the quality or quantity of water in supply wells, if any, in proximity to the site.

Table 7. MECP details of wells within 500m radius of Site boundary

No	Well ID	Date Completed	Well Completion	Well Type	Bedrock depth, feet	Water Found at, feet	Static Water Level, feet	Well Depth, feet	Recommended pumping rate, GPM	Recommended Pumping Depth, feet
1	910095888	28-Nov-94	n/a	Abandoned	n/a	n/a	n/a	29	n/a	n/a
2	1915420	8-Nov-01	n/a	Abandoned	n/a	n/a	n/a	32.5	n/a	n/a
3	4601870	6-May-57	Shale	Commercial Water Supply (Abandoned)	128	No Water Found	n/a	200	n/a	n/a
4	4601915	14-Jun-64	Limestone	Domestic (Abandoned)	133	No Water Found	n/a	218	n/a	n/a
5	4601916	9-Sep-67	Gravel	Domestic	n/a	102	90	102	2	95
6	4601918	17-Nov-65	Stones	Domestic (Abandoned)	n/a	No Water Found	n/a	130	n/a	n/a
7	4601919	15-Mar-47	Gravel	Domestic	n/a	105	25	204	6.7	204
8	4601920	21-Mar-62	Clay	Domestic	n/a	44	44	45	0.5	No Pump
9	4601921	17-Mar-67	Rock	Domestic (Abandoned)	167	202	75	202	2	150
10	4601923	17-Dec-65	Coal Tar, Possible Shale	Domestic (Abandoned)	122	No Water Found	n/a	200	n/a	n/a
11	7227606	29-Jul-14	n/a	Decomissioned	n/a	n/a	5	14	n/a	n/a
12	7338107	5-Jul-19	n/a	Decomissioned	n/a	n/a	n/a	24	n/a	n/a

10 DISCUSSION

1. Hydraulic conductivity values (k) calculated from on-site single well response tests, in overburden monitoring wells, are in the range 3.03 x 10^{-8} to 3.03 x 10^{-6} m/s (0.003 to 0.261 m/day). These are representative of the water bearing soils consisting of sandy silt till with interbedded sandy clayey silt till within the expected excavation depths.
2. Construction groundwater dewatering flowrates of 22.81 and 19.34 m^3/day were estimated for Phases 1 and 2 of construction respectively.
3. Permanent under-slab and perimeter drainage will be required for the buildings with 2UG levels. Permanent drainage rates of 22.81 to 2.26 m^3/day are applicable.
4. A factor of safety of 1.5 should be applied to construction groundwater and permanent drainage rates.
5. An additional volume of 25 m^3/day should be added to the factored construction groundwater dewatering for each development phase to account for accumulated precipitation.
6. Registration on the MECP's EASR Website for water taking during construction will be required.
7. An application for PTTW will not generally be required for each development phase for permanent drainage. If, however, both development phases are combined, then an application for PTTW will be required for permanent drainage.
8. Based on the subsurface investigation, rising head slug tests & analyses and types of soils at the expected excavation depth, recharge of groundwater is relatively slow. Construction dewatering may therefore be handled by pumping from sump pits.
9. Exceedances of storm and sanitary sewer quality were observed in groundwater analyses for sewer discharge. Treatment of the groundwater may therefore be required before it can be discharged to the public sewer system.
10. It should be noted that if it is intended that any accumulated water, following periods of heavy rainfall, be discharged into the public sewer, then a permit to discharge would be required along with laboratory analyses to ensure compliance with the Regional Sewer Use Bylaws.
11. Construction dewatering rates presented in the preceding are based on common practice and reasonable assumptions for the site.

11 LIMITATIONS

This report is limited in scope to those items specifically referenced in the text. The discussions and recommendations presented in this report are intended only as guidance for the named client, design engineers and those directly associated with implementing, regulating and monitoring of the project. The information on which these recommendations are based is subject to confirmation by engineering personnel at the time of construction. Localized variations in the subsoil conditions may be present between and beyond the boreholes and should be verified during construction.

As more specific subsurface information becomes available during excavations on the Site, this report should be updated. Contractors bidding on or undertaking the work should decide on their own investigations, as well as their own interpretations of the factual borehole results. This concern specifically applies to the classification of the subsurface soil and the potential reuse of these soils on/off Site. Contractors should draw their own conclusions as to how the near surface and subsurface conditions may affect them.

12 References

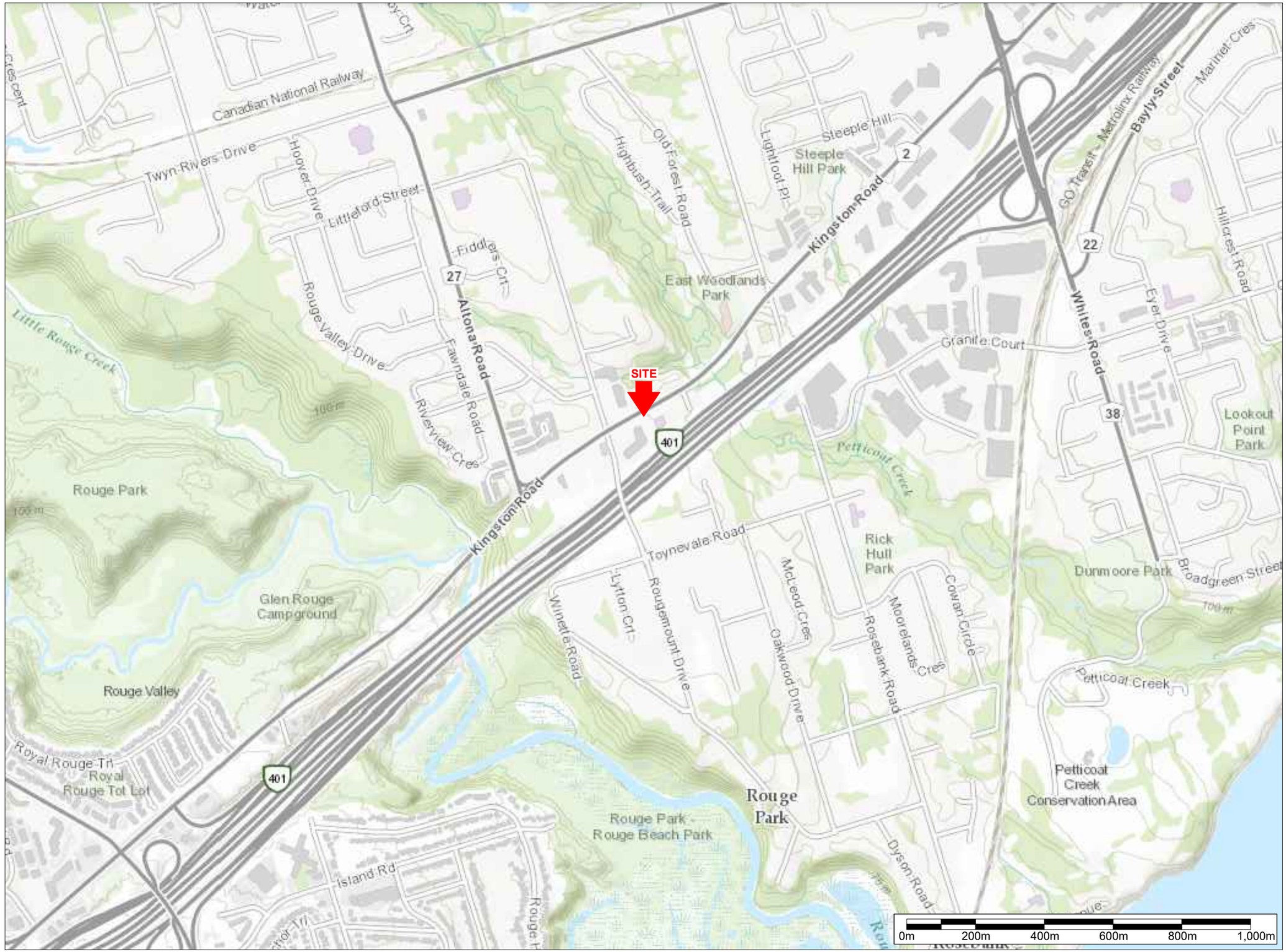
1. CTC Source Protection Region (2015). Approved Source Protection Plan. Retrieved from: https://trca.ca/wp-content/uploads/2016/04/CTC_SOURCE_PROTECTION_PLAN_FULL.pdf

2. Low Impact Development Stormwater Management Planning and Design Guide (2010). Version 1.0, TRCA and CVC. Retrieved from: https://cvc.ca/wp-content/uploads/2014/04/LID-SWM-Guide-v1.0_2010_1_no-appendices.pdf

3. Ministry of Environment and Climate Change (2003), Stormwater Management Planning and Design Manual. Retrieved from: https://www.ontario.ca/document/stormwater-managementplanning-and-design-manual-0

4. Toronto and Region Conservation Authority (2012), Stormwater Management Criteria, Version 1.0.

APPENDIX A – SITE AND LOCATION MAPS AND 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

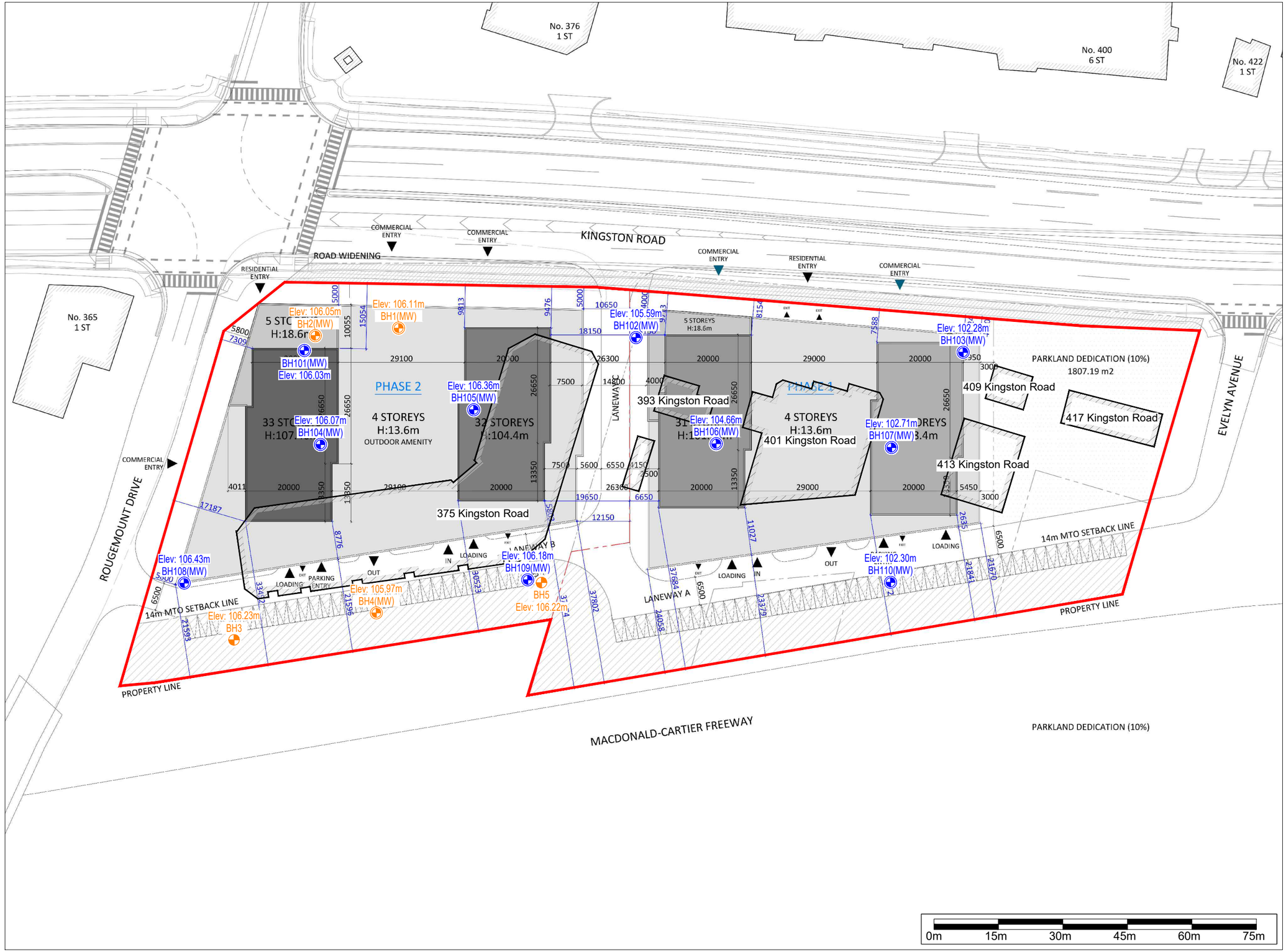
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

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

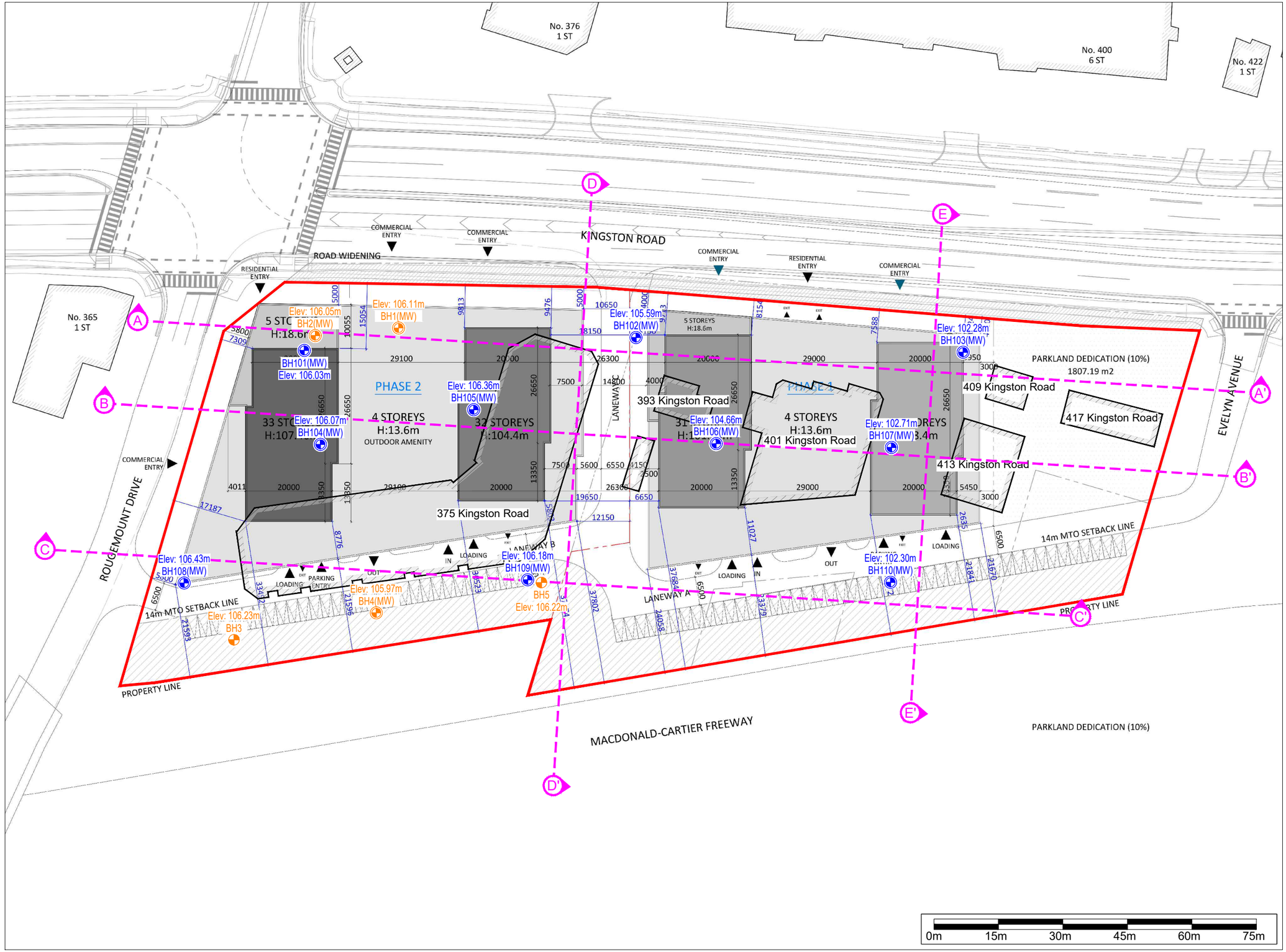
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

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

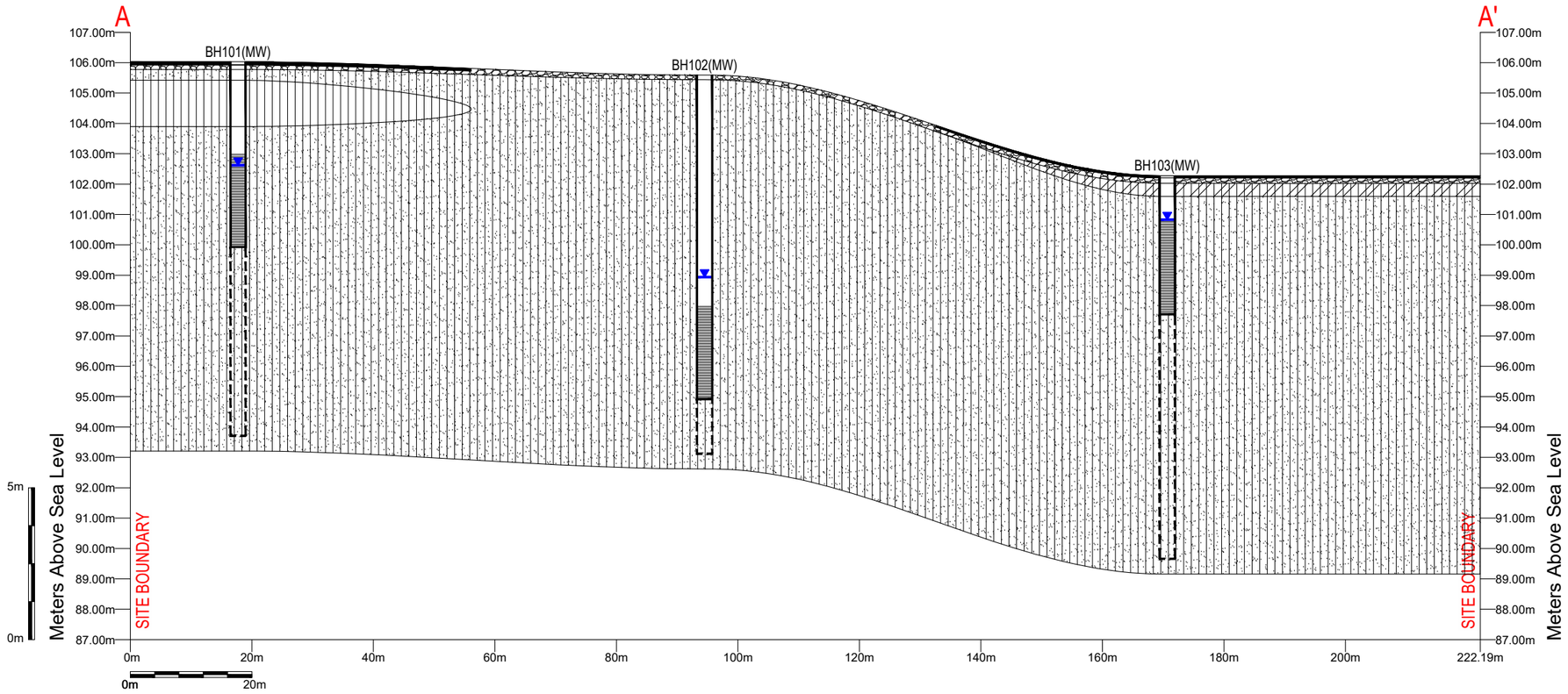
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

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

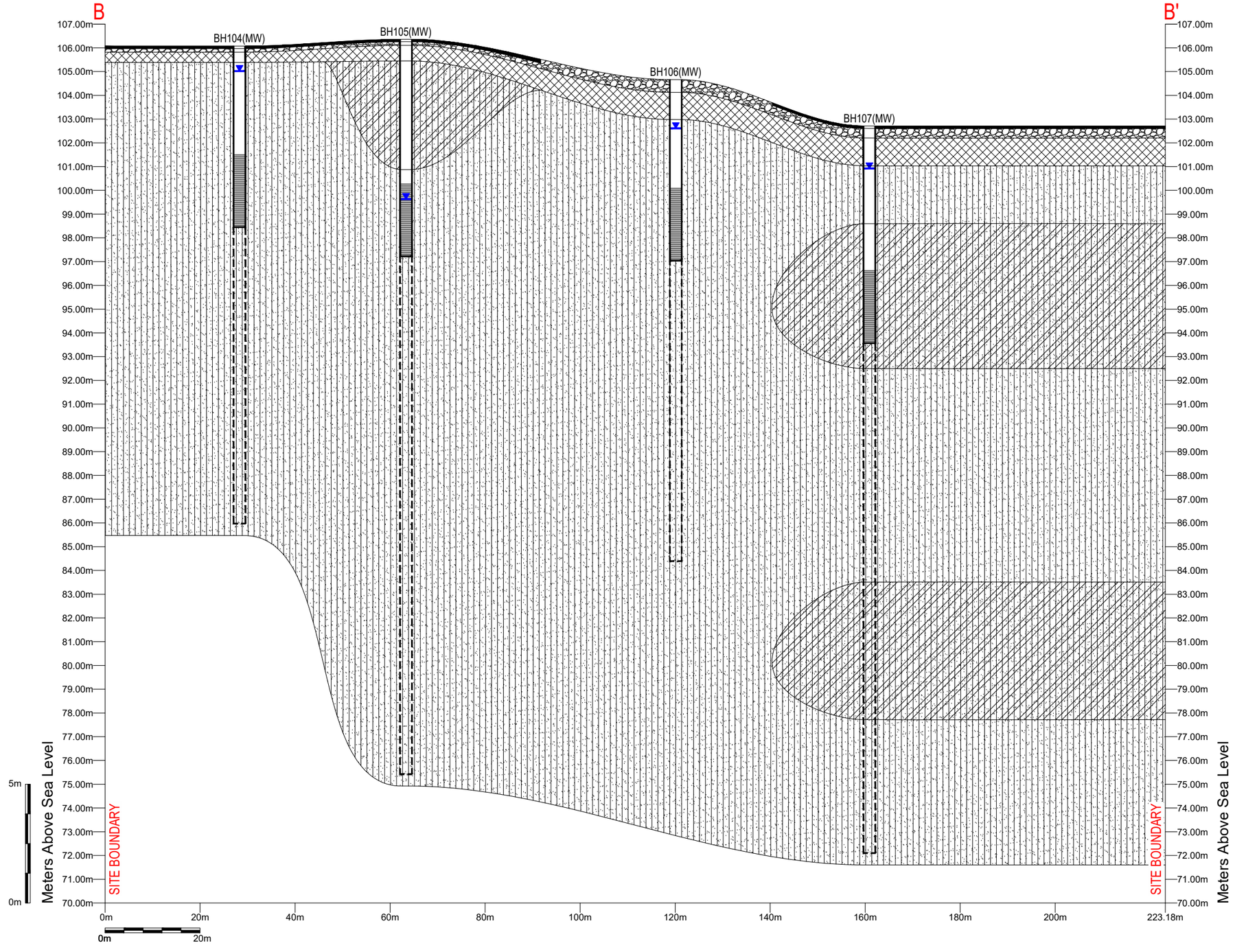
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

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	



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Markham, Ontario
L3R 3K2

Tel: 905 475-7755

NORTH

LEGEND

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

PROJECT NAME AND ADDRESS

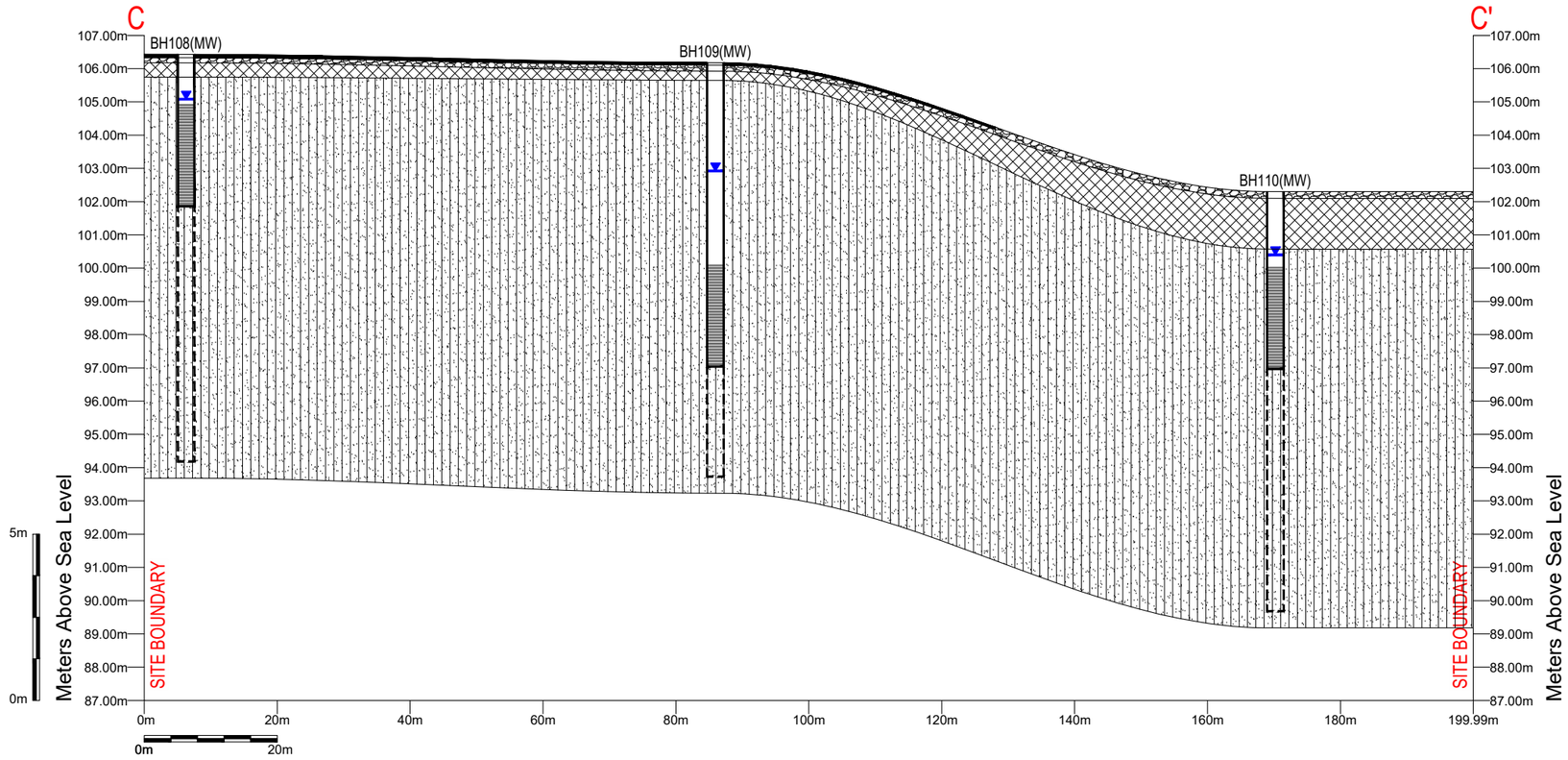
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

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

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Markham, Ontario
L3R 3K2

Tel: 905 475-7755

NORTH

LEGEND

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

PROJECT NAME AND ADDRESS

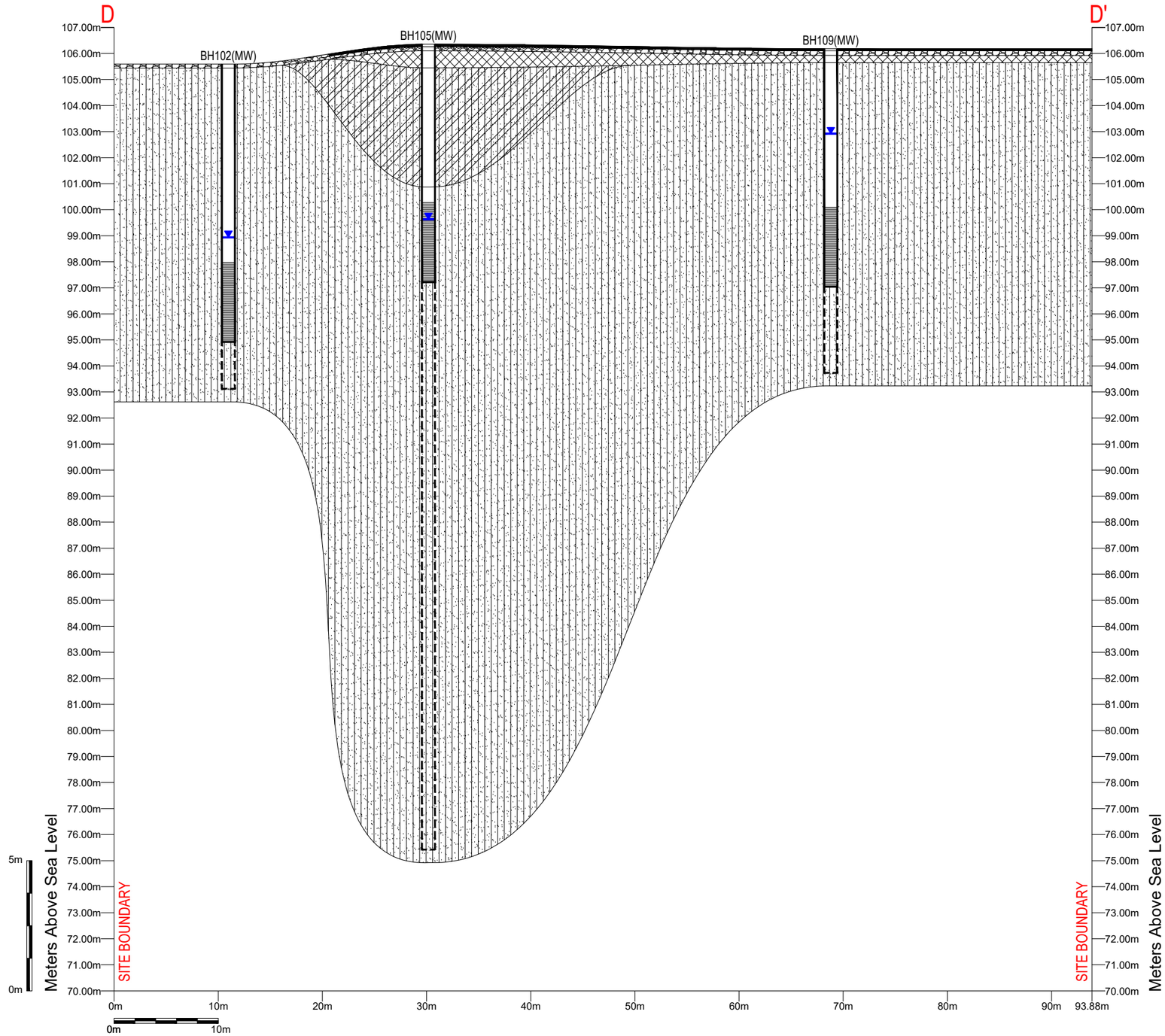
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

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

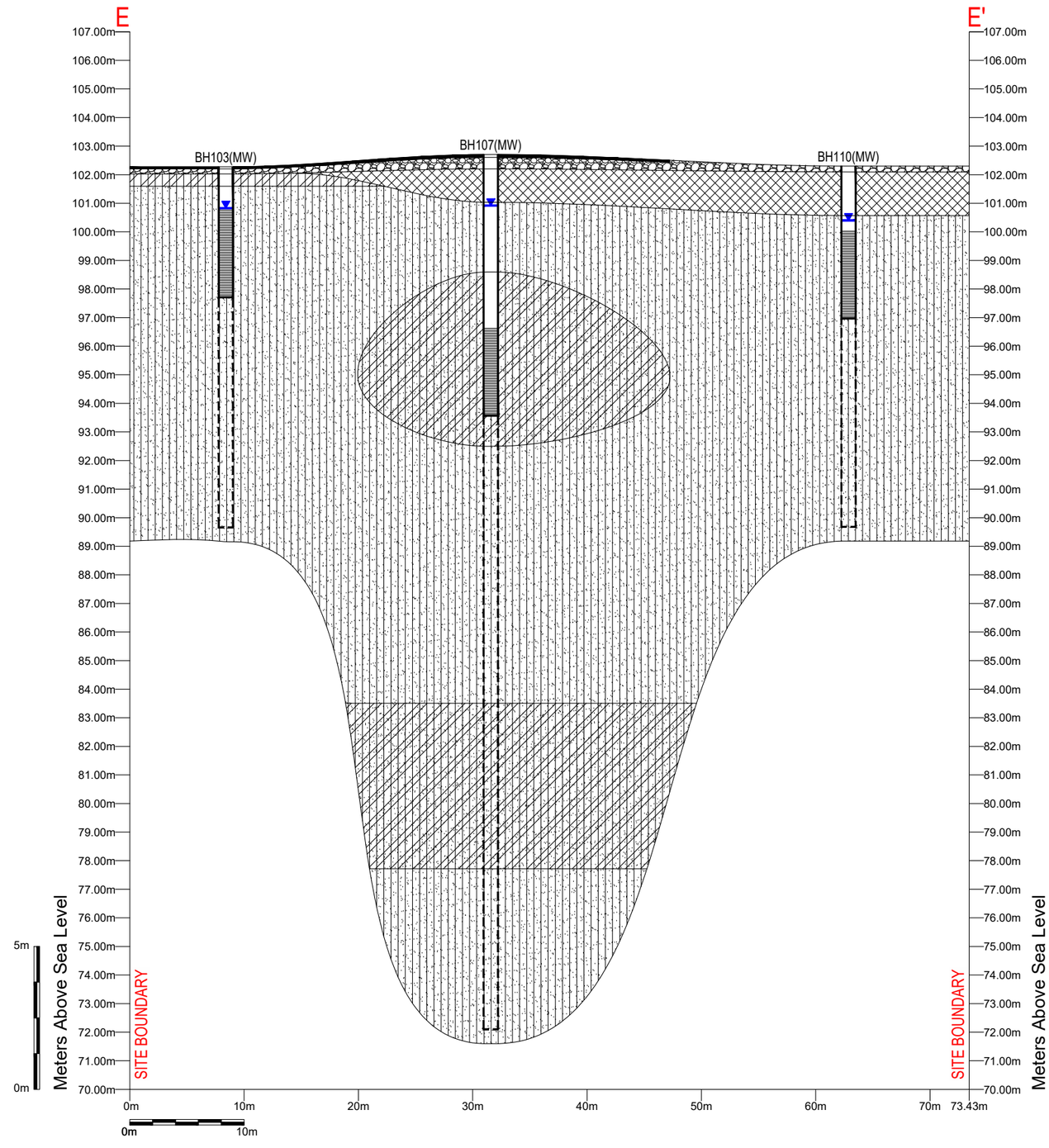
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

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	



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Markham, Ontario
L3R 3K2

Tel: 905 475-7755

NORTH

LEGEND

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

PROJECT NAME AND ADDRESS

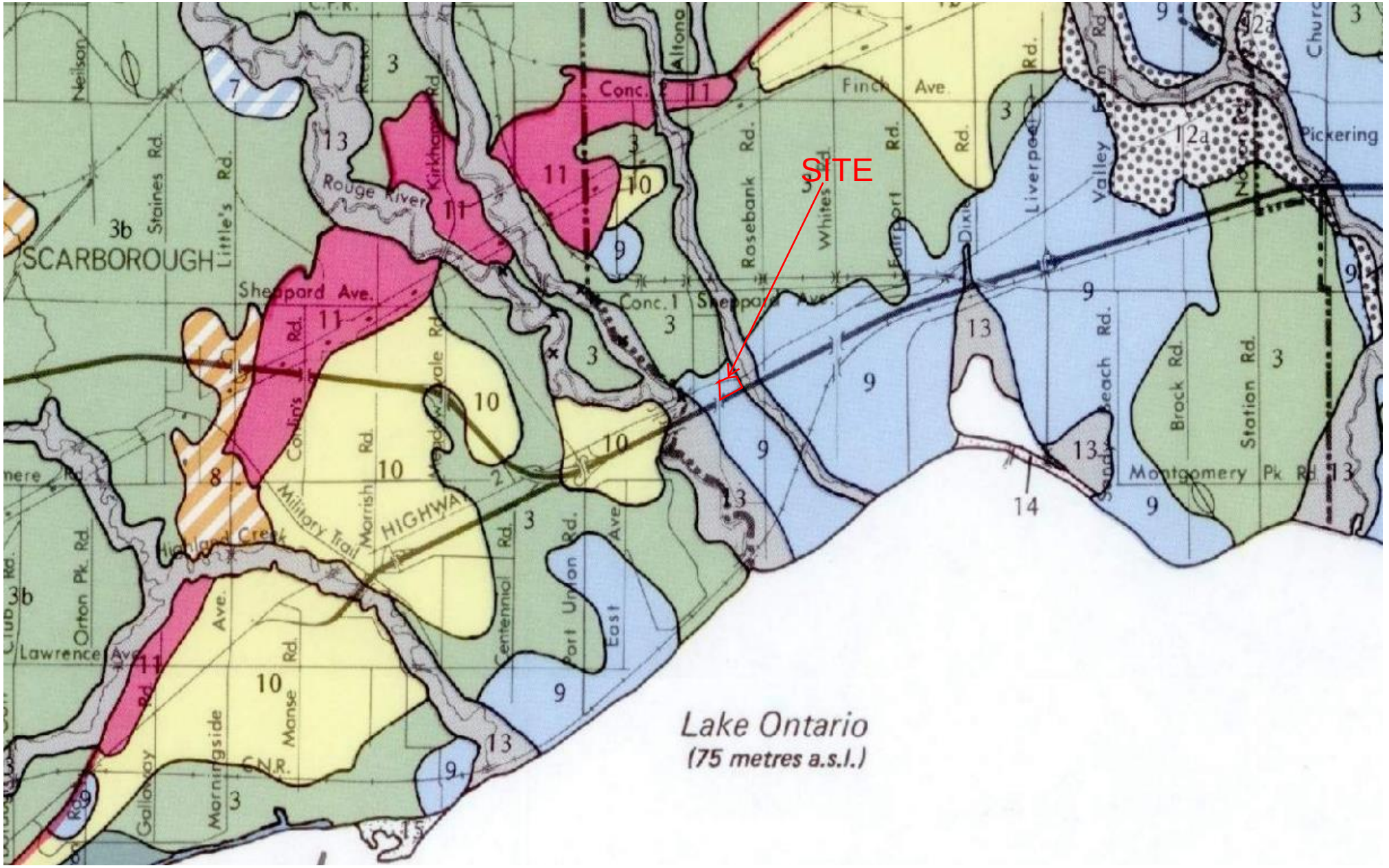
GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

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	



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400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2
Tel: 905 475-7755
Fax: 905 475-7718

KEY PLAN

LEGEND

ICE-AGE DEPOSITS: GLACIAL LAKE DEPOSITS
Lake Iroquois, deeper-water deposits: silt, clay

PROJECT NAME AND ADDRESS
HYDROGEOLOGICAL INVESTIGATION
375-417 Kingston Road,
PICKERING, ON

PROJECT NO. FH24-14411
DATE FEBRUARY 2024
SCALE As shown

FIGURE: 5
Surficial Geology Map.

FISHER ENGINEERING
400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2
Tel: 905 475-7755
Fax: 905 475-7718

KEY PLAN

LEGEND

Shale, Limestone, dolostone, siltstone:

Georgian Bay Formation; Blue Mountain Formation; Billings Formation; Collingwood Member & Eastview member.

PROJECT NAME AND ADDRESS

HYDROGEOLOGICAL INVESTIGATION

375-417 Kingston Road, PICKERING, ON

PROJECT NO. FH24-14411

DATE FEBRUARY 2025

SCALE As shown

FIGURE: A6

Bedrock Geology.

Ontario

Ministry of Natural Resources

Make-a-Map: Natural Heritage Areas

375 - 417 Kingston Road, Pickering, Natural Heritage Map

Map created:2/7/2025

Notes:

Enter map notes

Legend

- Assessment Parcel
- ANSI
- Earth Science Provincially Significant/sciences de la terre d'importance provinciale
- Earth Science Regionally Significant/sciences de la terre d'importance régionale
- Life Science Provincially Significant/sciences de la vie d'importance provinciale
- Life Science Regionally Significant/sciences de la vie d'importance régionale
- Conservation Reserve
- Provincial Park
- Natural Heritage System

0.3 0 0.17 0.3 Kilometres

Absence of a feature in the map does not mean they do not exist in this area.

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Natural Resources(OMNR) shall not be liable in any way for the use of, or reliance upon, this map or any information on this map.

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PROPOSED RESIDENTIAL DEVELOPMENT

375-409 KINGSTON ROAD, PICKERING, ON L1V 1A3

ARCHITECTURAL DRAWING LIST

A0.01 PROJECT STATISTICS

A0.10 AERIAL VIEWS
A0.11 PERSPECTIVE VIEWS
A0.12 PERSPECTIVE VIEWS

A1.00 SITE PLAN
A1.01 SITE PLAN - PHASE 1
A1.02 GROUND FLOOR F SITE PLAN - PHASE 1
A1.04 SITE PLAN - PHASE 1 (PREVIOUS PROPERTY LINE)
A1.03 PHASE DIAGRAM - EXISTING BUILDINGS

A3.00 P2 FLOOR PLAN
A3.01 P1 FLOOR PLAN
A3.02 GROUND FLOOR PLAN
A3.03 2ND-3TH FLOOR PLAN
A3.04 4TH FLOOR PLAN
A3.05 5TH-30TH FLOOR PLAN
A3.06 AMENITY/MECH LEVEL
A3.07 MECH PH
A3.08 ROOF PLAN

A6.00 SECTION A
A6.01 SECTION B & SECTION C
A6.01 SECTION D & SECTION E

CONTEXT PLAN
Scale: 1:4000

ISSUED FOR COORDINATION
NOVEMBER 21, 2024

Issued

ZBA XX.XX.24
Description: Date: (mm.dd.yy)

General Notes:

1. These Contract Documents are the property of the Architect. The Architect bears no responsibility for the interpretations of these documents by the Contractor. Upon written application the Architect will provide written/graphic clarification or supplementary information regarding the intent of the Contract Documents. The Architect will review Shop Drawings submitted by the Contractor for design conformance only.

2. Drawings are not to be scaled for construction. Contractor to verify all existing conditions and dimensions required to perform the Work and report any discrepancies with the Contract Documents to the Architect before commencing work.

3. Positions of exposed or finished mechanical or electrical devices, fittings, and fatures are indicated on the Architectural drawings. The locations shown on the Architectural drawings govern over the Mechanical and Electrical drawings. Those items not clearly located will be located as directed by the Architect.

4. Specifications must be read and interpreted with all the construction documents in combination. Drawings, schedules, and any other graphic representation supplement the written word. In the event of conflict between drawings and specifications, the specifications take precedence over the drawings.

Architects:

STUDIO JCI

20 De Boers Drive, Suite 525
Toronto, ON M3J 0H1
T. (416) 901 6528
www.studiojci.com

PROPOSED MIXED-USE DEVELOPMENT

375-409 Kingston Rd, Pickering, ON L1V 1A3

COVER

Project No.: 2423
Scale:
Date: November 21, 2024
Drawn by:

Drawing No.:

A0.00

PROPOSED RESIDENTIAL DEVELOPMENT
375-409 KINGSTON ROAD, PICKERING, ON L1V 1A3

PROJECT SUMMARY - TOTAL

01. SITE AREA		
	m²	*sf*
Existing lot area	17,601.9	189,465.3
MTO lands	1,337.7	14,398.9
Net Lot Area	18,067.1	194,472.6
Parkland Dedication (10% of net lot area)	1,806.7	19,447.3
TOTAL LOT AREA	**16,260.4**	**175,025.4**

02. GROSS FLOOR AREA		
	m²	*sf*
Estimated GFA	**93,653.3**	**1,008,075.7**

03. F.S.I	PROPOSED
(including Parkland dedication)	**5.18**

04. RETAIL	PROPOSED	
	m²	*sf*
Estimated Commercial	**3,167.8**	**34,097.9**

05. LOT COVERAGE	%
(including Parkland dedication)	**48.3%**
(excluding Parkland dedication)	**60.4%**

06. RESIDENTIAL UNITS	ESTIMATED	
1 Bedroom and 1B+Den	877	67%
2 Bedroom and 1B+Den	440	33%
TOTAL	**1317**	**100%**

07. CAR PARKING	ESTIMATED	
	REGULAR	**ACCESSIBLE**
P2	317	1
P1	285	2
GF (Loading and Staging)	45	4
Mezzanine	56	7
Floors 2	180	5
Floors 3	184	5
PARKING SPACES	**1067**	**24**
RATIO	**0.81**	

06. BIKE PARKING	ESTIMATED	
	LONG-TERM	**SHORT-TERM**
P2	256	0
P1	256	0
GF (Loading and Staging)	0	136
Mezzanine	128	0
L2	44	0
L3	0	0
TOTAL	**684**	**136**

PARKING SPACES WITHIN MTO SETBACK	78
TOTAL RATIO	0.87

08. AMENITY	ESTIMATED	
(4.54 m2 x total# of units)	*m²*	*sf*
Indoor	2779.4	29,917.2
Outdoor	5383.2	57,944.3
TOTAL	**8162.6**	**87,861.5**
Proposed Amenity Rate per Unit	**6.2**	66.7

09. BUILDING HEIGHT	ESTIMATED (m)
Building height	**107.40**
Building height (including mech)	**112.40**

AREA SUMMARY - TOTAL

LEVEL	ESTIMATED GCA		ESTIMATED GFA		EST. NSA : COMMERCIAL		EST. NSA : RESIDENTIAL		COMMON AREA		PARKING AREA		GFA EXEMPTION		INDOOR AMENITY		STORAGE	
	m²	*sf*	*m²*	*sf*	*m²*	*sf*	*m²*	*sf*	*m²*	*sf*	*m²*	*sf*	*m²*	*sf*	*m²*	*sf*	*m²*	*sf*
P2	12,009.5	129,269.2	215.5	2,319.6	0.0	0.0	0.0	0.0	410.5	4,418.6	10,909.1	117,424.6	11794	126,949.6	0.0	0.0	662.4	7,130.0
P1	12,009.5	129,269.2	215.5	2,319.6	0.0	0.0	0.0	0.0	930.1	10,011.5	10,909.1	117,424.6	11794	126,949.6	0.0	0.0	387	4,165.6
GROUND FLOOR (LOADING)	5,658.4	60,906.5	4,986.6	53,675.3	3,167.8	34,097.9	0.0	0.0	1,986.1	21,378.2	504.2	5,427.2	671.8	7,231.2	0.0	0.0	0	0.0
MEZZANINE	4,059.3	43,693.9	812.1	8,741.4	0.0	0.0	0.0	0.0	818.7	8,812.4	3,038.1	32,701.8	3247.2	34,952.6	0.0	0.0	202.6	2,180.8
FLOOR 2	8,728.3	93,950.6	510.6	5,496.1	0.0	0.0	0.0	0.0	480.3	5,169.9	7,887.1	84,896.0	8217.7	88,454.6	0.0	0.0	360.9	3,884.7
FLOOR 3	8,728.3	93,950.6	510.6	5,496.1	0.0	0.0	0.0	0.0	480.3	5,169.9	7,887.1	84,896.0	8217.7	88,454.6	0.0	0.0	360.9	3,884.7
FLOOR 4 (AMENITY)	3,723.9	40,083.7	1,751.9	18,857.3	0.0	0.0	1,413.3	15,212.6	547.6	5,894.3	0.0	0.0	1972	21,226.4	1763	18,976.8	0	0.0
FLOOR 5	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0	0.0	0.0	0.0
FLOOR 6	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 7	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 8	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 9	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 10	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 11	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 12	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 13	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 14	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 15	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 16	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 17	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 18	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 19	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 20	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 21	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 22	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 23	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 24	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 25	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 26	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 27	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 28	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 29	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 30	3,278.9	35,293.8	3,069.7	33,042.0	0.0	0.0	2,839.2	30,560.9	440.7	4,743.7	0.0	0.0	209.2	2,251.8	0.0	0.0	0.0	0.0
FLOOR 31	3,012.8	32,429.5	2,361.1	25,414.7	0.0	0.0	2,129.4	22,920.7	613.2	6,600.4	0.0	0.0	651.7	7,014.8	254.1	2,735.1	0.0	0.0
FLOOR 32	2,661.9	28,652.5	1,593.4	17,151.2	0.0	0.0	1,419.6	15,280.4	972.1	10,463.6	0.0	0.0	1,068.5	11,501.2	254.1	2,735.1	0.0	0.0
FLOOR 33	1,841.9	19,826.0	825.7	8,887.8	0.0	0.0	709.8	7,640.2	862.0	9,278.5	0.0	0.0	1,016.2	10,938.3	254.1	2,735.1	0.0	0.0
FLOOR 34	1,022.0	11,000.7	58.1	625.4	0.0	0.0	0.0	0.0	751.8	8,092.3	0.0	0.0	963.9	10,375.3	254.1	2,735.1	0.0	0.0
FLOOR 35 (MECH)	469.0	5,048.3	0.0	0.0	0.0	0.0	0.0	0.0	469.0	5,048.3	0.0	0.0	469	5,048.3	0.0	0.0	0.0	0.0
TOTAL	**149,176.2**	**1,605,719.3**	**93,653.3**	**1,008,075.7**	**3,167.8**	**34,097.9**	**79,491.3**	**855,637.2**	**20,779.9**	**223,673.0**	**41,134.7**	**442,770.2**	**55,522.9**	**597,643.5**	**2,779.4**	**29,917.2**	**1,973.8**	**21,245.8**

Issued

ZBA XX.XX.24
Description: Date: (mm.dd.yy)

General Notes:

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Architects:
STUDIO JCI
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PROPOSED MIXED-USE DEVELOPMENT

375-409 Kingston Rd, Pickering, ON L1V 1A3

PROJECT STATISTICS

Project No.: 2423
Scale: N/A
Date: November 20, 2024
Drawn by:

Drawing No.:
A0.01A

Issued

ZBA	XX.XX.24
Description:	Date: (mm.dd.yy)

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PROPOSED MIXED-USE DEVELOPMENT

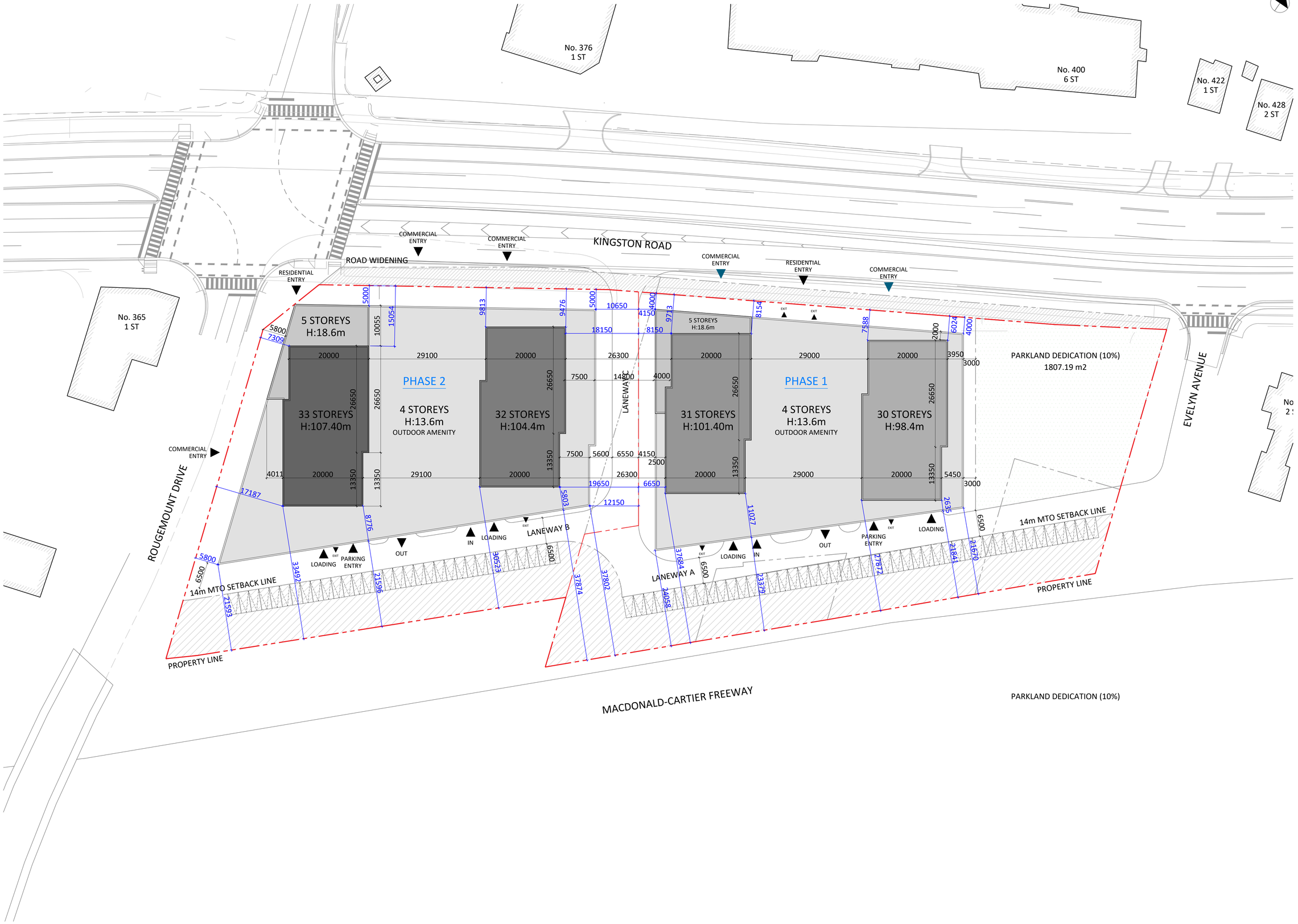
375-409 Kingston Rd, Pickering, ON L1V 1A3

AERIAL VIEWS

Project No.: 2423
Scale:
Date: November 21, 2024
Drawn by:

Drawing No.:

A0.010



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ZBA XX.XX.24

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PROPOSED MIXED-USE DEVELOPMENT

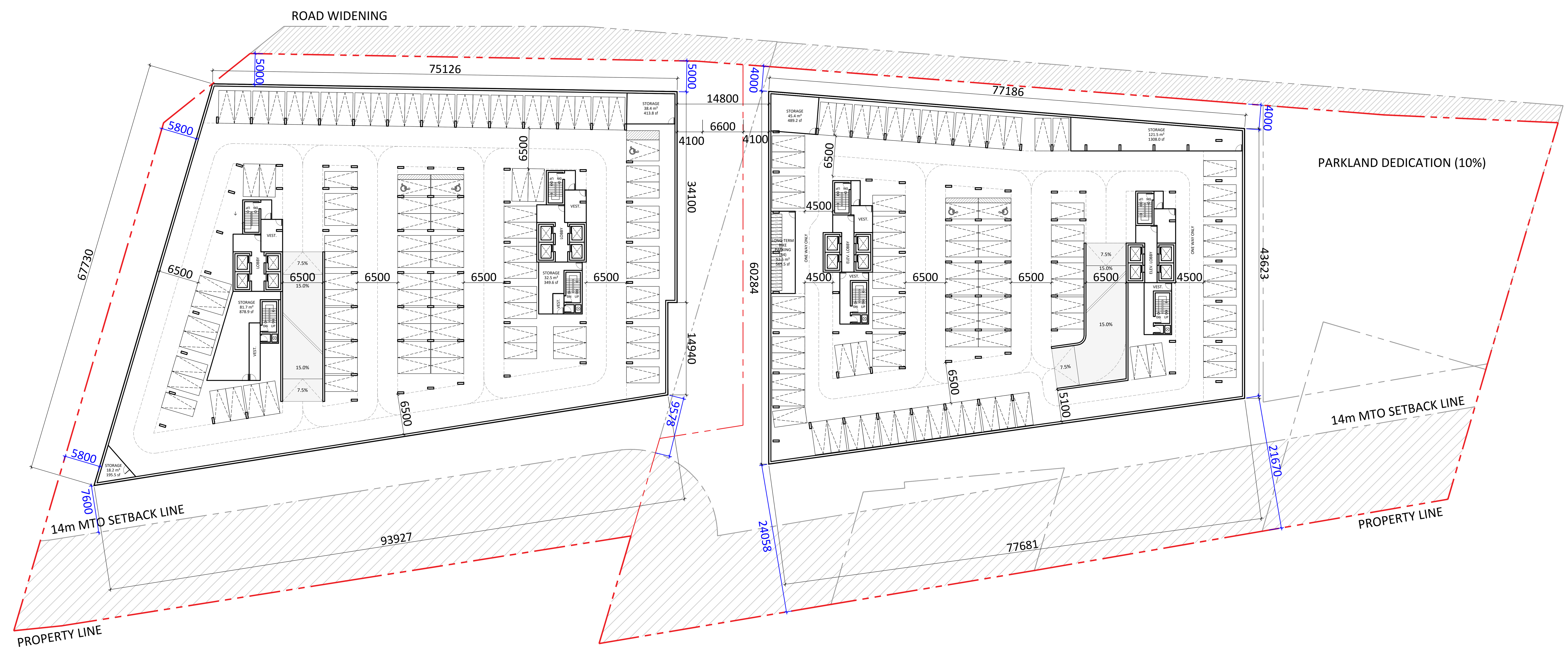
375-409 Kingston Rd, Pickering, ON L1V 1A3

SITE PLAN

Project No.: 2423
Scale: 1:400
Date: November 21, 2024
Drawn by:

Drawing No.:

A1.00



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Description:	Date: (mm.dd.yy)
ZBA	XX.XX.24

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PROPOSED MIXED-USE DEVELOPMENT

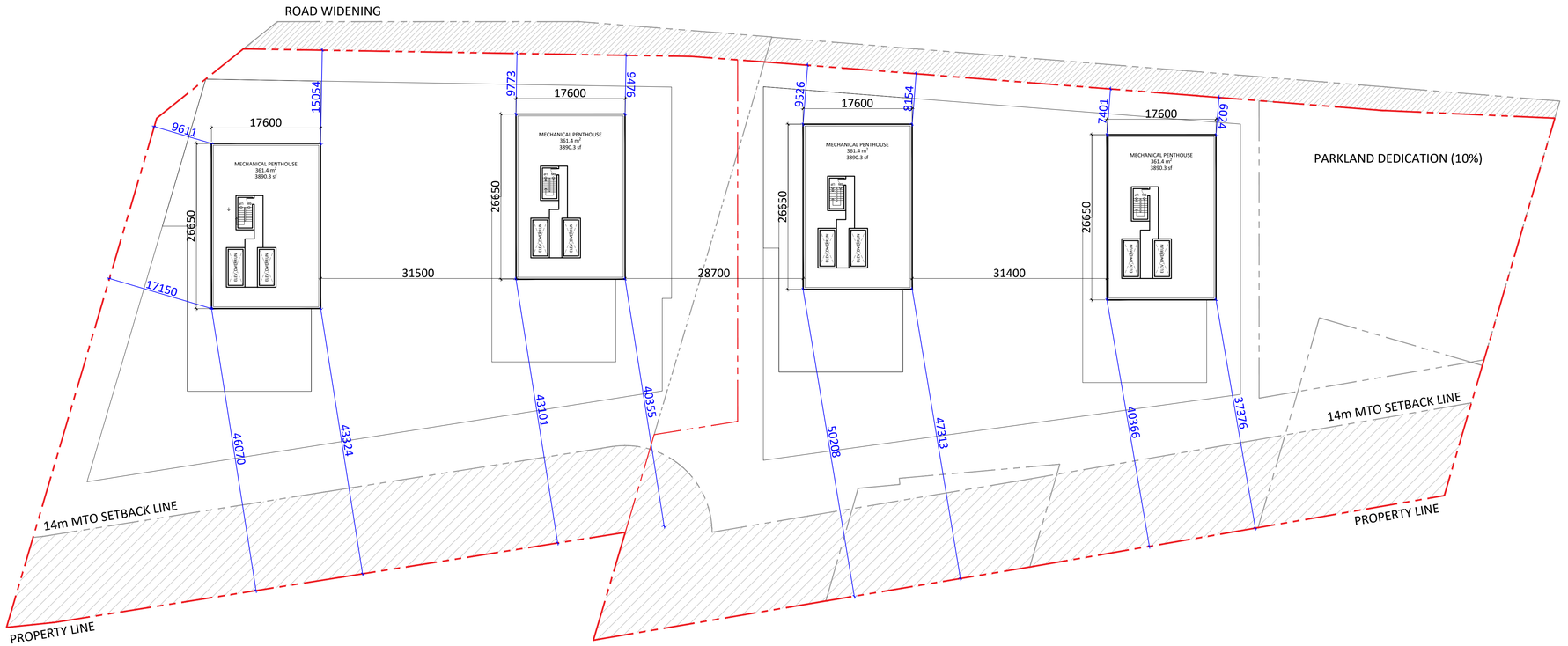
375-409 Kingston Rd, Pickering, ON L1V 1A3

2ND-3RD FLOOR PLAN

Project No.: 2423
Scale: 1:400
Date: November 21, 2024
Drawn by:

Drawing No.:

A3.04



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ZBA	XX.XX.24
Description:	Date: (mm.dd.yy)

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PROPOSED MIXED-USE DEVELOPMENT

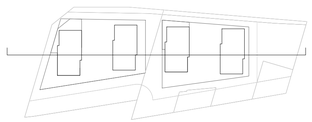
375-409 Kingston Rd, Pickering, ON L1V 1A3

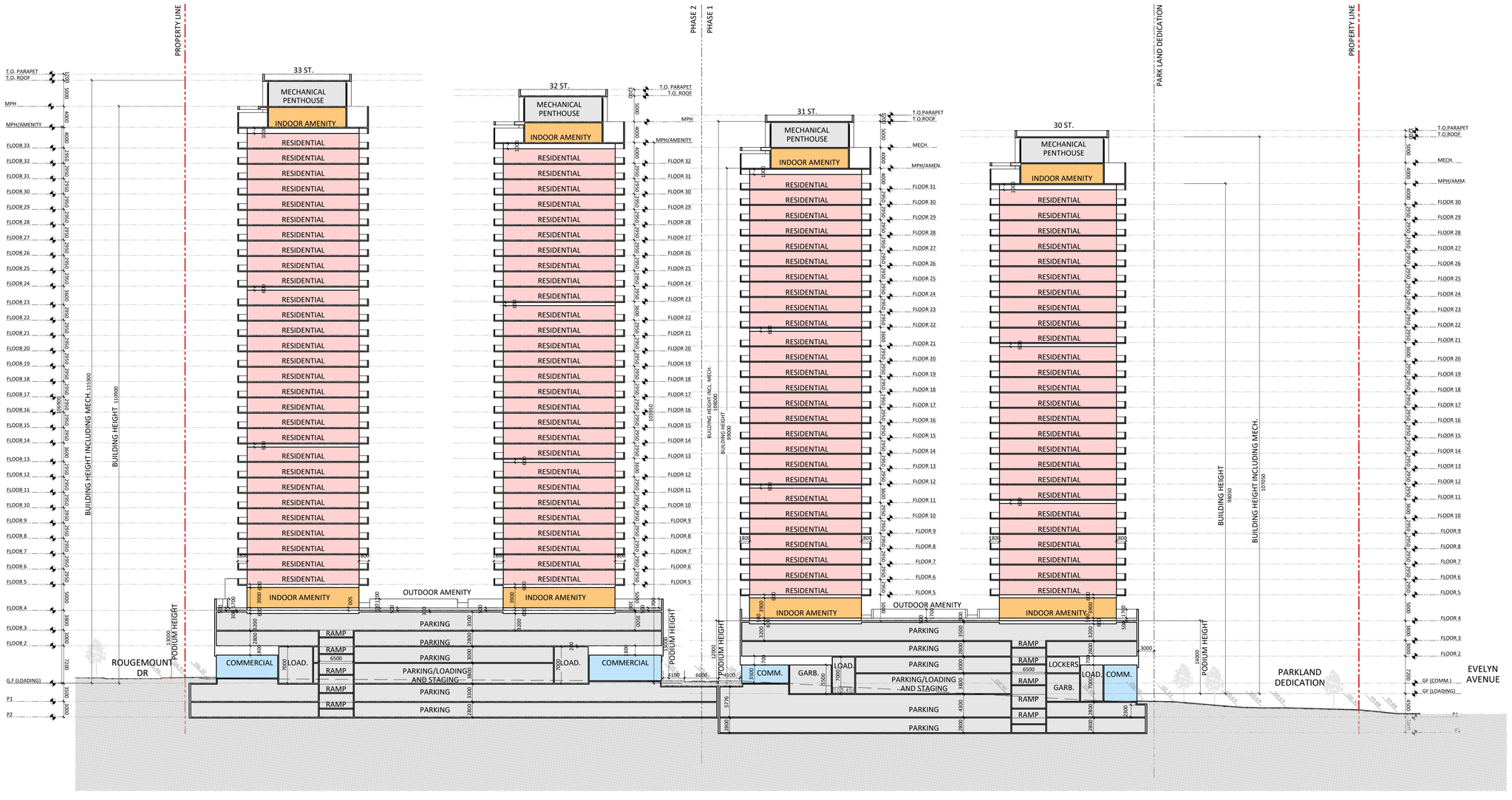
MECH.

Project No.:	2423
Scale:	1:400
Date:	November 21, 2024
Drawn by:	

Drawing No.:

A3.08





1 SECTION A

Issued

ZBA XX.XX.24

Description: Date: (mm.dd.yy)

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PROPOSED MIXED-USE DEVELOPMENT

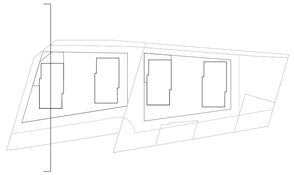
375-409 Kingston Rd, Pickering, ON L1V 1A3

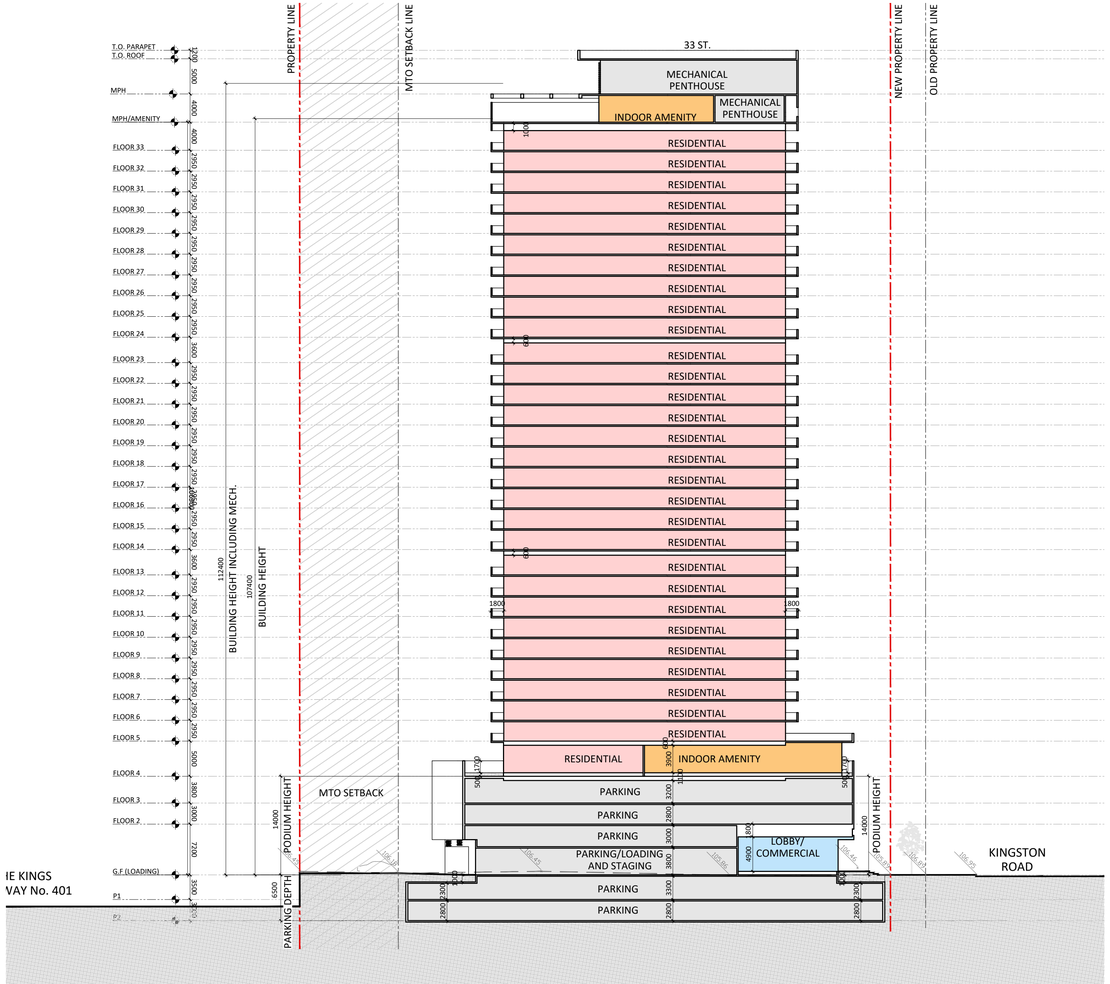
SECTION A

Project No.: 2423
Scale: 1:400
Date: November 21, 2024
Drawn by:

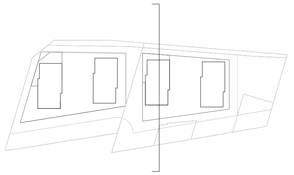
Drawing No.:

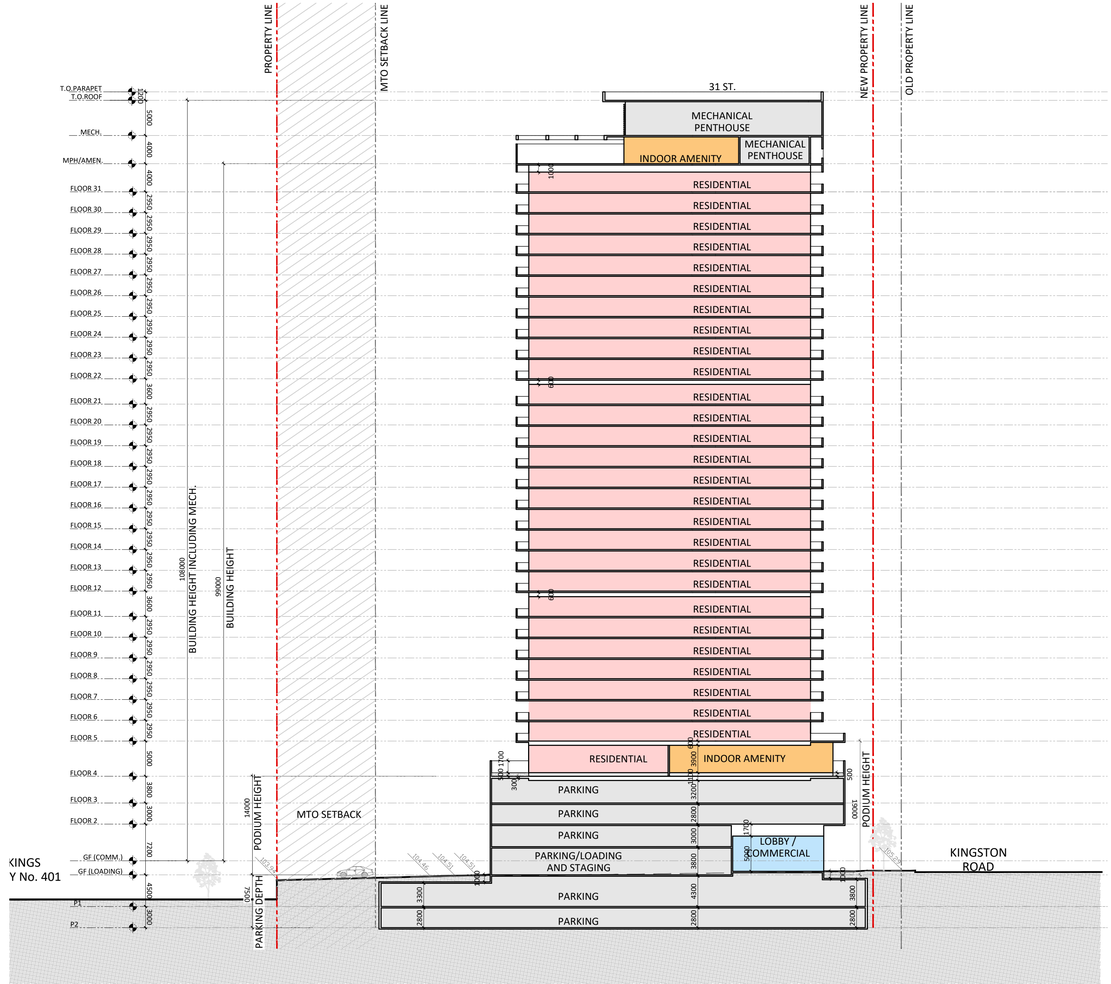
A6.00





1 SECTION B-PHASE 1





1 SECTION B-PHASE 1

Issued

ZBA XX.XX.24

Description: Date: (mm.dd.yy)

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PROPOSED MIXED-USE DEVELOPMENT

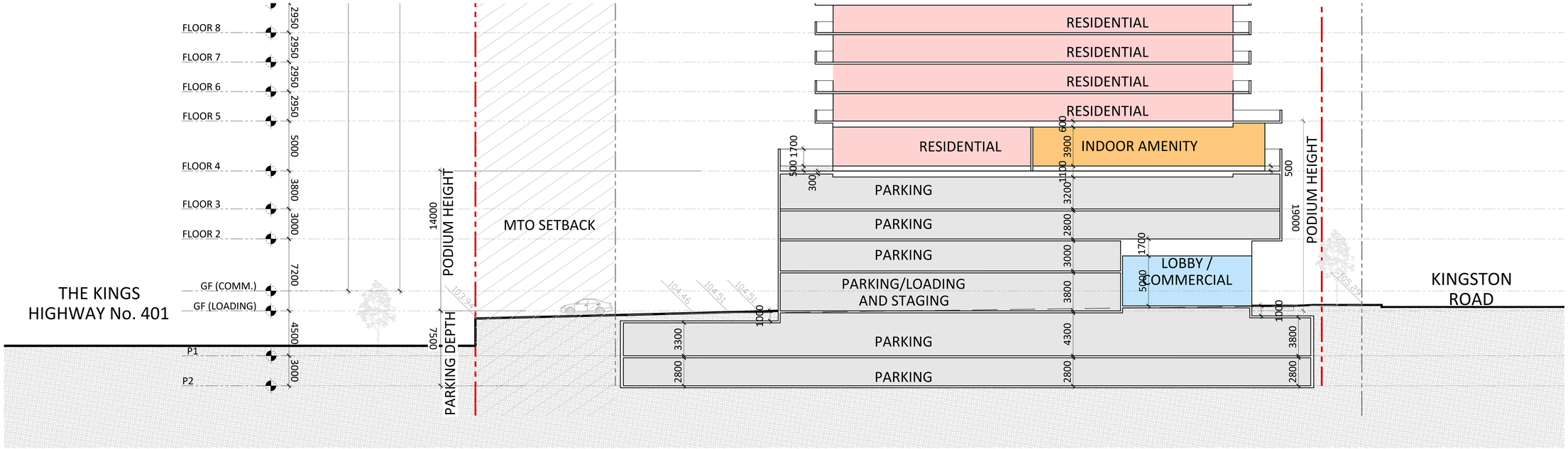
375-409 Kingston Rd, Pickering, ON L1V 1A3

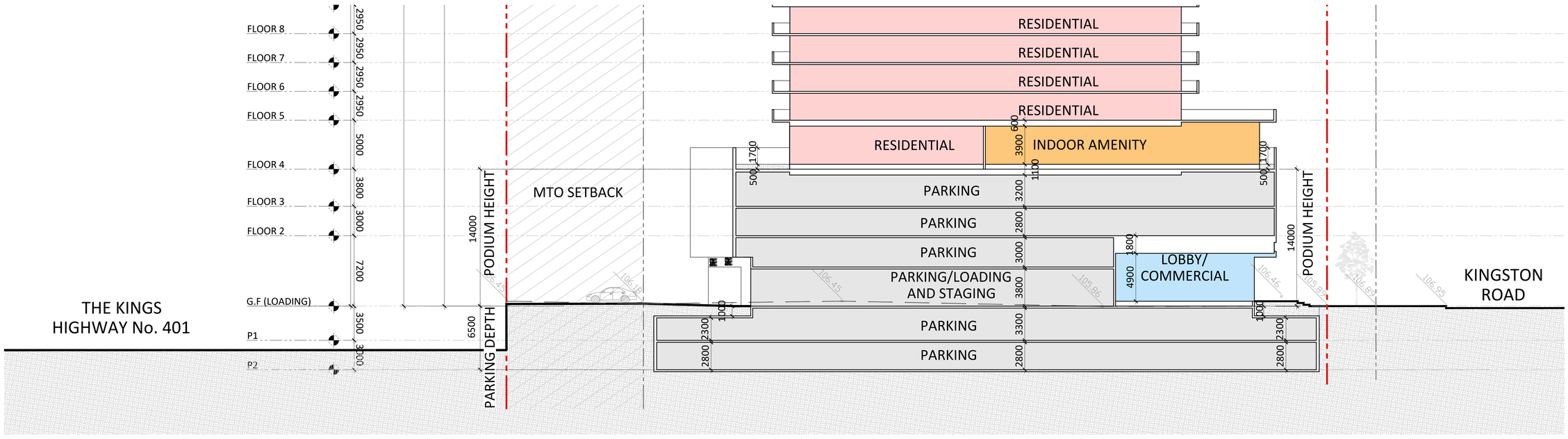
SECTION B & C

Project No.: 2423
Scale: 1:400
Date: November 21, 2024
Drawn by:

Drawing No.:

A6.01





Issued

ZBA XX.XX.24

Description: Date: (mm.dd.yy)

General Notes:

1. These Contract Documents are the property of the Architect. The Architect bears no responsibility for the interpretations of these documents by the Contractor. Upon written application the Architect will provide written/graphic clarification or supplementary information regarding the intent of the Contract Documents. The Architect will review Shop Drawings submitted by the Contractor for design conformance only.

2. Drawings are not to be scaled for construction. Contractor to verify all existing conditions and dimensions required to perform the Work and report any discrepancies with the Contract Documents to the Architect before commencing work.

3. Positions of exposed or finished mechanical or electrical devices, fittings, and fixtures are indicated on the Architectural drawings. The locations shown on the Architectural drawings govern over the Mechanical and Electrical drawings. Those items not clearly located will be located as directed by the Architect.

4. Specifications must be read and interpreted with all the construction documents in combination. Drawings, schedules, and any other graphic representation supplement the written word. In the event of conflict between drawings and specifications, the specifications take precedence over the drawings.

Architects:

STUDIO JCI

20 De Boers Drive, Suite 525
Toronto, ON M3J 0H1
T. (416) 901 6528
www.studiojci.com

PROPOSED MIXED-USE DEVELOPMENT

375-409 Kingston Rd, Pickering, ON L1V 1A3

SECTION D & E

Project No.: 2423
Scale: 1:200
Date: November 21, 2024
Drawn by:

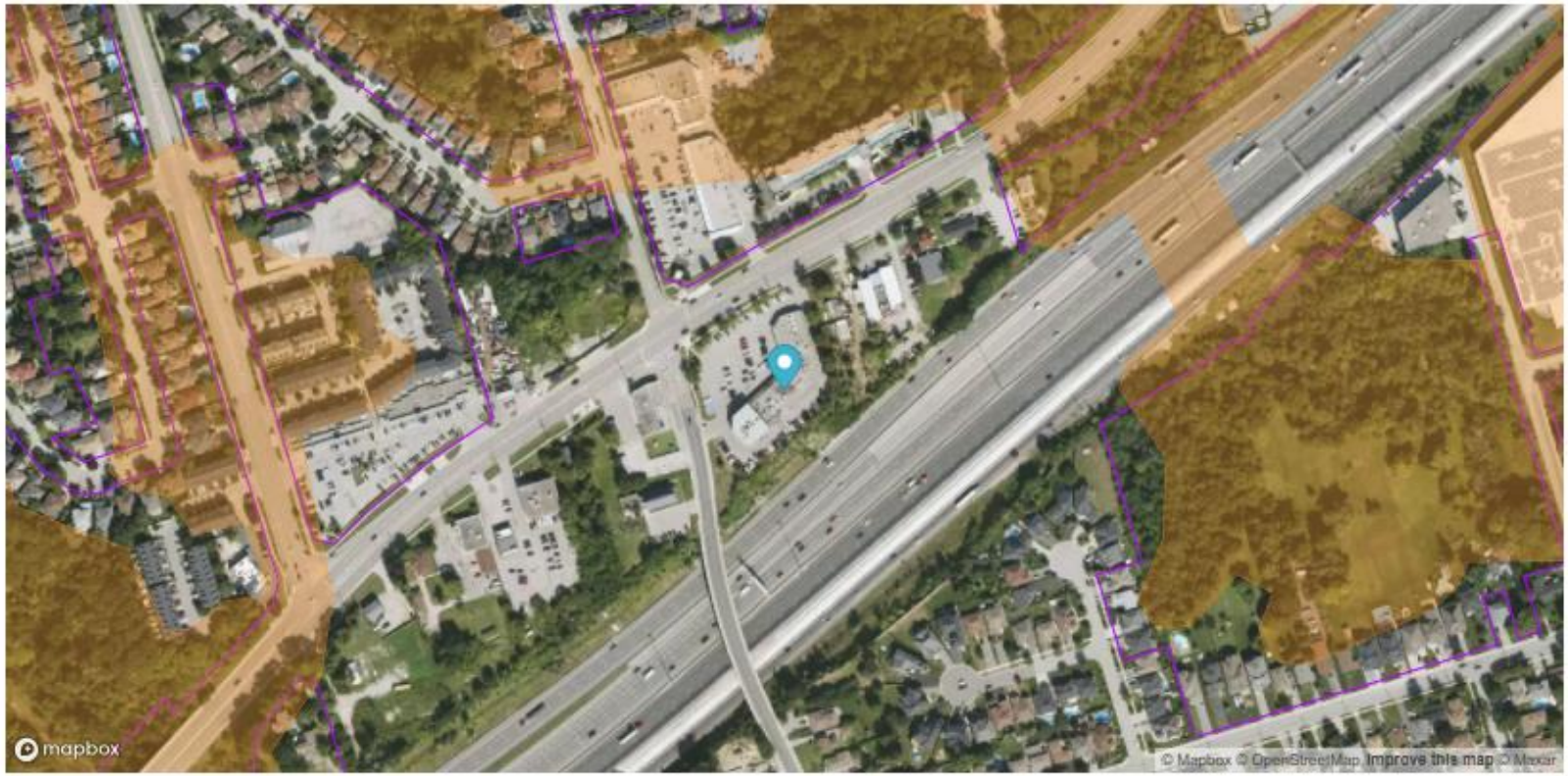
Drawing No.:

A6.02

375 Kingston Road, Pickering, Ontario L1V 1A3, Canada

☑ I agree that I have read and understood the Terms and Conditions

That address is within TRCA's jurisdiction, but does not appear to be within a TRCA Regulated Area. If you have further questions please contact us.



Map Layers

TRCA Conceptual Regulated Area

Parcel Boundary

PLAN OF TOPOGRAPHIC DETAIL OF 375 KINGSTON ROAD, PICKERING, ON REGIONAL MUNICIPALITY OF DURHAM

SCALE 1:250

5 0 5 10 15 METRES

DONEVAN FLEISCHMANN PETRICH LTD., 2021

METRIC

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

"CAUTION"

THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED EXCEPT FOR THE PURPOSE INDICATED IN THE TITLE BLOCK. THIS SKETCH IS PROTECTED BY COPYRIGHT. BOUNDARY INFORMATION SHOWN HEREON IS COMPILED FROM AVAILABLE SOURCES. CONTRACTOR TO VERIFY ALL UNDERGROUND SERVICES PRIOR TO EXCAVATION.

ELEVATION NOTE

ELEVATIONS ARE GEODETIC, DERIVED BY RTK GPS OBSERVATIONS USING THE TOPNET REAL-TIME NETWORK SERVICE AND REFERRED TO CGVD28-1978 USING THE NRCAN HTv2.0 GEOID SEPARATION MODEL.

TEMPORARY BENCHMARK (TBM)

TOP NUT OF HYDRANT, AS SHOWN ON PLAN, HAVING AN ELEVATION OF 107.48

LEGEND

PED	DENOTES COMMUNICATIONS PEDESTAL
CAB	DENOTES COMMUNICATIONS CABINET
UGV	DENOTES UNDERGROUND VAULT
HW	DENOTES HANDWELL
CB	DENOTES CATCHBASIN
HMH	DENOTES HYDRO MANHOLE
FH	DENOTES FIRE HYDRANT
GW	DENOTES GUY WIRE
MH	DENOTES MANHOLE
UP	DENOTES UTILITY POLE
LS	DENOTES LIGHT STANDARD
TL	DENOTES TRAFFIC LIGHT
TLS	DENOTES TRAFFIC LIGHT STANDARD
WV	DENOTES WATER VALVE
MW	DENOTES MONITORING WELL
GM	DENOTES GAS METER
DS	DENOTES DOWN SPOUT
BOL	DENOTES BOLLARD
FFE	DENOTES FINISHED FLOOR ELEVATION
DSE	DENOTES DOOR SILL ELEVATION
BH	DENOTES BOREHOLE
CLF	DENOTES CHAIN LINK FENCE
HGEN	DENOTES HYDRO GENERATOR
HV	DENOTES HYDRO VAULT

KINGSTON ROAD

ROUGEMONT DRIVE

THE KING'S HIGHWAY No. 401

PART 1, 40R-31275

PLAN REGISTERED PLAN 350

LOT 3

LOT 4

LOT 5

LOT 6

LOT 19

PIN 26308-0005

1 & 2 STOREY BRICK PLAZA No. 375 KINGSTON ROAD

TBM
TOP NUT OF HYDRANT
ELEV=107.48

FIELDWORK COMPLETION DATE: JUNE 11, 2021

REV	DATE	DESCRIPTION	BY
1	JUNE 15, 2021	ISSUED TO CLIENT	MDM

DFP SURVEYORS

DONEVAN FLEISCHMANN PETRICH LTD.
ONTARIO LAND SURVEYORS
SUITE 1, 1101 BOUNDARY ROAD
PH1: 905-725-4795 PH2: 1-888-743-2222
FAX: 905-725-9957

DRAWN BY: TD CHK'D: MDM
SCALE: 1:250 SIZE: 28X31
JOB No: 2021-120

THE WORK AND DRAWINGS HEREIN WERE COMPLETED FOR THE EXCLUSIVE USE OF
375 KINGSTON RD CORP
NO RESPONSIBILITY IS ASSUMED TO ANY THIRD PARTIES OR SUBSEQUENT OWNERS.

PLAN OF SURVEY OF

PART OF LOTS 17, 18 & 19
REGISTERED PLAN 230
PART OF LOT 6 & 19
REGISTERED PLAN 350
CITY OF PICKERING

REGIONAL MUNICIPALITY OF DURHAM

SCALE 1 : 200

0 1 2 3 4 5 10 20m.

AKSAN PILLER CORPORATION LTD.

BEARING NOTE:
BEARINGS ARE UTM GRID, DERIVED FROM GNSS OBSERVATIONS, USING A REAL TIME KINEMATIC SERVICE, ON MONUMENTS A & B, SHOWN HEREON, HAVING A BEARING OF N58° 37'30"E, AND ARE REFEREED TO THE CENTRAL MERIDIAN OF UTM ZONE 17 (81° 00' WEST LONGITUDE) NAD83 (CSRS) (2010).

NOTES:
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.9996.

POINT ID	NORTHING	EASTING
A ORP	4852459.26	650557.49
B ORP	4852528.98	650671.83
1	4852520.34	650670.13
2	4852480.88	650683.26
3	4852472.24	650657.27
4	4852438.78	650668.43
5	4852412.64	650641.78
6	4852428.99	650636.32
7	4852407.30	650611.85
8	4852389.24	650617.91
9	4852362.49	650590.66
10	4852455.17	650560.16
11	4852472.48	650589.97
12	4852488.06	650616.66
13	4852505.33	650646.23

COORDINATES ARE TO URBAN AS IN SEC. 14(2). OF O.REG. 216/10, AND CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

CAUTION:
TREE CALIPERS ARE NOT TO ARBORIST STANDARDS AND ARE DEFINED AT 1.4m ABOVE GRADE AT TREE FOR ARBORIST CALIPER REFER TO ARBORIST REPORT.

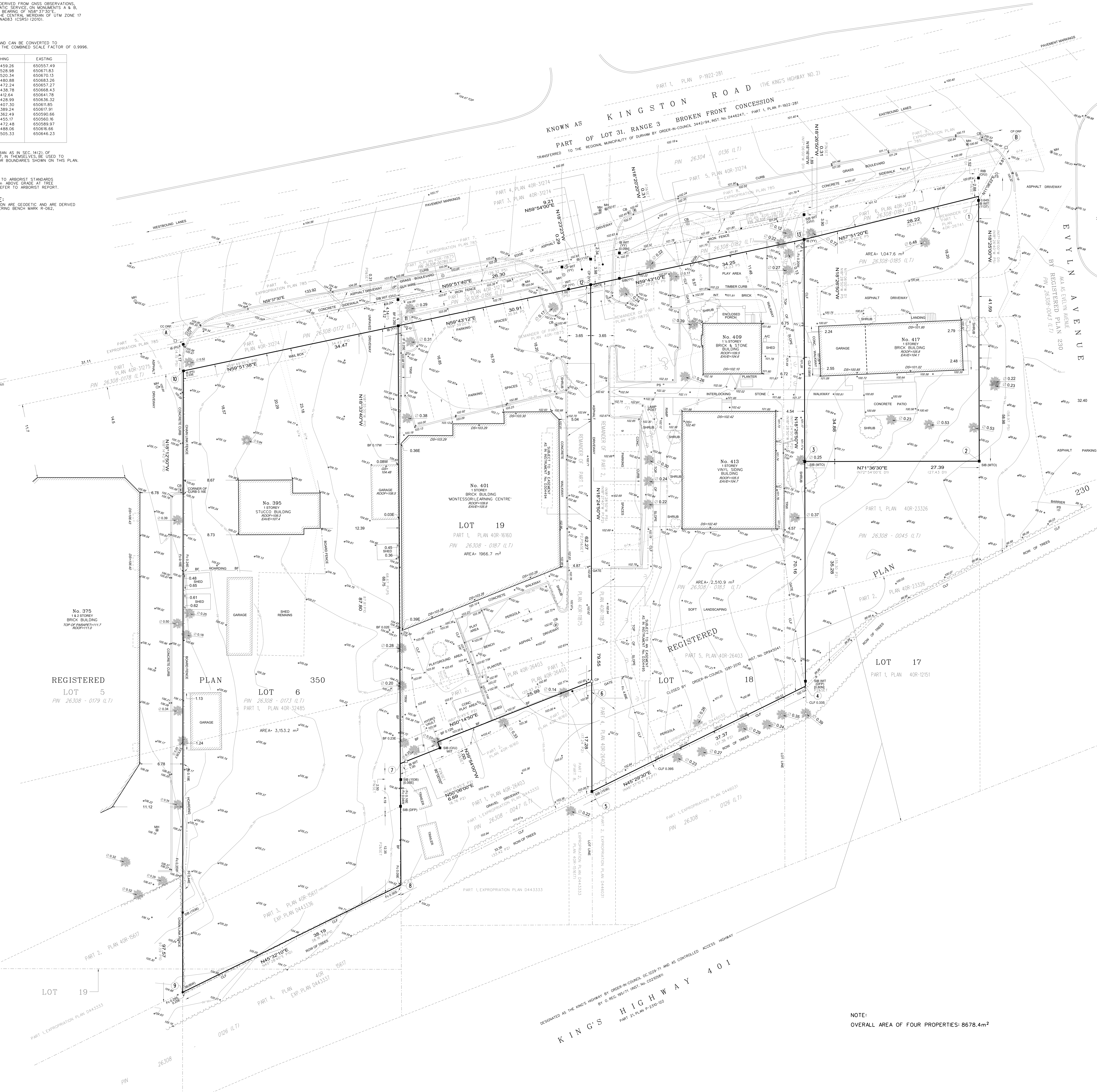
ELEVATIONS NOTE:
ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE DERIVED FROM THE CITY OF PICKERING BENCH MARK R-062, ELEVATION = 106.900 m.

LEGEND:

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT PLANTED
IB	DENOTES	IRON BAR
RIB	DENOTES	ROUND IRON BAR
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
CC	DENOTES	CUT CROSS
CP	DENOTES	CONCRETE PIN
WIT	DENOTES	WITNESS MONUMENT
O/U	DENOTES	ORIGIN UNKNOWN
N	DENOTES	NORTH
S	DENOTES	SOUTH
E	DENOTES	EAST
W	DENOTES	WEST
Fc.	DENOTES	FENCE
CLF	DENOTES	CHAIN LINK FENCE
BF	DENOTES	BOARD FENCE
IF	DENOTES	IRON FENCE
CB	DENOTES	CATCHBASIN
PS	DENOTES	PARKING SIGN
TS	DENOTES	TRAFFIC SIGN
TRW	DENOTES	TIMBER RETAINING WALL
T/W	DENOTES	TOP OF WALL ELEVATION
MH	DENOTES	MANHOLE
DS	DENOTES	DOOR SILL
GS	DENOTES	GARAGE SILL
O/W	DENOTES	OVERHEAD WIRES
WK	DENOTES	WATER KEY
UP	DENOTES	UTILITY POLE
D1	DENOTES	INST. No. D5007
D2	DENOTES	INST. No. D304495
D3	DENOTES	INST. No. D304494
PLAN	DENOTES	REGISTERED PLAN 230
P1	DENOTES	PLAN 40R-16160
P2	DENOTES	PLAN 40R-26403
P3	DENOTES	PLAN 40R-11875
P4	DENOTES	PLAN 40R-26741
P5	DENOTES	PLAN 40R-31274
P6	DENOTES	PLAN 40R-12151
P7	DENOTES	PLAN 40R-15617
P8	DENOTES	PLAN 40R-31275
P9	DENOTES	PLAN EXP. D554337
P10	DENOTES	PLAN 40R-32485
DFP	DENOTES	DONEVAN FLEISCHMANN PETRICH, O.L.S. (PLAN 40R-15425) (PLAN 40R-23326)
JDB	DENOTES	J.D. BARNES, O.L.S.
YY	DENOTES	YOUNG & YOUNG SURVEYING, O.L.S. (PLAN 40R-31274)
1137	DENOTES	R.G. McKIBBON, O.L.S.
MTO	DENOTES	MINISTRY OF TRANSPORTATION OF ONTARIO
1536	DENOTES	F. PETRICH, O.L.S.
⌀ 0.50	DENOTES	TREE TRUNK DIAMETER

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2198411

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR. In accordance with Regulation 1026, Section 29(3).



NOTE:
OVERALL AREA OF FOUR PROPERTIES: 8678.4m²

NOTE:
THIS PLAN WAS UPDATED ON THE 7th DAY OF JANUARY, 2025 TO ADD TOPOGRAPHIC DETAILS ON AREA DESCRIBED IN PIN 26308-0173 STREET LINE WAS RECALCULATED TO REFLECT RECENT EXPROPRATION
NO OTHER FEATURES WERE UPDATED

JANUARY 15, 2025
date

HELMUT PILLER
Ontario Land Surveyor

SURVEYOR'S CERTIFICATE:
I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM;
2. THE SURVEY WAS COMPLETED ON THE 15th DAY OF SEPTEMBER , 2022

SEPTEMBER 19, 2022
DATE

ANNA AKSAN
Ontario Land Surveyor

AKSAN PILLER CORPORATION LTD
ONTARIO LAND SURVEYORS
943 MT PLEASANT ROAD, TORONTO, ONTARIO, M4P 2L7
(T) 416-488-1174 (F) 416-488-7843 (E) ap@apsurveys.ca www.apsurveys.ca
CALC: MU DRAWN: LF CHECKED: HP
reference number: 22-24-14716-01

METRIC: DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

APPENDIX B – LOG 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

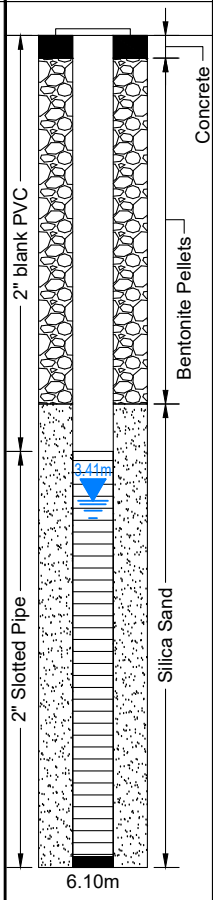
DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
				106.03			
0	0	100mm ASPHALT 150mm GRANULAR MATERIAL				SS-1	17
2		SILTY SAND/SILT: Grey, trace of clay, moist, compact (possible fill)		0.61 105.42			
4	1	SILT: Grey, trace of clay and sand, moist, compact 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							
14	4						
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
36	11	SANDY SILT TILL: Grey, trace of clay and gravel, moist, very dense				SS-10	100+		4.4%	
40	12					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

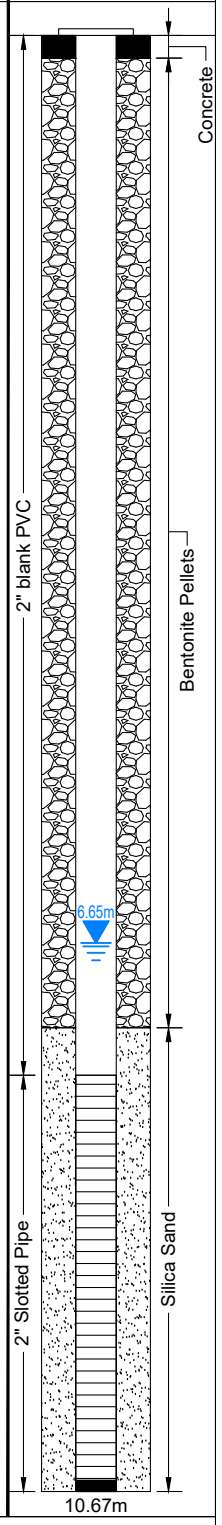
DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE
				105.59			
0	0	150mm GRANULAR MATERIAL		0.15 / 105.44			
2	1	SILTY SAND TILL: Reddish brown/brown, trace of clay and gravel, moist, dense to very dense				SS-1	37
4	1					SS-2	47
6	2					SS-3	100+
8	2			2.74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



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)	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+			10.67m
38	12									
40	12					SS-11	100+			
		End of borehole at 12.47m		12.47/ 93.12						
42	13									
44	13									
46	14									
48	15									
50	15									
52	16									
54	16									
56	17									
58	18									
60	18									
62	19									
64	19									
66	20									
68	21									
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

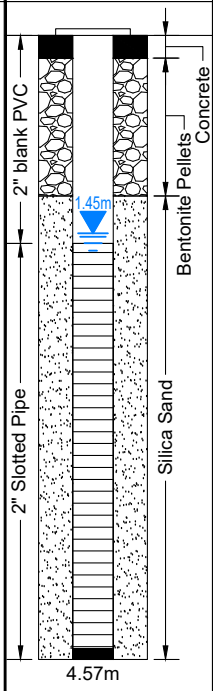
DRILLING DATE: 6 January, 2025

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%



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	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, some clay, trace of gravel, moist, very dense				SS-10	100+		6.6%	
38	12									
40						SS-11	100+		7.9%	
				12.62/ 89.66						
42	13	End of borehole at 12.62m								
44										
46	14									
48										
50	15									
52										
54	16									
56										
58	17									
60										
62	18									
64										
66	19									
68										
70	20									
	21									

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

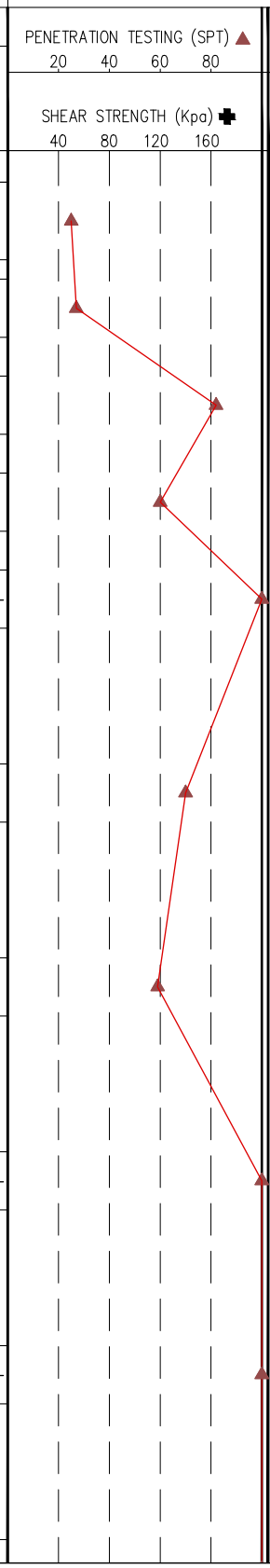
PROJECT NAME: GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATIONS

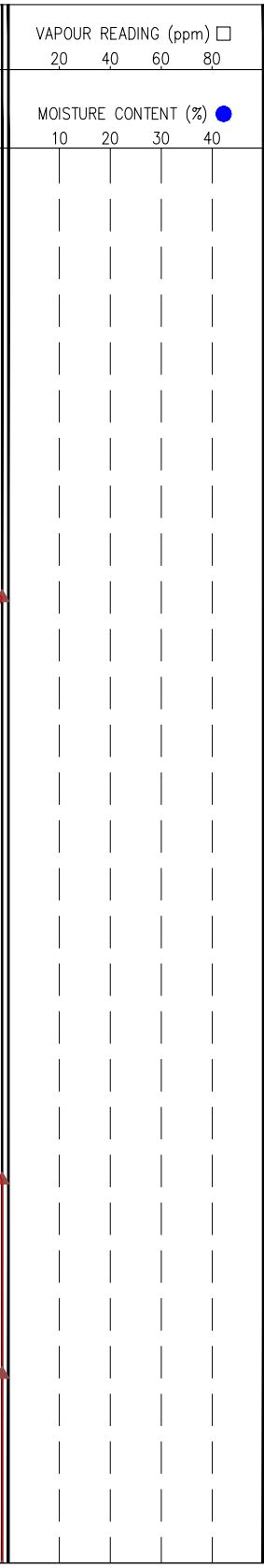
LOCATION: 375-417 Kingston Road, Pickering, ON

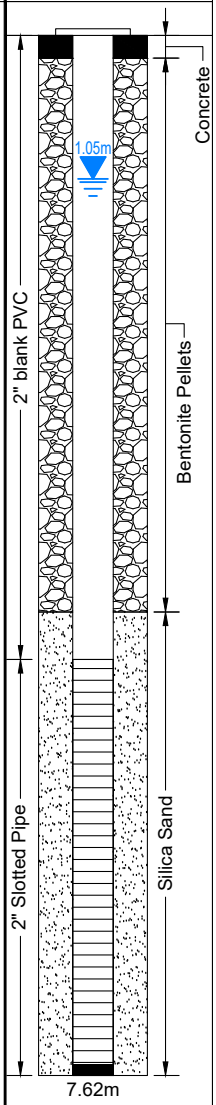
DRILLING METHOD: CME-75 Truck, Mud Rotary

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				SS-1	25
2		FILL: Dark brown clayey sandy silt, trace of gravel, moist		0.69 / 105.38			
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						SS-11	100+			
42	13									
44										
46	14					SS-12	100+			
48										
50	15					SS-13	100+			
52	16			16.15/ 89.92						
54		SANDY SILT TILL: Grey, trace of clay and gravel, moist, very dense								
56	17					SS-14	100+			
58										
60	18									
62						SS-15	100+			
64	19									
66	20			20.10/ 85.97		SS-16	100+			
68		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

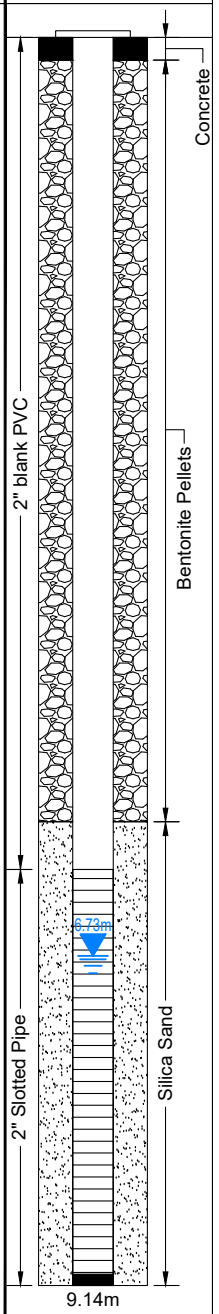
LOCATION: 375-417 Kingston Road, Pickering, ON

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							
2		FILL: Dark grey silty sand, trace of clay, gravel and topsoil, moist				SS-1	22		
				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						
82						SS-19	100+
84	25						
86						SS-20	100+
88	26						
90						SS-21	100+
92	27						
94							
96	28					SS-22	84
98							
100	29						
102	30					SS-23	69
104		End of borehole at 30.94m		30.94 / 75.42			
	31						
	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	SAMPLES Type NO.	"N" VALUE
				104.66			
0	0	GRANULAR MATERIAL		0.53 / 104.13		SS-1	34
2	1	FILL: Dark grey silty sand, trace of clay, gravel, roots and topsoil, moist				SS-2	52
4				1.68 / 102.98		SS-3	79
6	2	SANDY SILT TILL: Brown, some clay, trace of gravel, moist, very dense				SS-4	100+
8							
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							

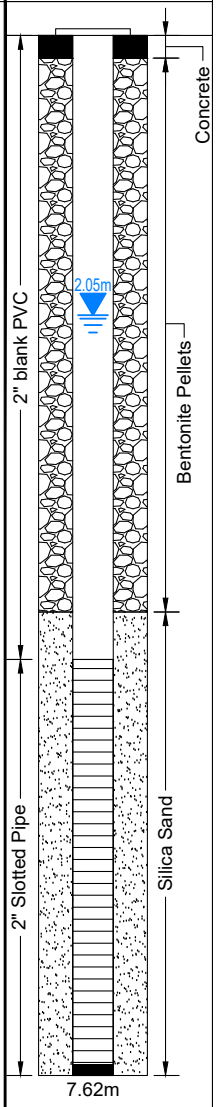
PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

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. 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+
44	13						
46	14					SS-12	100+
50	15					SS-13	100+
54	16						
56	17					SS-14	100+
60	18					SS-15	100+
64	19						
66	20					SS-15	57
68	21	End of borehole at 20.27m		20.27/ 84.39			
70							

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							
34	10	SANDY SILT TILL: Grey, some clay, trace of gravel, moist, very dense		10.21 / 92.50			

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%

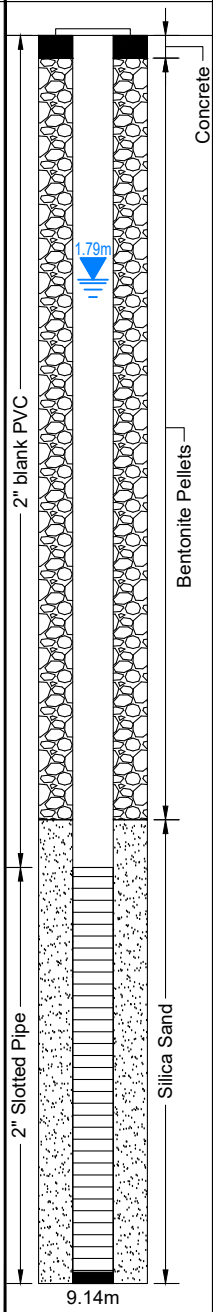
13.0%

7.4%

9.8%

7.7%

PIEZOMETER OR WELL CONSTRUCTION



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	13					SS-11	77		7.7%	
42	13									
44	14					SS-12	84		9.4%	
46	14									
48	15									
50	15					SS-13	100+		8.9%	
52	16									
54	16									
56	17					SS-14	83		9.4%	
58	18									
60	18									
62	19			19.20/ 83.51		SS-15	84		8.9%	
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										

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

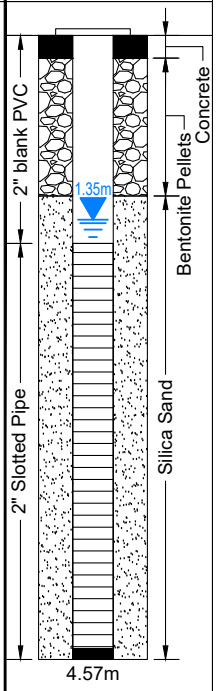
LOCATION: 375-417 Kingston Road, Pickering, ON

DRILLING METHOD: CME-75 Truck, Mud Rotary

DRILLING DATE: 18 December, 2024

DEPTH (feet)	DEPTH (meters)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID	Type NO.	"N" VALUE	PENETRATION TESTING (SPT) ▲ / SHEAR STRENGTH (Kpa) ✚	VAPOUR READING (ppm) □ / MOISTURE CONTENT (%) ●
				106.43				20 40 60 80 / 40 80 120 160	20 40 60 80 / 10 20 30 40
0	0	100mm ASPHALT 150mm GRANULAR MATERIAL							
2		FILL: Dark brown clayey sandy silt, trace of gravel, moist		0.69 105.74		SS-1	14		
4	1	SILT & SAND TILL: Brown to grey, trace of clay and gravel, moist, very dense				SS-2	54		
6	2					SS-3	100+		5.5%
8						SS-4	100+		
10	3					SS-5	100+		5.7%
12									
14	4								
16	5					SS-6	71		6.0%
18									
20	6					SS-7	100+		4.6%
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+		6.3%
28									
30	9					SS-9	100+		5.4%
32									
34	10								

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)	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, some/trace of clay, trace of gravel, moist, very dense				SS-10	100+		●5.1%	
38										
40	12			12.24/ 94.19		SS-11	100+		●5.5%	
		End of borehole at 12.24m								
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	Type NO.	"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	10						
34							

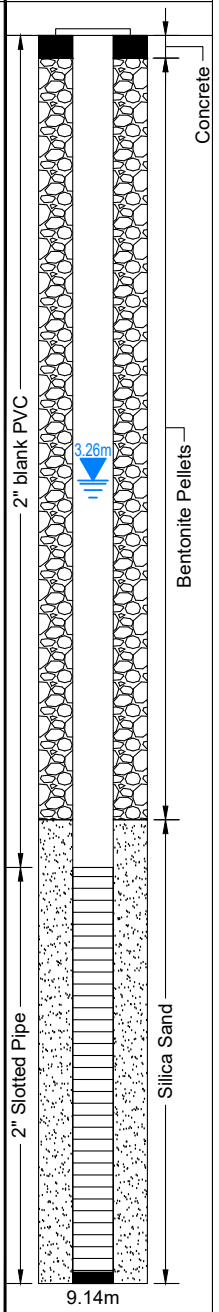
PENETRATION TESTING (SPT) ▲ 20 40 60 80

SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

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)	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, trace of clay and gravel, moist, very dense				SS-10	100+			
38										
40	12					SS-11	100+			
		End of borehole at 12.45m		12.45/ 93.73						
42	13									
44										
46	14									
48										
50	15									
52	16									
54										
56	17									
58										
60	18									
62	19									
64										
66	20									
68										
70	21									

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: 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		FILL: Dark brown sandy silt, trace to some clay, trace of gravel, roots and topsoil, moist					
4	1					SS-2	14
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	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

8.8%

4.5%

5.6%

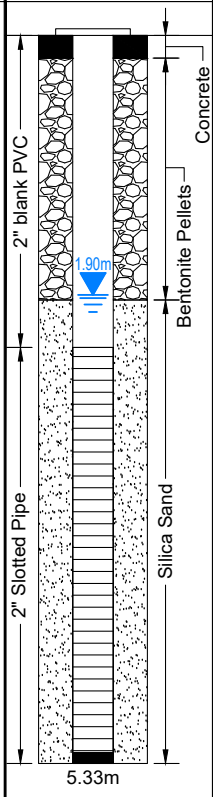
3.3%

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)	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, 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	16									
54										
56	17									
58										
60	18									
62	19									
64										
66	20									
68										
70	21									

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: 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

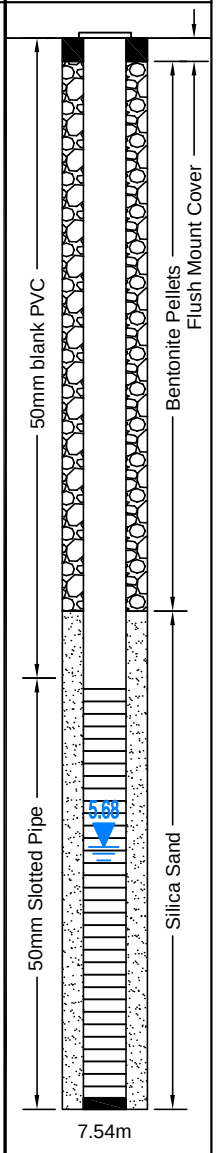
DEPTH (feet)	DEPTH (metres)	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	LAB ID:	TYPE NUMBER	P.I.D. Reading	"N" VALUE
		GROUND SURFACE (m asl)		100.33				
0	0	60mm Asphalt FILL: grey silty sand, slightly moist. Petrol odour.		0.46/ 99.87	21-6436-1	SS-1		12
4	1	GREY SILT: slightly moist, very dense. Petrol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

PIEZOMETER OR WELL CONSTRUCTION



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)	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
2						SS-2		31
4	1	GREY SILT: slightly moist, dense to very dense.						
6	2					SS-3		100+
8				2.44/ 97.79	21-6436-3	SS-4		100+
		GREY SANDY SILT TILL: trace of gravel, dry to moist, very dense.						
10	3			3.20/ 97.03		SS-5		58
12		GREY SILTY SAND TILL: trace of gravel, moist, very dense.						
14	4							
16						SS-6		64
18	5							
20	6							
				8.08/ 92.15		SS-7		82
22	7	End of Borehole						
24								
26	8							
28								
30	9							
32	10							

PENETRATION TESTING (SPT) ▲ 20 40 60 80

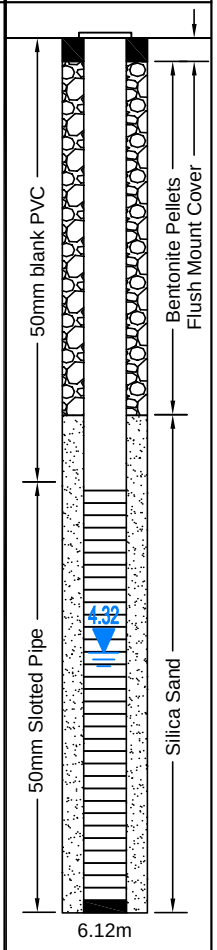
SHEAR STRENGTH (Kpa) ✚ 40 80 120 160

VAPOUR READING (ppm) □ 20 40 60 80

MOISTURE CONTENT (%) ● 10 20 30 40

● 5.9%

PIEZOMETER OR WELL CONSTRUCTION



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
0	0	GROUND SURFACE (m asl)		99.20				
		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					21-6436-4	SS-3		100+
	2	BROWNISH GREY SANDY SILT TILL: trace of gravel, dry, very dense.						
8						SS-4		100+
				3.05/ 96.15				
10	3					SS-5		100+
12		GREY SILTY SAND TILL: trace of gravel, slightly moist to dry, very dense.						
	4							
14								
16						SS-6		100+
	5							
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

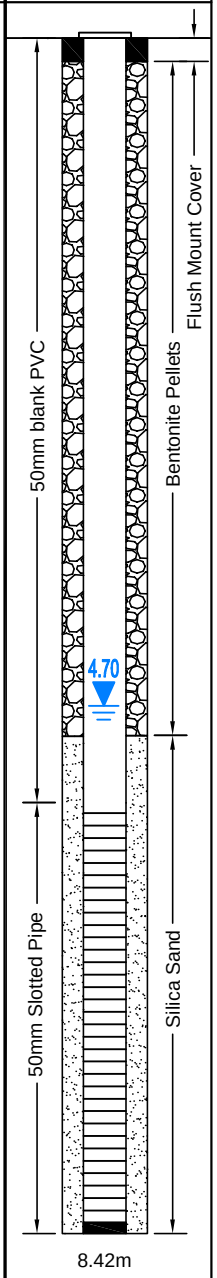
PROJECT NAME: Phase II ESA & Geotechnical Investigation	LOCATION: 375 Kingston Road, Pickering, Ontario
DRILLING METHOD: D-50, Solid Stem	DRILLING DATE: April 28, 2021

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							
				4.72/ 94.42				
16	5	GREY SILTY SAND TILL: trace of gravel, dry, very dense.				SS-6		100+
18								
20	6					SS-7		100+
22	7							
24								
26	8					SS-8		100+
28								
30	9							
32	10	End of Borehole		9.60/ 89.54				

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; 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 DISTRIBUTION ANALYSES

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

Results related only to the items tested

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

Results related only to the items tested

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			

Results related only to the items tested

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**

Results related only to the items tested

Certificate of Analysis

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

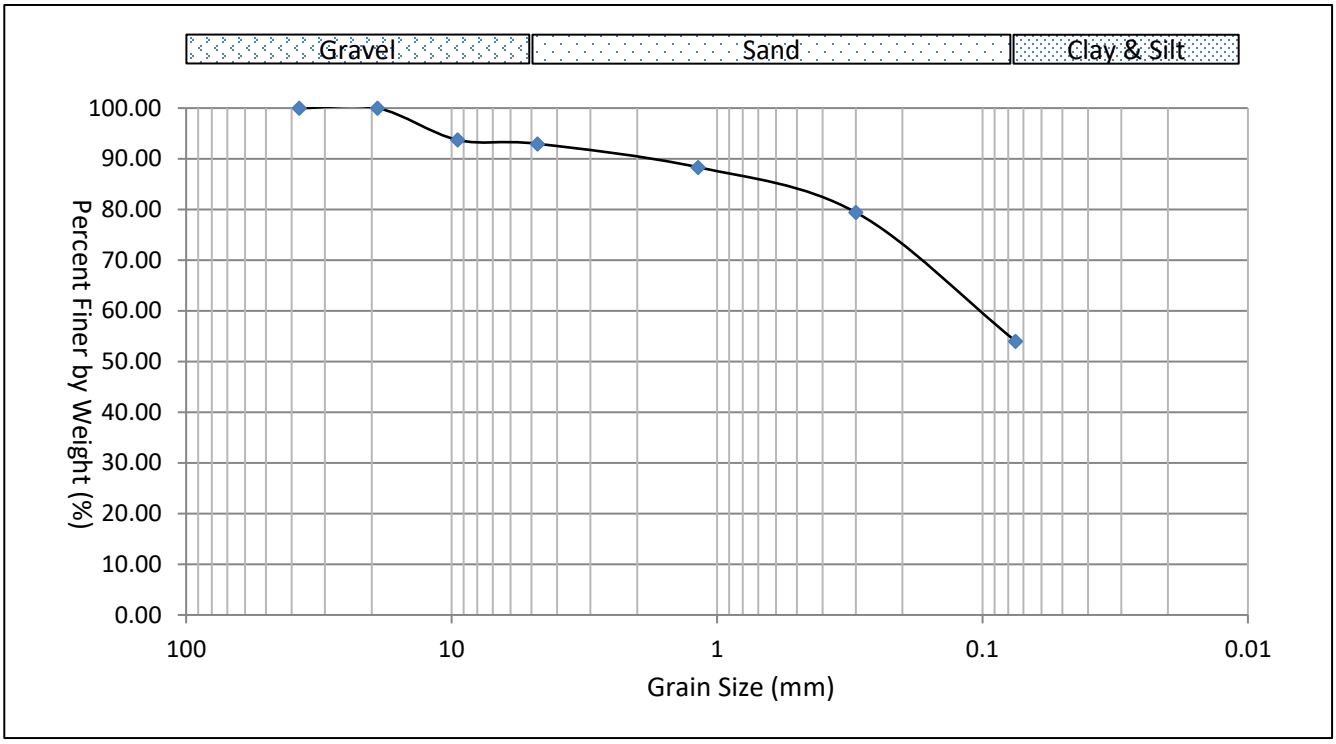
Sample Info	***25-125 BH110 SS7***	***25-126 BH110 SS9***	***25-127 BH110 SS11***			
Sample Depth (m)	***6.1-6.56***	***9.15-9.61***	***12.2-12.66***			
Grain Size (%)						
>19mm	0.0	0.0	0.0			
9.5mm-19mm	5.3	0.0	0.0			
4.75mm-9.5mm	0.3	2.3	1.6			
1.18mm-4.75mm	6.1	4.1	3.6			
300um-1.18mm	10.3	9.0	7.7			
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**			

Results related only to the items tested

Grain Size Distribution

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

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

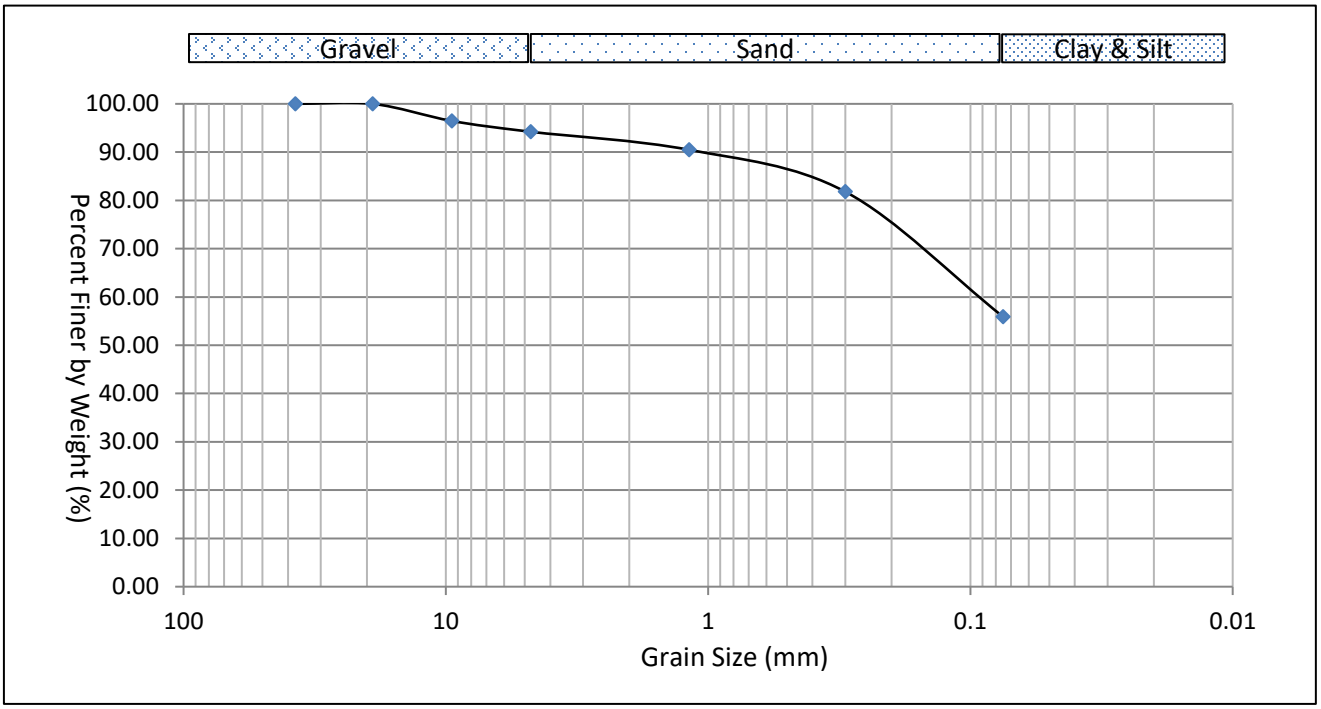


Results related only to the items tested

Grain Size Distribution

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

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

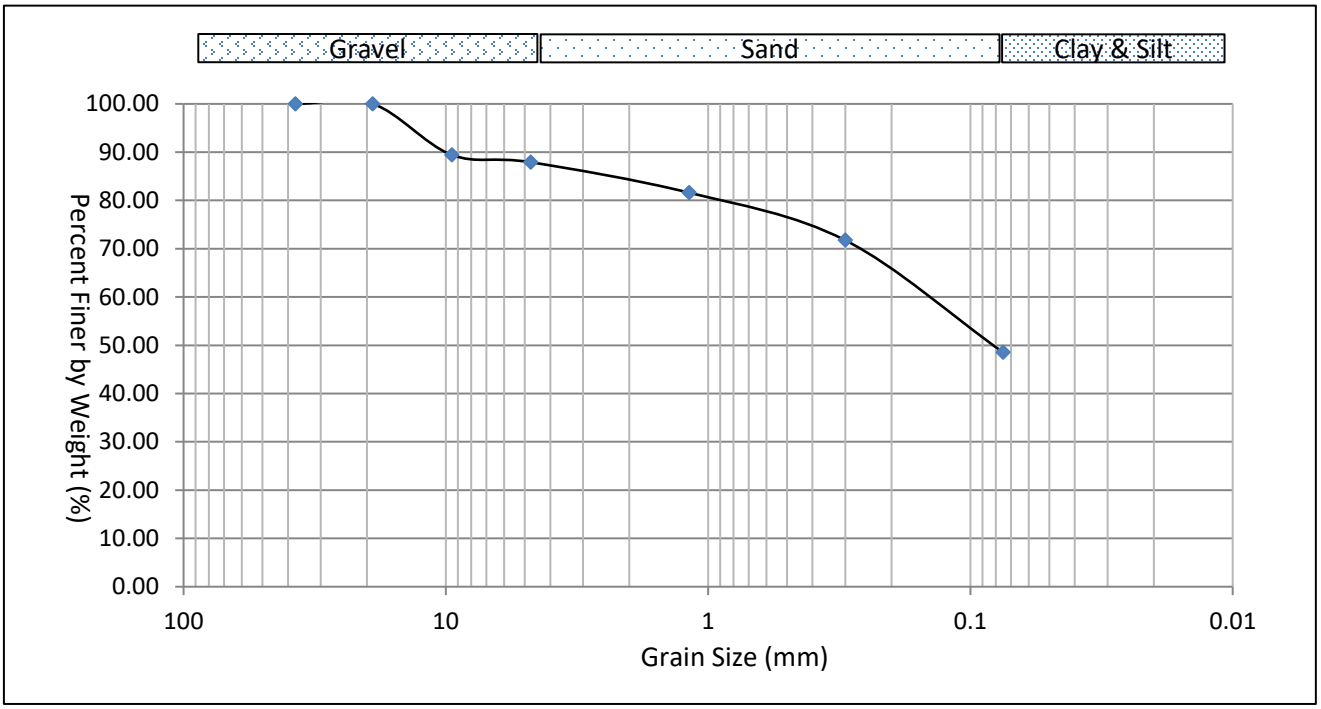


Results related only to the items tested

Grain Size Distribution

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

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

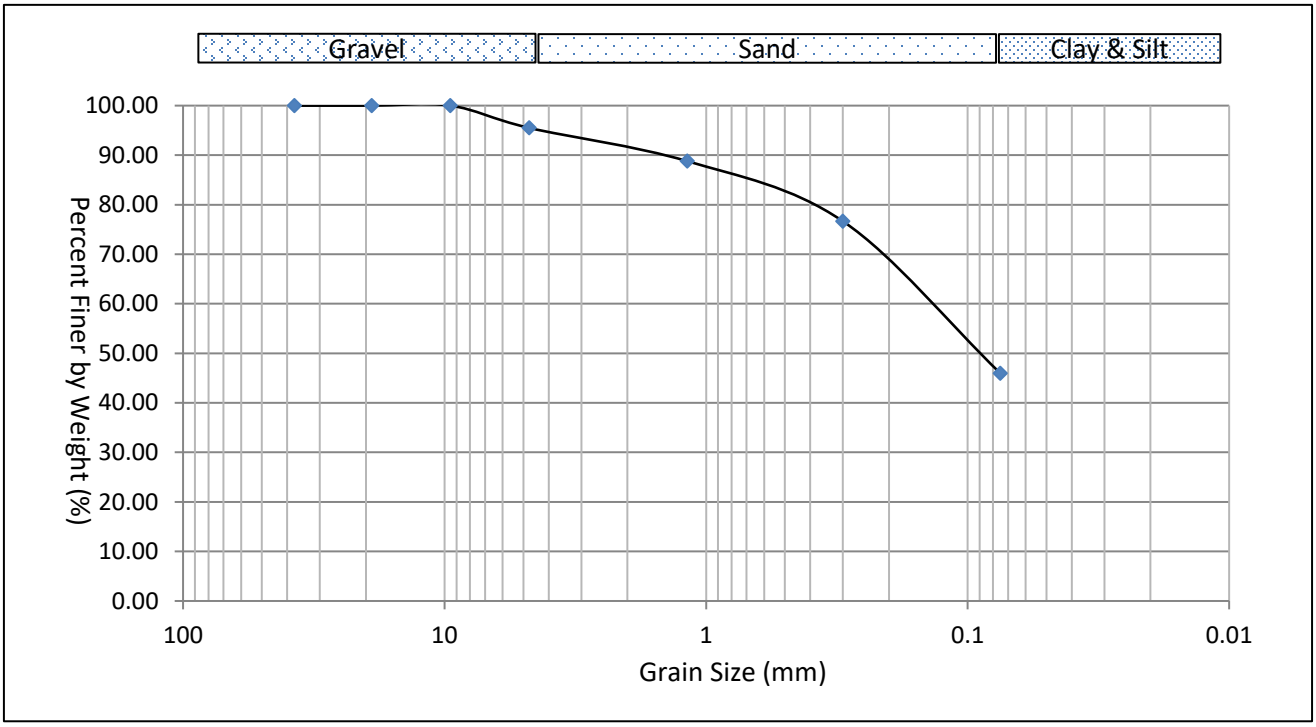


Results related only to the items tested

Grain Size Distribution

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

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

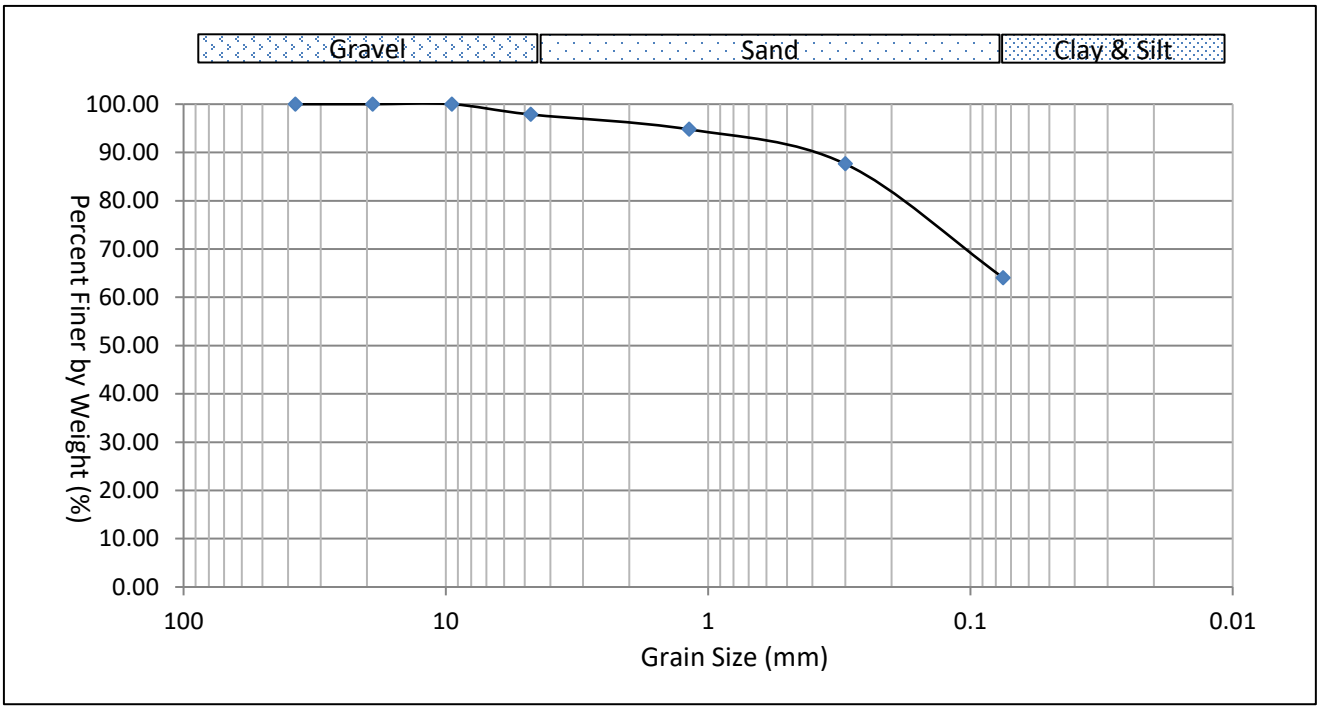


Results related only to the items tested

Grain Size Distribution

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

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

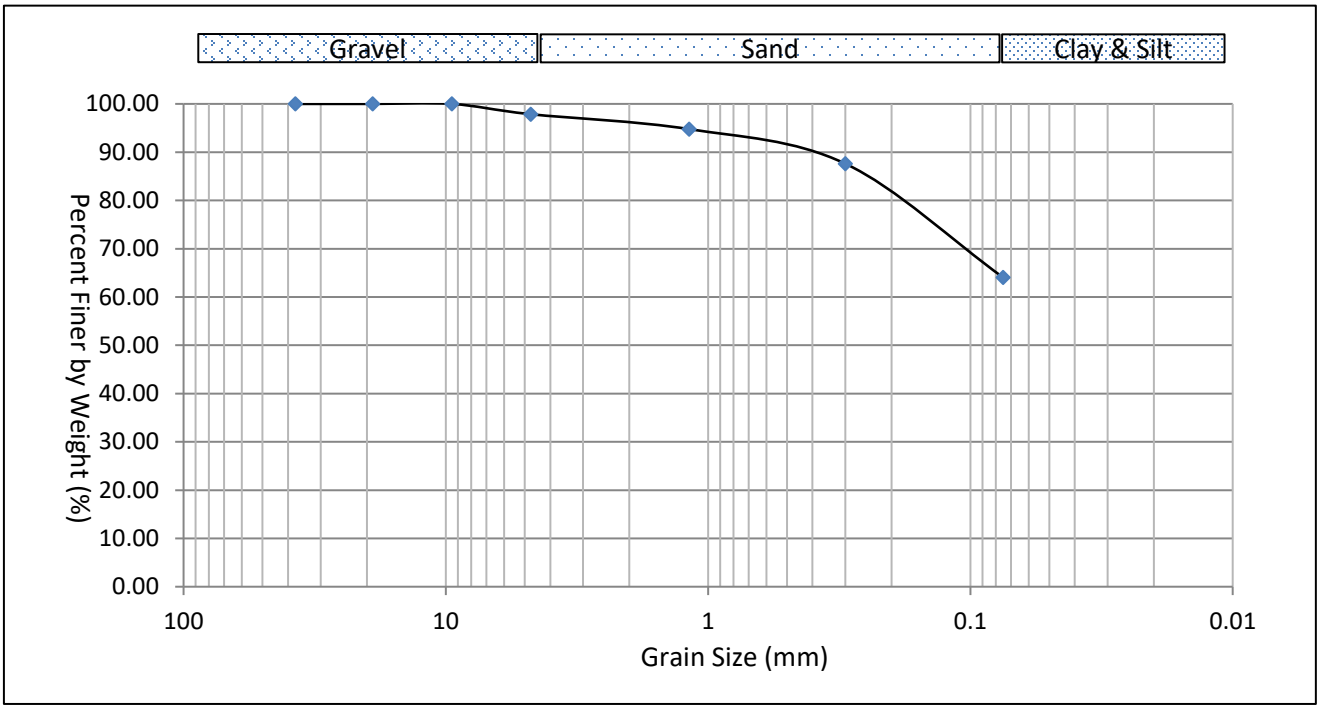


Results related only to the items tested

Grain Size Distribution

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

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

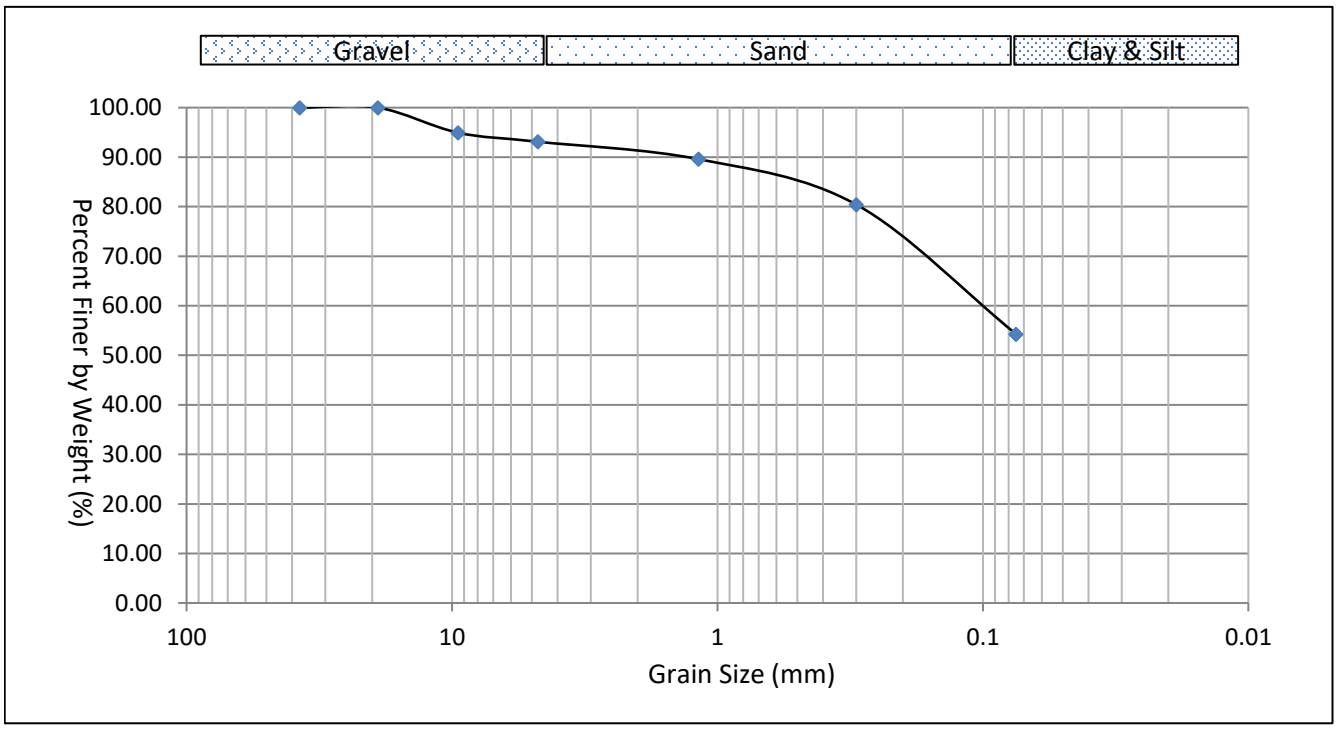


Results related only to the items tested

Grain Size Distribution

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

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

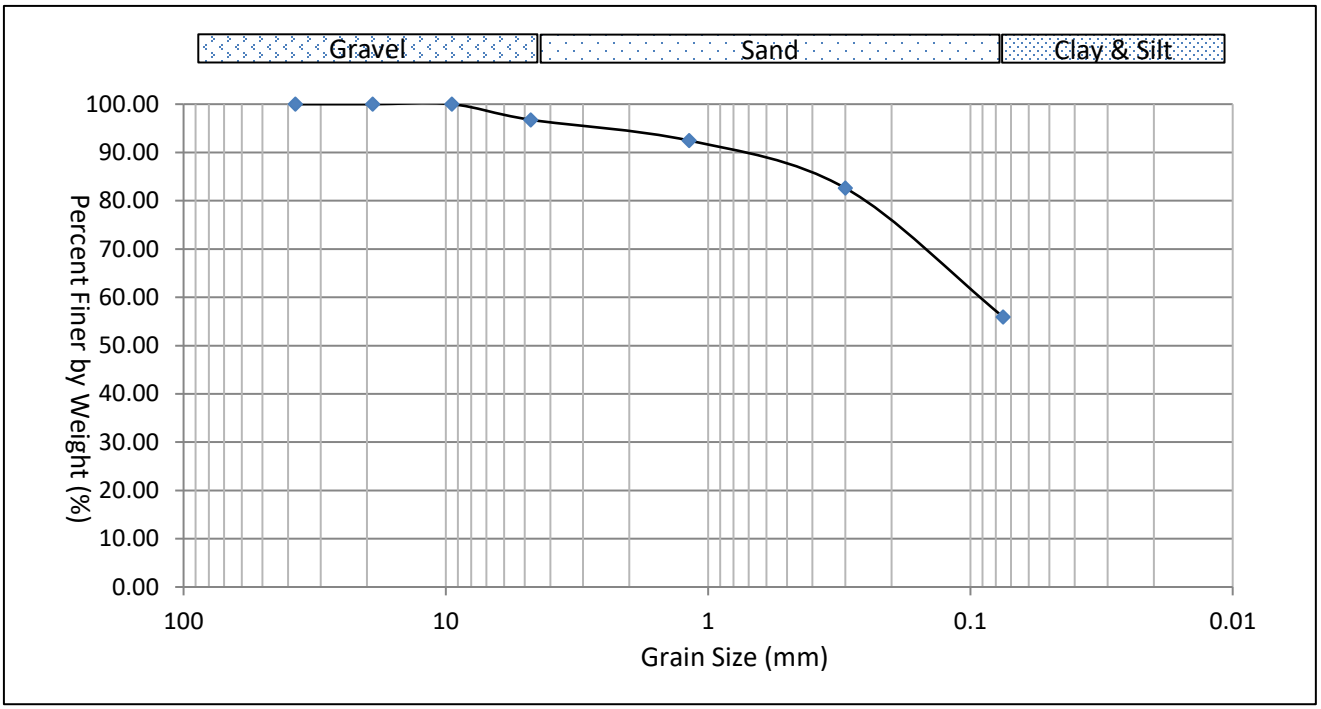


Results related only to the items tested

Grain Size Distribution

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

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

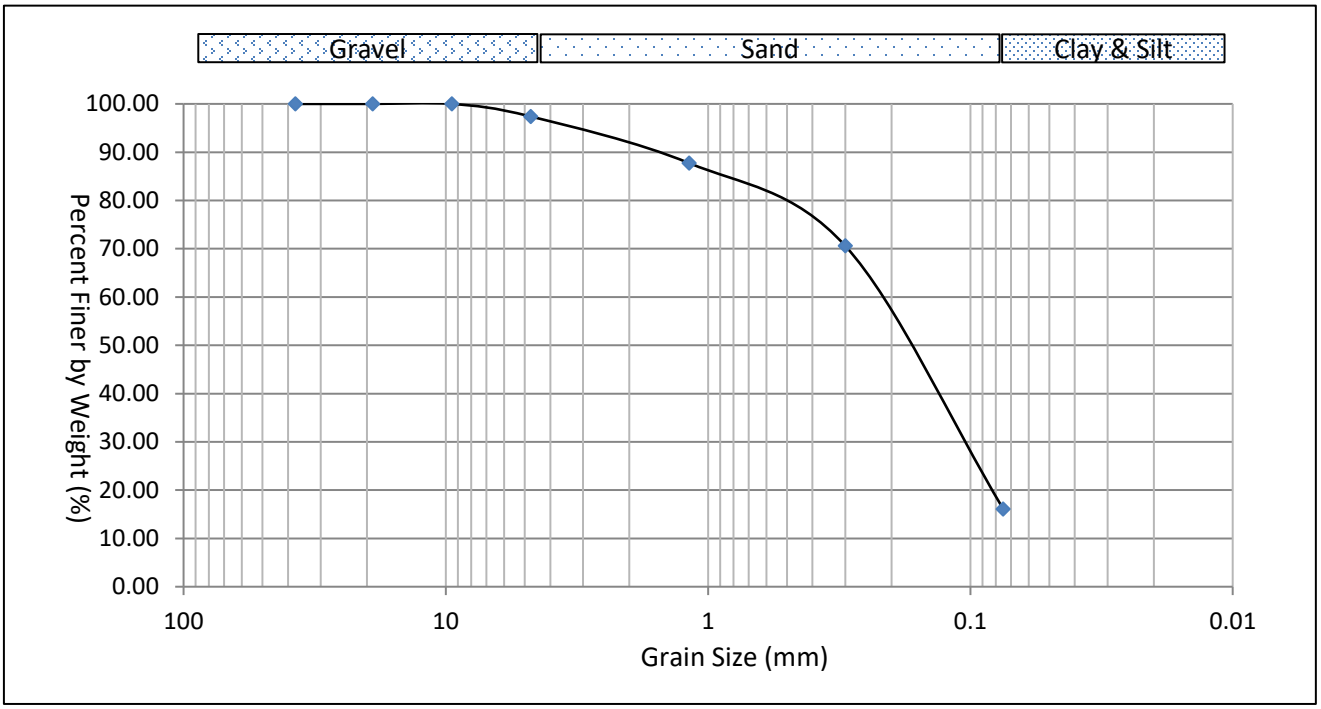


Results related only to the items tested

Grain Size Distribution

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

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

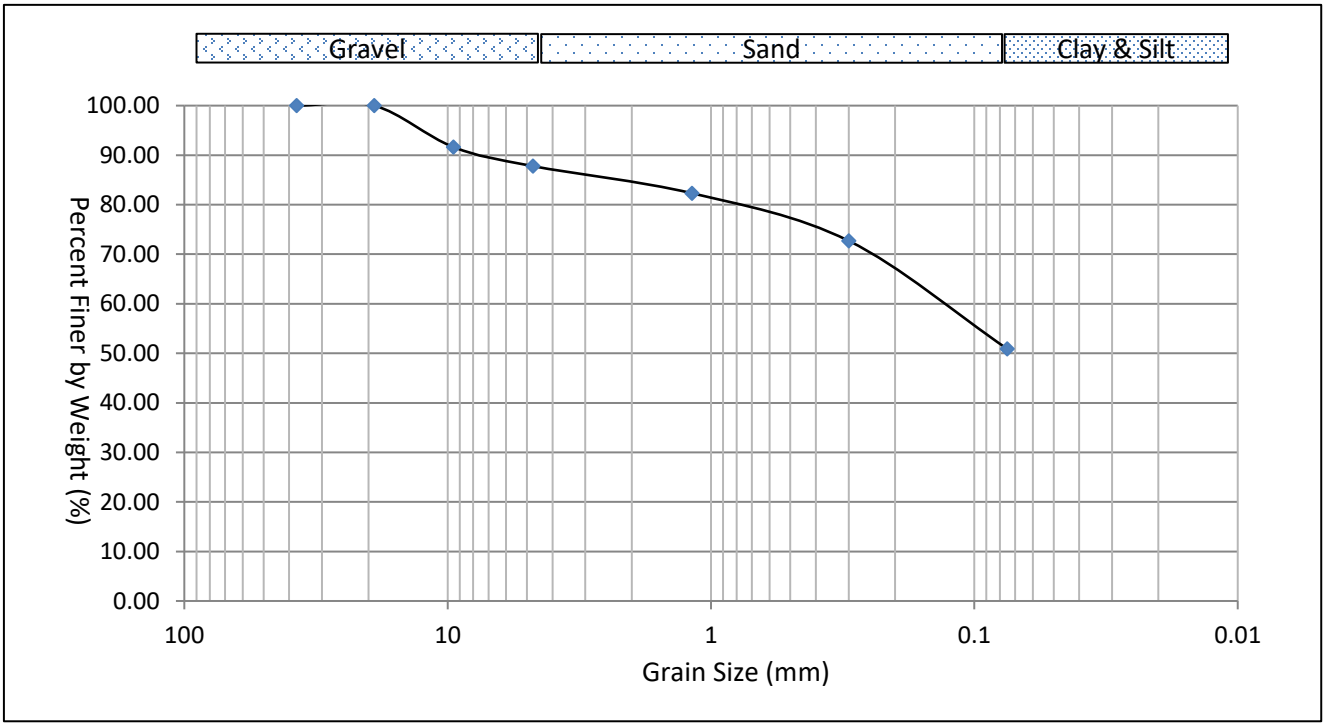


Results related only to the items tested

Grain Size Distribution

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

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

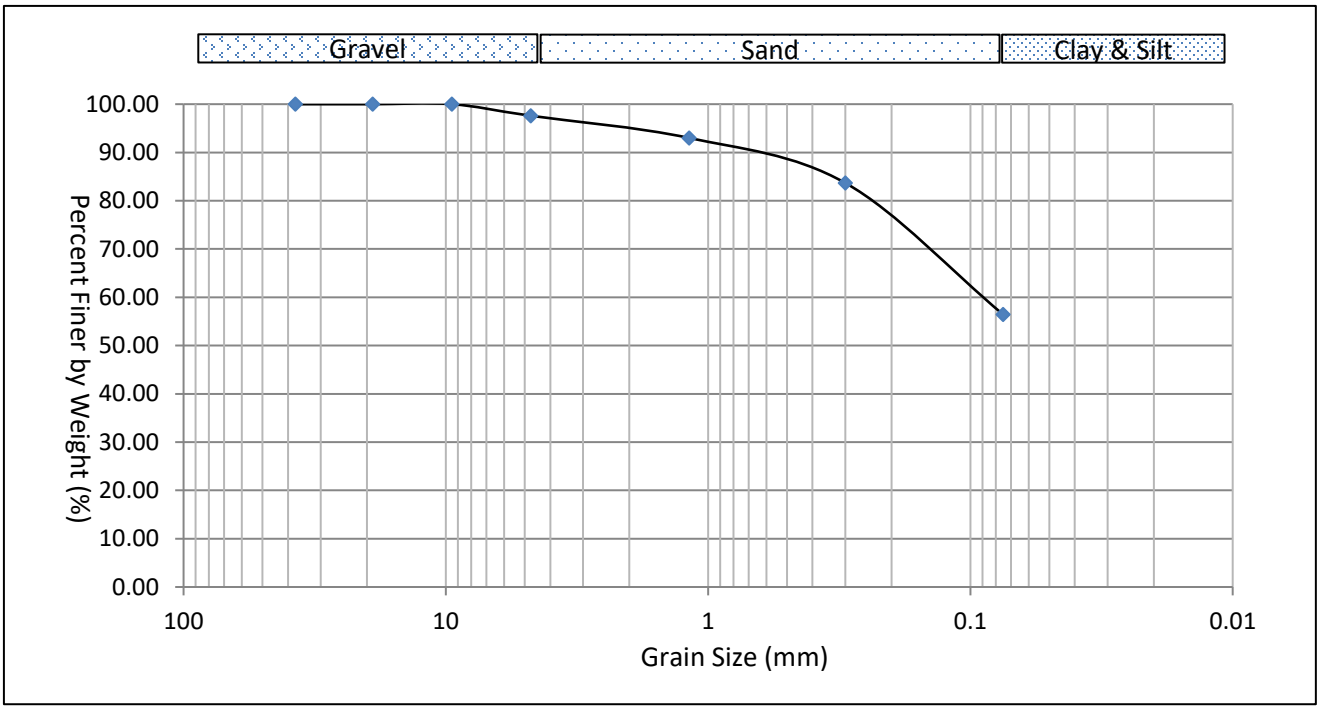


Results related only to the items tested

Grain Size Distribution

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

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

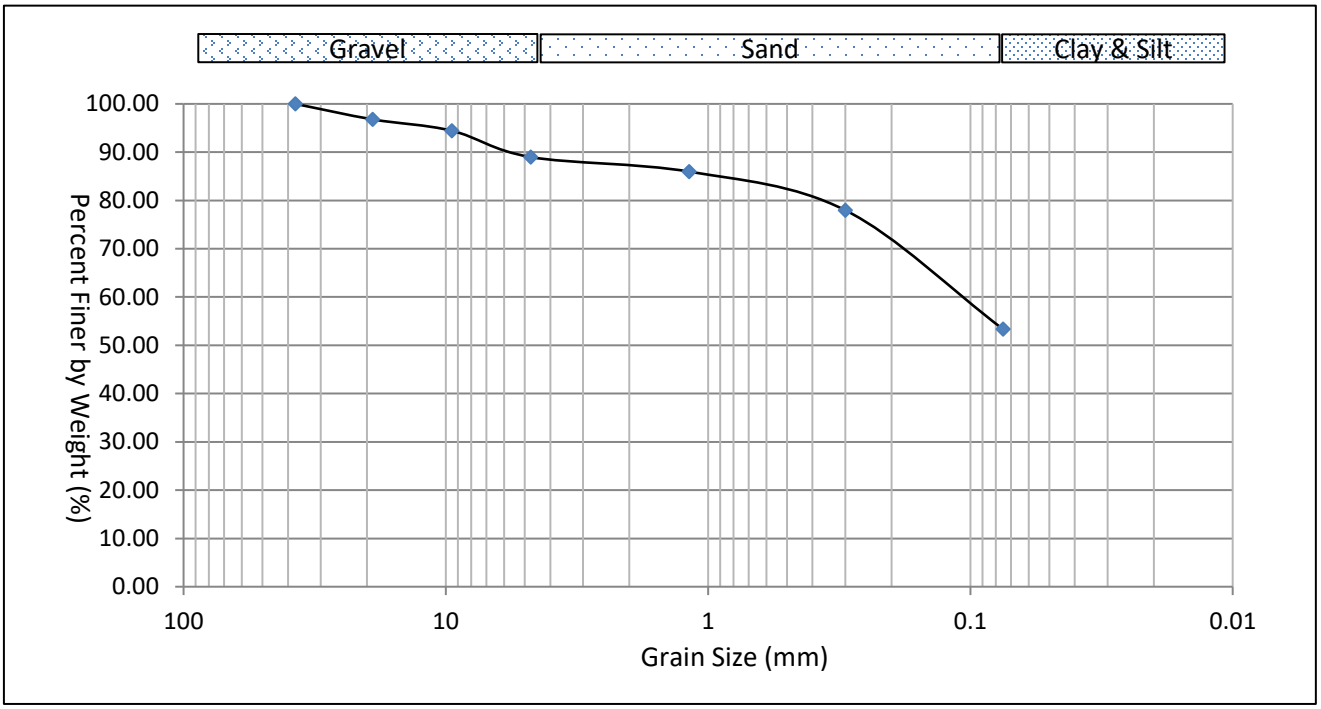


Results related only to the items tested

Grain Size Distribution

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

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

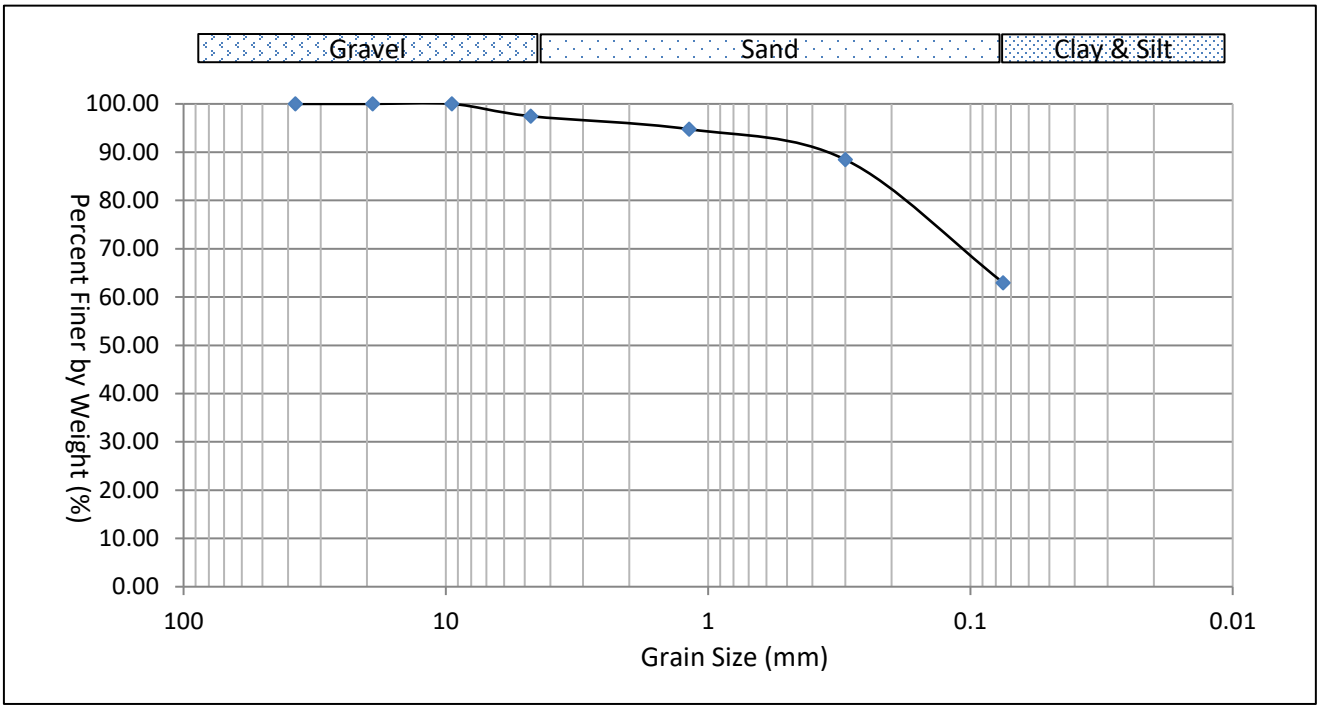


Results related only to the items tested

Grain Size Distribution

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

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

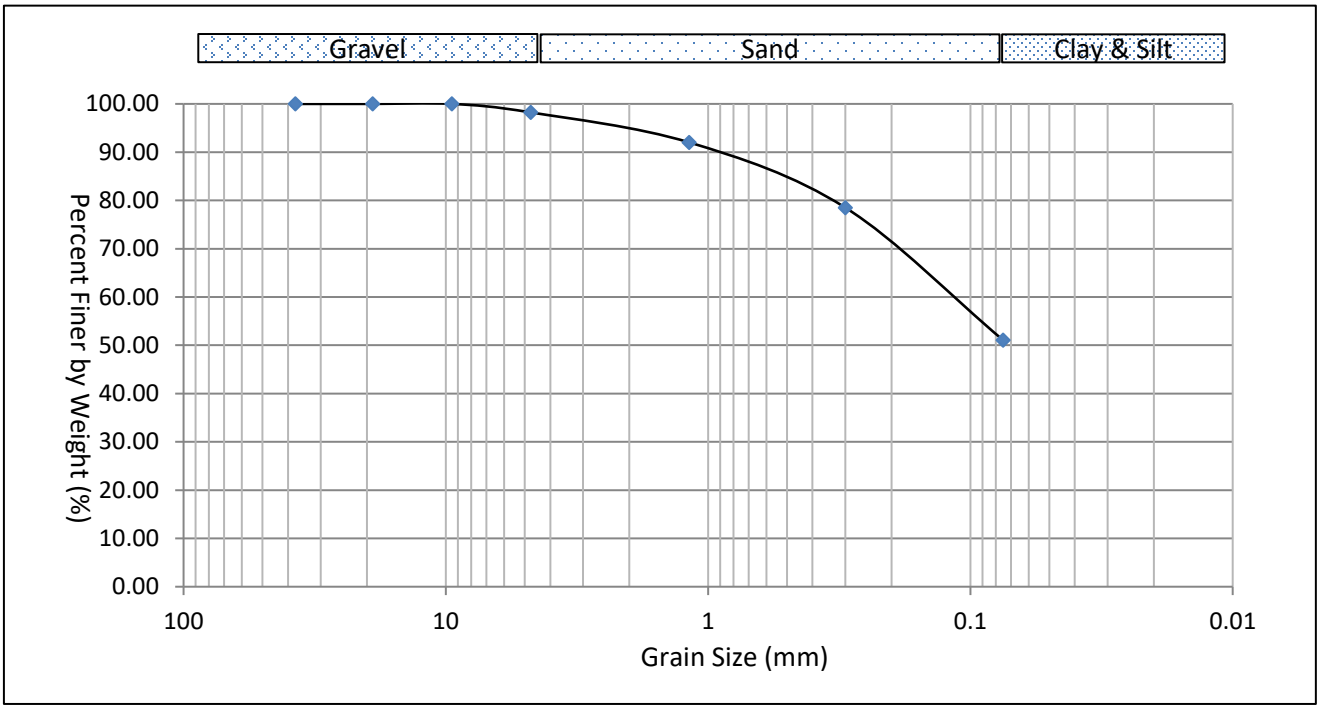


Results related only to the items tested

Grain Size Distribution

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

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

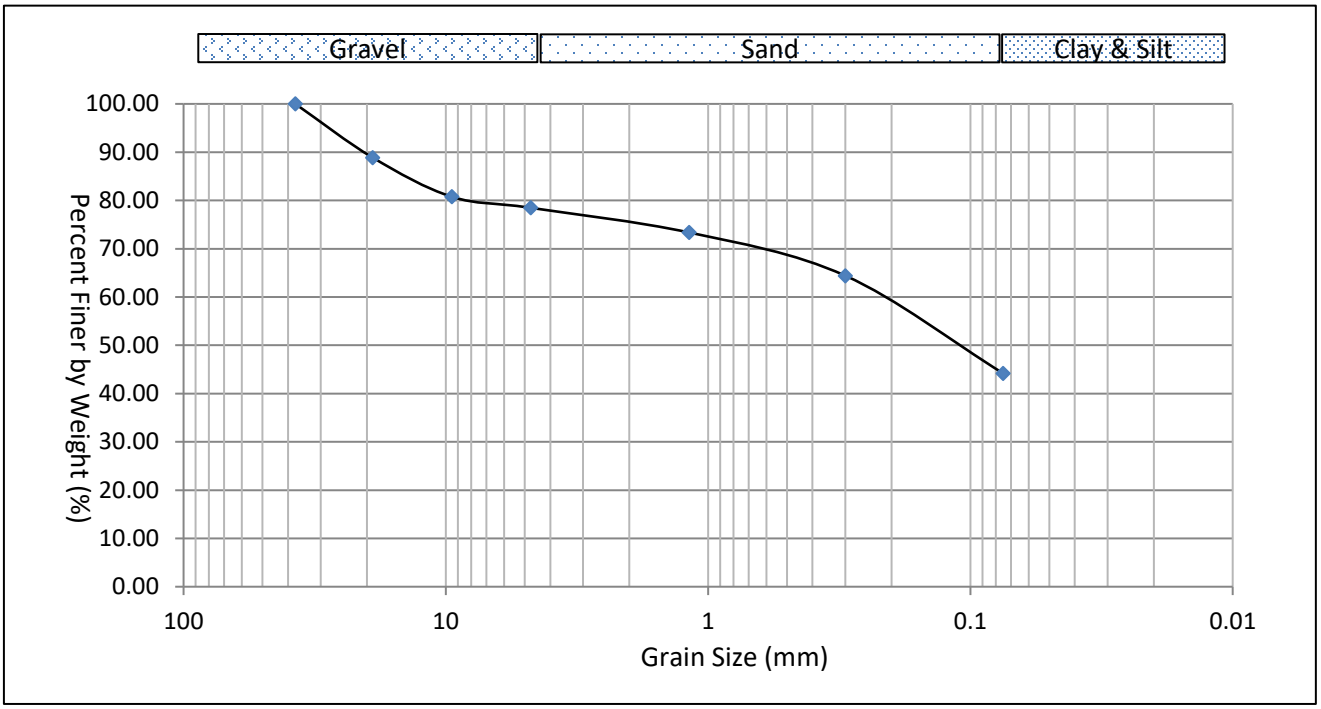


Results related only to the items tested

Grain Size Distribution

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

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

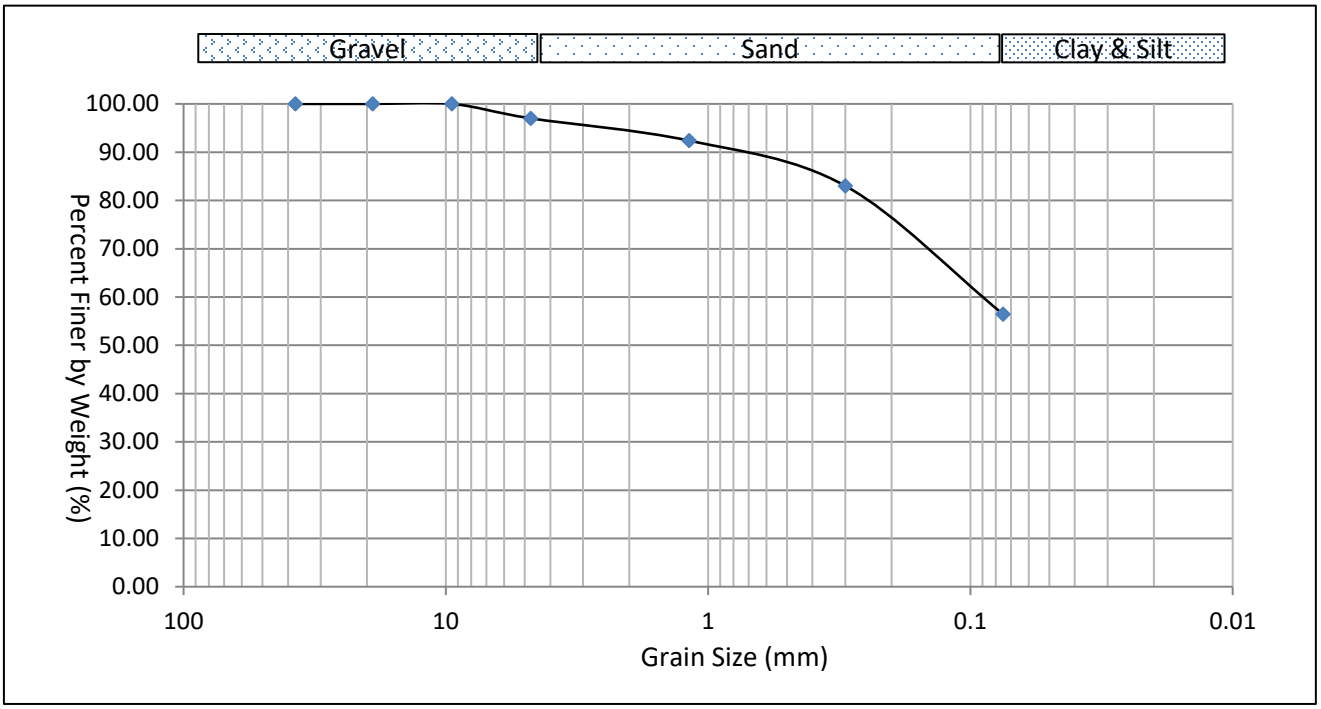


Results related only to the items tested

Grain Size Distribution

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

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

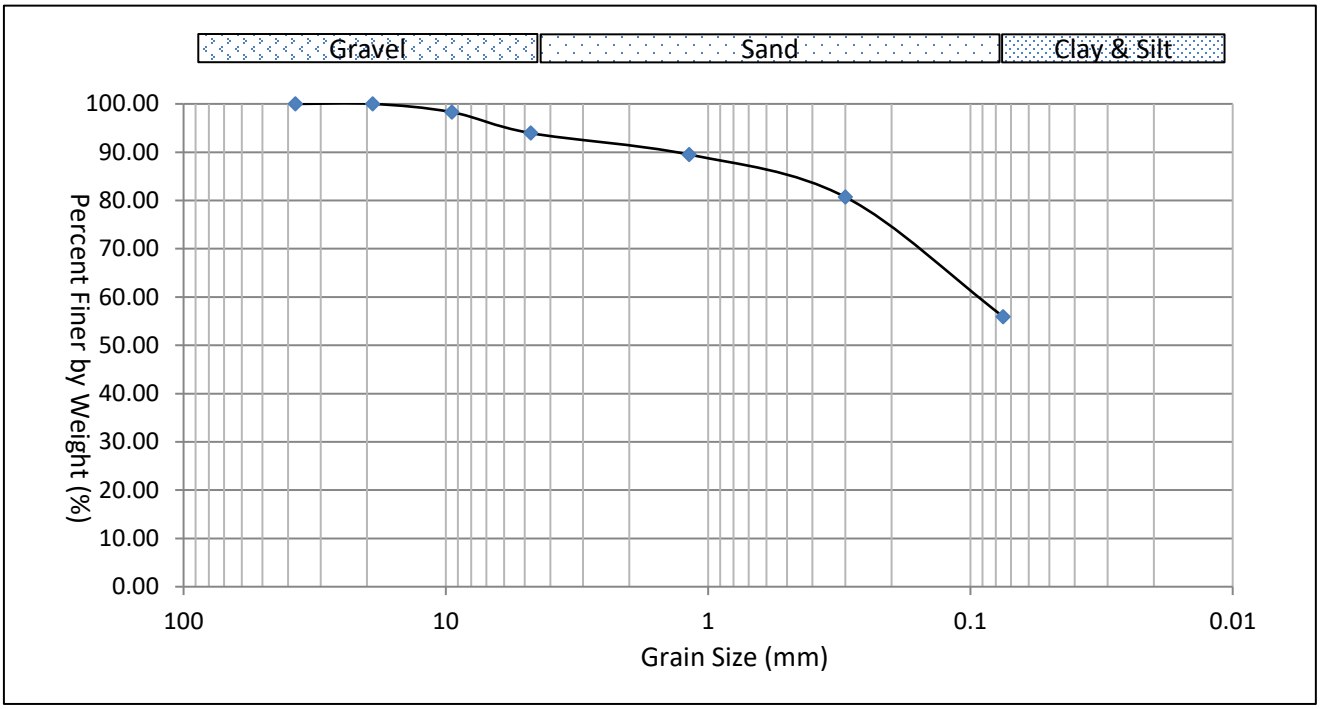


Results related only to the items tested

Grain Size Distribution

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

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

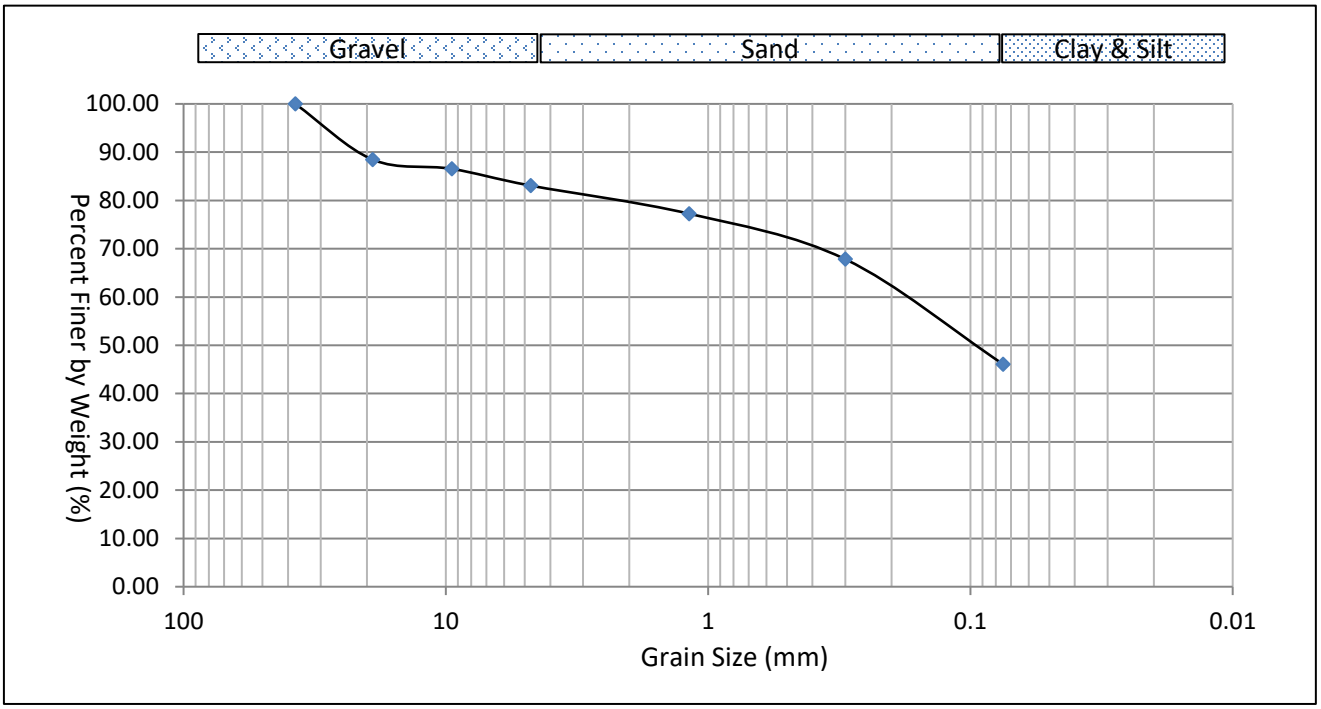


Results related only to the items tested

Grain Size Distribution

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

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

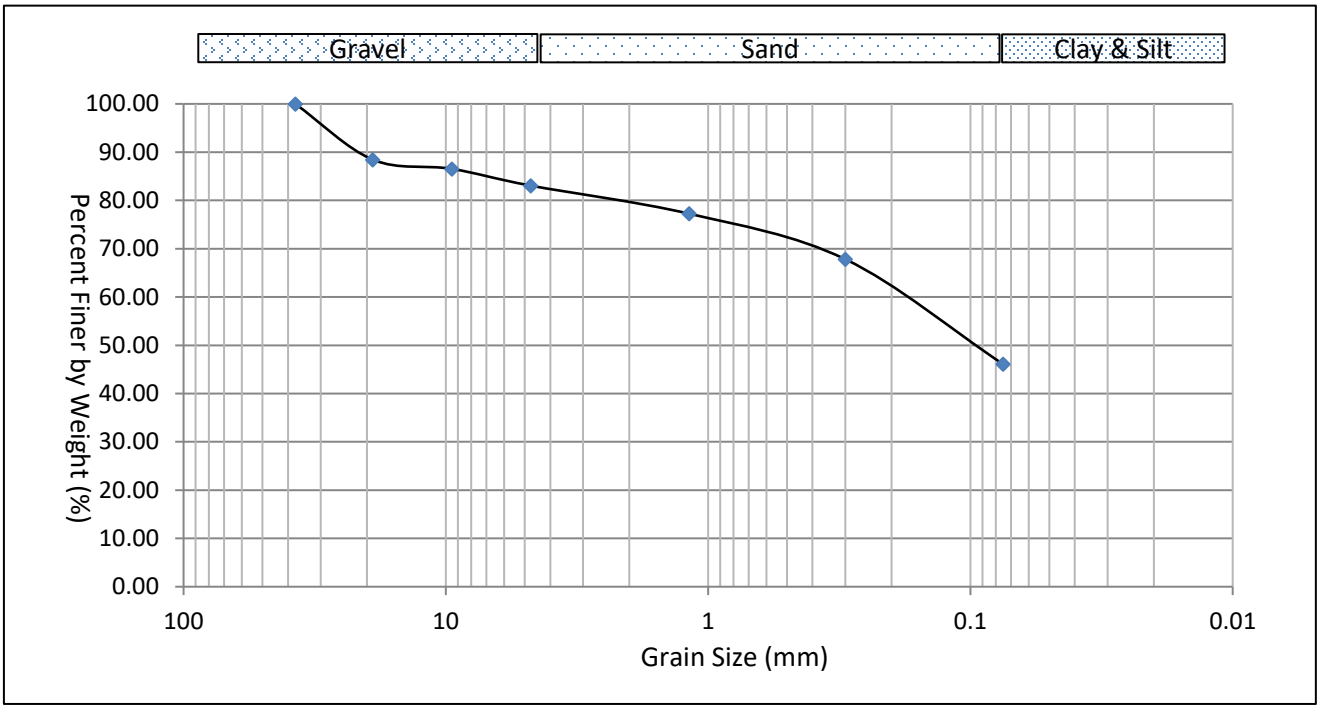


Results related only to the items tested

Grain Size Distribution

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

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

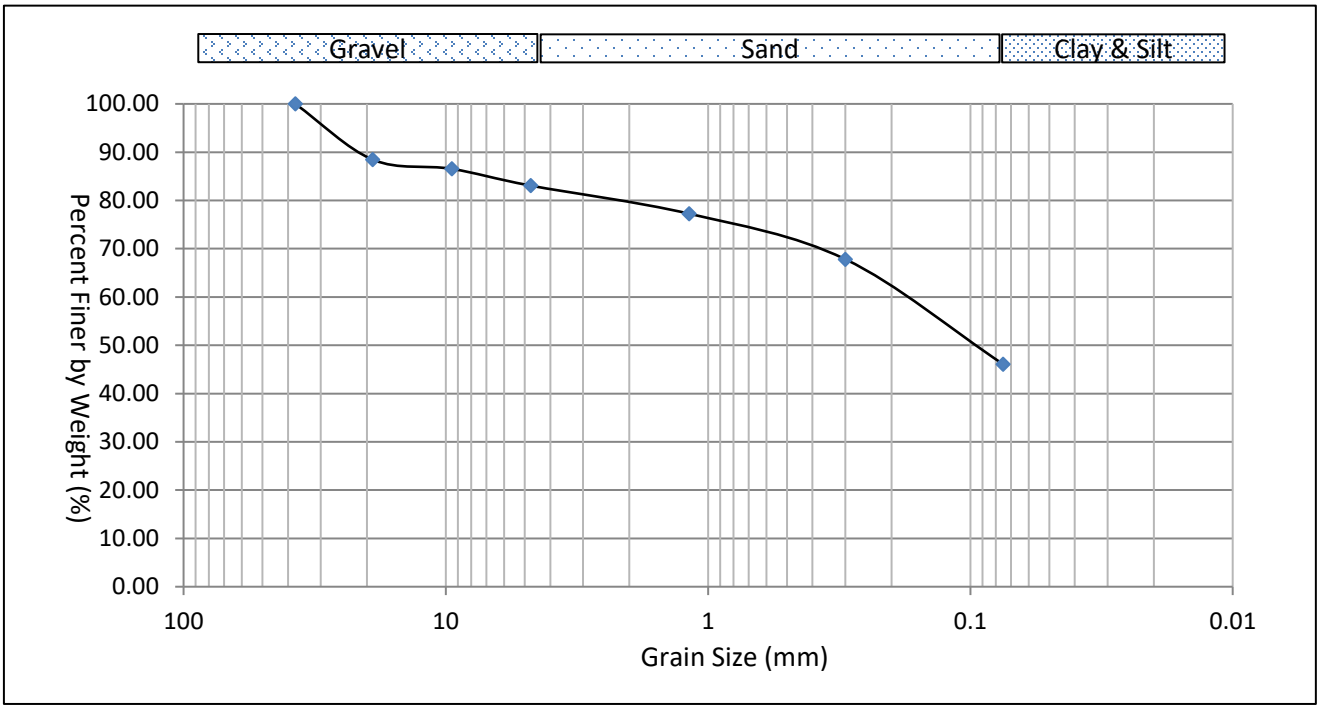


Results related only to the items tested

Grain Size Distribution

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

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

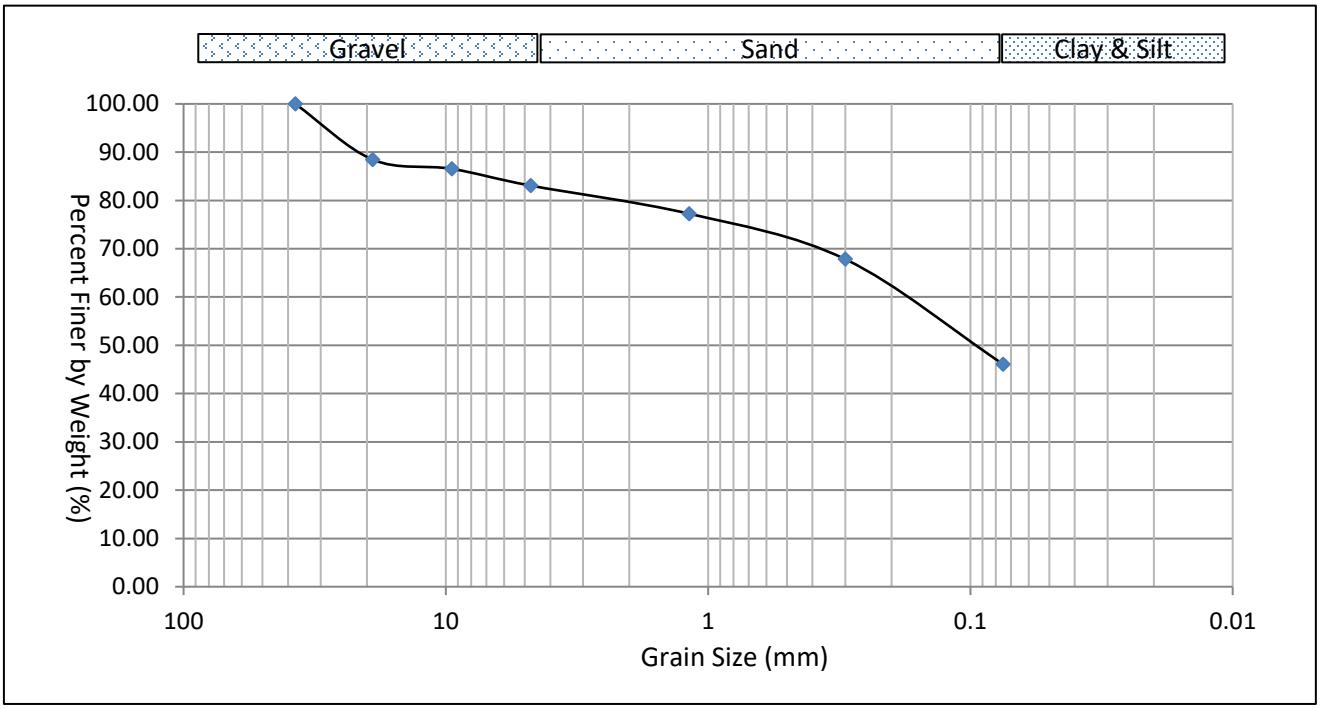


Results related only to the items tested

Grain Size Distribution

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

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



Results related only to the items tested

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**

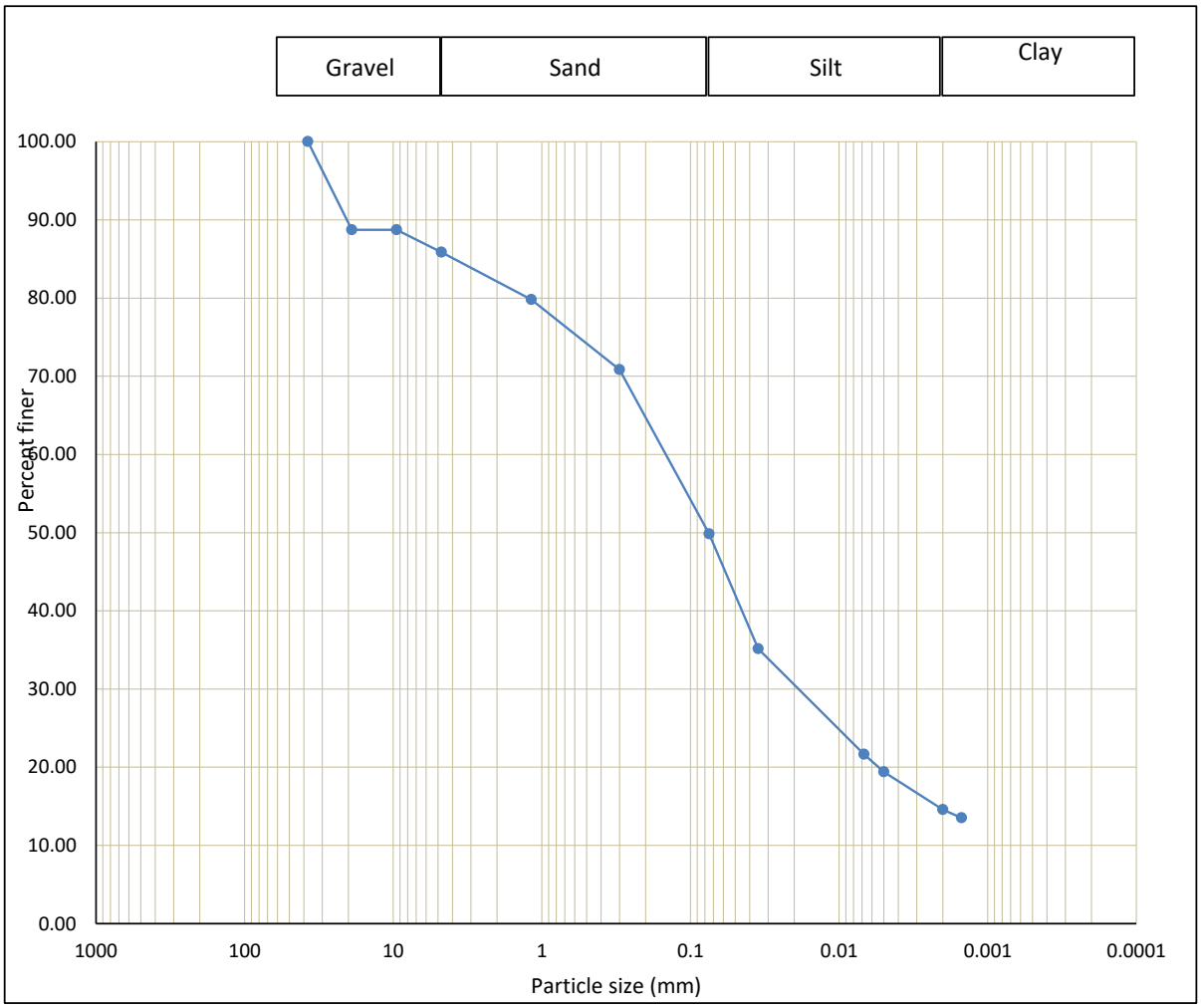
Sample Info	***25-115 BH107 SS5***					
Sample Depth (m)	***3.05-3.51***					
Grain Size (%)						
>19mm	12.2					
9.5mm-19mm	1.4					
4.75mm-9.5mm	2.2					
1.18mm-4.75mm	4.3					
300um-1.18mm	7.9					
75um-300um	18.6					
5um-75um	30.5					
2um-5um	5.6					
<2um	17.4					
Clay	**17.4**					
Silt	**36.1**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

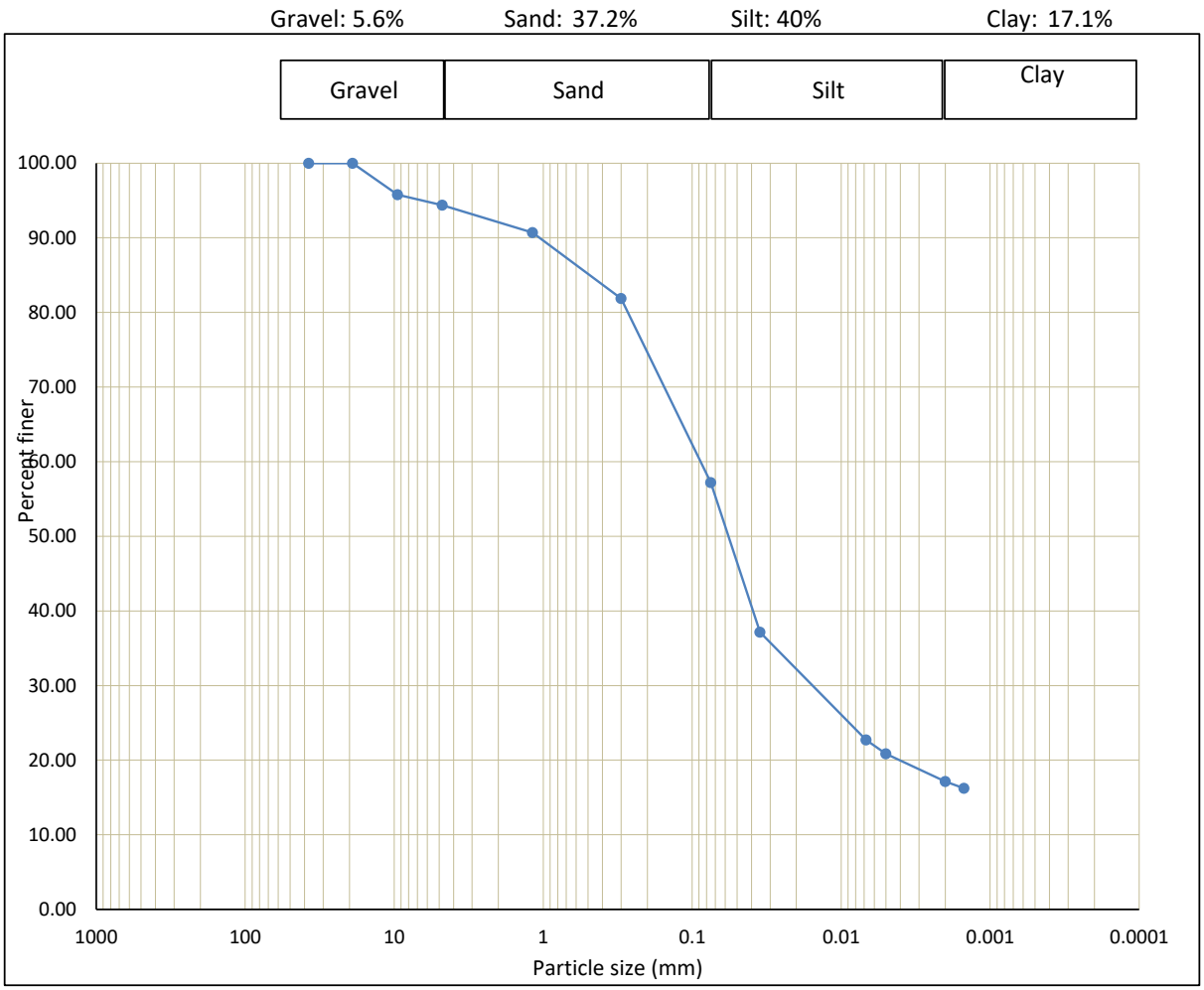


Sample ID: 25-102 BH101 SS5 (3.05-3.51m)		
Diameter	***Weight (%)***	***Grain Size***
>4.75mm	14.1	Gravel
1.18mm-4.75mm	6.0	Coarse Sand
300um-1.18mm	9.0	Medium Sand
75um-300um	21.0	Fine Sand
5um-75um	30.5	Silt
2um-5um	4.8	
<2um	14.6	Clay

F.E. Lab #: 25-101

Grain Size Distribution

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



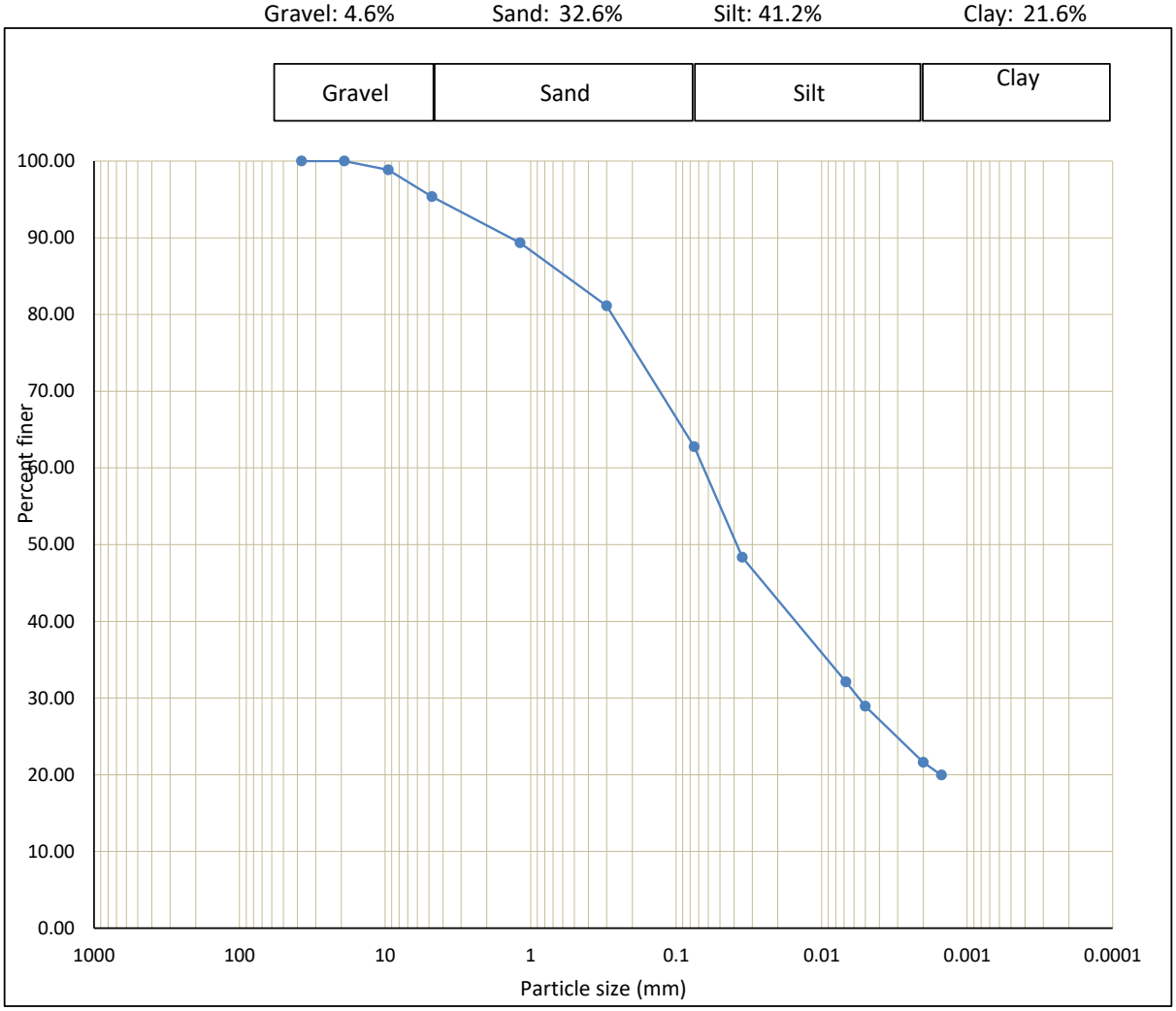
Sample ID: 25-103 BH101 SS7 (6.1-6.56m)		
Diameter	***Weight (%)***	***Grain Size***
>4.75mm	5.6	Gravel
1.18mm-4.75mm	3.7	Coarse Sand
300um-1.18mm	8.8	Medium Sand
75um-300um	24.7	Fine Sand
5um-75um	36.3	Silt
2um-5um	3.7	
<2um	17.1	Clay

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%



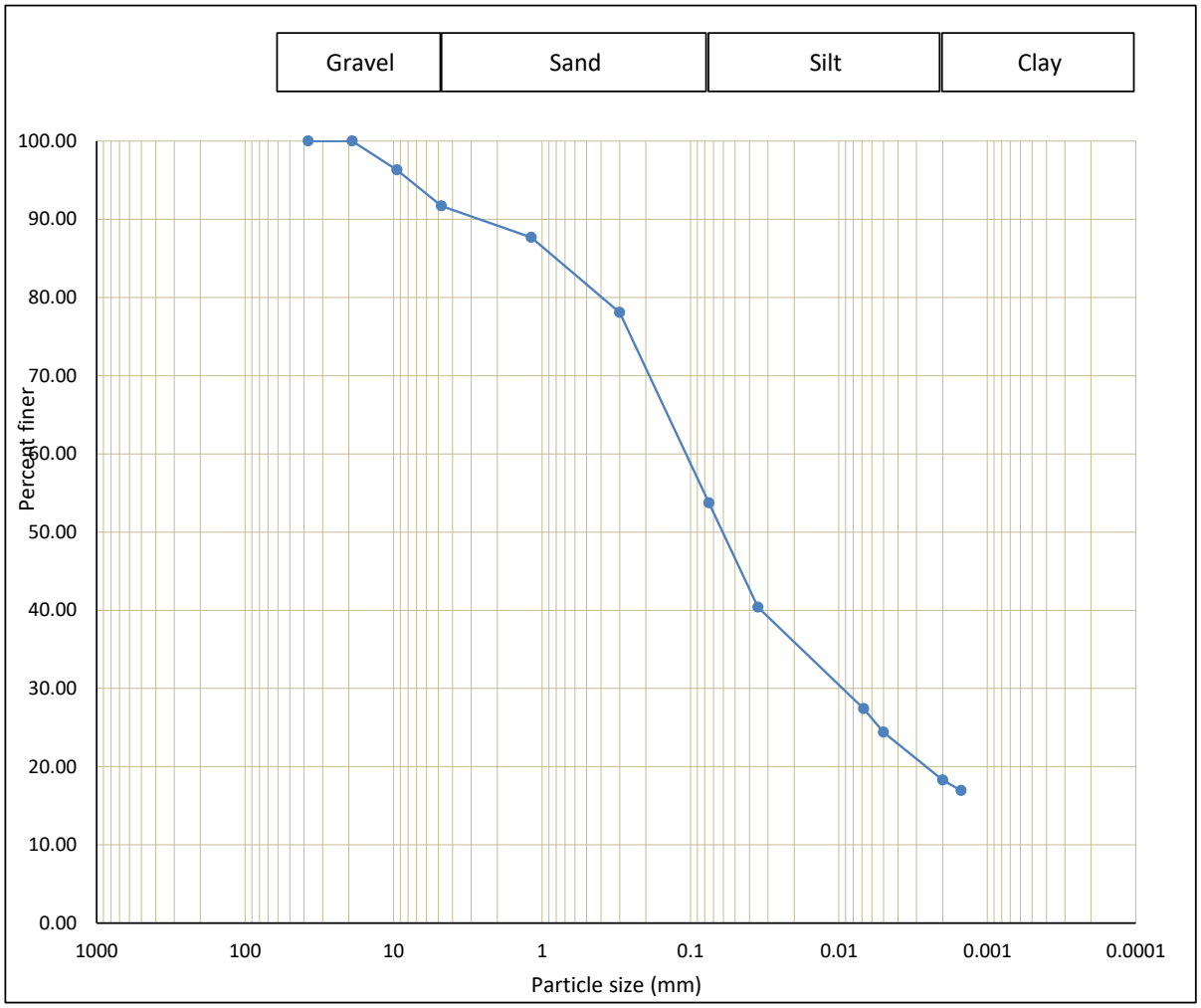
Sample ID: 25-110 BH105 SS5 (3.05-3.51m)		
Diameter	***Weight (%)***	***Grain Size***
>4.75mm	4.6	Gravel
1.18mm-4.75mm	6.0	Coarse Sand
300um-1.18mm	8.2	Medium Sand
75um-300um	18.4	Fine Sand
5um-75um	33.8	Silt
2um-5um	7.3	
<2um	21.6	Clay

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%

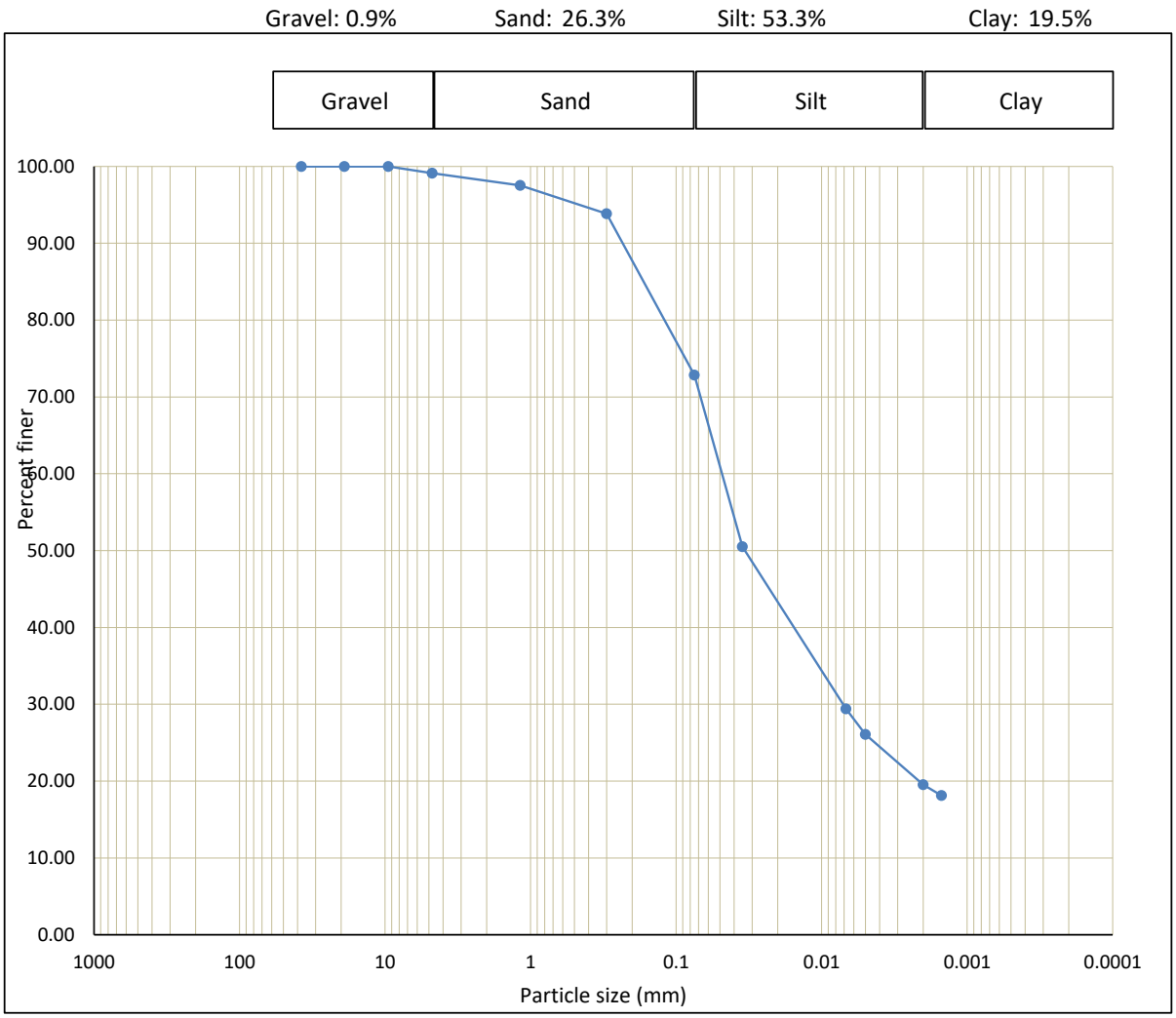


Sample ID: 25-111 BH105 SS7 (6.1-6.56m)		
Diameter	***Weight (%)***	***Grain Size***
>4.75mm	8.3	Gravel
1.18mm-4.75mm	4.0	Coarse Sand
300um-1.18mm	9.6	Medium Sand
75um-300um	24.4	Fine Sand
5um-75um	29.3	Silt
2um-5um	6.1	
<2um	18.3	Clay

F.E. Lab #: 25-101

Grain Size Distribution

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

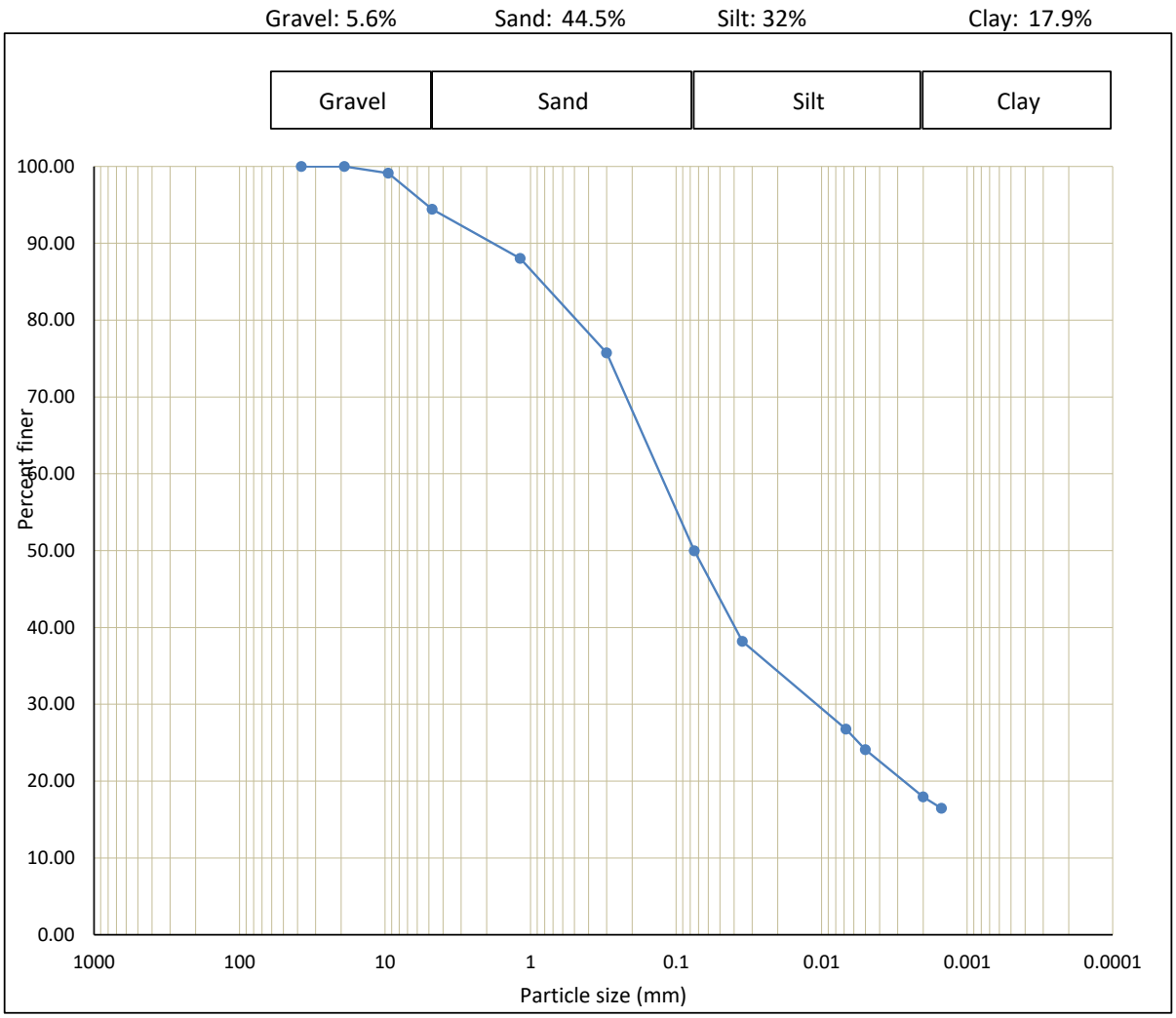


Sample ID: 25-154 BH106 SS5 (3.05-3.51m)		
Diameter	***Weight (%)***	***Grain Size***
>4.75mm	0.9	Gravel
1.18mm-4.75mm	1.6	Coarse Sand
300um-1.18mm	3.7	Medium Sand
75um-300um	21.0	Fine Sand
5um-75um	46.8	Silt
2um-5um	6.5	
<2um	19.5	Clay

F.E. Lab #: 25-101

Grain Size Distribution

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



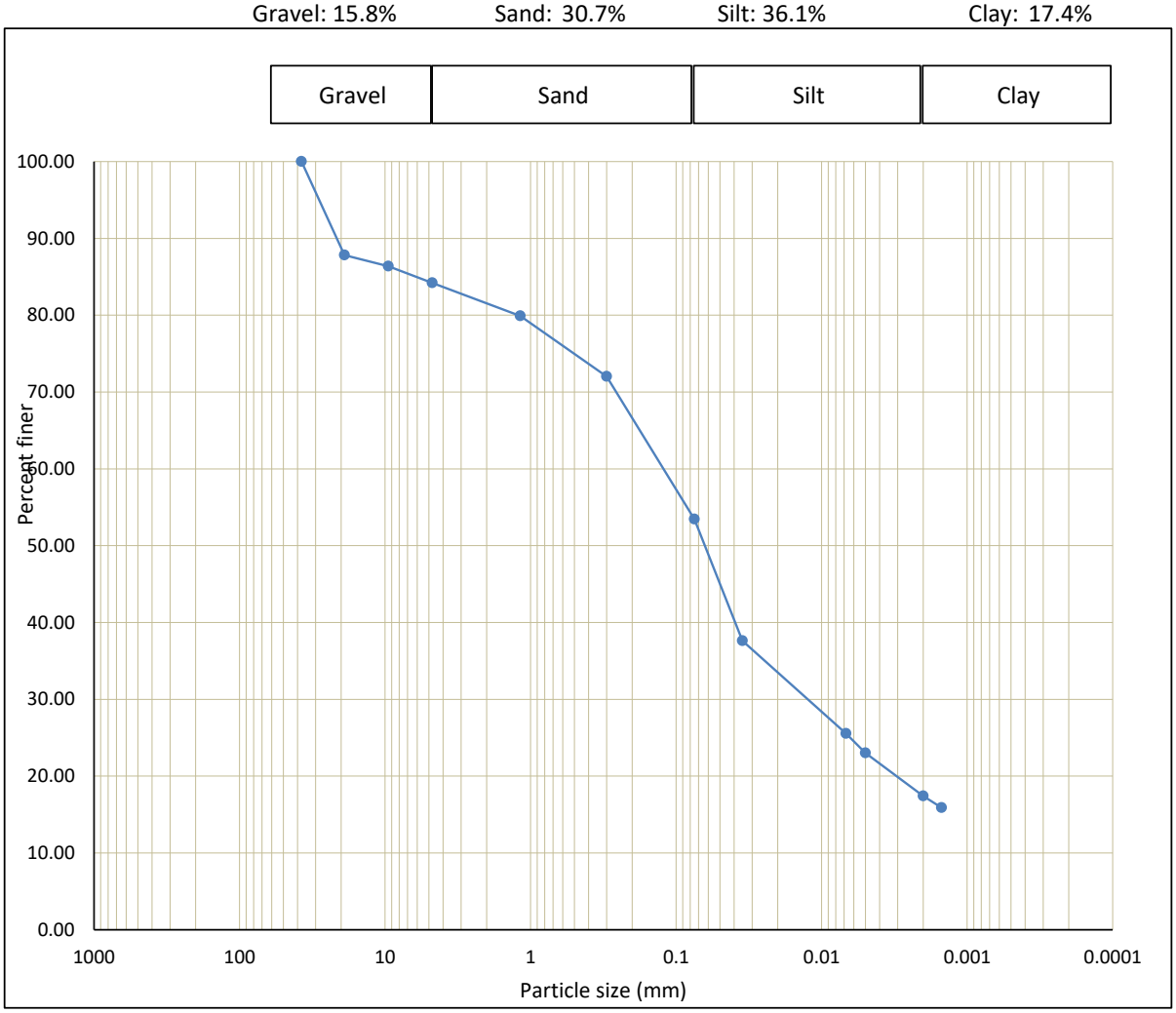
Sample ID: 25-155 BH106 SS6 (4.58-5.03m)		
Diameter	***Weight (%)***	***Grain Size***
>4.75mm	5.6	Gravel
1.18mm-4.75mm	6.4	Coarse Sand
300um-1.18mm	12.3	Medium Sand
75um-300um	25.8	Fine Sand
5um-75um	25.9	Silt
2um-5um	6.1	
<2um	17.9	Clay

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	Engineering Fill
Road Subbase	Soil Classification
Subgrade	Other
Backfill	

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

Arrival Temperature ° C:
Laboratory Remarks:

APPENDIX D – SEWER BYLAW RESULTS

ALS Canada Ltd.

right solutions.
right partner.

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: **WT2500943**	Page	: 1 of 6
Client	: **Fisher Engineering Limited**	Laboratory	: ALS Environmental - Waterloo
Contact	: Clive Wiggan	Account Manager	: Emily Hansen
Address	: 15-400 Esna Park Drive Markham ON Canada L3R 3K2	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 905 475 7755, Ext. 29	Telephone	: +1 519 886 6910
Project	: 24-14410	Date Samples Received	: 16-Jan-2025 15:29
PO	: ----	Date Analysis Commenced	: 18-Jan-2025
C-O-C number	: 23-1105097	Issue Date	: 28-Jan-2025 15:34
Sampler	: NNAMDI		
Site	: ----		
Quote number	: ALS 2025 STANDING OFFER		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Hannah Lewis	Inorganics Analyst	Inorganics, Waterloo, Ontario
Jeminikumari Patel	Analyst	Microbiology, Waterloo, Ontario
Manuel TavaraTello	Supervisor - Semi-Volatile Extractions	Organics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Metals, Waterloo, Ontario
Sanja Risticevic	Department Manager - LCMS	LCMS, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	VOC, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.
Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	*Description*
µg/L	micrograms per litre
CFU/100mL	colony forming units per hundred millilitres
mg/L	milligrams per litre
pH units	pH units

>: greater than.
<: less than.
Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit .

Workorder Comments

WT2500943-001 - RRR: Detection limit for bis(2-Ethylhexyl) phthalate raised due to biased low analyte response in continuing calibration standard.

Qualifiers

Qualifier	*Description*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
HTD	*Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.*
PEHT	*Parameter exceeded recommended holding time prior to analysis.*
RRR	*Refer to report comments for issues regarding this analysis.*

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	Method/Lab	LOR	Unit	Client sample ID: MW104 (UNFILTERED)		DURSUB SAN	DURSUB STM	--	--	--	--
				Sampling date/time: 16-Jan-2025 00:00							
				WT2500943-001							
Physical Tests											
pH	E108/WT	0.10	pH units	8.24		6 - 10.5 pH units	6 - 9 pH units	--	--	--	--
Solids, total suspended [TSS]	E160/WT	3.0	mg/L	77.7		350 mg/L	15 mg/L	--	--	--	--
Anions and Nutrients											
Fluoride	E235.F/WT	0.020	mg/L	0.822	DLM	10 mg/L	--	--	--	--	--
Kjeldahl nitrogen, total [TKN]	E318/WT	0.050	mg/L	0.594		100 mg/L	1 mg/L	--	--	--	--
Phosphorus, total	E372-U/WT	0.0020	mg/L	0.220		10 mg/L	0.4 mg/L	--	--	--	--
Sulfate (as SO4)	E235.SO4/WT	0.30	mg/L	90.8	DLM	1500 mg/L	--	--	--	--	--
Cyanides											
Cyanide, strong acid dissociable (Total)	E333/WT	0.0020	mg/L	<0.0020		2 mg/L	0.02 mg/L	--	--	--	--
Microbiological Tests											
Coliforms, Escherichia coli [E. coli]	E012A.EC/WT	1	CFU/100mL	<2	DLM PEHT	--	200 CFU/100mL	--	--	--	--
Total Metals											
Aluminum, total	E420/WT	0.0030	mg/L	7.50	DLHC	50 mg/L	--	--	--	--	--
Antimony, total	E420/WT	0.00010	mg/L	<0.00100	DLHC	5 mg/L	--	--	--	--	--
Arsenic, total	E420/WT	0.00010	mg/L	0.00350	DLHC	1 mg/L	0.02 mg/L	--	--	--	--
Cadmium, total	E420/WT	0.0000050	mg/L	0.000212	DLHC	0.7 mg/L	0.008 mg/L	--	--	--	--
Chromium, total	E420/WT	0.00050	mg/L	0.0107	DLHC	2 mg/L	0.08 mg/L	--	--	--	--
Cobalt, total	E420/WT	0.00010	mg/L	0.00391	DLHC	5 mg/L	--	--	--	--	--
Copper, total	E420/WT	0.00050	mg/L	0.0103	DLHC	3 mg/L	0.05 mg/L	--	--	--	--
Lead, total	E420/WT	0.000050	mg/L	0.00401	DLHC	1 mg/L	0.12 mg/L	--	--	--	--
Manganese, total	E420/WT	0.00010	mg/L	0.144	DLHC	5 mg/L	0.15 mg/L	--	--	--	--
Mercury, total	E508/WT	0.0000050	mg/L	<0.0000050		0.01 mg/L	0.0004 mg/L	--	--	--	--
Molybdenum, total	E420/WT	0.000050	mg/L	0.0203	DLHC	5 mg/L	--	--	--	--	--
Nickel, total	E420/WT	0.00050	mg/L	0.00914	DLHC	2 mg/L	0.08 mg/L	--	--	--	--
Selenium, total	E420/WT	0.000050	mg/L	0.00154	DLHC	1 mg/L	0.02 mg/L	--	--	--	--
Silver, total	E420/WT	0.000010	mg/L	<0.000100	DLHC	5 mg/L	0.12 mg/L	--	--	--	--
Tin, total	E420/WT	0.00010	mg/L	0.00117	DLHC	5 mg/L	--	--	--	--	--
Titanium, total	E420/WT	0.00030	mg/L	0.253	DLHC	5 mg/L	--	--	--	--	--
Zinc, total	E420/WT	0.0030	mg/L	<0.0300	DLHC	2 mg/L	0.04 mg/L	--	--	--	--

Analyte	Method/Lab	LOR	Unit	WT2500943-001 (Continued)	DURSUB SAN	DURSUB STM	--	--	--	--
Aggregate Organics										
Biochemical oxygen demand [BOD]	E550/WT	2.0	mg/L	652 HTD	300 mg/L	15 mg/L	--	--	--	--
Oil & grease (gravimetric)	E567/WT	5.0	mg/L	<5.0	--	--	--	--	--	--
Oil & grease, animal/vegetable (gravimetric)	EC567A.SG/WT	5.0	mg/L	<5.0	150 mg/L	--	--	--	--	--
Oil & grease, mineral (gravimetric)	E567SG/WT	5.0	mg/L	<5.0	15 mg/L	--	--	--	--	--
Phenols, total (4AAP)	E562/WT	0.0010	mg/L	<0.0010	1 mg/L	0.008 mg/L	--	--	--	--
Volatile Organic Compounds										
Benzene	E611D/WT	0.50	µg/L	<0.50	10 µg/L	2 µg/L	--	--	--	--
Chloroform	E611D/WT	0.50	µg/L	4.98	40 µg/L	2 µg/L	--	--	--	--
Dichlorobenzene, 1,2-	E611D/WT	0.50	µg/L	<0.50	50 µg/L	5.6 µg/L	--	--	--	--
Dichlorobenzene, 1,4-	E611D/WT	0.50	µg/L	<0.50	80 µg/L	6.8 µg/L	--	--	--	--
Dichloroethylene, cis-1,2-	E611D/WT	0.50	µg/L	<0.50	4000 µg/L	5.6 µg/L	--	--	--	--
Dichloromethane	E611D/WT	1.0	µg/L	<1.0	2000 µg/L	5.2 µg/L	--	--	--	--
Dichloropropylene, trans-1,3-	E611D/WT	0.30	µg/L	<0.30	140 µg/L	5.6 µg/L	--	--	--	--
Ethylbenzene	E611D/WT	0.50	µg/L	<0.50	160 µg/L	2 µg/L	--	--	--	--
Methyl ethyl ketone [MEK]	E611D/WT	20	µg/L	<20	8000 µg/L	--	--	--	--	--
Styrene	E611D/WT	0.50	µg/L	<0.50	200 µg/L	--	--	--	--	--
Tetrachloroethane, 1,1,2,2-	E611D/WT	0.50	µg/L	<0.50	1400 µg/L	17 µg/L	--	--	--	--
Tetrachloroethylene	E611D/WT	0.50	µg/L	<0.50	1000 µg/L	4.4 µg/L	--	--	--	--
Toluene	E611D/WT	0.50	µg/L	1.70	270 µg/L	2 µg/L	--	--	--	--
Trichloroethylene	E611D/WT	0.50	µg/L	<0.50	400 µg/L	8 µg/L	--	--	--	--
Xylene, m+p-	E611D/WT	0.40	µg/L	<0.40	--	--	--	--	--	--
Xylene, o-	E611D/WT	0.30	µg/L	<0.30	--	--	--	--	--	--
Xylenes, total	E611D/WT	0.50	µg/L	<0.50	1400 µg/L	4.4 µg/L	--	--	--	--
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	E611D/WT	1.0	%	99.2	--	--	--	--	--	--
Difluorobenzene, 1,4-	E611D/WT	1.0	%	97.3	--	--	--	--	--	--
Phthalate Esters										
bis(2-Ethylhexyl) phthalate [DEHP]	E625A/WT	0.60	µg/L	<7.20 RRR	12 µg/L	8.8 µg/L	--	--	--	--
Di-n-butyl phthalate	E625A/WT	1.0	µg/L	<1.0	80 µg/L	15 µg/L	--	--	--	--
Semi-Volatile Organics Surrogates										
Fluorobiphenyl, 2-	E625A/WT	1.0	%	80.8	--	--	--	--	--	--
Nitrobenzene-d5	E625A/WT	1.0	%	86.8	--	--	--	--	--	--
Terphenyl-d14, p-	E625A/WT	1.0	%	97.5	--	--	--	--	--	--

Analyte	Method/Lab	LOR	Unit	WT2500943-001 (Continued)	DURSUB SAN	DURSUB STM	--	--	--	--
Phenolics Surrogates										
Tribromophenol, 2,4,6-	E625A/WT	0.50	%	92.5	--	--	--	--	--	--
Nonylphenols										
Nonylphenol [NP]	E749A/WT	0.40	µg/L	<0.40	20 µg/L	--	--	--	--	--
Nonylphenol diethoxylate [NP2EO]	E749B/WT	0.10	µg/L	<0.10	--	--	--	--	--	--
Nonylphenol ethoxylates, mono+di	E749B/WT	2.0	µg/L	<2.0	200 µg/L	--	--	--	--	--
Nonylphenol monoethoxylate [NP1EO]	E749B/WT	0.40	µg/L	<0.40	--	--	--	--	--	--
Polychlorinated Biphenyls										
Aroclor 1016	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687/WT	0.020	µg/L	<0.020	--	--	--	--	--	--
Polychlorinated biphenyls [PCBs], total	E687/WT	0.060	µg/L	<0.060	1 µg/L	0.4 µg/L	--	--	--	--
Decachlorobiphenyl	E687/WT	0.1	%	65.0	--	--	--	--	--	--
Tetrachloro-m-xylene	E687/WT	0.1	%	94.0	--	--	--	--	--	--

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
MW104 (UNFILTERED)	Water	Biochemical oxygen demand [BOD]		DURSUB	SAN	652 mg/L	300 mg/L
	Water	Solids, total suspended [TSS]		DURSUB	STM	77.7 mg/L	15 mg/L
	Water	Biochemical oxygen demand [BOD]		DURSUB	STM	652 mg/L	15 mg/L
	Water	Chloroform		DURSUB	STM	4.98 µg/L	2 µg/L

Key:

DURSUB	Ontario Durham Sewer Use Bylaw (55-2013)
SAN	Durham Sanitary Sewer (55-2013)
STM	Durham Storm Sewer - (55-2013)

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2500943**	Page	: 1 of 10
Client	: **Fisher Engineering Limited**	Laboratory	: ALS Environmental - Waterloo
Contact	: Clive Wiggan	Account Manager	: Emily Hansen
Address	: 15-400 Esna Park Drive Markham ON Canada L3R 3K2	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 905 475 7755, Ext. 29	Telephone	: +1 519 886 6910
Project	: 24-14410	Date Samples Received	: 16-Jan-2025 15:29
PO	: ----	Issue Date	: 28-Jan-2025 15:36
C-O-C number	: 23-1105097		
Sampler	: NNAMDI		
Site	: ----		
Quote number	: ALS 2025 STANDING OFFER		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-4d] MW104 (UNFILTERED)	E550	16-Jan-2025	----	----	----		23-Jan-2025	4 days	7 days	× EHT
Aggregate Organics : Mineral Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid) MW104 (UNFILTERED)	E567SG	16-Jan-2025	20-Jan-2025	28 days	5 days	✓	22-Jan-2025	28 days	7 days	✓
Aggregate Organics : Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid) MW104 (UNFILTERED)	E567	16-Jan-2025	20-Jan-2025	28 days	5 days	✓	22-Jan-2025	28 days	7 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) [ON MECP] MW104 (UNFILTERED)	E562	16-Jan-2025	20-Jan-2025	28 days	5 days	✓	21-Jan-2025	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP] MW104 (UNFILTERED)	E235.F	16-Jan-2025	20-Jan-2025	28 days	5 days	✓	21-Jan-2025	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP] MW104 (UNFILTERED)	E235.SO4	16-Jan-2025	20-Jan-2025	28 days	5 days	✓	21-Jan-2025	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) [ON MECP] MW104 (UNFILTERED)	E318	16-Jan-2025	22-Jan-2025	28 days	6 days	✓	22-Jan-2025	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) [ON MECP] MW104 (UNFILTERED)	E372-U	16-Jan-2025	21-Jan-2025	28 days	6 days	✓	23-Jan-2025	28 days	8 days	✓
Cyanides : Total Cyanide										
Opaque HDPE - total (sodium hydroxide) MW104 (UNFILTERED)	E333	16-Jan-2025	21-Jan-2025	14 days	6 days	✓	21-Jan-2025	14 days	6 days	✓
Microbiological Tests : E. coli (MF-mFC-BCIG)										
Sterile HDPE (Sodium thiosulphate) [ON MECP] MW104 (UNFILTERED)	E012A.EC	16-Jan-2025	----	----	----		18-Jan-2025	48 hrs	56 hrs	✓
Nonylphenols : Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode										
Amber glass/Teflon lined cap - LCMS MW104 (UNFILTERED)	E749B	16-Jan-2025	20-Jan-2025	7 days	5 days	✓	20-Jan-2025	7 days	0 days	✓
Nonylphenols : Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode										
Amber glass/Teflon lined cap - LCMS MW104 (UNFILTERED)	E749A	16-Jan-2025	20-Jan-2025	7 days	5 days	✓	20-Jan-2025	7 days	0 days	✓
Phthalate Esters : BNA (Routine List) by GC-MS-MS										
Amber glass/Teflon lined septa cap - SVOCs (sodium thiosulfate) [ON MECP] MW104 (UNFILTERED)	E625A	16-Jan-2025	21-Jan-2025	14 days	5 days	✓	21-Jan-2025	40 days	0 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] MW104 (UNFILTERED)	E108	16-Jan-2025	20-Jan-2025	14 days	5 days	✓	21-Jan-2025	14 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE [ON MECP] MW104 (UNFILTERED)	E160	16-Jan-2025	----	----	----		21-Jan-2025	7 days	6 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Amber glass/Teflon lined cap MW104 (UNFILTERED)	E687	16-Jan-2025	20-Jan-2025	365 days	4 days	✓	21-Jan-2025	40 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) [ON MECP]										
MW104 (UNFILTERED)	E508	16-Jan-2025	20-Jan-2025	28 days	4 days	✓	20-Jan-2025	28 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
MW104 (UNFILTERED)	E420	16-Jan-2025	20-Jan-2025	180 days	4 days	✓	20-Jan-2025	180 days	4 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
MW104 (UNFILTERED)	E611D	16-Jan-2025	20-Jan-2025	14 days	4 days	✓	20-Jan-2025	14 days	4 days	✓

Legend & Qualifier Definitions

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Biochemical Oxygen Demand - 5 day	E550	1844271	1	19	5.2	5.0	✓
E. coli (MF-mFC-BCIG)	E012A.EC	1844009	1	9	11.1	5.0	✓
Fluoride in Water by IC	E235.F	1845212	1	12	8.3	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	1844716	1	16	6.2	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	1844715	1	16	6.2	5.0	✓
pH by Meter	E108	1845210	1	18	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1845533	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1845216	1	12	8.3	5.0	✓
Total Cyanide	E333	1844743	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1845371	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1844734	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1844677	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1845372	1	17	5.8	5.0	✓
TSS by Gravimetry	E160	1846362	1	20	5.0	4.7	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1844910	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Biochemical Oxygen Demand - 5 day	E550	1844271	1	19	5.2	5.0	✓
BNA (Routine List) by GC-MS-MS	E625A	1845765	1	8	12.5	5.0	✓
Fluoride in Water by IC	E235.F	1845212	1	12	8.3	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	1845317	1	16	6.2	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	1844716	1	16	6.2	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	1844715	1	16	6.2	5.0	✓
Oil & Grease by Gravimetry	E567	1845316	1	20	5.0	5.0	✓
PCB Aroclors by GC-MS	E687	1844707	1	7	14.2	4.7	✓
pH by Meter	E108	1845210	1	18	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1845533	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1845216	1	12	8.3	5.0	✓
Total Cyanide	E333	1844743	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1845371	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1844734	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1844677	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1845372	1	17	5.8	5.0	✓
TSS by Gravimetry	E160	1846362	1	20	5.0	4.7	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1844910	1	20	5.0	5.0	✓
Method Blanks (MB)							

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Biochemical Oxygen Demand - 5 day	E550	1844271	1	19	5.2	5.0	✓
BNA (Routine List) by GC-MS-MS	E625A	1845765	1	8	12.5	5.0	✓
E. coli (MF-mFC-BCIG)	E012A.EC	1844009	1	9	11.1	5.0	✓
Fluoride in Water by IC	E235.F	1845212	1	12	8.3	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	1845317	1	16	6.2	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	1844716	1	16	6.2	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	1844715	1	16	6.2	5.0	✓
Oil & Grease by Gravimetry	E567	1845316	1	20	5.0	5.0	✓
PCB Aroclors by GC-MS	E687	1844707	1	7	14.2	4.7	✓
Phenols (4AAP) in Water by Colorimetry	E562	1845533	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1845216	1	12	8.3	5.0	✓
Total Cyanide	E333	1844743	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1845371	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1844734	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1844677	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1845372	1	17	5.8	5.0	✓
TSS by Gravimetry	E160	1846362	1	20	5.0	4.7	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1844910	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Fluoride in Water by IC	E235.F	1845212	1	12	8.3	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	1844716	1	16	6.2	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	1844715	1	16	6.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1845533	1	11	9.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1845216	1	12	8.3	5.0	✓
Total Cyanide	E333	1844743	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1845371	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1844734	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1844677	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1845372	1	17	5.8	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	1844910	1	20	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
E. coli (MF-mFC-BCIG)	E012A.EC ALS Environmental - Waterloo	Water	APHA 9222D (mod)	Following filtration (0.45 µm), and incubation at 44.5±0.2°C for 24 hours, colonies exhibiting characteristic morphology of the target organism are enumerated.
pH by Meter	E108 ALS Environmental - Waterloo	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Waterloo	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Fluoride in Water by IC	E235.F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Cyanide	E333 ALS Environmental - Waterloo	Water	ISO 14403 (mod)	Total or Strong Acid Dissociable (SAD) Cyanide is determined by Continuous Flow Analyzer (CFA) with in-line UV digestion followed by colourmetric analysis. Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Waterloo	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Waterloo	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Mercury in Water by CVAAS	E508 ALS Environmental - Waterloo	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Biochemical Oxygen Demand - 5 day	E550 ALS Environmental - Waterloo	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Phenols (4AAP) in Water by Colorimetry	E562 ALS Environmental - Waterloo	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
Oil & Grease by Gravimetry	E567 ALS Environmental - Waterloo	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease.
Mineral Oil & Grease by Gravimetry	E567SG ALS Environmental - Waterloo	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane, followed by silica gel treatment after which the extract is evaporated to dryness. The residue is then weighed to determine Mineral Oil and Grease.
VOCs (Eastern Canada List) by Headspace GC-MS	E611D ALS Environmental - Waterloo	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
BNA (Routine List) by GC-MS-MS	E625A ALS Environmental - Waterloo	Water	EPA 8270E (mod)	BNA are analyzed by GC-MS-MS.
PCB Aroclors by GC-MS	E687 ALS Environmental - Waterloo	Water	EPA 8270E (mod)	PCB Aroclors are analyzed by GC-MS
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A ALS Environmental - Waterloo	Water	ASTM D7485-16 (mod)	An aliquot of 5.0 mL of sample is spiked with internal standards and analyzed by Direct Aqueous Injection and LC-MS-MS-Negative mode.
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B ALS Environmental - Waterloo	Water	ASTM D7485-16 (mod)	An aliquot of 5.0 mL of sample is spiked with internal standards and analyzed by Direct Aqueous Injection and LC-MS-MS.
Animal & Vegetable Oil & Grease by Gravimetry	EC567A.SG ALS Environmental - Waterloo	Water	APHA 5520 (mod)	Animal & vegetable oil and grease is calculated as follows: Oil & Grease (gravimetric) minus Mineral Oil & Grease (gravimetric)

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for TKN in water	EP318 ALS Environmental - Waterloo	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Waterloo	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Oil & Grease Extraction for Gravimetry	EP567 ALS Environmental - Waterloo	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane by liquid-liquid extraction.
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Waterloo	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into a GC-MS-FID.
BNA Extraction	EP625 ALS Environmental - Waterloo	Water	EPA 3510C (mod)	SVOCs are extracted from aqueous sample using DCM liquid-liquid extraction.
Pesticides, PCB, and Neutral Extractable Chlorinated Hydrocarbons Extraction	EP660 ALS Environmental - Waterloo	Water	EPA 3511 (mod)	Samples are extracted from aqueous sample using an organic solvent liquid-liquid extraction.
Preparation of Nonylphenol and Nonylphenol Ethoxylates	EP749 ALS Environmental - Waterloo	Water	ASTM D7485-16 (mod)	An aliquot of 5.0 mL of sample is spiked with internal standards and analyzed by Direct Aqueous Injection and LC-MS/MS.

QUALITY CONTROL REPORT

Work Order	: **WT2500943**	Page	: 1 of 12
Client	: Fisher Engineering Limited	Laboratory	: ALS Environmental - Waterloo
Contact	: Clive Wiggan	Account Manager	: Emily Hansen
Address	: 15-400 Esna Park Drive Markham ON Canada L3R 3K2	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 905 475 7755, Ext. 29	Telephone	: +1 519 886 6910
Project	: 24-14410	Date Samples Received	: 16-Jan-2025 15:29
PO	: ----	Date Analysis Commenced	: 18-Jan-2025
C-O-C number	: 23-1105097	Issue Date	: 28-Jan-2025 15:40
Sampler	: NNAMDI		
Site	: ----		
Quote number	: ALS 2025 STANDING OFFER		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Hannah Lewis	Inorganics Analyst	Waterloo Inorganics, Waterloo, Ontario
Jeminikumari Patel	Analyst	Waterloo Microbiology, Waterloo, Ontario
Manuel TavaraTello	Supervisor - Semi-Volatile Extractions	Waterloo Organics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
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Walt Kippenhuck	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1845210)											
WT2500835-004	Anonymous	pH	----	E108	0.10	pH units	8.33	8.32	0.120%	4%	----
Physical Tests (QC Lot: 1846362)											
WT2500787-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	19.1	20.3	1.2	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1845212)											
WT2500835-002	Anonymous	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.268	0.263	0.005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1845216)											
WT2500835-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	283	284	0.306%	20%	----
Anions and Nutrients (QC Lot: 1845371)											
WT2500878-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	1.62	1.89	15.2%	20%	----
Anions and Nutrients (QC Lot: 1845372)											
WT2500879-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0200	mg/L	8.39	8.36	0.297%	20%	----
Cyanides (QC Lot: 1844743)											
RG2500038-005	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Microbiological Tests (QC Lot: 1844009)											
WT2500967-001	Anonymous	Coliforms, Escherichia coli [E. coli]	----	E012A.EC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	----
Total Metals (QC Lot: 1844677)											
HA2500163-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0212	0.0209	0.0003	Diff <2x LOR	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00015	0.00014	0.000005	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000126	0.0000129	0.0000003	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.0988	0.0987	0.114%	20%	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	1.33 µg/L	0.00136	2.14%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.00103	0.00096	0.00007	Diff <2x LOR	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00061	0.00062	0.000008	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 1844677) - continued											
HA2500163-001	Anonymous	Titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	0.243	0.244	0.470%	20%	----
Total Metals (QC Lot: 1844734)											
TY2500455-002	Anonymous	Mercury, total	7439-97-6	E508	0.000100	mg/L	<0.100 µg/L	<0.000100	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1844271)											
WT2500962-001	Anonymous	Biochemical oxygen demand [BOD]	----	E550	3.0	mg/L	<3.0	<3.0	0.0%	30%	----
Aggregate Organics (QC Lot: 1845533)											
WP2500644-001	Anonymous	Phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1844910)											
HA2500148-001	Anonymous	Benzene	71-43-2	E611D	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611D	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611D	3.0	µg/L	<3.0	<3.0	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611D	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		Styrene	100-42-5	E611D	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611D	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----
		Toluene	108-88-3	E611D	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611D	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611D	2.00	µg/L	<2.00	<2.00	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611D	1.00	µg/L	<1.00	<1.00	0	Diff <2x LOR	----
Nonylphenols (QC Lot: 1844715)											
WT2500721-001	Anonymous	Nonylphenol [NP]	84852-15-3	E749A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
Nonylphenols (QC Lot: 1844716)											
WT2500721-001	Anonymous	Nonylphenol diethoxylate [NP2EO]	20427-84-3	E749B	0.10	µg/L	<0.10	<0.10	0	Diff <2x LOR	----
		Nonylphenol monoethoxylate [NP1EO]	27986-36-3	E749B	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1846362)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 1845212)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1845216)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1845371)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1845372)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Cyanides (QCLot: 1844743)						
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	<0.0020	----
Microbiological Tests (QCLot: 1844009)						
Coliforms, Escherichia coli [E. coli]	----	E012A.EC	1	CFU/100mL	<1	----
Total Metals (QCLot: 1844677)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Total Metals (QCLot: 1844734)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1844734) - continued						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Aggregate Organics (QCLot: 1844271)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 1845316)						
Oil & grease (gravimetric)	----	E567	5	mg/L	<5.0	----
Aggregate Organics (QCLot: 1845317)						
Oil & grease, mineral (gravimetric)	----	E567SG	5	mg/L	<5.0	----
Aggregate Organics (QCLot: 1845533)						
Phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Volatile Organic Compounds (QCLot: 1844910)						
Benzene	71-43-2	E611D	0.5	µg/L	<0.50	----
Chloroform	67-66-3	E611D	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	<0.50	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	<0.50	----
Dichloromethane	75-09-2	E611D	1	µg/L	<1.0	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	<0.30	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	<0.50	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	----
Styrene	100-42-5	E611D	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	<0.50	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611D	0.5	µg/L	<0.50	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	<0.30	----
Phthalate Esters (QCLot: 1845765)						
bis(2-Ethylhexyl) phthalate [DEHP]	117-81-7	E625A	0.6	µg/L	<0.60	----
Di-n-butyl phthalate	84-74-2	E625A	1	µg/L	<1.0	----
Nonylphenols (QCLot: 1844715)						
Nonylphenol [NP]	84852-15-3	E749A	0.4	µg/L	<0.40	----
Nonylphenols (QCLot: 1844716)						
Nonylphenol diethoxylate [NP2EO]	20427-84-3	E749B	0.1	µg/L	<0.10	----
Nonylphenol monoethoxylate [NP1EO]	27986-36-3	E749B	0.4	µg/L	<0.40	----
Polychlorinated Biphenyls (QCLot: 1844707)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polychlorinated Biphenyls (QCLot: 1844707) - continued						
Aroclor 1016	12674-11-2	E687	0.02	µg/L	<0.020	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	<0.020	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	<0.020	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	<0.020	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	<0.020	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	<0.020	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	<0.020	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	<0.020	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	<0.020	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1845210)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 1846362)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	92.2	85.0	115	----
Anions and Nutrients (QCLot: 1845212)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1845216)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1845371)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 1845372)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.333 mg/L	99.7	80.0	120	----
Cyanides (QCLot: 1844743)									
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	0.25 mg/L	92.5	80.0	120	----
Total Metals (QCLot: 1844677)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	95.4	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	103	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	106	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	102	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.012 mg/L	101	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.012 mg/L	99.3	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.012 mg/L	100.0	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	99.5	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.012 mg/L	102	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.012 mg/L	102	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	99.8	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	103	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	94.3	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	103	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.012 mg/L	98.0	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	102	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1844734)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0 mg/L	97.8	80.0	120	----
Aggregate Organics (QCLot: 1844271)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	97.6	85.0	115	----
Aggregate Organics (QCLot: 1845316)									
Oil & grease (gravimetric)	----	E567	5	mg/L	200 mg/L	97.9	70.0	130	----
Aggregate Organics (QCLot: 1845317)									
Oil & grease, mineral (gravimetric)	----	E567SG	5	mg/L	100 mg/L	89.5	70.0	130	----
Aggregate Organics (QCLot: 1845533)									
Phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	101	85.0	115	----
Volatile Organic Compounds (QCLot: 1844910)									
Benzene	71-43-2	E611D	0.5	µg/L	100 µg/L	103	70.0	130	----
Chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	100 µg/L	100	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	100 µg/L	103	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	100 µg/L	106	70.0	130	----
Dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	103	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	100 µg/L	95.9	70.0	130	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	100 µg/L	96.3	70.0	130	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	100 µg/L	86.6	70.0	130	----
Styrene	100-42-5	E611D	0.5	µg/L	100 µg/L	100	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	100 µg/L	95.0	70.0	130	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	102	70.0	130	----
Toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	104	70.0	130	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	105	70.0	130	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	200 µg/L	97.3	70.0	130	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	100 µg/L	96.3	70.0	130	----
Phthalate Esters (QCLot: 1845765)									
bis(2-Ethylhexyl) phthalate [DEHP]	117-81-7	E625A	0.6	µg/L	33.7 µg/L	88.6	50.0	140	----
Di-n-butyl phthalate	84-74-2	E625A	1	µg/L	33.7 µg/L	95.9	50.0	140	----
Nonylphenols (QCLot: 1844715)									
Nonylphenol [NP]	84852-15-3	E749A	0.4	µg/L	10 µg/L	99.5	60.0	140	----
Nonylphenols (QCLot: 1844716)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Nonylphenols (QCLot: 1844716) - continued									
Nonylphenol diethoxylate [NP2EO]	20427-84-3	E749B	0.1	µg/L	2 µg/L	100	60.0	140	----
Nonylphenol monoethoxylate [NP1EO]	27986-36-3	E749B	0.4	µg/L	10 µg/L	114	60.0	140	----
Polychlorinated Biphenyls (QCLot: 1844707)									
Aroclor 1016	12674-11-2	E687	0.02	µg/L	0.2 µg/L	94.8	60.0	140	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	0.2 µg/L	94.8	60.0	140	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	0.2 µg/L	94.8	60.0	140	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	0.2 µg/L	94.8	60.0	140	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	0.2 µg/L	120	60.0	140	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	0.2 µg/L	77.8	60.0	140	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	0.2 µg/L	90.4	60.0	140	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	0.2 µg/L	90.4	60.0	140	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	0.2 µg/L	90.4	60.0	140	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1845212)										
WT2500835-002	Anonymous	Fluoride	16984-48-8	E235.F	5.16 mg/L	5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 1845216)										
WT2500835-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	510 mg/L	500 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1845371)										
WT2500878-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	3.06 mg/L	2.5 mg/L	122	70.0	130	----
Anions and Nutrients (QCLot: 1845372)										
WT2500879-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	----	ND	70.0	130	----
Cyanides (QCLot: 1844743)										
RG2500038-005	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.242 mg/L	0.25 mg/L	96.8	75.0	125	----
Total Metals (QCLot: 1844677)										
HA2500163-002	Anonymous	Aluminum, total	7429-90-5	E420	0.0924 mg/L	0.1 mg/L	92.4	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0515 mg/L	0.05 mg/L	103	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0511 mg/L	0.05 mg/L	102	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00514 mg/L	0.005 mg/L	103	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0128 mg/L	0.012 mg/L	102	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0125 mg/L	0.012 mg/L	99.7	70.0	130	----
		Copper, total	7440-50-8	E420	ND mg/L	----	ND	70.0	130	----
		Lead, total	7439-92-1	E420	0.0241 mg/L	0.025 mg/L	96.5	70.0	130	----
		Manganese, total	7439-96-5	E420	0.0124 mg/L	0.012 mg/L	99.3	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0133 mg/L	0.012 mg/L	106	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0246 mg/L	0.025 mg/L	98.6	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0482 mg/L	0.05 mg/L	96.4	70.0	130	----
		Silver, total	7440-22-4	E420	0.00476 mg/L	0.005 mg/L	95.2	70.0	130	----
		Tin, total	7440-31-5	E420	0.0265 mg/L	0.025 mg/L	106	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0120 mg/L	0.012 mg/L	96.5	70.0	130	----
		Zinc, total	7440-66-6	E420	ND mg/L	----	ND	70.0	130	----
Total Metals (QCLot: 1844734)										
WT2500785-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000964 mg/L	0 mg/L	96.4	70.0	130	----
Aggregate Organics (QCLot: 1845533)										
WP2500644-001	Anonymous	Phenols, total (4AAP)	----	E562	0.0200 mg/L	0.02 mg/L	100	75.0	125	----
Volatile Organic Compounds (QCLot: 1844910)										
HA2500148-001	Anonymous	Benzene	71-43-2	E611D	106 µg/L	100 µg/L	106	60.0	140	----
		Chloroform	67-66-3	E611D	110 µg/L	100 µg/L	110	60.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	103 µg/L	100 µg/L	103	60.0	140	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1844910) - continued										
HA2500148-001	Anonymous	Dichloroethylene, cis-1,2-	156-59-2	E611D	110 µg/L	100 µg/L	110	60.0	140	----
		Dichloromethane	75-09-2	E611D	106 µg/L	100 µg/L	106	60.0	140	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	100 µg/L	100 µg/L	100	60.0	140	----
		Ethylbenzene	100-41-4	E611D	96.9 µg/L	100 µg/L	96.9	60.0	140	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	89 µg/L	100 µg/L	89.4	60.0	140	----
		Styrene	100-42-5	E611D	99.3 µg/L	100 µg/L	99.3	60.0	140	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	95.2 µg/L	100 µg/L	95.2	60.0	140	----
		Tetrachloroethylene	127-18-4	E611D	102 µg/L	100 µg/L	102	60.0	140	----
		Toluene	108-88-3	E611D	106 µg/L	100 µg/L	106	60.0	140	----
		Trichloroethylene	79-01-6	E611D	106 µg/L	100 µg/L	106	60.0	140	----
		Xylene, m+p-	179601-23-1	E611D	196 µg/L	200 µg/L	98.0	60.0	140	----
		Xylene, o-	95-47-6	E611D	95.9 µg/L	100 µg/L	95.9	60.0	140	----
Nonylphenols (QCLot: 1844715)										
WT2500721-001	Anonymous	Nonylphenol [NP]	84852-15-3	E749A	8.93 µg/L	10 µg/L	89.3	50.0	140	----
Nonylphenols (QCLot: 1844716)										
WT2500721-001	Anonymous	Nonylphenol diethoxylate [NP2EO]	20427-84-3	E749B	2.05 µg/L	2 µg/L	103	50.0	140	----
		Nonylphenol monoethoxylate [NP1EO]	27986-36-3	E749B	6.76 µg/L	10 µg/L	67.6	50.0	140	----

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BC-476 ON-545
N-542 L-076
OR-032 VW-149

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Chain of Custody (COC) / Analytical Request Form

COC Number: 23 - 1105097

Page of

Canada Toll Free: 1 800 668 9878

VM

Environmental Division Waterloo
Work Order Reference
WT2500943

Telephone : +1 519 886 6910

Report To	Contact and company name below will appear on the final report
Company:	Fisher Engineering
Contact:	Clive Wiggan
Phone:	905-475-7755
	Company address below will appear on the final report
Street:	15-400 Esna Park Dr
City/Province:	Markham, ON
Postal Code:	L3R 3K2
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Reports / Recipients	
Select Report Format:	☒ PDF ☐ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA	☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☒ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	clive@fisherenv.com
Email 2	
Email 3	

Invoice Recipients	
Select Invoice Distribution:	☐ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	
Email 2	

Turnaround Time (TAT) Requested
☒ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimun
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimun
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimun
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimun
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.
Additional fees may apply to rush requests on weekends.
Date and Time Required for all E&P TATs:
For all tests with rush TATs requested, please co

Project Information	
ALS Client Code / QUOTE #:	
Job / Project #:	24-14410
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only): WT2500943

ALS Contact: Emily Hansen Sampler: Nramdi

Analysis Req

Indicate Filtered (F), Preserved (P) or Filtered and P

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Durham Sewer discharge bylaws (Sanitary + Storm) MW 104 (Unfiltered)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIR	SUSPECTED HAZARD (see not
	375 Kingston Road Pickering Durham Sewer discharge bylaws (Sanitary + Storm) MW 104 (Unfiltered)	16-Jan-25		GW					

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☒ NO	
Are samples for human consumption/ use? ☐ YES ☒ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☒ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Cooler Custody Seals Intact: ☐ YES ☒ N/A Sample Custody Seals Intact: ☐ YES ☒ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C	
9.6				0.6	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: Nramdi	Date: 16/01/25	Time:	Received by: RV	Date: Jan 16/25	Time: 3:29	Received by: RP	Date: Jan 17/25	Time: 1045

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JAN 2023 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

APPENDIX E – HYDRAULIC CONDUCTIVITY ANALYSES

FISHER ENGINEERING

HYDRAULIC CONDUCTIVITY ANALYSIS

Location: 375 - 417 Kingston Rd, Pickering
Project: FH 24-14411
Test Date: 1/15/2025
Tested by: NE
Well No. MW101

Equilibrium Water level (from top of pipe) HE	338	cm
Initial Water level (from top of pipe) Ho	558	cm
Monitoring well inner Dia D	0.05	m
Initial Time offset To	1	second
Reverse of Luthin's reference system Ru = Ho - HE	220.00	cm
Slope of Log((ho-he)/(ht-he)) / T	6.00E-06	

G = Ru / (HT - HE)

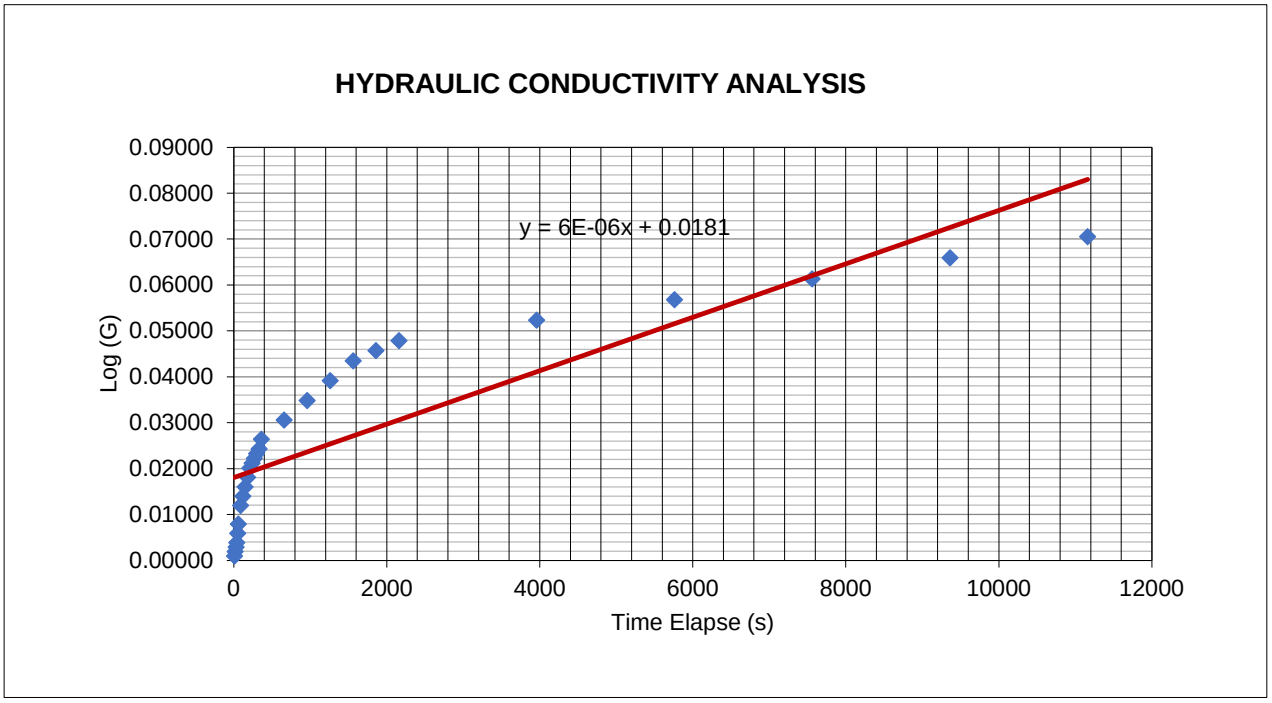
Hydraulic conductivity computed k = 0.0000091 cm/s
9.08E-08 m/s
0.008 m/day

Time	HT (Water Drop)			G	LOG (G)
(Interval s)	(Elapsed s)	(m)	(cm)		
	0	5.580	558.0		
10	10	5.575	557.5	1.00228	0.00099
10	20	5.57	557.0	1.00457	0.00198
10	30	5.565	556.5	1.00686	0.00297
10	40	5.56	556.0	1.00917	0.00397
10	50	5.55	555.0	1.01382	0.00596
10	60	5.54	554.0	1.01852	0.00797
30	90	5.52	552.0	1.02804	0.01201
30	120	5.51	551.0	1.03286	0.01404
30	150	5.5	550.0	1.03774	0.01609
30	180	5.49	549.0	1.04265	0.01814
30	210	5.48	548.0	1.04762	0.02020
30	240	5.475	547.5	1.05012	0.02124
30	270	5.47	547.0	1.05263	0.02228
30	300	5.465	546.5	1.05516	0.02332
30	330	5.46	546.0	1.05769	0.02436
30	360	5.45	545.0	1.06280	0.02645
300	660	5.43	543.0	1.07317	0.03067

FISHER ENGINEERING

HYDRAULIC CONDUCTIVITY ANALYSIS

Location: ***375 - 417 Kingston Rd, Pickering***
Project: ***FH 24-14411***
Test Date: ***1/15/2025***
Tested by: ***NE***
Well No. ***MW101***



FISHER ENGINEERING

HYDRAULIC CONDUCTIVITY ANALYSIS

Location: *375 - 417 Kingston Rd, Pickering*
Project: *FH 24-14411*
Test Date: *1/22/2025*
Tested by: *NE*
Well No. *MW103*

Equilibrium Water level (from top of pipe) HE	*145*	*cm*
Initial Water level (from top of pipe) Ho	*358*	*cm*
Monitoring well inner Dia D	*0.05*	*m*
Initial Time offset To	*1*	*second*
Reverse of Luthin's reference system Ru = Ho - HE	*213.00*	*cm*
Slope of Log((ho-he)/(ht-he)) / T	*2.00E-05*	
G = Ru / (HT - HE)		

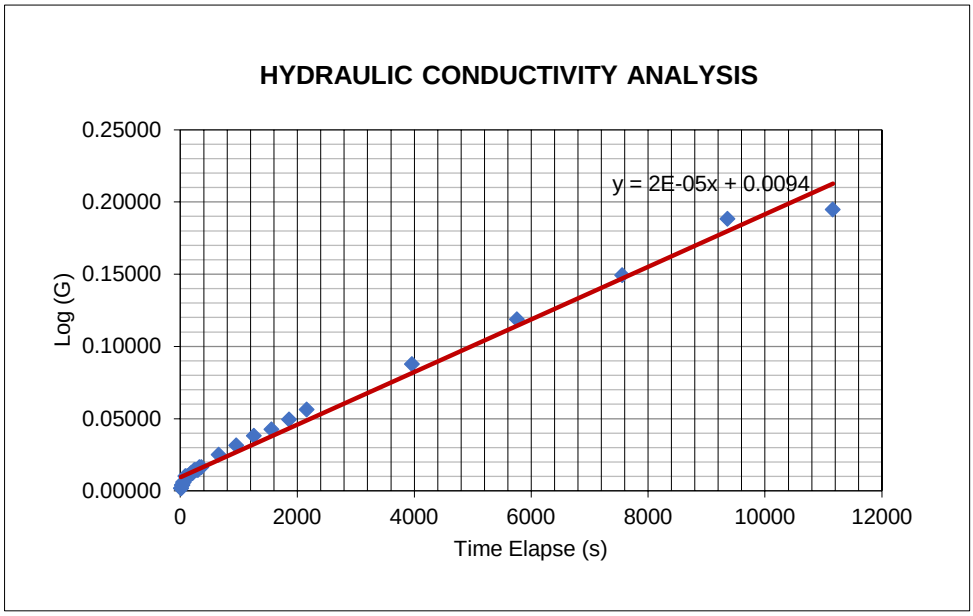
Hydraulic conductivity computed k = 0.0000303 cm/s
3.03E-07 m/s
0.026 m/day

Time	HT (Water Drop)			G	LOG (G)
(Interval s)	(Elapsed s)	(m)	(cm)		
	0	3.580			
10	10	3.57	357.0	1.00472	0.00204
10	20	3.57	357.0	1.00472	0.00204
10	30	3.56	356.0	1.00948	0.00410
10	40	3.56	356.0	1.00948	0.00410
10	50	3.55	355.0	1.01429	0.00616
10	60	3.55	355.0	1.01429	0.00616
30	90	3.53	353.0	1.02404	0.01032
30	120	3.53	353.0	1.02404	0.01032
30	150	3.53	353.0	1.02404	0.01032
30	180	3.52	352.0	1.02899	0.01241
30	210	3.52	352.0	1.02899	0.01241
30	240	3.51	351.0	1.03398	0.01451
30	270	3.51	351.0	1.03398	0.01451
30	300	3.51	351.0	1.03398	0.01451
30	330	3.5	350.0	1.03902	0.01663
30	360	3.5	350.0	1.03902	0.01663
300	660	3.46	346.0	1.05970	0.02518
300	960	3.43	343.0	1.07576	0.03171
300	1260	3.4	340.0	1.09231	0.03834
300	1560	3.38	338.0	1.10363	0.04282
300	1860	3.35	335.0	1.12105	0.04963
300	2160	3.32	332.0	1.13904	0.05654
1800	3960	3.19	319.0	1.22414	0.08783
1800	5760	3.07	307.0	1.31481	0.11886
1800	7560	2.96	296.0	1.41060	0.14940
1800	9360	2.83	283.0	1.54348	0.18850
1800	11160	2.810	281.0	1.56618	0.19484

FISHER ENGINEERING

HYDRAULIC CONDUCTIVITY ANALYSIS

Location: ***375 - 417 Kingston Rd, Pickering***
Project: ***FH 24-14411***
Test Date: ***1/22/2025***
Tested by: ***NE***
Well No. ***MW103***



FISHER ENGINEERING

HYDRAULIC CONDUCTIVITY ANALYSIS

Location: *375 - 417 Kingston Rd, Pickering*
Project: *FH 24-14411*
Test Date: *1/15/2025*
Tested by: *NE*
Well No. *MW104*

Equilibrium Water level (from top of pipe) HE	*103*	*cm*
Initial Water level (from top of pipe) Ho	*570*	*cm*
Monitoring well inner Dia D	*0.05*	*m*
Initial Time offset To	*1*	*second*
Reverse of Luthin's reference system Ru = Ho - HE	*467.00*	*cm*
Slope of Log((ho-he)/(ht-he)) / T	*4.00E-06*	
G = Ru / (HT - HE)		

Hydraulic conductivity computed k =

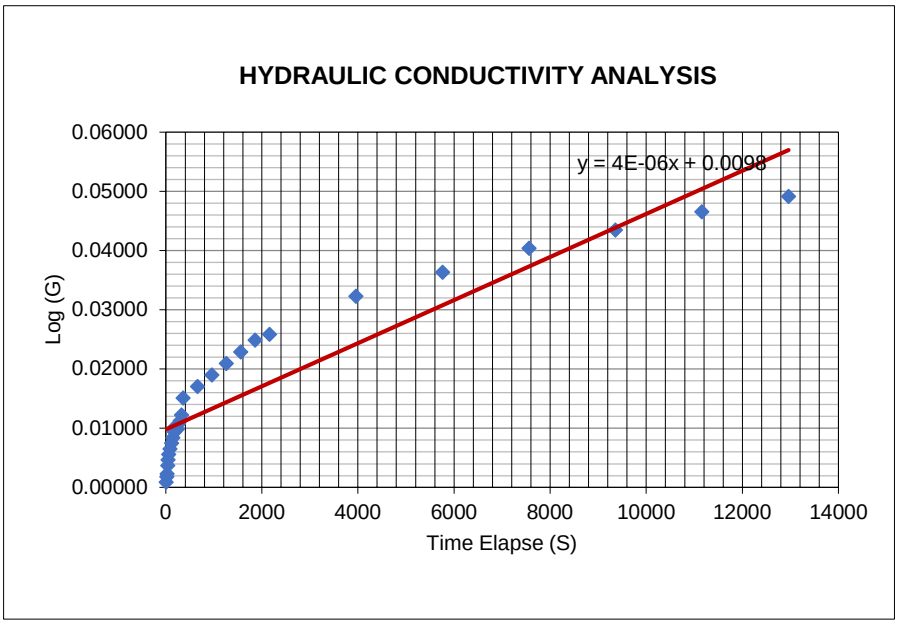
0.0000061	**cm/s**
6.05E-08	**m/s**
0.005	**m/day**

Time	HT (Water Drop)			G	LOG (G)
(Interval s)	(Elapsed s)	(m)	(cm)		
	0	5.7			
10	10	5.690	569.0	1.00215	0.00093
10	20	5.680	568.0	1.00430	0.00186
10	30	5.675	567.5	1.00538	0.00233
10	40	5.660	566.0	1.00864	0.00374
10	50	5.650	565.0	1.01082	0.00467
10	60	5.640	564.0	1.01302	0.00562
30	90	5.630	563.0	1.01522	0.00656
30	120	5.620	562.0	1.01743	0.00750
30	150	5.610	561.0	1.01965	0.00845
30	180	5.600	560.0	1.02188	0.00940
30	210	5.590	559.0	1.02412	0.01035
30	240	5.595	559.5	1.02300	0.00988
30	270	5.585	558.5	1.02525	0.01083
30	300	5.580	558.0	1.02637	0.01131
30	330	5.570	557.0	1.02863	0.01226
30	360	5.540	554.0	1.03548	0.01514
300	660	5.520	552.0	1.04009	0.01707
300	960	5.500	550.0	1.04474	0.01901
300	1260	5.480	548.0	1.04944	0.02096
300	1560	5.460	546.0	1.05418	0.02291
300	1860	5.440	544.0	1.05896	0.02488
300	2160	5.430	543.0	1.06136	0.02586
1800	3960	5.365	536.5	1.07728	0.03233
1800	5760	5.325	532.5	1.08731	0.03635
1800	7560	5.285	528.5	1.09753	0.04042
1800	9360	5.255	525.5	1.10533	0.04349
1800	11160	5.225	522.5	1.11323	0.04658
1800	12960	5.200	520.0	1.11990	0.04918

FISHER ENGINEERING

HYDRAULIC CONDUCTIVITY ANALYSIS

Location: ***375 - 417 Kingston Rd, Pickering***
Project: ***FH 24-14411***
Test Date: ***1/15/2025***
Tested by: ***NE***
Well No. ***MW104***



FISHER ENGINEERING

HYDRAULIC CONDUCTIVITY ANALYSIS

Location: *375 - 417 Kingston Rd, Pickering*
Project: *FH 24-14411*
Test Date: *1/22/2025*
Tested by: *NE*
Well No. *MW106*

Equilibrium Water level (from top of pipe) HE	*205*	*cm*
Initial Water level (from top of pipe) Ho	*474*	*cm*
Monitoring well inner Dia D	*0.05*	*m*
Initial Time offset To	*1*	*second*
Reverse of Luthin's reference system Ru = Ho - HE	*269.00*	*cm*
Slope of Log((ho-he)/(ht-he)) / T	*2.00E-04*	

G = Ru / (HT - HE)

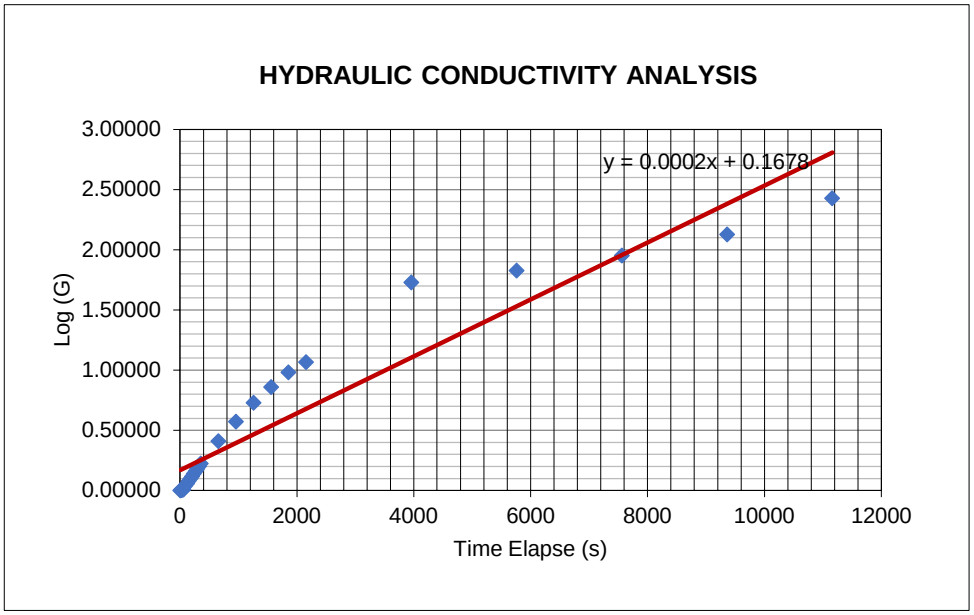
Hydraulic conductivity computed k = **0.0003027 cm/s**
3.03E-06 m/s
0.261 m/day

Time	HT (Water Drop)			G	LOG (G)
(Interval s)	(Elapsed s)	(m)	(cm)		
	0	4.740			
10	10	4.72	472.0	1.00749	0.00324
10	20	4.71	471.0	1.01128	0.00487
10	30	4.7	470.0	1.01509	0.00651
10	40	4.69	469.0	1.01894	0.00815
10	50	4.68	468.0	1.02281	0.00980
10	60	4.67	467.0	1.02672	0.01145
30	90	4.51	451.0	1.09350	0.03882
30	120	4.41	441.0	1.13983	0.05684
30	150	4.29	429.0	1.20089	0.07950
30	180	4.19	419.0	1.25701	0.09934
30	210	4.09	409.0	1.31863	0.12012
30	240	4	400.0	1.37949	0.13972
30	270	3.9	390.0	1.45405	0.16258
30	300	3.81	381.0	1.52841	0.18424
30	330	3.73	373.0	1.60119	0.20444
30	360	3.65	365.0	1.68125	0.22563
300	660	3.09	309.0	2.58654	0.41272
300	960	2.77	277.0	3.73611	0.57242
300	1260	2.55	255.0	5.38000	0.73078
300	1560	2.42	242.0	7.27027	0.86155
300	1860	2.33	233.0	9.60714	0.98259
300	2160	2.28	228.0	11.69565	1.06802
1800	3960	2.10	210.0	53.80000	1.73078
1800	5760	2.09	209.0	67.25000	1.82769
1800	7560	2.08	208.0	89.66667	1.95263
1800	9360	2.07	207.0	134.50000	2.12872
1800	11160	2.060	206.0	269.00000	2.42975

FISHER ENGINEERING

HYDRAULIC CONDUCTIVITY ANALYSIS

Location: ***375 - 417 Kingston Rd, Pickering***
Project: ***FH 24-14411***
Test Date: ***1/22/2025***
Tested by: ***NE***
Well No. ***MW106***



FISHER ENGINEERING

HYDRAULIC CONDUCTIVITY ANALYSIS

Location: *375 - 417 Kingston Rd, Pickering*
Project: *FH 24-14411*
Test Date: *1/22/2025*
Tested by: *NE*
Well No. *MW107*

Equilibrium Water level (from top of pipe) HE	*179*	*cm*
Initial Water level (from top of pipe) Ho	*709.5*	*cm*
Monitoring well inner Dia D	*0.05*	*m*
Initial Time offset To	*1*	*second*
Reverse of Luthin's reference system Ru = Ho - HE	*530.50*	*cm*
Slope of Log((ho-he)/(ht-he)) / T	*2.00E-06*	
G = Ru / (HT - HE)		

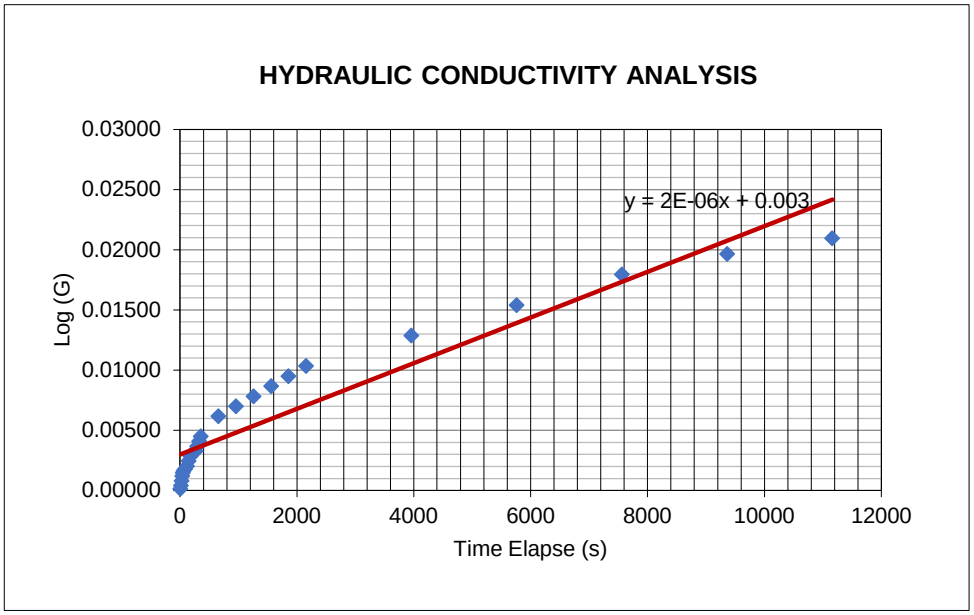
Hydraulic conductivity computed k = 0.0000030 cm/s
3.03E-08 m/s
0.003 m/day

Time	HT (Water Drop)			G	LOG (G)
(Interval s)	(Elapsed s)	(m)	(cm)		
	0	7.095			
10	10	7.093	709.3	1.00038	0.00016
10	20	7.090	709.0	1.00094	0.00041
10	30	7.085	708.5	1.00189	0.00082
10	40	7.080	708.0	1.00284	0.00123
10	50	7.077	707.7	1.00340	0.00148
10	60	7.075	707.5	1.00378	0.00164
30	90	7.073	707.3	1.00416	0.00180
30	120	7.070	707.0	1.00473	0.00205
30	150	7.065	706.5	1.00569	0.00246
30	180	7.060	706.0	1.00664	0.00287
30	210	7.058	705.8	1.00702	0.00304
30	240	7.056	705.6	1.00741	0.00320
30	270	7.055	705.5	1.00760	0.00329
30	300	7.050	705.0	1.00856	0.00370
30	330	7.045	704.5	1.00951	0.00411
30	360	7.040	704.0	1.01048	0.00453
300	660	7.020	702.0	1.01434	0.00618
300	960	7.010	701.0	1.01628	0.00701
300	1260	7.000	700.0	1.01823	0.00785
300	1560	6.990	699.0	1.02019	0.00868
300	1860	6.980	698.0	1.02216	0.00952
300	2160	6.970	697.0	1.02413	0.01036
1800	3960	6.940	694.0	1.03010	0.01288
1800	5760	6.910	691.0	1.03613	0.01542
1800	7560	6.880	688.0	1.04224	0.01797
1800	9360	6.860	686.0	1.04635	0.01968
1800	11160	6.845	684.5	1.04946	0.02096

FISHER ENGINEERING

HYDRAULIC CONDUCTIVITY ANALYSIS

Location: ***375 - 417 Kingston Rd, Pickering***
Project: ***FH 24-14411***
Test Date: ***1/22/2025***
Tested by: ***NE***
Well No. ***MW107***



FISHER ENGINEERING

HYDRAULIC CONDUCTIVITY ANALYSIS

Location: ***375 - 417 Kingston Rd, Pickering***
Project: ***FH 24-14411***
Test Date: ***1/15/2025***
Tested by: ***NE***
Well No. ***MW108***

Equilibrium Water level (from top of pipe) HE	***134***	***cm***
Initial Water level (from top of pipe) Ho	***407***	***cm***
Monitoring well inner Dia D	***0.05***	***m***
Initial Time offset To	***1***	***second***
Reverse of Luthin's reference system Ru = Ho - HE	***273.00***	***cm***
Slope of Log((ho-he)/(ht-he)) / T	***5.00E-06***	
G = Ru / (HT - HE)		

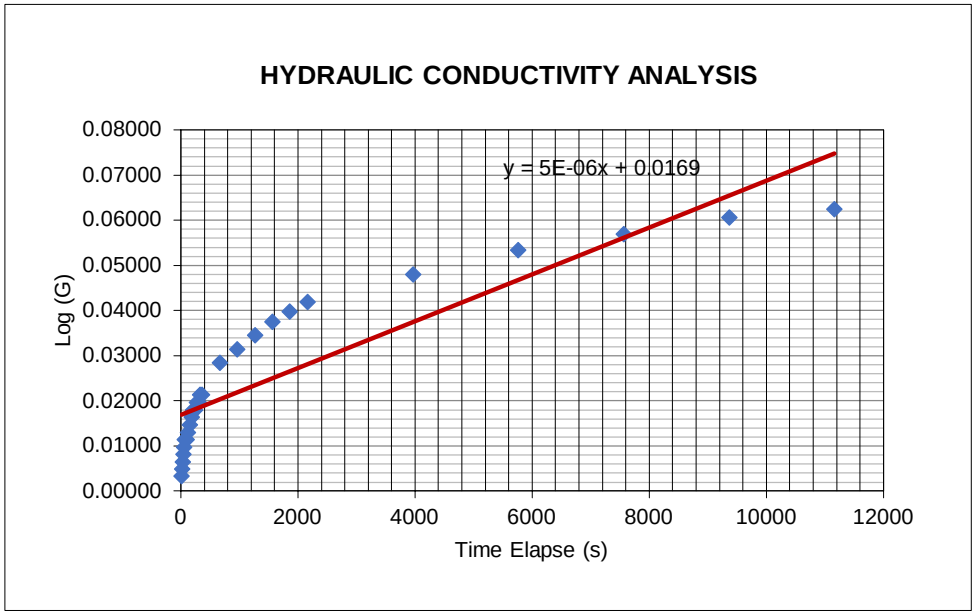
Hydraulic conductivity computed k = 0.0000076 cm/s
7.57E-08 m/s
0.007 m/day

Time	HT (Water Drop)			G	LOG (G)
(Interval s)	(Elapsed s)	(m)	(cm)		
	0	4.070	407.0		
10	10	4.050	405.0	1.00738	0.00319
10	20	4.040	404.0	1.01111	0.00480
10	30	4.030	403.0	1.01487	0.00641
10	40	4.020	402.0	1.01866	0.00803
10	50	4.010	401.0	1.02247	0.00965
10	60	4.000	400.0	1.02632	0.01128
30	90	4.000	400.0	1.02632	0.01128
30	120	3.990	399.0	1.03019	0.01292
30	150	3.980	398.0	1.03409	0.01456
30	180	3.970	397.0	1.03802	0.01621
30	210	3.960	396.0	1.04198	0.01786
30	240	3.960	396.0	1.04198	0.01786
30	270	3.950	395.0	1.04598	0.01952
30	300	3.950	395.0	1.04598	0.01952
30	330	3.940	394.0	1.05000	0.02119
30	360	3.940	394.0	1.05000	0.02119
300	660	3.898	389.8	1.06724	0.02826
300	960	3.880	388.0	1.07480	0.03133
300	1260	3.862	386.2	1.08247	0.03442
300	1560	3.845	384.5	1.08982	0.03735
300	1860	3.832	383.2	1.09551	0.03961
300	2160	3.820	382.0	1.10081	0.04171
1800	3960	3.785	378.5	1.11656	0.04788
1800	5760	3.755	375.5	1.13043	0.05325
1800	7560	3.735	373.5	1.13987	0.05686
1800	9360	3.715	371.5	1.14947	0.06050
1800	11160	3.705	370.5	1.15433	0.06233

FISHER ENGINEERING

HYDRAULIC CONDUCTIVITY ANALYSIS

Location: ***375 - 417 Kingston Rd, Pickering***
Project: ***FH 24-14411***
Test Date: ***1/15/2025***
Tested by: ***NE***
Well No. ***MW108***



FISHER ENGINEERING

HYDRAULIC CONDUCTIVITY ANALYSIS

Location: *375 - 417 Kingston Rd, Pickering*
Project: *FH 24-14411*
Test Date: *1/22/2025*
Tested by: *NE*
Well No. *MW110*

Equilibrium Water level (from top of pipe) HE	*190*	*cm*
Initial Water level (from top of pipe) Ho	*353*	*cm*
Monitoring well inner Dia D	*0.05*	*m*
Initial Time offset To	*1*	*second*
Reverse of Luthin's reference system Ru = Ho - HE	*163.00*	*cm*
Slope of Log((ho-he)/(ht-he)) / T	*1.00E-05*	

G = Ru / (HT - HE)

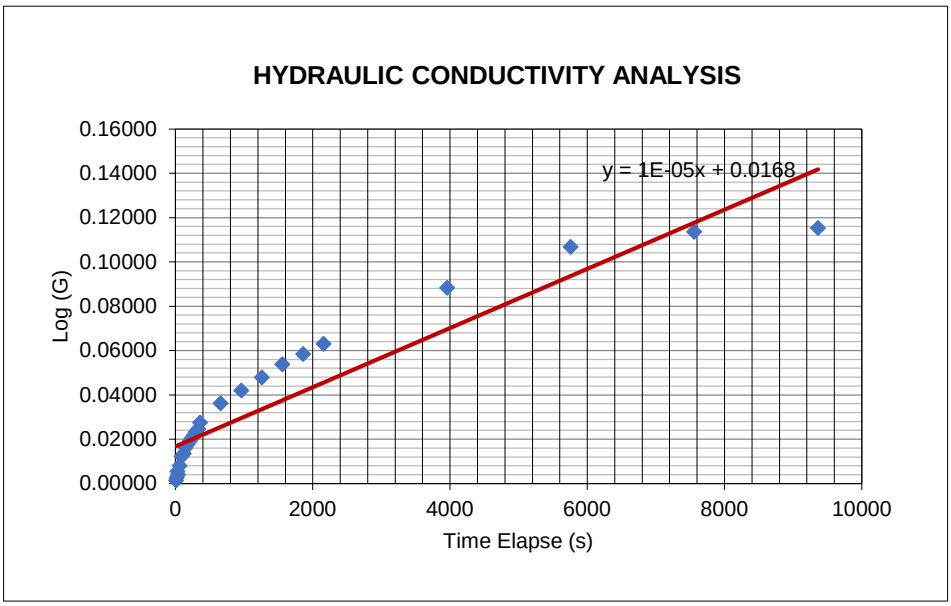
Hydraulic conductivity computed k = 0.0000151 cm/s
1.51E-07 m/s
0.013 m/day

Time		HT (Water Drop)		G	LOG (G)
(Interval s)	(Elapsed s)	(m)	(cm)		
	0	3.530	353.0		
10	10	3.525	352.5	1.00308	0.00133
10	20	3.520	352.0	1.00617	0.00267
10	30	3.510	351.0	1.01242	0.00536
10	40	3.515	351.5	1.00929	0.00402
10	50	3.550	355.0	0.98788	-0.00530
10	60	3.500	350.0	1.01875	0.00807
30	90	3.485	348.5	1.02839	0.01216
30	120	3.480	348.0	1.03165	0.01353
30	150	3.470	347.0	1.03822	0.01629
30	180	3.465	346.5	1.04153	0.01767
30	210	3.460	346.0	1.04487	0.01906
30	240	3.455	345.5	1.04823	0.02046
30	270	3.450	345.0	1.05161	0.02186
30	300	3.445	344.5	1.05502	0.02326
30	330	3.440	344.0	1.05844	0.02467
30	360	3.430	343.0	1.06536	0.02750
300	660	3.400	340.0	1.08667	0.03610
300	960	3.380	338.0	1.10135	0.04193
300	1260	3.360	336.0	1.11644	0.04783
300	1560	3.340	334.0	1.13194	0.05383
300	1860	3.325	332.5	1.14386	0.05837
300	2160	3.310	331.0	1.15603	0.06297
1800	3960	3.230	323.0	1.22556	0.08834
1800	5760	3.175	317.5	1.27843	0.10668
1800	7560	3.155	315.5	1.29880	0.11354
1800	9360	3.150	315.0	1.30400	0.11528

FISHER ENGINEERING

HYDRAULIC CONDUCTIVITY ANALYSIS

Location: *375 - 417 Kingston Rd, Pickering*
Project: *FH 24-14411*
Test Date: *1/22/2025*
Tested by: *NE*
Well No. *MW110*



APPENDIX F – DEWATERING RATES

FISHER ENGINEERING

Construction Dewatering Calculation

Location: *375 - 417 Kingston Rd, Pickering*
Project: *FH 24-14411*
Date: *2/6/2025*

Dupuit Forcheimer for Radial Flow to a Closely Welled System or Excavation

Construction Units	Finished lowest floor elevation (m asl)	Average grade (m asl)	Lowest Footing Elevation (m asl)	Required Dewatering Elevation (m asl)	Static water level		Well base elevation	H (m)	h_w (m)	H-h_w (m)	R_0 (m)		r_w	ab (m^2)	K (m/s)	H^2-h_w^2	lnR_0	lnr_w	Q_r (m^3/s)	Q_r (m^3/day)
					BGS (m)	Elevation (m asl)	(m)				Model	Adjusted								
PHASE 1 - 31 & 32 Storeys with 2 UG levels	96.01	103.51	94.81	93.81	2.24	101.27	93.56	7.71	0.3	7.46	16.35	52.04	35.69	4001	5.34E-07	59.38	3.95	3.57	2.64E-04	22.81
PHASE 2 - 32 & 33 Storeys with 2 UG levels	99.67	106.17	98.47	97.47	2.71	103.46	97.22	6.24	0.3	5.99	13.13	51.95	38.82	4734	5.34E-07	38.88	3.95	3.66	2.24E-04	19.34

Dupuit Forcheimer Equation

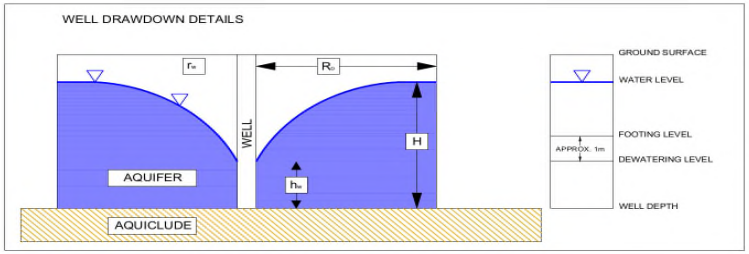
$$Q = \frac{\pi K(H^2 - h_w{}^2)}{lnR_0 - lnr_w}$$

Equivalent radius of well, r_w

$$r_w = \sqrt{\frac{ab}{\pi}}$$

Radius of influence in m, calculated from Sichardt's equation

$$R_0 = 3000(H - h_w)\sqrt{k}$$



Where:

r_w = equivalent radius of the well in m,
H = hydraulic head of the original water table (total saturated aquifer thickness) in m,
h_w = hydraulic head at maximum dewatering (proposed drawdown) in m,
R_0 = radius of influence in m, calculated from Sichardt's equation, and
K = hydraulic conductivity, in m/s
a = length of excavation area in m
b = width of excavation area in m

FISHER ENGINEERING

Permanent Drainage

Location: *375 - 417 Kingston Rd, Pickering*
Project: *FH 24-14411*
Date: *2/6/2025*

Dupuit Forcheimer for Radial Flow to a Closely Welled System or Excavation

Construction Units	Finished lowest floor elevation (m asl)	Average grade (m asl)	Lowest Footing Elevation (m asl)	Required Dewatering Elevation (m asl)	Static water level		Well base elevation	H (m)	h_w (m)	H-h_w (m)	R_0 (m)		r_w	ab (m^2)	K (m/s)	H^2-h_w^2	lnR_0	lnr_w	Q, (m^3/s)	Q, (m^3/day)
					BGS (m)	Elevation (m asl)	(m)				Model	Adjusted								
PHASE 1 - 31 & 32 Storeys with 2 UG levels	96.01	103.51	94.81	95.71	1.42	102.09	95.56	6.53	0.2	6.38	13.98	49.67	35.69	4001	5.34E-07	42.59	3.91	3.57	2.16E-04	18.67
PHASE 2 - 32 & 33 Storeys with 2 UG levels	99.67	106.17	98.47	99.37	1.42	104.74	99.22	5.53	0.2	5.38	11.79	50.61	38.82	4734	5.34E-07	30.53	3.92	3.66	1.93E-04	16.69

Dupuit Forcheimer Equation

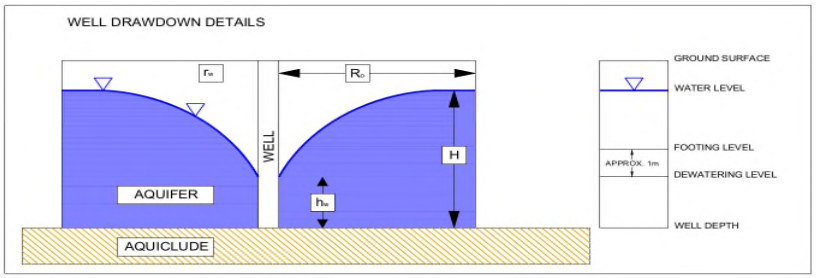
$$Q = \frac{\pi K(H^2 - h_w{}^2)}{lnR_0 - lnr_w}$$

Equivalent radius of well, r_w

$$r_w = \sqrt{\frac{ab}{\pi}}$$

Radius of influence in m, calculated from Sichardt's equation

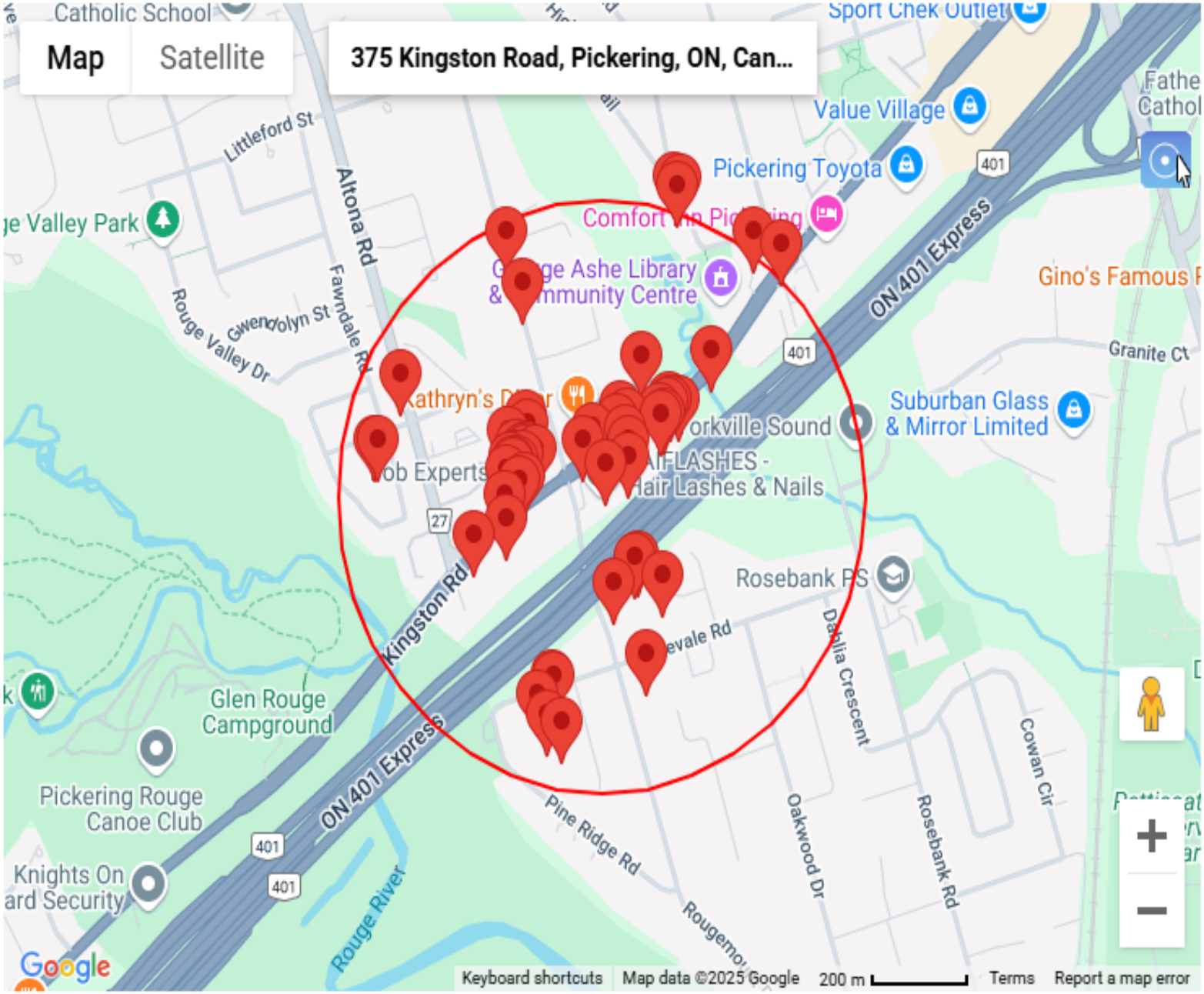
$$R_0 = 3000(H - h_w)\sqrt{k}$$



Where:

r_w = equivalent radius of the well in m,
H = hydraulic head of the original water table (total saturated aquifer thickness) in m,
h_w = hydraulic head at maximum dewatering (proposed drawdown) in m,
R_0 = radius of influence in m, calculated from Sichardt's equation, and
K = hydraulic conductivity, in m/s
a = length of excavation area in m
b = width of excavation area in m

APPENDIX G – WELL RECORDS



Latitude:43.80391, Longitude:-79.11692 (UTM Zone:17, Easting:651472, Northing:4851817)

FISHER ENGINEERING

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

Tel: 905 475-7755
Fax: 905 475-7718

NORTH

LEGEND

PROJECT NAME AND ADDRESS

HYDROGEOLOGICAL INVESTIGATION

375-417 Kingston Road, PICKERING, ONTARIO

FIGURE G1:

SITE LOCATION PLAN

SHEET NO.

G1

PROJECT NO.

FH24-14411

DATE

JANUARY 2025

SCALE

AS SHOWN

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1912262

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11

MUNICIP. 19605 CON. RANGE 03

COUNTY OR DISTRICT: [redacted] Pickering
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Rouge Mount & Hwy 2
CON., BLOCK, TRACT, SURVEY, ETC.: B.F
LOT: 28
DATE COMPLETED: DAY 28 MO 11 YR 94

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
36"	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC		29	0

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE: DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

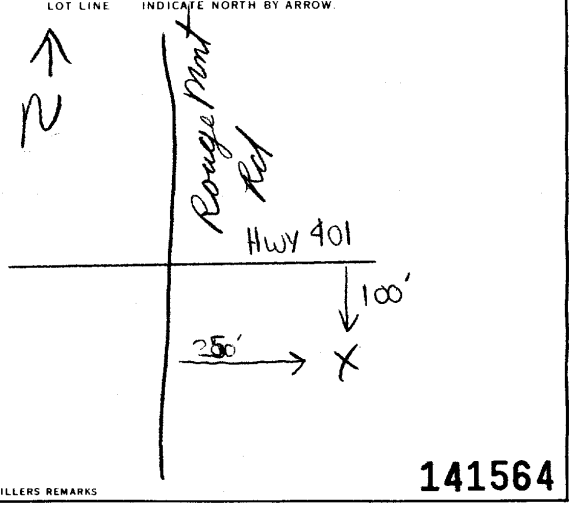
DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
29	28	Bensead
28	8	Blue Clay
8	0	Bensead Topsoil

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☐ BAILER
PUMPING RATE: GPM
DURATION OF PUMPING: HOURS MINS
STATIC LEVEL: FEET
WATER LEVEL END OF PUMPING: FEET
WATER LEVELS DURING: 1 ☐ PUMPING 2 ☐ RECOVERY
15 MINUTES: FEET
30 MINUTES: FEET
45 MINUTES: FEET
60 MINUTES: FEET
IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: 1 ☐ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☐ DEEP
RECOMMENDED PUMP SETTING: FEET
RECOMMENDED PUMPING RATE: GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

141564

FINAL STATUS OF WELL

1 ☐ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED ☐ DEWATERING

WATER USE

1 ☐ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Wilson's Water Wells
WELL CONTRACTOR'S LICENCE NUMBER: 5459
ADDRESS: R#4 Stouffville
NAME OF WELL TECHNICIAN: Peter Wilson
WELL TECHNICIAN'S LICENCE NUMBER: T-0248
SIGNATURE OF TECHNICIAN/CONTRACTOR: [signature]
SUBMISSION DATE: DAY 28 MO 11 YR 94

OFFICE USE ONLY

DATA SOURCE
CONTRACTOR: 5459
DATE RECEIVED: DEC 12 1994
DATE OF INSPECTION
INSPECTOR
REMARKS: COULD NOT LOCATE ORIGINAL W.W. RECORD. DEC. 12/94 - AB.

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ontario **Ministry of the Environment**

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 (1 2) **1915420** Municipality (10 14) 19605 Con. (15) RANGE (22 23 24) 03

County or District: [redacted] Durham

Township/Borough/City/Town/Village: Pickering

Con block tract survey, etc.: Old forest Rd

Lot # (25-27): 1415 31

Address: 20 Church St N Ajax On

Date completed (48-53): 8 day 11 month 01 year

21 (1 2) UTM (10) Northing (12 17 18 24) RC (25) Elevation (26) RC (30) Basin Code (31 47) ii iii iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To

31

32 (10 14 15 21 32 43 54 65 75 80)

41 WATER RECORD

Water found at - feet	Kind of water
10-13	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (14)
15-18	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (19)
20-23	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (24)
25-28	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (29)
30-33	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (34) 60

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
10-11	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic (12)			13-16
17-18	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic (19)			20-23
24-25	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic (26)			27-30

SCREEN

Sizes of opening (Slot No.) (31-33)	Diameter (34-38) inches	Length (39-40) feet
Material and type	Depth at top of screen (41-44) feet	30

61 PLUGGING & SEALING RECORD

☐ Annular space ☒ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
0 (10-13)	20 (14-17)	Concrete
20 (18-21)	32½ (22-25)	3/8 Peastone
26-29	30-33	80

71 PUMPING TEST

Pumping test method (10): 1 ☐ Pump 2 ☐ Bailer

Pumping rate (11-14): GPM

Duration of pumping (15-16 Hours, 17-18 Mins)

25 Water levels during: 1 ☐ Pumping 2 ☐ Recovery

Static level	Water level end of pumping	15 minutes	30 minutes	45 minutes	60 minutes
(19-21) feet	(22-24) feet	(26-28) feet	(29-31) feet	(32-34) feet	(35-37) feet

If flowing give rate (38-41) GPM

Pump intake set at feet

Water at end of test (42): ☐ Clear ☐ Cloudy

Recommended pump type: ☐ Shallow ☐ Deep

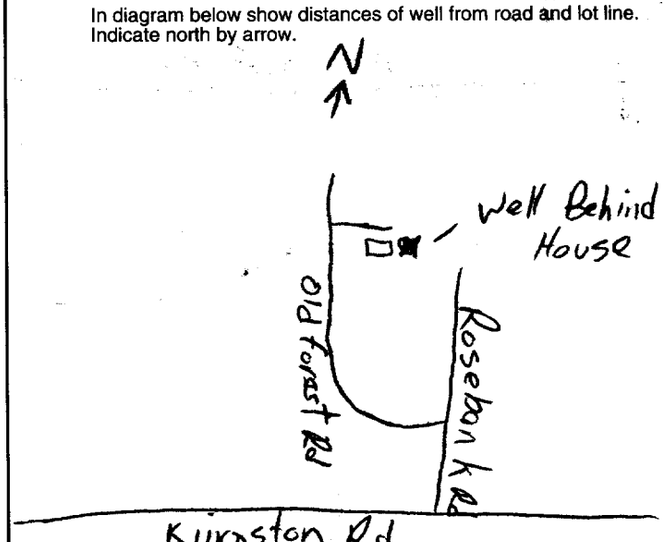
Recommended pump setting (43-45) feet

Recommended pump rate (46-49) GPM

50-53

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.



240016

FINAL STATUS OF WELL (54)

1 ☐ Water supply
2 ☐ Observation well
3 ☐ Test hole
4 ☐ Recharge well
5 ☐ Abandoned, insufficient supply
6 ☐ Abandoned, poor quality
7 ☒ Abandoned (Other)
8 ☐ Dewatering
9 ☐ Unfinished
10 ☐ Replacement well

WATER USE (55-56)

1 ☐ Domestic
2 ☐ Stock
3 ☐ Irrigation
4 ☐ Industrial
5 ☐ Commercial
6 ☐ Municipal
7 ☐ Public supply
8 ☐ Cooling & air conditioning
9 ☐ Not use
10 ☐ Other

METHOD OF CONSTRUCTION (57)

1 ☐ Cable tool
2 ☐ Rotary (conventional)
3 ☐ Rotary (reverse)
4 ☐ Rotary (air)
5 ☐ Air percussion
6 ☐ Boring
7 ☐ Diamond
8 ☐ Jetting
9 ☐ Driving
10 ☐ Digging
11 ☐ Other

Name of Well Contractor: Freelance Boring + Drilling LTD — Well Contractor's Licence No.: 2214

Address: 1151 Zion Rd RR#2 Little Britain On

Name of Well Technician: David Coburn — Well Technician's Licence No.: T0279

Signature of Technician/Contractor — Submission date: 14 day 11 mo 01 yr

MINISTRY USE ONLY

Data source (58) — Contractor (59-62): 2214 — Date received (63-68): NOV 20 2001 (80)

Date of inspection — Inspector

Remarks

0506 (07/00) Front Form 9

2 - MINISTRY OF THE ENVIRONMENT COPY

UTM Z E
9 R N
Elev. 9 R 13510
Basin 24

ONTARIO

The Water-well Drillers Act, 1954
Department of Mines

46 No. 1870

GROUND WATER BRANCH
MAY 28 1957
ONTARIO WATER RESOURCES COMMISSION

Water-Well Record

County or Territorial District Ontario Township, Village, Town or City Pickering
Con. RIII Lot 32 Street and Number (if in Village, Town or City)
Owner Imperial Oil Ltd Address Rosebank
Date completed 6 (day) May (month) 1957 (year)

Pipe and Casing Record

Casing diameter(s) 5 1/2 "
Length(s) 128 (casing removed)
Type of screen
Length of screen

Pumping Test

Static level
Pumping rate
Pumping level
Duration of test

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
red sandy clay	0	16			
hard pan & stone	16	[illegible] 117			
gray clay thin gravel layers	117	128 (gas)			
black shale	128	200	no water		

Water Record

For what purpose(s) is the water to be used? service station
Is water clear or cloudy?
Is well on upland, in valley, or on hillside? upland

Drilling firm F. R. Boadway & Son
Address Sutton West

Name of Driller F. R. Boadway
Address Sutton West

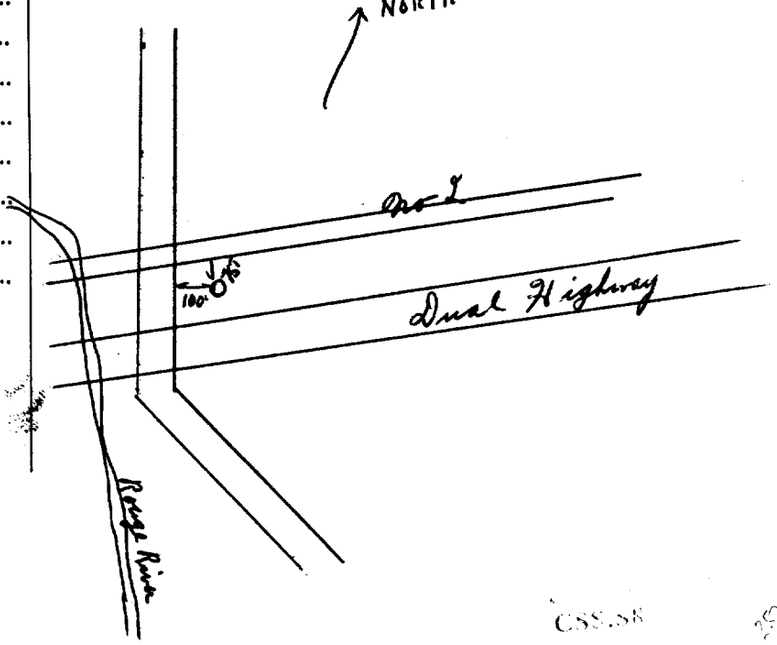
Licence Number 5-1

I certify that the foregoing statements of fact are true.

Date May 6 F. R. Boadway
Signature of Licensee

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Form 5

CSS.58

CO 5 Wells on this Record

UTM Zone E
R 11 N

Elev. 18 R 0345

Basin 24

The Ontario Water Resources Commission Act

WATER WELL RECORD

WATER RESOURCES DIVISION
46 No. 1975
MAR 8
ONTARIO WATER RESOURCES COMMISSION

County or District ONTARIO Township, Village, Town or City PICKERING

Con. R. III Lot 31 Date completed 14 (day) JUNE (month) 1964 (year)

[redacted] dress ~~Do~~ ROUGE HILL

Casing and Screen Record

Inside diameter of casing 6 5/8

Total length of casing 218'

Type of screen CASING

Length of screen PULLED.

Depth to top of screen

Diameter of finished hole

Pumping Test

Static level

Test-pumping rate G.P.M.

Pumping level Dry

Duration of test pumping

Water clear or cloudy at end of test

Recommended pumping rate G.P.M.

with pump setting of feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
GREY CLAY	0	133		
" SHALE	133	138		/
"NOTE" LIMESTONE	138	218	/	
4 HOLES PLUS THIS RECORD APPROX 20' APART FORMATION AND DEPTH ALL THE SAME NO WATER ENCOUNTERED.				

For what purpose(s) is the water to be used? ~~House~~ Dry

Is well on upland, in valley, or on hillside? /

Drilling or Boring Firm B. HUFFMAN & SONS.

Address 2678 LAKESHORE BLVD TORONTO 14 MIMICO

Licence Number 1448

Name of Driller or Borer J. HUFFMAN

Address TORONTO

Date MARCH 2/65

(Signature of Licensed Drilling or Boring Contractor)

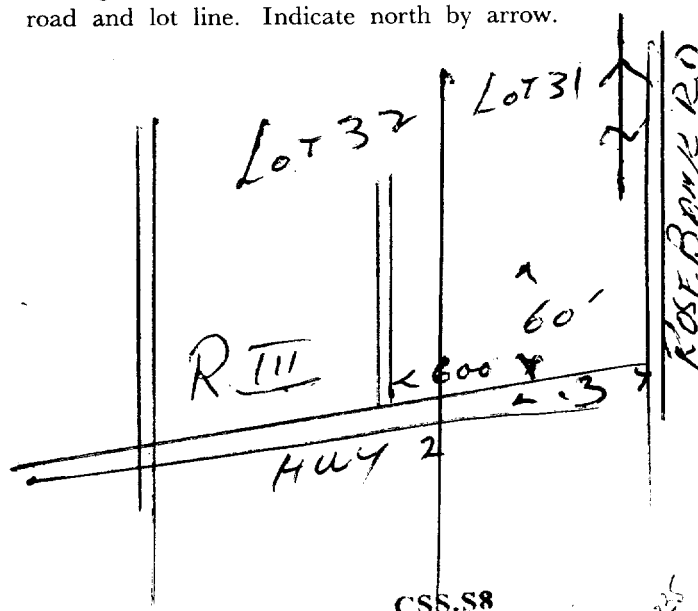
Form 7 15M-60-4188

OWRC COPY

3

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



CSS.S8

UTM 3 | | Z | 11 | | | | | | E

5 R | | | | | | | | N

Elev. 5 R 0 3 6 2

Basin 2 4 ~~York~~

46 № ~~1016~~

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District Ontario lot 31 Township, Village, Town or City Pickering ~~Pickering~~ Rouge Hill

Con. 230 Range III Lot 17, Plan 230 Date completed 9 (day) Sept (month) 1967 (year)

[redacted]dress ~~132 Confederation Dr.~~
on Rd Rouge Hill Ont

Casing and Screen Record

Inside diameter of casing	6¼"
Total length of casing	102'
Type of screen	NIL
Length of screen	NIL
Depth to top of screen	NIL
Diameter of finished hole	6¼"

Pumping Test

Static level	90'
Test-pumping rate	3 G.P.M.
Pumping level	95'
Duration of test pumping	2½"
Water clear or cloudy at end of test	cloudy
Recommended pumping rate	2 G.P.M.
with pump setting of	95' feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Dugwell	0	40'		
Clay	40'	100'		
Gravel	100'	102'	102'	fresh

For what purpose(s) is the water to be used? house

Is well on upland, in valley, or on hillside? hilltop.

Drilling or Boring Firm Gilbert

Address RR2 Baltimore

Licence Number 2618

Name of Driller or Borer Archie Livingston

Address RR 5 Cobourg.

Date Sept 9 67.

Signature

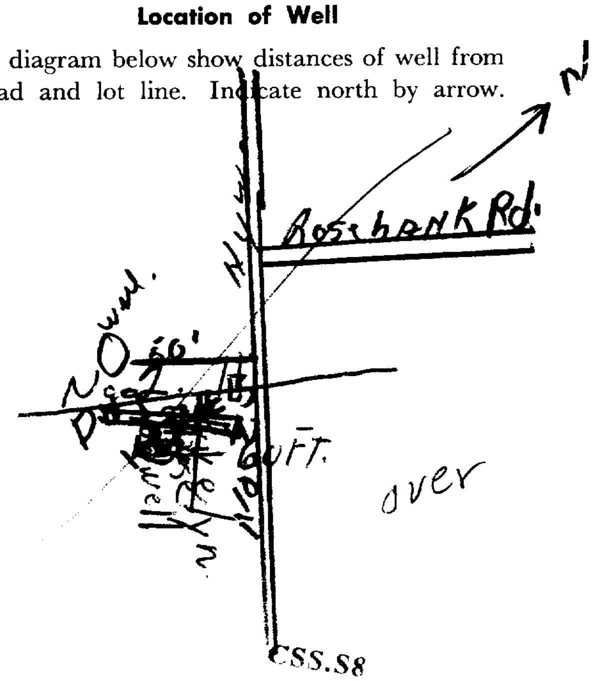
(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

OWRC COPY

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



E. Plan No 350

UTM | | Z | | E

9 all of 46 N

Elev. 9 Rc [illegible] Pt of lot 47

Basin 24

Rougemount drive

Range III

Lot 32

RECEIVED MAR 5 1956 GROUNDWATER BRANCH DEPARTMENT of MINES

46 № ~~1918~~

The Water-well Drillers Act, 1954

Department of Mines

Water-Well Record

County or Territorial District: Ontario Township, Village, Town or City: Pickering

[redacted] Village, Town or City)

[redacted]ddress: Dunbarton P.O. Ont.

(day) (month) (year)

Pipe and Casing Record

Casing diameter(s): 6 inch

Length(s): all pull out

Type of screen:

Length of screen:

Pumping Test

Static level: Dry hole

Pumping rate:

Pumping level:

Duration of test:

Well Log

Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
Dug well	0	50			
Blue clay and stones	50	130	Dry		

For what purpose(s) is the water to be used? home

Is water clear or cloudy? —

Is well on upland, in valley, or on hillside? upland

Drilling firm:

Address:

Name of Driller: Steve McCauly

Address: Mono Road

Licence Number: 609

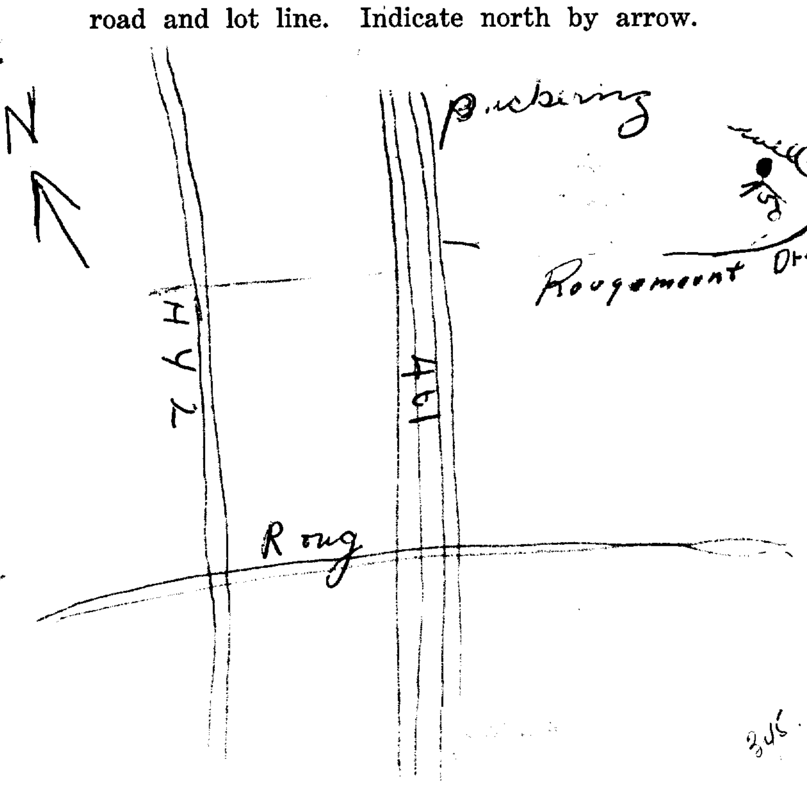
I certify that the foregoing statements of fact are true.

Date: Dec 3 Steve McCauly

Signature of Licensee

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Form 5

305

6

Form No. 2 1M-Jan. 1947-(A3601)

UTM 17 Z 6510340 E
9 R 4853120 N
Elev. 9 R 0356
Range III
Basin 27
Lot 32

ONTARIO

The Well Drillers Act

Department of Mines, Province of Ontario

RECEIVED
APR 3 1947
GEOLOGICAL BRANCH
DEPARTMENT OF MINES

46 No. 1919

Water Well Record

[redacted] Con. RANGE III Lot ~~18~~ Lot 32(?) approx. Pt. Lot
[redacted] Bush Trail Acres ±
cluding pump) 8.48.50

Pipe and Casing Record

Casing diameter(s) 6 in
Length(s) of casing(s) 204 ft.
Length of screen —
Type of screen —
Type of pump —
Capacity of pump —
Depth of pump setting —

Pumping Test

Date Mar 15 to 20
Developed Capacity 400 gal per hr.
Duration of Test 1 hr. 4 times per day.
Pumping Rate 400 gal per hr.
Drawdown none.
Static level of completed well 25 ft
Is well a gravel-wall type? Gravel.

Water Record

Kind (fresh or mineral) fresh
Quality (hard, soft, contains iron, sulphur etc.) hard.
Appearance (clear, cloudy, coloured) clear
For what purpose(s) is the water to be used? Household
How far is well from possible source of contamination? —
What is source of contamination? —
Enclose a copy of any mineral analysis that has been made of water —

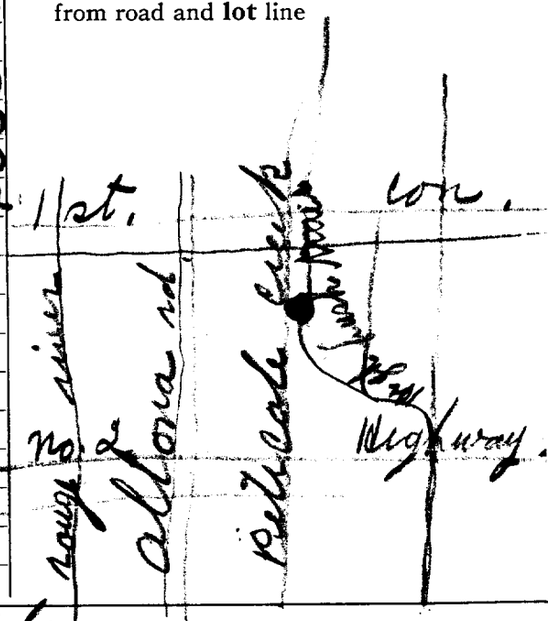
Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
105.	dirty	25
204	Clear	180

Well Log

Drift and Bedrock Record	From	To
	0 ft.	100 ft.
Drift & boulders.		
Sand & fine gravel	100	105
Blue clay & small stones	105	160
Quick sand.	160	190
Course sand.	190	200
Gravel.	200	204

Location of Well

In diagram below show distances of well from road and lot line



Situation: Is well on upland, in valley, or on hillside? Hillside

Drilling Firm C. W. Ludwig

Address R. R. 1 Locust Hill.

Recorded by ..... Address .....

Date ..... Licence Number 124

CSS.58

UTM |D| Z | | | | | | | E
Range III
|5| R | | | | | | | N
5T 63 33
Elev. |5| R |6|3|9|5|

Basin |2|4| | |

The Ontario Water Resources Commission Act

WATER WELL RECORD

GROUND WATER BRANCH
46 Nº 1920 B
MAY 9 1962
ONTARIO WATER RESOURCES COMMISSION

County or District: Ontario
Township, Village, Town or City: Pickering
Con: R III
Lot: 32
Date completed: 21 (day) Mar (month) '62 (year)
[redacted]ress: RR#1 Pickering

Casing and Screen Record

Inside diameter of casing: 34"
Total length of casing: 45'
Type of screen:
Length of screen:
Depth to top of screen:
Diameter of finished hole: # 34"

Pumping Test

Static level: 44'
Test-pumping rate: 1' per day G.P.M.
Pumping level:
Duration of test pumping:
Water clear or cloudy at end of test: clear
Recommended pumping rate: ½ G.P.M.
with pump setting of: NO PUMP feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Dark topsoil	0	1		
yellow clay	1	18	—	—
Blue clay	18	45	44	FRESH

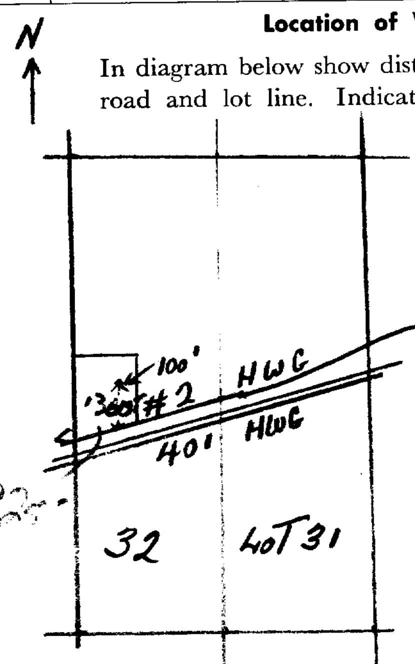
For what purpose(s) is the water to be used? house
Is well on upland, in valley, or on hillside? hillside
Drilling or Boring Firm: Wilson's Well Digging
Address: RR#2 Gormley
Licence Number: 10
Name of Driller or Borer: same
Address:
Date: May 7/62
William Wilson
(Signature of Licensed Drilling or Boring Contractor)

Form 7 5M-61-3852

OWRC COPY

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



R 11

CSS.S8

UTM [| |] Z [| | | | | |] E

5 R [| | | | | |] N

RANGE III LOT 32

Elev 5 R 32 0 3 7 0

Basin 24

The Ontario Water Resources Commission Act

WATER WELL RECORD

46 № 1921

WATER RESOURCES ... 1967 ... ONTARIO WATER RESOURCES COMMISSION

County or District: Ontario

Township, Village, Town or City: PICKERING

Con.: plan 228 Lot: 24 32

Date completed: 17 (day) MARCH (month) 1967 (year)

[redacted]ress: 944 LAWRENCE AVE E. TORONTO APT 2.

Casing and Screen Record

Inside diameter of casing: 6 1/4 INCHES

Total length of casing: ~~[illegible]~~ 167

Type of screen: NIL

Length of screen: NIL

Depth to top of screen: NIL

Diameter of finished hole: 6 1/4"

Pumping Test

Static level: ~~[illegible]~~ 75 feet from Top

Test-pumping rate: 2 to 3 G.P.M.

Pumping level: 150 feet from top

Duration of test pumping: 4 hrs

Water clear or cloudy at end of test: cloudy

Recommended pumping rate: 2 G.P.M.

with pump setting of 180 feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
dug well	0	30	202	a little
clay & stones	30	63		
fine dry gravel	63	100 ✓		sulphur
Clay & gravel course gravel	100	167		
Black soft rock	167	202		
finished in Rock at 202 feet				

For what purpose(s) is the water to be used? house

NOTE - WELL WENT DRY - ABANDONED IN OCT. 67.

Is well on upland, in valley, or on hillside? upland

Drilling or Boring Firm: Noah Gilbert

Address: R.R. #2 Baltimore Ont

Licence Number: 1826

Name of Driller or Borer: Lloyd Gillespie

Address: R.R. #2 Port Hope Ont.

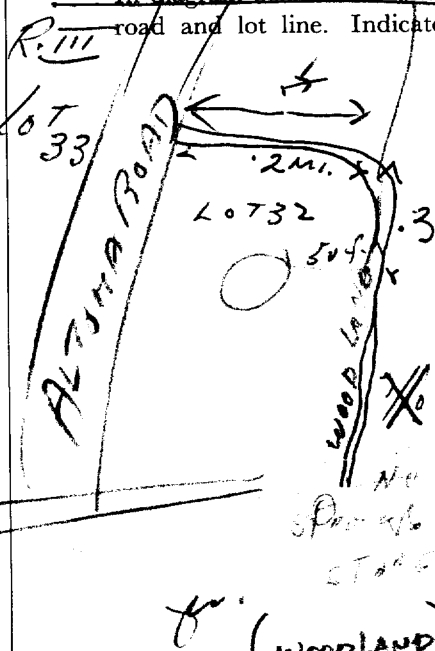
Date: March 17/1967

Noah Gilbert

(Signature of Licensed Drilling or Boring Contractor)

Location of Well

~~In diagram below show distances of well from road and lot line. Indicate north by arrow.~~



1376 WOODLAWN

WELL GONE DRY.

SKETCH SHOWS ROUGHLY AND INCORRECT

SEE CSP 3395 COPY ATTACHED FOR WOODLAWN OR

Form 7 15M-60-4138

OWRC COPY

UTM Z E N

Elev. R 0360

Basin 24

The Ontario Water Resources Commission Act

WATER WELL RECORD

WATER RESOURCES DIVISION
46 No. 1923
JAN 10 1966
ONTARIO WATER RESOURCES COMMISSION

County or District Ontario — Township, Village, Town or City Pickering

Con. RANGE III Lot LOT 33 — Date completed 17 December 1965 (day / month / year)

[redacted] — Address Pickering, Ontario

Casing and Screen Record

Inside diameter of casing 6 5/8"

Total length of casing

Type of screen

Length of screen

Depth to top of screen

Diameter of finished hole 6 5/8"

Pumping Test

Static level Dry Hole

Test-pumping rate G.P.M.

Pumping level Some Water Found Within 12' Of Surface With Smell of Gas

Duration of test pumping

Water clear or cloudy at end of test

Recommended pumping rate G.P.M.

with pump setting of feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
Black Sandy Soil	0	3		
Soft Clay With Gravel	3	12		
Hard Packed Clay	12	43		
Hard Blue Clay	43	122		
Coal Tar	122	200		

SHALE ?

BLACK SULFUR

For what purpose(s) is the water to be used? House DRY

Is well on upland, in valley, or on hillside? Upland

Drilling or Boring Firm Peter Spatuck

Address R.R.#3 Malton, Ontario

Licence Number 1619

Name of Driller or Borer Same

Address

Date January 8/66

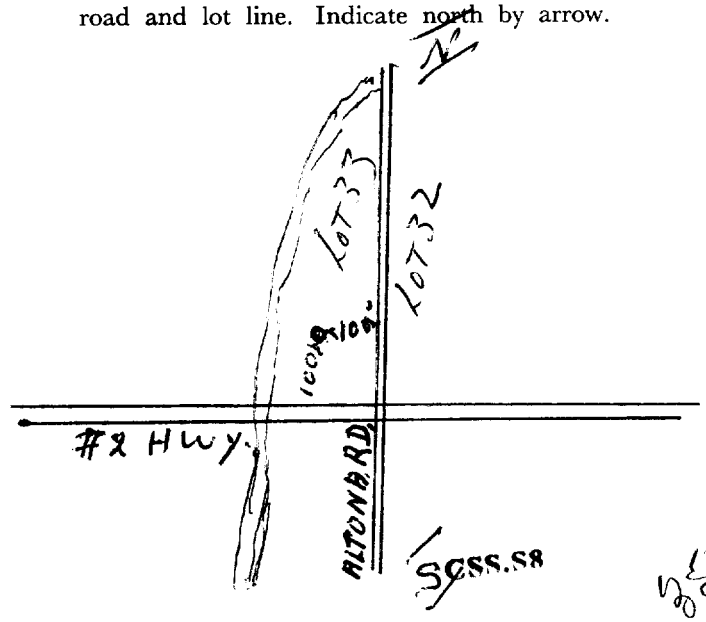
Peter Spatuck
(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

OWRC COPY

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Ontario — Ministry of the Environment

Well Tag No. *(Place Sticker and/or Print Below)*

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☑ Imperial

Page _____ of _____

Well Owner's Information customer

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
Rockhill	Construction		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
301 Bradwick Dr unit B	Concord	ON	L4K 1K5	9055320606

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1414 old Forest Rd.	Pickering	31	1

County/District/Municipality	City/Town/Village	Province	Postal Code
Durham	Pickering	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	650699	4852903		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
	Decomm. a 5 ft. Dia.	Brick Lined dug well 14 FT deep	Static	5 FT	
	Bentonite Hole Plug / grout			14	12.
	Clean clay fill and Bentonite quick grout			12	0
	Note: Chlorinate and Pump Standing Water. Remove Pump lines and Upper Casing. Clean out debris. Hole Plug Cap.				

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
		See above.	

Method of Construction

☐ Cable Tool ☐ Diamond ☐ Rotary (Conventional) ☐ Jetting ☐ Rotary (Reverse) ☐ Driving ☐ Boring ☐ Digging ☐ Air percussion ☐ Other, *specify* _____

Well Use

☐ Public ☐ Commercial ☐ Not used ☐ Domestic ☐ Municipal ☐ Dewatering ☐ Livestock ☐ Test Hole ☐ Monitoring ☐ Irrigation ☐ Cooling & Air Conditioning ☐ Industrial ☐ Other, *specify* _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To

Status of Well

☐ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☑ Abandoned, other, *specify* not in use ☐ Other, *specify*

Water Details

Water found at Depth (m/ft)	Kind of Water	Hole Diameter Depth From	Hole Diameter Depth To	Hole Diameter (cm/in)
☐ Gas ☐ Other, *specify*	☐ Fresh ☐ Untested			
☐ Gas ☐ Other, *specify*	☐ Fresh ☐ Untested			
☐ Gas ☐ Other, *specify*	☐ Fresh ☐ Untested			

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, *specify* _____

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping _____ hrs + _____ min

Final water level end of pumping *(m/ft)*

If flowing give rate *(l/min / GPM)*

Recommended pump depth *(m/ft)*

Recommended pump rate *(l/min / GPM)*

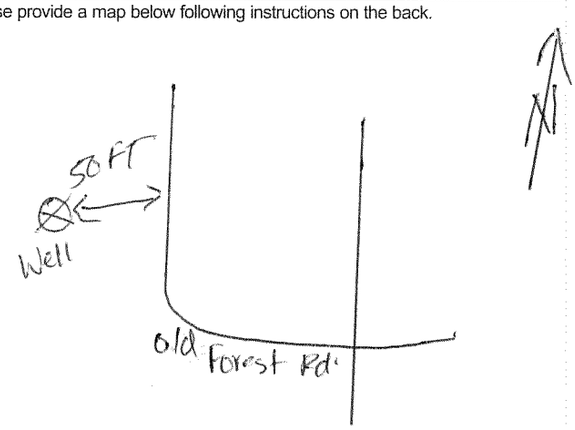
Well production *(l/min / GPM)*

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
2024257 ONTARIO LTD	4102

Business Address (Street Number/Name)	Municipality
3661 Mt Albert Rd	Sharon

Province	Postal Code	Business E-mail Address
ON	L0G 1N0	Sales@ontariodrilling.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
9057478163	MOORE, DAVID

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
2199	David Moore	2014 08 15

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☑ No		2014 07 29

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Audit No. Z 154883

Received SEP 16 2014

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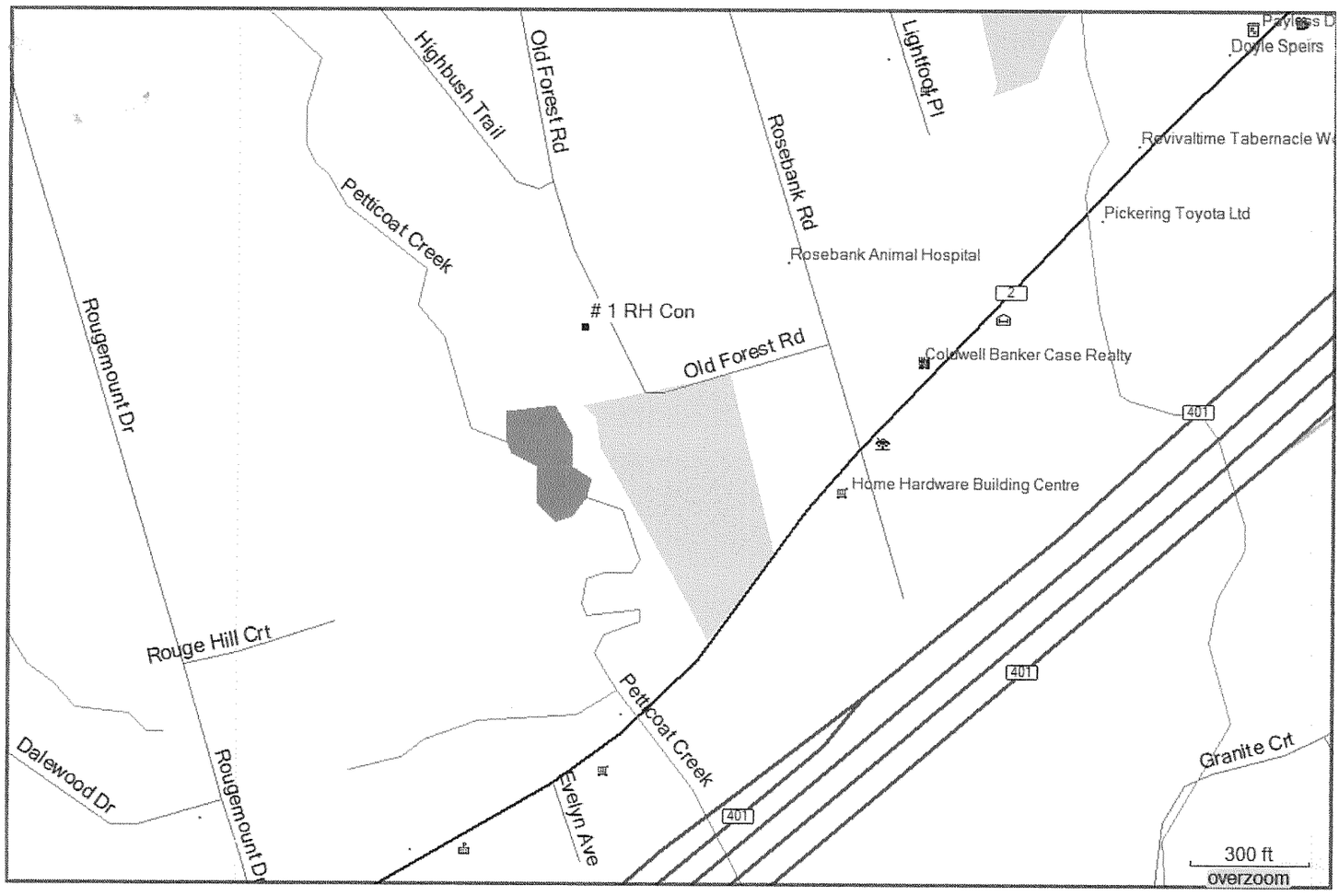

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SEP 1 0 2014

7338107

Ontario — Ministry of the Environment, Conservation and Parks

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. *(Place Sticker and/or Print Below)*: no tag

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

MARSHALL HOMES

Address of Well Location (Street Number/Name)	Township	Lot	Concession

County/District/Municipality	City/Town/Village	Province	Postal Code
Frontier Court	Pickering	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	650625	4852198		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
			Decommissioning by licensed well technician		

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	24'	Bentonite.	

Method of Construction

☐ Cable Tool ☐ Diamond ☐ Rotary (Conventional) ☐ Jetting ☐ Rotary (Reverse) ☐ Driving ☐ Boring ☐ Digging ☐ Air percussion ☐ Other, *specify* _____

Well Use

☐ Public ☐ Commercial ☐ Not used ☐ Domestic ☐ Municipal ☐ Dewatering ☐ Livestock ☐ Test Hole ☐ Monitoring ☐ Irrigation ☐ Cooling & Air Conditioning ☐ Industrial ☐ Other, *specify* _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To

Status of Well

☐ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☒ Abandoned, other, *specify* Decom ☐ Other, *specify*

Water Details

Water found at Depth (m/ft)	Kind of Water	Gas	Other, specify
	☐ Fresh ☐ Untested	☐ Gas	☐ Other, specify
	☐ Fresh ☐ Untested	☐ Gas	☐ Other, specify
	☐ Fresh ☐ Untested	☐ Gas	☐ Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	24'	

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, *specify* _____

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping _____ hrs + _____ min

Final water level end of pumping *(m/ft)*

If flowing give rate *(l/min / GPM)*

Recommended pump depth *(m/ft)*

Recommended pump rate *(l/min / GPM)*

Well production *(l/min / GPM)*

Disinfected? ☐ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.

Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Pontil Drilling Services Inc.	7161 4

Business Address (Street Number/Name)	Municipality
6 Albert St	Mt. Albert

Province	Postal Code	Business E-mail Address
ON	L0G 1M0	info@pontildrilling.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
289 338 1838	Belanger, Steve

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
31872	SB	2019 07 15

Well owner's information package delivered ☐ Yes ☒ No

Date Package Delivered: Y Y Y Y M M D D

Date Work Completed: 2019 07 15

Ministry Use Only

Audit No. Z 318159

Received JUL 24 2019

0506E (2018/12)

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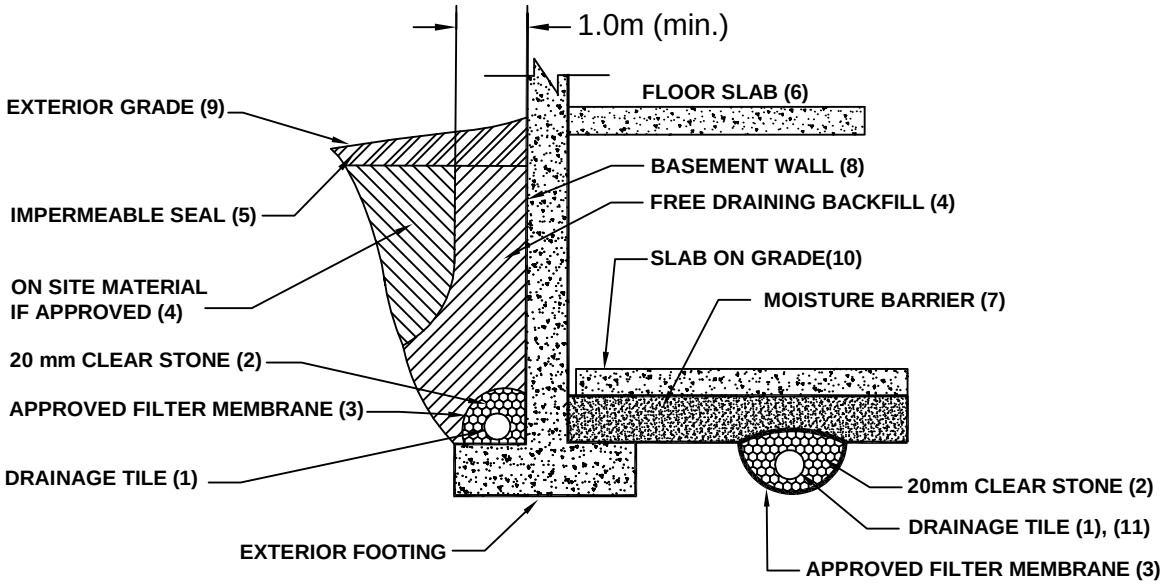
APPENDIX H – DRAINAGE GUIDELINES

FISHER ENGINEERING



NOTES:

(1) DRAINAGE TILE TO CONSIST OF 100mm (4") DIAMETER WEEPING TILE OR EQUIVALENT PERFORATED PIPE LEADING TO A POSITIVE SUMP OR OUTLET.

(2) 20mm (3/4") CLEAR STONE - 150mm (6") TOP AND SIDE OF DRAIN. IF DRAIN IS NOT ON FOOTING, PLACE 100mm (4") OF STONE BELOW DRAIN.

(3) WRAP THE CLEAR STONE WITH AN APPROVED FILTER MEMBRANE (TERRAFIX 279R OR EQUIVALENT).

(4) FREE DRAINING BACKFILL - OPSS GRANULAR B OR EQUIVALENT COMPACTED TO THE SPECIFIED DENSITY. DO NOT USE HEAVY COMPACTION EQUIPMENT WITHIN 1.8m (6') OF WALL.

(5) IMPERMEABLE BACKFILL SEAL - COMPACTED CLAY, CLAYEY SILT OR EQUIVALENT. IF ORIGINAL SOIL IS FREE-DRAINING, SEAL MAY BE OMITTED. MAXIMUM THICKNESS OF SEAL TO BE 0.5m.

(6) DO NOT BACKFILL UNTIL WALL IS SUPPORTED BY BASEMENT AND FLOOR SLABS OR ADEQUATE BRACING.

(7) MOISTURE BARRIER TO BE AT LEAST 200mm (8") OF COMPACTED CLEAR 20mm (3/4") STONE OR EQUIVALENT FREE DRAINING MATERIAL. A VAPOUR BARRIER MAY BE REQUIRED FOR SPECIALTY FLOORS.

(8) BASEMENT WALL TO BE DAMP PROOFED.

(9) EXTERIOR GRADE TO SLOPE AWAY FROM BUILDING.

(10) SLAB ON GRADE SHOULD NOT BE STRUCTURALLY CONNECTED TO THE WALL OR FOOTING

(11) UNDERFLOOR DRAIN INVERT TO BE AT LEAST 300mm (12") BELOW UNDERSIDE OF FLOOR SLAB. DRAINAGE TILE PLACED IN PARALLEL ROWS 6 TO 8m (20-25') CENTERS ONE WAY. PLACE DRAIN ON 100mm (4") CLEAR STONE WITH 150mm (6") OF CLEAR STONE ON TOP AND SIDES. ENCLOSE STONE WITH FILTER FABRIC AS NOTED IN (3)

(12) THE ENTIRE SUBGRADE TO BE SEALED WITH APPROVED FILER FABRIC (TERRAFIX 270R OR EQUIVALENT) IF NON-COHESIVE(SANDY) SOILS BELOW GROUND WATER TABLE ENCOUNTERED.

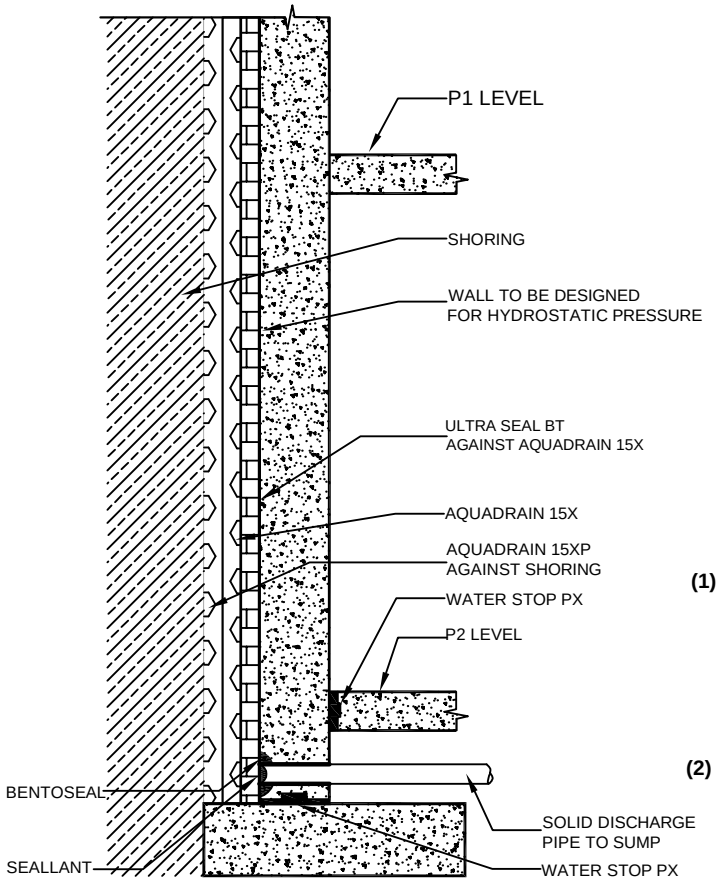
(13) DO NOT CONNECT THE UNDERFLOOR DRAINS TO PERIMETER DRAINS.

(14) REVIEW THE GEOTECHNICAL REPORT FOR SPECIFIC DETAILS.

DRAINAGE AND BACKFILL RECOMMENDATIONS

BASEMENT WITH UNDERFLOOR DRAINAGE

(NOT TO SCALE)



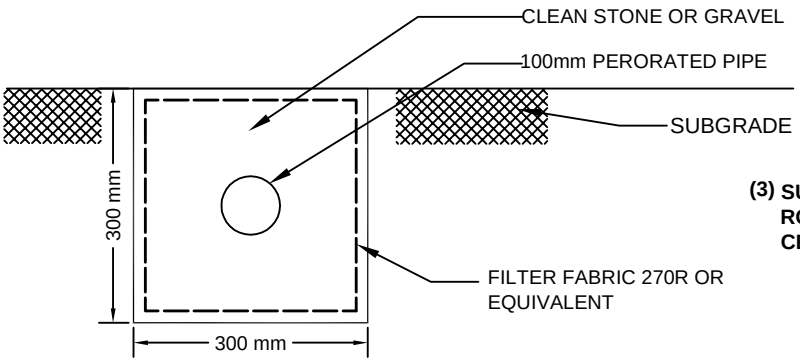
NOTES:

(1) ALL PERMANENT DRAINAGE PIPES MUST HAVE GEOTEXTILE FILTER SLEEVE TO PREVENT LONG TERM SILTING. TO FURTHER MINIMIZE SILTATION OF THE DRAINAGE SYSTEM, ALL DRAINAGE PIPE CONNECTION MUST BE SOLID PVC ELBOWS AND Ts. NO "BUTT" END CONNECTIONS SHOULD BE PERMITTED.

(2) PERIMETER COLLECTION PIPE TO BE SOLID PIPE,

SUGGESTED EXTERIOR DRAINAGE AGAINST SHORING

(NOT TO SCALE)



(3) SUBGRADE DRAIN TO BE PLACED IN PARALLEL ROWS 6-8 m (20'-25'), FROM CENTERLINE TO CENTERLINE.

DETAIL OF SUBGRADE DRAIN

(NOT TO SCALE)