Geomaple Geotechnics Inc.

HYDROGEOLOGICAL INVESTIGATION REPORT
PROPOSED RESIDENTIAL DEVELOPMENT
161 HEATHWOOD HEIGHTS DRIVE
AURORA, ONTARIO
L4G 4X2

Prepared for:
Mr. Kamran Rzayev
161 Heathwood Heights Drive
Aurora, Ontario
L4G 4X2

Prepared by:
Geomaple Geotechnics Inc.
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Date: March 7, 2025

Project No.: 2024-10-150

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1 INTRODUCTION

Geomaple Geotechnics Inc. (Geomaple) was retained by Mr. Kamran Rzayev (the Client) to conduct a geotechnical investigation and hydrogeological study for the proposed residential development at 161 Heathwood Heights Drive, Aurora, Ontario.

The geotechnical investigation report was prepared and submitted to the client under a separate cover. The current report provides the results of the hydrogeological study at the site.

The subsurface investigation was completed by Geomaple which involved advancement of six (6) boreholes at the site, equipped with 50 mm monitoring wells, to depths ranging from about 5.0 to 12.2 m below ground surface.

Groundwater levels were observed in the boreholes upon completion of drilling and in all of the monitoring wells installed in the boreholes for 3 months following the completion of the drilling. In-situ permeability (rising/falling head) testing was conducted in selected monitoring wells to determine the hydraulic conductivity of the soil layers in which the wells were screened. Groundwater samples were taken from selected monitoring wells and tested as per City of Toronto Sewer By-laws for groundwater quality testing.

Based on the information obtained from this investigation, interpretation, analysis, and recommendations with respect to the hydrogeological engineering aspects of the proposed development were provided.

2 SITE AND PROJECT DESCRIPTION

The site is located in a residential neighbourhood and is bound by Heathwood Heights Drive to the north, Tilston Grove to the west , Aurora Walking/ Bike Trail to the south, and by residential properties to the east. The general location of the site is shown on Figure 1 in Appendix A.

The site currently contains an existing single-family house, which is proposed to be demolished to accommodate the redevelopment of the property. The redevelopment will involve severing the property into five (5) separate lots, with a new detached two-storey house constructed on each lot. The proposed site plan, prepared by Arcica Inc. dated January 31, 2025, was provided by the client.

3 PROCEDURE

The field investigation of the site was conducted on November 21, 2024 which consisted of drilling and sampling of six (6) boreholes at the site, five (5) boreholes to a depth of about 5 m and one (1) deep borehole to a depth of 12.2 m.

All boreholes were equipped with 50 mm diameter monitoring wells for groundwater level

measurements and in-situ hydraulic conductivity test. The results of the boreholes are recorded in detail on the Borehole Logs in Appendix B. The approximate borehole locations are shown on the enclosed Figure 2 in Appendix A.

The borehole surface elevations noted on the enclosed Borehole Logs are taken from the Survey drawing provided by the client. The borehole surface elevations are provided only for relating borehole soil stratigraphy and should not be used or relied on for other purposes.

The boring was drilled by specialist drilling subcontractor using a track mounted drill rig power auger with hollow stem augers/wash boring and were sampled with conventional 25 mm diameter split barrel samplers when the Standard Penetration Test (SPT) was carried out (ASTM D1586). The boreholes were equipped with a 50 mm diameter well for groundwater level monitoring. The field work (drilling, sampling, and testing) was observed and recorded by a member of our engineering staff, who logged the boring and examined the samples as they were obtained.

All samples obtained during the investigation were sealed into clean plastic bags and transported to our office for detailed inspection and testing. The samples were examined (tactile) in detail by our staff and classified according to visual and index properties.

The geotechnical laboratory testing consisted of water content determination as well as Sieve and Hydrometer Analysis on selected soil samples. The laboratory test results of individual samples are plotted on the Borehole Logs at respective sampling depth, and presented in Appendix C.

Groundwater levels were measured in the open boreholes upon completion of drilling and in the monitoring wells installed in the boreholes. The results of the groundwater level monitoring are summarized in Section 4.2 of this report.

In-situ permeability testing was carried out in selected monitoring wells to determine the hydraulic conductivity of the soil layers at which the wells were screened. Soil hydraulic conductivity values were also determined using grain size analysis as per empirical equations for sand soils. Results of the hydraulic conductivity testing based on in-situ testing and grain size analysis are summarized in Section 5 and presented in Appendix E.

4 SUBSURFACE CONDITIONS

The ground surface at the Site gradually slopes down towards southwest. No significant water bodies were located at the Site or within 250 m of the boundaries of the Site.

Borehole results indicated that underlying surficial layer of earth fill, the site is underlain by glacial till deposit, extending the full depth of investigation. Bedrock was not encountered in the boreholes and is expected to be at a significant depth below grade in the general area of the site.

Borehole/monitoring well locations are shown in Figure 2, in Appendix A. Details of the boreholes

are provided in the Borehole Logs in Appendix B. Summary of the subsurface condition is provided in the table below and the following sections.

4.1 Soil Stratigraphy

It should be noted that soil and groundwater conditions are confirmed at the borehole locations only and may vary at other locations. The stratigraphic boundaries as shown on the Borehole Logs represent an inferred transition between various strata, rather than a precise plane of geologic change.

4.1.1 Glacial Till

Below the topsoil, a layer of undisturbed native glacial till deposit was encountered extending to the full depth of investigation in all boreholes. The composition of the till varied from sandy silt to silty sand at the top, to clayey silt to silty clay at the middle, and silty sand at the lower portion of the glacial deposit.

The samples obtained from the till layer loose to very dense for the silty sand to sandy silt layers, and soft to very stiff for the clayey silt to silty clay layer representing Standard Penetration Test results ('N' Values) of 2 to 92 blows per 300 mm of penetration and 50 blows per 75 to 100 mm of penetration.

It should be noted that the glacial till the deposit is likely to contain larger particles (cobbles and boulders) that are not specifically identified in the borehole. The size and distribution of such obstructions cannot be predicted with borings, because the borehole sampler size is insufficient to secure representative samples for particles of this size.

4.2 Groundwater Level Monitoring

Groundwater levels were measured in the monitoring wells installed in the boreholes for a period of over 3 months. The following table summarized the results of groundwater level measurement:

Monitoring Date	Groundwater Depth (m)					
	BH1	BH2	BH3	BH4	BH5	BH6
2024-11-29	Dry	Dry	Dry	Dry	6.60	Dry
2024-12-13	Dry	Dry	Dry	Dry	6.78	Dry
2024-12-27	Dry	Dry	Dry	Dry	6.41	Dry
2025-01-09	Dry	Dry	Dry	Dry	5.30	Dry
2025-01-31	Dry	Dry	Dry	Dry	6.54	Dry

Monitoring Date	Groundwater Depth (m)					
	BH1	**BH2**	**BH3**	**BH4**	**BH5**	**BH6**
2025-02-28	Dry	Dry	Dry	Dry	6.38	Dry
Average	**Dry**	**Dry**	**Dry**	**Dry**	**6.34**	**Dry**

Based on the results of groundwater level monitoring during a 3-month period, all boreholes except the deep borehole (BH5) were dry, while the average groundwater level depth in BH5 varied from 5.3 to 6.78 m, with an average of 6.34 m.

Monitoring Date	Groundwater Elevation (m)					
	BH1	**BH2**	**BH3**	**BH4**	**BH5**	**BH6**
2024-11-29	Dry	Dry	Dry	Dry	299.30	Dry
2024-12-13	Dry	Dry	Dry	Dry	299.12	Dry
2024-12-27	Dry	Dry	Dry	Dry	299.49	Dry
2025-01-09	Dry	Dry	Dry	Dry	300.60	Dry
2025-01-31	Dry	Dry	Dry	Dry	299.36	Dry
2025-02-28	Dry	Dry	Dry	Dry	299.52	Dry
Average	**Dry**	**Dry**	**Dry**	**Dry**	**299.57**	**Dry**

Based on the results of groundwater level monitoring during a 3-month period, all boreholes except the deep borehole (BH5) were dry, while the average groundwater level elevation in BH5 varied from 299.12 to 300.6 m, with an average of 299.57 m.

5 SOIL HYDRAULIC CONDUCTIVITY

In-situ permeability tests (rising head and falling head tests) were carried out in three monitoring wells (BH3, BH4, and BH5) to estimate hydraulic conductivity (k) for the representative geological units at which the wells were screened. Measurements were recorded in addition to a data logger placed at the bottom of the well to monitor hydraulic head reduction. Hydraulic conductivity (k) values were calculated using “Bower & Rice” methods. The associated percolation time (min/cm) and infiltration rate (mm/hr) were also calculated for the non-saturated conditions (above the aquifer) in BH3 and BH4.

The following table presents the values of Hydraulic Conductivity, Percolation Time and Infiltration rate for the respective stratigraphic layer at which each well was screened.

BH No.	Screen Depth (m)	Soil Layer at Screen Level	Type of Test	Hydraulic Conductivity Ks (cm/s)	Percolation Time, T (min/cm)	Infiltration Rate, 1/T (mm/hr)
BH3	3.0 – 4.5	Silty Sand Till	Falling Head	8.75×10^{-6}	25	24
BH4	3.0 – 4.5	Silty Sand Till	Falling Head	3.1×10^{-5}	18	34
BH5	9.1 – 12.1	Silty Sand Till	Rising Head	7.99×10^{-7}	NA	NA

The hydraulic conductivity value for BH5 is based on the saturated conditions within the aquifer which can be used for calculation of groundwater volume within the excavation, while the Hydraulic Conductivity, Percolation Time, and Infiltration Rate values for BH3 and BH4 are based on a non-saturated conditions above the aquifer which can be used for the design of Low Impact Development (LID) facility at the site.

6 GRROUNDWTER QUALITY TESTING

Samples of groundwater were collected from BH5 and analysed for the York Region sewer use by-law parameters for sanitary and storm sewer.

The untreated sample exceeded the Limits for Storm Sewer Discharge for the following parameters:

- Total Suspended Solids
- Mn
- Toluene

The untreated sample did not exceed the Limits for Sanitary Sewer Discharge.

The untreated groundwater will require treatment prior to discharge into the storm and sanitary sewer systems.

The results of groundwater quality testing are presented in the Appendix D.

7 DISCUSSION AND ANALYSIS

7.1 Summary of Hydrogeological Conditions

The results of the investigation completed by Geomaple indicated the following hydrogeological features for the site:

- The site is underlain by a layer of silty sand to sandy silt till, underlain by a layer of clayey silt to silty clay till, overlying a layer of silty sand till.
- Bedrock was not encountered to the maximum depth of investigation and is expected to be at a significant depth.
- The average groundwater level elevation in the monitoring wells was at Elev. 299.57 m
- The hydraulic conductivity of the silty sand till in saturated condition is 7.99 x 10^{-7} cm/s.

7.2 Proposed Development Plan

Based on the information provided by the client the proposed development includes construction of five (5) detached houses with one level of basement. The followings are details of the excavation:

- The building size at each lot is approximately 11.89 m by 15.24 m.
- The excavation would roughly be rectangular in shape with a size of 12.9 m by 16.2 m and an approximate area of 209 m^2.
- As the underside of footing levels were not know at the time of preparation of this report, the maximum excavation depth was assumed to be 3.0 m below grade.
- The lowest existing grade elevation within the footprint of the proposed buildings is about 305.54 m.
- The deepest level of excavation would extend to Elev. 302.5 m which is about 3.0 m above the groundwater level at the site.

7.3 Groundwater Taking Volumes

7.3.1 During Excavation

As the excavation base is above the groundwater level, there would be no groundwater seepage expected within the excavation.

The above estimate does not consider stormwater from rainfall events. At account for the stormwater runoff on a rainy day during the construction at the Site, a 20 mm daily rainfall has been considered for the purpose of dewatering design. It is known that the excavation area is approximately 209 m^2. The total runoff volume for each lot is calculated by multiplying the excavation area by the rainfall intensity as follows:

Total Runoff Volume per lot = Excavation Area x Rainfall Intensity
= 209 m^2 x 0.02 m/day
= 4.2 m^3/day

Based on the above, the total discharge volume from the excavation for short-term condition (during construction), considering the groundwater seepage and incidental precipitation, would be 4.2 m^3/day.

The above-noted dewatering volume does not include a factor of safety. Considering a factor of safety of 1.2, the factored total dewatering volume during the excavation would be 5.0 m^3/day.

7.3.2 After Construction (Foundation Drainage)

As the groundwater levels are below the proposed floor level, the perimeter foundation drainage system (if installed) would not collect any groundwater.

7.3.3 Summary of Discharge Volumes

A summary of discharge volumes during the excavation and after construction is presented in the following table.

Discharge Volume (m^3) – During Excavation					
Groundwater Seepage		**Incidental Precipitation**		**Total Discharge**	
No FS	FS = 1.2	No FS	FS = 1.2	No FS	FS = 1.2
0	0	4.2	5.0	4.2	5.0

Discharge Volume (m^3) – After Construction (Foundation Drainage)					
Groundwater Seepage		**Incidental Precipitation**		**Total Discharge**	
No FS	FS = 1.2	No FS	FS = 1.2	No FS	FS = 1.2
0	0	0	0	0	0

7.4 Assessment of Potential Impacts

7.4.1 Surface Water, Wetlands and Areas of Natural Significance

No water bodies were identified on the Site. Stormwater at the Site is expected to drain into landscaped areas on the Site or towards the catch basins located onsite or on the municipal roads adjacent to the Site.

There are no surface water bodies, wetlands, or other sensitive features on the Site or within the ZOI (groundwater) to be affected by potential dewatering activities.

7.4.2 Contamination Sources

The Site and immediately surrounding area currently consist mostly of residential. It is anticipated that the fill materials and native soils will be removed from the Site during redevelopment and therefore any impacts would be removed from the Site.

No environmental sampling and/or analysis of the soil or groundwater under O.Reg. 153/04 was conducted by Geomaple. As such, Geomaple cannot comment on the groundwater quality as it related to O.Reg. 153/04 for the Site.

8 LIMITATIONS AND USE OF REPORT

It must be recognized that there are special risks whenever engineering or related disciplines are applied to identify subsurface conditions. A comprehensive sampling and testing programme implemented in strict accordance with the most stringent level of care may fail to detect certain conditions. Geomaple has assumed for the purposes of providing advice, that the conditions that exist between sampling points are similar to those found at the sample locations. The conditions that Geomaple has interpreted to exist between sampling points can differ from those that exist. It must also be recognized that the passage of time, natural occurrences, and direct or indirect human intervention at or near the site have the potential to alter subsurface conditions.

The discussion and recommendations provided here are based on the factual data obtained from the investigation and are intended for use by the owner and its retained designers in the design phase of the project. Since the project is still in the design stage, all aspects of the project relative to the subsurface conditions cannot be anticipated. Geomaple should review the design drawings and specifications prior to the construction of this work. If there are changes to the project scope and development features, the interpretations made of the subsurface information, the geotechnical design parameters and comments relating to constructability issues and quality control may not be relevant to the revised project scope. Geomaple should be retained to review the implications of these changes with respect to the contents of this report.

The investigation at this site was conceived and executed to provide information for the slope stability study and the geotechnical design. It may not be possible to drill a sufficient number of boreholes, or samples and report them in a way that would provide all the subsurface information that could influence construction costs, techniques, equipment, and scheduling. Contractors bidding on or undertaking work on this project should therefore, in this light, be directed to decide on their own investigations, as well as their own interpretations of the factual investigation results. They should be cognizant of the risks implicit in subsurface investigation activities so that they may draw their own conclusions as to how the subsurface conditions may affect them.

It is recognized that the regulatory agencies in their capacities as the planning and building authorities under Provincial statutes, will make use of and rely upon this report, cognizant of the limitations thereof, both expressed and implied.

9 CLOSURE

We trust the foregoing information is sufficient for your present requirements. If you have any questions, or if we can be of further assistance, please do not hesitate to contact us.

Yours truly,

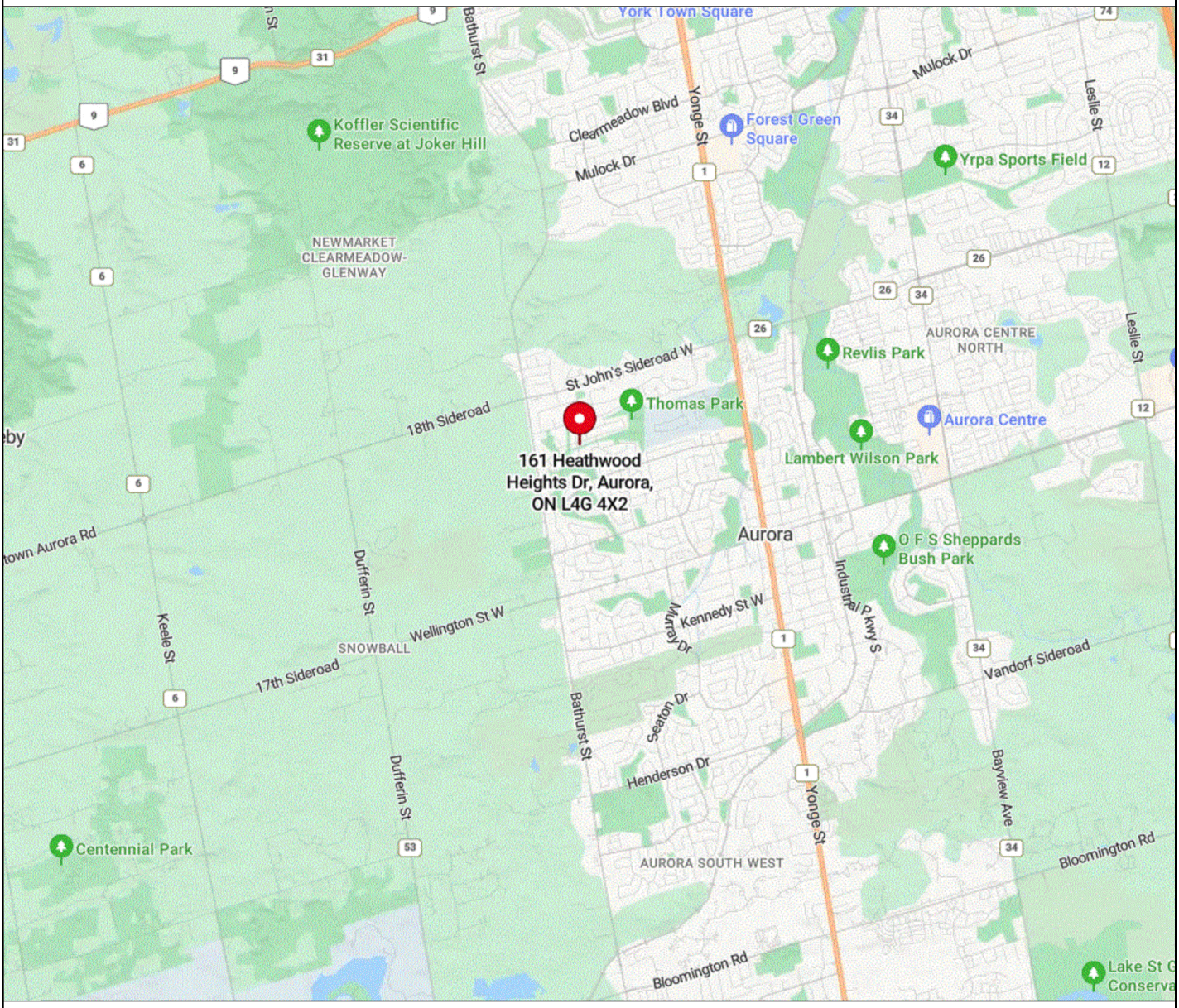
Geomaple Geotechnics Inc.

Navid Hatami, M.Eng, P.Eng.
Senior Geotechnical Engineer

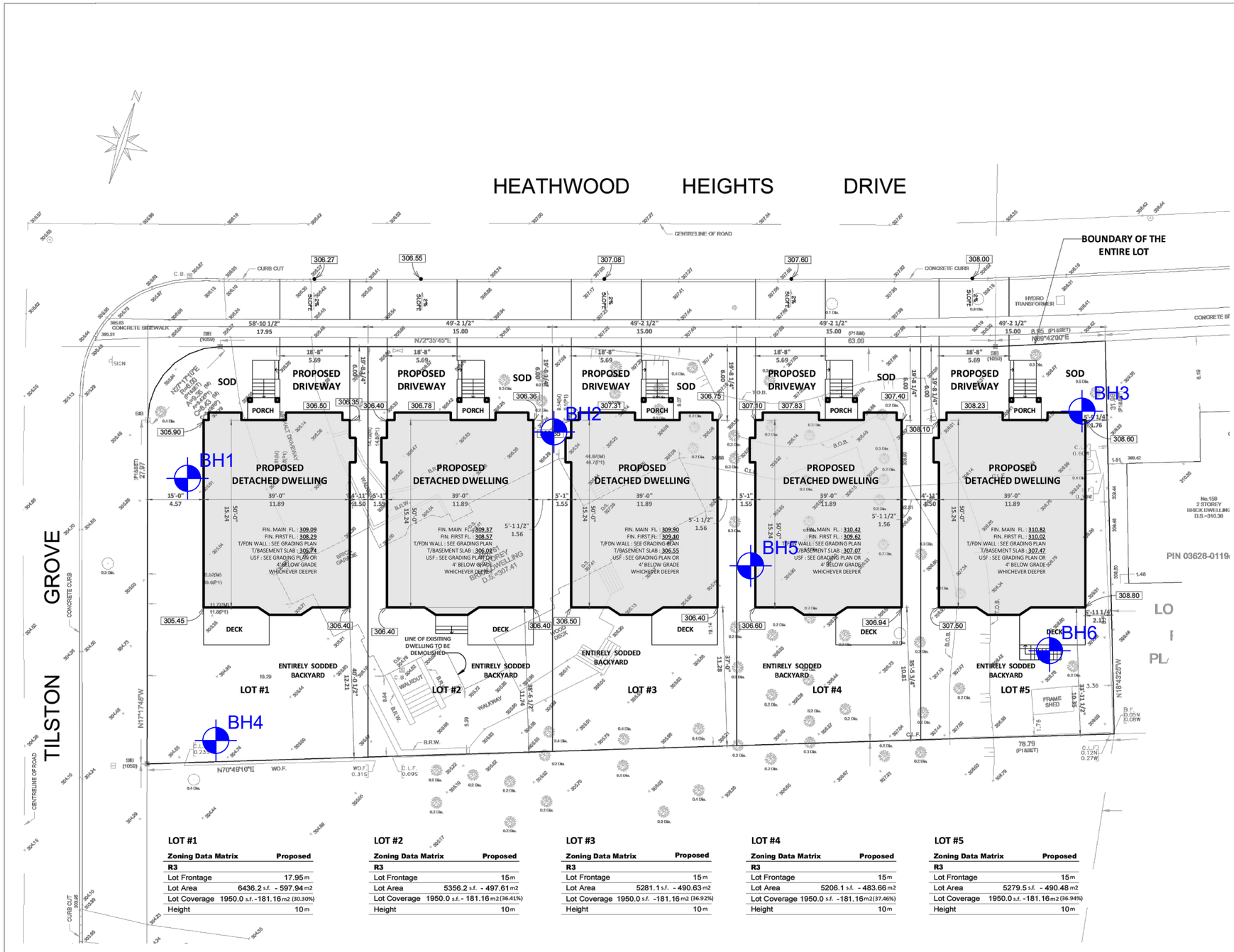
APPENDICES

APPENDIX A

FIGURES



Geomaple Geotechnics Inc.	60 Green Lane, Unit 12A Thornhill, Ontario L3T 7P5 Phone: (416) 444 1200 Fax: (416) 444 1200	No.	Revision	Date		161 Heathwood Heights Drive, Aurora, Ontario
						Site Location Plan
						Project No.: 2024-10-150
						Date: March 2025
						Drawn by: EL
						Checked by: NH
						Figure 1
						Scale: NA



LOT #1

Zoning Data Matrix	Proposed
R3	
Lot Frontage	17.95 m
Lot Area	6436.2 s.f. - 597.94 m2
Lot Coverage	1950.0 s.f. - 181.16 m2 (30.30%)
Height	10 m

LOT #2

Zoning Data Matrix	Proposed
R3	
Lot Frontage	15 m
Lot Area	5356.2 s.f. - 497.61 m2
Lot Coverage	1950.0 s.f. - 181.16 m2 (36.41%)
Height	10 m

LOT #3

Zoning Data Matrix	Proposed
R3	
Lot Frontage	15 m
Lot Area	5281.1 s.f. - 490.63 m2
Lot Coverage	1950.0 s.f. - 181.16 m2 (36.92%)
Height	10 m

LOT #4

Zoning Data Matrix	Proposed
R3	
Lot Frontage	15 m
Lot Area	5206.1 s.f. - 483.66 m2
Lot Coverage	1950.0 s.f. - 181.16 m2 (37.46%)
Height	10 m

LOT #5

Zoning Data Matrix	Proposed
R3	
Lot Frontage	15 m
Lot Area	5279.5 s.f. - 490.48 m2
Lot Coverage	1950.0 s.f. - 181.16 m2 (36.94%)
Height	10 m

1. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST VERSION OF THE OBC
2. VERIFY ALL DIMENSION BEFORE CONSTRUCTION.
3. DO NOT SCALE DRAWINGS.
4. ALL DIMENSIONS AND INFORMATION SHALL BE CHECKED AND VERIFIED ON THE JOB AND ANY VARIANCES OR DISCREPANCIES MUST BE REPORTED TO THE ARCHITECT BY PHONE AND SUBSEQUENT WRITTEN CONFIRMATION PRIOR TO COMMENCEMENT OF THE WORK.
5. USE ONLY LATEST VERSION OF DRAWINGS
6. ALL STRUCTURAL DESIGN MUST BE REVIEWED AND APPROVED BY CERTIFIED STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION

ONTARIO ASSOCIATION OF ARCHITECTS — Ali Shakeri — ALI SHAKERI-NEZHAD — LICENCE 9786

revisions:
SEP 20, 2024- SITE PLAN1
JAN 31, 2025- SITE PLAN2

project: 161 HEATHWOOD HEIGHT DRIVE
drawing: SITE PLAN
scale: 1/16" = 1'-0"
page: A1d

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Legend:

BH1 — Borehole Location

No.	Description	Date

Project

161 Heathwood Heights Drive, Aurora, Ontario

Borehole Location Plan

Project Number	2024-10-150
Date	March 2025
Drawn By	EL
Checked By	NH

Figure 2

Scale As Shown

APPENDIX B

BOREHOLE LOGS

Geomaple Geotechnics Inc.

RECORD OF BOREHOLE 1

PROJECT: 161 Heathwood Heights Drive
CLIENT: Kamran Rzayev
LOCATION: Aurora, ON
DRILLING DATE: 2024-11-21
PROJECT NO: 2024-10-147

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	STANDARD PENETRATION TEST RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (UNCONFINED, QUICK TRIAXIAL, FIELD VANE, LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
305.6											
305.6 / 0.0	~~**TOPSOIL** 50 mm~~										
305.5 / 0.1	**SANDY SILT TO SILTY SAND TILL** trace to some clay, trace gravel, loose, brown, moist.		1	SS	5		305				
			2	SS	6						
304.4 / 1.2	**CLAYEY SILT TO SILTY CLAY TILL** trace to some sand, trace gravel, soft to stiff, brown, moist.		3	SS	10		304				
			4	SS	2		303		o		0 4 45 51
			5	SS	10						
302.1 / 3.5	**SILTY SAND TILL** trace to some clay, trace gravel, very dense, brown, moist.		6	SS	50/ 150mm		302 / 301				
300.7 / 4.9	**END OF BOREHOLE**										

The borehole was open and dry upon completion of drilling.

WATER LEVELS

Date	Depth (m)
2024-11-29	Dry

+ 3, × 3: Numbers refer to Sensitivity
○ 3% STRAIN AT FAILURE

ONTARIO MOT 2024-10-150 HEATHWOOD HEIGHT DRIVE.GPJ ONTARIO MOT.GDT 3-6-25

Geomaple Geotechnics Inc.

RECORD OF BOREHOLE 2

PROJECT: 161 Heathwood Heights Drive
CLIENT: Kamran Rzayev
LOCATION: Aurora, ON
DRILLING DATE: 2024-11-21
PROJECT NO: 2024-10-147

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS
306.2						
306.0 0.1	**~~TOPSOIL~~** ~~50 mm~~					
	SANDY SILT TO SILTY SAND TILL trace to some clay, trace gravel, loose, brown, moist.		1	SS	8	
			2	SS	10	
305.0 1.2	**CLAYEY SILT TO SILTY CLAY TILL** trace to some sand, trace gravel, very stiff, brown, moist.		3	SS	15	
			4	SS	20	
303.5 2.8	**SILTY SAND TILL** trace to some clay, trace gravel, very dense, brown, moist.		5	SS	92	
			6	SS	65	
301.2 5.0	**END OF BOREHOLE** The borehole was open and dry upon completion of drilling. **WATER LEVELS** Date: 2024-11-29 Depth (m): Dry					

ELEVATION SCALE: 306, 305, 304, 303, 302

STANDARD PENETRATION TEST▲ RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa: ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L

WATER CONTENT (%): 10 20 30

UNIT WEIGHT γ kN/m³

REMARKS & GRAIN SIZE DISTRIBUTION (%)

	GR	SA	SI	CL
5	1	48	34	17

$+^{3}$, $\times^{3}$: Numbers refer to Sensitivity

$\circ^{3\%}$ STRAIN AT FAILURE

ONTARIO MOT 2024-10-150 HEATHWOOD HEIGHT DRIVE.GPJ ONTARIO MOT.GDT 3-6-25

Geomaple Geotechnics Inc.

RECORD OF BOREHOLE 3

PROJECT: 161 Heathwood Heights Drive
CLIENT: Kamran Rzayev
LOCATION: Aurora, ON
DRILLING DATE: 2024-11-21
PROJECT NO: 2024-10-147

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE
308.5							
308.4 / 0.1	~~**TOPSOIL** 50 mm~~						
	SANDY SILT TO SILTY SAND TILL trace to some clay, trace gravel, loose, brown, moist.		1	SS	6		
			2	SS	9		
			3	SS	7		
306.5 / 2.0	**CLAYEY SILT TO SILTY CLAY TILL** trace to some sand, trace gravel, firm, brown, moist.		4	SS	7		
305.7 / 2.8	**SILTY SAND TILL** trace to some clay, trace gravel, compact to very dense, brown, moist.		5	SS	21		
303.4			6	SS	78		
5.0	**END OF BOREHOLE** The borehole was open and dry upon completion of drilling. **WATER LEVELS** Date: 2024-11-29 — Depth (m): Dry						

STANDARD PENETRATION TEST RESISTANCE PLOT ▲ (20 40 60 80 100)

SHEAR STRENGTH kPa
○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE
(20 40 60 80 100)

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%) (10 20 30)

UNIT WEIGHT γ kN/m³

REMARKS & GRAIN SIZE DISTRIBUTION (%)

	GR	SA	SI	CL
1	50	33	16	

+ ³, × ³: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

ONTARIO MOT 2024-10-150 HEATHWOOD HEIGHT DRIVE.GPJ ONTARIO MOT.GDT 3-6-25

Geomaple Geotechnics Inc.

RECORD OF BOREHOLE 4

PROJECT: 161 Heathwood Heights Drive
CLIENT: Kamran Rzayev
LOCATION: Aurora, ON
DRILLING DATE: 2024-11-21
PROJECT NO: 2024-10-147

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	STANDARD PENETRATION TEST RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
305.0											
304.9 / 0.1	**TOPSOIL** 50 mm										
	SANDY SILT TO SILTY SAND TILL trace to some clay, trace gravel, loose, brown, moist.		1	SS	9						
			2	SS	4		304				
			3	SS	5						0 31 56 13
303.0 / 2.0	**CLAYEY SILT TO SILTY CLAY TILL** trace to some sand, trace gravel, firm, brown, moist.		4	SS	5		303				
302.2 / 2.8	**SILTY SAND TILL** trace to some clay, trace gravel, compact to very dense, brown, moist.		5	SS	11		302				
			6	SS	81		301				
299.9 / 5.0	**END OF BOREHOLE**						300				

The borehole was open and dry upon completion of drilling.

WATER LEVELS

Date	Depth (m)
2024-11-29	Dry

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

ONTARIO MOT 2024-10-150 HEATHWOOD HEIGHT DRIVE.GPJ ONTARIO MOT.GDT 3-6-25

Geomaple Geotechnics Inc.

RECORD OF BOREHOLE 5

PROJECT: 161 Heathwood Heights Drive
CLIENT: Kamran Rzayev
LOCATION: Aurora, ON
DRILLING DATE: 2024-11-21
PROJECT NO: 2024-10-147

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS
305.9						
305.8 0.1	~~TOPSOIL~~ 50 mm					
	SADY SILT TO SILTY SAND TILL trace to some clay, trace gravel, very loose to compact, brown, moist.		1	SS	2	
			2	SS	5	
			3	SS	17	
303.9 2.0	**SILTY SAND TILL** trace to some clay, trace gravel, very dense, brown, moist.		4	SS	50	
			5	SS	57	
			6	SS	50/ 100mm	
			7	SS	50/ 100mm	

ELEVATION SCALE: 305, 304, 303, 302, 301, 300, 299

STANDARD PENETRATION TEST RESISTANCE PLOT ▲ (20 40 60 80 100)

SHEAR STRENGTH kPa (20 40 60 80 100)
- ○ UNCONFINED
- ● QUICK TRIAXIAL
- + FIELD VANE
- × LAB VANE

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L

WATER CONTENT (%) (10 20 30)

UNIT WEIGHT γ kN/m³

REMARKS & GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
4	53	28	15

Continued Next Page

$+^3$, $\times^3$: Numbers refer to Sensitivity

○ 3% STRAIN AT FAILURE

Geomaple Geotechnics Inc.

RECORD OF BOREHOLE 5

PROJECT: 161 Heathwood Heights Drive
CLIENT: Kamran Rzayev
LOCATION: Aurora, ON
DRILLING DATE: 2024-11-21
PROJECT NO: 2024-10-147

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	STANDARD PENETRATION TEST RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILTY SAND TILL trace to some clay, trace gravel, very dense, brown, moist. *(continued)*										
			8	SS	50/100mm		298				
			9	SS	50/75mm		297				
			10	SS	50/100mm		296		○		8 60 24 8
							295				
293.7			11	SS	50/75mm		294				
12.2	**END OF BOREHOLE**										

The borehole was open and dry upon completion of drilling.

WATER LEVELS

Date	Depth (m)
2024-11-29	6.60 m

$+^3$, $\times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

Geomaple Geotechnics Inc.

RECORD OF BOREHOLE 6

PROJECT: 161 Heathwood Heights Drive
CLIENT: Kamran Rzayev
LOCATION: Aurora, ON
DRILLING DATE: 2024-11-21
PROJECT NO: 2024-10-147

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	STANDARD PENETRATION TEST RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
308.8											
308.8 / 0.0	**~~TOPSOIL~~** ~~50 mm~~										
0.1	**SANDY SILT TO SILTY SAND TILL** trace to some clay, trace gravel, compact, brown, moist.		1	SS	10						
			2	SS	11		308				
307.6											
1.2	**CLAYEY SILT TO SILTY CLAY TILL** trace to some sand, trace gravel, firm to stiff, brown, moist.		3	SS	15		307				
			4	SS	7						
306.1							306				
2.8	**SILTY SAND TILL** trace to some clay, trace gravel, compact to very dense, brown, moist.		5	SS	17						
			6	SS	70		305				
303.8							304				4 55 30 11
5.0	**END OF BOREHOLE**										

The borehole was open and dry upon completion of drilling.

WATER LEVELS

Date	Depth (m)
2024-11-29	Dry

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

ONTARIO MOT 2024-10-150 HEATHWOOD HEIGHT DRIVE.GPJ ONTARIO MOT.GDT 3-6-25

APPENDIX C

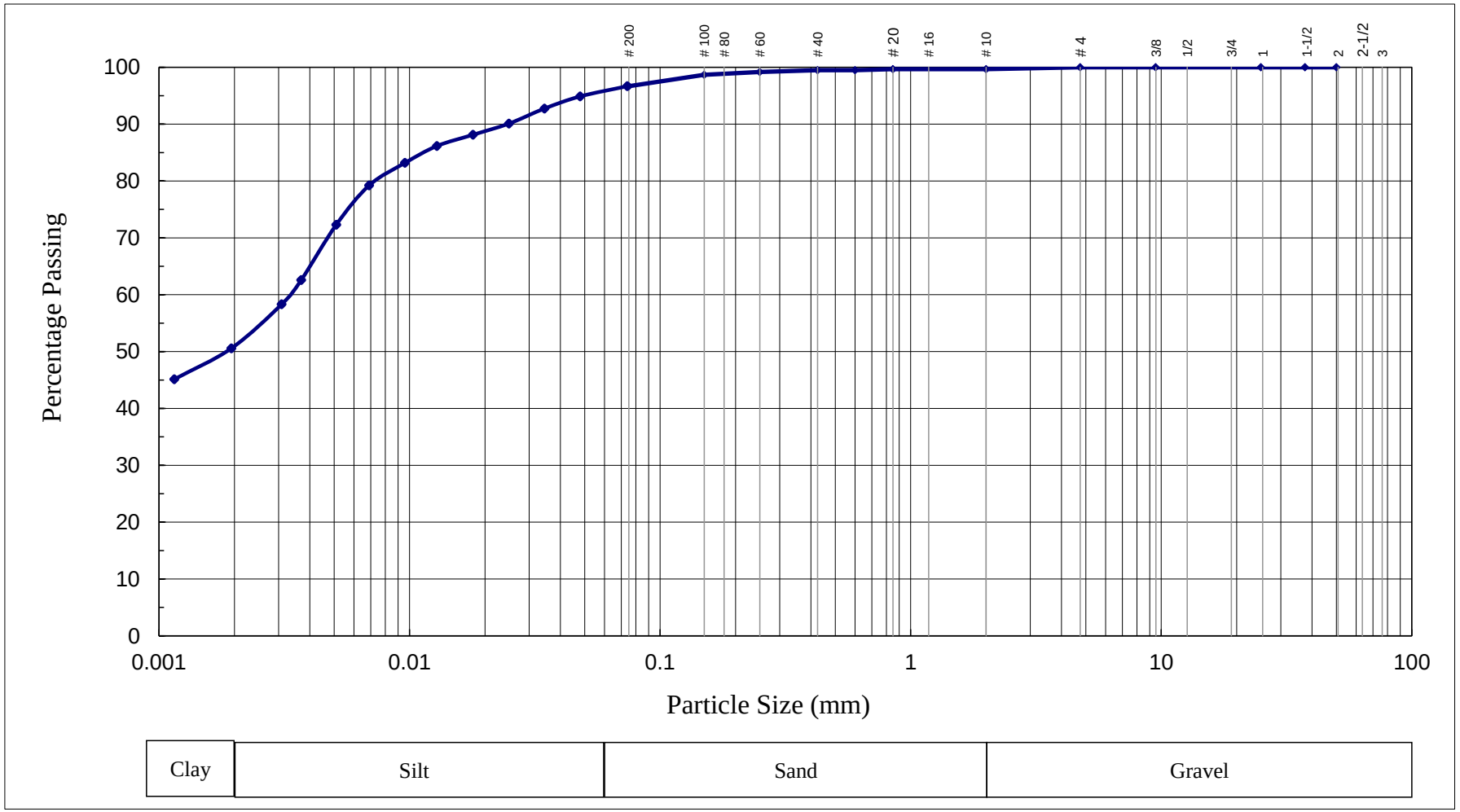
GEOTECHNICAL LABORATORY TEST RESULTS

GMGFR-006-R0

Sieve & Hydrometer Analysis

Lab#: 100633

Project Name:	**161 Heathwood Heights Drive**			**Project No:**	**2024-10-150**
Order No:		**Test Date:**	**09-Dec-24**	**Client:**	**Kamran Rzayev**
Borehole No:	**BH1**	**Borehole Location:**	**Figure2**	**Lead Consultant:**	
Sample No:	**SS4**	**Sample Depth:**	**2.52**	**moisture content:**	**30.8%**



Clay:	Silt:	Sand:	Gravel:
51	**45**	**4**	**0**

LL:	PL:	PI:

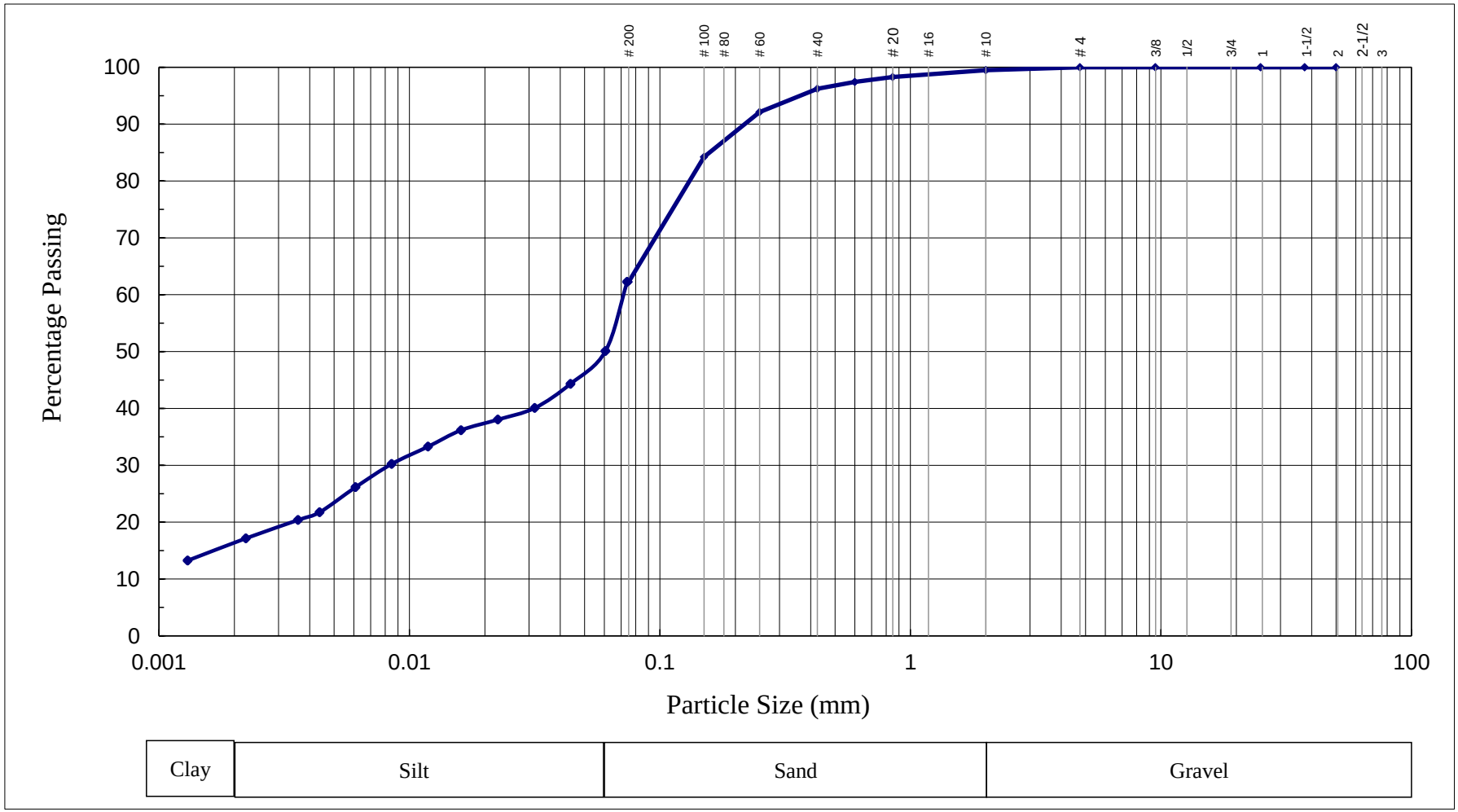
GMGFR-006-R0

Sieve & Hydrometer Analysis

Geomaple Geotechnics Inc.

Lab#: 100635

Project Name:	**161 Heathwood Heights Drive**			**Project No:**	**2024-10-150**
Order No:		**Test Date:**	**07-Dec-24**	**Client:**	**Kamran Rzayev**
Borehole No:	**BH2**	**Borehole Location:**	**Figure2**	**Lead Consultant:**	
Sample No:	**SS3**	**Sample Depth:**	**1.75**	**moisture content:**	**9.8%**



Clay:	**16**	Silt:	**33**	Sand:	**50**	Gravel:	**1**

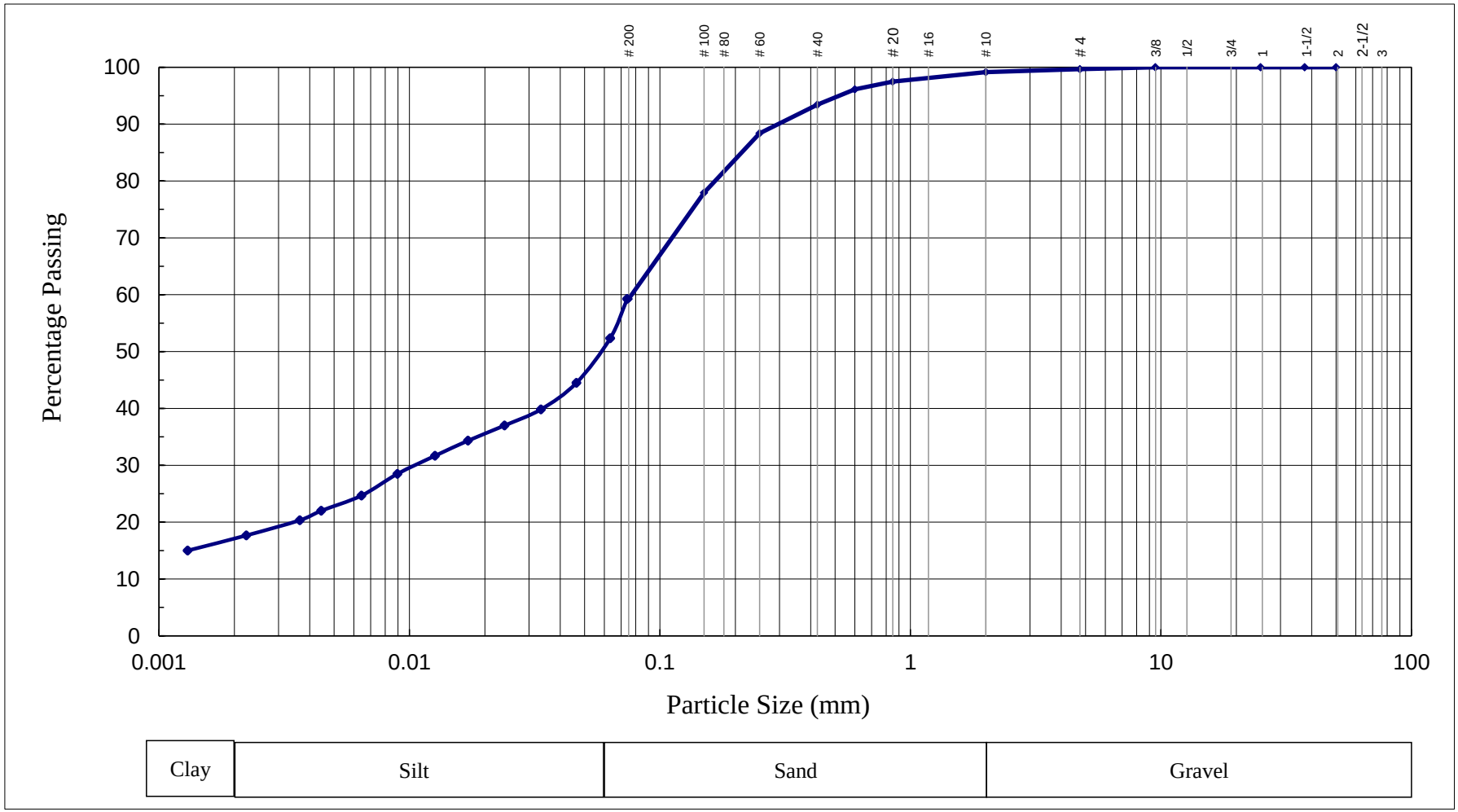
LL:		PL:		PI:	

GMGFR-006-R0

Sieve & Hydrometer Analysis

Lab#: 100634

Project Name:	**161 Heathwood Heights Drive**			**Project No:**	**2024-10-150**
Order No:		**Test Date:**	**09-Dec-24**	**Client:**	**Kamran Rzayev**
Borehole No:	**BH2**	**Borehole Location:**	**Figure2**	**Lead Consultant:**	
Sample No:	**SS5**	**Sample Depth:**	**3.28**	**moisture content:**	**7.0%**



Clay:	Silt:	Sand:	Gravel:
17	**33**	**49**	**1**

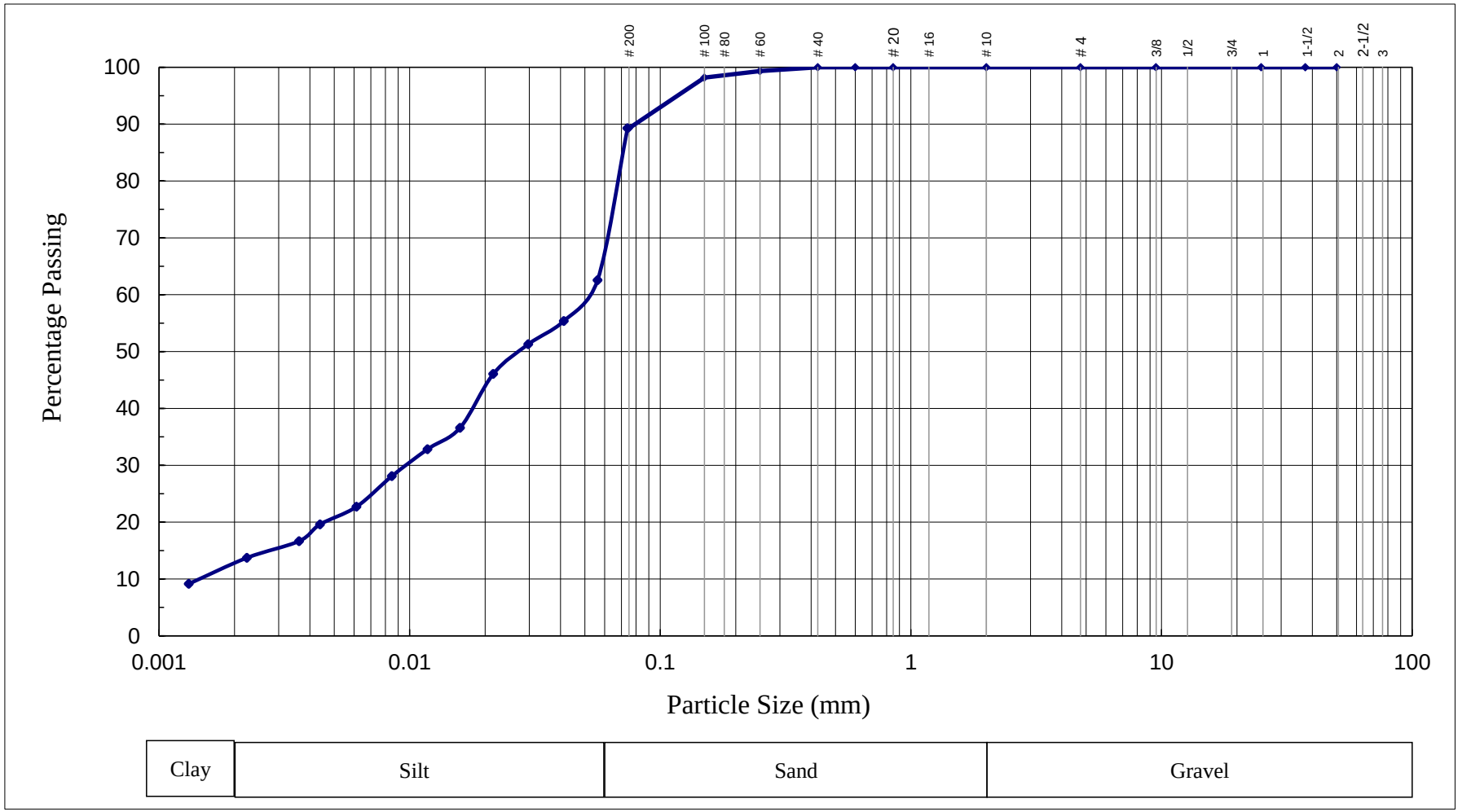
LL:	PL:	PI:

GMGFR-006-R0

Sieve & Hydrometer Analysis

Lab#: 100636

Project Name:	**161 Heathwood Heights Drive**			**Project No:**	**2024-10-150**
Order No:		**Test Date:**	**07-Dec-24**	**Client:**	**Kamran Rzayev**
Borehole No:	**BH4**	**Borehole Location:**	**Figure2**	**Lead Consultant:**	
Sample No:	**SS3**	**Sample Depth:**	**1.75**	**moisture content:**	**20.3%**



Clay:	Silt:	Sand:	Gravel:
13	**56**	**31**	**0**

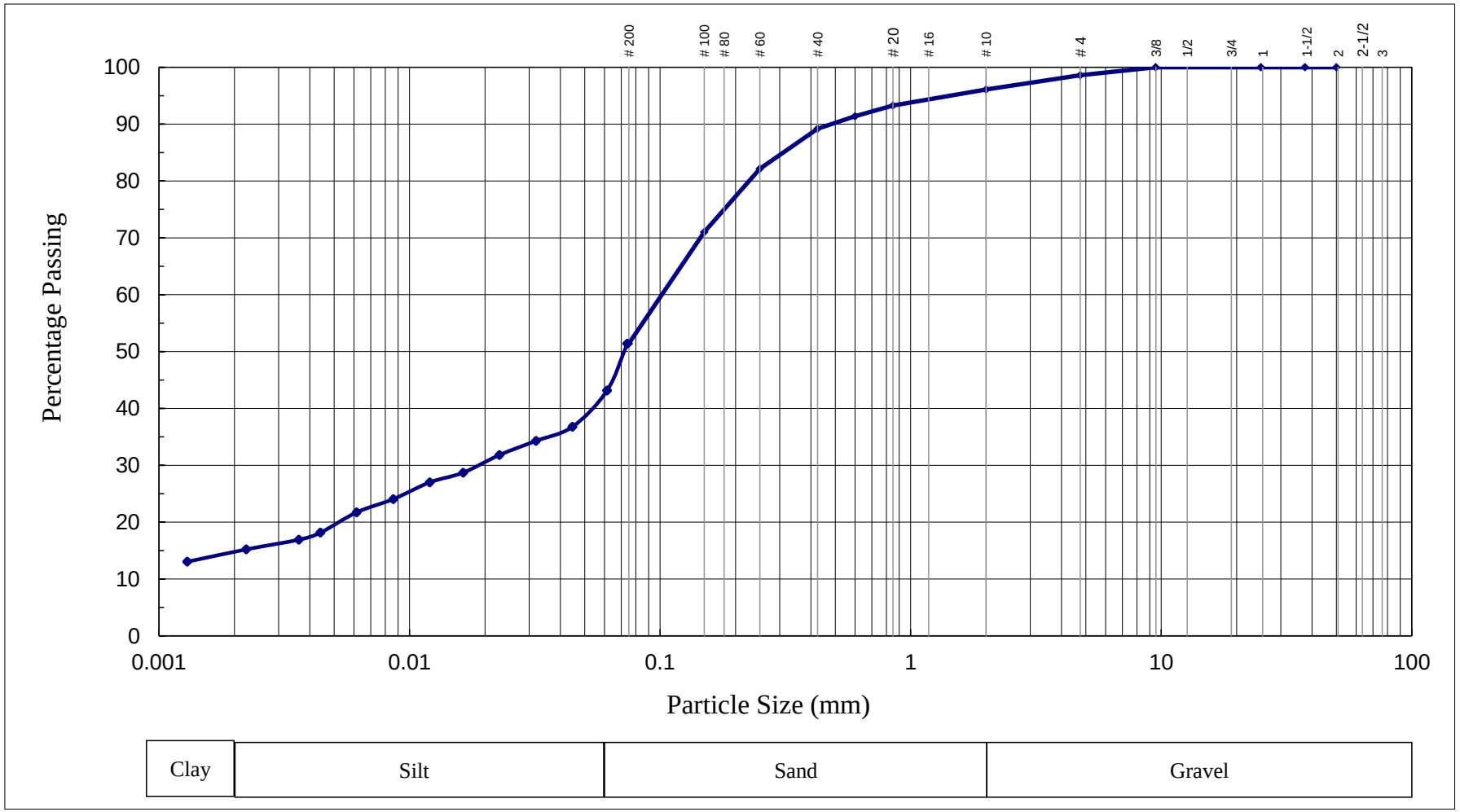
LL:	PL:	PI:

GMGFR-006-R0

Sieve & Hydrometer Analysis

Lab#: 100637

Project Name:	**161 Heathwood Heights Drive**			**Project No:**	**2024-10-150**
Order No:		**Test Date:**	**07-Dec-24**	**Client:**	**Kamran Rzayev**
Borehole No:	**BH5**	**Borehole Location:**	**Figure2**	**Lead Consultant:**	
Sample No:	**SS5**	**Sample Depth:**	**3.25**	**moisture content:**	**7.6%**



Clay:	Silt:	Sand:	Gravel:
15	**28**	**53**	**4**

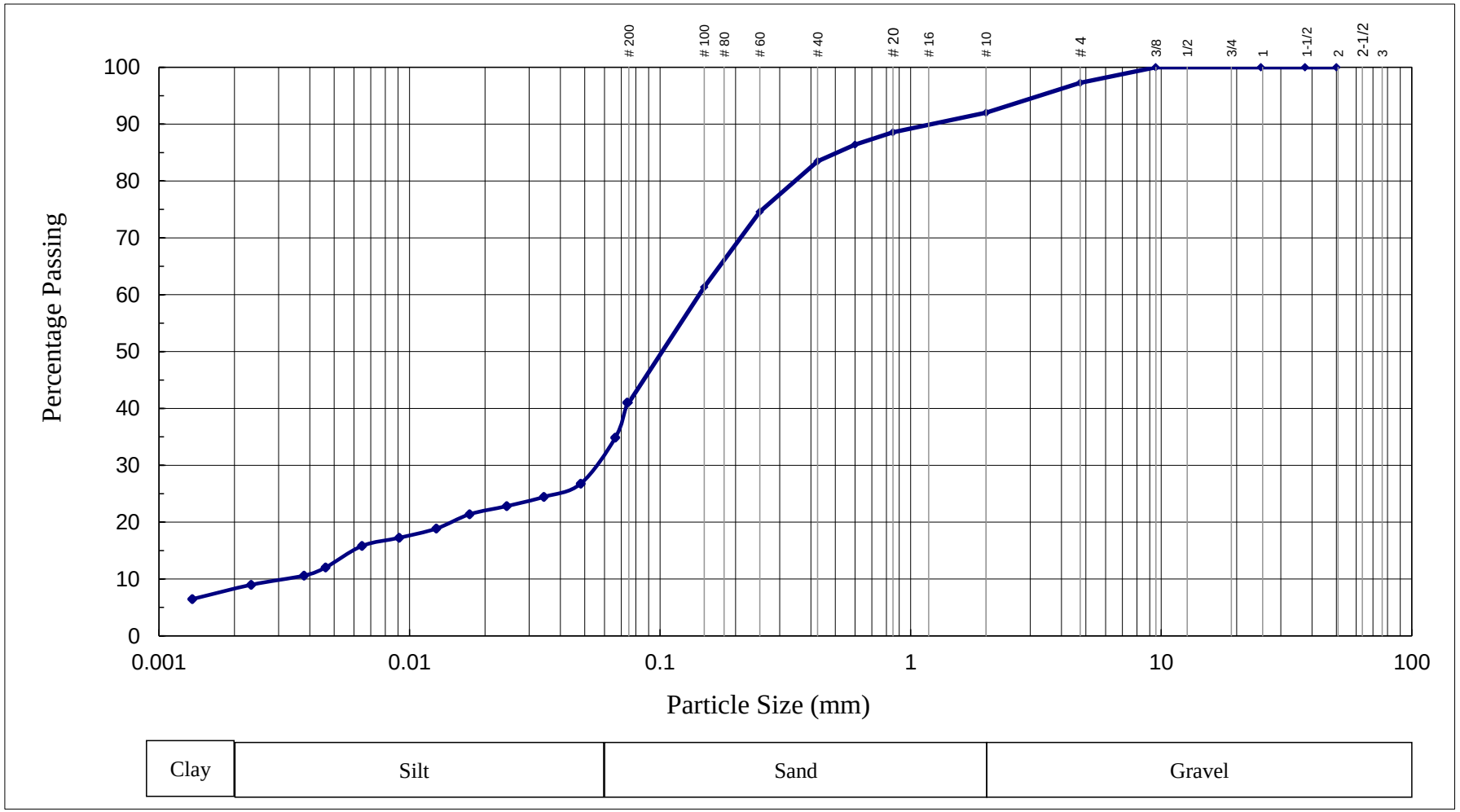
LL:	PL:	PI:

GMGFR-006-R0

Sieve & Hydrometer Analysis

Lab#: 100638

Project Name:	**161 Heathwood Heights Drive**			**Project No:**	**2024-10-150**
Order No:		**Test Date:**	**06-Dec-24**	**Client:**	**Kamran Rzayev**
Borehole No:	**BH5**	**Borehole Location:**	**Figure2**	**Lead Consultant:**	
Sample No:	**SS10**	**Sample Depth:**	**10.73**	**moisture content:**	**11.5%**



Clay:	Silt:	Sand:	Gravel:
8	**22**	**62**	**8**

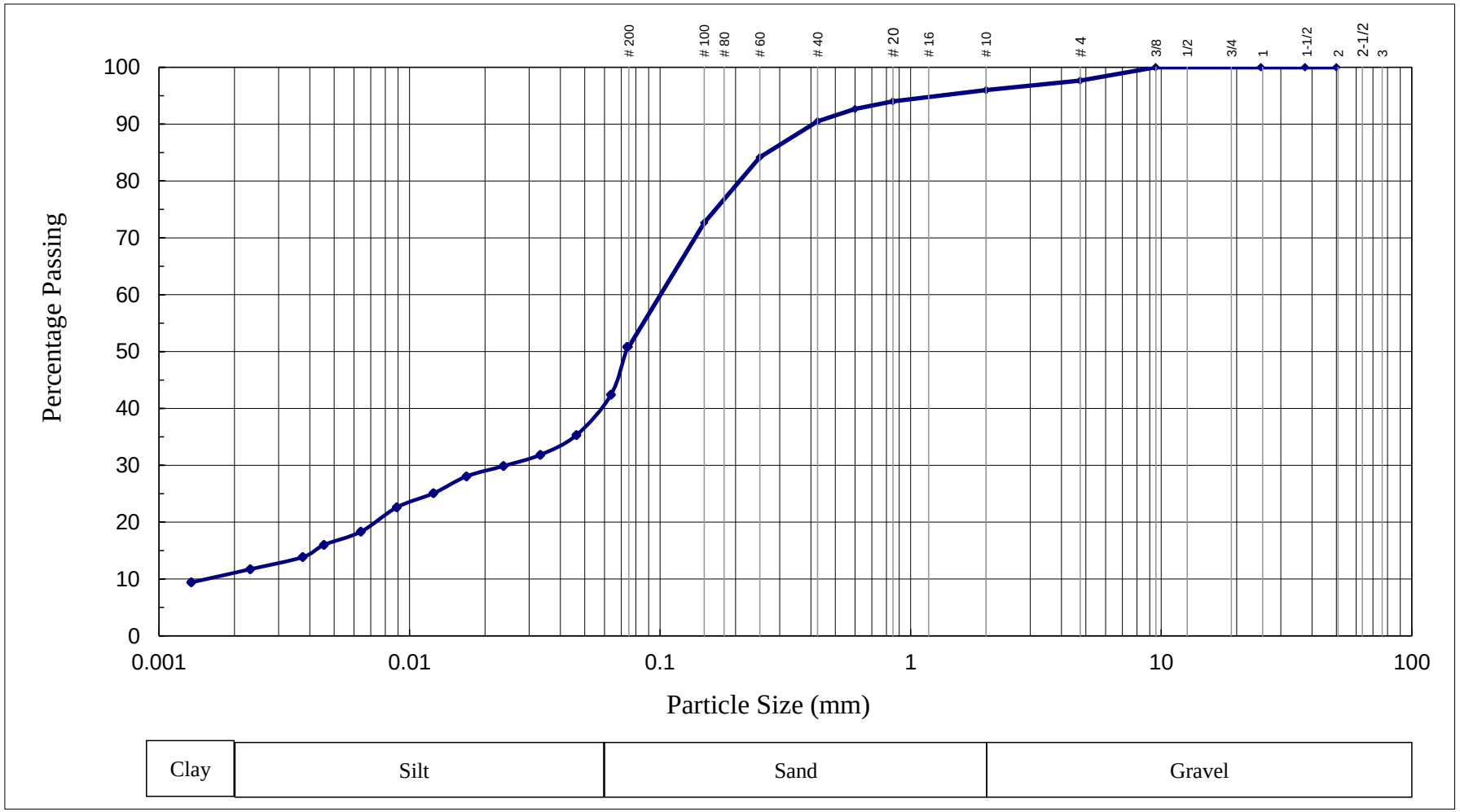
LL:	PL:	PI:

GMGFR-006-R0

Sieve & Hydrometer Analysis

Lab#: 100639

Project Name:	**161 Heathwood Heights Drive**			**Project No:**	**2024-10-150**
Order No:		**Test Date:**	**06-Dec-24**	**Client:**	**Kamran Rzayev**
Borehole No:	**BH6**	**Borehole Location:**	**Figure2**	**Lead Consultant:**	
Sample No:	**SS6**	**Sample Depth:**	**4.8**	**moisture content:**	**7.7%**



Clay:	**11**	Silt:	**28**	Sand:	**57**	Gravel:	**4**

LL:		PL:		PI:	

APPENDIX D

ANALYTICAL
TEST RESULTS

Certificate of Analysis

Client: Geomaple Geotechnics
156 St. Regis Cres. S.
North York, Ontario
M3J 1Y8
Attention: Mr. Navid
PO#:
Invoice to: Geomaple Geotechnics

Report Number: 3013319
Date Submitted: 2024-12-16
Date Reported: 2024-12-23
Project: 161 Heathwood Heights Drive
COC #: 232064

Dear Navid:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: _____
Patrick Jacques, Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: https://directory.cala.ca/.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

eurofins | Environment Testing

Certificate of Analysis

Client: Geomaple Geotechnics
156 St. Regis Cres. S.
North York, Ontario
M3J 1Y8
Attention: Mr. Navid
PO#:
Invoice to: Geomaple Geotechnics

Report Number: 3013319
Date Submitted: 2024-12-16
Date Reported: 2024-12-23
Project: 161 Heathwood Heights Drive
COC #: 232064

				Lab I.D.	1754409
				Sample Matrix	WW
				Sample Type	
				Sampling Date	2024-12-16
				Sample I.D.	2024-10-150-WS1
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
Anions	F	0.10	mg/L		0.14
	SO4	1	mg/L		48
General Chemistry	BOD5	1	mg/L	MAC 15	<1
	Cyanide (total)	0.005	mg/L	MAC 0.020	<0.005
	pH	1.00		6.0-9.0	7.83
	Phenols	0.001	mg/L	MAC 0.008	0.003
	Total Suspended Solids	2	mg/L	MAC 15	170*
Mercury	Hg	0.0001	mg/L	MAC 0.0004	<0.0001
Metals	Ag	0.01	mg/L	MAC 0.120	<0.01
	Al	0.1	mg/L		1.1
	Aqua-Regia Digest				y
	As	0.02	mg/L	MAC 0.020	<0.02
	Cd	0.008	mg/L	MAC 0.008	<0.008
	Co	0.01	mg/L		<0.01
	Cr	0.05	mg/L	MAC 0.080	<0.05
	Cu	0.01	mg/L	MAC 0.050	<0.01
	Mn	0.01	mg/L	MAC 0.150	0.23*
	Mo	0.01	mg/L		<0.01
	Ni	0.01	mg/L	MAC 0.080	<0.01
	Pb	0.01	mg/L	MAC 0.120	<0.01
	Sb	0.01	mg/L		<0.01
	Se	0.02	mg/L	MAC 0.020	<0.02
	Sn	0.1	mg/L		<0.1
	Ti	0.1	mg/L		<0.1
	Zn	0.04	mg/L	MAC 0.040	<0.04

Guideline = Storm Sewer - York

*** = Guideline Exceedence**

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

eurofins | Environment Testing

Certificate of Analysis

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Report Number: 3013319
Date Submitted: 2024-12-16
Date Reported: 2024-12-23
Project: 161 Heathwood Heights Drive
COC #: 232064

Group	Analyte	MRL	Units	Guideline	1754409 WW 2024-12-16 2024-10-150-WS1
				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	
Nutrients	Total Kjeldahl Nitrogen	0.100	mg/L	MAC 1	0.674
	Total P	0.020	mg/L	MAC 0.400	0.110
Oil and Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Others	Nonylphenol	0.20	ug/L		<0.20
	Nonylphenol Ethoxylates (Total)	0.10	ug/L		0.14
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	MAC 0.4	<0.1
Semi-Volatiles	Bis(2-ethylhexyl)phthalate	0.4	ug/L	MAC 8.8	0.7
	Di-n-butylphthalate	1.3	ug/L	MAC 15.0	<1.3
VOCs Surrogates	1,2-dichloroethane-d4	0	%		104
	4-bromofluorobenzene	0	%		98
	Toluene-d8	0	%		112
Volatiles	1,1,2,2-tetrachloroethane	0.5	ug/L	MAC 17.0	<0.5
	1,2-dichlorobenzene	0.4	ug/L	MAC 5.6	<0.4
	1,4-dichlorobenzene	0.4	ug/L	MAC 6.8	<0.4
	Benzene	0.5	ug/L	MAC 2.0	<0.5
	c-1,2-Dichloroethylene	0.4	ug/L	MAC 5.6	<0.4
	Chloroform	0.5	ug/L	MAC 2.0	<0.5
	Dichloromethane	4.0	ug/L	MAC 5.2	<4.0
	Ethylbenzene	0.5	ug/L	MAC 2.0	<0.5
	m/p-xylene	0.4	ug/L		0.7
	Methyl Ethyl Ketone (MEK)	2	ug/L		<2
	o-xylene	0.4	ug/L		<0.4
	Styrene	0.5	ug/L		<0.5

Guideline = Storm Sewer - York

*** = Guideline Exceedence**

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MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

eurofins | Environment Testing

Client: Geomaple Geotechnics
156 St. Regis Cres. S.
North York, Ontario
M3J 1Y8
Attention: Mr. Navid
PO#:
Invoice to: Geomaple Geotechnics

Report Number: 3013319
Date Submitted: 2024-12-16
Date Reported: 2024-12-23
Project: 161 Heathwood Heights Drive
COC #: 232064

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. 1754409 WW 2024-12-16 2024-10-150-WS1
Volatiles	t-1,3-Dichloropropylene	0.5	ug/L	MAC 5.6	<0.5
	Tetrachloroethylene	0.3	ug/L	MAC 4.4	<0.3
	Toluene	0.4	ug/L	MAC 2.0	2.1*
	Trichloroethylene	0.3	ug/L	MAC 8.0	<0.3
	Xylene; total	0.5	ug/L	MAC 4.4	0.7

Guideline = Storm Sewer - York *** = Guideline Exceedence**

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Client: Geomaple Geotechnics
156 St. Regis Cres. S.
North York, Ontario
M3J 1Y8
Attention: Mr. Navid
PO#:
Invoice to: Geomaple Geotechnics

Report Number: 3013319
Date Submitted: 2024-12-16
Date Reported: 2024-12-23
Project: 161 Heathwood Heights Drive
COC #: 232064

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 469919 **Analysis/Extraction Date** 2024-12-18 **Analyst** C M **Method** B 625/P 8270			
Bis(2-ethylhexyl)phthalate	<0.4 ug/L	91	20-140
Di-n-butylphthalate	<1.3 ug/L	93	20-140
Run No 470224 **Analysis/Extraction Date** 2024-12-18 **Analyst** SKH **Method** C SM2540			
Total Suspended Solids	<2 mg/L	97	90-110
Run No 470293 **Analysis/Extraction Date** 2024-12-18 **Analyst** AsA **Method** SM2320,2510,4500H/F			
F	<0.10 mg/L	102	90-110
pH		101	90-110
Run No 470297 **Analysis/Extraction Date** 2024-12-19 **Analyst** IP **Method** SM 4110			
SO4	<1 mg/L	110	90-110
Run No 470298 **Analysis/Extraction Date** 2024-12-23 **Analyst** Z S **Method** SM 5210B			
BOD5	<1 mg/L	90	75-125
Run No 470322 **Analysis/Extraction Date** 2024-12-19 **Analyst** IP **Method** SM5530D/EPA420.2			

Guideline = Storm Sewer - York *** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Geomaple Geotechnics
156 St. Regis Cres. S.
North York, Ontario
M3J 1Y8
Attention: Mr. Navid
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Report Number: 3013319
Date Submitted: 2024-12-16
Date Reported: 2024-12-23
Project: 161 Heathwood Heights Drive
COC #: 232064

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Phenols	<0.001 mg/L	105	50-120
Run No 470326 **Analysis/Extraction Date** 2024-12-19 **Analyst** D T **Method** EPA 8081B			
Polychlorinated Biphenyls	<0.1 ug/L	102	60-140
Run No 470328 **Analysis/Extraction Date** 2024-12-19 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	99	70-130
Run No 470329 **Analysis/Extraction Date** 2024-12-19 **Analyst** AaN **Method** EPA 200.8			
Silver	<0.01 mg/L	110	70-130
Aluminum	<0.1 mg/L	108	70-130
Aqua-Regia Digest			
Arsenic	<0.02 mg/L	102	70-130
Cadmium	<0.008 mg/L	108	70-130
Cobalt	<0.01 mg/L	110	70-130
Chromium Total	<0.05 mg/L	111	70-130
Copper	<0.01 mg/L	115	70-130
Manganese	<0.01 mg/L	111	70-130
Molybdenum	<0.01 mg/L	96	70-130

Guideline = Storm Sewer - York *** = Guideline Exceedence**

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

Certificate of Analysis

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M3J 1Y8
Attention: Mr. Navid
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Date Submitted: 2024-12-16
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Project: 161 Heathwood Heights Drive
COC #: 232064

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Nickel	<0.01 mg/L	112	70-130
Lead	<0.01 mg/L	105	70-130
Antimony	<0.01 mg/L	109	70-130
Selenium	<0.02 mg/L	110	70-130
Sn	<0.1 mg/L	88	70-130
Titanium	<0.1 mg/L	93	70-130
Zinc	<0.04 mg/L	106	70-130
Run No 470350 **Analysis/Extraction Date** 2024-12-19 **Analyst** AaN **Method** M SM3112B-3500B			
Mercury	<0.0001 mg/L	92	76-123
Run No 470355 **Analysis/Extraction Date** 2024-12-18 **Analyst** H S **Method** EPA 8260			
Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	85	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	98	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	102	60-130
Benzene	<0.5 ug/L	99	60-130
Dichloroethylene, 1,2-cis-	<0.4 ug/L	99	60-130
Chloroform	<0.5 ug/L	112	60-130

Guideline = Storm Sewer - York *** = Guideline Exceedence**

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Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

Client: Geomaple Geotechnics
156 St. Regis Cres. S.
North York, Ontario
M3J 1Y8
Attention: Mr. Navid
PO#:
Invoice to: Geomaple Geotechnics

Report Number: 3013319
Date Submitted: 2024-12-16
Date Reported: 2024-12-23
Project: 161 Heathwood Heights Drive
COC #: 232064

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Methylene Chloride	<4.0 ug/L	97	60-130
Ethylbenzene	<0.5 ug/L	102	60-130
m/p-xylene	<0.4 ug/L	102	60-130
Methyl Ethyl Ketone	<2 ug/L	110	60-130
o-xylene	<0.4 ug/L	92	60-130
Styrene	<0.5 ug/L	103	60-130
Dichloropropene,1,3-trans-	<0.5 ug/L	91	60-130
Tetrachloroethylene	<0.3 ug/L	127	60-130
Toluene	<0.4 ug/L	104	60-130
Trichloroethylene	<0.3 ug/L	99	60-130
Run No 470385 **Analysis/Extraction Date** 2024-12-20 **Analyst** SKH **Method** EPA 365.1			
Total P	<0.020 mg/L	102	80-120
Run No 470413 **Analysis/Extraction Date** 2024-12-20 **Analyst** H S **Method** EPA 8260			
Xylene Mixture			
Run No 470428 **Analysis/Extraction Date** 2024-12-23 **Analyst** ACN **Method** SM 5520B/F			
Oil & Grease - Mineral	<1 mg/L	80	70-130

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Project: 161 Heathwood Heights Drive
COC #: 232064

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Oil & Grease - Non-mineral	<1 mg/L		70-130
Oil & Grease - Total	<1 mg/L	95	70-130
Run No 470443 **Analysis/Extraction Date** 2024-12-23 **Analyst** Z S **Method** SM4500-CNC/MOE E3015			
Cyanide (total)	<0.005 mg/L	88	61-139
Run No 470448 **Analysis/Extraction Date** 2024-12-20 **Analyst** SD **Method** ASTM D7485			
Nonylphenol	<0.20 ug/L	96	50-150
Nonylphenol Ethoxylates (Total)			

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Date Submitted: 2024-12-16
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Project: 161 Heathwood Heights Drive
COC #: 232064

Dear Navid:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: _____
Patrick Jacques, Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: https://directory.cala.ca/.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Certificate of Analysis

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156 St. Regis Cres. S.
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Report Number: 3013319
Date Submitted: 2024-12-16
Date Reported: 2024-12-23
Project: 161 Heathwood Heights Drive
COC #: 232064

				Lab I.D.	1754409
				Sample Matrix	WW
				Sample Type	
				Sampling Date	2024-12-16
				Sample I.D.	2024-10-150-WS1
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
Anions	F	0.10	mg/L	MAC 10	0.14
	SO4	1	mg/L	MAC 1500	48
General Chemistry	BOD5	1	mg/L	MAC 300	<1
	Cyanide (total)	0.005	mg/L	MAC 2	<0.005
	pH	1.00		6.0-10.5	7.83
	Phenols	0.001	mg/L	MAC 1.0	0.003
	Total Suspended Solids	2	mg/L	MAC 350	170
Mercury	Hg	0.0001	mg/L	MAC 0.01	<0.0001
Metals	Ag	0.01	mg/L	MAC 5	<0.01
	Al	0.1	mg/L	MAC 50	1.1
	Aqua-Regia Digest				y
	As	0.02	mg/L	MAC 1	<0.02
	Cd	0.008	mg/L	MAC 0.7	<0.008
	Co	0.01	mg/L	MAC 5	<0.01
	Cr	0.05	mg/L	MAC 2	<0.05
	Cu	0.01	mg/L	MAC 3	<0.01
	Mn	0.01	mg/L	MAC 5	0.23
	Mo	0.01	mg/L	MAC 5	<0.01
	Ni	0.01	mg/L	MAC 2	<0.01
	Pb	0.01	mg/L	MAC 1	<0.01
	Sb	0.01	mg/L	MAC 5	<0.01
	Se	0.02	mg/L	MAC 1	<0.02
	Sn	0.1	mg/L	MAC 5	<0.1
	Ti	0.1	mg/L	MAC 5	<0.1
	Zn	0.04	mg/L	MAC 2	<0.04

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Date Submitted: 2024-12-16
Date Reported: 2024-12-23
Project: 161 Heathwood Heights Drive
COC #: 232064

Group	Analyte	MRL	Units	Guideline	1754409 WW 2024-12-16 2024-10-150-WS1
				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	
Nutrients	Total Kjeldahl Nitrogen	0.100	mg/L	MAC 100	0.674
	Total P	0.020	mg/L	MAC 10	0.110
Oil and Grease	Oil & Grease - Mineral	1	mg/L	MAC 15	<1
	Oil & Grease - Non-mineral	1	mg/L	MAC 150	<1
	Oil & Grease - Total	1	mg/L		<1
Others	Nonylphenol	0.20	ug/L	MAC 20	<0.20
	Nonylphenol Ethoxylates (Total)	0.10	ug/L	MAC 200	0.14
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	MAC 1	<0.1
Semi-Volatiles	Bis(2-ethylhexyl)phthalate	0.4	ug/L	MAC 12	0.7
	Di-n-butylphthalate	1.3	ug/L	MAC 80	<1.3
VOCs Surrogates	1,2-dichloroethane-d4	0	%		104
	4-bromofluorobenzene	0	%		98
	Toluene-d8	0	%		112
Volatiles	1,1,2,2-tetrachloroethane	0.5	ug/L	MAC 1400	<0.5
	1,2-dichlorobenzene	0.4	ug/L	MAC 50	<0.4
	1,4-dichlorobenzene	0.4	ug/L	MAC 80	<0.4
	Benzene	0.5	ug/L	MAC 10	<0.5
	c-1,2-Dichloroethylene	0.4	ug/L	MAC 4000	<0.4
	Chloroform	0.5	ug/L	MAC 40	<0.5
	Dichloromethane	4.0	ug/L	MAC 2000	<4.0
	Ethylbenzene	0.5	ug/L	MAC 160	<0.5
	m/p-xylene	0.4	ug/L		0.7
	Methyl Ethyl Ketone (MEK)	2	ug/L	MAC 8000	<2
	o-xylene	0.4	ug/L		<0.4
	Styrene	0.5	ug/L	MAC 200	<0.5

Guideline = Sanitary Sewer - York

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Certificate of Analysis

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156 St. Regis Cres. S.
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M3J 1Y8
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Invoice to: Geomaple Geotechnics

Report Number: 3013319
Date Submitted: 2024-12-16
Date Reported: 2024-12-23
Project: 161 Heathwood Heights Drive
COC #: 232064

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1754409 WW 2024-12-16 2024-10-150-WS1
Volatiles	t-1,3-Dichloropropylene	0.5	ug/L	MAC 140	<0.5
	Tetrachloroethylene	0.3	ug/L	MAC 1000	<0.3
	Toluene	0.4	ug/L	MAC 270	2.1
	Trichloroethylene	0.3	ug/L	MAC 400	<0.3
	Xylene; total	0.5	ug/L	MAC 1400	0.7

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Project: 161 Heathwood Heights Drive
COC #: 232064

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 469919 **Analysis/Extraction Date** 2024-12-18 **Analyst** C M **Method** B 625/P 8270			
Bis(2-ethylhexyl)phthalate	<0.4 ug/L	91	20-140
Di-n-butylphthalate	<1.3 ug/L	93	20-140
Run No 470224 **Analysis/Extraction Date** 2024-12-18 **Analyst** SKH **Method** C SM2540			
Total Suspended Solids	<2 mg/L	97	90-110
Run No 470293 **Analysis/Extraction Date** 2024-12-18 **Analyst** AsA **Method** SM2320,2510,4500H/F			
F	<0.10 mg/L	102	90-110
pH		101	90-110
Run No 470297 **Analysis/Extraction Date** 2024-12-19 **Analyst** IP **Method** SM 4110			
SO4	<1 mg/L	110	90-110
Run No 470298 **Analysis/Extraction Date** 2024-12-23 **Analyst** Z S **Method** SM 5210B			
BOD5	<1 mg/L	90	75-125
Run No 470322 **Analysis/Extraction Date** 2024-12-19 **Analyst** IP **Method** SM5530D/EPA420.2			

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Phenols	<0.001 mg/L	105	50-120
Run No 470326 **Analysis/Extraction Date** 2024-12-19 **Analyst** D T **Method** EPA 8081B			
Polychlorinated Biphenyls	<0.1 ug/L	102	60-140
Run No 470328 **Analysis/Extraction Date** 2024-12-19 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	99	70-130
Run No 470329 **Analysis/Extraction Date** 2024-12-19 **Analyst** AaN **Method** EPA 200.8			
Silver	<0.01 mg/L	110	70-130
Aluminum	<0.1 mg/L	108	70-130
Aqua-Regia Digest			
Arsenic	<0.02 mg/L	102	70-130
Cadmium	<0.008 mg/L	108	70-130
Cobalt	<0.01 mg/L	110	70-130
Chromium Total	<0.05 mg/L	111	70-130
Copper	<0.01 mg/L	115	70-130
Manganese	<0.01 mg/L	111	70-130
Molybdenum	<0.01 mg/L	96	70-130

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Nickel	<0.01 mg/L	112	70-130
Lead	<0.01 mg/L	105	70-130
Antimony	<0.01 mg/L	109	70-130
Selenium	<0.02 mg/L	110	70-130
Sn	<0.1 mg/L	88	70-130
Titanium	<0.1 mg/L	93	70-130
Zinc	<0.04 mg/L	106	70-130
Run No 470350 **Analysis/Extraction Date** 2024-12-19 **Analyst** AaN **Method** M SM3112B-3500B			
Mercury	<0.0001 mg/L	92	76-123
Run No 470355 **Analysis/Extraction Date** 2024-12-18 **Analyst** H S **Method** EPA 8260			
Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	85	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	98	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	102	60-130
Benzene	<0.5 ug/L	99	60-130
Dichloroethylene, 1,2-cis-	<0.4 ug/L	99	60-130
Chloroform	<0.5 ug/L	112	60-130

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Methylene Chloride	<4.0 ug/L	97	60-130
Ethylbenzene	<0.5 ug/L	102	60-130
m/p-xylene	<0.4 ug/L	102	60-130
Methyl Ethyl Ketone	<2 ug/L	110	60-130
o-xylene	<0.4 ug/L	92	60-130
Styrene	<0.5 ug/L	103	60-130
Dichloropropene,1,3-trans-	<0.5 ug/L	91	60-130
Tetrachloroethylene	<0.3 ug/L	127	60-130
Toluene	<0.4 ug/L	104	60-130
Trichloroethylene	<0.3 ug/L	99	60-130
Run No 470385 **Analysis/Extraction Date** 2024-12-20 **Analyst** SKH **Method** EPA 365.1			
Total P	<0.020 mg/L	102	80-120
Run No 470413 **Analysis/Extraction Date** 2024-12-20 **Analyst** H S **Method** EPA 8260			
Xylene Mixture			
Run No 470428 **Analysis/Extraction Date** 2024-12-23 **Analyst** ACN **Method** SM 5520B/F			
Oil & Grease - Mineral	<1 mg/L	80	70-130

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Date Submitted: 2024-12-16
Date Reported: 2024-12-23
Project: 161 Heathwood Heights Drive
COC #: 232064

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Oil & Grease - Non-mineral	<1 mg/L		70-130
Oil & Grease - Total	<1 mg/L	95	70-130
Run No 470443 **Analysis/Extraction Date** 2024-12-23 **Analyst** Z S **Method** SM4500-CNC/MOE E3015			
Cyanide (total)	<0.005 mg/L	88	61-139
Run No 470448 **Analysis/Extraction Date** 2024-12-20 **Analyst** SD **Method** ASTM D7485			
Nonylphenol	<0.20 ug/L	96	50-150
Nonylphenol Ethoxylates (Total)			

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APPENDIX E

IN-SITU PERMEABILITY TEST RESULTS

Geomaple Geotechnics Inc.

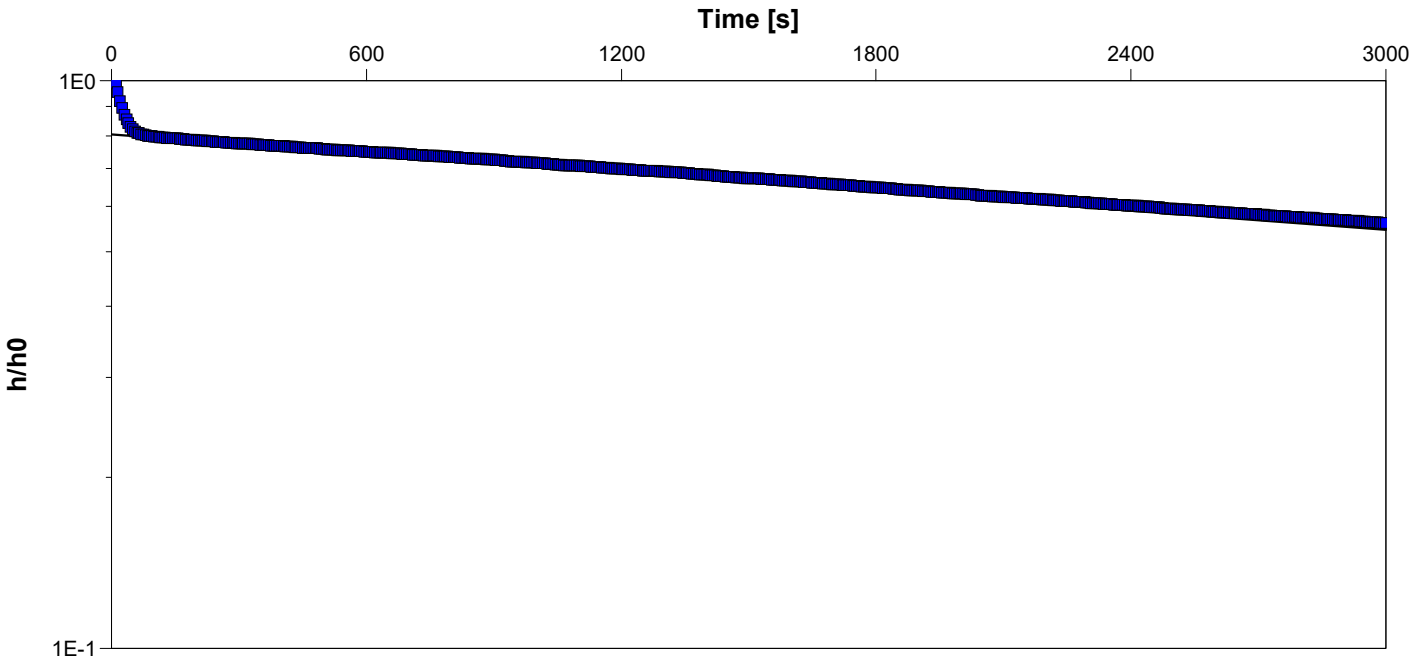
Well Response Test

Project: 161 Heathwood Heights Drive

Number: 2024-10-150

Client: Kamran Rzayev

Location: Aurora, Ontario		Test Well: BH3
Test Conducted by: Ehsan Lari		Test Date: 2024-12-13
Analysis Performed by: Ehsan Lari	Falling Head	Analysis Date: 2024-12-17



Observation Well	Hydraulic Conductivity [m/s]	
BH3	8.75×10^{-8}	

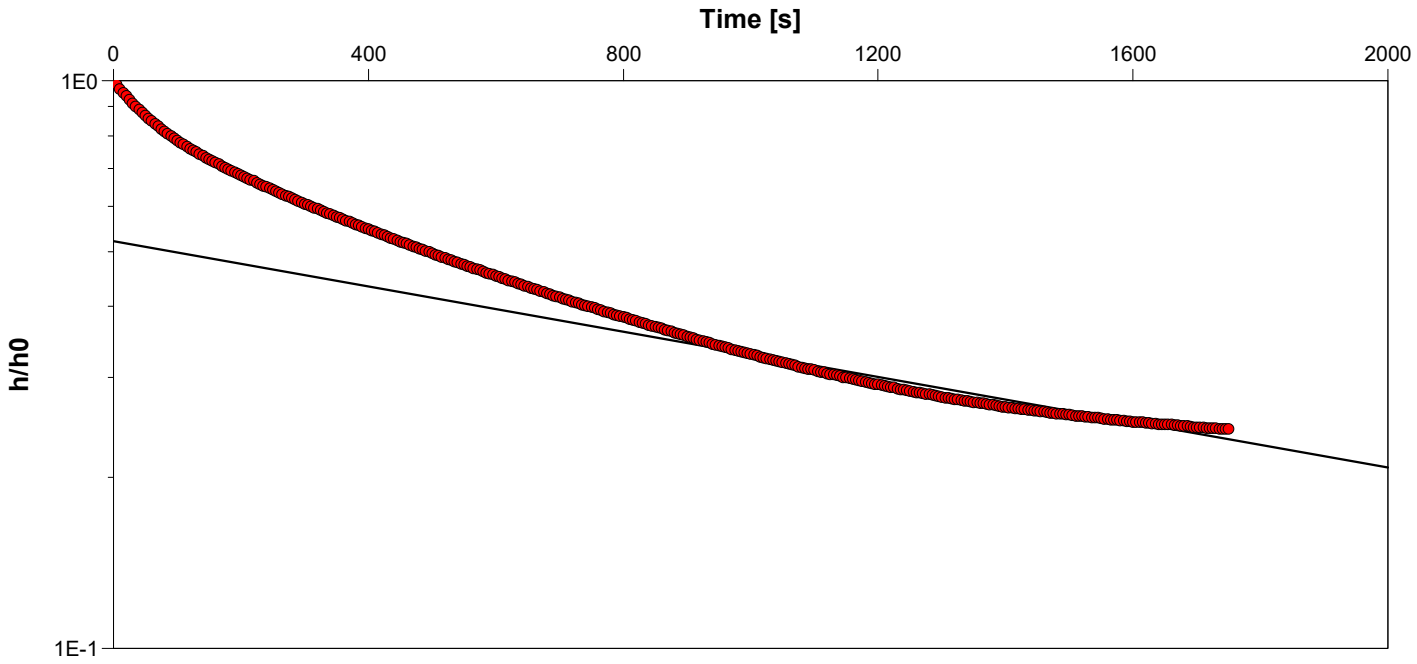
*Low Impact Development Stormwater Management Planning and Design Guide Appendix C (Version 1.0, 2010) TRCA & CVC

Infiltration Rate (mm/hr)	Percolation Time (minute/cm)	*Hydraulic Conductivity, Kfs (cm/s)
24	25	8.75E-06

Geomaple Geotechnics Inc.

Well Response Test	
Project: 161 Heathwood Heights Drive	
Number: 2024-10-150	
Client: Kamran Rzayev	

Location: Aurora, Ontario		Test Well: BH4
Test Conducted by: Ehsan Lari		Test Date: 2024-12-13
Analysis Performed by: Ehsan Lari	Falling Head	Analysis Date: 2024-12-17



Observation Well	Hydraulic Conductivity [m/s]	
BH4	3.10×10^{-7}	

*Low Impact Development Stormwater Management Planning and Design Guide Appendix C (Version 1.0, 2010) TRCA & CVC

Infiltration Rate (mm/hr)	Percolation Time (minute/cm)	*Hydraulic Conductivity, Kfs (cm/s)
34	18	3.10E-05

Geomaple Geotechnics Inc.

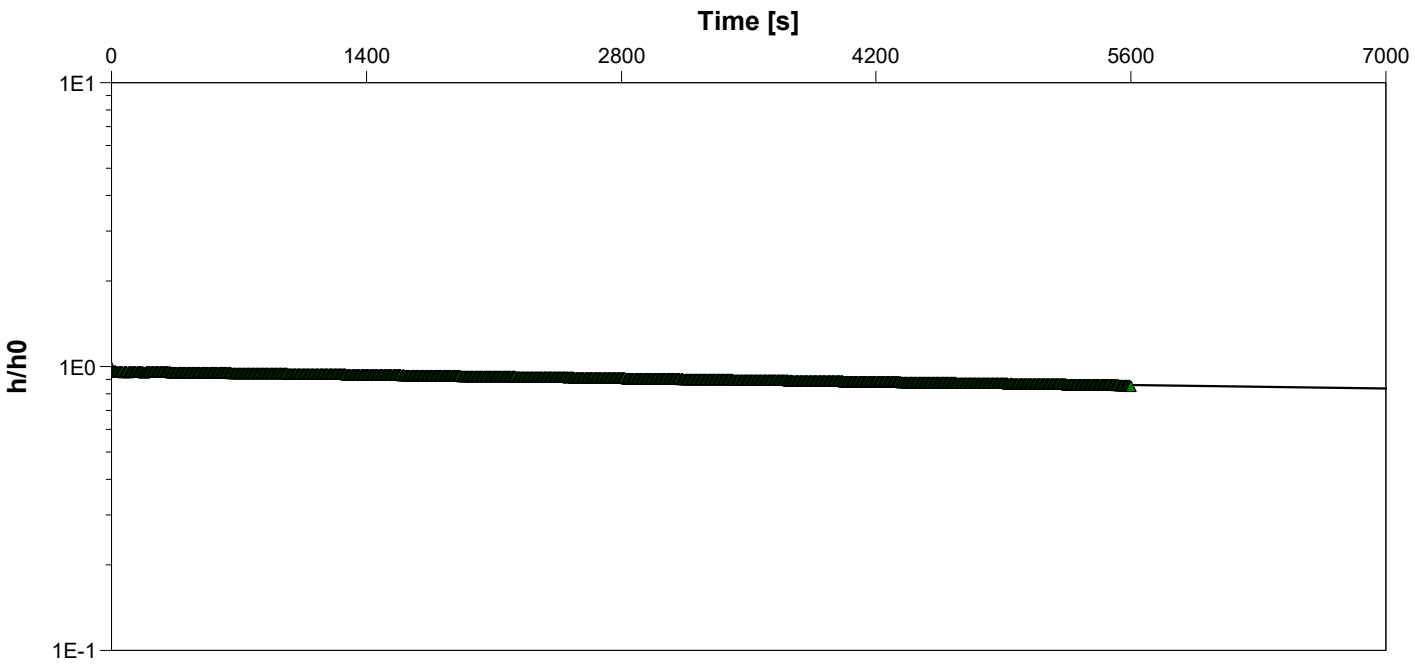
Slug Test Analysis Report

Project: 161 Heathwood Heights Drive

Number: 2024-10-150

Client: Kamran Rzayev

Location: Aurora, Ontario	Slug Test: Well Response BH5	Test Well: BH5
Test Conducted by: Ehsan Lari		Test Date: 2024-12-13
Analysis Performed by: Ehsan Lari	Rising Head	Analysis Date: 2024-12-17
Aquifer Thickness: 6.00 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH5	7.99×10^{-9}