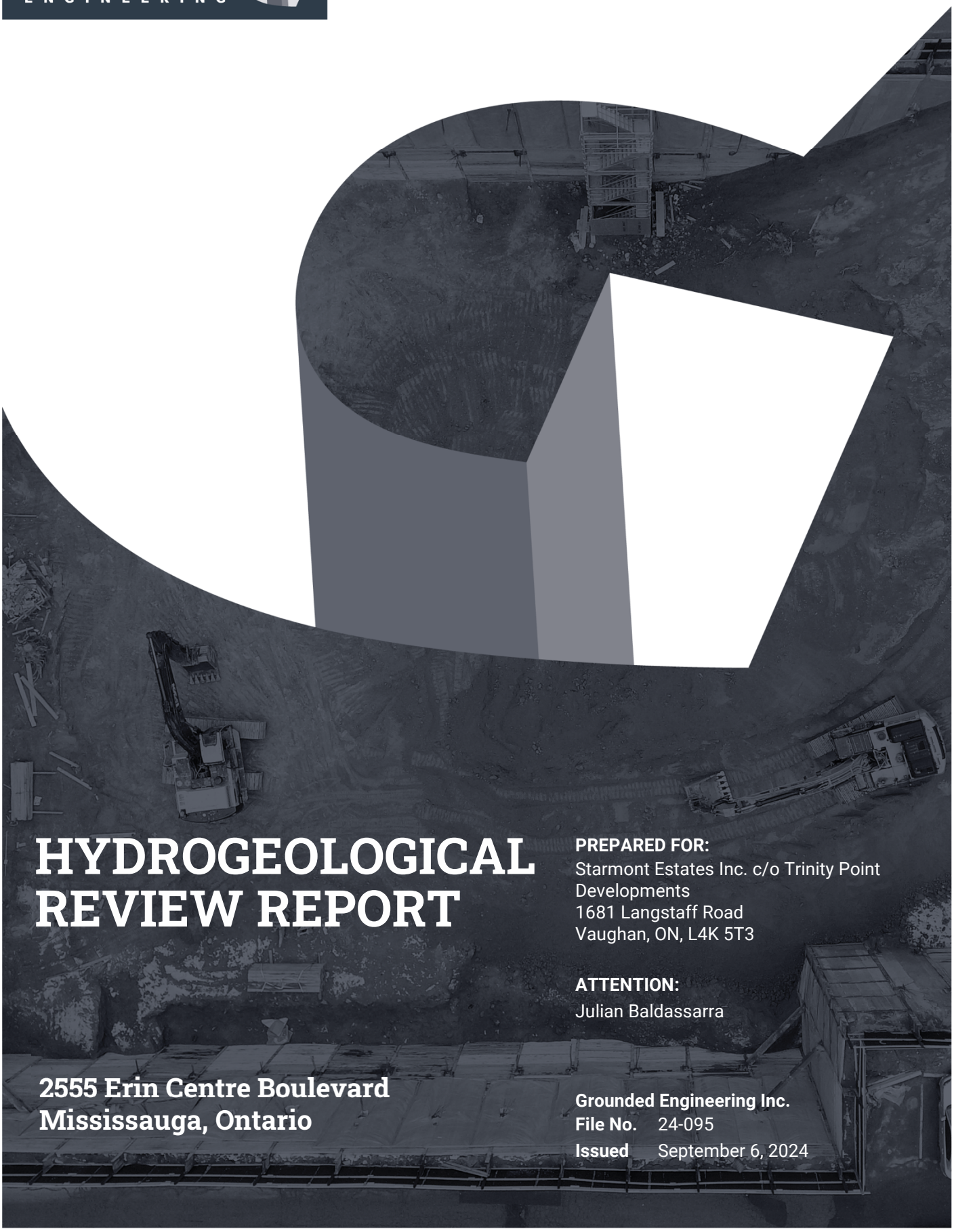

HYDROGEOLOGICAL REVIEW REPORT

PREPARED FOR:
Starmont Estates Inc. c/o Trinity Point Developments
1681 Langstaff Road
Vaughan, ON, L4K 5T3

ATTENTION:
Julian Baldassarra

2555 Erin Centre Boulevard
Mississauga, Ontario

Grounded Engineering Inc.
File No. 24-095
Issued September 6, 2024

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FIGURES

APPENDICES

1 Introduction

Starmont Estates Inc. c/o Trinity Point Developments has retained Grounded Engineering Inc. to provide hydrogeological engineering design advice for their proposed development at 2555 Erin Centre Boulevard, in Mississauga, Ontario.

Grounded has been provided with the following reports and drawings to assist in our scope of work:

- Architectural Progress Set, "2555 Erin Centre, Mississauga, Ontario"; Dated July 26th, 2024, prepared by Arcadis.
- Topographic Survey, "Plan of Survey and Topographic of Block 116- Registered Plan 43M-856"; Job No. 23-242, dated November 30, 2023, prepared by R-PE Surveying Ltd.

Property Information	
Location of Site	2555 Erin Centre Boulevard, Mississauga, Ontario, L5M 5H1
Ownership of Site	Starmont Estates Inc.
Site Dimensions (m)	142 x 75
Site Area (m^2)	10,000

Proposed Development	
Number of Building Structures	Three (3) towers
Number of Underground Levels	Four (4)
Lowest Finished Floor Elevation (FFE)	Depth 13.2 m / Elev. 156 masl
Approx. Base of Foundations	Depth 14.2 m / Elev. 155 masl
Sub-Grade Area (m^2)	9,250
Land Use Classification	Residential

Qualified Person and Hydrogeological Review Information	
Qualified Person	David MacGillivray, M.A.Sc., P.Geo., P.Eng., $QP_{ESA|RA}$ Nick Ng, P.Eng.
Consulting Firm	Grounded Engineering Inc.
Date of Hydrogeological Review	September 6, 2024
Scope of Work	▪ Review of MECP Water Well Records for the area ▪ Review of geological information for the area

Qualified Person and Hydrogeological Review Information	
	▪ Review of topographic information for the area ▪ Advancement of eight (8) boreholes to a maximum depth of 19.9 m, which were instrumented with eight (8) monitoring wells. ▪ Advancement of one (1) shallow borehole for environmental purposes ▪ Completion of slug tests in select available monitoring wells, depending on quantity of water observed ▪ Groundwater elevation monitoring for three (3) months on a monthly basis ▪ Groundwater sampling and analysis to the City of Mississauga Sewer Use and Region of Peel Sanitary and Combined Use Limits ▪ Assessment of groundwater controls and potential impacts ▪ Report preparation in accordance with Ontario Water Resources Act, Ontario Regulation 387/04

General Hydrogeological Characterization	
Site Topography	The site has an approximate ground surface elevation of 169± masl.
Local Physiographic Features	The site is composed of clayey silt till deposits, overlaying Queenston formation shale bedrock.
Regional Physiographic Features	The Peel plain occupies 800 km^2 area that lies below central portions of the Regional Municipalities of York, Peel, and Halton. The area is level to undulating with the Credit, Humber, Don, and Rouge Rivers along with other smaller stream cutting deep valleys across it. The dominant soil in the area is a dense till that is rich in shale and limestone. The plain overlies the contact of the Georgian Bay and Queenston Formations. The aquifers in this area are not very productive.
Watershed	The site is located within the Credit River Watershed. Locally, groundwater is anticipated to flow Southeast towards a tributary/branch of the Credit River.
Surface Drainage	Surface water is expected to flow towards municipal catch basins located on or adjacent to the site, via Erin Centre Blvd to the Southeast and Erin Mills Parkway to the Southwest

2 Study Area Map

A map has been enclosed which shows the following information:

- All monitoring wells identified on site, and within the study area
- All boreholes identified on site
- All buildings identified on site and within the study area
- The site boundaries
- Any watercourses and drainage features within the study area

3 Geology and Physical Hydrogeology

The site stratigraphy, including soil materials, composition and texture are presented in detail on the borehole logs in Appendix A. A summary of stratigraphic units that were encountered at the site is outlined as follows:

Site Stratigraphy				
Stratum/Formation	**Depth Range (mbgs)**	**Elevation Range (masl)**	**Hydraulic Conductivity (m/s)**	**Method of Determination**
Surficial Material/Earth Fill	0.0 to 1.2	169.2 to 168	1.0×10^{-4}	Literature[1]
Glacial Till	1.2 to 5.2	168.0 to 164.0	2.1×10^{-7}	Grain size

Bedrock				
Stratum/Formation	**Depth Range (mbgs)**	**Elevation Range (masl)**	**Hydraulic Conductivity (m/s)**	**Method of Determination**
Weathered	5.2 to 5.7	164.0 to 163.5	2.2×10^{-7}*	Slug Test
Sound	5.7 to 19.2	163.5 to 150.0	6.0×10^{-8}**	Slug test

*Weathered bedrock assumed to have a K_2/K_1 ratio (vertical to horizontal hydraulic conductivity) of 1.0
**Sound bedrock assumed to have a K_2/K_1 ratio (vertical to horizontal hydraulic conductivity) of 0.1 – hydraulic conductivity was estimated as a geometric mean of the slug test results.

Surface Water			
Surface Water Body	**Distance from site (m)**	**Direction from site**	**Hydraulically Connected to Site (yes/no)**
Tributary of the Credit River Valley	100	South	Yes

4 Groundwater Elevations

4.1 Monitoring Well Information

Well ID	Well Diameter (mm)	Ground Surface (masl)	Top of Screen (masl)	Bottom of Screen (masl)	Screened Geological Unit
BH101	50	169.1	153.2	150.2	Bedrock

[1] Freeze and Cherry (1979)

Well ID	Well Diameter (mm)	Ground Surface (masl)	Top of Screen (masl)	Bottom of Screen (masl)	Screened Geological Unit
BH102	50	169.1	167.5	164.5	Glacial Till
BH103	50	169.0	153.6	150.5	Bedrock
BH104	50	169.2	167.7	164.6	Glacial Till
BH105	50	169.5	153.9	150.9	Bedrock
BH106	50	169.4	166.4	163.4	Glacial Till
BH107	50	169.4	167.6	166.1	Glacial Till
BH108	50	169.4	167.1	164.0	Glacial Till

4.2 Well Observations

Well ID	Groundwater Elevation (masl)				
	July 11, 2024	July 19, 2024	July 24, 2024	August 27, 2024	Maximum
BH101	154.5*	161.2	159.9	160.2	**161.2**
BH102	165.2	165.7	165.6	165.2	**165.7**
BH103	N/A	161.7	161.7	161.6	**161.7**
BH104	165.5	166.0	166.2	166.1	**166.2**
BH105	160.7	161.2	161.2	160.5	**161.2**
BH106	165.3	166.2	165.9	165.2	**166.2**
BH107	167.0	166.9	166.9	166.9	**167.0**
BH108	165.0	165.8	166.0	165.5	**166.0**

* Unstabilized groundwater level measured.

The design groundwater table is at about Elev. 167± m. There is also a lower groundwater table within the bedrock. Within the zone of excavation, the earth fill will permit the free-flow of water when wet, whereas the native glacial till and sound bedrock will typically preclude free-flowing water when penetrated below the groundwater table. However, it can be expected that the weathered bedrock and fractures in the sound bedrock will produce groundwater seepage.

Based on the measured groundwater elevations, the anticipated groundwater flow direction at this site is to the Southeast.

Groundwater levels fluctuate with time depending on the amount of precipitation and surface runoff and may be influenced by known or unknown dewatering activities at nearby sites.

5 Aquifer Testing

5.1 Pumping Test

A pumping test was not attempted at the site. Slug tests were conducted and are presented in the section below.

5.2 Single Well Response Test (Slug Test)

The hydraulic conductivities from select monitoring wells were determined based on slug tests (single-well response tests). These tests involve rapid removal of water or addition of a "slug" which displaces a known volume of water from a single well, and then monitoring the water level in the well until it recovers. The results of the slug tests were analyzed using the Bouwer and Rice method (1976).

The hydraulic properties of the strata applicable to the site are as follows:

Well ID	Well Screen Elevation (masl)	Screened Geological Unit	Hydraulic Conductivity (m/s)
BH101	153.2 – 150.2	Bedrock	$3.0x10^{-8}$
BH103	135.6 – 150.5	Bedrock	$2.2x10^{-7}$
BH105	153.9 – 150.9	Bedrock	$3.3x10^{-8}$

5.3 Soil Grain Size Distribution

The hydraulic conductivities of various soil types can also be estimated from grain size analyses. An assessment of the grain sizes was conducted using the excel-based tool, HydrogeoSieve XL (*HydrogeoSieve XL ver.2.2, J.F. Devlin, University of Kansas, 2015*). HydrogeoSieve XL compares the results of the grain size analyses against fifteen (15) different analytical methods.

Given our experience in the area as well as published literature, some of the geometric means provided for the soil were biased low by one or more methods. In these instances, the values determined by these methods were excluded from the mean. The table below illustrates the hydraulic conductivity values estimated from the mean of the analytical methods where the soil met the applicable analysis criteria.

Sample ID	Soil Description	Applicable Analysis Methods	Hydraulic Conductivity (m/s)
BH101 SS5	Sand and Silt Glacial Till, Some Clay	Alyamani and Sen, Barr, Sauerbrei	4.9×10^{-8}
BH102 SS3	Clayey Silt Glacial Till, Some Sand	Alyamani and Sen, Barr, Sauerbrei	4.8×10^{-8}
BH104 SS3	Sandy Silt Glacial Till, Some Clay	Alyamani and Sen, Barr, Sauerbrei	1.5×10^{-8}

Sample ID	Soil Description	Applicable Analysis Methods	Hydraulic Conductivity (m/s)
BH106 SS3	Clayey Silt Glacial Till, Some Sand	Alyamani and Sen, Barr, Sauerbrei	3.7×10^{-9}
BH106SS6	Sandy Silt Glacial Till, Some Clay, Some Gravel	Alyamani and Sen, Barr, Sauerbrei	2.2×10^{-8}
BH106 SS7	Sandy Silt Glacial Till, Some Clay, Some Gravel	Alyamani and Sen, Barr, Sauerbrei, Krumbein and Monk	2.1×10^{-7}
BH107 SS5	Sandy Silt Glacial Till, Some Clay	Alyamani and Sen, Barr, Sauerbrei	2.1×10^{-8}
BH107 SS6	Silt and Sand Glacial Till, Some Clay	Alyamani and Sen, Barr, Sauerbrei	1.7×10^{-8}
BH108 SS5	Sand and Silt Glacial Till, Some Clay	Alyamani and Sen, Barr, Sauerbrei	4.9×10^{-8}

The results of the analyses are presented in Appendix D.

5.4 Literature

According to Freeze and Cherry (1979), the typical hydraulic conductivity of the strata investigated at the site are:

Stratum/Formation	Hydraulic Conductivity (m/s)
Earth Fill	10^{-2} to 10^{-6}
Glacial Tills	10^{-6} to 10^{-12}
Bedrock (Shale)	10^{-6} to 10^{-13}

6 Sump Monitoring

A new basement structure is proposed for the site. The monitoring of the existing sumps (where present) is excluded from the present scope.

7 Water Quality

One (1) unfiltered groundwater sample was collected and analyzed by a Canadian laboratory accredited and licensed by Standards Council of Canada and or Canadian Association for Laboratory Accreditation.

The sample was collected directly from monitoring well BH101 on July 11, 2024. The sample was analyzed for the following parameters:

- Region of Peel – Limits for Sanitary and Combined Sewers Discharge (BL-53-2010)
- City of Mississauga – Limits for Storm Sewer Use (BL-00460-2022)

The groundwater sample **exceeded** the City of Mississauga **Limits for Storm Sewer Discharge** for the following parameters:

- Total Suspended Solids (Limit 15 mg/L, Result 82 mg/L)
- Zinc (Limit 0.2 mg/L, Result 0.516 mg/L)
- Biochemical Oxygen Demand (Limit 15 mg/L, Result 24 mg/L)

The groundwater sample **met** the Region of Peel **Limits for Sanitary and Combined Sewer Discharge** for all parameters analyzed.

A true copy of the analysis report, Certificate of Analysis and a chain of custody record for the sample are enclosed.

8 Proposed Construction Method

For design purposes, the groundwater table at Elev. 167 m in the upper clayey silt till deposits. The groundwater table is present in all the native soil units. The lowest P4 FFE is at about Elev. 156± m. Bulk and foundation excavations will extend below the design groundwater table.

For present purposes, the proposed shoring at the site is assumed to consist of a conventional soldier piling and lagging system, and a conventionally drained below-grade structure (with perimeter and subfloor drainage systems) is considered.

The glacial till has a low permeability and will yield only minor seepage. It can be expected that fractures in the weathered and sound bedrock will produce groundwater seepage. There is also infiltrated stormwater perched in the earth fill which is flowing down towards the groundwater table. On this basis, seepage into excavations may be allowed to drain into the excavation and then controlled by a conventional sump pump arrangement. Nevertheless, delays in excavation will occur as the seepage is controlled and these delays should be anticipated in the construction schedule.

9 Private Water Drainage System (PWDS)

If the proposed development consists of drained foundations, then a private water drainage system will be required. The total sub floor drain area will be approximately 9,250 m^2 based on the drawings which have been provided. If the development is designed with a private water drainage system, the drainage system is a critical structural element since it keeps water pressure from acting on the basement walls and floor slab. As such, the sump that ensures the performance of this system must have a duplexed pump arrangement for 100% pumping redundancy and these pumps must be on emergency power. The size of the sump should be adequate to accommodate the estimated groundwater seepage. It is anticipated that the groundwater seepage can be controlled with typical, widely available, commercial/residential sump pumps.

10 Groundwater Extraction and Discharge

Numerical analyses were conducted for both short term and long term dewatering scenarios. The modeling was conducted using computer software, which deploys the finite element modelling method. The Finite Element Model (FEM) for groundwater seepage indicates the short term (construction) and long term (permanent) dewatering requirements as provided below. The finite element model results are presented in Appendix E.

The groundwater seepage estimates provided below represent the steady state groundwater seepage. There will also be an initial drawdown of the groundwater before a steady state condition is reached. The rate of the initial drawdown, and therefore discharge, is dependent on the dewatering contractor and how the groundwater is being dealt with at the site.

An estimated initial volume of stored groundwater has been provided below, which will require removal before steady state is reached. In addition to the stored groundwater, there will also be additional transient groundwater flow during the initial drawdown. Transient flow volumes (and therefore discharge volumes) are a function of the rate of drawdown and will need to be accounted for in the dewatering plan for this site.

If the excavation is exposed to the elements, stormwater will have to be managed. The short term control of groundwater should consider stormwater management from rainfall events. A dewatering system should be designed to consider the removal of rainfall from excavation. A design storm of 25 mm has been used in the quantity estimates. As required by Ontario Regulation 63/16, a plan for discharge must consider the conveyance of stormwater from a 100-year storm. The additional volume that will be generated in the occurrence of a 100-year storm event is approximately 1,001,000 L/day.

The following design considerations and values have been incorporated into the numerical modelling / dewatering estimates:

- A Factor of Safety of 2.0 is used for all groundwater seepage volume calculations.
- A permeable soldier pile & lagging shoring system and drained basement are considered.
- The design hydraulic conductivities for the site are:

Design Hydraulic Conductivity	
Stratum/Formation	**K (m/s)**
Earth Fill	1.0×10^{-4}
Till	2.1×10^{-7}
Weathered Bedrock	2.2×10^{-7}*
Sound Bedrock	6.0×10^{-8}**

*Weathered bedrock assumed to have a K_2/K_1 ratio (vertical to horizontal hydraulic conductivity) of 1.0
**Sound bedrock assumed to have a K_2/K_1 ratio (vertical to horizontal hydraulic conductivity) of 0.1 – hydraulic conductivity was estimated as a geometric mean of the slug test results.

Stored Groundwater (pre-excavation/dewatering)					
Volume of Excavation (m^3)	Volume of Excavation Below Water Table (m^3)	Estimated Volume of Stored Groundwater		Estimated Volume of Available Groundwater	
		m^3	L	m^3	L
145, 800	122, 400	24, 500	24, 500, 000	21, 100	21, 100, 000

The quantity estimates for both short- and long-term conditions are presented below and in the appendices.

Short Term (Construction) Steady State Groundwater Quantity					
Estimated Groundwater Seepage		Design Rainfall Event (25mm)		Estimated Total Daily Water Takings	
L/day	L/min	L/day	L/min	L/day	L/min
140,000	97.2	266,000	184.7	406,000	281.9

Long Term (Permanent) Steady State Groundwater Quantity					
Estimated Groundwater Seepage		Estimated Infiltrated Stormwater – Design Rainfall Event (25mm)		Estimated Total Daily Water Takings	
L/day	L/min	L/day	L/min	L/day	L/min
125,000	86.8	16,000	11.1	141,000	97.9

Regulatory Requirements	
Environmental Activity and Sector Registry (EASR) Posting	Required*
Short Term Permit to Take Water (PTTW)	Not Required
Long Term Permit to Take Water (PTTW)	Required
Short Term Discharge Agreement City of Mississauga	Required
Long Term Discharge Agreement City of Mississauga	Required

*Must log and subtract all precipitation events from water taking records.

The City of Mississauga will require Discharge Agreements in the short and long terms, if any water is to be discharged to the storm or sanitary sewers. It should be noted that securing a permit to take water on a permanent basis may not be supported by regulatory agencies.

Please note:

- The proposed pump schedule for short term construction dewatering has not been completed. As such, the actual peak short term discharge rate is not available at the time of writing this report. The pump schedule must be specified by either the dewatering contractor retained or the mechanical consultant.

- The proposed pump schedule for long term permanent drainage has not been completed. As such the actual peak long term discharge rate is not available at the time writing of this report. The pump schedule must be specified by the mechanical consultant.
- On-site containment (infiltration gallery/dry well etc.) has not been considered as part of the proposed development at this time. If this option is considered, additional work will have to be conducted (i.e. infiltration testing).

11 Evaluation of Impact

11.1 Zone of Influence

Localized dewatering of an aquifer produces a cone-shaped depression in the groundwater table that extends some distance away from the dewatering point. The lateral distance which the cone of depression extends (i.e., the distance to where drawdown is effectively zero) is known as the Zone of Influence (ZOI).

The ZOI was calculated using the Sichardt equation below.

$$R_0 = 3000(\Delta H)\sqrt{K}$$

ΔH	=	dewatering thickness (m)
K	=	hydraulic conductivity (m/s)
R_0	=	radius of influence (m)

The ZOI with respect to groundwater seepage at the site is summarized as follows.

Zone of Influence (ZOI)*		
	Short Term (Construction), m	**Long Term (Permanent), m**
Pile and Lagging Scenario	4.1	4.1

*Zone of influence is limited to overburden soils and weathered bedrock for practical purposes.

11.2 Land Stability

The impacts to land stability on adjacent structures due to the proposed short and long term dewatering at the site are summarized as follows:

Land Stability*		
	Short Term (Construction)	**Long Term (Permanent)**
Dewatering Thickness (m)	3.5	3.5
Increase in Effective Stress (kPa)	35	35
Maximum Theoretical Settlement due to Dewatering (mm)	<2	<2
Public Realm Theoretical Settlement due to Dewatering (mm)	<2	<2

*Change in groundwater table and induced settlement from groundwater control activities are limited to the overburden soils and weathered bedrock for practical purposes.

The theoretical maximum induced settlement (estimated) occurs directly adjacent to the proposed excavation and decreases in a nonlinear fashion with distance away from the excavation.

On this basis, the impact of the proposed dewatering on the existing adjacent structures is considered by Grounded to be within acceptable limits.

11.3 City's Sewage Works

Negative impacts to City's sewage works may occur in terms of the quantity or quality of the groundwater discharged. This report provided the estimated quantity of the water discharge. However, this report does not speak to the sewer capacities. The sewer capacity analysis is provided under a separate cover by the civil consultant.

The quality of the proposed groundwater discharge is provided in Section 7. As noted in that section, the groundwater sample exceeded the City of Mississauga Limits for Storm Sewer Discharge and met the Region of Peel Limits for Sanitary and Combined Sewer Discharge.

As such, additional treatment will be required before the water can be discharged to the Storm Sewer to avoid impacts to the City's sewage works caused by groundwater quality. Additional treatment will not be required before the water can be discharged to the Sanitary and Combined Sewer.

11.4 Natural Environment

The tributary of the Credit River Valley adjacent to site is not within the ZOI and therefore will not be affected by the proposed construction dewatering or permanent drainage. Any groundwater which will be taken from the site will be discharged (if required) into the City's sewer systems and not into any natural waterbody. As such, there will be no impact to the natural environment caused by the water takings at the site.

11.5 Local Drinking Water Wells

The site is located within the municipal boundaries of the City of Mississauga. The site and surrounding area are provided with municipal piped water and sewer supply. There is no use of the groundwater for water supply in this area of Mississauga. As such, there will be no impact to drinking water wells.

11.6 Contamination Source

The site and immediately surrounding area currently consist mostly of residential and commercial areas. These land uses are not anticipated to be a source of potential contamination and are not

expected to provide an Area of Potential Environmental Concern for the site. As such, the pumping of groundwater at the site is not anticipated to facilitate the movement of potential contaminants onto the site. Evaluation of the environmental condition of the site will be completed under a separate cover.

12 Proposed Mitigation Measures and Monitoring Plan

As a result of dewatering and draining the soil, changes in groundwater level have the potential to cause settlement based on the change in the effective stresses within the ZOI. The extent of the negative impact identified in previous sections will be limited to the ZOI caused by the groundwater taking at the site.

Both the temporary construction dewatering system and the permanent building drainage system must be properly installed and screened to ensure sediments and fines will not be removed, which is typically a primary cause of dewatering related settlement.

13 Limitations

Natural occurrences, the passage of time, local construction, and other human activity all have the potential to directly or indirectly alter the subsurface conditions at or near the project site. Contractual obligations related to groundwater or stormwater control must be considered with attention and care as they relate this potential site alteration.

The hydrogeological engineering advice provided in this report is based on the factual observations made from the site investigations as reported. It is intended for use by the owner and their retained design team. If there are changes to the features of the development or to the scope, the interpreted subsurface information, geotechnical engineering design parameters, advice, and discussion on construction considerations may not be relevant or complete for the project. Grounded should be retained to review the implications of such changes with respect to the contents of this report.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Grounded accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report, including consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

The authorized users of this report are Starmont Estates Inc. c/o Trinity Point Developments and their design team, for whom this report has been prepared. Grounded Engineering Inc. maintains the copyright and ownership of this document. Reproduction of this report in any format or medium requires explicit prior authorization from Grounded Engineering Inc. The City of Mississauga may also make use of and rely upon this report, subject to the limitations as stated.

14 Closure

If there are any questions regarding the discussion and advice provided, please do not hesitate to contact our office. We trust that this report meets your requirements at present.

For and on behalf of our team,

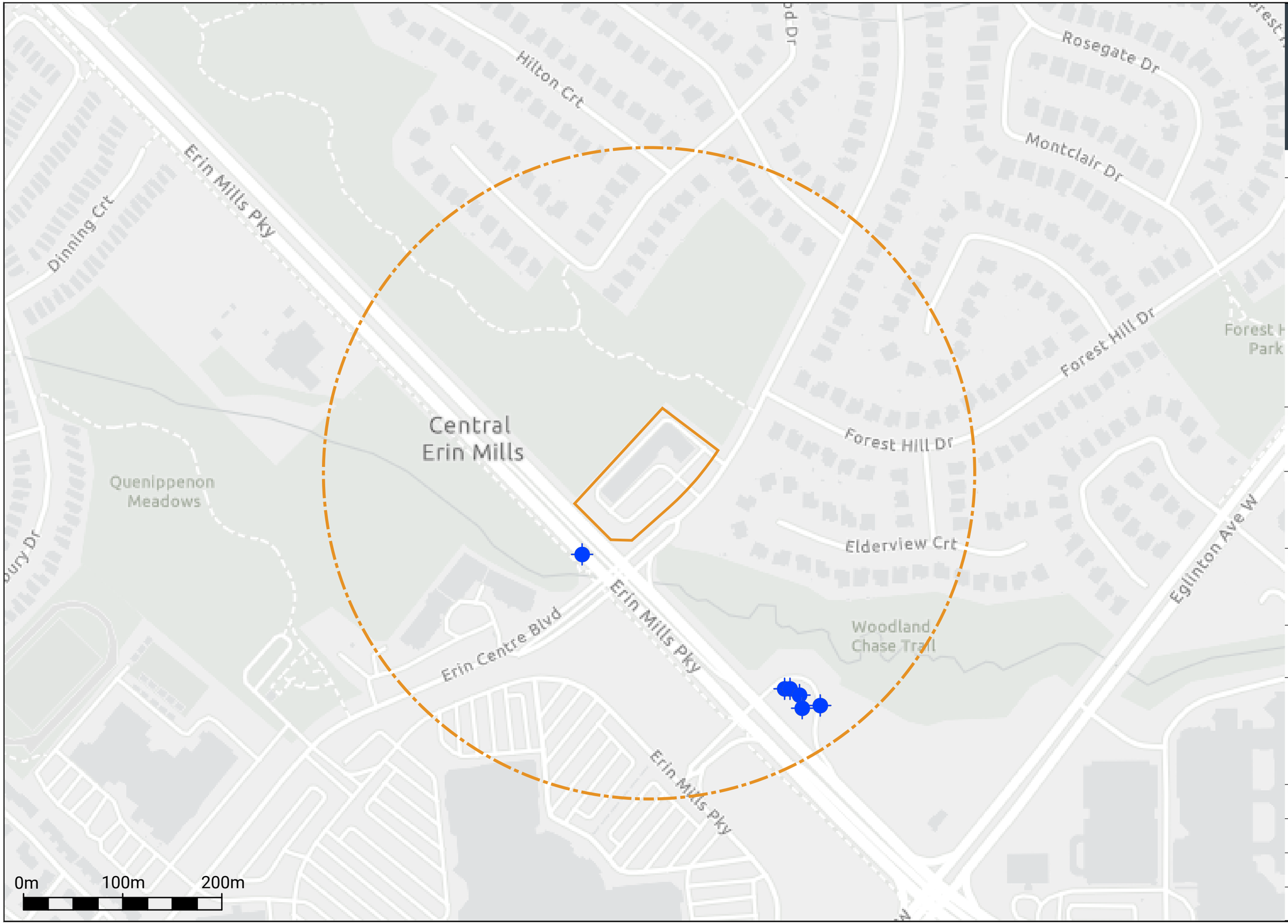
GROUNDED ENGINEERING

Ruth Schoenhardt, BASc.
Project Coordinator

Nick Ng, P. Eng.
Team Lead

David MacGillivray, P. Eng., P. Geo., QP RA-ESA
Associate, Environmental Engineering

FIGURES



GROUNDED
ENGINEERING
1 BANIGAN DRIVE, TORONTO, ONT., M4H 1G3
www.groundedeng.ca

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- STUDY AREA (250 m RADIUS)
- MECP WELL LOCATION

Note

Reference

ArcGIS Online 2024

Ontario.ca, "Map: Well Records", updated Jan 10, 2024

Project

2555 ERIN CENTRE, MISSISSAUGA, ONTARIO

Figure Title

STUDY AREA & SITE LOCATION PLAN

North

TRUE
PROJECT

Date

JULY 2024

Scale

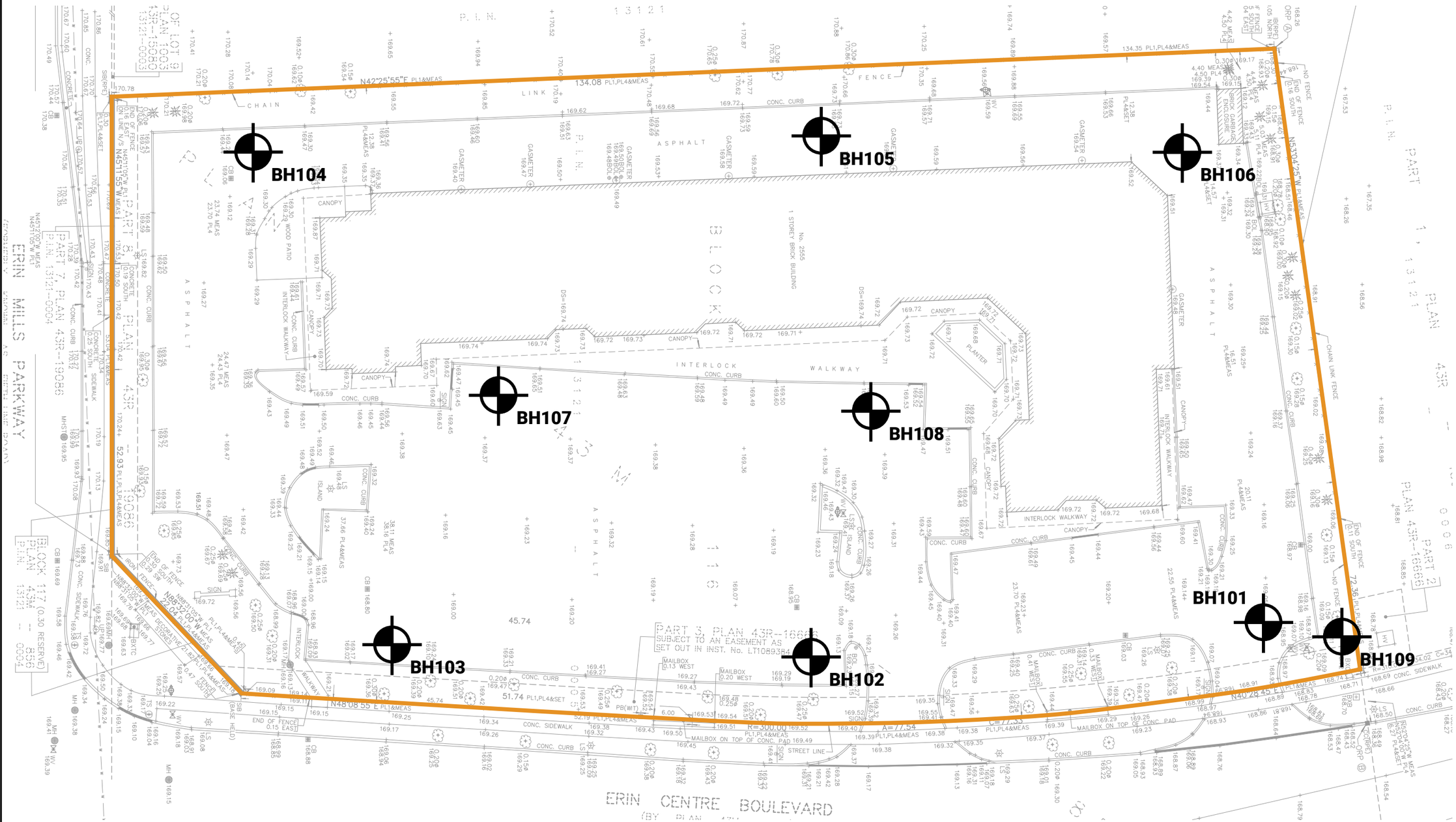
AS INDICATED

Job No

24-095

Figure No

FIGURE 1



GROUNDED ENGINEERING

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LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE MONITORING WELL/BOREHOLE LOCATION BY GROUNDED

Note

Reference

Topographic Survey, "Plan of Survey and Topography of Block 116 - Registered Plan 43M-856", Job No. 23-242, dated November 30, 2023, prepared by R-PE Surveying LTD.

Project

2555 ERIN CENTRE, MISSISSAUGA, ONTARIO

Figure Title

BOREHOLE LOCATION PLAN - EXISTING CONDITION

North

TRUE PROJECT

Date

JULY 2024

Scale

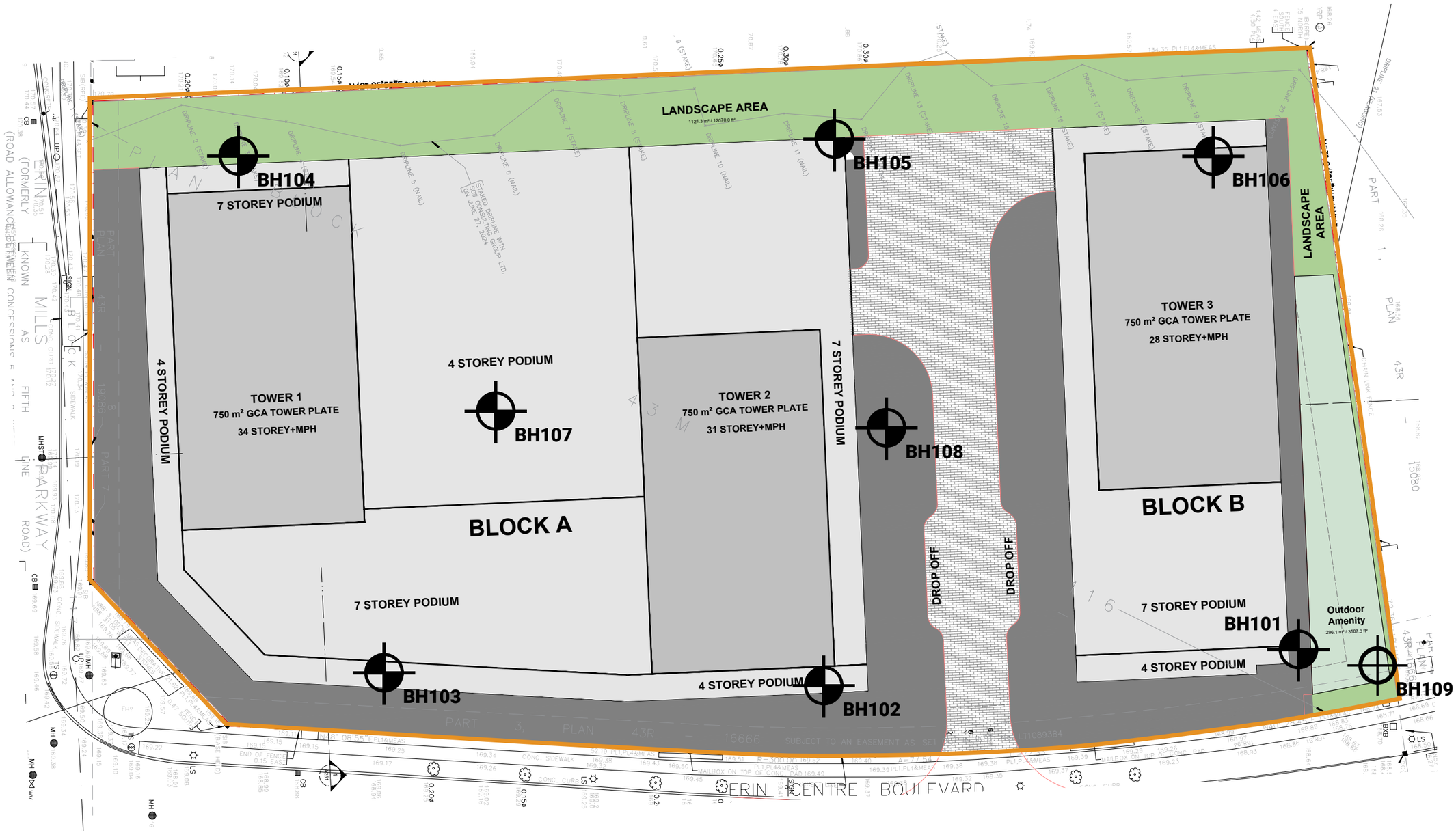
AS INDICATED

Job No

24-095

Figure No

FIGURE 2



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LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE MONITORING WELL/BOREHOLE LOCATION BY GROUNDED

Note

Reference

Architectural Progress Set "2555 Erin Centre Blvd."; Drawing No. 200, dated July 26th, 2024, prepared by Arcadis

Project

2555 ERIN CENTRE, MISSISSAUGA, ONTARIO

Figure Title

BOREHOLE LOCATION PLAN - PROPOSED CONDITION

North

TRUE
PROJECT

Date

JULY 2024

Scale

AS INDICATED

Job No

24-095

Figure No

FIGURE 3

Elevation (m)

BH 104 | BH 103 | BH 107 | BH 102 | BH 105 | BH 108 | BH 106 | BH 101 | BH 109

Average Existing Grade @Elev. 169.2± m

Design Groundwater Table @Elev. 167± m

Bedrock Groundwater Table @Elev. 161.5± m

Proposed P4 Level Finished Floor Elevation @Elev. 156± m

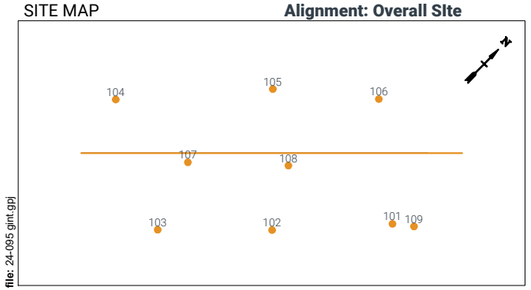
UCS = 39.5 MPa

UCS = 9.1 MPa

UCS = 16.5 MPa

SITE MAP

Alignment: Overall SIte



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Boreholes Equally Spaced

BOREHOLE STRATIGRAPHY LEGEND

- Asphalt
- Aggregate
- Fill
- Clayey Silt Till
- Bedrock (cored)
- Bedrock (inferred)
- Topsoil

GROUNDED ENGINEERING

1 Banigan Drive, Toronto, Ont., M4H 1G3
www.groundedeng.ca

LEGEND

- FILL
- GRAVELS (gravel to gravelly sand)
- SILT TO SAND (not till)
- COHESIONLESS TILLS
- COHESIVE SOILS (clayey silt to clay, incl. tills)
- DISTURBED/REWORKED/ORGANIC

BH 101 BOREHOLES BY GROUNDED

T-BH7 BOREHOLES BY OTHERS

- water level, unstabilized
- water level, stabilized (latest)
- water level, stabilized (highest)

Project

2555 ERIN CENTRE MISSISSAUGA

Figure Title

SUBSURFACE PROFILE

Overall SIte

Date

AUGUST 2024

Scale

AS INDICATED

Job No

24-095

Figure No

FIGURE 4

APPENDIX A

BOREHOLE LOG TERMINOLOGY

GROUNDED ENGINEERING

SAMPLING/TESTING METHODS

SS: split spoon sample

AS: auger sample

GS: grab sample

FV: shear vane

DP: direct push

PMT: pressuremeter test

ST: shelby tube

CORE: soil coring

RUN: rock coring

SYMBOLS & ABBREVIATIONS

MC: moisture content

LL: liquid limit

PL: plastic limit

NP: non-plastic

γ: soil unit weight (bulk)

G_s: specific gravity

S_u: undrained shear strength

▽ unstabilized water level

▼ water level measurement

▼ highest water level measurement

ENVIRONMENTAL SAMPLES

M&I: metals and inorganic parameters

PAH: polycyclic aromatic hydrocarbon

PCB: polychlorinated biphenyl

VOC: volatile organic compound

PHC: petroleum hydrocarbon

BTEX: benzene, toluene, ethylbenzene and xylene

PPM: parts per million

FIELD MOISTURE (based on tactile inspection)

DRY: no observable pore water

MOIST: inferred pore water, not observable (i.e. grey, cool, etc.)

WET: visible pore water

COHESIONLESS

Relative Density	N-Value
Very Loose	<4
Loose	4 - 10
Compact	10 - 30
Dense	30 - 50
Very Dense	>50

COHESIVE

Consistency	N-Value	Su (kPa)
Very Soft	<2	<12
Soft	2 - 4	12 - 25
Firm	4 - 8	25 - 50
Stiff	8 - 15	50 - 100
Very Stiff	15 - 30	100 - 200
Hard	>30	>200

COMPOSITION

Term	% by weight
trace silt	<10
some silt	10 - 20
silt***y***	20 - 35
sand ***and*** silt	>35

ASTM STANDARDS

ASTM D1586 Standard Penetration Test (SPT)
Driving a 51 mm O.D. split-barrel sampler ("split spoon") into soil with a 63.5 kg weight free falling 760 mm. The blows required to drive the split spoon 300 mm ("bpf") after an initial penetration of 150 mm is referred to as the N-Value.

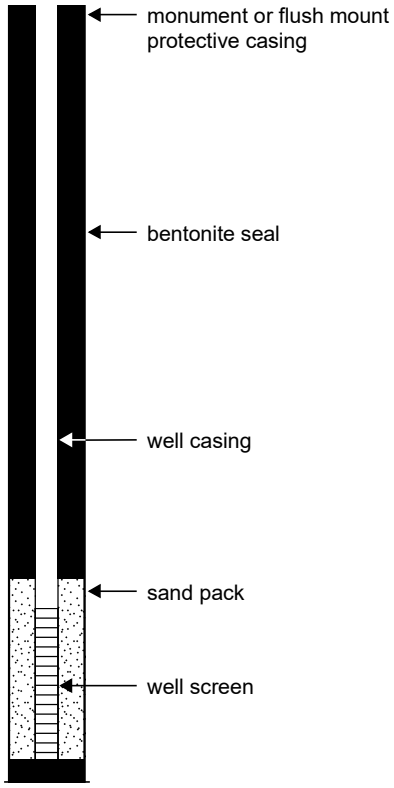
ASTM D3441 Cone Penetration Test (CPT)
Pushing an internal still rod with a outer hollow rod ("sleeve") tipped with a cone with an apex angle of 60° and a cross-sectional area of 1000 mm^2 into soil. The resistance is measured in the sleeve and at the tip to determine the skin friction and the tip resistance.

ASTM D2573 Field Vane Test (FVT)
Pushing a four blade vane into soil and rotating it from the surface to determine the torque required to shear a cylindrical surface with the vane. The torque is converted to the shear strength of the soil using a limit equilibrium analysis.

ASTM D1587 Shelby Tubes (ST)
Pushing a thin-walled metal tube into the in-situ soil at the bottom of a borehole, removing the tube and sealing the ends to prevent soil movement or changes in moisture content for the purposes of extracting a relatively undisturbed sample.

ASTM D4719 Pressuremeter Test (PMT)
Place an inflatable cylindrical probe into a pre-drilled hole and expanding it while measuring the change in volume and pressure in the probe. It is inflated under either equal pressure increments or equal volume increments. This provides the stress-strain response of the soil.

WELL LEGEND



ROCK CORE TERMINOLOGY (MTO SHALE)

TCR **Total Core Recovery** the total length of recovery (soil or rock) per run, as a percentage of the drilled length
SCR **Solid Core Recovery** the total length of sound full-diameter rock core pieces per run, as a percentage of the drilled length
RQD **Rock Quality Designation** the sum of all pieces of sound rock core in a run which are 10 cm or greater in length, as a percentage of the drilled length

Natural Fracture Frequency (typically per 0.3 m) The number of natural discontinuities (joints, faults, etc.) which are present per 0.3m. Ignores mechanical or drill-induced breaks, and closed discontinuities (e.g. bedding planes).

LOGGING DISCONTINUITIES

Discontinuity Type

BP bedding parting
CL cleavage
CS crushed seam
FZ fracture zone
MB mechanical break
IS infilled seam
JT Joint
SS shear surface
SZ shear zone
VN vein
VO void

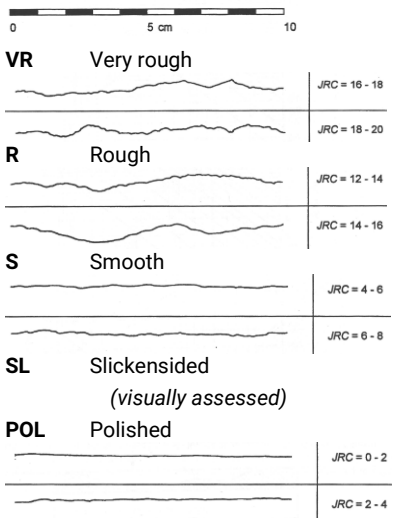
Coating

CN Clean
SN Stained
OX Oxidized
VN Veneer
CT Coating (>1 mm)

Dip Inclination

H	horizontal/flat	0 - 20°
D	dipping	20 - 50°
SV	sub-vertical	50 - 90°
V	vertical	90±°

Roughness (Barton et al.)



Spacing in Discontinuity Sets (*ISRM 1981*)

VC	very close	< 60 mm
C	close	60 – 200 mm
M	mod. close	0.2 to 0.6 m
W	wide	0.6 to 2 m
VW	very wide	> 2 m

Aperture Size

T	closed / tight	< 0.5 mm
GA	gapped	0.5 to 10 mm
OP	open	> 10 mm

Planarity

PR	Planar
UN	Undulating
ST	Stepped
IR	Irregular
DIS	Discontinuous
CU	Curved

GENERAL

Degree of Weathering (*after MTO, RR229 Evaluation of Shales for Construction Projects*)

Zone	Degree	Description
Z1	unweathered	shale, regular jointing
Z2	partially weathered	angular blocks of unweathered shale, no matrix, with chemically weathered but intact shale
Z3		soil-like matrix with frequent angular shale fragments < 25mm diameter
Z4a		soil-like matrix with occasional shale fragments < 3mm diameter
Z4b	fully weathered	soil-like matrix only

Strength classification (*after Marinos and Hoek, 2001; ISRM 1981b*)

Grade		UCS (MPa)	Field Estimate (Description)
R6	extremely strong	> 250	can only be chipped by geological hammer
R5	very strong	100 - 250	requires many blows from geological hammer
R4	strong	50 - 100	requires more than one blow from geological hammer
R3	medium strong	25 - 50	can't be scraped, breaks under one blow from geological hammer
R2	weak	5 - 25	can be peeled / scraped with knife with difficulty
R1	very weak	1 - 5	easily scraped / peeled, crumbles under firm blow of geo. hammer
R0	extremely weak	< 1	indented by thumbnail

Bedding Thickness (*Q. J. Eng. Geology, Vol 3, 1970*)

Very thickly bedded	> 2 m
Thickly bedded	0.6 – 2m
Medium bedded	200 – 600mm
Thinly bedded	60 – 200mm
Very thinly bedded	20 – 60mm
Laminated	6 – 20mm
Thinly Laminated	< 6mm

GROUNDED ENGINEERING

Date Started : Jun 27, 2024
Position : E: 604214, N: 4824137 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 101

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

drill method : CME TRACK

elev depth (m)	description	graphic log	number	type	SPT N-value
169.1	**GROUND SURFACE**				
168.9	100mm **ASPHALT**				
0.2	75mm **AGGREGATE**		1	SS	6
168.3	**FILL**, clayey silt, some sand, trace gravel, trace rock fragments, trace construction debris, firm, dark brown, moist				
0.8	**CLAYEY SILT**, trace sand, trace gravel, light grey silt partings, very stiff to hard, reddish brown, moist (GLACIAL TILL)		2	SS	27
			3	SS	41
	...at 2.3 m, some shale fragments		4	SS	50 / 100mm
	...at 3.0 m, sand and silt glacial till, some clay, very dense, below		5	SS	50 / 150mm
164.5			6	SS	50 / 25mm
4.6	**QUEENSTON FORMATION** (See rock core log for details)		1	RUN	
			2	RUN	
			3	RUN	
			4	RUN	
			5	RUN	
			6	RUN	

hollow stem augers OD=215 mm

rock coring (HQ) OD=96 mm

depth scale (m): 0 1 2 3 4 5 6 7 8 9 10 11

well details

elevation (m): 169 168 167 166 165 164 163 162 161 160 159 158

undrained shear strength (kPa)
■ unconfined + field vane
● pocket penetrometer ○ Lab Vane
40 80 120 160

SPT N-values (bpf)
× dynamic cone
10 20 30 40

headspace vapour (ppm)
× hexane □ isobutylene △ methane
100 200 300

moisture / plasticity
PL MC LL
10 20 30

unstabilized water level

lab data and comments

grain size distribution (%) (MIT)
GR SA SI CL

SS1: PAHs

SS2: BTEX, H-Ms, Metals, ORPs, PHCs, VOCs

SS3: PAHs

SS4: H-Ms, Metals, ORPs

0 47 41 12

SS5: BTEX, PHCs, VOCs

4.7m: split-spoon sampler bouncing

7.3 m (Elev. 161.8 m): transition to sound bedrock

file: 24-095 gint.gpj

Tech : SN | **PM** : JAW | **Rev** : NN

(continued next page)

GROUNDED ENGINEERING

Date Started : Jun 27, 2024
Position : E: 604214, N: 4824137 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 101

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

drill method : CME TRACK
rock coring (HQ) OD=96 mm

elev depth (m)	description (continued)	graphic log	number	type	SPT N-value
	QUEENSTON FORMATION (See rock core log for details) *(continued)*		6	RUN	
			7	RUN	
			8	RUN	
			9	RUN	
			10	RUN	
150.2					
18.9					

depth scale (m): 12, 13, 14, 15, 16, 17, 18
elevation (m): 157, 156, 155, 154, 153, 152, 151

undrained shear strength (kPa): unconfined, field vane, pocket penetrometer, Lab Vane; 40, 80, 120, 160
SPT N-values (bpf): dynamic cone; 10, 20, 30, 40
headspace vapour (ppm): hexane, isobutylene, methane; 100, 200, 300
moisture / plasticity: PL, MC, LL; 10, 20, 30
unstabilized water level
lab data and comments
grain size distribution (%) (MIT): GR SA SI CL

END OF BOREHOLE

Borehole was filled with drill water upon completion of drilling.

50 mm dia. monitoring well installed.
No. 10 screen

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jul 11, 2024	14.6	154.5
Jul 19, 2024	7.9	161.2
Jul 24, 2024	9.2	159.9
Aug 27, 2024	8.9	160.2

file: 24-095 gint.gpj

Tech : SN | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 27, 2024
Position : E: 604214, N: 4824137 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 101

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

Rock coring started at 4.6m below grade

QUEENSTON FORMATION
Shale, reddish brown, laminated to thinly bedded, weak, calcareous, green-grey banding; joints are horizontal, closed to gapped, clean;

interbedded with **limestone**, grey, laminated to thinly bedded, strong

Overall shale: 86%, limestone: 14%

Run 1 : 17% limestone, 83% shale

Run 2 : 6% limestone, 94% shale

... at 7.3 m (Elev. 161.8 m), transition to sound rock

Run 3 : 7% limestone, 93% shale

Run 4 : 18% limestone, 82% shale

Run 5 : 10% limestone, 90% shale

Run 6 : 10% limestone, 90% shale

Run 7 : 18% limestone, 82% shale

Run	elev. depth (m)	recovery
	164.5	
R1	4.6 – 5.2	TCR = **96%**, SCR = **83%**, RQD = **54%**
R2	5.2 – 6.7	TCR = **100%**, SCR = **90%**, RQD = **37%**
R3	6.7 – 8.2	TCR = **100%**, SCR = **90%**, RQD = **47%**
R4	8.2 – 9.8	TCR = **100%**, SCR = **88%**, RQD = **45%**
R5	9.8 – 11.3	TCR = **100%**, SCR = **95%**, RQD = **62%**
R6	11.3 – 12.8	TCR = **100%**, SCR = **95%**, RQD = **80%**
R7	12.8 – 14.3	TCR = **100%**, SCR = **100%**, RQD = **90%**
R8	14.3 – 14.8	

elevation (m)	natural fracture frequency
164	3
	3+RZ
	2
	2+RZ
163	2
	2
	5
162	4+RZ
	4+RZ
	5
	3
161	3
	3+RZ
	2
	5
160	4
	1
	2
159	4
	3
	2
158	4
	2
	4+RZ
157	3
	2
	0
156	2
	0
	0
	0
155	1
	1

notes and comments

4.9 / 164.2m: 75mm rubbilized zone
5.4 / 163.7m: 100mm FC SV PR S T CN
5.5 / 163.6m: 50mm rubbilized zone
5.6 / 163.4m: 13mm FC D PR S GA CN
6.0 / 163.1m: 50mm FC SV PR S GA CN
6.1 / 163.0m: 25mm rubbilized zone
6.1 / 163.0 - 6.2 / 162.8m: FC SV PR S T CN
6.3 / 162.8m: 50mm FC SV PR S T CN
6.4 / 162.6m: 13mm weathered zone
6.5 / 162.6m: 100mm FC SV PR S T CN
6.6 / 162.5m: 13mm weathered zone
6.6 / 162.4m: 13mm weathered zone
6.7 / 162.4m: 88mm FC SV PR S T CN
6.8 / 162.3m: 13mm rubbilized zone
6.9 / 162.2m: 50mm rubbilized zone
7.0 / 162.1 - 7.1 / 162.0m: FC SV PR S T CN
7.1 / 162.0m: 75mm rubbilized zone
8.2 / 160.8m: 50mm rubbilized zone
8.6 / 160.4 - 8.8 / 160.3m: FC SV IR S T CN
8.9 / 160.2m: 25mm rubbilized zone
8.8 / 160.2 - 9.4 / 159.6m: weathered zone
9.7 / 159.3m: 25mm rubbilized zone
9.8 / 159.3m: 50mm rubbilized zone
10.2 / 158.9m: 25mm rubbilized zone
10.9 / 158.2m: 25mm rubbilized zone
11.8 / 157.3m: 38mm rubbilized zone
12.0 / 157.0m: 25mm weathered zone
12.4 / 156.7m: 25mm rubbilized zone
12.8 / 156.3m: 25mm weathered zone

file: 24-095 gint.gpj

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Tech : SN | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 27, 2024
Position : E: 604214, N: 4824137 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 101

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

depth (m)	graphic log	stratigraphy	Run / elev. depth (m)	recovery	elevation (m)	shale weathering zones (Z1 Z2 Z3 Z4)	UCS (MPa) 5 25 50 100 250 / estimated strength (R1 R2 R3 R4 R5 R6)	natural fracture frequency	laboratory testing	notes and comments	elevation (m)
		QUEENSTON FORMATION **Shale**, reddish brown, laminated to thinly bedded, weak, calcareous, green-grey banding; joints are horizontal, closed to gapped, clean;						1			
15		interbedded with **limestone**, grey, laminated to thinly bedded, strong	R8	TCR = **100%** SCR = **98%** RQD = **68%**	154			4		**15.2 / 153.9m:** 13mm weathered zone	154
		Overall shale: 86%, limestone: 14%						3		**15.4 / 153.7m:** JT PR T CT; gypsum	
		Run 8 : 9% limestone 91% shale	153.3					0			
16			15.8		153			2			153
			R9	TCR = **100%** SCR = **100%** RQD = **92%**				1			
								1		**16.6 / 152.4m:** 13mm weathered zone	
17								1		**16.8 / 152.2m:** JT PR T CT; gypsum	
		Run 9 : 32% limestone 68% shale	151.7		152			0			152
			17.4					1			
			R10	TCR = **98%** SCR = **97%** RQD = **87%**				1			
18					151			0			151
								2		**18.5 / 150.6m:** 25mm weathered zone	
		Run 10 : 13% limestone 87% shale	150.2					0			
			18.9m								
		END OF COREHOLE									

file: 24-095 gint.gpj

Tech : SN | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 25, 2024
Position : E: 604180, N: 4824099 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 102

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

drill method : *CME TRACK*

hollow stem augers (med) OD=175 mm

rock coring (HQ) OD=96 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
169.1	**GROUND SURFACE**				
168.9 / 0.2	100mm **ASPHALT**				
	75mm **AGGREGATE**				
	FILL, silty sand, some gravel, some rock fragments, trace clay, trace asphalt, loose, brown, moist		1	SS	5
168.2 / 0.9	...at 0.8 m, clayey silt, some sand, trace gravel, trace rock fragments, brown, moist, hard		2A 2B	SS	88 / 250mm
	CLAYEY SILT, some sand, trace gravel, light grey silt partings, hard, reddish brown, moist (GLACIAL TILL)		3	SS	80
	...at 1.5 m, silt and sand glacial till, some clay, some gravel, very dense, below		4	SS	50 / 50mm
			5	SS	50 / 75mm
164.8 / 4.3	**QUEENSTON FORMATION** (See rock core log for details)		6	SS	50 / 75mm
			1	RUN	
			2	RUN	
			3	RUN	
			4	RUN	
			5	RUN	
			6	RUN	
			7	RUN	

depth scale (m): 0 1 2 3 4 5 6 7 8 9 10 11

well details

elevation (m): 169 168 167 166 165 164 163 162 161 160 159 158

undrained shear strength (kPa)
■ unconfined + field vane
● pocket penetrometer ○ Lab Vane
40 80 120 160

SPT N-values (bpf)
× dynamic cone
10 20 30 40

headspace vapour (ppm)
× hexane □ isobutylene △ methane
100 200 300

moisture / plasticity
PL MC LL
10 20 30

4.6 m (Elev. 164.5 m): transition to sound bedrock

unstabilized water level

lab data and comments

grain size distribution (%) (MIT)
GR SA SI CL

SS1: BTEX, PAHs, PHCs, VOCs

2A: H-Ms, Metals, ORPs

11 36 40 13

SS3: BTEX, PHCs, VOCs

SS4: H-Ms, Metals, ORPs

SS5: PAHs

Tech : BMS | **PM** : JAW | **Rev** : NN

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file: 24-095 gint.gpj

Date Started : Jun 25, 2024
Position : E: 604180, N: 4824099 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 102

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

drill method : CME TRACK

rock coring (HQ) OD=96 mm

elev depth (m)	description	graphic log	samples: number	samples: type	samples: SPT N-value
	(continued)				
	QUEENSTON FORMATION (See rock core log for details) *(continued)*		7	RUN	
			8	RUN	
			9	RUN	
			10	RUN	
			11	RUN	
150.3 18.8	**END OF BOREHOLE**				

depth scale (m): 12, 13, 14, 15, 16, 17, 18

well details

elevation (m): 157, 156, 155, 154, 153, 152, 151

undrained shear strength (kPa)
■ unconfined + field vane
● pocket penetrometer ○ Lab Vane
40 80 120 160

SPT N-values (bpf)
× dynamic cone
10 20 30 40

headspace vapour (ppm)
× hexane □ isobutylene
△ methane
100 200 300

moisture / plasticity
PL MC LL
10 20 30

unstabilized water level

lab data and comments

grain size distribution (%) (MIT)
GR SA SI CL

Borehole was filled with drill water upon completion of drilling.

50 mm dia. monitoring well installed.
No. 10 screen

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jul 11, 2024	3.9	165.2
Jul 19, 2024	3.4	165.7
Jul 24, 2024	3.5	165.6
Aug 27, 2024	3.9	165.2

file: 24-095 gint.gpj

Tech : BMS | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 25, 2024
Position : E: 604180, N: 4824099 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 102

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

Rock coring started at 4.4m below grade — 164.7

QUEENSTON FORMATION
Shale, reddish brown, laminated to thinly bedded, weak, calcareous, green-grey banding; joints are horizontal, closed to gapped, clean;

interbedded with **limestone**, grey, laminated to thinly bedded, strong

Overall shale: 90%, limestone: 10%
... at 4.6 m (Elev. 164.5 m), transition to sound rock

Run 1 : 7% limestone, 93% shale
Run 2 : 14% limestone, 86% shale
Run 3 : 7% limestone, 93% shale
Run 4 : 13% limestone, 87% shale
Run 5 : 0% limestone, 100% shale
Run 6 : 0% limestone, 100% shale
Run 7 : 3% limestone, 97% shale
Run 8 : 11% limestone, 89% shale

Run	elev. depth (m)	recovery	natural fracture frequency
	4.4		4
R1		TCR = **100%** SCR = **93%** RQD = **59%**	3
	163.9		1
	5.2		2
R2		TCR = **100%** SCR = **93%** RQD = **61%**	4
	162.5		4
	6.6		2
R3		TCR = **100%** SCR = **95%** RQD = **44%**	1
	160.9		4
	8.2		2
R4		TCR = **100%** SCR = **88%** RQD = **49%**	1
	159.4		0
	9.7		2
R5		TCR = **25%** SCR = **16%** RQD = **7%**	1
	158.0		1
R6	11.1	TCR = **0%**	3
	11.2		NA
			NA
			NA
			NA
			NA
			4
			3+RZ
R7		TCR = **53%** SCR = **38%** RQD = **17%**	3+RZ
	156.4		NA
	12.7		NA
R8		TCR = **100%** SCR = **100%** RQD = **88%**	2
	154.9		4
	14.2		1
			0
			1
			0

4.6 / 164.5m: 50mm rubbilized zone
5.0 / 164.0m: 13mm rubbilized zone
5.5 / 163.6m: 25mm rubbilized zone
5.8 / 163.3m: 75mm rubbilized zone
5.8 / 163.2m: 50mm FC SV PR R GA CN
6.0 / 163.0 - 6.2 / 162.8m: FC SV PR R T CN
7.0 / 162.1m: 50mm FC SV PR S T CN
7.6 / 161.4m: FC D CU S GA clay
8.8 / 160.2m: 50mm rubbilized zone
9.0 / 160.0m: JT PR S GA clay
9.1 / 159.9m: 50mm weathered zone
9.3 / 159.7m: 25mm weathered zone
9.5 / 159.5m: FC SV PR R GA CN; 100mm FC SV PR R GA CN
9.9 / 159.2 - 10.0 / 159.0m: rubbilized zone
10.0 / 159.0 - 11.1 / 158.0m: lost core (potential clay seam)
11.4 / 157.6m: 25mm rubbilized zone
11.8 / 157.3 - 11.9 / 157.1m: rubbilized zone
12.0 / 157.1m: 50mm rubbilized zone
12.0 / 157.0 - 12.7 / 156.3m: lost core
13.0 / 156.0m: 38mm weathered zone

(continued next page)
Tech : BMS | **PM** : JAW | **Rev** : NN

file: 24-095 gint.gpj

GROUNDED ENGINEERING

Date Started : Jun 25, 2024
Position : E: 604180, N: 4824099 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 102

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

depth (m)	graphic log	stratigraphy	Run / elev. depth (m)	recovery	elevation (m)	shale weathering zones (Z1 Z2 Z3 Z4)	UCS (MPa) 5 25 50 100 250 / estimated strength (R1 R2 R3 R4 R5 R6)	natural fracture frequency	laboratory testing	notes and comments	elevation (m)
		QUEENSTON FORMATION **Shale**, reddish brown, laminated to thinly bedded, weak, calcareous, green-grey banding; joints are horizontal, closed to gapped, clean;	**164.7**					0	**El. 154.8m:** UCS = 9.1 MPa E = 1.20 GPa γ = 25.4 kN/m^3		
15		interbedded with **limestone**, grey, laminated to thinly bedded, strong *Overall shale: 90%, limestone: 10%* Run 9 : 10% limestone 90% shale	R9 153.3	TCR = **100**% SCR = **97**% RQD = **90**%	154			1 0 3 2		**15.3 / 153.8m:** 38mm rubbilized zone	154
16			15.8 R10 151.9	TCR = **100**% SCR = **98**% RQD = **98**%	153			0 2 5 1		**16.4 / 152.7m:** 25mm weathered zone **16.6 / 152.4m:** 25mm weathered zone	153
17		Run 10 : 16% limestone 84% shale			152			0 0 1			152
18			17.2 R11 150.3	TCR = **97**% SCR = **92**% RQD = **89**%	151			0 3 1		**18.3 / 150.8m:** 38mm rubbilized zone	151
		Run 11 : 19% limestone 81% shale	**18.8m**								
		END OF COREHOLE									

file: 24-095 gint.gpj

Tech : BMS | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 28, 2024
Position : E: 604146, N: 4824065 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 103

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

drill method : CME 55

hollow stem augers (med) OD=175 mm

rock coring (HQ) OD=96 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
169.0	**GROUND SURFACE**				
	125mm **ASPHALT**				
168.6	225mm **AGGREGATE**		1	SS	7
0.4	**FILL**, silty sand, some gravel, trace rock fragments, clayey silt nodules, loose, light brown, moist				
	...at 0.8 m, silt, some clay, trace sand, trace gravel, reddish brown, moist, compact		2	SS	11
167.5					
1.5	**CLAYEY SILT**, some sand, trace gravel, light grey silt partings, hard, reddish brown, moist (GLACIAL TILL)		3	SS	57
			4	SS	50 / 50mm
			5	SS	50 / 75mm
164.3			6	SS	76 / 225mm
4.7	**QUEENSTON FORMATION** (See rock core log for details)		2	RUN	
			3	RUN	
			4	RUN	
			5	RUN	
			6	RUN	
			7	RUN	

depth scale (m): 0 1 2 3 4 5 6 7 8 9 10 11

well details

elevation (m): 169 168 167 166 165 164 163 162 161 160 159 158

undrained shear strength (kPa)
■ unconfined + field vane
● pocket penetrometer ○ Lab Vane
40 80 120 160

SPT N-values (bpf)
× dynamic cone
10 20 30 40

headspace vapour (ppm)
× hexane □ isobutylene △ methane
100 200 300

moisture / plasticity
PL MC LL
10 20 30

5.0 m (Elev. 164.0 m): transition to sound bedrock

unstabilized water level

lab data and comments

grain size distribution (%) (MIT)
GR SA SI CL

SS2: BTEX, H-Ms, Metals, ORPs, PAHs, PHCs, VOCs

SS3: H-Ms, Metals, ORPs, PAHs

SS5: BTEX, PHCs, VOCs

4.4m: Run 1 recovered caved material (overlapping with SS6); refer to Rock Core Log 103

Tech : DB | **PM** : JAW | **Rev** : NN

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file: 24-095 gint.gpj

GROUNDED ENGINEERING

Date Started : Jun 28, 2024
Position : E: 604146, N: 4824065 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 103

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

drill method : CME 55
rock coring (HQ) OD=96 mm

elev depth (m)	description (continued)	graphic log	samples: number	samples: type	samples: SPT N-value
	QUEENSTON FORMATION (See rock core log for details) *(continued)*		7	RUN	
			8	RUN	
			9	RUN	
			10	RUN	
			11	RUN	
150.5					
18.5	**END OF BOREHOLE**				

depth scale (m) | well details | elevation (m)

12 — 157
13 — 156
14 — 155
15 — 154
16 — 153
17 — 152
18 — 151

undrained shear strength (kPa): ■ unconfined + field vane ● pocket penetrometer ○ Lab Vane; 40 80 120 160
SPT N-values (bpf): ×dynamic cone; 10 20 30 40
headspace vapour (ppm): × hexane □ isobutylene △ methane; 100 200 300
moisture / plasticity: PL MC LL; 10 20 30
unstabilized water level
lab data and comments
grain size distribution (%) (MIT): GR SA SI CL

Borehole was filled with drill water upon completion of drilling.

50 mm dia. monitoring well installed.
No. 10 screen

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jul 19, 2024	7.3	161.7
Jul 24, 2024	7.3	161.7
Aug 27, 2024	7.4	161.6

file: 24-095 gint.gpj

Tech : DB | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 28, 2024
Position : E: 604146, N: 4824065 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 103

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

Rock coring started at 4.4m below grade

CLAYEY SILT, some sand, trace gravel, light grey silt partings, hard, reddish brown, moist (GLACIAL TILL)

QUEENSTON FORMATION
Shale, reddish brown, laminated to thinly bedded, weak, calcareous, green-grey banding; joints are horizontal, closed to gapped, clean;

interbedded with **limestone**, grey, laminated to thinly bedded, strong

Overall shale: 85%, limestone: 15%
... at 5.0 m (Elev. 164.0 m), transition to sound rock

Run 1 : 0% limestone, 100% shale
Run 2 : 12% limestone, 88% shale
Run 3 : 2% limestone, 98% shale
Run 4 : 2% limestone, 98% shale
Run 5 : 8% limestone, 92% shale
Run 6 : 23% limestone, 77% shale
Run 7 : 19% limestone, 81% shale
Run 8 : 10% limestone, 90% shale
Run 9 : 18% limestone, 82% shale

Run	elev. depth (m)	recovery
	164.6	
R1	4.4	TCR = **85%** SCR = **50%** RQD = **0%**
R2	4.9 – 163.3	TCR = **100%** SCR = **90%** RQD = **52%**
R3	5.7 – 162.6	TCR = **100%** SCR = **100%** RQD = **96%**
R4	6.4 – 161.1	TCR = **98%** SCR = **98%** RQD = **54%**
R5	7.9 – 159.6	TCR = **100%** SCR = **100%** RQD = **68%**
R6	9.4 – 158.1	TCR = **100%** SCR = **100%** RQD = **63%**
R7	10.9 – 156.6	TCR = **100%** SCR = **100%** RQD = **83%**
R8	12.4 – 155.1	TCR = **100%** SCR = **100%** RQD = **90%**
R9	13.9	TCR = **100%** SCR = **100%** RQD = **89%**

natural fracture frequency: NA, 2, 3, 3, 3, 2, 1, 0, 2, 0, 4, 7, 2, 4, 2, 2, 3, 1, 3, 2, 3, 1, 2, 0, 3, 1, 4, 0, 0, 1, 3, 0, 1, 3

notes and comments

4.4 / 164.6 - 4.7 / 164.4m: Run 1 recovered caved material (overlapping with SS6); refer to Borehole Log 103
4.7 / 164.4m: observed weathered bedrock
5.3 / 163.7m: JT PR S GA CT clay
5.6 / 163.4m: 25mm weathered zone
7.0 / 162.0m: 13mm FC D PR S T CN
7.4 / 161.6m: 13mm FC D PR S T CN
7.5 / 161.5m: 13mm FC D PR S T CN
7.6 / 161.4m: 13mm FC D PR S T CN
8.7 / 160.3m: 13mm FC D PR S T CN
9.6 / 159.5m: 75mm FC SV PR S T CN
9.7 / 159.4m: 25mm clay infilled seam
10.0 / 159.1m: 75mm FC SV PR S T CN
10.1 / 159.0m: 25mm weathered zone
11.9 / 157.2m: 25mm FC SV PR R GA CN
13.1 / 155.9m: 25mm clay infilled seam
14.0 / 155.0m: FC D PR S T CN

file: 24-095 gint.gpj

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Tech : DB | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 28, 2024
Position : E: 604146, N: 4824065 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 103

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

depth (m)	graphic log	stratigraphy	Run / elev. depth (m)	recovery	elevation (m)	shale weathering zones (Z1 Z2 Z3 Z4)	UCS (MPa) 5 25 50 100 250 / estimated strength (R1 R2 R3 R4 R5 R6)	natural fracture frequency	laboratory testing	notes and comments	elevation (m)
		QUEENSTON FORMATION	**164.6**					0			
		Shale, reddish brown, laminated to thinly bedded, weak, calcareous, green-grey banding; joints are horizontal, closed to gapped, clean;						3			
15		interbedded with **limestone**, grey, laminated to thinly bedded, strong	R9	TCR = **100**% SCR = **100**% RQD = **89**%	154			0			154
		Overall shale: 85%, limestone: 15%	153.5					1		**15.3 / 153.7m:** 25mm clay infilled seam	
		Run 9 : 18% limestone 82% shale	15.5					3		**15.6 / 153.4m:** FC D IR R T CN	
16			R10	TCR = **100**% SCR = **98**% RQD = **83**%	153			1			153
								0			
		Run 10 : 22% limestone 78% shale	152.0					1			
17			17.0		152			0			152
								0			
								1		**17.3 / 151.7m:** JT PR S GA; gypsum	
			R11	TCR = **100**% SCR = **100**% RQD = **100**%				0			
18					151			1			151
		Run 11 : 35% limestone 65% shale	150.5					1			
			18.5m								
		END OF COREHOLE									

file: 24-095 gint.gpj

Tech : DB | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 27, 2024
Position : E: 604095, N: 4824092 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 104

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

drill method : CME 55

hollow stem augers (med) OD=175 mm

rock coring (HQ) OD=96 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
169.2	**GROUND SURFACE**				
169.0 / 0.2	100mm **ASPHALT** 125mm **AGGREGATE**				
168.4 / 0.8	**FILL**, clayey silt, trace sand, trace gravel, trace rock fragments, light grey silt partings, hard, reddish brown, moist		1	SS	31
	CLAYEY SILT, some sand, trace gravel, light grey silt partings, hard, reddish brown, moist (GLACIAL TILL)		2	SS	63
	...at 1.5 m, sandy silt, some clay, inferred cobble / rock fragments		3	SS	100 / 200mm
	...at 2.3 m, trace shale fragments		4A 4B	SS	50 / 100mm
			5	SS	50 / 125mm
			1	RUN	
164.5 / 4.7	**QUEENSTON FORMATION** (See rock core log for details)		6	SS	50 / 75mm
			2	RUN	
			3	RUN	
			4	RUN	
			5	RUN	
			6	RUN	

depth scale (m) | well details | elevation (m)

undrained shear strength (kPa)
■ unconfined + field vane
● pocket penetrometer ○ Lab Vane
40 80 120 160

SPT N-values (bpf)
× dynamic cone
10 20 30 40

headspace vapour (ppm)
× hexane □ isobutylene △ methane
100 200 300

moisture / plasticity
PL MC LL
10 20 30

5.0 m (Elev. 164.2 m): transition to sound bedrock

unstabilized water level

lab data and comments

grain size distribution (%) (MIT)
GR SA SI CL

0.8m: split-spoon sampler bouncing

SS2: BTEX, H-Ms, Metals, ORPs, PAHs, PHCs, VOCs

1.5m: split-spoon sampler bouncing
0 29 54 17

SS3: H-Ms, Metals, ORPs

2.3m: split-spoon sampler bouncing

4B: PAHs

3.0m: split-spoon sampler bouncing

SS5: BTEX, PHCs, VOCs
3.4m: inferred caved material prior to coring Run 1 (overlapping with SS6); core loss was experienced during coring (refer to Rock Core Log 104) **to 4.7m**

4.5m: split-spoon sampler bouncing

file: 24-095 gint.gpj

Tech : BMS | **PM** : JAW | **Rev** : NN

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GROUNDED ENGINEERING

Date Started : Jun 27, 2024
Position : E: 604095, N: 4824092 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 104

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

drill method : CME 55
rock coring (HQ) OD=96 mm

elev depth (m)	description (continued)	graphic log	samples: number	samples: type	samples: SPT N-value
	QUEENSTON FORMATION (See rock core log for details) *(continued)*		6	RUN	
			7	RUN	
			8	RUN	
			9	RUN	
			10	RUN	
150.6 18.6					

depth scale (m): 12, 13, 14, 15, 16, 17, 18
elevation (m): 157, 156, 155, 154, 153, 152, 151

well details

undrained shear strength (kPa): unconfined, field vane, pocket penetrometer, Lab Vane; 40 80 120 160
SPT N-values (bpf): dynamic cone; 10 20 30 40
headspace vapour (ppm): hexane, isobutylene, methane; 100 200 300
moisture / plasticity: PL MC LL; 10 20 30
unstabilized water level
lab data and comments
grain size distribution (%) (MIT): GR SA SI CL

END OF BOREHOLE

Borehole was filled with drill water upon completion of drilling.

50 mm dia. monitoring well installed.
No. 10 screen

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jul 11, 2024	3.7	165.5
Jul 19, 2024	3.2	166.0
Jul 24, 2024	3.0	166.2
Aug 27, 2024	3.1	166.1

file: 24-095 gint.gpj

Tech : BMS | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 27, 2024
Position : E: 604095, N: 4824092 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 104

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

stratigraphy

Rock coring started at 3.4m below grade

CLAYEY SILT, some sand, trace gravel, light grey silt partings, hard, reddish brown, moist (GLACIAL TILL)

QUEENSTON FORMATION
Shale, reddish black, laminated to thinly bedded, weak, calcareous, green-grey banding; joints are horizontal, closed to gapped, clean;

interbedded with **limestone**, grey, laminated to thinly bedded, strong

Overall shale: 81%, limestone: 19%
... at 5.0 m (Elev. 164.2 m), transition to sound rock

Run 1 : 2% limestone, 98% shale
Run 2 : 14% limestone, 86% shale
Run 3 : 3% limestone, 97% shale
Run 4 : 15% limestone, 85% shale
Run 5 : 18% limestone, 82% shale
Run 6 : 17% limestone, 83% shale
Run 7 : 0% limestone, 100% shale

Run	elev / depth (m)	recovery	natural fracture frequency	notes and comments
	165.8			
	3.4		NA	
R1		TCR = **16%** SCR = **8%** RQD = **0%**	NA	**3.4 / 165.8 - 4.7 / 164.5m:** inferred caved material prior to coring Run 1 (overlapping with SS6); core loss was experienced during coring (refer to Borehole Log 104)
			NA	
	164.2		2	**4.7 / 164.5m:** observed weathered bedrock, 100mm rubbilized zone
	5.0		3	**5.2 / 164.0m:** FC D PR S GA CN
R2		TCR = **100%** SCR = **95%** RQD = **58%**	4	**5.4 / 163.8m:** 25mm rubbilized zone
			1	**5.6 / 163.6m:** 25mm rubbilized zone
			4	**5.9 / 163.3m:** 50mm rubbilized zone
	162.7		3	
	6.5		1	**6.7 / 162.5m:** 50mm rubbilized zone
R3		TCR = **60%** SCR = **43%** RQD = **47%**	1	
			1	**7.1 / 162.1 - 7.2 / 162.0m:** rubbilized zone
			LC	
	161.2		LC	**7.4 / 161.8 - 8.0 / 161.2m:** lost core
	8.0		1	**8.0 / 161.2m:** 25mm rubbilized zone
R4		TCR = **100%** SCR = **97%** RQD = **81%**	1	**8.1 / 161.1m:** 25mm rubbilized zone
			1	
			0	
	159.7		3	**9.3 / 159.9m:** FC SV IR R T CN
	9.5		2	
R5		TCR = **100%** SCR = **87%** RQD = **63%**	5+WZ	**9.7 / 159.5m:** 75mm weathered zone **9.8 / 159.4m:** 100mm clay infilled seam **9.9 / 159.3m:** 50mm weathered zone
			4	
			1	
	158.2		1	
	11.0		3	
R6		TCR = **100%** SCR = **100%** RQD = **60%**	2	
			1	**11.8 / 157.4m:** JT PR S GA; gypsum
			2	
	156.7		5	**12.3 / 156.9m:** JT PR S GA; gypsum **12.3 / 156.9m:** JT PR S GA; gypsum
	12.5		2	
R7		TCR = **100%** SCR = **100%** RQD = **85%**	1	
			3	**13.4 / 155.8m:** 50mm weathered zone

(continued next page)

Tech : BMS | **PM** : JAW | **Rev** : NN

file: 24-095 gint.gpj

GROUNDED ENGINEERING

Date Started : Jun 27, 2024
Position : E: 604095, N: 4824092 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 104

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

depth (m)	graphic log	stratigraphy	Run / elev. depth (m)	recovery	elevation (m)	shale weathering zones (Z1 Z2 Z3 Z4)	UCS (MPa) 5 25 50 100 250 / estimated strength (R1 R2 R3 R4 R5 R6)	natural fracture frequency	laboratory testing	notes and comments	elevation (m)
		QUEENSTON FORMATION	**165.8**								
		Shale, reddish black, laminated to thinly bedded, weak, calcareous, green-grey banding; joints are horizontal, closed to gapped, clean;	R7	TCR = **100%** SCR = **100%** RQD = **85%**				2			
14			155.2					0			
		interbedded with **limestone**, grey, laminated to thinly bedded, strong	14.0		155			1			155
		Overall shale: 81%, limestone: 19%						0	**El. 154.8m**: UCS = 39.5 MPa E = 7.20 GPa γ = 25.8 kN/m³		
		Run 7 : 0% limestone 100% shale	R8	TCR = **100%** SCR = **100%** RQD = **97%**				0			
15								1			
		Run 8 : 17% limestone 83% shale	153.7		154			0		**15.3 / 153.9m:** 25mm clay infilled seam **15.4 / 153.7m:** 25mm weathered zone	154
			15.5					3			
16								0			
			R9	TCR = **100%** SCR = **100%** RQD = **57%**	153			1			153
		Run 9 : 34% limestone 66% shale						3			
17			152.2					2		**16.9 / 152.3m:** 25mm weathered zone	
			17.0		152			0			152
								1			
			R10	TCR = **100%** SCR = **100%** RQD = **93%**				0		**17.8 / 151.4m:** JT PR S GA; gypsum	
18								1		**18.1 / 151.1m:** JT PR S GA; gypsum	
		Run 10 : 47% limestone 53% shale	150.6		151			2			151
			18.6m								

END OF COREHOLE

file: 24-095 gint.gpj

Tech : BMS | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 26, 2024
Position : E: 604139, N: 4824141 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 105

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

drill method : CME 55

hollow stem augers (med) OD=175 mm

rock coring (HQ) OD=96 mm

elev depth (m)	description	graphic log	sample number	sample type	SPT N-value
169.5	**GROUND SURFACE**				
	125mm **ASPHALT**				
169.1	225mm **AGGREGATE**				
0.4	**FILL**, clayey silt, trace sand, trace gravel, light grey silt partings, very stiff, reddish brown, moist		1	SS	15
168.7			2A	SS	99 / 275mm
0.8	**CLAYEY SILT**, some sand, trace gravel, light grey silt partings, hard, reddish brown, moist (GLACIAL TILL)		2B		
			3	SS	50 / 125mm
			4A	SS	50 / 100mm
			4B		
164.7			5	SS	50 / 50mm
4.8	**QUEENSTON FORMATION** (See rock core log for details)		1	RUN	
			2	RUN	
			3	RUN	
			4	RUN	
			5	RUN	
			6	RUN	

depth scale (m): 0 1 2 3 4 5 6 7 8 9 10 11

well details

elevation (m): 169 168 167 166 165 164 163 162 161 160 159 158

undrained shear strength (kPa)
■ unconfined + field vane
● pocket penetrometer ○ Lab Vane
40 80 120 160

SPT N-values (bpf)
× dynamic cone
10 20 30 40

headspace vapour (ppm)
× hexane □ isobutylene △ methane
100 200 300

moisture / plasticity
PL MC LL
10 20 30

5.2 m (Elev. 164.3 m): transition to sound bedrock

unstabilized water level

lab data and comments

grain size distribution (%) (MIT)
GR SA SI CL

SS1: H-Ms, Metals, ORPs, PAHs
0.8m: split-spoon sampler bouncing

2A: BTEX, PHCs, VOCs

1.5m: split-spoon sampler bouncing

SS3: H-Ms, Metals, ORPs, PAHs

4A: BTEX, PHCs, VOCs
3.0m: split-spoon sampler bouncing

4.6m: auger grinding, split-spoon sampler bouncing

file: 24-095 gint.gpj

Tech : BMS | **PM** : JAW | **Rev** : NN

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Date Started : Jun 26, 2024
Position : E: 604139, N: 4824141 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 105

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

drill method : CME 55
rock coring (HQ) OD=96 mm

elev depth (m)	description (continued)	graphic log	samples: number	samples: type	samples: SPT N-value
	QUEENSTON FORMATION (See rock core log for details) *(continued)*		6	RUN	
			7	RUN	
			8	RUN	
			9	RUN	
			10	RUN	
150.8 18.7					

depth scale (m): 12, 13, 14, 15, 16, 17, 18
well details
elevation (m): 157, 156, 155, 154, 153, 152, 151

undrained shear strength (kPa): unconfined, field vane, pocket penetrometer, Lab Vane; 40 80 120 160
SPT N-values (bpf): dynamic cone; 10 20 30 40
headspace vapour (ppm): hexane, isobutylene, methane; 100 200 300
moisture / plasticity: PL MC LL; 10 20 30
unstabilized water level
lab data and comments
grain size distribution (%) (MIT) GR SA SI CL

END OF BOREHOLE

Borehole was filled with drill water upon completion of drilling.

50 mm dia. monitoring well installed.
No. 10 screen

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jul 11, 2024	8.8	160.7
Jul 19, 2024	8.3	161.2
Jul 24, 2024	8.3	161.2
Aug 27, 2024	9.0	160.5

file: 24-095 gint.gpj

Tech : BMS | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 26, 2024
Position : E: 604139, N: 4824141 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 105

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

Rock coring started at 4.6m below grade

CLAYEY SILT, some sand, trace gravel, light grey silt partings, hard, reddish brown, moist (GLACIAL TILL)

QUEENSTON FORMATION
Shale, reddish black, laminated to thinly bedded, weak, calcareous, green-grey banding; joints are horizontal, closed to gapped, clean;

interbedded with **limestone**, grey, laminated to thinly bedded, strong

Overall shale: 82%, limestone: 18%
... at 5.2 m (Elev. 164.3 m), transition to sound rock

Run 1 : 7% limestone, 93% shale
Run 2 : 16% limestone, 84% shale
Run 3 : 8% limestone, 92% shale
Run 4 : 15% limestone, 85% shale
Run 5 : 13% limestone, 87% shale
Run 6 : 25% limestone, 75% shale
Run 7 : 12% limestone, 88% shale
Run 8 : 10% limestone, 90% shale

Run	elev. depth (m)	recovery
	164.9	
R1	4.6 – 5.0	TCR = **100%** SCR = **53%** RQD = **0%**
R2	5.0 – 6.5	TCR = **100%** SCR = **97%** RQD = **69%**
R3	6.5 – 8.0	TCR = **100%** SCR = **87%** RQD = **38%**
R4	8.0 – 9.5	TCR = **100%** SCR = **98%** RQD = **98%**
R5	9.5 – 11.1	TCR = **100%** SCR = **90%** RQD = **45%**
R6	11.1 – 12.6	TCR = **100%** SCR = **98%** RQD = **73%**
R7	12.6 – 14.1	TCR = **100%** SCR = **95%** RQD = **82%**
R8	14.1 –	TCR = **100%** SCR = **100%** RQD = **97%**

depth (m)	elevation (m)	natural fracture frequency
5	164	3
		3
		1
6		3
		2
		1
	163	3
7		4
		4
	162	2
		4
8		2
	161	3
		1
9		1
		2
	160	1
10		6
		2
	159	4
11		5
		1
	158	0
		2
12		6
	157	2
		0
13		1
		3
	156	3
14		0
		1
	155	2

notes and comments

4.6 / 164.9 - 4.8 / 164.8m: recovered caved material
4.8 / 164.8m: observed weathered bedrock
5.1 / 164.5m: FC D PR S T CN
5.1 / 164.5m: 25mm weathered zone
5.2 / 164.3m: FC D PR S T CN
5.6 / 163.9m: 25mm rubbilized zone
6.5 / 163.1m: 50mm rubbilized zone
6.6 / 162.9m: 75mm rubbilized zone
7.2 / 162.4m: FC D PR R GA CN
7.3 / 162.3m: FC D PR R GA CN
7.5 / 162.0m: FC D PR R GA CN
7.7 / 161.9m: FC D PR R GA CN
7.7 / 161.8m: FC D PR R GA CN
8.6 / 161.0m: FC D PR S GA CN
9.6 / 159.9m: 25mm weathered zone
9.6 / 159.9m: IS clay; 75mm clay infilled seam
9.7 / 159.8m: 25mm weathered zone
10.1 / 159.5m: 13mm weathered zone
10.1 / 159.4m: 50mm FC SV IR R T CT clay
10.5 / 159.1m: 50mm clay infilled seam
10.9 / 158.6m: JT PR S GA CT clay
13.4 / 156.2m: 75mm clay infilled seam

(continued next page)

Tech : BMS | **PM** : JAW | **Rev** : NN

file: 24-095 gint.gpj

GROUNDED ENGINEERING

Date Started : Jun 26, 2024
Position : E: 604139, N: 4824141 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 105

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

depth (m)	graphic log	stratigraphy	Run	elev / depth (m)	recovery	elevation (m)	shale weathering zones (Z1 Z2 Z3 Z4)	UCS (MPa) 5 25 50 100 250 / estimated strength (R1 R2 R3 R4 R5 R6)	natural fracture frequency	laboratory testing	notes and comments	elevation (m)
				164.9								
15		**QUEENSTON FORMATION** **Shale**, reddish black, laminated to thinly bedded, weak, calcareous, green-grey banding; joints are horizontal, closed to gapped, clean; interbedded with **limestone**, grey, laminated to thinly bedded, strong *Overall shale: 82%, limestone: 18%*	R8	153.9	TCR = **100**% SCR = **100**% RQD = **97**%	154			0 0 0			154
		Run 8 : 10% limestone 90% shale		15.6					2 2		**15.8 / 153.7m:** 25mm rubbilized zone	
16			R9	152.4	TCR = **83**% SCR = **82**% RQD = **67**%	153			0 1			153
17		Run 9 : 14% limestone 86% shale		17.1					1 1 1 1		**16.9 / 152.6 - 17.2 / 152.4m:** lost core	
18			R10	150.8	TCR = **100**% SCR = **97**% RQD = **87**%	152			3		**18.3 / 151.3m:** 50mm clay infilled seam	152
		Run 10 : 55% limestone 45% shale		**18.7m**		151			2			151
		END OF COREHOLE										

file: 24-095 gint.gpj

Tech : BMS | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 24, 2024
Position : E: 604173, N: 4824170 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 106

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

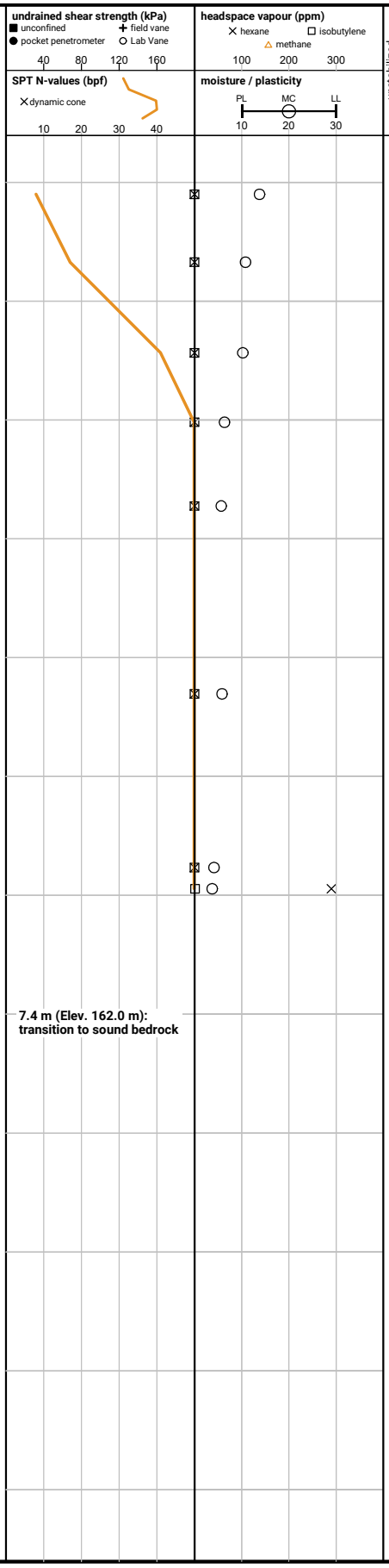
drill method : CME 55

elev depth (m)	description	graphic log	number	type	SPT N-value
169.4	**GROUND SURFACE**				
169.2 / 0.2	125mm **ASPHALT** 100mm **AGGREGATE**				
	FILL, clayey silt, trace sand, trace gravel, trace construction debris, firm, brown, moist		1	SS	8
	...at 0.8 m, reddish brown, very stiff		2	SS	17
167.9 / 1.5	**CLAYEY SILT**, some sand, trace gravel, light grey silt partings, hard, reddish brown, moist (GLACIAL TILL)		3	SS	41
			4	SS	50 / 100mm
			5	SS	50 / 140mm
	...at 4.6 m, sandy silt glacial till, some gravel, some clay, trace shale fragments, very dense		6	SS	50 / 100mm
			1	RUN	
	...at 6.1 m, silty sand glacial till, some clay, some gravel, trace shale fragments, very dense, below		7	SS	50 / 125mm
			8	SS	50 / 75mm
162.9 / 6.5	**QUEENSTON FORMATION** (See rock core log for details)		2	RUN	
			3	RUN	
			4	RUN	
			5	RUN	

hollow stem augers OD=215 mm

hollow stem augers (med) OD=175 mm

rock coring (HQ) OD=96 mm



unstabilized water level

lab data and comments

grain size distribution (%) (MIT)
GR SA SI CL

SS1: PAHs, PCBs

SS2: BTEX, H-Ms, Metals, ORPs, PHCs, VOCs

1 14 61 24

SS3: PAHs

2.3m: split-spoon sampler bouncing

SS4: H-Ms, Metals, ORPs

3.0m: split-spoon sampler bouncing

4.6m: split-spoon sampler bouncing

19 29 35 17

SS6: BTEX, PHCs, VOCs

4.9m: inferred caved material prior to coring Run 1 (overlapping with SS7 & SS8); core loss was experienced during coring (refer to Rock Core Log 106) **to 5.5m**

5.5m: Run 1 recovered inferred caved material (refer to Rock Core Log 106) **to 6.5m**

12 46 29 13

6.1m: auger grinding, split-spoon sampler bouncing

file: 24-095 gint.gpj

Tech : BMS | **PM** : JAW | **Rev** : NN

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GROUNDED ENGINEERING

Date Started : Jun 24, 2024
Position : E: 604173, N: 4824170 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 106

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

drill method : CME 55
rock coring (HQ) OD=96 mm

elev depth (m)	description	graphic log	samples: number	samples: type	samples: SPT N-value
	(continued)				
	QUEENSTON FORMATION (See rock core log for details) *(continued)*		5	RUN	
			6	RUN	
			7	RUN	
			8	RUN	
			9	RUN	
			10	RUN	
149.5 19.9					

depth scale (m): 12, 13, 14, 15, 16, 17, 18, 19
well details
elevation (m): 157, 156, 155, 154, 153, 152, 151, 150

undrained shear strength (kPa): unconfined, field vane, pocket penetrometer, Lab Vane; 40, 80, 120, 160
SPT N-values (bpf): dynamic cone; 10, 20, 30, 40
headspace vapour (ppm): hexane, isobutylene, methane; 100, 200, 300
moisture / plasticity: PL, MC, LL; 10, 20, 30
unstabilized water level
lab data and comments
grain size distribution (%) (MIT): GR SA SI CL

END OF BOREHOLE

Borehole was filled with drill water upon completion of drilling.

50 mm dia. monitoring well installed.
No. 10 screen

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jul 11, 2024	4.1	165.3
Jul 19, 2024	3.2	166.2
Jul 24, 2024	3.5	165.9
Aug 27, 2024	4.2	165.2

file: 24-095 gint.gpj

Tech : BMS | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 24, 2024
Position : E: 604173, N: 4824170 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 106

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

Rock coring started at 4.9m below grade

CLAYEY SILT, some sand, trace gravel, light grey silt partings, hard, reddish brown, moist (GLACIAL TILL)

Run R1 (4.9 – 162.9): TCR = **63%**, SCR = **0%**, RQD = **0%**

QUEENSTON FORMATION
Shale, reddish brown, laminated to thinly bedded, weak, calcareous, green-grey banding; joints are horizontal, closed to gapped, clean;

interbedded with **limestone**, grey, laminated to thinly bedded, strong

Overall shale: 82%, limestone: 18%
... at 7.4 m (Elev. 162.0 m), transition to sound rock

Run 1 (6.5 – 161.4): TCR = **100%**, SCR = **95%**, RQD = **40%**
0% limestone
100% shale

Run 2 (8.0 – 159.9): TCR = **100%**, SCR = **95%**, RQD = **59%**
8% limestone
92% shale

Run 3 (9.5 – 158.6): TCR = **100%**, SCR = **94%**, RQD = **45%**
19% limestone
81% shale

Run 4 (10.8 – 157.2): TCR = **100%**, SCR = **98%**, RQD = **89%**
22% limestone
78% shale

Run 5 (12.2 – 155.7): TCR = **100%**, SCR = **98%**, RQD = **82%**
19% limestone
81% shale

Run 6 (13.7 – 155.0): TCR = **100%**, SCR = **98%**, RQD = **74%**
13% limestone
87% shale

Run 7 :
23% limestone
77% shale

elevation (m)	natural fracture frequency	notes and comments
164	NA	**4.9 / 164.5 - 5.5 / 163.9m:** inferred caved material prior to coring Run 1 (overlapping with SS7 & SS8); core loss was experienced during coring (refer to Borehole Log 106)
	NA	
	NA	**5.5 / 163.9 - 6.5 / 162.9m:** recovered caved material
163	NA	
	4	**6.5 / 162.9m:** observed weathered bedrock **6.5 / 162.9m:** FC D PR R GA CN
	6	**6.6 / 162.8m:** FC D PR R GA CN
	2	**7.0 / 162.4m:** FC D PR R GA CN
162	2	
	4	
	5	**8.1 / 161.3m:** 50mm rubbilized zone
161	2	**8.4 / 161.0m:** 50mm weathered zone
	2	
	1	
160	6	
	3	**9.6 / 159.8m:** 25mm clay infilled seam **9.7 / 159.7m:** 25mm clay infilled seam
	2	
	4	**10.2 / 159.2m:** JT PR R GA clay
159	3	
	0	
	2	
158	2	
	2	**11.7 / 157.7m:** 13mm rubbilized zone **11.8 / 157.6m:** 13mm rubbilized zone
	2	
157	1	
	2	**12.7 / 156.7m:** 25mm rubbilized zone
	2	
	3	**13.1 / 156.3m:** 25mm rubbilized zone **13.2 / 156.2m:** 25mm weathered zone
156	2	
	1	
	1	
155	0	
	0	

file: 24-095 gint.gpj

(continued next page)
Tech : BMS | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 24, 2024
Position : E: 604173, N: 4824170 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 106

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

depth (m)	stratigraphy	Run elev. depth (m)	recovery	elevation (m)	natural fracture frequency	laboratory testing	notes and comments
	164.5						
15	**QUEENSTON FORMATION** **Shale**, reddish brown, laminated to thinly bedded, weak, calcareous, green-grey banding; joints are horizontal, closed to gapped, clean;	R7 154.1			1		
	interbedded with **limestone**, grey, laminated to thinly bedded, strong	15.3		154	2		154
	Overall shale: 82%, limestone: 18%				1	**El. 153.8m**: UCS = 16.5 MPa E = 1.70 GPa γ = 25.6 kN/m^3	
16	Run 7 : 23% limestone 77% shale	R8	TCR = **100%** SCR = **100%** RQD = **79%**		2		
				153	2		153
	Run 8 : 21% limestone 79% shale	152.6			2		
17		16.8			1		
		R9	TCR = **100%** SCR = **100%** RQD = **91%**	152	2		152
					1		
18					1		
	Run 9 : 17% limestone 83% shale	151.1			0		
		18.3		151	1		151
					1		
19		R10	TCR = **100%** SCR = **100%** RQD = **90%**		2		
				150	0		150
	Run 10 : 39% limestone 61% shale	149.5			2		
		19.9m					

END OF COREHOLE

shale weathering zones: Z1 Z2 Z3 Z4

UCS (MPa) 5 25 50 100 250 — estimated strength: R1 R2 R3 R4 R5 R6

file: 24-095 gint.gpj

Tech : BMS | **PM** : JAW | **Rev** : NN

Date Started : Jun 26, 2024
Position : E: 604135, N: 4824095 (UTM 17T)
Elev. Datum : Geodetic

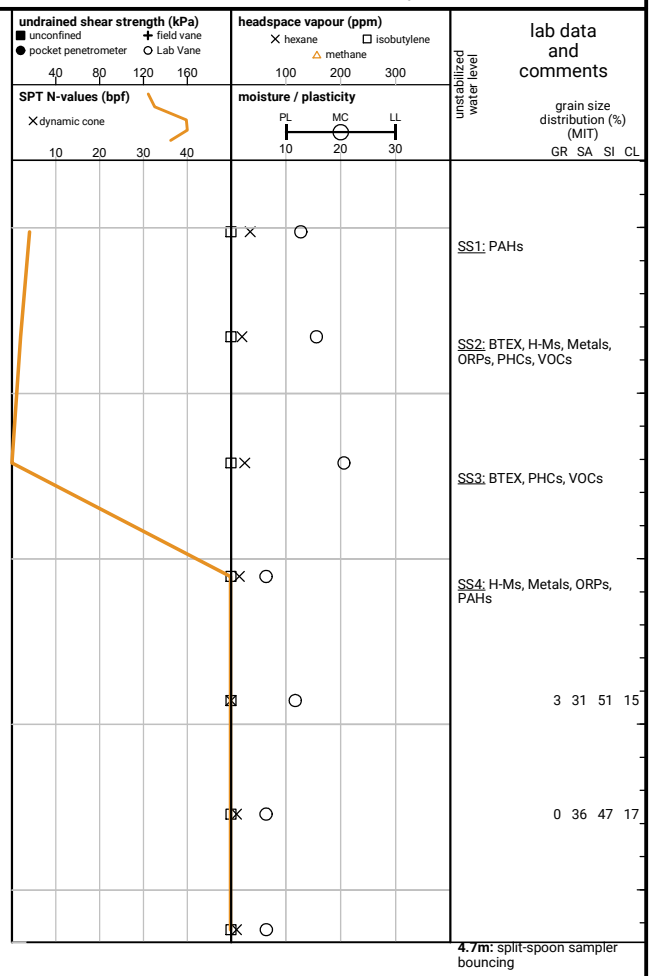
BOREHOLE LOG 107

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

drill method : CME TRACK

hollow stem augers (med) OD=175 mm

elev / depth (m)	description	number	type	SPT N-value
169.4	**GROUND SURFACE**			
	125mm **ASPHALT**			
169.0	100mm **AGGREGATE**			
0.4	**FILL**, clayey silt, trace sand, trace gravel, trace rock fragments, soft to very soft, reddish brown, moist	1	SS	4
		2	SS	2
	...at 1.5 m, wet	3	SS	0
167.1				
2.3	**CLAYEY SILT**, some sand, trace gravel, light grey silt partings, hard, reddish brown, moist (GLACIAL TILL)	4	SS	62
	...at 3.0 m, sandy silt glacial till, some clay, trace gravel, very dense	5	SS	70 / 275mm
	...at 3.8 m, silt and sand, some clay, very dense	6	SS	50 / 125mm
164.8				
164.7	**INFERRED BEDROCK**	7	SS	50 / 150mm
4.7				



4.7m: split-spoon sampler bouncing

END OF BOREHOLE
Refusal on inferred bedrock

Borehole was dry upon completion of drilling.

50 mm dia. monitoring well installed.
No. 10 screen

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jul 11, 2024	2.4	167.0
Jul 19, 2024	2.5	166.9
Jul 24, 2024	2.5	166.9
Aug 27, 2024	2.5	166.9

file: 24-095 gint.gpj

Tech : SN | **PM** : JAW | **Rev** : NN

BOREHOLE LOG 108

Date Started : Jun 26, 2024
Position : E: 604166, N: 4824123 (UTM 17T)
Elev. Datum : Geodetic

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

drill method : CME TRACK

hollow stem augers (med) OD=175 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
169.4 0.0	**GROUND SURFACE**				
	125mm **ASPHALT**				
169.0 0.4	100mm **AGGREGATE**				
	FILL, clayey silt, trace sand, trace gravel, firm, brown, moist		1	SS	5
168.6 0.8	**CLAYEY SILT**, some sand, trace gravel, light grey silt partings, hard, reddish brown, moist (GLACIAL TILL)		2	SS	54
			3	SS	89
			4	SS	94 / 200mm
	...at 3.0 m, sand and silt, some clay, below, very dense, below		5	SS	50 / 125mm
164.7 4.7			6	SS	50 / 125mm
	INFERRED BEDROCK		7	SS	50 / 125mm
161.6 7.8			8	SS	50 / 150mm

depth scale (m): 0, 1, 2, 3, 4, 5, 6, 7

well details

elevation (m): 169, 168, 167, 166, 165, 164, 163, 162

undrained shear strength (kPa)
■ unconfined + field vane
● pocket penetrometer ○ Lab Vane
40 80 120 160

SPT N-values (bpf)
× dynamic cone
10 20 30 40

headspace vapour (ppm)
× hexane □ isobutylene
△ methane
100 200 300

moisture / plasticity
PL MC LL
10 20 30

unstabilized water level

lab data and comments

grain size distribution (%) (MIT)
GR SA SI CL
0 48 40 12

SS1: PAHs

SS2: BTEX, H-Ms, Metals, ORPs, PHCs, VOCs

SS3: PAHs

SS4: BTEX, H-Ms, Metals, ORPs, PHCs, VOCs

3.2m: split-spoon sampler bouncing

6.7m: auger grinding

7.8m: split-spoon sampler bouncing

END OF BOREHOLE
Refusal on inferred bedrock

Borehole was dry upon completion of drilling.

50 mm dia. monitoring well installed.
No. 10 screen

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jul 11, 2024	4.4	165.0
Jul 19, 2024	3.6	165.8
Jul 24, 2024	3.4	166.0
Aug 27, 2024	3.9	165.5

file: 24-095 gint.gpj

Tech : SN | **PM** : JAW | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Jun 28, 2024
Position : E: 604222, N: 4824142 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 109

File No. : 24-095 **Project** : 2555 Erin Centre, Mississauga **Client** : Trinity Point Developments

drill method : *Manual methods* — hand augers

elev / depth (m)	description	graphic log	samples: number	samples: type	samples: SPT N-value
169.0	**GROUND SURFACE**				
168.8 / 0.2	150mm **TOPSOIL**				
	FILL, sandy silt, some clay, trace gravel, trace rootlets, brown, moist		1	GS	
168.4 / 0.6					

depth scale (m): 0

well details

elevation (m)

undrained shear strength (kPa): unconfined, pocket penetrometer, field vane, Lab Vane — 40 80 120 160

SPT N-values (bpf): dynamic cone — 10 20 30 40

headspace vapour (ppm): hexane, isobutylene, methane — 100 200 300

moisture / plasticity: PL MC LL — 10 20 30

unstabilized water level

lab data and comments

grain size distribution (%) (MIT): GR SA SI CL

GS1: BTEX, PCBs, PHCs

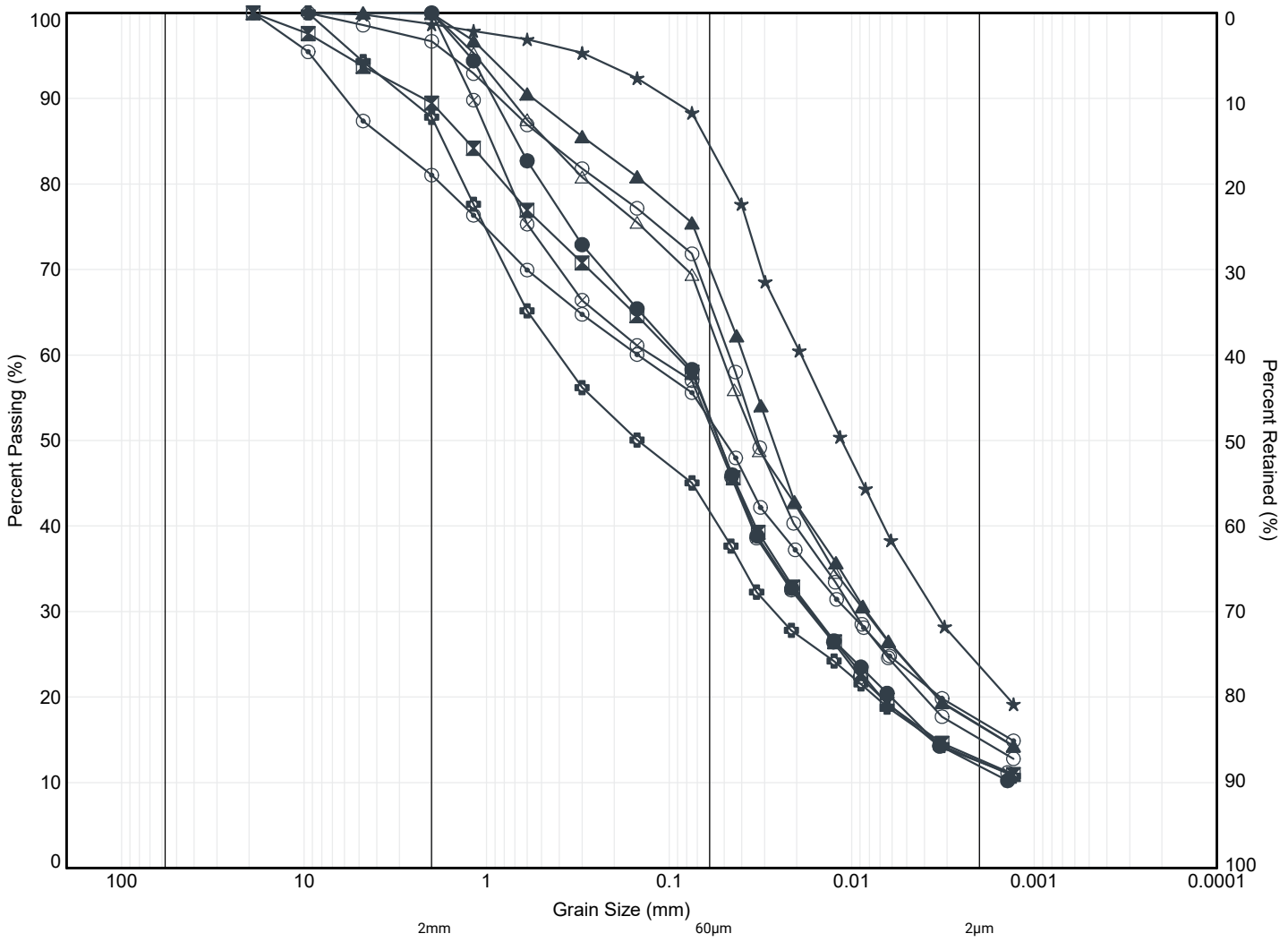
END OF BOREHOLE
Auger refusal

Dry and open upon completion of drilling.

file: 24-095 gint.gpj

Tech : DB | **PM** : JAW | **Rev** : NN

APPENDIX B



MIT SYSTEM	COBBLES	GRAVEL			SAND			SILT	CLAY
		COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

MIT SYSTEM

	Location	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**BH 101**	SS5	3.2	165.9	0	47	41	12	*(0)*
⊠	**BH 102**	SS3	1.8	167.3	11	36	40	13	*(0)*
▲	**BH 104**	SS3	1.7	167.5	0	29	54	17	*(0)*
★	**BH 106**	SS3	1.8	167.6	1	14	61	24	*(0)*
⊙	**BH 106**	SS6	4.7	164.7	19	29	35	17	*(0)*
✿	**BH 106**	SS7	6.2	163.2	12	46	29	13	*(0)*
○	**BH 107**	SS5	3.3	166.1	3	31	51	15	*(0)*
△	**BH 107**	SS6	3.9	165.5	0	36	47	17	*(0)*
⊗	**BH 108**	SS5	3.1	166.2	0	48	40	12	*(0)*

GROUNDED ENGINEERING

Title: **GRAIN SIZE DISTRIBUTION**
GLACIAL TILL

File No.: **24-095**

file: 24-095.gint.gpj

APPENDIX C

GROUNDED ENGINEERING

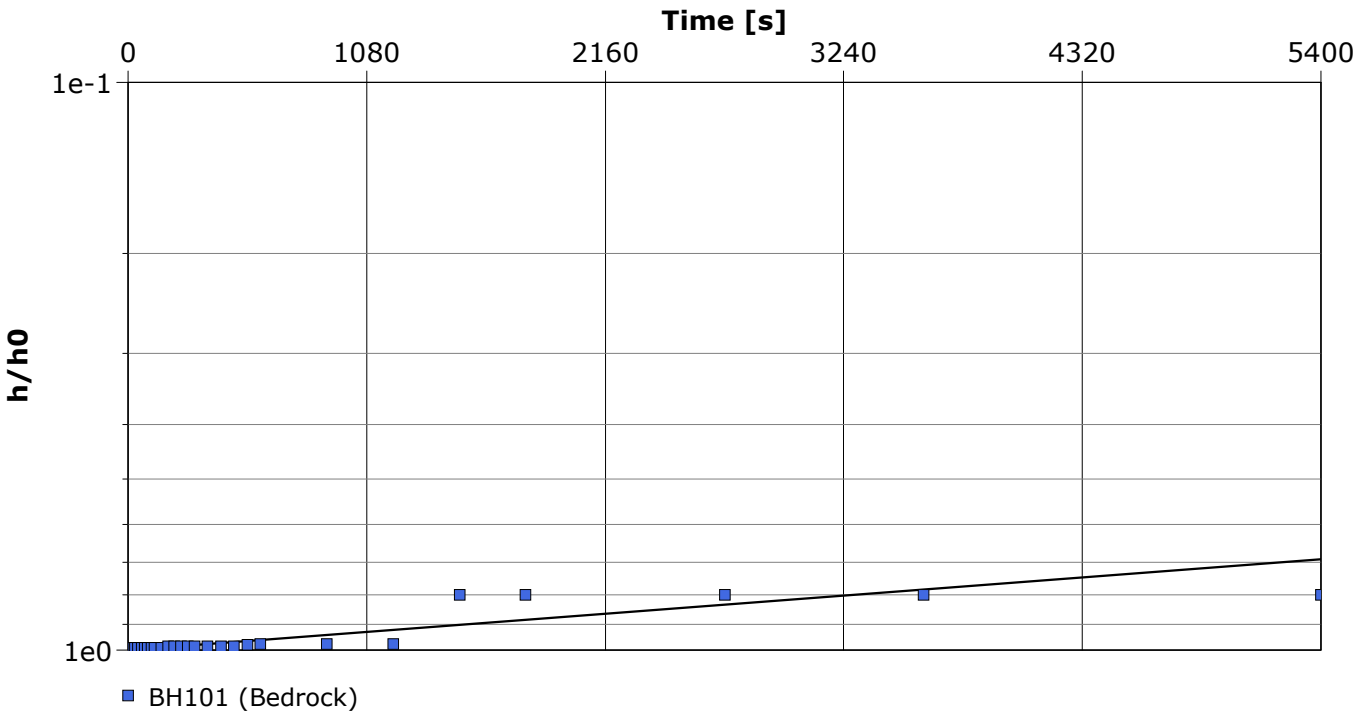
Slug Test Analysis Report

Project: 2555 Erin Centre Blvd.

Number: 24-095

Client: Trinity Point Developments

Location: Mississauga, ON	Slug Test: BH101 - RHT	Test Well: BH101 (Bedrock)
Test Conducted by: DB		Test Date: 2024-07-19
Analysis Performed by: JAW	Bouwer & Rice	Analysis Date: 2024-07-23
Aquifer Thickness: 20.00 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH101 (Bedrock)	3.00×10^{-8}	

GROUNDED ENGINEERING

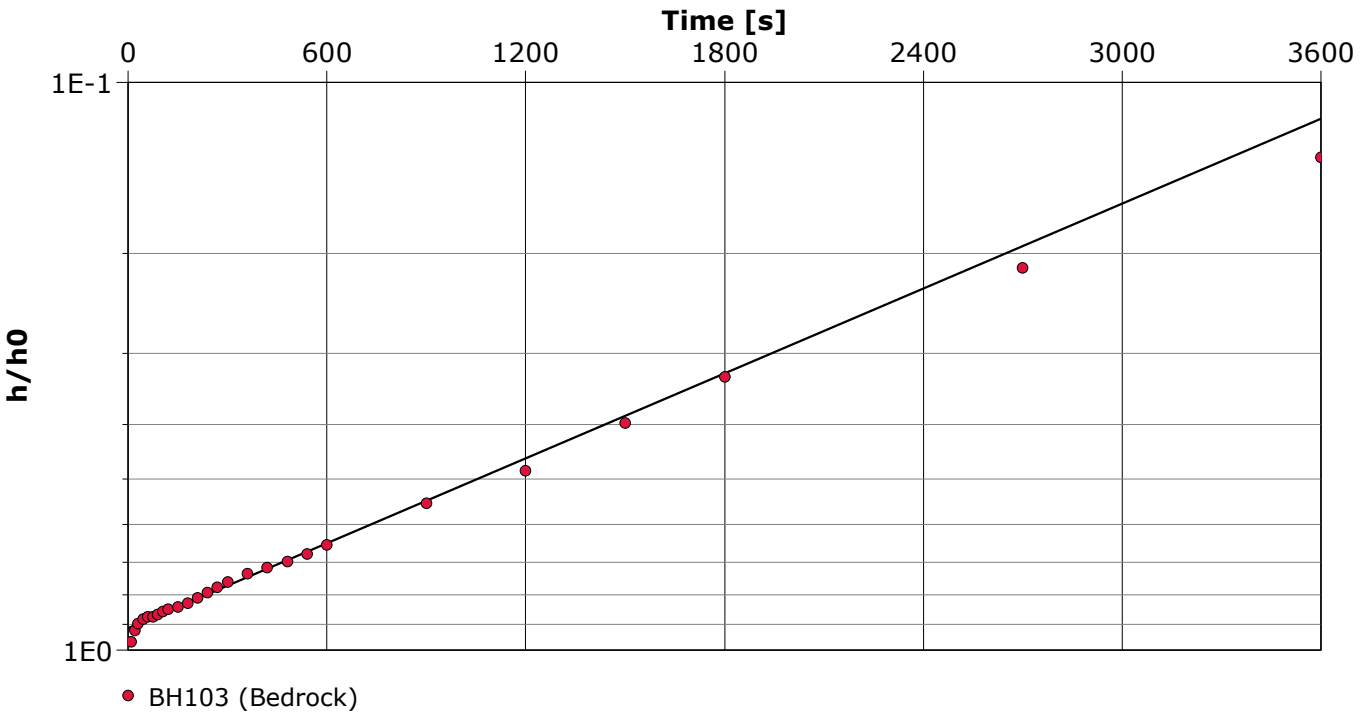
Slug Test Analysis Report

Project: 2555 Erin Centre Blvd.

Number: 24-095

Client: Trinity Point Developments

Location: Mississauga, ON	Slug Test: BH103 - RHT	Test Well: BH103 (Bedrock)
Test Conducted by: DB		Test Date: 2024-07-19
Analysis Performed by: JAW	Bouwer & Rice	Analysis Date: 2024-07-23
Aquifer Thickness: 20.00 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH103 (Bedrock)	2.20×10^{-7}	

GROUNDED ENGINEERING

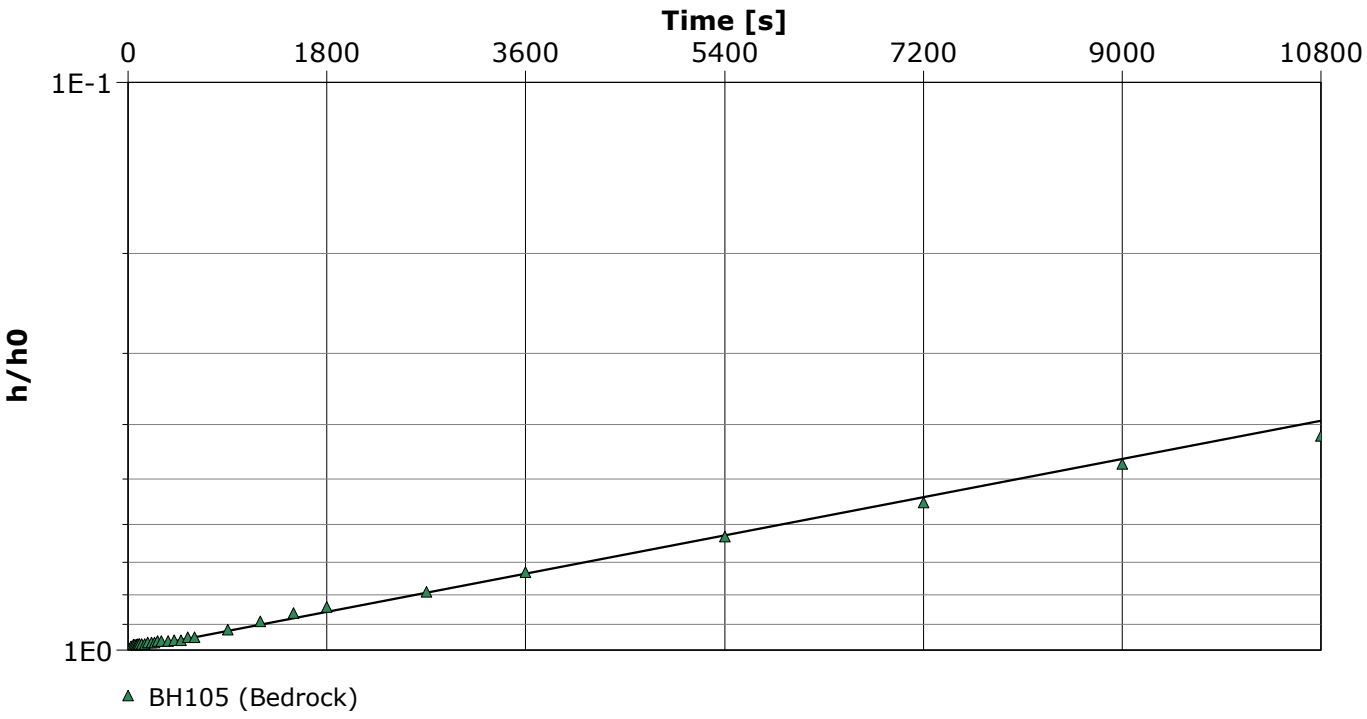
Slug Test Analysis Report

Project: 2555 Erin Centre Blvd.

Number: 24-095

Client: Trinity Point Developments

Location: Mississauga, ON	Slug Test: BH105 - RHT	Test Well: BH105 (Bedrock)
Test Conducted by: DB		Test Date: 2024-07-19
Analysis Performed by: JAW	Bouwer & Rice	Analysis Date: 2024-07-23
Aquifer Thickness: 20.00 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH105 (Bedrock)	3.30×10^{-8}	

APPENDIX D

K from Grain Size Analysis Report

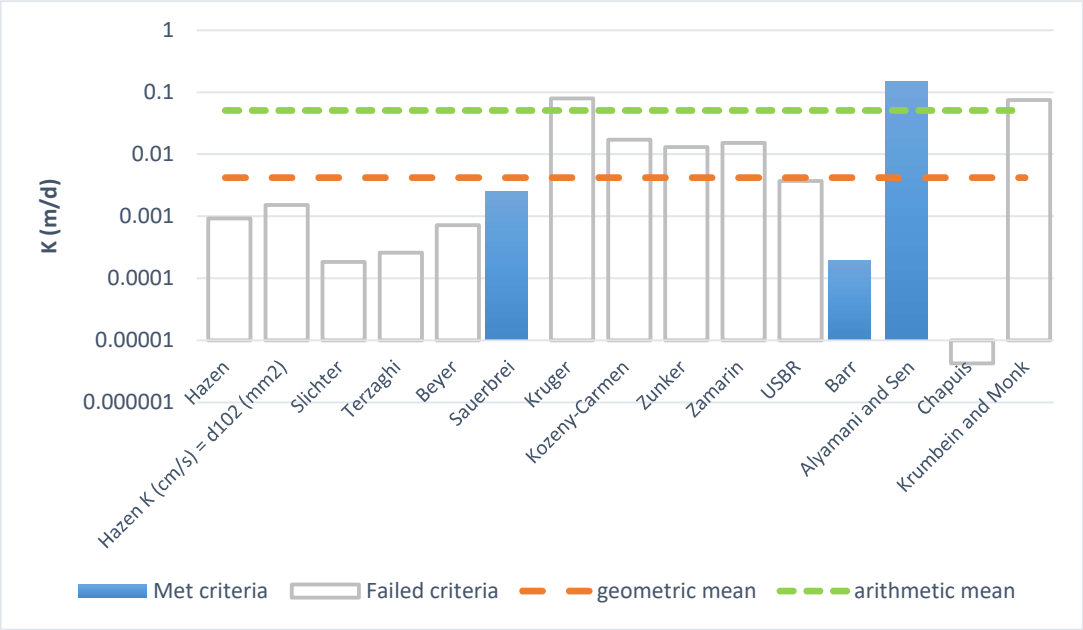
Date: 25-Jul-24

Sample Name: BH101-SS5

Mass Sample (g): 192.81

T (oC) 23

Poorly sorted sandy silt with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	1.1E-06	1.1E-08	0.00	
Hazen K (cm/s) = d_{10} (mm)	1.8E-06	1.8E-08	0.00	
Slichter	2.1E-07	2.1E-09	0.00	
Terzaghi	3.0E-07	3.0E-09	0.00	
Beyer	8.3E-07	8.3E-09	0.00	
Sauerbrei	2.9E-06	2.9E-08	0.00	
Kruger	9.2E-05	9.2E-07	0.08	
Kozeny-Carmen	2.0E-05	2.0E-07	0.02	
Zunker	1.5E-05	1.5E-07	0.01	
Zamarin	1.8E-05	1.8E-07	0.02	
USBR	4.3E-06	4.3E-08	0.00	
Barr	2.3E-07	2.3E-09	0.00	
Alyamani and Sen	1.7E-04	1.7E-06	0.15	
Chapuis	4.9E-09	4.9E-11	0.00	
Krumbein and Monk	8.7E-05	8.7E-07	0.07	
geometric mean	4.9E-06	4.9E-08	0.00	
arithmetic mean	5.9E-05	5.9E-07	0.05	

K from Grain Size Analysis Report

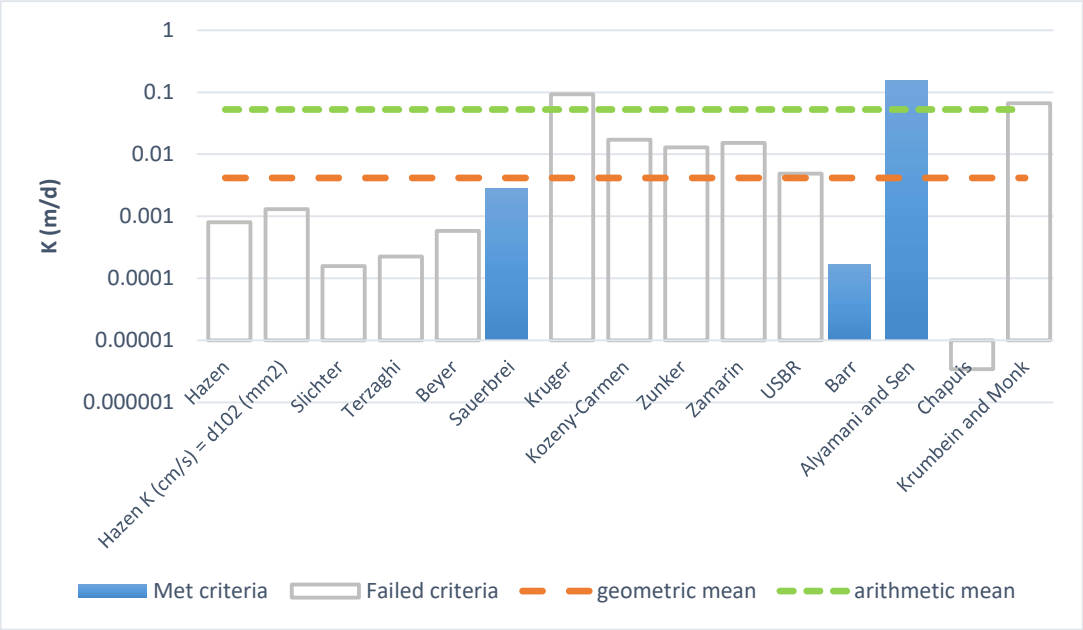
Date: 25-Jul-24

Sample Name: BH102-SS3

Mass Sample (g): 173.46

T (oC) 23

Poorly sorted sandy gravelly silt with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	9.2E-07	9.2E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	1.5E-06	1.5E-08	0.00	
Slichter	1.8E-07	1.8E-09	0.00	
Terzaghi	2.6E-07	2.6E-09	0.00	
Beyer	6.7E-07	6.7E-09	0.00	
Sauerbrei	3.2E-06	3.2E-08	0.00	
Kruger	1.1E-04	1.1E-06	0.09	
Kozeny-Carmen	2.0E-05	2.0E-07	0.02	
Zunker	1.5E-05	1.5E-07	0.01	
Zamarin	1.8E-05	1.8E-07	0.02	
USBR	5.6E-06	5.6E-08	0.00	
Barr	1.9E-07	1.9E-09	0.00	
Alyamani and Sen	1.8E-04	1.8E-06	0.16	
Chapuis	4.0E-09	4.0E-11	0.00	
Krumbein and Monk	7.7E-05	7.7E-07	0.07	
geometric mean	4.8E-06	4.8E-08	0.00	
arithmetic mean	6.1E-05	6.1E-07	0.05	

K from Grain Size Analysis Report

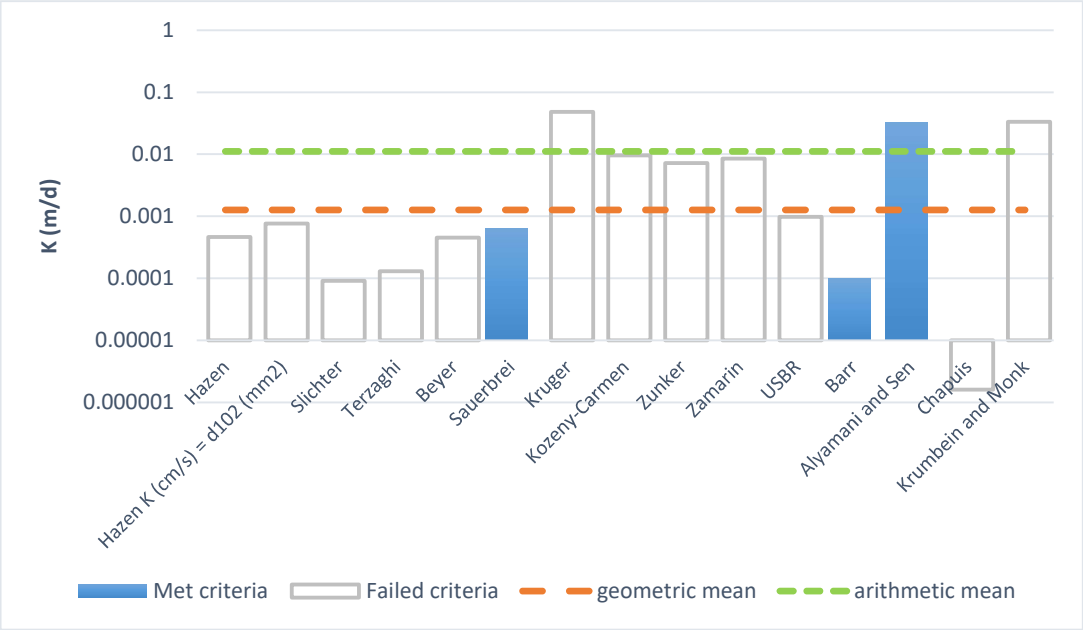
Date: 25-Jul-24

Sample Name: BH104-SS3

Mass Sample (g): 189.01

T (oC) 23

Poorly sorted sandy silt with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	5.4E-07	5.4E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	8.8E-07	8.8E-09	0.00	
Slichter	1.1E-07	1.1E-09	0.00	
Terzaghi	1.5E-07	1.5E-09	0.00	
Beyer	5.3E-07	5.3E-09	0.00	
Sauerbrei	7.4E-07	7.4E-09	0.00	
Kruger	5.6E-05	5.6E-07	0.05	
Kozeny-Carmen	1.1E-05	1.1E-07	0.01	
Zunker	8.4E-06	8.4E-08	0.01	
Zamarin	9.8E-06	9.8E-08	0.01	
USBR	1.1E-06	1.1E-08	0.00	
Barr	1.1E-07	1.1E-09	0.00	
Alyamani and Sen	3.8E-05	3.8E-07	0.03	
Chapuis	1.9E-09	1.9E-11	0.00	
Krumbein and Monk	3.9E-05	3.9E-07	0.03	
geometric mean	1.5E-06	1.5E-08	0.00	
arithmetic mean	1.3E-05	1.3E-07	0.01	

K from Grain Size Analysis Report

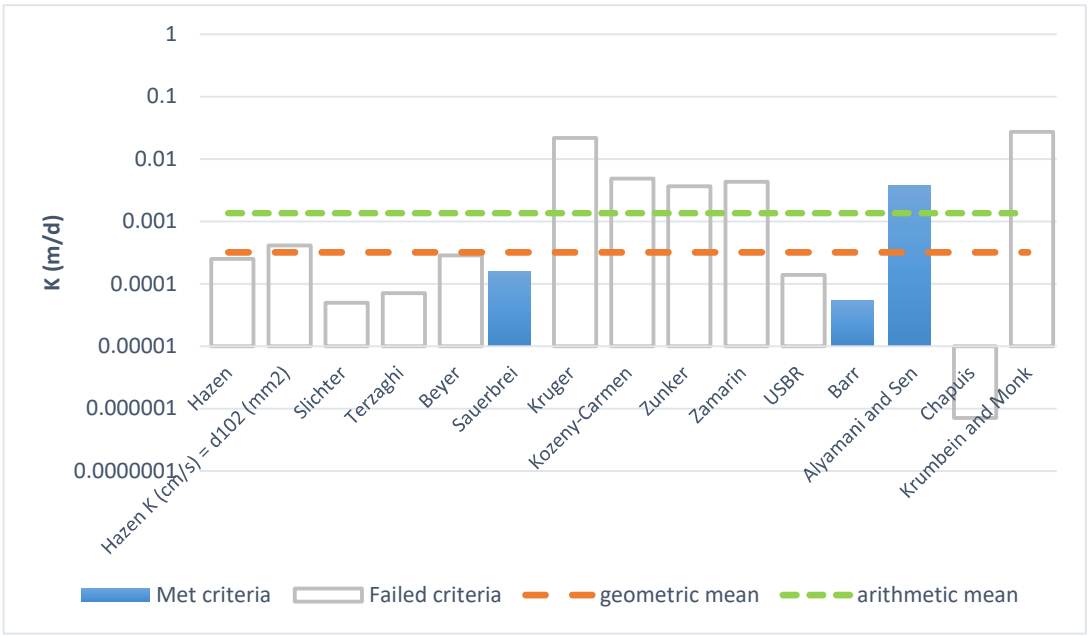
Date: 25-Jul-24

Sample Name: BH106-SS3

Mass Sample (g): 217.64

T (oC) 22.5

Poorly sorted clay with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	2.9E-07	2.9E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	4.8E-07	4.8E-09	0.00	
Slichter	5.7E-08	5.7E-10	0.00	
Terzaghi	8.2E-08	8.2E-10	0.00	
Beyer	3.3E-07	3.3E-09	0.00	
Sauerbrei	1.9E-07	1.9E-09	0.00	
Kruger	2.5E-05	2.5E-07	0.02	
Kozeny-Carmen	5.6E-06	5.6E-08	0.00	
Zunker	4.2E-06	4.2E-08	0.00	
Zamarin	5.0E-06	5.0E-08	0.00	
USBR	1.6E-07	1.6E-09	0.00	
Barr	6.2E-08	6.2E-10	0.00	
Alyamani and Sen	4.5E-06	4.5E-08	0.00	
Chapuis	8.1E-10	8.1E-12	0.00	
Krumbein and Monk	3.1E-05	3.1E-07	0.03	
geometric mean	3.7E-07	3.7E-09	0.00	
arithmetic mean	1.6E-06	1.6E-08	0.00	

K from Grain Size Analysis Report

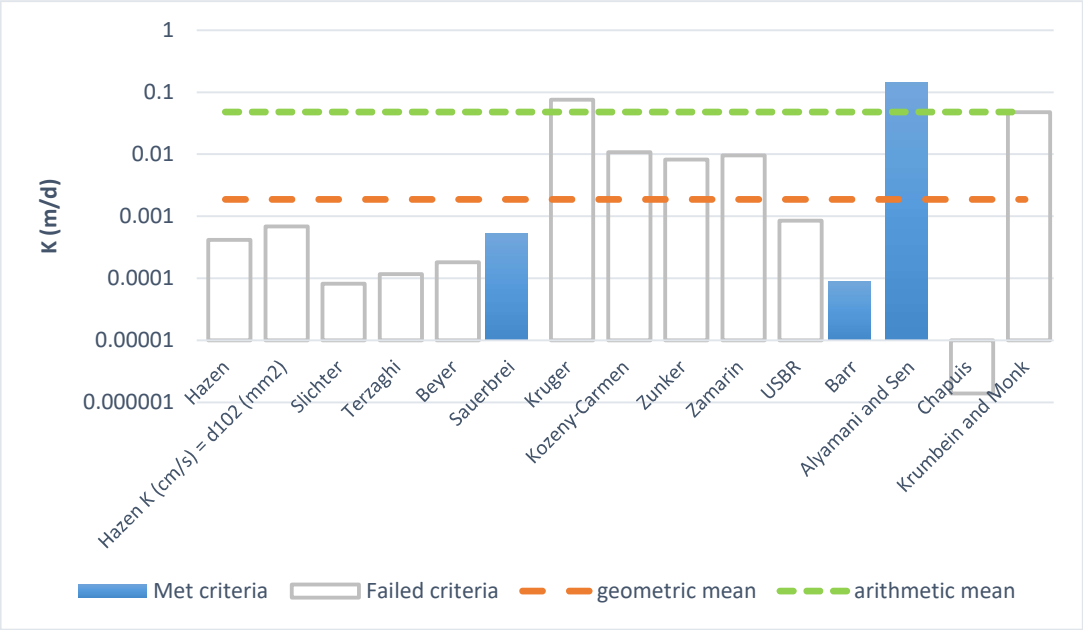
Date: 25-Jul-24

Sample Name: BH106-SS6

Mass Sample (g): 108.04

T (oC) 23

Poorly sorted sandy gravelly silt with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	4.8E-07	4.8E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	7.9E-07	7.9E-09	0.00	
Slichter	9.5E-08	9.5E-10	0.00	
Terzaghi	1.4E-07	1.4E-09	0.00	
Beyer	2.1E-07	2.1E-09	0.00	
Sauerbrei	6.0E-07	6.0E-09	0.00	
Kruger	8.7E-05	8.7E-07	0.08	
Kozeny-Carmen	1.3E-05	1.3E-07	0.01	
Zunker	9.5E-06	9.5E-08	0.01	
Zamarin	1.1E-05	1.1E-07	0.01	
USBR	9.8E-07	9.8E-09	0.00	
Barr	1.0E-07	1.0E-09	0.00	
Alyamani and Sen	1.7E-04	1.7E-06	0.14	
Chapuis	1.6E-09	1.6E-11	0.00	
Krumbein and Monk	5.5E-05	5.5E-07	0.05	
geometric mean	2.2E-06	2.2E-08	0.00	
arithmetic mean	5.6E-05	5.6E-07	0.05	

K from Grain Size Analysis Report

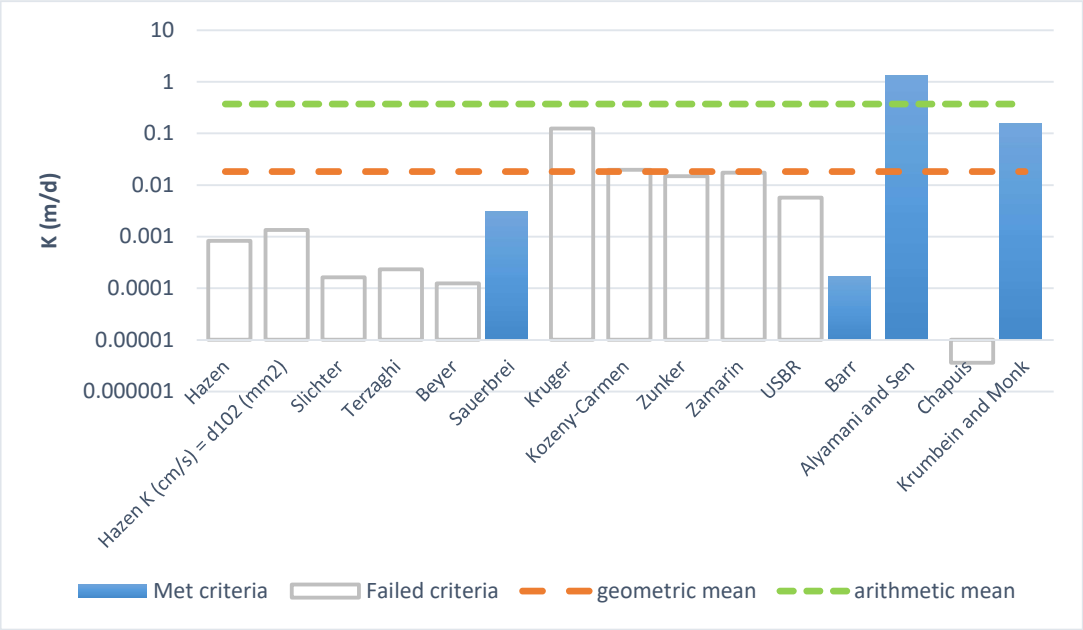
Date: 25-Jul-24

Sample Name: BH106-SS7

Mass Sample (g): 74.28

T (oC) 23

Poorly sorted gravelly sand with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	9.6E-07	9.6E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	1.6E-06	1.6E-08	0.00	
Slichter	1.9E-07	1.9E-09	0.00	
Terzaghi	2.7E-07	2.7E-09	0.00	
Beyer	1.4E-07	1.4E-09	0.00	
Sauerbrei	3.5E-06	3.5E-08	0.00	
Kruger	1.4E-04	1.4E-06	0.12	
Kozeny-Carmen	2.3E-05	2.3E-07	0.02	
Zunker	1.7E-05	1.7E-07	0.01	
Zamarin	2.0E-05	2.0E-07	0.02	
USBR	6.6E-06	6.6E-08	0.01	
Barr	2.0E-07	2.0E-09	0.00	
Alyamani and Sen	1.5E-03	1.5E-05	1.34	
Chapuis	4.2E-09	4.2E-11	0.00	
Krumbein and Monk	1.8E-04	1.8E-06	0.16	
geometric mean	2.1E-05	2.1E-07	0.02	
arithmetic mean	4.3E-04	4.3E-06	0.37	

K from Grain Size Analysis Report

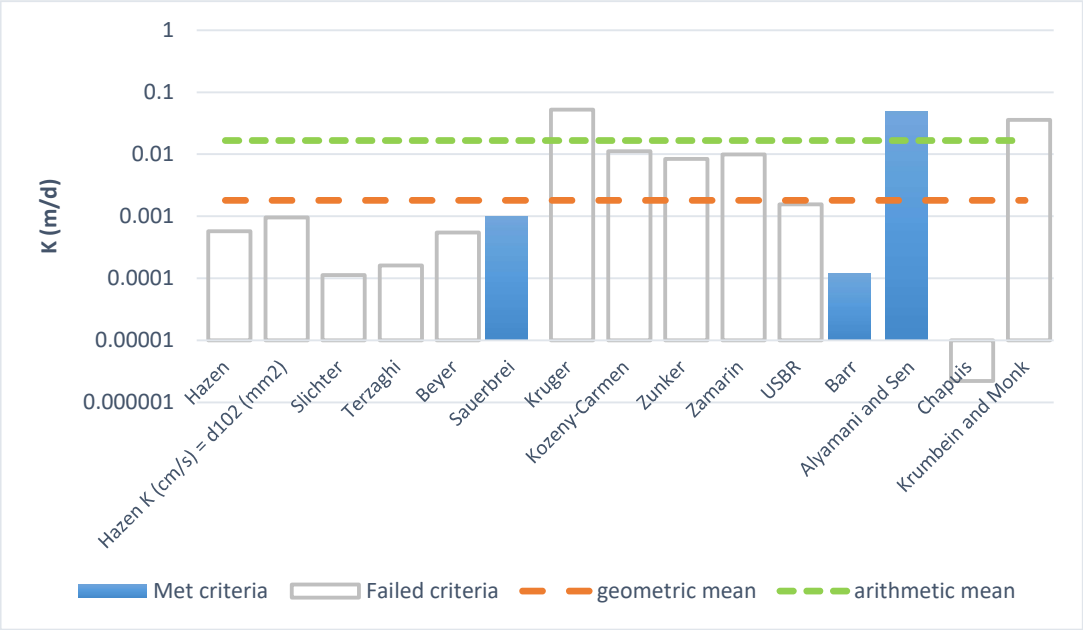
Date: 25-Jul-24

Sample Name: BH107-SS5

Mass Sample (g): 134.02

T (oC) 22.5

Poorly sorted sandy silt with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	6.7E-07	6.7E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	1.1E-06	1.1E-08	0.00	
Slichter	1.3E-07	1.3E-09	0.00	
Terzaghi	1.9E-07	1.9E-09	0.00	
Beyer	6.3E-07	6.3E-09	0.00	
Sauerbrei	1.2E-06	1.2E-08	0.00	
Kruger	6.1E-05	6.1E-07	0.05	
Kozeny-Carmen	1.3E-05	1.3E-07	0.01	
Zunker	9.8E-06	9.8E-08	0.01	
Zamarin	1.1E-05	1.1E-07	0.01	
USBR	1.8E-06	1.8E-08	0.00	
Barr	1.4E-07	1.4E-09	0.00	
Alyamani and Sen	5.7E-05	5.7E-07	0.05	
Chapuis	2.6E-09	2.6E-11	0.00	
Krumbein and Monk	4.1E-05	4.1E-07	0.04	
geometric mean	2.1E-06	2.1E-08	0.00	
arithmetic mean	1.9E-05	1.9E-07	0.02	

K from Grain Size Analysis Report

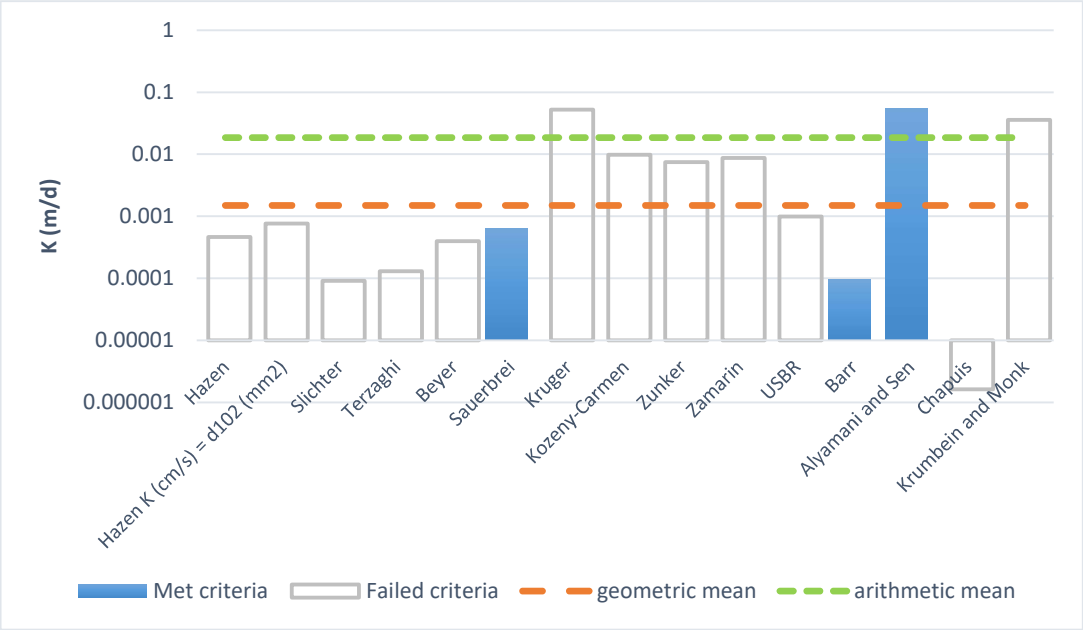
Date: 25-Jul-24

Sample Name: BH107-SS6

Mass Sample (g): 162.3

T (oC) 22.5

Poorly sorted sandy silt with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	5.3E-07	5.3E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	8.9E-07	8.9E-09	0.00	
Slichter	1.0E-07	1.0E-09	0.00	
Terzaghi	1.5E-07	1.5E-09	0.00	
Beyer	4.6E-07	4.6E-09	0.00	
Sauerbrei	7.4E-07	7.4E-09	0.00	
Kruger	6.1E-05	6.1E-07	0.05	
Kozeny-Carmen	1.1E-05	1.1E-07	0.01	
Zunker	8.6E-06	8.6E-08	0.01	
Zamarin	1.0E-05	1.0E-07	0.01	
USBR	1.1E-06	1.1E-08	0.00	
Barr	1.1E-07	1.1E-09	0.00	
Alyamani and Sen	6.4E-05	6.4E-07	0.06	
Chapuis	1.9E-09	1.9E-11	0.00	
Krumbein and Monk	4.2E-05	4.2E-07	0.04	
geometric mean	1.7E-06	1.7E-08	0.00	
arithmetic mean	2.2E-05	2.2E-07	0.02	

K from Grain Size Analysis Report

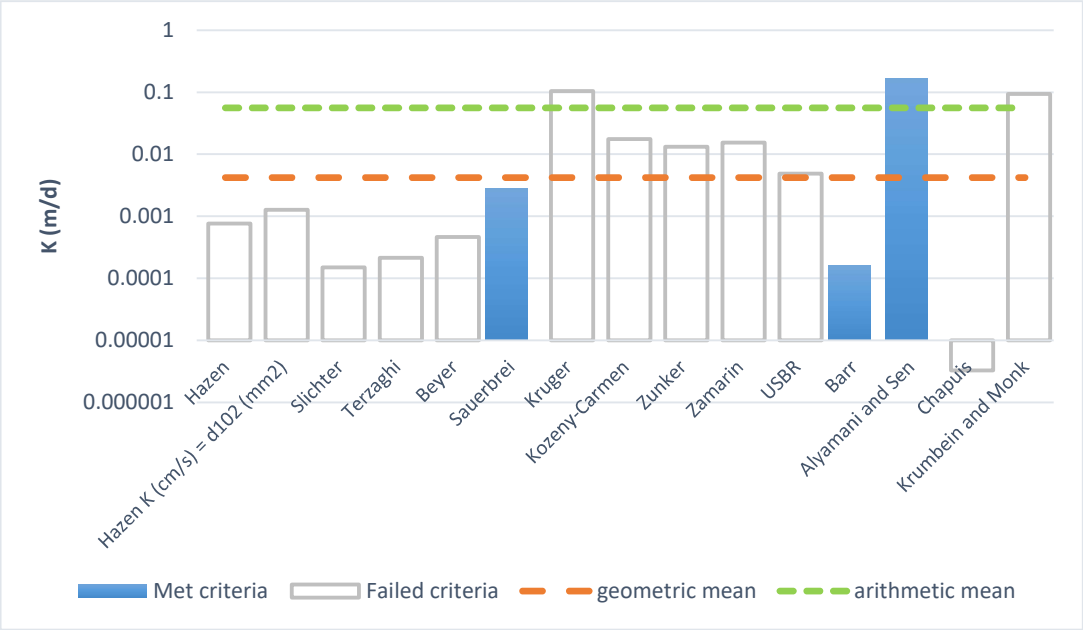
Date: 25-Jul-24

Sample Name: BH108-SS5

Mass Sample (g): 113.84

T (oC) 22.5

Poorly sorted sandy silt with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	8.8E-07	8.8E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	1.5E-06	1.5E-08	0.00	
Slichter	1.7E-07	1.7E-09	0.00	
Terzaghi	2.5E-07	2.5E-09	0.00	
Beyer	5.4E-07	5.4E-09	0.00	
Sauerbrei	3.3E-06	3.3E-08	0.00	
Kruger	1.2E-04	1.2E-06	0.10	
Kozeny-Carmen	2.0E-05	2.0E-07	0.02	
Zunker	1.5E-05	1.5E-07	0.01	
Zamarin	1.8E-05	1.8E-07	0.02	
USBR	5.7E-06	5.7E-08	0.00	
Barr	1.9E-07	1.9E-09	0.00	
Alyamani and Sen	1.9E-04	1.9E-06	0.17	
Chapuis	3.8E-09	3.8E-11	0.00	
Krumbein and Monk	1.1E-04	1.1E-06	0.09	
geometric mean	4.9E-06	4.9E-08	0.00	
arithmetic mean	6.5E-05	6.5E-07	0.06	

APPENDIX E

FINAL REPORT

CA40117-JUL24 R1

24-095-150, 2555 Erin Centre

Prepared for

Grounded Engineering Inc.

FINAL REPORT

CA40117-JUL24 R1

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Grounded Engineering Inc.	Project Specialist	Maarit Wolfe, Hon.B.Sc
		Laboratory	SGS Canada Inc.
Address	1 Banigan Drive Toronto, Ontario M4H 1E9. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	James Wagner	Telephone	705-652-2000
Telephone	647-264-7909	Facsimile	705-652-6365
Facsimile		Email	Maarit.Wolfe@sgs.com
Email	jwagner@groundedeng.ca	SGS Reference	CA40117-JUL24
Project	24-095-150, 2555 Erin Centre	Received	07/12/2024
Order Number		Approved	07/22/2024
Samples	Ground Water (1)	Report Number	CA40117-JUL24 R1
		Date Reported	07/22/2024

COMMENTS

RL - SGS Reporting Limit

Temperature of Sample upon Receipt: 7 degrees C
Cooling Agent Present: yes
Custody Seal Present: yes

Chain of Custody Number: 039124

F-ewl spk high, within acceptable range for fluoride

BOD spike low, accepted based on all other QC

TKN RL raised due to sample matrix

SIGNATORIES

Maarit Wolfe, Hon.B.Sc

TABLE OF CONTENTS

Client: Grounded Engineering Inc.
Project: 24-095-150, 2555 Erin Centre
Project Manager: James Wagner
Samplers: Michael Wong

MATRIX: WATER

L1 = SANSEW / WATER / - - Mississauga Sewer Use ByLaw - Storm Sewer Discharge - BL_0046_2022

L2 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010

Sample Number	9
Sample Name	SW-UF-BH101
Sample Matrix	Ground Water
Sample Date	11/07/2024

Parameter	Units	RL	L1	L2	Result
General Chemistry					
Biochemical Oxygen Demand (BOD5)	mg/L	2	15	300	24
Total Suspended Solids	mg/L	2	15	350	82
Total Kjeldahl Nitrogen	as N mg/L	25		100	< 25
Metals and Inorganics					
Total Chlorine	mg/L	0.02	1		< 0.02
Fluoride	mg/L	0.06		10	0.23
Cyanide (total)	mg/L	0.01	0.02	2	< 0.01
Sulphate	mg/L	2		1500	1000
Aluminum (total)	mg/L	0.001	1	50	0.891
Antimony (total)	mg/L	0.0009		5	0.0021
Arsenic (total)	mg/L	0.0002	0.02	1	0.0032
Cadmium (total)	mg/L	0.000003	0.008	0.7	0.000808
Chromium (total)	mg/L	0.00008	0.08	5	0.00540
Copper (total)	mg/L	0.001	0.04	3	0.006
Cobalt (total)	mg/L	0.000004		5	0.0187
Lead (total)	mg/L	0.00009	0.12	3	0.00174
Manganese (total)	mg/L	0.00001	2	5	0.470
Molybdenum (total)	mg/L	0.0004		5	0.0206
Nickel (total)	mg/L	0.0001	0.08	3	0.0167
Phosphorus (total)	mg/L	0.003	0.4	10	0.303
Selenium (total)	mg/L	0.00004	0.02	1	0.00105

Client: Grounded Engineering Inc.
Project: 24-095-150, 2555 Erin Centre
Project Manager: James Wagner
Samplers: Michael Wong

MATRIX: WATER

Sample Number	9
Sample Name	SW-UF-BH101
Sample Matrix	Ground Water
Sample Date	11/07/2024

L1 = SANSEW / WATER / - - Mississauga Sewer Use ByLaw - Storm Sewer Discharge - BL_0046_2022

L2 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010

Parameter	Units	RL	L1	L2	Result
Metals and Inorganics (continued)					
Silver (total)	mg/L	0.00005	0.12	5	0.00010
Tin (total)	mg/L	0.00006		5	0.0197
Titanium (total)	mg/L	0.0001		5	0.0168
Zinc (total)	mg/L	0.002	0.2	3	0.516
Microbiology					
E. Coli	cfu/100mL	0	200		20
Nonylphenol and Ethoxylates					
Nonylphenol	mg/L	0.001		0.02	< 0.001
Nonylphenol Ethoxylates	mg/L	0.01		0.2	< 0.01
Nonylphenol diethoxylate	mg/L	0.01			< 0.01
Nonylphenol monoethoxylate	mg/L	0.01			< 0.01
Oil and Grease					
Oil & Grease (total)	mg/L	2			< 2
Oil & Grease (animal/vegetable)	mg/L	4		150	< 4
Oil & Grease (mineral/synthetic)	mg/L	4		15	< 4

Client: Grounded Engineering Inc.
Project: 24-095-150, 2555 Erin Centre
Project Manager: James Wagner
Samplers: Michael Wong

MATRIX: WATER

Sample Number 9
Sample Name SW-UF-BH101
Sample Matrix Ground Water
Sample Date 11/07/2024

L1 = SANSEW / WATER / - - Mississauga Sewer Use ByLaw - Storm Sewer Discharge - BL_0046_2022

L2 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010

Parameter	Units	RL	L1	L2	Result
Other (ORP)					
pH	No unit	0.05	9	10	7.04
Chromium VI	mg/L	0.0002	0.04		0.0003
Mercury (total)	mg/L	0.00001	0.0004	0.01	< 0.00001
PAHs					
Benzo(b+j)fluoranthene	mg/L	0.0001			< 0.0001
PCBs					
Polychlorinated Biphenyls (PCBs) - Total	µg/L	0.04	0.4	1	< 0.04
Phenols					
4AAP-Phenolics	mg/L	0.002	0.008	1	0.003
SVOCs					
di-n-Butyl Phthalate	mg/L	0.002		0.08	< 0.002
Bis(2-ethylhexyl)phthalate	mg/L	0.002		0.012	< 0.002
PAHs (Total)	mg/L		0.002		< 0.001
Perylene	mg/L	0.0005			< 0.0005

Client: Grounded Engineering Inc.
Project: 24-095-150, 2555 Erin Centre
Project Manager: James Wagner
Samplers: Michael Wong

MATRIX: WATER

Sample Number 9
Sample Name SW-UF-BH101
Sample Matrix Ground Water
Sample Date 11/07/2024

L1 = SANSEW / WATER / - - Mississauga Sewer Use ByLaw - Storm Sewer Discharge - BL_0046_2022

L2 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010

Parameter	Units	RL	L1	L2	Result
SVOCs - PAHs					
7Hdibenzo(c,g)carbazole	mg/L	0.0001			< 0.0001
Anthracene	mg/L	0.0001			< 0.0001
Benzo(a)anthracene	mg/L	0.0001			< 0.0001
Benzo(a)pyrene	mg/L	0.0001			< 0.0001
Benzo(e)pyrene	mg/L	0.0001			< 0.0001
Benzo(ghi)perylene	mg/L	0.0002			< 0.0002
Benzo(k)fluoranthene	mg/L	0.0001			< 0.0001
Chrysene	mg/L	0.0001			< 0.0001
Dibenzo(a,h)anthracene	mg/L	0.0001			< 0.0001
Dibenzo(a,i)pyrene	mg/L	0.0001			< 0.0001
Dibenzo(a,j)acridine	mg/L	0.0001			< 0.0001
Fluoranthene	mg/L	0.0001			< 0.0001
Indeno(1,2,3-cd)pyrene	mg/L	0.0002			< 0.0002
Phenanthrene	mg/L	0.0001			< 0.0001
Pyrene	mg/L	0.0001			< 0.0001

Client: Grounded Engineering Inc.
Project: 24-095-150, 2555 Erin Centre
Project Manager: James Wagner
Samplers: Michael Wong

MATRIX: WATER

Sample Number 9
Sample Name SW-UF-BH101
Sample Matrix Ground Water
Sample Date 11/07/2024

L1 = SANSEW / WATER / - - Mississauga Sewer Use ByLaw - Storm Sewer Discharge - BL_0046_2022

L2 = SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010

Parameter	Units	RL	L1	L2	Result
VOCs					
Chloroform	mg/L	0.0005		0.04	< 0.0005
1,2-Dichlorobenzene	mg/L	0.0005	0.0056	0.05	< 0.0005
1,4-Dichlorobenzene	mg/L	0.0005	0.0068	0.08	< 0.0005
cis-1,2-Dichloroethene	mg/L	0.0005		4	< 0.0005
trans-1,3-Dichloropropene	mg/L	0.0005		0.14	< 0.0005
Methylene Chloride	mg/L	0.0005		2	< 0.0005
1,1,2,2-Tetrachloroethane	mg/L	0.0005	0.017	1.4	< 0.0005
1,1,1,2-Tetrachloroethane	mg/L	0.0005	0.017		< 0.0005
Methyl ethyl ketone	mg/L	0.02		8	< 0.02
Styrene	mg/L	0.0005		0.2	< 0.0005
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	0.0044	1	< 0.0005
Trichloroethylene	mg/L	0.0005	0.0076	0.4	< 0.0005
VOCs - BTEX					
Benzene	mg/L	0.0005	0.002	0.01	< 0.0005
Ethylbenzene	mg/L	0.0005	0.002	0.16	< 0.0005
Toluene	mg/L	0.0005	0.002	0.27	< 0.0005
Xylene (total)	mg/L	0.0005	0.0044	1.4	< 0.0005
m-p-xylene	mg/L	0.0005			< 0.0005
o-xylene	mg/L	0.0005			< 0.0005

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	SANSEW / WATER / - - Mississauga Sewer Use ByLaw - Storm Sewer Discharge - BL_0046_2022 L1	SANSEW / WATER / - - Peel Sewer Use ByLaw - Sanitary Sewer Discharge - BL_53_2010 L2
SW-UF-BH101					
Total Suspended Solids	SM 2540D	mg/L	82	15	
Zinc	SM 3030/EPA 200.8	mg/L	0.516	0.2	
Biochemical Oxygen Demand (BOD5)	SM 5210	mg/L	24	15	

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 375.4 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphate	DIO8037-JUL24	mg/L	2	<2	ND	20	108	80	120	109	75	125

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0027-JUL24	mg/L	2	< 2	3	30	109	70	130	61	70	130

Chlorine

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-008

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Chlorine	EWL0276-JUL24	mg/L	0.02	< 0.02	ND	20	96	90	110	NA		

QC SUMMARY

Cyanide by SFA

Method: SM 4500 I Internal ref.: ME-CA-IENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Cyanide (total)	SKA0119-JUL24	mg/L	0.01	<0.01	ND	10	92	90	110	95	75	125

Fluoride by Specific Ion Electrode

Method: SM 4500 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-014

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Fluoride	EWL0312-JUL24	mg/L	0.06	<0.06	ND	10	103	90	110	117	75	125

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A I Internal ref.: ME-CA-IENVISKA-LAK-AN-012

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chromium VI	SKA0129-JUL24	mg/L	0.0002	<0.0002	0	20	98	80	120	93	75	125

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-[ENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0032-JUL24	mg/L	0.00001	< 0.00001	ND	20	107	80	120	120	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0117-JUL24	mg/L	0.00005	<0.00005	ND	20	104	90	110	97	70	130
Aluminum (total)	EMS0117-JUL24	mg/L	0.001	<0.001	0	20	96	90	110	108	70	130
Arsenic (total)	EMS0117-JUL24	mg/L	0.0002	<0.0002	3	20	95	90	110	95	70	130
Cadmium (total)	EMS0117-JUL24	mg/L	0.000003	<0.000003	11	20	97	90	110	106	70	130
Cobalt (total)	EMS0117-JUL24	mg/L	0.000004	<0.000004	0	20	92	90	110	96	70	130
Chromium (total)	EMS0117-JUL24	mg/L	0.00008	<0.00008	0	20	97	90	110	110	70	130
Copper (total)	EMS0117-JUL24	mg/L	0.001	<0.001	3	20	93	90	110	98	70	130
Manganese (total)	EMS0117-JUL24	mg/L	0.00001	<0.00001	2	20	94	90	110	96	70	130
Molybdenum (total)	EMS0117-JUL24	mg/L	0.0004	<0.0004	2	20	100	90	110	104	70	130
Nickel (total)	EMS0117-JUL24	mg/L	0.0001	<0.0001	3	20	96	90	110	98	70	130
Lead (total)	EMS0117-JUL24	mg/L	0.00009	<0.00009	5	20	99	90	110	101	70	130
Phosphorus (total)	EMS0117-JUL24	mg/L	0.003	<0.003	13	20	97	90	110	NV	70	130
Antimony (total)	EMS0117-JUL24	mg/L	0.0009	<0.0009	1	20	98	90	110	114	70	130
Selenium (total)	EMS0117-JUL24	mg/L	0.00004	<0.00004	3	20	94	90	110	97	70	130
Tin (total)	EMS0117-JUL24	mg/L	0.00006	<0.00006	5	20	101	90	110	NV	70	130
Titanium (total)	EMS0117-JUL24	mg/L	0.0001	<0.0001	5	20	100	90	110	NV	70	130
Zinc (total)	EMS0117-JUL24	mg/L	0.002	<0.002	10	20	95	90	110	119	70	130

QC SUMMARY

Microbiology

Method: SM 9222D | Internal ref.: ME-CA-IENVIMIC-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
E. Coli	BAC9238-JUL24	cfu/100mL	-	ACCEPTED	ACCEPTED							

Nonylphenol and Ethoxylates

Method: ASTM D7065-06 | Internal ref.: ME-CA-IENVIGC-LAK-AN-015

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nonylphenol diethoxylate	GCM0294-JUL24	mg/L	0.01	<0.01			91	55	120			
Nonylphenol Ethoxylates	GCM0294-JUL24	mg/L	0.01	<0.01								
Nonylphenol monoethoxylate	GCM0294-JUL24	mg/L	0.01	<0.01			89	55	120			
Nonylphenol	GCM0294-JUL24	mg/L	0.001	<0.001			84	55	120			

QC SUMMARY

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (total)	GCM0293-JUL24	mg/L	2	<2	NSS	20	105	75	125			

Oil & Grease-AV/MS

Method: MOE E3401/SM 5520F | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (animal/vegetable)	GCM0293-JUL24	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0293-JUL24	mg/L	4	< 4	NSS	20	NA	70	130			

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0282-JUL24	No unit	0.05	NA	0		100			NA		

QC SUMMARY

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-[ENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0132-JUL24	mg/L	0.002	<0.002	ND	10	99	80	120	100	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A | Internal ref.: ME-CA-[ENVIGC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Polychlorinated Biphenyls (PCBs) - Total	GCM0233-JUL24	ug/L	0.04	< 0.04	NSS	30	94	60	140	NSS	60	140

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
7Hdibenzo(c,g)carbazole	GCM0274-JUL24	mg/L	0.0001	< 0.0001	NSS	30	89	50	140	NSS	50	140
Anthracene	GCM0274-JUL24	mg/L	0.0001	< 0.0001	NSS	30	82	50	140	NSS	50	140
Benzo(a)anthracene	GCM0274-JUL24	mg/L	0.0001	< 0.0001	NSS	30	89	50	140	NSS	50	140
Benzo(a)pyrene	GCM0274-JUL24	mg/L	0.0001	< 0.0001	NSS	30	90	50	140	NSS	50	140
Benzo(b+j)fluoranthene	GCM0274-JUL24	mg/L	0.0001	< 0.0001	NSS	30	95	50	140	NSS	50	140
Benzo(e)pyrene	GCM0274-JUL24	mg/L	0.0001	< 0.0001	NSS	30	87	50	140	NSS	50	140
Benzo(ghi)perylene	GCM0274-JUL24	mg/L	0.0002	< 0.0002	NSS	30	89	50	140	NSS	50	140
Benzo(k)fluoranthene	GCM0274-JUL24	mg/L	0.0001	< 0.0001	NSS	30	91	50	140	NSS	50	140
Bis(2-ethylhexyl)phthalate	GCM0274-JUL24	mg/L	0.002	< 0.002	NSS	30	96	50	140	NSS	50	140
Chrysene	GCM0274-JUL24	mg/L	0.0001	< 0.0001	NSS	30	88	50	140	NSS	50	140
di-n-Butyl Phthalate	GCM0274-JUL24	mg/L	0.002	< 0.002	NSS	30	93	50	140	NSS	50	140
Dibenzo(a,h)anthracene	GCM0274-JUL24	mg/L	0.0001	< 0.0001	NSS	30	87	50	140	NSS	50	140
Dibenzo(a,i)pyrene	GCM0274-JUL24	mg/L	0.0001	< 0.0001	NSS	30	87	50	140	NSS	50	140
Dibenzo(a,j)acridine	GCM0274-JUL24	mg/L	0.0001	< 0.0001	NSS	30	89	50	140	NSS	50	140
Fluoranthene	GCM0274-JUL24	mg/L	0.0001	< 0.0001	NSS	30	88	50	140	NSS	50	140
Indeno(1,2,3-cd)pyrene	GCM0274-JUL24	mg/L	0.0002	< 0.0002	NSS	30	88	50	140	NSS	50	140
Perylene	GCM0274-JUL24	mg/L	0.0005	< 0.0005	NSS	30	84	50	140	NSS	50	140
Phenanthrene	GCM0274-JUL24	mg/L	0.0001	< 0.0001	NSS	30	84	50	140	NSS	50	140
Pyrene	GCM0274-JUL24	mg/L	0.0001	< 0.0001	NSS	30	86	50	140	NSS	50	140

QC SUMMARY

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0300-JUL24	mg/L	2	< 2	0	10	106	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0162-JUL24	as N mg/L	25	<0.5	ND	10	100	90	110	95	75	125

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,1,2-Tetrachloroethane	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	93	60	130	91	50	140
1,1,2,2-Tetrachloroethane	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	100	60	130	98	50	140
1,2-Dichlorobenzene	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	99	60	130	97	50	140
1,4-Dichlorobenzene	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	99	60	130	96	50	140
Benzene	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	103	60	130	100	50	140
Chloroform	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	99	60	130	99	50	140
cis-1,2-Dichloroethene	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	100	60	130	99	50	140
Ethylbenzene	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	98	60	130	96	50	140
m-p-xylene	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	97	60	130	95	50	140
Methyl ethyl ketone	GCM0244-JUL24	mg/L	0.02	<0.02	ND	30	100	50	140	99	50	140
Methylene Chloride	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	100	60	130	97	50	140
o-xylene	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	93	60	130	91	50	140
Styrene	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	99	60	130	97	50	140
Tetrachloroethylene (perchloroethylene)	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	100	60	130	99	50	140
Toluene	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	99	60	130	98	50	140
trans-1,3-Dichloropropene	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	95	60	130	96	50	140
Trichloroethylene	GCM0244-JUL24	mg/L	0.0005	<0.0005	ND	30	97	60	130	96	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.
RL Reporting Limit.
↑ Reporting limit raised.
↓ Reporting limit lowered.
NA The sample was not analysed for this analyte
ND Non Detect

Results relate only to the sample tested.
Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.
"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.
Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

No: 039124

Page 1 of 1

SGS Industries & Environment - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

Laboratory Information Section - Lab use only

Received By: R. Cano
Received Date: 07 / 12 / 24 (mm/dd/yy)
Received Time: 18 : 00 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☐ No ☐
Custody Seal Intact: Yes ☐ No ☐
Cooling Agent Present: ~~Yes~~ ☐ No ☐ Type: ICE
Temperature Upon Receipt (°C) 7.7.7
LAB LIMS #: CA40117-JUL24 AMC

REPORT INFORMATION

Company: GROUNDED ENGINEERING
Contact: JAMES WAGNER
Address: 1 BANIGAN DR TORONTO, ON
Phone: 647 264 0042
Fax:
Email: jwagner@groundedeng.ca

INVOICE INFORMATION

☑ (same as Report Information)
Company:
Contact:
Address:
Phone:
Email:

Quotation #: P.O. #:
Project #: 24-095-150 Site Location/ID: 2555 ERIN CENTRE

TURNAROUND TIME (TAT) REQUIRED

☑ Regular TAT (5-7days)
TAT's are quoted in business days (exclude statutory holidays & weekends).
Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:
*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture: ☐ Coarse
☐ Table 2 ☐ Ind/Com ☐ Medium/Fine
☐ Table 3 ☐ Agri/Other
☐ Table _____ Appx. _____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA _____
☐ ODWS Not Reportable *See note

Sewer By-Law:
☑ Sanitary
☑ Storm
Municipality: Please see special instructions

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	M & I: Field Filtered (Y/N)	M & I: Metals & Inorganics (Incl CrVI, CN, Hg pH,(B(HWS),EC,SAR–soil) (Cl, Na-water)	M & I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI	M & I: ICP Metals only Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Tl,U,V,Zn	SVOC: PAHs only	SVOC: SVOCs all incl PAHs, ABNs, CPs	PCB: PCBs Total ☐ Aroclor ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only no BTEX	VOC: VOCs all incl BTEX	VOC: BTEX only	Pest: Pesticides Organochlorine or specify other	Other (please specify)	Other (please specify)	Other (please specify)	Other (please specify)	Other (please specify)	SPLP: Specify tests	TCLP: Specify tests	COMMENTS:
																					Sewer Use: X Specify pkg: MISS STORM / PEEL SANI	Water Characterization Pkg ☐ General ☐ Extended	☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN	☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.	
1	SW-UF-BH101	2024/07/11	12:00	21	GW	N															X				
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions: MISSISSAUGA STORM / REGION OF PEEL SANITARY

Sampled By (NAME): Michell Wong Signature: Michell Date: ~~2007~~ 11 / 24 (mm/dd/yy)
Relinquished by (NAME): Michell Wong Signature: Michell Date: 07 / 11 / 24 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.7
Date of Issue: 07 JUNE 2023

APPENDIX G

Material Name	Color	KS (m/s)
Fill		0.0001
Glacial Till		2.1e-07
Weathered Bedrock		2.2e-07
Sound Bedrock		6e-08

Short Term - Pile and Lagging

Excavation Dimensions: 76.0 (N-S) m x 140.0 (E-W) m
Section Cut: N-S

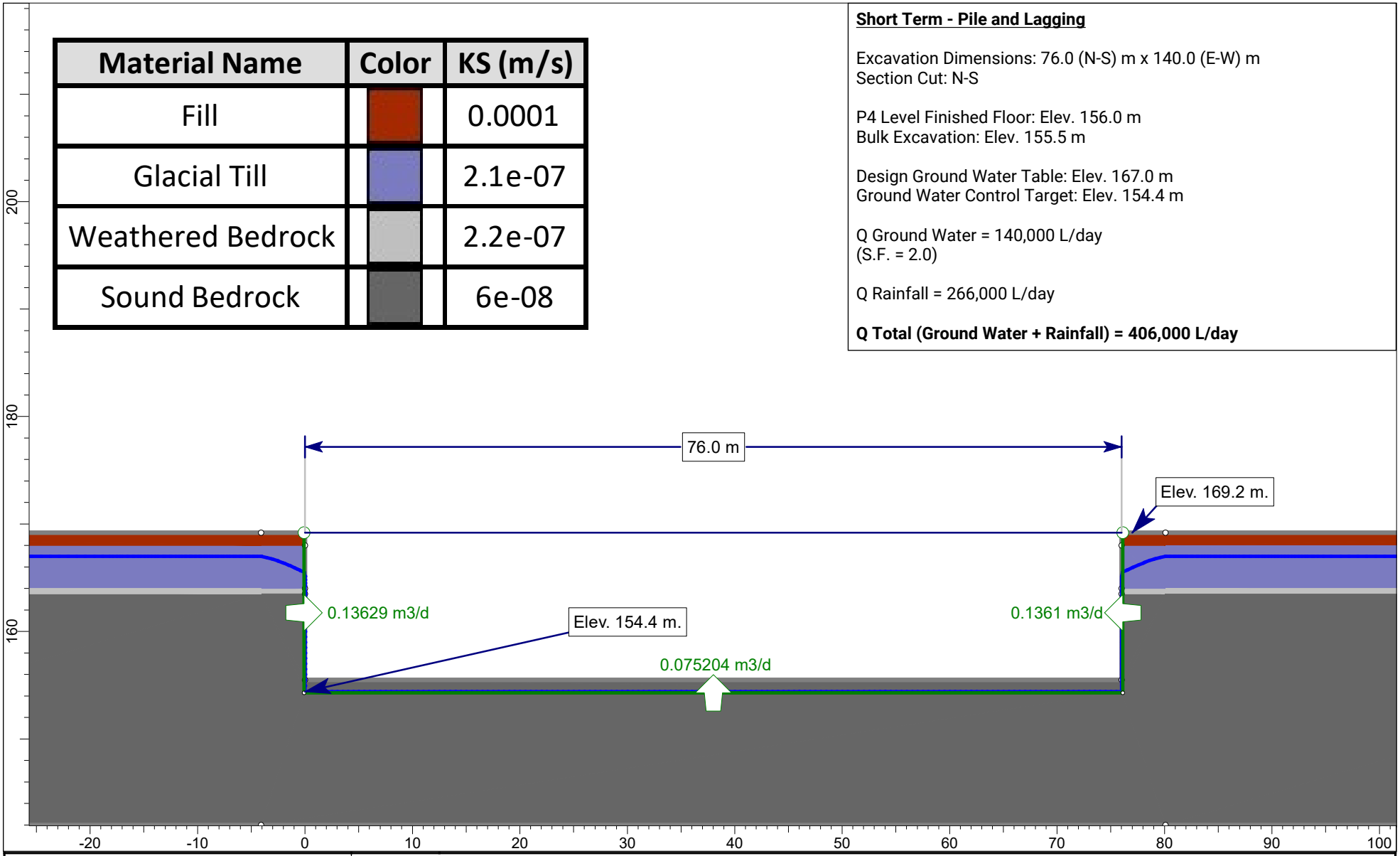
P4 Level Finished Floor: Elev. 156.0 m
Bulk Excavation: Elev. 155.5 m

Design Ground Water Table: Elev. 167.0 m
Ground Water Control Target: Elev. 154.4 m

Q Ground Water = 140,000 L/day
(S.F. = 2.0)

Q Rainfall = 266,000 L/day

Q Total (Ground Water + Rainfall) = 406,000 L/day



GROUNDED ENGINEERING

File	2555 Erin Centre			
Analysis	FEM: zoi 4.1m, Short Term- Pile and Lagging			
Ref.				
RS2 File	24-095 FEM.slmd	Scale	1:500	Eng JAW

SLIDEINTERPRET 9.034

Material Name	Color	KS (m/s)
Fill		0.0001
Glacial Till		2.1e-07
Weathered Bedrock		2.2e-07
Sound Bedrock		6e-08

Long Term - Pile and Lagging

Excavation Dimensions: 76.0 (N-S) m x 140.0 (E-W) m
Section Cut: N-S

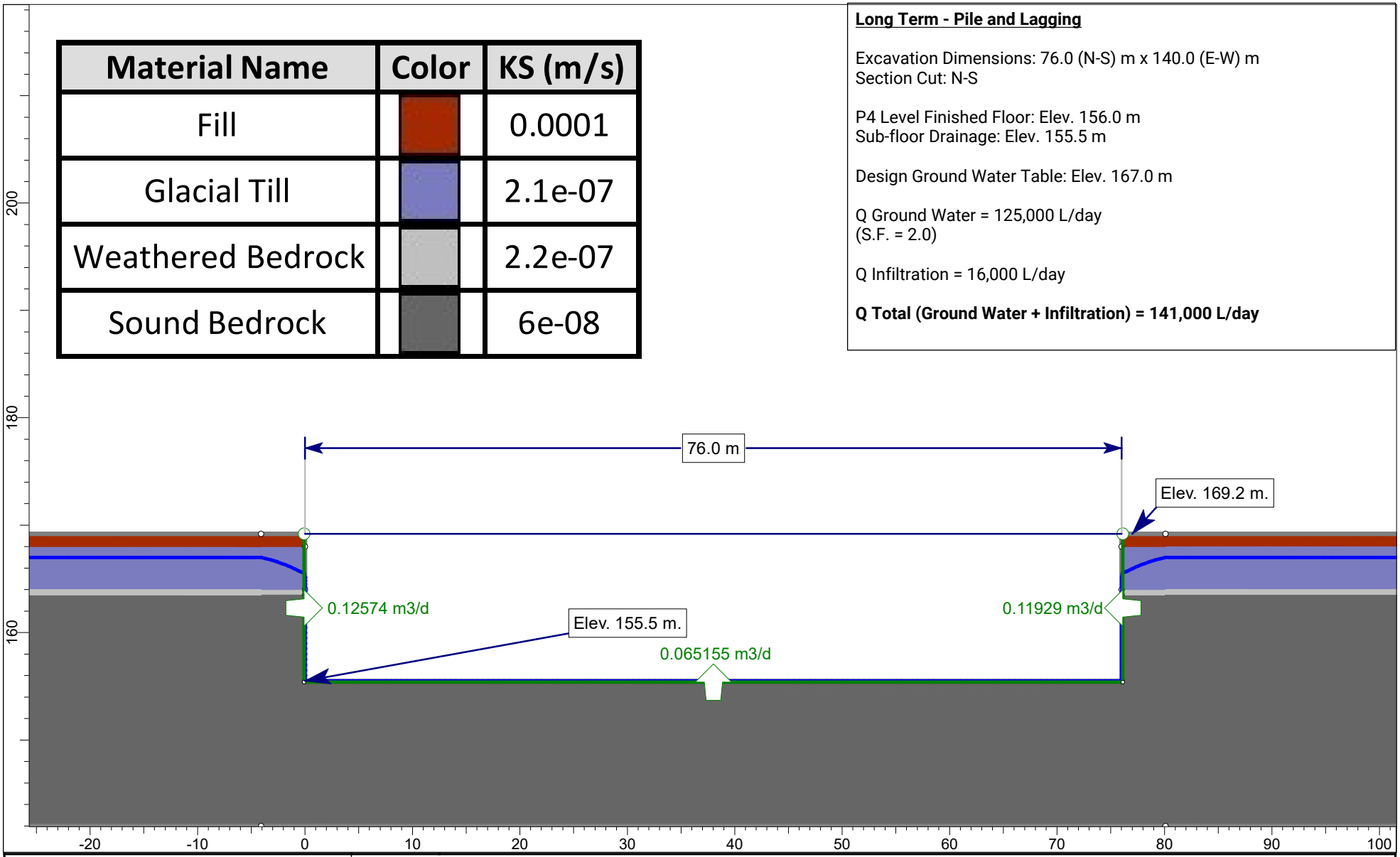
P4 Level Finished Floor: Elev. 156.0 m
Sub-floor Drainage: Elev. 155.5 m

Design Ground Water Table: Elev. 167.0 m

Q Ground Water = 125,000 L/day
(S.F. = 2.0)

Q Infiltration = 16,000 L/day

Q Total (Ground Water + Infiltration) = 141,000 L/day



GROUNDED ENGINEERING

File	2555 Erin Centre			
Analysis	FEM: zoi 4.1m, Long Term - Pile and Lagging			
Ref.				
RS2 File	24-095 FEM.slmd	Scale	1:500	Eng JAW

SLIDEINTERPRET 9.034

APPENDIX H

SHORT TERM - PILE & LAGGING

Excavation Dimensions [m]	
N-S	76
E-W	140
Area (m2)	10640
Perimeter (m)	432

Rainfall Data		
Year	2	100
Hour	3	12
Depth (mm)	25	94
Depth (m)	0.025	0.094

Section		Flow [m3/day]	Length [m]	Volume [L/day]
Base		0.075204	140	10,529
Sides		0.136195	432	58,836
				-
Total				69,365
Factor of Safety	2.0			138,730

Storm Events	
2 Year [L/day]	100 Year [L/day]
266,000	1,001,000

Summary	L/day	L/min
Groundwater	140,000	97.2
Rainfall	266,000	184.7
Total	406,000	281.9

LONG TERM - PILE & LAGGING

Excavation Dimensions [m]	
N-S	76
E-W	140
Area (m2)	10640
Perimeter (m)	432

Rainfall Data		
Year	2	100
Hour	3	12
Depth (mm)	25	94
Depth (m)	0.025	0.094

Section		Flow [m3/day]	Length [m]	Volume [L/day]
Base		0.065155	140	9,122
Sides		0.122515	432	52,926
				-
Total				62,048
Factor of Safety	2.0			124,096

Infiltration [L/day]
15202.5

Summary	L/day	L/min
Groundwater	125,000	86.8
Infiltration	16,000	11.1
Total	141,000	97.9