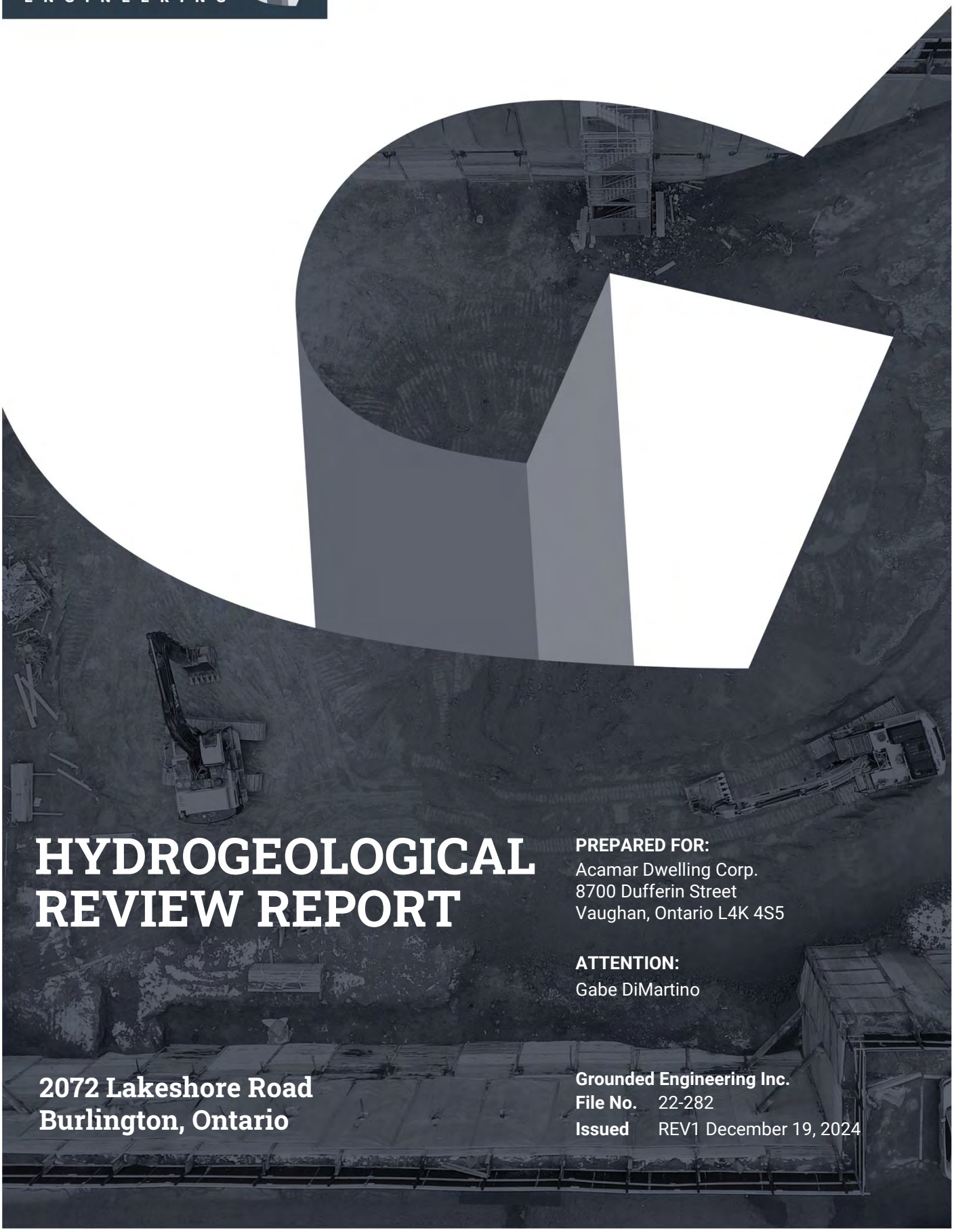


HYDROGEOLOGICAL REVIEW REPORT

PREPARED FOR:
Acamar Dwelling Corp.
8700 Dufferin Street
Vaughan, Ontario L4K 4S5

ATTENTION:
Gabe DiMartino

2072 Lakeshore Road
Burlington, Ontario

Grounded Engineering Inc.
File No. 22-282
Issued REV1 December 19, 2024

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Executive Summary

Grounded Engineering Inc. (Grounded) was retained by Acamar Dwelling Corp. to conduct a Hydrogeological Review for the proposed redevelopment of 2072 Lakeshore Road in Burlington, Ontario (site). Revision 1 of this report includes the following changes:

- Reduction in tower height (currently at 20-storeys), and deepening of P7 level lowest FFE (currently at Elev. 58.4± m).
- Additional boreholes (Boreholes 201 to 206) advanced on site for environmental engineering purposes and additional long-term groundwater level monitoring.

The conclusions of the investigation are summarized as follows:

Site Information

Existing Development

Site	Above Grade Levels	Below Grade Levels		
		Level #	Lowest Finished Floor	
			Depth (m)	Elevation (masl)
2072 Lakeshore Road, Burlington	1	n/a	n/a	n/a

Proposed Development

Site	Above Grade Levels	Below Grade Levels			
		Level #	Lowest Finished Floor		Approximate Base of Foundations (masl)
			Depth (m)	Elevation (masl)	
2072 Lakeshore Road, Burlington	20	P7	24.5	58.4	57.4

Site Conditions

Site Stratigraphy

Stratum/Formation	Depth Range (mbgs)	Elevation Range (masl)	Hydraulic Conductivity (m/s)	Method
Earth Fill	0.0 to 2.0	82.5 to 80.5	1.0×10^{-4}	Literature
Native Glacial Till	2.0 to 3.5	80.5 to 79.0	1.0×10^{-7}	Literature
Weathered Bedrock	3.5 to 4.5	79.0 to 78.0	1.0×10^{-7}	Literature
Sound Bedrock	Below 4.5	Below 78.0	7.7×10^{-7}*	Slug Test

*Considering a K2 to K1 ratio of 0.1 for sound bedrock.

**A hydraulic conductivity of 4.3×10^{-6} m/s is considered for sound bedrock with fractures, which will produce more free-flowing water.

Groundwater Elevation

Design Groundwater Elevation (masl)	**Elev. 75± m**

Groundwater Quality				
Sample ID	**Sample Date**	**Sample Expiry Date**	**Halton Storm Sewer Limits**	**Halton Sanitary Sewer Limits**
BH103 SWE	Mar 21, 2023	Dec 21, 2023	Meets	Meets

Groundwater Control

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**
37,800	26,275	5,500	5,500,000	4,900	4,900,000

Short Term (Construction) Steady State Groundwater Quantity – Safety Factor of 2.0 Used					
Estimated Groundwater Seepage		**Design Rainfall Event (25mm)**		**Estimated Total Daily Water Takings**	
L/day	**L/min**	**L/day**	**L/min**	**L/day**	**L/min**
255,000	177.1	39,000	27.1	294,000	204.2

Long Term (Permanent) Steady State Groundwater Quantity – Safety Factor of 2.0 Used					
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**
245,000	170.1	1,000	0.7	246,000	170.8

Land Stability		
	Short Term (Construction)	**Long Term (Permanent)**
Maximum Zone of Influence (m)	Negligible	Negligible
Maximum Potential Settlement (mm)	<2	<2

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)	Not Required
Short Term Discharge Agreement	Required
Long Term Discharge Agreement	Required

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Appendix F – Finite Element Model
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1 Introduction

Acamar Dwelling Corp. has retained Grounded Engineering Inc. ("Grounded") to provide hydrogeological engineering design advice for their proposed development at 2072 Lakeshore Road, in Burlington, Ontario. Revision 1 of this report includes the following changes:

- Reduction in tower height (currently at 20-storeys), and deepening of P7 level lowest FFE (currently at Elev. 58.4± m).
- Additional boreholes (Boreholes 201 to 206) advanced on site for environmental engineering purposes, and additional long-term groundwater level monitoring.

Property Information	
Location of Site	2072 Lakeshore Road, Burlington, Ontario L7R 1E3
Ownership of Site	Acamar Dwelling Corp.
Site Dimensions (m)	27.1±m (N-S) x 56.7± m (W-E) (Irregular)
Site Area (m^2)	1,533 m^2

Existing Development	
Number of Building Structures	One (1)
Number of Above Grade Levels	One (1)
Number of Underground Levels	n/a
Sub-Grade Depth of Development (m)	n/a
Sub-Grade Area (m^2)	n/a
Land Use Classification	Commercial

Proposed Development	
Number of Building Structures	One (1)
Number of Above Grade Levels	20-storeys
Number of Underground Levels	P7
Sub-Grade Depth of Development (m)	24.5± m
Sub-Grade Area (m^2)	1,390 ± m^2
Land Use Classification	Mixed-Use Residential and Commercial

Qualified Person and Hydrogeological Review Information	
Qualified Person	Matt Bielaski, P.Eng., $QP_{ESA/RA}$
Consulting Firm	Grounded Engineering Inc.
Date of Hydrogeological Review	REV1 December 19, 2024
Scope of Work	▪ Review of MECP Water Well Records for the area ▪ Review of geological information for the area ▪ Review of topographic information for the area ▪ Advancement of thirteen (13) boreholes to a maximum depth of 27.9 m, which were instrumented with 9 monitoring wells. o The additional 200 series boreholes drilled in June 2024 were mainly for environmental purposes ▪ Three (3) boreholes by the previous consultant (Pinchin) were advanced at the site to a maximum depth of 4.6 m, and were instrumented with 3 monitoring wells. The boreholes/monitoring wells are relied upon for stratigraphy, groundwater levels and monitoring well construction data. ▪ Completion of slug tests in selected available monitoring wells ▪ Groundwater elevation monitoring for three (3) months on a monthly basis ▪ Additional groundwater elevation measurements completed between initial report issue and revision 1 ▪ Groundwater sampling and analysis to the Region of Halton Sewer 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 82.5 masl.
Local Physiographic Features	The site is composed of a native clayey silt glacial till overlying bedrock of the Queenston Formation.
Regional Physiographic Features	The West St Lawrence Lowland consists of a limestone plain (elevation 200–250 masl) that is separated by a broad, shale lowland from a broader dolomite and limestone plateau west of Lake Ontario. This plateau is bounded by the Niagara Escarpment. From the escarpment the plateau slopes gently southwest to lakes Huron and Erie (elevation 173 masl). Glaciation has mantled this region with several layers of glacial till (i.e., an unsorted mixture of clay, sand, etc.), the youngest forming extensive, undulating till plains, often enclosing rolling drumlin fields.
Watershed	The site is located within the Lower Rambo Creek Watershed. Locally, groundwater is anticipated to flow southeast towards Lake Ontario.

General Hydrogeological Characterization	
Surface Drainage	Surface water is expected to flow towards municipal catch basins located on or adjacent to the site, via Lakeshore Road to the North, Old Lakeshore Road to the south and east, and Pearl Street to the west.

2 Study Area Map

A map has been enclosed which shows the following information:

- All monitoring wells identified on site
- All monitoring wells identified off site 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
Earth Fill	0.0 to 2.0	82.5 to 80.5	1.0×10^{-4}	Literature
Native Glacial Till	2.0 to 3.5	80.5 to 79.0	1.0×10^{-7}	Literature
Weathered Bedrock	3.5 to 4.5	79.0 to 78.0	1.0×10^{-7}	Literature
Sound Bedrock	Below 4.5	Below 78.0	$7.7 \times 10^{-7*}$	Slug Test

*Considering a K2 to K1 ratio of 0.1 for sound bedrock.
**A hydraulic conductivity of 4.3×10^{-6} m/s is considered for sound bedrock with fractures, which will produce more free-flowing water.

Surface Water

Surface Water Body	Distance from site (m)	Direction from site	Hydraulically Connected to Site (yes/no)
Lake Ontario	110	South	Yes

4 Monitoring Well Information

Well ID	Well Diameter (mm)	Ground Surface (masl)	Top of Screen (masl)	Bottom of Screen (masl)	Screened Geological Unit
101	50	82.6	58.1	55.0	Sound Bedrock
102	50	82.4	77.8	74.8	Sound Bedrock
103	50	82.3	57.7	54.6	Sound Bedrock
104	50	82.8	76.1	73.1	Sound Bedrock
105	50	82.5	77.6	74.6	Sound Bedrock
106	50	82.5	77.6	74.6	Sound Bedrock
107	50	82.3	75.9	72.8	Sound Bedrock
201	50	82.5	75.6	72.6	Inferred Bedrock
202	50	82.5	75.5	72.5	Inferred Bedrock
PIN-MW01	50	82.4	80.9	77.8	Sand, Silt and Inferred Bedrock
PIN-MW02	50	82.5	81.0	78.0	Sand, Silt and Inferred Bedrock
PIN-MW03	50	82.5	80.9	77.9	Sand, Silt and Inferred Bedrock

5 Groundwater Elevations

Well ID	Groundwater Elevation (masl)								
	Mar 20, 2023	Apr 3, 2203	May 5, 2023	Jun 9, 2023	Jul 3, 2024	Jul 11, 2024	Jul 24, 2024	Dec 10, 2024	Maximum
101	10.2 / 72.4	9.9 / 72.7	*	10.1 / 72.5	*	*	*	17.2 / 65.4	**72.5**
102	Dry	Dry	Dry	Dry	*	*	*	Dry	**Dry**
103	10.4 / 71.9	10.1 / 72.2	9.0 / 73.3	9.2 / 73.1	*	*	*	17.7 / 64.6	**73.1**
104	5.4 / 77.4	5.5 / 77.3	5.7 / 77.1	5.8 / 77.0	*	*	*	7.2 / 75.6	**77.4**
105	Dry	Dry	Dry	Dry	*	*	*	Dry	**Dry**
106	7.8 / 74.7	7.8 / 74.7	7.8 / 74.7	7.8 / 74.7	*	*	*	7.8 / 74.7	**74.7**
107	8.9 / 73.4	8.7 / 73.6	8.6 / 73.7	8.7 / 73.6	*	*	*	9.1 / 73.2	**73.7**
201	*	*	*	*	Dry	9.4 / 73.1	Dry	9.1 / 73.4	**73.4**
202	*	*	*	*	9.0 / 73.5	8.9 / 73.6	8.9 / 73.6	9.3 / 73.2	**73.6**

Well ID	Groundwater Elevation (masl)								
	Mar 20, 2023	Apr 3, 2203	May 5, 2023	Jun 9, 2023	Jul 3, 2024	Jul 11, 2024	Jul 24, 2024	Dec 10, 2024	Maximum
PIN-MW01	*	*	*	*	1.5 / 80.9	*	*	1.8 / 80.6	**80.9**
PIN-MW02	*	*	*	*	*	*	*	2.2 / 80.3	**80.3**
PIN-MW03	1.4 / 81.1	*	*	Dry	1.7 / 80.8	*	*	2.0 / 80.5	**81.1**

*No water level taken due to nonexistent or inaccessible monitoring well.

The design groundwater table is hydraulically connected with the water level of Lake Ontario, at about Elev. 75± m. There is also infiltrated stormwater perched in the earth fill which is flowing down towards the groundwater table (as observed and previously reported in the Pinchin monitoring wells).

Locally higher water level readings (at Elev. 77± m) were observed in Borehole 104, which was completed in the north corner of the site. These higher water level readings are considered not representative of the stabilized groundwater condition across the site.

Within the zone of excavation, the earth fill will permit the free-flow of water when wet, whereas the native clayey silt glacial till will typically preclude free-flowing water. It can be expected that weathered bedrock and fractures in sound bedrock will produce free-flowing water below the groundwater table.

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

6 Aquifer Testing

6.1 Pumping Test

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

6.2 Single Well Response Test (Slug Test)

The hydraulic conductivities from the selected 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	58.1 - 55.0	Sound Bedrock	3.8×10^{-7}
BH102	77.8 - 74.7	Sound Bedrock	3.0×10^{-7}
BH103	57.7 - 54.6	Sound Bedrock	4.3×10^{-6}
BH104	76.1 - 73.1	Sound Bedrock	2.8×10^{-7}
BH105	77.6 - 74.5	Sound Bedrock	1.9×10^{-6}
BH106	77.6 - 74.6	Sound Bedrock	4.5×10^{-7}

6.3 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)
BH102 SS4	Silt and Sand Glacial Till, some gravel, some clay	Sauerbrei, Barr, Alyamani and Sen	5.7×10^{-8}
BH103 SS4	Sandy Silt Glacial Till, some clay, some gravel	Sauerbrei, Barr, Alyamani and Sen	1.1×10^{-8}
BH104 SS4	Sandy Silt Glacial Till, some clay, trace gravel	Sauerbrei, Barr, Alyamani and Sen	8.2×10^{-9}

The results of the analyses are presented in Appendix D.

6.4 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}

Stratum/Formation	Hydraulic Conductivity (m/s)
Sands	10^{-2} to 10^{-7}
Silts	10^{-5} to 10^{-9}
Glacial Tills	10^{-6} to 10^{-12}
Bedrock (Shale)	10^{-6} to 10^{-13}

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 Borehole 103 on March 21, 2023. The sample was analyzed for the following parameters:

- Halton Sewer Discharge By-Law for Sanitary & Combined Discharge (2-03)
- Halton Sewer Discharge By-Law for Storm Discharge (2-03)

The groundwater sample **met** the **Limits for Storm Sewer Discharge** for all parameters analyzed.

The groundwater sample **met** the **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 stabilized groundwater table is hydraulically connected to Lake Ontario at about Elev. 75± m. The lowest (P7) FFE is at about Elev. 58.4± m. Therefore,

- Bulk excavation will extend through the overburden soils and weathered bedrock, and penetrate into sound bedrock below the elevation of the design groundwater table.
- Foundation excavations will extend below the design groundwater table.
- Foundation excavations will penetrate sound bedrock, which will typically preclude free-flowing water; however, it can be expected that fractures in the sound bedrock will produce free-flowing water below the groundwater table.

The proposed shoring at the site may consist of conventional soldier piling and lagging.

The design groundwater table is hydraulically connected with the water level of Lake Ontario, at about Elev. 75± m. There is also infiltrated stormwater perched in the earth fill which is flowing down towards the groundwater table (as observed and previously reported in the Pinchin monitoring wells).

Within the zone of excavation, the earth fill will permit the free-flow of water when wet, whereas the native clayey silt glacial till will typically preclude free-flowing water. It can be expected that weathered bedrock and fractures in sound bedrock will produce free-flowing water below 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.

Positive dewatering of the bedrock is not required.

The City / Region will require a Discharge Agreement in the short term, if any water is to be discharged to the storm or sanitary sewers during construction.

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 1390± 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.

If the proposed development is designed as a watertight structure, then a private water drainage system will not be required. However, the structure must then be designed to resist hydrostatic pressure and uplift forces.

10 Groundwater Extraction and Discharge

Numerical analyses were conducted for both short term and long term dewatering scenarios, by finite element modelling using the Slide2 software package by Rocscience. 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, which have been provided, 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.

Please note that if 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 145,000 L.

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

- A Factor of Safety of 2.0 was used for all groundwater seepage volume calculations.
- The design hydraulic conductivities for the site are:

Design Hydraulic Conductivity	
Stratum/Formation	**K (m/s)**
Earth Fill	1.0×10^{-4}
Native Glacial Till	1.0×10^{-7}
Weathered Bedrock	1.0×10^{-7}
Sound Bedrock	7.7×10^{-7}*

*Considering a K2 to K1 ratio of 0.1 for sound bedrock.
**A hydraulic conductivity of 4.3×10^{-6} m/s is considered for sound bedrock with fractures, which will produce more free-flowing water.

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**
37,800	26,275	5,500	5,500,000	4,900	4,900,000

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

Short Term (Construction) Steady State Groundwater Quantity – Safety Factor of 2.0 Used					
Estimated Groundwater Seepage		Design Rainfall Event (25mm)		Estimated Total Daily Water Takings	
L/day	L/min	L/day	L/min	L/day	L/min
255,000	177.1	39,000	27.1	294,000	204.2

Long Term (Permanent) Steady State Groundwater Quantity – Safety Factor of 2.0 Used					
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
245,000	170.1	1,000	0.7	246,000	170.8

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)	Not Required
Short Term Discharge Agreement	Required
Long Term Discharge Agreement	Required

The city/municipality 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:

- After controlling groundwater during construction (sumps and pumps), it is anticipated that the groundwater table will rise to the elevation of the subfloor drainage system in the event of a drained structure.
- 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 or 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 (ZOI)

The Zone of Influence (ZOI) with respect to groundwater was calculated based on the estimated groundwater taking rate and the hydraulic conductivity of the unit which water will be taken at the Site.

As positive dewatering of the bedrock is not required, a ZOI with respect to groundwater seepage at the site is expected to be negligible.

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)	17.7	17.1
Increase in Effective Stress (kPa)	170	170
Maximum Theoretical Settlement due to Dewatering (mm)	<2	<2
Public Realm Theoretical Settlement due to Dewatering (mm)	<2	<2

The theoretical maximum induced settlement 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 met the Limits for Storm Sewer Discharge and met the Limits for Sanitary and Combined Sewer Discharge.

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

11.4 Natural Environment

There are no natural waterbodies within the ZOI that will 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 Burlington. 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 Burlington. 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/bedrock, 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.

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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, B.A.Sc.
Project Coordinator



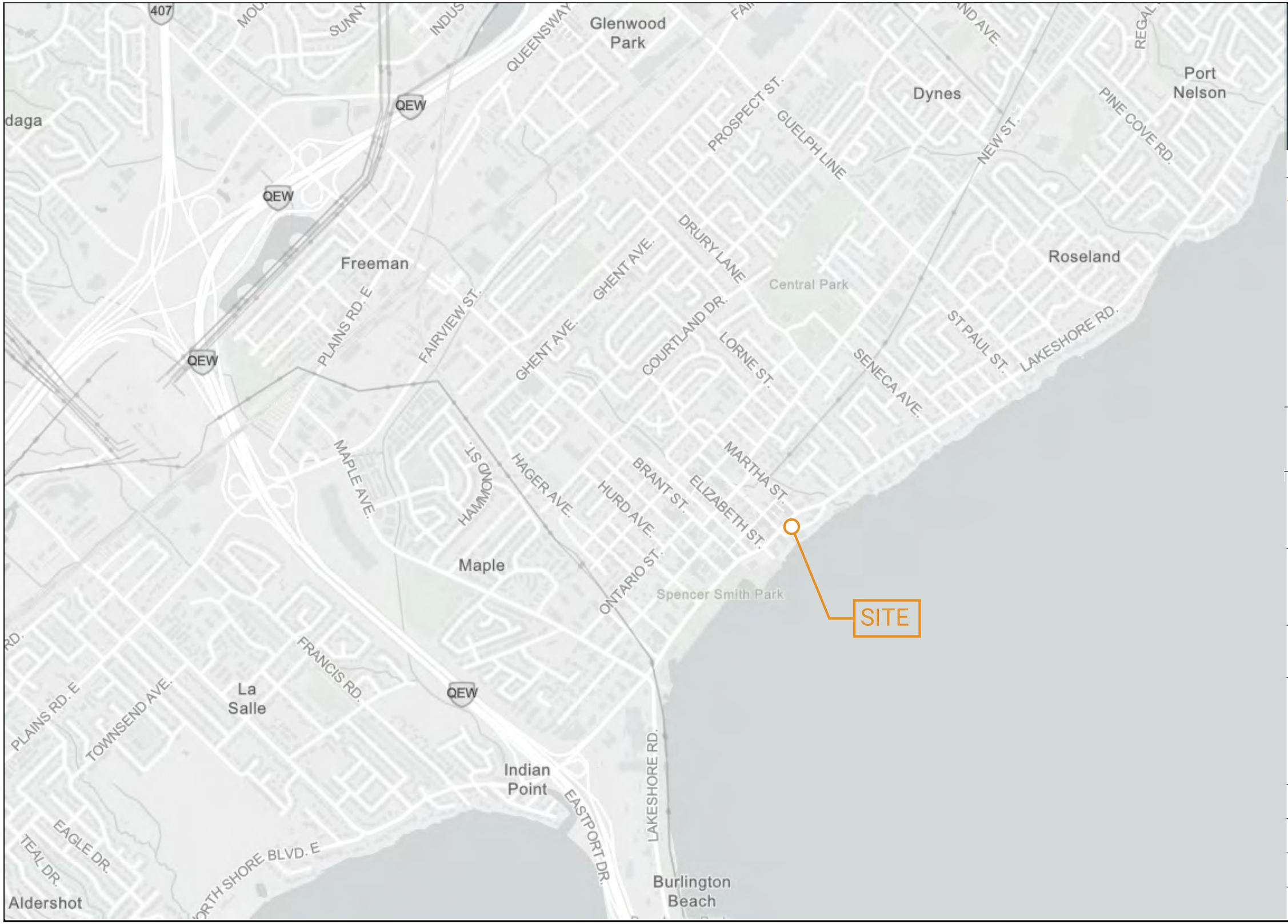
Nick Ng, P.Eng.
Team Lead



Matt Bielaski, P.Eng., $QP_{ESA/RA}$
Principal

FIGURES





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1 BANIGAN DRIVE, TORONTO, ONT., M4H 1G3
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LEGEND

APPROXIMATE PROPERTY BOUNDARY

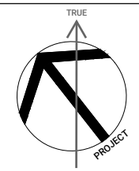
Note

Reference
ArcGIS My Map 2024.

Project
2072 LAKESHORE ROAD BURLINGTON, ONTARIO

Figure Title
SITE LOCATION PLAN

North



Date
DECEMBER 2024

Scale
N.T.S

Job No
22-282

Figure No
FIGURE 1



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LEGEND

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

Note

Reference

ArcGIS My Map 2024.

Project

2072 LAKESHORE ROAD BURLINGTON, ONTARIO

Figure Title

STUDY AREA

North

TRUE PROJECT

Date

DECEMBER 2024

Scale

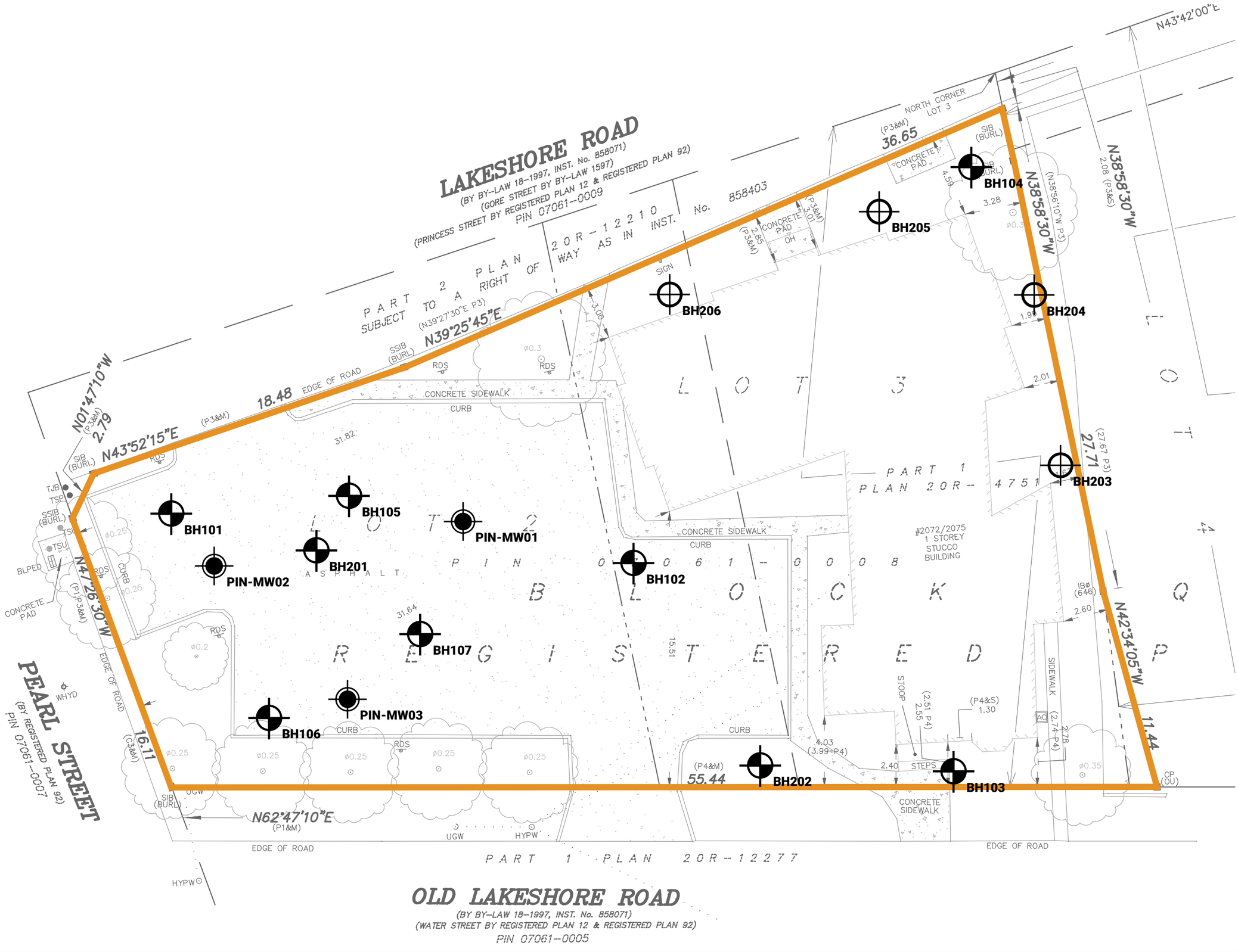
N.T.S

Job No

22-282

Figure No

FIGURE 2



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LEGEND

- APPROXIMATE SITE BOUNDARY
- MONITORING WELL/BOREHOLE BY GROUNDED
- MONITORING WELL/BOREHOLE BY OTHERS

Note

Reference

Topographic Survey, "Plan of Survey of Part of Lots 2, 3 and 4, Registered Plan 92, City of Burlington", Project No. 19-002, dated February 15, 2019, prepared by Mackay Mackay and Peters Limited.

Project

2072 LAKESHORE ROAD BURLINGTON, ONTARIO

Figure Title

BOREHOLE LOCATION PLAN (EXISTING CONDITION)

North

Date

DECEMBER 2024

Scale

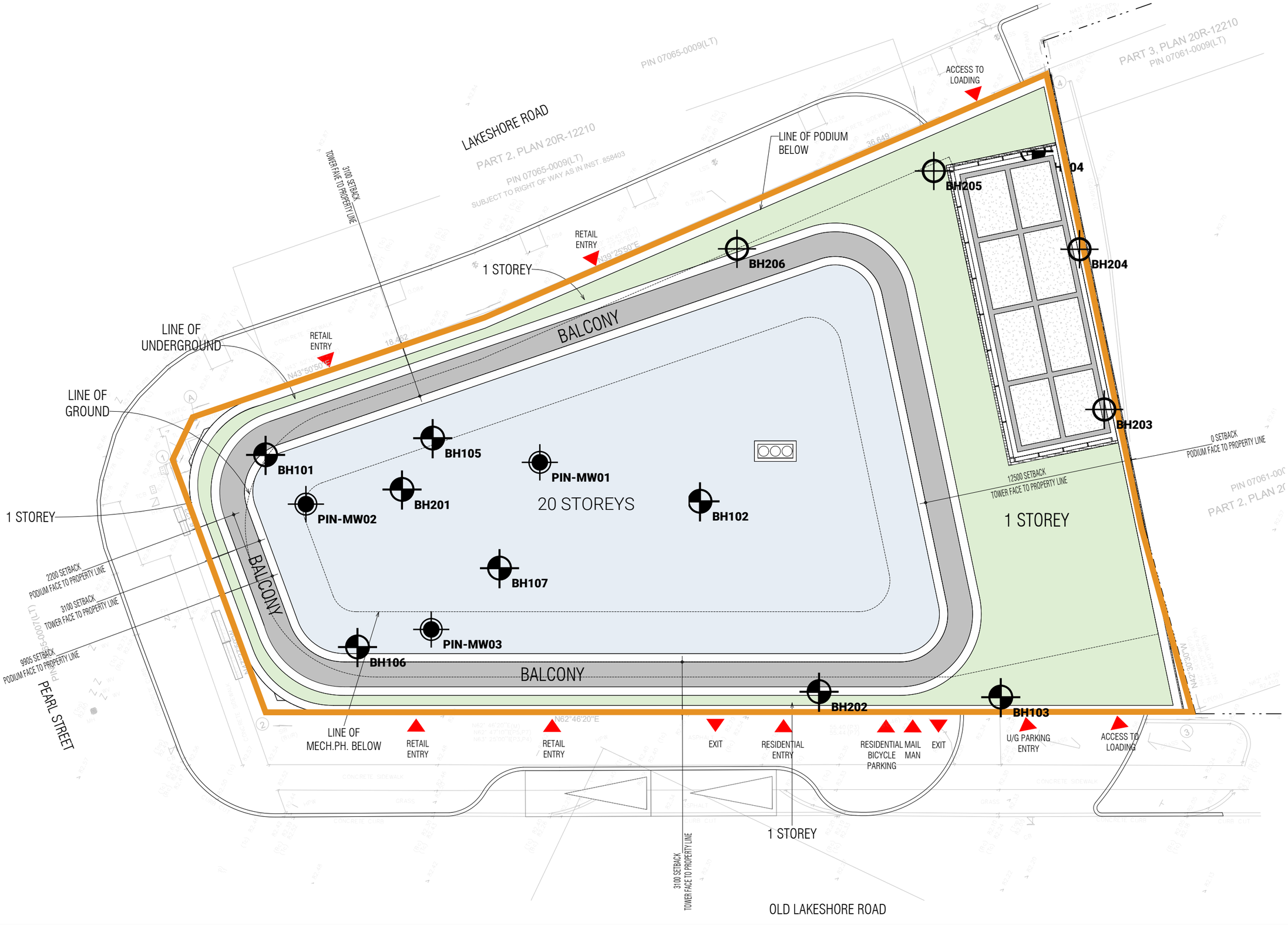
N.T.S

Job No

22-282

Figure No

FIGURE 3



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LEGEND

- APPROXIMATE SITE BOUNDARY
- MONITORING WELL/BOREHOLE BY GROUNDED
- MONITORING WELL/BOREHOLE BY OTHERS

Note

Reference

Architectural Set, "2072 Lakeshore Road"; Drawing No: A.103 (Site Plan); Project No. 2069.22, dated December 11, 2024, prepared by Graziani and Corazza Architects.

Project

2072 LAKESHORE ROAD BURLINGTON, ONTARIO

Figure Title

BOREHOLE LOCATION PLAN (PROPOSED CONDITION)

North

TRUE PROJECT

Date

DECEMBER 2024

Scale

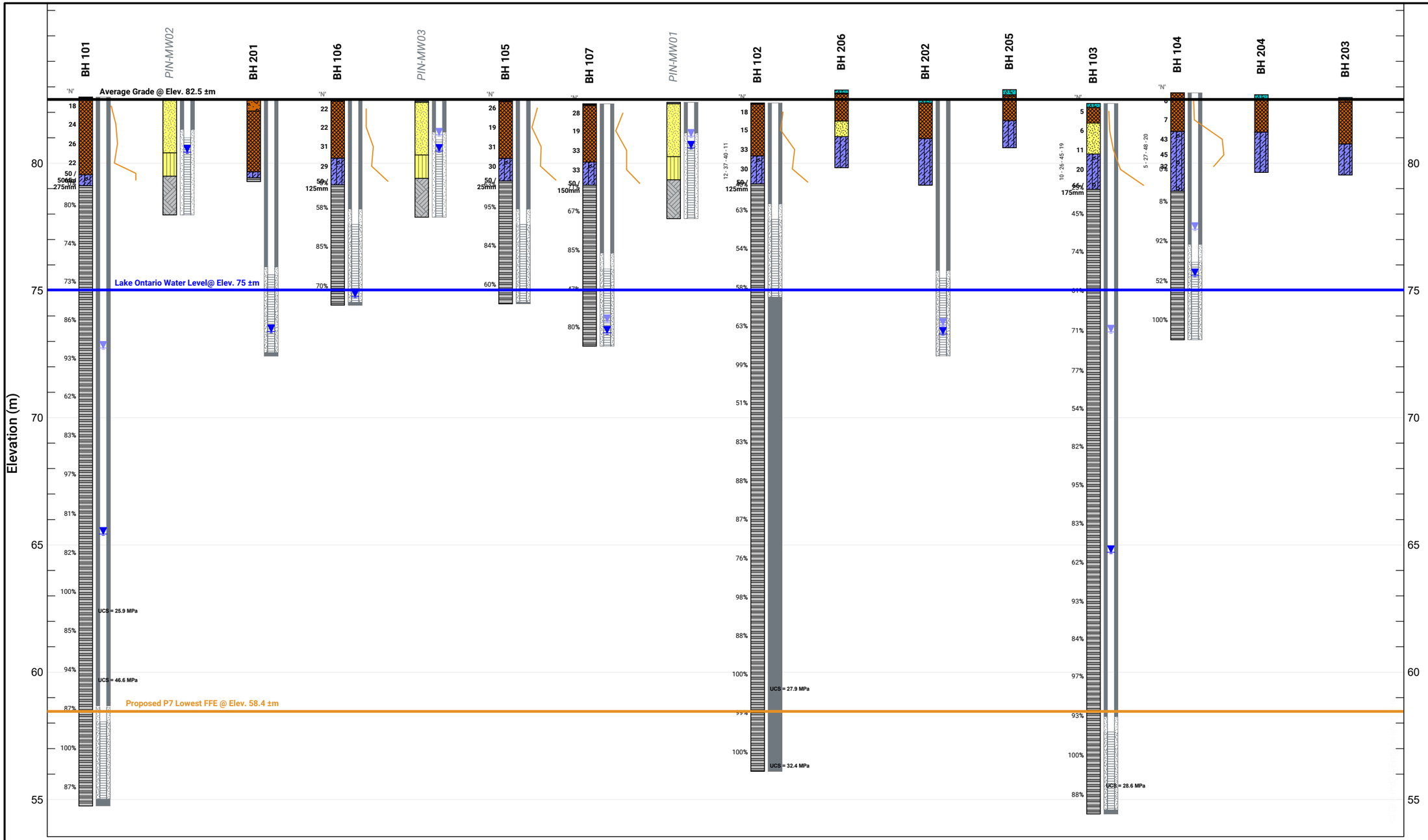
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Job No

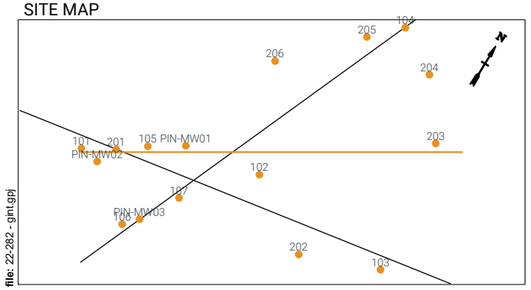
22-282

Figure No

FIGURE 4



SITE MAP



file: 22-282 - gint.gpj

Boreholes Equally Spaced

BOREHOLE STRATIGRAPHY LEGEND

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

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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
2072 LAKESHORE ROAD BURLINGTON, ON

Figure Title
SUBSURFACE PROFILE

Date
DECEMBER 2024

Scale
AS INDICATED

Job No
22-282

Figure No
FIGURE 5

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

PI: plasticity index

γ: soil unit weight (bulk)

G_s: specific gravity

S_u: undrained shear strength

▽ unstabilized water level

▼ 1st water level measurement

▼ 2nd water level measurement most recent

▼ 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.

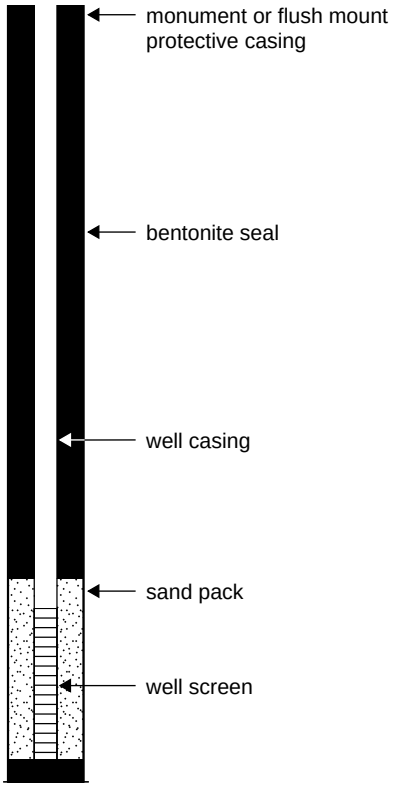
ASTM D3441 Cone Penetration Test (CPT)
Pushing an internal still rod with a outer hollow rod ("sleeve") tipped with a cone with an apex angle of 60° and a cross-sectional area of 1000 mm^2 into soil. The resistance is measured in the sleeve and at the tip to determine the skin friction and the tip resistance.

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)

GROUNDED ENGINEERING

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

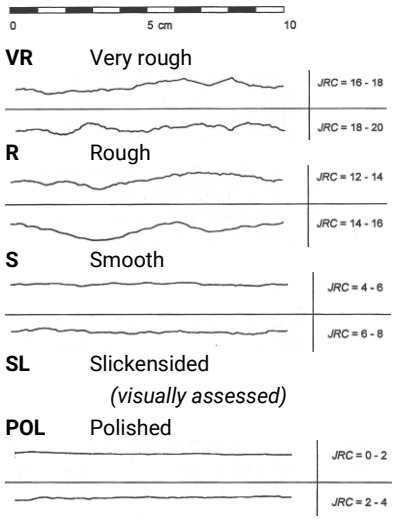
Coating

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 : Mar 7, 2023
Position : E: 597841, N: 4797701 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 101

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

drill method : *LC rig*

hollow stem augers OD=215 mm

rock coring (HQ) OD=96 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
82.6	**GROUND SURFACE**				
	50mm **ASPHALT**				
	FILL, sand, some gravel, trace to some silt, compact, brown, moist ...at 0.4 m, trace asphalt fragments		1	SS	18
			2	SS	24
			3	SS	26
			4	SS	22
79.6 3.0	...at 3.0 m, inferred concrete obstruction		5	SS	50 / 50mm
			6	SS	65 / 275mm
79.1 3.5	**CLAYEY SILT**, trace shale fragments, trace sand, trace gravel, hard, reddish brown, moist (GLACIAL TILL)				
	QUEENSTON FORMATION (See rock core log for details)		2	RUN	
			3	RUN	
			4	RUN	
			5	RUN	
			6	RUN	
			7	RUN	
			8	RUN	
			9	RUN	

depth scale (m): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

well details

elevation (m): 82 81 80 79 78 77 76 75 74 73 72 71 70 69 68

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. 77.6 m): transition to sound bedrock

unstabilized water level

lab data and comments

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

SS3: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs

SS4: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs
3.0m: auger grinding and sampler bouncing with practical refusal, re-located borehole and re-drilled to depth, resumed sampling
3.3m: Run 1 encountered inferred caved materials overlapping with the SS6 interval

file: 22-282 - gint.gpj

Tech : CSH/MW | **PM** : NN | **Rev** : NN

(continued next page)

Date Started : Mar 7, 2023
Position : E: 597841, N: 4797701 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 101

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

drill method : LC rig

rock coring (HQ) OD=96 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
	(continued)				
	QUEENSTON FORMATION (See rock core log for details) *(continued)*		9	RUN	
			10	RUN	
			11	RUN	
			12	RUN	
			13	RUN	
			14	RUN	
			15	RUN	
			16	RUN	
			17	RUN	
54.8 27.8	**END OF BOREHOLE**				

depth scale (m): 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27

well details

elevation (m): 67, 66, 65, 64, 63, 62, 61, 60, 59, 58, 57, 56, 55

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

Contained drill water upon completion of drilling. Unstabilized water level and cave not measured.

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

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Mar 20, 2023	10.2	72.4
Apr 3, 2023	9.9	72.7
Jun 9, 2023	10.1	72.5
Dec 10, 2024	17.2	65.4

file: 22-282 - gint.gpj

Tech : CSH/MW | **PM** : NN | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Mar 7, 2023
Position : E: 597841, N: 4797701 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 101

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

Rock coring started at 3.3m below grade (elev. 79.3)

CLAYEY SILT, trace shale fragments, trace sand, trace gravel, hard, reddish brown, moist (GLACIAL TILL)
3.3 / R1 / 3.5 — TCR = **0%** SCR = **0%** RQD = **0%**

QUEENSTON FORMATION
Shale, reddish brown, thinly bedded to medium bedded, weak; joints are horizontal, closed to gapped, clean, calcareous

R2 — 3.5 to 77.6 — TCR = **98%** SCR = **92%** RQD = **80%**

... at 5.0 m (Elev. 77.6 m), transition to sound rock

Run	elev. depth (m)	recovery	natural fracture frequency	notes and comments
	3.3		core loss	**3.3 / 79.3 - 3.5 / 79.1m:** inferred caved materials and subsequent core loss
R1	3.5	TCR = **0%** SCR = **0%** RQD = **0%**	4	**3.5 / 79.1m:** observed weathered bedrock, with 25mm of rubblized core
R2	77.6	TCR = **98%** SCR = **92%** RQD = **80%**	3 1 1 0	**3.8 / 78.8m:** 75mm of rubblized core
R3	76.1	TCR = **100%** SCR = **98%** RQD = **74%**	2 1 3 1 2	**5.7 / 76.9 - 5.9 / 76.7m:** JT SV PR SU CN 125mm
R4	74.6	TCR = **90%** SCR = **80%** RQD = **73%**	4 1 3 4	**7.3 / 75.3m:** 25mm of rubblized core **7.4 / 75.2m:** IS CI 63mm
R5	73.1	TCR = **98%** SCR = **95%** RQD = **86%**	0 1 2 2 1	
R6	71.6	TCR = **98%** SCR = **98%** RQD = **93%**	4 1 3 1 2 1	
R7	70.1	TCR = **98%** SCR = **87%** RQD = **62%**	0 0 7 4	**11.5 / 71.1m:** 50mm of rubblized core **11.6 / 71.0m:** IS CI 38mm
R8	68.6	TCR = **98%** SCR = **89%** RQD = **83%**	1 4 7 3 0	**12.3 / 70.3m:** 25mm of rubblized core **12.5 / 70.1m:** JT D PR SU CN **12.9 / 69.7m:** 25mm of rubblized core
R9	67.0	TCR = **100%** SCR = **100%** RQD = **97%**	0 0 0 0 1 2	
R10	65.5	TCR = **100%** SCR = **95%** RQD = **81%**	0 0 0 0 0 4 5	**16.8 / 65.8m:** JT D PR SU CN; , with 150mm of rubblized core **17.0 / 65.6m:** JT D PR SU CN
R11	64.4	TCR = **100%** SCR = **90%** RQD = **82%**	0 1 2	**17.9 / 64.7m:** 38mm of rubblized core **18.2 / 64.4m:** JT D PR SU CN

(continued next page)

Tech : CSH/MW | **PM** : NN | **Rev** : NN

file: 22-282 - gint.gpj

GROUNDED ENGINEERING

Date Started : Mar 7, 2023
Position : E: 597841, N: 4797701 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 101

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

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, thinly bedded to medium bedded, weak; joints are horizontal, closed to gapped, clean, calcareous	R11 63.9		64			2			64
19			18.7 R12 62.4	TCR = **100**% SCR = **100**% RQD = **100**%				7			
								0			
					63			0			63
20								0			
								0	**El. 62.4m**: UCS = 25.9 MPa E = 3.60 GPa γ = 25.9 kN/m^3		
			20.2 R13 60.9	TCR = **99**% SCR = **98**% RQD = **85**%	62			0			62
21								0			
								1		**21.2 / 61.4m:** JT D PR SU CN	
								3			
22			21.7 R14 59.3	TCR = **100**% SCR = **100**% RQD = **94**%	61			0			61
								0			
								0			
23					60			0	**El. 59.7m**: UCS = 46.6 MPa E = 9.50 GPa γ = 25.9 kN/m^3		60
								1			
			23.3 R15 57.8	TCR = **100**% SCR = **95**% RQD = **87**%				0		**23.3 / 59.3m:** JT D PR SU CN	
24					59			1			59
								2			
								0			
					58			0			58
25			24.8 R16 56.3	TCR = **100**% SCR = **100**% RQD = **100**%				2			
								0			
					57			0			57
								0			
26								0			
								0			
			26.3 R17 54.8	TCR = **100**% SCR = **96**% RQD = **87**%	56			0			56
27								3		**26.8 / 55.8m:** calcareous, green-grey band **26.8 / 55.8m:** JT D PR SU CN **27.3 / 55.3m:** JT D PR SU CN	
								2			
					55			2			55
			27.9m								
		END OF COREHOLE									

file: 22-282 - gint.gpj

Tech : CSH/MW | **PM** : NN | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Mar 9, 2023
Position : E: 597865, N: 4797712 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 102

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

drill method : LC rig

hollow stem augers OD=215 mm

rock coring (HQ) OD=96 mm

elev depth (m)	description	graphic log	number	type	SPT N-value	depth scale (m)	elevation (m)	lab data and comments
82.4	**GROUND SURFACE**					0	82	
	50mm **ASPHALT**		1	SS	18			
	FILL, sand, some gravel, trace to some silt, moderate petroleum hydrocarbon odour, compact, brown, moist ...at 0.4 m, trace asphalt fragments		2	SS	15	1	81	SS2: BTEX, PAHs, PHCs, VOCs
	...at 1.5 m, dense		3A	SS	33	2	80	3A: EC/SAR, H-Ms, Metals, ORPs, pH
80.3 2.1	**CLAYEY SILT**, some gravel, trace sand, moderate petroleum hydrocarbon odour, hard, reddish brown, moist (GLACIAL TILL) ...at 2.6 m, layer of silt and sand glacail till, some gravel, some clay, dense, reddish brown, moist		3B					12 37 40 11
			4	SS	30	3	79	SS4: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs
79.2 3.2			5	SS	50 / 125mm			**3.0m:** auger grinding
	QUEENSTON FORMATION (See rock core log for details)		1	RUN		4	78	**4.2 m (Elev. 78.2 m): transition to sound bedrock**
			2	RUN		5	77	
			3	RUN		6	76	
			4	RUN		7	75	
			5	RUN		8	74	
			6	RUN		9	73	
			7	RUN		10	72	RUN7: BTEX, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs
			8	RUN		11	71	
			9	RUN		12	70	
						13	69	
						14	68	

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

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

file: 22-282 - gint.gpj

Tech : CSH/MW | **PM** : NN | **Rev** : NN

(continued next page)

GROUNDED ENGINEERING

Date Started : Mar 9, 2023
Position : E: 597865, N: 4797712 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 102

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

drill method : *LC rig*
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)*		9	RUN	
			10	RUN	
			11	RUN	
			12	RUN	
			13	RUN	
			14	RUN	
			15	RUN	
			16	RUN	
56.1 26.3	**END OF BOREHOLE**				

depth scale (m): 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26
well details
elevation (m): 67, 66, 65, 64, 63, 62, 61, 60, 59, 58, 57

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

Contained drill water upon completion of drilling. Unstabilized water level and cave not measured.

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

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Mar 20, 2023	dry	n/a
Apr 3, 2023	dry	n/a
May 5, 2023	dry	n/a
Jun 9, 2023	dry	n/a

file: 22-282 - gint.gpj

Tech : CSH/MW | **PM** : NN | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Mar 9, 2023
Position : E: 597865, N: 4797712 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 102

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

Rock coring started at 2.9m below grade

CLAYEY SILT, some gravel, trace sand, moderate petroleum hydrocarbon odour, hard, reddish brown, moist (GLACIAL TILL)

QUEENSTON FORMATION
Shale, reddish brown, thinly bedded to medium bedded, weak; joints are horizontal, closed to gapped, clean, calcareous
... at 4.2 m (Elev. 78.2 m), transition to sound rock

Run	elev. depth (m)	recovery
	79.5	
R1	2.9	TCR = **88%** SCR = **55%** RQD = **40%**
	3.5	
R2		TCR = **100%** SCR = **88%** RQD = **63%**
	77.4	
R3	5.0	TCR = **100%** SCR = **92%** RQD = **54%**
	75.9	
R4	6.5	TCR = **100%** SCR = **85%** RQD = **58%**
	74.4	
R5	8.0	TCR = **100%** SCR = **87%** RQD = **63%**
	72.9	
R6	9.5	TCR = **99%** SCR = **99%** RQD = **99%**
	71.4	
R7	11.0	TCR = **100%** SCR = **90%** RQD = **51%**
	69.9	
R8	12.5	TCR = **100%** SCR = **100%** RQD = **83%**
	68.3	
R9	14.1	TCR = **99%** SCR = **99%** RQD = **88%**
	66.8	
R10	15.6	TCR = **100%** SCR = **98%** RQD = **87%**
	65.3	
R11	17.1	TCR = **100%** SCR = **97%** RQD = **76%**

natural fracture frequency
n/a
0
3
3
1
0
3
3
1
3
3
4
2
1
3
4
3
5
1
5
0
1
1
2
0
0
0
0
4
2
7
5
7
0
1
0
0
0
3
0
0
0
0
1
2
7
0
3
2
1

notes and comments

2.9 / 79.5 - 3.2 / 79.2m: recovered caved materials and native soil
3.2 / 79.2m: observed weathered bedrock
3.7 / 78.7m: 25mm of rubblized core
3.9 / 78.4m: JT SV PR SU CN 88mm
4.9 / 77.5m: JT SV PR SU CN 25mm
6.3 / 76.0m: 50mm of rubblized core
7.3 / 75.1m: 63mm of rubblized core
7.4 / 75.0m: 25mm of rubblized core
8.1 / 74.3m: 50mm of rubblized core
8.2 / 74.1m: 50mm of rubblized core
8.4 / 74.0m: JT SV PR SU CN 75mm
8.6 / 73.7m: 50mm of rubblized core
12.2 / 70.1m: 13mm of rubblized core
12.4 / 70.0m: 38mm of rubblized core

(continued next page)
Tech : CSH/MW | **PM** : NN | **Rev** : NN

file: 22-282 - gint.gpj

GROUNDED ENGINEERING

Date Started : Mar 9, 2023
Position : E: 597865, N: 4797712 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 102

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

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)
18		**QUEENSTON FORMATION** **Shale**, reddish brown, thinly bedded to medium bedded, weak; joints are horizontal, closed to gapped, clean, calcareous	**79.5** R11 63.8	TCR = **100**% SCR = **97**% RQD = **76**%				6			
			18.6		64			0			64
19			R12 62.2	TCR = **100**% SCR = **100**% RQD = **98**%				0 0 0 0 0			
20			20.2		63						63
			R13 60.7	TCR = **99**% SCR = **94**% RQD = **88**%	62			2 0 0 1		**20.2 / 62.1m:** calcareous, green-grey band **20.9 / 61.5m:** calcareous, green-grey band	62
21			21.7		61			0			61
			R14 59.2	TCR = **100**% SCR = **100**% RQD = **100**%				4 0 0 0			
22			23.2		60						60
23			R15 57.7	TCR = **99**% SCR = **99**% RQD = **99**%	59			0 1 0 0 1	**El. 59.4m**: UCS = 27.9 MPa E = 5.40 GPa γ = 26.0 kN/m^3		59
24			24.7		58						58
			R16 56.1	TCR = **100**% SCR = **100**% RQD = **100**%				0 0 0 1 0			
25			**26.3m**		57						57
26		**END OF COREHOLE**						1	**El. 56.3m**: UCS = 32.4 MPa E = 6.80 GPa γ = 25.8 kN/m^3		

file: 22-282 - gint.gpj

Tech : CSH/MW | **PM** : NN | **Rev** : NN

BOREHOLE LOG 103

Date Started : Mar 15, 2023
Position : E: 597887, N: 4797709 (UTM 17T)
Elev. Datum : Geodetic

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

drill method : LC rig

hollow stem augers OD=215 mm

rock coring (HQ) OD=96 mm

elev / depth (m)	description	graphic log	number	type	SPT N-value
82.3	**GROUND SURFACE**				
82.1 / 0.2	150mm **TOPSOIL**				
	FILL, sand, trace silt, trace rock fragments, trace rootlets, loose, blackish brown, moist		1	SS	5
81.5 / 0.8	**SAND**, some silt, trace gravel, loose to compact, brown, moist to wet		2	SS	6
			3A	SS	11
80.3 / 2.0	**CLAYEY SILT**, trace sand, trace gravel, very stiff, reddish brown, moist (GLACIAL TILL)		3B		
			4	SS	20
	...at 3.0 m, layer of sandy silt glacial till, some clay, some gravel, some shale fragments, hard, reddish brown, moist		5	SS	66 / 175mm
78.9 / 3.4			1	RUN	
	QUEENSTON FORMATION (See rock core log for details)		2	RUN	
			3	RUN	
			4	RUN	
			5	RUN	
			6	RUN	
			7	RUN	
			8	RUN	
			9	RUN	

depth scale (m): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

well details

elevation (m): 82 81 80 79 78 77 76 75 74 73 72 71 70 69 68

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

3.9 m (Elev. 78.4 m): transition to sound bedrock

unstabilized water level

lab data and comments

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

SS2: BTEX, PAHs, PHCs, VOCs

3A: EC/SAR, H-Ms, Metals, ORPs, pH

10 26 45 19

SS4: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs

file: 22-282 - gint.gpj

Tech : CSH | **PM** : NN | **Rev** : NN

(continued next page)

GROUNDED ENGINEERING

Date Started : Mar 15, 2023
Position : E: 597887, N: 4797709 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 103

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

drill method : LC rig

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)*		9	RUN	
			10	RUN	
			11	RUN	
			12	RUN	
			13	RUN	
			14	RUN	
			15	RUN	
			16	RUN	
			17	RUN	
54.4					
27.9	**END OF BOREHOLE**				

depth scale (m): 15 16 17 18 19 20 21 22 23 24 25 26 27

well details

elevation (m): 67 66 65 64 63 62 61 60 59 58 57 56 55

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

RUN12: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs

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)
Mar 20, 2023	10.4	71.9
Apr 3, 2023	10.1	72.2
May 5, 2023	9.0	73.3
Jun 9, 2023	9.2	73.1
Dec 10, 2024	17.7	64.6

file: 22-282 - gint.gpj

Tech : CSH | **PM** : NN | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Mar 15, 2023
Position : E: 597887, N: 4797709 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 103

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

Rock coring started at 3.0m below grade

depth (m)	stratigraphy	Run	elev depth (m)	recovery	elevation (m)	natural fracture frequency	notes and comments
			79.3				
	CLAYEY SILT, trace sand, trace gravel, very stiff, reddish brown, moist (GLACIAL TILL)	R1	3.0	TCR = **100%** SCR = **70%** RQD = **25%**		core loss	**3.0 / 79.3 - 3.2 / 79.1m:** inferred caved materials and subsequent core loss
			3.6		79	>10	**3.2 / 79.1 - 3.4 / 78.9m:** observed native soil
4	**QUEENSTON FORMATION** **Shale**, reddish brown, thinly bedded to medium bedded, weak; joints are horizontal, closed to gapped, clean, calcareous **... at 3.9 m (Elev. 78.4 m), transition to sound rock**	R2		TCR = **100%** SCR = **90%** RQD = **45%**		3	**3.4 / 78.9m:** observed weathered bedrock
						2	
						2	**4.1 / 78.2m:** JT SV UN R GA CN 50mm
					78	2	**4.2 / 78.2m:** JT SV UN R GA CN 38mm
5			77.2			1	**4.7 / 77.6m:** JT SV UN R GA CN 88mm
			5.1			3	**5.2 / 77.1m:** JT SV UN R GA CN 50mm
		R3		TCR = **100%** SCR = **88%** RQD = **74%**	77	2	**5.3 / 77.1m:** JT SV IR R GA CN 25mm
						1	
6						1	
			75.7		76	5	**6.2 / 76.1m:** 38mm of rubblized core
			6.6			5	**6.6 / 75.8m:** JT SV CU R T CN
							6.7 / 75.7m: 113mm of rubblized core
7						9	**7.1 / 75.3m:** 50mm of rubblized core
		R4		TCR = **100%** SCR = **74%** RQD = **61%**	75	4	**7.4 / 74.9m:** 25mm of rubblized core
						>10	
8			74.2			1	**7.9 / 74.4m:** 38mm of rubblized core
			8.1			3	**8.1 / 74.2 - 8.3 / 74.0m:** IS CI 175mm; , with 25mm of rubblized core
					74	3	**8.5 / 73.9m:** 75mm of rubblized core
						6	**8.7 / 73.6m:** 50mm of rubblized core
9		R5		TCR = **100%** SCR = **78%** RQD = **71%**		3	
					73	2	
			72.6			4	**9.8 / 72.5m:** IS CI 50mm
			9.7			1	
10						0	
					72	4	
		R6		TCR = **100%** SCR = **95%** RQD = **77%**		1	
						0	
11			71.0		71	5	**11.6 / 70.7m:** 50mm of rubblized core
			11.3			3	**11.7 / 70.7m:** JT D UN R GA CN
						8	**11.8 / 70.5m:** JT D UN R GA CN
12		R7		TCR = **100%** SCR = **93%** RQD = **54%**	70	4	
			69.6			7	
			12.7			3	
13						0	
		R8		TCR = **100%** SCR = **95%** RQD = **82%**	69	0	
			68.1			0	
14			14.2			0	
						0	
					68	3	
		R9		TCR = **100%** SCR = **98%** RQD = **95%**		0	**14.8 / 67.5m:** JT SV ST R GA CN
15			66.6			0	
			15.7		67	0	
						1	
						0	
16		R10		TCR = **100%** SCR = **95%** RQD = **83%**		1	
			65.1		66	5	
			17.2			1	
17						2	
		R11		TCR = **100%** SCR = **97%** RQD = **62%**	65	4	**17.8 / 64.6m:** JT D UN R GA CN
18						1	

shale weathering zones: Z1 Z2 Z3 Z4

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

laboratory testing

(continued next page)

file: 22-282 - gint.gpj

GROUNDED ENGINEERING

Date Started : Mar 15, 2023
Position : E: 597887, N: 4797709 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 103

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

depth (m)	graphic log	stratigraphy	Run / elev / depth (m)	recovery	elevation (m)	shale weathering zones	UCS (MPa) / estimated strength	natural fracture frequency	laboratory testing	notes and comments	elevation (m)
			79.3			Z1 Z2 Z3 Z4	5 25 50 100 250 R1 R2 R3 R4 R5 R6				
		QUEENSTON FORMATION **Shale**, reddish brown, thinly bedded to medium bedded, weak; joints are horizontal, closed to gapped, clean, calcareous	R11 63.5	TCR = **100**% SCR = **97**% RQD = **62**%	64			3			64
19			18.8 R12 62.0	TCR = **100**% SCR = **100**% RQD = **93**%	63			0 0 0 2 0 0			63
20			20.3 R13 60.6	TCR = **100**% SCR = **96**% RQD = **84**%	62			0 0 5		**20.4 / 61.9m:** calcareous, green-grey band **21.0 / 61.3m:** 63mm of rubblized core	62
21					61			0 0 0			61
22			21.7 R14 59.0	TCR = **100**% SCR = **98**% RQD = **97**%	60			2 0 0			60
23			23.3 R15 57.5	TCR = **100**% SCR = **97**% RQD = **93**%	59			1 2 0 0			59
24					58			0 3 3			58
25			24.8 R16 55.9	TCR = **100**% SCR = **100**% RQD = **100**%	57			0 0 0			57
26			26.4 R17 54.4	TCR = **100**% SCR = **100**% RQD = **88**%	56			0 0 1	**El. 55.5m**: UCS = 28.6 MPa E = 6.60 GPa γ = 25.9 kN/m^3	**26.7 / 55.7m:** calcareous, green-grey band **26.7 / 55.6m:** JT D PR R GA CN	56
27					55			0 0 0			55
			27.9m								
		END OF COREHOLE									

file: 22-282 - gint.gpj

Tech : CSH | **PM** : NN | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Mar 6, 2023
Position : E: 597872, N: 4797741 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 104

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

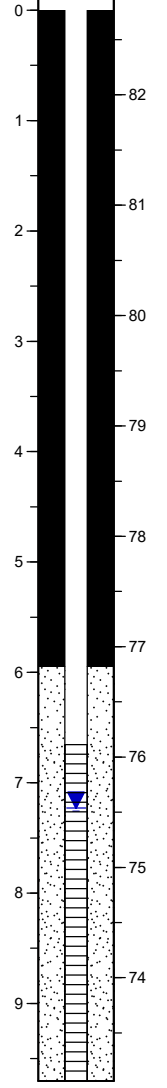
drill method : LC rig

elev depth (m)	description	graphic log	number	type	SPT N-value
82.8	**GROUND SURFACE**				
	FILL, silt, some sand, some gravel, some rootlets, trace clay, trace topsoil inclusions, loose, brownish black, moist		1	SS	6
	...at 0.2 m, sand fill, some gravel, trace silt, brown with oxidation staining, moist to wet		2A	SS	7
	...at 0.9 m, no topsoil inclusions, mottled brownish grey		2B		
81.3					
1.5	**CLAYEY SILT**, sandy, trace gravel, hard, reddish brown, moist (GLACIAL TILL)		3	SS	43
			4	SS	45
			5	SS	32
	...at 3.0 m, sandy silt, clayey, trace gravel, trace shale fragments		1	RUN	
78.9					
3.9	**QUEENSTON FORMATION** (See rock core log for details)		2	RUN	
			3	RUN	
			4	RUN	
			5	RUN	
73.1					
9.7					

hollow stem augers OD=215 mm

rock coring (HQ) OD=96 mm

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

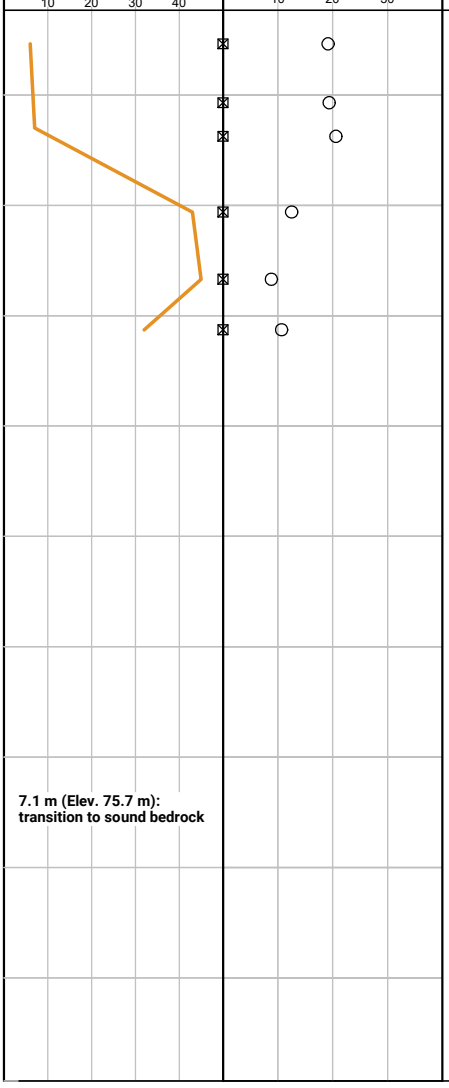


undrained shear strength (kPa)
■ unconfined + field vane
● pocket penetrometer ○ Lab Vane
40 80 120 160

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



unstabilized water level

lab data and comments

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

SS1: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs

SS3: BTEX, PAHs, PHCs, VOCs
1.8m: auger grinding
5 27 48 20

SS4: EC/SAR, H-Ms, Metals, ORPs, pH
2.6m: auger grinding with refusal, and Run 1 encountered inferred caved materials overlapping with the SS4 and SS5 intervals

END OF BOREHOLE

Contained drill water upon completion of drilling. Unstabilized water level and cave not measured.

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

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Mar 20, 2023	5.4	77.4
Apr 3, 2023	5.5	77.3
May 5, 2023	5.7	77.1
Jun 9, 2023	5.8	77.0
Dec 10, 2024	7.2	75.6

file: 22-282 - gint.gpj

Tech : CSH/MW | **PM** : NN | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Mar 6, 2023
Position : E: 597872, N: 4797741 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 104

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

depth (m)	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)
	Rock coring started at 2.5m below grade	**80.3**								
3	**CLAYEY SILT**, sandy, trace gravel, hard, reddish brown, moist (GLACIAL TILL)	2.5 R1 79.3	TCR = **69%** SCR = **0%** RQD = **0%**	80			n/a		**2.5 / 80.3 - 3.2 / 79.6m:** inferred caved materials	80
							n/a		**3.2 / 79.6 - 3.9 / 78.9m:** recovered native soil	
4	**QUEENSTON FORMATION** **Shale**, reddish brown, thinly bedded to medium bedded, weak; joints are horizontal, closed to gapped, clean, calcareous	3.5 R2 77.8	TCR = **98%** SCR = **64%** RQD = **8%**	79			n/a		**3.9 / 78.9m:** observed weathered bedrock	79
							>10		**4.2 / 78.6m:** 75mm of rubblized core	
							>10		**4.4 / 78.4m:** 50mm of rubblized core	
5		5.0 R3 76.2	TCR = **100%** SCR = **98%** RQD = **92%**	78			4			78
							6			
							4			
							3		**5.5 / 77.3m:** JT SV PR R GA CN 50mm	
6				77			3			77
							6			
							5		**6.4 / 76.4m:** 75mm of rubblized core	
7	**... at 7.1 m (Elev. 75.7 m), transition to sound rock**	6.6 R4 74.6	TCR = **100%** SCR = **95%** RQD = **52%**	76			4		**6.7 / 76.1m:** JT SV IR R T CN 25mm **6.7 / 76.0m:** 25mm of rubblized core	76
							2			
							1			
							3		**7.6 / 75.1m:** JT SV IR R T CN 25mm	
8				75			2			75
							1			
		8.2 R5 73.1	TCR = **100%** SCR = **100%** RQD = **100%**	74			1			74
							0			
9							1			
							1			
		9.7m					0			

END OF COREHOLE

file: 22-282 - gint.gpj

Tech : CSH/MW | **PM** : NN | **Rev** : NN

Date Started : Mar 14, 2023
Position : E: 597849, N: 4797707 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 105

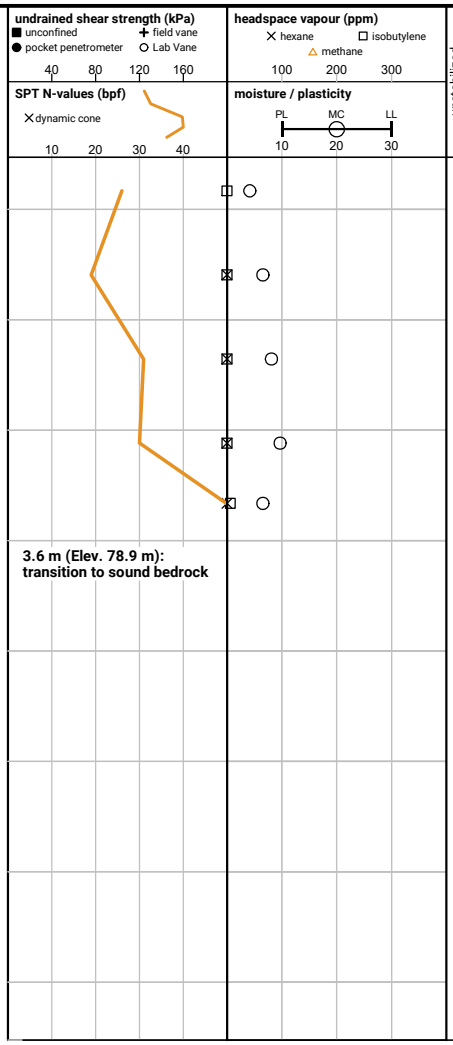
File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

drill method : *LC rig*

elev depth (m)	description	number	type	SPT N-value
82.5	**GROUND SURFACE**			
	50mm **ASPHALT**	1	SS	26
	FILL, gravelly sand, trace to some silt, faint petroleum hydrocarbon odour, compact to dense, brownish grey, moist	2	SS	19
		3	SS	31
80.2 2.3	**CLAYEY SILT**, some gravel, trace sand, hard, brownish red, moist (GLACIAL TILL)	4	SS	30
79.3 3.2	...at 3.1 m, some shale fragments, faint petroleum hydrocarbon odour	5	SS	50 / 25mm
		1	RUN	
	QUEENSTON FORMATION (See rock core log for details)	2	RUN	
		3	RUN	
		4	RUN	
74.5 8.0	**END OF BOREHOLE**			

hollow stem augers OD=215 mm

rock coring (HQ) OD=96 mm



unstabilized water level

lab data and comments

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

SS2: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs

SS4: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs

3.2m: sampler bouncing

RUN3: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs

Water level and cave not measured upon completion of drilling.

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

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Mar 20, 2023	dry	n/a
Apr 3, 2023	dry	n/a
May 5, 2023	dry	n/a
Jun 9, 2023	dry	n/a
Dec 10, 2024	dry	n/a

file: 22-282 - gint.gpj

Tech : CSH/MW | **PM** : NN | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Mar 14, 2023
Position : E: 597849, N: 4797707 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 105

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

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)
		Rock coring started at 3.2m below grade	**79.3**								
		QUEENSTON FORMATION **Shale**, reddish brown, thinly bedded to medium bedded, weak; joints are horizontal, closed to gapped, clean, calcareous **... at 3.6 m (Elev. 78.9 m), transition to sound rock**	3.2 R1 3.5	TCR = **100%** SCR = **100%** RQD = **63%**	79			2			79
4								2		**3.6 / 78.9m:** JT D PR S GA CN	
			R2	TCR = **100%** SCR = **100%** RQD = **95%**				2			
			77.6					0			
					78			0			78
5			4.9					1		**4.7 / 77.8m:** JT SV PR S T CN 50mm	
			R3	TCR = **84%** SCR = **98%** RQD = **84%**				4			
			76.0					1			
					77			0			77
6			6.5					1			
								2		**6.3 / 76.2m:** JT SV PR R T CN 25mm	
					76			3			76
7			R4	TCR = **97%** SCR = **85%** RQD = **60%**				1			
								4		**7.3 / 75.1m:** JT SV IR R T CN 25mm	
					75			4		**7.6 / 74.9m:** 38mm of rubblized core	75
			74.5					7		**7.8 / 74.7 - 7.9 / 74.6m:** 125mm of rubblized core	
8			**8.0m**								
		END OF COREHOLE									

file: 22-282 - gint.gpj

Tech : CSH/MW | **PM** : NN | **Rev** : NN

BOREHOLE LOG 106

Date Started : Mar 13, 2023
Position : E: 597852, N: 4797695 (UTM 17T)
Elev. Datum : Geodetic

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

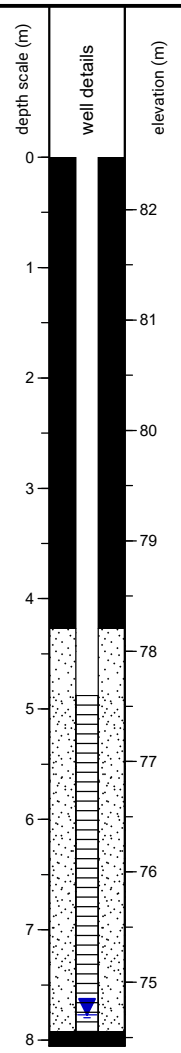
drill method : *LC rig*

elev depth (m)	description	graphic log	number	type	SPT N-value
82.5	**GROUND SURFACE**				
	40mm **ASPHALT**		1	SS	22
	FILL, sand, some gravel, trace to some silt, moderate petroleum hydrocarbon odour, compact to dense, brown, moist		2	SS	22
			3	SS	31
80.2 / 2.3	**CLAYEY SILT**, some gravel, trace sand, trace shale fragments, very stiff to hard, brownish red, moist (GLACIAL TILL)		4	SS	29
			5	SS	50 / 125mm
79.2 / 3.3	...at 3.2 m, layer of gravelly sand, trace silt, moderate petroleum hydrocarbon odour, very dense, grey, wet		1	RUN	
	QUEENSTON FORMATION (See rock core log for details)		2	RUN	
			3	RUN	
			4	RUN	
74.4 / 8.1	**END OF BOREHOLE**				

hollow stem augers OD=215 mm

rock coring (HQ) OD=96 mm

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

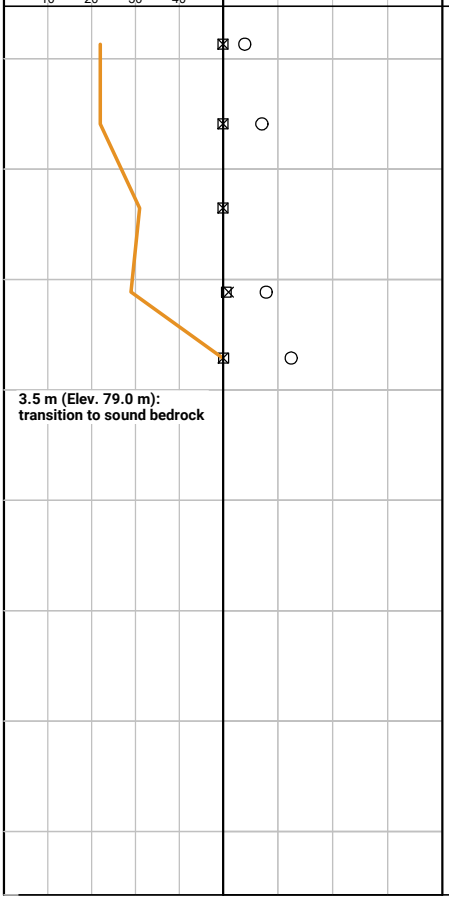


undrained shear strength (kPa)
■ unconfined + field vane
● pocket penetrometer ○ Lab Vane
40 80 120 160

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



3.5 m (Elev. 79.0 m): transition to sound bedrock

unstabilized water level

lab data and comments

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

SS3: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs

2.4m: auger grinding

SS4: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs
2.9m: auger grinding
3.0m: Run 1 encountered inferred caved materials overlapping with the SS5 interval

Contained drill water upon completion of drilling. Unstabilized water level and cave not measured.

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

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Mar 20, 2023	7.8	74.7
Apr 3, 2023	7.8	74.7
May 5, 2023	7.8	74.7
Jun 9, 2023	7.8	74.7

file: 22-282 - gint.gpj

Tech : CSH/MW | **PM** : NN | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Mar 13, 2023
Position : E: 597852, N: 4797695 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 106

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

Rock coring started at 3.0m below grade

depth (m)	stratigraphy	Run	elev. depth (m)	recovery
			79.5	
	CLAYEY SILT, some gravel, trace sand, trace shale fragments, very stiff to hard, brownish red, moist (GLACIAL TILL)	R1	3.0	TCR = **100%** SCR = **16%** RQD = **0%**
			3.5	
4	**QUEENSTON FORMATION** **Shale**, reddish brown, thinly bedded to medium bedded, weak; joints are horizontal, closed to gapped, clean, calcareous	R2		TCR = **100%** SCR = **100%** RQD = **58%**
	... at 3.5 m (Elev. 79.0 m), transition to sound rock		77.5	
5		R3	5.0	TCR = **100%** SCR = **97%** RQD = **85%**
6			76.0	
		R4	6.5	TCR = **100%** SCR = **88%** RQD = **70%**
7				
8			74.4	
	END OF COREHOLE		**8.1m**	

elevation (m)	shale weathering zones (Z1 Z2 Z3 Z4)	UCS (MPa) / estimated strength (R1 R2 R3 R4 R5 R6)	natural fracture frequency	laboratory testing	notes and comments	elevation (m)
			n/a		**3.0 / 79.4 - 3.4 / 79.1m:** inferred caved materials	
79			1		**3.4 / 79.1m:** observed weathered bedrock	79
			1			
			4			
			4		**4.3 / 78.2m:** JT D PR R GA OX	
78			2		**4.3 / 78.1m:** JT D PR R GA OX	78
			1			
			0			
77			1			77
			3			
			0			
			2			
76			4			76
			0			
			2			
75			4		**7.5 / 75.0m:** IS Cl 38mm	75
			>10		**7.5 / 74.9m:** 38mm of rubblized core **7.7 / 74.7m:** 50mm of rubblized core **7.9 / 74.6m:** JT SV IR R T CN	

file: 22-282 - gint.gpj

Tech : CSH/MW | **PM** : NN | **Rev** : NN

BOREHOLE LOG 107

Date Started : Mar 13, 2023
Position : E: 597857, N: 4797703 (UTM 17T)
Elev. Datum : Geodetic

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

drill method : *LC rig*

elev depth (m)	description	graphic log	samples: number	samples: type	samples: SPT N-value
82.3	**GROUND SURFACE**				
	65mm **ASPHALT**				
	FILL, sand, some gravel, trace silt, faint petroleum hydrocarbon odour, compact to dense, brown, moist		1	SS	28
			2	SS	19
			3	SS	33
80.0					
2.3	**CLAYEY SILT**, some gravel, trace sand, trace shale fragments, hard, reddish brown, moist (GLACIAL TILL)		4	SS	33
79.1			5	SS	50 / 150mm
3.2	**QUEENSTON FORMATION** (See rock core log for details)		1	RUN	
			2	RUN	
			3	RUN	
			4	RUN	
			5	RUN	
72.8					
9.5	**END OF BOREHOLE**				

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

well details

elevation (m): 82 81 80 79 78 77 76 75 74 73

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

3.6 m (Elev. 78.7 m): transition to sound bedrock

lab data and comments

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

SS3: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs

2.4m: auger grinding

SS4: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs
3.0m: sampler bouncing
3.1m: Run 1 encountered inferred caved materials overlapping with the SS5 interval

Water level and cave not measured upon completion of drilling.

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

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Mar 20, 2023	8.9	73.4
Apr 3, 2023	8.7	73.6
May 5, 2023	8.6	73.7
Jun 9, 2023	8.7	73.6
Dec 10, 2024	9.1	73.2

file: 22-282 - gint.gpj

Tech : CSH/MW | **PM** : NN | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Mar 13, 2023
Position : E: 597857, N: 4797703 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 107

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

Rock coring started at 3.1m below grade

depth (m)	stratigraphy	Run	elev depth (m)	recovery	elevation (m)	shale weathering zones	UCS (MPa) / estimated strength	natural fracture frequency	laboratory testing	notes and comments	elevation (m)
			79.2								
	CLAYEY SILT, some gravel, trace sand, trace shale fragments, hard, reddish brown, moist (GLACIAL TILL)	R1	3.1	TCR = **100**% SCR = **100**% RQD = **71**%				n/a		**3.1 / 79.2 - 3.2 / 79.1m:** inferred caved materials	
			3.5		79			7		**3.2 / 79.1m:** observed weathered bedrock	79
	QUEENSTON FORMATION **Shale**, reddish brown, thinly bedded to medium bedded, weak; joints are horizontal, closed to gapped, clean, calcareous **... at 3.6 m (Elev. 78.7 m), transition to sound rock**	R2		TCR = **100**% SCR = **93**% RQD = **67**%				4			
4								5		**3.9 / 78.4m:** 25mm of rubblized core	
					78			3			78
								2			
			77.3					1		**4.7 / 77.6m:** JT SV UN R GA OX 38mm	
5		R3	5.0	TCR = **100**% SCR = **93**% RQD = **85**%				1			
					77			2			77
								1			
6								3		**6.0 / 76.3m:** 50mm of rubblized core	
			75.8		76			2		**6.3 / 76.0 - 6.4 / 75.9m:** JT SV PR R T CN 100mm	76
			6.5					4		**6.6 / 75.8m:** JT D PR R T CN	
		R4		TCR = **100**% SCR = **90**% RQD = **47**%				1			
7								3			
					75			7		**7.3 / 75.1 - 7.4 / 74.9m:** 125mm of rubblized core	75
								5		**7.5 / 74.8m:** 63mm of rubblized core	
			74.3					0			
8		R5	8.0	TCR = **100**% SCR = **92**% RQD = **80**%				6			
					74			1		**8.4 / 73.9m:** JT SV UN R T CN 50mm	74
								6		**8.5 / 73.9m:** 25mm of rubblized core	
9								1		**8.9 / 73.5m:** IS Cl; , with 12mm of rubblized core	
			72.8		73			0			73
			9.5m								

END OF COREHOLE

file: 22-282 - gint.gpj

Tech : CSH/MW | **PM** : NN | **Rev** : NN

BOREHOLE LOG 201

Date Started : Jun 25, 2024
Position : E: 597846, N: 4797704 (UTM 17T)
Elev. Datum : Geodetic

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

drill method : Geoprobe

elev depth (m)	description	graphic log	number	type	SPT N-value
82.5	**GROUND SURFACE**				
82.1	425mm **AGGREGATE**		1	DP	
0.4	**FILL**, gravelly sand, trace silt, trace rock fragments, brown, moist		2	DP	
			3	DP	
79.7			4A	DP	
2.8			4B		
79.5	**CLAYEY SILT**, some gravel, trace sand, some rock fragments, brownish red, moist (GLACIAL TILL)		5	DP	
3.0					
79.3	**SHALE FRAGMENTS**, trace gravel, red, moist				
3.2					

direct push OD=50 mm

solid stem augers OD=150 mm

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

elevation (m): 82 81 80 79 78 77 76 75 74 73

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

DP2: H-Ms, Metals, ORPs

4A: BTEX, PHCs

END OF BOREHOLE

Borehole was dry and caved to 9.9 m below ground surface upon completion of drilling.

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

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jul 3, 2024	dry	n/a
Jul 11, 2024	9.4	73.1
Jul 27, 2024	dry	n/a
Dec 10, 2024	9.1	73.4

file: 22-282 - gint.gpj

Tech : MW | **PM** : LL | **Rev** : FS

GROUNDED ENGINEERING

Date Started : Jun 25, 2024
Position : E: 597876, N: 4797705 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 202

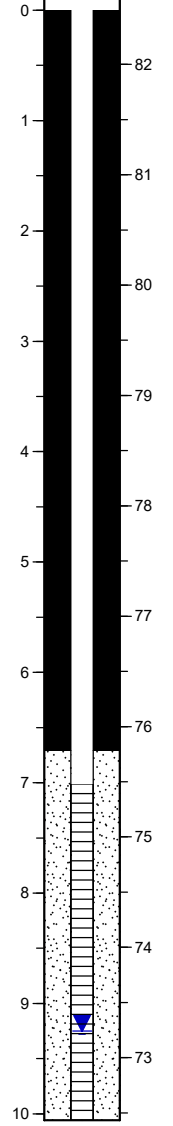
File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

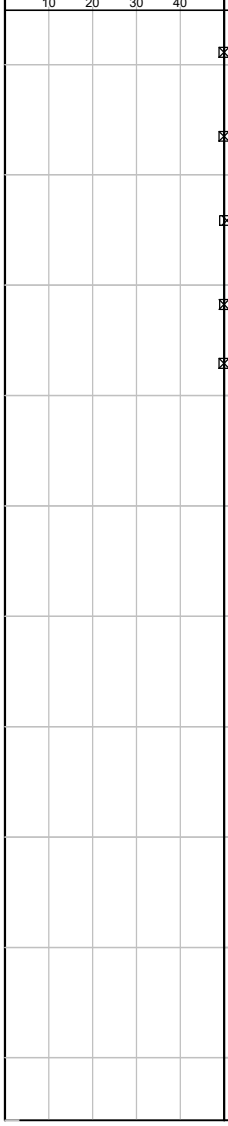
drill method : *Geoprobe*

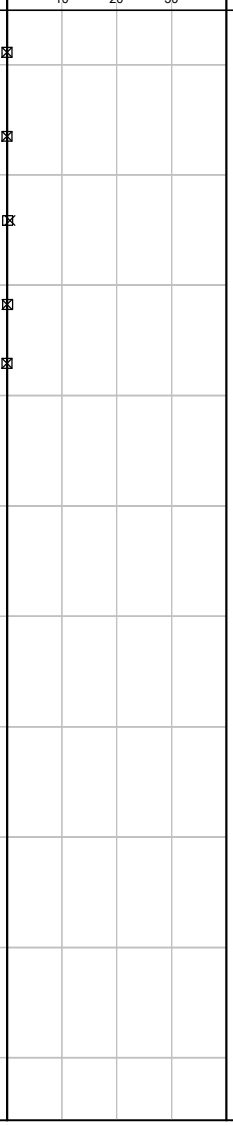
elev depth (m)	description	graphic log	number	type	SPT N-value
82.5	**GROUND SURFACE**				
	125mm **TOPSOIL**				
	FILL, sand, some silt, trace to some gravel, trace rootlets, light brown, moist		1	DP	
			2	DP	
81.0					
1.5	**CLAYEY SILT**, some gravel, trace sand, reddish brown, moist (GLACIAL TILL)		3	DP	
			4	DP	
79.1			5	DP	
3.4					

direct push OD=50 mm

solid stem augers OD=150 mm







unstabilized water level

lab data and comments

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

DP2: H-Ms, Metals, ORPs

END OF BOREHOLE

Borehole was dry upon completion of drilling.

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

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jul 3, 2024	9.0	73.5
Jul 11, 2024	8.9	73.6
Jul 24, 2024	8.9	73.6
Dec 10, 2024	9.3	73.2

file: 22-282 - gint.gpj

Tech : MW | **PM** : LL | **Rev** : FS

GROUNDED ENGINEERING

Date Started : Jun 26, 2024
Position : E: 597884, N: 4797729 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 203

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

drill method : *Geoprobe*

direct push OD=50 mm

elev depth (m)	description	graphic log	samples: number	samples: type	samples: SPT N-value
82.6	**GROUND SURFACE**				
82.4 / 0.2	100mm **TOPSOIL** 75mm **AGGREGATE**		1	DP	
	FILL, sand, some silt, trace gravel, brown, moist		2	DP	
	...at 1.2 m, reddish brown		3	DP	
80.8 / 1.8	**CLAYEY SILT**, trace sand, trace gravel, reddish brown, moist (GLACIAL TILL)		4	DP	
			5	DP	
79.6 / 3.0	**END OF BOREHOLE**				

depth scale (m): 0, 1, 2, 3

well details

elevation (m): 82, 81, 80

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

DP5: BTEX, PHCs

Unstabilized water level measured at 1.2 m below ground surface upon completion of drilling.

GROUNDED ENGINEERING

Date Started : Jun 26, 2024
Position : E: 597878, N: 4797737 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 204

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

drill method : *Geoprobe*

direct push OD=50 mm

elev depth (m)	description	graphic log	samples: number	samples: type	samples: SPT N-value
82.7	**GROUND SURFACE**				
82.5 / 0.2	175mm **TOPSOIL**				
	FILL, sand, some silt, trace gravel, reddish brown, moist		1	DP	
			2	DP	
	...at 1.2 m, trace clay pockets		3A	DP	
81.2 / 1.5	**CLAYEY SILT**, trace sand, trace gravel, brownish grey, moist (GLACIAL TILL)		3B		
	...at 1.8 m, reddish brown		4	DP	
			5	DP	
79.7 / 3.0	**END OF BOREHOLE**				

Borehole was dry upon completion of drilling.

depth scale (m): 0, 1, 2, 3

well details

elevation (m): 82, 81, 80

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

DP5: BTEX, PHCs

file: 22-282 - gint.gpj

Tech : MW | **PM** : LL | **Rev** : FS

GROUNDED ENGINEERING

Date Started : Jun 26, 2024
Position : E: 597868, N: 4797737 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 205

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

drill method : *Geoprobe*

direct push OD=50 mm

elev depth (m)	description	graphic log	samples: number	samples: type	samples: SPT N-value
82.9	**GROUND SURFACE**				
82.7 / 0.2	230mm **TOPSOIL**				
82.6 / 0.3	25mm **AGGREGATE**		1	DP	
	FILL, sand, some gravel, trace silt, brown, moist ...at 0.6 m, trace organics		2	DP	
81.7 / 1.2	**CLAYEY SILT**, some gravel, trace sand, brownish grey, moist (GLACIAL TILL) ...at 1.8 m, reddish brown		3	DP	
80.6 / 2.3			4	DP	

depth scale (m): 0, 1, 2

well details

elevation (m): 82, 81

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

DP2: H-Ms, Metals, ORPs

DP4: BTEX, PHCs

END OF BOREHOLE

Borehole was dry upon completion of drilling.

file: 22-282 - gint.gpj

Tech : MW | **PM** : LL | **Rev** : FS

GROUNDED ENGINEERING

Date Started : Jun 26, 2024
Position : E: 597858, N: 4797727 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 206

File No. : 22-282 **Project** : 2072 Lakeshore Road, Burlington, ON **Client** : Trinity Point

drill method : *Direct Push*

elev depth (m)	description	graphic log	samples: number	samples: type	samples: SPT N-value
82.9	**GROUND SURFACE**				
82.7 / 0.2	125mm **TOPSOIL**				
	25mm **AGGREGATE**		1	DP	
	FILL, silt, trace to some sand, trace gravel, brown, moist		2	DP	
81.7 / 1.2	...at 0.6 m, reddish light brown				
	SAND, some silt, light brown, moist		3	DP	
81.1 / 1.8	**CLAYEY SILT**, some gravel, trace sand, reddish brown, moist (GLACIAL TILL)		4	DP	
			5	DP	
79.9 / 3.0	**END OF BOREHOLE**				

direct push OD=50 mm

depth scale (m): 0, 1, 2, 3

well details

elevation (m): 82, 81, 80

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

DP3: H-Ms, Metals, ORPs

DP4: BTEX, PHCs

Unstabilized water level measured at 1.2 m below ground surface upon completion of drilling.

file: 22-282 - gint.gpj

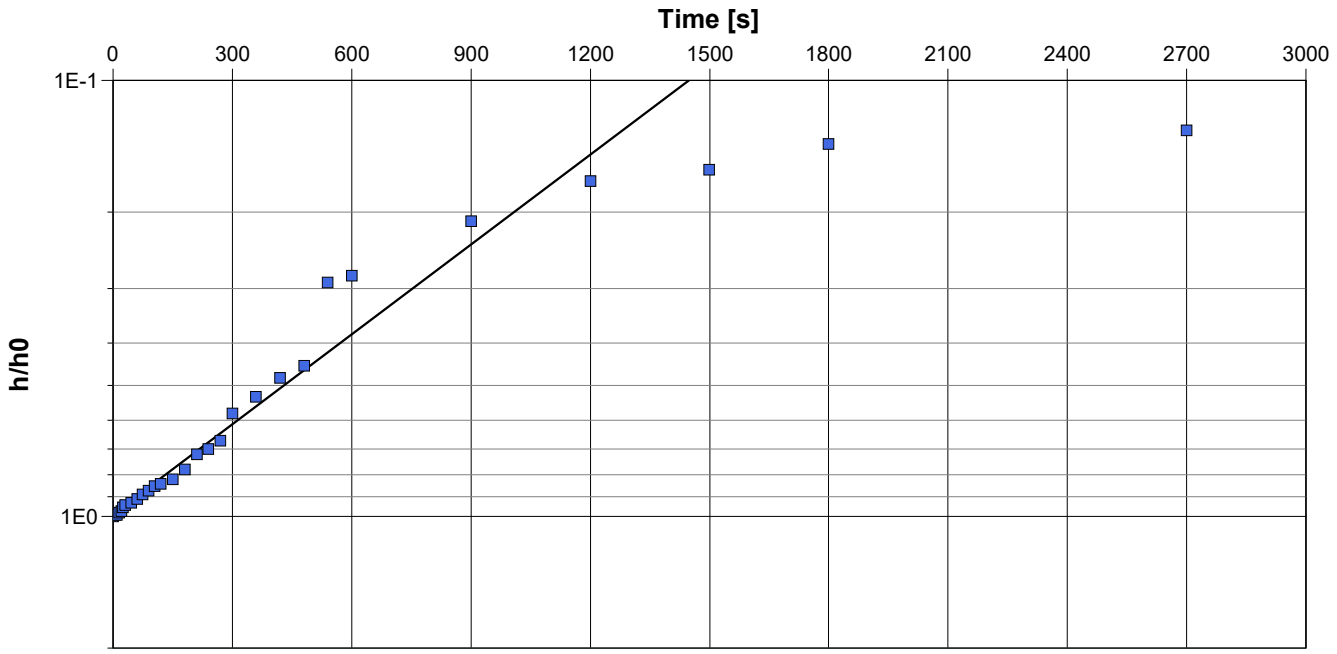
Tech : MW | **PM** : LL | **Rev** : FS

APPENDIX B



GROUNDED ENGINEERING	**Slug Test Analysis Report**
	Project: 22-282
	Number: 2072 Lakeshore Road
	Client: Trinity Point

Location: Burlington, Ontario	Slug Test: BH101 - RHT1	Test Well: BH101 (Sound Bedrock)
Test Conducted by: MW		Test Date: 2023-04-03
Analysis Performed by: NN	Bouwer & Rice	Analysis Date: 2023-04-10
Aquifer Thickness: 30.00 m		

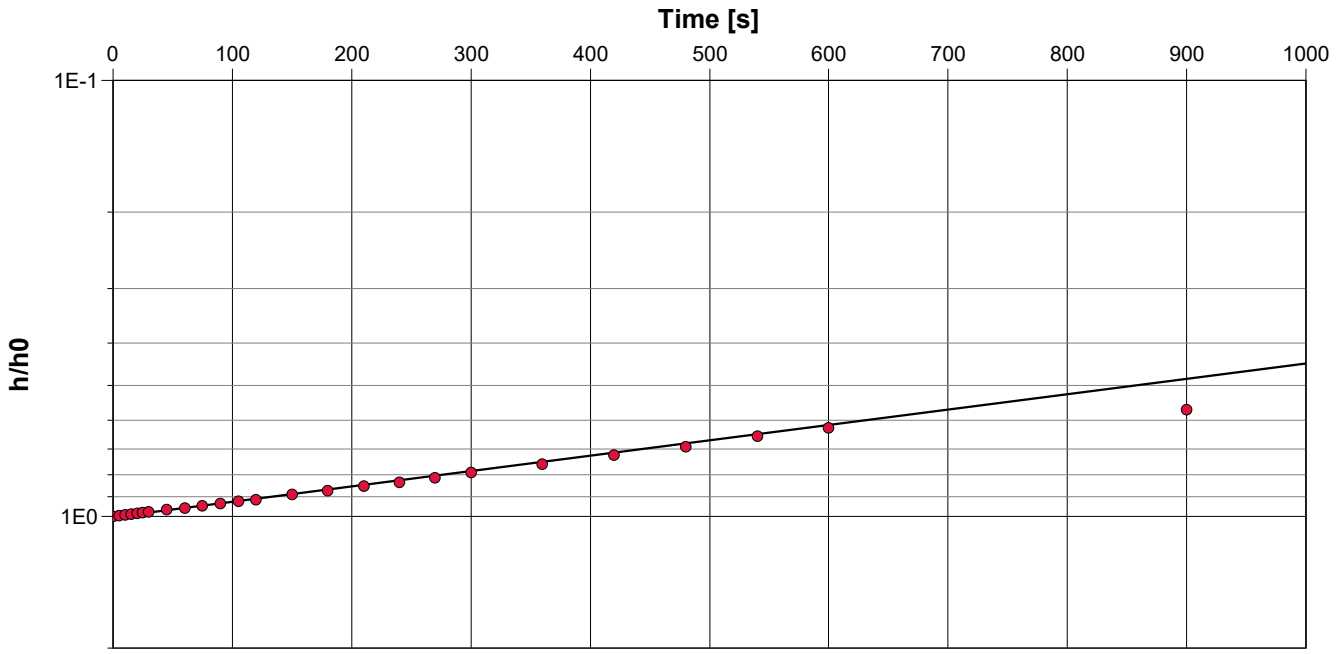


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH101 (Sound Bedrock)	7.00×10^{-7}	

GROUNDED ENGINEERING	**Slug Test Analysis Report**
	Project: 22-282
	Number: 2072 Lakeshore Road
	Client: Trinity Point

Location: Burlington, Ontario	Slug Test: BH102 - FHT1	Test Well: BH102 (Sound Bedrock)
Test Conducted by: MW		Test Date: 2023-04-04
Analysis Performed by: NN	Bouwer & Rice	Analysis Date: 2023-04-10
Aquifer Thickness: 30.00 m		

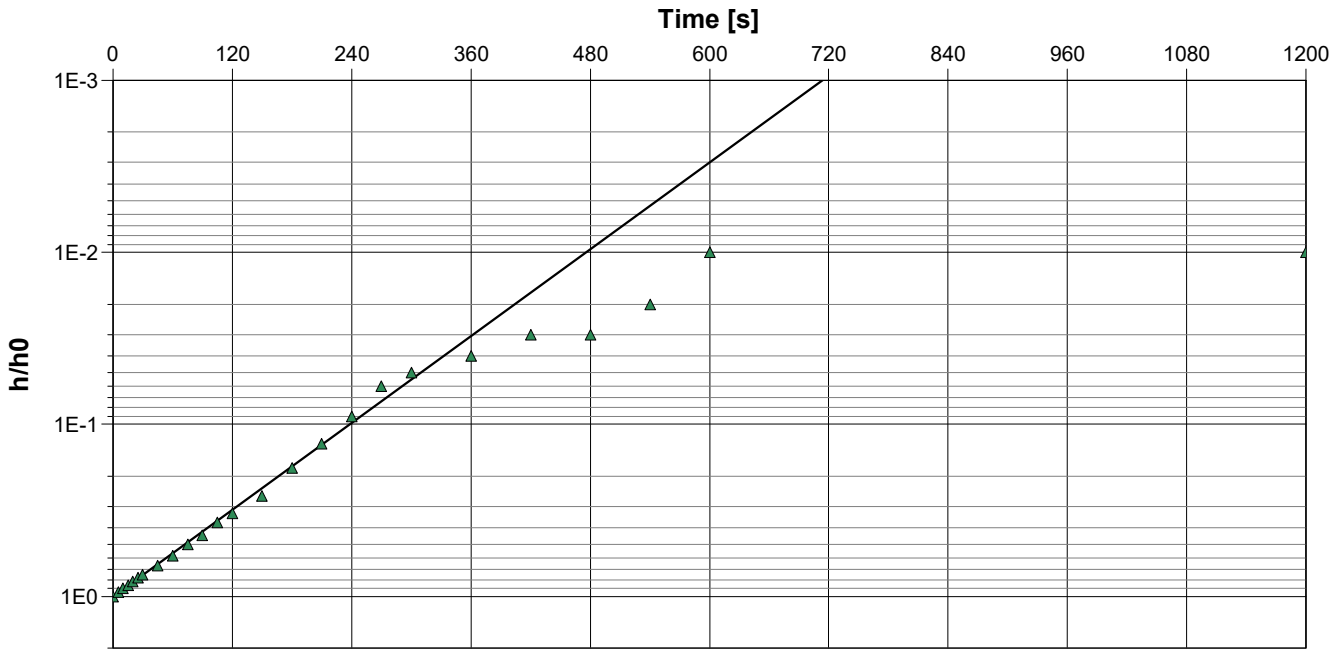


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH102 (Sound Bedrock)	3.00×10^{-7}	

GROUNDED ENGINEERING	**Slug Test Analysis Report**
	Project: 22-282
	Number: 2072 Lakeshore Road
	Client: Trinity Point

Location: Burlington, Ontario	Slug Test: BH103 - RHT1	Test Well: BH103 (Sound Bedrock)
Test Conducted by: MW		Test Date: 2023-03-21
Analysis Performed by: NN	Bouwer & Rice	Analysis Date: 2023-04-10
Aquifer Thickness: 30.00 m		

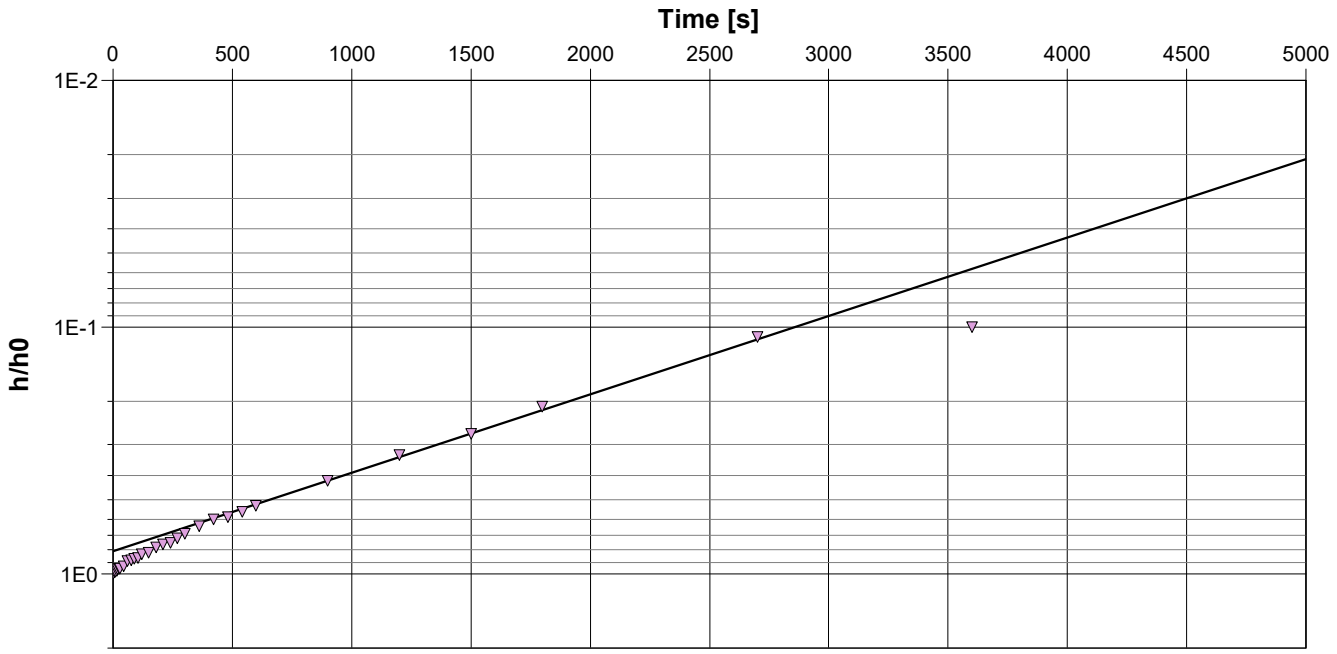


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH103 (Sound Bedrock)	4.30×10^{-6}	

GROUNDED ENGINEERING	**Slug Test Analysis Report**
	Project: 22-282
	Number: 2072 Lakeshore Road
	Client: Trinity Point

Location: Burlington, Ontario	Slug Test: BH104 - RHT1	Test Well: BH104 (Sound Bedrock)
Test Conducted by: MW		Test Date: 2023-04-03
Analysis Performed by: NN	Bouwer & Rice	Analysis Date: 2023-04-10
Aquifer Thickness: 30.00 m		

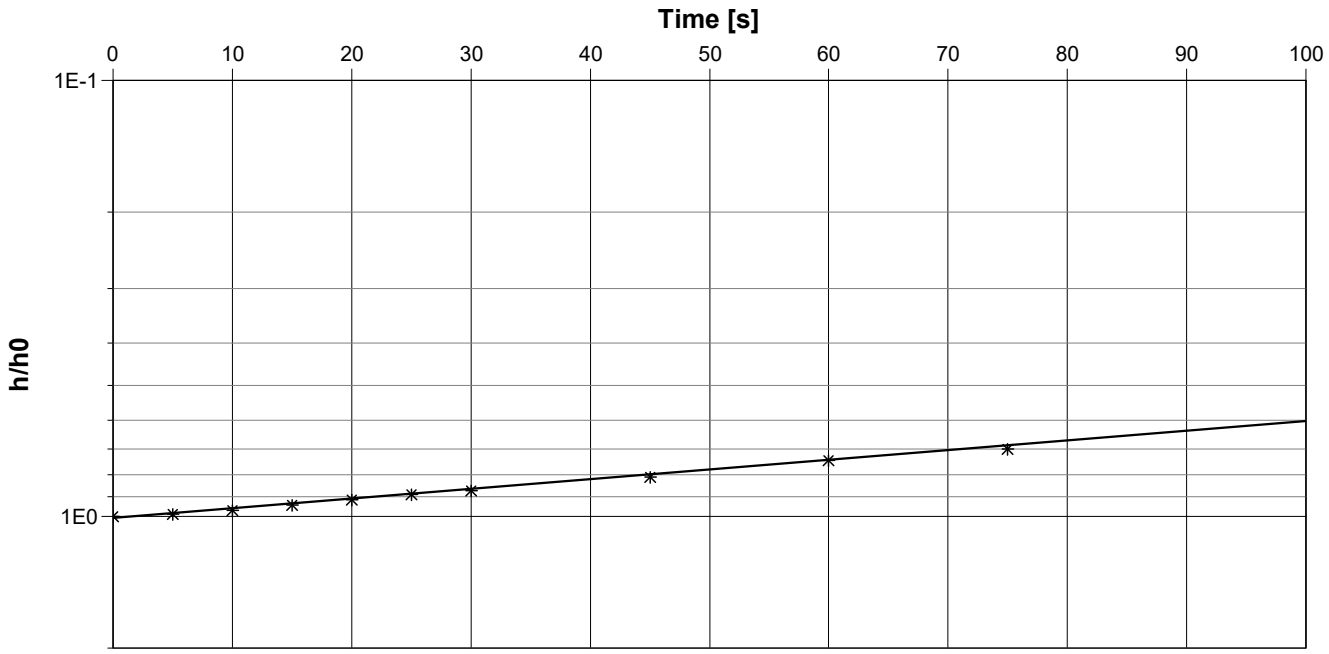


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH104 (Sound Bedrock)	2.80×10^{-7}	

GROUNDED ENGINEERING	**Slug Test Analysis Report**
	Project: 22-282
	Number: 2072 Lakeshore Road
	Client: Trinity Point

Location: Burlington, Ontario	Slug Test: BH105 - FHT1	Test Well: BH105 (Sound Bedrock)
Test Conducted by: MW		Test Date: 2023-04-04
Analysis Performed by: NN	Bouwer & Rice	Analysis Date: 2023-04-10
Aquifer Thickness: 30.00 m		

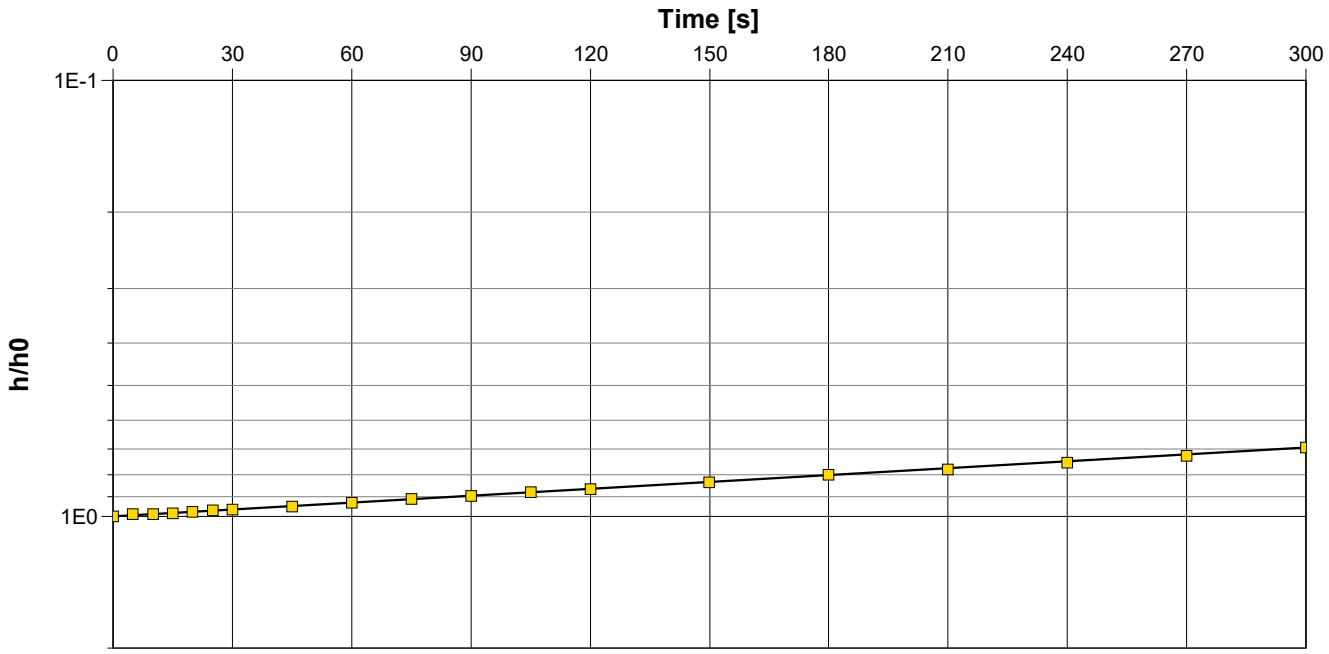


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH105 (Sound Bedrock)	1.90×10^{-6}	

GROUNDED ENGINEERING	**Slug Test Analysis Report**
	Project: 22-282
	Number: 2072 Lakeshore Road
	Client: Trinity Point

Location: Burlington, Ontario	Slug Test: BH106 - FHT1	Test Well: BH106 (Sound Bedrock)
Test Conducted by: MW		Test Date: 2023-04-04
Analysis Performed by: NN	Bouwer & Rice	Analysis Date: 2023-04-10
Aquifer Thickness: 30.00 m		

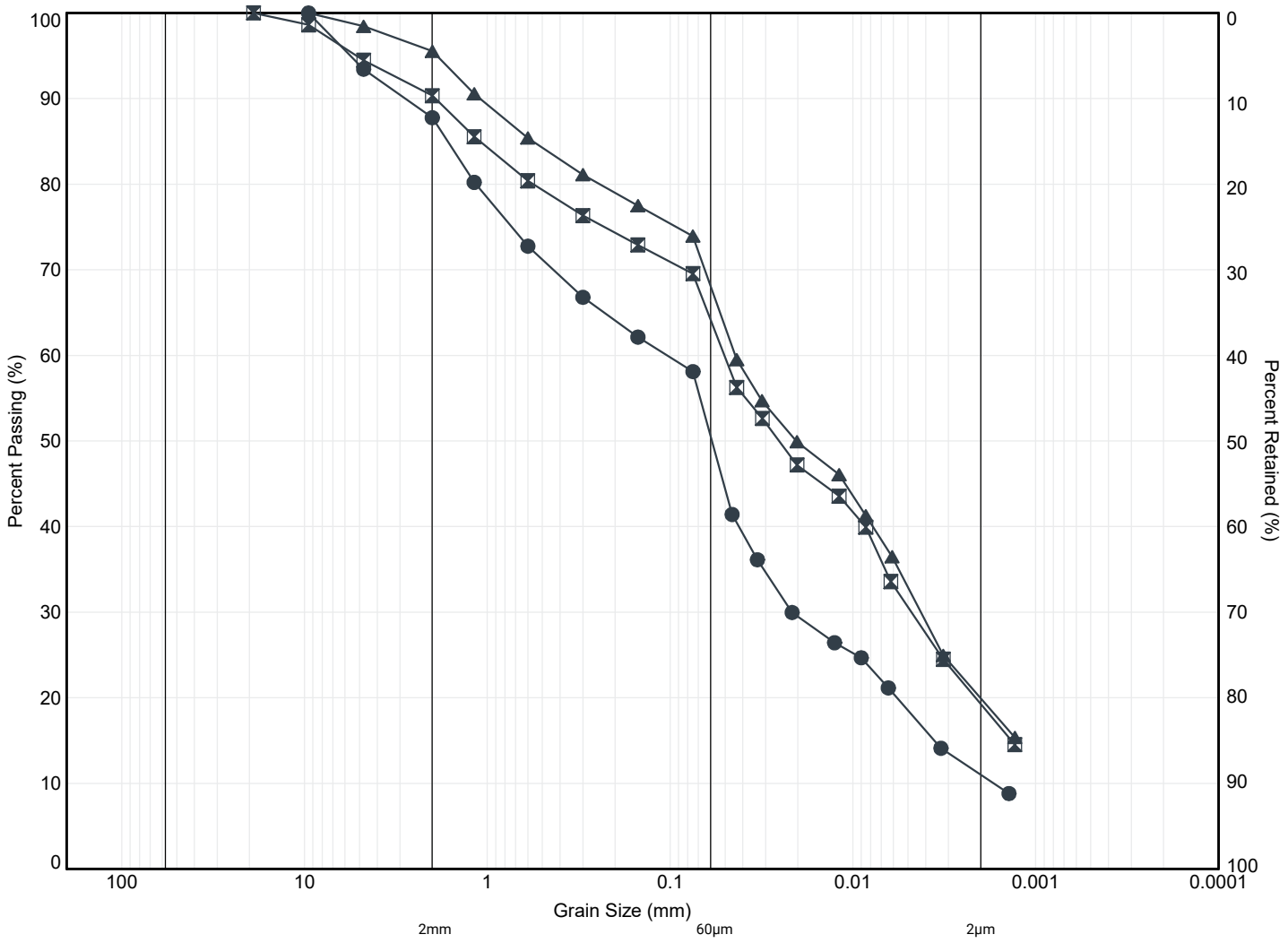


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH106 (Sound Bedrock)	4.50×10^{-7}	

APPENDIX C





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

MIT SYSTEM

	Borehole	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
●	**102**	SS4	2.6	79.8	12	37	40	11
⊠	**103**	SS4	2.6	79.8	10	26	45	19
▲	**104**	SS4	2.6	80.2	5	27	48	20

GROUNDED ENGINEERING

Title: **GRAIN SIZE DISTRIBUTION GLACIAL TILL**

File No.: **22-282**

file: 22-282 - gint.gpj

APPENDIX D



K from Grain Size Analysis Report

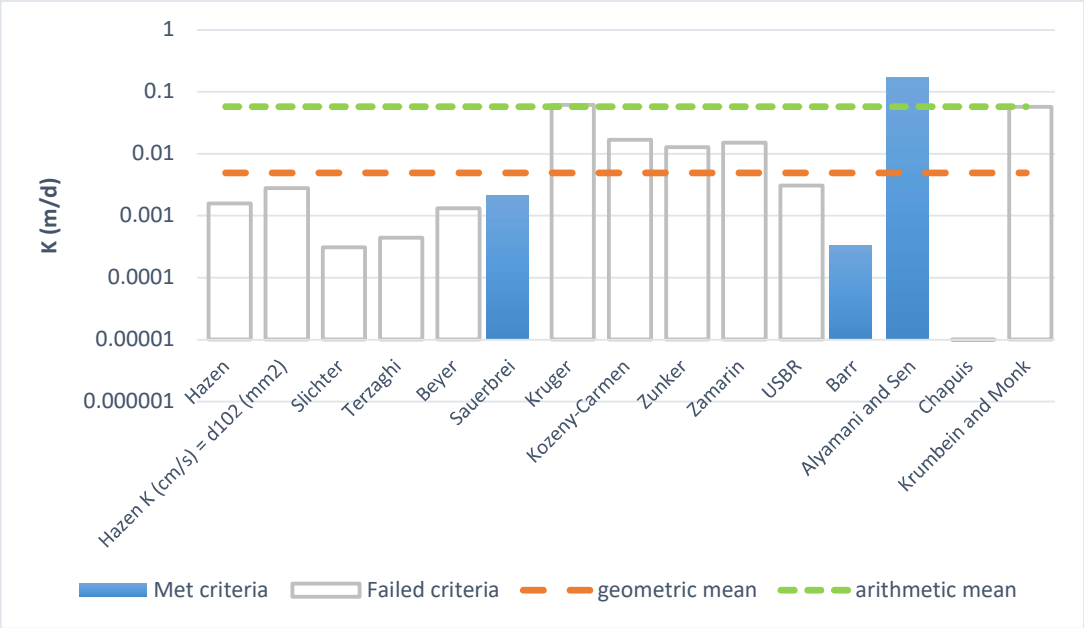
Date: 26-Jun-23

Sample Name: BH102 SS4

Mass Sample (g): 100

T (oC) 20

Poorly sorted sandy gravelly silt with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	1.8E-06	1.8E-08	0.00	
Hazen K (cm/s) = d_{10} (mm)	3.2E-06	3.2E-08	0.00	
Slichter	3.6E-07	3.6E-09	0.00	
Terzaghi	5.1E-07	5.1E-09	0.00	
Beyer	1.5E-06	1.5E-08	0.00	
Sauerbrei	2.5E-06	2.5E-08	0.00	
Kruger	7.1E-05	7.1E-07	0.06	
Kozeny-Carmen	1.9E-05	1.9E-07	0.02	
Zunker	1.5E-05	1.5E-07	0.01	
Zamarin	1.8E-05	1.8E-07	0.02	
USBR	3.6E-06	3.6E-08	0.00	
Barr	3.8E-07	3.8E-09	0.00	
Alyamani and Sen	2.0E-04	2.0E-06	0.17	
Chapuis	1.2E-08	1.2E-10	0.00	
Krumbein and Monk	6.7E-05	6.7E-07	0.06	
geometric mean	5.7E-06	5.7E-08	0.00	
arithmetic mean	6.7E-05	6.7E-07	0.06	

K from Grain Size Analysis Report

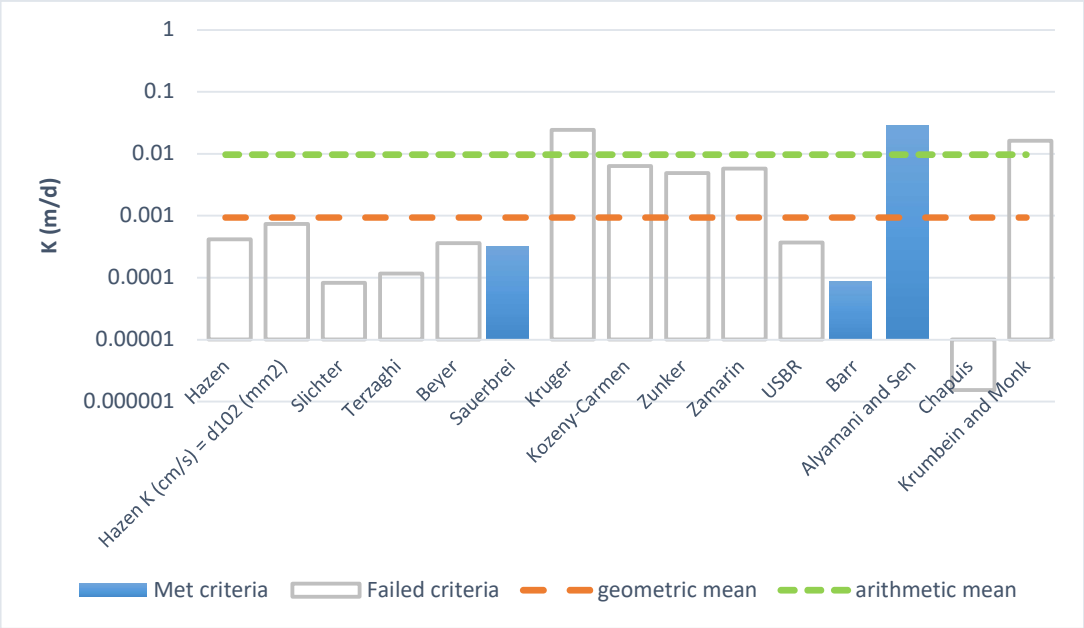
Date: 26-Jun-23

Sample Name: BH103 SS4

Mass Sample (g): 100

T (oC) 20

Poorly sorted sandy 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)	8.5E-07	8.5E-09	0.00	
Slichter	9.5E-08	9.5E-10	0.00	
Terzaghi	1.4E-07	1.4E-09	0.00	
Beyer	4.2E-07	4.2E-09	0.00	
Sauerbrei	3.8E-07	3.8E-09	0.00	
Kruger	2.8E-05	2.8E-07	0.02	
Kozeny-Carmen	7.4E-06	7.4E-08	0.01	
Zunker	5.6E-06	5.6E-08	0.00	
Zamarin	6.7E-06	6.7E-08	0.01	
USBR	4.3E-07	4.3E-09	0.00	
Barr	1.0E-07	1.0E-09	0.00	
Alyamani and Sen	3.3E-05	3.3E-07	0.03	
Chapuis	1.8E-09	1.8E-11	0.00	
Krumbein and Monk	1.9E-05	1.9E-07	0.02	
geometric mean	1.1E-06	1.1E-08	0.00	
arithmetic mean	1.1E-05	1.1E-07	0.01	

K from Grain Size Analysis Report

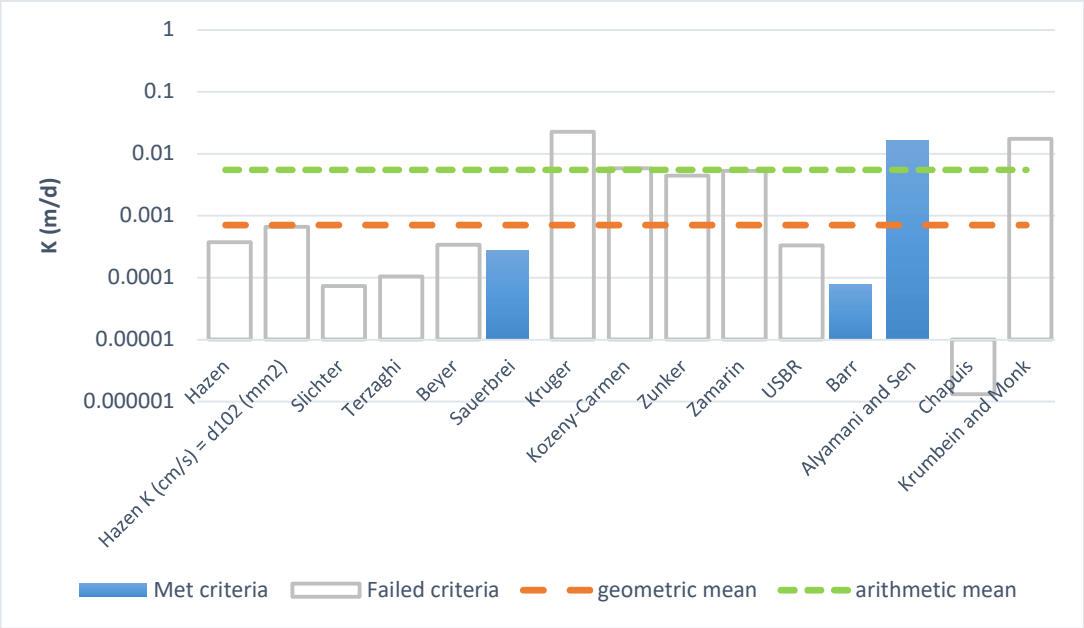
Date: 26-Jun-23

Sample Name: BH104 SS4

Mass Sample (g): 100

T (oC) 20

Poorly sorted sandy silt with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	4.3E-07	4.3E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	7.6E-07	7.6E-09	0.00	
Slichter	8.5E-08	8.5E-10	0.00	
Terzaghi	1.2E-07	1.2E-09	0.00	
Beyer	3.9E-07	3.9E-09	0.00	
Sauerbrei	3.2E-07	3.2E-09	0.00	
Kruger	2.6E-05	2.6E-07	0.02	
Kozeny-Carmen	6.7E-06	6.7E-08	0.01	
Zunker	5.2E-06	5.2E-08	0.00	
Zamarin	6.1E-06	6.1E-08	0.01	
USBR	3.8E-07	3.8E-09	0.00	
Barr	9.1E-08	9.1E-10	0.00	
Alyamani and Sen	1.9E-05	1.9E-07	0.02	
Chapuis	1.5E-09	1.5E-11	0.00	
Krumbein and Monk	2.0E-05	2.0E-07	0.02	
geometric mean	8.2E-07	8.2E-09	0.00	
arithmetic mean	6.4E-06	6.4E-08	0.01	

APPENDIX E



Your Project #: 22-282
Site Location: 2072 Lakeshore Road, Burlington, ON
Your C.O.C. #: 925895-02-01

Attention: Nick Ng

Grounded Engineering Inc.
1 Banigan Drive
Toronto, ON
CANADA M4H 1G3

Report Date: 2023/03/28
Report #: R7565045
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C379636
Received: 2023/03/21, 15:47

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Carbonaceous BOD	1	2023/03/22	2023/03/27	CAM SOP-00427	SM 23 5210B m
Total Cyanide	1	2023/03/22	2023/03/22	CAM SOP-00457	OMOE E3015 5 m
Fluoride	1	2023/03/22	2023/03/22	CAM SOP-00449	SM 23 4500-F C m
Mercury in Water by CVAA	1	2023/03/23	2023/03/23	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by Axial ICP	1	2023/03/24	2023/03/24	CAM SOP-00408	EPA 6010D m
E.coli, (CFU/100mL)	1	N/A	2023/03/21	CAM SOP-00552	
Animal and Vegetable Oil and Grease	1	N/A	2023/03/24	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2023/03/24	2023/03/24	CAM SOP-00326	EPA1664B m,SM5520B m
PAH Compounds in Water by GC/MS (SIM)	1	2023/03/22	2023/03/23	CAM SOP-00318	EPA 8270E
pH	1	2023/03/22	2023/03/22	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2023/03/22	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Turbidimetry	1	N/A	2023/03/23	CAM SOP-00464	SM 23 4500-SO42- E m
Total Kjeldahl Nitrogen in Water	1	2023/03/22	2023/03/27	CAM SOP-00938	OMOE E3516 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2023/03/24	2023/03/24	CAM SOP-00326	EPA1664B m,SM5520F m
Total Suspended Solids	1	2023/03/23	2023/03/24	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	1	N/A	2023/03/23	CAM SOP-00228	EPA 8260D

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Your Project #: 22-282
Site Location: 2072 Lakeshore Road, Burlington, ON
Your C.O.C. #: 925895-02-01

Attention: Nick Ng

Grounded Engineering Inc.
1 Banigan Drive
Toronto, ON
CANADA M4H 1G3

Report Date: 2023/03/28
Report #: R7565045
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C379636

Received: 2023/03/21, 15:47

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Marijane Cruz, Senior Project Manager
Email: Marijane.Cruz@bureauveritas.com
Phone# (905)817-5756

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C379636
Report Date: 2023/03/28

Grounded Engineering Inc.
Client Project #: 22-282
Site Location: 2072 Lakeshore Road, Burlington, ON
Sampler Initials: CSH

HALTON SANITARY & COMBINED BYLAW (2-03)

Bureau Veritas ID			VIQ039			VIQ039		
Sampling Date			2023/03/21 12:00			2023/03/21 12:00		
COC Number			925895-02-01			925895-02-01		
	UNITS	Criteria	BH103 SEW	RDL	QC Batch	BH103 SEW Lab-Dup	RDL	QC Batch
Calculated Parameters								
Total Animal/Vegetable Oil and Greas	mg/L	150	<0.50	0.50	8564418			
Inorganics								
Total Carbonaceous BOD	mg/L	300	12	2	8566242			
Fluoride (F-)	mg/L	10	0.18	0.10	8567361			
Total Kjeldahl Nitrogen (TKN)	mg/L	100	1.2	0.50	8566600			
Phenols-4AAP	mg/L	1	<0.0010	0.0010	8566961			
Total Suspended Solids	mg/L	350	19	10	8568701			
Dissolved Sulphate (SO4)	mg/L	1500	250	1.0	8566937			
Total Cyanide (CN)	mg/L	2	<0.0050	0.0050	8566192			
Petroleum Hydrocarbons								
Total Oil & Grease	mg/L	-	1.1	0.50	8571861			
Total Oil & Grease Mineral/Synthetic	mg/L	-	1.0	0.50	8571869			
Metals								
Total Aluminum (Al)	mg/L	50	0.2	0.1	8570993	0.2	0.1	8570993
Total Antimony (Sb)	mg/L	5	<0.02	0.02	8570993	<0.02	0.02	8570993
Total Arsenic (As)	mg/L	1	<0.01	0.01	8570993	<0.01	0.01	8570993
Total Beryllium (Be)	mg/L	5	<0.0005	0.0005	8570993	<0.0005	0.0005	8570993
Total Cadmium (Cd)	mg/L	1	<0.002	0.002	8570993	<0.002	0.002	8570993
Total Chromium (Cr)	mg/L	3	<0.01	0.01	8570993	<0.01	0.01	8570993
Total Cobalt (Co)	mg/L	5	<0.002	0.002	8570993	<0.002	0.002	8570993
Total Copper (Cu)	mg/L	3	<0.01	0.01	8570993	<0.01	0.01	8570993
Total Iron (Fe)	mg/L	50	0.32	0.02	8570993	0.31	0.02	8570993
Total Lead (Pb)	mg/L	3	<0.01	0.01	8570993	<0.01	0.01	8570993
Total Manganese (Mn)	mg/L	5	0.19	0.001	8570993	0.19	0.001	8570993
Mercury (Hg)	mg/L	0.05	<0.00010	0.00010	8568511	<0.00010	0.00010	8568511
Total Molybdenum (Mo)	mg/L	5	0.007	0.005	8570993	0.007	0.005	8570993
Total Nickel (Ni)	mg/L	3	<0.005	0.005	8570993	<0.005	0.005	8570993
Total Phosphorus (P)	mg/L	10	0.14	0.05	8570993	0.14	0.05	8570993

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Halton Sanitary & Combined Sewer Bylaw (2-03)

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C379636
Report Date: 2023/03/28

Grounded Engineering Inc.
Client Project #: 22-282
Site Location: 2072 Lakeshore Road, Burlington, ON
Sampler Initials: CSH

HALTON SANITARY & COMBINED BYLAW (2-03)

Bureau Veritas ID			VIQ039			VIQ039		
Sampling Date			2023/03/21 12:00			2023/03/21 12:00		
COC Number			925895-02-01			925895-02-01		
	UNITS	**Criteria**	**BH103 SEW**	**RDL**	**QC Batch**	**BH103 SEW Lab-Dup**	**RDL**	**QC Batch**
Total Selenium (Se)	mg/L	5	<0.02	0.02	8570993	<0.02	0.02	8570993
Total Silver (Ag)	mg/L	5	<0.01	0.01	8570993	<0.01	0.01	8570993
Total Tin (Sn)	mg/L	5	<0.02	0.02	8570993	<0.02	0.02	8570993
Total Titanium (Ti)	mg/L	5	<0.005	0.005	8570993	<0.005	0.005	8570993
Total Zinc (Zn)	mg/L	3	0.015	0.005	8570993	0.015	0.005	8570993
Polyaromatic Hydrocarbons								
Naphthalene	mg/L	0.14	0.000059	0.000050	8566859			
Volatile Organics								
Benzene	mg/L	0.01	<0.00040	0.00040	8566810			
Chloroform	mg/L	0.04	<0.00040	0.00040	8566810			
1,4-Dichlorobenzene	mg/L	0.08	<0.00080	0.00080	8566810			
Ethylbenzene	mg/L	0.16	<0.00040	0.00040	8566810			
Methylene Chloride(Dichloromethane	mg/L	2.0	<0.0040	0.0040	8566810			
Tetrachloroethylene	mg/L	1.0	<0.00040	0.00040	8566810			
Toluene	mg/L	0.016	<0.00040	0.00040	8566810			
Trichloroethylene	mg/L	0.4	<0.00040	0.00040	8566810			
Surrogate Recovery (%)								
D10-Anthracene	%	-	101		8566859			
D14-Terphenyl (FS)	%	-	97		8566859			
D8-Acenaphthylene	%	-	104		8566859			
4-Bromofluorobenzene	%	-	101		8566810			
D4-1,2-Dichloroethane	%	-	110		8566810			
D8-Toluene	%	-	96		8566810			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Halton Sanitary & Combined Sewer Bylaw (2-03)

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Bureau Veritas Job #: C379636
Report Date: 2023/03/28

Grounded Engineering Inc.
Client Project #: 22-282
Site Location: 2072 Lakeshore Road, Burlington, ON
Sampler Initials: CSH

HALTON STORM SEWER BYLAW (2-03)

Bureau Veritas ID				VIQ039		
Sampling Date				2023/03/21 12:00		
COC Number				925895-02-01		
	UNITS	Criteria	Criteria-2	BH103 SEW	RDL	QC Batch
Inorganics						
pH	pH	6.0:10.0	6.5:8.5	7.62		8567435
Microbiological						
Escherichia coli	CFU/100mL	-	200	<10	10	8565780

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Halton Sanitary & Combined Sewer Bylaw (2-03)
Criteria-2: Halton Storm Sewer ByLaw

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Bureau Veritas Job #: C379636
Report Date: 2023/03/28

Grounded Engineering Inc.
Client Project #: 22-282
Site Location: 2072 Lakeshore Road, Burlington, ON
Sampler Initials: CSH

TEST SUMMARY

Bureau Veritas ID: VIQ039
Sample ID: BH103 SEW
Matrix: Water

Collected: 2023/03/21
Shipped:
Received: 2023/03/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Carbonaceous BOD	DO	8566242	2023/03/22	2023/03/27	Gurjot Kaur
Total Cyanide	SKAL/CN	8566192	2023/03/22	2023/03/22	Kruti Jitesh Patel
Fluoride	ISE	8567361	2023/03/22	2023/03/22	Kien Tran
Mercury in Water by CVAA	CV/AA	8568511	2023/03/23	2023/03/23	Jaswinder Kaur
Total Metals Analysis by Axial ICP	ICPX	8570993	2023/03/24	2023/03/24	Jolly John
E.coli, (CFU/100mL)	PL	8565780	N/A	2023/03/21	Soham Patel
Animal and Vegetable Oil and Grease	BAL	8564418	N/A	2023/03/24	Automated Statchk
Total Oil and Grease	BAL	8571861	2023/03/24	2023/03/24	Rutvik Patel
PAH Compounds in Water by GC/MS (SIM)	GC/MS	8566859	2023/03/22	2023/03/23	Joe Paino
pH	AT	8567435	2023/03/22	2023/03/22	Kien Tran
Phenols (4AAP)	TECH/PHEN	8566961	N/A	2023/03/22	Mandeep Kaur
Sulphate by Automated Turbidimetry	KONE	8566937	N/A	2023/03/23	Alina Dobreanu
Total Kjeldahl Nitrogen in Water	SKAL	8566600	2023/03/22	2023/03/27	Jency Sara Johnson
Mineral/Synthetic O & G (TPH Heavy Oil)	BAL	8571869	2023/03/24	2023/03/24	Rutvik Patel
Total Suspended Solids	BAL	8568701	2023/03/23	2023/03/24	Shaneil Hall
Volatile Organic Compounds in Water	GC/MS	8566810	N/A	2023/03/23	Gladys Guerrero

Bureau Veritas ID: VIQ039 Dup
Sample ID: BH103 SEW
Matrix: Water

Collected: 2023/03/21
Shipped:
Received: 2023/03/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury in Water by CVAA	CV/AA	8568511	2023/03/23	2023/03/23	Jaswinder Kaur
Total Metals Analysis by Axial ICP	ICPX	8570993	2023/03/24	2023/03/24	Jolly John

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C379636
Report Date: 2023/03/28

Grounded Engineering Inc.
Client Project #: 22-282
Site Location: 2072 Lakeshore Road, Burlington, ON
Sampler Initials: CSH

GENERAL COMMENTS

Cooler custody seal present and intact.

Sample VIQ039 [BH103 SEW] : VOC Analysis: Due sample matrix of target analytes, sample required dilution. Detection limits were adjusted accordingly. on Volatiles Batch: 8566810

Results relate only to the items tested.

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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C379636
Report Date: 2023/03/28

QUALITY ASSURANCE REPORT

Grounded Engineering Inc.
Client Project #: 22-282
Site Location: 2072 Lakeshore Road, Burlington, ON
Sampler Initials: CSH

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8566810	4-Bromofluorobenzene	2023/03/23	101	70 - 130	99	70 - 130	102	%				
8566810	D4-1,2-Dichloroethane	2023/03/23	107	70 - 130	101	70 - 130	102	%				
8566810	D8-Toluene	2023/03/23	98	70 - 130	100	70 - 130	98	%				
8566859	D10-Anthracene	2023/03/23	103	50 - 130	99	50 - 130	103	%				
8566859	D14-Terphenyl (FS)	2023/03/23	103	50 - 130	97	50 - 130	100	%				
8566859	D8-Acenaphthylene	2023/03/23	103	50 - 130	100	50 - 130	103	%				
8566192	Total Cyanide (CN)	2023/03/22	97	80 - 120	96	80 - 120	<0.0050	mg/L	1.2	20		
8566242	Total Carbonaceous BOD	2023/03/27					<2	mg/L	0.34	30	99	85 - 115
8566600	Total Kjeldahl Nitrogen (TKN)	2023/03/28	NC	80 - 120	100	80 - 120	<0.10	mg/L	0.91	20	100	80 - 120
8566810	1,4-Dichlorobenzene	2023/03/23	110	70 - 130	109	70 - 130	<0.00040	mg/L	NC	30		
8566810	Benzene	2023/03/23	92	70 - 130	92	70 - 130	<0.00020	mg/L	NC	30		
8566810	Chloroform	2023/03/23	99	70 - 130	98	70 - 130	<0.00020	mg/L	4.2	30		
8566810	Ethylbenzene	2023/03/23	91	70 - 130	93	70 - 130	<0.00020	mg/L	NC	30		
8566810	Methylene Chloride(Dichloromethane)	2023/03/23	104	70 - 130	100	70 - 130	<0.0020	mg/L	NC	30		
8566810	Tetrachloroethylene	2023/03/23	88	70 - 130	88	70 - 130	<0.00020	mg/L	NC	30		
8566810	Toluene	2023/03/23	91	70 - 130	92	70 - 130	<0.00020	mg/L	NC	30		
8566810	Trichloroethylene	2023/03/23	102	70 - 130	101	70 - 130	<0.00020	mg/L	NC	30		
8566859	Naphthalene	2023/03/23	102	50 - 130	104	50 - 130	<0.000050	mg/L	NC	30		
8566937	Dissolved Sulphate (SO4)	2023/03/23	99	75 - 125	95	80 - 120	<1.0	mg/L	0.097	20		
8566961	Phenols-4AAP	2023/03/22	100	80 - 120	100	80 - 120	<0.0010	mg/L	4.9	20		
8567361	Fluoride (F-)	2023/03/22	101	80 - 120	107	80 - 120	<0.10	mg/L	4.8	20		
8567435	pH	2023/03/22			102	98 - 103			0.58	N/A		
8568511	Mercury (Hg)	2023/03/23	95	75 - 125	99	80 - 120	<0.00010	mg/L	NC	20		
8568701	Total Suspended Solids	2023/03/24					<10	mg/L	3.2	20	96	85 - 115
8570993	Total Aluminum (Al)	2023/03/24	131 (1)	80 - 120	101	80 - 120	<0.1	mg/L	7.2	20		
8570993	Total Antimony (Sb)	2023/03/24	102	80 - 120	100	80 - 120	<0.02	mg/L	NC	20		
8570993	Total Arsenic (As)	2023/03/24	108	80 - 120	102	80 - 120	<0.01	mg/L	NC	20		
8570993	Total Beryllium (Be)	2023/03/24	100	80 - 120	101	80 - 120	<0.0005	mg/L	NC	20		
8570993	Total Cadmium (Cd)	2023/03/24	103	80 - 120	101	80 - 120	<0.002	mg/L	NC	20		
8570993	Total Chromium (Cr)	2023/03/24	106	80 - 120	100	80 - 120	<0.01	mg/L	NC	20		
8570993	Total Cobalt (Co)	2023/03/24	97	80 - 120	100	80 - 120	<0.002	mg/L	NC	20		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8570993	Total Copper (Cu)	2023/03/24	101	80 - 120	100	80 - 120	<0.01	mg/L	NC	20		
8570993	Total Iron (Fe)	2023/03/24	99	80 - 120	102	80 - 120	<0.02	mg/L	4.7	20		
8570993	Total Lead (Pb)	2023/03/24	95	80 - 120	100	80 - 120	<0.01	mg/L	NC	20		
8570993	Total Manganese (Mn)	2023/03/24	98	80 - 120	101	80 - 120	<0.001	mg/L	0.52	20		
8570993	Total Molybdenum (Mo)	2023/03/24	100	80 - 120	100	80 - 120	<0.005	mg/L	0	20		
8570993	Total Nickel (Ni)	2023/03/24	98	80 - 120	102	80 - 120	<0.005	mg/L	NC	20		
8570993	Total Phosphorus (P)	2023/03/24	108	80 - 120	100	80 - 120	<0.05	mg/L	2.7	20		
8570993	Total Selenium (Se)	2023/03/24	107	80 - 120	103	80 - 120	<0.02	mg/L	NC	20		
8570993	Total Silver (Ag)	2023/03/24	95	80 - 120	95	80 - 120	<0.01	mg/L	NC	20		
8570993	Total Tin (Sn)	2023/03/24	97	80 - 120	101	80 - 120	<0.02	mg/L	NC	20		
8570993	Total Titanium (Ti)	2023/03/24	99	80 - 120	100	80 - 120	<0.005	mg/L	NC	20		
8570993	Total Zinc (Zn)	2023/03/24	101	80 - 120	101	80 - 120	<0.005	mg/L	0	20		
8571861	Total Oil & Grease	2023/03/24			99	85 - 115	<0.50	mg/L	0.76	25		
8571869	Total Oil & Grease Mineral/Synthetic	2023/03/24			97	85 - 115	<0.50	mg/L	1.0	25		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

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

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Bureau Veritas Job #: C379636
Report Date: 2023/03/28

Grounded Engineering Inc.
Client Project #: 22-282
Site Location: 2072 Lakeshore Road, Burlington, ON
Sampler Initials: CSH

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Anastassia Hamanov, Scientific Specialist

Soham Patel, Senior Analyst

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by {0}, {1} responsible for {2} {3} laboratory operations.

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Page 1 of 1

CHAIN OF CUSTODY RECORD

INVOICE TO:	REPORT TO:	PROJECT INFORMATION:	Laboratory Use Only:
Company Name: #36876 Grounded Engineering Inc.	Company Name:	Quotation #: C20582	Bureau Veritas Job #: / Bottle Order #: 925895
Attention: ~~Lindsy Levesque~~ Nick Ng	Attention: ~~Lindsy Levesque~~ Nick Ng	P.O. #:	
Address: ~~1 Banigan Drive~~ 1 Banigan Dr Toronto ON M4H 1G3	Address:	Project: 22-282	
Tel: (647) 361-5254 Fax:	Tel: (647) 361-5254 Fax:	Project Name:	COC #: C#925895-02-01 / Project Manager: Marijane Cruz
Email: ~~llevesque@groundedeng.ca~~ nng@groundedeng.ca	Email: ~~llevesque@groundedeng.ca~~ nng@groundedeng.ca	Site #: 2072 Lakeshore Road, Burlingto	
		Sampled By: CSH	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☒ Sanitary Sewer Bylaw
- ☐ Reg 558 ☒ Storm Sewer Bylaw
- ☐ MISA Municipality: Halton
- ☐ PWQO ☐ Reg 406 Table
- ☐ Other

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ____

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number: ____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O Reg 153 Metals & Inorganics Pkg (With)	O Reg 153 PAHs	O Reg 153 VOCs by HS & F1-F4	Halton Sanitary & Combined Bylaw (2-03)	Halton Storm Sewer Bylaw (2-03)	# of Bottles	Comments
1		BH 103 SEW	23-03-21	12:00	GW					X	X	13	
2													
3													
4													
5													
6													
7													
8													
9													
10													

21-Mar-23 15:47
Marijane Cruz
C379636
RJM ENV-1390

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Christopher Hartley	23 03 21	13:00	ANERI	2023/03/21	1547	

Laboratory Use Only
Time Sensitive | Temperature (°C) on Recei: 6 / 7 / 8 | Custody Seal: Present ✓ / Intact ✓ | Yes | No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

Bureau Veritas Job #: C379636
Report Date: 2023/03/28

Grounded Engineering Inc.
Client Project #: 22-282
Site Location: 2072 Lakeshore Road, Burlington, ON
Sampler Initials: CSH

Exceedance Summary Table – Halton Sanitary Sewer

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
No Exceedances						

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

Exceedance Summary Table – Halton Storm Sewer

Result Exceedances

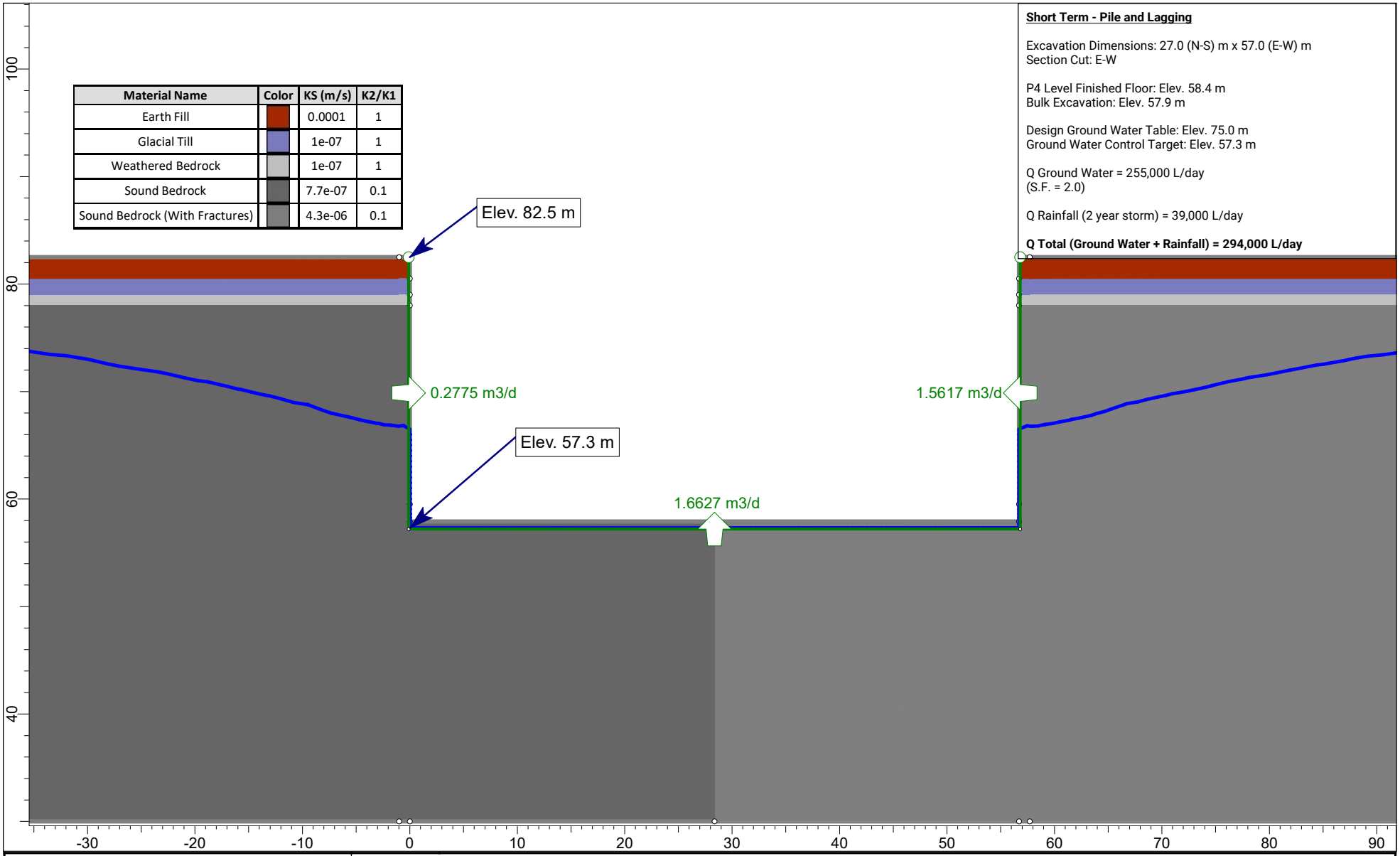
Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
No Exceedances						

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

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APPENDIX F

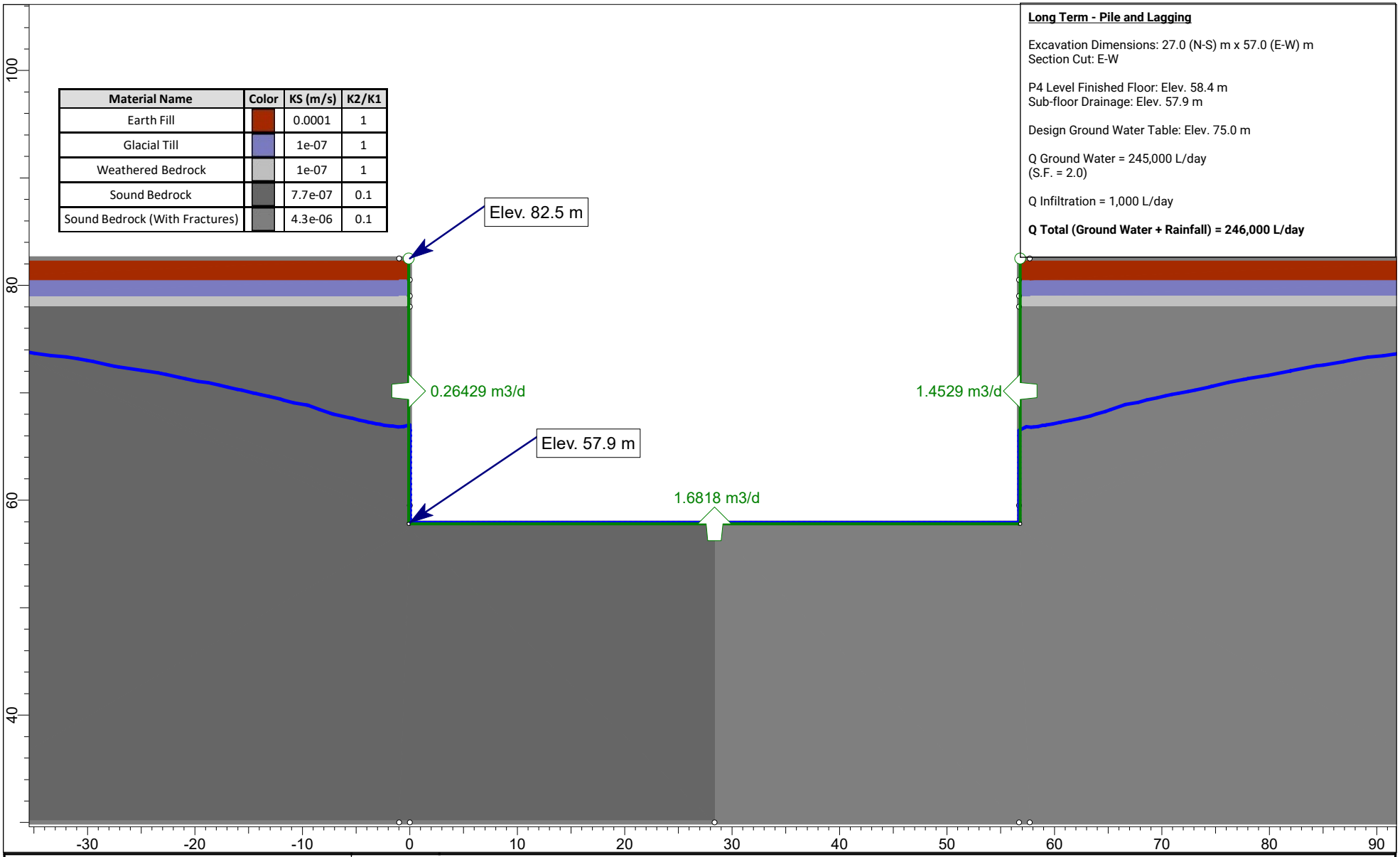




GROUNDED ENGINEERING

File	22-282 - 2150 Lakeshore Rd, Burlington		
Analysis	Steady State Seepage Analysis: W-E Section - Soldier Pile & Lagging Shoring - P7 Level, Short Term		
Ref.			
RS2 File	22-282 - FEM Rev 1.slmd	Scale 1:500	Eng RS

SLIDEINTERPRET 9.036



GROUNDED ENGINEERING

File	22-282 - 2150 Lakeshore Rd, Burlington		
Analysis	Steady State Seepage Analysis: W-E Section - Soldier Pile & Lagging Shoring - P7 Level, Long-Term		
Ref.			
RS2 File	22-282 - FEM Rev 1.slmd	Scale 1:500	Eng RS

SLIDEINTERPRET 9.036

APPENDIX G



SHORT TERM - PILE AND LAGGING (P7)

Excavation Dimensions [m]	
N-S	27
E-W	57
Area (m2)	1536.57
Perimeter (m)	167.6

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	1.6627	27.1	45,059
Sides	0.2775	140.6	39,017
(extra row if sides are different)	1.5617	27	42,166
Total			126,242
Factor of Safety 2.0			252,483

Storm Events	
2 Year [L/day]	100 Year [L/day]
38,414	145,000

Summary	L/day	L/min
Groundwater	255,000	177.1
Rainfall	39,000	27.1
Total	294,000	204.2

LONG TERM - PILE AND LAGGING (P7)

Excavation Dimensions [m]	
N-S	27
E-W	57
Area (m2)	1536.57
Perimeter (m)	167.6

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	1.6818	27.1	45,577
Sides	0.26429	140.6	37,159
(extra row if sides are different)	1.4529	27	39,228
Total			121,964
Factor of Safety 2.0			243,929

Infiltration [L/day]
628.5

Summary	L/day	L/min
Groundwater	245,000	170.1
Infiltration	1,000	0.7
Total	246,000	170.8

APPENDIX H





PINCHIN

PROJECT NAME: PHASE II ENVIRONMENTAL SITE ASSESSMENT			
CLIENT NAME: THE DAVID LANDRY FAMILY TRUST			
PROJECT LOCATION: 2072 LAKESHORE ROAD, BURLINGTON, ONTARIO			
FIGURE NAME: KEY MAP			FIGURE NO.: 1
APPROXIMATE SCALE: AS SHOWN	PROJECT NO.: 233963.001	DATE: FEB. 2019	



PINCHIN

PROJECT NAME: PHASE II ENVIRONMENTAL SITE ASSESSMENT			
CLIENT NAME: THE DAVID LANDRY FAMILY TRUST			
PROJECT LOCATION: 2072 LAKESHORE ROAD, BURLINGTON, ONTARIO			
FIGURE NAME: MONITORING WELL LOCATION PLAN			FIGURE NO.: 2
APPROXIMATE SCALE: AS SHOWN	PROJECT NO.: 233963.001	DATE: FEB. 2019	

Log of Borehole: MW01

Project #: 233963.001 **Logged By:** AH

Project: Phase II Environmental Site Assessment

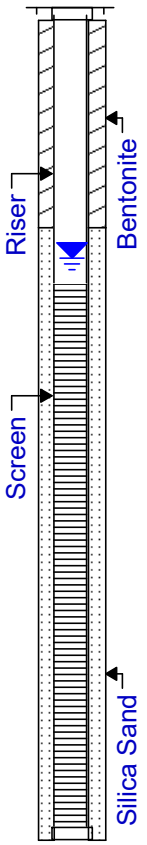
Client: The David Landry Family Trust

Location: 2072 Lakeshore Road, Burlington, Ontario

Drill Date: February 2, 2019

SUBSURFACE PROFILE

Depth (ft / m)	Description	Measured Depth (m)
0 / 0	Ground Surface	0.00
	Asphalt	
	Sand Brown, some gravel, damp.	
4 / 1	Wet below 1.52 mbgs.	
7 / 2		2.13
	Silt Red-brown to grey, trace weathered shale, damp.	
10 / 3	Sampler refusal at 3.05 mbgs. Augered to 4.57 mbgs for well installation.	3.05
	Silt Till / Weathered Shale Complex (Inferred) Red-brown to grey, damp.	
15 / 4		4.57
	End of Borehole	
18 / 5	Soil vapour concentrations measured using a RKI Eagle 2 equipped with a photoionization detector (PID) and a combustible gas indicator (CGI).	



Water level measured at 1.38 mbgs on February 7, 2019.

SAMPLE

Recovery (%)	Sample ID	Soil Vapour Concentration (ppm) CGI/PID	Laboratory Analysis
30	MW01-1	0/0	PAHs
90	MW01-2	0/0	Grain Size, PHCs, VOCs
	MW01-3	0/0	pH

Contractor: Strata

Drilling Method: Direct Push & Solid Stem Auger

Well Casing Size: 5.1 cm

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1

Log of Borehole: MW02

Project #: 233963.001 ***Logged By:*** AH

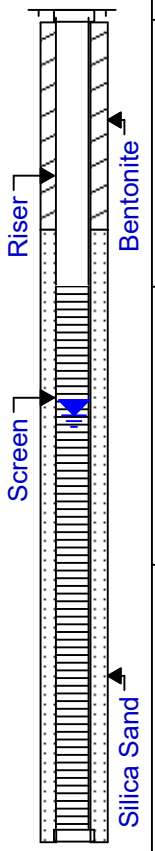
Project: Phase II Environmental Site Assessment

Client: The David Landry Family Trust

Location: 2072 Lakeshore Road, Burlington, Ontario

Drill Date: February 2, 2019

SUBSURFACE PROFILE					SAMPLE			
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration (ppm) CGI/PID	Laboratory Analysis
0 / 0		Ground Surface	0.00					
		Asphalt						
1		***Sand*** Brown, some gravel, damp.			60	MW02-1	0/0	
2 / 1						MW02-2	0/2	
		Wet below 1.52 mbgs.						
6 / 2			2.13			MW02-3	0/2	PHCs, VOCs, Lead
7		***Silt*** Red-brown to grey, trace weathered shale, damp.			80			
8						MW02-4	0/0	
9		Sampler refusal at 3.05 mbgs. Augered to 4.57 mbgs for well installation.						
10 / 3			3.05					
11		***Silt Till / Weathered Shale Complex (Inferred)*** Red-brown to grey, damp.						
12								
13 / 4								
14								
15			4.57					
		End of Borehole						
16 / 5								
17								
18		Soil vapour concentrations measured using a RKI Eagle 2 equipped with a photoionization detector (PID) and a combustible gas indicator (CGI).						
19								
20 / 6								



Water level measured at 2.23 mbgs on February 7, 2019.

Contractor: Strata

Drilling Method: Direct Push & Solid Stem Auger

Well Casing Size: 5.1 cm

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1

Log of Borehole: MW03

Project #: 233963.001 **Logged By:** AH

Project: Phase II Environmental Site Assessment

Client: The David Landry Family Trust

Location: 2072 Lakeshore Road, Burlington, Ontario

Drill Date: February 2, 2019

SUBSURFACE PROFILE

Depth (ft / m)	Description	Measured Depth (m)
0 / 0	Ground Surface	0.00
	Asphalt	
	Sand Brown, some gravel, damp.	
	Wet below 1.52 mbgs.	
7 / 2		2.13
	Silt Red-brown to grey, trace weathered shale, damp.	
	Sampler refusal at 3.05 mbgs. Augered to 4.57 mbgs for well installation.	3.05
	Silt Till / Weathered Shale Complex (Inferred) Red-brown to grey, damp.	
15 / 4.57		4.57
	End of Borehole	

Soil vapour concentrations measured using a RKI Eagle 2 equipped with a photoionization detector (PID) and a combustible gas indicator (CGI).

Monitoring Well Details: Riser, Bentonite, Screen, Silica Sand

Water level measured at 1.42 mbgs on February 7, 2019.

SAMPLE

Recovery (%)	Sample ID	Soil Vapour Concentration (ppm) CGI/PID	Laboratory Analysis
60	MW03-1	0/0	
	MW03-2	0/0	pH
80	MW03-3	0/0	PHCs, VOCs, Lead
	MW03-4	0/0	

Contractor: Strata

Drilling Method: Direct Push & Solid Stem Auger

Well Casing Size: 5.1 cm

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1