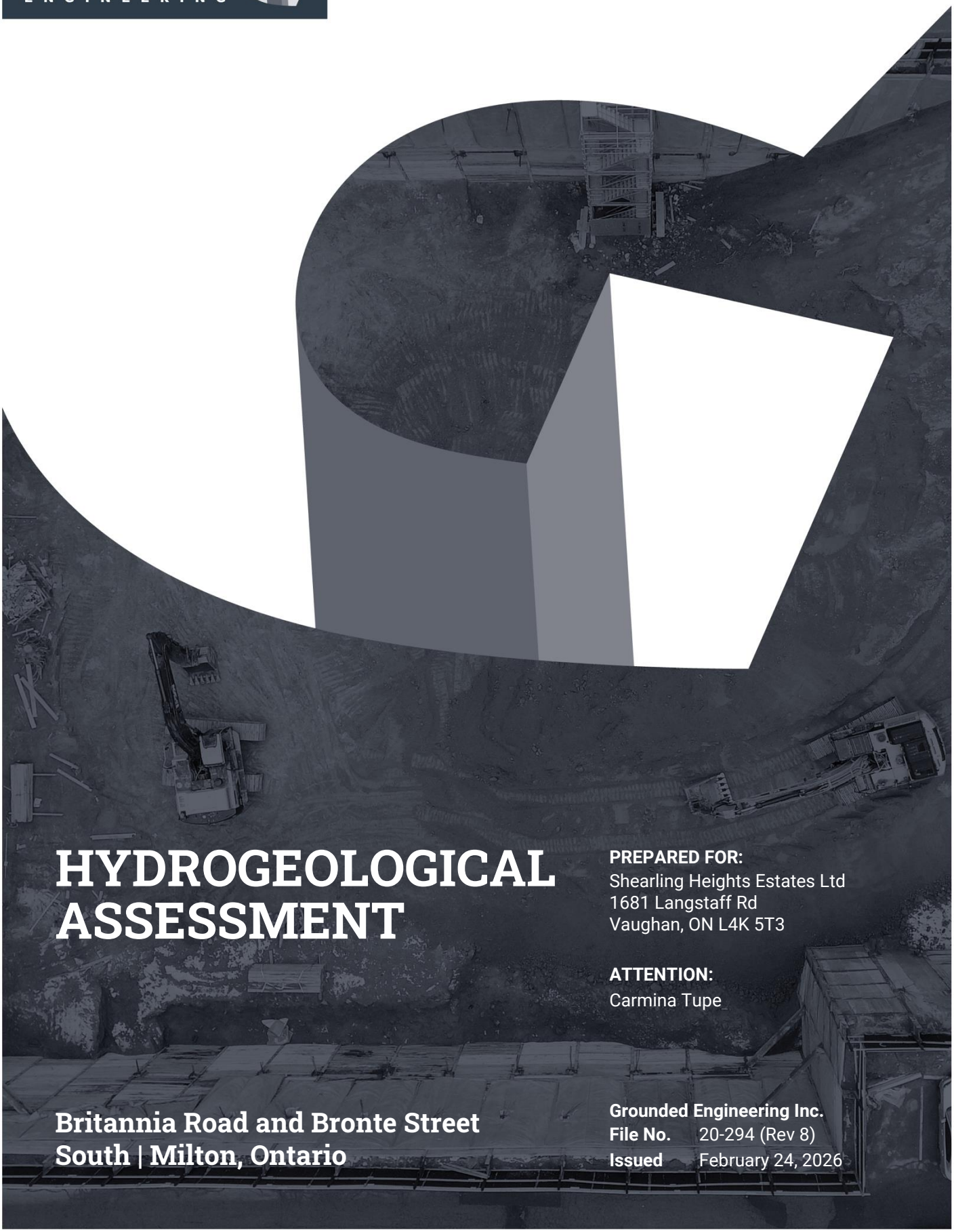

HYDROGEOLOGICAL ASSESSMENT

PREPARED FOR:
Shearling Heights Estates Ltd
1681 Langstaff Rd
Vaughan, ON L4K 5T3

ATTENTION:
Carmina Tupe

Britannia Road and Bronte Street South | Milton, Ontario

Grounded Engineering Inc.
File No. 20-294 (Rev 8)
Issued February 24, 2026

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1 Introduction

1.1 Background

Trinity Point Developments retained Grounded Engineering Inc. to complete a Hydrogeological Assessment for the property located on the northeast corner lot at the intersection of Britannia Road and Bronte Street South, Milton, Ontario (the Property). The site location is presented in Figure 1.

Based on the architectural drawings (reference below), the proposed development consists of 13 double-car garage townhouse blocks with basements in the northern, central, and southeastern portions of the site, and a 7-storey midrise structure with one underground parking level on the southwestern portion of the site. This hydrogeological assessment has been prepared in support of the rezoning of the property. The survey and site plan are provided in Appendix A.

A brief revision history of this hydrogeological assessment report for this site is as follows:

- Original report, labeled Revision 1 (April 19, 2021), included hydrogeological engineering for townhouse blocks with residential basements, and townhouse blocks and multiple mid-rise buildings set on top of a P2 underground parking structure
- Revision 2 (May 12, 2021), included clarifications for townhouse descriptions and updated architectural drawing references.
- Revision 3 (February 18, 2022), referenced updated architectural drawings with adjusted tower heights.
- Revision 4 (February 29, 2024), referenced updated architectural drawings with modified basement elevations.
- Revision 5 (March 14, 2024), referenced updated architectural drawings for application consistency purposes.
- Revision 6 (October 30, 2025), referenced updated architectural drawings with modified basements elevations.
- Revision 7 (January 26, 2026), referenced updated architectural drawings with a P1 underground parking structure.
- **Revision 8 (current)** of this report includes references to updated architectural drawings minor site plan changes.

The hydrogeological assessment was undertaken to evaluate hydrogeological conditions of the proposed development on the Property and to develop a plan to manage risk of potential impacts associated with activities related to the proposed land use.

1.2 Scope of Work

A summary of the scope of work is provided below:

- Background Information Review: Available background geologic and hydrogeological information for the Property and surrounding areas were reviewed. This includes a review of the Ministry of the Environment, Conservation and Parks (MECP) well records, watershed information by Conservation Halton and the Halton Region, and results of previous studies and subsurface investigations.
- Groundwater Level Monitoring: Groundwater level monitoring was conducted in order to assess the groundwater flow conditions.
- Hydraulic Conductivity Test: In-situ hydraulic conductivity tests were conducted in select monitoring wells to assess hydraulic conductivity of the strata. The underlying soils were assessed in order to determine potential dewatering requirements.
- Water Balance: A water balance and assessment of infiltration rates for existing (pre-development) and post development conditions was completed to determine the feasibility of the proposed development.

2 Site Information

2.1 Site Location and Description

The Property is approximately rectangular in shape, with a total area of 2.12 hectares. The Property is currently an empty, undeveloped field. The existing site conditions are presented in Appendix A.

The immediate neighboring areas are serviced with municipal piped water and sewage services. The surrounding areas are occupied with residential subdivisions or are empty lots.

The Property information is provided below:

Address	Britannia Road and Bronte Street South, Milton, Ontario
Area	2.12 ha
Legal Description	Block 360 on Plan 20M-1184, Part of Lot 6, Concession 2, N.S. (Trafalgar)
UTM Coordinates	E: 593376 m N: 4814565 m (UTM 17T)
Current Land Use	Vacant
Property Owner Information	Shearling Heights Estate Inc. c/o Trinity Point Developments 1681 Langstaff Rd Vaughan, ON L4K 5T3
Person who has engaged the Qualified Person to conduct the assessment	Gabriel DiMartino Senior Vice President, Development Trinity Point Developments

2.2 Topography & Drainage

The Ministry of Natural Resources and Forestry (MNRF) and Ministry of Energy, Northern Development and Mines (MENDM) database were searched to obtain topographic and geological maps of Ontario for review. The maps are provided in Appendix B and E respectively, and the information obtained is summarized below:

Records	Information
Topographic Maps	The elevation of the Property varies, ranging from 194 to 185± masl. It has multiple hills, but generally slopes downward towards to the south.
Hydrology	There is a stormwater retention pond 300 m east of the Property. The groundwater flow is expected to flow locally and regionally to the southeast, towards Lake Ontario.
Run Offs	Storm water at the Property is expected to drain towards ditches within the Property, and towards catch basins and landscaped areas on the municipal roads adjacent to the site.

2.3 Regional Physiography

From a regional perspective the Property is situated within the physiographic region known as the West St. Lawrence Lowlands. The West St. Lawrence Lowlands consist of a limestone plain (Elev. 200-250 masl) that is separated by a broad, shale lowland from 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 (Elev. 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.

The Property is located within the Indian Creek Subwatershed of the Bronte Creek watershed according to Conservation Halton. The Property is not located within any wellhead/source protection area. The source protection area and watershed maps are presented in Appendix C.

2.4 Regional Geology and Soils

Based on the published information, the regional geology is described as below.

Records	Information
Geological Maps	Overburden: The overburden at the Property consists of fine-textured glaciolacustrine deposits comprised of silt and clay, minor sand and gravel, interbedded silt and clay and gritty, pebbly flow till, and rainout deposits. Bedrock:

Records	Information
	The bedrock at the Property is of the Queenston Formation and is comprised of shale, siltstone, minor limestone, and sandstone. Depth to Bedrock: An Ontario Well Records Search indicated that bedrock is approximately 18 m below ground surface.

It should be noted that the subsurface soil and rock conditions described above represent generalized conditions only and should not be considered site specific. The information is presented in Appendix E.

2.5 Regional Hydrogeology

The regional hydrogeologic conditions were assessed through reviewing of the water well records, geologic mapping, published information from Conservation Halton, and the results of previous investigations completed within the vicinity of the site and for the Property. Based on the information, the below hydrostratigraphic units were defined in the vicinity of the Property.

Glacial Till (Aquifer):

The till material in the region is comprised of silt and clay. It has a low permeability and conducts limited quantities of groundwater. The till is observed to extend to depths of approximately 13 m below ground surface around the property.

Queenston Formation Bedrock (Aquifer):

The Queenston Formation Bedrock generally consists of shale and minor limestone. The bedrock is typically located at depths of approximately 18 m below ground surface in the vicinity of the property. Wells installed into the bedrock typically have limited groundwater yielded.

2.6 Regional Climate

The following general climate data for the Property was obtained from Halton Region Source Protection Area Assessment Report for Indian Creek Subwatershed, dated October 2017.

Mean annual precipitation	937 mm
Mean annual evapotranspiration	637 mm
Mean annual water surplus	300 mm

It is noted that the above are average values, which are representative in a regional context. There will be seasonal and annual variations in these values. However, the average values will govern long-term groundwater recharge and discharge rates. Therefore, average values are appropriate for assessment of hydrogeologic conditions at the site.

2.7 Groundwater Resources

Private well records from the MECP well record database were reviewed for wells located within a 250 m radius of the Property. A total of 9 well records were retrieved from the well record database. The MECP well record is presented in Appendix D. A summary of data obtained is presented in the following table.

Total Number of Wells	**9**
Wells completed in Overburden	1 (11%)
Bedrock	2 (22%)
Unknown	6 (67%)
Depth Ranges	
50 ft. or less	7 (78%)
51 ft. to 100 ft.	2 (22%)
Water Use	
Monitoring/Test Holes	0 (0%)
Water Supply (domestic/public/livestock)	2 (22%)
Abandoned	5 (56%)
Unknown	2 (22%)

The above summary indicates that most local wells registered in the area likely obtained their water supply from the overburden aquifer. The wells were generally used for water supply for domestic purposes. It is unlikely that these wells installed for domestic use are still existing given that they were installed in the 1950s to 1970s, and they are now located in developed areas serviced with municipal water.

2.8 Subsurface Investigation

A subsurface investigation was conducted by Grounded Engineering Inc. at the Property in January 2021. The investigation details are described below. Borehole logs are presented in Appendix F. The location of the boreholes is shown on Figure 2A. A subsurface cross section is shown in Figure 4.

Boreholes	BH101 to BH114
Monitoring Wells	BH101, BH102, BH103, BH107, BH108, BH112, and BH114
Well Depth	5.2 to 15.5 mbgs

The stratigraphy beneath the investigated areas of the Property generally consists of the following:

Geological Units	Description
Earth Fill	Stockpiles of fill were noted across the site during the time of our investigation. At existing grade, all boreholes observed a layer of earth fill that extends to depths of 1.5 to 4.6 m below grade (Elev. 189.6 to 184.0 m). The earth fill varies in composition but generally consists of clayey silt and sandy silt with trace gravel. It contains trace rootlets, wood fragments, asphalt, and rock fragments. The earth fill is typically dark brown to dark brown with black, and moist.
Clayey Silt Till	Underlying the fill materials, boreholes encountered a native clayey silt glacial till at depths of 1.5 to 4.6 m below grade (Elev. 189.6 to 184.0 m) and extending to depths of 7.6 to 10.7 m below grade (Elev 178.9 to 176.7 m). Boreholes 101, 102, and 110 observed weathering in this deposit at a depth of 2.3 m below grade (Elev. 187.3 to 185.7 m) and extending to depths of 3.0 to 3.8 m below grade (Elev. 185.0 to 184.2 m). The clayey silt till generally consists of some sand, trace gravel, and trace rock fragments. The weathered layers are generally blackish grey to dark brown with black, and moist. The unweathered till is generally reddish brown and moist.
Sandy Silt Till	Underlying the clayey silt till, boreholes encountered a dense to very dense sandy silt glacial till at depths of 7.6 to 10.7 m below grade (Elev. 178.9 to 176.7 m). The sandy silt till consists of trace clay, trace gravel, and trace rock fragments. It is typically reddish brown and moist. In Boreholes 104 and 106, the sandy silt till transitions to a silty sand glacial till at depths of 12.2 and 10.7 m below grade (Elev. 176.8 and 177.3 m). The silty sand till consists of trace to some gravel and trace clay. It is reddish grey and wet. The sandy silt to silty sand till extended beyond the depth of investigation (Elev. 176 to 172 m).

2.9 Groundwater Level Monitoring

A total of 7 monitoring wells were installed on the Property. Groundwater level measurements were made as part of the hydrogeological assessment. A detailed table of monitoring well information is appended.

Observations pertaining to the depth of the water level and caving were made in the open boreholes immediately after completion of drilling and are reported on the borehole logs. The measured water levels along with other borehole details are presented in Appendix F. Our findings are generally consistent with the groundwater level monitoring data from nearby boreholes in the Main Sail Estates Inc. Subdivision as reported by R.J. Burnside & Associates Ltd (2015). Groundwater levels are summarized in the following table:

Groundwater levels may be influenced by climatic variations, seasonal fluctuations and presence of underground services and structures. For design purposes, the groundwater table is set at Elev. 184.3 masl. Groundwater levels measured in February 2024 showed elevated levels in BH102 and BH103. These groundwater levels are an outlier, likely caused from infiltrated storm water in the fill. The groundwater flows southwards locally.

2.10 Groundwater Quality

A groundwater sample was obtained from the monitoring wells on-site and submitted for laboratory analysis on January 27, 2025. Monitoring well construction details are provided Table 1. The sample was analyzed with respect to the Halton Sewer Discharge Criteria. The results of the groundwater testing are presented in Appendix H and summarized below.

Region of Halton Sewer Bylaw	Exceedance
Sanitary & Combined Sewer Discharge Criteria	Dissolved Sulphate (Limit 1,500 mg/L, Result 3,100 mg/L)
Storm Sewer Criteria	None

The groundwater sample **exceeded** the **Limits for Sanitary and Combined Sewer Discharge** for the parameters listed above.

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

2.11 Hydraulic Conductivity

2.11.1 In Situ Permeability Test (Single Well Response Test)

In situ single well response tests (SWRT) were conducted on five (5) monitoring wells, to assess the hydraulic conductivity of the underlying soil. The tests were conducted by drawing down the water levels (rising head test). The monitoring wells screened in clayey silt till and fill were dry at the time of initial monitoring, and SWRTs were not conducted in them.

Data from the SWRT was analyzed using the Bouwer and Rice method (1976). The table below summarizes the results of the hydraulic conductivity testing. The analysis graphs of the tests are presented in Appendix I.

Monitoring Well	Well Screen Elevation (masl)	Screened Geological Unit	Hydraulic Conductivity (m/s)
BH101	178.9 – 175.8	Sandy Silt Till	2.2×10^{-7}
BH107	178.9 – 175.9	Sandy Silt Till	8.5×10^{-8}
BH108	175.2 – 172.2	Sandy Silt Till	3.7×10^{-7}
BH112	177.9 – 174.8	Sandy Silt Till	5.3×10^{-8}
BH114	177.4 – 174.3	Sandy Silt Till	4.4×10^{-8}

Based on the SWRT analysis, the hydraulic conductivity of the underlying sandy silt till ranges from 4.4×10^{-8} to 3.7×10^{-7} m/s.

2.11.2 Grain Size Analysis

Grain size analyses were conducted on representative soil samples using sieves and hydrometers. The analysis is summarized below and presented in Appendix G.

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. The results of the analysis are also presented in Appendix G.

Sample ID	Soil Description	Applicable Analysis Methods	Hydraulic Conductivity (m/s)
BH101 SS6	Clayey silt, some sand, trace gravel	Sauerbrei, Barr & Alyamani and Sen	1.1×10^{-9}
BH101 SS11	Silt and sand, trace gravel, trace clay	Sauerbrei, Barr & Alyamani and Sen	1.4×10^{-7}
BH104 SS11	Clayey silt, sandy, trace gravel	Sauerbrei, Barr & Alyamani and Sen	3.9×10^{-9}
BH104 SS13	Silty sand, some gravel, trace clay	Sauerbrei, Barr & Alyamani and Sen	1.1×10^{-6}
BH108 SS8	Clayey silt, sandy, trace gravel	Sauerbrei, Barr & Alyamani and Sen	4.5×10^{-9}
BH109 SS11	Sandy silt, some clay, some gravel	Sauerbrei, Barr & Alyamani and Sen	1.0×10^{-8}
BH113 SS4	Clayey silt, some sand, trace gravel	Sauerbrei, Barr & Alyamani and Sen	2.8×10^{-9}
GP1*	Silt and clay, some sand, trace gravel	Sauerbrei, Barr & Alyamani and Sen	7.9×10^{-10}
GP2*	Silt and clay, some sand, trace gravel	Sauerbrei, Barr & Alyamani and Sen	5.9×10^{-10}

** indicates sample from Guelph Permeameter test attempt on December 3rd. These tests were attempted in the vicinity of tests completed on April 7th.*

Based on the in-situ testing and grain size analysis, the Property generally consists of moderate to low permeability soils and is not considered to be significant in terms of groundwater recharge.

2.12 Infiltration Testing

On April 7th, 2021, Grounded conducted two (2) in-situ infiltration tests, in two (2) locations to support a water balance, using a Guelph Permeameter. The infiltration tests were completed in unsaturated soils and carried out in accordance with the methodology recommended by the Toronto Region Conservation Authority (TRCA). The location of the infiltration testing is presented on Figure 2A. Flow rates over the duration of each test were nearly stagnant.

The results of the infiltration tests are presented in Appendix J and summarized below.

Test ID	Ground Surface Elev. (masl)	Approx. Test Depth (mbgs)	Approx. Test Elev. (masl)	Soil Description	Field Saturated Hydraulic Conductivity (m/s)	Infiltration Rate (mm/hr)	Factored Infiltration Rate (mm/hr)
GP1A	189.3	0.3	189	Silt and clay, some sand	3.53×10^{-9}	10.2	4.1
GP2A	187.8	0.3	187.5	Silt and clay, some sand	3.28×10^{-9}	10.7	4.3

* A Factor of Safety of 2.5 has been applied to the measured rates, as determined by TRCA guidelines.

Borehole logs indicate that the strata within 1.5 m of the tested layers is the same strata encountered across the site, indicating a continuous soil horizon. The mean factored infiltration rate obtained from the Guelph Permeameter test results is 4.2 mm/hr.

2.13 Surface Water Features

A site inspection was conducted to assess the presence of surface water features on/or bounding the Property. The inspection includes the following:

- Inspection of surface and groundwater interactions and associated features
- Inspection of areas of actual and potential groundwater discharge
- Inspection of swales and drainage courses
- Evidence of phreatophytic vegetation, which may indicate seasonally high groundwater levels and/or groundwater discharge and seepage

The site inspection was conducted on December 10th, 2020. The Property is hilly with some low-lying areas and shallow trenches which would allow ponding of water. There is young vegetation scattered in the low-lying areas of the Property. Surface water looks likely to flow south overland into ditches and towards catch basins on municipal roads.

2.14 Review of Current Regulatory Requirements

Current regulatory requirements associated with water supply and hydrogeology in connection with the proposed development were reviewed. This includes the review of the Conservation Halton Regulatory Plan. Relevant information is presented in Appendix K.

The Property is not located within Conservation Halton Approximate Regulatory Limits mapping area.

3 Discussion and Analysis

3.1 Proposed Development Plan

The proposed development plan is presented in Appendix A.

The proposed project consists of 13 double-car garage townhouse blocks with basements in the northern, central, and southeastern portions of the site, and a 7-storey midrise structure with one underground parking level on the southwestern portion of the site. The following summarizes the proposed land coverage areas for the development:

Land Coverage Type	Areas
Building Envelope	0.87 ha
Hard Surface Paving	1.25 ha
Landscape areas for infiltration	0 ha
Total Area	**2.12 ha**

3.2 Summary of Hydrogeologic Conditions

For design purposes, the stabilized groundwater table is at Elev. 184.8± m. The groundwater table is present in all the native soil units. The lowest (P1) FFE is at about Elev. 183.66 m. Townhouse basements vary between Elev. 186.9 and 185.6± m.

For the P1 structure, bulk and foundation excavations will extend below the design groundwater table within the clayey silt till which has a low permeability and will yield only minor seepage in the long-term. The proposed shoring at the site will consist of conventional permeable soldier piling and lagging for present purposes.

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.

A professional dewatering contractor must be consulted to review the subsurface conditions and to design a site-specific dewatering system. It is the dewatering contractor's responsibility to assess the factual data and to provide recommendations on dewatering system requirements.

A fully drained underground structure is proposed.

The above hydrogeologic features and functions were considered in assessing the potential impact of the proposed development. This information was used to provide mitigating measures to ensure that hydrogeologic function is not adversely affected during the proposed development.

3.3 Water Balance Analysis

A water balance model was prepared for the Property to assess the distribution of rainfall run-off and infiltration for existing (pre- and post-development) conditions (Appendix L). The model is based on Halton Region Climate Data presented in Section 2.6. Typical recharge rates used in calculations were taken from MOEE Table 3 approach in the MOEE Hydrogeological Technical Information Requirement for Land Development Applications (1995). The recharge rate is representative of the soil types found across the surficial soils at the Property. The water balance for pre-and post-development conditions is summarized below:

Pre-Development Water Balance

	Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-Off (m^3)
Existing Landscaped/Bare Areas	21,233	19,895	13,525	2,123	4,247

The post-development water balance accounts for hard-surfaced areas created by buildings and pavements. The areas for the proposed land types are determined from architectural drawings provided by Graziani + Corazza Architects Inc.

Post-Development Water Balance

	Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-Off (m^3)
Proposed Development	11,520	10,795	-	-	10,795
Hard Surface Paving	8,383	7,854	-	-	7,854
Landscaped Area for Infiltration	1,330	1,246	-	133	266

The volume of surface water run-off available from residential roof tops was calculated to be 9,715 m^3. This volume of water will be available as a resource, to maintain groundwater recharge and function. The volume of roof run-off available is compared to the difference in infiltration volume between pre-development and post-development, as noted below:

Potential Post-Development Infiltration Deficit (m^3)	Volume of Roof Run-off Available (m^3)
1,990	9,715

The water balance calculation indicated that there is a decrease in infiltration post-development. A minimum of 20% volume of roof run-off will need to be captured to match the pre-development infiltration rates at the Property. Storm water management and mitigation measures are required to maintain the overall infiltration rates at the Property.

3.4 Groundwater Control Requirements

The finite element model (FEM) modelling method was used to conduct numerical analysis for groundwater seepage and to determine the short-term (construction) and long-term dewatering requirements.

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

- For midrise building foundations made on the clayey silt till, positive dewatering is not anticipated. Dewatering will be limited to sump and pumps for excavations made within the clayey silt till.
- The townhouse bulk excavation is above the groundwater table, with foundation excavations in clayey silt till which will not yield free-flowing water. These are excluded from the finite element model as they will yield negligible groundwater seepage. In the short term, the townhouse basements are assumed to only yield rainfall.
- In the long term, the townhouse basements are above the groundwater table, and are assumed to only collect infiltrated stormwater.
- A Factor of Safety of 3 was used for all groundwater seepage volume calculations.

The FEM results are summarized below and presented in Appendix M.

Short Term (Construction) Groundwater Quantity – Safety Factor of 3.0 Used					
Groundwater Seepage		**Design Rainfall Event (32 mm)**		**Total Daily Water Takings**	
L/day	**L/min**	**L/day**	**L/min**	**L/day**	**L/min**
25,000	17.4	285,000	197.9	310,000	215.3

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 (94 mm) is approximately 1,071,000 L/day.

The groundwater control system is required to be designed by a dewatering contractor. The groundwater must be dewatered prior to excavation in order to maintain a stable working base in the excavation.

Mitigation measures based on dewatering and infiltration requirements as per the MECP are discussed in Section 3.6.

Long Term (Permanent) Groundwater Quantity – Safety Factor of 3 Used					
Groundwater Seepage		Infiltration Design Rainfall Event (32 mm)		Total Daily Water Takings	
L/day	L/min	L/day	L/min	L/day	L/min
25,000	17.4	7,000	4.9	32,000	22.2

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

3.5 Assessment of Potential Impact

The Property will be serviced with municipal piped water, storm sewers, and sanitary sewers. The proposed development does not pose significant concern with respect to potential impact to groundwater quality in the area.

3.5.1 Sewage Works

Negative impacts to sewage works may occur in terms of the quantity or quality of the groundwater discharged. This report provided the estimated quantity of the water that will be discharged. 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 discussed in Section 2.10. As noted, the groundwater sampled exceeded the Halton Limits for Sanitary and Combined Sewer Discharge.

Additional treatment will be required before the water can be discharged to sanitary and combined sewers to avoid impacts to sewage works by groundwater quality.

3.5.2 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 Property.

The ZOI was calculated using the Sichardt equation below.

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

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

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

Zone of Influence (ZOI)		
	Short Term (Construction), m	**Long Term (Permanent), m**
Pile and Lagging Scenario	2.5	2.5

3.5.3 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 water body. As such, there will be no impact to the natural environment caused by the water takings at the site.

3.5.4 Local Drinking Water Wells

The site and surrounding area are provided with municipal piped water and sewer supply. Historic wells dating as far back as the 1950s are likely no longer in use due to the more recent developments in the area. As such, there is no anticipated impact to drinking water wells.

3.5.5 Contamination Source

The site and immediate surrounding area currently consist of residential areas. These lands 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.

3.6 Mitigation Measures to Maintain Hydrogeologic Functions

3.6.1 Maintenance of Groundwater Recharge

The existing groundwater recharge rate at the Property is approximately 100 mm/a. This recharge occurs in a broad diffuse manner over the entire site. Mitigation measures are available to maintain recharge rates. There are no wetlands in the immediate vicinity of the Property. The nearest water body is located approximately 0.3 km to the northeast. There will be no direct surface runoff from the Property to the water body.

Appropriate low-impact development (LID) techniques which can be applied include maintenance of overall groundwater recharge across the site area. In order to mitigate the infiltration deficit for the Property, an effort should be made to implement LID methods. There is a surplus of water available following development to maintain groundwater recharge and function. The following LID measures can be considered for the proposed development, but the soil infiltration rate of 4.2 mm/hr, as determined by infiltration testing, is low and may limit their feasibility:

- Stormwater planters adjacent to proposed buildings
- Extended tree pits
- Bio-swales or rain gardens within the landscaped areas of the Property

Infiltration rates can potentially be improved by permeable pavers on sidewalks, driveways, and/or roadways. Note that the overall effectiveness of permeable pavers will still be limited by the low infiltration rate of the native soils.

3.6.2 Maintenance of Groundwater Transmission Pathways

As previously indicated, the soils present on the Property are of low permeabilities. No significant groundwater flow or transmission zones were encountered on the Property. However, the overall continuity of the groundwater flow at the Property should be maintained, where practical. Generally, the groundwater transmission pathways can be maintained through the following means:

- Bedding materials beneath underground services may serve as a subdrain to collect and convey groundwater. To prevent drainage of groundwater along bedding materials, clay trench plugs should be provided at all manhole locations in order to cut off the granular bedding.
- The excavation of any underground services or utilities across permeable layers may interrupt the groundwater flow. It is recommended that trench backfilling be carried out with materials that are similar to the materials that have been excavated.

Groundwater flow may occur into the open shallow excavations if more permeable deposits (such as sand or gravel) are encountered. Localized groundwater flow into shallow excavations can be controlled by utilizing localized sumps and pumps at the base of the excavations. In addition to this, it is recommended that any excavations should be staged or constructed in such a manner to avoid the collection of overland drainage.

4 Conclusions and Recommendations

The Property, currently an empty field, is proposed development includes constructing 13 double-car garage townhouse blocks with basements) in the northern, middle, and southeastern portions of the site, and a 7-storey midrise structure with one underground parking level on the southwestern portion of the site. The following conclusions and recommendations are made in consideration of the proposed development:

- The site is characterized by earth fill overlying a native clayey silt till overlying a sandy silt to silty sand till. These deposits generally have low permeability. As such, they generally cause slower recharge rates and groundwater movement.
- Groundwater control, including positive dewatering or relief wells, will be required mitigate basal heave and maintain the integrity of the subgrade for foundation and slab-on-grade support.
- In order to maintain groundwater recharge for the Property, LID methods should be implemented. There is a surplus of water available following development to maintain groundwater recharge and function. Approximately 20% of roof runoff would need to be captured to match pre-development infiltration.
- Treatment of groundwater is required before it can be discharged to Halton Sanitary and Combined Sewers.

4.1 Signatures

The Hydrogeological Assessment was conducted by Matthew Garcia, P.Eng., under the supervision of Matthew Bielaski, P.Eng., QP $_{\text{RA-ESA}}$.

We trust that this report meets your requirements at present.

For and on behalf of our team,

GROUNDED ENGINEERING

Matthew Garcia, P.Eng.
Project Engineer

Matthew Bielaski, P.Eng., QP RA-ESA
Principal

5 References

1. ArcGIS. *WebMap*. https://www.arcgis.com/home/webmap/viewer.html Accessed: January 2021.
2. Conservation Halton. Regulation Limits Search. https://camaps.maps.arcgis.com/apps/webappviewer/index.html?id=a2928bf280194294a4027111f8ff284a Accessed: March 8, 2021.
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6. Halton-Hamilton Source Protection Region. *Assessment Report for the Halton Region Source Protection Area Version 3.5*. October 12, 2017.
7. Ministry of Environment, Conservation and Parks. *Source Protection Information Atlas*. Retrieved from : https://www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?viewer=SourceWaterProtection.SWPViewer&locale=en-US Accessed: March 8, 2021.
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13. Ontario MOEE. *MOEE Hydrogeological Technical Information Requirements for Land Development Applications*. April 1995.
14. R-PE Surveying Ltd. *Survey and Topography of Block 360 Plan 20M-1184*. Job No. 20-096. June 11, 2020.
15. WSP Canada Inc. *Hydrogeological Investigation Main Sail Estates Subdivision, Milton, Toronto*. Project No. 151-62866-00. May 26, 2016.

6 Limitations and Restrictions

The assessment should not be considered a comprehensive investigation that eliminates all risks of encountering environmental problems. The information presented in this report is based on information collected during the completion of the Hydrogeological Assessment by Grounded Engineering Inc. It was based on the conditions on the Hydrogeological Assessment at the time of the site inspection supplemented by a review of historical information to assess the environmental conditions regarding the Property.

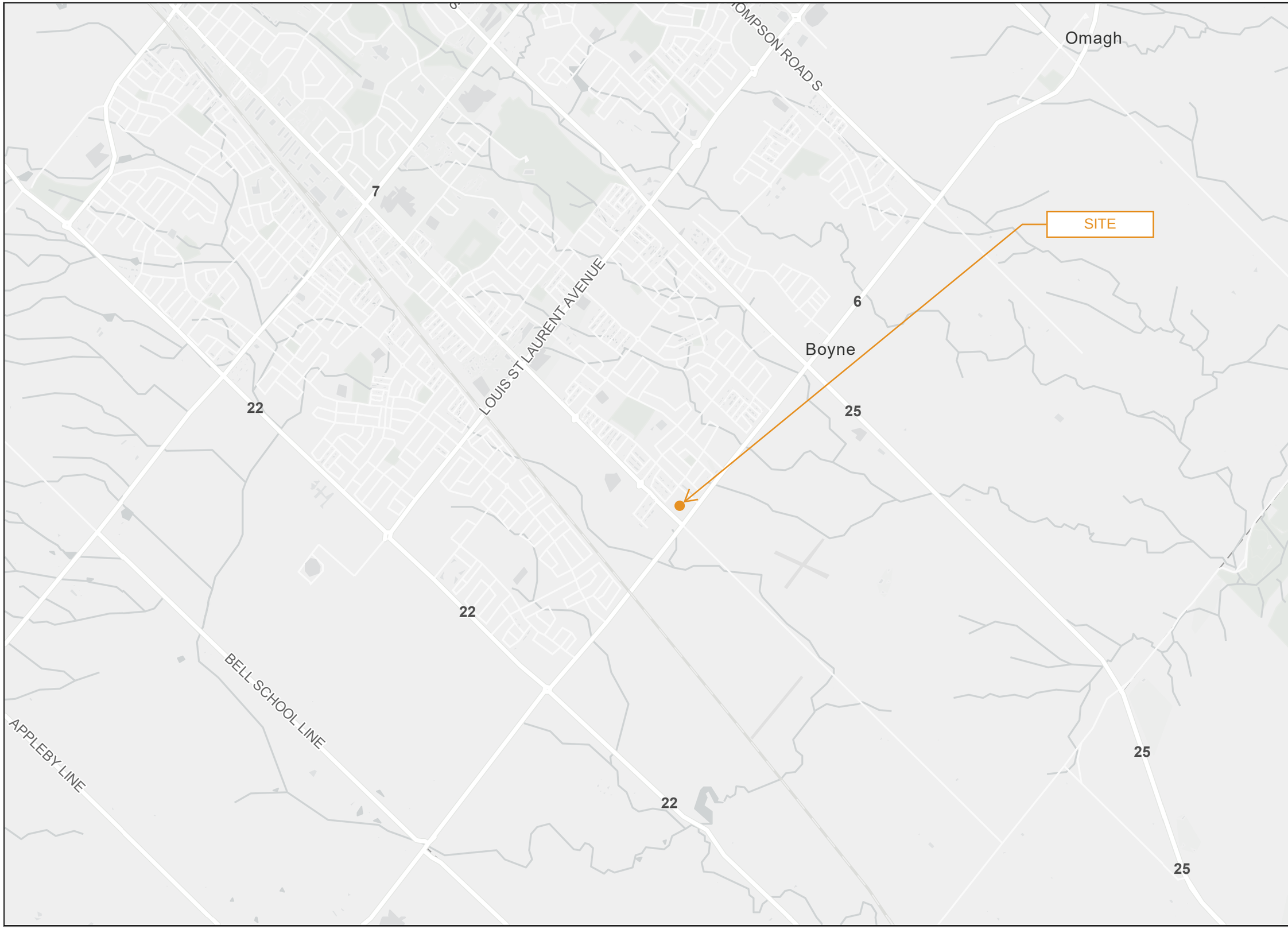
There is no warranty expressed or implied by this report regarding the hydrogeologic conditions of the Property. Professional judgement was exercised in gathering and analysing information collected by our staff, as well as that submitted by others. The conclusions presented are the product of professional care and competence and cannot be construed as an absolute guarantee.

If new information regarding the hydrogeological condition of the Property is identified during future work, or outstanding responses from regulatory agencies indicate outstanding issues on file with respect to the Property, Grounded Engineering Inc. should be notified so that we may re-evaluate the findings of this assessment and provide amendments.

6.1 Report Use

The authorized users of this report are Shearling Heights Estates Ltd, for whom this report has been prepared. Grounded Engineering Inc. maintains the copyright and ownership of this document. Reproduction of this report in any format or medium requires explicit prior authorization from Grounded Engineering Inc.

FIGURES



GROUNDED ENGINEERING

49 MOBILE DRIVE, TORONTO, ONT., M4A 1H5
www.groundedeng.ca

LEGEND

- APPROXIMATE SITE LOCATION

Note

Reference

ArcGIS. 2024

Project

BRITANNIA ROAD AND BRONTE STREET SOUTH, MILTON, ONTARIO

Figure Title

SITE LOCATION PLAN

North

TRUE PROJECT

Date

FEBRUARY 2026

Scale

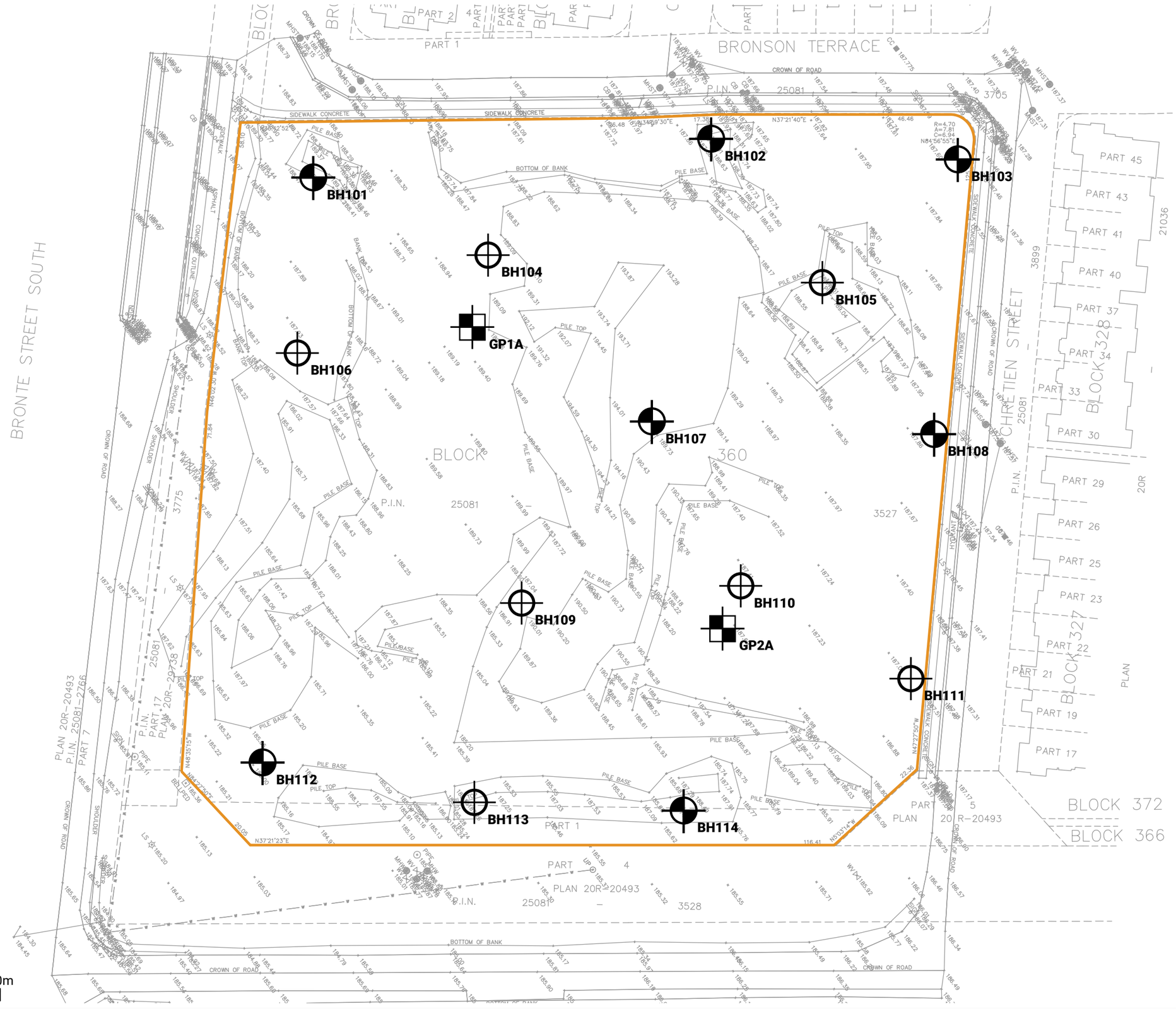
NTS

Job No

20-294

Figure No

FIGURE 1



GROUNDED ENGINEERING

49 MOBILE DRIVE, TORONTO, ONT., M4A 1H5
www.groundedeng.ca

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- MONITORING WELL/BOREHOLE BY GROUNDED
- GUELPH PERMEAMETER TEST

Note
Boreholes were drilled in 2021, prior to the time that the shown site survey was completed.

Reference
Site Survey, prepared by 4Sight Utility Engineers (Completed May 2024).

Project
BRITANNIA ROAD AND BRONTE STREET SOUTH, MILTON, ONTARIO

Figure Title
BOREHOLE AND MONITORING WELL LOCATION PLAN EXISTING CONDITIONS

North
TRUE
PROJECT

Date
FEBRUARY 2026

Scale
AS INDICATED

Job No
20-294

Figure No
FIGURE 2A

GROUNDED ENGINEERING

49 MOBILE DRIVE, TORONTO, ONT., M4A 1H5
www.groundedeng.ca

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- MONITORING WELL/BOREHOLE BY GROUNDED

Note

Overlaid on Site Plan architectural drawing.

Reference

Architectural Drawings, "Trinity Point-Shearling Heights"; Project 2268.24, dated February 13, 2026 (Draft for SPA), prepared by Graziani + Corazza Architects.

Project

BRITANNIA ROAD AND BRONTE STREET SOUTH, MILTON, ONTARIO

Figure Title

BOREHOLE AND MONITORING WELL LOCATION PLAN PROPOSED CONDITIONS (SITE PLAN)

North

TRUE
PROJECT

Date

FEBRUARY 2026

Scale

AS INDICATED

Job No

20-294

Figure No

FIGURE 2B

0m 15m 30m

GROUNDED ENGINEERING

49 MOBILE DRIVE, TORONTO, ONT., M4A 1H5
www.groundedeng.ca

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- MONITORING WELL/BOREHOLE BY GROUNDED
- APPROXIMATE EXTENT OF MIDRISE ABOVE

Note

Overlaid on P1 architectural drawing. Excludes unfinished townhouse basements.

Reference

Architectural Drawings, "Trinity Point-Shearling Heights", Project 2268.24, dated February 13, 2026 (Draft for SPA), prepared by Graziani + Corazza Architects.

Project

BRITANNIA ROAD AND BRONTE STREET SOUTH, MILTON, ONTARIO

Figure Title

BOREHOLE AND MONITORING WELL LOCATION PLAN PROPOSED CONDITIONS (P1)

North

TRUE PROJECT

Date

FEBRUARY 2026

Scale

AS INDICATED

Job No

20-294

Figure No

FIGURE 2C

PROPOSED MIDRISE BUILDING

PROPOSED TOWNHOUSE BUILDING BLOCKS

P1 FFE
183.66± m

TOWNHOUSE BASEMENT
ELEV. VARIES
186.9 to 185.6± m

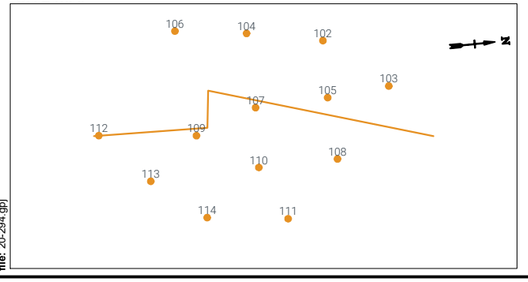
GWT
184.8± m

BH 112 BH 113 BH 109 BH 114 BH 110 BH 101 BH 106 BH 104 BH 107 BH 102 BH 111 BH 105 BH 108 BH 103

Elevation (m)

192 190 188 186 184 182 180 178 176 174 172 170

SITE MAP



file: 20-294.gpj

Boreholes Equally Spaced

BOREHOLE STRATIGRAPHY LEGEND

- Fill
- Silty Sand Till
- Clayey Silt
- Clayey Silt Till
- Sandy Silt Till

GROUNDED ENGINEERING

49 MOBILE DRIVE, TORONTO, ONT., M4A 1H5
www.groundedeng.ca

LEGEND

- FILL
- GRAVELS (gravel to gravelly sand)
- SILT TO SAND (not till)
- COHESIONLESS TILLS
- COHESIVE SOILS (clayey silt to clay, incl. tills)
- DISTURBED/REWORKED/ORGANIC
- **BH 101** BOREHOLES BY GROUNDED
- *T-BH7* BOREHOLES BY OTHERS
- water level, unstabilized
- water level, stabilized (latest)
- water level, stabilized (highest)

Project
BRITANNIA RD AND BRONTE ST S, MILTON ON

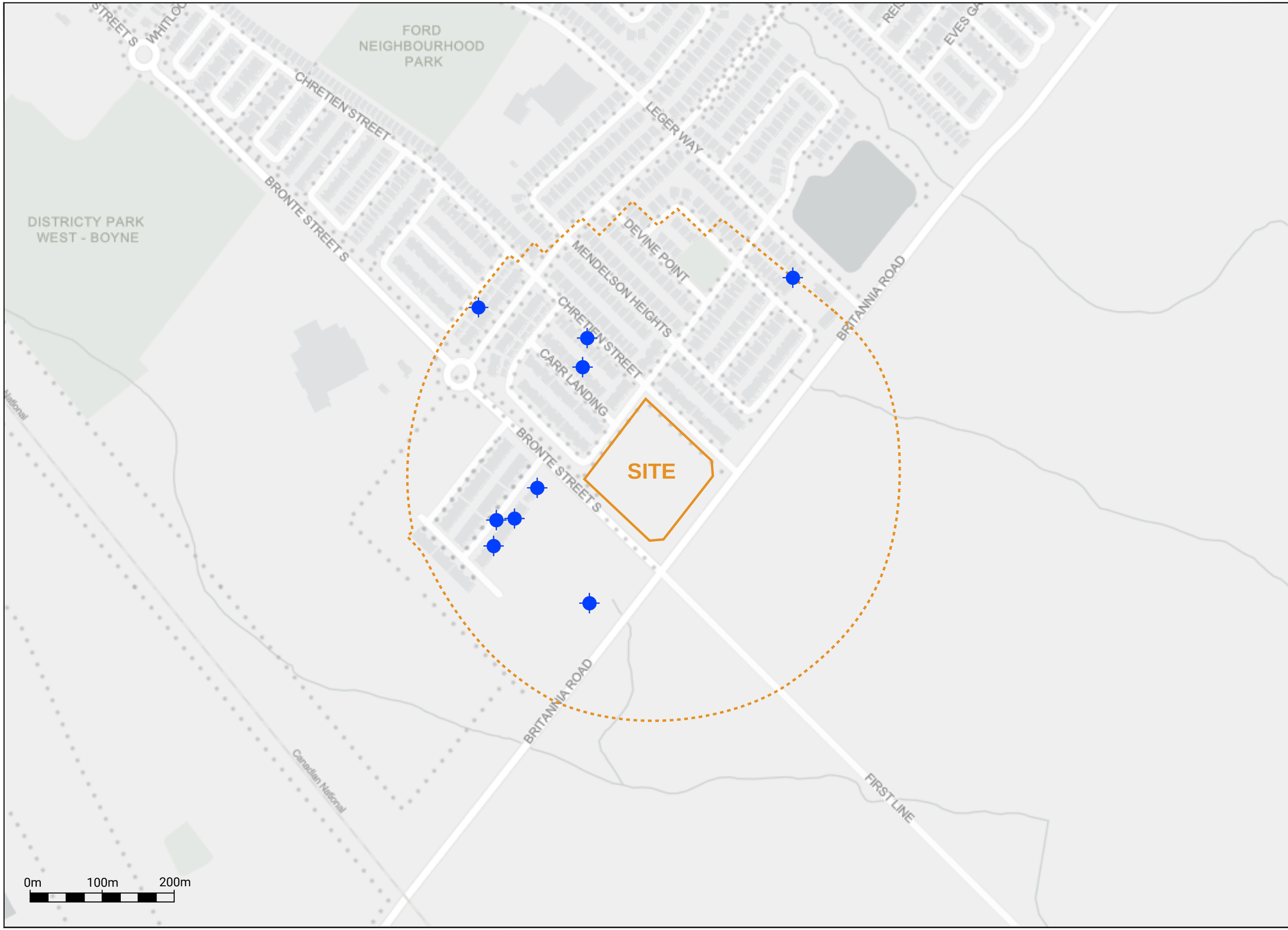
Figure Title
SUBSURFACE PROFILE

Date
FEBRUARY 2026

Scale
AS INDICATED

Job No
20-294

Figure No
FIGURE 3



GROUNDED ENGINEERING

49 MOBILE DRIVE, TORONTO, ONT., M4A 1H5
www.groundedeng.ca

LEGEND

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

Note

Reference
ArcGIS. 2021.

Project
BRITANNIA ROAD AND BRONTE STREET SOUTH, MILTON, ONTARIO

Figure Title
MECP WELL LOCATION PLAN

North
TRUE
PROJECT

Date
FEBRUARY 2026

Scale
AS INDICATED

Job No
20-294

Figure No
FIGURE 4

APPENDIX A

PLAN OF SURVEY AND TOPOGRAPHY OF BLOCK 360 PLAN 20M–1184 TOWN OF MILTON REGIONAL MUNICIPALITY OF HALTON

SCALE 1:500

10m 5m 0m 10m 20m 30m 40metres

R–PE SURVEYING LTD., O.L.S.

METRIC

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

NOTES

■	DENOTES MONUMENT FOUND
□	DENOTES MONUMENT SET
SIB	DENOTES STANDARD IRON BAR
SSIB	DENOTES SHORT STANDARD IRON BAR
P.I.N.	DENOTES PROPERTY IDENTIFIER NUMBER
PL	DENOTES PLAN 20M–1184
CALC'D	DENOTES CALCULATED FROM PL
MEAS	DENOTES MEASURED
(RPE)	DENOTES R–PE SURVEYING LTD, O.L.S.
(950)	DENOTES CUNNINGHAM McCONNELL LIMITED O.L.S.
(WIT)	DENOTES WITNESS
MH	DENOTES MANHOLE
MHSA	DENOTES MANHOLE SANITARY
MHST	DENOTES MANHOLE STORM
CB	DENOTES CATCH BASIN
UP	DENOTES UTILITY POLE
LS	DENOTES LAMP STANDARD
ORP	DENOTES OBSERVED REFERENCE POINT
–W–	DENOTES OVERHEAD WIRE
INV.	DENOTES INVERT ELEVATION

DUE TO ONGOING CONSTRUCTION ACTIVITY, ALL SET MONUMENTS ARE SHORT STANDARD IRON BARS.

INTEGRATION NOTE

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS (A) AND (B) USING CANNET REAL TIME NETWORK (RTN) No. 20120110009, UTM ZONE 17, NAD83 (CSRS) (CBNV6–2010.0)

COORDINATES ARE UTM ZONE 17, NAD83 (CSRS) (CBNV6–2010.0), TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10, AND CANNOT, IN THEMSELVES, BE USED TO RE–ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

POINT ID	NORTHING	EASTING
ORP (A)	4814683.22	593364.08
ORP (B)	4814483.34	593388.21
RTN 20120110009	4801633.53	597944.45

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999679.

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO MTO FIRST ORDER VERTICAL BENCHMARK NUMBER 00819828155 HAVING AN ORTHOMETRIC ELEVATION OF 185.351 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD–1928:1978).

BENCHMARK LOCATED ON A CONCRETE CULVERT UNDER BRITANNIA RD W, 1.4 KM WEST OF HWY 25, 75.4 M WEST OF FIRST LINE RD, 6.3 M NORTH OF THE CENTRELINE OF BRITTANIA RD W (HALTON REG RD 6). TABLET IS SET VERTICALLY IN THE TOP OF NORTH END OF SAID CULVERT, 33 CM SOUTH OF NORTH END OF CULVERT, 32 CM WEST OF EAST FACE OF CULVERT.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 8TH DAY OF JUNE , 2020

DATE JUNE 11TH , 2020

S. GOONEWARDENA
ONTARIO LAND SURVEYOR

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2119245

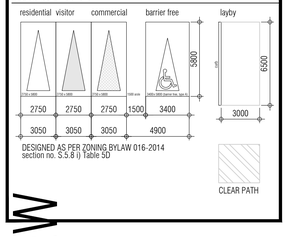
THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR
In accordance with Regulation 1026, Section 29(3).

R–PE SURVEYING LTD.
ONTARIO LAND SURVEYORS
643 Chrislea Road, Suite 7
Woodbridge, Ontario L4L 8A3
Tel.(416)635–5000 Fax (416)635–5001
Tel.(905)264–0881 Fax (905)264–2099
Website: www.r–pe.ca

DRAWN: J.W. CHECKED: S.G.
JOB No. 20–096 CAD FILE No. 20096tp01a

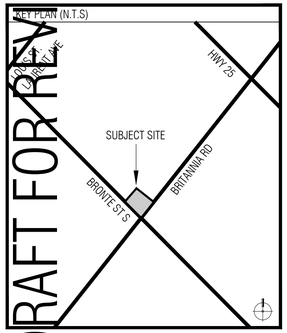
01. FEB.XX.2026 issued for SPA EC

PARKING LEGEND



DRAFT FOR REVIEW

KEY PLAN (N.T.S)



ISSUED FOR REVISIONS

GRAZIANI + CORAZZA ARCHITECTS
8400 JANE STREET, BUILDING-D, SUITE 300 CONCORD, ONTARIO L4K 4L8
T 905.795.2601 F 905.795.2844 WWW.GC-ARCHITECTS.COM

Proposed Mixed-Use Development

Shearling Heights

Trinity Point Developments

Milton Ontario

PROJECT ARCHITECT:	E.CORAZZA
ASSISTANT DESIGNER:	K.KORB
DRAWN BY:	K.K + A.P
CHECKED BY:	D.BIASE
PLOT DATE:	FEB.13.2026
JOB #	2268.24

Site Plan

1:500 A101

TITLEBLOCK SIZE: 610 x 900

TABLE 1

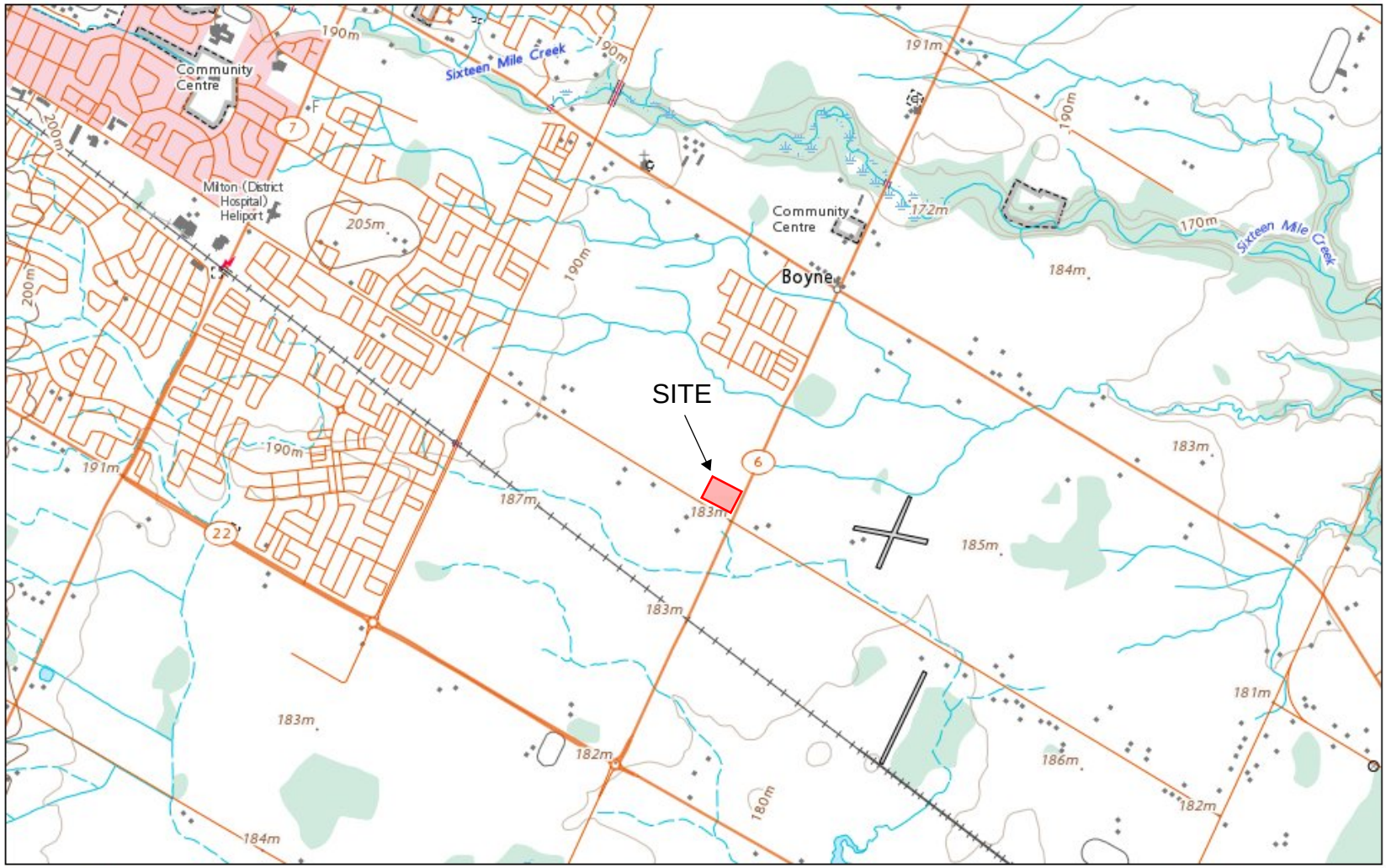
TABLE 1:
GROUNDWATER LEVEL MONITORING SUMMARY
BRITANNIA RD AND BRONTE ST S, MILTON, ON

Well ID	Ground Surface Elev. (masl)	Well Screen Interval		Soil Strata	Grounded Engineering																Minimum Elev. (Lowest)		Maximum Elev. (Highest)		Seasonal Fluctuation	Number of Monitoring Events
					Jan. 12, 2021		Jan. 29, 2021		Mar. 02, 2021		Mar. 28, 2021		Apr. 18, 2021		Feb. 16, 2024		Jan. 20, 2025		July 21, 2025							
		(mbgs)	(masl)		(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)	(mbgs)	(masl)	(±m)	
BH101	188.0	9.1 - 12.2	178.9 - 175.8	Sandy Silt Till	3.7	184.3	3.7	184.3	3.8	184.2	3.7	184.3	3.6	184.4	3.6	184.4	3.9	184.1	NA	-	3.9	184.1	3.6	184.4	0.2	7
BH102	188.0	1.5 - 4.6	186.5 - 183.4	Clayey Silt Till / Fill	dry	dry	dry	dry	dry	dry	4.1	183.9	4.0	184.0	0.6	187.4	0.6	187.4	2.7	185.3	4.1	183.9	0.6	187.4	3.5	8
BH103	187.6	1.5 - 4.6	186.1 - 183.0	Clayey Silt Till / Fill	dry	dry	4.2	183.4	3.1	184.5	2.9	184.7	2.9	184.7	2.1	185.5	1.9	185.7	1.8	185.9	4.2	183.4	1.8	185.9	2.4	8
BH107	189.6	10.7 - 13.7	178.9 - 175.9	Sandy Silt Till	4.4*	185.2*	5.4	184.2	5.5	184.1	5.5	184.1	5.4	184.2	5.4	184.3	4.8	184.8	NA	-	5.5	184.1	4.8	184.8	0.7	7
BH108	187.4	12.2 - 15.2	175.2 - 172.2	Sandy Silt Till	3.4	184.0	3.5	183.9	3.6	183.8	3.6	183.8	3.5	183.9	3.3	184.1	NA	-	NA	-	3.6	183.8	3.4	184.0	0.2	6
BH112	185.5	7.6 - 10.7	177.9 - 174.8	Sandy Silt Till	1.8	183.7	1.6	183.9	1.7	183.8	1.6	183.9	1.6	183.9	1.5	184.0	NA	-	NA	-	1.8	183.7	1.6	183.9	0.2	6
BH114	186.5	9.1 - 12.2	177.4 - 174.3	Sandy Silt Till	7.6	178.9	2.6	183.9	2.7	183.8	2.6	183.9	2.6	184.0	2.4	184.1	2.4	184.1	2.8	183.7	7.6	178.9	2.4	184.1	5.2	8

mbgs = metres below existing ground surface
masl = metres above sea level
* = unstabilized groundwater level
NA = not available, unable to access monitoring well

APPENDIX B

Toporama



March 8, 2021

1:30,000

0 0.25 0.5 1 mi

0 0.4 0.8 1.6 km

Natural Resources Canada Ressources naturelles Canada

Canada

APPENDIX C

Source Water Protection Map

Legend

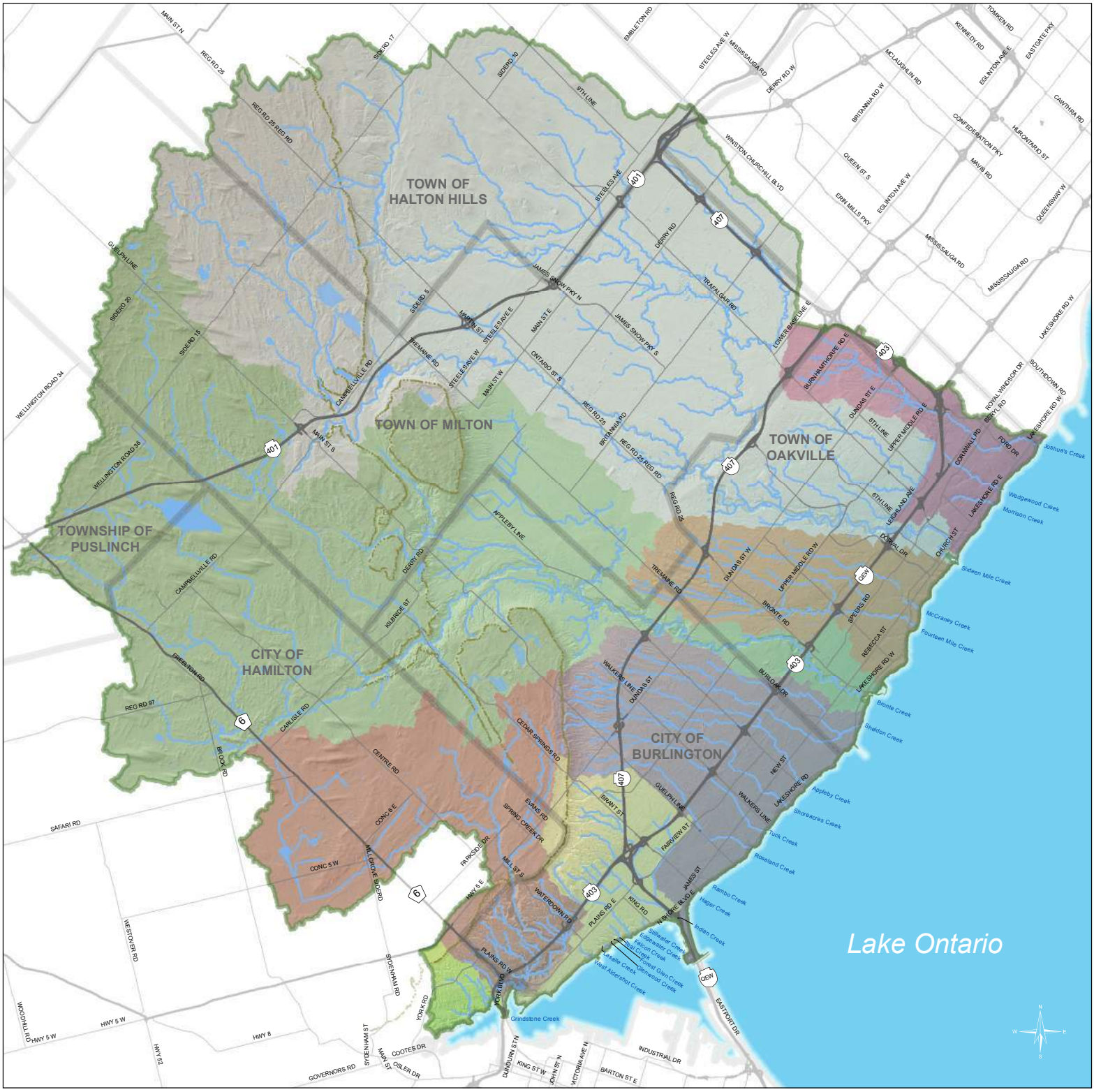
- Source Protection Areas
- Issue Contributing Areas
- WHPA Groundwater Under Direct Influence (WHPA-E)
- Wellhead Protection Area
  - A
  - B
  - C
  - C1
  - D
  - F
- Intake Protection Zone 1
- Event Based Areas
- Intake Protection Zone 2
- Assessment Parcel

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

Ontario

Map Created: 3/8/2021
Map Center: 43.47829 N, -79.84506 W

Conservation Halton Watersheds



Legend

- Expressway / Highway
- Arterial Roads
- Creeks & Waterbodies
- Niagara Escarpment
- Municipal Boundaries

Watersheds

- Bronte Creek
- Burlington Urban Creeks
- Grindstone Creek
- North Cootes Paradise
- North Shore
- Oakville East Urban Creeks
- Oakville West Urban Creeks
- Sixteen Mile Creek

0 1 2 4 6 8 10 Kilometres

APPENDIX D

Water Well Records

March 8, 2021
5:19:56 PM

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
MILTON TOWN (TRAFALG	17 593214 4814553 W	2015-11 7472						7255182 (Z224514) A	
MILTON TOWN (TRAFALG NS 01 006	17 593157 4814506 W	2016-03 7556	36			DO		7262912 (Z226393) A	
MILTON TOWN (TRAFALG NS 01 006	17 593214 4814554 W	2015-11 7472						7255120 (Z224515) A156026 A	
MILTON TOWN (TRAFALG NS 01 006	17 593154 4814473 W	1970-02 3637	30	FR 0016 FR 0025	10/40//:	DO		2803312 ()	BRWN LOAM 0001 BRWN CLAY 0016 GREY CLAY STNS 0021 BRWN MSND GRVL SILT 0041
MILTON TOWN (TRAFALG NS 01 006	17 593180 4814511 W	1955-01 1642	6 6	MN 0072	18//1/:	DO		2802463 ()	BLUE CLAY 0024 CLAY MSND STNS 0062 RED SHLE 0073
MILTON TOWN (TRAFALG NS 01 006	17 593288 4814397 W	1955-01 1642	6 6	MN 0084	18//0/:	NU		2802462 () A	BLUE CLAY 0022 CLAY MSND GRVL 0060 RED SHLE 0085
MILTON TOWN (TRAFALG NS 02 006	17 593129 4814802 W	2012-04 7407	24 42		1///:	DO		7180170 (Z136890) A	
MILTON TOWN (TRAFALG NS 02 006	17 593274 4814722 W	2010-01 7219	30			NU		7141644 (Z107398) A093064 A	0005
MILTON TOWN (TRAFALG NS 02 006	17 593276 4814759 W	2010-01 7219	30		0///:	NU		7141643 (Z107402) A093065 A	

Notes:
UTM: UTM in Zone, Easting, Northing and Datum is NAD83; L: UTM estimated from Centroid of Lot; W: UTM not from Lot Centroid
DATE CNTR: Date Work Completedand Well Contractor Licence Number
CASING DIA: Casing diameter in inches
WATER: Unit of Depth in Fee. See Table 4 for Meaning of Code

PUMP TEST: Static Water Level in Feet / Water Level After Pumping in Feet / Pump Test Rate in GPM / Pump Test Duration in Hour : Minutes
WELL USE: See Table 3 for Meaning of Code
SCREEN: Screen Depth and Length in feet
WELL: WEL (AUDIT #) Well Tag . A: Abandonment; P: Partial Data Entry Only
FORMATION: See Table 1 and 2 for Meaning of Code

1. Core Material and Descriptive terms

Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
BLDR	BOULDERS	FCRD	FRACTURED	IRFM	IRON FORMATION	PORS	POROUS	SOFT	SOFT
BSLT	BASALT	FGRD	FINE-GRAINED	LIMY	LIMY	PRDG	PREVIOUSLY DUG	SPST	SOAPSTONE
CGRD	COARSE-GRAINED	FGVL	FINE GRAVEL	LMSN	LIMESTONE	PRDR	PREV. DRILLED	STKY	STICKY
CGVL	COARSE GRAVEL	FILL	FILL	LOAM	TOPSOIL	QRTZ	QUARTZITE	STNS	STONES
CHRT	CHERT	FLDS	FELDSPAR	LOOS	LOOSE	QSND	QUICKSAND	STNY	STONEY
CLAY	CLAY	FLNT	FLINT	LTCL	LIGHT-COLOURED	QTZ	QUARTZ	THIK	THICK
CLN	CLEAN	FOSS	FOSILIFEROUS	LYRD	LAYERED	ROCK	ROCK	THIN	THIN
CLYY	CLAYEY	FSND	FINE SAND	MARL	MARL	SAND	SAND	TILL	TILL
CMTD	CEMENTED	GNIS	GNEISS	MGRD	MEDIUM-GRAINED	SHLE	SHALE	UNKN	UNKNOWN TYPE
CONG	CONGLOMERATE	GRNT	GRANITE	MGVL	MEDIUM GRAVEL	SHLY	SHALY	VERY	VERY
CRYS	CRYSTALLINE	GRSN	GREENSTONE	MRBL	MARBLE	SHRP	SHARP	WBRG	WATER-BEARING
CSND	COARSE SAND	GRVL	GRAVEL	MSND	MEDIUM SAND	SHST	SCHIST	WDFR	WOOD FRAGMENTS
DKCL	DARK-COLOURED	GRWK	GREYWACKE	MUCK	MUCK	SILT	SILT	WTHD	WEATHERED
DLMT	DOLOMITE	GVLY	GRAVELLY	OBDN	OVERBURDEN	SLTE	SLATE		
DNSE	DENSE	GYPS	GYPSUM	PCKD	PACKED	SLTY	SILTY		
DRTY	DIRTY	HARD	HARD	PEAT	PEAT	SNDS	SANDSTONE		
DRY	DRY	HPAN	HARDPAN	PGVL	PEA GRAVEL	SNDY	SANDYOAPSTONE		

2. Core Color

Code	Description
WHIT	WHITE
GREY	GREY
BLUE	BLUE
GREN	GREEN
YLLW	YELLOW
BRWN	BROWN
RED	RED
BLCK	BLACK
BLGY	BLUE-GREY

3. Well Use

Code	Description	Code	Description
DO	Domestic	OT	Other
ST	Livestock	TH	Test Hole
IR	Irrigation	DE	Dewatering
IN	Industrial	MO	Monitoring
CO	Commercial	MT	Monitoring TestHole
MN	Municipal		
PS	Public		
AC	Cooling And A/C		
NU	Not Used		

4. Water Detail

Code	Description	Code	Description
FR	Fresh	GS	Gas
SA	Salty	IR	Iron
SU	Sulphur		
MN	Mineral		
UK	Unknown		

APPENDIX E


Ontario
Ontario Geological Survey
8b Fine-textured glaciolacustrine deposits
silt and clay, minor sand and gravel
Interbedded silt and clay and gritty, pebbly flow till and rainout deposits
8b Fine-textured glaciolacustrine deposits
Dee Way
Cochrane Terrace
Monaghan Crescent
Zdest Crescent
Leger Way
McDougall Crossing
Speers Ct
Rotsa Ct
Biason Ct
Louis Saint Laurent Ave
Yaver Ct
Potts Terrace
Wiler Terrace
Scott Blvd
Castle Way
Etherington Way
Seivert Pl
Savoline Blvd
Sales Ct
Whaley Way
Pickersgill Crescent
Cedric Terrace
Durno Ct
Dymott Ave
Ironmaine Rd
Regional Road 25
Regional Road 22
Pan Am Blvd
Bronte St S
1 Line
6
© 2021 Google
1086 m
Google Earth
1985
Imagery Date: 6/8/2018 17 T 593389.23 m E 4814840.68 m N elev 186 m eye alt 4.88 km


Ontario
Ontario Geological Survey
55a
Shale, limestone, dolostone, siltstone
Queenston Formation
Martin St
Main St E
Bronte St N
Ontario St S
Ferguson Dr
James Snow Pkwy
Sixth Line
Tremaine Rd
Main St N
Pringle Ave
Scott Blvd
Laurier Ave
Yates Dr
Thompson Rd S
Fourth Line
Steeles Ave W
Bronte St S
Regional Road 22
Britannia Rd W
Appleby Line
1 Line
Lower Base Line
Regional Road 25
Express Toll Route
407
Guelph Line
Britannia Rd
2674 m
© 2021 Google
Google Earth
1985
17 T 588189.22 m E 4819167.97 m N elev 210 m eye alt 11.87 km

APPENDIX F

BOREHOLE LOG TERMINOLOGY

GROUNDED ENGINEERING

SAMPLING/TESTING METHODS

SS: split spoon sample

AS: auger sample

GS: grab sample

FV: shear vane

DP: direct push

PMT: pressuremeter test

ST: shelby tube

CORE: soil coring

RUN: rock coring

SYMBOLS & ABBREVIATIONS

MC: moisture content

LL: liquid limit

PL: plastic limit

NP: non-plastic

γ: soil unit weight (bulk)

G_s: specific gravity

S_u: undrained shear strength

▽ unstabilized water level

▼ water level measurement

▼ highest water level measurement

ENVIRONMENTAL SAMPLES

M&I: metals and inorganic parameters

PAH: polycyclic aromatic hydrocarbon

PCB: polychlorinated biphenyl

VOC: volatile organic compound

PHC: petroleum hydrocarbon

BTEX: benzene, toluene, ethylbenzene and xylene

PPM: parts per million

FIELD MOISTURE (based on tactile inspection)

DRY: no observable pore water

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

WET: visible pore water

COHESIONLESS

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

COHESIVE

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

COMPOSITION

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

ASTM STANDARDS

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

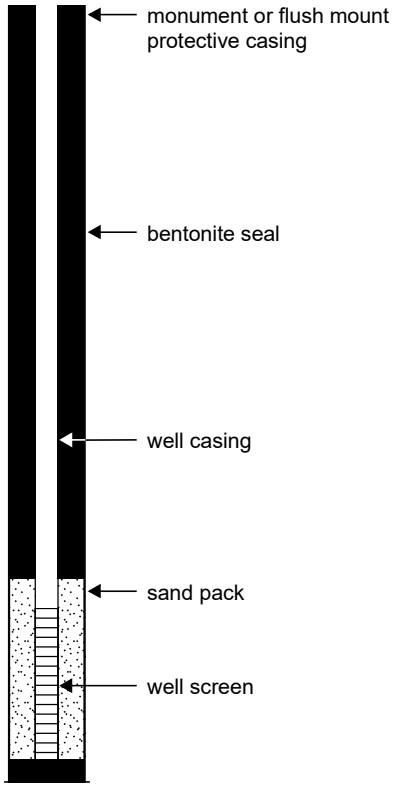
ASTM D3441 Cone Penetration Test (CPT)
Pushing an internal still rod with a outer hollow rod ("sleeve") tipped with a cone with an apex angle of 60° and a cross-sectional area of 1000 mm^2 into soil. The resistance is measured in the sleeve and at the tip to determine the skin friction and the tip resistance.

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

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

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

WELL LEGEND



GROUNDED ENGINEERING

Date Started : Jan 8, 2021
Position : E: 593287, N: 4814571 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 101

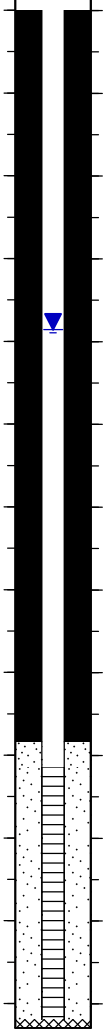
File No. : 20-294 **Project** : Britannia Rd and Bronte St S, Milton, ON **Client** : Trinity Point

drill method : G78

elev depth (m)	description	graphic log	sample number	sample type	SPT N-value
188.0	**GROUND SURFACE**				
	FILL, clayey silt, trace sand, trace gravel, trace rootlets, very soft to firm, brown, wet		1	SS	2
	...at 0.8 m, moist		2	SS	3
	...at 1.5 m, trace organics, trace plastic fragments, brown with dark brown		3	SS	8
185.7 / 2.3	**CLAYEY SILT**, trace sand, trace gravel, trace rootlets, stiff, blackish grey, moist (WEATHERED)		4	SS	10
			5	SS	11
184.2 / 3.8	**CLAYEY SILT**, some sand, trace gravel, very stiff, reddish brown, moist (GLACIAL TILL)		6	SS	24
			7	SS	25
			8	SS	20
	...at 7.6 m, grey, stiff		9	SS	12
178.9 / 9.1	**SANDY SILT**, trace clay, trace gravel, trace rock fragments, very dense, reddish brown (GLACIAL TILL)		10	SS	75 / 225mm
	...at 10.7 m, silt and sand, wet		11	SS	50 / 125mm
175.7 / 12.3			12	SS	50 / 100mm

hollow stem augers OD=215 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

3 15 47 35

5 38 51 6

END OF BOREHOLE

Borehole was dry upon completion of drilling.

50 mm dia. monitoring well installed.

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jan 12, 2021	3.7	184.3
Jan 29, 2021	3.7	184.3
Mar 2, 2021	3.8	184.2
Mar 28, 2021	3.7	184.3
Apr 18, 2021	3.6	184.4
Feb 16, 2024	3.6	184.4
Jan 20, 2025	3.9	184.1

file: 20-294.gpj

Tech : KS | **PM** : MG | **Rev** : MD

GROUNDED ENGINEERING

Date Started : Jan 4, 2021
Position : E: 593329, N: 4814637 (UTM 17T)
Elev. Datum : Geodetic

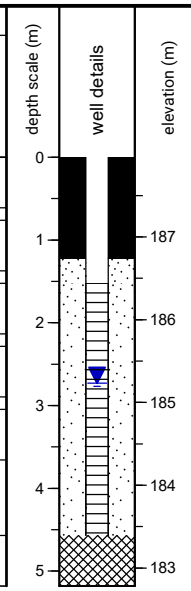
BOREHOLE LOG 102

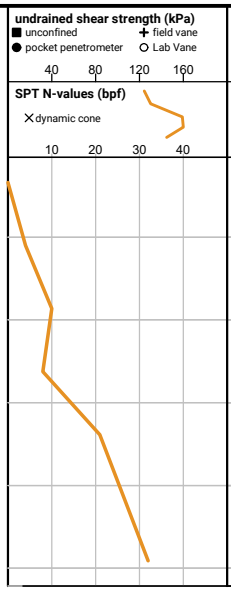
File No. : 20-294 **Project** : Britannia Rd and Bronte St S, Milton, ON **Client** : Trinity Point

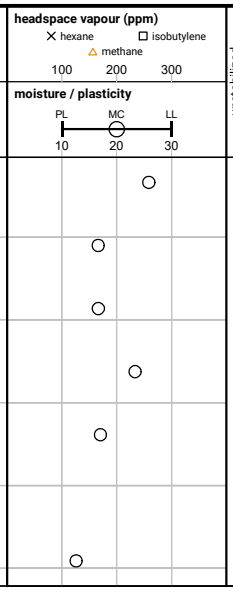
drill method : G78

elev depth (m)	description	graphic log	number	type	SPT N-value
188.0	**GROUND SURFACE**				
	FILL, clayey silt, trace sand, trace gravel, trace rootlets, very soft, dark brown, moist		1	SS	0
	...at 0.8 m, firm		2	SS	4
	...at 1.5 m, stiff		3	SS	10
185.7					
2.3	**CLAYEY SILT**, trace sand, trace gravel, trace rootlets, stiff, blackish grey, moist (WEATHERED)		4	SS	8
185.0					
3.0	**CLAYEY SILT**, some sand, trace gravel, very stiff to hard, reddish brown, moist (GLACIAL TILL)		5	SS	21
	...at 4.6 m, trace rock fragments		6	SS	32
182.8					
5.2	**END OF BOREHOLE**				

hollow stem augers OD=215 mm







unstabilized water level

lab data and comments

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

SS2: H-Ms, Metals, ORPs, OCs

SS3: BTEX, PHCs

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jan 12, 2021	dry	n/a
Jan 29, 2021	dry	n/a
Mar 2, 2021	dry	n/a
Mar 28, 2021	4.1	183.9
Apr 18, 2021	4.0	184.0
Feb 16, 2024	0.6	187.4
Jan 20, 2025	0.6	187.4
Jul 21, 2025	2.7	185.3

Borehole was dry upon completion of drilling.

50 mm dia. monitoring well installed.

file: 20-294.gpj

Tech : KS | **PM** : MG | **Rev** : MD

Date Started : Jan 4, 2021
Position : E: 593361, N: 4814675 (UTM 17T)
Elev. Datum : Geodetic

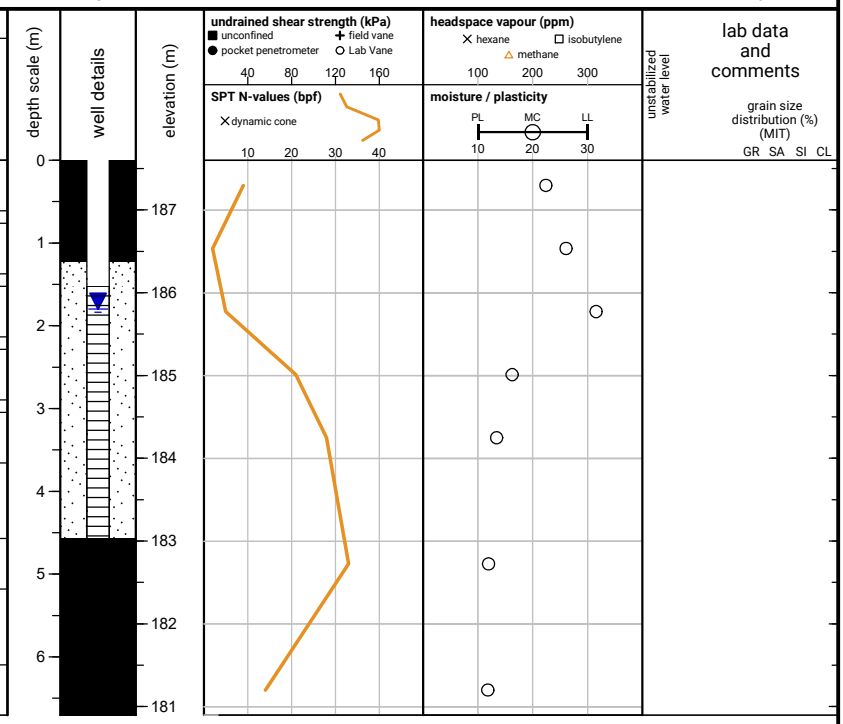
BOREHOLE LOG 103

File No. : 20-294 **Project** : Britannia Rd and Bronte St S, Milton, ON **Client** : Trinity Point

drill method : G78

elev depth (m)	description	graphic log	number	type	SPT N-value
187.6	**GROUND SURFACE**				
	FILL, clayey silt, trace gravel, trace rock fragments, trace organics, stiff to very stiff, dark brown, moist		1	SS	9
			2	SS	2
			3	SS	5
185.3					
2.3	**CLAYEY SILT**, some sand, trace gravel, very stiff to hard, brown, moist (GLACIAL TILL)		4	SS	21
	...at 3.0 m, trace rock fragments, reddish brown		5	SS	28
			6	SS	33
	...at 6.1 m, dark brown, stiff		7	SS	14
180.9					
6.7	**END OF BOREHOLE**				

hollow stem augers OD=215 mm



Borehole was dry upon completion of drilling.

50 mm dia. monitoring well installed.

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jan 12, 2021	dry	n/a
Jan 29, 2021	4.2	183.4
Mar 2, 2021	3.1	184.5
Mar 28, 2021	2.9	184.7
Apr 18, 2021	2.9	184.7
Feb 16, 2024	2.1	185.5
Jan 20, 2025	1.9	185.7
Jul 21, 2025	1.8	185.8

file: 20-294.gpj

Tech : KS | **PM** : MG | **Rev** : MD

GROUNDED ENGINEERING

Date Started : Jan 6, 2021
Position : E: 593319, N: 4814589 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 104

File No. : 20-294 **Project** : Britannia Rd and Bronte St S, Milton, ON **Client** : Trinity Point

drill method : G78

hollow stem augers OD=215 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
189.0	**GROUND SURFACE**				
	FILL, clayey silt, trace sand, trace gravel, trace organics, very stiff, dark brown with black, moist		1	SS	19
	...at 0.8 m, firm		2	SS	8
	...at 1.5 m, trace rootlets		3	SS	6
			4	SS	5
			5	SS	4
	...at 3.8 m, very stiff		6	SS	18
184.4 / 4.6	**CLAYEY SILT**, some sand, trace gravel, very stiff to hard, reddish brown, moist (GLACIAL TILL)		7	SS	20
			8	SS	38
	...at 6.1 m, trace rock fragments		9	SS	37
			10	SS	14
	...at 9.1 m, sandy		11	SS	10
178.3 / 10.7	**SANDY SILT**, trace clay, trace gravel, very dense, greyish brown, moist (GLACIAL TILL)		12	SS	64 / 225mm
176.8 / 12.2	**SILTY SAND**, some gravel, trace rock fragments, trace clay, compact, reddish grey, wet (GLACIAL TILL)		13	SS	24
175.2 / 13.8	...at 13.7 m, very dense		14	SS	50 / 100mm

END OF BOREHOLE

Borehole was dry upon completion of drilling.

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

well details

elevation (m) 189 188 187 186 185 184 183 182 181 180 179 178 177 176

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

8 25 41 26

15 57 25 3

file: 20-294.gpj

Tech : KS | **PM** : MG | **Rev** : MD

GROUNDED ENGINEERING

Date Started : Jan 4, 2021
Position : E: 593365, N: 4814636 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 105

File No. : 20-294 **Project** : Britannia Rd and Bronte St S, Milton, ON **Client** : Trinity Point

drill method : G78

elev depth (m)	description	graphic log	number	type	SPT N-value
188.4	**GROUND SURFACE**				
	FILL, clayey silt, trace sand, trace gravel, trace wood fragments, organic odour, soft to stiff, dark brown with black, moist		1	SS	5
			2	SS	2
			3	SS	8
	...at 2.3 m, trace rootlets		4	SS	12
185.4					
3.0	**CLAYEY SILT**, trace sand, trace gravel, very stiff, brown, moist (GLACIAL TILL)		5	SS	15
	...at 3.8 m, trace rock fragments, reddish brown		6	SS	28
			7	SS	26
183.2					
5.2	**END OF BOREHOLE**				

hollow stem augers OD=215 mm

Borehole was dry upon completion of drilling.

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

well details

elevation (m): 188, 187, 186, 185, 184

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

file: 20-294.gpj

Tech : KS | **PM** : MG | **Rev** : MD

GROUNDED ENGINEERING

Date Started : Jan 7, 2021
Position : E: 593313, N: 4814544 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 106

File No. : 20-294 **Project** : Britannia Rd and Bronte St S, Milton, ON **Client** : Trinity Point

drill method : GT8

hollow stem augers OD=215 mm

elev / depth (m)	description	graphic log	number	type	SPT N-value
188.0	**GROUND SURFACE**				
	FILL, clayey silt, trace sand, trace gravel, trace organics, soft to very stiff, brown, moist		1	SS	5
			2	SS	2
	...at 1.5 m, trace rootlets		3	SS	3
	...at 2.3 m, trace wood fragments		4	SS	6
	...at 3.0 m, trace rock fragments, dark grey		5	SS	10
184.2 / 3.8	**CLAYEY SILT**, some sand, trace gravel, trace rock fragments, stiff, reddish brown, moist (GLACIAL TILL)		6	SS	9
	...at 4.6 m, hard		7	SS	30
			8	SS	35
	...at 6.1 m, very stiff		9	SS	25
	...at 7.6 m, greyish brown, stiff		10	SS	9
178.9 / 9.1	**SANDY SILT**, trace clay, trace gravel, trace rock fragments, dense, reddish brown, moist (GLACIAL TILL)		11	SS	36
177.3 / 10.7	**SILTY SAND**, trace clay, trace gravel, very dense, brown, wet (GLACIAL TILL)		12	SS	50 / 125mm
175.6 / 12.4			13	SS	50 / 50mm

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

well details

elevation (m): 188 187 186 185 184 183 182 181 180 179 178 177 176

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

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

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

moisture / plasticity
PL MC LL
10 20 30

unstabilized water level

lab data and comments

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

END OF BOREHOLE

Borehole was dry upon completion of drilling.

file: 20-294.gpj

Tech : KS | **PM** : MG | **Rev** : MD

GROUNDED ENGINEERING

Date Started : Jan 6, 2021
Position : E: 593366, N: 4814590 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 107

File No. : 20-294 **Project** : Britannia Rd and Bronte St S, Milton, ON **Client** : Trinity Point

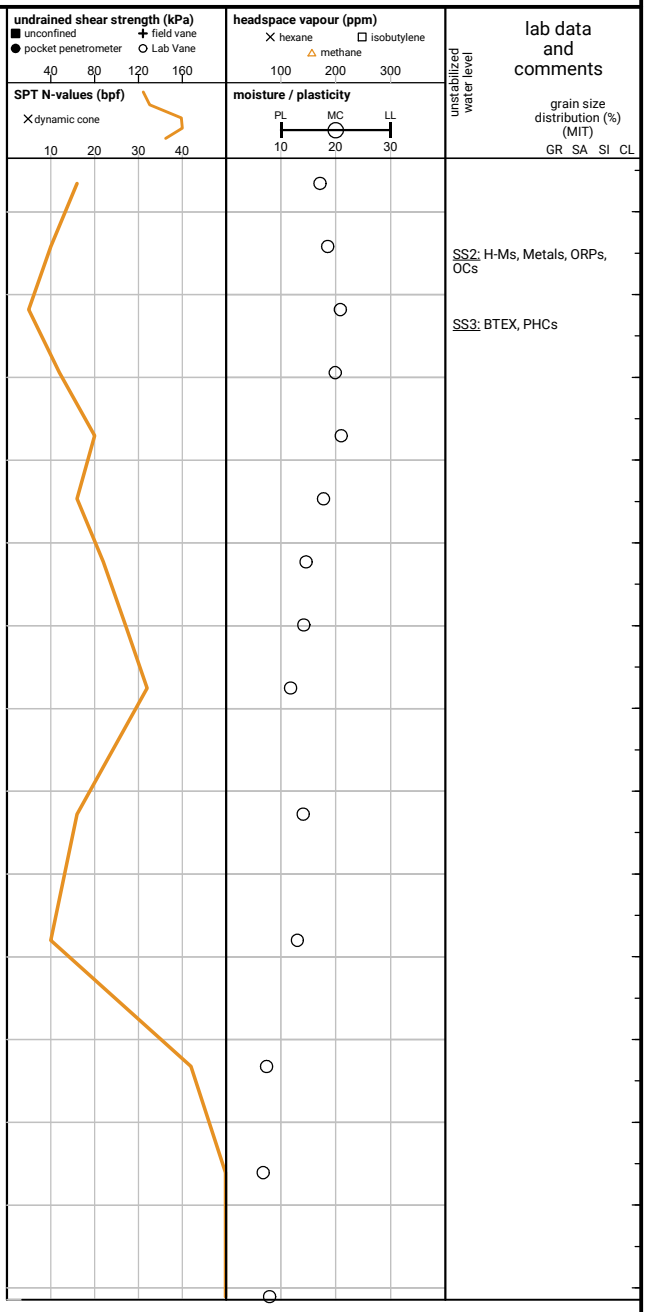
drill method : G78

hollow stem augers OD=215 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
189.6	**GROUND SURFACE**				
	FILL, sandy silt, trace gravel, trace organics, trace rootlets, organic odour, compact, dark brown with black, moist		1	SS	16
			2	SS	10
			3	SS	5
187.3 / 2.3	**CLAYEY SILT**, some sand, trace gravel, trace rootlets, organic odour, stiff to very stiff, dark brown with black, moist (WEATHERED)		4	SS	12
			5	SS	20
			6	SS	16
185.0 / 4.6	**CLAYEY SILT**, some sand, trace gravel, trace rock fragments, very stiff to hard, reddish brown, moist (GLACIAL TILL)		7	SS	22
			8	SS	27
			9	SS	32
			10	SS	16
			11	SS	10
178.9 / 10.7	**SANDY SILT**, trace clay, trace gravel, trace rock fragments, dense to very dense, reddish brown, moist (GLACIAL TILL)		12	SS	42
			13	SS	50 / 125mm
175.8 / 13.8	**END OF BOREHOLE**		14	SS	50 / 75mm

Borehole was dry upon completion of drilling.

50 mm dia. monitoring well installed.



GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jan 12, 2021	4.4	185.2
Jan 29, 2021	5.4	184.2
Mar 2, 2021	5.5	184.1
Mar 28, 2021	5.5	184.1
Apr 18, 2021	5.4	184.2
Feb 16, 2024	5.4	184.2
Jan 20, 2025	4.8	184.8

file: 20-294.gpj

Tech : KS | **PM** : MG | **Rev** : MD

BOREHOLE LOG 108

Date Started : Jan 4, 2021
Position : E: 593404, N: 4814638 (UTM 17T)
Elev. Datum : Geodetic

File No. : 20-294 **Project** : Britannia Rd and Bronte St S, Milton, ON **Client** : Trinity Point

drill method : G78

hollow stem augers OD=215 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
187.4	**GROUND SURFACE**				
	FILL, clayey silt, trace sand, trace gravel, trace rock fragments, trace asphalt, trace organics, firm, dark brown, moist		1	SS	6
	...at 0.8 m, stiff		2	SS	8
185.9 / 1.5	**CLAYEY SILT**, some sand, trace gravel, very stiff to hard, brown with grey, moist (GLACIAL TILL)		3	SS	22
			4	SS	20
	...at 3.0 m, trace rock fragments		5	SS	25
	...at 3.8 m, reddish brown		6	SS	37
			7	SS	32
	...at 6.1 m, sandy		8	SS	25
	...at 7.6 m, grey		9	SS	16
			10	SS	18
176.7 / 10.7	**SANDY SILT**, trace clay, trace gravel, trace rock fragments, very dense, reddish brown, moist (GLACIAL TILL)		11	SS	50 / 125mm
	...at 11.4 m, trace rock fragments		12	SS	50 / 150mm
	...at 12.2 m, silty sand, trace limestone fragments		13	SS	50 / 125mm
			14	SS	50 / 50mm
171.9 / 15.5			15	SS	50 / 125mm

depth scale (m): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

well details

elevation (m): 187 186 185 184 183 182 181 180 179 178 177 176 175 174 173 172

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

SS2: H-Ms, Metals, ORPs, OCs

SS3: BTEX, PHCs

9 24 43 24

END OF BOREHOLE

Borehole was dry upon completion of drilling.

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jan 12, 2021	3.4	184.0
Jan 29, 2021	3.5	183.9
Mar 2, 2021	3.6	183.8
Mar 28, 2021	3.6	183.8
Apr 18, 2021	3.5	183.9
Feb 16, 2024	3.3	184.1

file: 20-294.gpj

Tech : KS | **PM** : MG | **Rev** : MD

GROUNDED ENGINEERING

Date Started : Jan 5, 2021
Position : E: 593380, N: 4814551 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 109

File No. : 20-294 **Project** : Britannia Rd and Bronte St S, Milton, ON **Client** : Trinity Point

drill method : G78

hollow stem augers OD=215 mm

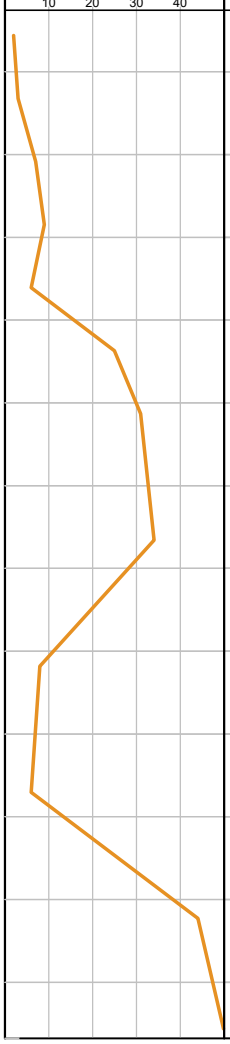
elev depth (m)	description	graphic log	number	type	SPT N-value
188.7	**GROUND SURFACE**				
	FILL, clayey silt, trace sand, trace gravel, trace organics, trace rock fragments, organic odour, very soft, dark brown, moist		1	SS	2
	...at 0.8 m, wet, soft		2	SS	3
	...at 1.5 m, sandy		3	SS	7
	...at 2.3 m, trace wood fragments		4	SS	9
	...at 3.0 m, dark brown with black		5	SS	6
184.7	...at 3.8 m, very stiff		6A	SS	
4.0			6B	SS	25
	CLAYEY SILT, some sand, trace gravel, trace rock fragments, very stiff to hard, reddish brown, moist (GLACIAL TILL)		7	SS	31
			8	SS	34
	...at 7.6 m, greyish brown, stiff		9	SS	8
	...at 9.1 m, soft		10	SS	6
178.0					
10.7	**SANDY SILT**, some clay, some gravel, trace rock fragments, dense to very dense, reddish brown, moist (GLACIAL TILL)		11	SS	44
176.3			12	SS	50 / 75mm
12.4	**END OF BOREHOLE**				

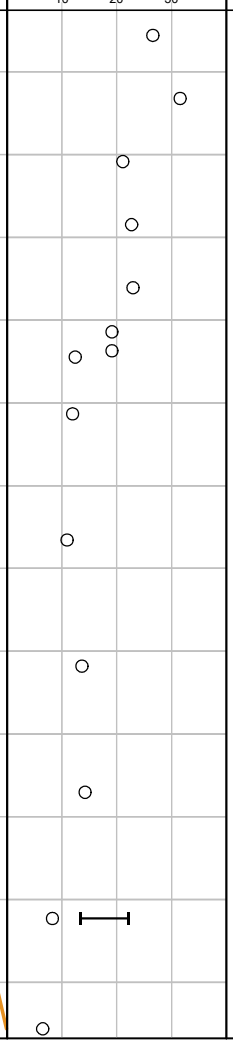
Borehole was dry upon completion of drilling.

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

well details

elevation (m): 188 187 186 185 184 183 182 181 180 179 178 177





unstabilized water level

lab data and comments

grain size distribution (%) (MIT)

GR SA SI CL

10 29 42 19

file: 20-294.gpj

Tech : KS | **PM** : MG | **Rev** : MD

GROUNDED ENGINEERING

Date Started : Jan 5, 2021
Position : E: 593404, N: 4814588 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 110

File No. : 20-294 **Project** : Britannia Rd and Bronte St S, Milton, ON **Client** : Trinity Point

drill method : GT8

hollow stem augers OD=215 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
187.1	**GROUND SURFACE**				
	FILL, clayey silt, trace sand, trace gravel, trace organics, stiff, dark brown, moist		1	SS	11
			2	SS	12
	...at 1.5 m, organic odour		3	SS	13
184.8					
2.3	**CLAYEY SILT**, some sand, trace gravel, trace rock fragments, hard to very stiff, reddish brown, moist (GLACIAL TILL)		4	SS	13
			5	SS	32
			6	SS	23
			7	SS	26
	...at 6.1 m, grey, firm		8	SS	6
	...at 7.6 m, firm		9	SS	9
178.0					
9.1	**SANDY SILT**, trace gravel, trace rock fragments, compact, reddish brown, moist (GLACIAL TILL)		10	SS	23
176.3					
10.8	...at 10.7 m, silty sand		11	SS	50 / 100mm

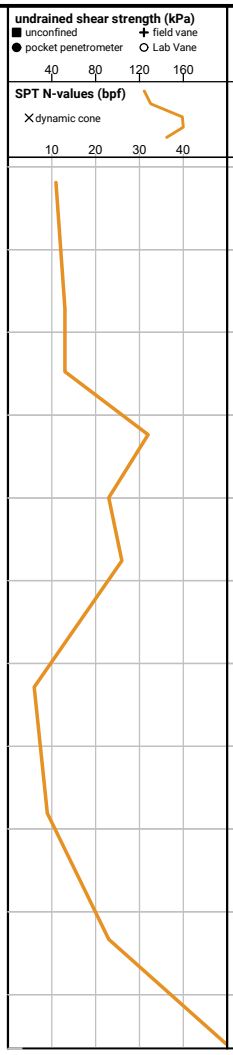
END OF BOREHOLE

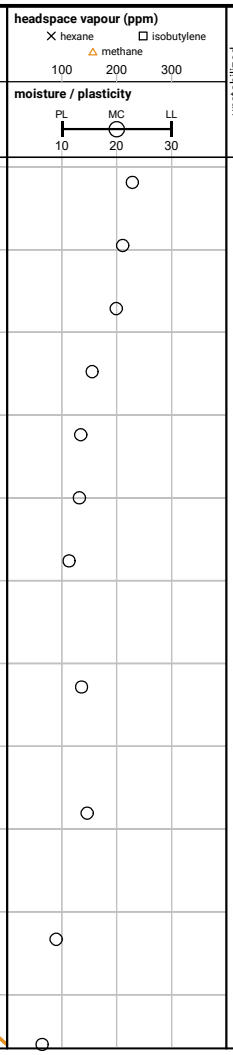
Borehole was dry upon completion of drilling.

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

well details

elevation (m): 187 186 185 184 183 182 181 180 179 178 177





unstabilized water level

lab data and comments

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

SS2: H-Ms, Metals, ORPs, OCs

SS3: BTEX, PHCs

file: 20-294.gpj

Tech : KS | **PM** : MG | **Rev** : MD

GROUNDED ENGINEERING

Date Started : Jan 5, 2021
Position : E: 593438, N: 4814603 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 111

File No. : 20-294 **Project** : Britannia Rd and Bronte St S, Milton, ON **Client** : Trinity Point

drill method : G78

hollow stem augers OD=215 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
187.7	**GROUND SURFACE**				
	FILL, clayey silt, trace sand, trace gravel, trace organics, trace rock fragments, stiff, dark brown, moist		1	SS	12
	...at 0.8 m, brow		2	SS	4
186.2 / 1.5	**CLAYEY SILT**, trace sand, trace gravel, very stiff, black with grey, moist (GLACIAL TILL)		3	SS	17
			4	SS	20
	...at 3.0 m, some sand, trace rock fragments, reddish brown		5	SS	23
			6	SS	25
			7	SS	25
			8	SS	19
	...at 7.6 m, grey, stiff		9	SS	9
178.6 / 9.1	**SANDY SILT**, trace clay, trace gravel, trace rock fragments, very dense, reddish brown with grey, moist (GLACIAL TILL)		10	SS	50 / 50mm
176.6 / 11.1			11	SS	78 / 275mm

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

well details

elevation (m): 187 186 185 184 183 182 181 180 179 178 177

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

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

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

moisture / plasticity: PL MC LL; 10 20 30

unstabilized water level

lab data and comments

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

END OF BOREHOLE

Borehole was dry upon completion of drilling.

file: 20-294.gpj

Tech : KS | **PM** : MG | **Rev** : MD

BOREHOLE LOG 112

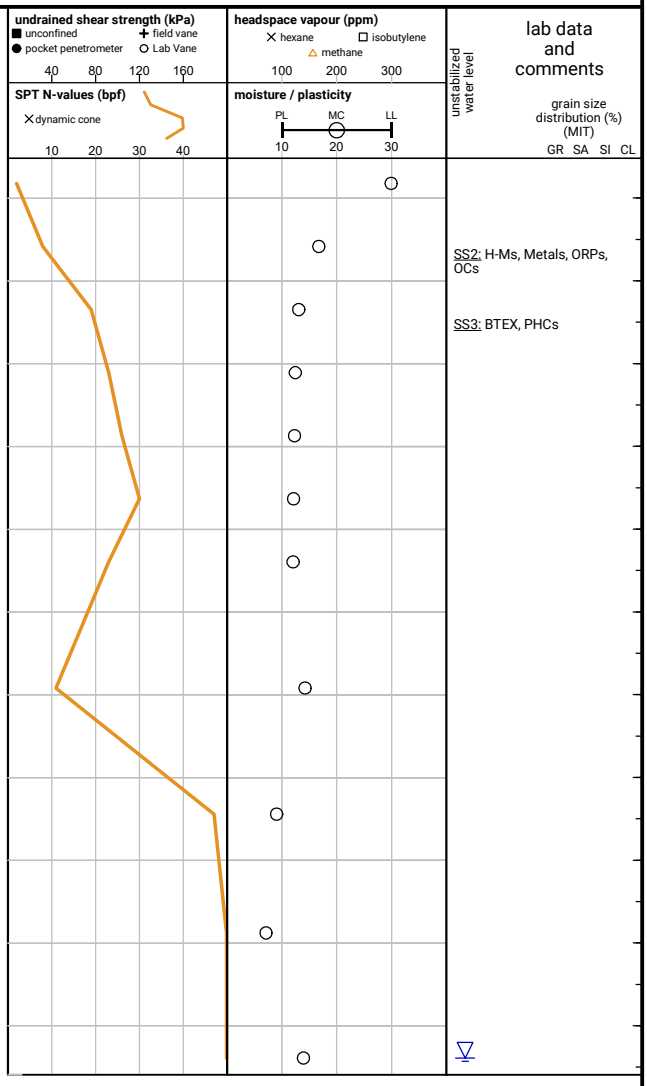
Date Started : Jan 11, 2021
Position : E: 593374, N: 4814490 (UTM 17T)
Elev. Datum : Geodetic

File No. : 20-294 **Project** : Britannia Rd and Bronte St S, Milton, ON **Client** : Trinity Point

drill method : G78

hollow stem augers OD=215 mm

elev / depth (m)	description	graphic log	number	type	SPT N-value
185.5	**GROUND SURFACE**				
	FILL, clay and silt, trace sand, trace gravel, trace organics, very soft to stiff, dark brown, wet		1	SS	2
	...at 0.8 m, clayey silt, brown with grey, moist		2	SS	8
184.0 / 1.5	**CLAYEY SILT**, some sand, trace gravel, trace rock fragments, very stiff to hard, reddish brown, moist (GLACIAL TILL)		3	SS	19
			4	SS	23
			5	SS	26
			6	SS	30
			7	SS	23
	...at 6.1 m, grey, stiff		8	SS	11
177.9 / 7.6	**SANDY SILT**, trace clay, trace gravel, trace rock fragments, dense to very dense, reddish brown, moist (GLACIAL TILL)		9	SS	47
			10	SS	91 / 275mm
	...at 10.7 m, silty sand, wet		11	SS	96 / 250mm
174.4 / 11.1					



END OF BOREHOLE

Unstabilized water level measured at 10.9 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jan 12, 2021	1.8	183.7
Jan 29, 2021	1.6	183.9
Mar 2, 2021	1.7	183.8
Mar 28, 2021	1.6	183.9
Apr 18, 2021	1.6	183.9
Feb 16, 2024	1.5	184.0

file: 20-294.gpj

Tech : KS | **PM** : MG | **Rev** : MD

BOREHOLE LOG 113

Date Started : Jan 8, 2021
Position : E: 593406, N: 4814520 (UTM 17T)
Elev. Datum : Geodetic

File No. : 20-294 **Project** : Britannia Rd and Bronte St S, Milton, ON **Client** : Trinity Point

drill method : G78

hollow stem augers OD=215 mm

elev / depth (m)	description	graphic log	number	type	SPT N-value
185.9	**GROUND SURFACE**				
	FILL, clay and silt, trace sand, trace gravel, trace organics, very soft to stiff, dark brown, wet		1	SS	2
	...at 0.8 m, clayey silt, browm with grey, moist		2	SS	13
184.4 / 1.5	**CLAYEY SILT**, some sand, trace gravel, trace rock fragments, very stiff to hard, reddish brown, moist (GLACIAL TILL)		3	SS	19
	...at 2.3 m, sandy		4	SS	29
			5	SS	27
			6	SS	31
			7	SS	19
	...at 6.1 m, grey, stiff		8	SS	11
	...at 7.6 m, grey		9	SS	30
176.8 / 9.1	**SANDY SILT**, trace clay, trace gravel, trace rock fragments, dense to very dense, reddish brown, moist (GLACIAL TILL)		10	SS	45
			11	SS	64
173.4 / 12.5	...at 12.2 m, wet		12	SS	50 / 125mm

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

well details

elevation (m): 185 184 183 182 181 180 179 178 177 176 175 174

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

SS2: H-Ms, Metals, ORPs, OCs

SS3: BTEX, PHCs

7 23 42 28

END OF BOREHOLE

Borehole was dry upon completion of drilling.

file: 20-294.gpj

Tech : KS | **PM** : MG | **Rev** : MD

BOREHOLE LOG 114

Date Started : Jan 11, 2021
Position : E: 593432, N: 4814553 (UTM 17T)
Elev. Datum : Geodetic

File No. : 20-294 **Project** : Britannia Rd and Bronte St S, Milton, ON **Client** : Trinity Point

drill method : G78

hollow stem augers OD=215 mm

elev depth (m)	description	number	type	SPT N-value
186.5	**GROUND SURFACE**			
	FILL, clayey silt, trace sand, trace gravel, trace organics, very soft, dark brown, wet	1	SS	2
	...at 0.8 m, brown with grey, moist, stiff	2	SS	12
185.0 / 1.5	**CLAYEY SILT**, some sand, trace gravel, trace rock fragments, very stiff, reddish brown, moist (GLACIAL TILL)	3	SS	22
		4	SS	27
		5	SS	28
		6	SS	24
		7	SS	21
	...at 6.1 m, stiff	8	SS	14
178.9 / 7.6	**SANDY SILT**, some clay, trace gravel, trace rock fragments, dense to very dense, reddish brown, moist (GLACIAL TILL)	9	SS	30
		10	SS	38
		11	SS	50 / 125mm
174.1 / 12.4		12	SS	50 / 100mm

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

elevation (m): 186 185 184 183 182 181 180 179 178 177 176 175

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

SS2: H-Ms, Metals, ORPs

SS3: BTEX, OCs, PHCs

END OF BOREHOLE

Borehole was dry upon completion of drilling.

50 mm dia. monitoring well installed.

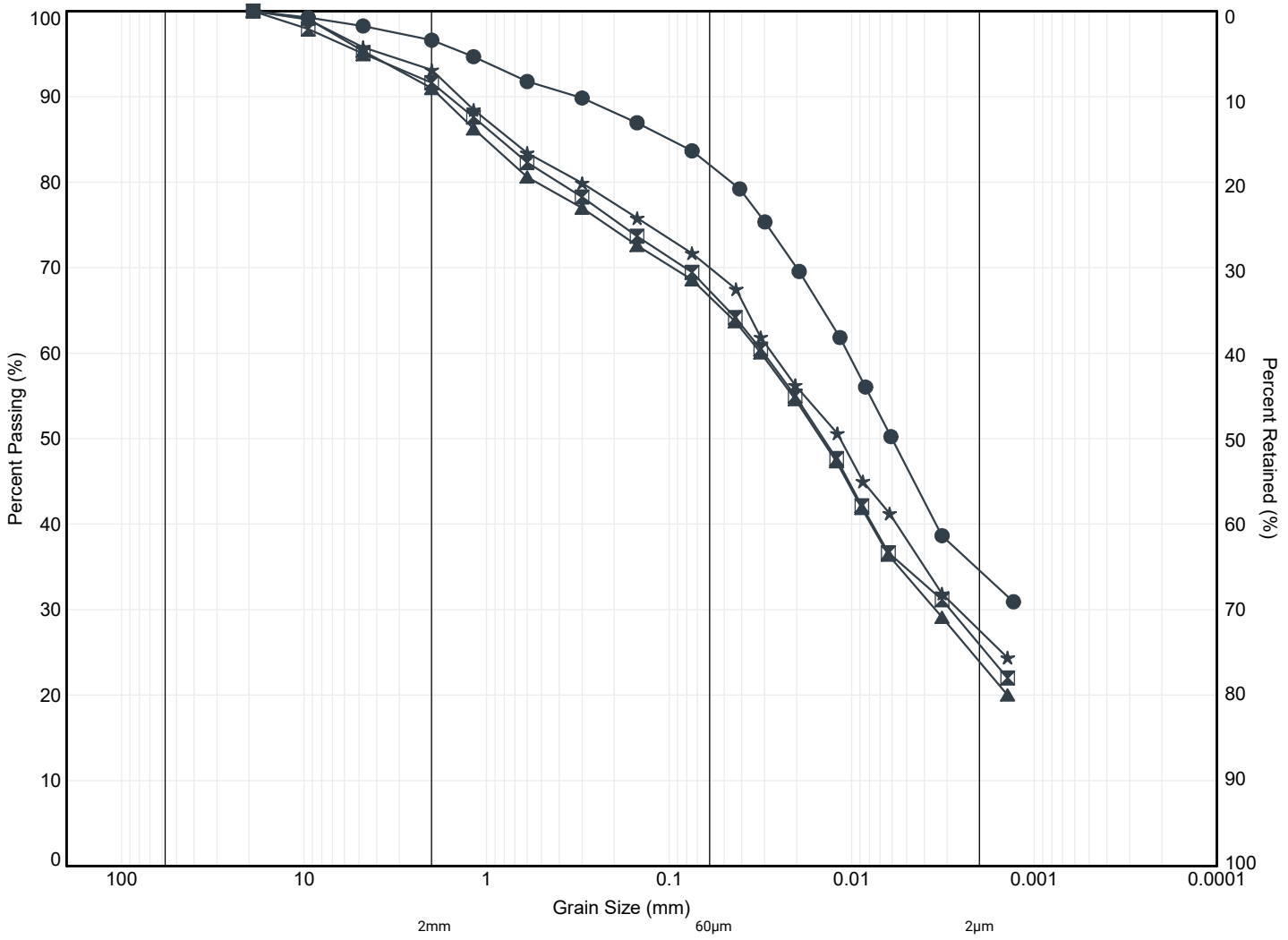
GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Jan 12, 2021	7.6	178.9
Jan 29, 2021	2.6	183.9
Mar 2, 2021	2.7	183.8
Mar 28, 2021	2.6	183.9
Apr 18, 2021	2.6	183.9
Feb 16, 2024	2.4	184.1
Jan 20, 2025	2.4	184.1
Jul 21, 2025	2.8	183.7

file: 20-294.gpj

Tech : KS | **PM** : MG | **Rev** : MD

APPENDIX G



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

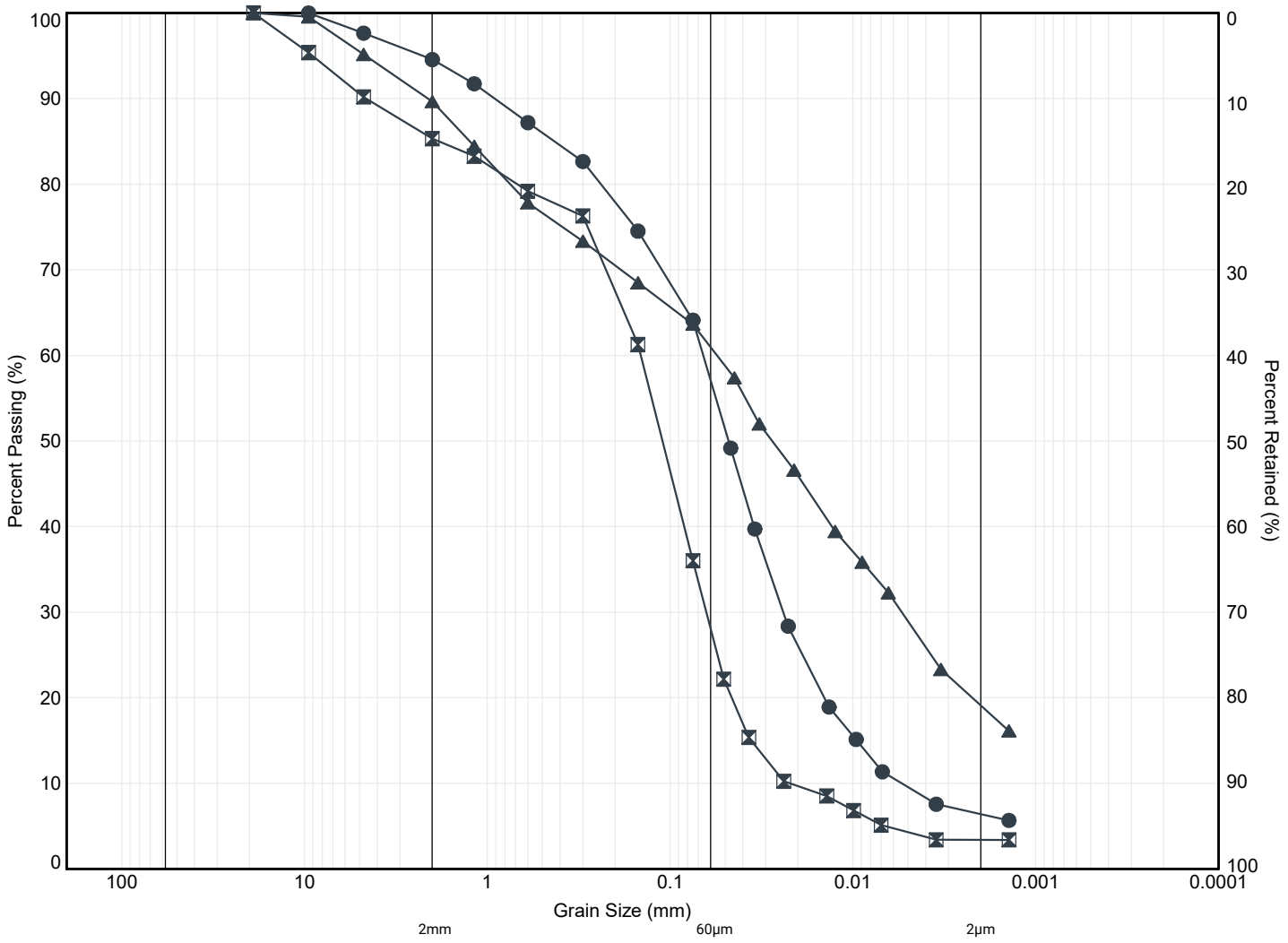
MIT SYSTEM

	Borehole	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
●	**101**	SS6	4.1	183.9	3	15	47	35
⊠	**104**	SS11	9.5	179.5	8	25	41	26
▲	**108**	SS8	6.4	181.0	9	24	43	24
★	**113**	SS4	2.6	183.3	7	23	42	28

GROUNDED ENGINEERING

Title: **GRAIN SIZE DISTRIBUTION**
CLAYEY SILT

File No.: **20-294**



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 (%)
●	**101**	SS11	10.7	177.3	5	38	51	6
⊠	**104**	SS13	12.5	176.5	15	57	25	3
▲	**109**	SS11	11.0	177.8	10	29	42	19

GROUNDED ENGINEERING

Title: **GRAIN SIZE DISTRIBUTION**
SANDY SILT TO SILTY SAND TILL

File No.: **20-294**

K from Grain Size Analysis Report

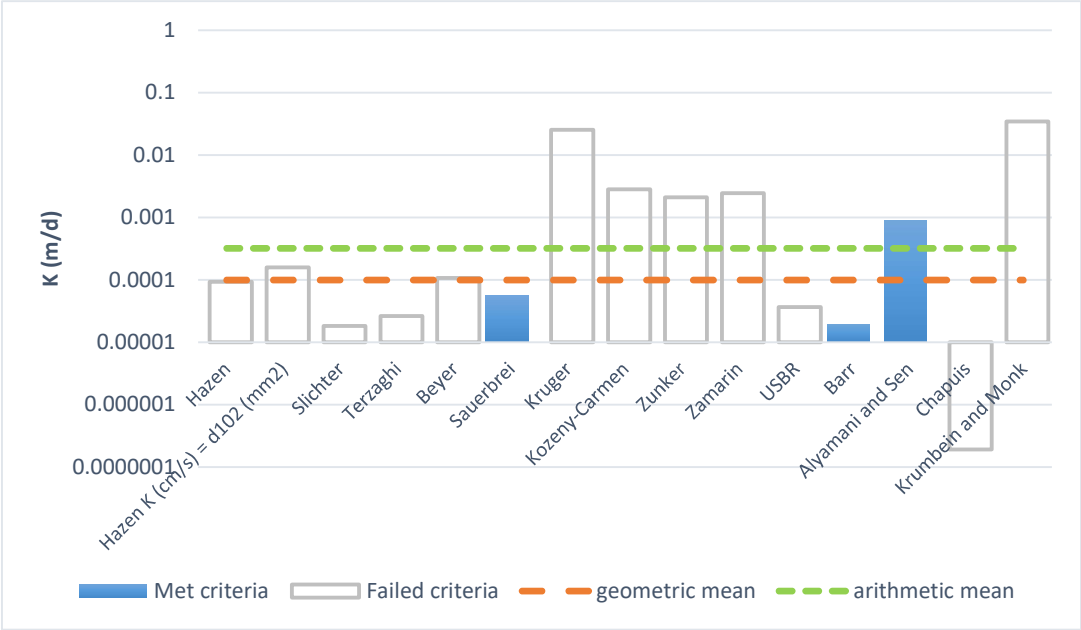
Date: Feb. 18, 2021

Sample Name: BH101 SS6

Mass Sample (g): 100

T (oC) 20

Poorly sorted clay with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	1.1E-07	1.1E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	1.8E-07	1.8E-09	0.00	
Slichter	2.1E-08	2.1E-10	0.00	
Terzaghi	3.0E-08	3.0E-10	0.00	
Beyer	1.2E-07	1.2E-09	0.00	
Sauerbrei	6.5E-08	6.5E-10	0.00	
Kruger	2.9E-05	2.9E-07	0.03	
Kozeny-Carmen	3.3E-06	3.3E-08	0.00	
Zunker	2.4E-06	2.4E-08	0.00	
Zamarin	2.8E-06	2.8E-08	0.00	
USBR	4.2E-08	4.2E-10	0.00	
Barr	2.3E-08	2.3E-10	0.00	
Alyamani and Sen	1.0E-06	1.0E-08	0.00	
Chapuis	2.2E-10	2.2E-12	0.00	
Krumbein and Monk	4.0E-05	4.0E-07	0.03	
geometric mean	1.1E-07	1.1E-09	0.00	
arithmetic mean	3.7E-07	3.7E-09	0.00	

K from Grain Size Analysis Report

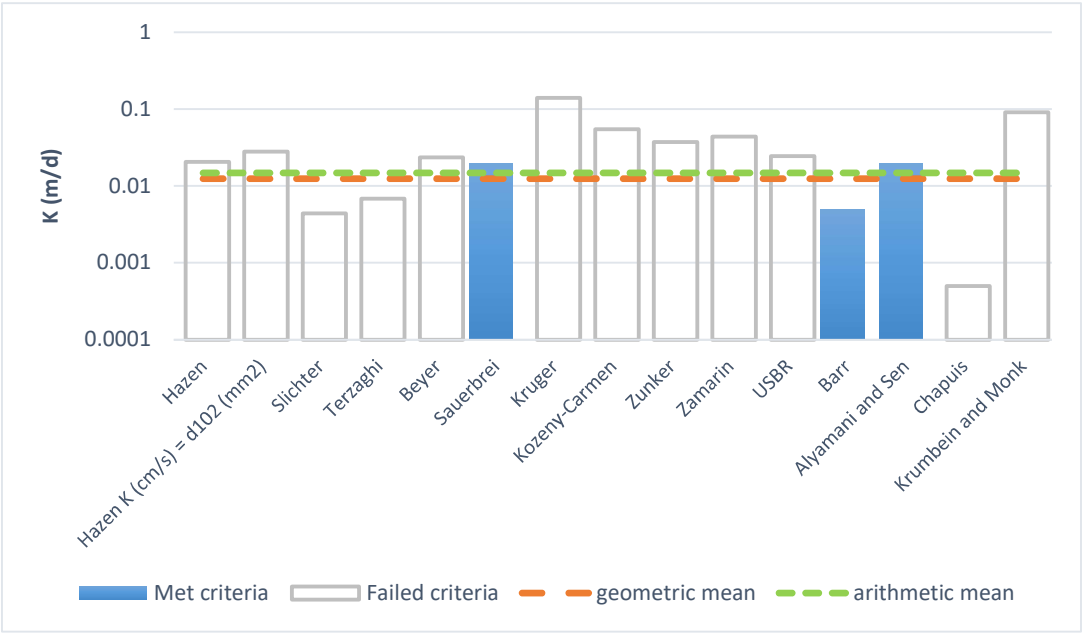
Date: Feb. 18, 2021

Sample Name: BH101 SS11

Mass Sample (g): 100

T (oC) 20

Poorly sorted sandy silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	2.4E-05	2.4E-07	0.02	
Hazen K (cm/s) = d_{10} (mm)	3.2E-05	3.2E-07	0.03	
Slichter	5.1E-06	5.1E-08	0.00	
Terzaghi	7.9E-06	7.9E-08	0.01	
Beyer	2.7E-05	2.7E-07	0.02	
Sauerbrei	2.3E-05	2.3E-07	0.02	
Kruger	1.6E-04	1.6E-06	0.14	
Kozeny-Carmen	6.3E-05	6.3E-07	0.05	
Zunker	4.3E-05	4.3E-07	0.04	
Zamarin	5.1E-05	5.1E-07	0.04	
USBR	2.8E-05	2.8E-07	0.02	
Barr	5.7E-06	5.7E-08	0.00	
Alyamani and Sen	2.3E-05	2.3E-07	0.02	
Chapuis	5.8E-07	5.8E-09	0.00	
Krumbein and Monk	1.1E-04	1.1E-06	0.09	
geometric mean	1.4E-05	1.4E-07	0.01	
arithmetic mean	1.7E-05	1.7E-07	0.01	

K from Grain Size Analysis Report

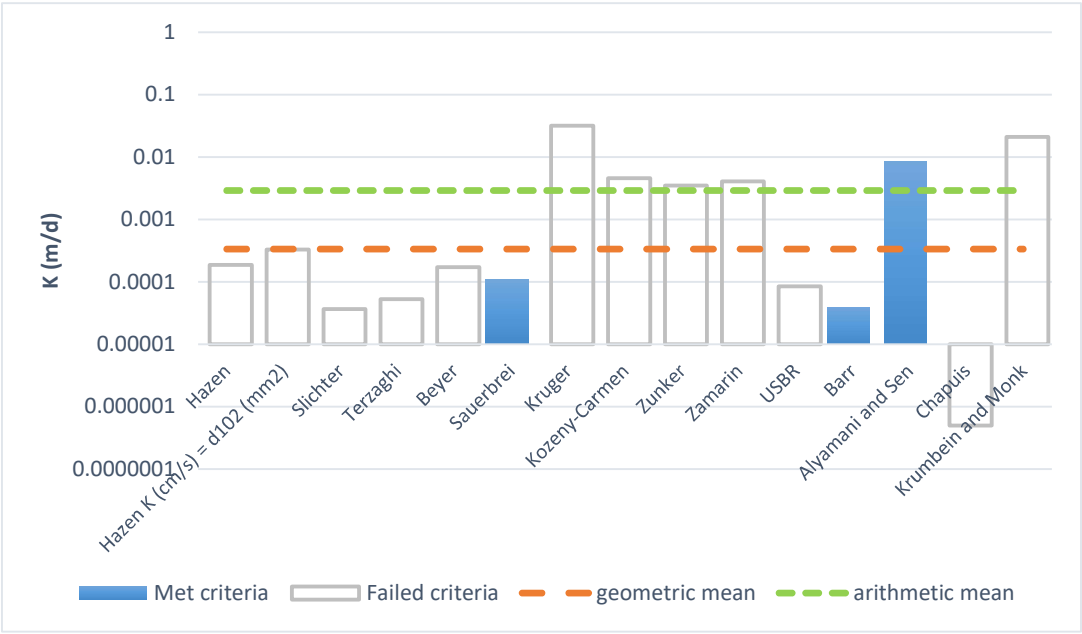
Date: Feb. 18, 2021

Sample Name: BH104 SS11

Mass Sample (g): 100

T (oC) 20

Poorly sorted clay with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	2.2E-07	2.2E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	3.8E-07	3.8E-09	0.00	
Slichter	4.2E-08	4.2E-10	0.00	
Terzaghi	6.1E-08	6.1E-10	0.00	
Beyer	2.0E-07	2.0E-09	0.00	
Sauerbrei	1.3E-07	1.3E-09	0.00	
Kruger	3.7E-05	3.7E-07	0.03	
Kozeny-Carmen	5.3E-06	5.3E-08	0.00	
Zunker	4.0E-06	4.0E-08	0.00	
Zamarin	4.7E-06	4.7E-08	0.00	
USBR	9.8E-08	9.8E-10	0.00	
Barr	4.6E-08	4.6E-10	0.00	
Alyamani and Sen	9.9E-06	9.9E-08	0.01	
Chapuis	5.7E-10	5.7E-12	0.00	
Krumbein and Monk	2.4E-05	2.4E-07	0.02	
geometric mean	3.9E-07	3.9E-09	0.00	
arithmetic mean	3.4E-06	3.4E-08	0.00	

K from Grain Size Analysis Report

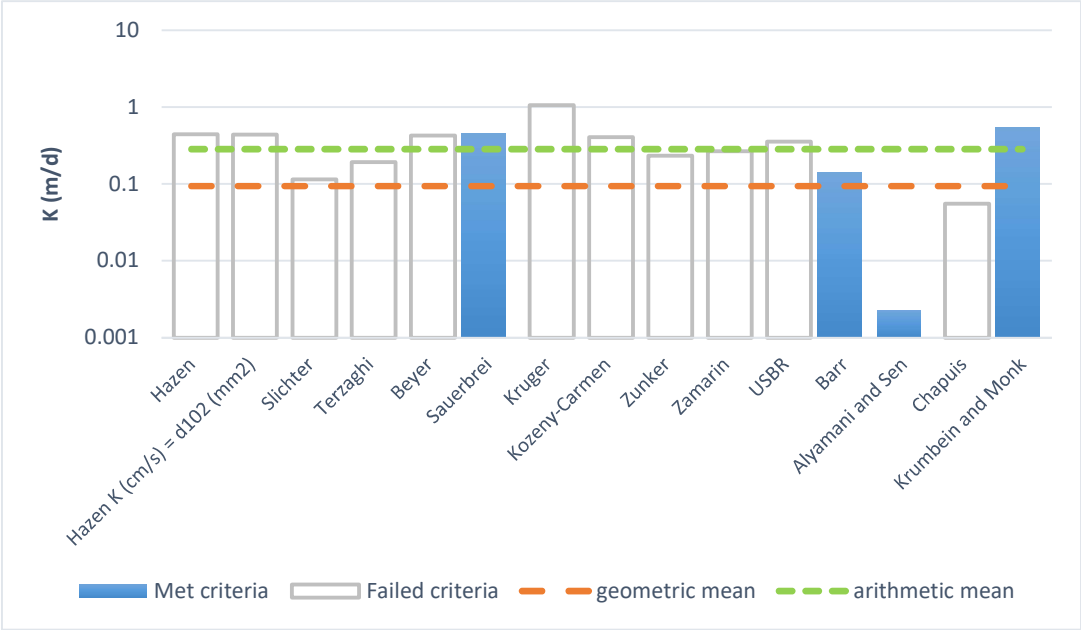
Date: Feb. 18, 2021

Sample Name: BH104 SS13

Mass Sample (g): 100

T (oC) 20

Poorly sorted gravelly sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	5.2E-04	5.2E-06	0.44	
Hazen K (cm/s) = d_{10} (mm)	5.1E-04	5.1E-06	0.44	
Slichter	1.3E-04	1.3E-06	0.11	
Terzaghi	2.2E-04	2.2E-06	0.19	
Beyer	4.9E-04	4.9E-06	0.43	
Sauerbrei	5.2E-04	5.2E-06	0.45	
Kruger	1.2E-03	1.2E-05	1.06	
Kozeny-Carmen	4.7E-04	4.7E-06	0.41	
Zunker	2.7E-04	2.7E-06	0.23	
Zamarin	3.1E-04	3.1E-06	0.27	
USBR	4.1E-04	4.1E-06	0.36	
Barr	1.6E-04	1.6E-06	0.14	
Alyamani and Sen	2.6E-06	2.6E-08	0.00	
Chapuis	6.4E-05	6.4E-07	0.06	
Krumbein and Monk	6.3E-04	6.3E-06	0.54	
geometric mean	1.1E-04	1.1E-06	0.09	
arithmetic mean	3.3E-04	3.3E-06	0.28	

K from Grain Size Analysis Report

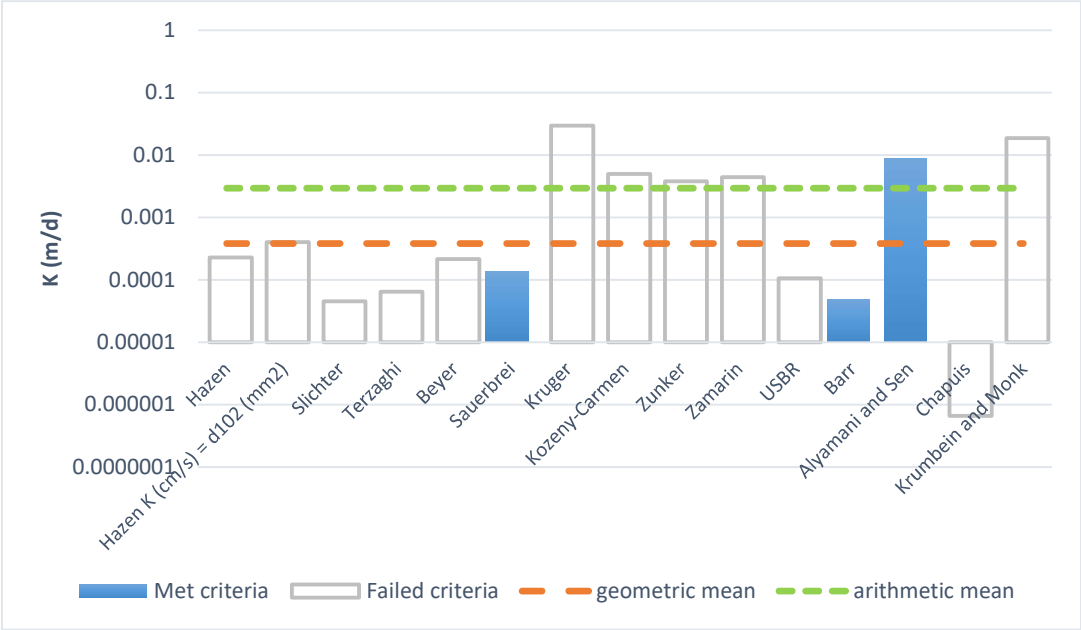
Date: Feb. 18, 2021

Sample Name: BH108 SS8

Mass Sample (g): 100

T (oC) 20

Poorly sorted clay with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	2.6E-07	2.6E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	4.7E-07	4.7E-09	0.00	
Slichter	5.2E-08	5.2E-10	0.00	
Terzaghi	7.4E-08	7.4E-10	0.00	
Beyer	2.5E-07	2.5E-09	0.00	
Sauerbrei	1.6E-07	1.6E-09	0.00	
Kruger	3.4E-05	3.4E-07	0.03	
Kozeny-Carmen	5.8E-06	5.8E-08	0.00	
Zunker	4.4E-06	4.4E-08	0.00	
Zamarin	5.1E-06	5.1E-08	0.00	
USBR	1.2E-07	1.2E-09	0.00	
Barr	5.6E-08	5.6E-10	0.00	
Alyamani and Sen	1.0E-05	1.0E-07	0.01	
Chapuis	7.6E-10	7.6E-12	0.00	
Krumbein and Monk	2.2E-05	2.2E-07	0.02	
geometric mean	4.5E-07	4.5E-09	0.00	
arithmetic mean	3.4E-06	3.4E-08	0.00	

K from Grain Size Analysis Report

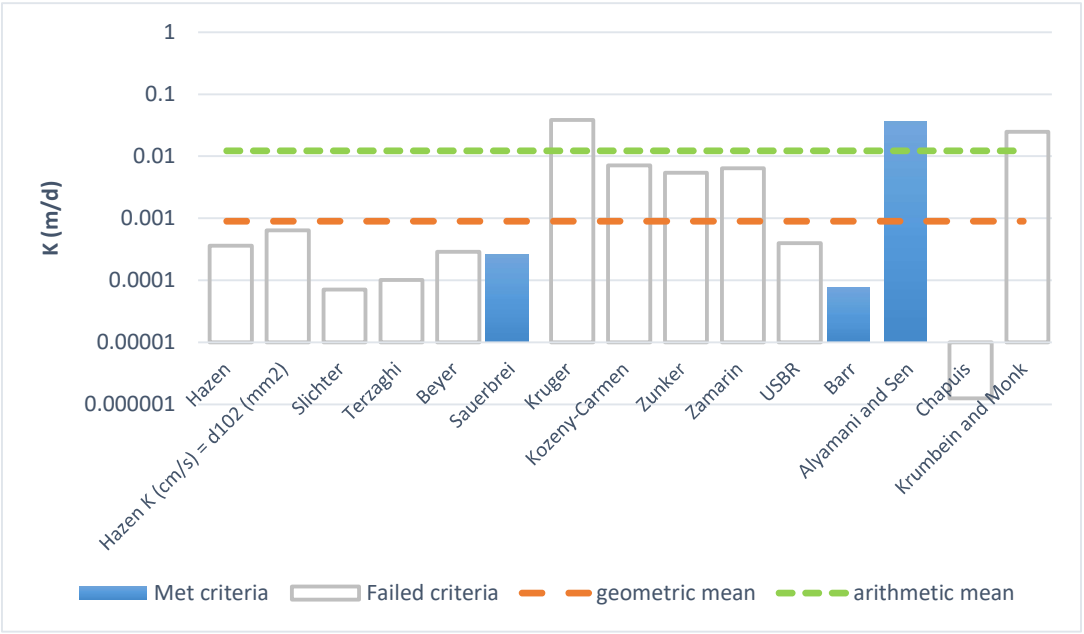
Date: Feb. 18, 2021

Sample Name: BH109 SS11

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	4.2E-07	4.2E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	7.4E-07	7.4E-09	0.00	
Slichter	8.2E-08	8.2E-10	0.00	
Terzaghi	1.2E-07	1.2E-09	0.00	
Beyer	3.3E-07	3.3E-09	0.00	
Sauerbrei	3.1E-07	3.1E-09	0.00	
Kruger	4.5E-05	4.5E-07	0.04	
Kozeny-Carmen	8.3E-06	8.3E-08	0.01	
Zunker	6.3E-06	6.3E-08	0.01	
Zamarin	7.4E-06	7.4E-08	0.01	
USBR	4.6E-07	4.6E-09	0.00	
Barr	8.8E-08	8.8E-10	0.00	
Alyamani and Sen	4.2E-05	4.2E-07	0.04	
Chapuis	1.4E-09	1.4E-11	0.00	
Krumbein and Monk	2.9E-05	2.9E-07	0.02	
geometric mean	1.0E-06	1.0E-08	0.00	
arithmetic mean	1.4E-05	1.4E-07	0.01	

K from Grain Size Analysis Report

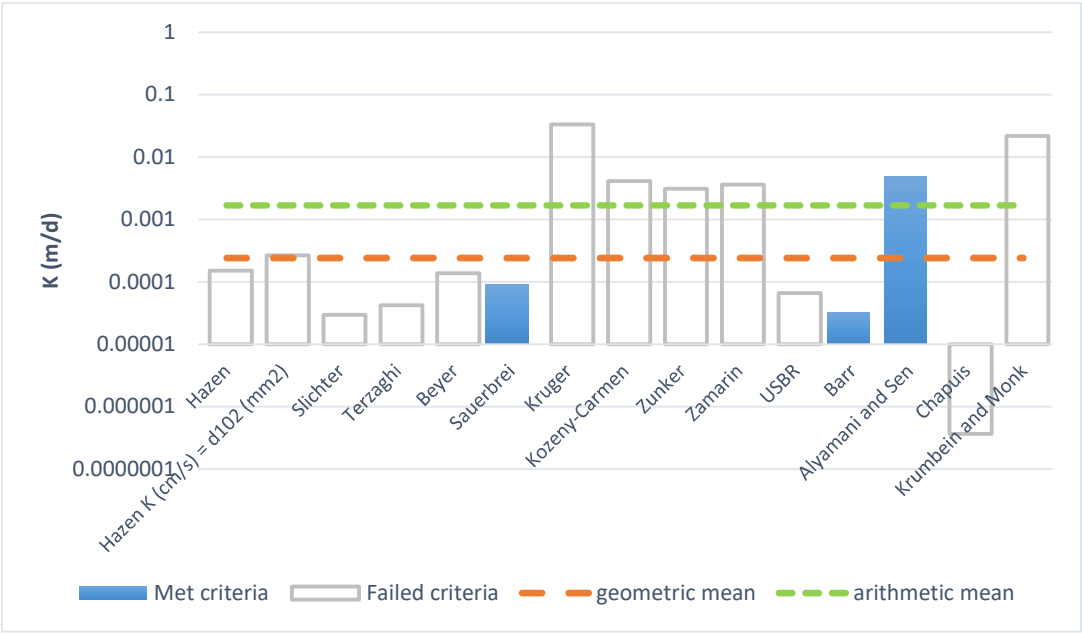
Date: Feb. 18, 2021

Sample Name: BH113 SS4

Mass Sample (g): 100

T (oC) 20

Poorly sorted clay with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	1.7E-07	1.7E-09	0.00	
Hazen K (cm/s) = d_{10} (mm)	3.1E-07	3.1E-09	0.00	
Slichter	3.4E-08	3.4E-10	0.00	
Terzaghi	4.9E-08	4.9E-10	0.00	
Beyer	1.6E-07	1.6E-09	0.00	
Sauerbrei	1.0E-07	1.0E-09	0.00	
Kruger	3.9E-05	3.9E-07	0.03	
Kozeny-Carmen	4.8E-06	4.8E-08	0.00	
Zunker	3.6E-06	3.6E-08	0.00	
Zamarin	4.2E-06	4.2E-08	0.00	
USBR	7.6E-08	7.6E-10	0.00	
Barr	3.7E-08	3.7E-10	0.00	
Alyamani and Sen	5.7E-06	5.7E-08	0.00	
Chapuis	4.2E-10	4.2E-12	0.00	
Krumbein and Monk	2.5E-05	2.5E-07	0.02	
geometric mean	2.8E-07	2.8E-09	0.00	
arithmetic mean	2.0E-06	2.0E-08	0.00	

K from Grain Size Analysis Report

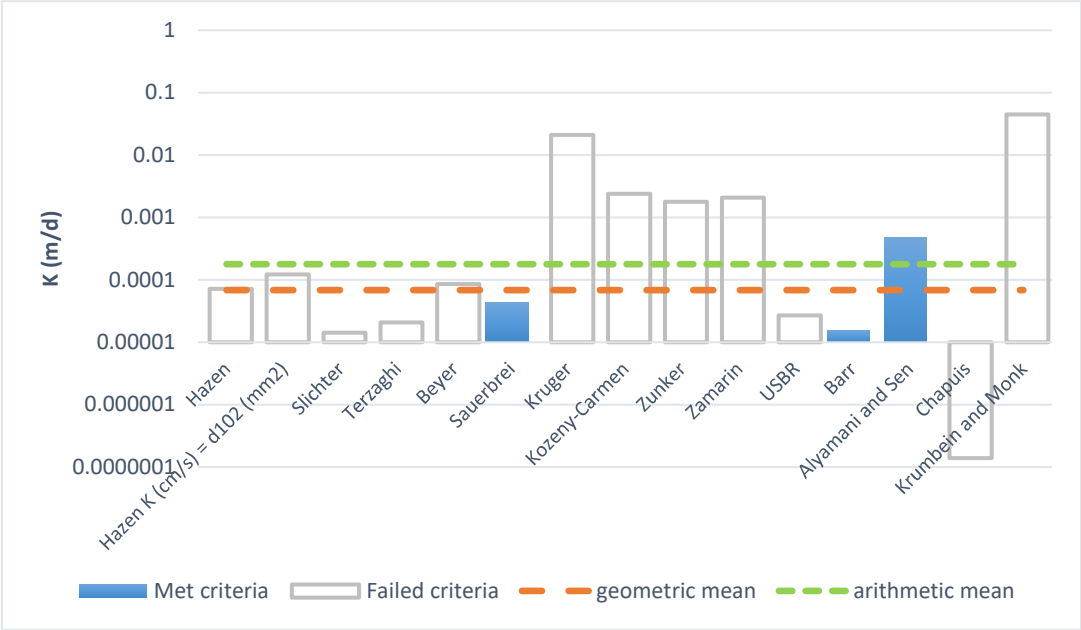
Date: Feb. 18, 2021

Sample Name: GP1

Mass Sample (g): 100

T (oC) 20

Poorly sorted clay with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	8.3E-08	8.3E-10	0.00	
Hazen K (cm/s) = d_{10} (mm)	1.4E-07	1.4E-09	0.00	
Slichter	1.7E-08	1.7E-10	0.00	
Terzaghi	2.4E-08	2.4E-10	0.00	
Beyer	9.9E-08	9.9E-10	0.00	
Sauerbrei	5.1E-08	5.1E-10	0.00	
Kruger	2.4E-05	2.4E-07	0.02	
Kozeny-Carmen	2.8E-06	2.8E-08	0.00	
Zunker	2.1E-06	2.1E-08	0.00	
Zamarin	2.4E-06	2.4E-08	0.00	
USBR	3.1E-08	3.1E-10	0.00	
Barr	1.8E-08	1.8E-10	0.00	
Alyamani and Sen	5.6E-07	5.6E-09	0.00	
Chapuis	1.6E-10	1.6E-12	0.00	
Krumbein and Monk	5.2E-05	5.2E-07	0.04	
geometric mean	7.9E-08	7.9E-10	0.00	
arithmetic mean	2.1E-07	2.1E-09	0.00	

K from Grain Size Analysis Report

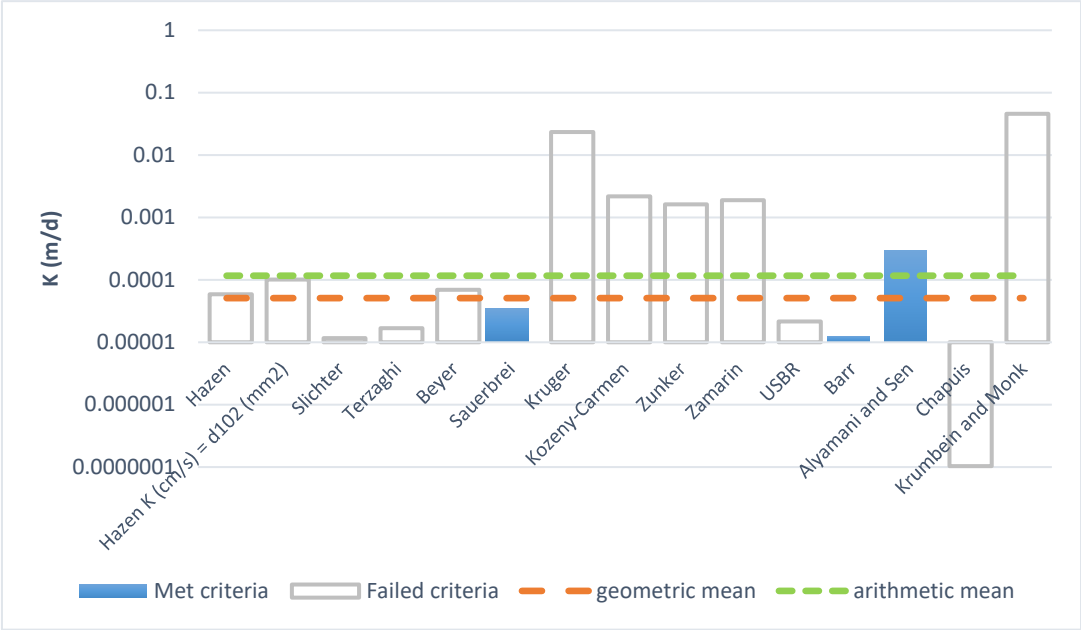
Date: Feb. 18, 2021

Sample Name: GP2

Mass Sample (g): 100

T (oC) 20

Poorly sorted clay with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	de
Hazen	6.8E-08	6.8E-10	0.00	
Hazen K (cm/s) = d_{10} (mm)	1.2E-07	1.2E-09	0.00	
Slichter	1.3E-08	1.3E-10	0.00	
Terzaghi	1.9E-08	1.9E-10	0.00	
Beyer	8.0E-08	8.0E-10	0.00	
Sauerbrei	4.1E-08	4.1E-10	0.00	
Kruger	2.7E-05	2.7E-07	0.02	
Kozeny-Carmen	2.5E-06	2.5E-08	0.00	
Zunker	1.9E-06	1.9E-08	0.00	
Zamarin	2.2E-06	2.2E-08	0.00	
USBR	2.5E-08	2.5E-10	0.00	
Barr	1.5E-08	1.5E-10	0.00	
Alyamani and Sen	3.5E-07	3.5E-09	0.00	
Chapuis	1.2E-10	1.2E-12	0.00	
Krumbein and Monk	5.3E-05	5.3E-07	0.05	
geometric mean	5.9E-08	5.9E-10	0.00	
arithmetic mean	1.3E-07	1.3E-09	0.00	

APPENDIX H

Your Project #: 20-294
Site Location: BRITANNIA RD & BRONTE ST S
Your C.O.C. #: 1031461-01-01

Attention: Hailey O'Blenes

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

Report Date: 2025/01/27
Report #: R8476332
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C506253
Received: 2025/01/20, 16:20

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Carbonaceous BOD	1	2025/01/21	2025/01/26	CAM SOP-00427	SM 24 5210B m
Total Cyanide	1	2025/01/21	2025/01/21	CAM SOP-00457	OMOE E3015 5 m
Fluoride	1	2025/01/21	2025/01/22	CAM SOP-00449	SM 24 4500-F C m
Mercury in Water by CVAA	1	2025/01/22	2025/01/23	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by Axial ICP	1	2025/01/21	2025/01/21	CAM SOP-00408	EPA 6010D m
E.coli, (CFU/100mL)	1	N/A	2025/01/20	CAM SOP-00552	SM9222B, MECP E3371
Animal and Vegetable Oil and Grease	1	N/A	2025/01/24	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2025/01/24	2025/01/24	CAM SOP-00326	EPA1664B m,SM5520B m
PAH Compounds in Water by GC/MS (SIM)	1	2025/01/22	2025/01/23	CAM SOP-00318	EPA 8270E
Phenols (4AAP)	1	N/A	2025/01/21	CAM SOP-00444	OMOE E3179 m
pH	1	2025/01/22	2025/01/23	CAM SOP-00413	SM 24th-4500H+ B
Sulphate by Automated Turbidimetry	1	N/A	2025/01/23	CAM SOP-00464	SM 24 4500-SO42- E m
Total Kjeldahl Nitrogen in Water	1	2025/01/21	2025/01/22	CAM SOP-00938	SM 4500-N B m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2025/01/24	2025/01/24	CAM SOP-00326	EPA1664B m,SM5520F m
Total Suspended Solids	1	2025/01/22	2025/01/23	CAM SOP-00428	SM 24 2540D m
Volatile Organic Compounds in Water	1	N/A	2025/01/22	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, EPA, APHA or the Quebec Ministry of Environment.

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 #: 20-294
Site Location: BRITANNIA RD & BRONTE ST S
Your C.O.C. #: 1031461-01-01

Attention: Hailey O'Blenes

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

Report Date: 2025/01/27
Report #: R8476332
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C506253

Received: 2025/01/20, 16:20

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.

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

Marijane Cruz
Senior Project Manager
27 Jan 2025 15:49:31

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

Bureau Veritas Job #: C506253
Report Date: 2025/01/27

Grounded Engineering Inc.
Client Project #: 20-294
Site Location: BRITANNIA RD & BRONTE ST S
Sampler Initials: MD

HALTON SANITARY & COMBINED BYLAW (2-03)

Bureau Veritas ID				ANIR73			ANIR73		
Sampling Date				2025/01/20 14:30			2025/01/20 14:30		
COC Number				1031461-01-01			1031461-01-01		
	UNITS	Criteria	Criteria-2	SW-UF-BH107	RDL	QC Batch	SW-UF-BH107 Lab-Dup	RDL	QC Batch
Calculated Parameters									
Total Animal/Vegetable Oil and Grease	mg/L	150	-	1.4	0.50	9861889			
Inorganics									
Total Carbonaceous BOD	mg/L	300	-	<2	2	9862001			
Fluoride (F-)	mg/L	10	-	0.19	0.10	9862698			
Total Kjeldahl Nitrogen (TKN)	mg/L	100	-	0.61	0.10	9862392			
pH	pH	6.0:10.0	6.5:8.5	7.43		9863384			
Phenols-4AAP	mg/L	1	-	<0.0010	0.0010	9862652			
Total Suspended Solids	mg/L	350	-	210	20	9862520			
Dissolved Sulphate (SO4)	mg/L	1500	-	**3100**	10	9862305			
Total Cyanide (CN)	mg/L	2	-	<0.0050	0.0050	9862032			
Petroleum Hydrocarbons									
Total Oil & Grease	mg/L	-	-	1.4	0.50	9864641			
Total Oil & Grease Mineral/Synthetic	mg/L	-	-	<0.50	0.50	9864643			
Metals									
Total Aluminum (Al)	mg/L	50	-	3	1	9862086	3	1	9862086
Total Antimony (Sb)	mg/L	5	-	<0.2	0.2	9862086	<0.2	0.2	9862086
Total Arsenic (As)	mg/L	1	-	<0.1	0.1	9862086	<0.1	0.1	9862086
Total Beryllium (Be)	mg/L	5	-	<0.005	0.005	9862086	<0.005	0.005	9862086
Total Cadmium (Cd)	mg/L	1	-	<0.02	0.02	9862086	<0.02	0.02	9862086
Total Chromium (Cr)	mg/L	3	-	<0.1	0.1	9862086	<0.1	0.1	9862086
Total Cobalt (Co)	mg/L	5	-	<0.02	0.02	9862086	<0.02	0.02	9862086
Total Copper (Cu)	mg/L	3	-	<0.1	0.1	9862086	<0.1	0.1	9862086
Total Iron (Fe)	mg/L	50	-	6.7	0.2	9862086	6.6	0.2	9862086
Total Lead (Pb)	mg/L	3	-	<0.1	0.1	9862086	<0.1	0.1	9862086
Total Manganese (Mn)	mg/L	5	-	0.37	0.01	9862086	0.37	0.01	9862086
Mercury (Hg)	mg/L	0.05	-	<0.00010	0.00010	9863304			
Total Molybdenum (Mo)	mg/L	5	-	0.14	0.05	9862086	<0.05	0.05	9862086
Total Nickel (Ni)	mg/L	3	-	<0.05	0.05	9862086	<0.05	0.05	9862086

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)
Criteria-2: Halton Storm Sewer ByLaw

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

Bureau Veritas Job #: C506253
Report Date: 2025/01/27

Grounded Engineering Inc.
Client Project #: 20-294
Site Location: BRITANNIA RD & BRONTE ST S
Sampler Initials: MD

HALTON SANITARY & COMBINED BYLAW (2-03)

Bureau Veritas ID				ANIR73			ANIR73		
Sampling Date				2025/01/20 14:30			2025/01/20 14:30		
COC Number				1031461-01-01			1031461-01-01		
	UNITS	Criteria	Criteria-2	SW-UF-BH107	RDL	QC Batch	SW-UF-BH107 Lab-Dup	RDL	QC Batch
Total Phosphorus (P)	mg/L	10	-	<0.5	0.5	9862086	<0.5	0.5	9862086
Total Selenium (Se)	mg/L	5	-	<0.2	0.2	9862086	<0.2	0.2	9862086
Total Silver (Ag)	mg/L	5	-	<0.1	0.1	9862086	<0.1	0.1	9862086
Total Tin (Sn)	mg/L	5	-	<0.2	0.2	9862086	<0.2	0.2	9862086
Total Titanium (Ti)	mg/L	5	-	0.05	0.05	9862086	<0.05	0.05	9862086
Total Zinc (Zn)	mg/L	3	-	<0.05	0.05	9862086	<0.05	0.05	9862086
Polyaromatic Hydrocarbons									
Naphthalene	mg/L	0.14	-	<0.000050	0.000050	9863136			
Volatile Organics									
Benzene	mg/L	0.01	-	<0.00020	0.00020	9862238			
Chloroform	mg/L	0.04	-	<0.00020	0.00020	9862238			
1,4-Dichlorobenzene	mg/L	0.08	-	<0.00040	0.00040	9862238			
Ethylbenzene	mg/L	0.16	-	<0.00020	0.00020	9862238			
Methylene Chloride(Dichloromethane)	mg/L	2.0	-	<0.0020	0.0020	9862238			
Tetrachloroethylene	mg/L	1.0	-	<0.00020	0.00020	9862238			
Toluene	mg/L	0.016	-	<0.00020	0.00020	9862238			
Trichloroethylene	mg/L	0.4	-	<0.00020	0.00020	9862238			
Surrogate Recovery (%)									
D10-Anthracene	%	-	-	103		9863136			
D14-Terphenyl (FS)	%	-	-	81		9863136			
D8-Acenaphthylene	%	-	-	103		9863136			
4-Bromofluorobenzene	%	-	-	102		9862238			
D4-1,2-Dichloroethane	%	-	-	106		9862238			
D8-Toluene	%	-	-	97		9862238			

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)
Criteria-2: Halton Storm Sewer ByLaw

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Bureau Veritas Job #: C506253
Report Date: 2025/01/27

Grounded Engineering Inc.
Client Project #: 20-294
Site Location: BRITANNIA RD & BRONTE ST S
Sampler Initials: MD

HALTON STORM SEWER BYLAW (2-03)

Bureau Veritas ID			ANIR73		
Sampling Date			2025/01/20 14:30		
COC Number			1031461-01-01		
	UNITS	Criteria	SW-UF-BH107	RDL	QC Batch
Microbiological					
Escherichia coli	CFU/100mL	200	<10	10	9861985

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 Storm Sewer ByLaw

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

Bureau Veritas Job #: C506253
Report Date: 2025/01/27

Grounded Engineering Inc.
Client Project #: 20-294
Site Location: BRITANNIA RD & BRONTE ST S
Sampler Initials: MD

TEST SUMMARY

Bureau Veritas ID: ANIR73
Sample ID: SW-UF-BH107
Matrix: Water

Collected: 2025/01/20
Shipped:
Received: 2025/01/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Carbonaceous BOD	DO	9862001	2025/01/21	2025/01/26	Frank Zhang
Total Cyanide	SKAL/CN	9862032	2025/01/21	2025/01/21	Prgya Panchal
Fluoride	ISE	9862698	2025/01/21	2025/01/22	Nachiketa Gohil
Mercury in Water by CVAA	CV/AA	9863304	2025/01/22	2025/01/23	Maninder Kaur
Total Metals Analysis by Axial ICP	ICPX	9862086	2025/01/21	2025/01/21	Medhat Nasr
E.coli, (CFU/100mL)	PL	9861985	N/A	2025/01/20	Jessica (Ya Ping) Qiang
Animal and Vegetable Oil and Grease	BAL	9861889	N/A	2025/01/24	Automated Statchk
Total Oil and Grease	BAL	9864641	2025/01/24	2025/01/24	Jay Hareshkumar Vaghasia
PAH Compounds in Water by GC/MS (SIM)	GC/MS	9863136	2025/01/22	2025/01/23	Jonghan Yoon
Phenols (4AAP)	TECH/PHEN	9862652	N/A	2025/01/21	Chandra Nandlal
pH	AT	9863384	2025/01/22	2025/01/23	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9862305	N/A	2025/01/23	Massarat Jan
Total Kjeldahl Nitrogen in Water	SKAL	9862392	2025/01/21	2025/01/22	Rajni Tyagi
Mineral/Synthetic O & G (TPH Heavy Oil)	BAL	9864643	2025/01/24	2025/01/24	Jay Hareshkumar Vaghasia
Total Suspended Solids	BAL	9862520	2025/01/22	2025/01/23	Razieh Tabesh
Volatile Organic Compounds in Water	GC/MS	9862238	N/A	2025/01/22	Manpreet Sarao

Bureau Veritas ID: ANIR73 Dup
Sample ID: SW-UF-BH107
Matrix: Water

Collected: 2025/01/20
Shipped:
Received: 2025/01/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Metals Analysis by Axial ICP	ICPX	9862086	2025/01/21	2025/01/21	Medhat Nasr

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	7.3°C

Sample ANIR73 [SW-UF-BH107] : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

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

Bureau Veritas Job #: C506253
Report Date: 2025/01/27

QUALITY ASSURANCE REPORT

Grounded Engineering Inc.
Client Project #: 20-294
Site Location: BRITANNIA RD & BRONTE ST S
Sampler Initials: MD

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		Reagent Blank		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	Value	UNITS	% Recovery	QC Limits
9862238	4-Bromofluorobenzene	2025/01/22	102	70 - 130	100	70 - 130	101	%						
9862238	D4-1,2-Dichloroethane	2025/01/22	104	70 - 130	103	70 - 130	100	%						
9862238	D8-Toluene	2025/01/22	98	70 - 130	100	70 - 130	100	%						
9863136	D10-Anthracene	2025/01/22	104	50 - 130	104	50 - 130	107	%						
9863136	D14-Terphenyl (FS)	2025/01/22	87	50 - 130	103	50 - 130	98	%						
9863136	D8-Acenaphthylene	2025/01/22	101	50 - 130	91	50 - 130	99	%						
9862001	Total Carbonaceous BOD	2025/01/26					<2	mg/L	NC	30			93	80 - 120
9862032	Total Cyanide (CN)	2025/01/21	107	80 - 120	109	80 - 120	<0.0050	mg/L	NC	20				
9862086	Total Aluminum (Al)	2025/01/21	NC (1)	80 - 120	104	80 - 120	<0.1	mg/L	0.037	20	<0.1	mg/L		
9862086	Total Antimony (Sb)	2025/01/21	NC (1)	80 - 120	109	80 - 120	<0.02	mg/L	NC	20	<0.02	mg/L		
9862086	Total Arsenic (As)	2025/01/21	NC (1)	80 - 120	106	80 - 120	<0.01	mg/L	NC	20	<0.01	mg/L		
9862086	Total Beryllium (Be)	2025/01/21	NC (1)	80 - 120	106	80 - 120	<0.0005	mg/L	NC	20	<0.0005	mg/L		
9862086	Total Cadmium (Cd)	2025/01/21	NC (1)	80 - 120	105	80 - 120	<0.002	mg/L	NC	20	<0.002	mg/L		
9862086	Total Chromium (Cr)	2025/01/21	NC (1)	80 - 120	108	80 - 120	<0.01	mg/L	NC	20	<0.01	mg/L		
9862086	Total Cobalt (Co)	2025/01/21	NC (1)	80 - 120	105	80 - 120	<0.002	mg/L	NC	20	<0.002	mg/L		
9862086	Total Copper (Cu)	2025/01/21	NC (1)	80 - 120	107	80 - 120	<0.01	mg/L	NC	20	<0.01	mg/L		
9862086	Total Iron (Fe)	2025/01/21	NC (1)	80 - 120	105	80 - 120	<0.02	mg/L	0.54	20	<0.02	mg/L		
9862086	Total Lead (Pb)	2025/01/21	NC (1)	80 - 120	105	80 - 120	<0.01	mg/L	NC	20	<0.01	mg/L		
9862086	Total Manganese (Mn)	2025/01/21	NC (1)	80 - 120	104	80 - 120	<0.001	mg/L	0.21	20	<0.001	mg/L		
9862086	Total Molybdenum (Mo)	2025/01/21	NC (1)	80 - 120	109	80 - 120	<0.005	mg/L	NC	20	<0.005	mg/L		
9862086	Total Nickel (Ni)	2025/01/21	NC (1)	80 - 120	105	80 - 120	<0.005	mg/L	NC	20	<0.005	mg/L		
9862086	Total Phosphorus (P)	2025/01/21	NC (1)	80 - 120	110	80 - 120	<0.05	mg/L	NC	20	<0.05	mg/L		
9862086	Total Selenium (Se)	2025/01/21	NC (1)	80 - 120	108	80 - 120	<0.02	mg/L	NC	20	<0.02	mg/L		
9862086	Total Silver (Ag)	2025/01/21	NC (1)	80 - 120	101	80 - 120	<0.01	mg/L	NC	20	<0.01	mg/L		
9862086	Total Tin (Sn)	2025/01/21	NC (1)	80 - 120	107	80 - 120	<0.02	mg/L	NC	20	<0.02	mg/L		
9862086	Total Titanium (Ti)	2025/01/21	NC (1)	80 - 120	107	80 - 120	<0.005	mg/L	0.40	20	<0.005	mg/L		
9862086	Total Zinc (Zn)	2025/01/21	NC (1)	80 - 120	103	80 - 120	<0.005	mg/L	NC	20	<0.005	mg/L		
9862238	1,4-Dichlorobenzene	2025/01/22	102	70 - 130	103	70 - 130	<0.00040	mg/L	NC	30				
9862238	Benzene	2025/01/22	98	70 - 130	97	70 - 130	<0.00020	mg/L	NC	30				
9862238	Chloroform	2025/01/22	101	70 - 130	99	70 - 130	<0.00020	mg/L	NC	30				

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		Reagent Blank		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	Value	UNITS	% Recovery	QC Limits
9862238	Ethylbenzene	2025/01/22	99	70 - 130	98	70 - 130	<0.00020	mg/L	NC	30				
9862238	Methylene Chloride(Dichloromethane)	2025/01/22	100	70 - 130	97	70 - 130	<0.0020	mg/L	NC	30				
9862238	Tetrachloroethylene	2025/01/22	96	70 - 130	97	70 - 130	<0.00020	mg/L	NC	30				
9862238	Toluene	2025/01/22	98	70 - 130	98	70 - 130	<0.00020	mg/L	NC	30				
9862238	Trichloroethylene	2025/01/22	102	70 - 130	101	70 - 130	<0.00020	mg/L	0.75	30				
9862305	Dissolved Sulphate (SO4)	2025/01/23	NC	75 - 125	98	80 - 120	<1.0	mg/L	1.7	20				
9862392	Total Kjeldahl Nitrogen (TKN)	2025/01/22	95	80 - 120	98	80 - 120	<0.10	mg/L	19	20			97	80 - 120
9862520	Total Suspended Solids	2025/01/23			96	80 - 120	<10	mg/L	11	20				
9862652	Phenols-4AAP	2025/01/21	99	80 - 120	105	80 - 120	<0.0010	mg/L	1.4	20				
9862698	Fluoride (F-)	2025/01/22	101	80 - 120	103	80 - 120	<0.10	mg/L	5.2	20				
9863136	Naphthalene	2025/01/22	95	50 - 130	99	50 - 130	<0.000050	mg/L	NC	30				
9863304	Mercury (Hg)	2025/01/23	100	75 - 125	98	80 - 120	<0.00010	mg/L	NC	20				
9863384	pH	2025/01/23			102	98 - 103			0.58	N/A				
9864641	Total Oil & Grease	2025/01/24			99	80 - 110	<0.50	mg/L	0.51	25				
9864643	Total Oil & Grease Mineral/Synthetic	2025/01/24			97	65 - 130	<0.50	mg/L	0.52	25				

N/A = Not Applicable

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

Reagent Blank: A blank matrix containing all reagents used in the analytical procedure. Used to determine any analytical contamination.

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) Matrix Spike not calculated. Original sample and matrix spike sample were analyzed at a dilution, due to high target analytes, or sample matrix interference

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Bureau Veritas Job #: C506253
Report Date: 2025/01/27

Grounded Engineering Inc.
Client Project #: 20-294
Site Location: BRITANNIA RD & BRONTE ST S
Sampler Initials: MD

VALIDATION SIGNATURE PAGE

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

Cristina Carriere, Senior Scientific Specialist

Jessica (Ya Ping) Qiang, Analyst II

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.

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C506253
2025/01/20 16:20

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NONT-2025-01-2885

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#36876 Grounded Engineering Inc.	Company Name:		Quotation #:	C35487
Attention:	Hailey O'Blenes	Attention:	Hailey O'Blenes	P.O. #:	
Address:	1 Banigan Drive Toronto ON M4H 1G3	Address:		Project:	20-294
Tel:	(709) 687-3178 Fax:	Tel:	(709) 687-3178 Fax:	Project Name:	
Email:	hoblenes@groundedeng.ca	Email:	hoblenes@groundedeng.ca	Site #:	Britannia Rd & Bronte St
				Sampled By:	MO

Bottle Order #: 1031461

COC #: C#1031461-01-01

Project Manager: Marijane Cruz

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)? ___

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

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	Halton Sanitary & Combined Bylaw (2-03)	Halton Storm Sewer Bylaw (2-03)	# of Bottles	Comments
1		SW-UF-BH107	25-01-20	14:30	GW	X	X	14	
2									
3									
4									
5									
6									
7									
8									
9									
10									

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
MARY DAKA	25/01/20	16:00		25/01/20	1620	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	6.1 8.8	Present		
		Intact	✓	

* 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 #: C506253
Report Date: 2025/01/27

Grounded Engineering Inc.
Client Project #: 20-294
Site Location: BRITANNIA RD & BRONTE ST S
Sampler Initials: MD

Exceedance Summary Table – Halton Sanitary Sewer

Result Exceedances

Sample ID	Bureau Veritas ID	Parameter	Criteria	Result	DL	UNITS
SW-UF-BH107	ANIR73-02	Dissolved Sulphate (SO4)	1500	3100	10	mg/L

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 I

GROUNDED ENGINEERING

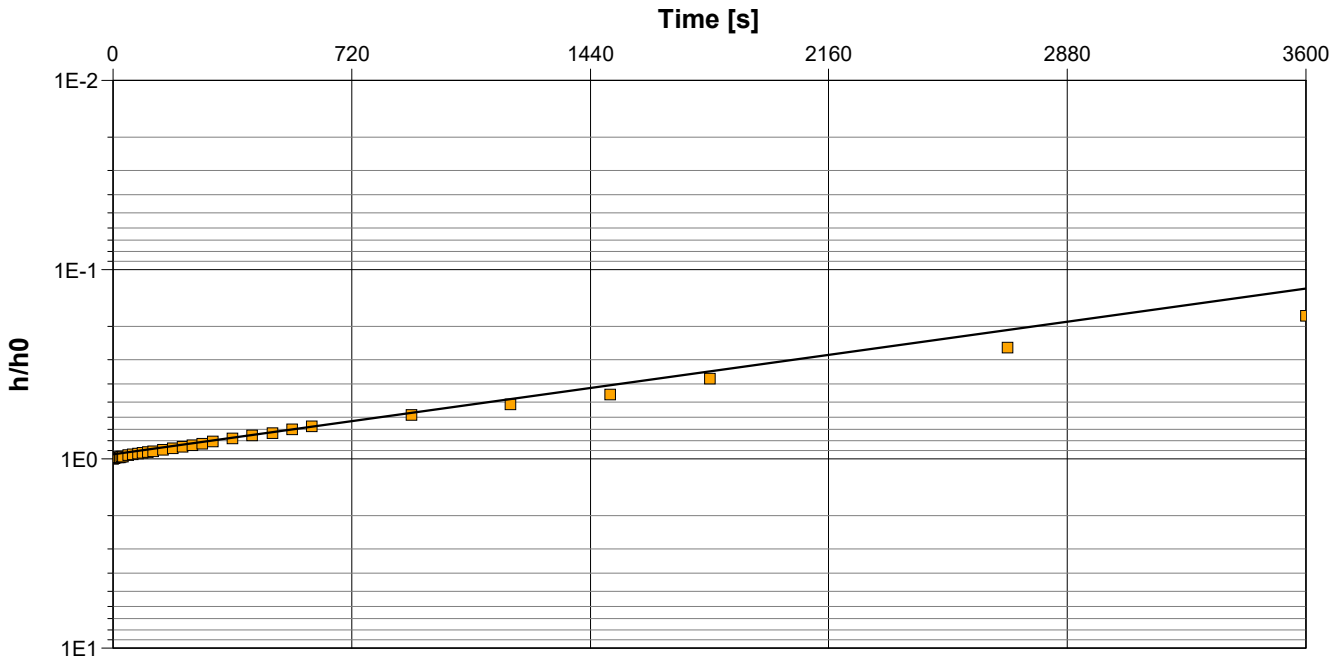
Slug Test Analysis Report

Project: Britannia Road and Bronte Street

Number: 20-294

Client: Trinity Point

Location: Milton, Ontario	Slug Test: RHT BH101	Test Well: BH101
Test Conducted by: KS		Test Date: 2021-01-12
Analysis Performed by: MG	RHT BH101	Analysis Date: 2021-02-18
Aquifer Thickness: 12.20 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH101	2.15×10^{-7}	

GROUNDED ENGINEERING

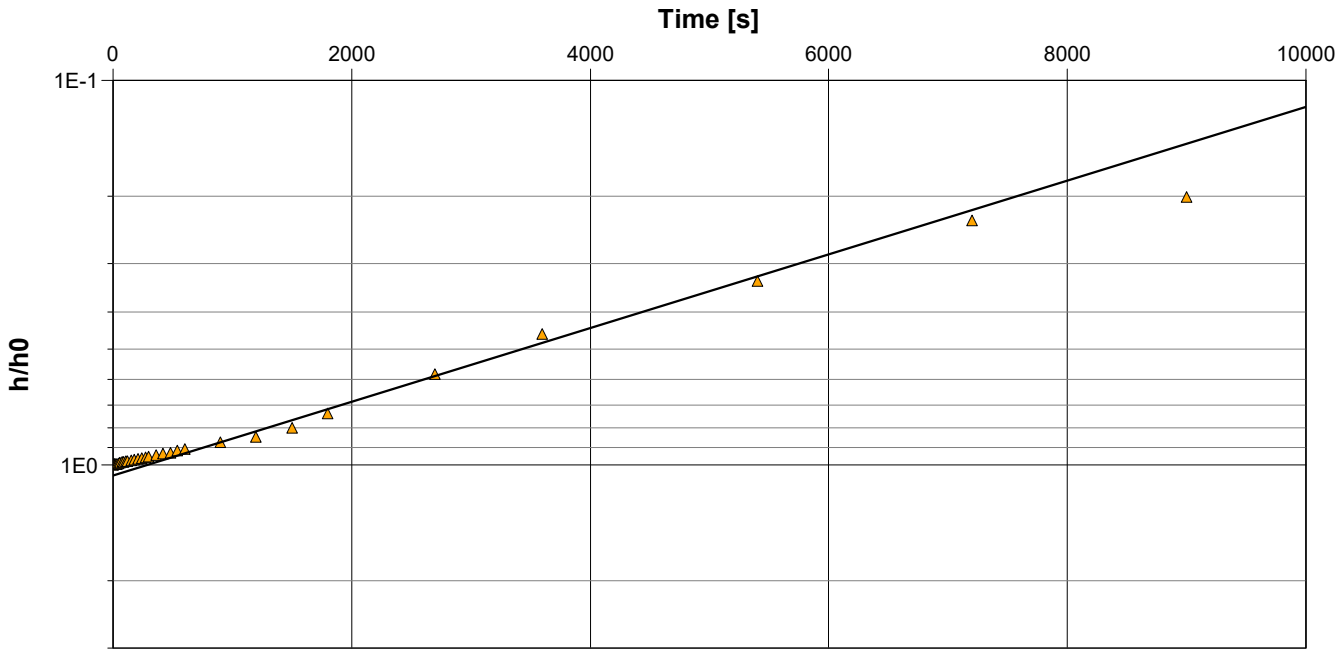
Slug Test Analysis Report

Project: Britannia Road and Bronte Street

Number: 20-294

Client: Trinity Point

Location: Milton, Ontario	Slug Test: RHT BH107	Test Well: BH107
Test Conducted by: KS		Test Date: 2021-01-12
Analysis Performed by: MG	RHT BH107	Analysis Date: 2021-02-18
Aquifer Thickness: 13.70 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH107	8.46×10^{-8}	

GROUNDED ENGINEERING

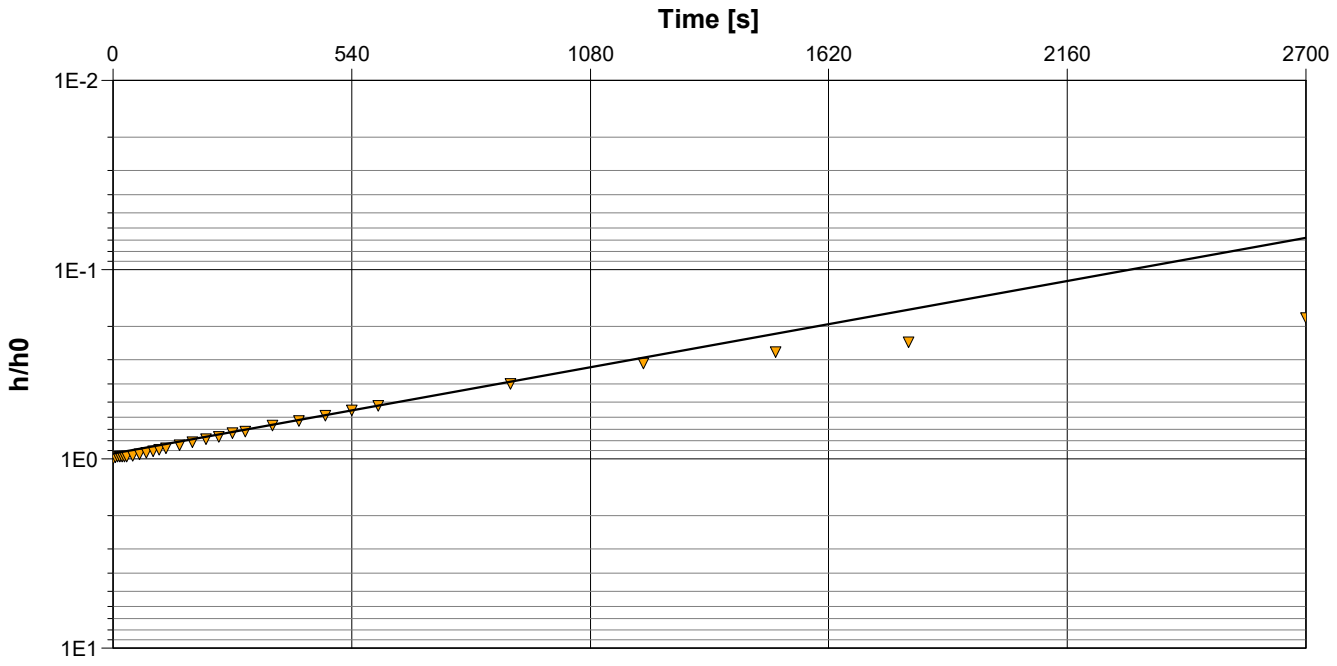
Slug Test Analysis Report

Project: Britannia Road and Bronte Street

Number: 20-294

Client: Trinity Point

Location: Milton, Ontario	Slug Test: RHT BH108	Test Well: BH108
Test Conducted by: KS		Test Date: 2021-01-12
Analysis Performed by: MG	RHT BH108	Analysis Date: 2021-02-18
Aquifer Thickness: 15.20 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH108	3.73×10^{-7}	

GROUNDED ENGINEERING

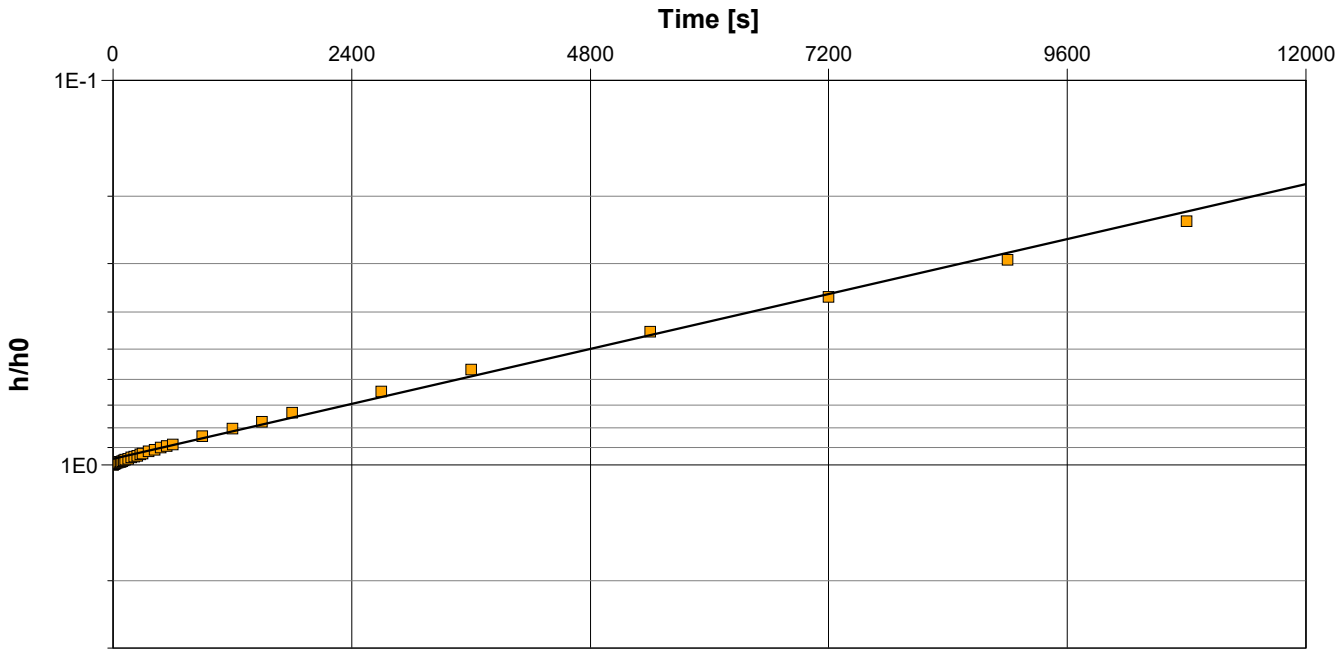
Slug Test Analysis Report

Project: Britannia Road and Bronte Street

Number: 20-294

Client: Trinity Point

Location: Milton, Ontario	Slug Test: RHT BH112	Test Well: BH112
Test Conducted by: KS		Test Date: 2021-01-12
Analysis Performed by: MG	RHT BH112	Analysis Date: 2021-02-18
Aquifer Thickness: 10.70 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH112	5.25×10^{-8}	

GROUNDED ENGINEERING

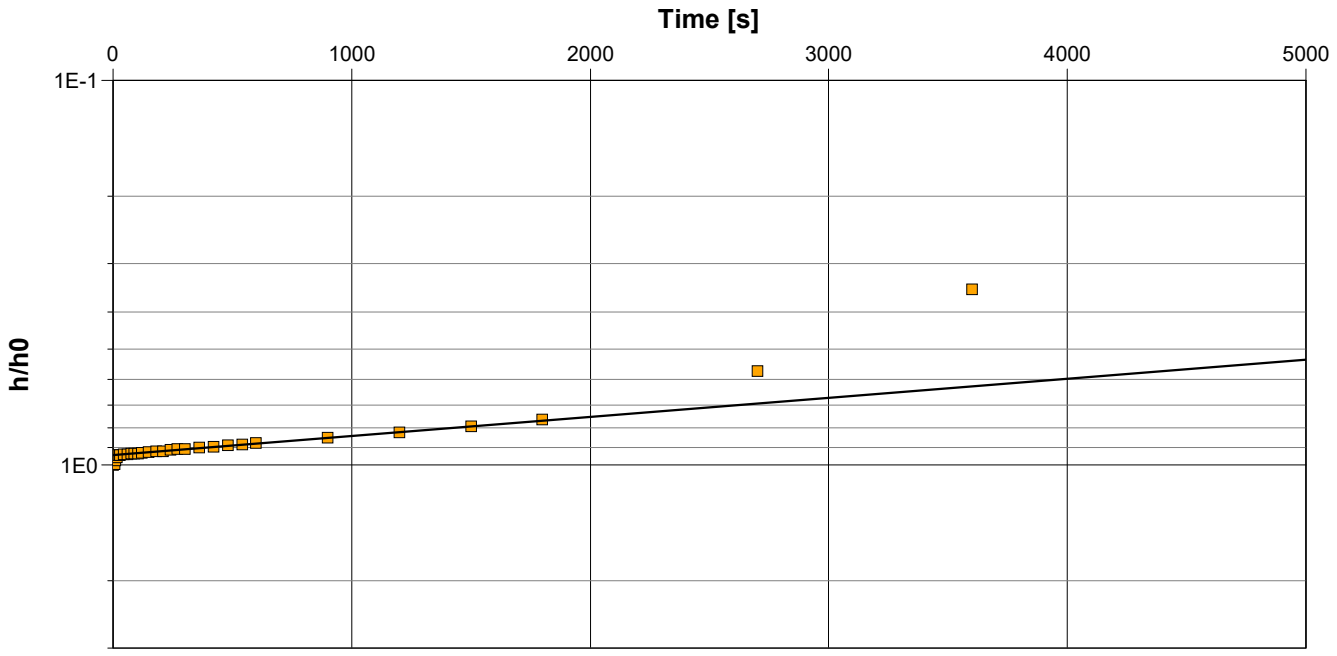
Slug Test Analysis Report

Project: Britannia Road and Bronte Street

Number: 20-294

Client: Trinity Point

Location: Milton, Ontario	Slug Test: RHT BH114	Test Well: BH114
Test Conducted by: KS		Test Date: 2021-01-12
Analysis Performed by: MG	RHT BH114	Analysis Date: 2021-02-18
Aquifer Thickness: 12.20 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH114	4.37×10^{-8}	

APPENDIX J

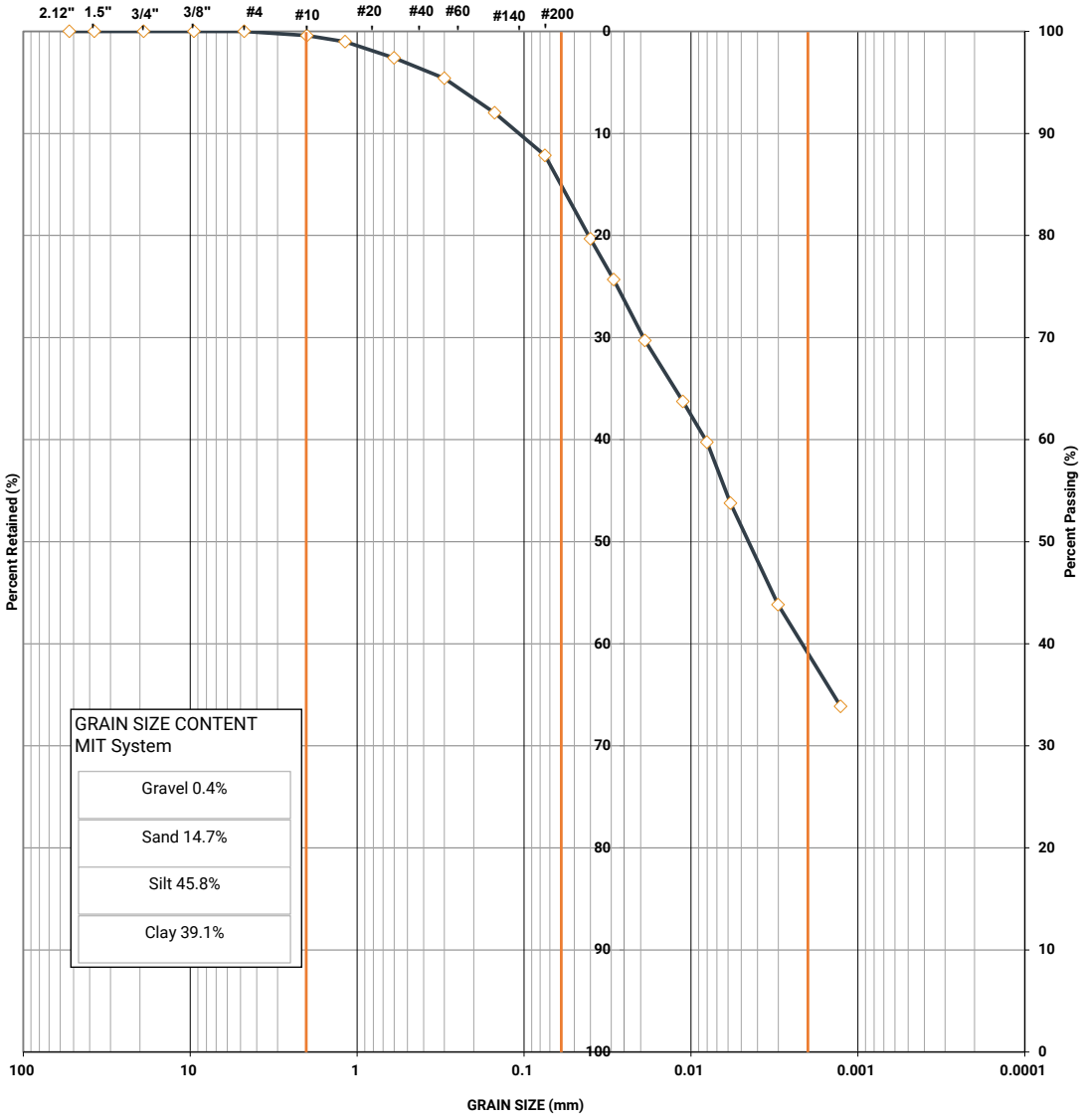
SIEVE AND HYDROMETER ANALYSIS

PROJECT: **Britannia Road and Bronte St S**
LOCATION: **Milton, Ontario**
CLIENT: **Trinity Point**
Borehole : **GP1**
Sample : **GP1**
Sample Depth : **0.3m**
SAMPLE DESCRIPTION: **Silt and clay, some sand**

FILE NO.: **20-294**
LAB NO.: **0**
SAMPLE DATE: **2020-12-10**
SAMPLED BY: **MG**

GRAIN SIZE DISTRIBUTION

U.S. STANDARD SIEVE SIZES



MIT SYSTEM	GRAVEL	COARSE	MEDIUM	FINE	SILT	CLAY
		SAND				

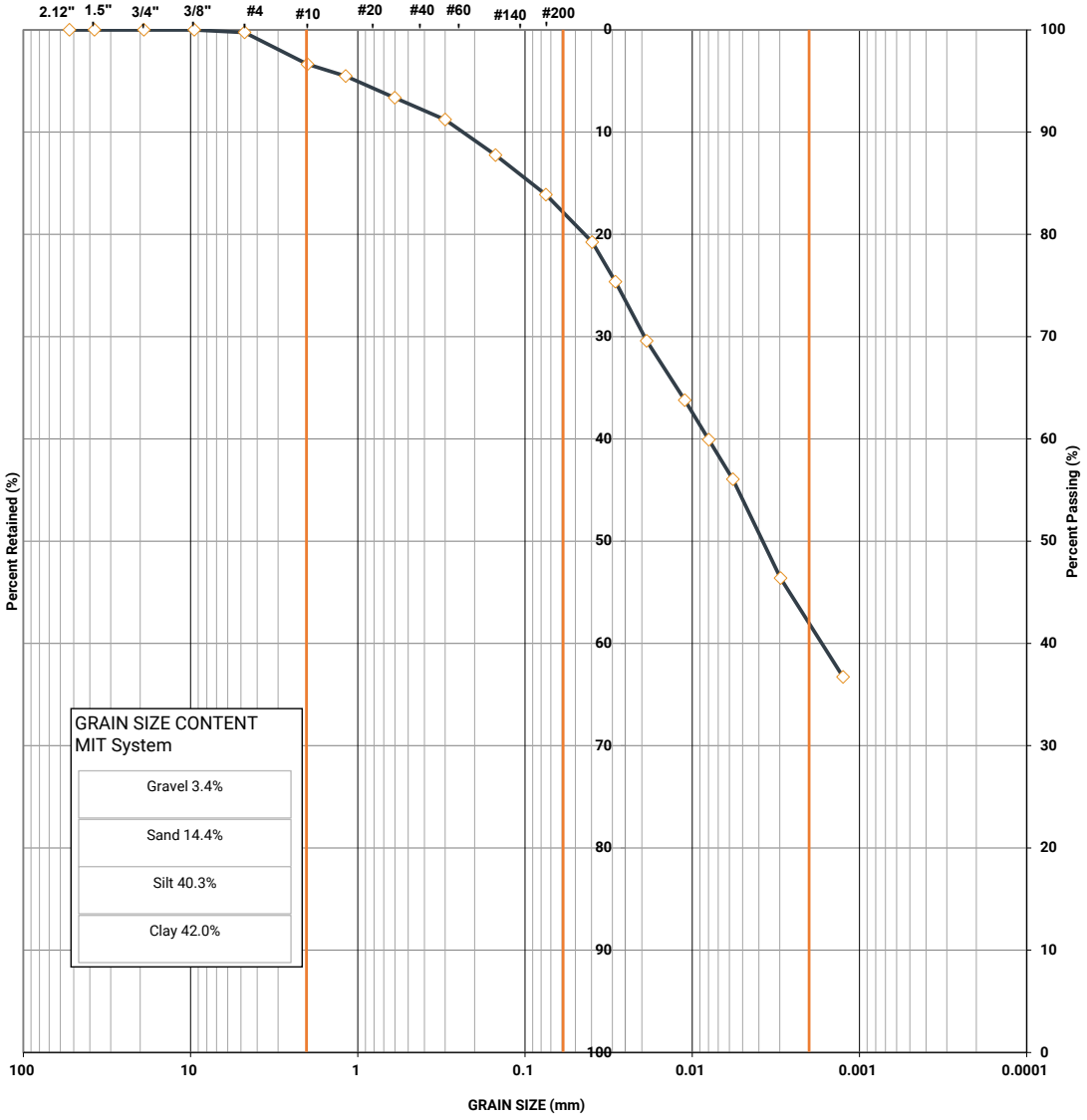
SIEVE AND HYDROMETER ANALYSIS

PROJECT: **Britannia Road and Bronte St S**
LOCATION: **Milton, Ontario**
CLIENT: **Trinity Point**
Borehole : **GP2**
Sample : **GP2**
Sample Depth : **0.35m**
SAMPLE DESCRIPTION: **Silt and clay, some sand**

FILE NO.: **20-294**
LAB NO.: **0**
SAMPLE DATE: **2020-12-10**
SAMPLED BY: **MG**

GRAIN SIZE DISTRIBUTION

U.S. STANDARD SIEVE SIZES



MIT SYSTEM	GRAVEL	SAND			SILT	CLAY
		COARSE	MEDIUM	FINE		

TEST GP1A

SOILMOISTURE® **Guelph Permeameter**

Input

Result

Single Head Method (1)

Reservoir Cross-sectional area in cm²
(enter "35.22" for Combined and "2.16" for Inner reservoir): 2.16
Enter water Head Height ("H" in cm): 10
Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 2

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): 0.0170

Res Type 2.16
H 10
a 3
H/a 3.333
a* 0.04
C0.01 1.218
C0.04 1.29
C0.12 1.288
C0.36 1.288
C 1.29
R 0.017
Q 6E-04
pi 3.142

α*= 0.04 cm⁻¹

C = 1.290234
Q = 0.000612

K_{fs} = 3.53E-07 cm/sec
2.12E-05 cm/min
3.53E-09 m/sec
8.34E-06 inch/min
1.39E-07 inch/sec

Φ_m = 8.83E-06 cm²/min

Single Head Method (2)

Reservoir Cross-sectional area in cm²
(enter "35.22" for Combined and "2.16" for Inner reservoir): 2.16
Enter water Head Height ("H" in cm): 10
Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 2

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): 0.0170

Res Type 2.16
H 10
a 3
H/a 3.33333
a* 0.04
C0.01 1.21841
C0.04 1.29023
C0.12 1.28754
C0.36 1.28754
C 1.29023
R 0.017
Q 0.00061
pi 3.1415

α*= 0.04 cm⁻¹

C = 1.290234
Q = 0.000612

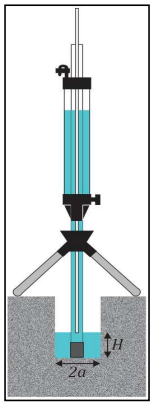
K_{fs} = 3.53E-07 cm/sec
2.12E-05 cm/min
3.53E-09 m/ses
8.34E-06 inch/min
1.39E-07 inch/sec

Φ_m = 8.83E-06 cm²/min

Average

K_{fs} = 3.53E-07 cm/sec
2.12E-05 cm/min
3.53E-09 m/s
8.34E-06 inch/min
1.39E-07 inch/sec

Φ_m = 8.83E-06 cm²/min



Double Head Method

Reservoir Cross-sectional area in cm²
(enter "35.22" for Combined and "2.16" for Inner reservoir):

Enter the first water Head Height ("H1" in cm):
Enter the second water Head Height ("H2" in cm):

Enter the Borehole Radius ("a" in cm):

Enter the soil texture-structure category (enter one of the below numbers):

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

α*= 0 cm⁻¹

α= #DIV/0!

Steady State Rate of Water Level Change ("R1" in cm/min): 4.6000
Steady State Rate of Water Level Change ("R2" in cm/min): 13.2000

Q_1 = 0

Q_2 = 0

Res Type: 0
H1/a: #DIV/0!
H2/a: #DIV/0!
C1-0.01: #DIV/0!
C1-0.04: #DIV/0!
C1-0.12: #DIV/0!
C1-0.36: #DIV/0!
C2-0.01: #DIV/0!
C2-0.04: #DIV/0!
C2-0.12: #DIV/0!
C2-0.36: #DIV/0!
G-Denominator: 0

C_1 = 0

C_2 = 0

G_1 = #DIV/0!

G_2 = #DIV/0!

G_3 = #DIV/0!

G_4 = #DIV/0!

K_{fs} = #DIV/0! cm/sec
#DIV/0! cm/min
#DIV/0! m/sec
#DIV/0! inch/min
#DIV/0! inch/sec

Φ_m = #DIV/0! cm²/min

Θ_{fs} = 0.65 cm³/cm³

Θ_i = 0.4 cm³/cm³

Sorptivity #DIV/0! (cm min^-½)

Calculation formulas related to shape factor (C). Where H_1 is the first water head height (cm), H_2 is the second water head height (cm), a is borehole radius (cm) and α^* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C_1 needs to be calculated while for two-head method, C_1 and C_2 are calculated (Zang et al., 1998).

Soil Texture-Structure Category	α^*(cm^{-1})	Shape Factor
Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01	$C_1 = \left(\frac{H_2/a}{2.081 + 0.121\left(H_2/a\right)}\right)^{0.672}$
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04	$C_1 = \left(\frac{H_1/a}{1.992 + 0.091\left(H_1/a\right)}\right)^{0.683}$ $C_2 = \left(\frac{H_2/a}{1.992 + 0.091\left(H_2/a\right)}\right)^{0.683}$
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$
Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macro pores, etc.	0.36	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$

Calculation formulas related to one-head and two-head methods. Where R is steady-state rate of fall of water in reservoir (cm/s), K_{fs} is Soil saturated hydraulic conductivity (cm/s), Φ_m is Soil matric flux potential (cm²/s), α^* is Macroscopic capillary length parameter (from Table 2), a is Borehole radius (cm), H_1 is the first head of water established in borehole (cm) , H_2 is the second head of water established in borehole (cm) and C is Shape factor (from Table 2).

One Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$	$K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{\alpha^*}\right)}$ $\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \pi a^2 C_1)\alpha^* + 2\pi H_1}$
One Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$	
Two Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$ $Q_2 = \bar{R}_2 \times 35.22$	$G_1 = \frac{H_2 C_1}{\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $G_2 = \frac{H_1 C_2}{\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $K_{fs} = G_2Q_2 - G_1Q_1$ $G_3 = \frac{(2H_2^2 + a^2C_2)C_1}{2\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$
Two Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$ $Q_2 = \bar{R}_2 \times 2.16$	$G_4 = \frac{(2H_1^2 + a^2C_1)C_2}{2\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $\Phi_m = G_3Q_1 - G_4Q_2$

TEST GP2A

SOILMOISTURE® **Guelph Permeameter**

Input

Result

Single Head Method (1)

Reservoir Cross-sectional area in cm^2

(enter "35.22" for Combined and "2.16" for Inner reservoir): 2.16

Enter water Head Height ("H" in cm): 10

Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 2

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): 0.0200

Res Type	2.16
H	10
a	3
H/a	3.333
a*	0.04
C0.01	1.218
C0.04	1.29
C0.12	1.288
C0.36	1.288
C	1.29
R	0.020
Q	7E-04
pi	3.142

α^*= 0.04 cm^{-1}

C = 1.290234

Q = 0.00072

K_{fs} = 4.16E-07 cm/sec
2.49E-05 cm/min
4.16E-09 m/sec
9.82E-06 inch/min
1.64E-07 inch/sec

Φ_m = 1.04E-05 cm^2/min

Single Head Method (2)

Reservoir Cross-sectional area in cm^2

(enter "35.22" for Combined and "2.16" for Inner reservoir): 2.16

Enter water Head Height ("H" in cm): 20

Enter the Borehole Radius ("a" in cm): 3

Enter the soil texture-structure category (enter one of the below numbers): 2

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

Steady State Rate of Water Level Change ("R" in cm/min): 0.0200

Res Type	2.16
H	20
a	3
H/a	6.66667
a*	0.04
C0.01	1.7546
C0.04	1.90307
C0.12	1.98019
C0.36	1.98019
C	1.90307
R	0.020
Q	0.00072
pi	3.1415

α^*= 0.04 cm^{-1}

C = 1.903071

Q = 0.00072

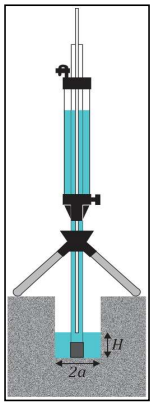
K_{fs} = 2.40E-07 cm/sec
1.44E-05 cm/min
2.40E-09 m/ses
5.67E-06 inch/min
9.45E-08 inch/sec

Φ_m = 6.00E-06 cm^2/min

Average

K_{fs} = 3.28E-07 cm/sec
1.97E-05 cm/min
3.28E-09 m/s
7.74E-06 inch/min
1.29E-07 inch/sec

Φ_m = 8.19E-06 cm^2/min



Double Head Method

Reservoir Cross-sectional area in cm^2

(enter "35.22" for Combined and "2.16" for Inner reservoir):

Enter the first water Head Height ("H1" in cm):

Enter the second water Head Height ("H2" in cm):

Enter the Borehole Radius ("a" in cm):

Enter the soil texture-structure category (enter one of the below numbers):

1. Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropors, etc

α^*= 0 cm^{-1}

α= #DIV/0!

Steady State Rate of Water Level Change ("R1" in cm/min): 4.6000

Steady State Rate of Water Level Change ("R2" in cm/min): 13.2000

Q_1 = 0

Q_2 = 0

Res Type:	0
H1/a:	#DIV/0!
H2/a:	#DIV/0!
C1-0.01:	#DIV/0!
C2-0.01:	#DIV/0!
C1-0.04:	#DIV/0!
C2-0.04:	#DIV/0!
C1-0.12:	#DIV/0!
C2-0.12:	#DIV/0!
C1-0.36:	#DIV/0!
C2-0.36:	#DIV/0!
G-Denominator:	0

C_1 = 0

C_2 = 0

G_1 = #DIV/0!

G_2 = #DIV/0!

G_3 = #DIV/0!

G_4 = #DIV/0!

K_{fs} = #DIV/0! cm/sec
#DIV/0! cm/min
#DIV/0! m/sec
#DIV/0! inch/min
#DIV/0! inch/sec

Φ_m = #DIV/0! cm^2/min

Θ_{fs} = 0.65 cm^3/cm^3

Θ_i = 0.4 cm^3/cm^3

Sorptivity #DIV/0! $(cm\ min^{-\frac{1}{2}})$

Calculation formulas related to shape factor (C). Where H_1 is the first water head height (cm), H_2 is the second water head height (cm), a is borehole radius (cm) and α^* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C_1 needs to be calculated while for two-head method, C_1 and C_2 are calculated (Zang et al., 1998).

Soil Texture-Structure Category	$\alpha^*(cm^{-1})$	Shape Factor
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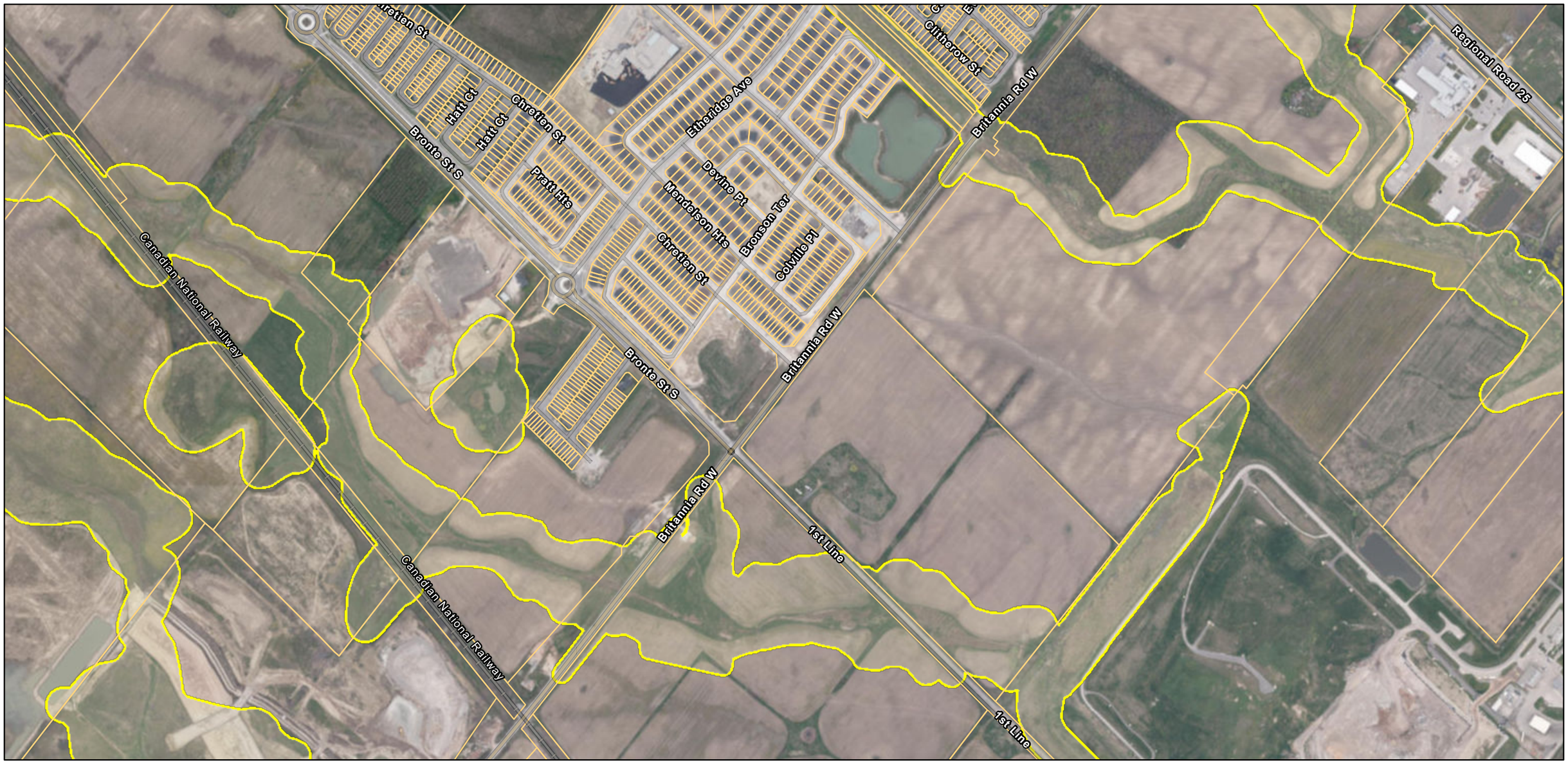
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04	$C_1 = \left(\frac{H_1/a}{1.992 + 0.091\left(H_1/a\right)}\right)^{0.683}$ $C_2 = \left(\frac{H_2/a}{1.992 + 0.091\left(H_2/a\right)}\right)^{0.683}$
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$
Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macro pores, etc.	0.36	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093\left(H_1/a\right)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093\left(H_2/a\right)}\right)^{0.754}$

Calculation formulas related to one-head and two-head methods. Where R is steady-state rate of fall of water in reservoir (cm/s), K_{fs} is Soil saturated hydraulic conductivity (cm/s), Φ_m is Soil matric flux potential (cm^2/s), α^* is Macroscopic capillary length parameter (from Table 2), a is Borehole radius (cm), H_1 is the first head of water established in borehole (cm) , H_2 is the second head of water established in borehole (cm) and C is Shape factor (from Table 2).

One Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$	$K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{\alpha^*}\right)}$ $\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \pi a^2 C_1)\alpha^* + 2\pi H_1}$
One Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$	
Two Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$ $Q_2 = \bar{R}_2 \times 35.22$	$G_1 = \frac{H_2 C_1}{\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $G_2 = \frac{H_1 C_2}{\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $K_{fs} = G_2Q_2 - G_1Q_1$ $G_3 = \frac{(2H_2^2 + a^2C_2)C_1}{2\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $G_4 = \frac{(2H_1^2 + a^2C_1)C_2}{2\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $\Phi_m = G_3Q_1 - G_4Q_2$
Two Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$ $Q_2 = \bar{R}_2 \times 2.16$	

APPENDIX K

Conservation Halton Regulations Mapping



3/8/2021, 3:30:46 PM

- Parcels
- Approximate Regulation Limit
- Spill Arrows
- Spill Lines
- Conservation Halton

1:9,028

0 0.07 0.15 0.3 mi

0 0.13 0.25 0.5 km

CH GIS, Conservation Halton, 2020, Esri Community Maps Contributors, City of Burlington, Province of Ontario, Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada, Conservation

APPENDIX L

Water Balance - Shearling Heights

1. Climate Information

Precipitation	937	mm/a	0.94	m/a *
Evapotranspiration	637	mm/a	0.64	m/a *
Water Surplus	300	mm/a	0.30	m/a

2. Infiltration Rates

Selected Approach **Table 3**

Table 2 Approach - Infiltration Factors

Topography - (Flat land, rolling land, hilly land)		*		
Soil - (Tight impervious clay, etc...)		*		
Cover - (Cultivated lands, woodland)		*		
TOTAL:	0			
Infiltration (Infiltration Factor x Water Surplus)	0	mm/a	0	m/a
Run-off (Water Surplus - Infiltration)	300	mm/a	0.3	m/a

Table 3 Approach - Typical Recharge Rates

coarse sand and gravel	250+	mm/a	*
fine to medium sand	200 - 250	mm/a	*
silty sand to sandy silt	150 - 200	mm/a	*
silt	125 - 150	mm/a	*
clayey silt	100 - 125	mm/a	*
clay	< 100	mm/a	*

The site development area is underlain by clayey silt till.

Based on the above, the recharge rate is	100	mm/a	0.100	m/a
with runoff of	200	mm/a	0.200	m/a

3. Property Statistics - Pre-development

Area Covered by Existing Building	0	m^2	0.00	ha
Area Covered by Existing Hard Surface Paving	0	m^2	0.00	ha
Area Covered by Existing Landscaped area	21,233	m^2	2.12	ha
TOTAL	21,233	m^2	2.12	ha

4. Property Statistics - Post-development

Area Covered by Building with Additions	11,520	m^2	1.15	ha
Area Covered by Hard Surface Paving	8,383	m^2	0.84	ha
Area Covered by Landscaped Area	1,330	m^2	0.13	ha
TOTAL:	21,233	m^2	2.12	ha

*Based on published information

Water Balance - Shearling Heights

5. Annual Water Balance Before Building Additions

Land Use	Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Evaporation (m^3)	Infiltration (m^3)	Run-Off (m^3)
Building (entire site)	0	0	-	-	-	0
Hard Surface Paving	0	0	-	-	-	0
Landscape Area (entire site)	21,233	19,895	13,525	-	2,123	4,247
TOTAL	**21,233**	**19,895**	**13,525**	**0**	**2,123**	**4,247**

6. Annual Water Balance After Building Additions

Land Use	Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Evaporation (m^3)	Infiltration (m^3)	Run-Off (m^3)
Building (entire site)	11,520	10,795	-	-	-	10,795
Hard Surface Paving	8,383	7,854	-	-	-	7,854
Landscape Area (entire site)	1,330	1,246	847	-	133	266
TOTAL	**21,233**	**19,895**	**847**	**0**	**133**	**18,915**

7. Comparison of Pre-Development (before buidling additions) and Post-Development (after building additions)

	Precipitation (m^3)	Evapotranspiration (m^3)	Evaporation (m^3)	Infiltration (m^3)	Run-Off (m^3)
Pre-Development	19,895	13,525	-	2,123	4,247
Post-Development	19,895	847	-	133	18,915

8. Requirement for Infiltration of Roof Runoff

Volume of roof (building additions) run-off captured (90%)	9,715	m^3
Volume of post-development infiltration without roof run-off	133	m^3
Volume of roof run-off required to match pre-development infiltration rates	1,990	m^3
Percentage of roof run-off (building additions roof) required to match pre-development infiltration	20%	

APPENDIX M

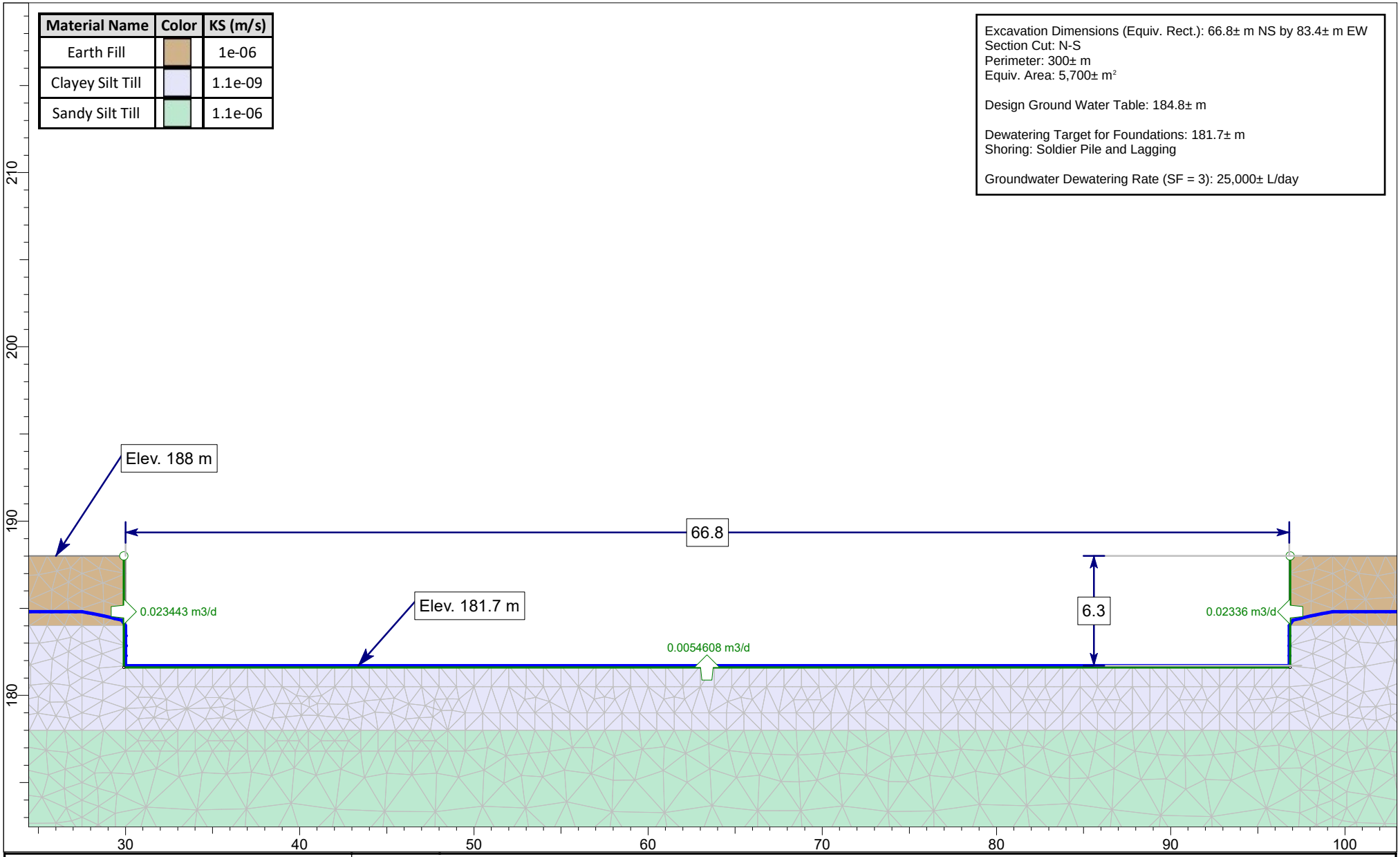
Material Name	Color	KS (m/s)
Earth Fill		1e-06
Clayey Silt Till		1.1e-09
Sandy Silt Till		1.1e-06

Excavation Dimensions (Equiv. Rect.): 66.8± m NS by 83.4± m EW
Section Cut: N-S
Perimeter: 300± m
Equiv. Area: 5,700± m²

Design Ground Water Table: 184.8± m

Dewatering Target for Foundations: 181.7± m
Shoring: Soldier Pile and Lagging

Groundwater Dewatering Rate (SF = 3): 25,000± L/day



GROUNDED ENGINEERING

File	20-294 | Shearling Heights (Britannia Rd & Bronte St), Milton, ON
Analysis	Dewatering: P1, Permeable Shoring - Short-Term (No active DW)
Ref.	
RS2 File	20-294 FEM - AK.slmd
Scale	1:300
Eng	MG

SLIDEINTERPRET 9.040

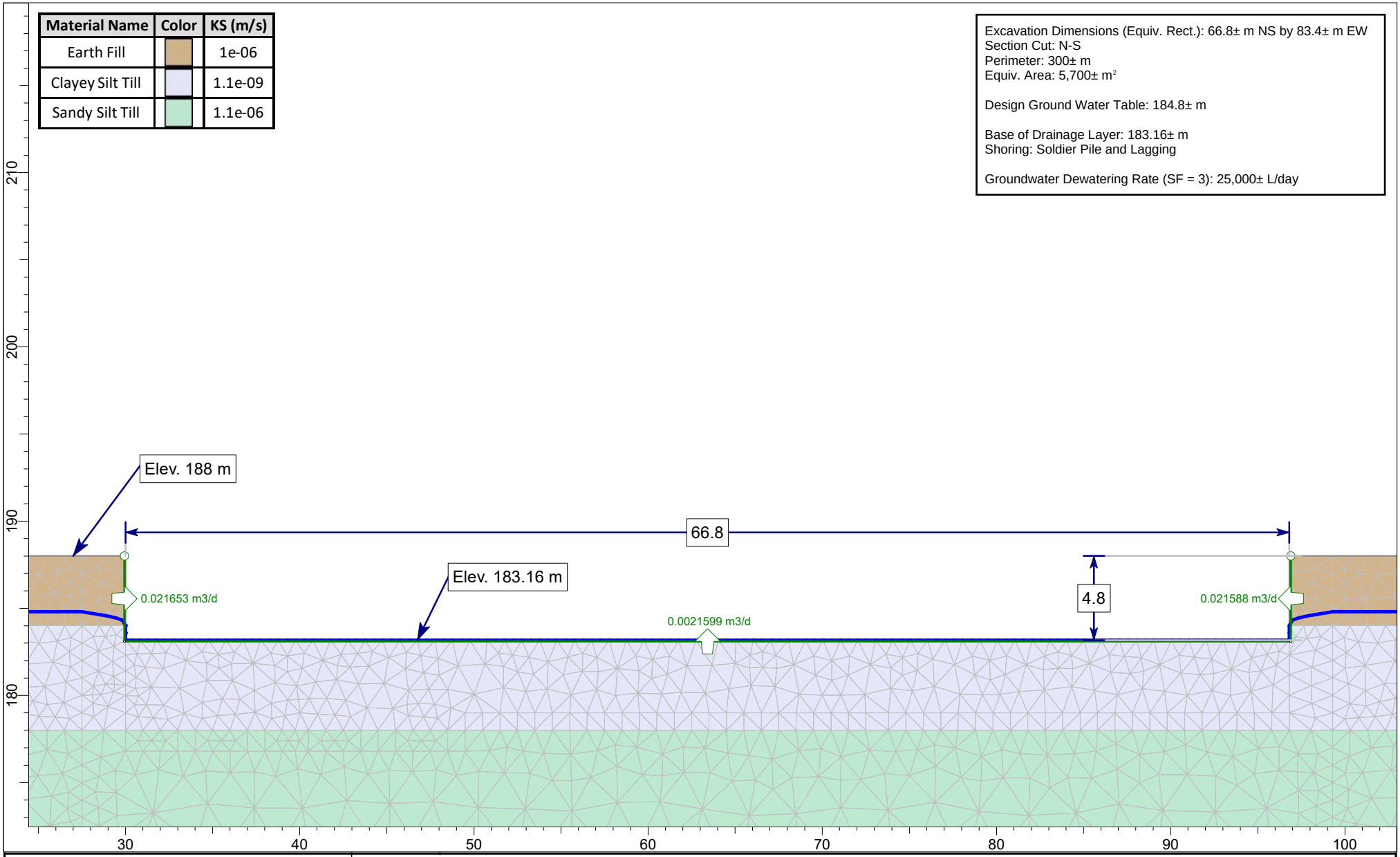
Material Name	Color	KS (m/s)
Earth Fill		1e-06
Clayey Silt Till		1.1e-09
Sandy Silt Till		1.1e-06

Excavation Dimensions (Equiv. Rect.): 66.8± m NS by 83.4± m EW
Section Cut: N-S
Perimeter: 300± m
Equiv. Area: 5,700± m²

Design Ground Water Table: 184.8± m

Base of Drainage Layer: 183.16± m
Shoring: Soldier Pile and Lagging

Groundwater Dewatering Rate (SF = 3): 25,000± L/day



GROUNDED ENGINEERING

File	20-294 | Shearling Heights (Britannia Rd & Bronte St), Milton, ON
Analysis	Dewatering: P1, Permeable Shoring - Long-Term
Ref.	
RS2 File	20-294 FEM - AK.slmd
Scale	1:300
Eng	MG

SLIDEINTERPRET 9.040

SHORT TERM - PERMEABLE SHORING

P2 Excavation Dimensions [m]	
N-S	66.8
E-W	83.4
Area (m2)	5571
Perimeter (m)	300

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

Section		Flow [m3/day]	Length [m]	Volume [L/day]
Base		0.0054608	83.4	455
Sides		0.023443	300	7,042
Total				7,498
Factor of Safety	3.0			22,493

Storm Events	
2 Year [L/day]	100 Year [L/day]
284,663	1,071,000

Summary	L/day	L/min
Groundwater	25,000	17.4
Rainfall	285,000	197.9
Total	310,000	215.3

LONG TERM - PERMEABLE SHORING

P2 Excavation Dimensions [m]	
N-S	66.8
E-W	83.4
Area (m2)	5571
Perimeter (m)	300

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

Section		Flow [m3/day]	Length [m]	Volume [L/day]
Base		0.0021599	83.4	180
Sides		0.021653	300	6,496
Total				6,676
Factor of Safety	3.0			20,028

Infiltration [L/day]
6015

Summary	L/day	L/min
Groundwater	25,000	17.4
Infiltration	7,000	4.9
Total	32,000	22.2