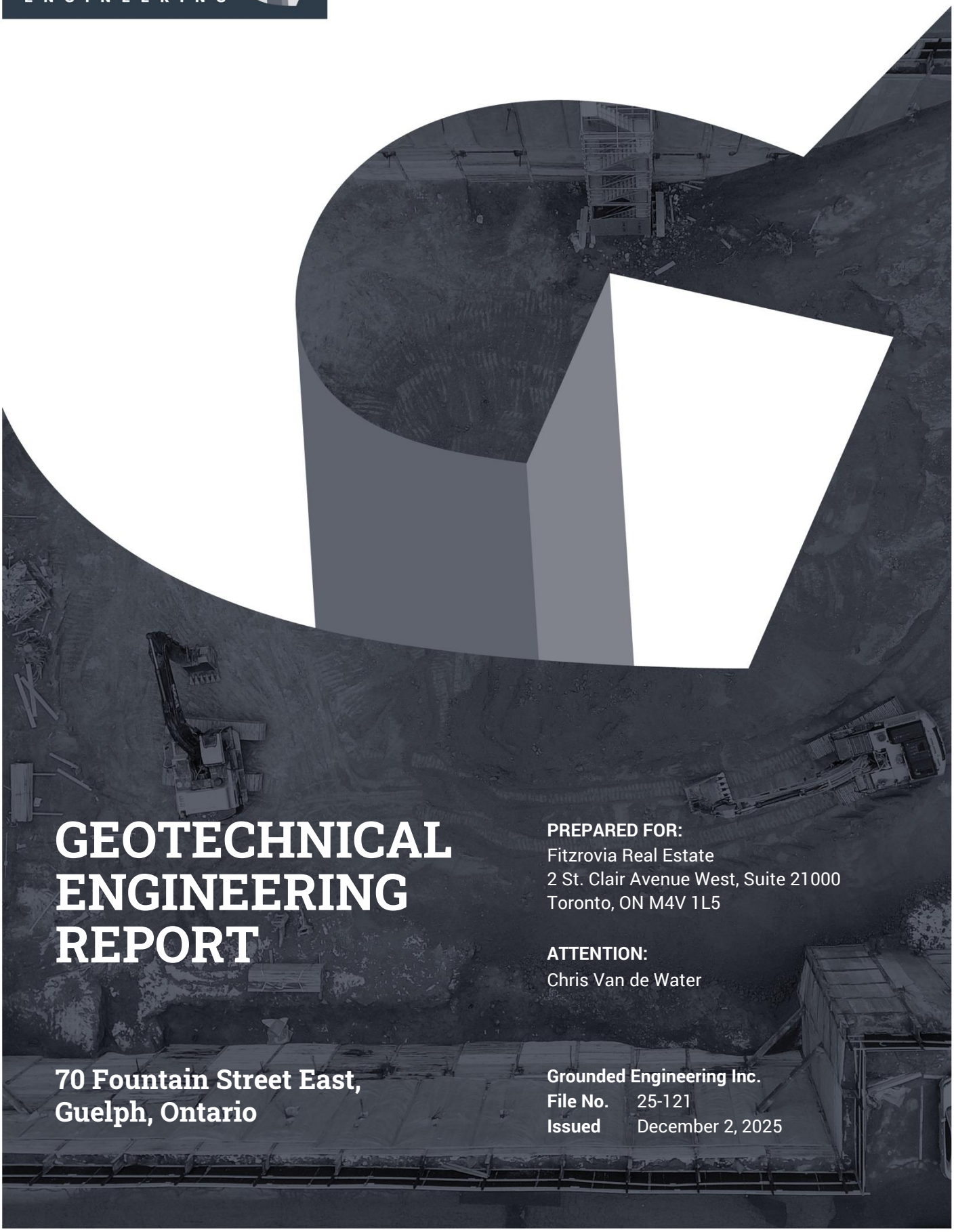

GEOTECHNICAL ENGINEERING REPORT

PREPARED FOR:
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ATTENTION:
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70 Fountain Street East, Guelph, Ontario

Grounded Engineering Inc.
File No. 25-121
Issued December 2, 2025

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TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

1 Introduction

Fitzrovia Real Estate has retained Grounded Engineering Inc. to provide geotechnical engineering design advice for their proposed development at 70 Fountain Street East (The site), in Guelph, Ontario.

The site is bound by Wyndham Street S to the south, Farquhar Street to the west, and Fountain Street E to the east. The existing grade at this site is at about Elev. 322.2± m along Farquhar Street, and slopes down from west to east along Wyndham Street to approximately Elev. 318.5± m along Fountain Street E. The site is currently occupied by a two-storey commercial building with one basement level constructed as a partial basement that walks out on to Fountain Street E. The current site conditions are shown on Figure 2.

A new 24± storey building is proposed for the site. Two options for underground parking was considered for this proposed structure: the first option being one level of underground parking set at a lowest finished floor elevation (FFE) of Elev. 316.2± m, and the second option being two levels of underground parking set at a lowest FFE of Elev. 313.2± m. Present architectural plans (referenced below) show a P2 underground structure, however; it has been communicated to Grounded by Fitzrovia that the P1 option has been chosen as the preferred underground design based on the findings of a feasibility study previously conducted by Grounded Engineering (File No. 25-121, dated September 30, 2025 – issued in Draft).

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

- Site survey, prepared by Van Harten Surveying Inc (August 9, 2019).
- Architectural Drawings, “70 Fountain Street East, Guelph, Ontario”; dated August 8, 2025 (Pre-Application Submission), prepared by Hariri Pontarini Architects Inc.
- Geotechnical Report, “Proposed 18 Storey High-rise Building 70 Fountain Street Guelph, Ontario”, File 161-B-0013813-1-GE-R-0001-00, dated December 15, 2015, prepared by Englobe Inc.
- Hydrogeology Assessment – Proposed Residential Development, “75 Farquhar Street and 70 Fountain Street East, Guelph, Ontario”, File 245320.001, dated July 17, 2023, prepared by Pinchin Inc.
- Phase Two Environmental Site Assessment, “75 Farquhar Street and 70 Fountain Street East, Guelph, Ontario”; Project 245320.003, dated August 19, 2022, prepared by Pinchin Inc.

Grounded has been provided with factual borehole information from other consultants as listed above. These borehole logs are provided in reports that are signed by professional

engineers/geoscientists. As such, this borehole information (appended) is taken as factual for present purposes. Unless noted, borehole labels appended with "ENG-" refer to Englobe's boreholes, and "PIN-" refer to Pinchin's boreholes.

Grounded's subsurface investigation of the site to date includes:

- Two (2) boreholes (Boreholes 301, and 302) which were advanced from July 30th to 31st, 2025 as part of the feasibility study
- Four (4) boreholes (Borehole 05B, 203B, 208B, and 302B) which were advanced on October 7th, 2025, as part of an environmental engineering scope. These boreholes are relatively shallow, and are not utilized for geotechnical engineering purposes, and have been excluded from this report.
- Ten (10) boreholes (Boreholes 401 to 410) which were advanced from October 6th to 10th, 2025 as part of the detailed design for geotechnical scope of work

Based on the borehole findings, geotechnical engineering advice for the proposed development is provided for foundations, seismic site designation, earth pressure design, slab on grade design, and basement drainage. Construction considerations including excavation, groundwater control, and geostructural engineering design advice are also provided.

Grounded Engineering must conduct the on-site evaluation of founding subgrade as foundation and slab construction proceeds. This is a vital and essential part of the geotechnical engineering function and must not be grouped together with other "third-party inspection services". Grounded will not accept responsibility for foundation performance if Grounded is not retained to carry out all the foundation evaluations during construction.

2 Ground Conditions

The borehole results are detailed on the attached borehole logs. Our assessment of the relevant stratigraphic units is intended to highlight the strata as they relate to geotechnical engineering. The ground conditions reported here will vary between and beyond the borehole locations.

The stratigraphic boundary lines shown on the borehole logs are assessed from non-continuous samples supplemented by drilling observations. These stratigraphic boundary lines represent transitions between soil types and should be regarded as approximate and gradual. They are not exact points of stratigraphic change.

Elevations are measured relative to geodetic datum as established by the Van Harten Surveying Inc survey. The horizontal coordinates are provided relative to the Universal Transverse Mercator (UTM) geographic coordinate system.

SPT N values were obtained using a 32 kg hammer falling 760 mm in Borehole 401 due to access constraints at the Borehole location. The results on the logs have been corrected to equivalent N values based on a 63.5 kg hammer falling 760 mm based on ASTMD1586.

2.1 Stratigraphy

The following stratigraphic summary is based on the results of the boreholes drilled at the site, as well as the associated geotechnical laboratory testing (by Grounded, Grounded's subcontractors, and as reported by others) on subsurface samples recovered from those boreholes. Our findings are generally consistent with those reported by the other consultants.

A subsurface profile showing stratigraphy and engineering units is appended and includes the relevant borehole and well information from the other consultants.

2.1.1 Surficial and Earth Fill

Surficial fill (pavements, aggregate, topsoil, etc.) thicknesses were observed in individual borehole locations through the top of the open borehole. Thicknesses may vary between and beyond each borehole location.

All boreholes drilled in the parking area (as shown in Figure 2) encountered an asphalt layer ranging in thickness between 60 to 150± mm at ground surface. Among these, Boreholes 301 and 302 also encountered a 75± mm thick aggregate layer underlying the asphalt layer. Boreholes 401, 402, 403, PIN-MW205, PINMW-206 and PIN-BH211 were drilled within the existing building footprint and encountered a 150 to 250± mm thick concrete slab at the borehole surface, overlying a 50 to 100± mm thick aggregate layer.

Boreholes PIN-MW01, PIN-BH02, PIN-MW03, and ENG-BH05-15 were drilled outside the property boundary on the site-adjacent sidewalk and within landscaped areas. PIN-MW01 encountered a 150± mm thick concrete slab at ground surface and PIN-BH02, PIN-MW03, and ENG-BH05-15 encountered 300 to 400± mm of topsoil at the ground surface.

Underlying the surficial materials, the boreholes observed a layer of earth fill that extends to depths of 0.3 to 4.4± m below grade (Elev. 321.5 to 316.3± m). The earth fill varies in composition but generally consists of sands and gravels, with some silts and clays. It contains trace amounts of topsoil, cinders, brick fragments, asphalt fragments and wood fragments. The earth fill is typically dark brown to black, and moist.

Standard Penetration Test (SPT) results (N-Values) measured in the fill range from 2 to 27 blows per 300 mm of penetration ("bpf"). Due to inconsistent placement and the inherent heterogeneity of earth fill materials, the relative density of the earth fill is variable.

2.1.2 Sands and Gravels

Underlying the fill materials, all the boreholes encountered an undisturbed native deposit consisting primarily of varying amounts of sands and gravels (sand with trace gravel, to sand and gravel), and with varying amounts of silt (trace to silty). These soils are grouped together as the "**sands and gravels**" unit. This unit was encountered at 0.2 to 2.7 m below grade (Elev. 321.5 to 316.3± m) and extends down to depths of 2.1 to 8.8± m below grade (Elev. 315.7 to 313.3± m).

The sands and gravels unit is generally light brown, to brownish grey, and moist. This unit contains occasional rock fragments, inferring the presence of cobbles. SPT N-values measured in the sands unit range from 4 to greater than 50 bpf (very loose to very dense).

2.1.3 Bedrock

Inferred bedrock was encountered in multiple Grounded boreholes and boreholes by previous consultants underlying the sand and gravel layer at depths of 2.1 to 9.1± m below grade (Elev. 315.7 to 312.4± m). Bedrock was confirmed by rock cores recovered in Boreholes 301, 302, 401, 402, 403 and 410 to depths of 7.7 to 13.4± m below grade (Elev. 310.3 and 308.4± m, respectively).

Grounded's boreholes 404 to 409 indirectly inferred the top of weathered bedrock through auger cuttings, split spoon samples, and auger grinding/resistance observations. Each of these boreholes was terminated due to auger and sampler refusal (at target investigation depth) at elevations ranging from Elev. 315.5 to 312.3± m.

Multiple boreholes by previous consultants also reported inferring top of bedrock surface using augur refusal and percussion hammer spoils. Since coring was not conducted in these boreholes, Grounded has conservatively estimated that the elevations of inferred bedrock in these boreholes are the top of weathered bedrock surface.

Detailed core logs are included with the corresponding borehole logs. Photographs of the recovered rock core and a guide of rock core terminology are appended. The rock core terminology sheet defines many of the descriptive terms used below.

The bedrock beneath the site is dolostone bedrock. This bedrock contains vuggs of various sizes and occasional fractures. Per the appended terminology, the dolostone bedrock is typically classified as "strong".

Joints occurring within the shale are closely to very closely spaced, and typically weathered with a veneer to coating of clay. Widely-spaced subvertical joints (closed, planar, clean) were also observed within the shale.

Directly below the overburden soils, the uppermost portion of this bedrock formation is often weathered in the form of fractured rock pieces. The International Society for Rock Mechanics[1] (ISRM) provides descriptions for different grades of rock weathering as follows:

Term	Weathering Grade	Description
Completely Weathered	V	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.
Highly Weathered	IV	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Moderately Weathered	III	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a continuous framework or as corestones.
Slightly Weathered	II	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than in its fresh condition.
Fresh (Sound)	I	No visible sign of rock material weathering; perhaps slight discolouration only

The bedrock surface as indicated on the Borehole Logs from this investigation is intended to be consistently interpreted as the surface of Grade II unless noted otherwise (e.g. Boreholes 301, 302, 403 and 410). Weathered and sound bedrock elevations are summarized as follows:

Borehole	Ground Surface Elevation (m)	Partially Weathered (Grade II) Bedrock		Sound (Grade I) Bedrock	
		Depth (m)	Elevation (m)	Depth (m)	Elevation (m)
301	321.2	-	-	6.8	314.4
302	322.1	-	-	8.8	313.3
401	318.0	3.0	315.0	3.3	314.7
402	318.0	3.1	314.9	3.5	314.5
403	318.0	-	-	3.3	314.7
404	321.6	7.6*	314.0*	n/a	n/a
405	321.8	6.1*	315.7*	n/a	n/a
406	321.6	6.8*	314.8*	n/a	n/a
407	320.7	7.6*	313.1*	n/a	n/a
408	321.5	9.1*	312.4*	n/a	n/a
409	322.3	8.2*	314.1*	n/a	n/a
410	321.3	8.9	313.7	8.9	312.4

[1] International Society for Rock Mechanics (ISRM), 1981b. "Rock Characterization, Testing and Monitoring; ISRM Suggested Method", Pergamon Press, Oxford, UK.

Borehole	Ground Surface Elevation (m)	Partially Weathered (Grade II) Bedrock		Sound (Grade I) Bedrock	
		Depth (m)	Elevation (m)	Depth (m)	Elevation (m)
ENG-BH01-15	321.3	7.0**	314.3**	n/a	n/a
ENG-BH05-15	317.9	2.9**	315.0**	n/a	n/a
PIN-MW01	317.9	2.4**	315.5**	n/a	n/a
PIN-MW03	318.0	3.0**	315.0**	n/a	n/a
PIN-MW201	321.6	6.9**	314.7**	n/a	n/a
PIN-MW203D	321.2	7.2**	314.0**	n/a	n/a
PIN-MW-204	321.9	7.2**	314.1**	n/a	n/a
PIN-MW-205	317.4	6.2**	315.7**	n/a	n/a
PIN-MW-206	318.0	2.1**	315.3**	n/a	n/a

*Top of weathered bedrock inferred by Grounded through auger refusal
**Top of bedrock as reported by previous consultants, inferred as top of weathered bedrock by Grounded
n/a: Coring not conducted. Hence, depth and elevation of sound bedrock cannot be reported.

It should be noted that the elevation of the top of bedrock surface varies (Elev. 312.4± m to Elev. 315.7± m) across the site as shown in the above table and in Figures 2 and 3.

Rock Quality Designation (RQD) is an index measurement that refers to the total length of pieces of sound core in a core run that are at least 100 mm in length, expressed as a percentage of the total length of that core run. Only natural discontinuities are used in assessing RQD. The RQD of the recovered rock cores was typically 0 to 56% in the weathered bedrock, and between 30% and 100% in the sound bedrock.

Rock core samples were submitted for testing of unconfined compressive strength (ASTM D7012) and elastic moduli in uniaxial compression (ASTM D7012). The detailed rock laboratory testing results are appended. The test results are summarized as follows:

Borehole ID	Core ID	Depth (m)	Elevation (masl)	Bulk Density (kg/m^3)	UCS (MPa)	Young's Modulus, E (GPa)	Lithology
BH301	CS1	11.3 - 11.5	309.9 - 309.7	2,677	64.3	58.3	Dolostone
BH302	CS2	12.5 - 12.7	309.6 - 309.4	2,495	53.8	38.8	Dolostone
BH401	CS1	3.9 - 4.1	314.1 – 314.0	2,505	36.1	18.6	Dolostone

Borehole ID	Core ID	Depth (m)	Elevation (masl)	Bulk Density (kg/m^3)	UCS (MPa)	Young's Modulus, E (GPa)	Lithology
BH410	CS2	9 - 9.3	312.3 – 312.0	2,497	48.0	26.6	Dolostone
BH403	CS3	3.5 - 3.7	314.5 - 314.3	2,529	31.0	18.4	Dolostone

2.2 Groundwater

Monitoring wells were installed in select boreholes, and stabilized groundwater levels were measured in each of the installed monitoring wells.

A detailed table of monitoring well observation data is appended (Table 1).

There is groundwater in the sands and gravel deposit as well as the underlying bedrock.

Groundwater elevations were reported at Elev. 321± in monitoring wells PIN-203S and PIN-204 between May 2022 to July 2022. The groundwater levels reported within this time period in these wells have fluctuated between Elev. 321± and Elev. 316± m within a span of a few days. Given the significant fluctuation over a short time period, the data may not be reliable.

The groundwater table for design purposes should be taken as Elev. 318.0± m in the northwest portion of the site (where the existing grade is higher), and at Elev. 317.0± in the southeast portion of the site based on seasonal high groundwater levels from May to July 2022, reported by previous consultants. Based on the historical data, there appears to be seasonal variation in the water table of approximately 3 to 6± m. Continuous groundwater level monitoring is currently underway to confirm the seasonal groundwater conditions.

The overburden soils as well as the underlying bedrock both have a relatively high permeability and will yield free-flowing water when penetrated below the groundwater table.

The groundwater flow is interpreted to flow from northwest to southeast across the site.

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

Grounded has prepared a hydrogeological report for this site (File No. 25-121) under separate cover.

2.3 Corrosivity and Sulphate Attack

Three (3) soil samples were submitted for corrosivity testing parameters (pH, Resistivity, Electrical Conductivity, Redox Potential, Sulphate, Sulphide and Chloride). The Certificate of Analyses and interpretation sheet is appended.

The soil samples were analysed for soluble sulphate concentration and compared to the Canadian Standard CAN3/CSA A23.1-M94 Table 3, *Additional Requirements for Concrete Subjected to Sulphate Attack*. Corrosivity parameters are also used for assessing soil corrosivity applicable to cast iron alloys, according to the 10-point soil evaluation procedure described in the American Water Work Association (AWWA) C-105-18 standard[2].

The analytical results only provide an indication of the potential for corrosion. The results of this analysis are in reference to only the soil samples collected from specific locations, and soil chemistry may vary between and beyond the locations of the analysed samples. In summary:

- All of the samples have negligible sulphate concentrations.
- **Two** of the three samples scored more than 10 points in the AWWA C-105 evaluation. Corrosion protective measures are **recommended** for cast iron alloys.

3 Geotechnical Engineering Recommendations

Based on the factual data summarized above, we are providing the following geotechnical engineering design recommendations. Contractors must review the factual data while bidding or scoping services for this project and must provide their own opinion as to means, methods, and schedule.

This report assumes that the design features relevant to the geotechnical analyses will be in accordance with applicable codes, standards, and guidelines of practice. If there are any changes to the site development features, or there is any additional information relevant to the interpretations made of the subsurface information with respect to the geotechnical analyses or other recommendations, then Grounded should be retained to review the implications of these changes with respect to the contents of this report.

3.1 Foundation Design Parameters

A new 24± storey building is proposed for the site. It is presently proposed to construct one level of underground parking (P1) set at a lowest finished floor elevation (FFE) of Elev. 316.2± m.

[2] ANSI/AWWA C105/A21.5-18, Appendix A

The key considerations with respect to geotechnical engineering for the proposed development are as follows:

- The elevation of the top of bedrock varies at the site between about Elev. 315.7± and Elev. 312.4± m. The bedrock is generally higher in the south and lower in the north portions of the site.
- Above the bedrock is a deposit of wet sand and gravel (likely including cobbles and boulders, and bedrock inclusions) that is highly permeable and will yield free-flowing groundwater when penetrated below the groundwater table

Based on the above site-specific considerations, the following foundation options have been considered in our analysis.

- Conventional footings bearing on sound bedrock; either made as spread footings or drilled piles.
- Conventional spread footings bearing on a structural fill pad comprised of lean-mix concrete; where, at a minimum, the footprint of the proposed building structure is excavated to the top of bedrock and the lean mix concrete has been placed as a structural fill pad directly on the bedrock surface, up to the underside of foundation elevation.

3.1.1 General Foundation Recommendations

Grounded should be retained by the Owner to review the structural engineering drawings prior to issue or construction, to ensure that the recommendations in this report have been appropriately implemented.

It will be necessary to positively dewater the site to a minimum 1.2 m below the lowest excavation elevation prior to excavation to preserve the in situ integrity of the native soils. If the subsurface is not dewatered prior to excavation, the native soils will become disturbed by the ingress of groundwater and the recommendations for bearing capacity below will not be valid.

In the rock, there must be a minimum of 300 mm between the edge of any footing and the top of a sloped 2V:1H sound rock cut down to another footing. This requirement exists to avoid undermining adjacent footings.

When exposed to ambient environmental temperatures in Guelph, the design earth cover for frost protection of foundations and grade beams is 1.2 metres.

The founding subgrade must be cleaned of all unacceptable materials and approved by Grounded prior to pouring concrete for the footings. Such unacceptable materials may include disturbed or caved soils, ponded water, or similar as indicated by Grounded during founding

subgrade inspection. During the winter, adequate temporary frost protection for the footing bases and concrete must be provided if construction proceeds during freezing weather conditions.

The SLS capacity is estimated using conventional assumptions on footing uniformity and spacing, and is applicable for a first round of foundation design. In reality, a detailed spread footing plan includes many different footing sizes, spacings, and depths. Footings will influence each other if they are spaced closer than 1 footing width apart, which is almost always needed in structural foundation design. As such, the initial SLS capacity is conservative as it anticipates these complexities.

3.1.2 Spread Footings Bearing on Sound Bedrock

Conventional spread footing foundations are typically be designed at minimum depths of about 1± m below the proposed lowest FFE. This indicates an estimated underside of foundation elevation of about 315.0± m. Based on the boreholes drilled at the site by Grounded and as reported by other consultants, the elevation of the top of bedrock varies at the site between about Elev. 315.7± and 313.3± m, and is generally higher in the south portion of the site and lower in the north portion of the site. Therefore, bedrock will be encountered at or above the expected foundation bearing elevation in some of the southern areas of the site. Since some of the foundations supporting the proposed building structure will bear on bedrock, then it is recommended that all foundations extend to bear on bedrock to minimize the risk of adverse differential settlement.

Where the bedrock surface is encountered at depths less than about 1.0 to 2.0± m below the base of the excavation, it may be feasible to excavate to the top of sound bedrock via conventional methods (i.e. an excavator) with sloped foundation excavation sides and localized dewatering. In the north end of the site, the top of bedrock may be too deep for conventional excavation methods while maintaining appropriately sloped excavation sides. Consideration could also be given to constructing foundations where rock is deeper (north portion of the site) as drilled piles extending to the top of the bedrock.

Within this option, regardless of foundation construction methodology (spread footings or drilled piles on bedrock), dewatering of the sands and gravels down to the top of rock across the site is required prior to excavation.

In this rock formation, the top of bedrock is often weathered and / or fractured at depths of up to 1.3 m (Borehole 410). Foundation excavations must fully penetrate any highly fractured and/or weathered bedrock at the bedrock surface (if present), such that the foundations will bear on unweathered (sound) bedrock.

Conventional footings (spread footings or drilled piles) bearing on or within sound bedrock can be designed using a preliminary maximum geotechnical reaction at SLS of 6 MPa (for an estimated 10 to 15 mm of settlement) and a maximum factored geotechnical resistance at ULS of 9 MPa.

The capacities provided above are based on an individual spread footing foundations that are 2 to 4 m wide, spaced one footing width apart, and embedded a minimum of 1 m below FFE. These minimum requirements apply in conjunction with the above recommended geotechnical resistance regardless of loading considerations. The geotechnical reaction at SLS refers to an estimated settlement which for practical purposes is linear and non-recoverable. Differential settlement is related to column spacing, column loads, and footing sizes.

For drilled piles, we have estimated a maximum diameter of about 2 m, and spaced at a minimum of one footing diameter apart.

3.1.3 Spread Footings Bearing on a Structural Fill Pad

As discussed in Section 3.1.2, the depth to sound bedrock from the base of the P1 bulk excavation will be deeper in the northern portion of the site. This may pose constructability challenges, as it may not be feasible or practical to open-cut these isolated footings.

Alternatively, all overburden soils and weathered bedrock may be excavated and removed down to the top of sound bedrock. The excavation can then be backfilled using lean-mix concrete with a minimum compressive strength of 5 MPa, from the surface of the sound bedrock up to the proposed spread footing bearing elevation as indicated by the structural engineer. The bulk excavation must be dewatered to the top of bedrock throughout construction, particularly during the placement and curing process of the concrete structural fill. The concrete must be tested for compressive strength by a testing and inspection firm, and the minimum required strength of the concrete must be confirmed prior to foundation construction atop the engineered fill surface.

Conventional spread footings made to bear on the concrete engineered fill as described above may be designed using a maximum factored geotechnical resistance at ULS of 3 MPa. The net geotechnical reaction at SLS is 2 MPa.

Individual spread footing foundations designed to these capacities must be at least 1± mm wide, spaced one footing width apart and must be embedded a minimum of 1± m below FFE. These minimum requirements apply in conjunction with the above recommended geotechnical resistance regardless of loading considerations. The geotechnical reaction at SLS refers to an estimated settlement which for practical purposes is linear and non-recoverable. Differential settlement is related to column spacing, column loads, and footing sizes.

In some areas of the site, there may be bedrock above the proposed foundation elevation, implying that concrete structural fill will not be required in these areas. In these cases, the bedrock can be excavated/removed down to the proposed foundation elevation, and the same bearing capacities for footings bearing on concrete structural fill should be utilized.

3.2 Seismic Site Designation

The Ontario Building Code (2024) stipulates the methodology for earthquake load and effects analysis and design, as set out in Subsection 4.1.8. The determination of the type of analysis is predicated on the importance of the structure, the spectral response acceleration, and the site classification.

The site designation, X, is determined using the average shear wave velocity, V_{s30}, calculated from in situ measurements of shear wave velocity, in accordance with ground profiles provided in Table 4.1.8.4.-A. For all other ground profiles, the site designation is X_V, where V is the value of V_{s30}. At sites where V_{s30} is not available, the site designation is X_S, where S is the Site Class as determined from rational analysis of average undrained shear strength (s_u) or energy-corrected average standard penetration resistance (SPT N-values) in accordance with Table 4.1.8.4.-B.

The structural commentaries to the NBC 2020, on which the OBC 2024 are based, have been recently released. Based on the structural commentaries, site designation must be evaluated in the top 30 m of site stratigraphy.

Multichannel Analysis of Surface Waves (MASW) was performed at this site to determine the average shear wave velocity in the 30 metres of site stratigraphy (V_{s30}). The reported results are appended. An average V_{s30} value of 675 m/s was assessed from grade. Based on the measured shear wave velocities, the site designation for seismic analysis is $\mathbf{X_{675}}$.

3.3 Earth Pressure Design Parameters

At this site, the design parameters for structures subject to unbalanced earth pressures such as basement walls and retaining walls are shown in the table below.

Stratigraphic Unit	γ	φ	K_a	K_o	K_p
Compact Granular Fill Granular 'B' (OPSS.MUNI 1010)	21	32	0.31	0.47	3.25
Existing Earth Fill	19	29	0.35	0.52	2.88
Sands and Gravels	21	34	0.28	0.44	3.54
Sound Bedrock	24.9	45	n/a		

γ	=	soil bulk unit weight (kN/m^3)
φ	=	internal friction angle (degrees)
K_a	=	active earth pressure coefficient (Rankine, dimensionless)
K_o	=	at-rest earth pressure coefficient (Rankine, dimensionless)
K_p	=	passive earth pressure coefficient (Rankine, dimensionless)

These earth pressure parameters assume that grade is horizontal behind the retaining structure. If retained grade is inclined, these parameters do not apply and must be re-evaluated.

The following equation can be used to calculate the unbalanced earth pressure imposed on walls:

$$P = K[\gamma(h - h_w) + \gamma' h_w + q] + \gamma_w h_w$$

P	=	horizontal pressure (kPa) at depth h	γ	=	soil bulk unit weight (kN/m^3)
h	=	the depth at which P is calculated (m)	γ'	=	submerged soil unit weight (γ - 9.8 kN/m^3)
K	=	earth pressure coefficient	q	=	total surcharge load (kPa)
h_w	=	height of groundwater (m) above depth h			

If the wall backfill is drained such that hydrostatic pressures on the wall are effectively eliminated, this equation simplifies to:

$$P = K[\gamma h + q]$$

Where walls are made directly against shoring, prefabricated composite drainage panel covering the blind side of the wall is used to provide drainage. Water from the composite drainage panel is collected and discharged through the basement wall in solid ports directly to the sumps. This is discussed in Section 3.5.

The City of Guelph has expressed to the client's team during a pre-application meeting that long term discharge of groundwater will not be permitted into the City sewer systems. Hence, it is likely that the proposed development will be designed as a watertight structure. In this case, the full height of the basement walls should be watertight and designed to withstand horizontal hydrostatic pressure based on the design groundwater elevation (as per Section 2.2).

The possible effects of frost on retaining earth structures must be considered. In frost-susceptible soils, pressures induced by freezing pore water are basically irresistible. Insulation typically addresses this issue. Alternatively, non-frost-susceptible backfill may be specified.

Foundation resistance to sliding is proportional to the friction between the subgrade and the base of the footing. The factored geotechnical resistance to friction ($\mathbf{R_f}$) at ULS provided in the following equation:

$$R_f = \Phi N \tan \varphi$$

R_f	=	frictional resistance (kN)
Φ	=	reduction factor per CFEM 5th Ed. (0.8 for cohesionless soils or rock; 0.6 for cohesive soils)

N	=	normal load at base of footing (kN)
φ	=	internal friction angle (see table above)

3.4 Slab on Grade Design Parameters

It has been communicated to Grounded by the client team that the City of Guelph will not be allowing discharge of groundwater into their sewer systems for long term discharge. Hence, the structure will likely be designed as a fully watertight structure and designed to withstand uplift and hydrostatic pressures, with no permanent drainage. If designed as a watertight structure, conventional slab-on-grade design parameters do not apply. The lowest floor will be made as a pressure slab spanning between foundation elements, to be designed by the structural engineer.

Although the City of Guelph is likely to require a watertight basement at this site, a drained basement is also feasible from an engineering perspective. Grounded can provide conventional slab-on-grade design parameters and constructability advice on request.

3.5 Long-Term Groundwater and Seepage Control

To limit seepage to the extent practicable, exterior grades adjacent to foundation walls should be sloped at a minimum 2 percent gradient away from the wall for 1.2 m minimum.

A fully watertight basement approach is the client's preferred solution, which is to be adopted for this site.

A watertight basement implies that the basement structure is designed to withstand hydrostatic pressures, with no permanent drainage system. The full height of the basement walls should be watertight (no drainage) and designed to withstand hydrostatic pressure (horizontal and uplift) from groundwater.

The groundwater table for design purposes should be taken as Elev. 318.0± m in the northwest portion of the site (where the existing grade is higher), and at Elev. 317.0± in the southeast portion of the site based on seasonal high groundwater levels from May to July 2022, reported by previous consultants. Based on the historical data, there appears to be seasonal variation in the water table of approximately 3 to 6± m. Continuous groundwater level monitoring is currently underway to confirm the seasonal groundwater conditions.

A connection to the City's sewer for emergency repair services is recommended.

3.6 Site Servicing

All services must have at least 1.2 metres of earth cover or equivalent insulation for frost protection.

Where site services extend beyond the building footprint, the following recommendations apply.

3.6.1 Bedding

The soil subgrade encountered within the proposed site servicing trenches will consist of either earth fill or native soil. The trench base must be inspected for obvious loose, wet, or disturbed material. Any unsuitable material must be subexcavated and replaced with imported fill compacted to 98% SPMDD. If suitable earth fill is encountered, the subgrade must be compacted in place to a minimum 98% SPMDD.

Site servicing drawings are not available for review. It is assumed that trenches will be made at least 1.2 m above the groundwater table.

If trenches extend below the groundwater table, dewatering should be considered to lower the groundwater table below the lowest trench invert prior to excavation. At this site, the subgrade soils are permeable and will yield free-flowing water. Positive dewatering prior to trench excavation will be required.

Bedding material below the groundwater table must consist of well graded granular fill such as Granular A (OPSS.MUNI 1010). The bedding material must be compacted to a minimum 98% SPMDD. Clear stone is specifically prohibited below the groundwater table.

3.6.2 Backfill

Excavated earth fill and native soils on site will constitute adequate backfill material if the soil meets the following backfill specifications:

- Any deleterious material in the earth fill is removed prior to reuse as backfill.
- Backfill materials are not frozen.
- The moisture content is within 2% of optimum, or moisture conditioned to within 2% of optimum.
- The backfill must be compacted to a minimum 98% SPMDD.

3.6.3 Trench Plugs

For site servicing trench excavations that extend below the groundwater table, trench plugs can generally be utilized to prevent the groundwater from preferentially flowing through the granular

bedding and backfill material into and/or from the site. Trench plugs can potentially prevent a local drawdown of the groundwater table. Where local drawdown is not tolerated or contaminant transport is a risk, trench plugs can be installed in the granular bedding and backfill material. However, it should be considered that trench plugs may not be effective when the surrounding subgrade soils have a similar or faster hydraulic conductivity than the granular backfill within the trench.

Trench plugs may be constructed as clay plugs or cut off collars around the pipe. Clay plugs should be installed no further than 50 m apart along the full length of the trench. Clay plugs must be a minimum of 1 m thick along the length of the trench and will completely replace any bedding or backfill material around the pipe. Soil used for clay plugs must have greater than 50% fines content, 15% of the particles finer than 2 microns, and a hydraulic conductivity of less than 10^{-8} m/s. The clay plug must be compacted to minimum 95% SPMDD. A representative sample of the clay plug material must be submitted prior to construction and during construction for hydraulic conductivity and particle size testing to confirm the material is adequate and in compliance with the above material specifications.

If cutoff collars are used instead of clay plugs, the cutoff collar must not be placed within 1 m of a pipe joint to ensure adequate compaction of the backfill. The soils around the cutoff collar must be compacted to 95% SPMDD. Cutoff collars are designed by the civil engineer.

The municipality may have its own minimum design requirements for trench plugs. If this is the case, the relevant specifications should be reviewed and incorporated by the civil engineer, and the more stringent of the two specifications should be used.

4 Considerations for Construction

4.1 Excavations

Excavations must be carried out in accordance with the *Occupational Health and Safety Act – Regulation 213/91 – Construction Projects (Part III - Excavations, Section 222 through 242)*. These regulations designate four (4) broad classifications of soils to stipulate appropriate measures for excavation safety. For practical purposes:

- The earth fill is a Type 3 soil
- The sands and gravel are Type 4 soils below the groundwater table / when wet, or Type 3 soils if dewatered / above the groundwater table

In accordance with the regulation's requirements, the soil must be suitably sloped and/or braced where workers must enter a trench or excavation deeper than 1.2 m. Safe excavation slopes (of no more than 3 m in height) by soil type are stipulated as follows, per Section 234:

Soil Type	Base of Slope	Steepest Slope Inclination
1	within 1.2 metres of bottom of trench	1 horizontal to 1 vertical
2	within 1.2 metres of bottom of trench	1 horizontal to 1 vertical
3	from bottom of trench	1 horizontal to 1 vertical
4	from bottom of trench	3 horizontal to 1 vertical

Minimum support system requirements for steeper excavations are stipulated in Sections 235 through 239 and 241 of the Act and Regulations and include provisions for timbering, shoring and moveable trench boxes. Any excavation slopes greater than 3 m in height should be checked by Grounded for global stability issues.

Larger obstructions (e.g. buried concrete debris, other obstructions) not directly observed in the boreholes are likely present in the earth fill. Similarly, larger inclusions (e.g. cobbles and boulders) may be encountered in the native soils. The size and distribution of these obstructions cannot be predicted with boreholes, as the split spoon sampler is not large enough to capture particles of this size. Provision must be made in excavation contracts to allocate risks associated with the time spent and equipment utilized to remove or penetrate such obstructions when encountered.

Excess soil is governed by Ontario Regulation 406/19: On-Site and Excess Soil Management (ESM). The Project Leader (typically the owner) may be required to file a notice in the excess soil registry and a Qualified Person (within the meaning of O.Reg. 153/04) may be required to prepare the associated planning documents and/or develop and implement a tracking system in accordance with the Soil Rules, to track each load of excess soil during its transportation and deposit before removing excess soil from the project area.

The bedrock beneath the site generally consists of dolostone of the Guelph Formation. This type of rock cannot be excavated by conventional methods. For excavations that extend below the surface of the bedrock, they will likely require the use of rippers and/or breakers or similar mechanical equipment (or potentially blasting) suitable for hard rock excavation to achieve the required excavation depths.

4.2 Short-Term Groundwater Control

Considerations pertaining to groundwater discharge quantities and quality are discussed in Grounded's hydrogeological report for the site, under separate cover.

Groundwater elevations were reported at Elev. 321± in monitoring wells PIN-203S and PIN-204 between May 2022 to July 2022. The groundwater levels reported within this time period in these wells have fluctuated between Elev. 321± and Elev. 316± m within a span of a few days. Given the significant fluctuation over a short time period, the data may not be reliable.

The groundwater table for design purposes should be taken as Elev. 318.0± m in the northwest portion of the site (where the existing grade is higher), and at Elev. 317.0± in the southeast portion of the site based on seasonal high groundwater levels from May to July 2022, reported by previous consultants. Based on the historical data, there appears to be seasonal variation in the water table of approximately 3 to 6± m. Continuous groundwater level monitoring is currently underway to confirm the seasonal groundwater conditions.

Positive dewatering to lower the groundwater table will be required (during the wet season) to facilitate construction as well as to maintain the integrity of the subgrade for foundation and slab-on-grade support. Based on available (limited) groundwater level data, the groundwater levels at this Site may be below the base of excavation during the dry season and hence, this Site may not need active dewatering during the dry season.

Dewatering will take some time to accomplish prior to the start of excavation. It must be highlighted, that the historic coal gasification site for the City of Guelph is located immediately to the southwest. This is a well-known contaminated site with a groundwater plume that extends south and east of the coal gasification property (towards Gordon Street to the south and Wellington Street to the east). These land uses are anticipated to be a source of potential contamination and are expected to provide an Area of Potential Environmental Concern for the Site. As such, the pumping of groundwater at the Site may facilitate the movement of potential contaminants onto the Site.

Evaluation of the environmental condition of the Site will be completed as part of a separate scope of work.

Please refer to Grounded’s environmental reports for more details.

The site must be dewatered to the top of the bedrock surface for the entirety of below-grade construction, as this is essential for foundation construction at this site. Localized dewatering to maintain dry working conditions within isolated foundation excavations will also be required. Positive dewatering of the bedrock may be required.

A professional dewatering contractor should 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.

Should the excavation be supported using permeable soldier pile and lagging shoring, positive dewatering will be required on a continuous ongoing basis during excavation and throughout construction.

4.3 Earth-Retention Shoring Systems

No excavation shall extend below the foundations of existing adjacent structures without adequate alternative support being provided. Excavation zone of influence guidelines are appended.

Continuous interlocking caisson wall shoring is to be used where the excavation must be constructed as a rigid shoring system, or where groundwater seepage into the excavation needs to be limited for environmental reasons. Caisson wall shoring preserves the support capabilities and integrity of the soil beneath existing foundations of adjacent buildings, in a state akin to the at-rest condition. Otherwise, excavations can be supported using conventional soldier pile and lagging walls with active dewatering prior to and during construction.

4.3.1 Lateral Earth Pressure Distribution

If the shoring is supported with a single level of earth anchor or bracing, a triangular earth pressure distribution like that used for the basement wall design is appropriate.

Where multiple rows of lateral supports are used to support the shoring walls, research has shown that a distributed pressure diagram more realistically approximates the earth pressure on a shoring system of this type, when restrained by pre-tensioned anchors. A multi-level supported shoring system can be designed based on an earth pressure distribution with a maximum pressure defined by:

$$P = 0.65\,K[\gamma H + q] + \gamma_w h_w$$ … in cohesionless soils

P = maximum horizontal pressure (kPa)
K = earth pressure coefficient (see Section 3.3)
H = total depth of the excavation (m)
h_w = height of groundwater (m) above the base of excavation
γ = soil bulk unit weight (kN/m3)
q = total surcharge loading (kPa)

Where shoring walls are drained to effectively eliminate hydrostatic pressure on the shoring system (e.g. pile and lagging walls), h_w is equal to zero. For the design of impermeable shoring, the design groundwater table should be taken as Elev. 318.0± m in the northwest portion of the site (where the existing grade is higher), and at Elev. 317.0± in the southeast portion of the site based on seasonal high groundwater levels from May to July 2022, reported by previous

consultants. Based on the historical data, there appears to be seasonal variation in the water table of approximately 3 to 6± m. Continuous groundwater level monitoring is currently underway to confirm the seasonal groundwater conditions.

In cohesionless soils, the lateral earth pressure distribution is rectangular.

4.3.2 Soldier Pile Toe Embedment

Soldier pile toes resist horizontal movement due to the passive earth pressure acting on the toe below the base of excavation. The maximum factored vertical geotechnical resistance at ULS for the design of a pile embedded in the sound bedrock is 10 MPa. The maximum factored lateral geotechnical resistance at ULS of the undisturbed rock is 1 MPa.

The subgrade soils at this site are cohesionless, wet, and permeable. The bedrock is also highly permeable. Augered holes for piles made into the soils will be prone to caving and blowback. Temporarily cased holes advanced to the bedrock surface are required to prevent borehole caving during installations in drilled holes. To prevent groundwater issues (groundwater inflow, caving and blowback into the drill holes, disturbance to placed concrete, etc.) during drilling and installation, construction methods such as utilizing temporary liners, pre-advancing liners deeper than the augered holes, mud/slurry/polymer drilling techniques, tremie pour concrete, or other methods as deemed necessary by the shoring contractor are required. Concrete for shoring piles and fillers must be placed by tremie method wherever there is more than 300 mm of water or fluid at the base of the drill hole.

4.3.3 Lateral Bracing Elements

The shoring system at this site will require lateral bracing. If feasible, the shoring system should be supported by pre-stressed soil anchors (tiebacks) extending into the subgrade of the adjacent properties. To limit the movement of the shoring system as much as is practically possible, tiebacks are installed and stressed as excavation proceeds. The use of tiebacks through adjacent properties requires the consent (through encroachment agreements) of the adjacent property owners.

Anchors can be designed to react in either the overburden native soils, or the rock. They will not engage the soil and rock simultaneously, due to strain incompatibility.

In the compact to dense subgrade, post-grouted micropile ground anchors in tension can be designed using a maximum factored geotechnical resistance at ULS of 60 to 80 kN/m of adhered anchor length (at a nominal diameter of 150 mm). This capacity is provided assuming that a site specific tension load test is performed, implying a resistance factor of 0.6.

In the sound dolostone bedrock, conventional micropile anchors (at a nominal borehole diameter of 115 mm) can be designed using an ultimate resistance of 1,800 kPa. Assuming that a site specific tension load test is performed, a resistance factor of 0.60 is applicable. The maximum factored geotechnical resistance at ULS is taken as the ultimate resistance multiplied by a resistance factor. Following the load test, the micropile capacity can be re-evaluated and potentially improved.

Production tiebacks require a minimum 3 m socket length.

At least one prototype anchor per tieback level must be performance-tested to 200% of the design load to demonstrate the anchor capacity and validate design assumptions. For temporary applications, the performance test anchor may be used as a production anchor.

Every production anchor must be proof tested to 133% of design load, and then locked in at 100% of design load.

The compact to dense subgrade below the proposed FFE is suitable for the placement of raker foundations. Raker footings established on compact to dense soils at an inclination of 45 degrees can be designed for a maximum factored geotechnical resistance at ULS of 100 kPa.

4.4 Site Work

Excavations at this site must be cut neat, inspected, and then immediately protected with a skim coat of concrete (i.e. a mud mat). Wet sands and exposed bedrock are susceptible to degradation and disturbance due to even mild site work, frost, weather, or a combination thereof.

Site work carried out during periods of inclement weather may result in the subgrade becoming disturbed, unless a granular working mat or concrete mud mat is placed to preserve the subgrade in its undisturbed condition. Subgrade preparation activities should not be conducted in wet weather and the project must be scheduled accordingly.

If site work causes disturbance to the subgrade, removal of the disturbed soils and/or bedrock and the use of lean concrete or granular fill material for site restoration or underfloor fill will be required at additional cost to the project.

It is construction activity itself that often imparts the most severe loading conditions on the subgrade. Special provisions such as end dumping and forward spreading of earth and aggregate fills, restricted construction lanes, and half-loads during placement of the granular base and other work may be required, especially if construction is carried out during unfavourable weather.

Adequate temporary frost protection for the founding subgrade must be provided if construction proceeds in freezing weather conditions. The subgrade at this site is susceptible to frost damage. The slab on grade should not be placed on frozen subgrade, to prevent excess settlement of the slab as the subgrade thaws. Areas of frozen subgrade should be removed during subgrade preparation. Depending on the project context, consideration should be given to frost effects (heaving, softening, etc.) on exposed subgrade surfaces.

4.5 Engineering Review

By issuing this report, Grounded Engineering has assumed the role of Geotechnical Engineer of Record for this site. Grounded should be retained by the Owner to review the structural and geostructural engineering drawings prior to issue or construction, to ensure that the recommendations in this report have been appropriately implemented.

All foundation installations must be reviewed in the field by Grounded, the Geotechnical Engineer of Record, as they are constructed. The on-site review of foundation installations and the condition of the founding subgrade as the foundations are constructed is as much a part of the geotechnical engineering design function as the design itself; it is also required by Section 4.2.2.3. of the 2024 Ontario Building Code. If Grounded is not retained to carry out foundation engineering field review during construction, then Grounded accepts no responsibility for the performance or non-performance of the foundations, even if they are constructed in general conformance with the engineering design advice contained in this report.

Strict procedures must be maintained during construction to maintain the integrity of the subgrade to the extent possible. The design advice in this report is based on an assessment of the subgrade support capabilities as indicated by the boreholes. These conditions may vary across the site depending on the final design grades and therefore, the preparation of the subgrade should be monitored by Grounded at the time of construction to confirm material quality, and thickness.

A visual pre-construction survey of adjacent lands and buildings is recommended to be completed prior to the start of any construction. This documents the baseline condition and can prevent unwarranted damage claims. Any shoring system, regardless of the execution and design, has the potential for movement. Small changes in stress or soil volume can cause cracking in adjacent buildings.

5 Limitations and Restrictions

Grounded should be retained by the Owner to review the structural and geostructural engineering, as well as dewatering drawings prior to issue or construction, to ensure that the recommendations in this report have been appropriately implemented.

5.1 Investigation Procedures

The geotechnical engineering analysis and advice provided here are based in part on factual data obtained from investigations at this site conducted by other consultants as described above, as well as the factual borehole information observed and recorded by Grounded. This previous consultant subsurface information is provided in a professional engineer's signed and sealed geotechnical report, and as such this borehole information is taken as factual for present purposes.

The geotechnical engineering analysis and advice provided are also based on the factual borehole information observed and recorded by Grounded. The investigation methodology and engineering analysis methods used to carry out this scope of work are consistent with Grounded's standard of practice as well as other reasonable and prudent geotechnical consultants, working under similar conditions and constraints (time, financial, and physical).

Borehole drilling services were provided to Grounded by a specialist professional contractor. The drilling was observed and recorded by Grounded's field supervisor on a full-time basis. Drilling was conducted using conventional drilling rigs equipped with hollow stem augers. Rock coring was carried out with HQ size diamond bit core drilling barrels. As drilling proceeded, groundwater observations were made in the boreholes. Based on examination of recovered borehole samples, our field supervisor made a record of borehole and drilling observations. The field samples were secured in air-tight clean jars and bags and taken to the Grounded soil laboratory where they were each logged and reviewed by the geotechnical engineering team and the senior reviewer.

The Split-Barrel Method technique (ASTM D1586) was used to obtain the soils samples. This technique was modified for half-weight hammer testing (see Section 2) for the soils samples at Borehole 401 due to site access constraints. The sampling was conducted at conventional intervals and not continuously. As such, stratigraphic interpolation between samples is required and stratigraphic boundary lines do not represent exact depths of geological change. They should be taken as gradual transition zones between soil or rock types.

A carefully conducted, fully comprehensive investigation and sampling scope of work carried out under the most stringent level of oversight may still fail to detect certain ground conditions.

As such, users of this report must be aware of the risks inherent in using engineered field investigations to observe and record subsurface conditions. As a necessary requirement of working with discrete test locations, Grounded has assumed that the conditions between test locations are the same as the test locations themselves, for the purposes of providing geotechnical engineering advice.

It is not possible to design a field investigation with enough test locations that would provide complete subsurface information, nor is it possible to provide geotechnical engineering advice that completely identifies or quantifies every element that could affect construction, scheduling, or tendering. Contractors undertaking work based on this report (in whole or in part) must make their own determination of how they may be affected by the subsurface conditions, based on their own analysis of the factual information provided and based on their own means and methods. Contractors using this report must be aware of the risks implicit in using factual information at discrete test locations to infer subsurface conditions across the site and are directed to conduct their own investigations as needed.

5.2 Site and Scope Changes

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

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

5.3 Report Use

The authorized users of this report are Fitzrovia Real Estate and their design team, for whom this report has been prepared.

The City of Guelph may also make use of and rely upon this report, subject to the limitations as stated.

The local municipal/regional governing bodies may also make use of and rely upon this report, subject to the limitations as stated.

6 Closure

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

For and on behalf of our team,

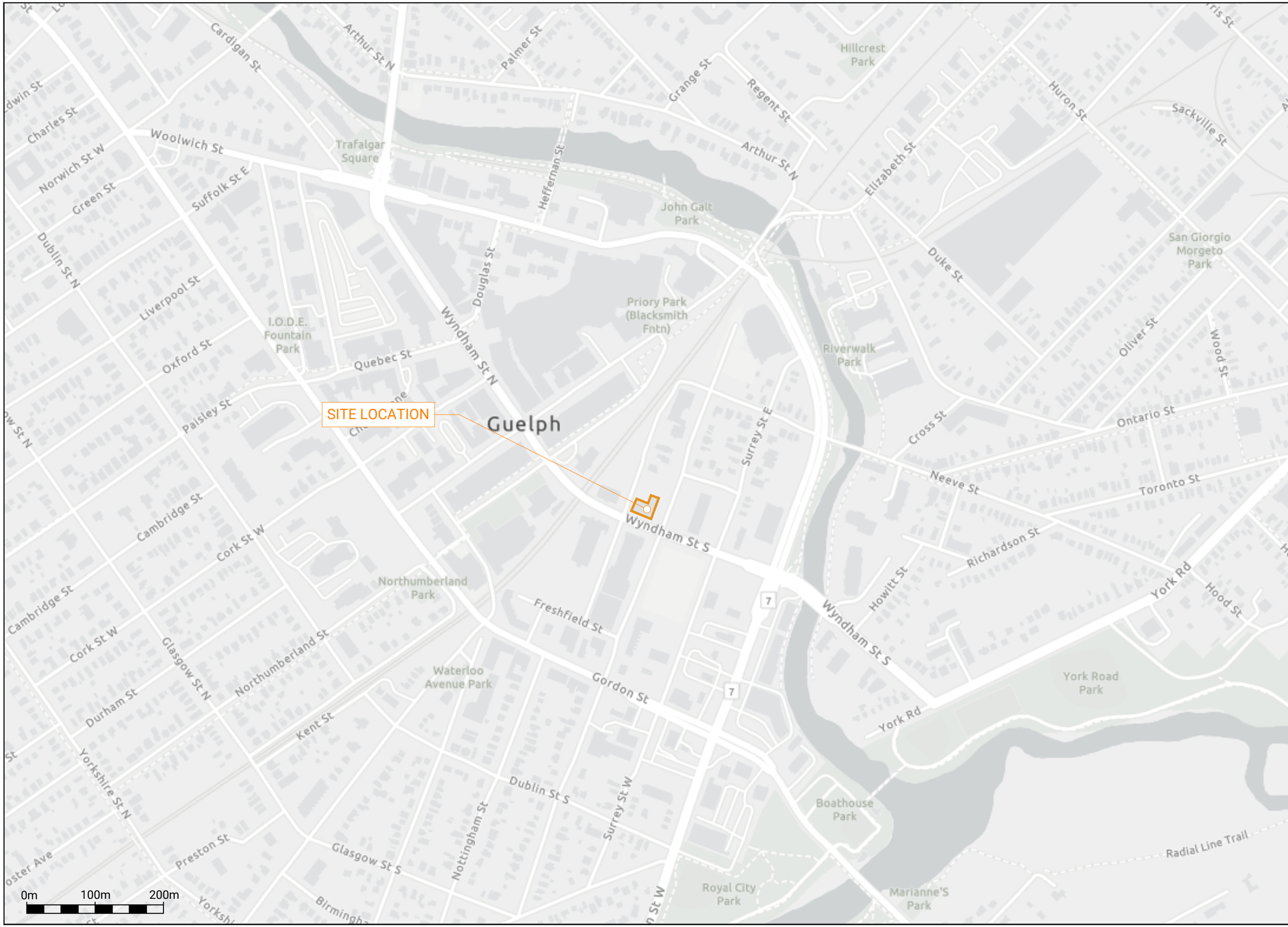
GROUNDED ENGINEERING

Deepak Kanraj, M.A.Sc., P.Eng.
Project Engineer

Kyle Byckalo, P.Eng.
Associate

Jason Crowder, Ph.D., P.Eng.
Principal

FIGURES



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LEGEND

APPROXIMATE PROPERTY BOUNDARY

Note

Reference

ArcGIS Maps Online 2025

Project

70 FOUNTAIN ST E, GUELPH, ONTARIO

Figure Title

SITE LOCATION PLAN

North

TRUE

PROJECT

Date

NOVEMBER 2025

Scale

AS INDICATED

Job No

25-121

Figure No

FIGURE 1

FARQUHAR STREET

WYNDHAM STREET SOUTH

FOUNTAIN STREET EAST

ENG-BH04-15
321.95

PIN-MW205
315.3± m

BH401
314.4± m

BH404
314.0± m

BH402
315.0± m

PIN-MW204
315.7± m

TPX-BH07

PIN-BH207

PIN-MW07

ENG-BH02-15

BH302

BH302B

313.3± m

BH409
314.1± m

BH406
314.8± m

314.1± m

PIN-BH06

PIN-MW203S

314.0± m

PIN-MW203D

BH208B

PIN-BH208

BH408

312.4± m

TPX-BH101

BH301
314.4± m

BH405
315.7± m

ENG-BH03-15

PIN-BH210

313.1± m

PIN-BH209

BH407

PIN-BH04

PIN-MW202

PIN-BH05

BH-05B

PIN-MW201

314.7± m

BH410

313.7± m

ENG-BH01-15

314.3± m

315.3± m

PIN-MW206

314.7± m

BH403

PIN-BH211

ENG-BH05-15
315.0± m

PIN-BH02

315.0± m

PIN-MW03

PIN-MW01

315.5± m

A

A'

2 STOREY
STONE SLAB BUILDING
No. 70

PAVESTONE PATIO

STEEL FENCE

CHAIN LINK FENCE

CONCRETE RETAINING WALL

CONCRETE WALK

0m 5m 10m

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LEGEND

- PROPERTY BOUNDARY
- EXISTING BUILDING STRUCTURE
- MONITORING WELL/BOREHOLE BY GROUNDED
- MONITORING WELL/BOREHOLE BY OTHERS
- 314.1± m — TOP OF BEDROCK ELEVATION INFERRED / CONFIRMED

Note

Reference

Topographic Survey of All of Lots 19 & 20, Registered Plan 8, City of Guelph, County of Wellington. Project No.: 19814-11. Prepared by Van Harten Surveying Inc. Certified August 8, 2019.

Project

70 FOUNTAIN ST E, GUELPH, ONTARIO

Figure Title

BOREHOLE LOCATION PLAN - EXISTING SITE CONDITIONS

North

PROJECT TRUE

Date

NOVEMBER 2025

Scale

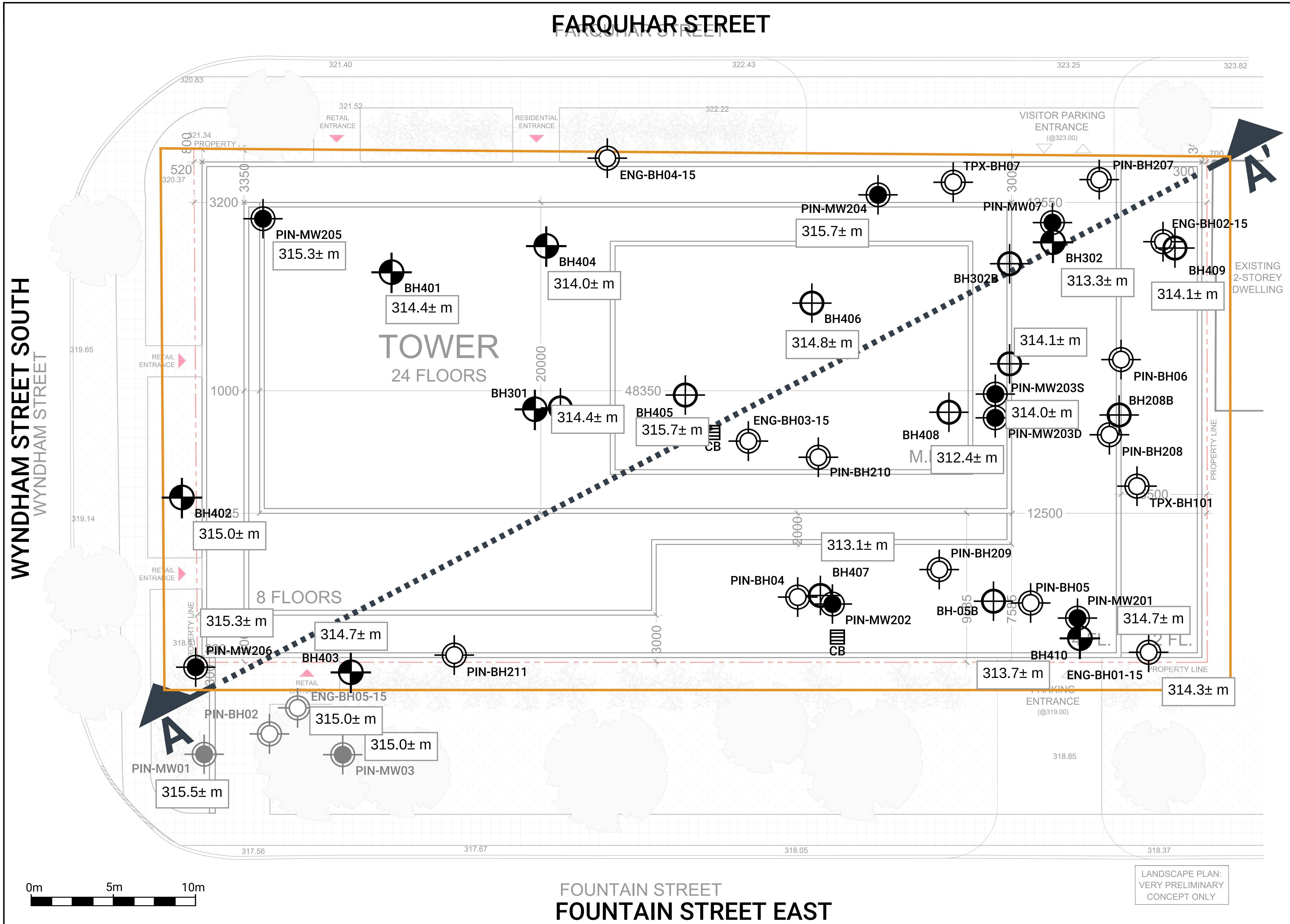
AS INDICATED

Job No

25-121

Figure No

FIGURE 2



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LEGEND

- PROPERTY BOUNDARY
- EXISTING BUILDING STRUCTURE
- MONITORING WELL/BOREHOLE BY GROUNDED
- MONITORING WELL/BOREHOLE BY OTHERS
- TOP OF BEDROCK ELEVATION INFERRED / CONFIRMED

Note

Reference

Topographic Survey of All of Lots 19 & 20, Registered Plan 8, City of Guelph, County of Wellington. Project No.: 19814-11. Prepared by Van Harten Surveying Inc. Certified August 8, 2019.

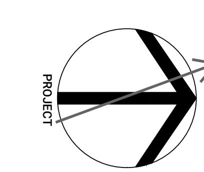
Project

70 FOUNTAIN ST E, GUELPH, ONTARIO

Figure Title

BOREHOLE LOCATION PLAN - PROPOSED SITE CONDITION

North



Date: NOVEMBER 2025

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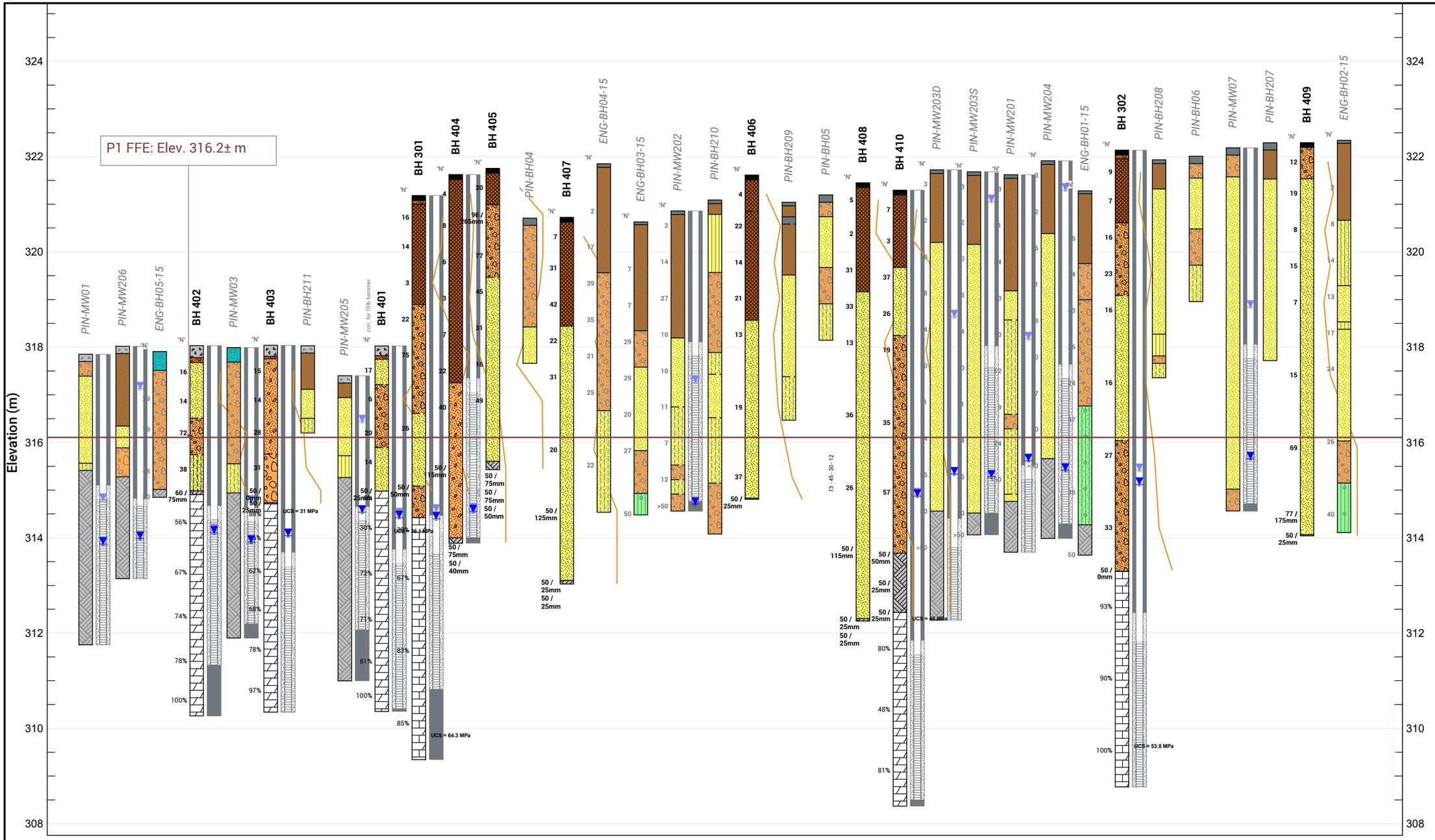
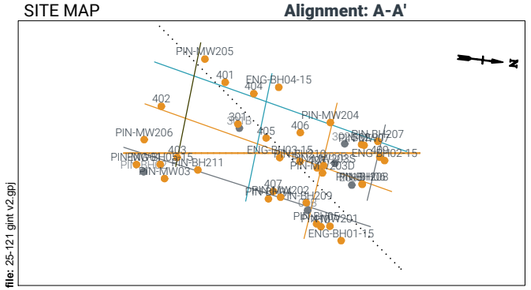
Job No: 25-121

Figure No: **FIGURE 3**



SITE MAP

Alignment: A-A'



file: 25-121 gint v2.gpj

Boreholes Equally Spaced

BOREHOLE STRATIGRAPHY LEGEND

Asphalt	Sand	DOLOMITE	Gravel	Silty Till
Aggregate	Sandy Gravel	Silty Sand	Sandy Silt Till	Topsoil
Fill	DOLOMITIC LIMESTONE	Bedrock (inferred)	Silt and Sand	
Sand and Gravel	Concrete	Gravelly Sand	Silt	

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LEGEND

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

BH 101 BOREHOLES BY GROUNDED

T-BH7 BOREHOLES BY OTHERS

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

Project

70 FOUNTAIN STREET EAST GUELPH, ONTARIO

Figure Title

SUBSURFACE PROFILE

A-A'

Date

NOVEMBER 2025

Scale

AS INDICATED

Job No

25-121

Figure No

FIGURE 4

P1 FFE: Elev. 316.2± m

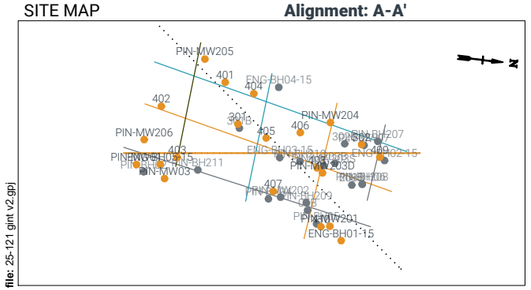
Interpolated Top of Bedrock Elevation as Inferred/Observed in Boreholes

Elevation (m)

Distance Along A-A' Baseline (m)

SITE MAP

Alignment: A-A'



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BOREHOLE STRATIGRAPHY LEGEND

Asphalt	Sand	DOLOMITE	Gravel
Aggregate	Sandy Gravel	Silty Sand	Sandy Silt Till
Fill	DOLOMITIC LIMESTONE	Bedrock (inferred)	Topsoil
Sand and Gravel	Concrete	Gravelly Sand	Silt

GROUNDED ENGINEERING

49 Mobile Drive, Toronto ON, 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

INTERPOLATED TOP OF BEDROCK ELEVATION AS INFERRED/OBSERVED IN BOREHOLES

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

Project

70 FOUNTAIN STREET EAST GUELPH, ONTARIO

Figure Title

SUBSURFACE PROFILE

BEDROCK BOREHOLES

Date: NOVEMBER 2025

Scale: AS INDICATED

Job No: 25-121

Figure No: **FIGURE 5**

TABLE 1

TABLE 1:
GROUNDWATER LEVEL MONITORING SUMMARY
[SITE ADDRESS]

Well ID	Ground Surface Elev. (masl)	Well Screen Interval		Soil Strata	Pinchin																																Stantec Engineering						Minimum Elev. (Lowest)		Maximum Elev. (Highest)		Seasonal Fluctuation
		mbgs	masl		July 6, 2016		July 25, 2019		August 13, 2019		May 2, 2022		May 17, 2022		May 31, 2022		June 1, 2022		June 7, 2022		June 13, 2022		June 17, 2022		June 27, 2022		June 29, 2022		July 7, 2022		August 18, 2022		September 21, 2022		November 9, 2022		December 9, 2022		February 7, 2023		March 3, 2023		April 3, 2023		May 1, 2023		July 29, 2025		August 6, 2025		September 29, 2025		October 15, 2025		October 23, 2025					
					mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl	mbgs	masl		
PIN-MW01**	317.85	3.1 - 6.1	314.8 - 311.7	Limestone	3.80	314.05	3.2	314.65	3.60	314.25	3.12	314.73	3.15	314.70	3.14	314.71	-	-	3.59	314.26	3.09	314.76	3.60	314.25	3.15	314.70	3.60	314.25	3.19	314.66	3.68	314.17	3.68	314.17	3.82	314.03	3.86	313.97	3.83	314.02	3.85	314.00	3.65	314.20	3.64	314.21	3.56	313.95	3.91	313.94	4.00	313.85	3.88	313.97	4.05	313.84	4.07	313.84	3.09	314.76	0.92
PIN-MW03**	317.99	3.7 - 5.8	314.3 - 312.2	Limestone	3.84	314.15	3.60	314.39	3.96	314.03	3.88	314.11	3.28	314.71	3.92	314.07	-	-	3.66	314.33	3.28	314.71	3.67	314.32	3.27	314.72	3.70	314.29	3.99	314.00	3.77	314.22	3.82	314.17	3.93	314.06	4.00	313.99	4.02	313.96	3.96	314.03	3.72	314.27	3.72	314.27	3.93	314.05	3.99	314.00	4.07	313.92	3.86	314.13	4.11	313.88	4.11	313.88	3.27	314.72	0.84
PIN-MW07	322.18	4.4 - 7.5	317.7 - 314.7	Sand	6.34	315.84	5.80	316.38	6.00	316.18	3.37	318.81	3.46	318.72	4.05	318.13	5.83	316.35	5.97	316.21	3.48	318.70	5.84	316.34	3.46	318.72	5.90	316.28	4.32	317.86	5.97	316.21	6.06	316.12	6.33	315.85	6.50	315.68	6.90	315.28	5.68	315.50	6.20	315.98	5.89	316.29	-	-	6.22	316.96	6.45	315.73	6.52	315.66	6.55	315.63	6.90	315.28	3.37	318.81	3.53
PIN-MW205	321.62	6.4 - 7.9	315.2 - 313.7	Silty Sand							5.75	315.87	4.27	317.35	5.74	315.88	5.31	316.31	5.40	316.22	4.17	317.45	5.39	316.23	3.47	318.15	5.50	316.12	4.90	316.72	5.67	315.95	5.77	315.85	5.98	315.64	6.09	315.53	6.18	315.44	5.72	315.90	5.26	316.42	5.24	316.38	5.75	315.87	5.79	315.83	6.02	315.60	6.06	315.56	6.03	315.59	6.18	315.44	3.47	318.15	2.71
PIN-MW202	320.86	3.0 - 6.1	317.8 - 314.8	Sand							4.25	316.61	3.71	317.15	4.16	316.70	3.49	317.37	5.54	315.32	3.62	317.24	5.55	315.31	3.68	317.18	5.60	315.26	4.33	316.53	5.67	315.19	5.72	315.14	6.05	314.81	6.06	314.80	6.02	314.84	6.03	314.83	5.59	315.27	5.58	315.28	5.92	314.94	5.93	314.93	6.13	314.73	6.17	314.69	6.18	314.68	3.62	317.24	2.56
PIN-MW203B***	321.72	7.9 - 9.4	313.8 - 312.3	Limestone							3.36	318.33	3.11	318.61	3.43	318.29	3.74	317.98	5.76	315.96	3.22	318.50	5.75	315.97	3.15	318.57	5.80	315.92	4.23	317.49	5.94	315.78	6.02	315.70	6.30	315.42	6.47	315.25	6.68	315.04	6.52	315.20	6.13	315.59	5.83	315.87	6.11	315.61	6.15	315.57	6.37	315.35	6.41	315.31	6.41	315.31	6.68	315.04	3.11	318.61	3.57
PIN-MW203D***	321.68	3.0 - 6.1	318.6 - 315.6	Sand							-	-	0.65	321.03	0.92	320.75	5.92	315.76	5.68	316.04	0.68	321.00	5.71	315.97	0.72	320.96	5.70	315.98	0.74	320.94	5.89	315.79	5.97	315.71	6.25	315.43	6.42	315.26	6.62	315.06	6.46	315.22	6.06	315.62	6.08	315.60	6.30	315.38	6.35	315.33	6.43	315.25	6.62	315.06	6.65	315.03	3.57
PIN-MW204	321.91	4.6 - 7.6	317.3 - 314.3	Sand							-	-	0.64	321.27	0.91	321.00	5.81	316.10	5.82	316.09	0.64	321.27	5.83	316.08	0.68	321.23	5.90	316.01	0.70	321.21	5.91	316.00	6.06	315.85	6.27	315.64	6.55	315.36	6.82	315.09	6.66	315.26	6.25	315.66	5.92	315.99	dry	-	6.18	315.73	6.42	315.49	6.47	315.44	6.52	315.39	6.82	315.09	0.64	321.27	5.18
PIN-MW205	317.40	3.0 - 5.3	314.4 - 312.1	Limestone							0.99	316.41	1.01	316.39	1.26	316.01	2.35	315.06	2.37	315.03	1.03	316.37	2.37	315.03	1.07	316.32	2.40	315.00	1.09	316.31	2.48	314.92	2.53	314.87	2.69	314.71	2.89	313.60	2.94	314.46	2.83	314.57	2.56	314.84	2.43	314.97	2.64	314.76	2.70	314.70	2.83	314.57	2.85	314.55	2.89	314.51	3.80	313.60	0.99	316.41	2.81
PIN-MW206	318.02	3.4 - 4.9	314.7 - 313.1	Limestone							1.16	316.86	1.33	316.70	1.56	316.46	2.62	314.40	2.62	314.40	0.92	317.10	2.63	314.39	0.99	317.03	2.70	314.32	1.22	316.79	2.71	314.31	2.72	314.27	2.90	314.12	3.23	314.79	3.46	314.56	3.23	314.79	2.71	314.31	2.92	314.10	2.95	314.07	4.02	313.99	4.02	313.99	4.06	313.96	0.92	317.10	3.14
BH301	321.18	7.3 - 10.4	313.9 - 310.8	Dolostone Bedrock																																																				9.65	314.53	9.93	314.25	9.77	314.42	9.81	314.37	9.93	314.25	9.65	314.53	0.28
BH302	322.13	10.3 - 13.4	311.8 - 308.8	Dolostone Bedrock																																																		6.75	315.38	6.77	315.36	7.01	315.12	7.04	315.09	7.04	315.09	6.75	315.38	0.29
BH401	318.03	4.6 - 7.6	313.5 - 310.4	Dolostone Bedrock																																																		3.57	314.46	3.63	314.40	3.63	314.40	3.57	314.46	0.06
BH402	318.03	3.7 - 6.7	314.4 - 311.3	Dolostone Bedrock																																																		3.91	314.13	3.96	314.07	3.96	314.07	3.91	314.13	0.06
BH403	318.04	4.6 - 7.7	313.4 - 310.3	Dolostone Bedrock																																																		-	-	4.02	314.02	4.02	314.02	4.02	314.02	0.00
BH404	321.62	4.6 - 7.6	317.0 - 314.0	Dolostone Bedrock																																																		7.06	314.56	7.70	314.52	7.06	314.56	0.04
BH410	321.30	9.8 - 12.8	311.5 - 308.5	Dolostone Bedrock																																																		6.42	314.88	6.45	314.85	6.45	314.85	6.42	314.88	0.03

mbgs = metres below existing ground surface
masl = metres above sea level
***** = unestablished groundwater level
****** = monitoring well installed outside property boundary
******* = BH elevation was resurveyed by Grounded
NA = not available, unable to access monitoring well

APPENDIX A

BOREHOLE LOG TERMINOLOGY

GROUNDED ENGINEERING

SAMPLING/TESTING METHODS

SS: split spoon sample

AS: auger sample

GS: grab sample

FV: shear vane

DP: direct push

PMT: pressuremeter test

ST: shelby tube

CORE: soil coring

RUN: rock coring

SYMBOLS & ABBREVIATIONS

MC: moisture content

LL: liquid limit

PL: plastic limit

NP: non-plastic

γ: soil unit weight (bulk)

G_s: specific gravity

S_u: undrained shear strength

▽ unstabilized water level

▼ water level measurement

▼ highest water level measurement

ENVIRONMENTAL SAMPLES

M&I: metals and inorganic parameters

PAH: polycyclic aromatic hydrocarbon

PCB: polychlorinated biphenyl

VOC: volatile organic compound

PHC: petroleum hydrocarbon

BTEX: benzene, toluene, ethylbenzene and xylene

PPM: parts per million

FIELD MOISTURE (based on tactile inspection)

DRY: no observable pore water

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

WET: visible pore water

COHESIONLESS

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

COHESIVE

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

COMPOSITION

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

ASTM STANDARDS

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

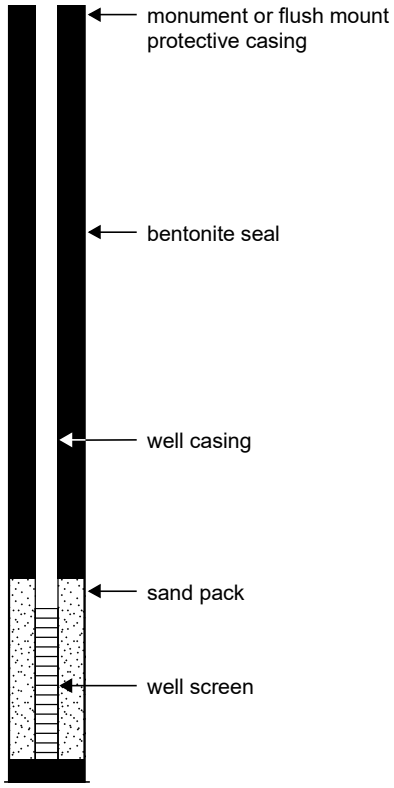
ASTM D3441 Cone Penetration Test (CPT)
Pushing an internal still rod with a outer hollow rod ("sleeve") tipped with a cone with an apex angle of 60° and a cross-sectional area of 1000 mm^2 into soil. The resistance is measured in the sleeve and at the tip to determine the skin friction and the tip resistance.

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

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

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

WELL LEGEND



ROCK CORE TERMINOLOGY (ISRM)

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

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

LOGGING DISCONTINUITIES

Discontinuity Type

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

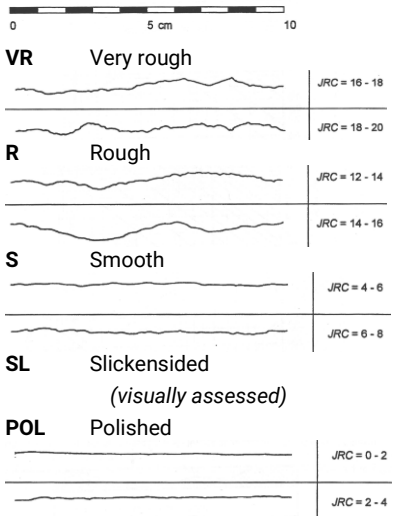
Coating

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

Dip Inclination

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

Roughness (Barton et al.)



Spacing in Discontinuity Sets (*ISRM 1981*)

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

Aperture Size

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

Planarity

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

GENERAL

Weathering Grades (*after ISRM 1981b*)

Grade	Term	Description
I	fresh	no visible sign of rock material weathering; perhaps slight discoloration only
II	slightly weathered	discoloration indicates weathering; rock material may be somewhat weaker than in its fresh condition
III	moderately weathered	less than half of rock is decomposed to soil; fresh rock is present as continuous framework
IV	highly weathered	more than half of rock is decomposed to soil; fresh rock is present as discontinuous framework
V	completely weathered	soil-like matrix only; original mass structure is still largely intact

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

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

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

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

GROUNDED ENGINEERING

Date Started : Jul 30, 2025
Position : E: 560923, N: 4821483 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 301

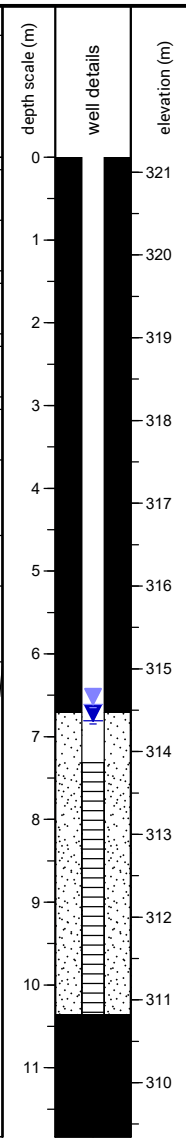
File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

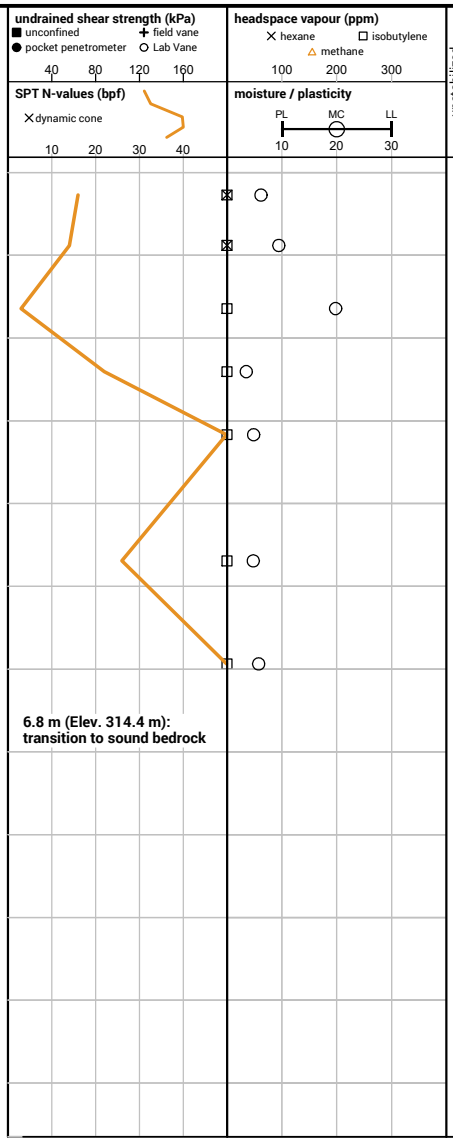
drill method : CME 75

elev depth (m)	description	graphic log	number	type	SPT N-value
321.2	**GROUND SURFACE**				
	100mm **ASPHALT**				
	75mm **AGGREGATE**		1	SS	16
	FILL, silty sand, trace gravel, trace rock fragments, trace topsoil, compact, dark brown, moist		2	SS	14
	...at 0.8 m, trace cinders, black staining				
	...at 1.2 m, very loose		3	SS	3
318.9 / 2.3	**SAND and GRAVEL**, trace silt, compact, light brown, moist		4	SS	22
	...at 3.0 m, very dense		5	SS	75
316.6 / 4.6	**SAND**, some gravel, trace silt, compact, light brown, moist		6	SS	26
315.1 / 6.1	**SANDY GRAVEL**, trace silt, trace rock fragments, very dense, brown, moist		7	SS	50 / 50mm
314.4 / 6.8	**GUELPH FORMATION** (See rock core log for details)		1	RUN	
			2	RUN	
			3	RUN	
			4	RUN	
309.4 / 11.8	**END OF BOREHOLE**				

mud rotary small OD=100 mm

rock coring (HQ) OD=96 mm





unstabilized water level

lab data and comments

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

SS1: PCBs

SS2: BTEX, PHCs, VOCs

SS3: EC/SAR, H-Ms, Metals, ORPs, PAHs

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

Contained drill water upon completion of drilling. Unstabilized water level not measured. Borehole was open.

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

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Aug 6, 2025	6.7	314.5
Sep 29, 2025	6.9	314.3
Oct 15, 2025	7.0	314.2
Oct 23, 2025	6.8	314.4

file: 25-121 gint.gpj

Tech : RR/EB | **PM** : DK/ET | **Rev** : KB

GROUNDED ENGINEERING

Date Started : Jul 30, 2025
Position : E: 560923, N: 4821483 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 301

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

Rock coring started at 6.8m below grade

GUELPH FORMATION
Dolostone, strong, grey to tan, crystalline, vuggy; gapped to closed, joints are horizontal to dipping, clean to stained

... at 6.8 m (Elev. 314.4 m), transition to sound rock

Run	elev. depth (m)	recovery
	314.4	
R1	6.8 – 7.3	TCR = **100**% SCR = **90**% RQD = **30**%
R2	7.3 – 8.8	TCR = **100**% SCR = **98**% RQD = **67**%
R3	8.8 – 10.3	TCR = **100**% SCR = **93**% RQD = **83**%
R4	10.3 – 11.8	TCR = **97**% SCR = **97**% RQD = **85**%
	309.4	

11.8m

END OF COREHOLE

elevation (m)	natural fracture frequency	laboratory testing	notes and comments
314	3		
	2		
	3		
	2		
	4		**6.8 / 314.4 - 9.0 / 312.2m:** vuggs ranging from 1mm to 10mm in size
313	3		
	3		**8.6 / 312.6m:** fractured rock
	1		**9.0 / 312.2 - 9.1 / 312.1m:** fractured rock
312	3		
	1		**9.0 / 312.2 - 9.8 / 311.4m:** vuggs ranging from 10mm to 70mm in size
	1		
311	0		
	1		
	2		**9.8 / 311.4 - 11.6 / 309.6m:** vuggs ranging from 1mm to 10mm in size
	1		
310	1	**El. 309.9m**: UCS = 64.3 MPa E = 58.30 GPa γ = 26.3 kN/m^3	
	1		

shale weathering zones: Z1 Z2 Z3 Z4

UCS (MPa) ● 5 25 50 100 250

estimated strength: R1 R2 R3 R4 R5 R6

depth (m): 7 8 9 10 11

graphic log

file: 25-121 gint.gpj

Tech : RR/EB | **PM** : DK/ET | **Rev** : KB

Borehole 301

Run #	Depth	Elevation
1	6.8 – 7.3 m	314.4 – 313.9 m
2	7.3 – 8.8 m	313.9 – 312.4 m
3	8.8 – 10.3 m	312.4 – 310.9 m
4	10.3 – 11.8 m	310.9 – 309.4 m

Runs 1 and 2

Runs 3 and 4

BOREHOLE LOG 302

Date Started : Jul 31, 2025
Position : E: 560925, N: 4821517 (UTM 17T)
Elev. Datum : Geodetic

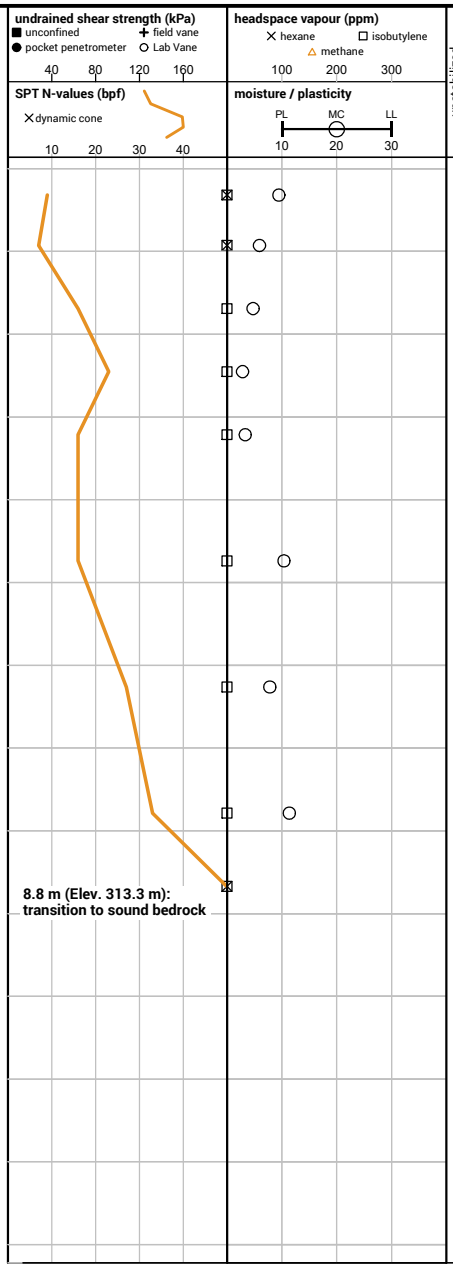
File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

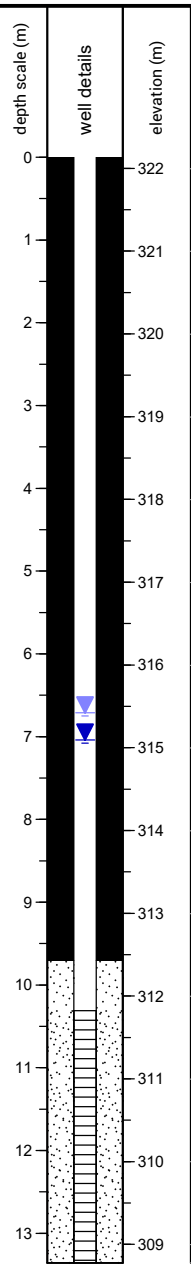
drill method : CME 75

elev depth (m)	description	graphic log	number	type	SPT N-value
322.1	**GROUND SURFACE**				
	100mm **ASPHALT**		1	SS	9
	75mm **AGGREGATE**				
	FILL, silty sand, some gravel, trace cinders, trace brick fragments, trace asphalt, loose, dark brown, moist		2	SS	7
320.6 1.5	...at 0.8 m, mild petroleum odour				
	SAND and GRAVEL, compact, light brown, moist		3	SS	16
			4	SS	23
319.1 3.0	**SAND**, trace gravel, trace silt, compact, light brown, moist		5	SS	16
	...at 4.6 m, some silt		6	SS	16
316.0 6.1	**SANDY GRAVEL**, trace rock fragments, trace silt, compact, light brown, moist		7	SS	27
	...at 7.6 m, some silt, dense, trace rock fragments, trace gypsum		8	SS	33
313.3 8.8	**GUELPH FORMATION** (See rock core log for details)		9	SS	50 / 0mm
			1	RUN	
			2	RUN	
			3	RUN	
308.7 13.4	**END OF BOREHOLE**				

mud rotary small OD=100 mm

rock coring (HQ) OD=96 mm





unstabilized water level

lab data and comments

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

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

SS2: BTEX, PHCs, VOCs

SS3: EC/SAR, H-Ms, Metals, ORPs, PAHs

43 47 8 2

1 91 7 1

6.1m: Auger grinding

SS7: BTEX, PHCs, VOCs

Contained drill water upon completion of drilling. Unstabilized water level not measured. Borehole was open.

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

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Aug 6, 2025	6.8	315.3
Sep 29, 2025	6.8	315.3
Oct 15, 2025	7.0	315.1
Oct 23, 2025	7.0	315.1

file: 25-121 gint.gpj

Tech : RR/EB | **PM** : DK/ET | **Rev** : KB

ROCK CORE LOG 302

Date Started : Jul 31, 2025
Position : E: 560925, N: 4821517 (UTM 17T)
Elev. Datum : Geodetic

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

Rock coring started at 8.8m below grade

depth (m)	stratigraphy	Run	elev. depth (m)	recovery	elevation (m)	natural fracture frequency	laboratory testing	notes and comments
			313.3					
9	**GUELPH FORMATION** **Dolostone**, strong, grey to tan, crystalline, vuggy; gapped to closed, joints are horizontal to dipping, clean to stained		8.8		313	0 0 1		313 **8.8 / 313.3 - 10.5 / 311.6m:** vuggs ranging from 10mm to 30mm in size
10	**... at 8.8 m (Elev. 313.3 m), transition to sound rock**	R1		TCR = **98%** SCR = **97%** RQD = **93%**	312	2 2		312
			311.8					
			10.3			0 2		**10.5 / 311.6 - 11.1 / 311.0m:** vuggs ranging from 10mm to 30mm in size
11		R2		TCR = **100%** SCR = **97%** RQD = **90%**	311	3 0		**11.1 / 311.0m:** fractured rock 311
			310.3					
			11.8			1 1		**11.2 / 311.0 - 12.8 / 309.3m:** vuggs ranging from 1mm to 10mm in size
12					310	1		310
		R3		TCR = **100%** SCR = **100%** RQD = **100%**		2	**El. 309.6m:** UCS = 53.8 MPa E = 38.80 GPa γ = 24.5 kN/m^3	
13						2 2		**12.8 / 309.3 - 12.9 / 309.2m:** vuggs ranging from 10mm to 20mm in size **12.9 / 309.2 - 13.3 / 308.9m:** vuggs <5mm in size
			308.7		309			309
			13.4m					**13.3 / 308.9 - 13.4 / 308.8m:** vuggs ranging from 5mm to 15mm in size
	END OF COREHOLE							

shale weathering zones: Z1, Z2, Z3, Z4

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

Tech : RR/EB | **PM** : DK/ET | **Rev** : KB

file: 25-121 gint.gpj

Borehole 302

Run #	Depth	Elevation
1	8.8 – 10.3 m	313.3 – 311.8 m
2	10.3 – 11.8 m	311.8 – 310.3 m
3	11.8 – 13.4 m	310.3 – 308.7 m

Runs 1 and 2

Runs 3

BOREHOLE LOG 401

Date Started : Oct 6, 2025
Position : E: 560912, N: 4821478 (UTM 17T)
Elev. Datum : Geodetic

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

drill method : Hilti DD350

elev depth (m)	description	graphic log	number	type	SPT N-value**
318.0	**GROUND SURFACE**				
	200mm **CONCRETE**				
	75mm **AGGREGATE**		1	SS	17
317.2 / 0.8	**SAND**, some silt, compact, light brown, moist		2	SS	6
	SANDY GRAVEL, loose to compact, brownish grey, wet ...at 1.5 m, rock fragments		3	SS	20
315.9 / 2.1	**SAND**, some silt to silty, some gravel, compact, brown, wet		4	SS	14
315.0 / 3.0	...at 3.0 m, sand and gravel, very dense		5	SS	50 / 25mm
	GUELPH FORMATION (See rock core log for details)		1	RUN	
			2	RUN	
			3	RUN	
			4	RUN	
			5	RUN	
			6	RUN	
310.3 / 7.7					

mud rotary small OD=100 mm

Rock coring (NQ) OD=76 mm

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

well details

elevation (m): 318, 317, 316, 315, 314, 313, 312, 311

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

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

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

moisture / plasticity: PL, MC, LL; 10, 20, 30

unstabilized water level

lab data and comments

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

3.3 m (Elev. 314.7 m): transition to sound bedrock

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

SS2: BTEX, PHCs, VOCs

SS3: BTEX, PCBs, PHCs, VOCs

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

3.0m: auger grinding

END OF BOREHOLE

Borehole was filled with drill water upon completion of drilling.

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

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Oct 15, 2025	3.6	314.4
Oct 23, 2025	3.6	314.4

file: 25-121 gint.gpj

Tech : RR | **PM** : DK/SB/ET | **Rev** : NN

** SPT N-values corrected based on energy of 32 kg hammer dropped 760 mm

GROUNDED ENGINEERING

Date Started : Oct 6, 2025
Position : E: 560912, N: 4821478 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 401

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

Rock coring started at 3.0m below grade

GUELPH FORMATION
Dolostone, strong, grey to tan, crystalline, vuggy; gapped to closed, joints are horizontal to dipping, clean to stained
... at 3.3 m (Elev. 314.7 m), transition to sound rock

Run	elev depth (m)	recovery
	315.0	
R1	3.0	TCR = **82%** SCR = **0%** RQD = **0%**
R2	3.3	TCR = **100%** SCR = **98%** RQD = **30%**
R3	313.7 4.3	TCR = **100%** SCR = **97%** RQD = **72%**
R4	312.7 5.3	TCR = **89%** SCR = **89%** RQD = **71%**
R5	311.8 6.2	TCR = **100%** SCR = **94%** RQD = **81%**
R6	311.0 7.0	TCR = **100%** SCR = **100%** RQD = **100%**
	310.3 **7.7m**	

END OF COREHOLE

ISRM weathering grades: 1 2 3 4
UCS (MPa): 5 25 50 100 250
estimated strength: R1 R2 R3 R4 R5 R6
natural fracture frequency: >10, 6, 4, 4, 4, 3, 2, 2, 3, 2, 1, 2, 2, 0, 1, 1

El. 314.1m:
UCS = 36.1 MPa
E = 18.60 GPa
γ = 24.6 kN/m^3

3.0 / 315.0 - 3.3 / 314.8m: fractured rock

3.3 / 314.7 - 4.3 / 313.7m: vuggs ranging from 1mm to 15mm in size

4.3 / 313.7m: fractured rock

4.3 / 313.7 - 4.7 / 313.3m: vuggs ranging from 1mm to 20mm in size

4.7 / 313.3 - 5.6 / 312.5m: vuggs ranging from 1mm to 5mm in size

5.6 / 312.5m: JT D UN R GA CN

5.6 / 312.5 - 6.2 / 311.8m: vuggs ranging from 10mm to 30mm in size

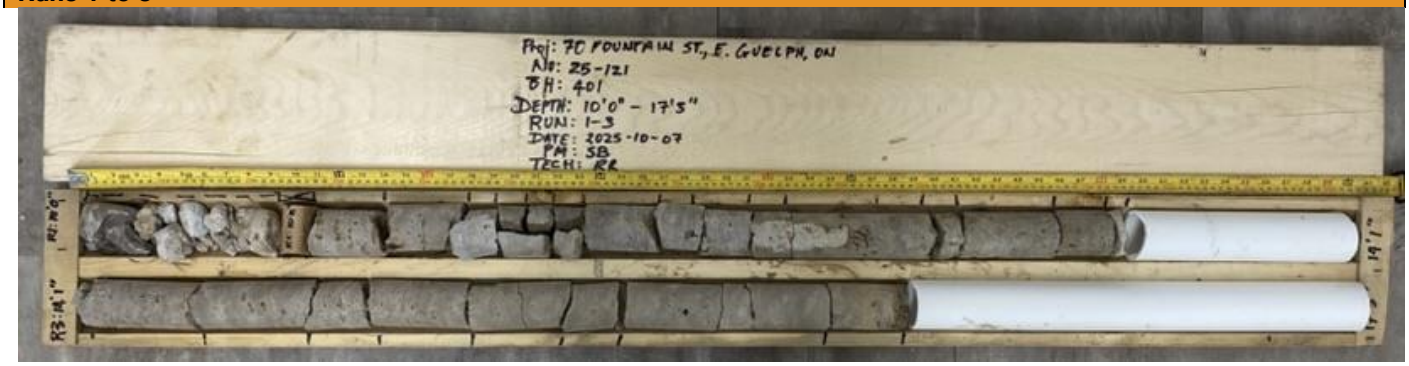
6.2 / 311.8 - 6.3 / 311.8m: fractured rock

6.2 / 311.8 - 7.7 / 310.4m: vuggs ranging from 1mm to 10mm in size

Borehole 401

Run #	Depth	Elevation
1	3.0 – 3.3 m	315.0 – 314.7 m
2	3.3 – 4.3 m	314.7 – 313.7 m
3	4.3 – 5.3 m	313.7 – 312.7 m
4	5.3 – 6.2 m	312.7 – 311.8 m
5	6.2 – 7.0 m	311.8 – 311.0 m
6	7.0 – 7.7 m	311.0 – 310.3 m

Runs 1 to 3



Runs 4 to 6

BOREHOLE LOG 402

Date Started : Oct 9, 2025
Position : E: 560921, N: 4821462 (UTM 17T)
Elev. Datum : Geodetic

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

drill method : *Hilti DD350*

elev depth (m)	description	graphic log	number	type	SPT N-value
318.0	**GROUND SURFACE**				
317.6 / 0.4	250mm **CONCRETE**				
	100mm **AGGREGATE**		1	SS	16
	SAND, some gravel, trace silt, trace rock fragments, compact, light brown, moist ...at 0.8 m, wet		2	SS	14
316.5 / 1.5	**SANDY GRAVEL**, trace rock fragments, very dense, brownish grey, wet		3	SS	72
315.7 / 2.3	**SILTY SAND**, some gravel, dense, brown, wet		4	SS	38
315.0 / 3.0	**INFERRED BEDROCK**, dolostone fragments		5	SS	60 / 75mm
314.9 / 3.1	**GUELPH FORMATION** (See rock core log for details)		1	RUN	
			2	RUN	
			3	RUN	
			4	RUN	
310.2 / 7.8			5	RUN	

mud rotary small OD=100 mm

rock coring (NQ) OD=76 mm

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

well details

elevation (m) 318 317 316 315 314 313 312 311

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

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

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

moisture / plasticity
PL MC LL
10 20 30

3.5 m (Elev. 314.5 m): transition to sound bedrock

unstabilized water level

lab data and comments

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

SS1: EC/SAR, H-Ms, Metals, ORPs, PAHs, PCBs, pH

SS2: BTEX, PHCs, VOCs

SS3: BTEX, PHCs, VOCs

SS4: EC/SAR, H-Ms, Metals, ORPs, PAHs, pH
2.7m: auger grinding

END OF BOREHOLE

Borehole was filled with drill water upon completion of drilling.

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

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Oct 15, 2025	3.9	314.1
Oct 23, 2025	4.0	314.0

file: 25-121 gint.gpj

Tech : RR | **PM** : SB/ET | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Oct 9, 2025
Position : E: 560921, N: 4821462 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 402

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

depth (m)	stratigraphy	Run / elev. depth (m)	recovery	elevation (m)	ISRM weathering grades (1 2 3 4)	UCS (MPa) 5 25 50 100 250 / estimated strength R1 R2 R3 R4 R5 R6	natural fracture frequency	laboratory testing	notes and comments	elevation (m)
	Rock coring started at 3.1m below grade	**314.9**								
	GUELPH FORMATION **Dolostone**, strong, grey to tan, crystalline, vuggy; gapped to closed, joints are horizontal to dipping, clean to stained **... at 3.5 m (Elev. 314.5 m), transition to sound rock**	3.1 R1 313.7	TCR = **100**% SCR = **76**% RQD = **56**%				3 1 1		**3.1 / 314.9 - 3.2 / 314.8m:** fractured rock **3.3 / 314.7 - 3.5 / 314.6m:** fractured rock **3.8 / 314.3m:** 15mm to 20mm Vugg in size	
4				314					**4.0 / 314.0 - 4.1 / 314.0m:** fractured rock **3.1 / 314.9 - 5.2 / 312.8m:** vuggs ranging from 1mm to 10mm in size	314
		4.3 R2 312.8	TCR = **81**% SCR = **78**% RQD = **67**%				3 3 2		**4.5 / 313.5m:** fractured rock	
5				313			2 0			313
		5.2 R3 311.9	TCR = **100**% SCR = **95**% RQD = **74**%				3 2		**5.6 / 312.4 - 5.7 / 312.3m:** fractured rock **5.2 / 312.8 - 6.4 / 311.6m:** vuggs ranging from 1mm to 50mm in size	
6				312			4 0		**6.5 / 311.6 - 6.5 / 311.5m:** fractured rock	312
		6.1 R4 310.9	TCR = **97**% SCR = **96**% RQD = **78**%				2 2			
7				311						311
		7.1 R5 310.2	TCR = **100**% SCR = **100**% RQD = **100**%				0 0		**7.1 / 310.9 - 7.6 / 310.5m:** vuggs ranging from 1mm to 10mm in size **7.6 / 310.5m:** vuggs ranging from 20mm to 30mm in size **7.6 / 310.4 - 7.8 / 310.3m:** vuggs ranging from 1mm to 10mm in size	
	END OF COREHOLE	**7.8m**								

file: 25-121 gint.gpj

Tech : RR | **PM** : SB/ET | **Rev** : NN

Borehole 402

Run #	Depth	Elevation
1	3.1 – 4.3 m	314.9 – 313.7 m
2	4.3 – 5.2 m	313.7 – 312.8 m
3	5.2 – 6.1 m	312.8 – 311.9 m
4	6.1 – 7.1 m	311.9 – 310.9 m
5	7.1 – 7.8 m	310.9 – 310.2 m

Runs 1 and 2

Runs 3 to 5

BOREHOLE LOG 403

Date Started : Oct 10, 2025
Position : E: 560934, N: 4821467 (UTM 17T)
Elev. Datum : Geodetic

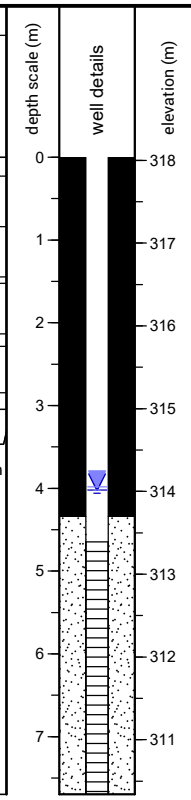
File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

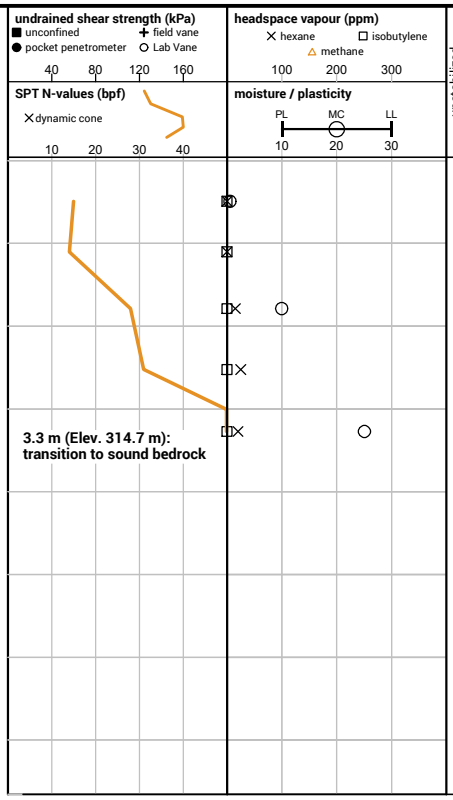
drill method : *Hilti DD350*

elev depth (m)	description	graphic log	number	type	SPT N-value
318.0	**GROUND SURFACE**				
	225mm **CONCRETE**				
	50mm **AGGREGATE**		1	SS	15
	GRAVELLY SAND, trace silt, compact, brown, moist		2	SS	14
	...at 1.5 m, wet		3	SS	28
315.7					
2.3	**GRAVEL**, some sand, dense to very dense, brown		4	SS	31
314.7			5	SS	50 / 0mm
3.3	**INFERRED BEDROCK**, dolostone fragments		6	SS	
314.7			1	RUN	50 / 25mm
3.3	**GUELPH FORMATION** (See rock core log for details)		2	RUN	
			3	RUN	
			4	RUN	
			5	RUN	
			6	RUN	
310.3					
7.7					

mud rotary small OD=100 mm

rock coring (NQ) OD=76 mm





unstabilized water level

lab data and comments

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

SS1: BTEX, PHCs, VOCs

SS2: EC/SAR, H-Ms, Metals, ORPs, PAHs, OCs, pH

SS3: PAHs

SS4: BTEX, EC/SAR, H-Ms, Metals, ORPs, pH, PHCs, VOCs
3.0m: auger grinding **to 3.3m**

END OF BOREHOLE

Borehole was filled with drill water upon completion of drilling.

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

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Oct 23, 2025	4.0	314.0

file: 25-121 gint.gpj

Tech : RR | **PM** : SB/ET | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Oct 10, 2025
Position : E: 560934, N: 4821467 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 403

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

Rock coring started at 3.3m below grade

depth (m)	stratigraphy	Run	elev. depth (m)	recovery	elevation (m)	ISRM weathering grades	UCS (MPa) / estimated strength	natural fracture frequency	laboratory testing	notes and comments	elevation (m)
			314.7			1 2 3 4	5 25 50 100 250 R1 R2 R3 R4 R5 R6				
	GUELPH FORMATION **Dolostone**, strong, grey to tan, crystalline, vuggy; gapped to closed, joints are horizontal to dipping, clean to stained **... at 3.3 m (Elev. 314.7 m), transition to sound rock**	3.3 R1		TCR = **100%** SCR = **100%** RQD = **88%**				0 2	**El. 314.6m**: UCS = 31 MPa E = 18.40 GPa γ = 24.8 kN/m^3		
		3.7 R2		TCR = **96%** SCR = **96%** RQD = **96%**	314			0 0			314
		4.3 R3	312.9	TCR = **100%** SCR = **100%** RQD = **62%**				1 0			
		5.1 R4	312.0	TCR = **100%** SCR = **94%** RQD = **68%**	313			3 3			313
		6.0 R5	311.2	TCR = **72%** SCR = **94%** RQD = **78%**	312			1 2 2 1		**3.3 / 314.7 - 5.1 / 312.9m:** vuggs ranging from 1mm to 15mm in size **5.1 / 312.9 - 6.2 / 311.8m:** vuggs ranging from 1mm to 30mm in size **5.9 / 312.1 - 6.0 / 312.1m:** fractured rock **6.2 / 311.8 - 6.3 / 311.8m:** fractured rock **6.3 / 311.7 - 6.4 / 311.6m:** large vug **6.2 / 311.8 - 6.8 / 311.3m:** vuggs ranging from 1mm to 80mm in size	312
		6.8 R6	310.3	TCR = **100%** SCR = **100%** RQD = **97%**	311			0 2 0 0		**6.8 / 311.3 - 7.7 / 310.3m:** vuggs ranging from 1mm to 10mm in size **7.2 / 310.8 - 7.3 / 310.7m:** fractured rock	311
	END OF COREHOLE		**7.7m**								

file: 25-121 gint.gpj

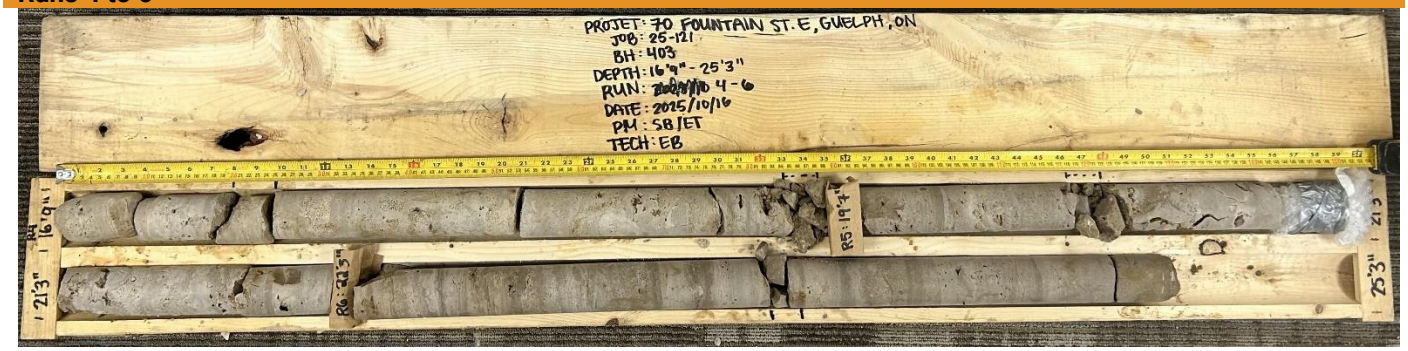
Tech : RR | **PM** : SB/ET | **Rev** : NN

Borehole 403

Run #	Depth	Elevation
1	3.3 – 3.7 m	314.7 – 314.3 m
2	3.7 – 4.3 m	314.3 – 313.3 m
3	4.3 – 5.1 m	313.3 – 312.9 m
4	5.1 – 6.0 m	312.9 – 312.0 m
5	6.0 – 6.8 m	312.0 – 311.2 m
6	6.8 – 7.7 m	311.2 – 310.3 m

Runs 1 to 3

Runs 4 to 6



GROUNDED ENGINEERING

Date Started : Oct 10, 2025
Position : E: 560914, N: 4821486 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 404

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

drill method : CME 75

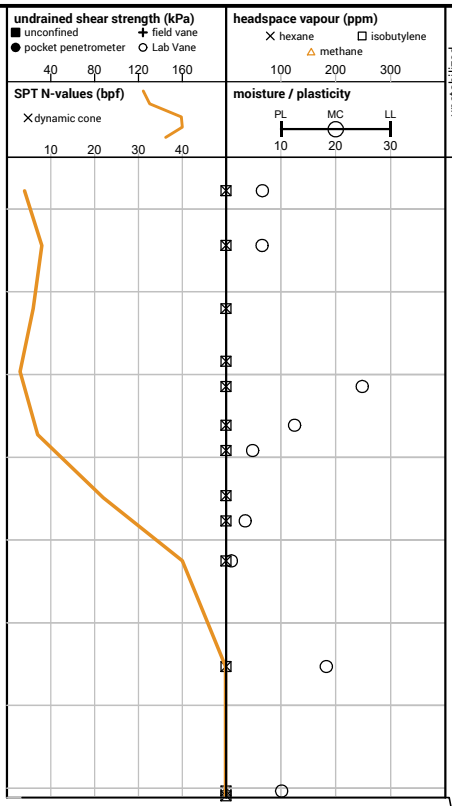
hollow stem augers OD=215 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
321.6	**GROUND SURFACE**				
	100mm **ASPHALT**		1	SS	4
	FILL, sandy gravel, trace asphalt, trace rock fragments, loose to very loose, dark brown to black, moist		2	SS	8
			3	SS	6
	...at 2.6 m, layer of sandy silt, clayey, trace gravel, brown. very soft, wet		4A	SS	3
	...at 3.0 m, gravelly sand, some silt, some clay, dark brown, moist		4B		
	...at 3.4 m, sandy gravel, loose to compact, brown		5A	SS	7
			5B		
317.2			6A	SS	22
4.4	**GRAVELLY SAND**, trace silt, trace clay, compact to dense, brown, moist		6B		
			7	SS	40
	...at 6.1 m, wet, very dense		8	SS	50 / 115mm
314.0					
313.9	**INFERRED BEDROCK**, dolostone fragments		9	SS	50 / 75mm
7.7			10	SS	50 / 40mm

END OF BOREHOLE
Auger refusal on inferred bedrock

Unstabilized water level measured at 7.3 m below ground surface upon completion of drilling.

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



GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Oct 15, 2025	7.1	314.5
Oct 23, 2025	7.1	314.5

file: 25-121 gint.gpj

Tech : EB | **PM** : SB/ET | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Oct 8, 2025
Position : E: 560926, N: 4821491 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 405

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

drill method : CME 75

hollow stem augers OD=215 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
321.8	**GROUND SURFACE**				
	100mm **ASPHALT**		1	SS	20
321.0 / 0.8	**FILL**, sand and gravel, trace brick fragments, compact, brown, moist		2	SS	96 / 265mm
	SAND AND GRAVEL, very dense, brown, moist		3	SS	77
319.5 / 2.3	**SAND**, some gravel to gravelly, trace silt, trace rock fragments, compact to dense, brown, moist		4	SS	45
			5	SS	31
	...at 3.8 m, some silt		6A	SS	16
	...at 4.3 m, trace silt		6B		
			7	SS	49
315.7					
315.5 / 6.3	...at 6.1 m, trace clay, some silt		8A	SS	50 / 75mm
	INFERRED BEDROCK, dolostone fragments		8B	SS	
			9	SS	50 / 75mm
			10		50 / 50mm

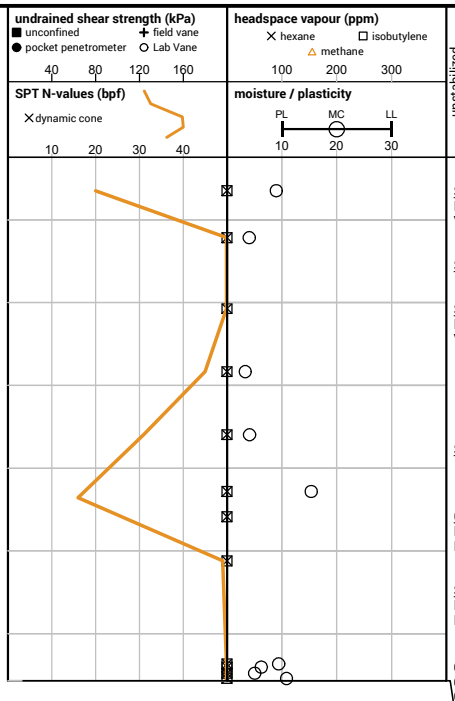
END OF BOREHOLE
Auger refusal on inferred bedrock

Unstabilized water level measured at 5.7 m below ground surface; caved to 6.0 m below ground surface upon completion of drilling.

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

well details

elevation (m) 321 320 319 318 317 316



unstabilized water level

lab data and comments

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

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

SS2: PAHs

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

SS5: PAHs

6B: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs

SS7: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs

6.1m: auger grinding **to 6.2m**
6.2m: auger grinding

file: 25-121 gint.gpj

Tech : EB | **PM** : SB/ET | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Oct 9, 2025
Position : E: 560923, N: 4821500 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 406

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

drill method : CME 75

hollow stem augers OD=215 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
321.6	**GROUND SURFACE**				
	100mm **ASPHALT**		1	SS	4
320.8 (0.8)	**FILL**, gravel, some sand, very loose, brown, moist		2	SS	22
	FILL, sand, some gravel, compact, brown, moist		3A	SS	14
	...at 2.0 m, layer of sandy silt, clayey, some gravel, trace rock fragments, brown, stiff, moist		3B		
318.6 (3.0)	**SAND**, some gravel, trace rock fragments, compact to dense, brown, moist		4	SS	21
			5	SS	13
			6	SS	19
			7A	SS	37
314.8 (6.8)	...at 6.6 m, silty, trace clay		7B		
314.8 (6.8)	**INFERRED BEDROCK**, dolostone fragments		8	SS	50 / 25mm

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

well details

elevation (m): 321, 320, 319, 318, 317, 316, 315

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

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

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

moisture / plasticity
PL MC LL
10 20 30

unstabilized water level

lab data and comments

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

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

SS5: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, PHCs, VOCs

SS6: BTEX, EC/SAR, H-Ms, Metals, ORPs, pH, PHCs

7A: BTEX, PAHs, PHCs, VOCs

6.7m: auger grinding
6.8m: auger refusal

END OF BOREHOLE
Auger refusal on inferred bedrock

Borehole was dry and caved to 6.1 m below ground surface upon completion of drilling.

file: 25-121 gint.gpj

Tech : EB | **PM** : SB/ET | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Oct 7, 2025
Position : E: 560940, N: 4821494 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 407

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

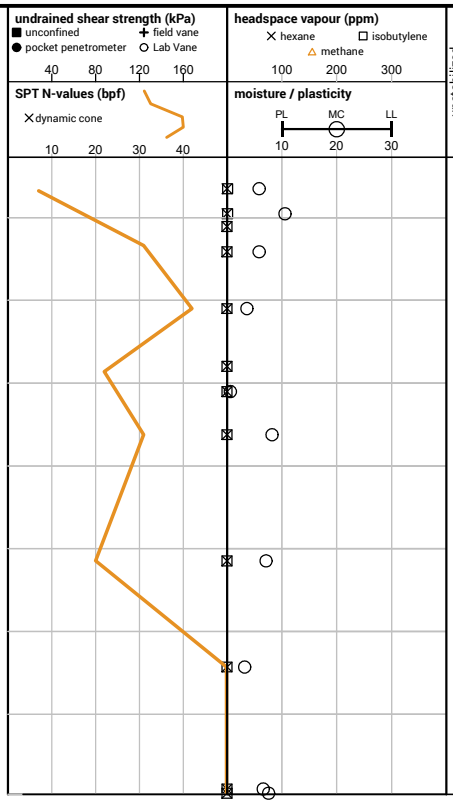
drill method : Hilti DD350

elev depth (m)	description	graphic log	number	type	SPT N-value
320.7	**GROUND SURFACE**				
	100mm **ASPHALT**		1A	SS	7
	FILL, sand and gravel, loose, brown to black, moist		1B/2A/2B	SS	31
	...at 0.9 m, dense		3	SS	42
318.4 / 2.3	**SAND**, some gravel, some silt, compact, brown, moist		4A/4B	SS	22
	...at 3.0 m, dense		5	SS	31
	...at 4.6 m, layer of silty sand, trace gravel		6	SS	20
	...at 6.1 m, sand and gravel, very dense		7	SS	50 / 125mm
313.1 / 313.0 / 7.7	**INFERRED BEDROCK**, dolostone fragments		8/9	SS/SS	50 / 25mm / 50 / 25mm

hollow stem augers OD=215 mm

END OF BOREHOLE
Auger refusal on inferred bedrock

Unstabilized water level measured at 4.9 m below ground surface; caved to 5.5 m below ground surface upon completion of drilling.



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

elevation (m): 320 319 318 317 316 315 314

unstabilized water level

lab data and comments

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

1A: EC/SAR, H-Ms, Metals, ORPs, PAHs, pH

2A: BTEX, PHCs, VOCs

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

4A: EC/SAR, H-Ms, Metals, ORPs, PAHs, pH

4B: BTEX, PHCs, VOCs

SS6: EC/SAR, H-Ms, Metals, ORPs, PAHs, pH

SS7: BTEX, PHCs, VOCs
6.4m: auger grinding **to 7.0m**

7.6m: auger grinding

file: 25-121 gint.gpj

Tech : EB | **PM** : SB/ET | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Oct 8, 2025
Position : E: 560932, N: 4821505 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 408

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

drill method : CME 75

hollow stem augers OD=215 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
321.5	**GROUND SURFACE**				
	95mm **ASPHALT**		1A, 1B, 1C	SS	5
	FILL, sand and gravel, loose to very loose, brown, moist ...at 0.2 m, black ...at 0.4 m, sandy silt, clayey, trace gravel, trace wood fragments, brown, moist, loose to very loose ...at 1.5 m, dense		2	SS	2
			3	SS	31
319.2					
2.3	**SAND**, trace gravel, trace silt, compact to dense, brown, moist		4	SS	33
	...at 3.0 m, silty, wet		5A	SS	13
	...at 3.6 m, trace to some silt, moist		5B		
	...at 4.6 m, wet		6A	SS	36
	...at 4.9 m, moist		6B		
	...at 6.1 m, silty sand, some gravel, some clay, brown, moist, compact		7	SS	26
	...at 7.6 m, rock fragments, very dense		8	SS	50 / 15mm
312.4					
312.3	**INFERRED BEDROCK**, dolostone fragments		9	SS	50 / 25mm
9.2			10	SS	50 / 25mm

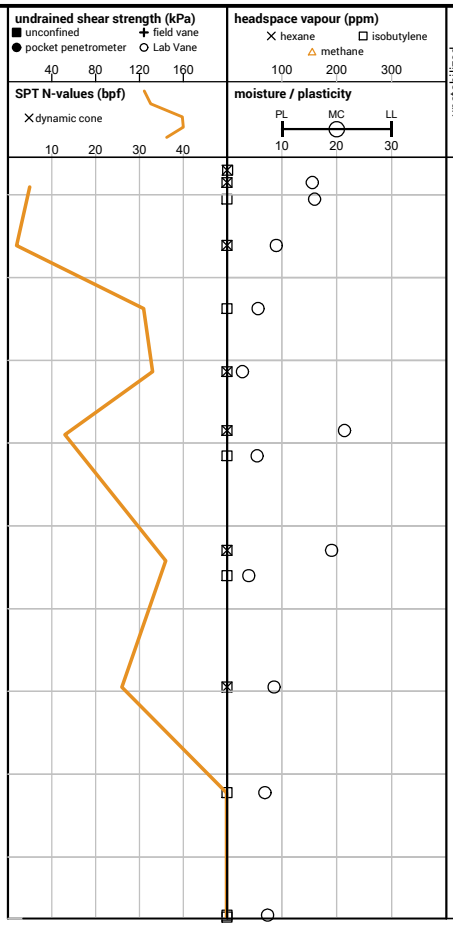
END OF BOREHOLE
Auger refusal on inferred bedrock

Unstabilized water level measured at 8.2 m below ground surface; caved to 8.5 m below ground surface upon completion of drilling.

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

well details

elevation (m) 321 320 319 318 317 316 315 314 313



unstabilized water level

lab data and comments

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

1A: BTEX, EC/SAR, H-Ms, Metals, ORPs, pH, VOCs

1B: BTEX, PHCs

1C: PAHs

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

5A: BTEX, PHCs, VOCs

13 45 30 12

SS7: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, pH, VOCs

7.6m: spoon bouncing, auger grinding

9.1m: auger grinding

GROUNDED ENGINEERING

Date Started : Oct 8, 2025
Position : E: 560928, N: 4821522 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 409

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

drill method : CME 75

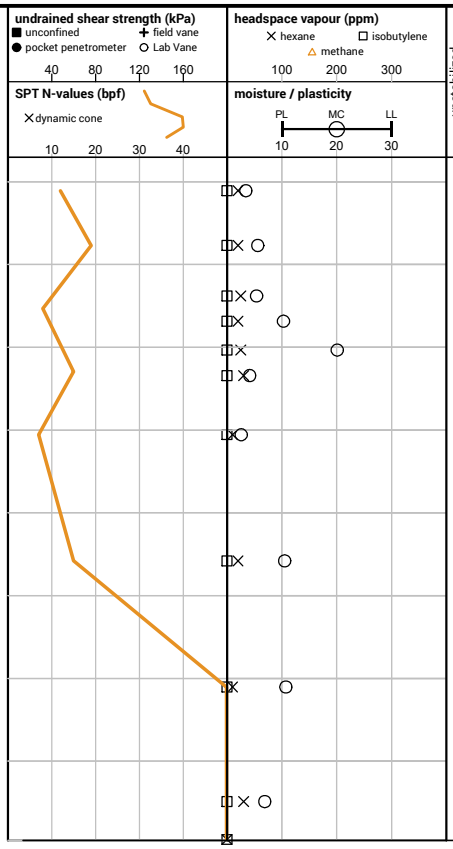
hollow stem augers OD=215 mm

elev depth (m)	description	graphic log	number	type	SPT N-value
322.3	**GROUND SURFACE**				
	100mm **ASPHALT**		1	SS	12
321.5	**FILL**, sand and gravel, compact, brown, moist				
0.8	**SAND**, trace gravel, trace silt, loose to compact, brown, moist		2	SS	19
	...at 1.8 m, some silt		3A / 3B	SS	8
	...at 2.3 m, wet ...at 2.4 m, trace silt, moist		4A / 4B	SS	15
			5	SS	7
			6	SS	15
	...at 6.1 m, gravelly sand, some rock fragments, brown, wet, very dense		7	SS	69
	...at 7.6 m, silty sand, trace clay, trace gravel, moist, very dense		8	SS	77 / 175mm
314.1					
314.0	**INFERRED BEDROCK**, dolostone fragments		9	SS	50 / 25mm
8.3					

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

well details

elevation (m): 322 321 320 319 318 317 316 315



unstabilized water level

lab data and comments

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

SS1: BTEX, PAHs, CPs, PCBs, PHCs, VOCs

SS2: EC/SAR, H-Ms, Metals, ORPs, pH

3B: BTEX, EC/SAR, H-Ms, Metals, ORPs, PAHs, PCBs, pH, PHCs, VOCs

0 88 9 3

SS7: BTEX, PHCs, VOCs

SS8: EC/SAR, H-Ms, Metals, ORPs, PAHs, pH

8.2m: auger grinding

END OF BOREHOLE
Auger refusal on inferred bedrock

Unstabilized water level measured at 5.5 m below ground surface; caved to 5.8 m below ground surface upon completion of drilling.

file: 25-121 gint.gpj

Tech : EB | **PM** : SB/ET | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Oct 6, 2025
Position : E: 560948, N: 4821508 (UTM 17T)
Elev. Datum : Geodetic

BOREHOLE LOG 410

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

drill method : CME 75

elev depth (m)	description	graphic log	sample number	sample type	SPT N-value
321.3	**GROUND SURFACE**				
	100mm **ASPHALT**				
	FILL, sand and gravel, trace rock fragments, loose to very loose, dark brown, moist		1	SS	7
			2	SS	3
319.7 / 1.6	**SAND**, some silt, trace gravel, dense to compact, brown, moist		3A / 3B	SS	37
			4A / 4B	SS	26
318.3 / 3.0	**SAND AND GRAVEL**, some rock fragments, compact to dense, brown to grey, moist		5	SS	19
			6	SS	35
	...at 6.1 m, very dense		7	SS	57
313.7 / 7.6	**INFERRED BEDROCK**, dolostone fragments		8	SS	50 / 50mm
			9	SS	50 / 25mm
312.4 / 8.9	**GUELPH FORMATION** (See rock core log for details)		10	SS	50 / 25mm
			1	RUN	
			2	RUN	
			3	RUN	
308.4 / 12.9					

hollow stem augers OD=215 mm

rock coring (HQ) OD=96 mm

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

well details

elevation (m): 321 320 319 318 317 316 315 314 313 312 311 310 309

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

8.9 m (Elev. 312.4 m): transition to sound bedrock

unstabilized water level

lab data and comments

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

SS1: EC/SAR, H-Ms, Metals, ORPs, PAHs, CPs, pH

SS2: BTEX, PCBs, PHCs, VOCs

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

4A: BTEX, VOCs

4B: BTEX, PHCs

SS5: EC/SAR, H-Ms, Metals, ORPs, pH

4.6m: auger grinding

6.1m: spoon bouncing

SS7: BTEX, PAHs, PHCs, VOCs

7.9m: auger grinding **to 8.8m**

8.8m: spoon bouncing

END OF BOREHOLE

Unstabilized water level measured at 7.5 m below ground surface upon completion of drilling.

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

GROUNDWATER LEVELS

date	depth (m)	elevation (m)
Oct 15, 2025	6.4	314.9
Oct 23, 2025	6.5	314.8

file: 25-121 gint.gpj

Tech : EB | **PM** : SB/ET | **Rev** : NN

GROUNDED ENGINEERING

Date Started : Oct 6, 2025
Position : E: 560948, N: 4821508 (UTM 17T)
Elev. Datum : Geodetic

ROCK CORE LOG 410

File No. : 25-121 **Project** : 70 Fountain Street East, Guelph, Ontario **Client** : Fitzrovia

depth (m)	graphic log	stratigraphy	Run elev. depth (m)	recovery	elevation (m)	ISRM weathering grades	UCS (MPa) / estimated strength	natural fracture frequency	laboratory testing	notes and comments	elevation (m)
		Rock coring started at 8.9m below grade	**312.4**			1 2 3 4	5 25 50 100 250 R1 R2 R3 R4 R5 R6				
9		**GUELPH FORMATION** **Dolostone**, strong, grey to tan, crystalline, vuggy; gapped to closed, joints are horizontal to dipping, clean to stained **... at 8.9 m (Elev. 312.4 m), transition to sound rock**	8.9					1	**El. 312.3m:** UCS = 48 MPa E = 25.60 GPa γ = 24.5 kN/m^3	**8.8 / 312.5 - 9.3 / 312.0m:** vuggs ranging from 1mm to 30mm in size	
					312			1			312
			R1	TCR = **100%** SCR = **91%** RQD = **80%**				0			
10								>10		**9.9 / 311.4 - 10.1 / 311.2m:** fractured rock	
			310.9		311			1		**9.3 / 312.0 - 11.4 / 309.9m:** vuggs ranging from 1mm to 10mm in size	311
			10.4					3			
			R2	TCR = **88%** SCR = **86%** RQD = **48%**				3			
11								2			
			309.9		310			1			310
			11.4							**11.5 / 309.8m:** JT H PR OP VN sand	
								2		**11.8 / 309.5m:** JT H PR OP VN sand	
12								3		**12.0 / 309.3m:** JT H PR OP VN sand	
			R3	TCR = **100%** SCR = **97%** RQD = **81%**	309					**11.4 / 309.9 - 12.9 / 308.4m:** vuggs ranging from 1mm to 15mm in size	309
								2		**12.2 / 309.1m:** JT H PR OP VN sand	
										12.3 / 309.0 - 12.4 / 308.9m: fractured rock	
								2		**12.5 / 308.8m:** JT H PR OP VN sand	
			308.4					1		**12.6 / 308.7m:** JT H PR OP VN sand	
			12.9m								

END OF COREHOLE

file: 25-121 gint.gpj

Tech : EB | **PM** : SB/ET | **Rev** : NN

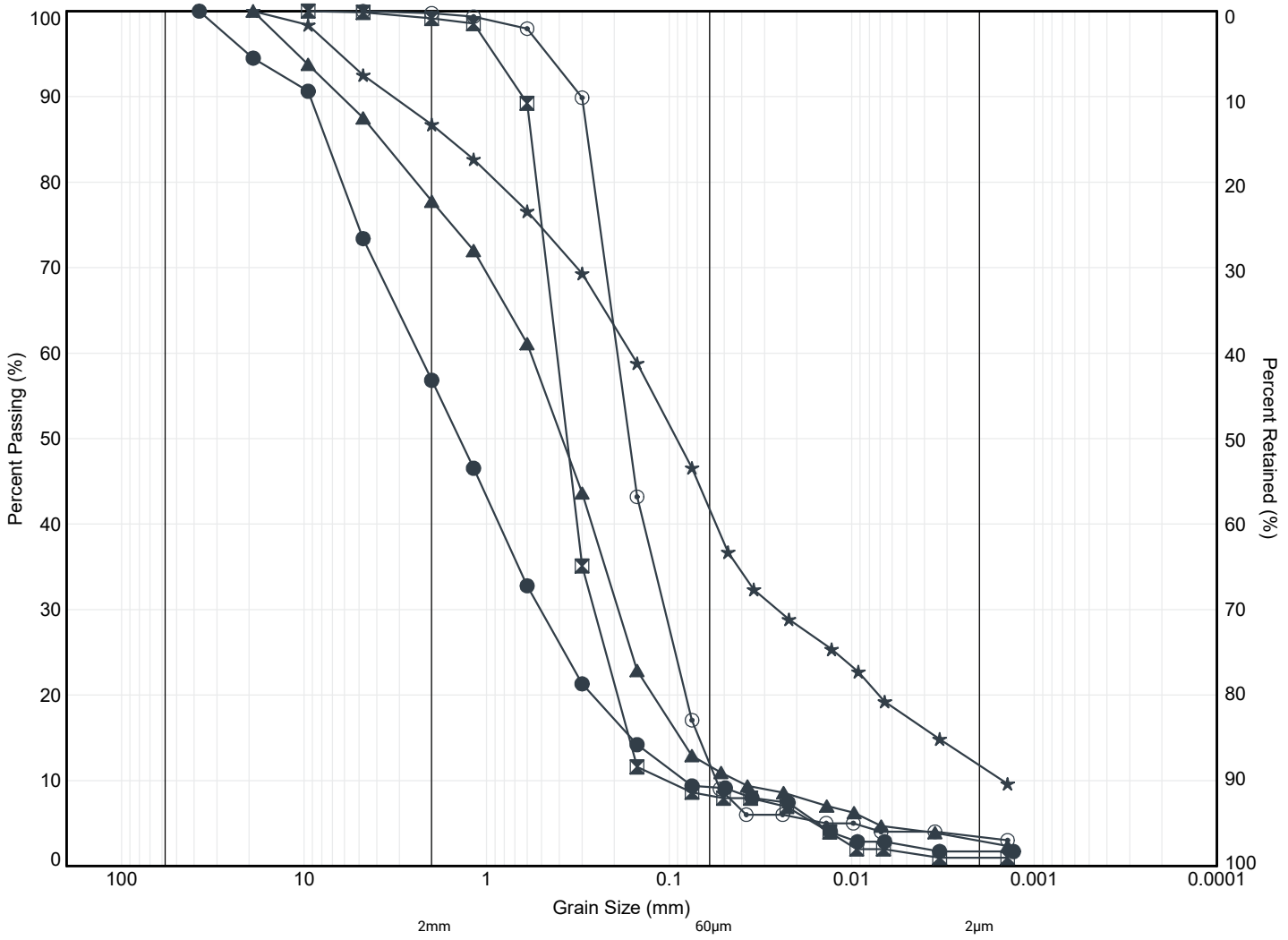
Borehole 410

Run #	Depth	Elevation
1	8.8 – 10.4 m	312.4 – 310.9 m
2	10.4 – 11.4 m	310.9 – 309.9 m
3	11.4 – 12.9 m	309.9 – 308.4 m

Runs 1

Runs 2 and 3

APPENDIX B



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

MIT SYSTEM

	Location	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
●	**BH 302**	SS4	2.6	319.5	43	47	8	2
⊠	**BH 302**	SS5	3.4	318.8	1	91	7	1
▲	**BH 404**	6B	4.4	317.2	22	66	9	3
★	**BH 408**	SS7	6.4	315.0	13	45	30	12
⊙	**BH 409**	4B	2.6	319.7	0	88	9	3

GROUNDED ENGINEERING

Title: **GRAIN SIZE DISTRIBUTION**

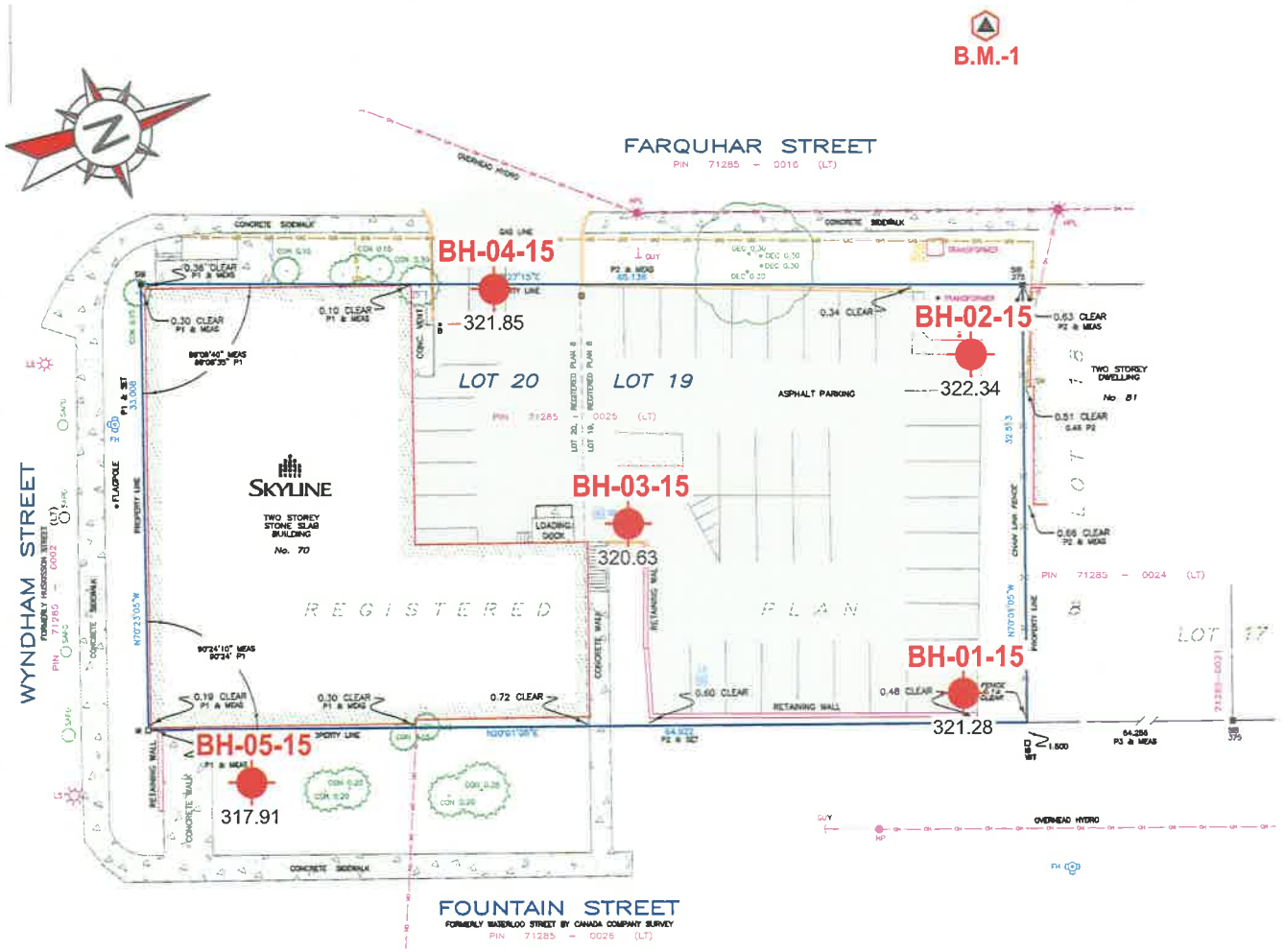
File No.: **25-121**

file: 25-121 gint.gpj

APPENDIX C

G:\161\PROJECTS\2015\B-0013813 70 FOUNTAIN STREET, GUELPH\Z4_CAD\B-13813-1_SITE PLAN_DWG2.DWG

0 1 2 3 4 5 10 cm



LEGEND :

BH-01-15 — BOREHOLE LOCATION

321.28 — GROUND SURFACE ELEVATION (m)

B.M.-1 — TEMPORARY BENCHMARK

NOTES :

1-REFERENCES : COMPANY: Van Harten Surveying Inc., PROJECT: Surveyor's Real Property Report All of Lots 19 and 20 , PLAN: Registered Plan 8, DATE: Feb 7, 2011

2-TEMPORARY BENCHMARK : Cut 'T' in the West Sidewalk of Farquhar Street, Elevation 323.61 m (geodetic)

3-Drawing scale may be distorted due to file conversion and/or copying. Measurements taken from the drawing must be verified in the field.

Project

Proposed 18 Storey Highrise Building

70 Fountain Street, Guelph

Title

Site Plan

Englobe

Englobe Corp.
12-60 Meg Drive
London (Ontario) N6E 3T6
Telephone : 519.685.6400
Fax : 519.685.0943

Prepared	A.Stewart	Discipline	GEOTECHNICAL	Project manager	R.Helwig
Drawn	A.Stewart	Scale	1 : 500	Sequence no.	02 of 02
Checked	S.Burt	Date	2015-11-30		

M. dept.	Project	Disc.	Dwg no.	Rev.
161	B-0013813-1	GE	002	00

CONSULTING SOILS AND MATERIALS ENGINEERS

12 - 60 Meg Drive, London, ON, N6E 3T6 Phone: 519-685-6400 Fax: 519-685-0943

REF. NO.: B-0013813-1
CLIENT: Tricar Developments
PROJECT: Proposed 18 Storey Highrise Building
LOCATION: 70 Fountain Street, Guelph
DATUM ELEVATION: Cut 'T' in Sidewalk, 323.61 m

LOG OF BOREHOLE NO.
01-15

Encl. No. 1 (Sheet 1 of 1)
DRILLING DATA: Morokka Drill Rig
METHOD: Solid Stem Augers
DIAMETER: 150mm
DATE: Nov 19, 2015

Elev. metres	Depth metres	DESCRIPTION	SYMBOL	GROUND WATER	NUMBER	TYPE	"N" Blows/ft	Penetration Resistance Blows/ft (20 40 60 80) / Undrained Shear Strength kPa ▲ Field Vane Test ★ Compression Test (20 40 60 80)	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
321.28	0	60mm ASPHALT.									
321		Loose, brown, silty sand FILL, some gravel.			1	ss	6			6	
320	1										
		Dense, brown, SAND & GRAVEL, some silt.			2	ss	74			2	
319	2										
					3	ss	43			2	
		Dense to compact, brown, fine SAND & GRAVEL, some silt to silty.									
318	3				4	ss	36			3	
317	4				5	ss	24			6	
	5	Dense, brown, sandy SILT till, gravelly seams.			6	ss	47			6	
316											
	6										
315					7	ss	36			14	
	7			▽							
314		Weathered limestone BEDROCK.									
					8	ss	50/1"	50/1"			
		End of Borehole due to auger refusal. Water level at 7.3m depth at completion.									

LOG OF BOREHOLE B-0013813-1.GPJ ATK_DAV.GDT 10/12/15

CONSULTING SOILS AND MATERIALS ENGINEERS

12 - 60 Meg Drive, London, ON, N6E 3T6 Phone: 519-685-6400 Fax: 519-685-0943

REF. NO.: B-0013813-1
CLIENT: Tricar Developments
PROJECT: Proposed 18 Storey Highrise Building
LOCATION: 70 Fountain Street, Guelph
DATUM ELEVATION: Cut 'T' in Sidewalk, 323.61 m

LOG OF BOREHOLE NO. 02-15

Encl. No. 2 (Sheet 1 of 1)
DRILLING DATA: Morokka Drill Rig
METHOD: Solid Stem Augers
DIAMETER: 150mm
DATE: Nov 19, 2015

Elev. metres	Depth metres	DESCRIPTION	SYMBOL	GROUND WATER	NUMBER	TYPE	"N" Blows/ft	Penetration Resistance Blows/ft (20 40 60 80) / Undrained Shear Strength kPa ▲ Field Vane Test ★ Compression Test (20 40 60 80)	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
322.34											
322	0	60mm ASPHALT.									
		Brown, sand FILL, some gravel.									
321	1	Very loose, brown, sand & silt FILL, some clay, trace gravel, wire fragment.			1	ss	2			18	
					2	ss	8			14	
320	2	Loose to compact, brown, SILT & fine SAND, trace gravel.			3	ss	14			7	
319	3	Compact, brown, fine SAND, trace silt.			4	ss	13			2	
	4	Compact, brown, dilatent SILT, some fine sand.			5	ss	17			1	
318		Compact, brown, fine SAND, trace silt, lower silt seams.			6	ss	24			3	
317	5										
	6										
316		Compact, brown SAND & GRAVEL, some silt..		▽	7	ss	26			7	
315	7	Dense, grey SILT till, clayey seams.			8	ss	40			7	
	8	End of Borehole due to auger refusal on pressumed bedrock. Water level at 6.7m depth at completion.									

LOG OF BOREHOLE B-0013813-1.GPJ ATK_DAV.GDT 10/12/15

CONSULTING SOILS AND MATERIALS ENGINEERS

12 - 60 Meg Drive, London, ON, N6E 3T6 Phone: 519-685-6400 Fax: 519-685-0943

REF. NO.: B-0013813-1
CLIENT: Tricar Developments
PROJECT: Proposed 18 Storey Highrise Building
LOCATION: 70 Fountain Street, Guelph
DATUM ELEVATION: Cut 'T' in Sidewalk, 323.61 m

LOG OF BOREHOLE NO. 03-15

Encl. No. 3 (Sheet 1 of 1)
DRILLING DATA: Morokka Drill Rig
METHOD: Solid Stem Augers
DIAMETER: 150mm
DATE: Nov 19, 2015

Elev. metres	Depth metres	DESCRIPTION	SYMBOL	GROUND WATER	NUMBER	TYPE	"N" Blows/ft	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
320.63	0	60mm ASPHALT.								
320	1	Loose, dark brown, silty sand & gravel FILL, lower brick fragments.			1	ss	7		6	
319	2				2	ss	7		14	
318	3	Compact, brown, SAND & GRAVEL, trace silt.			3	ss	29		5	
317	4	Compact, brown, fine SAND, trace to some silt, silt seams.			4	ss	29		20	
316	5				5	ss	20		4	
315	6	Compact, brown, SAND & GRAVEL, some silt.			6	ss	27		4	
		Dense, brown SILT till.			7	ss	50/2"			
		End of Borehole due to auger refusal on presummed bedrock. Borehole open and dry at completion.								

Penetration Resistance Blows/ft: 20 40 60 80
Undrained Shear Strength kPa
▲ Field Vane Test ★ Compression Test
20 40 60 80

50/2"

LOG OF BOREHOLE B-0013813-1.GPJ ATK_DAV.GDT 10/12/15

CONSULTING SOILS AND MATERIALS ENGINEERS

12 - 60 Meg Drive, London, ON, N6E 3T6 Phone: 519-685-6400 Fax: 519-685-0943

REF. NO.: B-0013813-1
CLIENT: Tricar Developments
PROJECT: Proposed 18 Storey Highrise Building
LOCATION: 70 Fountain Street, Guelph
DATUM ELEVATION: Cut 'T' in Sidewalk, 323.61 m

LOG OF BOREHOLE NO. 04-15

Encl. No. 4 (Sheet 1 of 1)
DRILLING DATA: Morokka Drill Rig
METHOD: Solid Stem Augers
DIAMETER: 150mm
DATE: Nov 19, 2015

Elev. metres	Depth metres	DESCRIPTION	SYMBOL	GROUND WATER	NUMBER	TYPE	"N" Blows/ft	Penetration Resistance Blows/ft (20 40 60 80) / Undrained Shear Strength kPa ▲ Field Vane Test ★ Compression Test (20 40 60 80)	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
321.85	0	75mm ASPHALT.									
		Loose to compact, brown, sand & gravel FILL, some silt, lower clayey seams.			1	ss	2			23	
321	1										
					2	ss	17			18	
320	2										
					3	ss	39			4	
319	3	Dense to compact, brown, SAND & GRAVEL, trace to some silt, occasional silt seams.									
					4	ss	35			1	
318	4										
					5	ss	21			16	
317	5	Compact, brown, dilatent, silty fine SAND.									
				▽	6	ss	25			3	
316	6										
					7	ss	22			20	
315	7	End of Borehole due to auger refusal on pressumed bedrock. Waet cave-in at 5.2m depth at completion.									

LOG OF BOREHOLE B-0013813-1.GPJ ATK_DAV.GDT 10/12/15

CONSULTING SOILS AND MATERIALS ENGINEERS

12 - 60 Meg Drive, London, ON, N6E 3T6 Phone: 519-685-6400 Fax: 519-685-0943

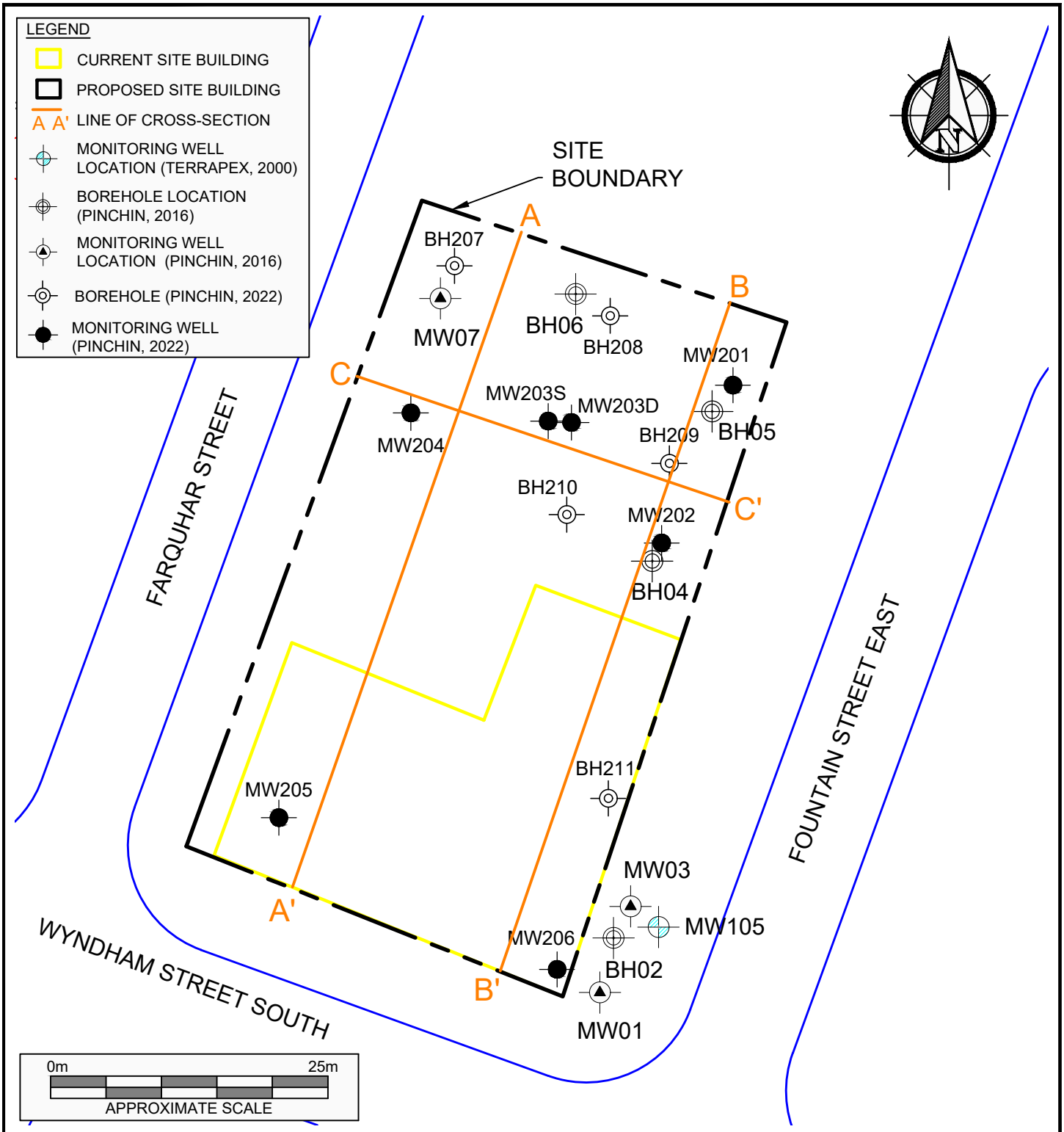
REF. NO.: B-0013813-1
CLIENT: Tricar Developments
PROJECT: Proposed 18 Storey Highrise Building
LOCATION: 70 Fountain Street, Guelph
DATUM ELEVATION: Cut 'T' in Sidewalk, 323.61 m

LOG OF BOREHOLE NO.
05-15

Encl. No. 5 (Sheet 1 of 1)
DRILLING DATA: Morokka Drill Rig
METHOD: Solid Stem Augers
DIAMETER: 150mm
DATE: Nov 19, 2015

Elev. metres	Depth metres	DESCRIPTION	SYMBOL	GROUND WATER	NUMBER	TYPE	"N" Blows/ft	Penetration Resistance Blows/ft (20 40 60 80) / Undrained Shear Strength kPa ▲ Field Vane Test ★ Compression Test (20 40 60 80)	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
317.91	0	400mm TOPSOIL.									
317	1	Compact to dense, brown, SAND & GRAVEL, some silt.			1	ss	29			3	
					2	ss	79/ 9"	79/9"		4	
316	2				3	ss	48			7	
315	3	Weathered limestone BEDROCK.			4	ss	50/ 0.5"	50/0.5"			
		End of Borehole due to auger refusal. Borehole dry with dry cave in at 2.3m depth at completion.									

LOG OF BOREHOLE B-0013813-1.GPJ ATK_DAV.GDT 10/12/15



PINCHIN

PROJECT NAME	HYDROGEOLOGICAL ASSESSMENT		
CLIENT NAME	SKYDEVCO INC.		
PROJECT LOCATION	75 FARQUHAR STREET AND 70 FOUNTAIN STREET EAST, GUELPH, ONTARIO		
FIGURE NAME	BOREHOLE AND MONITORING WELL LOCATION PLAN		FIGURE NO. 2
SCALE	PROJECT NO.	DATE	
AS SHOWN	245320.001	JULY 2022	

Log of Borehole: MW201

Project #: 245320.001 **Logged By:** KM

Project: Phase Two ESA, Hydrogeological/Geotechnical Investigation

Client: Skydevco Inc.

Location: 70 Fountain Street East, Guelph, Ontario

Drill Date: May 2, 2022 **Project Manager:** TM

SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	321.62
	Asphalt	321.32
	Fill	321.02
	Brown sand and gravel, very loose, moist	
1	Brown silty sand, very loose, moist	
	Brown sand and gravel, trace silt, compact, moist	
2		319.19
	Sand Brown, trace silt, compact, moist	318.58
3	Brown silty sand, loose, moist	
		317.81
4	Trace gravel, compact	
		316.60
5	Brown sand and gravel, loose, moist	316.29
	Brown silty sand, compact, moist	
6		315.53
	Trace gravel, very dense	
		314.92
7	Some gravel	
	Limestone Grey	
		313.70
8	End of Borehole	
	Borehole terminated at 7.9 mbgs.	
9		
10		

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

Water level = 5.40 mbgs, as measured Jun. 7, 2022.

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	S1	40	3
SS	S2	50	11
SS	S3	50	24
SS	S4	50	13
SS	S5	40	10
SS	S6	50	12
SS	S7	50	9
SS	S8	75	24
SS	S9	30	>50

Standard Penetration N-Value: 20, 40, 60

Shear Strength: kPa, 100, 200

Water Content: %, 10, 20, 30, 40

Contractor: Strata **Grade Elevation:** 321.62

Drilling Method: Hollow Stem Auger/Water Rotary **Top of Casing Elevation:** 321.51

Well Casing Size: 2" **Sheet:** 1 of 1

Log of Borehole: MW202

Project #: 245320.001 **Logged By:** KM

Project: Phase Two ESA, Hydrogeological/Geotechnical Investigation

Client: Skydevco Inc.

Location: 70 Fountain Street East, Guelph, Ontario

Drill Date: April 29, 2022 **Project Manager:** TM

Depth (m)	Description	Elevation (m)
0	Ground Surface	320.86
	Asphalt	
	Fill	320.25
	Brown silty sand, very loose, moist	
1	Brown/gray sand and gravel, compact, moist	319.34
	Brown sand, some gravel	
2		318.27
	Sand	
3	Brown sand, trace silt, loose, very moist	317.81
	Some silt, trace gravel, compact	317.21
	Some gravel	316.75
4	Silty sand	
5		315.53
	Sand and gravel, moist	315.22
	Brown silty sand, very moist	314.92
6	Grey sand and gravel, some silt, very dense, moist	314.61
	End of Borehole	
7	Borehole terminated at 6.3 mbgs.	
8		
9		
10		

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

Water level = 5.54 mbgs, as measured on Jun. 7, 2022.

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	S1	50	2
SS	S2	25	14
SS	S3	40	27
SS	S4	40	10
SS	S5	40	10
SS	S6	50	11
SS	-	0	7
SS	S7	50	12
SS	S8	20	>50

Standard Penetration N-Value: 20, 40, 60

Shear Strength: kPa, 100, 200

Water Content: %, 10, 20, 30, 40

Contractor: Strata **Grade Elevation:** 320.86

Drilling Method: Hollow Stem Auger/Water Rotary **Top of Casing Elevation:** 320.76

Well Casing Size: 2" **Sheet:** 1 of 1

Log of Borehole: MW203D

Project #: 245320.001 **Logged By:** KM

Project: Phase Two ESA, Hydrogeological/Geotechnical Investigation

Client: Skydevco Inc.

Location: 70 Fountain Street East, Guelph, Ontario

Drill Date: April 28, 2022 **Project Manager:** TM

SUBSURFACE PROFILE

Depth (m)	Description	Elevation (m)
0	Ground Surface	321.19
	Asphalt	
	Fill Brown sand and gravel, very loose, moist	320.27
1	Silty sand	319.67
	Sand Brown sand, some gravel, very loose, moist	318.90
2	Sand and gravel	318.14
3	Sand, trace silt, compact	317.38
	Loose	316.62
4	Sand and gravel, compact	315.86
5	Silty sand, loose, wet	315.09
	Sand, some silt, dense, saturated	314.03
6	**Limestone** Highly weathered, grey/white	313.26
7	Limestone	311.74
8	End of Borehole Borehole terminated at 9.4 mbgs.	
9		
10		

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

SAMPLE

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	5	3
SS	2	25	2
SS	3	40	10
SS	4	40	8
SS	5	20	14
SS	6	50	10
SS	7	25	11
SS	8	25	4
SS	9	20	35
SS	-	50	30
SS	-	0	>50

Standard Penetration N-Value: 20, 40, 60

Shear Strength: kPa, 100, 200

Water Content: %, 10, 20, 30, 40

Contractor: Strata

Drilling Method: Hollow Stem Auger

Well Casing Size: 2"

Water level = 5.76 mbgs, as measured on Jun. 7, 2022.

Grade Elevation: 321.19

Top of Casing Elevation: 321.13

Sheet: 1 of 1

Log of Borehole: MW203S

Project #: 245320.001 **Logged By:** KM

Project: Phase Two ESA, Hydrogeological/Geotechnical Investigation

Client: Skydevco Inc.

Location: 70 Fountain Street East, Guelph, Ontario

Drill Date: April 27, 2022 **Project Manager:** TM

Depth (m)	Description	Elevation (m)
0	Ground Surface	321.29
	Asphalt	
	Fill Brown sand and gravel, very loose, moist	320.38
1	Silty sand	319.77
	Sand Brown sand, some gravel, very loose, moist	319.00
2	Sand and gravel	318.24
3	Sand, trace silt, compact	317.48
	Loose	316.72
4	Sand and gravel, compact	315.96
5	Silty sand, loose, wet	315.19
	Sand, some silt, dense, saturated	314.13
6	**Limestone** Highly weathered, grey/white	313.67
7	End of Borehole	
	Borehole terminated at 7.6 mbgs.	
8		
9		
10		

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

Water level = 5.64 mbgs, as measured on Jun. 7, 2022.

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	S1	5	3
SS	S2	25	2
SS	S3	40	10
SS	S4	40	8
SS	S5	20	14
SS	S6	50	10
SS	S7	25	11
SS	S8	25	4
SS	S9	20	35
SS	-	50	30
SS	-	0	>50

Standard Penetration N-Value: 20, 40, 60

Shear Strength: kPa, 100, 200

Water Content: %, 10, 20, 30, 40

Contractor: Strata **Grade Elevation:** 321.29

Drilling Method: Hollow Stem Auger **Top of Casing Elevation:** 321.20

Well Casing Size: 2" **Sheet:** 1 of 1

Log of Borehole: MW204

Project #: 245320.001 **Logged By:** KM

Project: Phase Two ESA, Hydrogeological/Geotechnical Investigation

Client: Skydevco Inc.

Location: 70 Fountain Street East, Guelph, Ontario

Drill Date: May 2, 2022 **Project Manager:** TM

Depth (m)	Description	Elevation (m)
0	Ground Surface	321.91
	Asphalt	321.61
	Fill Brown sand and gravel, very loose, moist	321.15
1	Brown silty sand, very loose, moist	
	Trace clay	320.39
	Sand Brown sand, some silt, some gravel, loose	319.63
2	Sand and gravel, trace silt, compact	
	Some gravel, loose	318.86
3		
4		317.34
	Sand, trace silt, very moist	
5		
		315.97
6	Wet	
	Saturated	
	Limestone Highly weathered, grey	
7		
		313.99
8	End of Borehole	
	Borehole terminated at 7.9 mbgs.	
9		
10		

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

Water level = 5.82 mbgs, as measured on Jun. 7, 2022.

Sample Type	Sampler #	Recovery (%)	SPT N-Value
SS	1	50	3
SS	2	40	2
SS	3	40	6
SS	4	50	11
SS	5	50	9
SS	-	0	10
SS	6	75	7
SS	7	50	10
SS	8	40	>50

Standard Penetration N-Value: 20, 40, 60

Shear Strength: kPa, 100, 200

Water Content: %, 10, 20, 30, 40

Contractor: Strata **Grade Elevation:** 321.91

Drilling Method: Hollow Stem Auger/Water Rotary **Top of Casing Elevation:** 321.82

Well Casing Size: 2" **Sheet:** 1 of 1

Log of Borehole: MW205

Project #: 245320.001 **Logged By:** KM

Project: Phase Two ESA, Hydrogeological/Geotechnical Investigation

Client: Skydevco Inc.

Location: 70 Fountain Street East, Guelph, Ontario

Drill Date: June 1, 2022

SUBSURFACE PROFILE					SAMPLE			
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration* (ppm) CGI/PID	Laboratory Analysis
0 / 0		Ground Surface	317.40					
0–1 / 0		***Concrete***			50	1	<5/1	
1–3 / 0–1		***Fill*** Brown sand and gravel, moist				2	<5/1	Metals, PAHs, PHCs
4–5 / 1		***Sand*** Brown, trace silt, moist	315.72					
6–7 / 2		***Silt*** Brown, some sand, moist	315.27		100	3	<5/1	
7–20 / 2–6		***Limestone*** Weathered, grey		Riser; Bentonite; Silica Sand; Screen; Water level = 2.37 mbgs, as measured Jun. 7, 2022.				
20 / 6			311.00					
21 / 6		End of Borehole Borehole terminated at 6.2 mbgs.						

Contractor: Strata

Drilling Method: Direct Push/Water Rotary

Well Casing Size: 1.25

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

Grade Elevation: 317.40

Top of Casing Elevation: 317.26

Sheet: 1 of 1

Log of Borehole: MW206

Project #: 245320.001 **Logged By:** KM

Project: Phase Two ESA, Hydrogeological/Geotechnical Investigation

Client: Skydevco Inc.

Location: 70 Fountain Street East, Guelph, Ontario

Drill Date: May 31, 2022

SUBSURFACE PROFILE					SAMPLE			
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration* (ppm) CGI/PID	Laboratory Analysis
0 / 0		Ground Surface	318.02					
0–3 / 0–1		***Concrete***			40	1	<5/4	
		Fill Brown sand and gravel, dry				2	<5/3	Metals, PAHs, PHCs
			316.34					
6–7 / 2		***Sand*** Brown, some silt, moist	315.89		90	3	<5/3	Metals PAHs PHCs VOCs
8–9 / 2–3		***Gravel*** Brown/grey, moist	315.28					
10–15 / 3–4		***Limestone*** Grey						
			313.14					
16 / 5		End of Borehole						
		Borehole terminated at 4.9 mbgs.						

Riser; Bentonite; Silica Sand; Screen

Water level measured at 3.62 mbgs, as measured Jun. 7, 2022.

Contractor: Strata

Drilling Method: Direct Push/Water Rotary

Well Casing Size: 1.25

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

Grade Elevation: 318.02

Top of Casing Elevation: 317.88

Sheet: 1 of 1

Log of Borehole: BH207

Project #: 245320.001 **Logged By:** KM

Project: Phase Two ESA, Hydrogeological/Geotechnical Investigation

Client: Skydevco Inc.

Location: 70 Fountain Street East, Guelph, Ontario

Drill Date: April 26, 2022

SUBSURFACE PROFILE					SAMPLE			
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration* (ppm) CGI/PID	Laboratory Analysis
0 / 0		Ground Surface	322.29	No Monitoring Well Installed				
1 / 0		***Asphalt***	321.83		50	BH207-S1	<5/1	Metals, PAHs
2 / 0		***Fill*** Brown sand and gravel, moist	321.53			BH207-S2	<5/1	PHCs (F1 - F4) PCBs
3 / 1		Silty sand, black staining and coal pieces throughout						
4 / 1								
5 / 1								
6 / 2		***Sand*** Brown sand, trace gravel, trace silt, moist	320.00		50	BH207-S3	<5/1	
7 / 2			319.70			BH207-S4	<5/1	
8 / 2		Silty sand						
9 / 3		Sand, some silt			75	BH207-S5	<5/1	
10 / 3						BH207-S6	<5/1	
11 / 3								
12 / 4								
13 / 4								
14 / 4			317.72					
15 / 5		End of Borehole						
16 / 5		Borehole terminated at 4.6 mbgs.						
17 / 5								
18 / 5								
19 / 6								
20 / 6								
21 / 6								
22 / 6								
23 / 7								
24 / 7								
25 / 7								
26 / 8								
27 / 8								
28 / 8								
29 / 9								
30 / 9								
31 / 9								
32 / 9								
33 / 10								
34 / 10								

Contractor: Altech

Drilling Method: Direct Push

Well Casing Size: N/A

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

Grade Elevation: 322.29

Top of Casing Elevation: N/A

Sheet: 1 of 1

Log of Borehole: BH208

Project #: 245320.001 **Logged By:** KM

Project: Phase Two ESA, Hydrogeological/Geotechnical Investigation

Client: Skydevco Inc.

Location: 70 Fountain Street East, Guelph, Ontario

Drill Date: April 26, 2022

SUBSURFACE PROFILE					SAMPLE			
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration* (ppm) CGI/PID	Laboratory Analysis
0 / 0		Ground Surface	321.93	No Monitoring Well Installed				
		Asphalt			60	BH208-S1	<5/1	PAHs, Metals
		Fill Brown sand and gravel, moist	321.32			BH208-S2	<5/1	
3 / 1		Brown/black sand, some silt, coal pieces and roots throughout, organic odour, moist	320.10		75	BH208-S3	<5/1	
		Sand Brown, some silt, some black staining, some rust-colouring, moist				BH208-S4	<5/1	
10 / 3		Brown sand, moist	318.27		80	BH208-S5	<5/1	
13 / 4		***Silt*** Brown, some sand, wet	317.81			BH208-S6	<5/1	
15 / 4.5		***Sand*** Grey sand and gravel, moist	317.36					
		Brown silty sand, moist						
		End of Borehole						
		Borehole terminated at 4.6 mbgs.						

Contractor: Altech

Drilling Method: Direct Push

Well Casing Size: N/A

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

Grade Elevation: 321.93

Top of Casing Elevation: N/A

Sheet: 1 of 1

Log of Borehole: BH209

Project #: 245320.001 **Logged By:** KM

Project: Phase Two ESA, Hydrogeological/Geotechnical Investigation

Client: Skydevco Inc.

Location: 70 Fountain Street East, Guelph, Ontario

Drill Date: April 26, 2022

SUBSURFACE PROFILE

Depth (ft / m)	Description	Measured Depth (m)
0 / 0	Ground Surface	321.04
0 / 0	***Asphalt***	
1 / 0	***Fill*** Brown sand and gravel, moist	
3 / 1	***Asphalt*** Weathered asphalt	319.52
5 / 1	***Fill*** Brown, sand and gravel, some rust-colouring, moist	
9 / 2	***Sand*** Brown sand and gravel, rust-colouring, moist	317.53
11 / 3	Some black staining	
12 / 3	Brown silty sand, rust-colouring, moist	316.47
15 / 4	End of Borehole	
16 / 5	Borehole terminated at 4.6 mbgs.	

Monitoring Well Details: No Monitoring Well Installed

SAMPLE

Recovery (%)	Sample ID	Soil Vapour Concentration* (ppm) CGI/PID	Laboratory Analysis
40	BH209-S1	-	Metals
40	BH209-S2	-	PAHs
50	BH209-S3	<5/1	
50	BH209-S4	<5/1	
75	BH209-S5	<5/1	
75	BH209-S6	<5/1	

Contractor: Altech

Drilling Method: Direct Push

Well Casing Size: N/A

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

Grade Elevation: 321.04

Top of Casing Elevation: N/A

Sheet: 1 of 1

Log of Borehole: BH210

Project #: 245320.001 **Logged By:** KM

Project: Phase Two ESA, Hydrogeological/Geotechnical Investigation

Client: Skydevco Inc.

Location: 70 Fountain Street East, Guelph, Ontario

Drill Date: April 26, 2022

SUBSURFACE PROFILE

Depth (ft / m)	Description	Measured Depth (m)
0 / 0	Ground Surface	321.09
	Asphalt	
	Fill Brown sand and gravel, moist	320.02
3 / 1	***Silt*** Brown sandy silt, black staining, moist	319.56
6 / 2	Brown, moist	
	Sand Brown sand and gravel, moist	318.35
9 / 3	Black staining, organic odour	317.89
	Brown silty sand, moist	317.43
12 / 4	Brown sand, moist	316.52
15 / 5	Silty sand, trace gravel	315.45
18 / 6	Rust-colouring	315.14
	Brown sand and gravel, some silt, wet	314.08
23 / 7	End of Borehole	
	Borehole terminated at 7.0 mbgs.	
33 / 10		

Monitoring Well Details: No Monitoring Well Installed

SAMPLE

Recovery (%)	Sample ID	Soil Vapour Concentration* (ppm) CGI/PID	Laboratory Analysis
65	BH210-S1	10/0	
65	BH210-S2	65/0	PAHs
70	BH210-S3	<5/1	
70	BH210-S4	<5/0	
75	BH210-S5	<5/1	
75	BH210-S6	<5/1	
80	BH210-S7	<5/1	
80	-	<5/1	
90	-	<5/1	

Contractor: Altech

Drilling Method: Direct Push

Well Casing Size: N/A

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

Grade Elevation: 321.09

Top of Casing Elevation: N/A

Sheet: 1 of 1

Log of Borehole: BH211

Project #: 245320.001 **Logged By:** KM

Project: Phase Two ESA, Hydrogeological/Geotechnical Investigation

Client: Skydevco Inc.

Location: 70 Fountain Street East, Guelph, Ontario

Drill Date: May 31, 2022

SUBSURFACE PROFILE					SAMPLE			
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration* (ppm) CGI/PID	Laboratory Analysis
0 / 0		Ground Surface	318.03	No Monitoring Well Installed				
1 / 0		***Concrete***			70	BH211-S1	<5/1	
2 / 0		***Fill*** Brown sand and gravel, moist	317.12			BH211-S2	<5/2	Metals, PAHs, PHCs
3 / 1		***Sand*** Brown, trace silt, moist	316.51		90	BH211-S3	<5/2	
5 / 1		Silty sand	316.26					
6 / 2		End of Borehole						
		Borehole terminated at 1.8 mbgs.						
10 / 3								
13 / 4								
16 / 5								
19 / 6								
23 / 7								
26 / 8								
29 / 9								
33 / 10								

Contractor: Strata

Drilling Method: Direct Push

Well Casing Size: N/A

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

Grade Elevation: 318.03

Top of Casing Elevation: N/A

Sheet: 1 of 1

Log of Borehole: BH/MW01

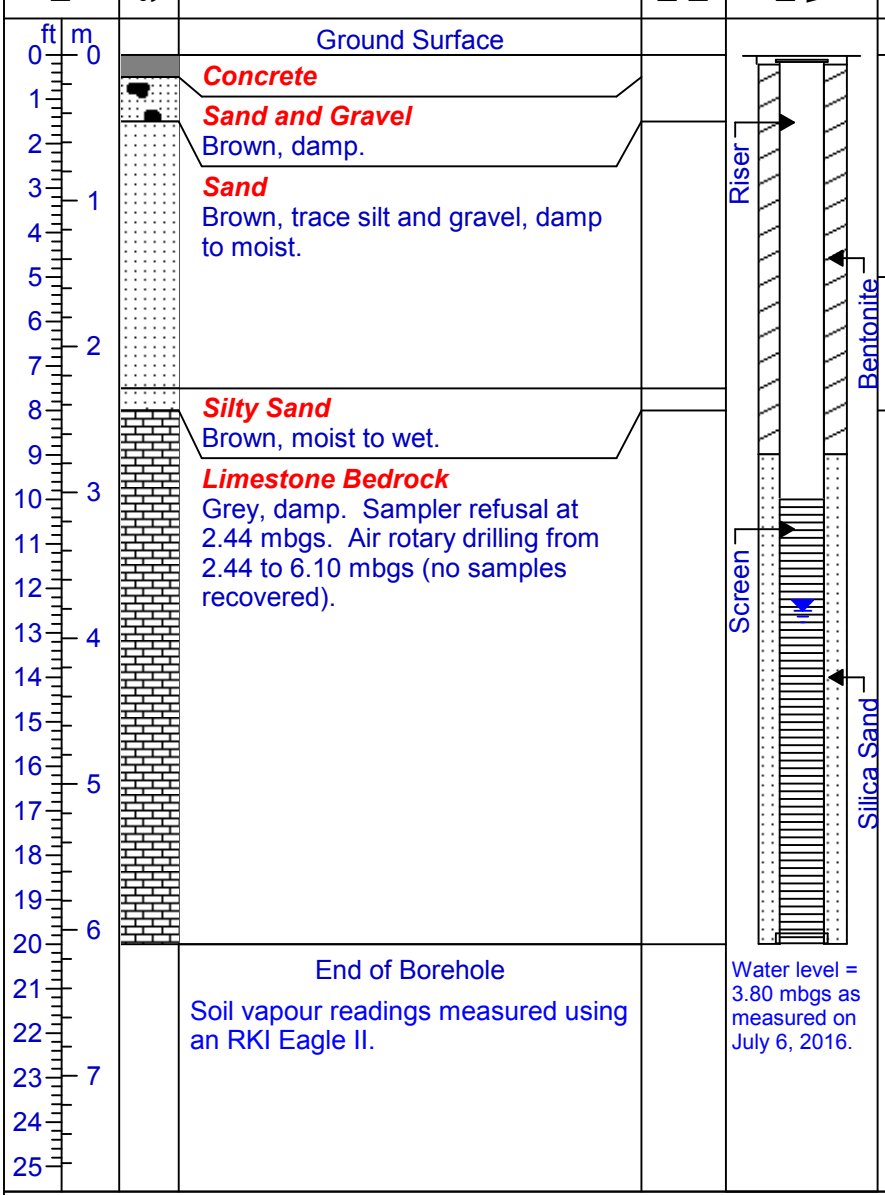
Project #: 115303.002 **Logged By:** TM

Project: Phase II Environmental Site Assessment

Client: Skyline Asset Management Inc.

Location: 70 Fountain Street East and 75 Farquhar Street, Guelph, ON

Drill Date: July 4, 2016 **Project Manager:** CG



SUBSURFACE PROFILE					SAMPLE					
Depth	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	N-Value	Sample ID	Soil Vapour Concentration (ppm)	Laboratory Analysis
ft / m		Ground Surface								
		Concrete								
		Sand and Gravel Brown, damp.						S1	100 / 2	
		Sand Brown, trace silt and gravel, damp to moist.			1	60	NA	S2	180 / 2	
					2	60	NA	S3	290 / 2	PHCs, BTEX
		Silty Sand Brown, moist to wet.								
		Limestone Bedrock Grey, damp. Sampler refusal at 2.44 mbgs. Air rotary drilling from 2.44 to 6.10 mbgs (no samples recovered).								
		End of Borehole		Water level = 3.80 mbgs as measured on July 6, 2016.						
		Soil vapour readings measured using an RKI Eagle II.								

Contractor: Strata Drilling Group

Drilling Method: Direct Push / Air Rotary

Well Casing Size: 5.1 cm

Pinchin Ltd.
875 Main Street West, Unit 11
Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1

Log of Borehole: BH02

Project #: 115303.002 **Logged By:** TM

Project: Phase II Environmental Site Assessment

Client: Skyline Asset Management Inc.

Location: 70 Fountain Street East and 75 Farquhar Street, Guelph, ON

Drill Date: July 4, 2016 **Project Manager:** CG

SUBSURFACE PROFILE					SAMPLE					
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	N-Value	Sample ID	Soil Vapour Concentration (ppm)	Laboratory Analysis
0 / 0		Ground Surface		No Monitoring Well Installed						
		Topsoil Brown, some organics, moist.								
1		***Sand and Gravel*** Brown, damp.						S1	220 / 0	
2					1	50	NA			
3 / 1		***Sand*** Brown, trace silt and gravel, damp to moist.						S2	400 /2	PHCs, BTEX, Metals
4										
5										
6								S3	220 / 0	
7 / 2					2	70	NA			
8								S4	240 / 0	
9										
10 / 3		***Silty Sand*** Brown, moist to wet.								
11		End of Borehole Sampler refusal on inferred limestone bedrock at 3.05 mbgs.								
12										
13 / 4		Soil vapour readings measured using an RKI Eagle II.								
14										

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: NA

Pinchin Ltd.
875 Main Street West, Unit 11
Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1

Log of Borehole: BH/MW03

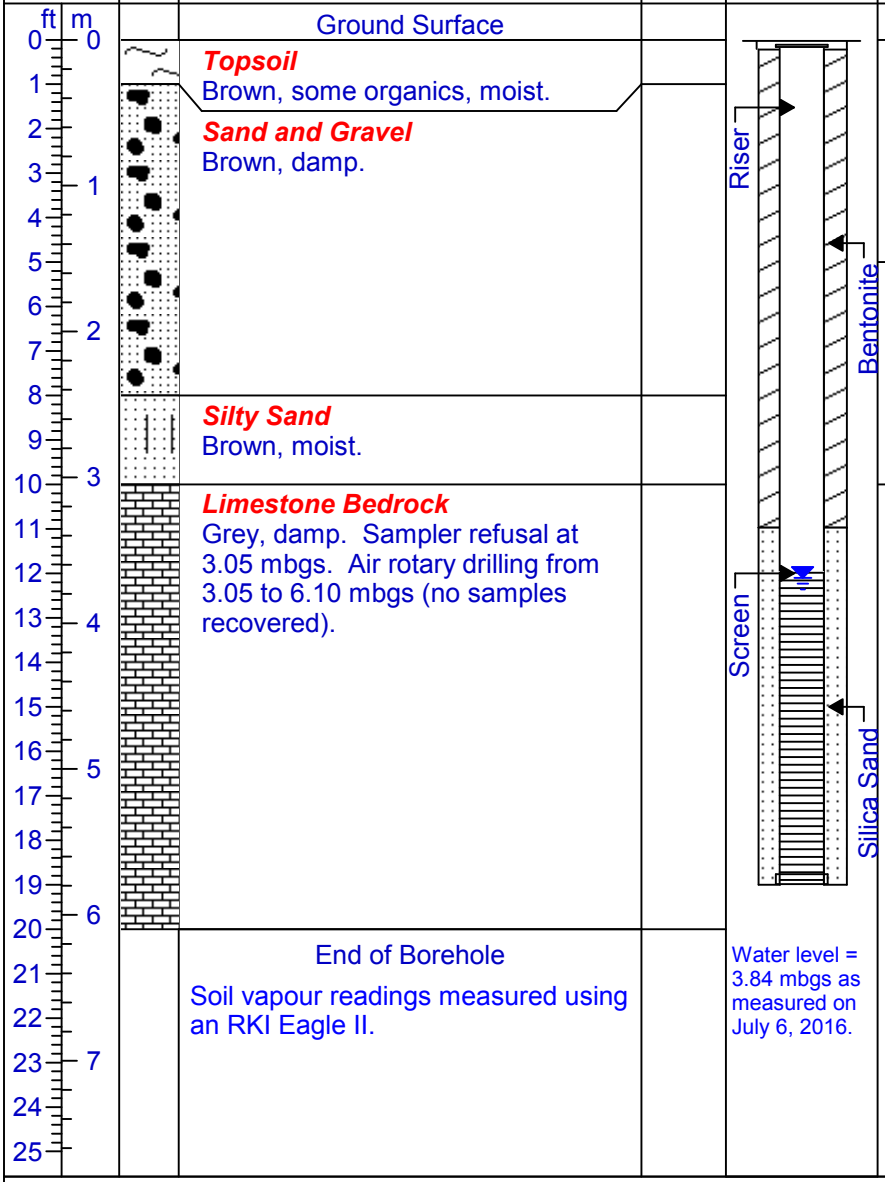
Project #: 115303.002 **Logged By:** TM

Project: Phase II Environmental Site Assessment

Client: Skyline Asset Management Inc.

Location: 70 Fountain Street East and 75 Farquhar Street, Guelph, ON

Drill Date: July 4, 2016 **Project Manager:** CG



SUBSURFACE PROFILE					SAMPLE					
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	N-Value	Sample ID	Soil Vapour Concentration (ppm)	Laboratory Analysis
0 / 0		Ground Surface								
0–3 / 0–1		***Topsoil*** Brown, some organics, moist.			1	70	NA	S1	15 / 0	
		Sand and Gravel Brown, damp.						S2	350 / 0	
3–10 / 1–3		***Silty Sand*** Brown, moist.			2	75	NA	S3	390 / 0	PHCs, BTEX
								S4	15 / 0	
10–20 / 3–6		***Limestone Bedrock*** Grey, damp. Sampler refusal at 3.05 mbgs. Air rotary drilling from 3.05 to 6.10 mbgs (no samples recovered).								
20 / 6		End of Borehole		Water level = 3.84 mbgs as measured on July 6, 2016.						
		Soil vapour readings measured using an RKI Eagle II.								

Contractor: Strata Drilling Group

Drilling Method: Direct Push/ Air Rotary

Well Casing Size: 5.1 cm

Pinchin Ltd.
875 Main Street West, Unit 11
Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1

Log of Borehole: BH04

Project #: 115303.002 **Logged By:** TM

Project: Phase II Environmental Site Assessment

Client: Skyline Asset Management Inc.

Location: 70 Fountain Street East and 75 Farquhar Street, Guelph, ON

Drill Date: July 4, 2016 **Project Manager:** CG

SUBSURFACE PROFILE					SAMPLE					
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	N-Value	Sample ID	Soil Vapour Concentration (ppm)	Laboratory Analysis
0 / 0		Ground Surface								
		Asphalt								
1		***Sand and Gravel*** Brown, damp.						S1	290 / 0	
2					1	60	NA			
3 / 1		Blackish-brown staining from 0.76 1.37 mbgs, some glass and coal fragments, moist.						S2	230 / 0	PAHs, Metals
5										
6								S3	230 / 0	
7 / 2					2	60	NA			
8		***Sand*** Brown, trace silt and gravel, damp.						S4	310 / 0	
9										
10 / 3										
		End of Borehole								
11		Soil vapour readings measured using an RKI Eagle II.								
12										
13 / 4										
14										

No Monitoring Well Installed

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: NA

Pinchin Ltd.
875 Main Street West, Unit 11
Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1

Log of Borehole: BH05

Project #: 115303.002 **Logged By:** TM

Project: Phase II Environmental Site Assessment

Client: Skyline Asset Management Inc.

Location: 70 Fountain Street East and 75 Farquhar Street, Guelph, ON

Drill Date: July 4, 2016 **Project Manager:** CG

SUBSURFACE PROFILE					SAMPLE					
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	N-Value	Sample ID	Soil Vapour Concentration (ppm)	Laboratory Analysis
0 / 0		Ground Surface								
		Asphalt								
1		***Sand and Gravel*** Black staining, some coal fragments.						S1	210 / 0	PAHs, Metals
2		***Sand*** Brown, trace gravel, moist to wet.			1	40	NA	S2	230 / 0	
5		***Sand and Gravel*** Brown, trace silt, moist.						S3	230 / 0	
7					2	60	NA			
8		***Silty Sand*** Brown, trace gravel, damp.						S4	260 / 0	
10 / 3		End of Borehole								
11		Soil vapour readings measured using an RKI Eagle II.								
13 / 4										
14										

No Monitoring Well Installed

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: NA

Pinchin Ltd.
875 Main Street West, Unit 11
Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1

Log of Borehole: BH06

Project #: 115303.002 **Logged By:** TM

Project: Phase II Environmental Site Assessment

Client: Skyline Asset Management Inc.

Location: 70 Fountain Street East and 75 Farquhar Street, Guelph, ON

Drill Date: July 4, 2016 **Project Manager:** CG

SUBSURFACE PROFILE					SAMPLE					
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	N-Value	Sample ID	Soil Vapour Concentration (ppm)	Laboratory Analysis
0 / 0		Ground Surface								
		Asphalt								
1		***Sand and Gravel*** Black staining, some coal fragments.						S1	210 / 0	PAHs, Metals
2		***Sand*** Brown, trace gravel, moist to wet. Blackish-brown staining from 0.76 1.37 mbgs, some glass and coal fragments, moist.		No Monitoring Well Installed	1	40	NA	S2	230 / 0	
1 / 3										
4										
5		***Sand and Gravel*** Brown, trace silt, moist.						S3	230 / 0	
6										
2 / 7					2	60	NA			
8		***Silty Sand*** Brown, trace gravel, damp.						S4	260 / 0	
9										
10 / 3										
		End of Borehole Soil vapour readings measured using an RKI Eagle II.								
11										
12										
13 / 4										
14										

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: NA

Pinchin Ltd.
875 Main Street West, Unit 11
Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1

Log of Borehole: BH/MW07

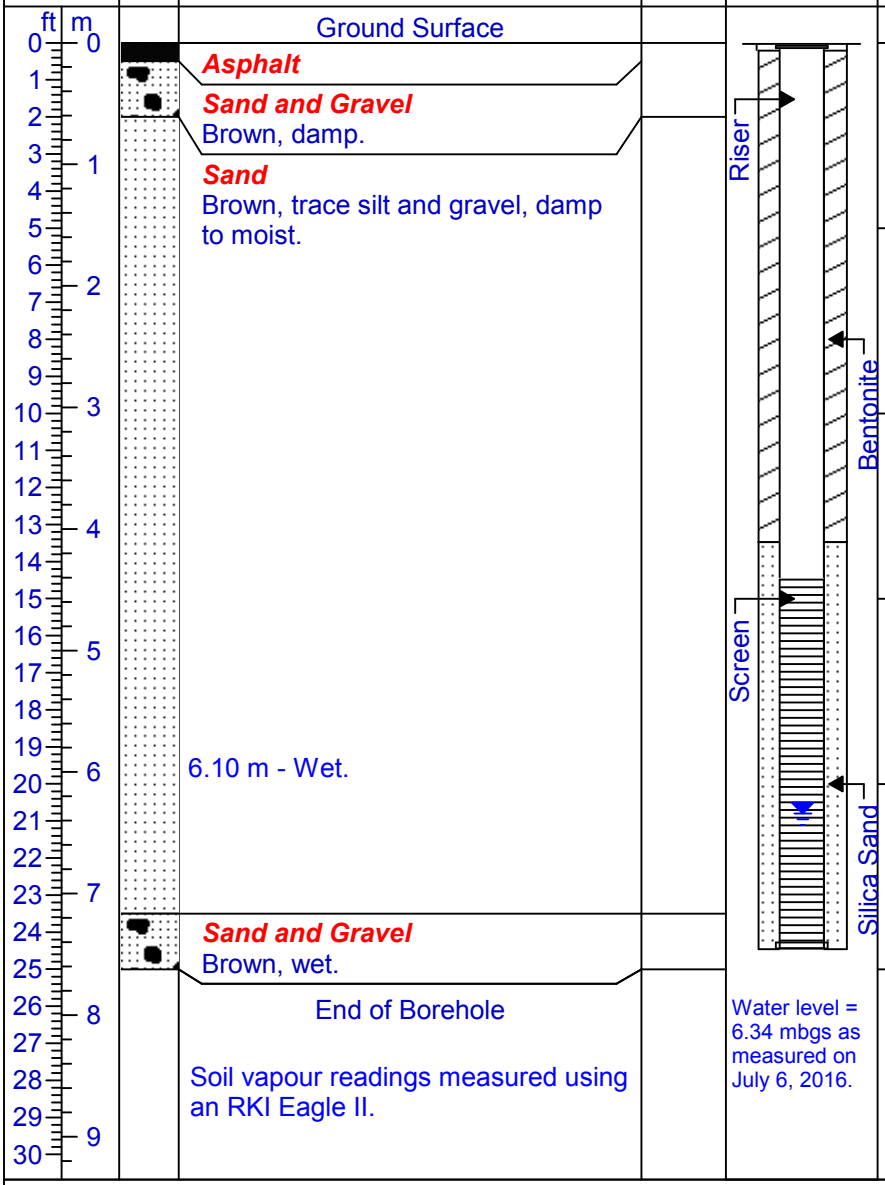
Project #: 115303.002 **Logged By:** TM

Project: Phase II Environmental Site Assessment

Client: Skyline Asset Management Inc.

Location: 70 Fountain Street East and 75 Farquhar Street, Guelph, ON

Drill Date: July 4, 2016 **Project Manager:** CG



SUBSURFACE PROFILE					SAMPLE					
Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	N-Value	Sample ID	Soil Vapour Concentration (ppm)	Laboratory Analysis
0 / 0		Ground Surface								
0–1 / 0		Asphalt			1	50	NA	S1	55 / 0	
1–2 / 0–1		Sand and Gravel, Brown, damp.						S2	55 / 0	pH
2–3 / 1		Sand, Brown, trace silt and gravel, damp to moist.			2	80	NA	S3	55 / 0	
4–5 / 1–2								S4	<5 / 0	
6–7 / 2					3	85	NA	S5	65 / 0	
8–9 / 2–3								S6	55 / 0	
10–11 / 3					4	70	NA	S7	80 / 1	pH
12–13 / 4								S8	85 / 1	Grain Size
14–15 / 4–5					5	90	NA	S9	100 / 0	PHCs, BTEX
16–17 / 5								S10	50 / 0	
18–19 / 5–6		6.10 m - Wet.								
20–21 / 6										
22–23 / 6–7										
24–25 / 7		Sand and Gravel, Brown, wet.								
26–27 / 8		End of Borehole								
28–29 / 8–9		Soil vapour readings measured using an RKI Eagle II.								
30 / 9										

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: 5.1 cm

Pinchin Ltd.
875 Main Street West, Unit 11
Hamilton, ON L8S 4P9

Grade Elevation: NM

Top of Casing Elevation: NM

APPENDIX D

Geomechanica Inc.
#14-1240 Speers Rd.
Oakville ON
L6L 2X4 Canada

August 28, 2025

Deepak Kanraj
Grounded Engineering Inc.
49 Mobile Drive
Toronto, Ontario
Canada, M4A 1H5

Re: UCS Testing
(Grounded Engineering Inc. Project No. 25-121)

Dear Deepak Kanraj:

On August 20, 2025 a series of 2 core samples (HQ-sized) were received by Geomechanica Inc. via drop-off by Grounded personnel. These samples were identified as being from Grounded Engineering Inc. Project No. 25-121. From these samples, 2 Uniaxial Compressive Strength (UCS) tests were completed.

Details regarding the steps of specimen preparation and testing along with the test results are presented in the accompanying laboratory report and summary spreadsheet.

Sincerely,

Bryan Tatone, PhD, PEng

Geomechanica Inc.
Tel: +1-647-478-9767
lab@geomechanica.com

GEOMECHANICA

Rock Laboratory Testing Results

A report submitted to:

Deepak Kanraj
Grounded Engineering Inc.
49 Mobile Drive
Toronto, Ontario
Canada, M4A 1H5

Prepared by:

Bryan Tatone, PhD, PEng

Omid Mahabadi, PhD, PEng
Geomechanica Inc.
#14-1240 Speers Rd.
Oakville ON
L6L 2X4 Canada
Tel: +1-647-478-9767
lab@geomechanica.com

August 28, 2025
Project number: 25-121

Abstract

This document summarizes the results of 2 Uniaxial Compressive Strength (UCS) tests. The UCS and Young's modulus values, along with photographs of speciemns before and after testing, are presented herein.

In this document:

1 Uniaxial Compressive Strength Tests

1.1 Overview

This section summarizes the results of uniaxial compressive strength (UCS) testing. The testing was performed in Geomechanica Inc.'s rock testing laboratory using a 150 ton (1.3 MN) Forney loading frame equipped with pressure-compensated control valve to maintain an axial displacement rate of approximately 0.150 mm/min (Figure 1). The preparation and testing procedure for each specimen included the following:

1. Unwrapping the core sample and inspecting it for damage.
2. Diamond cutting the core sample to obtain a cylindrical specimen with an appropriate length (length:diameter = 2:1) and nearly parallel end faces.
3. Diamond grinding the specimen to obtain flat (within ± 0.025 mm) and parallel end faces (within 0.25°).
4. Placing the specimen into the loading frame and applying a 1 kN axial pre-load.
5. Axially loading the specimens to rupture while continuously recording axial force and axial deformation to determine the peak strength (UCS) and tangent Young's modulus.

Figure 1: Forney loading frame setup for UCS testing.

Using a precision V-block mounted on the magnetic chuck of the surface grinder, test specimens met the end flatness, end parallelism, and perpendicularity criteria set out in ASTM D4543-19. The side straightness criteria, as checked with a feeler gauge, and the minimum length:diameter criteria were met for all specimens unless noted otherwise in Table 1. Testing of the specimens followed a hybrid of ASTM D7012-14 Method C and D in that testing included the measurement of UCS and elastic modulus, but not the Poisson's ratio.

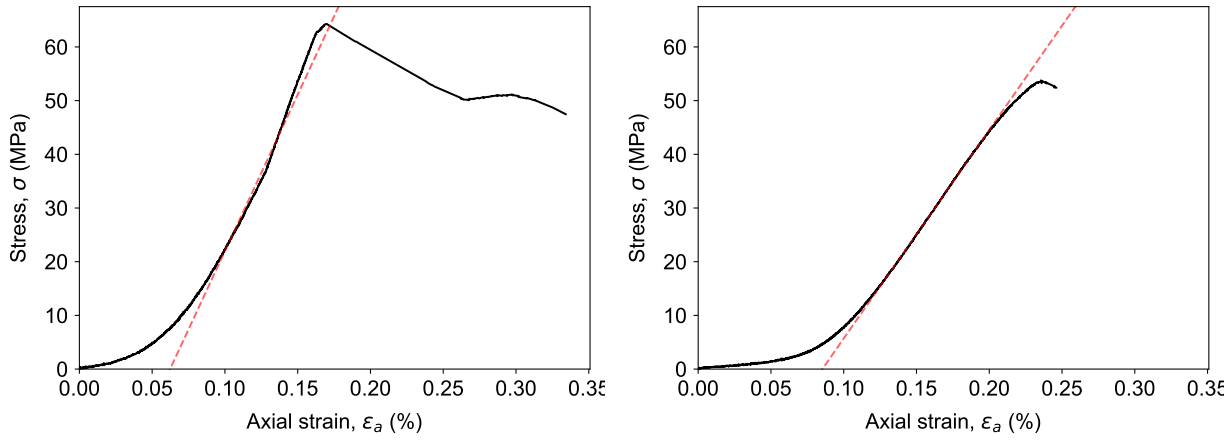
1.2 Results

The results of UCS testing are summarized in Table 1. The corresponding stress-strain curves are presented in Figure 2. The Young's modulus is the tangent modulus, calculated as the slope of the best-fit line through ±300 on either side of the point representing 50.0% of the peak strength. Additional specimen and testing details are provided on the summary spreadsheet that accompanies this report.

Table 1: Summary of UCS test results.

Sample	Depth (m)	Bulk density ρ (g/cm^3)	UCS (MPa)	Young's modulus E (GPa)	Lithology	Failure description
BH301 CS1	11.33 - 11.53	2.677	64.3	58.3	Dolostone	1, 2
BH302 CS2	12.50 - 12.70	2.495	53.8	38.8	Dolostone	3

[1] Inclined shear fracture and axial splitting failure
[2] Length:Diameter ratio less than 2
[3] Axial splitting failure



(a) BH301-CS1 (b) BH302-CS2

Figure 2: Measured stress-strain curves.

1.3 Specimen photographs

Photographs of the specimens before and after testing are presented in the Appendix of this report.

Appendices

Specimen sheets

- BH301 CS1
- BH302 CS2

GEOMECHANICA

Uniaxial Compression Test

Client	Grounded Engineering Inc.	**Project**	25-121
Sample	BH301 CS1	**Depth**	11.33 - 11.53

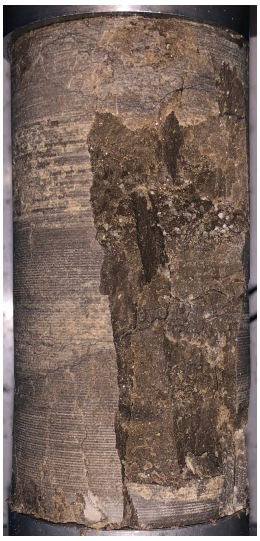
Specimen parameters

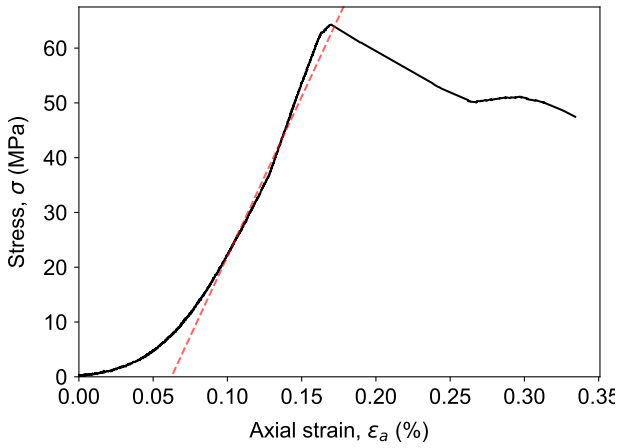
Diameter (mm) [a]	60.70
Length (mm) [a]	116.04
Bulk density ρ (g/cm^3)	2.677
UCS (MPa)	64.3
Young's modulus E (GPa) [b]	58.3
Lithology	Dolostone
Failure description [c]	1, 2

[a] Additional specimen measurement/details provided in accompanying summary spreadsheet.
[b] Tangent modulus, calculated as the slope of the best fit line through ±265 data points on either side of the point representing 50.0% of the peak strength.
[c] Failure description: [1] Inclined shear fracture and axial splitting failure; [2] Length:Diameter ratio less than 2;

Prior to testing

After testing





Remarks: Loading rate: 0.05 mm/min.

Performed by	AA	**Date**	2025-08-14

GEOMECHANICA

Uniaxial Compression Test

Client	Grounded Engineering Inc.	**Project**	25-121
Sample	BH302 CS2	**Depth**	12.50 - 12.70

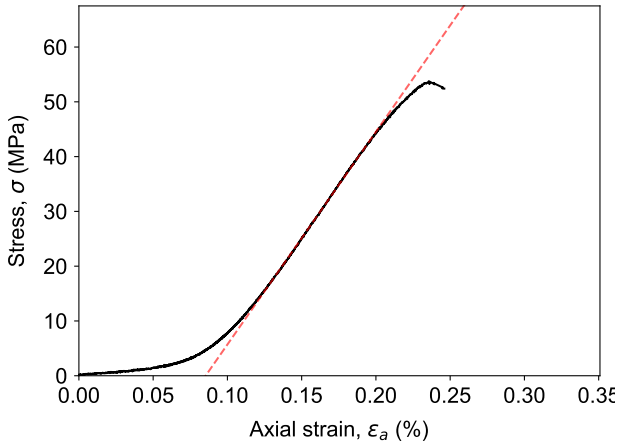
Specimen parameters

Diameter (mm) [a]	60.65
Length (mm) [a]	120.59
Bulk density ρ (g/cm^3)	2.495
UCS (MPa)	53.8
Young's modulus E (GPa) [b]	38.8
Lithology	Dolostone
Failure description [c]	3

[a] Additional specimen measurement/details provided in accompanying summary spreadsheet.
[b] Tangent modulus, calculated as the slope of the best fit line through $\pm$300 data points on either side of the point representing 50.0% of the peak strength.
[c] Failure description: [3] Axial splitting failure;

Prior to testing

After testing



Remarks: Loading rate: 0.05 mm/min.

Performed by	AA	**Date**	2025-08-14

Geomechanica Inc.
#14-1240 Speers Rd.
Oakville ON
L6L 2X4 Canada

November 11, 2025

Deepak Kanraj
Grounded Engineering Inc.
49 Mobile Drive
Toronto, Ontario
Canada, M4A 1H5

Re: UCS Testing
(Grounded Engineering Inc. Project No. 25-121)

Dear Deepak Kanraj:

On October 22, 2025 a series of 3 core samples (NX- and HQ-sized) were received by Geomechanica Inc. via drop-off by Grounded personnel. These samples were identified as being from Grounded Engineering Inc. Project No. 25-121. From these samples, 3 Uniaxial Compressive Strength (UCS) tests were completed.

Details regarding the steps of specimen preparation and testing along with the test results are presented in the accompanying laboratory report and summary spreadsheet.

Sincerely,

Bryan Tatone, PhD, PEng

Geomechanica Inc.
Tel: +1-647-478-9767
lab@geomechanica.com

GEOMECHANICA

Rock Laboratory Testing Results

A report submitted to:

Deepak Kanraj
Grounded Engineering Inc.
49 Mobile Drive
Toronto, Ontario
Canada, M4A 1H5

Prepared by:

Bryan Tatone, PhD, PEng

Omid Mahabadi, PhD, PEng
Geomechanica Inc.
#14-1240 Speers Rd.
Oakville ON
L6L 2X4 Canada
Tel: +1-647-478-9767
lab@geomechanica.com

November 11, 2025
Project number: 25-121

Abstract

This document summarizes the results of rock laboratory testing of 3 Uniaxial Compressive Strength (UCS) tests. Results including Uniaxial Compressive Strength (UCS) and Young's modulus along with photographs of samples before and after testing are presented.

In this document:

1 Uniaxial Compressive Strength Tests

1.1 Overview

This section summarizes the results of uniaxial compressive strength (UCS) testing. The testing was performed in Geomechanica Inc.'s rock testing laboratory using a 150 ton (1.3 MN) Forney loading frame equipped with pressure-compensated control valve to maintain an axial displacement rate of approximately 0.150 mm/min (Figure 1). The preparation and testing procedure for each specimen included the following:

1. Unwrapping the core sample and inspecting it for damage.
2. Diamond cutting the core sample to obtain a cylindrical specimen with an appropriate length (length:diameter = 2:1) and nearly parallel end faces.
3. Diamond grinding the specimen to obtain flat (within ± 0.025 mm) and parallel end faces (within 0.25°).
4. Placing the specimen into the loading frame and applying a 1 kN axial pre-load.
5. Axially loading the specimens to rupture while continuously recording axial force and axial deformation to determine the peak strength (UCS) and tangent Young's modulus.

Figure 1: Forney loading frame setup for UCS testing.

Using a precision V-block mounted on the magnetic chuck of the surface grinder, test specimens met the end flatness, end parallelism, and perpendicularity criteria set out in ASTM D4543-19. The side straightness criteria, as checked with a feeler gauge, and the minimum length:diameter criteria were met for all specimens unless noted otherwise in Table 1. Testing of the specimens followed a hybrid of ASTM D7012-14 Method C and D in that testing included the measurement of UCS and elastic modulus, but not the Poisson's ratio.

1.2 Results

The results of UCS testing are summarized in Table 1. The corresponding stress-strain curves are presented in Figure 2. The Young's modulus is the tangent modulus, calculated as the slope of the best-fit line through ± 300 on either side of the point representing 50.0% of the peak strength. Additional specimen and testing details are provided on the summary spreadsheet that accompanies this report.

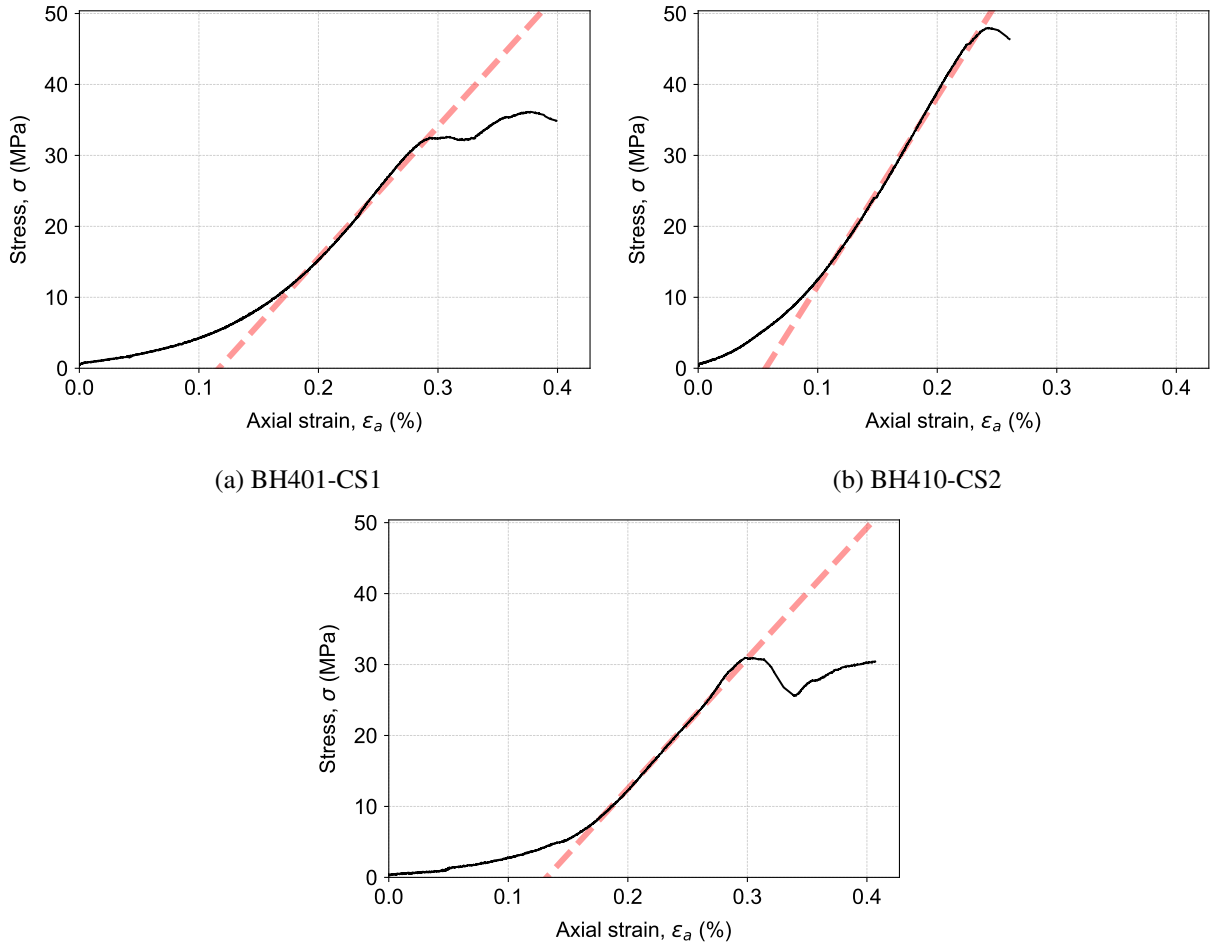
Table 1: Summary of Uniaxial Compression test results.

Sample	Depth (m)	Bulk density ρ (g/cm^3)	UCS (MPa)	Young's modulus E (GPa)	Lithology	Failure description
BH401, CS1	3.89 - 4.05	2.505	36.1	18.6	Dolostone	1, 2
BH410, CS2	8.99 - 9.28	2.497	48.0	26.6	Dolostone	1, 2
BH403, CS3	3.48 - 3.73	2.529	31.0	18.4	Dolostone	1, 2

[1] Inclined shear fracture and axial splitting failure
[2] Side straightness varied > 0.5 mm

1.3 Specimen photographs

Photographs of the specimens before and after testing are presented in the Appendix of this report.



(a) BH401-CS1

(b) BH410-CS2

(c) BH403-CS3

Figure 2: Measured stress-strain curves.

Appendices

Specimen sheets

- BH401, CS1
- BH410, CS2
- BH403, CS3

GEOMECHANICA

Uniaxial Compression Test

Client	Grounded Engineering Inc.	**Project**	25-121
Sample	BH401, CS1	**Depth**	3.89 - 4.05

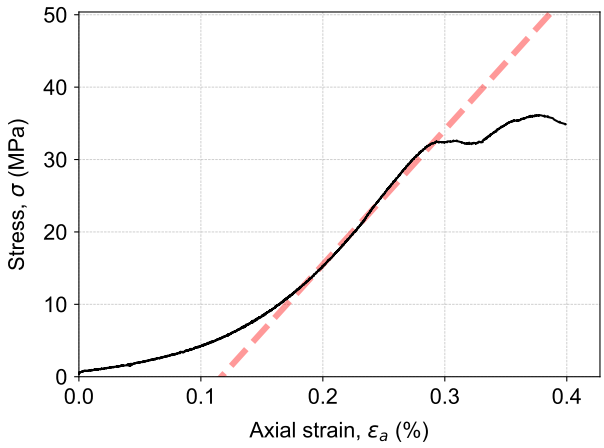
Specimen parameters

Diameter (mm) [a]	55.44
Length (mm) [a]	116.17
L/D ratio	2.10
Bulk density ρ (g/cm^3)	2.505
UCS (MPa)	36.1
Young's modulus E (GPa) [b]	18.6
Lithology	Dolostone
Failure description [c]	1, 2

[a] Additional specimen measurement/details provided in accompanying summary spreadsheet.
[b] Tangent modulus, calculated as the slope of the best fit line through $\pm$300 data points on either side of the point representing 50.0% of the peak strength.
[c] Failure description: [1] Inclined shear fracture and axial splitting failure; [2] Side straightness varied $>$ 0.5 mm;

Prior to testing

After testing



Remarks: Loading Rate 0.05 mm/min. Specimen experienced pre-peak localized failure(s).

Performed by	JNO	**Date**	2025-11-11

GEOMECHANICA

Uniaxial Compression Test

Client	Grounded Engineering Inc.	**Project**	25-121
Sample	BH410, CS2	**Depth**	8.99 - 9.28

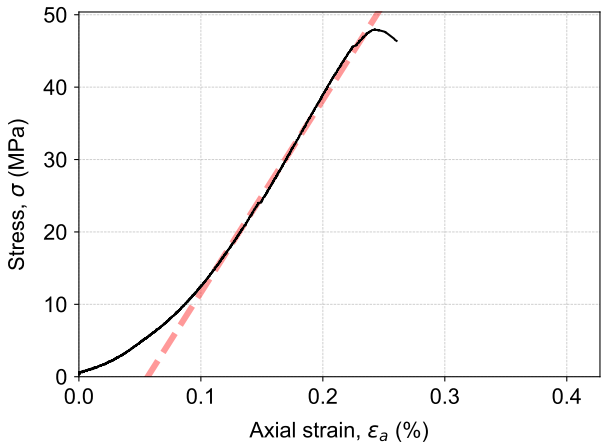
Specimen parameters

Diameter (mm) [a]	62.84
Length (mm) [a]	125.38
L/D ratio	2.00
Bulk density ρ (g/cm^3)	2.497
UCS (MPa)	48.0
Young's modulus E (GPa) [b]	26.6
Lithology	Dolostone
Failure description [c]	1, 2

[a] Additional specimen measurement/details provided in accompanying summary spreadsheet.
[b] Tangent modulus, calculated as the slope of the best fit line through $\pm$300 data points on either side of the point representing 50.0% of the peak strength.
[c] Failure description: [1] Inclined shear fracture and axial splitting failure; [2] Side straightness varied $>$ 0.5 mm;

Prior to testing

After testing



Remarks: Loading Rate 0.05 mm/min.

Performed by	JNO	**Date**	2025-11-11

GEOMECHANICA

Uniaxial Compression Test

Client	Grounded Engineering Inc.	**Project**	25-121
Sample	BH403, CS3	**Depth**	3.48 - 3.73

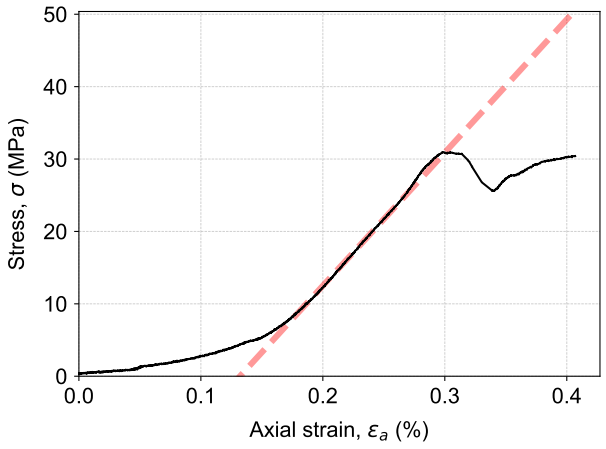
Specimen parameters

Diameter (mm) [a]	55.02
Length (mm) [a]	115.02
L/D ratio	2.09
Bulk density ρ (g/cm^3)	2.529
UCS (MPa)	31.0
Young's modulus E (GPa) [b]	18.4
Lithology	Dolostone
Failure description [c]	1, 2

[a] Additional specimen measurement/details provided in accompanying summary spreadsheet.
[b] Tangent modulus, calculated as the slope of the best fit line through ±266 data points on either side of the point representing 50.0% of the peak strength.
[c] Failure description: [1] Inclined shear fracture and axial splitting failure; [2] Side straightness varied > 0.5 mm;

Prior to testing

After testing



Remarks: Loading Rate 0.05 mm/min.

Performed by	JNO	**Date**	2025-11-11

APPENDIX E

CORROSIVITY (SGS)

Report No.	**CA40092-OCT25**
Customer	**Grounded Engineering Inc.**
Attention	**Sam Bastan**
Reference	**25-121, Sam Bastan**
Works#	
Title	**Final Report**

Sample ID		Analysis Start Date	Analysis Start Time	Analysis Completed Date	Analysis Completed Time	BH408 SS3 (5'-7')	BH407 SS5 (10'-12')	BH409 SS6 (15'-17')
Sample Date / Time						09-Oct-25 11:15	09-Oct-25 11:20	09-Oct-25 11:25
Analysis	**Units**							
Corrosivity Index	none	15-Oct-25	15:09	15-Oct-25	15:09	14	14	4
Soil Redox Potential	mV	10-Oct-25	16:00	13-Oct-25	18:28	326	298	275
Sulphide (Na2CO3)	%	14-Oct-25	17:00	15-Oct-25	10:10	< 0.01	< 0.01	< 0.01
Moisture Content	%	10-Oct-25	16:00	13-Oct-25	18:28	1	1	1
pH	pH Units	15-Oct-25	07:55	15-Oct-25	15:09	8.67	9.11	9.19
Chloride	µg/g	10-Oct-25	08:53	16-Oct-25	11:36	1600	980	32
Sulphate	µg/g	10-Oct-25	08:53	16-Oct-25	11:36	26	36	5.3
Conductivity	uS/cm	15-Oct-25	07:55	15-Oct-25	15:09	2290	2130	157
Resistivity (calculated)	ohms.cm	15-Oct-25	07:55	15-Oct-25	15:09	437	469	6370

INTERPRETATION

AWWA C-105 Standard		**Points**	**Points**	**Points**
% Moisture		**2**	**0**	**0**
pH				
Is pH bet 6.5-7.5 ?		NO	NO	NO
Is Redox Potential < 100 mv?		NO	NO	NO
Are Sulphides present ?		NO	NO	NO
If above three conditions are met, pH is assigned 3 points				
pH - Score		**3**	**3**	**3**
Redox Potential		**0**	**0**	**0**
Resistivity		**10**	**10**	**0**
Acid Volatile Sulphides		**0**	**0**	**0**
TOTAL SCORE (AWWA C-105)		**15**	**13**	**3**
Sample		**BH408 SS3 (5'-7')**	**BH407 SS5 (10'-12')**	**BH409 SS6 (15'-17')**
Corrosion Protection Recommended?		**YES**	**YES**	**No**
Sulphate	**%**	0.003%	0.004%	0.001%
CLASS OF EXPOSURE		**Negligible**	**Negligible**	**Negligible**

FINAL REPORT

CA40092-OCT25 R1

25-121, 70 Fountain St. E. Guelph, ON

Prepared for

Grounded Engineering Inc.

FINAL REPORT

First Page

CLIENT DETAILS

Client	Grounded Engineering Inc.
Address	49 Mobile Drive Toronto, Ontario M4A 1H5. Canada
Contact	Sam Bastan
Telephone	
Facsimile	
Email	sbastan@groundedeng.ca
Project	25-121, 70 Fountain St. E. Guelph, ON
Order Number	
Samples	Soil (3)

LABORATORY DETAILS

Project Specialist	Brad Moore Hon. B.Sc
Laboratory	SGS Canada Inc.
Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-652-2143
Facsimile	705-652-6365
Email	brad.moore@sgs.com
SGS Reference	CA40092-OCT25
Received	10/09/2025
Approved	10/16/2025
Report Number	CA40092-OCT25 R1
Date Reported	10/16/2025

COMMENTS

Temperature of Sample upon Receipt: 6 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:045307

Corrosivity Index is based on the American Water Works Corrosivity Scale according to AWWA C-105. An index greater than 10 indicates the soil matrix may be corrosive to cast iron alloys.

SIGNATORIES

Brad Moore Hon. B.Sc

TABLE OF CONTENTS

FINAL REPORT

CA40092-OCT25 R1

Client: Grounded Engineering Inc.
Project: 25-121, 70 Fountain St. E. Guelph, ON
Project Manager: Sam Bastan
Samplers: Elizabeth Beard

MATRIX: SOIL

Sample Number	5	6	7
Sample Name	BH408 SS3 (5'-7')	BH407 SS5 (10'-12')	BH409 SS6 (15'-17')
Sample Matrix	Soil	Soil	Soil
Sample Date	09/10/2025	09/10/2025	09/10/2025

Parameter	Units	RL		Result	Result	Result
Corrosivity Index						
Corrosivity Index	none	1		14	14	4
pH	pH Units	0.05		8.67	9.11	9.19
Soil Redox Potential	mV	no		326	298	275
Sulphide (Na2CO3)	%	0.01		< 0.01	< 0.01	< 0.01
Resistivity (calculated)	ohms.cm	-9999		437	469	6370
General Chemistry						
Conductivity	uS/cm	2		2290	2130	157
Metals and Inorganics						
Sulphate	µg/g	0.4		26	36	5.3
Other (ORP)						
Chloride	µg/g	0.4		1600	980	32

QC SUMMARY

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0245-OCT25	µg/g	0.4	<0.4	1	35	107	80	120	111	75	125
Sulphate	DIO0245-OCT25	µg/g	0.4	<0.4	15	35	96	80	120	97	75	125

Carbon/Sulphur

Method: ASTM E1915-07A | Internal ref.: ME-CA-[ENV]ARD-LAK-AN-020

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphide (Na2CO3)	ECS0041-OCT25	%	0.01	< 0.01								

QC SUMMARY

Conductivity

Method: SM 2510 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0333-OCT25	uS/cm	2	< 2	3	20	99	90	110	NA		
Conductivity	EWL0334-OCT25	uS/cm	2	< 2	1	20	99	90	110	NA		

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0333-OCT25	pH Units	0.05	NA	0		100			NA		
pH	EWL0334-OCT25	pH Units	0.05	NA	0		100			NA		

QC SUMMARY

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

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

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

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

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

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

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

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

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

LEGEND

FOOTNOTES

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

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

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

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

This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

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

No: 045307 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: BD
Received Date: 10/9/25 (mm/dd/yy)
Received Time: 1400 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ICE
Temperature Upon Receipt (°C): 6x3
LAB LIMS #: CA10092025

REPORT INFORMATION

Company: Grounded Engineering
Contact: Sam Bastan
Address: 49 Mobile Dr, North York, ON M4A 1H5
Phone:
Fax:
Email: Sbastan@groundedeng.ca

INVOICE INFORMATION

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

Quotation #:
P.O. #:
Project #: 25-121
Site Location/ID: 70 Fountain St. E, Guelph, ON

TURNAROUND TIME (TAT) REQUIRED

☐ Client Regular TAT ☒ Regular TAT (5-7days)

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

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

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

REGULATIONS

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

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

Sewer By-Law:
☐ Sanitary
☐ Storm
Municipality:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	BH408 SS3 (5'-7')	2025/10/09	11:15	1	Soil
2	BH407 SS5 (10'-12')	↓	11:20	1	↓
3	BH409 SS6 ~~(10'-12')~~ (15'-17')	↓	11:25	1	↓
4					
5					
6					
7					
8					
9					
10					
11					
12					

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

COMMENTS:

Observations/Comments/Special Instructions

Sampled By (NAME): Elizabeth Beard Signature: E. Beard Date: 10/09/25 (mm/dd/yy)
Relinquished by (NAME): Elizabeth Beard Signature: E. Beard Date: 10/09/25 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.8
Date of Issue: 06 SEP 2024

APPENDIX F

GEOPHYSICS GPR INTERNATIONAL INC.

August 26, 2025

Transmitted by email: dkanraj@groundedeng.ca
Ref.: GPR-25-6499

Deepak Kanraj, P.Eng.
Project Engineer
Grounded Engineering Inc.
49 Mobile Drive,
Toronto, Ontario
M4A 1H5

Subject: Shear Wave Velocity Survey for Seismic Site Class Determination at 70 Fountain St E, Guelph, Ontario

Dear Deepak,

Geophysics GPR International Inc. has been requested by Grounded Engineering Inc. to carry out seismic shear-wave velocity (V_s) measurements at 70 Fountain St R, Guelph, Ontario (Figure 1/ Figure 2).

The data collection was carried out August 1, 2025, by the GPR field crew of Simon MacDiarmid and Gurmann Ubhi. Figure 1 shows the regional location of the site and Figure 2 illustrates the location of the seismic spread. Figures are presented in the Appendix.

The geophysical investigation used the Multi-channel Analysis of Surface Waves (MASW), the Spatial AutoCorrelation (SPAC), and the seismic refraction methods. From the subsequent results, the seismic shear wave velocity values were calculated for the soil and the rock, to determine the seismic site classification.

The following report describes the survey design, the principles of the test methods, the methodology for interpreting the data, and a culmination of the results in table and chart formats.

MASW Principle

The Multi-channel Analysis of Surface Waves (MASW) and the SPatial AutoCorrelation (SPAC or MAM for Microtremors Array Method) are seismic methods used to evaluate the shear wave velocities of subsurface materials through the analysis of the dispersion properties of the Rayleigh surface wave. MASW is considered an "active" method, as the seismic signal is induced at known location and time in the vibration sensors' (geophones) array axis. Conversely, the SPAC method is considered a "passive" method, using the low frequency "signals" produced far away. The method can also be used with "active" seismic source records. The SPAC method generally allows deeper V_s soundings. Its dispersion curve can then be merged with the one of higher frequency from the MASW analysis to calculate a more complete inversion. The dispersion properties are expressed as a change of velocities with respect to frequencies. Surface wave energy will decay exponentially with depth. Lower frequency surface waves will travel deeper and thus be more influenced by deeper velocity layering than the shallow higher frequency waves. The inversion of the Rayleigh wave dispersion curve yields a shear wave (V_s) velocity depth profile (sounding).

Figure 3 outlines the basic operating procedure for the MASW method. Figure 4 illustrates an example of one of the MASW/SPAC records, the corresponding spectrogram analysis and resulting 1D V_s model.

Survey Design

The seismic investigation consisted of a linear array of 24 x 4.5Hz geophones connected to an ABEM Terraloc Pro2 or equivalent seismograph. An elastic accelerated weight-drop and/or sledgehammer was used as the primary energy source with traces being recorded at several locations. Data were collected using arrays with geophone spacings of 3m and 1m.

Unlike the seismic refraction method, which produces a data point beneath each geophone, the shear-wave depth profile is the average of the bulk area within the middle third of the geophone spread.

The theoretical maximum depth of penetration (34.5m) for the MASW method is half of the maximum seismic array length (69 m), in practice the maximum depth of penetration is often influenced by the geology. The SPAC method in some cases can resolve greater depths.

Interpretation Method and Accuracy of the Results

The main processing sequence involved data inspection and editing when required; spectral analysis ("phase shift" for MASW, and "cross-correlation" for SPAC); picking the fundamental mode; and 1D inversion of the MASW and SPAC shot records using the SeisImagerSW™ software and/or MASwAI from Geophysics GPR.

Assuming all layers are flat, horizontal, and laterally homogeneous, all the shot records for a given seismic spread should produce a similar shear-wave velocity profile. In practice, however,

differences can arise due to energy dissipation, local surface seismic velocities variations, and/or dipping of overburden layers or rock. In general, the precision of the calculated seismic shear wave velocities (V_s) is of the order of 15% or better.

The results of the inversion process are inherently non-unique, and the final model must be judged to be geologically realistic. Additionally, the inversion model is interpreted as a lateral average of the studied profiles, represented as a single column located at the centre of the survey area.

More detailed descriptions of these methods are presented in Shear Wave Velocity Measurement Guidelines for Canadian Seismic Site Characterization in Soil and Rock, Hunter, J.A., Crow, H.L., et al., Geological Surveys of Canada, General Information Product 110, 2015.

Results

The results of this investigation are presented as 1D shear-wave velocity profiles in Figure 5 and in Table 1.

The chart plots the average V_s values versus depth along with the minimum and maximum modelled envelopes. The spread of the minimum to maximum envelopes provides a visual representation of the confidence and variability in the results.

The V_{s30} value is calculated from the harmonic mean of the shear wave velocities, between the surface to 30 m below grade. It is calculated by dividing the total depth of interest (30 m) by the sum of the time spent in each velocity layer from the surface down to 30 m, as:

$$\bar{V}_{S30} = \frac{\sum_{i=1}^{N} H_i}{\sum_{i=1}^{N} {H_i}/{V_i}} \quad | \quad \sum_{i=1}^{N} H_i = 30 \text{ m}$$

(N: number of layers; H_i : thickness of layer "*i*" ; V_i : V_S of layer "*i*")

Thus, the V_{s30} value represents the seismic shear wave velocity of an equivalent homogeneous single layer response for the upper 30 m.

Based on the above formula, the average Vs30 value at this test location is calculated as 675 m/s over the depth interval of 0 to 30 m below grade (as determined through the MASW/SPAC and/or MAM methods). The minimum and maximum envelopes of the calculation over the same depth interval are 472 m/s and 804 m/s respectively.

Conclusions

A non-invasive geophysical survey was carried out to measure shear-wave velocities for seismic site classification at 70 Fountain St E, Guelph, Ontario (Figure 2). The seismic survey used the MASW, MAM and the SPAC analysis methods to model the shear-wave velocities used in the calculation of the V_{s30} value. Its calculation is presented in Table 1 and summarized below.

Borehole data provided by the client indicates dolostone bedrock at depths of 6.8m to 8.8m

Sounding	V_{s30}	Site Class	Site Designation
#1	675 m/s	C	X_{675}

The site classification provided in this report is based solely on the V_{s30} value as derived from non-invasive surface seismic methods and can be superseded by other geotechnical information. This geotechnical information includes, but is not limited to, variations in the thickness of the overburden within the building footprint, the presence of sensitive and/or liquefiable soils, more than 3m of soft clays, high moisture content, etc. The reader is referred to Table 4.1.8.4.A/B of the NBC, the 2020 NBC Structural Commentaries and the Ontario 2024 Building Code Compendium.

The V_S value calculated is representative of the in-situ materials and are not corrected for the total and effective stresses.

Analysis of the data was carried out by Duro Zeljkovic and reviewed by Ben McClement, P.Eng.

Ben McClement, P.Eng.

LICENSED PROFESSIONAL ENGINEER
R.B. McCLEMENT
2025-08-26
PROVINCE OF ONTARIO

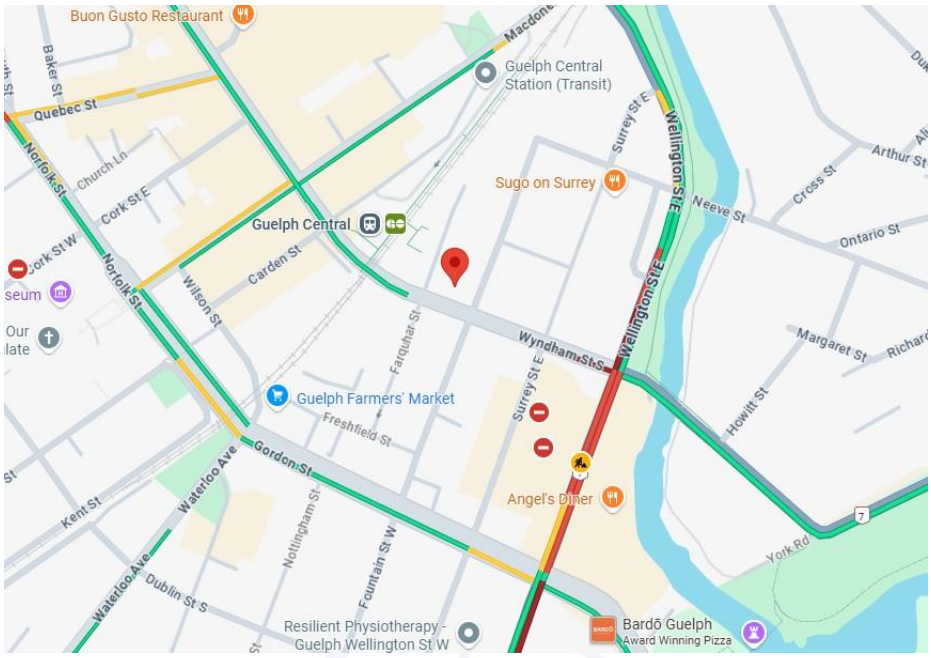


Figure 1: Regional location of the Site
(Source: *Open Google Maps™*)

Figure 2: Location of the seismic spread
(Source: *Google Earth™*)

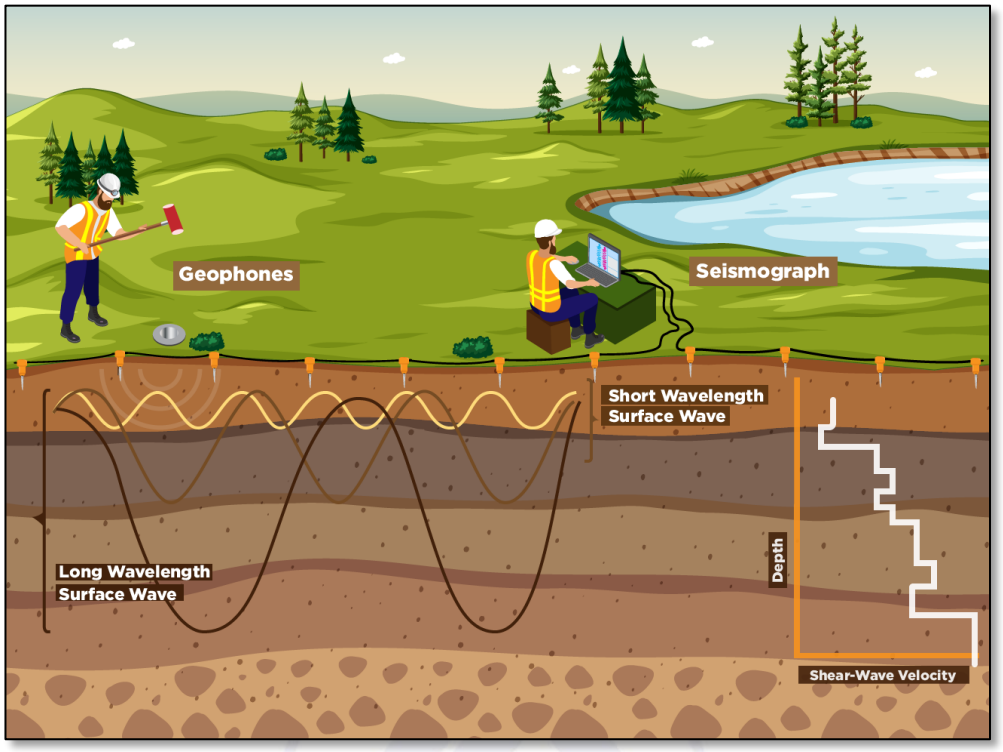


Figure 3: MASW Operating Principle

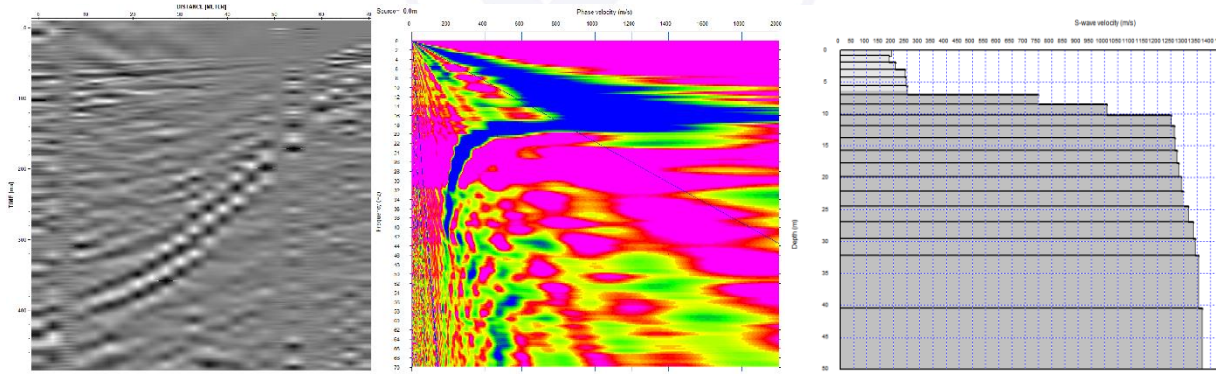


Figure 4: Example of a MASW/SPAC record, Phase Velocity - Frequency curve of the Rayleigh wave and resulting 1D Shear Wave Velocity Model

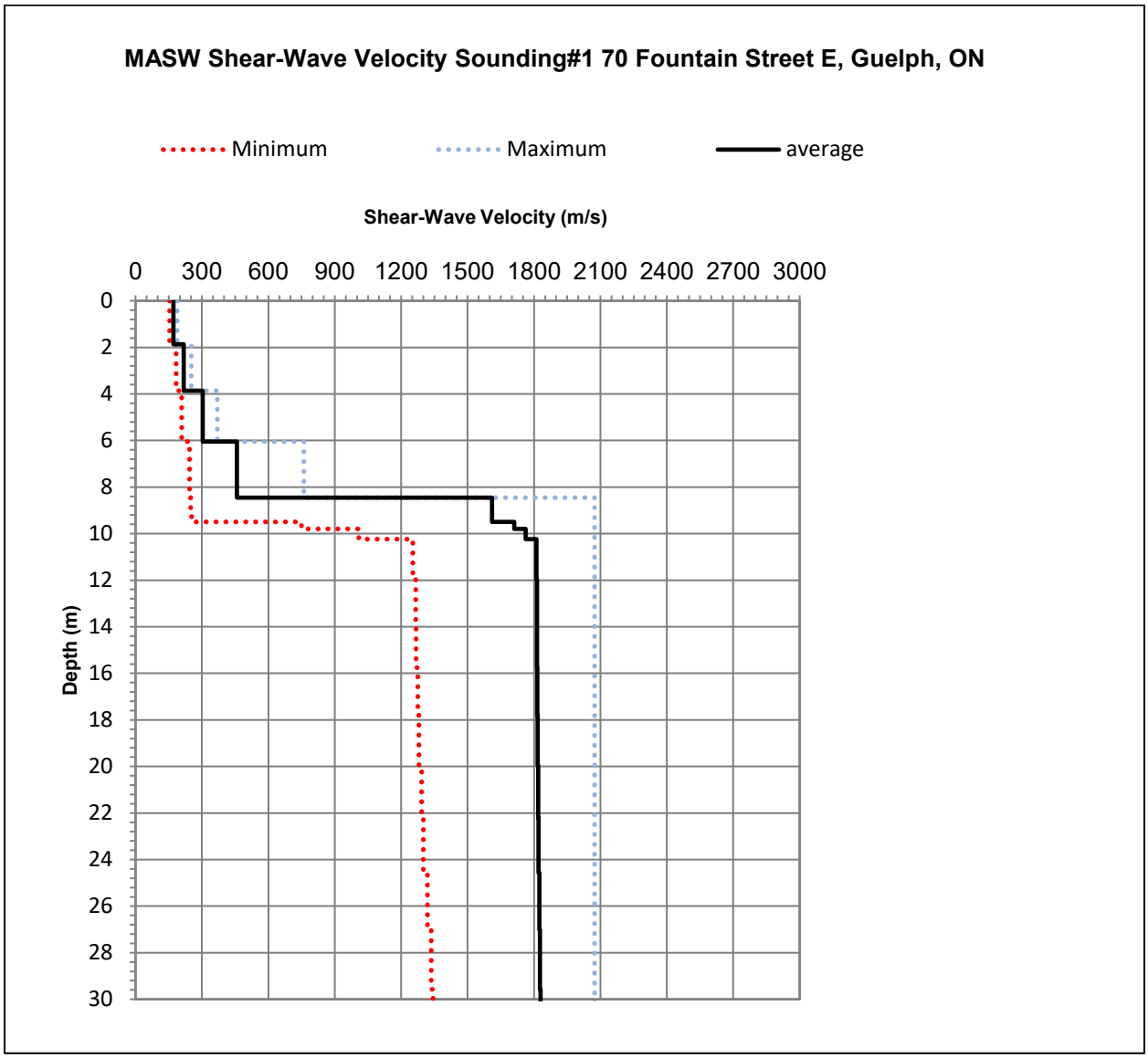
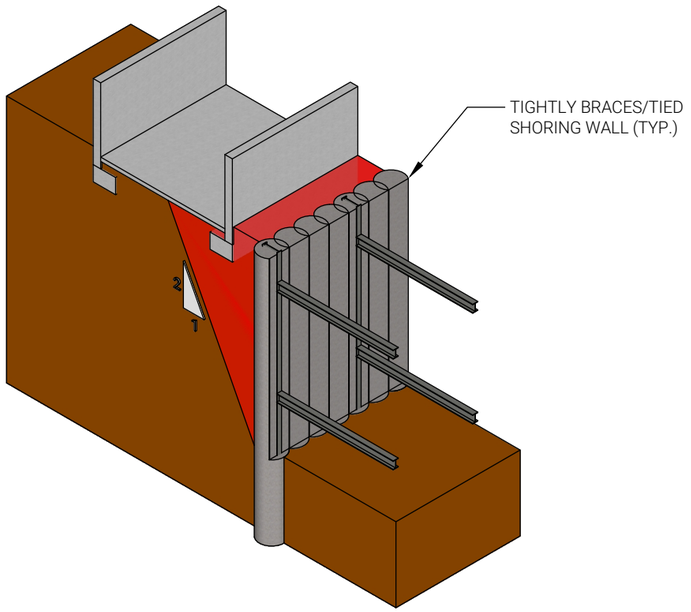


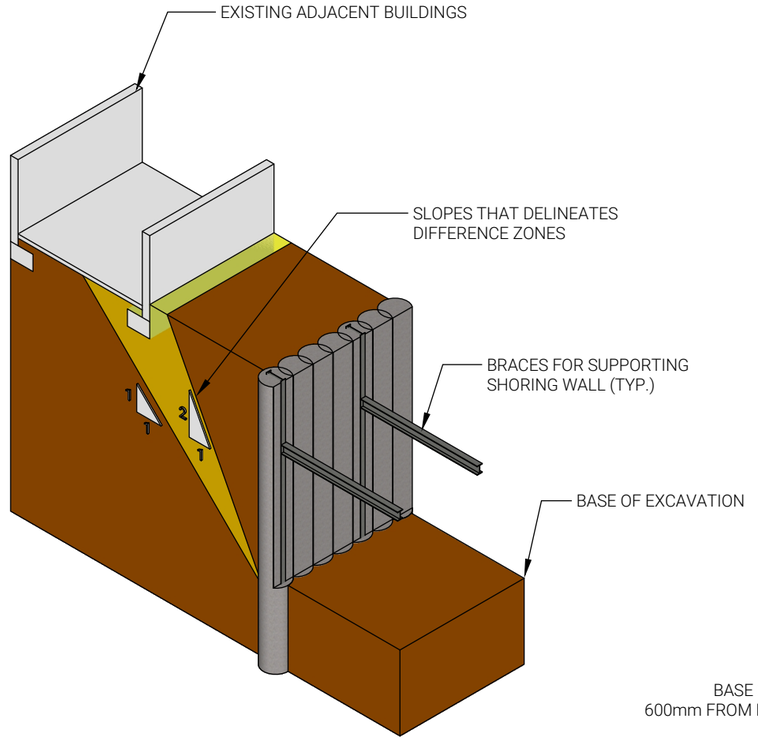
Figure 5: Shear-Wave Velocity Inversion Model from MASW/SPAC

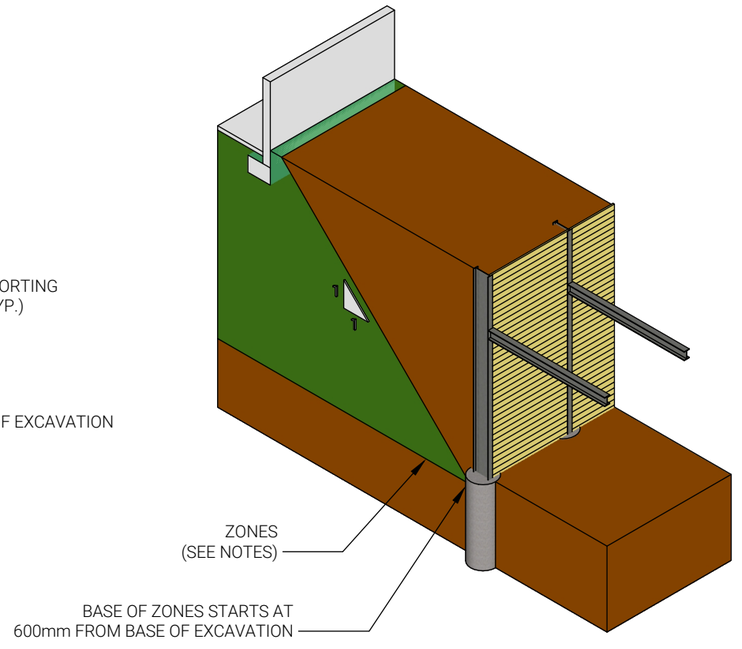
TABLE 1: V_{S30} Calculation for the Site Class

Depth	Vs			Thickness	Cumulative Thickness	Delay for Vs Mean	Cumulative Delay	Vs Mean at given Depth
	Min.	Mean	Max.					
(m)	(m/s)	(m/s)	(m/s)	(m)	(m)	(s)	(s)	(m/s)
0.0	154	171	188	Grade Level				
1.9	184	217	251	1.9	1.9	0.010895	0.010895	171
3.9	209	304	369	2.0	3.9	0.009206	0.020101	192
6.0	244	458	760	2.2	6.0	0.007155	0.027256	222
8.5	249	1610	2074	2.4	8.5	0.005273	0.032529	260
9.0	253	1611	2074	0.5	9.0	0.000338	0.032867	274
9.5	750	1710	2074	0.5	9.5	0.000310	0.033178	286
9.8	1009	1762	2074	0.3	9.8	0.000175	0.033353	294
10.2	1253	1811	2074	0.4	10.2	0.000244	0.033597	304
12.0	1266	1813	2074	1.7	12.0	0.000961	0.034558	346
13.8	1267	1814	2074	1.8	13.8	0.001015	0.035573	388
15.8	1275	1815	2074	2.0	15.8	0.001075	0.036648	430
17.8	1281	1816	2074	2.0	17.8	0.001124	0.037772	471
20.0	1292	1819	2074	2.2	20.0	0.001184	0.038955	512
22.2	1300	1820	2074	2.3	22.2	0.001237	0.040193	552
24.6	1318	1824	2074	2.4	24.6	0.001296	0.041489	592
27.0	1335	1827	2074	2.5	27.0	0.001343	0.042832	631
29.6	1344	1829	2074	2.6	29.6	0.001401	0.044233	669
30.0				0.4	30.0	0.000235	0.044468	675

APPENDIX G







ZONE A (RED)

FOUNDATIONS WITHIN THIS ZONE OFTEN REQUIRE UNDERPINNING OR SHORING SYSTEM. HORIZONTAL AND VERTICAL PRESSURES ON EXCAVATION WALL OF NON-UNDERPINNED FOUNDATION MUST BE CONSIDERED

ZONE B (YELLOW)

FOUNDATIONS WITHIN THIS ZONE OFTEN DO NOT REQUIRE UNDERPINNING BUT MAY REQUIRE SHORING SYSTEM. HORIZONTAL AND VERTICAL PRESSURES ON EXCAVATION WALL OF NON-UNDERPINNED FOUNDATION MUST BE CONSIDERED

ZONE C (GREEN)

FOUNDATIONS WITHIN THIS ZONE USUALLY DO NOT REQUIRE UNDERPINNING OR SHORING SYSTEM

NOTES:
1. USER'S GUIDE - NBC 2005 STRUCTURAL COMMENTARIES (PART 4 OF DIVISION B) - COMMENTARY K.

GROUNDED ENGINEERING

Title

EXCAVATION ZONE OF INFLUENCE GUIDELINES