



CHUNG & VANDER DOELEN
ENGINEERING LTD.

**PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED SUBDIVISION – STAGE 1**

1949 Gerber Road
Township of Wellesley, Ontario

SUBMITTED TO:

James Gies Construction Ltd. c/o Meritech Engineering
1305 Bishop St. North, Suite 202
Cambridge, ON
N1R 6Z

ATTENTION:

Mr. Alexander Orakwue



CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 5E1
519-742-8979

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James Gies Construction Ltd. c/o Meritech Engineering
1305 Bishop St. North, Suite 202
Cambridge, ON
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Attention: Mr. Alexander Orakwue

RE: Preliminary Geotechnical Investigation
Proposed Subdivision – Stage 1
1949 Gerber Road, Township of Wellesley, Ontario

We take pleasure in enclosing one (1) copy of our Preliminary Geotechnical Investigation Report carried out at the above-referenced Site. Soil samples will be retained for a period of three (3) months and will thereafter be disposed of unless we are otherwise instructed.

If you have any questions or clarifications are required, please contact the undersigned at your convenience.

We thank you for giving us this opportunity to be of service to you.

Yours truly,
CHUNG & VANDER DOELEN ENGINEERING LTD.

Mark Marriner, P.Eng.
Associate Director – Geotechnical Services

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1.0 INTRODUCTION

CHUNG & VANDER DOELEN ENGINEERING LTD. (CVD) has been retained by James Gies Construction Ltd. c/o Meritech Engineering (“Client”) to carry out a preliminary geotechnical investigation for a proposed subdivision development to be located at 1949 Gerber Road in the Township of Wellesley, Ontario (“Site”).

It is understood that the proposed subdivision will be developed in two stages: Stage 1 and Stage 2. This report will specifically address the details of Stage 1 which encompasses the western portion of the subject lands that are currently located within the “urban area boundary” of the Town of Wellesley. The development will consist of a residential area (Blocks 1 to 5), a park (Block 7), a commercial area (6), and a stormwater management (SWM) facility (Block 8). It is understood that the development will be fully municipally serviced with water and wastewater infrastructure. The overall grading of the Stage 1 development is shown in the Overall Grading and Servicing Concept Plan (Meritech Engineering, May 22, 2026), included in Appendix B.

It should be noted that the specific construction details of each block (i.e., building specifications and finished floor elevations) were not provided at the time of writing this report. Additional block-specific investigations may be required at later stages to support the final subdivision design and development. CVD should review the final design and site grading plans once they are made available, and as such, the recommendations provided in this report should be viewed as preliminary in nature and will need to be reviewed at the detailed design stage.

The purpose of this investigation was to determine the subsurface soil and groundwater conditions at the site and based on the findings, to make geotechnical recommendations in aid of grading and design for the following:

- Preliminary foundation bearing pressures;
- Site grading operations and engineered fill construction;
- Recommendations for suitability of existing on-site soil, reuse, and frost susceptibility;
- Recommended coefficients of encountered soil types for anticipated volume change during earthmoving operations (i.e. bulking/shrinkage for cut/fill operations);
- Excavation condition;
- Groundwater control during construction;
- Foundation soil classification for seismic design per OBC 2024;
- Site servicing recommendations;
- Corrosivity potential of existing soils;
- Pavement design and construction; and
- Estimates of infiltration rates of encountered soil deposits and extent of permeable soils.

It should be noted that a groundwater monitoring program is currently ongoing at the site as part of CVD’s hydrogeological investigation. As such, details pertaining to the hydrogeological aspects of the proposed development will be addressed separately in a Hydrogeological Assessment at a later date.



Additionally, the results of the topsoil investigation, completed through hand-dug test pits, will either be incorporated into a future revision of this report or provided separately in an addendum letter.

2.0 FIELDWORK

As part of the initial field investigation, ten (10) boreholes, identified as Boreholes 1 to 10, were advanced to depths between 4.55 and 8.25 m below ground surface (mbgs) between July 2 and 3, 2026. Five (5) monitoring wells were installed beside Boreholes 2, 4, 5, 7, and 9 (wells labelled BH 2, 4, 5, 7, and 9). All borehole/monitoring well locations are illustrated on the Borehole & Monitoring Well Location Plan, Figure 1 (see Appendix C).

The fieldwork was carried out under the supervision of a member of our engineering team, who logged the boreholes, collected subsurface soil samples, and monitored the groundwater conditions. All CVD monitoring well / borehole logs are included on Enclosures 1 to 10, included in Appendix E.

The boreholes were advanced using a track-mounted CME-55 drill rig, equipped both with standard 152 mm outer diameter solid stem augers (SSA) and with standard 108 mm inner diameter hollow stem augers (HSA) operated by Direct Environmental Drilling (DED) of St. Thomas, Ontario. Standard penetration tests (SPTs) in accordance with ASTM Specification D1586, were carried out at frequent intervals of depth, and the results are shown on the Borehole Logs as Penetration Resistance or “N”-values.

The undrained shear strength of the cohesive soil deposits was determined on the slightly disturbed SPT samples using a field pocket penetrometer. The compactness condition or consistency of the soil strata has been inferred from these various test results.

The borehole and monitoring well locations and associated ground surface elevations were surveyed by CVD for the purpose of this report using a Network RTK Global Navigation Satellite System (GNSS) Receiver. The survey data was collected using The UTM Zone 17N Projection, NAD83(CSRS)v7-2010 datum and Canada Geoid Model HT2_2010v70 (CGVD28).

3.0 LABORATORY TESTING

3.1 Geotechnical Laboratory Testing

Soil samples obtained from the in-situ tests were examined in the field and subsequently brought to our laboratory for visual and tactile examination to confirm field classification. Moisture content determination of all retrieved samples occurred.

In addition, four (4) grain size distribution analyses were carried out on representative soil samples of the major soil deposits to establish the physical and engineering properties as well as assist to provide estimates of infiltration rates of the encountered soil deposits. The results of these tests are presented in Enclosures 11 to 14 (Appendix E). Furthermore, an Atterberg Limits test was completed on a sample of the native silty clay soil to help classify the deposit, the results of which are shown in Enclosure 12.



3.2 Analytical Laboratory Testing

Three (3) soil samples were submitted to ALS Laboratories of Waterloo, Ontario for analysis of sodium absorption ratio (SAR) and electrical conductivity (EC). Additionally, two (2) samples were submitted for corrosivity testing in order to determine the potential for sulphate attack on buried concrete and to assess the likelihood of external corrosion for buried metallic pipelines, bends, and appurtenances.

The following table presents the location, depth, description, and parameters analysed for each sample collected and submitted for analysis.

Sample No.	Sample Depth	Sample Description	Parameters Analysed
BH2 SS1	0.00 to 0.60 m	Topsoil and Fill	SAR and EC
BH4 SS1	0.00 to 0.60 m	Topsoil and Fill	
BH9 SS1	0.00 to 0.60 m	Topsoil and Fill	
BH3 SS3	1.50 to 2.10 m	Silty Clay	Corrosivity Testing
BH5 SS3	1.50 to 2.10 m	Silty Clay	

No exceedances were detected for any of the samples for SAR or EC. The results of the corrosivity testing will be further discussed in Sections 5.7 and 5.8.

The laboratory certificates of chemical analysis and results provided by ALS Laboratories are enclosed in Appendix D.

4.0 EXISTING SITE CONDITIONS

The approximately 13.1-hectare Stage 1 subject lands, situated at the corner of Gerber Road and Greenwood Hill Road, currently comprise undeveloped agricultural fields. A small dirt entrance driveway with several scattered medium-sized trees is present off Gerber Road; however, the remainder of the site consists of agricultural fields.

The property is located 60± m north of the Nith River, and multiple small streams associated with the river are found directly south of the property. Other nearby surface water features include Firella Creek, located 700± m west of the site, Campell Drain located 800± m northwest of the property, and an unidentified stream located 500± m north of the subject lands.

In terms of local topography, the topography of the subject lands and surrounding area may be described as rolling land. Elevations across the site typically increase in elevation from south to north with elevations varying from 355± to 367± mASL. The ground surface elevations at the borehole locations ranged between 355.88 and 364.94 mASL.



5.0 SUBSURFACE CONDITIONS

The detailed subsurface conditions encountered in the ten (10) boreholes advanced as part of this investigation are shown on the Borehole Log Sheets, Enclosures 1 to 10. Enclosure A provides explanations of the various soil abbreviations and terms used on these borehole log sheets.

The following sections provide descriptions of the major soil deposits encountered in the boreholes. The stratigraphic boundaries shown on the borehole logs are inferred from non-continuous sampling conducted during advancement of the borehole drilling procedures, and therefore, represent transitions between soil types rather than exact planes of geologic change. The subsurface conditions will vary between and beyond the borehole locations.

5.1 Topsoil and Fill

The upper layer of all ten (10) boreholes consisted of sandy silt to silty sand fill with topsoil, likely resulting from the reworking of the upper portion of the native soils and topsoil due to agricultural tilling. Occasional wood fragments were observed within the fill deposits in Boreholes 2, 4, and 5. Trace amounts of clay and occasional rootlets were also encountered within the layer. This surficial topsoil and reworked fill layer extend to depths between 0.60 to 0.95 mbgs.

A detailed investigation of topsoil thicknesses across the site will be conducted to delineate the topsoil from the reworked fill. The results of the hand-dug test pit investigation will be provided in a future revision to this report or as a separate addendum letter.

The SPT “N”-values measured within the reworked fill deposit range from 6 to 21 blows per 300 mm of penetration, indicating a variable loose to compact compactness condition. Natural moisture contents were measured between 12 and 26%, exhibiting typically a moist moisture condition. Higher moisture contents are indicative of the presence of organics and/or topsoil.

5.2 Silty Clay

Following the surficial topsoil and fill layer, all ten (10) boreholes were underlain by a silty clay deposit with trace amounts of gravel and sand. Occasional sand and/or silt seams were also observed with the deposit. The silty clay soils are the predominant near-surface soils at the site and extend to at least 8.25 mbgs, the maximum depth explored during the investigation.

The results of three (3) grain size distribution analyses taken from the silty clay deposit in Boreholes 2, 4, and 5, are shown graphically on Enclosures 11 to 13. Furthermore, an Atterberg Limits test was completed on the sample retrieved from Borehole 4, Sample 7, and the results are presented in Enclosure 12. It was determined that the tested sample has a plastic limit of 16% and a liquid limit of 29%, and can therefore be classified as CL.

Standard penetration testing within the till deposits yielded “N”-values ranging from 4 to 31 blows per 300 mm of penetration. The undrained shear strength obtained on retrieved samples of the cohesive



silty clay deposit was measured from 25 to over 250 kPa. Based on the above test results, the silty clay till deposit is considered to have a variable firm to hard consistency.

Natural moisture contents were measured between 10 and 31%, and the general plasticity of the silty clay till deposit ranges from drier than plastic limit (DTPL) to wetter than plastic limit (WTPL).

5.3 Silt Till

A layer of silt till with trace amounts of sand, clay and occasional clayey seams was encountered within the silty clay deposit in Boreholes 7 and 9. The silt till layer varied from 1.70 to 2.10 m thick.

The results of one (1) grain size distribution analysis taken from the silt till in Borehole 9, Sample 4, are shown graphically on Enclosure 14.

Standard penetration testing within the silt till layer yielded “N”-values ranging from 28 to 57 blows per 300 mm of penetration, indicating a compact to very dense compactness condition. Natural moisture contents were measured between 14 and 20% and generally displayed moist to wet moisture conditions.

5.4 Groundwater

Throughout the field investigation, groundwater conditions were monitored during advancement of boreholes, and, as of the writing of this report, water level readings were measured in the five (5) monitoring wells (wells BH 2, 4, 5, 7, and 9) on July 9, 2026.

The groundwater measurements for each monitoring well collected thus far for the investigation are summarized in Table 1 (Appendix C) and shown below. Figure 2 provides an interpretation of on-site groundwater contours and general groundwater flow directions based on these July 9, 2026, water levels.

Monitoring Well	Ground Elevation (mASL)	Top Pipe Elevation (mASL)	Stickup (m)	Water Level (mbgs)	Water Elevation (mASL)
				09-Jul-26	09-Jul-26
BH 2	355.88	356.66	0.78	2.80	353.08
BH 4	361.82	362.60	0.77	1.00	360.82
BH 5	360.44	361.28	0.84	1.71	358.73
BH 7	362.34	363.15	0.81	0.99	361.36
BH 9	364.94	365.75	0.81	0.98	363.96



The water table was manually measured at depths varying from 0.98 to 2.80 mbgs, corresponding to elevations between 353.08 to 363.96 mASL. It should be noted that it is expected that peak spring groundwater levels will be noticeably higher than those measured during the July 2026 site visit. Due to the aquitard nature of the predominant silty clay soils, relatively large seasonal fluctuations are expected.

As shown in Figure 2, the shallow groundwater flow direction generally follows local site topography, with groundwater flowing from the elevated northern portion of the property towards the lower-lying southern portion of the site. It should be noted that GRCA mapping identifies streams emanating from an area directly south of the site and flowing towards the Nith River, which further supports the interpreted groundwater flow direction.

It should be noted that CVD's groundwater monitoring program is still on-going and more detailed characterization of the on-site water table will be provided in CVD's Scoped Hydrogeological Assessment at a later date once more groundwater monitoring data is collected.

5.5 Sulphate Attack on Buried Concrete

Two (2) soil samples were submitted to the Waterloo laboratory of ALS Canada Ltd. to evaluate the potential for sulphate attack on concrete, and the test results are summarized below:

Soil Characteristics	Borehole 3 Sample 3 (Silty Clay)	Borehole 5 Sample 3 (Silty Clay)
Soluble Sulphate (µg/g) / (%)	<20 / <0.002	<20 / <0.002

The Canadian Standards Association (CSA) document CAN/CSA A23.1-19, titled "*Concrete Materials and Methods of Concrete Construction*," identifies four categories of potential sulphate attack on buried concrete based on the percentage of soluble sulphate in the soil. These categories are as follows:

- **Negligible potential:** 0 to 0.10%
- **Moderate potential:** 0.10% to 0.20%
- **Severe potential:** 0.20% to 2.0%
- **Very severe potential:** 2.0% or higher

Based on the laboratory results, the silty clay samples for Borehole 3, Samples 3 and Borehole 5, Sample 3 indicate negligible potential for sulphate attack.

As such, for concrete elements not in contact with any corrosive fill (e.g., native on-site soils), General Use (GU) or blended General Use (GUB, GULb) cement may be used.



5.6 Corrosion Potential on Buried Metallic Pipelines

Two (2) soil samples were submitted to the Waterloo laboratory of ALS Canada Ltd. to evaluate the corrosion potential of the on-site soils, in order to assess the likelihood of external corrosion to grey or ductile cast iron pipe and other metallic objects. The corrosion potential test results are summarized below with reference to "AWWA C105 Appendix A":

Soil Characteristics	Borehole 101 Sample 3 (Sand / Sand and Gravel)	Borehole 103 Sample 3 (Silty Sand)
Resistivity (Ω -cm)	9010 (0)	6710 (0)
pH	7.85 (0)	7.90 (0)
Redox Potential (mV)	304 (0)	316 (0)
Sulphides (μ g/g)	1.38 (2)	1.54 (2)
Moisture	Fair (1)	Fair (1)
Total Points	3	3

In accordance with "AWWA C105 Appendix A," when the total point count is less than 10, the soil is not considered corrosive to grey or ductile cast iron pipe. While this guideline is specifically intended to assess the corrosion potential for grey or ductile cast iron pipe piping, it also serves as a useful indicator of the potential for corrosion of steel piles and other buried metallic elements.

The corrosivity test results indicate that the soil is generally not corrosive to grey or ductile cast iron pipe and other metallic objects such as steel piles.

The results and laboratory certificates of chemical analysis provided by ALS Canada Ltd. are enclosed in Appendix D.

5.7 Analytical Chemical Testing for EC and SAR

Three (3) soil samples were submitted to the Waterloo laboratory of ALS Canada Ltd. to determine the sodium absorption ratio (SAR) and electrical conductivity (EC) of near surface samples across the site. Samples were tested from Borehole 2 – Sample 1, Borehole 4 – Sample 1, and Borehole 9 – Sample 1.

The analytical results for soils were compared to the following O. Reg. 406/19 regulatory standards:

- Table 1 (Full Depth Background Site Condition Standards) for Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use (Table 1 RPIICC SCS)
- Table 2.1 (Full Depth Generic Excess Soil Quality Standards in a Potable Ground Water Condition) for Agricultural Property Use (Table 2.1 Ag ESQS)



- Table 2.1 (Full Depth Generic Excess Soil Quality Standards in a Potable Ground Water Condition) for Residential/Parkland/Institutional Property Use (Table 2.1 RPI ESQS)
- Table 2.1 (Full Depth Excess Soil Quality Standards in a Potable Ground Water Condition) for Industrial/Commercial/Community Property Use (Table 2.1 ICC ESQS)

No exceedances were detected in any of the three (3) samples. The results and laboratory certificates of chemical analysis provided by ALS Canada Ltd. are enclosed in Appendix D.

6.0 DISCUSSION AND RECOMMENDATIONS

6.1 General

It is understood that Stage 1 of the proposed subdivision will consist of a residential area (Blocks 1 to 5), a park (Block 7), a commercial area (6), and a stormwater management (SWM) facility (Block 8). It is understood that the development will be fully municipally serviced with water and wastewater infrastructure. The overall grading of the Stage 1 development is shown in the Overall Grading and Servicing Concept Plan (Meritech Engineering, May 22, 2026), included in Appendix B.

It should be noted that the specific construction details of each block (i.e., building specifications and finished floor elevations) were not provided at the time of writing this report. Additional block-specific investigations may be required at later stages to support the final subdivision design and development. CVD should review the final design and site grading plans once they are made available, and as such, the recommendations provided in this report should be viewed as preliminary in nature and will need to be reviewed at the detailed design stage.

In general, the surficial topsoil and loose to compact reworked fill extend to depths between extends to depths between 0.60 to 0.95 mbgs. Following the fill layer, the site is predominantly underlain by stiff to hard silty clay deposits, with occasional sand seams, which extend to at least 8.25 mbgs, the maximum depth explored during the investigation. A 1.70 to 2.10 m thick layer of compact to very dense silt till with occasional clayey seams was encountered within the silty clay deposit in Boreholes 7 and 9.

Based on July 2026 preliminary groundwater level readings, the water table was manually measured at depths varying from 0.98 to 2.80 mbgs, corresponding to elevations between 353.08 to 363.96 mASL. It should be noted that it is expected that peak spring groundwater levels will be noticeably higher than those measured during the July 2026 site visit. Due to the aquitard nature of the predominant silty clay soils, relatively large seasonal fluctuations are expected. The shallow groundwater flow direction is interpreted to generally follows local site topography, with groundwater flowing from the elevated northern portion of the property towards the lower-lying southern portion of the site.

Based on the Overall Grading and Servicing Concept Plan Meritech Engineering (May 22, 2026), it appears that the existing grade will generally be raised in Blocks 1 to 7. However, with the exception of the water level measured in well BH2, water levels were generally measured at depths less than 2 mbgs. These measurements were collected during the summer and should therefore be considered representative of relatively low groundwater conditions.



Depending on the final design of the on-site structures and whether any underground structures are planned, some degree of temporary construction dewatering may be required. Due to the predominant very low permeable silty clay underlying the site, it is anticipated that temporary construction dewatering may be achieved using conventional sump-pumping techniques together with intercept ditches. It is recommended that building structures be founded 0.6 m above the high groundwater table.

During the detailed design stage, once more finalized grading plans are available, CVD should be retained to review these designs and provide recommendations for any required construction dewatering and discharge.

6.2 Site Grading and Engineered Fill Construction

Based on the Overall Grading and Servicing Concept Plan Meritech Engineering (May 22, 2026) site grading operations involving “cut and fill” procedures are anticipated. It appears that the generally the grade will be raised in Blocks 1 to 7 while notable excavations will occur in the proposed SWM facility area of Block 8. It is recommended to construct engineered fill in areas to be raised in order to suitably support the proposed development, future roadways, and infrastructure servicing.

Due to the low infiltration rates of the predominant silty clay, groundwater levels may be higher during wetter periods, particularly following the spring freshet. The fine-grained soils are also moisture-sensitive and may be difficult to handle and compact when wet. Accordingly, major excavation and site grading operations should, where practical, be scheduled during the drier summer months. Moisture conditioning of granular soils may also be required to achieve the specified compaction.

The thickness of topsoil may vary across the Site. Hand-dug test pits are proposed to further assess the thickness of topsoil during subsequent stages of the development. Topsoil stripping should be undertaken when the ground is sufficiently dry to support construction equipment and minimize disturbance of the underlying subgrade.

Small amounts of fill and/or poor soil conditions were encountered at all borehole locations and extended up to depths of 1.4± m below existing grade. The following table provides the depth and elevation at each borehole location where non-suitable soil conditions were encountered:

Borehole No.	Existing Ground Elevation (m)	Thickness of Non-Suitable Soils (m)	Elevation of Suitable Soils (m)
1	356.3±	0.6±	355.7±
2	355.9±	1.0±	354.9±
3	360.4±	0.9±	359.5±
4	361.8±	0.9±	360.9±
5	360.4±	0.9±	359.5±



Borehole No.	Existing Ground Elevation (m)	Thickness of Non-Suitable Soils (m)	Elevation of Suitable Soils (m)
6	362.7±	0.9±	361.8±
7	362.3±	0.8±	361.5±
8	363.1±	1.4±	361.7±
9	364.9±	0.6±	364.3±
10	363.8±	0.7±	363.1±

Inorganic soil excavated from “cut” areas can be salvaged for re-use as bulk fill for site regrading and engineered fill purposes. The natural moisture content of the fill soil to be reused should be within 3% drier of the optimum moisture content to achieve the specified degree of compaction. Moisture adjustment of the salvaged material may be necessary to achieve a suitable moisture content for effective compaction.

Any shortfall of fill material required for site grading operations may be made with similarly graded imported soils. It is recommended that any proposed borrow source materials be tested prior to importing to ensure that the environmental quality of the imported fill meets all environmental approval criteria and to ensure that the natural moisture content of the fill is suitable for compaction.

A minimum of six (6) months is recommended as a waiting period for engineered fill pads, constructed with cohesive soils, to allow for minor settlements and dissipation of pore pressure within the silty clay to take place prior to pouring concrete footings or placement of settlement sensitive structures on the engineered fill.

In general, the majority of the cut materials are expected to consist of fine-grained, clay-rich soils that are susceptible to frost and softening when exposed to moisture and construction traffic. Accordingly, these materials should not generally be used for engineered fill, footing and foundation wall backfill, or service trenches during winter conditions unless suitable conditions can be maintained and appropriate construction procedures are followed.

Grading and filling operations should be planned to promote positive surface drainage and minimize ponding, while construction traffic should be limited to designated routes to minimize disturbance and rutting of exposed subgrade soils. Temporary granular access roads may be required during periods of wet weather.

Engineered fill should be constructed in accordance with the following procedures in order to support future buildings, infrastructure servicing and roadway pavements.

1. All existing topsoil, organic and deleterious materials should be stripped from building and roadway areas. Loose/soft soils encountered within future building areas as presented in the previous table are to also be removed. Suitable inorganic native soils may be carefully segregated and salvaged for potential reuse purposes to construct engineered fill;



2. The exposed inorganic subgrade is to be thoroughly recompacted by large heavy compaction equipment (sheepsfoot roller for the predominant underlying cohesive soils) if it can support such equipment and remaining stable. Careful review and guidance by the geotechnical engineer are recommended should the subgrade become unstable. All prepared subgrade areas are to be inspected by qualified geotechnical personnel prior to placement of fill;
3. Where wet / saturated subgrade conditions are encountered, the initial lift to raise the grade will require coarse pit run sand and gravel, 450 to 600 mm thick and be statically rolled to stabilize and “bridge” the prepared subgrade;
4. The required grades can then be achieved by placing approved inorganic onsite fill in maximum 200 to 300 mm thick loose lifts, which are to be thoroughly compacted to no less than 100% Standard Proctor maximum dry density (SPMDD) to the underside of the proposed footings.

The engineered fill above the footing level for the support of floor slabs and pavement structures can be reduced to 95% SPMDD. The moisture content of the fill materials should be within 3% below their optimum moisture contents in order to achieve the specified degree of compaction;

5. Engineered fill used to support future buildings, infrastructure servicing and roadway pavements must be placed such that the fill pad extends horizontally outwards at least a distance equal to the depth of fill to be placed;
6. Overly wet and organic materials should be placed in non-structural areas and outside of stormwater management (SWM) feature areas where 90% SPMDD is adequate. Alternatively, wet inorganic soils can be mixed with drier soils to produce a suitable moisture content to allow appropriate compaction to occur if conditions dictate; and
7. Adequate earth cover must be provided to protect engineered fill from freezing if left over the winter months; and
8. All engineered fill placement and compaction operations must be supervised on a full-time basis by qualified geotechnical personnel to approve fill material and ensure the specified degrees of compaction have been achieved.

Vibration could be generated from various construction equipment during construction, such as compactors and rollers which could be harmful to any nearby residential dwellings surrounding the property. Peak particle velocity (PPV) of ground motion is widely accepted as the best descriptor of potential for vibration damage to structures. The safe vibration limit can be set to 8 to 25 mm/s PPV, depending on frequency of vibrations and the sensitivity of surrounding structures to vibration.

Vibration monitoring should be carried out to measure the PPV of ground motion from vibration generated from typical compaction equipment at the beginning of the project in the potentially critical areas. This will set criteria and establish the type of equipment to be used for this project. Although the site is generally isolated, the property is bordered by roads, and a residential subdivision exists to the west of the subject lands. As such, it is recommended that a pre-construction condition survey be conducted to document the condition of the existing structures within the possible zone of influence.



6.3 Site Servicing

The subdivision will be municipally serviced with watermain and sewers. According to the Region of Waterloo Design Guidelines and Supplemental Specifications for Municipal Services (DGSSMS) (January 2026), it is anticipated that municipal servicing will generally lie $2.0\pm$ to $3.0\pm$ m below finished grades. The sanitary sewer invert should be located a minimum of 2.5 m below final road grade, the storm sewer obvert should be located 1.2 m below final road grade, and the top of the watermain pipe should be located 1.8 to 2.0 m below finished grade, depending on the diameter of the watermain.

6.3.1 Groundwater Control and Open Cut Excavation

With the exception Block 8, excavations are expected to be in the order of $1\pm$ to $3.5\pm$ m deep for foundations and site servicing. The excavations will penetrate topsoil, loose to compact fill, and firm to hard silty clay. Provided the groundwater is controlled/lowered below the excavation depths, these materials are considered to be Type 3 Soils in accordance with the latest Occupational Health and Safety Act.

Above the groundwater table, uncontrollable groundwater is not expected within the anticipated depths of excavation, and excavations in the Type 3 Soils are expected to remain stable during the construction period provided that side slopes are cut to 1H : 1V from the bottom of the excavation. Where seepage or perched groundwater is encountered, side slopes should be cut to more stable angles of 3H : 1V. The side slopes should be suitably protected from erosion processes. Surface run-off which inadvertently enters the excavation can be controlled by using conventional filtered sump pumping techniques, as and where required.

Based on the July 2026 water level readings, which ranged from 0.98 to 2.80 mbgs, corresponding to elevations of 353.08 to 363.96 mASL, and considering that these summer water levels are likely lower than those expected during peak groundwater conditions, groundwater control may be required for at least some footing excavations, depending on the proposed finished floor elevations and whether below-grade structures are included.

Considering the low permeability of the predominant silty clay soils, groundwater control will likely be achievable using filtered sump pits, with drainage and/or interceptor ditches as required. Groundwater should be controlled as necessary to maintain stable and workable excavation conditions. Conventional sump pumping may have limited effectiveness due to the clayey nature of the soils. Where wet conditions persist, a 50 to 75 mm thick lean concrete mud slab may be used to protect the founding soils from disturbance during placement of reinforcing steel and formwork.

If pockets and/or areas of more permeable saturated granular deposits are encountered, then more sophisticated temporary construction dewatering methods (i.e., wellpoints) designed by a specialist contractor may be required to control groundwater ingress and lower groundwater levels 0.6 m below the target elevation.

It is recommended that CVD be retained to review the final design grades once a finalized site grading plan with finished floor elevations is available and evaluate the need for dewatering. Additional



boreholes or test pits will need to be excavated in the proposed foundation areas in order to properly assess the rate of groundwater ingress into the excavation and provide more tailored conclusions for the any potential temporary construction dewatering.

6.3.2 Pipe and Structure Bedding

The native undisturbed soils encountered throughout the site will generally provide suitable subgrade support for the site services and manholes.

Any loose, unstable and/or organic soils encountered at the pipe invert and below the manholes and catch basins should be sub-excavated and replaced with well compacted Granular "A", which should be placed in 150 mm thick layers and compacted to at least 95% Standard Proctor Maximum Dry Density (SPMDD). The support of pipes in these areas can also be achieved with unshrinkable fill if poor soil is encountered at the subgrade level and is fully removed.

The bedding requirements for the services should be in accordance with Ontario Provincial Standard Drawings OPSD - 802 for flexible and rigid pipes. The bedding shall be a Class "B" and consist of at least 150 mm thick Granular "A" compacted to at least 95% SPMDD. Granular "A" should be used to backfill around the pipe to at least 300 mm above the top of the pipe.

Particular attention should be given to ensure material placed beneath the haunches of the pipe is adequately compacted. Recycled asphalt should not be used in Granular "A" bedding material.

Maintenance holes and catch basins should be founded on a minimum 150 mm thick layer of Granular "A" bedding placed on approved subgrade and compacted to at least 95% SPMDD, with Granular "A" extending a minimum of 300 mm around the structures in accordance with the applicable OPSD Division 7 drawings.

6.3.3 Trench Backfill

The existing inorganic native soils are considered suitable for re-use as trench backfill, provided that all deleterious or excessively wet materials are separated prior to re-use. The on-site soils are considered frost susceptible and are not considered suitable for use where free-draining material is required.

If necessary, excavated soils with differing moisture contents may be blended in appropriate proportions to produce a mixture near the material's optimum moisture content to achieve the specified compaction requirements. Conversely, controlled addition of water may be required where soils are significantly drier than optimum to facilitate proper compaction.

The backfill should be placed in thin layers, 300 mm thick or less dependant on the demonstrated success of compaction based on in-situ density test results. Organic soils, overly wet soils, and frozen materials are to be discarded and not permitted to be used for backfilling.

All backfill should be compacted to at least 95% SPMDD. Backfilling operations should follow closely



after excavation so that only a minimal length of trench slope is exposed at any one time to minimize potential problems. This will potentially minimize over-wetting of the subgrade material. Particular attention should be given to make sure frozen material is not used as backfill should construction extend into the winter season.

It has been our experience that excavated cohesive soils (i.e., silty clay) should be broken into smaller pieces (less than 150 mm diameter) before returning into the trench as backfill. This will eliminate “wedging” problems and reduce long term settlement. Particular attention must be made to backfilling the laterals where the trenches are narrow and against the manholes and catch-basins. Thinner lifts and additional compaction must be applied.

Frequent inspections by experienced geotechnical personnel should be carried out to examine and approve backfill material, to carefully inspect placement, and to verify that the specified degree of compaction has been obtained by in-situ density testing.

6.3.4 Stormwater Management Facility Construction

The proposed subdivision will be serviced by a SWM facility in Block 8 as shown in the Overall Grading and Servicing Concept Plan (Meritech Engineering, May 22, 2026).

Based on review of both the current development plans, it is understood that the wet pond bottom will be founded at 354.70 mASL and the outer edge of the SWM facility will be situated at 359.10 mASL. As such, notable cut and fill operations will be required considering that current ground surface elevations range from 355± to 362± mASL. The permanent pool elevation is proposed at 356.70 mASL, and the pond bottom area is planned to be 7,050 m².

Based on the July 2026 groundwater measurements, as shown in Figure 2, which should be considered as being relatively low in comparison to potential peak groundwater elevations, the water table around the proposed SWM facility ranges from approximately 354± to 361± mASL, from southwest to northeast across the area. As such, the water table will intersect the SWM area and will generally be above the proposed permanent pool elevation.

Subject to confirmation of hydraulic conductivity through additional testing and provided the materials meet the infiltration criteria established by the civil design, the predominant silty clay soils encountered throughout the explored areas of the site may be considered potentially suitable for use as compacted liner material. Final suitability should be confirmed during detailed design and verified during construction through appropriate field inspection and testing. The determination of seepage performance criteria and the design of any liner or other water retention measures (e.g., compacted clay liner, geosynthetic liner, or equivalent), if required, are the responsibility of the civil engineer as part of the detailed stormwater management pond design.

The detailed SWM facility design should also address erosion protection and long-term sediment management. Appropriate stabilization measures (e.g., rip rap, vegetation, erosion control blankets, or similar measures) may be required at inlet and outlet locations and along pond side slopes subject to concentrated flow. Consideration should also be given to sediment control features, such as forebays or



similar provisions, to limit the accumulation of fine-grained soils within the pond base and to facilitate long-term maintenance of the pond storage capacity.

During construction, the exposed SWM subgrade should be inspected by the geotechnical engineer following excavation. If soft, disturbed, or wet soils are encountered at the SWM facility base, localized removal and replacement, drying and recompaction, or other stabilization measures may be required prior to placement of any liner or cover materials. Additional geotechnical input related to liner suitability and construction considerations can be provided during the detailed design and construction stages, if required.

Engineered fill placement and compaction for any pond liner and/or pond berm construction should follow the procedures outlined in Section 6.2 of this report, using materials approved for the intended application.

6.4 Estimated Soil Volume Changes

The following table provides estimated volume changes for in-situ cut soils, relative to their proposed placement fill application:

Existing Soil	Proposed Application (Estimated Volume Change)	
	Engineered Fill	Landscape Areas
Native	0 +/- 2%	+3 to +7%
Fill	N/A	+1 to +5%

A positive (+) value represents an increase in soil volume, and a negative (-) value represents a decrease in soil volume. These values are provided as rough estimates only based on relative compactness of existing soils and compaction effort required for the proposed applications. Over-compaction will lead to a reduction of the estimation volume change.

It should be noted that the existing fill is not suitable for engineered fill due to the inclusions of topsoil and other organics.

6.5 Preliminary Footing Foundation Recommendations

The stiff to very stiff clayey silt or compact silt native soil deposits encountered at the site are considered suitable to support building foundations.

For preliminary design purposes, building foundations cast on the native undisturbed compact or stiff to very stiff soils or suitably placed and compacted engineered fill per Section 6.2 can be designed using a Net Geotechnical Reaction at SLS of 150 kPa. The SLS value given above is based on a maximum settlement of 25 mm under the footing foundations. The Factored Net Geotechnical Resistance at ULS is



225 kPa.

These soil bearing pressures can be achieved provided that the founding subgrade is undisturbed during construction. New footings should be founded below any existing fill materials on competent native undisturbed soils. Spacing between adjacent footing steps should not be steeper than 10H to 7V.

The maximum total and differential settlements of footings designed to the above recommended soil bearing pressure are expected to be less than 25 and 20 mm, respectively, and these are considered tolerable for the structure being contemplated. The majority of the settlements will take place during construction and the first loading cycle of the building.

If wet or saturated subgrade conditions are encountered, it is recommended that a 50 to 75 mm thick protective concrete slab should be poured and allowed to set on the prepared subgrade to further protect it from disturbance by construction traffic and the elements.

Exterior footings and footings in unheated portions of the building should be provided with a soil cover of not less than 1.2 m or equivalent synthetic thermal insulation for adequate frost protection. The founding subgrade soils must be protected from frost penetration during winter construction. The footing excavations should be inspected by the geotechnical engineer to ensure adequate soil bearing and proper subgrade preparation.

It should be noted that a site and project specific geotechnical investigation should be carried out for any apartment buildings or commercial buildings as the current preliminary geotechnical investigation is insufficient and not intended for detailed building design purposes.

6.6 Radon Mitigation Rough-In System

The 2024 Ontario Building Code, effective January 1, 2025, requires that buildings containing components that separate interior conditioned space from exterior space, interior space from the ground, or environmentally dissimilar interior spaces, be constructed in a manner that minimizes the ingress of airborne radon and other soil gases from the ground, with the objective of controlling indoor concentrations to acceptable levels.

Radon mitigation is typically achieved through the installation of a rough-in for a subfloor depressurization system, together with a continuous membrane beneath and at the perimeter of the slab and flexible sealant at construction joints and penetrations to limit soil-gas entry. Native soils at the site are variable and generally of low permeability which are considered unsuitable as a venting medium for radon control.

A minimum 150 mm layer of 19 mm clear stone (OPSS 1004) beneath the slab-on-grade is recommended to facilitate soil-gas movement, together with appropriate radon piping rough-in installed in accordance with the Ontario Building Code.

Radon concentrations cannot be determined as part of the geotechnical investigation. Indoor radon levels should be assessed following construction through long-term radon testing under normal



occupied conditions, in accordance with Health Canada guidelines. Testing should be completed using approved measurement devices and, where required, by a Canadian National Radon Proficiency Program (C-NRPP) certified professional. If measured radon concentrations exceed the Health Canada guideline of 200 Bq/m³, the radon rough-in system may be activated or supplemented with additional mitigation measures.

6.7 Earthquake Considerations

In accordance with The Ontario Building Code 2024 (OBC), the proposed structures should be designed to resist earthquake load and effects as per Subsection 4.1.8.

Based on the condition of the underlying soil encountered at the boreholes, the fact that any loose/soft soils will be removed, and our experience with the local soil conditions up to a depth of 30 m, the site can be classified as a **Site Class D** as per OBC Table 4.1.8.4.B.

6.8 Infiltration Rate of Native Soil Deposits

Based on the laboratory gradational results and our experience, the permeability (hydraulic conductivity) and infiltration rate of the notable inorganic soil deposits encountered are estimated and provided in the following table:

Material	Permeability (K) (cm/s)	Factored Infiltration Rate (mm/hr)
Silty Clay (Enclosures 11 to 13)	$< 1 \times 10^{-6}$	<5

If infiltration features are to be included in the development of the property, they should be located below the footing drain/weeper and at least 5 m away from any proposed building footprints. Additionally, the infiltration features should have the base located at least 1.0 m above the groundwater table.

Considering the above information, the very low infiltration rate of the native predominant silty clay deposits, and the expected relatively low depth of the water table aquifer in peak groundwater periods (generally less than 2.0 mbgs based on July 2026 measurements), on-site infiltration may be difficult to implement. Furthermore, no pockets or areas of higher permeable granular deposits were encountered.

6.9 Pavement Design and Construction

The earth subgrade is generally expected to consist of native silty clay or engineered fill soils. For preliminary design purposes, the following flexible pavement structures shown in the table below are considered suitable for local roads and for (passenger vehicle) parking areas within the commercial



block (Block 6). The final pavement design should be reviewed during detailed design to confirm compliance with the Township's current specifications and to account for any heavier traffic loading associated with the proposed commercial development in Block 6.

Pavement Component	Local Road Component Thickness (mm)	Block 6 Passenger Parking Areas Component Thickness (mm)
HL3 Surface Asphaltic Concrete	40	40
HL4 Binder Asphaltic Concrete	60	50
Granular "A" Base Course	150	150
Granular "B" Sub-Base Course	450	350

The pavement design considers that road construction will be carried out during the drier time of the year and that the subgrade is stable, not heaving under construction equipment traffic. If the subgrade is wet or unstable, additional granular sub-base may be required.

The subgrade should be prepared in accordance with the recommendations provided in Section 6.2 and Section 6.3 prior to placement of the granular base layers.

The base and sub-base materials should be produced in accordance with the current OPSS specifications and placed and uniformly compacted to at least 100% SPMD. The asphaltic concrete should be placed and compacted in accordance with OPSS Form 310 and to a minimum of 92% of the Marshall Density (MRD). Frequent in-situ density testing by this office should be carried out to verify that the specified degree of compaction is being achieved and maintained.

SS-1 or SS-1HH tack coat should be applied to all binder course surfaces and vertical surfaces (i.e., curbs, pavement joints, etc.) prior to placement of asphalt. Refer to OPSS 310 and OPSS 1101 for additional details.

It should be noted that even well-compacted trench backfill could settle for a period of time after construction. In this regard, the surface course of the asphaltic concrete should be placed at least one (1) year after trench backfill is completed so as to allow any minor settlements to occur within the trench backfill. The incomplete pavement structure may not be capable of supporting construction traffic. Consequently, minor repairs of the sub-base, base and asphaltic concrete may be required prior to paving with the base course and/or the surface course asphaltic concrete.

Longitudinal sub-drains with positive drainage outlets are recommended to be installed at the subgrade level along the edges of the roadway construction to enhance the performance of the pavement. Systematic drainage of the granular base materials will promote the longevity of the pavement structure. The prepared earth subgrade and final pavement surfaces should be graded to direct water runoff away from buildings, sidewalks, and other similar pertinent structures. The roadway subgrade should be free of depressions and should have a 2% slope from the crown to the edge of the pavement.



6.10 Handling of Excess Soils

Excess soil may be generated and removed off-site during the construction activities associated with the proposed site works. The management of excess soil is now governed by O.Reg. 406/19, MECP document entitled “On-site and Excess Soil Management Regulation”. In accordance with the regulation, the Project Leader is responsible for the handling, storage, reuse, transportation, and removal of all soil. To support off-site removal of excess soil, the following may be required:

- Planning Documentation
 - Assessment of Past Use
 - Sampling and Analysis Plan
 - Excess Soil Characterization Report
 - Excess Soil Destination Report
- Tracking
- Registry
- Record Keeping

Soil sampling and analysis may be required as per the above-noted MECP document and/or as per the requirement of the receiving site owner(s), depending on the volume of excess soil generated during construction. The analytical results and environmental assessment findings must be disclosed to the receiving site owner(s) and approval by the receiving site owner(s) be obtained prior to exporting/transferring the materials.

If any impacted soils are discovered during construction, CVD should be contacted for sampling and testing to determine the limit of the impacted soils.



7.0 CLOSURE

The Limitations of Report, as quoted in Appendix A, is an integral part of this report.

We trust that the information presented in this report is complete within our terms of reference. If there are any further questions concerning this report, please do not hesitate to contact our office.

Yours truly,

CHUNG & VANDER DOELEN ENGINEERING LTD.

Yaroslav Chudin, P.Eng.
Project Engineer



Mark Marriner, P.Eng.
Associate Director – Geotechnical Services



APPENDIX A

Limitations of Report



APPENDIX “A”

LIMITATIONS OF REPORT

The conclusions and recommendations given in this report are based on information determined at the testhole locations. Subsurface and groundwater conditions between and beyond the testholes may differ from those encountered at the testhole locations, and conditions may become apparent during construction which could not be detected or anticipated at the time of the site investigation. It is recommended practice that the Soils Engineer be retained during construction to confirm that the subsurface conditions throughout the site do not deviate materially from those encountered in the testholes.

The comments made in this report on potential construction problems and possible methods are intended only for the guidance of the designer. The number of testholes and their respective depths may not be sufficient to determine all the factors that may affect construction methods and costs. For example, the thickness of surficial topsoil or fill layers may vary markedly and unpredictably. The contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual information presented and draw their own conclusion as to how the subsurface conditions may affect their work.

The benchmark and elevations mentioned in this report were obtained strictly for use in the geotechnical design of the project and by this office only, and should not be used by any other parties for any other purposes.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. CHUNG & VANDER DOELEN ENGINEERING LIMITED accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The design recommendations given in this report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report. Since all details of the design may not be known, we recommend that we be retained during the final design stage to verify that the design is consistent with our recommendations, and that assumptions made in our analysis are valid.

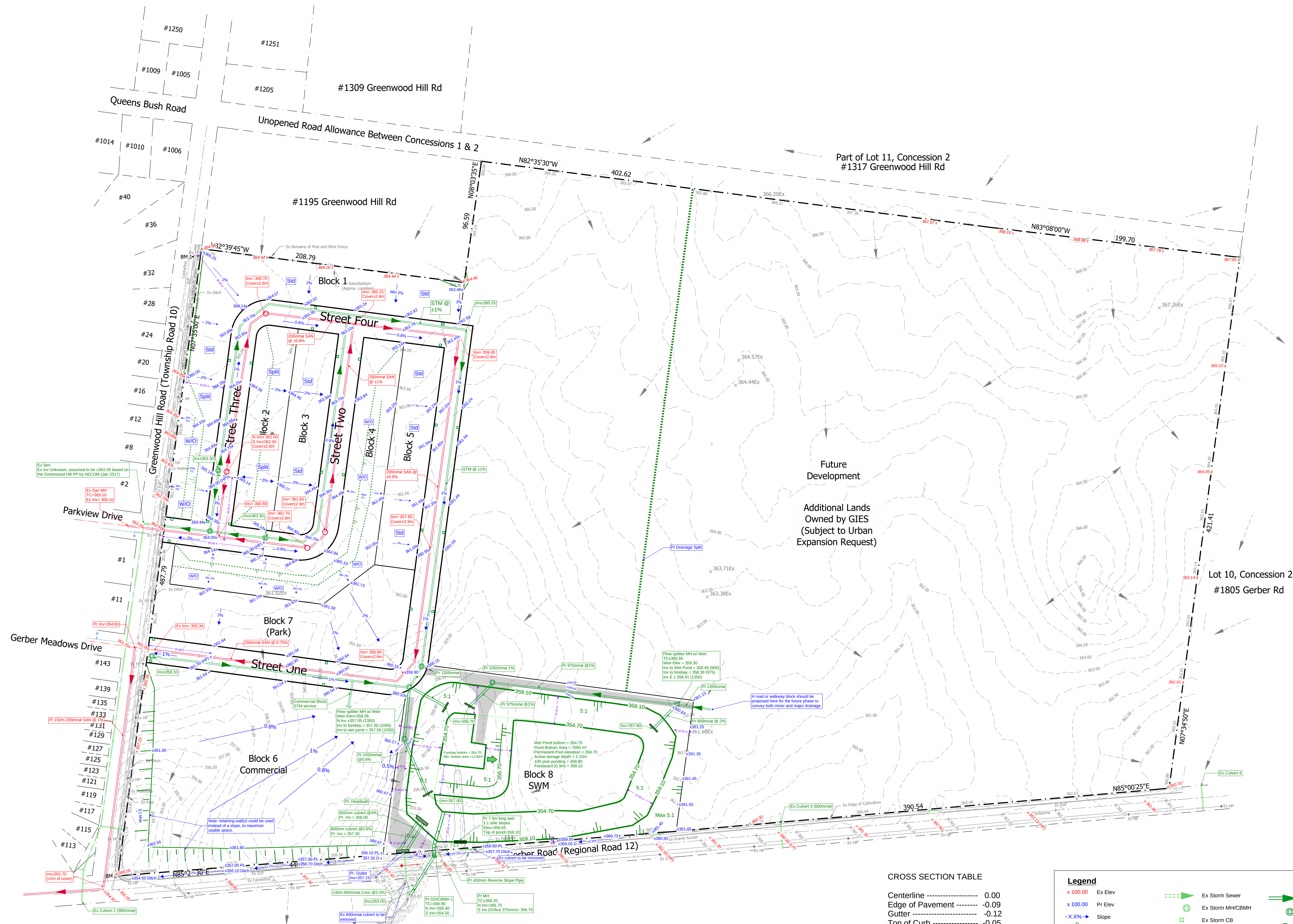
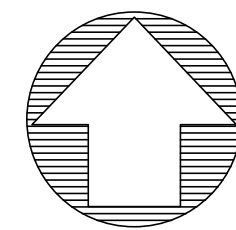
This report does not reflect the environmental issues or concerns unless otherwise stated in the report.



APPENDIX B

Selected Design Drawings





CROSS SECTION TABLE

Centerline	0.00
Edge of Pavement	-0.09
Gutter	-0.12
Top of Curb	-0.05
Front of Sidewalk	0.11
Back of Sidewalk	0.14
Property Line	0.14

Mountable Curb 600.100

Legend

x 100.00 Ex Elev

x 100.00 Pr Elev

-X.X%- Slope

Drainage Split Line

Overland Flow Arrow

Ex Storm Sewer

Ex Storm MH/CBMH

Ex Storm CB

Ex Sanitary Sewer

Ex Sanitary MH

Ex Watermain

Ex Storm Sewer

Ex Storm MH/CBMH

Ex Storm CB

Pr Storm Sewer

Pr Storm MH/CBMH

Pr Storm CB

Pr Sanitary Sewer

Pr Sanitary MH

Pr Watermain

Pr Hydrant

APPENDIX C

Tables and Figures



Table 1 - Summary of Water Levels, Elevations & Fluctuations

1949 Gerber Road, Township of Wellesley
CVD Engineering Ltd.
Project: 3211H

Monitoring Well	Ground Elevation (mASL)	Top Pipe Elevation (mASL)	Stickup (m)	Water Level (mbgs)	Water Elevation (mASL)
				09-Jul-26	09-Jul-26
BH 2	355.88	356.66	0.78	2.80	353.08
BH 4	361.82	362.60	0.77	1.00	360.82
BH 5	360.44	361.28	0.84	1.71	358.73
BH 7	362.34	363.15	0.81	0.99	361.36
BH 9	364.94	365.75	0.81	0.98	363.96

- Notes:
- 1) All Elevations Referenced to Geodetic Survey by CVD.

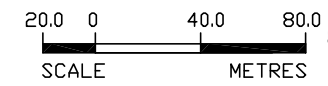
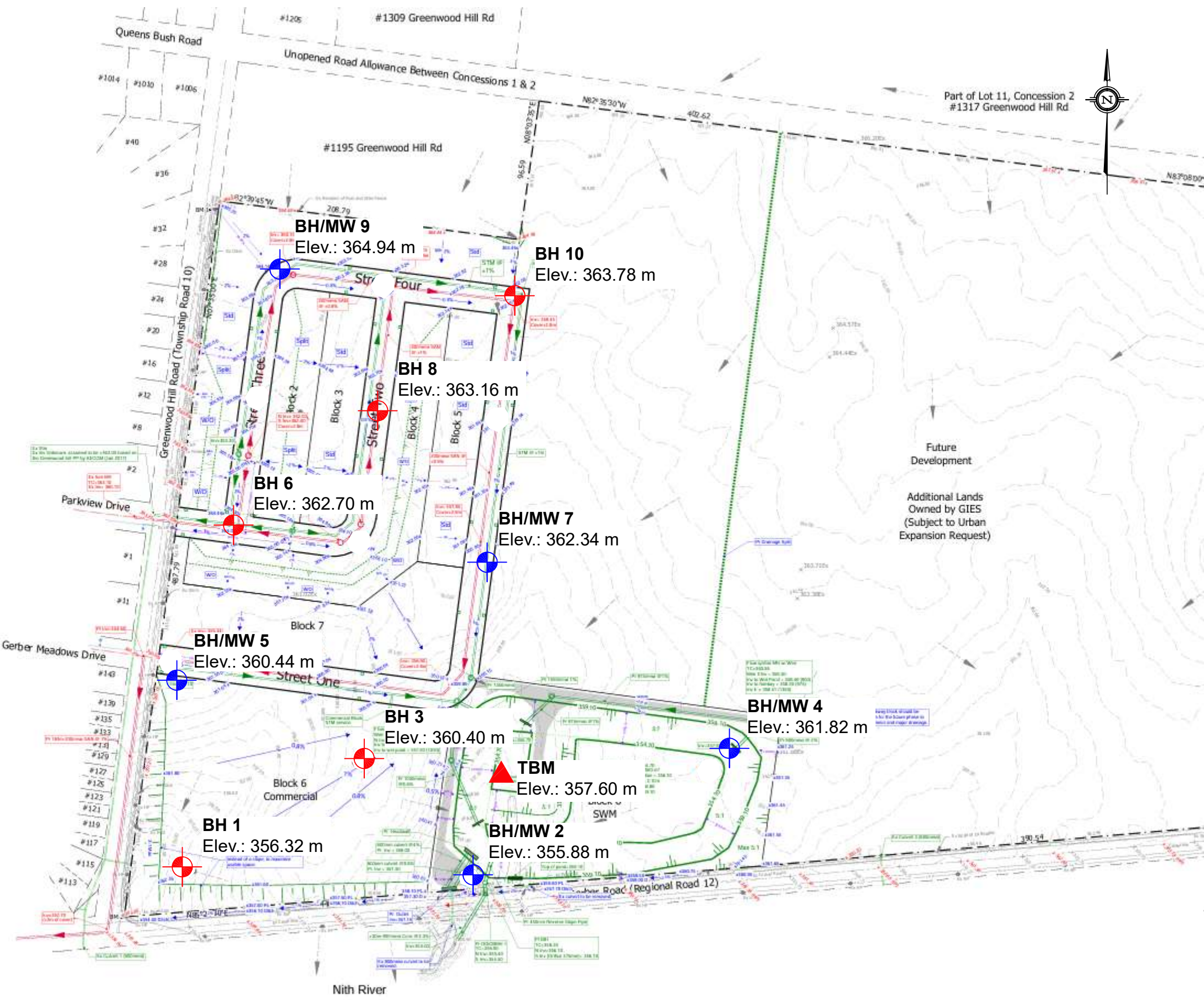
2) **Bolded** elevations represent the maximum water table aquifer elevation manually measured at each monit throughout all seasons.

3) Negative water level indicates that water level is above ground.

4) : Monitoring well dry.

5) Negative fluctuation indicates drop in water level relative to baseline.

6) : Water level not stabilized.



KEY PLAN SOURCE: Google Earth

LEGEND

- TBM: Orange painted nail located in South entrance to farm field. Elev: 357.60 m (Geodetic)
- Borehole Location
- Borehole and Monitoring Well Location

Elev. Ref.: CVD borehole locations and associated ground surface elevations were surveyed using a Network RTK Global Navigation Satellite System (GNSS) Receiver. The survey data was collected using UTM Zone 17N Projection, NAD83(CSRS)v7-2010 datum and Canada Geoid Model HT2_2010v70 (CGVD28).

DWG. Ref.: Meritech Engineering: "Overall Grading and Servicing Concept Plan", 1949 Gerber Road, Wellesley, Ontario; Rev No.: 4599.DPA; Dated: May 22, 2026.

BOREHOLE AND MONITORING WELL LOCATION PLAN

Proposed Subdivision

1949 Gerber Road
Township of Wellesley, Ontario



CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 5E1 / 519-742-8979

Drawn By: RP/JR	Date: August 2026	File No.: 3211G
Checked By: YC	Scale: As Shown	Figure: 1



LEGEND

- Approximate Site Boundary
- Monitoring Well Location
- (361.36) Water Table Elevation (mASL)
- 361.00 Interpreted Groundwater Contour (mASL)
- Interpreted Shallow Groundwater Flow Direction

Image Ref.: Region of Waterloo; ESRI; Property Search Map; Retrieved: August 2026

Figure 2:
Water Table Interpretation (July 9, 2026)

Preliminary Geotechnical Investigation
Proposed Subdivision – Stage 1

1949 Gerber Road
Township of Wellesley, ON

CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 2E1 / 519-742-8979

Drawn By: YC	Date: August 2026	File No.: 3211H
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APPENDIX D

Analytical Chemical and Soil Corrosivity Test Results (ALS Canada Ltd.)



CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: WT2621353		
Client	: Chung & Vander Doelen Engineering Ltd.	Laboratory	: ALS Environmental - Waterloo
Contact	: Mark Marriner	Account Manager	: Andrew Martin
Address	: 311 Victoria St. N. Kitchener Ontario Canada N2H 5E1	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 1949 GERBER ROAD, WATERLOO (WELLESLEY)	Date Samples Received	: 22-Jul-2026 17:35
PO	: 3211	Date Analysis Commenced	: 29-Jul-2026
C-O-C number	: ----	Issue Date	: 30-Jul-2026 12:27
Sampler	: RP		
Site	: ----		
Quote number	: 2026 Excess Soils Quote		
No. of samples received	: 3		
No. of samples analysed	: 3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Metals, Waterloo, Ontario



No Breaches Found

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key: LOR: Limit of Reporting (detection limit).

Unit	Description
-	no units
mg/L	milligrams per litre
mS/cm	millisiemens per centimetre

>: greater than.

<: less than.

Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.



Analytical Results Evaluation

Matrix: Soil/Solid				Client sample ID	BH 2 SS 1 ----	BH 4 SS 1 ----	BH 9 SS 1 ----	----	----	----	----
Client sampling date / time					02-Jul-2026 12:00	02-Jul-2026 12:00	03-Jul-2026 12:00	----	----	----	----
Sub-Matrix					Soil	Soil	Soil	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit		WT2621353-001	WT2621353-002	WT2621353-003	----	----	----	----
					Result	Result	Result	----	----	----	----
Physical Tests											
Conductivity (1:2 leachate)	----	E100-L/WT	mS/cm		0.222	0.143	0.153	----	----	----	----
Metals											
Calcium, soluble ion content	7440-70-2	E484/WT	mg/L		17.8	8.10	8.59	----	----	----	----
Magnesium, soluble ion content	7439-95-4	E484/WT	mg/L		2.39	1.03	1.81	----	----	----	----
Sodium, soluble ion content	17341-25-2	E484/WT	mg/L		2.88	0.85	0.92	----	----	----	----
Sodium adsorption ratio [SAR]	----	E484/WT	-		0.17	<0.10	<0.10	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.



Summary of Guideline Limits

Analyte	CAS Number	Unit	ON153/04 T1-RPIICC	ON406 T2.1-S-AG	ON406 T2.1-S-ICC	ON406 T2.1-S-RPI			
Physical Tests									
Conductivity (1:2 leachate)		mS/cm	0.57 mS/cm	0.7 mS/cm	1.4 mS/cm	0.7 mS/cm	----	----	----
Metals									
Calcium, soluble ion content	7440-70-2	mg/L	----	----	----	----	----	----	----
Magnesium, soluble ion content	7439-95-4	mg/L	----	----	----	----	----	----	----
Sodium, soluble ion content	17341-25-2	mg/L	----	----	----	----	----	----	----
Sodium adsorption ratio [SAR]		-	2.4 -	5 -	12 -	5 -	----	----	----

Key:

ON153/04		Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)
	T1-RPIICC	153 Soil T1 Res/Park/Inst/Ind/Com/Commu Property Use
ON406		Ontario Regulation 406/19 - Excess Soils (Bulk) (12-April -2022)
	T2.1-S-AG	406 T2.1 - Volume Independent Soil - Agricultural or Other Property Use
	T2.1-S-ICC	406 T2.1 - Volume Independent Soil - Ind/Com/Commu Property Use
	T2.1-S-RPI	406 T2.1 - Volume Independent Soil - Res/Park/Inst Property Use

Quality Control Interpretive Report

Work Order : WT2621353

Client : Chung & Vander Doelen Engineering Ltd.
Contact : Mark Marriner
Address : 311 Victoria St. N.
Kitchener ON Canada N2H 5E1
Telephone : ----
Project : 1949 GERBER ROAD, WATERLOO (WELLESLEY)
PO : 3211
C-O-C number : ----
Sampler : RP
Site : ----
Quote number : 2026 Excess Soils Quote
No. of samples received : 3
No. of samples analysed : 3

Laboratory : ALS Environmental - Waterloo
Account Manager : Andrew Martin
Address : 60 Northland Road, Unit 1
Waterloo Ontario Canada N2V 2B8
Telephone : +1 519 886 6910
Date Samples Received : 22-Jul-2026 17:35
Issue Date : 30-Jul-2026 12:27

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Laboratory Control Sample Duplicate (LCSD) outliers occur
- No Matrix Spike outliers occur.
- No Matrix Spike Duplicate (MSD) outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and/or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance; ✔ = Within Holding Time

Analyte Group : Analytical Method	ALS Sample ID	QC Lot	Method	Sampling Date	Extraction / Preparation				Analysis			
Container					Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Client sample ID						Rec	Actual			Rec	Actual	
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)												
Glass soil jar/Teflon lined cap [ON MECP]												
BH 2 SS 1	001	2733626	E484	02-Jul-2026	29-Jul-2026	180 days	27 days	✓	29-Jul-2026	180 days	0 days	✓
BH 4 SS 1	002	2733626	E484	02-Jul-2026	29-Jul-2026	180 days	27 days	✓	29-Jul-2026	180 days	0 days	✓
BH 9 SS 1	003	2733626	E484	03-Jul-2026	29-Jul-2026	180 days	26 days	✓	29-Jul-2026	180 days	0 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)												
Glass soil jar/Teflon lined cap [ON MECP]												
BH 2 SS 1	001	2733627	E100-L	02-Jul-2026	29-Jul-2026	30 days	27 days	✓	29-Jul-2026	30 days	27 days	✓
BH 4 SS 1	002	2733627	E100-L	02-Jul-2026	29-Jul-2026	30 days	27 days	✓	29-Jul-2026	30 days	27 days	✓
BH 9 SS 1	003	2733627	E100-L	03-Jul-2026	29-Jul-2026	30 days	26 days	✓	29-Jul-2026	30 days	26 days	✓

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: Soil/Solid

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method / Lab	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L / WT	2733627	1	3	33.3	5.0	✔
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484 / WT	2733626	1	3	33.3	5.0	✔
Laboratory Control Samples (LCS)							
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L / WT	2733627	2	3	66.7	10.0	✔
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484 / WT	2733626	2	3	66.7	10.0	✔
Method Blanks (MB)							
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L / WT	2733627	1	3	33.3	5.0	✔
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484 / WT	2733626	1	3	33.3	5.0	✔



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L ALS Environmental - Waterloo	Soil/Solid	CSSS Ch. 15 (mod)/APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Conductance is measured in the fluid that is observed in the upper layer.
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484 ALS Environmental - Waterloo	Soil/Solid	SW846 6010C	A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Waterloo	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.



QUALITY CONTROL REPORT

Work Order : WT2621353

Client : Chung & Vander Doelen Engineering Ltd.
Contact : Mark Marriner
Address : 311 Victoria St. N.
Kitchener ON Canada N2H 5E1
Telephone : ----
Project : 1949 GERBER ROAD, WATERLOO (WELLESLEY)
PO : 3211
C-O-C number : ----
Sampler : RP
Site : ----
Quote number : 2026 Excess Soils Quote
No. of samples received : 3
No. of samples analysed : 3

Laboratory : ALS Environmental - Waterloo
Account Manager : Andrew Martin
Address : 60 Northland Road, Unit 1
Waterloo ON Canada N2V 2B8
Telephone : +1 519 886 6910
Date Samples Received : 22-Jul-2026 17:35
Date Analysis Commenced : 29-Jul-2026
Issue Date : 30-Jul-2026 12:27

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Metals, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key:

- Anonymous=Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number=Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO=Data Quality Objective.
- LOR=Limit of Reporting (detection limit).
- RPD=Relative Percent Difference
- # =Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: Soil

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests(QC Lot: 2733627)											
WT2621353-003	BH 9 SS 1	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	0.153 mS/cm	151	1.12 %	20%	---
Metals(QC Lot: 2733626)											
WT2621353-003	BH 9 SS 1	Calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	8.59	8.36	2.71 %	30%	---
		Magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	1.81	1.79	0.02	Diff <2x LOR	---
		Sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	0.92	0.89	0.04	Diff <2x LOR	---

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests(QC Lot: 2733627)						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Metals(QC Lot: 2733626)						
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	<0.50	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	<0.50	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	<0.50	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Soil

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests(QC Lot: 2733627)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1409 µS/cm	101	90.0	110	----
Metals(QC Lot: 2733626)									
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	105	80.0	120	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	101	80.0	120	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	103	80.0	120	----

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix: Soil

					Reference Material (RM) Report				
					RM	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Target Concentration	RM	Low	High	Qualifier
Physical Tests(QC Lot: 2733627)									
QC-MRG2-2733626001		Conductivity (1:2 leachate)	----	E100-L	930 µS/cm	# 97.1	70.0	130	----
Metals(QC Lot: 2733626)									
QC-MRG2-2733626001		Calcium, soluble ion content	7440-70-2	E484	109.9 mg/L	# 105	70.0	130	----
		Magnesium, soluble ion content	7439-95-4	E484	11.82 mg/L	# 102	70.0	130	----
		Sodium, soluble ion content	17341-25-2	E484	43.02 mg/L	# 90.9	70.0	130	----



www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Report To					
Contact and company name below will appear on the final report					
Company:		CVD			
Contact:		Mark Marriner			
Phone:		519 742 8979			
Company address below will appear on the final report					
Street:		311 Victoria St N			
City/Province:		Kitchener, ON			
Postal Code:		N2H 5E1			
Invoice To		Same as Report To ☐ YES ☐ NO			
		Copy of Invoice with Report ☐ YES ☐ NO			
Company:		CVD			
Contact:					
Project Information					
ALS Account # / Quote #:					
Job #:		1949 Gerber Road, Waterloo (Wellesley)			
PO / AFE:		3211			
LSD:		AP			
ALS Lab Work Order # (ALS use only):					
Select Report Format:		☒ PDF ☐ EXCEL ☐ EDD (DIGITAL)			
Merge QC/QCI Reports with COA		☐ YES ☐ NO ☐ N/A			
☒ Compare Results to Criteria on Report - provide details below if box checked					
Select Distribution:		☒ EMAIL ☐ MAIL ☐ FAX			
Email 1 or Fax		mark.marriner@cvdengineering.com			
Email 2					
Email 3					
Turnaround Time (TAT) Requested					
☒ Routine [R] if received by 3pm M-F - no surcharges apply					
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum					
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum					
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum					
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum					
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.					
Additional fees may apply to rush requests on weekends, s					
Date and Time Required for all E&P TATs:					
For all tests with rush TATs requested, please contact your AM to confirm availability.					
Analysis Request					
Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below					
NUMBER OF CONTAINERS					
EC and SAR					
SAMPLES ON HOLD					
EXTENDED STORAGE REQUIRED					
SUSPECTED HAZARD (see notes)					
Oil and Gas Required Fields (client use)					
AFE/Cost Center:		PO#			
Major/Minor Code:		Routing Code:			
Requisitioner:					
Location:					
ALS Contact:		AM		Sampler: RP	
Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mm-yy)		Time (hh:mm)	
BH 2 SS 1		July 02-2026		12:00 SOIL	
BH 4 SS 1		July 02-2026		12:00 SOIL	
BH 9 SS 1		July 03-2026		12:00 SOIL	
Drinking Water (DW) Samples ¹ (client use)		Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)		SAMPLE RECEIPT DETAILS (ALS use only)	
Are samples taken from a Regulated DW System?				Cooling Method: ☐ NONE ☐ ICE ☒ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED	
☐ YES ☐ NO				Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO	
Are samples for human consumption/ use?		O.Reg. 153/04 Table 1 RPI/ICC O.Reg. 406/19 Table 2.1 Ag		Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A	
☐ YES ☐ NO		O.Reg. 406/19 Table 2.1 RPI/ICC		INITIAL COOLER TEMPERATURES °C FINAL COOLER TEMPERATURES °C	
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (ALS use only)		FINAL SHIPMENT RECEPTION (ALS use only)	
Released by: Katarina Poganatz		Received by:		Received by:	
Date: July 22-2026		Date:		Date:	
Time: 17:30		Time:		Time:	
REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION					

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

ജി.എ. 2007. 6408.

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: WT2621350		
Client	: Chung & Vander Doelen Engineering Ltd.	Laboratory	: ALS Environmental - Waterloo
Contact	: Mark Marriner	Account Manager	: Andrew Martin
Address	: 311 Victoria St. N. Kitchener Ontario Canada N2H 5E1	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 1949 GERBER ROAD, WATERLOO (WELLESLEY)	Date Samples Received	: 22-Jul-2026 17:35
PO	: 3211	Date Analysis Commenced	: 26-Jul-2026
C-O-C number	: ----	Issue Date	: 30-Jul-2026 14:21
Sampler	: RP		
Site	: ----		
Quote number	: 2025/2026 SOA		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Josphin Masihi	Supervisor I	Centralized Prep, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario



No Breaches Found

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key: LOR: Limit of Reporting (detection limit).

Unit	Description
%	percent
mg/kg	milligrams per kilogram
mV	millivolts
ohm cm	ohm centimetres (resistivity)
pH units	pH units
µS/cm	microsiemens per centimetre

>: greater than.

<: less than.

Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.



Analytical Results Evaluation

Matrix: Soil/Solid

Matrix: Soil/Solid			Client sample ID	BH 3 SS 3 ----	BH 5 SS 3 ----	----	----	----	----	----
Client sampling date / time				03-Jul-2026 12:00	02-Jul-2026 12:00	----	----	----	----	----
Sub-Matrix				Soil	Soil	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit	WT2621350-001	WT2621350-002	----	----	----	----	----
				Result	Result	----	----	----	----	----
Physical Tests										
Conductivity (1:2 leachate)	----	E100-L/WT	µS/cm	111	149	----	----	----	----	----
Moisture	n/a	E144/WT	%	13.8	14.0	----	----	----	----	----
Oxidation-reduction potential [ORP]	----	E125/WT	mV	304	316	----	----	----	----	----
pH (1:2 soil:CaCl2-aq)	----	E108A/WT	pH units	7.85	7.90	----	----	----	----	----
Resistivity	----	EC100R/WT	ohm cm	9010	6710	----	----	----	----	----
Inorganics										
Sulfides, acid volatile	----	E396-L/WT	mg/kg	1.38	1.54	----	----	----	----	----
Leachable Anions & Nutrients										
Chloride, soluble ion content	16887-00-6	E236.Cl/WT	mg/kg	<5.0	27.4	----	----	----	----	----
Sulfate, soluble ion content	14808-79-8	E236.SO4/WT	mg/kg	<20	<20	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.



Summary of Guideline Limits

Quality Control Interpretive Report

Work Order : WT2621350

Client : Chung & Vander Doelen Engineering Ltd.
Contact : Mark Marriner
Address : 311 Victoria St. N.
Kitchener ON Canada N2H 5E1
Telephone : ----
Project : 1949 GERBER ROAD, WATERLOO (WELLESLEY)
PO : 3211
C-O-C number : ----
Sampler : RP
Site : ----
Quote number : 2025/2026 SOA
No. of samples received : 2
No. of samples analysed : 2

Laboratory : ALS Environmental - Waterloo
Account Manager : Andrew Martin
Address : 60 Northland Road, Unit 1
Waterloo Ontario Canada N2V 2B8
Telephone : +1 519 886 6910
Date Samples Received : 22-Jul-2026 17:35
Issue Date : 30-Jul-2026 14:21

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Laboratory Control Sample Duplicate (LCSD) outliers occur
- No Matrix Spike outliers occur.
- No Matrix Spike Duplicate (MSD) outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and/or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance; ✔ = Within Holding Time

Analyte Group : Analytical Method	ALS Sample ID	QC Lot	Method	Sampling Date	Extraction / Preparation				Analysis			
Container					Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Client sample ID						Rec	Actual			Rec	Actual	
Inorganics : Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)												
Glass soil jar/Teflon lined cap [ON MECP]												
BH 3 SS 3	001	2733979	E396-L	03-Jul-2026	28-Jul-2026	14 days	25 days	✖ EHTR	28-Jul-2026	7 days	0 days	✔
BH 5 SS 3	002	2733979	E396-L	02-Jul-2026	28-Jul-2026	14 days	26 days	✖ EHTR	28-Jul-2026	7 days	0 days	✔
Leachable Anions & Nutrients : Water Extractable Chloride by IC												
Glass soil jar/Teflon lined cap [ON MECP]												
BH 3 SS 3	001	2734453	E236.Cl	03-Jul-2026	28-Jul-2026	30 days	25 days	✔	28-Jul-2026	28 days	0 days	✔
BH 5 SS 3	002	2734453	E236.Cl	02-Jul-2026	28-Jul-2026	30 days	26 days	✔	28-Jul-2026	28 days	0 days	✔
Leachable Anions & Nutrients : Water Extractable Sulfate by IC												
Glass soil jar/Teflon lined cap [ON MECP]												
BH 3 SS 3	001	2734454	E236.SO4	03-Jul-2026	28-Jul-2026	30 days	25 days	✔	28-Jul-2026	28 days	0 days	✔
BH 5 SS 3	002	2734454	E236.SO4	02-Jul-2026	28-Jul-2026	30 days	26 days	✔	28-Jul-2026	28 days	0 days	✔
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)												
Glass soil jar/Teflon lined cap [ON MECP]												
BH 3 SS 3	001	2731114	E100-L	03-Jul-2026	28-Jul-2026	30 days	25 days	✔	28-Jul-2026	30 days	25 days	✔
BH 5 SS 3	002	2731114	E100-L	02-Jul-2026	28-Jul-2026	30 days	26 days	✔	28-Jul-2026	30 days	26 days	✔



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance; ✔ = Within Holding Time

Analyte Group : Analytical Method	ALS Sample ID	QC Lot	Method	Sampling Date	Extraction / Preparation				Analysis			
Container					Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
						Rec	Actual			Rec	Actual	
Client sample ID	ALS Sample ID	QC Lot	Method	Sampling Date	Preparation Date	Rec	Actual	Eval	Analysis Date	Rec	Actual	Eval
Physical Tests : Moisture Content by Gravimetry												
Glass soil jar/Teflon lined cap [ON MECP]												
BH 3 SS 3	001	2731124	E144	03-Jul-2026	----	----	----		26-Jul-2026	----	----	
BH 5 SS 3	002	2731124	E144	02-Jul-2026	----	----	----		26-Jul-2026	----	----	
Physical Tests : ORP by Electrode												
Glass soil jar/Teflon lined cap [ON MECP]												
BH 3 SS 3	001	2731121	E125	03-Jul-2026	26-Jul-2026	180 days	23 days	✓	29-Jul-2026	180 days	26 days	✓
BH 5 SS 3	002	2731121	E125	02-Jul-2026	26-Jul-2026	180 days	24 days	✓	29-Jul-2026	180 days	27 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received												
Glass soil jar/Teflon lined cap [ON MECP]												
BH 3 SS 3	001	2731119	E108A	03-Jul-2026	26-Jul-2026	30 days	23 days	✓	30-Jul-2026	30 days	27 days	✓
BH 5 SS 3	002	2731119	E108A	02-Jul-2026	26-Jul-2026	30 days	24 days	✓	30-Jul-2026	30 days	28 days	✓

Legend & Qualifier Definitions

EHTR: Exceeded ALS recommended hold time prior to sample receipt.
 Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: Soil/Solid

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method / Lab	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L / WT	2731114	1	8	12.5	5.0	✔
pH by Meter (1:2 Soil:0.01M CaCl ₂ Extraction) - As Received	E108A / WT	2731119	1	7	14.3	5.0	✔
ORP by Electrode	E125 / WT	2731121	1	7	14.3	5.0	✔
Moisture Content by Gravimetry	E144 / WT	2731124	1	9	11.1	5.0	✔
Water Extractable Chloride by IC	E236.Cl / WT	2734453	1	15	6.7	5.0	✔
Water Extractable Sulfate by IC	E236.SO ₄ / WT	2734454	1	15	6.7	5.0	✔
Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)	E396-L / WT	2733979	1	21	4.8	4.8	✔
Laboratory Control Samples (LCS)							
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L / WT	2731114	2	8	25.0	10.0	✔
pH by Meter (1:2 Soil:0.01M CaCl ₂ Extraction) - As Received	E108A / WT	2731119	1	7	14.3	5.0	✔
ORP by Electrode	E125 / WT	2731121	1	7	14.3	5.0	✔
Moisture Content by Gravimetry	E144 / WT	2731124	1	9	11.1	5.0	✔
Water Extractable Chloride by IC	E236.Cl / WT	2734453	2	15	13.3	10.0	✔
Water Extractable Sulfate by IC	E236.SO ₄ / WT	2734454	2	15	13.3	10.0	✔
Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)	E396-L / WT	2733979	1	21	4.8	4.8	✔
Method Blanks (MB)							
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L / WT	2731114	1	8	12.5	5.0	✔
Moisture Content by Gravimetry	E144 / WT	2731124	1	9	11.1	5.0	✔
Water Extractable Chloride by IC	E236.Cl / WT	2734453	1	15	6.7	5.0	✔
Water Extractable Sulfate by IC	E236.SO ₄ / WT	2734454	1	15	6.7	5.0	✔
Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)	E396-L / WT	2733979	1	21	4.8	4.8	✔



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)	E396-L ALS Environmental - Waterloo	Soil/Solid	APHA 4500S2J	This analysis is carried out in accordance with the method described in APHA 4500 S2-J. After extraction the Acid Volatile Sulphide is determined colourimetrically.
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L ALS Environmental - Waterloo	Soil/Solid	CSSS Ch. 15 (mod)/APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Conductance is measured in the fluid that is observed in the upper layer.
Moisture Content by Gravimetry	E144 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
ORP by Electrode	E125 ALS Environmental - Waterloo	Soil/Solid	APHA 2580 (mod)	Oxidation Reduction Potential (ORP) is reported as the oxidation-reduction potential of the platinum metal-reference electrode employed in the analysis, measured in mV.
pH by Meter (1:2 Soil:0.01M CaCl ₂ Extraction) - As Received	E108A ALS Environmental - Waterloo	Soil/Solid	MECP E3530	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C) and is carried out in accordance with procedures described in the Analytical Protocol (prescriptive method). A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling, or decanting and then analyzed using a pH meter and electrode. This method is equivalent to ASTM D4972 and is acceptable for topsoil analysis.
Resistivity Calculation for Soil Using E100-L	EC100R ALS Environmental - Waterloo	Soil/Solid	APHA 2510 B	Soil Resistivity (calculated) is determined as the inverse of the conductivity of a 2:1 water:soil leachate (dry weight). This method is intended as a rapid approximation for Soil Resistivity. Where high accuracy results are required, direct measurement of Soil Resistivity by the Wenner Four-Electrode Method (ASTM G57) is recommended.
Water Extractable Chloride by IC	E236.Cl ALS Environmental - Waterloo	Soil/Solid	EPA 300.1	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection using a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Anions are measured in the fluid that is observed in the upper layer.
Water Extractable Sulfate by IC	E236.SO ₄ ALS Environmental - Waterloo	Soil/Solid	EPA 300.1	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection using a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Anions are measured in the fluid that is observed in the upper layer.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Anions Leach 1:10 Soil:Water (Dry)	EP236 ALS Environmental - Waterloo	Soil/Solid	EPA 300.1	5 grams of dried soil is mixed with 50 grams of distilled water for a minimum of 30 minutes. The extract is filtered and analyzed by ion chromatography.
Distillation for Acid Volatile Sulfide in Soil	EP396-L ALS Environmental - Waterloo	Soil/Solid	APHA 4500S2J	Acid Volatile Sulfide is determined by colourimetric measurement on a sediment sample that has been treated with hydrochloric acid within a purge and trap system, where the evolved hydrogen sulfide gas is carried into a basic solution by argon gas for analysis.
Leach 1:2 Soil : 0.01CaCl ₂ - As Received for pH	EP108A ALS Environmental - Waterloo	Soil/Solid	MOEE E3137A	A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling or decanting and then analyzed using a pH meter and electrode.



Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Waterloo	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Preparation of ORP by Electrode	EP125 ALS Environmental - Waterloo	Soil/Solid	APHA 2580 (mod)	Field-moist sample is extracted in a 1:2 ratio with DI water and then analyzed by ORP meter.



QUALITY CONTROL REPORT

Work Order : WT2621350

Client : Chung & Vander Doelen Engineering Ltd.
Contact : Mark Marriner
Address : 311 Victoria St. N.
Kitchener ON Canada N2H 5E1
Telephone : ----
Project : 1949 GERBER ROAD, WATERLOO (WELLESLEY)
PO : 3211
C-O-C number : ----
Sampler : RP
Site : ----
Quote number : 2025/2026 SOA
No. of samples received : 2
No. of samples analysed : 2

Laboratory : ALS Environmental - Waterloo
Account Manager : Andrew Martin
Address : 60 Northland Road, Unit 1
Waterloo ON Canada N2V 2B8
Telephone : +1 519 886 6910
Date Samples Received : 22-Jul-2026 17:35
Date Analysis Commenced : 26-Jul-2026
Issue Date : 30-Jul-2026 14:21

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Josphin Masihi	Supervisor I	Waterloo Centralized Prep, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key:

- Anonymous=Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number=Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO=Data Quality Objective.
- LOR=Limit of Reporting (detection limit).
- RPD=Relative Percent Difference
- # =Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: Soil

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests(QC Lot: 2731114)											
WT2621725-001	Anonymous	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	0.575 mS/cm	604	4.92 %	20%	---
Physical Tests(QC Lot: 2731119)											
RG2601077-001	Anonymous	pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units	7.64	7.67	0.392 %	5%	---
Physical Tests(QC Lot: 2731121)											
RG2601077-001	Anonymous	Oxidation-reduction potential [ORP]	----	E125	0.10	mV	550	500	9.52 %	25%	---
Physical Tests(QC Lot: 2731124)											
WT2621725-001	Anonymous	Moisture	n/a	E144	0.25	%	10.7	10.8	0.639 %	20%	---
Inorganics(QC Lot: 2733979)											
EO2606193-001	Anonymous	Sulfides, acid volatile	----	E396-L	0.23	mg/kg	<0.23	<0.23	0	Diff <2x LOR	---
Leachable Anions & Nutrients(QC Lot: 2734453)											
EO2606193-001	Anonymous	Chloride, soluble ion content	16887-00-6	E236.Cl	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	---
Leachable Anions & Nutrients(QC Lot: 2734454)											
EO2606193-001	Anonymous	Sulfate, soluble ion content	14808-79-8	E236.SO4	20	mg/kg	285	295	3.47 %	30%	---



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests(QC Lot: 2731114)						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Physical Tests(QC Lot: 2731119)						
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	----	----
Physical Tests(QC Lot: 2731124)						
Moisture	n/a	E144	0.25	%	<0.25	----
Inorganics(QC Lot: 2733979)						
Sulfides, acid volatile	----	E396-L	0.2	mg/kg	<0.20	----
Leachable Anions & Nutrients(QC Lot: 2734453)						
Chloride, soluble ion content	16887-00-6	E236.Cl	5	mg/kg	<5.0	----
Leachable Anions & Nutrients(QC Lot: 2734454)						
Sulfate, soluble ion content	14808-79-8	E236.SO4	20	mg/kg	<20	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Soil

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests(QC Lot: 2731114)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1409 µS/cm	101	90.0	110	----
Physical Tests(QC Lot: 2731119)									
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	7 pH units	101	98.0	102	----
Physical Tests(QC Lot: 2731124)									
Moisture	n/a	E144	0.25	%	50 %	100	90.0	110	----
Inorganics(QC Lot: 2733979)									
Sulfides, acid volatile	----	E396-L	0.2	mg/kg	100 mg/kg	92.0	70.0	130	----
Leachable Anions & Nutrients(QC Lot: 2734453)									
Chloride, soluble ion content	16887-00-6	E236.Cl	5	mg/kg	1000 mg/kg	99.9	80.0	120	----
Leachable Anions & Nutrients(QC Lot: 2734454)									
Sulfate, soluble ion content	14808-79-8	E236.SO4	20	mg/kg	1000 mg/kg	99.3	80.0	120	----

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix: Soil

					Reference Material (RM) Report				
					RM	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Target Concentration	RM	Low	High	Qualifier
Physical Tests(QC Lot: 2731114)									
QC-MRG2-2731114001		Conductivity (1:2 leachate)	----	E100-L	930 µS/cm	# 106	70.0	130	----
Physical Tests(QC Lot: 2731121)									
QC-MRG2-2731120001		Oxidation-reduction potential [ORP]	----	E125	475 mV	# 98.3	90.0	110	----
Leachable Anions & Nutrients(QC Lot: 2734453)									
QC-MRG2-2734453001		Chloride, soluble ion content	16887-00-6	E236.Cl	335 mg/kg	# 101	70.0	130	----
Leachable Anions & Nutrients(QC Lot: 2734454)									
QC-MRG2-2734453001		Sulfate, soluble ion content	14808-79-8	E236.SO4	258 mg/kg	# 92.5	70.0	130	----



Environmental Division
Waterloo
Work Order Reference
WT2621350



Telephone : +1 519 886 6910

SAMPLES ON HOLD

EXTENDED STORAGE REQ

SUSPECTED HAZARD (see r

SEP 30 1997

REFER TO BACK PAGE FOR AIS LOCATIONS AND SAMPLING INFORMATION

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

APPENDIX E

Enclosures



Soil Abbreviations and Terms Used on Record of Borehole Sheets

TERMINOLOGY DESCRIBING COMMON SOIL TYPES:

Topsoil	-	mixture of soil and humus capable of supporting vegetation
Peat	-	mixture of visible and invisible fragments of decayed organic matter
Till	-	unstratified glacial deposit which may range from clay to boulders
Fill	-	soil materials identified as being placed anthropologically

CLASSIFICATION (UNIFIED SYSTEM)

Clay	<0.002mm
Silt	0.002 to .075mm
Sand	0.075 to 4.75mm
	Fine 0.075 to 0.425 mm
	Medium 0.425 to 2.0 mm
	Coarse 2.0 to 4.75 mm
Gravel	4.75 to 75mm
	Fine 4.75 to 19 mm
	Coarse 19 to 75 mm
Cobbles	75 to 300mm
Boulders	>300mm

TERMINOLOGY

Soil Composition	% by Weight
"traces"	<10%
"some"(eg. some silt)	10-20%
Adjective (eg. sandy)	20-35%
"and"(eg. sand and gravel)	35-50%

Standard Penetration Resistance (SPT): Standard Penetration Resistance ('N' Values) refers to the number of blows required to advance a standard (ASTM D1586) 51 mm Ø (2 inch) split-spoon sampler by the use of a free falling, 63.5 Kg (140lbs) hammer. The number of blows from the drop weight is recorded for every 15 cm (6 inches). The hammer is dropped from a distance of 0.76m (30 inches) providing 474.5 Joules per blow. When the sampler is driven a total of 45 cm (18 inches) into the soil, the standard penetration index ('N' Value) is the total number of blows for the last 30 cm (12 inches).

Dynamic Cone Penetration Resistance (DCPT): Dynamic Cone Penetration Resistance is similar to a SPT with the 474.5 Joule/blow impulse provided by the free falling hammer where the split-spoon sampler is replaced by a 51 mm Ø, 60° conical point and the number of blows is recorded continuously for every 30 cm (12 inches).

COHESIVE SOILS CONSISTENCY

	(kPa)	(P.S.F.)	Nominal 'N' Value
Very Soft	<12	<250	0-2
Soft	12-25	250-500	2-4
Firm	25-50	500-1000	4-8
Stiff	50-100	1000-2000	8-15
Very Stiff	100-200	2000-4000	15-30
Hard	>200	>4000	>30

RELATIVE DENSITY OF COHESIONLESS SOIL

	'N' Value
Very Loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very Dense	>50

MOISTURE CONDITIONS:

Cohesive Soil
DTPL- Drier than plastic limit
APL- About plastic limit
WTPL- Wetter than plastic limit
MWTPL- Much wetter than plastic limit

Cohesionless Soil
Damp
Moist
Wet
Saturated

SAMPLE TYPES AND ADDITIONAL FIELD TESTS

SS or SA	Split Spoon Sample (obtained from SPT)	GS	Grab Sample	PP	Pocket Penetrometer
AS	Auger Sample	BS	Bulk Sample	VANE	Peak & Remolded shear
		TW	Thin Wall Sample or Shelby Tube	DMT	Flat Plate Dilatometer

LABORATORY TESTS

SG	Specific Gravity	S	Sieve Analysis	W	Water Content
H	Hydrometer	P	Field Permeability	K	Lab Permeability
W_p	Plastic Limit	W_l	Liquid Limit	I_p	Plasticity Index
GSA	Grain Size Analysis	C	Consolidation	UNC	Unconfined compression

FILE No: 3211G**BOREHOLE No. 1**

Client: **James Gies Construction Ltd. c/o Meritech Engineering**
 Project: **Proposed Subdivision**
 Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
 Method: **Hollow Stem Augers**
 Size: **108 mm I.D.**
 Date: **Jul 02 - 26 TO Jul 02 - 26**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				W _p W W _L ↔ — ○ — ↔					
Ground Elevation: 356.32 m							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				10 20 30					
355.72 0.60	loose, dark brown FILL silty sand (ploughed surface) some topsoil, trace clay occ. rootlets, moist	0.5		1	SS	8	●							○		
	stiff to very stiff, brown SILTY CLAY trace gravel, trace sand DTPL to APL ----- grey	1.0		2	SS	11	●			□				○		
		1.5														
		2.0		3	SS	14	●			□					○	
		2.5		4	SS	13	●			□				○		
		3.0														
		3.5		5	SS	18	●			□				○		
		4.0		6	SS	17	●									
351.77 4.55	End of Borehole	4.5														borehole open and dry upon removal of augers; auger refusal at 4.55 mbgs
		5.0														
		5.5														
		6.0														
		6.5														
		7.0														
		7.5														
		8.0														
		8.5														

PROJECT MANAGER: **MM/YC**

**CHUNG & VANDER DOELEN
ENGINEERING LTD.**

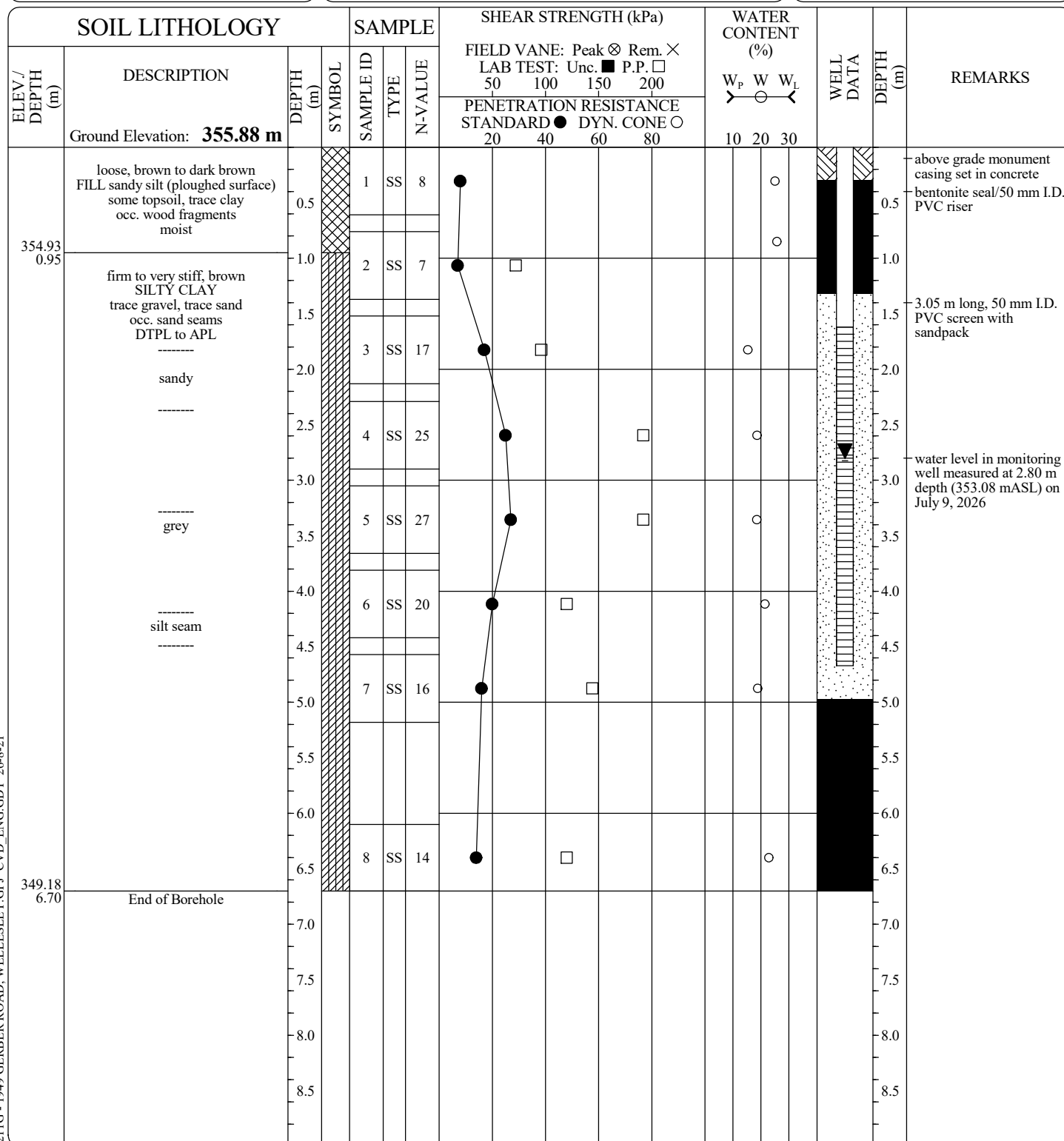
311 Victoria Street North
 Kitchener, Ontario N2H 5E1
 ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 3211G**BOREHOLE No. 2**

Client: **James Gies Construction Ltd. c/o Meritech Engineering**
 Project: **Proposed Subdivision**
 Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
 Method: **Hollow Stem Augers**
 Size: **108 mm I.D.**
 Date: **Jul 02 - 26 TO Jul 02 - 26**

PROJECT MANAGER: **MM/YC**

**CHUNG & VANDER DOELEN
ENGINEERING LTD.**

311 Victoria Street North
 Kitchener, Ontario N2H 5E1
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FILE No: 3211G**BOREHOLE No. 3**

Client: **James Gies Construction Ltd. c/o Meritech Engineering**
 Project: **Proposed Subdivision**
 Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

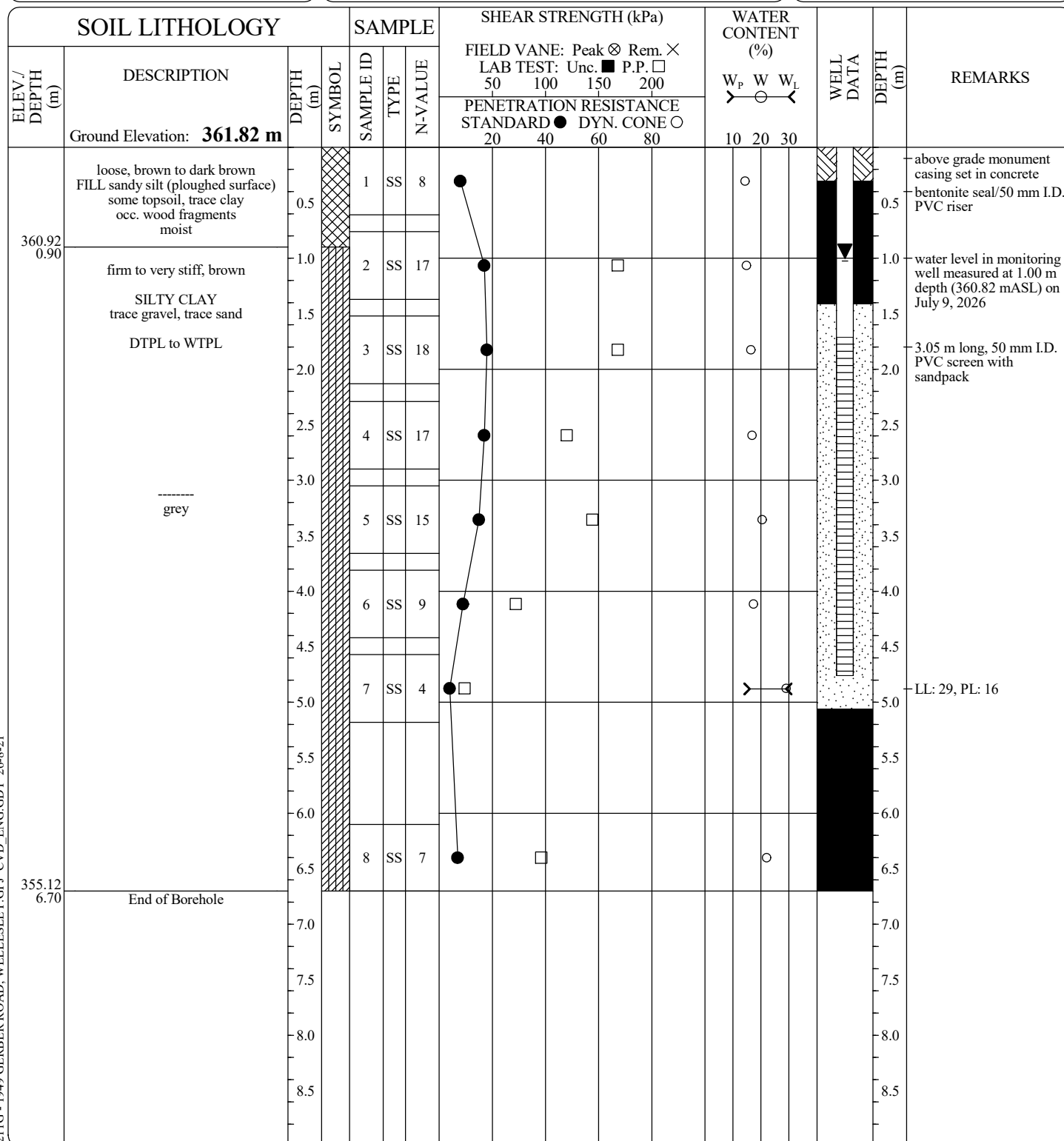
Machine: **Diedrich D-70T**
 Method: **Solid Stem Augers**
 Size: **152 mm O.D.**
 Date: **Jul 03 - 26 TO Jul 03 - 26**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				WATER CONTENT (%) W _p W W _L					
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80				↗ — ○ — ↖					
											10 20 30					
359.50 0.90	loose, brown to dark brown FILL sandy silt (ploughed surface) some topsoil trace clay moist	0.5		1	SS	7	●						○		0.5	
	firm to very stiff, brown SILTY CLAY trace gravel, trace sand DTPL to WTPL ----- grey ----- occ. sand seams	1.0		2	SS	9	●		□				○			
1.5															1.5	
2.0			3	SS	19	●		□					○		2.0	
2.5			4	SS	17	●		□					○		2.5	
3.0															3.0	
3.5			5	SS	9	●	□						○		3.5	
4.0			6	SS	9	●	□							○	4.0	
4.5															4.5	
353.70 6.70	End of Borehole	5.0		7	SS	6	●	□						○	5.0	
		5.5													5.5	
		6.0													6.0	
		6.5		8	SS	17	●	□					○		6.5	
		7.0													7.0	
		7.5													7.5	
		8.0													8.0	
		8.5													8.5	

PROJECT MANAGER: **MM/YC**

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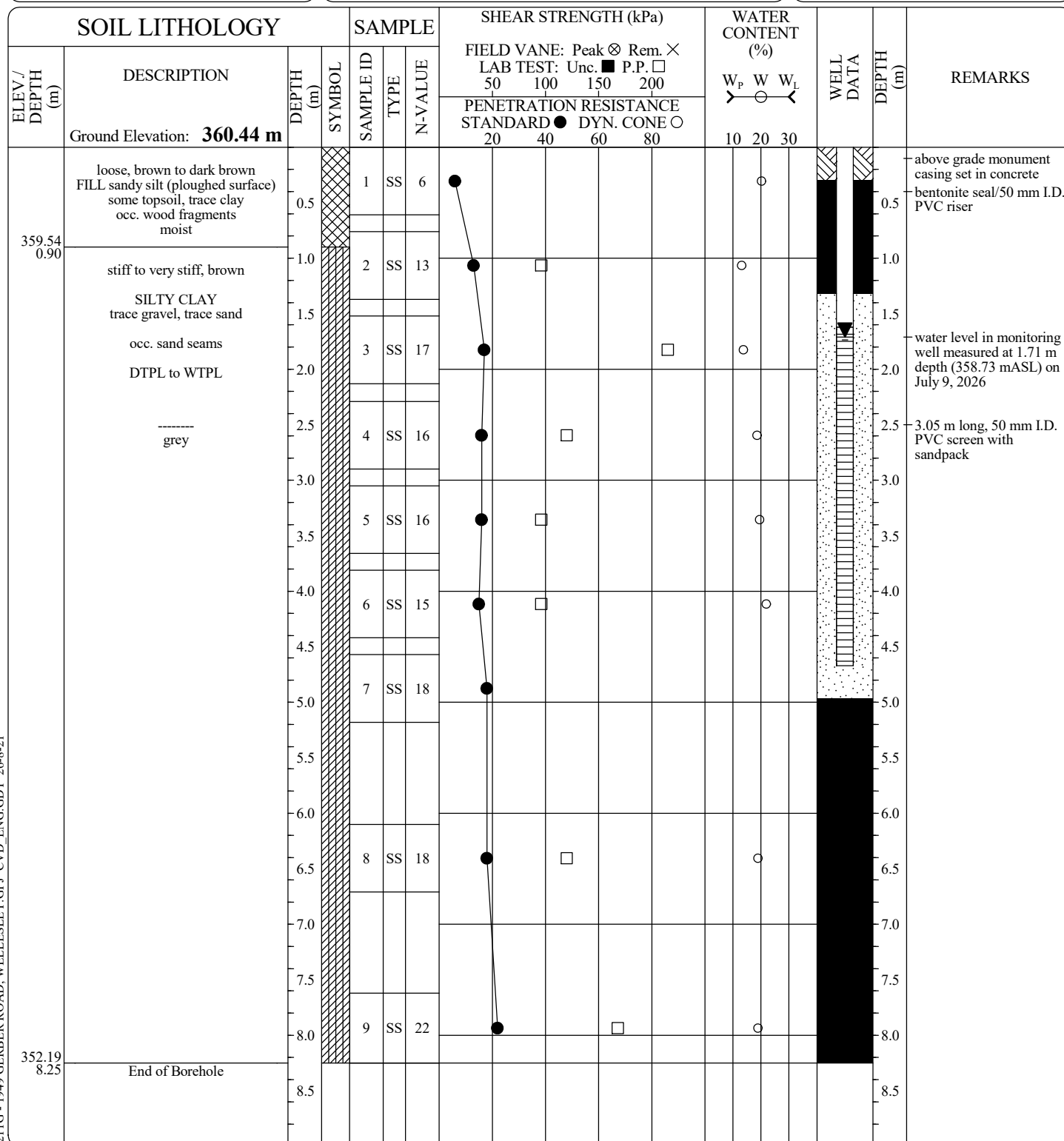
FILE No: 3211G**BOREHOLE No. 4**Client: **James Gies Construction Ltd. c/o**Project: **Meritech Engineering**Location: **Proposed Subdivision**Location: **1949 Gerber Road, Wellesley, Ontario****EQUIPMENT DATA**Machine: **Diedrich D-70T**Method: **Hollow Stem Augers**Size: **108 mm I.D.**Date: **Jul 02 - 26 TO Jul 02 - 26**PROJECT MANAGER: **MM/YC****CHUNG & VANDER DOELEN
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FILE No: 3211G**BOREHOLE No. 5**

Client: **James Gies Construction Ltd. c/o Meritech Engineering**
 Project: **Proposed Subdivision**
 Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
 Method: **Hollow Stem Augers**
 Size: **108 mm I.D.**
 Date: **Jul 02 - 26 TO Jul 02 - 26**

PROJECT MANAGER: **MM/YC**

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FILE No: 3211G**BOREHOLE No. 6**

Client: **James Gies Construction Ltd. c/o Meritech Engineering**
 Project: **Proposed Subdivision**
 Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
 Method: **Hollow Stem Augers**
 Size: **108 mm I.D.**
 Date: **Jul 02 - 26 TO Jul 02 - 26**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS	
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □				WATER CONTENT (%)						
							PENETRATION RESISTANCE				W _p W W _L						
							STANDARD ● DYN. CONE ○				↗ ○ ↖						
	Ground Elevation: 362.70 m						20	40	60	80	10	20	30				
361.80 0.90	loose, brown to dark brown FILL sandy silt (ploughed surface) some topsoil trace clay moist	0.5		1	SS	6	●						○				
	firm to very stiff, brown SILTY CLAY trace sand occ. sand seams DTPL to APL ----- grey	1.0		2	SS	21	●				■		○				
		1.5															
		2.0		3	SS	20	●				■						
		2.5		4	SS	15	●			□				○			
		3.0															
		3.5		5	SS	23	●			□				○			
		4.0		6	SS	23	●			□				○			
4.5																	
		5.0		7	SS	14	●			□				○			
		5.5															
		6.0															
		6.5		8	SS	6	●			□				○			
356.00 6.70	End of Borehole															borehole open and dry upon removal of augers	
		7.0															
		7.5															
		8.0															
		8.5															

borehole open and dry
upon removal of augers

PROJECT MANAGER: **MM/YC**

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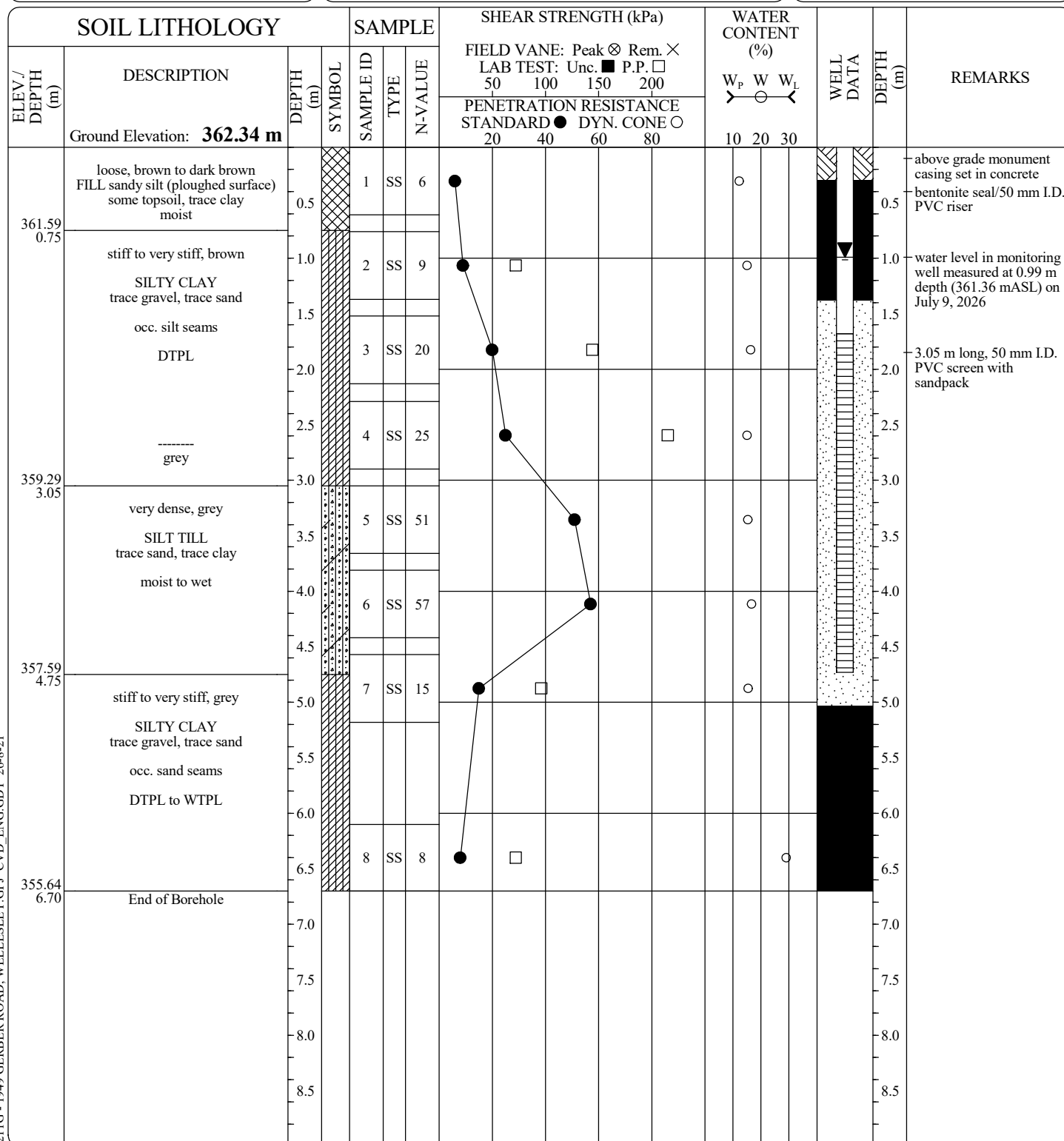
311 Victoria Street North
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FILE No: 3211G**BOREHOLE No. 7**

Client: **James Gies Construction Ltd. c/o Meritech Engineering**
 Project: **Proposed Subdivision**
 Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
 Method: **Solid Stem Augers**
 Size: **152 mm O.D.**
 Date: **Jul 03 - 26 TO Jul 03 - 26**

PROJECT MANAGER: **MM/YC**

**CHUNG & VANDER DOELEN
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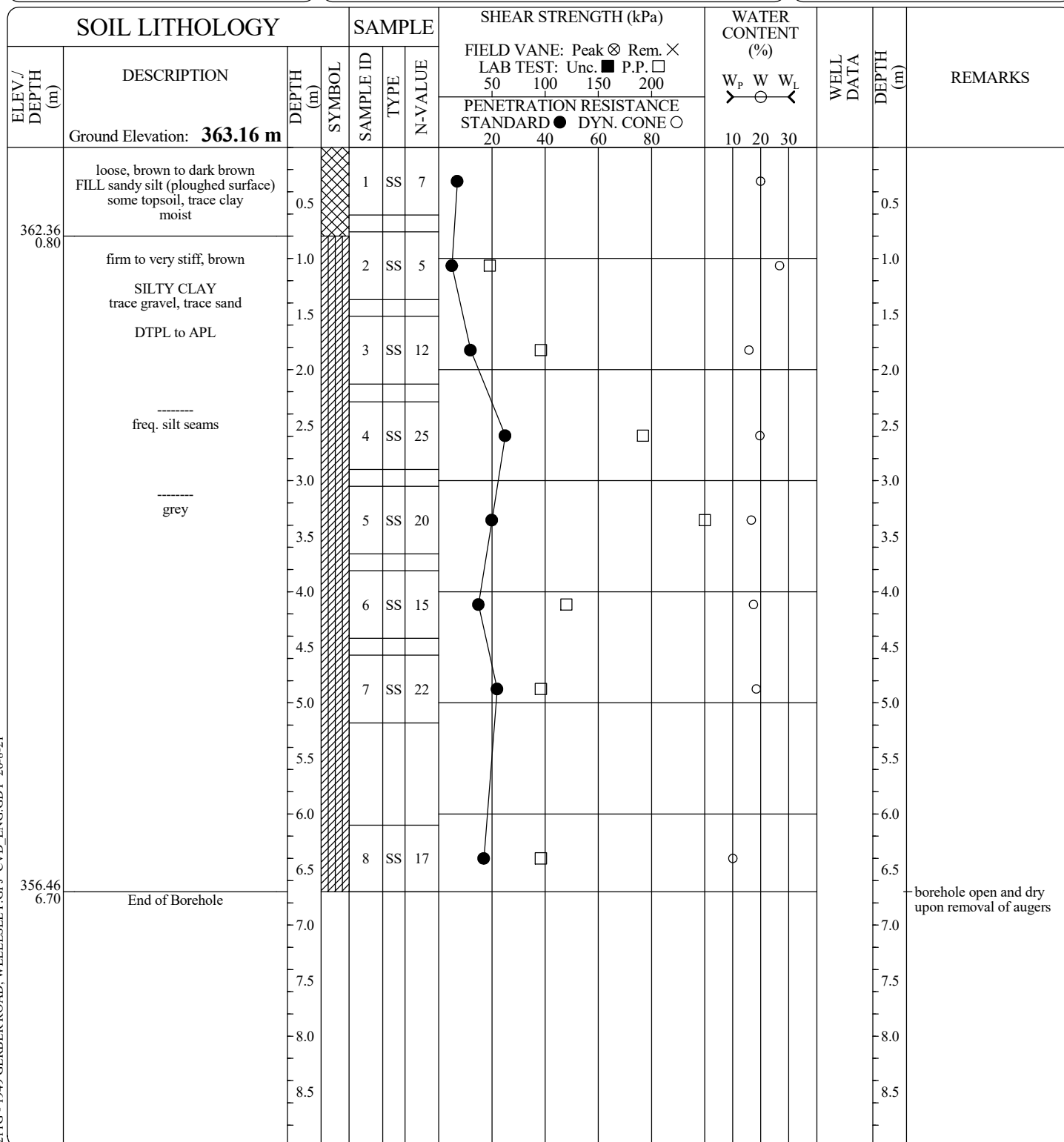
311 Victoria Street North
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 ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 3211G**BOREHOLE No. 8**

Client: **James Gies Construction Ltd. c/o Meritech Engineering**
 Project: **Proposed Subdivision**
 Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
 Method: **Solid Stem Augers**
 Size: **152 mm O.D.**
 Date: **Jul 03 - 26 TO Jul 03 - 26**

PROJECT MANAGER: **MM/YC**

**CHUNG & VANDER DOELEN
ENGINEERING LTD.**

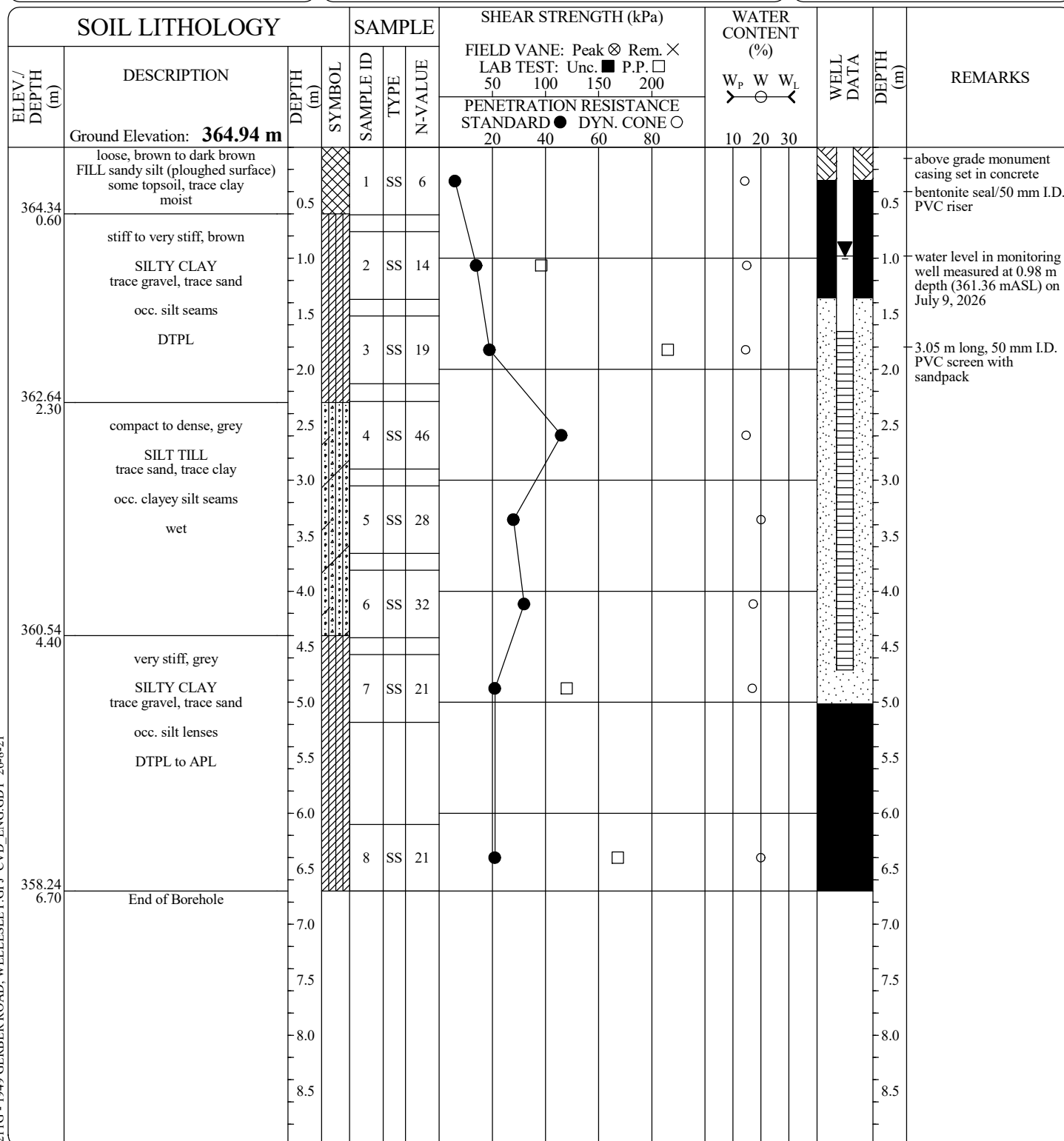
311 Victoria Street North
 Kitchener, Ontario N2H 5E1
 ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 3211G**BOREHOLE No. 9**

Client: **James Gies Construction Ltd. c/o Meritech Engineering**
 Project: **Proposed Subdivision**
 Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
 Method: **Solid Stem Augers**
 Size: **152 mm O.D.**
 Date: **Jul 03 - 26 TO Jul 03 - 26**

PROJECT MANAGER: **MM/YC**

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FILE No: 3211G**BOREHOLE No. 10**

Client: **James Gies Construction Ltd. c/o Meritech Engineering**
 Project: **Proposed Subdivision**
 Location: **1949 Gerber Road, Wellesley, Ontario**

EQUIPMENT DATA

Machine: **Diedrich D-70T**
 Method: **Solid Stem Augers**
 Size: **152 mm O.D.**
 Date: **Jul 03 - 26 TO Jul 03 - 26**

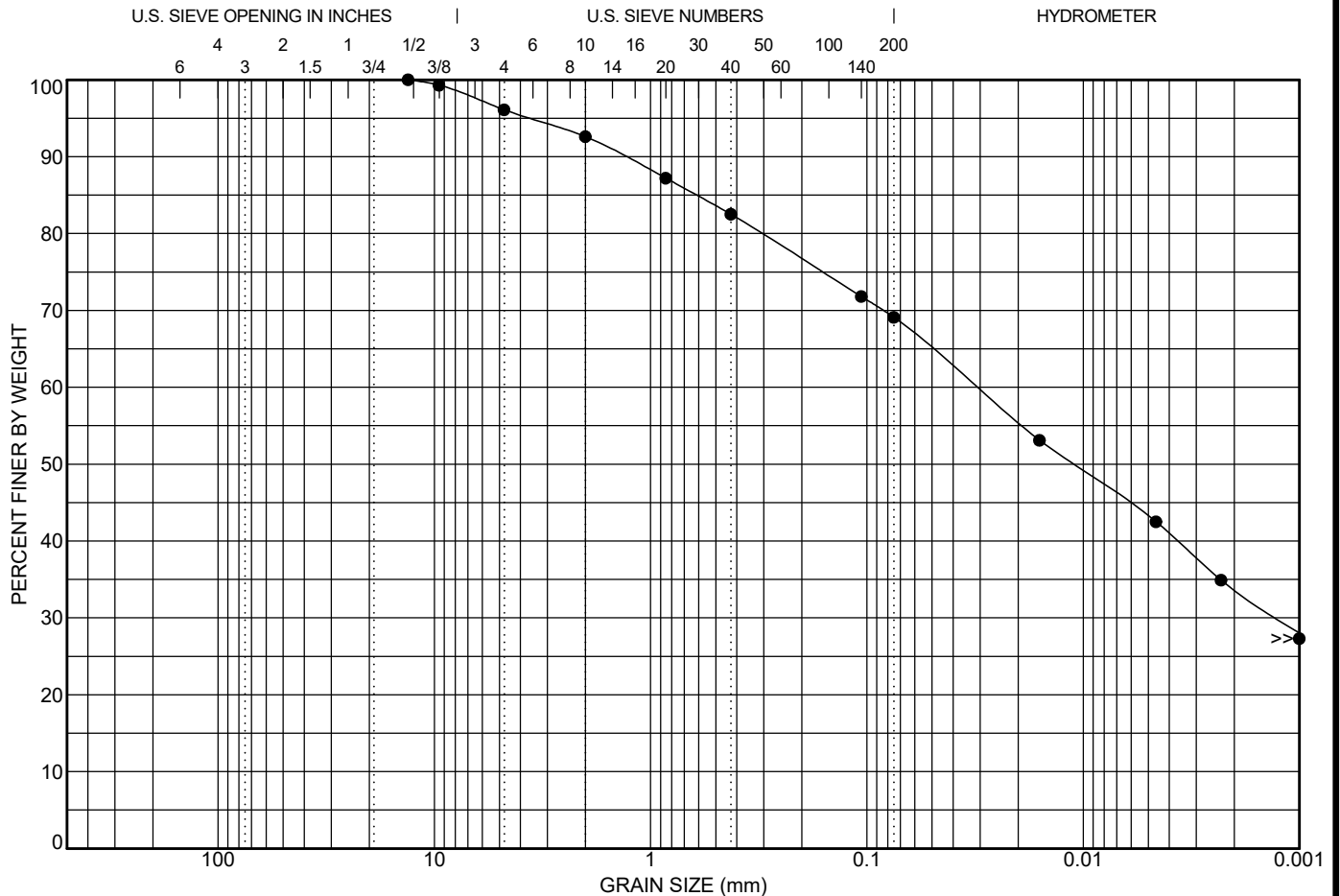
SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS	
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □ 50 100 150 200				WATER CONTENT (%) W _p W W _L ↗ — ○ ↖						
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○ 20 40 60 80										
											10 20 30						
363.18 0.60	loose, brown to dark brown FILL sandy silt (ploughed surface) some topsoil, trace clay moist	0.5		1	SS	6	●						○				
	stiff to very stiff, brown SILTY CLAY trace gravel trace sand (to sandy above 1.35 m) occ. silt seams DTPL to APL ----- grey	1.0		2	SS	13	●				■		○				
		1.5															
		2.0		3	SS	18	●				■		○				
		2.5		4	SS	17	●				■		○				
		3.0															
		3.5		5	SS	12	●				■		○				
		4.0		6	SS	31	●				■		○				
		4.5															
		5.0		7	SS	19	●				■		○				
5.5																	
357.08 6.70	End of Borehole	6.0															
		6.5		8	SS	8	●				■		○				
		7.0															
		7.5															
		8.0															

← borehole cave-in to 5.5±
mbgs upon removal of
augers

PROJECT MANAGER: **MM/YC**

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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
					13.2	0.031	0.001		3.9	27.0	69.1	

Date: Jul. 27 - 2026
Client: James Gies Construction Ltd.
Contractor: c/o Meritech Engineering
Source:
Sampled From: BH 2 - SA 3; 1.50 to 2.10 m depth
Sample No.: 2-3
Date Sampled: Jul. 02 - 2026
Sampled By: RP
Lab No.: 812
Date Tested: Jul. 27 - 2026
Type of Material: Sandy Silty Clay, trace gravel

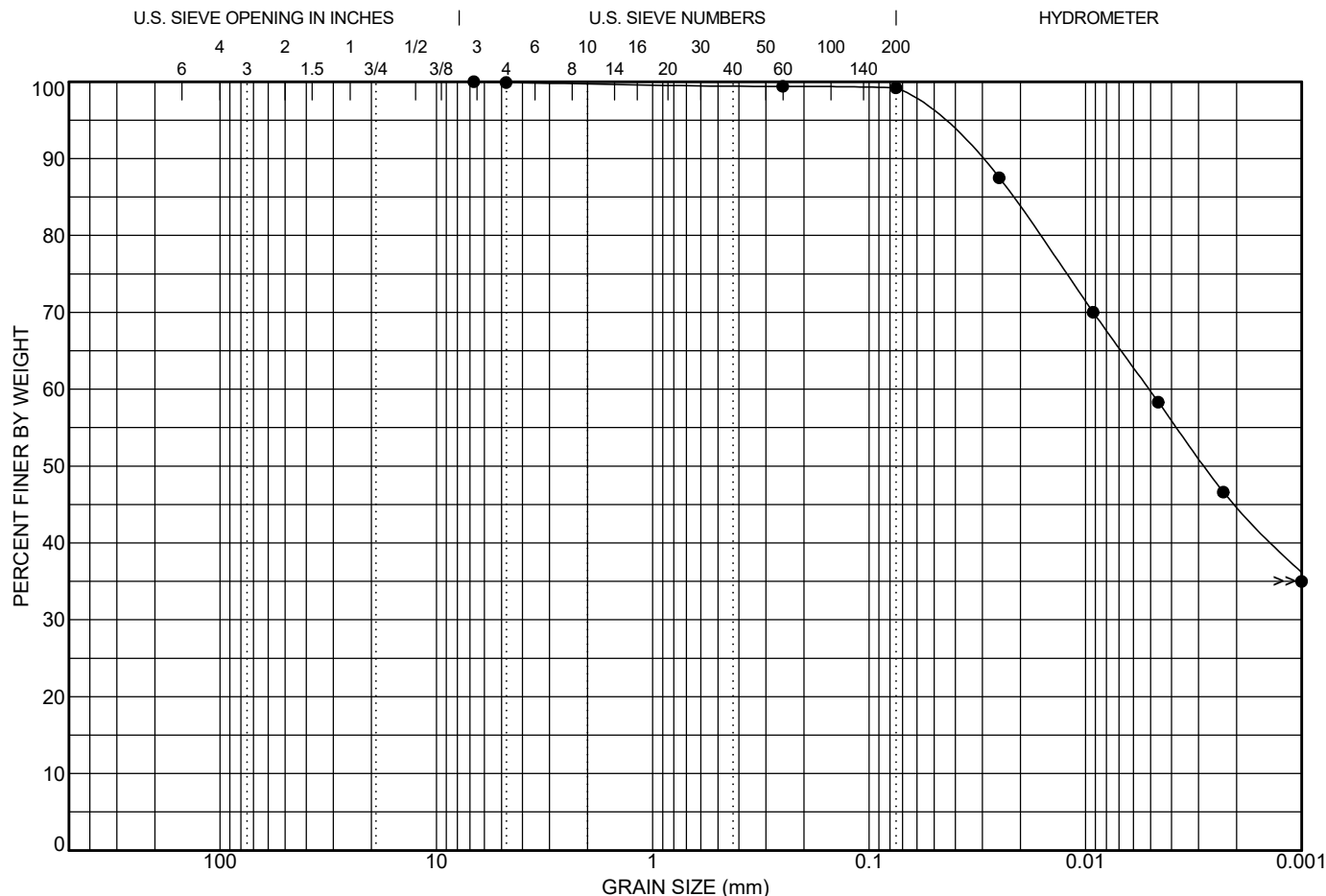
Sieve Size (mm)	Percent Passing	No Specifications



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 Fax: 519-742-7739
 e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

Project: Proposed Subdivision
Location: 1949 Gerber Road, Wellesley, Ontario
File No.: 3211G
Enclosure No.: 11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
29	16				6.7	0.005			0.1	0.7	99.2	

Date: Jul. 27 - 2026
Client: James Gies Construction Ltd.
Contractor: c/o Meritech Engineering
Source:
Sampled From: BH 4 - SA 7; 4.55 to 5.15 m depth
Sample No.: 4-7
Date Sampled: Jul. 02 - 2026
Sampled By: RP
Lab No.: 815
Date Tested: Jul. 27 - 2026
Type of Material: Silty Clay, trace sand

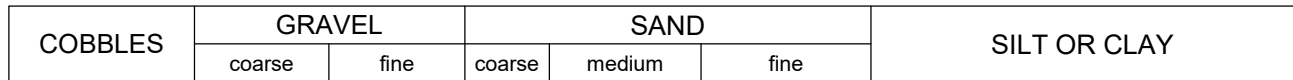
Sieve Size (mm)	Percent Passing	No Specifications



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 Fax: 519-742-7739
 e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

Project: Proposed Subdivision
Location: 1949 Gerber Road, Wellesley, Ontario
File No.: 3211G
Enclosure No.: 12

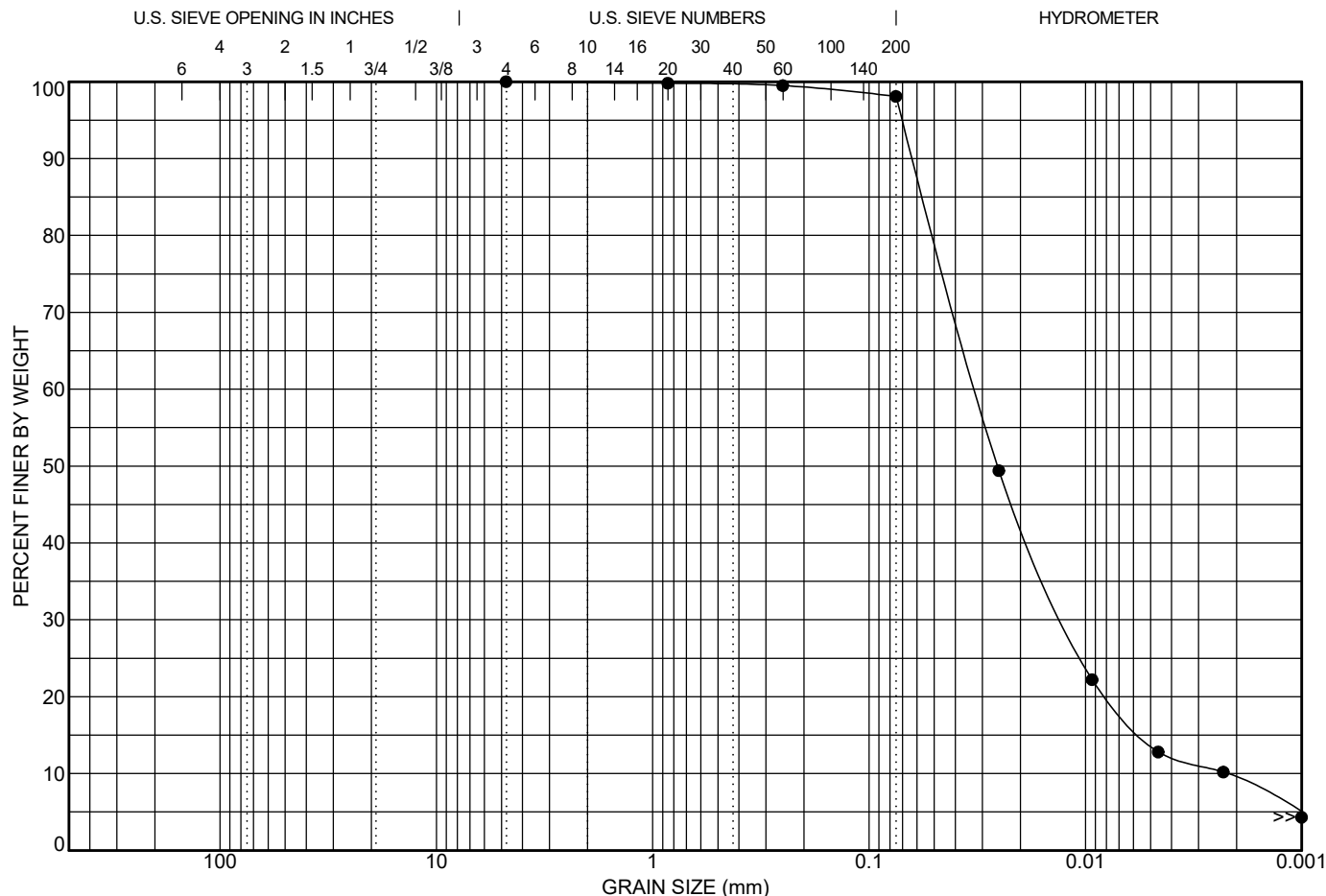


Date:	Jul. 27 - 2026	Sieve Size (mm)	Percent Passing	No Specifications
Client:	James Gies Construction Ltd.			
Contractor:	c/o Meritech Engineering			
Source:				
Sampled From:	BH 5 - SA 4; 2.30 to 2.90 m depth			
Sample No.:	5-4			
Date Sampled:	Jul. 02 - 2026			
Sampled By:	RP			
Lab No.:	813			
Date Tested:	Jul. 27 - 2026			
Type of Material:	Silty Clay, trace gravel, trace sand			



GRAIN SIZE DISTRIBUTION

Enclosure No.: 13



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			2.15	14.30	4.75	0.032	0.012	0.002	0.0	1.9	98.1	

Date: Jul. 27 - 2026
Client: James Gies Construction Ltd.
Contractor: c/o Meritech Engineering
Source:
Sampled From: BH 9 - SA 4; 2.30 to 2.90 m depth
Sample No.: 9-4
Date Sampled: Jul. 03 - 2026
Sampled By: RP
Lab No.: 814
Date Tested: Jul. 27 - 2026
Type of Material: Silt Till, trace sand, trace clay

Sieve Size (mm)	Percent Passing	No Specifications



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 e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

Project: Proposed Subdivision
Location: 1949 Gerber Road, Wellesley, Ontario
File No.: 3211G
Enclosure No.: 14