SUPPLEMENTAL
GEOTECHNICAL INVESTIGATION

Proposed Residential Development
299 Lynden Road
Brantford, Ontario

October 26, 2022

Terrapex Environmental Ltd.
90 Scarsdale Road
Toronto, Ontario, M3B 2R7
Telephone: (416) 245-0011
Email: toronto@terrapex.com
Website: www.terrapex.com

DISTRIBUTION: **Welton and Innes G.P. Inc** **PROJECT # CT3087.02**

TABLE OF CONTENTS

APPENDICES

1 INTRODUCTION

Terrapex Environmental Ltd. (Terrapex) has been retained by Welton and Innes G.P. Inc to carry out a supplemental geotechnical investigation for the proposed residential development at the property with the municipal address 299 Lynden Road, Brantford, Ontario. Authorization to proceed with this study was given by Ms. Natalie Shurigina of Welton and Innes G.P. Inc.

We understand that it is proposed to develop the property with a low-rise residential subdivision. Development of the site will require significant regrading, with cuts as deep as approximately 7 m in depth and fills ranging to approximately 4 m in height. The preliminary geotechnical report dated May 5, 2020, prepared for the site by Terraprobe and provided for our review reveals that a total of 30 boreholes were advanced at the site extended to depths ranging from 8.1 to 11.2 mbg. Terraprobe's investigation revealed that the soil profile at the site under a thin layer of topsoil and locally earth fill consists of predominantly stiff to soft clayey silt to silty clay soil. Majority of the boreholes were terminated in soft soil; accordingly, the extent and thickness of the soft clay was not determined. Terraprobe stated that raising the site grade will result in long term consolidation settlement of the soft clay.

To supplement the Terraprobe findings, Terrapex carried out this investigation which included deep boreholes to determine the depth of the soft clay. As requested, boreholes were also advanced within the proposed Stormwater Management (SWM) Pond and at the potential locations of a pumping station. The purpose of this investigation was to determine the thickness and deformation properties of the soft clay/clayey layer, characterize the underlying soil and groundwater conditions, to determine the relevant geotechnical properties of encountered soils.

The geotechnical investigation was carried out in conjunction with the Hydrogeological Assessment undertaken by Terrapex, the findings of which are reported under separate cover.

This report presents the results of the investigation performed in accordance with the general terms of reference outlined above and is intended for the guidance of the owner and the design architects or engineers only. It is assumed that the design will be in accordance with the applicable building codes and standards.

2 FIELDWORK

The fieldwork for this study was carried out during the period June 13 to July 21, 2022. It consisted of nine (9) boreholes advanced by a drilling contractor commissioned by Terrapex utilizing mud rotary drilling technique. The boreholes are designated as MW101, BH102, BH103, MW104, BH105, BH106, MW107, MW108, and BH109. The boreholes were advanced to depths ranging from 12.7 m to 33.5 m below ground surface (mbg).

Monitoring wells were installed in Boreholes MW101, MW104, MW107, and MW108 for long-term monitoring of the groundwater table necessary for the Hydrogeological Assessment.

Boreholes BH106 and BH109 were located to determine the subsurface conditions at the potential locations of a proposed pumping station, and Boreholes MW107 and MW108 were located within the footprint of the proposed SWM pond.

The locations of the Terrapex boreholes and monitoring wells, along with the locations of the previous Terraprobe boreholes are shown on Figure 1 'Borehole Location Plan' in Appendix B. The Terrapex borehole log sheets are enclosed in Appendix C of this report. The borehole log sheets from the Terraprobe investigation are included in Appendix G.

Standard penetration tests were carried out in the course of advancing the boreholes to take representative soil samples and to measure penetration index values (N-values) to characterize the condition of the various soil materials. The number of blows of the striking hammer required to drive the split spoon sampler through 300 mm depth increments was recorded and these are presented on the logs as penetration index values.

Additionally, sounding with a Marchetti Flat Dilatometer (DMT) were performed at four locations across the site to determine the deformation properties of soft silty clay. The DMT consists of a thin blade shaped probe that incorporates a pressure cell. The probe is advanced into the ground at 200 mm depth increments; the pressure cell is activated at each increment to measure the enclosing soil pressure and the additional pressure required to cause deformation in the enclosing soils. From these two direct operator independent measurements, values of geotechnical parameters are interpreted such as angle of internal friction or undrained shear strength, unit weight, coefficient of at rest earth pressure and deformation modulus, as well as providing an interpretation of the engineering behavior of the soil materials under test.

Groundwater level observations were made in all boreholes during their advancement, and subsequently in the monitoring wells.

The ground surface elevations at the locations of the boreholes were established by Terrapex using a Topcon Hiper V GNSS Receiver.

The fieldwork for this project was carried out under the full-time supervision of an experienced technician from this office who laid out the positions of the boreholes in the field; arranged locates of buried services; effected the drilling, sampling and in situ testing; observed groundwater conditions; and prepared field borehole log sheets.

3 LABORATORY TESTS

The soil samples recovered from the split spoon sampler were properly sealed, labelled and delivered to our laboratory. They were visually classified and water content tests were conducted on all samples retained from Boreholes MW101 and BH103. The results of the classification, water contents, and Standard Penetration tests are presented on the borehole log sheets in Appendix C.

Grain-size analyses tests were carried out on six (6) soil samples (MW101 Samples 10, 14 and 18, and BH103 Samples 12, 16 and 21). The results of these tests are enclosed in Appendix D as Figures 1 through 6.

One-dimensional consolidation (Oedometer) tests were carried out on three (3) soil samples obtained using thin wall Shelby Tube samplers. The results of these tests are enclosed in Appendix D as Figures 9 through 11.

In addition, two (2) soil samples, were submitted to AGAT Laboratories for determination of pH and sulphate content and its potential for sulphate attack on buried concrete. The results of these tests are enclosed in Appendix E; discussed in Section 5.13 of this report.

4 SITE AND SUBSURFACE CONDITONS

Full details of the subsurface soil and groundwater conditions at the site are given on the Borehole Log Sheets attached in Appendix C of this report.

The following paragraphs present a description of the site and commentary on the engineering properties of the various soil materials contacted in the boreholes.

It should be noted that the boundaries of soil types indicated on the borehole logs are inferred from non-continuous soil sampling and observations made during drilling. These boundaries are intended to reflect transition zones for the purpose of geotechnical design, and therefore, should not be construed as exact planes of geological change.

4.1. SITE DESCRIPTION

The site is situated north of the intersection of Garden Avenue and Lynden Road and has an approximate area of 600,000 m^2. Welton Road passes through the southern section of the site and a storage shed is present on the east end of Welton Road. The site is currently used for agricultural purposes and is bounded by Lynden Road to the south, a rail line to the east, vacant lands and a creek to the north, and residential houses to the west.

The ground surface topography of the site is extensively undulating. The ground surface elevations at the locations of the boreholes range by as much as 6.3 m.

4.2. TOPSOIL

Topsoil is present at the ground surface in all boreholes. The thickness of the topsoil at the borehole locations ranges from approximately 150 to 250 mm.

It should be noted that the topsoil thickness will vary between boreholes. Thicker topsoil than that found in the boreholes may be present in places. This renders it difficult to estimate the quantity of topsoil to be stripped based on the findings of the boreholes.

4.3. NATIVE SOIL

The native soils below the topsoil predominantly consist of clayey silt with trace of sand and occasional silty clay layers, which is sporadically parted by layers of silt with trace sand and trace to some clay.

The clayey silt is brown in colour, becoming grey below depths ranging from 3.1 to 4.3 mbg. The water content of samples of clayey silt obtained from Boreholes MW101 and BH103 range from 18 to 36% weight; moist to wet in appearance.

SPT carried out in the clayey silt provided N-values ranging from 1 to 20. In-situ field vane tests and DMT soundings in the clayey silt measured the undrained shear strength of the clayey silt to range from 40 to 203 kPa, more typically being in the range of 50 to 100 kPa. Based on the results of field vane tests and DMT, the clayey silt possesses a stiff to very stiff consistency.
The Constrained Modulus (M) values of the clayey silt typically exceed 20 MPa above depths of 6 to 10 m below grade, and less than 20 MPa below these depths, ranging to as low as 3 MPa.

Grain size analyses and Atterberg Limits tests were carried out on five (5) samples of clayey silt. The test results are enclosed in Appendix D as Figure 2 through 8 and summarized in the following table.

Sample No. and Depth	Sample Description	Gravel %	Sand %	Silt %	Clay %	LL	PL
MW101 Sample 14; 15.2 m	CLAYEY SILT trace sand	0	5	66	29	26.2	16.4
MW101 Sample 18; 21.3 m	SILT AND CLAY trace sand	0	1	62	37	29.2	17.0

Sample No. and Depth	Sample Description	Gravel %	Sand %	Silt %	Clay %	LL	PL
BH103 Sample 12; 12.2 m	CLAYEY SILT	0	0	69	31	27.6	18.2
BH103 Sample 16; 18.3 m	SILT AND CLAY	0	0	59	41	31.9	18.3
BH103 Sample 21; 25.9 m	SILT AND CLAY	0	0	55	45	36.3	18.4

The Atterberg Limits tests revealed that the clayey silt has a low to medium plasticity and based on the results of the grain size analyses, the Coefficient of Permeability (k) of the clayey silt is estimated to be less than 10^{-8} cm/sec, corresponding to very low relative permeability.

Layers of silt with trace sand and trace to some clay are present within native clayey silt. The silt is brown and grey in colour and the water content of samples of silt obtained from Boreholes MW101 and BH103 range from 20 to 31% weight; moist to wet in appearance.

SPT carried out in the silt provided N-values ranging from 3 to 25 indicating a very loose to compact compactness condition.

Grain size analysis and Atterberg Limits test were carried out on one (1) sample of the silt. The result of the grain size analysis is enclosed in Appendix D as Figures 1 and 7, and summarized in the following table.

Sample No. and Depth	Sample Description	Gravel %	Sand %	Silt %	Clay %
MW101 Sample 10; 9.1 m	SILT some clay	0	0	88	12

Atterberg limits test conducted on this sample revealed that the silt is non-plastic and based on the results of the grain size analysis, the Coefficient of Permeability (k) of the silt is estimated to be less than 10^{-6} cm/sec, corresponding to very low relative permeability.

4.4. BEDROCK

The native soils are underlain by bedrock of the Guelph formation at approximate depths ranging from 28.1 to 32.0 mbg. The samples of bedrock obtained from the split spoons consisted of limestone fragments. The depth of bedrock was determined based on our observations during borehole advancement and samples collected using split spoons; the bedrock was not investigated (cored).

4.5. GROUNDWATER

Groundwater level measurements were made during advancement of the boreholes and subsequently in the monitoring wells on July 29, 2022.

The groundwater levels measured in the monitoring wells are shown on the individual borehole logs and are summarized in the following table.

Borehole No.	Ground Surface Elevation (m)	Date	Groundwater Depth (mbgs)	Groundwater Elevation (m)
MW101	221.44	July 29, 2022	1.52	219.92
MW104	217.57	July 29, 2022	1.24	216.33
MW107	215.92	July 29, 2022	1.12	214.80
MW108	220.19	July 29, 2022	3.48	216.71

It should be noted that groundwater levels are subject to seasonal fluctuations. A higher groundwater level condition may develop following significant rainfall events.

5 DISCUSSION AND RECOMMENDATIONS

The following discussions and recommendations are based on the factual data obtained from the boreholes advanced at the site and are intended for use by the client and design architects and engineers only.

We understand that it is proposed to develop the site with a low-rise residential subdivision. Development of the site will require significant regrading, with cuts as deep as approximately 7 m and fills ranging to approximately 4 m in height. The findings of the boreholes at the site reveal that the site is underlain by predominately stiff to very stiff clayey silt and silty clay and loose to compact silt. Bedrock is situated approximately 30 mbg. Given the significant depth of clay overburden soils, special considerations for site grading and settlement resulting from grade raise will be required. However, construction of site services, roads, and buildings should not pose any unusual difficulty.

The construction methods described in this report are not specifications or recommendations to the contractors or as the only suitable methods. The collected data and the interpretation presented in this report may not be sufficient to assess all the factors that may influence the construction. Contractors bidding on this project or conducting work associated with this project should make their own interpretation of the factual data and/or carry out their own investigations as they might deem necessary. The contractor should also select the method of construction, equipment and sequence based on their previous experience on similar projects.

5.1. SITE GRADING AND SETTLEMENT CONSIDERATIONS

We understand that significant regrading will be required for the proposed development. The existing site grades will be lowered by up to approximately 7 m, and raised by approximately 4 m. The boreholes advanced at the site and DMT soundings carried out by Terrapex reveal that the site is underlain by a significant depth of native clayey silt and silty clay soil. The consistency of the native clay soils ranges from stiff to very stiff. The Oedometric Modulus values estimated based on the results of the DMT soundings reveal that compressible layers of clay soils are present below depths of 6 to 10 m below grade.

Terrapex has carried out settlement analyses for various heights of grade raise utilizing the findings of the boreholes and the soil properties provided by the DMT soundings. The results of our settlement analyses reveal that a grade raise which exceeds 1 m above the existing site grades will result in settlement which exceeds the conventional limit of 25 mm for total settlement of structures.

Based on the results of the settlement analysis, it is recommended that areas of the site which will be raised by more than 1 m above existing grade be preloaded in order to effect consolidation of the native soils prior to installation of site services, and construction of roads and buildings.

Site preloading should consist of raising the site grade with engineered fill to pregrade proposed finished grades. The grade should be further raised with earth fill to 1 m above the proposed finished grade elevation. Settlement monitors should be installed in the preload areas and surveyed in relation to local benchmarks on a weekly basis. Once the settlement measured by the surveys of settlement monitors has been substantially completed, the surcharge earth fill can be removed, and construction may proceed. It is recommended that an allowance of 4 to 18 months be included in the project schedule for preloading works.

5.2. EXCAVATION

Based on the field results, excavations for the basement and foundation are not expected to pose any unusual difficulty. Excavation of the soils at this site can be carried out with hydraulic excavators.

All excavations must be carried out in accordance with the Occupational Health and Safety Act (OHSA). With respect to the OHSA, the fill materials and native clayey silt soils are expected to conform to Type 3 soils. Sand and silt soils below the groundwater table are expected to conform to Type 4 soils.

Temporary excavation sidewalls in Type 3 soils should not exceed 1.0 horizontal to 1.0 vertical. Side slopes of excavations extended into Type 4 soil should not be any steeper than 3.0 horizontal to 1.0 vertical.

In the event very loose and/or soft soils are encountered at shallow depths or within zones of persistent seepage, it will be necessary to flatten the side slopes to achieve stable conditions.

For excavations through multiple soil types, the side slope geometry is governed by the soil with the highest number designation. Excavation side-slopes should not be unduly left exposed to inclement weather.

Where workers must enter excavations extending deeper than 1.2 m below grade, the excavation sidewalls must be suitably sloped and/or braced in accordance with the Occupational Health and Safety Act and Regulations for Construction Projects.

5.3. GROUNDWATER CONTROL

Based on observations made during drilling of the boreholes, and close examination of the soil samples extracted from the boreholes, significant groundwater seepage is not anticipated to occur within the presumed excavation depths.

The native clayey silt, silty clay, and silt possess very low relative permeability. The groundwater yield from these soils is expected to be small.

It is anticipated that adequate control of groundwater can be achieved with a series of filtered sump pumps in the bases of the excavations. Surface water should be directed away from open excavations.

5.4. REUSE OF ON-SITE EXCAVATED SOIL

On-site excavated inorganic soils, and soils free of debris and other deleterious materials are considered suitable for reuse as backfill provided their water content is within 2% of their optimum water contents (OWC) as determined by Standard Proctor test, and the materials are effectively compacted with a heavy sheepsfoot compactor.

The moisture content of the soils and the lift thickness for compaction must be properly controlled during backfilling. Measured water content within the fill and native soils within the presumed excavation depth generally range from approximately 18 to 35%; typically, being above the optimum water content of the soils. Soils wetter than their OWC must be sufficiently dried to achieve adequate compaction levels.

5.5. SERVICE TRENCHES

Based on the anticipated site grades, sewer pipes and water mains will likely be supported on undisturbed native clayey silt / silty clay, silt, or engineered fill which are considered suitable for supporting water mains, sewer pipes, manholes, catch basins and other related structures.

The type of bedding depends mainly on the strength of the subgrade immediately below the invert levels.

Normal Class 'B' bedding is recommended for underground utilities. Granular 'A' or 19 mm crusher-run limestone can be used as bedding material; all granular materials should meet OPS 1010 specifications. The bedding material should be compacted to a minimum of 95% Standard Proctor Maximum Dry Density. Bedding details should follow the applicable governing design detail (i.e. Brantford, OPSD). Trenches dug for these purposes should not be unduly left exposed to inclement weather.

Pipe bedding and backfill for flexible pipes should be undertaken in accordance with OPSD 802.010. Pipe embedment and cover for rigid pipes should be undertaken in accordance with OPSD 802.030.

If unsuitable bedding conditions occur, careful preparation and strengthening of the trench bases prior to sewer installation will be required. The subgrade may be strengthened by placing a thick mat consisting of 50 mm crusher-run limestone. Field conditions will determine the depth of stone required. Geotextiles and/or geogrids may be helpful and these options should be reviewed by Terrapex on a case by case basis.

Sand cover material should be placed as backfill to at least 300 mm above the top of pipes. Placement of additional granular material (thickness dictated by the type of compaction equipment) as required or use of smaller compaction equipment for the first few lifts of native material above the pipe will probably be necessary to prevent damage to the pipe during the trench backfill compaction.

It is recommended that service trenches be backfilled with on-site native materials such that at least 95% of Standard Proctor Maximum Dry Density (SPMDD) is obtained in the lower zone of the trench and 98% of SPMDD for the upper 1000 mm.

In areas of narrow trenches or confined spaces such as around manholes, catch basins, etc., the use of aggregate fill such as Granular 'B' Type I (OPSS 1010) is required if there is to be post-construction grade integrity.

5.6. FOUNDATION DESIGN

We understand that it is proposed to develop the site with low-rise residential buildings. Based on the proposed site grades, it is anticipated that the house foundations will be supported on native stiff to very stiff clayey silt / silty clay, loose to compact silt, or engineered fill, which are considered suitable for the support of foundations. Conventional spread and strip footings may be used to support the buildings.

Foundations supported on the native soils or engineered fill may be designed based on a bearing resistance of 80 kPa at Serviceability Limit States (SLS) and factored geotechnical bearing resistance at Ultimate Limit States (ULS) of 120 kPa.

Recommendations for engineered fill construction are provided in Section 5.7 of this report.

The total and differential settlements of spread footing foundations designed in accordance with the recommendations provided in this report should not exceed the conventional limits of 25 mm and 19 mm, respectively. Typical footing dimensions for these applications include a minimum strip footing with of 500 mm and an isolated column footing dimension of not less than 900 mm.

Due to variations in the consistency of the founding soils and/or loosening caused by excavating disturbance and/or seasonal frost effects, all footing subgrade must be evaluated by the Geotechnical Engineer prior to placing formwork and foundation concrete to ensure that the soil exposed at the excavation base is consistent with the design geotechnical bearing resistance.

In the event necessary, the stepping of the footings at different elevations should be carried out at an angle no steeper than 2 horizontal (clear horizontal distance between footings) to 1 vertical (difference in elevation) and no individual foot step should be greater than 0.45 m.

Rainwater or groundwater seepage entering the foundation excavations must be pumped away (not allowed to pond). The foundation subgrade soils should be protected from freezing, inundation, and equipment traffic at all times. If unstable subgrade contacted in order to assess the conditions and make appropriate recommendations.

All exterior footings and footings in unheated areas should be provided by at least 1.2 m of soil cover or equivalent artificial thermal insulation for frost protection purposes. If construction proceeds during freezing weather conditions, adequate temporary frost protection for the footing bases and concrete must be provided.

5.7. ENGINEERED FILL

The following recommendations regarding construction of engineered fill should be adhered to:

- All fill, topsoil, and disturbed soils must be removed, and be inspected by the Geotechnical Engineer prior to any fill placement.
- Engineered fill operations should be monitored and compaction tests should be performed on a full-time basis by a qualified engineering technician supervised by the project engineer.
- The engineered fill must be placed in lifts not exceeding 200 mm in thickness and

compacted to minimum 98% Standard Proctor Maximum Dry Density (SPMDD).

- If fill is required adjacent to sloped banks (> 3:1, horizontal to vertical), it is imperative that the fill is placed in stepped planes in order to avoid a plane weakness.
- The engineered fill should be placed at least 0.6 m above the elevation of the proposed underside of footing.
- The engineered fill operation should take place in favorable climatic conditions. If the work is carried out in months where freezing temperatures may occur, all frost affected material must be removed prior to the placement of frost-free fill.
- The foundation walls of house foundations should be reinforced to bridge localized soft spots and zones of non-uniform compaction, and to minimize structural distress due to differential settlement of the engineered fill. The actual steel reinforcement design should be confirmed / designed by the project structural engineer.
- When engineered fill is left over the winter, a minimum of 1.2 m of earth cover must be provided as frost protection.
- If unusual soil conditions become apparent during construction, due to subsurface groundwater influences, our office should be contacted in order to assess the conditions and recommend appropriate remedial measures.

The footing and underground services subgrade must be inspected by the Geotechnical Engineer that supervised the engineered fill construction. This is to ensure that the foundations are placed within the engineered fill envelope, and the integrity of the fill has not been compromised by interim construction, environmental degradation and/or disturbance by the footing excavation. Extended footings and/or steel reinforcement may be required based on the footing inspection.

5.8. BASEMENT FLOOR SLAB

Excavation for basements is expected to extend to an approximate depth of 2 m below grade. It is expected that the subgrade below the basement floor will consist of undisturbed clayey silt / silty clay, silt or engineered fill; suitable for slab-on-grade construction.

Subgrade preparation should include the removal of any wet, soft/loose and disturbed soils. After removal of all unsuitable materials, the subgrade should be inspected and adjudged as satisfactory before preparing the granular base course. Any loose or unsuitable subgrade areas should be sub-excavated and replaced with suitable approved compacted backfill; placed in maximum lifts of 200 mm thickness and compacted to at least 98% of Standard Proctor Maximum Dry Density (SPMDD).

It is recommended that a combined moisture barrier and a levelling course, having a minimum thickness of 150 mm and comprised of free draining material using 19 mm clear stone be provided as a base for the slab-on-grade. The base material should be compacted to a dense condition.

The basement of the proposed building must be provided with perimeter drainage. The basement wall backfill for a minimum lateral distance of 0.6 m out from the wall should consist of free-draining material such as OPSS Granular 'B' Type I. The native soil may be used to backfill excavations along foundation walls provided that a suitable alternative drainage cellular media is placed on the wall. Damp proofing must be applied to the exterior basement walls.

In areas where the basements will extend into wet silt, it will also be necessary to install a sub-floor drainage system.

The perimeter and sub-floor drains must be connected to positive frost-free outlets from which the water can be removed or connected to sumps located in the basements. The water from the sumps must be pumped out to a suitable discharge point.

The installation of the perimeter drains as well as the outlet must conform to the applicable plumbing code requirements.

5.9. STORM WATER MANAGEMENT POND

The Grading Concept plan prepared by Urbantech Consulting dated April 2022, reveals that the northeast section of the pond will consist of a forebay and the southwest section will consist of a detention pond. The base of the pond will be situated at Elevation 211.29 m, and the top of the surrounding berms at Elevation 217.0 m. The Permanent Water Level (PWL) will be set at Elevation 213.50 m.

Boreholes MW107 and MW108 were advanced in the area of the proposed SWM Pond. The boreholes reveal that the subsurface soil conditions consist of a thin layer of topsoil followed by stiff to very stiff clayey silt with occasional layers of silty clay. A layer of compact silt with trace sand and trace clay is present in MW108 within a depth range of 2.3 to 4.0 m.

Based on the findings of the boreholes, the side slopes and base of the SWM pond will consist of stiff to very stiff clayey silt and locally silt soil. Significant groundwater seepage is not anticipated during pond excavation.

Grain Size analysis of samples of native clayey silt obtained during this investigation reveal that the clay content of the samples ranges from 29 to 45%. Based on the high clay content of the native soil, a liner should not be required. Confirmation of liner requirements will be necessary on site during excavation for the pond. In the event that permeable soils are encountered throughout the sideslopes of the pond, a liner will be required to be constructed utilizing local clay soils excavated from the site.

Terrapex carried out an analysis of the stability of the SWM Pond side slopes. A cross section of the proposed pond geometry, Slope Stability Cross Section 1 shown on in Grading Concept Plan

in Appendix B was analyzed using the GEO5 2022 Slope Stability software package. The program was configured to calculate the minimum factor of safety for moment equilibrium assuming circular failure surfaces. The Bishop method employing effective stress was used to calculate the minimum factor of safety against circular failure.

For land development and planning, a minimum Factor of Safety of 1.5 is required for permanent, long-term design of slopes for stability. For short term conditions, a Factor of Safety of 1.3 is deemed adequate for temporary draining of the pond.

The subsurface soil stratigraphy and soil properties were selected for the analysis based on the findings of Boreholes MW107 and MW108.

The results of the stability analyses are enclosed with this report in Appendix H and reveal that the Factors of Safety with respect to Slope Stability for the permanent pond condition range from 1.78 to 2.91. The Factors of Safety with respect to Slope Stability for the temporary condition of draining the pond for occasional maintenance range from 1.61 to 1.84.

Based on the results of the Slope Stability Analyses, the proposed SWM Pond will remain stable against deep seated slope failure.

5.10. PUMPING STATION

As requested by Urbantech Consulting, Boreholes BH106 and BH109 were advanced to depths of 29.6 and 29.4 mbg respectively at the potential locations of the pumping station. Soil conditions at these locations consist of predominantly stiff to very stiff clayey silt / silty clay parted with silt layers to the bedrock. Groundwater is anticipated to be situated at about 3.0mbg based on the findings of the boreholes.

It will likely be necessary to shore the excavation sidewalls of the well associated with the pumping station. Recommendations relating to the construction of the pumping station and well can be provided upon receipt of the conceptual designs of these structures.

5.11. LATERAL EARTH PRESSURE

Parameters used in the determination of earth pressure acting on structures subject to unbalanced pressures are defined below.

SOIL PARAMETERS

Parameter	Definition	Units
Φ'	angle of internal friction	degrees
γ	bulk unit weight of soil	kN/m^3
Ka	active earth pressure coefficient (Rankine)	dimensionless
Ko	at-rest earth pressure coefficient (Rankine)	dimensionless
Kp	passive earth pressure coefficient (Rankine)	dimensionless

The appropriate un-factored values for use in the design of structures subject to unbalanced earth pressures at this site are tabulated as follows:

SOIL PARAMETER VALUES

SOIL	Parameters				
	Φ'	γ	Ka	Kp	Ko
Engineered Fill Material	30°	21.0	0.32	3.0	0.50
Clayey Silt / Silty Clay	28°	19.0	0.362	2.77	0.53
Silt	30°	19.0	0.33	3.00	0.50

Walls or bracings subject to unbalanced earth pressures must be designed to resist a pressure that can be calculated based on the following formula:

$P = K (\gamma h + q)$

where **P** = lateral pressure in kPa acting at a depth h (m) below ground surface

K = applicable lateral earth pressure coefficient (Use Ko for basement wall design)

γ = bulk unit weight of backfill (kN/m^3)

h = height at any point along the interface (m)

q = the complete surcharge loading (kPa)

This equation assumes that free-draining backfill and positive drainage is provided behind the basement walls.

Subsurface walls that are subject to unbalanced earth and hydrostatic pressures must be designed to resist a pressure that can be calculated based on the following formula:

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

where **P** = lateral pressure in kPa acting at a depth h (m) below ground surface

K = applicable lateral earth pressure coefficient

H = height at any point along the interface (m)

$\mathbf{h_w}$ = depth below the groundwater level at point of interest (m)

γ = bulk unit weight of backfill (kN/m^3)

γ' = the submerged unit weight (kN/m^3) of exterior soil ($\gamma' = \gamma - \gamma_w$)

γ_w = unit weight of water, assume a value of 9.8 kN/m^3

q = the complete surcharge loading (kPa)

Resistance to sliding of earth retaining structures is developed by friction between the base of the footing and the soil. This friction (R) depends on the normal load on the soil contact (N) and the frictional resistance of the soil (tan Φ') expressed as: **R = N tan Φ'**. This is an ultimate resistance value and does not contain a factor of safety.

5.12. PAVEMENT DESIGN

Based on the existing topography of the site and the proposed grading plan, it is anticipated that the sub-grade material for the pavement will consist of native stiff to very stiff clayey silt soil, loose to compact silt, or engineered fill.

The subgrade should be thoroughly proof-rolled and re-compacted to ensure uniformity in subgrade strength and support. Lift thicknesses should not exceed 200 mm in loose state and the excavated site material should be compacted using heavy vibratory rollers. As an alternative, if suitable on-site native material is not available, the upper part of the subgrade could be improved by placing imported granular material.

If construction is carried out in inclement weather, there is a likelihood that some amount of road sub-base supplement will be required (i.e. some sub-excavation followed by granular replacement).

Given the frost susceptibility and drainage characteristics of the subgrade soils, the pavement design presented below is recommended.

RECOMMENDED ASPHALTIC CONCRETE PAVEMENT STRUCTURE DESIGN (MINIMUM COMPONENT THICKNESSES)

Pavement Layer	Compaction Requirements	House Driveways	Local Residential Roads
Surface Course Asphaltic Concrete	97% Marshall Density	40 mm Hot-Laid HL3	40 mm Hot-Laid HL3
Binder Course Asphaltic Concrete	97% Marshall Density	40 mm Hot-Laid HL8	50 mm Hot-Laid HL8
Granular Base	100% SPMDD	200 mm compacted depth OPSS Granular A	150 mm compacted depth Granular A
Granular Sub-Base	100% SPMDD	-	300 mm compacted depth Granular B

* Standard Proctor maximum dry density (ASTM-D698)

The subgrade must be compacted to 98% of the material's SPMDD for at least the upper 1.0 m and 95% below this level. The granular base and sub-base materials should be compacted to a minimum of 100% SPMDD.

The gradation and physical properties of the asphaltic concrete and granular materials shall conform to the OPSS standards. The asphaltic concrete materials should be rolled and compacted in accordance with OPSS 310 requirements.

The long-term performance of the proposed pavement structure is highly dependent upon the subgrade support conditions. Stringent construction control procedures should be maintained to ensure that uniform subgrade moisture and density conditions are achieved as much as is practically possible, and that the subgrade is not disturbed and weakened after it is exposed.

Control of surface water is a significant factor in achieving good pavement life. Grading adjacent to the pavement areas must be designed so that water is not allowed to pond adjacent to the outside edges of the pavement or curb. In addition, the need for adequate drainage cannot be over-emphasized. The subgrade must be free of depressions and sloped (preferably at a minimum gradient of three percent) to provide effective drainage towards subgrade drains. Sub-drains are recommended to intercept excess subsurface moisture at the curb lines and catch basins. The invert of sub-drains should be maintained at least 0.3 m below subgrade level.

Additional comments on the construction of pavement areas are as follows:

- As part of the subgrade preparation, the proposed pavement areas should be stripped of vegetation, topsoil, unsuitable earth fill and other obvious objectionable material. The subgrade should be properly shaped and sloped as required, and then proof-rolled. Loose/soft or spongy subgrade areas should be sub-excavated and replaced with suitable approved material compacted to at least 98% of SPMDD.

- Where new fill is needed to increase the grade or replace disturbed portions of the subgrade, excavated inorganic soils or similar clean imported fill materials may be used, provided their moisture content is maintained within 2 % of the soil's optimum moisture content. All fill must be placed and compacted to not less than 98% of SPMDD.

- For fine-grained soils, as encountered at the site, the degree of compaction specification alone cannot ensure distress free subgrade. Proof-rolling must be carried out and witnessed by Terrapex personnel for final recommendations of sub-base thicknesses.

- In the event that pavement construction takes place in the spring thaw, the late fall, or following periods of significant rainfall, it should be anticipated that an increase in thickness of the granular sub-base layer will be required to compensate for reduced subgrade strength.

5.13. EARTHQUAKE DESIGN PARAMETERS

The Ontario Building Code (2006) stipulates the methodology for earthquake design analysis, as set out in Subsection 4.18.7. The determination of the type of analysis is predicated on the importance of the structure, the spectral response acceleration and the site classification.

The parameters for determination of the Site Classification for Seismic Site Response are set out in Table 4.1.8.4.A of the Ontario Building Code (2006). The classification is based on the determination of the average shear wave velocity in the top 30 metres of the site stratigraphy, where shear wave velocity (vs) measurements have been taken. In the absence of such measurements, the classification is estimated on the basis of empirical analysis of undrained shear strength or penetration resistance. The applicable penetration resistance is that which has been corrected to a rod energy efficiency of 60% of the theoretical maximum or the (N60) value.

Based on the borehole information, the subsurface stratigraphy generally comprises a thin layer of topsoil followed by predominantly stiff to very stiff clayey silt, followed by bedrock situated approximately 31 m below grade. Based on the above, the site designation for seismic analysis is Class D ("stiff soil").

The site specific 5% damped spectral acceleration coefficients, and the peak ground acceleration factors are provided in the 2006 Ontario Building Code - Supplementary Standard SB-1 (August 15, 2006), Table 1.2, location Brantford, Ontario.

5.14. CHEMICAL CHARACTERIZATION OF SUBSURFACE SOIL

Two (2) native soil samples obtained from Borehole BH102 from approximate depths of 2.3 mbg and BH105 from approximate depth of 3.1 mbg were submitted to AGAT Laboratories for pH index test and water-soluble sulphate content to determine the potential of attacking the subsurface concrete. The Certificate of Analysis provided by the analytical chemical testing laboratory is contained in Appendix E of this report.

The test results revealed that the pH index of the soil samples are 7.92 and 8.19, indicating a slight alkalinity.

The water-soluble sulphate content of the tested samples are 0.002% and 0.0061%. The concentration of water-soluble sulphate content of the tested samples is below the CSA Standard of 0.1% water-soluble sulphate (Table 12 of CSA A23.1, Requirements for Concrete Subjected to Sulphate Attack). Special concrete mixes against sulphate attack are therefore not required for the sub-surface concrete of the proposed buildings.

6 LIMITATIONS OF REPORT

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

Yours respectfully,
Terrapex Environmental Ltd.

Kellen Campbell, C.Tech.
Manager, Geotechnical Investigations

Vic Nersesian, P.Eng.
Senior Geotechnical Engineer

APPENDIX A

LIMITATIONS OF REPORT

LIMITATIONS OF REPORT

This report has been completed in accordance with the terms of reference for this project as agreed upon by Welton and Innes G.P. Inc (the Client) and Terrapex Environmental Ltd. (Terrapex) and generally accepted engineering consulting practices in this area.

The conclusion and recommendations in this report are based on information determined at the inspection locations. Soil and groundwater conditions between and beyond the test holes may differ from those encountered at the test hole locations, and conditions may become apparent during construction which could not be detected or anticipated at the time of the soil investigation. If new or different information is identified, Terrapex should be requested to re-evaluate its conclusions and recommendations and amend the report as appropriate.

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 details of alignment and elevations stated in the report. Since all details of the design may not be known to us, in our analysis certain assumptions had to be made as set out in this report. The actual conditions may, however, vary from those assumed, in which case changes and modifications may be required to our recommendations.

This report was prepared for the sole use of Welton and Innes G.P. Inc. Terrapex accepts no liability for claims arising from the use of this report, or from actions taken or decisions made as a result of this report, by parties other than Welton and Innes G.P. Inc. The material herein reflects Terrapex's judgement in light of the information available to it at the time of preparation. We recommend, therefore, that we be retained during the final design stage to review the design drawings and to verify that they are consistent with our recommendations, or the assumptions made in our analysis. We also recommend that we be retained during construction to confirm that the subsurface conditions throughout the site do not deviate materially from those encountered in the test holes. In cases where these recommendations are not followed, Terrapex's responsibility is limited to accurately interpreting the conditions encountered at the test holes, only.

The comments given in this report on potential construction problems and possible methods are intended for the guidance of the design engineer, only. The number of inspection locations may not be sufficient to determine all the factors that may affect construction methods and costs. Contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the subsurface conditions may affect their work.

APPENDIX B

BOREHOLE LOCATION PLAN AND GRADING CONCEPT PLAN

LEGEND

- APPROXIMATE SITE BOUNDARY
- WELTON ROAD ROAD ALLOWANCE
- BOREHOLE (TERRAPEX)
- MONITORING WELL (TERRAPEX)
- BOREHOLE (TERRAPROBE, 2020)

0 50 100 150 200
Metres

DATA SOURCE: CITY OF TORONTO
SITE PLAN PROVIDED BY CLIENT
MAP PROJECTION: NAD 1983 UTM ZONE 17N

CLIENT:
Welton and Innes G.P. Inc

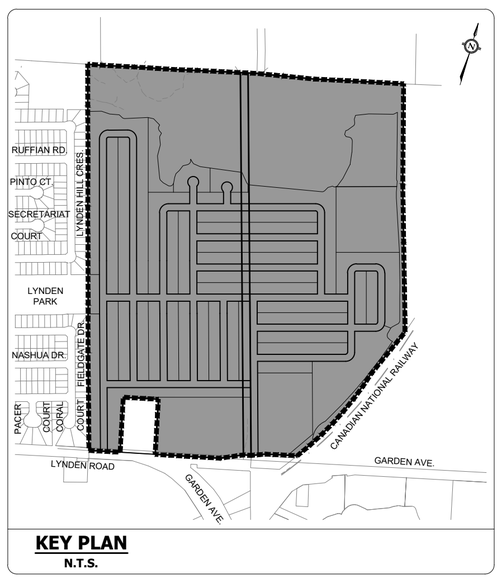
SITE LOCATION:
299 LYNDEN ROAD
BRANTFORD, ONTARIO

TERRAPEX

TITLE:
BOREHOLE LOCATION PLAN

DRAWN BY:	PROJECT NO.:	CHECKED BY:
SW	CT3087.02	XX
REVISION:	DATE:	FIGURE:
00	AUGUST 2022	1

W:\PROJECTS\Toronto\CT3087.02 299 Lynden Road, Brantford\MXD\CT3087.02 FIG1 BOREHOLE LOCATION PLAN.mxd



KEY PLAN
N.T.S.

LYNDEN HILL CRESCENT
RUFFIAN ROAD
PINTO COURT
SECRETARIAT COURT
LYNDEN HILL CRESCENT
FIELDGATE DRIVE
NASHUA DRIVE
FIELDGATE DRIVE
PACER COURT
CORAL COURT
LYNDEN ROAD
GARDEN AVENUE
CANADIAN NATIONAL RAILWAY

STREET 'A' · STREET 'B' · STREET 'C' · STREET 'D' · STREET 'E' · STREET 'F' · STREET 'G' · STREET 'H' · STREET 'J' · STREET 'K' · STREET 'L' · STREET 'M' · STREET 'N' · STREET 'O' · STREET 'P' · STREET 'Q'

Slope Stability
Cross Section 1

RIP RAP SPILLWAYS (500mm DEPTH OF 200-300mm RIP RAP STONE PLACED ON TERRAFIX 270R FILTER CLOTH) (OR APPROVED EQUIVALENT)

4.0m ASPHALT ACCESS ROAD · 4.0m WET CELL ACCESS @ MAX. 10% · ASPHALT ABOVE PWL · TURFSTONE BELOW PWL · SEDIMENT FOREBAY · BOTTOM EL. 211.29 · WET CELL · 3.5m WIDE · 4.0m WIDE · 5.0m WIDE TURFSTONE EMERGENCY SPILLWAY

LEGEND

- LIMIT OF DEVELOPMENT
- 188.50 — PROPOSED ELEVATION
- 188.00SW — PROPOSED SWALE ELEVATION
- (188.50) — PROPOSED ELEVATION (BY OTHERS)
- 188.50 — EXISTING ELEVATION
- MAXIMUM 3:1 (UNLESS OTHERWISE NOTED)
- PROPOSED OVERLAND FLOW ROUTE
- EXISTING OVERLAND FLOW ROUTE
- 215.00 — EXISTING CONTOUR & ELEVATION
- FUTURE / EXISTING DEVELOPMENT LANDS

BENCHMARK
ELEVATIONS ARE RELATED TO GEODETIC DATUM AND ARE DERVIED FROM THE MNR BENCHMARK No. 1196U861
ELEVATION = 208.33

Urbantech® Consulting
A Division of Leighton-Zec West Ltd.
2030 Bristol Circle, Suite 105
Oakville, ON. L6H 0H2
TEL 905.829.8818 • urbantech.com

299 LYNDEN ROAD
CITY OF BRANTFORD

GRADING CONCEPT

PROJECT No.	DATE	SCALE	DWG No.
19-617	APR. 2022	1:2000	**GRD-1**

F:\PROJECTS\19-617 (299 LYNDEN ROAD -SOBARA BRANTFORD)\DRAWINGS\PRELIMINARY ENGINEERING & FIGURES\BSS\GRD-1_GRADING CONCEPT.DWG

APPENDIX C

BOREHOLE LOG SHEETS

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: MW101**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781511.77	EASTING (m): 563068.63 ELEV. (m) 221.44
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10 SAND TYPE: 0 SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) ● / N-VALUE (Blows/300mm) ▲	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		Topsoil (200mm)	0	221	4	18	1		21			Bentonite	
		stiff to very stiff, very moist, brown CLAYEY SILT trace sand with occasional silty clay layers	0.5										
			1	220.5	5	24	2		100				50 mm monitoring well was installed. Water level measured on July 29, 2022: 1.52 mbg
			1.5	220									
		loose to compact, wet, brown SILT trace sand, trace clay	2	219.5	9	23	3		83				
			2.5	219	12	21	4		100				
			3	218.5								Sand	
		stiff to very stiff, very moist CLAYEY SILT trace sand with occasional silty clay layers	3.5	218	8	29	5		100			Screen + Sand	
		brown	4	217.5	6	27	6		100				
			4.5	217									
			5	216.5	5	24	7		100				
			5.5	216	135								
		grey	6	215.5									
			6.5	215	8	21	8		100				
			7	214.5									
			7.5	214									
		compact, wet, grey SILT some clay	8	213.5	6	24	9		100				
			8.5	213									
			9	212.5									

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 15&16&17-June-2022
INPUT BY: EMZ	MONITORING DATE: 29-July-2022
REVIEWED BY: VN	PAGE 1 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: MW101**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781511.77	EASTING (m): 563068.63 ELEV. (m) 221.44
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10 SAND TYPE: 0 SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		compact, wet, grey SILT some clay	9.5	212	18	20	10		100				
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	10	211.5									
			10.5	211									
			11	210.5	7	28	11		100				
			11.5	210									
			12	209.5									
			12.5	209	4	27	12		100				shelby tube sample: 12.8-13.4 mbg
			13	208.5									
			13.5	208									
			14	207.5	6	27	13		100				
			14.5	207									
			15	206.5									
			15.5	206	7	25	14		100				
			16	205.5									
			16.5	205									
			17	204.5	15	25	15		100				
			17.5	204									
			18	203.5									
			18.5	203									

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 15&16&17-June-2022
INPUT BY: EMZ	MONITORING DATE: 29-July-2022
REVIEWED BY: VN	PAGE 2 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: MW101**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781511.77	EASTING (m): 563068.63 ELEV. (m) 221.44
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10 SAND TYPE: 0 SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	19	202.5	2, 35	30	16		100				
			19.5	202									
			20	201.5	6	23	17		100				
			20.5	201									
			21	200.5									
			21.5	200	7	25	18		100				
			22	199.5									
			22.5	199									
			23	198.5	7	26	19		100				
			23.5	198									
			24	197.5									
			24.5	197	3	36	20		100				
		loose to compact, wet, grey SILT trace clay	25	196.5									
			25.5	196									
			26	195.5	15	26	21		100				
			26.5	195									
			27	194.5									
			27.5	194	5	23	22		100				

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 15&16&17-June-2022
INPUT BY: EMZ	MONITORING DATE: 29-July-2022
REVIEWED BY: VN	PAGE 3 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: MW101**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781511.77	EASTING (m): 563068.63 ELEV. (m) 221.44
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10 SAND TYPE: 0 SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		loose, wet, grey SILT trace clay	28	193.5									
		stiff to very stiff, wet, grey CLAYEY SILT	28.5	193									
			29	192.5	4	28	23		100				
			29.5	192									
		loose, wet, grey SILT trace to some clay	30	191.5									
			30.5	191	4	31	24		100				
			31	190.5									
			31.5	190									
		Inferred BEDROCK	32	189.5	50/75	4	25		67				
			32.5	189									
			33	188.5									
		END OF BOREHOLE	33.5	188	50/12		26		0				

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 15&16&17-June-2022
INPUT BY: EMZ	MONITORING DATE: 29-July-2022
REVIEWED BY: VN	PAGE 4 OF 4

CLIENT: Welton and Innes G.P. Inc | PROJECT NO.: CT3087.02 | **RECORD OF: BH102**

ADDRESS: 299 Lynden Road

CITY/PROVINCE: Brantford, Ontario | NORTHING (m): 4781301.90 | EASTING (m): 563826.99 | ELEV. (m) 220.20

CONTRACTOR: Profile Drilling Inc. | METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling

BOREHOLE DIAMETER (cm): 15 | WELL DIAMETER (cm): | SCREEN SLOT #: | SAND TYPE: | SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) ● / N-VALUE (Blows/300mm) ▲	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		topsoil (250mm)	0	220	6								
		stiff to very stiff, moist, brown CLAYEY SILT trace sand with occasional silty clay layers	0.5	219.5	5		1		13				
			1	219			2		100				
			1.5	218.5	5		3		100				
			2	218									
		compact, moist, brown SILT trace sand, trace clay	2.5	217.5	18		4		100				
			3	217	22		5		100				
			3.5	216.5									
		stiff to very stiff, grey CLAYEY SILT trace sand with occasional silty clay layers	4	216	6		6		100				
			4.5	215.5	6		7		100				
			5	215									
		moist to very moist	5.5	214.5									
			6	214	7		8		100				
			6.5	213.5									
		----------	7	213									
			7.5	212.5	6		9		100				
		wet	8	212									
			8.5	211.5									
			9	211									

TERRAPEX

LOGGED BY: EMZ | DRILLING DATE: 22&23&24-June-2022

INPUT BY: EMZ | MONITORING DATE:

REVIEWED BY: VN |

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH102**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781301.90	EASTING (m): 563826.99 ELEV. (m) 220.20
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) ▲ PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	9.5	210.5	▲8		10		100				
			10	210									
			10.5	209.5	▲7		11		100				
			11	209									
			11.5	208.5									
			12	208	▲6		12		100				
			12.5	207.5									
			13	207									
			13.5	206.5									
			14	206	▲6 59		13		100				
			14.5	205.5									
			15	205									
			15.5	204.5	▲4		14		100				
			16	204									
			16.5	203.5									
			17	203	▲5		15		100				
			17.5	202.5									
			18	202									
			18.5										

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 22&23&24-June-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 2 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH102**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781301.90	EASTING (m): 563826.99 ELEV. (m) 220.20
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	19	201.5	10		16		100				
			19.5	201									
			20	200.5	9		17		100				
			20.5	200									
			21	199.5									
			21.5	199	7		18		100				
			22	198.5									
			22.5	198									
			23	197.5	4		19		100				
			23.5	197									
			24	196.5									
			24.5	196	12		20		100				
			25	195.5									
			25.5	195									
			26	194.5	14		21		100				
			26.5	194									
			27	193.5									
			27.5	193									
				192.5	17		22		100				

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 22&23&24-June-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 3 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH102**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781301.90	EASTING (m): 563826.99 ELEV. (m) 220.20
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) ▲ PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	28	192									
			28.5	191.5									
			29	191	20 ▲		23		100				
			29.5	190.5									
			30	190									
			30.5	189.5	▲ 14		24		100				
			31	189									
		Inferred BEDROCK	31.5	188.5									
			32		50/10 ▲		25		0				
		END OF BOREHOLE											

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 22&23&24-June-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 4 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH103**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780958.49	EASTING (m): 563375.62 ELEV. (m) 215.13
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		topsoil (150mm)	0	215	6	30	1		25				
		stiff to very stiff CLAYEY SILT trace sand with occasional silty clay layers	0.5	214.5									
			1	214	7	35	2		28				
			1.5	213.5		22							
		moist to very moist brown	2	213	14		3		100				
			2.5	212.5	7	29	4		100				
			3	212		30							
			3.5	211.5	9		5		100				
		---------- wet grey	4	211	5	26	6		100				
		compact, wet, grey SILT trace clay	4.5	210.5		20							
			5	210	11		7		100				
			5.5	209.5									
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	6	209	5	27	8		100				
			6.5	208.5									
			7	208									
			7.5	207.5		19							
			8	207	6		9		100				
			8.5	206.5									
			9	206									

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 08&11-July-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 1 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH103**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780958.49	EASTING (m): 563375.62 ELEV. (m) 215.13
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) ▲ PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	9.5	205.5	▲4	23	10		100				shelby tube sample: 9.8-10.4mbg
			10	205									
			10.5	204.5	▲6	29	11		100				
			11	204									
			11.5	203.5									
			12	203	▲5	27	12		100				
			12.5	202.5									
			13	202									
			13.5	201.5									
			14	201	▲6	30	13		100				
			14.5	200.5									
			15	200									
			15.5	199.5	▲5	28	14		100				
			16	199									
			16.5	198.5									
			17	198	▲6	24	15		100				
			17.5	197.5									
			18	197									
			18.5										

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 08&11-July-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 2 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH103**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780958.49	EASTING (m): 563375.62 ELEV. (m) 215.13
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) ▲ PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	19	196.5	▲7	32	16		100				
			19.5	196									
			20	195.5	▲7	27	17		100				
			20.5	195									
		compact, wet, grey SILT some clay	21	194.5									
			21.5	194	▲12	28	18		100				
			22	193.5									
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	22.5	193									
			23	192.5	▲12	27	19		28				
			23.5	192									
			24	191.5									
			24.5	191	▲8		20		100				
			25	190.5									
			25.5	190									
			26	189.5	▲7	35	21		100				
			26.5	189									
			27	188.5									
			27.5	188									
				187.5	▲11	27	22		100				

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 08&11-July-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 3 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH103**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780958.49	EASTING (m): 563375.62 ELEV. (m) 215.13
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 / N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) ▲ PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	28	187									
		Inferred BEDROCK	28.5	186.5	50/10 ▲		23		0				
		END OF BOREHOLE											

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 08&11-July-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 4 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: MW104**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781472.49	EASTING (m): 563609.02 ELEV. (m) 217.57
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10 SAND TYPE: 0 SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		topsoil (220mm)	0	217.5	6							Bentonite	
		stiff to very stiff CLAYEY SILT trace sand with occasional silty clay layers	0.5	217			1		17				50 mm monitoring well was installed. Water level measured on July 29, 2022: 1.24 mbg
			1	216.5	11		2		100				
		damp brown	1.5	216	15		3		100				
			2	215.5									
			2.5	215	9		4		100				
		----------	3	214.5									
			3.5	214	5		5		100				Sand
		moist grey											Screen + Sand
			4	213.5	4		6		83				
		----------	4.5	213									
					5		7		100				
		wet	5	212.5									
		loose, wet, grey SILT some clay	5.5	212									
			6	211.5	5		8		83				
			6.5	211									
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	7	210.5									
			7.5	210									
					6		9		100				
			8	209.5									
			8.5	209									shelby tube sample: 8.4-9.0mbg
			9	208.5									

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 20&21&22-June-2022
INPUT BY: EMZ	MONITORING DATE: 29-July-2022
REVIEWED BY: VN	PAGE 1 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: MW104**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781472.49	EASTING (m): 563609.02 ELEV. (m) 217.57
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10 SAND TYPE: 0 SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	9.5	208	3		10		100				
			10	207.5									
			10.5	207									
			11	206.5	4		11		100				
			11.5	206	59								
			12	205.5									
			12.5	205	3		12		100				
		loose, wet, grey SILT some clay	13	204.5									
			13.5	204									
			14	203.5	9		13		100				
			14.5	203									
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	15	202.5									
			15.5	202	5		14		100				
			16	201.5									
			16.5	201									
			17	200.5	2		15		100				
			17.5	200									
			18	199.5									
			18.5										

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 20&21&22-June-2022
INPUT BY: EMZ	MONITORING DATE: 29-July-2022
REVIEWED BY: VN	PAGE 2 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: MW104**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781472.49	EASTING (m): 563609.02 ELEV. (m) 217.57
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10 SAND TYPE: 0 SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	19	198.5									
	19.5	198									shelby tube sample: 19.1-19.7mbg
	20	197.5	4		16		100				
	20.5	197	53								
	21	196.5									
	21.5	196	2		17		100				
	22	195.5									
loose, wet, grey SILT some clay	22.5	195									
	23	194.5	5		18		100				
	23.5	194									
stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	24	193.5									
	24.5	193	2		19		100				
	25	192.5									
	25.5	192									
	26	191.5	1		20		100				
	26.5	191		117							
	27	190.5									
	27.5	190	10		21		100				
					22		100				

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 20&21&22-June-2022
INPUT BY: EMZ	MONITORING DATE: 29-July-2022
REVIEWED BY: VN	PAGE 3 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: MW104**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781472.49	EASTING (m): 563609.02 ELEV. (m) 217.57
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10 SAND TYPE: 0 SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) ▲ PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	28	189.5									
		Inferred BEDROCK	28.5	189									
		END OF BOREHOLE											

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 20&21&22-June-2022
INPUT BY: EMZ	MONITORING DATE: 29-July-2022
REVIEWED BY: VN	PAGE 4 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF:** **BH105**	
ADDRESS: 299 Lynden Road			
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781159.79	EASTING (m): 563318.41	ELEV. (m) 221.24
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling		
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #:	SAND TYPE:	SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		topsoil (230mm)	0	221	4		1		25				
		stiff to very stiff, moist, brown CLAYEY SILT trace sand with occasional silty clay layers	0.5	220.5									
			1	220	4		2		50				
			1.5	219.5	8		3A		100				
		loose to compact, moist to wet, brown SILT trace sand, some clay	2	219			3B						
			2.5	218.5	17		4		100				
			3	218	11		5		83				
			3.5	217.5									
			4	217	8		6		22				
		stiff to very stiff, grey CLAYEY SILT trace sand with occasional silty clay layers	4.5	216.5	5		7		100				
			5	216									
		very moist	5.5	215.5									
			6	215	5		8		100				
			6.5	214.5	82								
		----------	7	214									
			7.5	213.5	6		9		100				
		wet	8	213									
			8.5	212.5									
			9	212									

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 13&14&15-June-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 1 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH105**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781159.79	EASTING (m): 563318.41 ELEV. (m) 221.24
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	9.5	211.5	6		10		100				
		loose, wet, grey SILT trace sand, trace clay	10.5	210.5	7		11		56				
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	12	209	2		12		100				
			13.5	207.5	6		13		56				
			15	206	12		14		100				
			16.5	204.5	6		15		100				
			18.5	203									

SHEAR STRENGTH (kPa) 40 80 120 160 | N-VALUE (Blows/300mm) 20 40 60 80 | WATER CONTENT (%) 20 40 60 80

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 13&14&15-June-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 2 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH105**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781159.79	EASTING (m): 563318.41 ELEV. (m) 221.24
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) ▲ PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	19	202.5	2		16		100				
			19.5	202									
			20	201.5	3		17		100				
			20.5	201									
			21	200.5									
			21.5	200	4		18		100				
			22	199.5									
			22.5	199									
			23	198.5	9		19		28				
		compact, wet, grey SILT some clay	23.5	198									
			24	197.5									
			24.5	197	10		20		100				
			25	196.5									
			25.5	196									
			26	195.5	6		21		100				
			26.5	195									
			27	194.5									
			27.5	194									
				193.5	12		22		100				

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 13&14&15-June-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 3 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH105**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4781159.79	EASTING (m): 563318.41 ELEV. (m) 221.24
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		compact, wet, grey SILT some clay	28	193									
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	28.5	192.5	3		23		100				
			29	192									
			29.5	191.5									
			30	191									
			30.5	190.5	7		24		100				
			31	190									
		Inferred BEDROCK	31.5	189.5									
			32	189	50/10		25		100				
			32.5	188.5									
			33	188									
		END OF BOREHOLE	33.5		50/10		26		0				

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 13&14&15-June-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 4 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF:**	
ADDRESS: 299 Lynden Road		**BH106**	
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780769.78	EASTING (m): 563261.31	ELEV. (m) 216.56
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling		
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #:	SAND TYPE:	SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		topsoil (150mm) stiff to very stiff CLAYEY SILT trace sand with occasional silty clay layers	0	216.5	8		1		25				
			0.5	216									
			1	215.5	7		2		100				
		moist brown	1.5	215	12		3		100				
			2	214.5									
			2.5	214	10		4		100				
		----------	3	213.5	7		5		100				
			3.5	213									
			4	212.5	5		6		100				
			4.5	212									
			5	211.5	5		7		100				
		wet grey	5.5	211									
			6	210.5	11		8		100				
			6.5	210									
			7	209.5									
			7.5	209									
			8	208.5	5		9		100				
			8.5	208									
			9	207.5									

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 12&13-July-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 1 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH106**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780769.78	EASTING (m): 563261.31 ELEV. (m) 216.56
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) ▲ PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	9.5	207	▲4								
			10	206.5	88		10		100				
		loose, wet, grey SILT trace sand, some clay	10.5	206									
			11	205.5	▲5		11		100				
			11.5	205									
			12	204.5									
			12.5	204	▲5		12		67				
			13	203.5									
			13.5	203									
			14	202.5	▲9		13		100				
			14.5	202									
			15	201.5									
			15.5	201	▲9		14		100				
			16	200.5									
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	16.5	200									
			17	199.5	▲4		15		100				
			17.5	199									
			18	198.5									
			18.5										

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 12&13-July-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 2 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH106**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780769.78	EASTING (m): 563261.31 ELEV. (m) 216.56
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) ▲ PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	19	198	7		16		100				
			19.5	197.5									
			20	197									
			20.5	196.5	6		17		100				
			21	196									
			21.5	195.5									
			22	195	8		18		100				
			22.5	194.5									
			23	194									
			23.5	193.5	8		19		100				
			24	193									
			24.5	192.5									
		compact to loose, wet, grey SILT some clay	25	192	12		20		100				
			25.5	191.5									
			26	191									
			26.5	190.5	11		21		100				
			27	190									
			27.5	189.5									
				189	9		22		100				

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 12&13-July-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 3 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH106**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780769.78	EASTING (m): 563261.31 ELEV. (m) 216.56
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) ▲ PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		loose, wet, grey SILT some clay	28	188.5									
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	28.5	188	▲ 8		23		100				
			29	187.5									
		Inferred BEDROCK	29.5	187	50/10 ▲		24		0				
		END OF BOREHOLE											

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 12&13-July-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 4 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: MW107**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780816.53	EASTING (m): 563410.23 ELEV. (m) 215.92
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10 SAND TYPE: 0 SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) ● 40 80 120 160 / N-VALUE (Blows/300mm) ▲ 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		topsoil (200mm)	0	215.5	7		1		42			Bentonite	
		stiff to very stiff CLAYEY SILT trace sand with occasional silty clay layers	0.5	215	9		2		56				50 mm monitoring well was installed. Water level measured on July 29, 2022: 1.12 mbg
		moist brown	1.5	214.5	12		3		100				
			2	214									
			2.5	213.5	11		4		100				
		----------	3	213								Sand	
			3.5	212.5	6		5		100			Screen + Sand	
		very moist grey	4	212	6		6		100				
			4.5	211.5									
			5	211	9		7		100				
		----------	5.5	210.5									
			6	210									
			6.5	209.5	11		8		100				
			7	209									
		wet	7.5	208.5									
			8	208	10		9		100				
			8.5	207.5									
			9	207									

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 18&19-July-2022
INPUT BY: EMZ	MONITORING DATE: 29-July-2022
REVIEWED BY: VN	PAGE 1 OF 2

CLIENT: Welton and Innes G.P. Inc		PROJECT NO.: CT3087.02	**RECORD OF: MW107**
ADDRESS: 299 Lynden Road			
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780816.53	EASTING (m): 563410.23	ELEV. (m) 215.92
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Split Spoon Sampling		
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10	SAND TYPE: 0	SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) ▲ PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	9.5	206.5	▲ 7		10		100				
			10	206									
			10.5	205.5									
			11	205	▲ 9		11		100				
			11.5	204.5									
			12	204									
			12.5	203.5	▲ 5		12		100				
		END OF BOREHOLE											

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 18&19-July-2022
INPUT BY: EMZ	MONITORING DATE: 29-July-2022
REVIEWED BY: VN	PAGE 2 OF 2

CLIENT: Welton and Innes G.P. Inc | PROJECT NO.: CT3087.02 | **RECORD OF: MW108**

ADDRESS: 299 Lynden Road

CITY/PROVINCE: Brantford, Ontario | NORTHING (m): 4780908.12 | EASTING (m): 563538.86 | ELEV. (m) 220.19

CONTRACTOR: Profile Drilling Inc. | METHOD: Hollow Stem Auger + Split Spoon Sampling

BOREHOLE DIAMETER (cm): 15 | WELL DIAMETER (cm): 5 | SCREEN SLOT #: 10 | SAND TYPE: 0 | SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) ● 40 80 120 160 / N-VALUE (Blows/300mm) ▲ 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		topsoil (230mm)	0	220	12							Bentonite	
		stiff to very stiff, moist, brown CLAYEY SILT trace sand with occasional silty clay layers	0.5	219.5	7		1		67				50 mm monitoring well was installed. Water level measured on July 29, 2022: 3.48 mbg
			1	219			2		100				
			1.5	218.5	12		3		100				
			2	218									
		compact, moist to very moist, brown SILT trace sand, trace clay	2.5	217.5	24		4		100			Sand	
			3	217									Screen + Sand
			3.5	216.5	21		5		100				
		stiff to very stiff, grey CLAYEY SILT trace sand with occasional silty clay layers	4	216	10		6		100				
			4.5	215.5	7		7		100				
			5	215									
		very moist	5.5	214.5									
			6	214	7		8		100				
			6.5	213.5									
		----------	7	213									
			7.5	212.5	6		9		100				
		wet	8	212									
			8.5	211.5									
			9	211									

TERRAPEX

LOGGED BY: EMZ | DRILLING DATE: 18-July-2022

INPUT BY: EMZ | MONITORING DATE: 29-July-2022

REVIEWED BY: VN | PAGE 1 OF 2

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: MW108**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780908.12	EASTING (m): 563538.86 ELEV. (m) 220.19
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm): 5	SCREEN SLOT #: 10 SAND TYPE: 0 SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	9.5	210.5	6		10		100				
		loose, wet, brown SILT trace sand, trace clay	10	210									
			10.5	209.5	8		11		100				
			11	209									
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	11.5	208.5									
			12	208	5		12		100				
			12.5										
		END OF BOREHOLE											

TERRAPEX	LOGGED BY: EMZ	DRILLING DATE: 18-July-2022
	INPUT BY: EMZ	MONITORING DATE: 29-July-2022
	REVIEWED BY: VN	

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH109**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780870.59	EASTING (m): 563647.58 ELEV. (m) 216.02
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		topsoil (230mm)	0	216	7								
		stiff to very stiff CLAYEY SILT trace sand with occasional silty clay layers	0.5	215.5			1		63				
			1	215	11		2		100				
		moist brown	1.5	214.5	11		3		100				
			2	214									
			2.5	213.5	9		4		100				
			3	213									
		----------			9		5		100				
			3.5	212.5									
			4	212	6		6		100				
		wet grey	4.5	211.5									
					10		7		100				
			5	211									
		compact, wer, grey SILT trace clay	5.5	210.5									
			6	210									
			6.5	209.5	15		8		100				
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	7	209									
			7.5	208.5									
			8	208	5		9		100				shelby tube sample: 8.2-8.8mbg
			8.5	207.5									
			9	207									

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 06&07&08-July-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 1 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH109**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780870.59	EASTING (m): 563647.58 ELEV. (m) 216.02
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	9.5	206.5	4		10		100				
			10	206									
			10.5	205.5									
			11	205	7		11		100				
			11.5	204.5									
			12	204									
					19		12A		100				
			12.5	203.5			12B						
		loose to compact, wet, grey SILT trace to some clay	13	203									
			13.5	202.5									
			14	202	4		13		100				
			14.5	201.5									
			15	201									
			15.5	200.5	25		14		100				
			16	200									
			16.5	199.5									
			17	199	10		15		56				
			17.5	198.5									
			18	198									
			18.5										

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 06&07&08-July-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 2 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH109**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780870.59	EASTING (m): 563647.58 ELEV. (m) 216.02
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 / N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) ▲ PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		compact, wet, grey SILT trace to some clay	19	197									
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	19.5	196.5									
			20	196	▲6		17		100				
			20.5	195.5									
			21	195									
			21.5	194.5	▲9		18		100				
			22	194									
			22.5	193.5									
			23	193	▲7		19		100				
			23.5	192.5									
		very loose to loose, wet, grey SILT trace to some clay	24	192									
			24.5	191.5	▲9		20		100				
			25	191									
			25.5	190.5									
			26	190	▲3		21		100				
			26.5	189.5									
			27	189									
			27.5	188.5	▲4		22		100				

TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 06&07&08-July-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 3 OF 4

CLIENT: Welton and Innes G.P. Inc	PROJECT NO.: CT3087.02	**RECORD OF: BH109**
ADDRESS: 299 Lynden Road		
CITY/PROVINCE: Brantford, Ontario	NORTHING (m): 4780870.59	EASTING (m): 563647.58 ELEV. (m) 216.02
CONTRACTOR: Profile Drilling Inc.	METHOD: Hollow Stem Auger + Mud Rotary + Split Spoon Sampling	
BOREHOLE DIAMETER (cm): 15	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE: 2

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) ▲ PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		stiff to very stiff, wet, grey CLAYEY SILT trace sand with occasional silty clay layers	28	188									
			28.5	187.5									
			29	187	▲16		23A		96				
		Inferred BEDROCK					23B						
		END OF BOREHOLE											

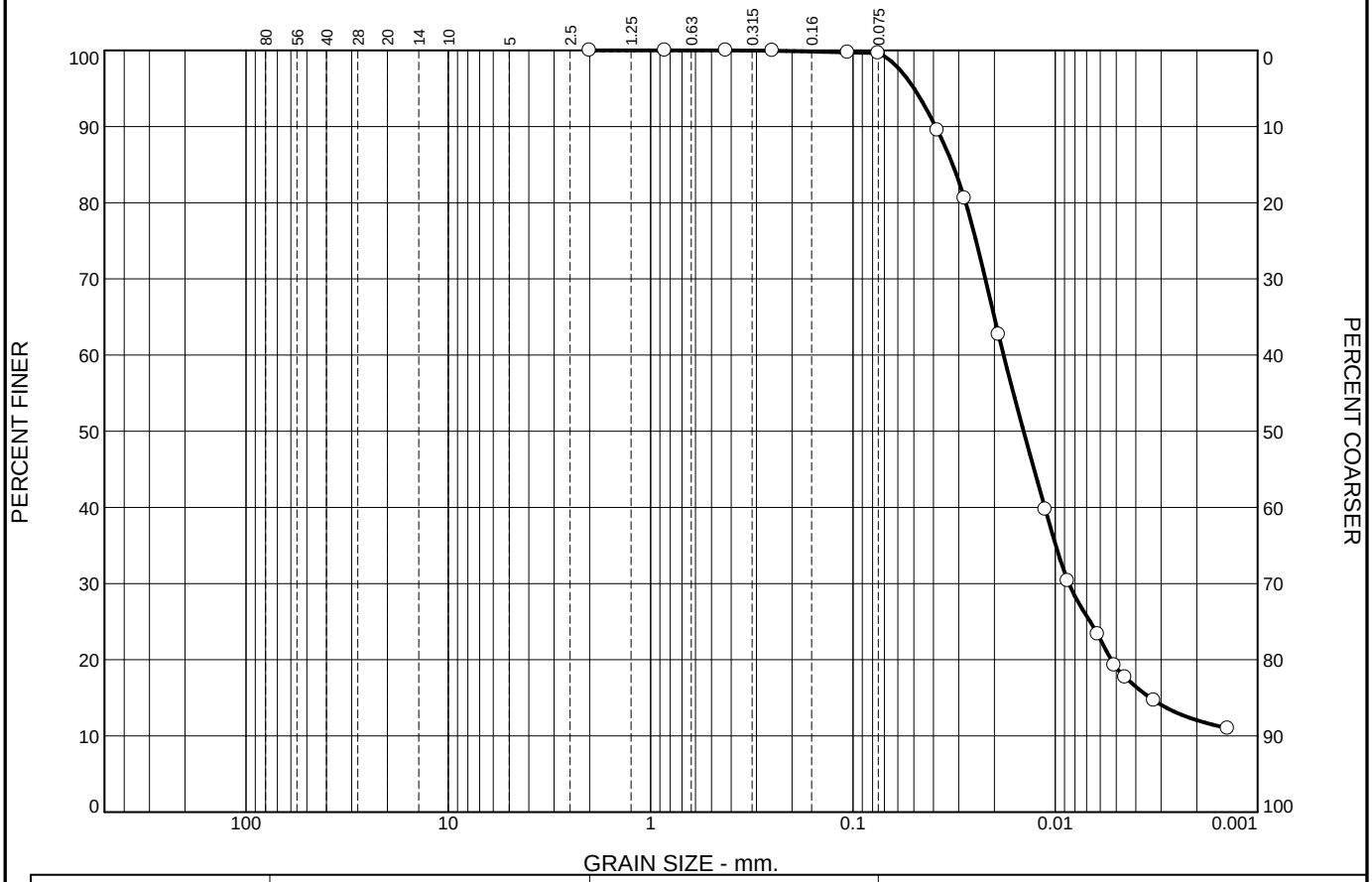
TERRAPEX

LOGGED BY: EMZ	DRILLING DATE: 06&07&08-July-2022
INPUT BY: EMZ	MONITORING DATE:
REVIEWED BY: VN	PAGE 4 OF 4

APPENDIX D

GEOTECHNICAL LABORATORY TEST RESULTS

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0	0	0	0	88	12

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NV	NP	0.0321	0.0180	0.0143	0.0086	0.0034			

Material Description	USCS	AASHTO
○ SILT some clay	ML	A-4(0)

Project No. CT3087.02 **Client:** Welton & Innes Limited Partnership

Project: 299 Lynden Road, Brantford

○ **Sample Number:** MW 101, S 10

Terrapex

Toronto, Ontario

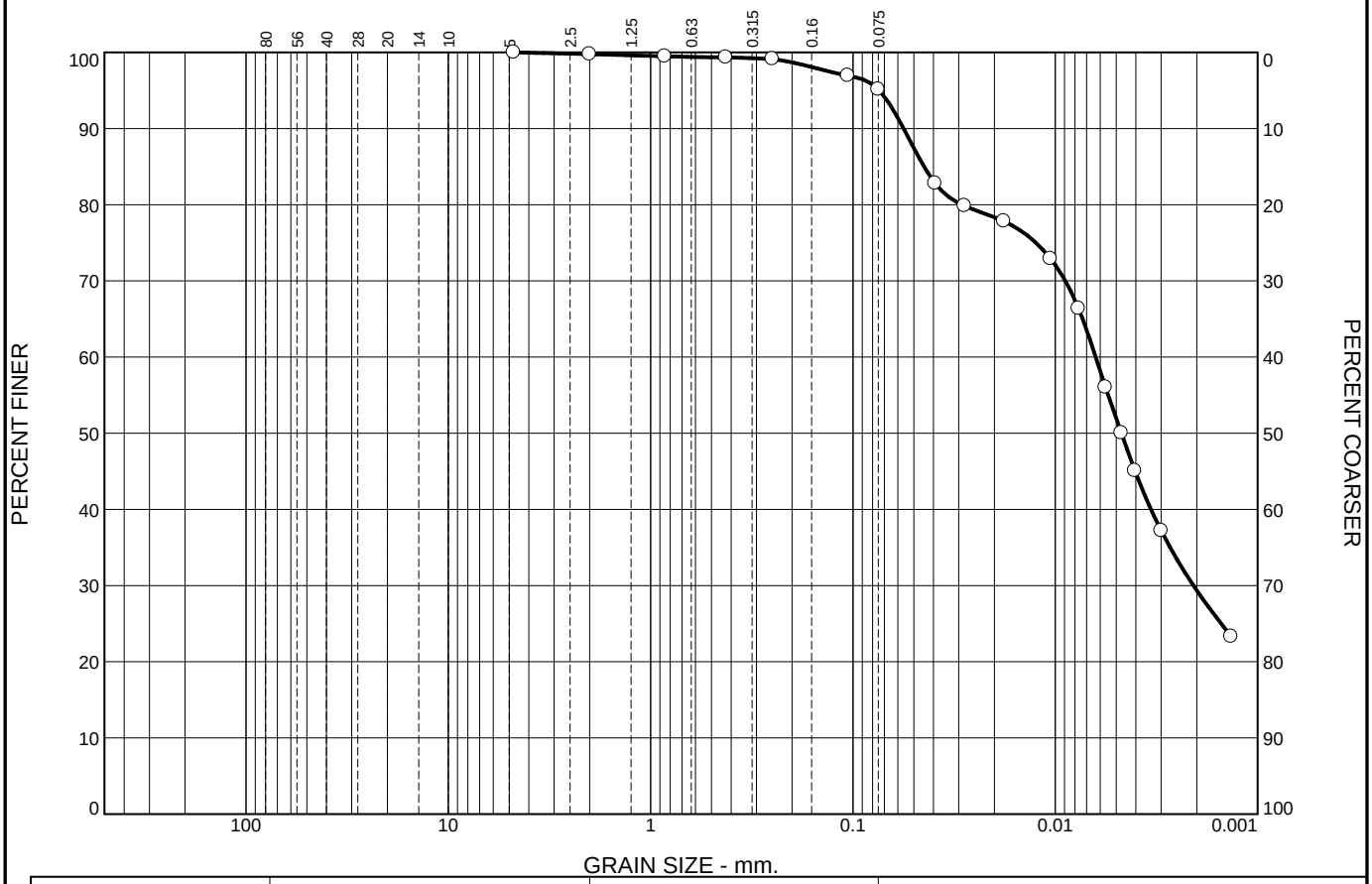
Remarks:

○HYDROMETER DETAILS: Spec. Grav. 2.75(assumed);Vb=53cm^3; L2=13.8cm; L1=10.7cm; hs= 0.16cm/Div; A=30.2cm^2; Mass of Disp. Agent=40g/1 Test Date: Aug. 3, 2022

Figure 1

Tested By: AM/TH

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0	0	1	4	66	29

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	26.2	16.4	0.0445	0.0063	0.0047	0.0021				

Material Description	USCS	AASHTO
○ CLAYEY SILT trace sand	CL	A-4(8)

Project No. CT3087.02 **Client:** Welton & Innes Limited Partnership

Project: 299 Lynden Road, Brantford

○ **Sample Number:** MW 101, S 14

Terrapex

Toronto, Ontario

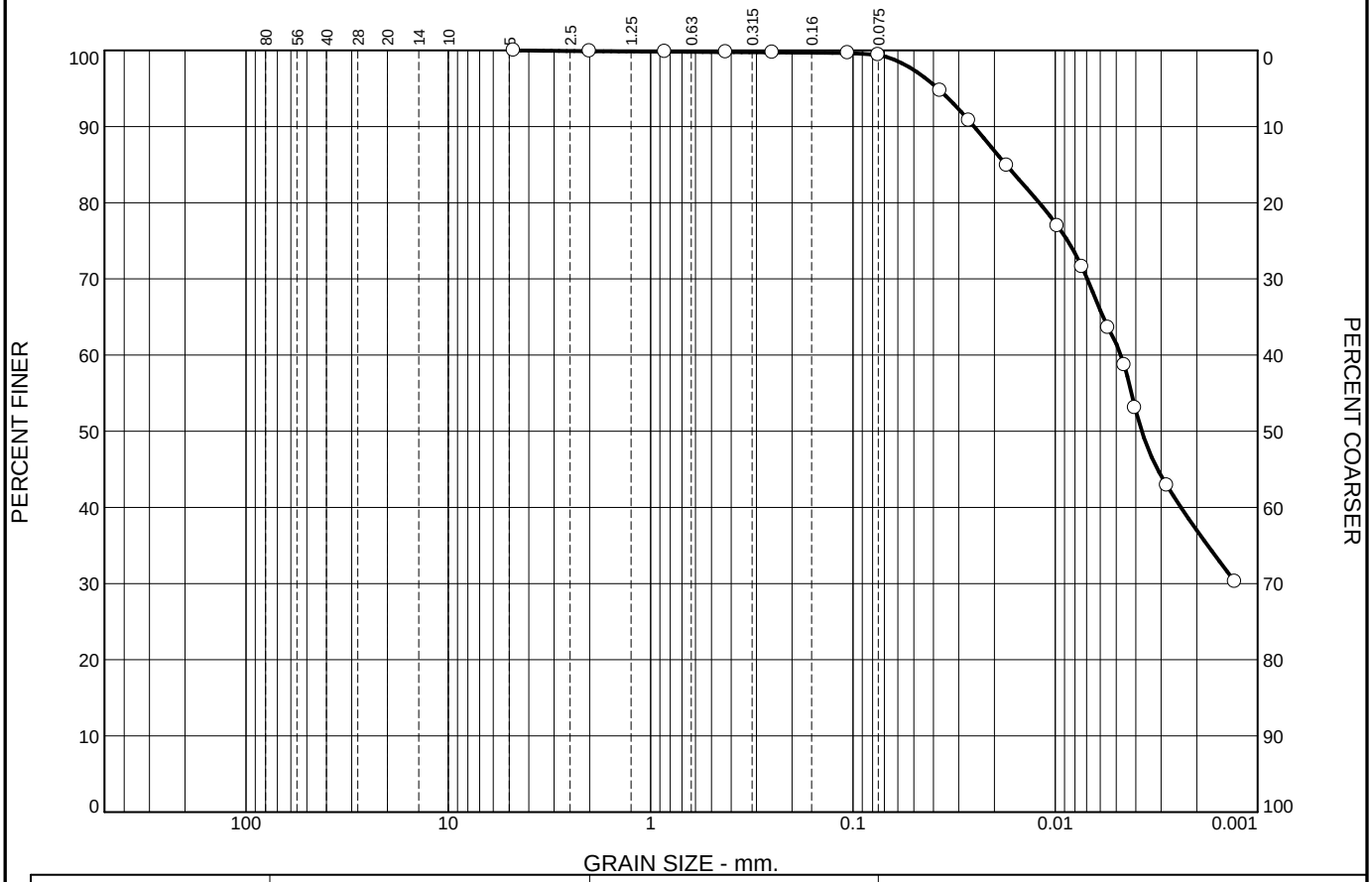
Remarks:

○HYDROMETER DETAILS: Spec. Grav. 2.75(assumed);Vb=53cm^3; L2=13.8cm; L1=10.7cm; hs= 0.16cm/Div; A=30.2cm^2; Mass of Disp. Agent=40g/1 Test Date: Aug. 3, 2022

Figure 2

Tested By: AM/TH

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0	0	0	1	62	37

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	29.2	17.0	0.0175	0.0047	0.0037					

Material Description	USCS	AASHTO
○ SILT AND CLAY trace sand	CL	A-6(11)

Project No. CT3087.02 **Client:** Welton & Innes Limited Partnership

Project: 299 Lynden Road, Brantford

○ **Sample Number:** MW 101, S 18

Terrapex

Toronto, Ontario

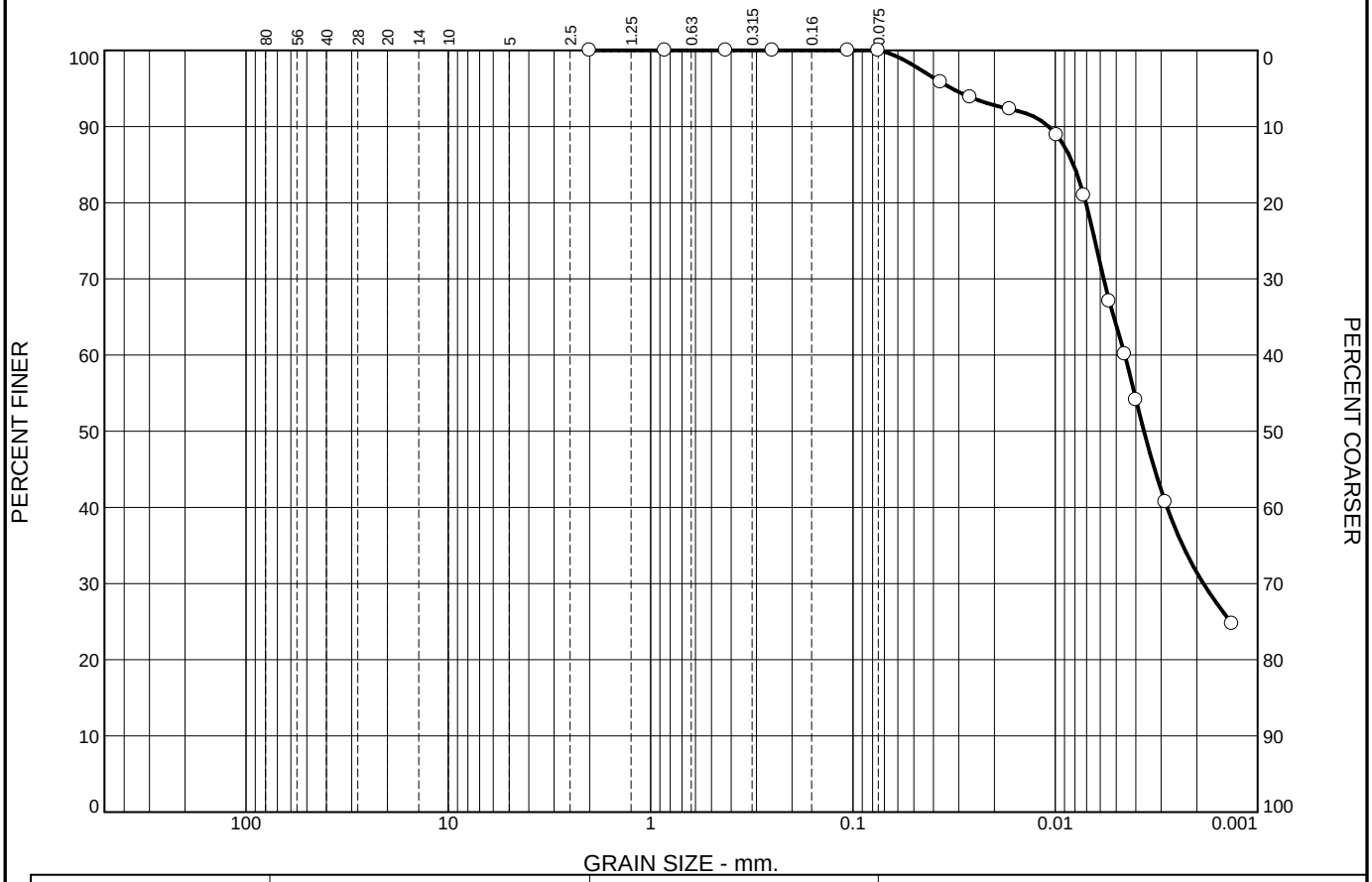
Remarks:

○HYDROMETER DETAILS: Spec. Grav. 2.75(assumed);Vb=53cm^3; L2=13.8cm; L1=10.7cm; hs= 0.16cm/Div; A=30.2cm^2; Mass of Disp. Agent=40g/1 Test Date: Aug. 3, 2022

Figure 3

Tested By: AM/TH

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0	0	0	0	69	31

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	27.6	18.2	0.0081	0.0045	0.0036	0.0019				

Material Description	USCS	AASHTO
○ CLAYEY SILT	CL	A-4(9)

Project No. CT3087.02 **Client:** Welton & Innes Limited Partnership

Project: 299 Lynden Road, Brantford

○ **Sample Number:** MW 103, S 12

Terrapex

Toronto, Ontario

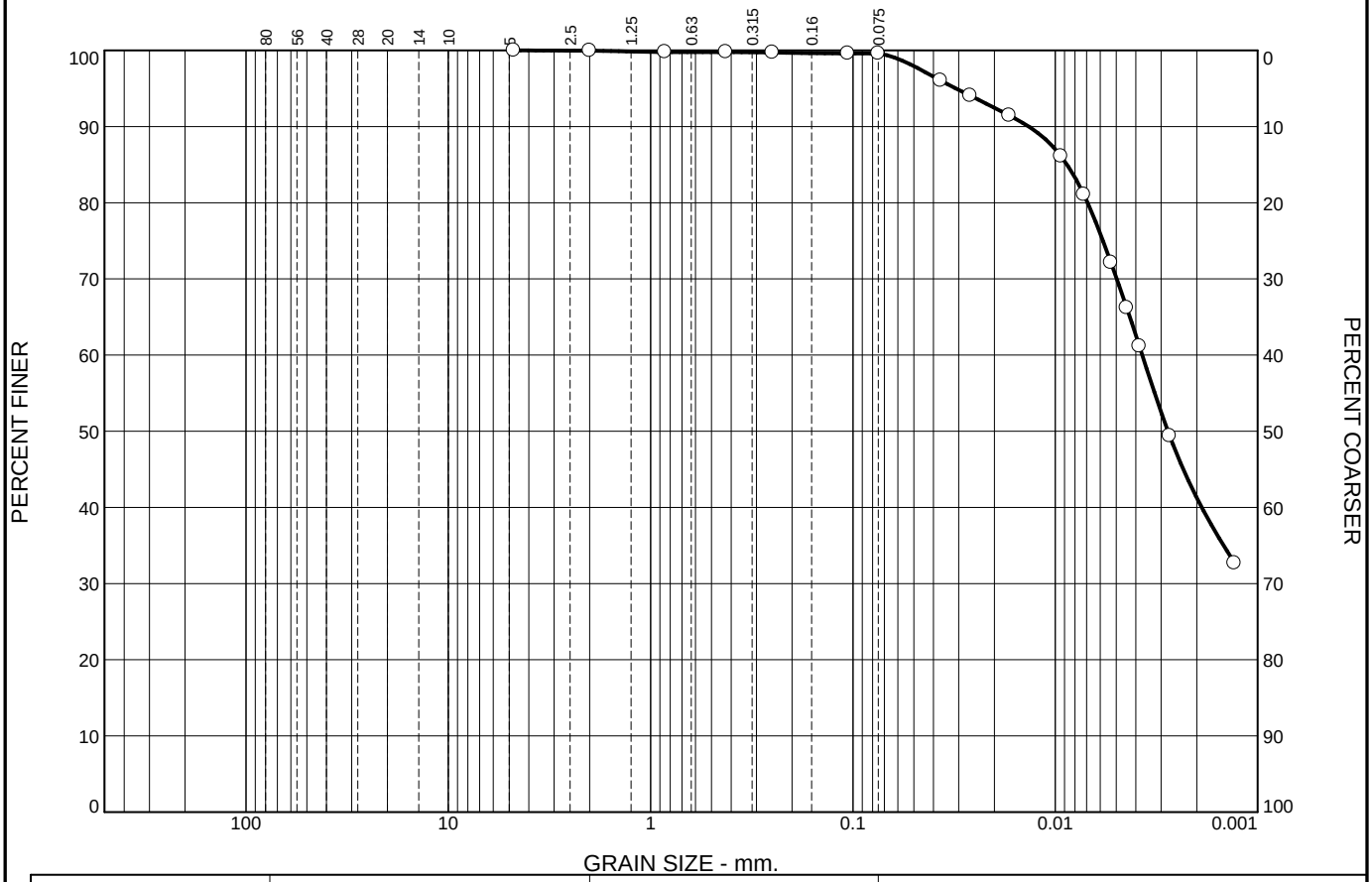
Remarks:

○HYDROMETER DETAILS: Spec. Grav. 2.75(assumed);Vb=53cm^3; L2=13.8cm; L1=10.7cm; hs= 0.16cm/Div; A=30.2cm^2; Mass of Disp. Agent=40g/1 Test Date: Aug. 3, 2022

Figure 4

Tested By: AM/TH

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0	0	0	0	59	41

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	31.9	18.3	0.0088	0.0037	0.0028					

	Material Description	USCS	AASHTO
○	SILT AND CLAY	CL	A-6(14)

Project No. CT3087.02 **Client:** Welton & Innes Limited Partnership

Project: 299 Lynden Road, Brantford

○ **Sample Number:** MW 103, S 16

Terrapex

Toronto, Ontario

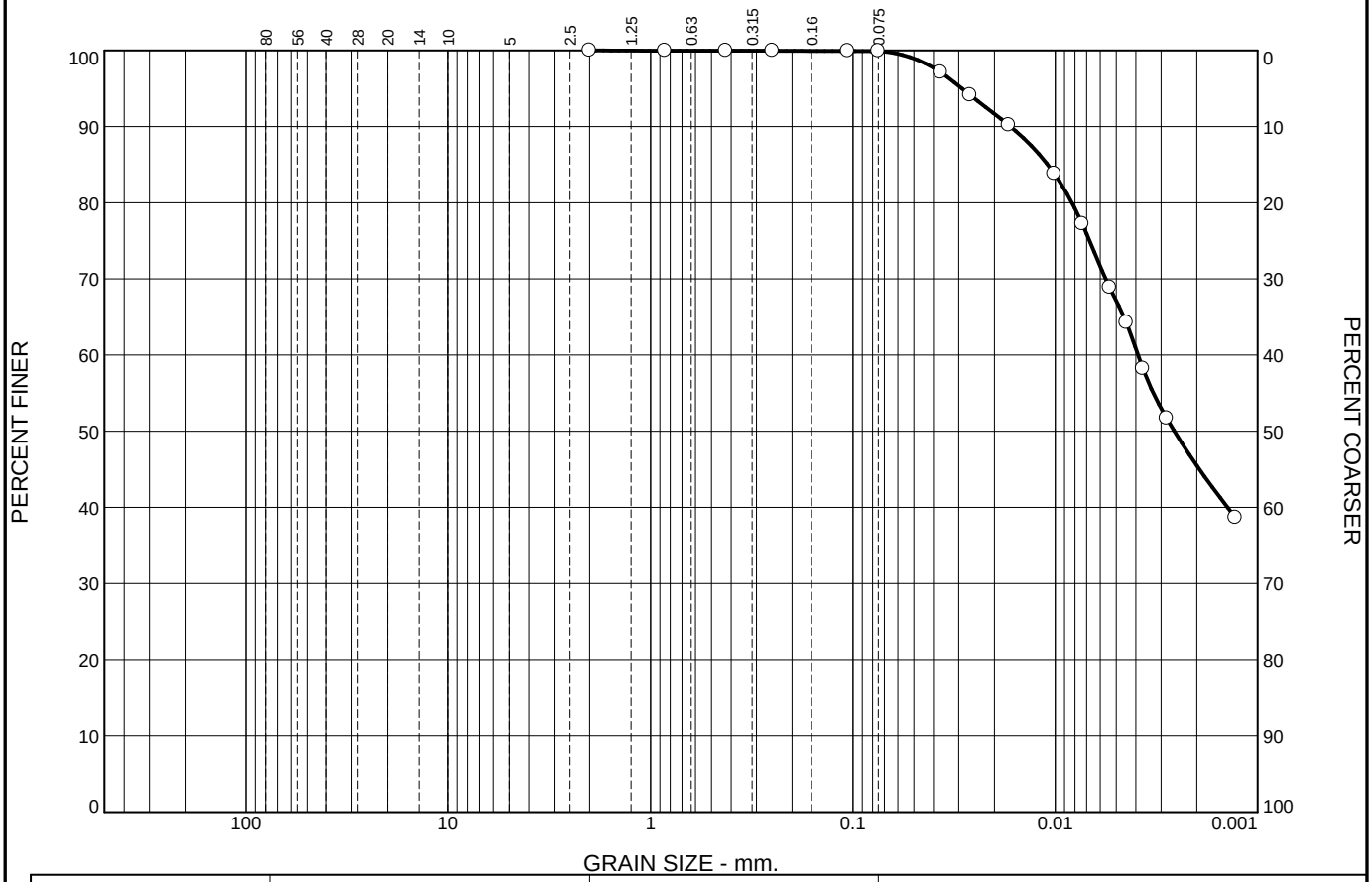
Remarks:

○HYDROMETER DETAILS: Spec. Grav. 2.75(assumed);Vb=53cm^3; L2=13.8cm; L1=10.7cm; hs= 0.16cm/Div; A=30.2cm^2; Mass of Disp. Agent=40g/1 Test Date: Aug. 3, 2022

Figure 5

Tested By: AM/TH

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0	0	0	0	55	45

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	36.3	18.4	0.0109	0.0039	0.0026					

	Material Description	USCS	AASHTO
○	SILT AND CLAY	CL	A-6(18)

Project No. CT3087.02 **Client:** Welton & Innes Limited Partnership

Project: 299 Lynden Road, Brantford

○ **Sample Number:** MW 103, S 21

Terrapex

Toronto, Ontario

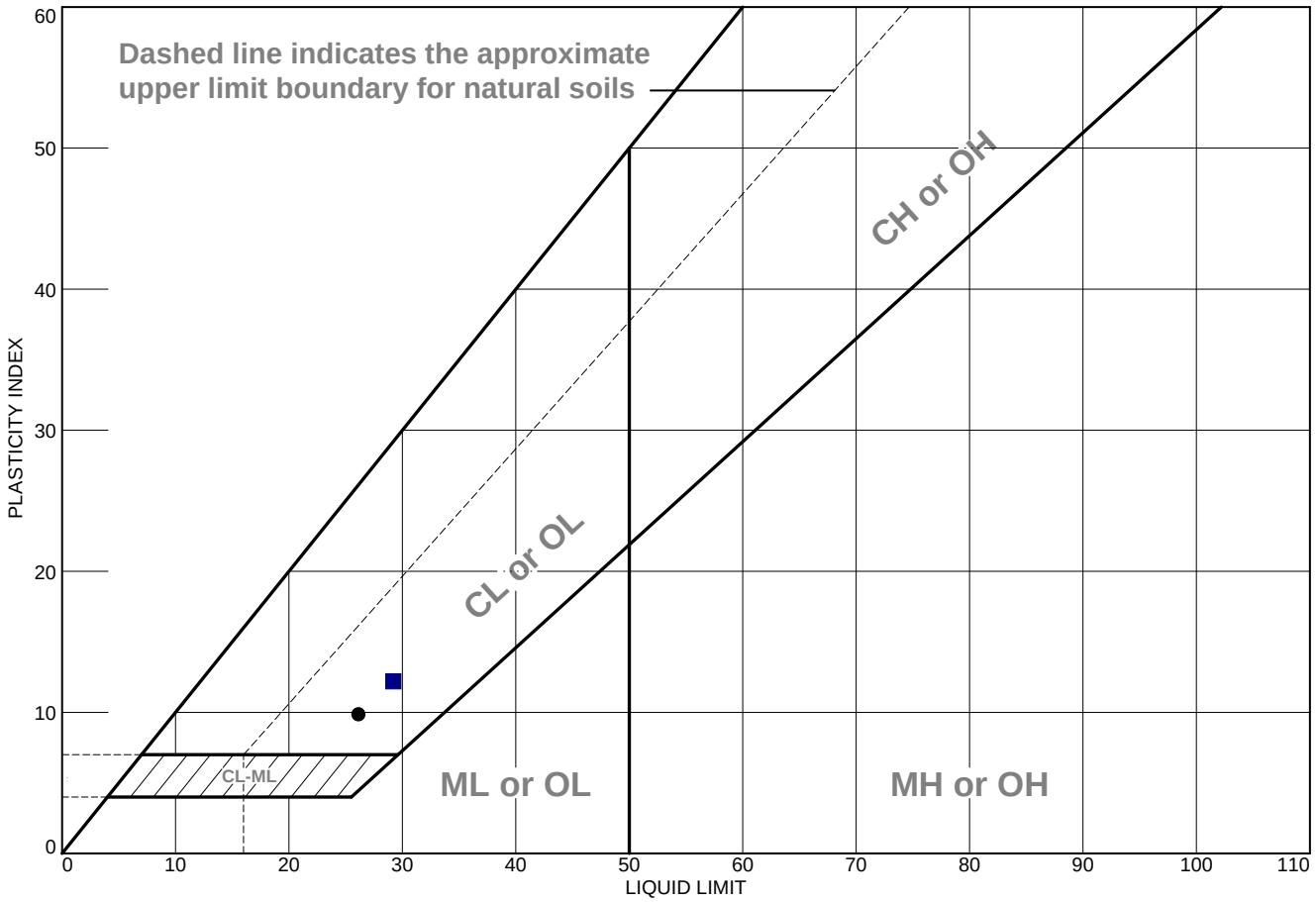
Remarks:

○HYDROMETER DETAILS: Spec. Grav. 2.75(assumed);Vb=53cm^3; L2=13.8cm; L1=10.7cm; hs= 0.16cm/Div; A=30.2cm^2; Mass of Disp. Agent=40g/1 Test Date: Aug. 3, 2022

Figure 6

Tested By: AM/TH

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	CLAYEY SILT trace sand	26.2	16.4	9.8	99	95	CL
■	SILT AND CLAY trace sand	29.2	17.0	12.2	100	99	CL
▲	SILT some clay	NV	NP	NP	100	100	ML

Project No. CT3087.02 **Client:** Welton & Innes Limited Partnership

Project: 299 Lynden Road, Brantford

●**Sample Number:** MW 101, S 14
■**Sample Number:** MW 101, S 18
▲**Sample Number:** MW 101, S 10

Remarks:
●Test Date: Aug. 9, 2022
■Test Date: Aug. 10, 2022
▲Test Date: Aug. 9, 2022

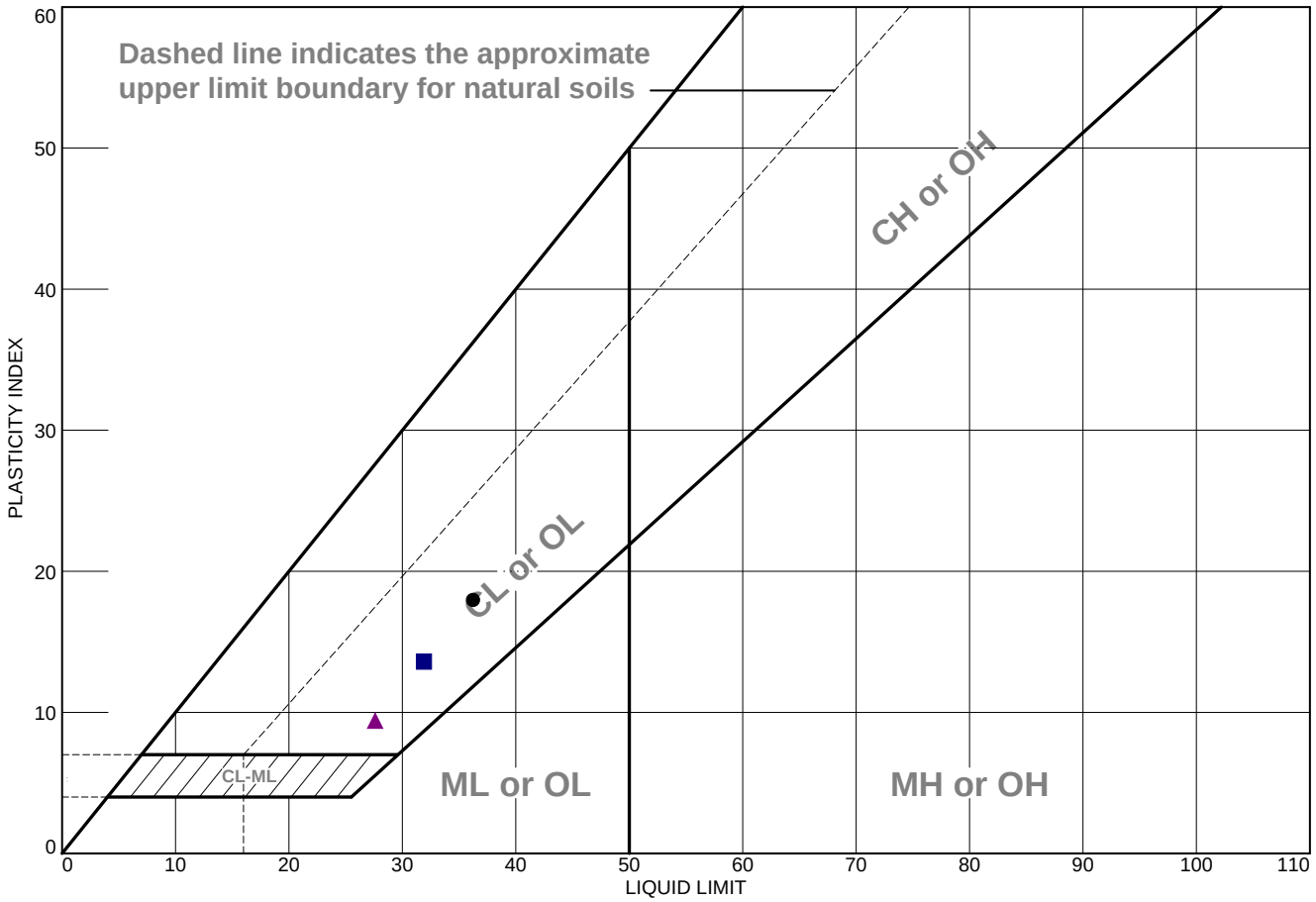
Terrapex

Toronto, Ontario

Figure 7

Tested By: AM

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	SILT AND CLAY	36.3	18.4	17.9	100	100	CL
■	SILT AND CLAY	31.9	18.3	13.6	100	100	CL
▲	CLAYEY SILT	27.6	18.2	9.4	100	100	CL

Project No. CT3087.02 **Client:** Welton & Innes Limited Partnership

Project: 299 Lynden Road, Brantford

●**Sample Number:** MW 103, S 21
■**Sample Number:** MW 103, S 16
▲**Sample Number:** MW 103, S 12

Remarks:
●Test Date: Aug. 9, 2022
■Test Date: Aug. 11, 2022
▲Test Date: Aug. 9, 2022

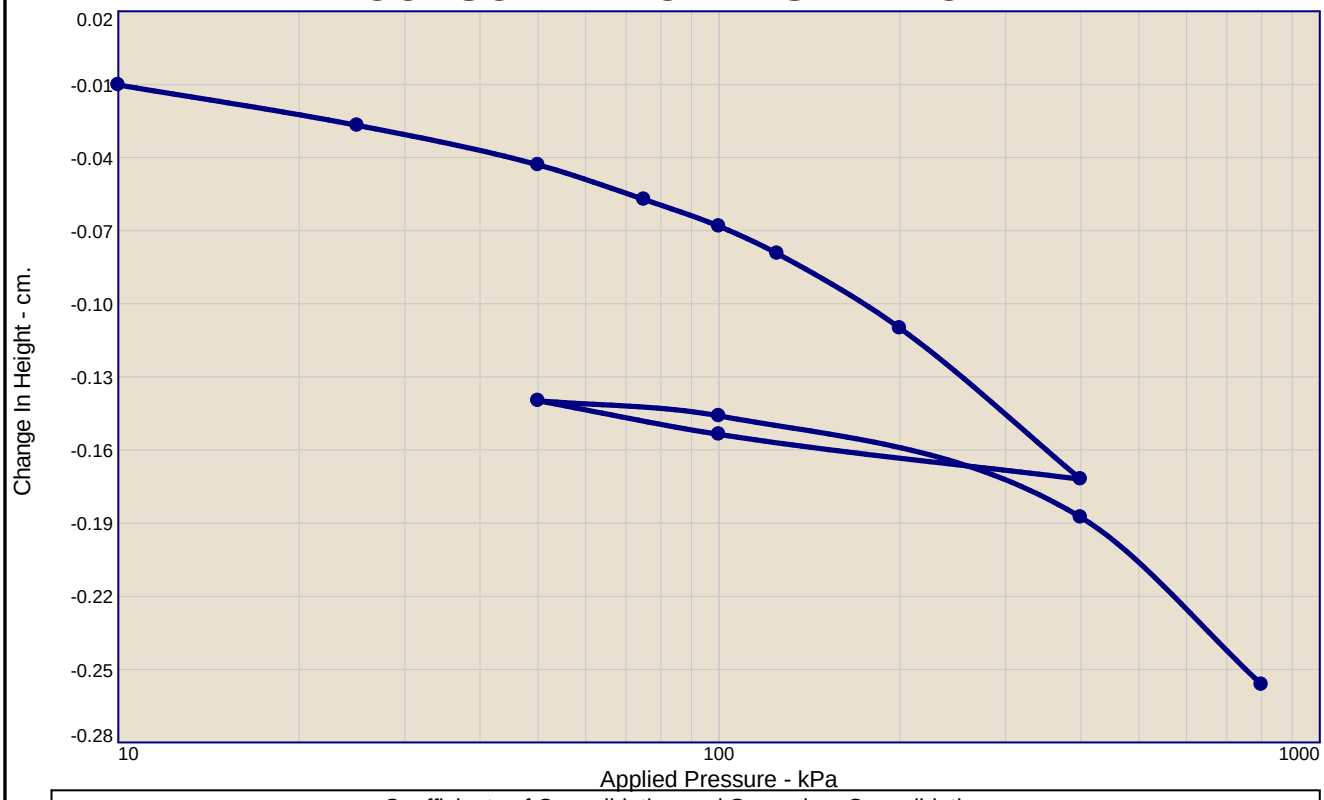
Terrapex

Toronto, Ontario

Figure 8

Tested By: AM

CONSOLIDATION TEST REPORT



Coefficients of Consolidation and Secondary Consolidation

No.	Load (kPa)	C_v (cm.^{2}/day)	C_α	No.	Load (kPa)	C_v (cm.^{2}/day)	C_α	No.	Load (kPa)	C_v (cm.^{2}/day)	C_α
1	10.0	833.90		8	400.0	41.93					
2	25.0	59.46		10	50.0	454.50					
3	50.0	367.24		11	100.0	697.00					
4	75.0	446.44		12	400.0	658.11					
5	100.0	86.91		13	800.0	136.37					
6	125.0	58.36									
7	200.0	209.34									

Natural Sat.	Natural Moist.	Dry Dens. (kg/m^3)	LL	PI	Sp. Gr.	Overburden (kPa)	P_c (kPa)	C_c	C_r	Swell Press. (kPa)	Swell %	e_o
93.1 %	32.5 %	1390			2.7	95	185	0.29	0.04			0.942

MATERIAL DESCRIPTION	USCS	AASHTO
Silty Clay, grey		

Project No. CT3087.02 **Client:** Welton & Inns Partnership Ltd.

Project: 299 Lynden Rd., Brantford.

Sample Number: BH103 32'-34'

Terrapex

Toronto, Ontario

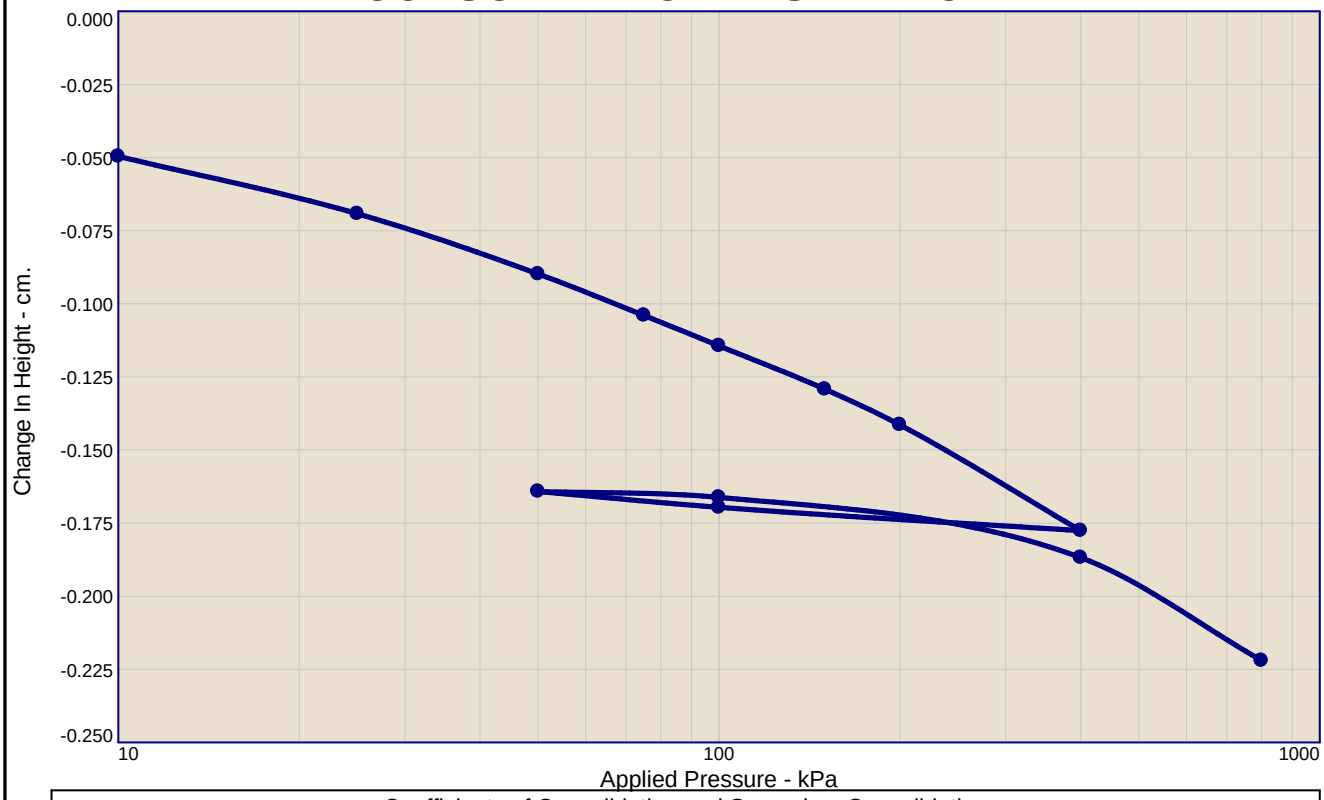
Remarks:

Tested on 10 Aug 2022

Figure Fig. 9

Tested By: RJ

CONSOLIDATION TEST REPORT



Coefficients of Consolidation and Secondary Consolidation

No.	Load (kPa)	C_v (cm.^{2}/day)	C_α	No.	Load (kPa)	C_v (cm.^{2}/day)	C_α	No.	Load (kPa)	C_v (cm.^{2}/day)	C_α
1	10.0	54.20		8	400.0	373.22					
2	25.0	68.59		9	100.0	861.30					
3	50.0	107.85		10	50.0	241.44					
4	75.0	630.76		11	100.0	410.29					
5	100.0	353.38		12	400.0	365.61					
6	150.0	565.63		13	800.0	322.11					
7	200.0	471.45									

Natural Sat.	Natural Moist.	Dry Dens. (kg/m^3)	LL	PI	Sp. Gr.	Overburden (kPa)	P_c (kPa)	C_c	C_r	Swell Press. (kPa)	Swell %	e_o
105.4 %	26.5 %	1608			2.7	160	196	0.13	0.02			0.679

MATERIAL DESCRIPTION	USCS	AASHTO
Clayey Silt, brown to grey		

Project No. CT3087.02 **Client:** Welton & Inns Partnership Ltd.

Project: 299 Lynden Rd., Brantford.

Sample Number: BH104 62'-64'

Terrapex

Toronto, Ontario

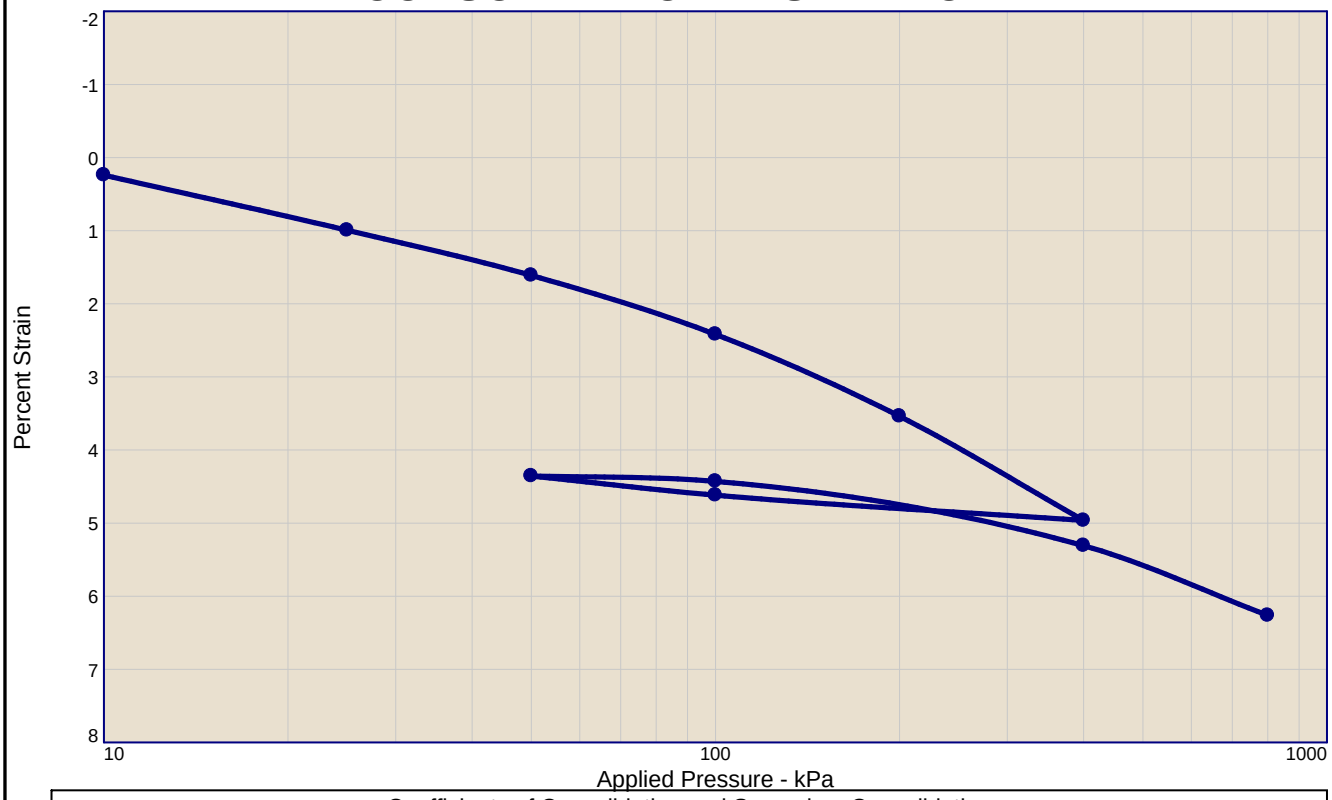
Remarks:

Tested on 12 Aug 2022

Figure Fig. 10

Tested By: RJ

CONSOLIDATION TEST REPORT



Coefficients of Consolidation and Secondary Consolidation

No.	Load (kPa)	C_v (cm.^{2}/day)	C_α	No.	Load (kPa)	C_v (cm.^{2}/day)	C_α	No.	Load (kPa)	C_v (cm.^{2}/day)	C_α
1	10.0	767.67		8	50.0	62.14					
2	25.0	290.42		9	100.0	1025.91					
3	50.0	787.28		10	400.0	400.01					
4	100.0	329.19		11	800.0	52.42					
5	200.0	347.25									
6	400.0	265.90									
7	100.0	913.16									

Natural		Dry Dens. (kg/m^3)	LL	PI	Sp. Gr.	Overburden (kPa)	P_c (kPa)	C_c	C_r	Swell Press. (kPa)	Swell %	e_o
Sat.	Moist.											
81.4 %	15.4 %	1788			2.7	110	112	0.07	0.01			0.510

MATERIAL DESCRIPTION	USCS	AASHTO
Clayey Silt, trace sand, grey, wet		

Project No. CT3087.02 **Client:** Welton & Inns Partnership Ltd.

Project: 299 Lynden Rd., Brantford.

Sample Number: MW101 42'-44'

Remarks:
Tested on 8 Aug 2022

Terrapex

Toronto, Ontario

Figure Fig. 11

Tested By: RJ

APPENDIX E

CERTIFICATE OF CHEMICAL ANALYSES

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: TERRAPEX ENVIRONMENTAL LIMITED
90 SCARSDALE RD
TORONTO, ON M3B2R7
(905) 474-5265
ATTENTION TO: Kellen Campbell
PROJECT: CT3087.02
AGAT WORK ORDER: 22T927094
SOIL ANALYSIS REVIEWED BY: Jacky Zhu, Spectroscopy Technician
DATE REPORTED: Aug 05, 2022
PAGES (INCLUDING COVER): 6
VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.*

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 22T927094

PROJECT: CT3087.02

CLIENT NAME: TERRAPEX ENVIRONMENTAL LIMITED

ATTENTION TO: Kellen Campbell

SAMPLING SITE:299 Lynden Road, Brantford

SAMPLED BY:EM

pH + Sulphate (Soil)

DATE RECEIVED: 2022-07-29

DATE REPORTED: 2022-08-05

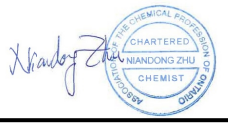
				SAMPLE DESCRIPTION:	BH102-SS4	BH105-SS5
				SAMPLE TYPE:	Soil	Soil
				DATE SAMPLED:	2022-07-17 18:00	2022-07-17 18:30
Parameter	Unit	G / S	RDL		4151227	4151230
Sulphate (2:1)	µg/g		2		20	61
pH (2:1)	pH Units		NA		7.92	8.19

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

4151227-4151230 pH and Sulphate were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water: 1 part soil).

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: TERRAPEX ENVIRONMENTAL LIMITED

AGAT WORK ORDER: 22T927094

PROJECT: CT3087.02

ATTENTION TO: Kellen Campbell

SAMPLING SITE:299 Lynden Road, Brantford

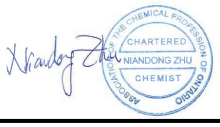
SAMPLED BY:EM

Soil Analysis

RPT Date: Aug 05, 2022			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
pH + Sulphate (Soil)															
Sulphate (2:1)	4149226		15	15	0.0%	< 2	101%	70%	130%	98%	80%	120%	104%	70%	130%
pH (2:1)	4150003		6.79	6.93	2.0%	NA	100%	80%	120%						

Comments: NA signifies Not Applicable.
pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.
Duplicate NA: results are under 5X the RDL and will not be calculated.

Certified By:



AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Time Markers

AGAT WORK ORDER: 22T927094
PROJECT: CT3087.02

CLIENT NAME: TERRAPEX ENVIRONMENTAL LIMITED

ATTENTION TO: Kellen Campbell

Sample ID	Sample Description	Sample Type	Date Sampled	Date Received
4151227	BH102-SS4	Soil	17-JUL-2022	29-JUL-2022

pH + Sulphate (Soil)

Parameter	Date Prepared	Date Analyzed	Initials
Sulphate (2:1)	04-AUG-2022	04-AUG-2022	LC
pH (2:1)	03-AUG-2022	03-AUG-2022	AM

Sample ID	Sample Description	Sample Type	Date Sampled	Date Received
4151230	BH105-SS5	Soil	17-JUL-2022	29-JUL-2022

pH + Sulphate (Soil)

Parameter	Date Prepared	Date Analyzed	Initials
Sulphate (2:1)	04-AUG-2022	04-AUG-2022	LC
pH (2:1)	03-AUG-2022	03-AUG-2022	AM

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: TERRAPEX ENVIRONMENTAL LIMITED

AGAT WORK ORDER: 22T927094

PROJECT: CT3087.02

ATTENTION TO: Kellen Campbell

SAMPLING SITE:299 Lynden Road, Brantford

SAMPLED BY:EM

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Sulphate (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
pH (2:1)	INOR 93-6031	modified from EPA 9045D and MCKEAGUE 3.11	PH METER

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 22T927094

Cooler Quantity: Mod

Arrival Temperatures: 6.7 | 7.1 | 7.3

Custody Seal Intact: ☐ Yes ☐ No ☑ N/A

Notes: 100KE IR

Report Information:

Company: TERRAPEX
Contact: KELLEN CAMPBELL
Address: 90 Scarsdale Road, Toronto

Phone: 647-463-0519 Fax:
Reports to be sent to:
1. Email: V.nersesian@terrapex.com, k.campbell@terrapex.com,
2. Email: e.montag@terrapex.com

Regulatory Requirements: N/A

(Please check all applicable boxes)

☐ Regulation 153/04
Table ____ (Indicate One)
☐ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture (Check One)
☐ Coarse
☑ Fine

☐ Excess Soils R406
Table ____ (Indicate One)

☐ Regulation 558

☐ CCME

☐ Sewer Use
☐ Sanitary ☐ Storm
____ (Region)

☐ Prov. Water Quality Objectives (PWQO)

☐ Other
____ (Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☑ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☑ No

Turnaround Time (TAT) Required:

Regular TAT ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply): ____

Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: CT 3087.02
Site Location: 299 Lyndon Road, Brantford
Sampled By: EM
AGAT Quote #: ____ PO: ____
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☑ No ☐

Company:
Contact:
Address:
Email: accountspayable@terrapex.com

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI, DOC (Y/N)	O. Reg 153: Metals & Inorganics	O. Reg 153: Metals - ☐ CrVI, ☐ Hg, ☐ HWSB	O. Reg 153: BTEX, F1-F4 PHCs; Analyze F4G if required ☐ Yes ☐ No	O. Reg 153: PAHs	O. Reg 153: PCBs	O. Reg 153: VOC	O. Reg 558: Landfill Disposal Characterization TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	O. Reg 406: Excess Soils SPLP Rainwater Leach: ☐ Metals ☐ VOCs ☐ SVOCs	O. Reg 406: Excess Soils Characterization Package: pH, ICPMS Metals, BTEX, F1-F4	Salt - EC/SAR	pH	Water Soluble Sulphides					Potentially Hazardous or High Concentration (Y/N)
BH102-SS4	22/6/22	3:00 AM/PM	1	S													1	1					N
BH105-SS5	17/6/22	12:00 AM/PM	1	S													1	1					N
		AM/PM																					
		AM/PM																					
		AM/PM																					
		AM/PM																					
		AM/PM																					
		AM/PM																					
		AM/PM																					
		AM/PM																					
		AM/PM																					
		AM/PM																					

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
John R.	28/7/22	6:30 pm	A. Rivas		
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time

Page 1 of 1

N°: T 125597

Document ID: DIV-78-1511-021

Pink Copy - Client | Yellow Copy - AGAT | White Copy- AGAT

Date Issued: March 9, 2021

APPENDIX F

RESULTS OF FLAT PLATE DILATOMETER TESTING

Depth (m)	A (bar)	B (bar)	C (bar)	p0 (bar)	p1 (bar)	p2 (bar)	Sigma (bar)	u0 (bar)	ED (bar)	ID	KD	Gamma (kN/m3)	OCR	Ko	M (MPa)	Cu (kPa)	Phi (degrees)	Soil Description	Consistency
2.00	2.20	7.20	0.00	2.09	6.55	0.00	0.36	0.00	155	2.14	5.80	18.0	-	-	30.9	-	36.6	SILTY SAND	-
2.20	4.60	11.50	1.20	4.39	10.85	1.30	0.40	0.00	224	1.47	11.09	18.0	-	-	58.2	-	-	SANDY SILT	-
2.40	5.60	13.00	0.20	5.37	12.35	0.30	0.43	0.00	242	1.30	12.42	19.5	-	-	65.6	-	-	SANDY SILT	-
2.60	5.80	13.00	0.00	5.58	12.35	0.00	0.47	0.00	235	1.21	11.92	19.5	-	-	62.7	-	-	SANDY SILT	-
2.80	6.00	13.00	1.80	5.79	12.35	1.90	0.50	0.00	228	1.13	11.48	19.5	8.9	2.0	59.9	99	-	SILT	STIFF
3.00	5.40	10.80	2.60	5.27	10.15	2.70	0.54	0.00	169	0.93	9.75	18.0	7.2	1.8	41.9	86	-	SILT	STIFF
3.20	5.30	10.80	2.00	5.16	10.15	2.10	0.58	0.00	173	0.97	8.96	18.0	6.5	1.7	41.4	83	-	SILT	STIFF
3.40	6.20	10.50	1.20	6.12	9.85	1.30	0.61	0.00	129	0.61	10.00	18.0	7.5	1.8	32.3	101	-	CLAYEY SILT	VERY STIFF
3.60	5.80	10.50	1.20	5.70	9.85	1.30	0.65	0.00	144	0.73	8.80	18.0	6.4	1.7	34.1	91	-	CLAYEY SILT	STIFF
3.80	6.80	11.00	3.80	6.73	10.35	3.90	0.67	0.01	126	0.54	9.96	18.0	7.4	1.8	31.4	110	-	SILTY CLAY	VERY STIFF
4.00	6.00	10.00	3.60	5.94	9.35	3.70	0.69	0.03	118	0.58	8.56	18.0	6.2	1.7	27.7	93	-	SILTY CLAY	STIFF
4.20	6.20	9.00	3.80	6.20	8.35	3.90	0.71	0.05	75	0.35	8.70	18.0	6.3	1.7	17.6	98	-	SILTY CLAY	STIFF
4.40	5.80	9.00	4.20	5.78	8.35	4.30	0.72	0.07	89	0.45	7.89	18.0	5.6	1.6	20.2	89	-	SILTY CLAY	STIFF
4.60	5.60	10.50	2.00	5.49	9.85	2.10	0.74	0.09	151	0.81	7.31	18.0	5.0	1.5	33.0	82	-	SILT	STIFF
4.80	5.20	8.20	2.00	5.19	7.55	2.10	0.76	0.11	82	0.47	6.72	18.0	4.5	1.4	17.2	76	-	SILTY CLAY	STIFF
5.00	5.40	10.50	0.40	5.28	9.85	0.50	0.77	0.13	158	0.89	6.67	18.0	4.5	1.4	33.2	77	-	SILT	STIFF
5.20	5.20	10.50	0.40	5.07	9.85	0.50	0.79	0.15	166	0.97	6.24	18.0	4.1	1.4	33.6	72	-	SILT	STIFF
5.40	5.20	12.50	0.20	4.97	11.85	0.30	0.81	0.17	239	1.43	5.97	18.0	-	-	47.7	-	-	SANDY SILT	-
5.60	5.40	12.00	0.00	5.21	11.35	0.00	0.82	0.19	213	1.22	6.11	18.0	-	-	43.0	-	-	SANDY SILT	-
5.80	6.80	19.00	0.80	6.33	18.35	0.90	0.84	0.21	417	1.96	7.30	20.0	-	-	92.0	-	37.7	SILTY SAND	-
6.00	3.40	6.80	0.60	3.37	6.15	0.70	0.85	0.23	97	0.89	3.68	18.0	2.1	0.9	14.4	40	-	SILT	FIRM
6.20	5.00	7.80	2.40	5.00	7.15	2.50	0.87	0.25	75	0.45	5.46	18.0	3.5	1.2	14.0	67	-	SILTY CLAY	STIFF
6.40	4.80	7.40	2.40	4.81	6.75	2.50	0.89	0.26	67	0.43	5.12	18.0	3.2	1.2	12.2	63	-	SILTY CLAY	STIFF
6.60	6.00	8.20	3.40	6.03	7.55	3.50	0.90	0.28	53	0.27	6.35	18.0	4.2	1.4	10.8	84	-	CLAY	STIFF
6.80	5.80	9.00	3.40	5.78	8.35	3.50	0.92	0.30	89	0.47	5.95	18.0	3.9	1.3	17.6	79	-	SILTY CLAY	STIFF
7.00	5.00	6.50	4.20	5.06	5.85	4.30	0.94	0.32	27	0.17	5.06	17.0	3.2	1.2	4.9	66	-	CLAY	STIFF
7.20	6.60	8.40	5.00	6.65	7.75	5.10	0.95	0.34	38	0.17	6.62	18.0	4.5	1.4	7.9	94	-	CLAY	STIFF
7.40	6.20	8.20	4.20	6.24	7.55	4.30	0.97	0.36	46	0.22	6.06	18.0	4.0	1.3	9.0	85	-	CLAY	STIFF
7.60	6.20	8.00	4.20	6.25	7.35	4.30	0.99	0.38	38	0.19	5.95	18.0	3.9	1.3	7.5	85	-	CLAY	STIFF
7.80	6.60	10.00	4.00	6.57	9.35	4.10	1.00	0.40	97	0.45	6.15	18.0	4.1	1.3	19.3	90	-	SILTY CLAY	STIFF
8.00	5.80	8.20	3.60	5.82	7.55	3.70	1.02	0.42	60	0.32	5.30	18.0	3.4	1.2	11.1	76	-	CLAY	STIFF
8.20	5.40	7.20	4.00	5.45	6.55	4.10	1.04	0.44	38	0.22	4.84	17.0	3.0	1.1	6.7	69	-	CLAY	STIFF
8.40	6.20	9.00	4.00	6.20	8.35	4.10	1.05	0.46	75	0.38	5.46	18.0	3.5	1.2	14.0	81	-	SILTY CLAY	STIFF
8.60	6.20	8.20	4.80	6.24	7.55	4.90	1.07	0.48	46	0.23	5.39	18.0	3.5	1.2	8.5	81	-	CLAY	STIFF
8.80	5.60	9.00	3.60	5.57	8.35	3.70	1.08	0.50	97	0.55	4.67	18.0	2.9	1.1	16.6	69	-	SILTY CLAY	STIFF
9.00	5.00	8.80	2.80	4.95	8.15	2.90	1.10	0.52	111	0.72	4.02	18.0	2.4	1.0	17.5	58	-	CLAYEY SILT	STIFF
9.20	4.00	9.50	1.80	3.86	8.85	1.90	1.12	0.54	173	1.50	2.98	18.0	-	-	23.0	-	-	SANDY SILT	-
9.40	5.00	6.80	4.00	5.05	6.15	4.10	1.13	0.56	38	0.25	3.96	17.0	2.3	1.0	5.9	59	-	CLAY	STIFF
9.60	5.20	6.60	3.80	5.27	5.95	3.90	1.15	0.58	24	0.15	4.08	17.0	2.4	1.0	3.7	62	-	CLAY	STIFF
9.80	5.40	7.40	3.80	5.44	6.75	3.90	1.17	0.60	46	0.27	4.15	18.0	2.5	1.0	7.3	64	-	CLAY	STIFF
10.00	5.40	7.00	4.00	5.46	6.35	4.10	1.18	0.62	31	0.18	4.09	17.0	2.4	1.0	4.9	64	-	CLAY	STIFF
10.20	5.80	8.00	4.00	5.83	7.35	4.10	1.20	0.64	53	0.29	4.33	18.0	2.6	1.0	8.7	69	-	CLAY	STIFF
10.40	6.20	9.50	3.80	6.17	8.85	3.90	1.22	0.66	93	0.49	4.54	18.0	2.8	1.1	15.7	74	-	SILTY CLAY	STIFF
10.60	6.60	9.50	4.20	6.59	8.85	4.30	1.23	0.68	78	0.38	4.80	18.0	3.0	1.1	13.7	81	-	SILTY CLAY	STIFF

Depth (m)	A (bar)	B (bar)	C (bar)	p0 (bar)	p1 (bar)	p2 (bar)	Sigma (bar)	u0 (bar)	ED (bar)	ID	KD	Gamma (kN/m3)	OCR	Ko	M (MPa)	Cu (kPa)	Phi (degrees)	Soil Description	Consistency
10.80	6.80	8.80	5.20	6.84	8.15	5.30	1.25	0.70	46	0.21	4.92	18.0	3.1	1.1	8.1	85	-	CLAY	STIFF
11.00	7.00	9.50	4.40	7.01	8.85	4.50	1.26	0.72	64	0.29	4.98	18.0	3.1	1.2	11.4	87	-	CLAY	STIFF
11.20	7.00	10.00	4.80	6.99	9.35	4.90	1.28	0.74	82	0.38	4.88	18.0	3.1	1.1	14.5	86	-	SILTY CLAY	STIFF
11.40	7.20	10.50	4.00	7.17	9.85	4.10	1.30	0.75	93	0.42	4.95	18.0	3.1	1.2	16.5	89	-	SILTY CLAY	STIFF
11.60	7.20	10.00	5.40	7.20	9.35	5.50	1.31	0.77	75	0.34	4.89	18.0	3.1	1.1	13.2	88	-	SILTY CLAY	STIFF
11.80	8.80	12.00	5.80	8.78	11.35	5.90	1.33	0.79	89	0.32	6.00	18.0	3.9	1.3	17.6	116	-	CLAY	VERY STIFF
12.00	9.50	12.00	7.20	9.51	11.35	7.30	1.35	0.81	64	0.21	6.46	18.0	4.3	1.4	13.1	128	-	CLAY	VERY STIFF
12.20	8.60	10.50	6.20	8.64	9.85	6.30	1.36	0.83	42	0.15	5.73	18.0	3.7	1.3	8.1	112	-	CLAY	VERY STIFF
12.40	8.80	10.50	5.60	8.85	9.85	5.70	1.38	0.85	35	0.12	5.80	18.0	3.8	1.3	6.7	115	-	CLAY	VERY STIFF
12.60	9.50	11.00	7.60	9.56	10.35	7.70	1.40	0.87	27	0.09	6.23	17.0	4.1	1.4	5.5	127	-	CLAY	VERY STIFF
12.80	9.00	10.50	7.20	9.06	9.85	7.30	1.41	0.89	27	0.10	5.79	17.0	3.8	1.3	5.3	117	-	CLAY	VERY STIFF
13.00	8.20	10.00	6.40	8.25	9.35	6.50	1.43	0.91	38	0.15	5.14	18.0	3.3	1.2	7.0	102	-	CLAY	VERY STIFF
13.20	8.50	10.00	7.60	8.56	9.35	7.70	1.45	0.93	27	0.10	5.28	18.0	3.4	1.2	5.0	107	-	CLAY	VERY STIFF
13.40	7.80	10.00	6.20	7.83	9.35	6.30	1.46	0.95	53	0.22	4.71	18.0	2.9	1.1	9.1	94	-	CLAY	STIFF
13.60	8.00	9.50	6.00	8.06	8.85	6.10	1.48	0.97	27	0.11	4.80	18.0	3.0	1.1	4.8	97	-	CLAY	STIFF
13.80	8.80	10.50	8.20	8.85	9.85	8.30	1.49	0.99	35	0.13	5.26	18.0	3.4	1.2	6.4	110	-	CLAY	VERY STIFF
14.00	9.50	11.00	8.40	9.56	10.35	8.50	1.51	1.01	27	0.09	5.66	17.0	3.7	1.3	5.2	122	-	CLAY	VERY STIFF
14.20	8.20	11.50	6.60	8.17	10.85	6.70	1.53	1.03	93	0.37	4.68	18.0	2.9	1.1	16.0	97	-	SILTY CLAY	STIFF
14.40	7.60	10.50	4.80	7.59	9.85	4.90	1.54	1.05	78	0.34	4.24	18.0	2.6	1.0	12.7	87	-	SILTY CLAY	STIFF
14.60	8.80	12.00	6.80	8.78	11.35	6.90	1.56	1.07	89	0.33	4.94	18.0	3.1	1.2	15.9	106	-	SILTY CLAY	VERY STIFF
14.80	9.00	12.00	7.20	8.99	11.35	7.30	1.58	1.09	82	0.30	5.01	18.0	3.2	1.2	14.7	109	-	CLAY	VERY STIFF
15.00	9.00	12.50	7.40	8.96	11.85	7.50	1.59	1.11	100	0.37	4.93	18.0	3.1	1.1	17.8	108	-	SILTY CLAY	VERY STIFF
15.20	10.00	12.00	8.00	10.04	11.35	8.10	1.61	1.13	46	0.15	5.54	18.0	3.6	1.2	8.6	126	-	CLAY	VERY STIFF
15.40	7.80	14.00	4.60	7.63	13.35	4.70	1.63	1.15	199	0.88	3.99	19.5	2.4	1.0	31.3	85	-	SILT	STIFF
15.60	8.20	10.00	7.20	8.25	9.35	7.30	1.64	1.17	38	0.16	4.31	18.0	2.6	1.0	6.3	94	-	CLAY	STIFF
15.80	7.80	11.50	6.40	7.75	10.85	6.50	1.66	1.19	107	0.47	3.96	18.0	2.3	1.0	16.7	86	-	SILTY CLAY	STIFF
16.00	9.00	11.00	7.20	9.04	10.35	7.30	1.67	1.21	46	0.17	4.68	18.0	2.9	1.1	7.8	107	-	CLAY	VERY STIFF
16.20	8.50	10.50	7.00	8.54	9.85	7.10	1.69	1.23	46	0.18	4.32	18.0	2.6	1.0	7.5	98	-	CLAY	STIFF
16.40	8.20	9.50	7.20	8.27	8.85	7.30	1.71	1.24	20	0.08	4.12	17.0	2.5	1.0	3.2	93	-	CLAY	STIFF
16.60	8.20	10.00	4.80	8.25	9.35	4.90	1.72	1.26	38	0.16	4.05	18.0	2.4	1.0	6.0	92	-	CLAY	STIFF
16.80	8.00	10.00	7.00	8.04	9.35	7.10	1.74	1.28	46	0.19	3.88	18.0	2.3	1.0	7.0	88	-	CLAY	STIFF
17.00	8.20	13.00	3.20	8.10	12.35	3.30	1.76	1.30	148	0.63	3.87	18.0	2.3	1.0	22.5	88	-	CLAYEY SILT	STIFF
17.20	9.00	11.00	8.20	9.04	10.35	8.30	1.77	1.32	46	0.17	4.35	18.0	2.6	1.0	7.5	103	-	CLAY	VERY STIFF
17.40	9.00	11.50	7.00	9.01	10.85	7.10	1.79	1.34	64	0.24	4.29	18.0	2.6	1.0	10.4	102	-	CLAY	VERY STIFF
17.60	8.60	10.00	7.40	8.67	9.35	7.50	1.81	1.36	24	0.09	4.05	17.0	2.4	1.0	3.7	96	-	CLAY	STIFF
17.80	9.50	11.00	8.20	9.56	10.35	8.30	1.82	1.38	27	0.10	4.49	17.0	2.7	1.1	4.6	110	-	CLAY	VERY STIFF
18.00	9.50	12.50	8.00	9.49	11.85	8.10	1.84	1.40	82	0.29	4.40	18.0	2.7	1.1	13.6	108	-	CLAY	VERY STIFF
18.20	10.00	12.50	8.40	10.01	11.85	8.50	1.86	1.42	64	0.21	4.63	18.0	2.9	1.1	10.9	117	-	CLAY	VERY STIFF
18.40	10.00	11.50	8.40	10.06	10.85	8.50	1.87	1.44	27	0.09	4.61	17.0	2.8	1.1	4.7	117	-	CLAY	VERY STIFF
18.60	10.00	12.00	8.60	10.04	11.35	8.70	1.89	1.46	46	0.15	4.54	18.0	2.8	1.1	7.7	116	-	CLAY	VERY STIFF
18.80	9.50	11.00	8.40	9.56	10.35	8.50	1.90	1.48	27	0.10	4.24	17.0	2.6	1.0	4.4	107	-	CLAY	VERY STIFF
19.00	10.00	11.50	8.40	10.06	10.85	8.50	1.92	1.50	27	0.09	4.46	17.0	2.7	1.1	4.6	115	-	CLAY	VERY STIFF
19.20	10.00	12.00	8.20	10.04	11.35	8.30	1.94	1.52	46	0.15	4.40	18.0	2.7	1.1	7.6	114	-	CLAY	VERY STIFF
19.40	10.00	13.00	8.60	9.99	12.35	8.70	1.95	1.54	82	0.28	4.33	18.0	2.6	1.0	13.5	113	-	CLAY	VERY STIFF

Depth (m)	A (bar)	B (bar)	C (bar)	p0 (bar)	p1 (bar)	p2 (bar)	Sigma (bar)	u0 (bar)	ED (bar)	ID	KD	Gamma (kN/m3)	OCR	Ko	M (MPa)	Cu (kPa)	Phi (degrees)	Soil Description	Consistency
19.60	10.50	12.50	9.00	10.54	11.85	9.10	1.97	1.56	46	0.15	4.56	18.0	2.8	1.1	7.7	121	-	CLAY	VERY STIFF
19.80	10.50	12.00	9.50	10.56	11.35	9.60	1.99	1.58	27	0.09	4.52	17.0	2.8	1.1	4.6	121	-	CLAY	VERY STIFF
20.00	9.50	11.00	8.50	9.56	10.35	8.60	2.00	1.60	27	0.10	3.98	17.0	2.4	1.0	4.2	104	-	CLAY	VERY STIFF
20.20	10.50	13.50	8.00	10.49	12.85	8.10	2.02	1.62	82	0.27	4.39	18.0	2.7	1.1	13.6	119	-	CLAY	VERY STIFF
20.40	10.00	12.00	8.80	10.04	11.35	8.90	2.04	1.64	46	0.16	4.13	18.0	2.5	1.0	7.3	111	-	CLAY	VERY STIFF
20.60	10.00	11.50	8.40	10.06	10.85	8.50	2.05	1.66	27	0.09	4.10	17.0	2.5	1.0	4.3	111	-	CLAY	VERY STIFF
20.80	11.00	14.00	8.00	10.99	13.35	8.10	2.07	1.68	82	0.25	4.50	18.0	2.8	1.1	13.8	125	-	CLAY	VERY STIFF
21.00	11.00	13.00	9.00	11.04	12.35	9.10	2.08	1.70	46	0.14	4.48	18.0	2.7	1.1	7.6	126	-	CLAY	VERY STIFF
21.20	10.00	12.00	8.80	10.04	11.35	8.90	2.10	1.72	46	0.16	3.96	18.0	2.3	1.0	7.1	109	-	CLAY	VERY STIFF
21.40	10.00	12.00	8.00	10.04	11.35	8.10	2.12	1.73	46	0.16	3.92	18.0	2.3	1.0	7.0	108	-	CLAY	VERY STIFF
21.60	10.00	12.00	8.40	10.04	11.35	8.50	2.13	1.75	46	0.16	3.88	18.0	2.3	1.0	7.0	108	-	CLAY	VERY STIFF
21.80	10.00	12.00	8.20	10.04	11.35	8.30	2.15	1.77	46	0.16	3.84	18.0	2.3	1.0	6.9	107	-	CLAY	VERY STIFF
22.00	10.50	15.00	8.20	10.41	14.35	8.30	2.17	1.79	137	0.46	3.98	19.0	2.4	1.0	21.2	113	-	SILTY CLAY	VERY STIFF
22.20	11.00	13.00	9.50	11.04	12.35	9.60	2.18	1.81	46	0.14	4.23	18.0	2.5	1.0	7.4	122	-	CLAY	VERY STIFF
22.40	10.50	12.50	9.00	10.54	11.85	9.10	2.20	1.83	46	0.15	3.96	18.0	2.3	1.0	7.1	114	-	CLAY	VERY STIFF
22.60	10.50	13.00	8.50	10.51	12.35	8.60	2.22	1.85	64	0.21	3.91	18.0	2.3	1.0	9.8	113	-	CLAY	VERY STIFF
22.80	10.50	14.00	8.00	10.46	13.35	8.10	2.23	1.87	100	0.34	3.85	19.0	2.3	1.0	15.2	111	-	SILTY CLAY	VERY STIFF
23.00	11.00	13.50	8.40	11.01	12.85	8.50	2.25	1.89	64	0.20	4.06	18.0	2.4	1.0	10.0	120	-	CLAY	VERY STIFF
23.20	11.00	13.50	8.40	11.01	12.85	8.50	2.27	1.91	64	0.20	4.02	18.0	2.4	1.0	10.0	119	-	CLAY	VERY STIFF
23.40	11.00	12.50	8.60	11.06	11.85	8.70	2.28	1.93	27	0.09	4.00	17.0	2.4	1.0	4.3	119	-	CLAY	VERY STIFF
23.60	10.00	14.50	8.00	9.91	13.85	8.10	2.30	1.95	137	0.49	3.47	19.0	2.0	0.9	19.3	100	-	SILTY CLAY	VERY STIFF
23.80	11.00	13.00	8.20	11.04	12.35	8.30	2.31	1.97	46	0.14	3.92	18.0	2.3	1.0	7.0	118	-	CLAY	VERY STIFF
24.00	11.00	12.50	8.40	11.06	11.85	8.50	2.33	1.99	27	0.09	3.89	17.0	2.3	1.0	4.2	118	-	CLAY	VERY STIFF
24.20	10.50	13.00	8.20	10.51	12.35	8.30	2.35	2.01	64	0.22	3.62	18.0	2.1	0.9	9.3	109	-	CLAY	VERY STIFF
24.40	11.50	17.00	8.40	11.36	16.35	8.50	2.36	2.03	173	0.53	3.95	19.0	2.3	1.0	26.8	122	-	SILTY CLAY	VERY STIFF
24.60	10.50	15.00	8.40	10.41	14.35	8.50	2.38	2.05	137	0.47	3.51	19.0	2.0	0.9	19.5	106	-	SILTY CLAY	VERY STIFF
24.80	11.00	21.50	5.20	10.61	20.85	5.30	2.40	2.07	355	1.20	3.57	19.5	2.1	0.9	52.7	109	-	SILT	VERY STIFF

Depth (m)	A (bar)	B (bar)	C (bar)	p0 (bar)	p1 (bar)	p2 (bar)	Sigma (bar)	u0 (bar)	ED (bar)	ID	KD	Gamma (kN/m3)	OCR	Ko	M (MPa)	Cu (kPa)	Phi (degrees)	Soil Description	Consistency
1.80	3.00	8.20	0.00	2.88	7.55	0.00	0.32	0.00	162	1.62	8.88	18.0	-	-	38.7	-	-	SANDY SILT	-
2.00	3.80	11.00	0.00	3.58	10.35	0.00	0.36	0.00	235	1.89	9.94	19.0	-	-	58.6	-	39.2	SILTY SAND	-
2.20	3.40	10.50	0.00	3.18	9.85	0.00	0.40	0.00	231	2.10	8.04	19.0	-	-	53.1	-	38.2	SILTY SAND	-
2.40	4.80	12.50	0.00	4.55	11.85	0.00	0.43	0.00	253	1.60	10.54	19.5	-	-	64.6	-	-	SANDY SILT	-
2.60	6.00	13.50	0.00	5.76	12.85	0.00	0.47	0.00	246	1.23	12.31	19.5	-	-	66.3	-	-	SANDY SILT	-
2.80	6.40	15.00	0.00	6.11	14.35	0.00	0.50	0.00	286	1.35	12.12	19.5	-	-	76.7	-	-	SANDY SILT	-
3.40	8.40	13.50	0.00	8.28	12.85	0.90	0.61	0.00	158	0.55	13.53	19.0	10.9	2.2	44.2	147	-	SILTY CLAY	VERY STIFF
3.60	7.20	14.00	0.80	7.00	13.35	1.10	0.65	0.00	220	0.91	10.80	19.5	8.2	1.9	56.7	117	-	SILT	VERY STIFF
3.80	9.00	17.00	1.00	8.74	16.35	3.30	0.68	0.00	264	0.87	12.77	19.5	10.2	2.1	72.2	153	-	SILT	VERY STIFF
4.00	7.40	13.00	3.20	7.26	12.35	3.30	0.72	0.00	177	0.70	10.08	19.5	7.6	1.8	44.3	120	-	CLAYEY SILT	VERY STIFF
4.20	7.60	13.00	3.20	7.47	12.35	4.30	0.76	0.00	169	0.65	9.88	19.5	7.4	1.8	42.1	122	-	CLAYEY SILT	VERY STIFF
4.40	7.40	13.00	4.20	7.26	12.35	4.30	0.79	0.00	177	0.70	9.16	19.5	6.7	1.7	42.6	117	-	CLAYEY SILT	VERY STIFF
4.60	8.20	13.00	4.20	8.10	12.35	5.50	0.82	0.01	148	0.53	9.88	19.0	7.4	1.8	36.7	133	-	SILTY CLAY	VERY STIFF
4.80	7.60	12.00	5.40	7.52	11.35	6.10	0.83	0.03	133	0.51	8.97	19.0	6.5	1.7	31.8	120	-	SILTY CLAY	VERY STIFF
5.00	7.40	12.00	6.00	7.31	11.35	5.70	0.85	0.05	140	0.56	8.53	19.0	6.1	1.7	32.8	115	-	SILTY CLAY	VERY STIFF
5.20	6.80	11.00	5.60	6.73	10.35	4.90	0.87	0.07	126	0.54	7.68	19.0	5.4	1.6	28.0	103	-	SILTY CLAY	VERY STIFF
5.40	8.00	13.00	4.80	7.89	12.35	5.70	0.88	0.09	155	0.57	8.82	19.0	6.4	1.7	36.7	124	-	SILTY CLAY	VERY STIFF
5.60	10.00	14.50	5.60	9.91	13.85	5.50	0.90	0.11	137	0.40	10.89	19.0	8.3	1.9	35.3	165	-	SILTY CLAY	VERY STIFF
5.80	10.50	15.50	5.40	10.39	14.85	6.70	0.92	0.13	155	0.43	11.19	19.0	8.6	2.0	40.4	174	-	SILTY CLAY	VERY STIFF
6.00	10.00	15.00	6.60	9.89	14.35	5.10	0.93	0.15	155	0.46	10.44	19.0	7.9	1.9	39.3	162	-	SILTY CLAY	VERY STIFF
6.20	10.00	15.50	5.00	9.86	14.85	5.50	0.95	0.17	173	0.51	10.21	19.0	7.7	1.9	43.6	160	-	SILTY CLAY	VERY STIFF
6.40	9.50	13.50	5.40	9.44	12.85	3.70	0.97	0.19	118	0.37	9.58	19.0	7.1	1.8	29.1	151	-	SILTY CLAY	VERY STIFF
6.60	8.80	14.00	3.60	8.68	13.35	4.30	0.98	0.21	162	0.55	8.63	19.0	6.2	1.7	38.1	134	-	SILTY CLAY	VERY STIFF
6.80	7.60	12.00	4.20	7.52	11.35	4.50	1.00	0.23	133	0.53	7.30	19.0	5.0	1.5	29.0	111	-	SILTY CLAY	VERY STIFF
7.00	7.00	11.00	4.40	6.94	10.35	4.50	1.02	0.25	118	0.51	6.59	18.0	4.4	1.4	24.5	99	-	SILTY CLAY	STIFF
7.20	6.80	10.00	4.40	6.78	9.35	4.10	1.03	0.26	89	0.39	6.31	18.0	4.2	1.4	18.1	95	-	SILTY CLAY	STIFF
7.40	6.80	11.00	4.00	6.73	10.35	4.10	1.05	0.28	126	0.56	6.15	18.0	4.1	1.3	25.2	94	-	SILTY CLAY	STIFF
7.60	7.20	11.50	3.80	7.12	10.85	3.90	1.06	0.30	129	0.55	6.41	18.0	4.3	1.4	26.4	100	-	SILTY CLAY	VERY STIFF
7.80	6.60	10.00	3.40	6.57	9.35	3.50	1.08	0.32	97	0.45	5.78	18.0	3.8	1.3	18.7	90	-	SILTY CLAY	STIFF
8.00	8.40	13.00	5.80	8.31	12.35	5.90	1.10	0.34	140	0.51	7.26	19.0	5.0	1.5	30.5	121	-	SILTY CLAY	VERY STIFF
8.20	9.50	13.50	6.20	9.44	12.85	6.30	1.11	0.36	118	0.38	8.15	19.0	5.8	1.6	27.1	142	-	SILTY CLAY	VERY STIFF
8.40	6.80	12.60	2.80	6.65	11.95	2.90	1.13	0.38	184	0.85	5.55	19.5	3.6	1.2	35.1	89	-	SILT	STIFF
8.60	7.40	15.40	2.00	7.14	14.75	2.10	1.15	0.40	264	1.13	5.88	19.5	3.8	1.3	52.1	97	-	SILT	STIFF
8.80	5.80	14.50	1.20	5.50	13.85	1.30	1.16	0.42	290	1.64	4.37	19.5	-	-	49.5	-	-	SANDY SILT	-
9.00	6.20	17.80	1.40	5.76	17.15	1.50	1.18	0.44	395	2.14	4.51	20.0	-	-	69.7	-	35.4	SILTY SAND	-
9.20	7.00	11.00	3.20	6.94	10.35	3.30	1.20	0.46	118	0.53	5.42	18.0	3.5	1.2	22.2	91	-	SILTY CLAY	STIFF
9.40	7.00	11.00	3.80	6.94	10.35	3.90	1.21	0.48	118	0.53	5.33	18.0	3.4	1.2	22.0	91	-	SILTY CLAY	STIFF
9.60	6.20	11.50	1.80	6.07	10.85	1.90	1.23	0.50	166	0.86	4.54	18.0	2.8	1.1	28.2	75	-	SILT	STIFF
9.80	6.40	19.00	0.20	5.91	18.35	0.30	1.24	0.52	432	2.31	4.33	20.0	-	-	74.9	-	35.2	SILTY SAND	-
10.00	5.80	8.20	4.00	5.82	7.55	4.10	1.26	0.54	60	0.33	4.19	18.0	2.5	1.0	9.7	70	-	CLAY	STIFF
10.20	7.60	11.50	4.80	7.54	10.85	4.90	1.28	0.56	115	0.47	5.47	18.0	3.5	1.2	21.6	99	-	SILTY CLAY	STIFF
10.40	8.20	12.00	5.40	8.15	11.35	5.50	1.29	0.58	111	0.42	5.85	18.0	3.8	1.3	21.7	109	-	SILTY CLAY	VERY STIFF
10.60	7.80	11.00	5.60	7.78	10.35	5.70	1.31	0.60	89	0.36	5.48	18.0	3.5	1.2	16.8	102	-	SILTY CLAY	VERY STIFF
10.80	7.40	12.80	4.60	7.27	12.15	4.70	1.33	0.62	169	0.73	5.01	19.5	3.2	1.2	30.5	92	-	CLAYEY SILT	STIFF

Depth (m)	A (bar)	B (bar)	C (bar)	p0 (bar)	p1 (bar)	p2 (bar)	Sigma (bar)	u0 (bar)	ED (bar)	ID	KD	Gamma (kN/m3)	OCR	Ko	M (MPa)	Cu (kPa)	Phi (degrees)	Soil Description	Consistency
11.00	8.00	12.00	5.40	7.94	11.35	5.50	1.34	0.64	118	0.47	5.44	19.0	3.5	1.2	22.2	103	-	SILTY CLAY	VERY STIFF
11.20	7.60	11.00	5.40	7.57	10.35	5.50	1.36	0.66	97	0.40	5.08	18.0	3.2	1.2	17.4	96	-	SILTY CLAY	STIFF
11.40	8.60	12.50	5.80	8.54	11.85	5.90	1.38	0.68	115	0.42	5.72	19.0	3.7	1.3	22.1	113	-	SILTY CLAY	VERY STIFF
11.60	9.20	13.40	7.40	9.13	12.75	7.50	1.39	0.70	126	0.43	6.06	19.0	4.0	1.3	25.0	122	-	SILTY CLAY	VERY STIFF
11.80	8.60	11.00	6.80	8.62	10.35	6.90	1.41	0.72	60	0.22	5.61	18.0	3.6	1.3	11.5	112	-	CLAY	VERY STIFF
12.00	8.20	11.00	6.60	8.20	10.35	6.70	1.43	0.74	75	0.29	5.24	18.0	3.3	1.2	13.7	104	-	CLAY	VERY STIFF
12.20	8.00	11.00	6.20	7.99	10.35	6.30	1.44	0.75	82	0.33	5.02	18.0	3.2	1.2	14.7	100	-	CLAY	VERY STIFF
12.40	7.60	10.40	6.00	7.60	9.75	6.10	1.46	0.77	75	0.32	4.68	18.0	2.9	1.1	12.9	93	-	CLAY	STIFF
12.60	9.00	12.40	7.00	8.97	11.75	7.10	1.47	0.79	97	0.34	5.54	18.0	3.6	1.2	18.3	116	-	SILTY CLAY	VERY STIFF
12.80	9.60	12.80	7.40	9.58	12.15	7.50	1.49	0.81	89	0.29	5.88	18.0	3.8	1.3	17.5	126	-	CLAY	VERY STIFF
13.00	9.20	12.00	7.60	9.20	11.35	7.70	1.51	0.83	75	0.26	5.55	18.0	3.6	1.2	14.2	119	-	CLAY	VERY STIFF
13.20	9.00	11.80	7.60	9.00	11.15	7.70	1.52	0.85	75	0.26	5.35	18.0	3.4	1.2	13.9	115	-	CLAY	VERY STIFF
13.40	9.20	12.60	7.00	9.17	11.95	7.10	1.54	0.87	97	0.34	5.39	19.0	3.5	1.2	18.0	117	-	SILTY CLAY	VERY STIFF
13.60	9.60	13.80	5.20	9.53	13.15	5.30	1.56	0.89	126	0.42	5.55	19.0	3.6	1.2	23.8	123	-	SILTY CLAY	VERY STIFF
13.80	8.40	14.20	4.80	8.25	13.55	4.90	1.57	0.91	184	0.72	4.66	19.5	2.9	1.1	31.7	100	-	CLAYEY SILT	STIFF
14.00	8.60	13.40	4.80	8.50	12.75	4.90	1.59	0.93	148	0.56	4.76	19.0	3.0	1.1	25.7	103	-	SILTY CLAY	VERY STIFF
14.20	9.40	12.60	6.60	9.38	11.95	6.70	1.61	0.95	89	0.31	5.25	19.0	3.3	1.2	16.4	118	-	CLAY	VERY STIFF
14.40	8.00	11.20	6.40	7.98	10.55	6.50	1.62	0.97	89	0.37	4.32	18.0	2.6	1.0	14.6	93	-	SILTY CLAY	STIFF
14.60	8.00	11.40	6.00	7.97	10.75	6.10	1.64	0.99	97	0.40	4.26	18.0	2.6	1.0	15.7	93	-	SILTY CLAY	STIFF
14.80	7.80	11.00	6.00	7.78	10.35	6.10	1.65	1.01	89	0.38	4.09	18.0	2.4	1.0	14.1	89	-	SILTY CLAY	STIFF
15.00	7.60	11.00	5.60	7.57	10.35	5.70	1.67	1.03	97	0.43	3.91	18.0	2.3	1.0	14.9	85	-	SILTY CLAY	STIFF
15.20	7.80	11.80	5.40	7.74	11.15	5.50	1.69	1.05	118	0.51	3.96	18.0	2.4	1.0	18.4	87	-	SILTY CLAY	STIFF
15.40	8.00	11.00	6.20	7.99	10.35	6.30	1.70	1.07	82	0.34	4.06	18.0	2.4	1.0	12.9	91	-	SILTY CLAY	STIFF
15.60	8.20	11.40	6.60	8.18	10.75	6.70	1.72	1.09	89	0.36	4.12	18.0	2.5	1.0	14.2	93	-	SILTY CLAY	STIFF
15.80	9.40	11.60	7.80	9.43	10.95	7.90	1.74	1.11	53	0.18	4.79	18.0	3.0	1.1	9.2	114	-	CLAY	VERY STIFF
16.00	10.00	14.20	7.80	9.93	13.55	7.90	1.75	1.13	126	0.41	5.02	19.0	3.2	1.2	22.5	122	-	SILTY CLAY	VERY STIFF
16.20	10.20	18.80	5.20	9.91	18.15	5.30	1.77	1.15	286	0.94	4.95	19.5	3.1	1.2	51.3	121	-	SILT	VERY STIFF
16.40	11.20	15.20	8.40	11.14	14.55	8.50	1.79	1.17	118	0.34	5.58	19.0	3.6	1.3	22.5	142	-	SILTY CLAY	VERY STIFF
16.60	9.40	14.00	6.60	9.31	13.35	6.70	1.80	1.19	140	0.50	4.51	19.0	2.8	1.1	23.6	109	-	SILTY CLAY	VERY STIFF
16.80	10.40	13.20	8.60	10.40	12.55	8.70	1.82	1.21	75	0.23	5.05	18.5	3.2	1.2	13.4	127	-	CLAY	VERY STIFF
17.00	11.20	15.60	7.80	11.12	14.95	7.90	1.84	1.23	133	0.39	5.39	19.0	3.5	1.2	24.8	139	-	SILTY CLAY	VERY STIFF
17.20	10.20	12.60	8.40	10.22	11.95	8.50	1.85	1.24	60	0.19	4.85	18.0	3.0	1.1	10.6	123	-	CLAY	VERY STIFF
17.40	10.20	23.00	3.40	9.70	22.35	3.50	1.87	1.26	439	1.50	4.52	19.5	-	-	76.0	-	-	SANDY SILT	-
17.60	9.00	10.60	7.60	9.06	9.95	7.70	1.88	1.28	31	0.11	4.13	18.0	2.5	1.0	4.9	102	-	CLAY	VERY STIFF
17.80	8.40	10.00	7.60	8.46	9.35	7.70	1.90	1.30	31	0.12	3.76	18.0	2.2	0.9	4.6	92	-	CLAY	STIFF
18.00	9.80	11.60	8.20	9.85	10.95	8.30	1.92	1.32	38	0.13	4.45	18.0	2.7	1.1	6.4	115	-	CLAY	VERY STIFF
18.20	9.20	17.40	3.40	8.93	16.75	3.50	1.93	1.34	271	1.03	3.92	19.5	2.3	1.0	42.5	99	-	SILT	STIFF
18.40	8.20	10.40	5.60	8.23	9.75	5.70	1.95	1.36	53	0.22	3.52	18.0	2.0	0.9	7.6	87	-	CLAY	STIFF
18.60	9.20	11.80	7.60	9.21	11.15	7.70	1.97	1.38	67	0.25	3.98	18.0	2.4	1.0	10.5	102	-	CLAY	VERY STIFF
18.80	7.00	12.00	3.20	6.89	11.35	3.30	1.98	1.40	155	0.81	2.77	18.0	1.5	0.7	18.6	65	-	SILT	STIFF
19.00	10.00	11.60	8.00	10.06	10.95	8.10	2.00	1.42	31	0.10	4.32	18.0	2.6	1.0	5.1	115	-	CLAY	VERY STIFF
19.20	10.80	12.20	9.20	10.87	11.55	9.30	2.02	1.44	24	0.07	4.68	17.0	2.9	1.1	4.1	128	-	CLAY	VERY STIFF
19.40	10.40	14.00	7.80	10.36	13.35	7.90	2.03	1.46	104	0.34	4.38	19.0	2.7	1.1	17.2	119	-	SILTY CLAY	VERY STIFF
19.60	10.40	19.20	2.80	10.10	18.55	2.90	2.05	1.48	293	0.98	4.21	19.5	2.5	1.0	47.9	114	-	SILT	VERY STIFF

Depth (m)	A (bar)	B (bar)	C (bar)	p0 (bar)	p1 (bar)	p2 (bar)	Sigma (bar)	u0 (bar)	ED (bar)	ID	KD	Gamma (kN/m3)	OCR	Ko	M (MPa)	Cu (kPa)	Phi (degrees)	Soil Description	Consistency
19.80	10.20	12.00	8.20	10.25	11.35	8.30	2.06	1.50	38	0.13	4.24	18.0	2.6	1.0	6.2	116	-	CLAY	VERY STIFF
20.00	9.80	11.60	8.40	9.85	10.95	8.50	2.08	1.52	38	0.13	4.00	18.0	2.4	1.0	6.0	109	-	CLAY	VERY STIFF
20.20	10.20	12.40	8.60	10.23	11.75	8.70	2.10	1.54	53	0.18	4.14	18.0	2.5	1.0	8.4	115	-	CLAY	VERY STIFF
20.40	7.80	9.60	6.60	7.85	8.95	6.70	2.11	1.56	38	0.18	2.98	18.0	1.6	0.8	4.8	76	-	CLAY	STIFF
20.60	9.60	11.00	8.40	9.67	10.35	8.50	2.13	1.58	24	0.08	3.80	17.0	2.2	0.9	3.6	104	-	CLAY	VERY STIFF
20.80	9.80	11.20	8.40	9.87	10.55	8.50	2.15	1.60	24	0.08	3.85	17.0	2.3	1.0	3.6	107	-	CLAY	VERY STIFF
21.00	9.40	11.00	8.20	9.46	10.35	8.30	2.16	1.62	31	0.11	3.62	18.0	2.1	0.9	4.5	100	-	CLAY	VERY STIFF
21.20	8.40	17.80	0.60	8.07	17.15	0.70	2.18	1.64	315	1.41	2.95	19.5	-	-	41.4	-	-	SANDY SILT	-
21.40	10.00	12.80	7.40	10.00	12.15	7.50	2.20	1.66	75	0.26	3.80	18.0	2.2	0.9	11.3	108	-	CLAY	VERY STIFF

Depth (m)	A (bar)	B (bar)	C (bar)	p0 (bar)	p1 (bar)	p2 (bar)	Sigma (bar)	u0 (bar)	ED (bar)	ID	KD	Gamma (kN/m3)	OCR	Ko	M (MPa)	Cu (kPa)	Phi (degrees)	Soil Description	Consistency
1.80	7.20	13.00	0.00	7.05	12.40	0.00	0.32	0.00	186	0.76	21.74	19.5	19.7	2.9	60.1	141	-	CLAYEY SILT	VERY STIFF
2.00	9.00	19.40	1.40	8.62	18.80	1.50	0.36	0.00	353	1.18	23.93	19.5	22.3	3.1	117.6	176	-	SILT	VERY STIFF
2.20	9.20	21.20	2.60	8.74	20.60	2.70	0.40	0.00	412	1.36	22.06	19.5	-	-	133.8	-	-	SANDY SILT	-
2.40	9.00	20.00	1.40	8.59	19.40	1.50	0.43	0.00	375	1.26	19.87	19.5	-	-	118.2	-	-	SANDY SILT	-
2.60	9.40	18.40	3.20	9.09	17.80	3.30	0.47	0.00	302	0.96	19.41	19.5	17.1	2.7	94.6	176	-	SILT	VERY STIFF
2.80	10.60	19.20	4.60	10.31	18.60	4.70	0.50	0.00	288	0.80	20.45	19.5	18.3	2.8	91.4	203	-	SILT	HARD
3.00	10.80	20.80	2.20	10.44	20.20	2.30	0.54	0.00	339	0.94	19.32	19.5	17.0	2.7	105.8	202	-	SILT	HARD
3.20	9.40	18.60	3.40	9.08	18.00	3.50	0.58	0.00	310	0.98	15.76	19.5	13.2	2.4	90.8	167	-	SILT	VERY STIFF
3.40	9.40	17.80	3.00	9.12	17.20	3.10	0.61	0.00	281	0.89	15.01	19.5	12.4	2.4	80.9	166	-	SILT	VERY STIFF
3.60	6.80	11.00	4.20	6.73	10.40	4.30	0.62	0.02	128	0.55	10.75	18.0	8.2	1.9	32.7	112	-	SILTY CLAY	VERY STIFF
3.80	6.20	9.20	4.40	6.19	8.60	4.50	0.64	0.04	84	0.39	9.60	18.0	7.1	1.8	20.6	100	-	SILTY CLAY	STIFF
4.00	8.20	15.20	2.80	7.99	14.60	2.90	0.66	0.06	230	0.84	12.07	19.5	9.5	2.1	61.5	137	-	SILT	VERY STIFF
4.20	7.00	10.40	3.80	6.97	9.80	3.90	0.67	0.08	98	0.41	10.23	18.0	7.7	1.9	24.8	114	-	SILTY CLAY	VERY STIFF
4.40	6.40	10.60	3.40	6.33	10.00	3.50	0.69	0.10	128	0.59	9.03	18.0	6.6	1.7	30.5	100	-	SILTY CLAY	STIFF
4.60	5.60	8.00	4.20	5.62	7.40	4.30	0.71	0.12	62	0.32	7.79	18.0	5.5	1.6	13.9	85	-	CLAY	STIFF
4.80	6.00	8.40	4.20	6.02	7.80	4.30	0.72	0.14	62	0.30	8.14	18.0	5.8	1.6	14.2	92	-	CLAY	STIFF
5.00	5.60	9.80	3.20	5.53	9.20	3.30	0.74	0.16	128	0.69	7.26	18.0	5.0	1.5	27.7	81	-	CLAYEY SILT	STIFF
5.20	6.60	19.40	0.20	6.10	18.80	0.30	0.75	0.18	441	2.15	7.84	20.0	-	-	100.3	-	38.1	SILTY SAND	-
5.40	5.80	13.00	0.60	5.58	12.40	0.70	0.77	0.20	237	1.27	6.97	19.5	-	-	50.8	-	-	SANDY SILT	-
5.60	5.60	13.80	0.80	5.33	13.20	0.90	0.79	0.22	273	1.54	6.48	19.5	-	-	56.9	-	-	SANDY SILT	-
5.80	5.80	21.40	0.60	5.16	20.80	0.70	0.80	0.24	543	3.18	6.11	20.0	-	-	112.5	-	36.9	SILTY SAND	-
6.00	4.40	11.40	0.40	4.19	10.80	0.50	0.82	0.26	230	1.69	4.79	18.0	-	-	41.2	-	-	SANDY SILT	-
6.20	4.00	11.20	0.40	3.78	10.60	0.50	0.84	0.28	237	1.95	4.18	19.0	-	-	39.8	-	35.0	SILTY SAND	-
6.40	4.00	10.40	0.00	3.82	9.80	0.00	0.85	0.30	208	1.70	4.12	18.0	-	-	34.4	-	-	SANDY SILT	-
6.60	5.20	7.80	2.20	5.21	7.20	2.30	0.87	0.32	69	0.41	5.62	18.0	3.6	1.3	13.2	70	-	SILTY CLAY	STIFF
6.80	6.40	9.00	4.00	6.41	8.40	4.10	0.89	0.34	69	0.33	6.85	18.0	4.7	1.4	14.6	91	-	CLAY	STIFF
7.00	6.80	9.80	4.00	6.79	9.20	4.10	0.90	0.36	84	0.38	7.12	18.0	4.9	1.5	18.0	97	-	SILTY CLAY	STIFF
7.20	7.00	9.40	4.20	7.02	8.80	4.30	0.92	0.38	62	0.27	7.23	18.0	5.0	1.5	13.4	101	-	CLAY	VERY STIFF
7.40	7.20	10.00	4.80	7.20	9.40	4.90	0.94	0.40	77	0.32	7.27	18.0	5.0	1.5	16.6	103	-	CLAY	VERY STIFF
7.60	6.80	10.00	4.00	6.78	9.40	4.10	0.95	0.42	91	0.41	6.68	18.0	4.5	1.4	19.0	95	-	SILTY CLAY	STIFF
7.80	7.40	9.60	5.20	7.43	9.00	5.30	0.97	0.44	55	0.23	7.22	18.0	5.0	1.5	11.8	106	-	CLAY	VERY STIFF
8.00	8.20	11.00	4.40	8.20	10.40	4.50	0.98	0.46	77	0.28	7.86	18.0	5.5	1.6	17.2	120	-	CLAY	VERY STIFF
8.20	8.20	10.80	5.80	8.21	10.20	5.90	1.00	0.48	69	0.26	7.72	18.0	5.4	1.6	15.5	119	-	CLAY	VERY STIFF
8.40	7.80	10.60	5.40	7.80	10.00	5.50	1.02	0.49	77	0.30	7.18	18.0	4.9	1.5	16.5	111	-	CLAY	VERY STIFF
8.60	8.20	11.00	5.20	8.20	10.40	5.30	1.03	0.51	77	0.29	7.43	18.0	5.2	1.5	16.8	117	-	CLAY	VERY STIFF
8.80	8.40	10.80	4.80	8.42	10.20	4.90	1.05	0.53	62	0.23	7.51	18.0	5.2	1.5	13.7	121	-	CLAY	VERY STIFF
9.00	8.60	12.20	5.80	8.56	11.60	5.90	1.07	0.55	106	0.38	7.50	18.0	5.2	1.5	23.3	122	-	SILTY CLAY	VERY STIFF
9.20	7.40	9.80	5.80	7.42	9.20	5.90	1.08	0.57	62	0.26	6.32	18.0	4.2	1.4	12.6	100	-	CLAY	VERY STIFF
9.40	6.40	8.20	4.80	6.45	7.60	4.90	1.10	0.59	40	0.20	5.32	18.0	3.4	1.2	7.4	82	-	CLAY	STIFF
9.60	6.20	7.40	5.00	6.28	6.80	5.10	1.12	0.61	18	0.09	5.08	17.0	3.2	1.2	3.3	79	-	CLAY	STIFF
9.80	6.80	8.20	5.20	6.87	7.60	5.30	1.13	0.63	26	0.12	5.51	17.0	3.5	1.2	4.8	88	-	CLAY	STIFF
10.00	6.80	8.40	4.60	6.86	7.80	4.70	1.15	0.65	33	0.15	5.40	17.0	3.5	1.2	6.1	87	-	CLAY	STIFF
10.20	7.40	9.20	5.60	7.45	8.60	5.70	1.16	0.67	40	0.17	5.82	18.0	3.8	1.3	7.8	97	-	CLAY	STIFF
10.40	7.80	10.00	6.20	7.83	9.40	6.30	1.18	0.69	55	0.22	6.04	18.0	4.0	1.3	10.8	103	-	CLAY	VERY STIFF

Depth (m)	A (bar)	B (bar)	C (bar)	p0 (bar)	p1 (bar)	p2 (bar)	Sigma (bar)	u0 (bar)	ED (bar)	ID	KD	Gamma (kN/m3)	OCR	Ko	M (MPa)	Cu (kPa)	Phi (degrees)	Soil Description	Consistency
10.60	8.40	11.00	6.60	8.41	10.40	6.70	1.20	0.71	69	0.26	6.43	18.0	4.3	1.4	14.2	113	-	CLAY	VERY STIFF
10.80	8.60	11.00	6.40	8.62	10.40	6.50	1.21	0.73	62	0.23	6.50	18.0	4.4	1.4	12.7	116	-	CLAY	VERY STIFF
11.00	9.60	14.40	4.40	9.50	13.80	4.50	1.23	0.75	149	0.49	7.11	19.0	4.9	1.5	32.1	132	-	SILTY CLAY	VERY STIFF
11.20	10.00	13.20	7.40	9.98	12.60	7.50	1.25	0.77	91	0.29	7.38	19.0	5.1	1.5	19.9	140	-	CLAY	VERY STIFF
11.40	6.80	14.60	2.80	6.55	14.00	2.90	1.26	0.79	259	1.30	4.56	19.5	-	-	44.8	-	-	SANDY SILT	-
11.60	12.80	28.00	1.80	12.18	27.40	1.90	1.28	0.81	528	1.34	8.88	21.0	-	-	126.0	-	-	SANDY SILT	-
11.80	8.20	10.40	6.40	8.23	9.80	6.50	1.30	0.83	55	0.21	5.71	18.0	3.7	1.3	10.5	106	-	CLAY	VERY STIFF
12.00	8.20	10.60	6.60	8.22	10.00	6.70	1.31	0.85	62	0.24	5.61	18.0	3.6	1.3	11.8	105	-	CLAY	VERY STIFF
12.20	8.60	11.60	6.00	8.59	11.00	6.10	1.33	0.87	84	0.31	5.81	18.0	3.8	1.3	16.3	111	-	CLAY	VERY STIFF
12.40	9.20	11.80	7.80	9.21	11.20	7.90	1.35	0.89	69	0.24	6.18	18.0	4.1	1.3	13.9	121	-	CLAY	VERY STIFF
12.60	9.40	12.60	8.00	9.38	12.00	8.10	1.36	0.91	91	0.31	6.22	18.0	4.1	1.4	18.3	124	-	CLAY	VERY STIFF
12.80	10.20	13.00	7.80	10.20	12.40	7.90	1.38	0.93	77	0.24	6.73	18.0	4.6	1.4	16.0	138	-	CLAY	VERY STIFF
13.00	9.60	11.20	7.00	9.66	10.60	7.10	1.39	0.95	33	0.11	6.25	18.0	4.2	1.4	6.6	127	-	CLAY	VERY STIFF
13.20	9.60	11.20	8.20	9.66	10.60	8.30	1.41	0.97	33	0.11	6.16	18.0	4.1	1.3	6.6	127	-	CLAY	VERY STIFF
13.40	8.00	11.20	6.60	7.98	10.60	6.70	1.43	0.98	91	0.38	4.90	18.0	3.1	1.1	16.1	96	-	SILTY CLAY	STIFF
13.60	8.20	11.00	6.00	8.20	10.40	6.10	1.44	1.00	77	0.31	4.98	18.0	3.1	1.2	13.7	99	-	CLAY	STIFF
13.80	9.80	12.00	8.40	9.83	11.40	8.50	1.46	1.02	55	0.18	6.03	18.0	4.0	1.3	10.8	128	-	CLAY	VERY STIFF
14.00	9.80	12.40	8.00	9.81	11.80	8.10	1.48	1.04	69	0.23	5.93	18.0	3.9	1.3	13.6	126	-	CLAY	VERY STIFF
14.20	10.20	16.00	6.80	10.05	15.40	6.90	1.49	1.06	186	0.60	6.02	19.0	4.0	1.3	36.8	130	-	SILTY CLAY	VERY STIFF
14.40	10.20	21.40	3.20	9.78	20.80	3.30	1.51	1.08	383	1.27	5.76	19.5	-	-	74.9	-	-	SANDY SILT	-
14.60	7.80	10.40	5.40	7.81	9.80	5.50	1.53	1.10	69	0.30	4.39	18.0	2.7	1.1	11.5	90	-	CLAY	STIFF
14.80	8.00	12.80	5.20	7.90	12.20	5.30	1.54	1.12	149	0.64	4.39	19.5	2.7	1.1	24.8	91	-	CLAYEY SILT	STIFF
15.00	11.60	23.40	3.20	11.15	22.80	3.30	1.56	1.14	404	1.17	6.42	19.5	4.3	1.4	83.4	147	-	SILT	VERY STIFF
15.20	9.80	11.60	7.80	9.85	11.00	7.90	1.57	1.16	40	0.13	5.51	18.0	3.6	1.2	7.6	123	-	CLAY	VERY STIFF
15.40	10.00	11.80	8.40	10.05	11.20	8.50	1.59	1.18	40	0.13	5.57	18.0	3.6	1.3	7.6	126	-	CLAY	VERY STIFF
15.60	9.60	11.00	8.40	9.67	10.40	8.50	1.61	1.20	26	0.09	5.27	17.0	3.4	1.2	4.7	119	-	CLAY	VERY STIFF
15.80	10.00	11.80	8.60	10.05	11.20	8.70	1.62	1.22	40	0.13	5.43	18.0	3.5	1.2	7.5	125	-	CLAY	VERY STIFF
16.00	9.20	10.40	8.20	9.28	9.80	8.30	1.64	1.24	18	0.07	4.90	17.0	3.1	1.1	3.2	111	-	CLAY	VERY STIFF
16.20	9.20	11.20	8.20	9.24	10.60	8.30	1.66	1.26	47	0.17	4.81	18.0	3.0	1.1	8.3	109	-	CLAY	VERY STIFF
16.40	9.20	10.80	8.00	9.26	10.20	8.10	1.67	1.28	33	0.12	4.77	18.0	3.0	1.1	5.7	109	-	CLAY	VERY STIFF
16.60	9.00	10.80	7.80	9.05	10.20	7.90	1.69	1.30	40	0.15	4.59	18.0	2.8	1.1	6.8	105	-	CLAY	VERY STIFF
16.80	9.40	11.60	8.00	9.43	11.00	8.10	1.71	1.32	55	0.19	4.75	18.0	3.0	1.1	9.5	111	-	CLAY	VERY STIFF
17.00	9.40	12.00	7.40	9.41	11.40	7.50	1.72	1.34	69	0.25	4.68	18.0	2.9	1.1	11.9	110	-	CLAY	VERY STIFF
17.20	9.00	10.20	8.20	9.08	9.60	8.30	1.74	1.36	18	0.07	4.44	17.0	2.7	1.1	3.0	104	-	CLAY	VERY STIFF
17.40	9.40	11.00	8.20	9.46	10.40	8.30	1.76	1.38	33	0.12	4.60	18.0	2.8	1.1	5.6	109	-	CLAY	VERY STIFF
17.60	9.80	11.60	8.40	9.85	11.00	8.50	1.77	1.40	40	0.14	4.77	18.0	3.0	1.1	7.0	115	-	CLAY	VERY STIFF
17.80	9.40	12.40	8.00	9.39	11.80	8.10	1.79	1.42	84	0.30	4.46	18.0	2.7	1.1	14.0	107	-	CLAY	VERY STIFF
18.00	9.00	12.40	6.40	8.97	11.80	6.50	1.80	1.44	98	0.38	4.17	18.0	2.5	1.0	15.8	100	-	SILTY CLAY	STIFF
18.20	9.40	11.60	8.20	9.43	11.00	8.30	1.82	1.46	55	0.20	4.38	18.0	2.7	1.1	9.0	107	-	CLAY	VERY STIFF
18.40	9.00	10.20	8.40	9.08	9.60	8.50	1.84	1.47	18	0.07	4.14	17.0	2.5	1.0	2.9	100	-	CLAY	VERY STIFF
18.60	9.20	10.80	8.20	9.26	10.20	8.30	1.85	1.49	33	0.12	4.19	18.0	2.5	1.0	5.3	103	-	CLAY	VERY STIFF
18.80	9.80	11.00	8.40	9.88	10.40	8.50	1.87	1.51	18	0.06	4.47	17.0	2.7	1.1	3.1	112	-	CLAY	VERY STIFF
19.00	9.80	11.00	8.40	9.88	10.40	8.50	1.89	1.53	18	0.06	4.42	17.0	2.7	1.1	3.0	112	-	CLAY	VERY STIFF
19.20	10.00	11.40	8.80	10.07	10.80	8.90	1.90	1.55	26	0.09	4.47	17.0	2.7	1.1	4.3	115	-	CLAY	VERY STIFF

Depth (m)	A (bar)	B (bar)	C (bar)	p0 (bar)	p1 (bar)	p2 (bar)	Sigma (bar)	u0 (bar)	ED (bar)	ID	KD	Gamma (kN/m3)	OCR	Ko	M (MPa)	Cu (kPa)	Phi (degrees)	Soil Description	Consistency
19.40	10.00	12.40	8.60	10.02	11.80	8.70	1.92	1.57	62	0.21	4.40	18.0	2.7	1.1	10.3	113	-	CLAY	VERY STIFF
19.60	10.60	12.40	8.20	10.65	11.80	8.30	1.94	1.59	40	0.13	4.68	18.0	2.9	1.1	6.9	123	-	CLAY	VERY STIFF
19.80	10.40	12.40	8.80	10.44	11.80	8.90	1.95	1.61	47	0.15	4.52	18.0	2.8	1.1	8.0	119	-	CLAY	VERY STIFF
20.00	10.20	11.40	9.00	10.28	10.80	9.10	1.97	1.63	18	0.06	4.39	17.0	2.7	1.1	3.0	116	-	CLAY	VERY STIFF
20.20	9.80	11.00	8.80	9.88	10.40	8.90	1.98	1.65	18	0.06	4.14	17.0	2.5	1.0	2.9	109	-	CLAY	VERY STIFF
20.40	10.00	11.80	8.60	10.05	11.20	8.70	2.00	1.67	40	0.14	4.18	18.0	2.5	1.0	6.4	111	-	CLAY	VERY STIFF
20.60	10.20	12.60	8.60	10.22	12.00	8.70	2.02	1.69	62	0.21	4.23	18.0	2.5	1.0	10.0	113	-	CLAY	VERY STIFF
20.80	10.60	12.80	8.80	10.63	12.20	8.90	2.03	1.71	55	0.18	4.38	18.0	2.7	1.1	9.0	119	-	CLAY	VERY STIFF
21.00	10.20	12.60	8.60	10.22	12.00	8.70	2.05	1.73	62	0.21	4.14	18.0	2.5	1.0	9.9	112	-	CLAY	VERY STIFF
21.20	10.00	12.20	8.20	10.03	11.60	8.30	2.07	1.75	55	0.19	4.00	18.0	2.4	1.0	8.5	108	-	CLAY	VERY STIFF
21.40	10.00	11.80	8.40	10.05	11.20	8.50	2.08	1.77	40	0.14	3.97	18.0	2.4	1.0	6.2	108	-	CLAY	VERY STIFF
21.60	9.60	11.60	7.80	9.64	11.00	7.90	2.10	1.79	47	0.17	3.74	18.0	2.2	0.9	7.1	101	-	CLAY	VERY STIFF
21.80	10.20	12.20	8.80	10.24	11.60	8.90	2.12	1.81	47	0.16	3.98	18.0	2.4	1.0	7.4	110	-	CLAY	VERY STIFF
22.00	10.20	12.20	8.80	10.24	11.60	8.90	2.13	1.83	47	0.16	3.94	18.0	2.3	1.0	7.3	110	-	CLAY	VERY STIFF
22.20	10.60	13.20	8.00	10.61	12.60	8.10	2.15	1.85	69	0.23	4.08	18.0	2.4	1.0	10.9	115	-	CLAY	VERY STIFF
22.40	10.40	13.00	8.40	10.41	12.40	8.50	2.17	1.87	69	0.23	3.94	18.0	2.3	1.0	10.7	111	-	CLAY	VERY STIFF
22.60	10.60	13.20	8.60	10.61	12.60	8.70	2.18	1.89	69	0.23	4.00	18.0	2.4	1.0	10.8	114	-	CLAY	VERY STIFF
22.80	11.20	13.80	8.20	11.21	13.20	8.30	2.20	1.91	69	0.21	4.23	18.0	2.6	1.0	11.2	123	-	CLAY	VERY STIFF
23.00	11.20	14.20	8.80	11.19	13.60	8.90	2.21	1.93	84	0.26	4.18	19.0	2.5	1.0	13.5	122	-	CLAY	VERY STIFF
23.20	10.60	13.80	8.00	10.58	13.20	8.10	2.23	1.95	91	0.30	3.87	19.0	2.3	1.0	13.9	112	-	CLAY	VERY STIFF
23.40	11.00	13.60	8.20	11.01	13.00	8.30	2.25	1.96	69	0.22	4.02	18.0	2.4	1.0	10.8	118	-	CLAY	VERY STIFF

Depth (m)	A (bar)	B (bar)	C (bar)	p0 (bar)	p1 (bar)	p2 (bar)	Sigma (bar)	u0 (bar)	ED (bar)	ID	KD	Gamma (kN/m3)	OCR	Ko	M (MPa)	Cu (kPa)	Phi (degrees)	Soil Description	Consistency
2.00	1.80	5.20	0.00	1.76	4.65	0.00	0.36	0.00	100	1.64	4.90	17.0	-	-	18.2	-	-	SANDY SILT	-
2.20	4.60	15.40	0.00	4.19	14.85	0.00	0.40	0.00	370	2.54	10.59	19.0	-	-	94.5	-	39.6	SILTY SAND	-
2.40	5.60	18.20	0.00	5.10	17.65	0.00	0.43	0.00	435	2.46	11.81	20.0	-	-	115.7	-	40.1	SILTY SAND	-
2.60	9.40	20.20	0.00	8.99	19.65	0.00	0.47	0.00	370	1.19	19.21	19.5	16.9	2.7	115.3	174	-	SILT	VERY STIFF
2.80	4.80	20.00	0.00	4.17	19.45	0.00	0.50	0.00	530	3.66	8.28	20.0	-	-	123.8	-	38.4	SAND	-
3.00	5.40	24.20	0.00	4.59	23.65	0.00	0.54	0.00	661	4.15	8.50	20.0	-	-	156.0	-	38.5	SAND	-
3.20	7.20	24.60	0.00	6.46	24.05	0.00	0.58	0.00	610	2.72	11.22	20.0	-	-	159.2	-	39.8	SILTY SAND	-
3.40	9.40	25.20	0.00	8.74	24.65	0.00	0.61	0.00	552	1.82	14.29	20.0	-	-	156.6	-	41.0	SILTY SAND	-
3.60	11.20	26.00	0.20	10.59	25.45	0.30	0.65	0.00	516	1.40	16.35	21.0	-	-	152.9	-	-	SANDY SILT	-
3.80	9.40	18.60	1.80	9.07	18.05	1.90	0.68	0.00	312	0.99	13.26	19.5	10.6	2.2	86.2	160	-	SILT	VERY STIFF
4.00	10.00	17.20	3.20	9.77	16.65	3.30	0.70	0.02	239	0.71	13.92	19.5	11.3	2.2	67.1	174	-	CLAYEY SILT	VERY STIFF
4.20	10.20	17.80	3.60	9.95	17.25	3.70	0.72	0.04	253	0.74	13.83	19.5	11.2	2.2	71.1	177	-	CLAYEY SILT	VERY STIFF
4.40	9.80	13.20	4.00	9.76	12.65	4.10	0.73	0.06	100	0.30	13.23	19.0	10.6	2.2	27.7	171	-	CLAY	VERY STIFF
4.60	9.20	12.80	4.60	9.15	12.25	4.70	0.75	0.08	107	0.34	12.11	19.0	9.5	2.1	28.8	157	-	SILTY CLAY	VERY STIFF
4.80	7.80	11.00	5.20	7.77	10.45	5.30	0.77	0.10	93	0.35	10.02	18.0	7.5	1.8	23.2	126	-	SILTY CLAY	VERY STIFF
5.00	8.40	13.00	3.00	8.30	12.45	3.10	0.78	0.12	144	0.51	10.46	19.0	7.9	1.9	36.6	136	-	SILTY CLAY	VERY STIFF
5.20	9.20	14.40	1.60	9.07	13.85	1.70	0.80	0.14	166	0.53	11.19	19.0	8.6	2.0	43.2	151	-	SILTY CLAY	VERY STIFF
5.40	8.80	13.00	3.80	8.72	12.45	3.90	0.82	0.16	129	0.44	10.51	19.0	8.0	1.9	32.9	143	-	SILTY CLAY	VERY STIFF
5.60	7.80	14.40	2.00	7.60	13.85	2.10	0.83	0.18	217	0.84	8.93	19.5	6.5	1.7	51.7	119	-	SILT	VERY STIFF
5.80	7.00	11.20	3.40	6.92	10.65	3.50	0.85	0.20	129	0.55	7.93	18.0	5.6	1.6	29.3	104	-	SILTY CLAY	VERY STIFF
6.00	7.60	11.20	3.80	7.55	10.65	3.90	0.86	0.22	107	0.42	8.49	18.0	6.1	1.7	25.1	116	-	SILTY CLAY	VERY STIFF
6.20	7.20	10.40	4.40	7.17	9.85	4.50	0.88	0.24	93	0.39	7.88	18.0	5.5	1.6	21.0	107	-	SILTY CLAY	VERY STIFF
6.40	9.00	13.20	3.80	8.92	12.65	3.90	0.90	0.25	129	0.43	9.66	19.0	7.2	1.8	31.9	141	-	SILTY CLAY	VERY STIFF
6.60	8.20	12.00	4.60	8.14	11.45	4.70	0.91	0.27	115	0.42	8.61	19.0	6.2	1.7	26.9	125	-	SILTY CLAY	VERY STIFF
6.80	8.00	13.00	4.20	7.88	12.45	4.30	0.93	0.29	158	0.60	8.16	19.0	5.8	1.6	36.3	119	-	CLAYEY SILT	VERY STIFF
7.00	8.00	11.40	5.00	7.96	10.85	5.10	0.95	0.31	100	0.38	8.08	18.0	5.7	1.6	22.9	119	-	SILTY CLAY	VERY STIFF
7.20	8.00	11.00	4.80	7.98	10.45	4.90	0.96	0.33	86	0.32	7.94	18.0	5.6	1.6	19.4	119	-	CLAY	VERY STIFF
7.40	7.20	10.20	4.20	7.18	9.65	4.30	0.98	0.35	86	0.36	6.97	18.0	4.8	1.5	18.2	103	-	SILTY CLAY	VERY STIFF
7.60	8.40	11.60	4.00	8.37	11.05	4.10	1.00	0.37	93	0.33	8.04	18.0	5.7	1.6	21.1	125	-	SILTY CLAY	VERY STIFF
7.80	9.60	14.60	2.40	9.48	14.05	2.50	1.01	0.39	158	0.50	8.98	19.0	6.5	1.7	37.9	146	-	SILTY CLAY	VERY STIFF
8.00	9.80	14.40	4.00	9.70	13.85	4.10	1.03	0.41	144	0.45	9.03	19.0	6.6	1.7	34.5	149	-	SILTY CLAY	VERY STIFF
8.20	8.00	12.20	4.00	7.92	11.65	4.10	1.04	0.43	129	0.50	7.17	19.0	4.9	1.5	27.9	113	-	SILTY CLAY	VERY STIFF
8.40	6.80	10.60	3.40	6.74	10.05	3.50	1.06	0.45	115	0.53	5.93	18.0	3.9	1.3	22.5	91	-	SILTY CLAY	STIFF
8.60	7.20	10.00	4.60	7.19	9.45	4.70	1.08	0.47	78	0.34	6.24	18.0	4.1	1.4	15.8	98	-	SILTY CLAY	STIFF
8.80	6.60	9.80	4.00	6.57	9.25	4.10	1.09	0.49	93	0.44	5.56	18.0	3.6	1.3	17.6	86	-	SILTY CLAY	STIFF
9.00	6.20	8.60	4.00	6.21	8.05	4.10	1.11	0.51	64	0.32	5.14	18.0	3.3	1.2	11.6	79	-	CLAY	STIFF
9.20	6.80	11.80	2.80	6.68	11.25	2.90	1.13	0.53	158	0.74	5.46	18.0	3.5	1.2	29.9	87	-	CLAYEY SILT	STIFF
9.40	6.20	10.00	2.80	6.14	9.45	2.90	1.14	0.55	115	0.59	4.89	18.0	3.1	1.1	20.3	77	-	SILTY CLAY	STIFF
9.60	10.40	21.00	2.60	10.00	20.45	2.70	1.16	0.57	363	1.11	8.14	19.5	5.8	1.6	83.2	147	-	SILT	VERY STIFF
9.80	6.60	10.20	2.60	6.55	9.65	2.70	1.18	0.59	107	0.52	5.07	18.0	3.2	1.2	19.4	83	-	SILTY CLAY	STIFF
10.00	6.20	10.40	1.20	6.12	9.85	1.30	1.19	0.61	129	0.68	4.63	18.0	2.9	1.1	22.2	75	-	CLAYEY SILT	STIFF
10.20	4.60	9.80	0.60	4.47	9.25	0.70	1.21	0.63	166	1.24	3.18	18.0	-	-	22.8	-	-	SANDY SILT	-
10.40	6.20	21.00	0.00	5.59	20.45	0.00	1.23	0.65	516	3.00	4.04	20.0	-	-	88.3	-	34.8	SILTY SAND	-
10.60	6.60	8.40	4.80	6.64	7.85	4.90	1.24	0.67	42	0.20	4.81	18.0	3.0	1.1	7.3	82	-	CLAY	STIFF

Depth (m)	A (bar)	B (bar)	C (bar)	p0 (bar)	p1 (bar)	p2 (bar)	Sigma (bar)	u0 (bar)	ED (bar)	ID	KD	Gamma (kN/m3)	OCR	Ko	M (MPa)	Cu (kPa)	Phi (degrees)	Soil Description	Consistency
10.80	8.80	12.40	4.20	8.75	11.85	4.30	1.26	0.69	107	0.38	6.41	19.0	4.3	1.4	22.0	119	-	SILTY CLAY	VERY STIFF
11.00	9.00	11.60	5.60	9.00	11.05	5.70	1.27	0.71	71	0.25	6.51	18.0	4.4	1.4	14.6	123	-	CLAY	VERY STIFF
11.20	9.00	12.40	5.40	8.96	11.85	5.50	1.29	0.73	100	0.35	6.38	19.0	4.3	1.4	20.4	121	-	SILTY CLAY	VERY STIFF
11.40	9.00	12.00	5.40	8.98	11.45	5.50	1.31	0.74	86	0.30	6.30	18.0	4.2	1.4	17.4	121	-	CLAY	VERY STIFF
11.60	8.80	12.60	6.20	8.74	12.05	6.30	1.32	0.76	115	0.41	6.03	19.0	4.0	1.3	22.7	116	-	SILTY CLAY	VERY STIFF
11.80	9.60	13.40	5.20	9.54	12.85	5.30	1.34	0.78	115	0.38	6.54	19.0	4.4	1.4	23.7	130	-	SILTY CLAY	VERY STIFF
12.00	9.40	12.80	6.40	9.36	12.25	6.50	1.36	0.80	100	0.34	6.31	19.0	4.2	1.4	20.3	125	-	SILTY CLAY	VERY STIFF
12.20	11.20	15.00	6.60	11.14	14.45	6.70	1.37	0.82	115	0.32	7.52	19.0	5.2	1.5	25.3	158	-	CLAY	VERY STIFF
12.40	10.60	13.40	6.20	10.59	12.85	6.30	1.39	0.84	78	0.23	7.02	19.0	4.8	1.5	16.7	147	-	CLAY	VERY STIFF
12.60	10.20	12.20	7.60	10.23	11.65	7.70	1.41	0.86	49	0.15	6.67	18.0	4.5	1.4	10.3	139	-	CLAY	VERY STIFF
12.80	9.00	12.60	4.60	8.95	12.05	4.70	1.42	0.88	107	0.38	5.68	19.0	3.7	1.3	20.6	115	-	SILTY CLAY	VERY STIFF
13.00	8.00	9.60	6.60	8.05	9.05	6.70	1.44	0.90	35	0.14	4.97	18.0	3.1	1.2	6.2	99	-	CLAY	STIFF
13.20	9.20	11.00	8.00	9.24	10.45	8.10	1.45	0.92	42	0.15	5.72	18.0	3.7	1.3	8.1	119	-	CLAY	VERY STIFF
13.40	9.00	11.00	7.60	9.03	10.45	7.70	1.47	0.94	49	0.18	5.50	18.0	3.5	1.2	9.3	115	-	CLAY	VERY STIFF
13.60	8.80	10.40	6.60	8.85	9.85	6.70	1.49	0.96	35	0.13	5.31	18.0	3.4	1.2	6.4	111	-	CLAY	VERY STIFF
13.80	7.80	11.40	5.60	7.75	10.85	5.70	1.50	0.98	107	0.46	4.50	18.0	2.8	1.1	18.1	91	-	SILTY CLAY	STIFF
14.00	9.00	11.80	7.20	8.99	11.25	7.30	1.52	1.00	78	0.28	5.26	18.0	3.3	1.2	14.4	112	-	CLAY	VERY STIFF
14.20	9.20	12.00	6.40	9.19	11.45	6.50	1.54	1.02	78	0.28	5.32	18.0	3.4	1.2	14.5	115	-	CLAY	VERY STIFF
14.40	9.60	11.00	7.80	9.66	10.45	7.90	1.55	1.04	27	0.09	5.55	17.0	3.6	1.2	5.2	122	-	CLAY	VERY STIFF
14.60	9.60	11.20	8.00	9.65	10.65	8.10	1.57	1.06	35	0.12	5.48	18.0	3.5	1.2	6.5	122	-	CLAY	VERY STIFF
14.80	9.60	11.00	8.20	9.66	10.45	8.30	1.59	1.08	27	0.09	5.41	17.0	3.5	1.2	5.1	121	-	CLAY	VERY STIFF
15.00	9.00	10.60	7.80	9.05	10.05	7.90	1.60	1.10	35	0.13	4.96	18.0	3.1	1.2	6.2	110	-	CLAY	VERY STIFF
15.20	9.60	11.40	7.80	9.64	10.85	7.90	1.62	1.12	42	0.14	5.27	18.0	3.4	1.2	7.7	119	-	CLAY	VERY STIFF
15.40	9.60	11.60	8.00	9.63	11.05	8.10	1.64	1.14	49	0.17	5.20	18.0	3.3	1.2	9.0	119	-	CLAY	VERY STIFF
15.60	9.40	11.40	8.00	9.43	10.85	8.10	1.65	1.16	49	0.17	5.01	18.0	3.2	1.2	8.8	115	-	CLAY	VERY STIFF
15.80	9.40	11.20	8.00	9.44	10.65	8.10	1.67	1.18	42	0.15	4.96	18.0	3.1	1.2	7.5	114	-	CLAY	VERY STIFF
16.00	8.20	10.00	7.40	8.24	9.45	7.50	1.68	1.20	42	0.17	4.18	18.0	2.5	1.0	6.7	93	-	CLAY	STIFF
16.20	8.20	9.60	7.40	8.26	9.05	7.50	1.70	1.22	27	0.11	4.14	18.0	2.5	1.0	4.4	93	-	CLAY	STIFF
16.40	9.00	10.20	7.40	9.07	9.65	7.50	1.72	1.23	20	0.07	4.56	17.0	2.8	1.1	3.4	106	-	CLAY	VERY STIFF
16.60	9.60	11.60	7.60	9.63	11.05	7.70	1.73	1.25	49	0.17	4.83	18.0	3.0	1.1	8.6	115	-	CLAY	VERY STIFF
16.80	9.60	11.60	8.20	9.63	11.05	8.30	1.75	1.27	49	0.17	4.78	18.0	3.0	1.1	8.6	114	-	CLAY	VERY STIFF
17.00	9.60	12.80	7.80	9.57	12.25	7.90	1.77	1.29	93	0.32	4.69	18.0	2.9	1.1	16.0	113	-	CLAY	VERY STIFF
17.20	9.80	11.60	8.20	9.84	11.05	8.30	1.78	1.31	42	0.14	4.78	18.0	3.0	1.1	7.3	117	-	CLAY	VERY STIFF
17.40	9.80	12.20	8.20	9.81	11.65	8.30	1.80	1.33	64	0.22	4.71	18.0	2.9	1.1	11.0	116	-	CLAY	VERY STIFF
17.60	9.20	10.60	8.00	9.26	10.05	8.10	1.82	1.35	27	0.10	4.36	17.0	2.6	1.1	4.5	106	-	CLAY	VERY STIFF
17.80	9.00	10.40	8.00	9.06	9.85	8.10	1.83	1.37	27	0.10	4.20	17.0	2.5	1.0	4.4	102	-	CLAY	VERY STIFF
18.00	9.00	10.20	8.00	9.07	9.65	8.10	1.85	1.39	20	0.08	4.16	17.0	2.5	1.0	3.2	101	-	CLAY	VERY STIFF
18.20	9.80	11.60	8.20	9.84	11.05	8.30	1.86	1.41	42	0.14	4.52	18.0	2.8	1.1	7.1	114	-	CLAY	VERY STIFF
18.40	9.60	12.20	8.20	9.60	11.65	8.30	1.88	1.43	71	0.25	4.34	18.0	2.6	1.0	11.7	109	-	CLAY	VERY STIFF
18.60	10.20	13.20	8.00	10.18	12.65	8.10	1.90	1.45	86	0.28	4.60	18.0	2.8	1.1	14.6	118	-	CLAY	VERY STIFF
18.80	10.00	13.00	8.40	9.98	12.45	8.50	1.91	1.47	86	0.29	4.45	18.0	2.7	1.1	14.3	114	-	CLAY	VERY STIFF
19.00	10.00	12.00	8.40	10.03	11.45	8.50	1.93	1.49	49	0.17	4.43	18.0	2.7	1.1	8.2	115	-	CLAY	VERY STIFF
19.20	10.00	12.00	8.20	10.03	11.45	8.30	1.95	1.51	49	0.17	4.38	18.0	2.7	1.1	8.1	114	-	CLAY	VERY STIFF
19.40	10.00	12.00	8.40	10.03	11.45	8.50	1.96	1.53	49	0.17	4.33	18.0	2.6	1.0	8.1	113	-	CLAY	VERY STIFF

Depth (m)	A (bar)	B (bar)	C (bar)	p0 (bar)	p1 (bar)	p2 (bar)	Sigma (bar)	u0 (bar)	ED (bar)	ID	KD	Gamma (kN/m3)	OCR	Ko	M (MPa)	Cu (kPa)	Phi (degrees)	Soil Description	Consistency
19.60	10.00	12.00	8.00	10.03	11.45	8.10	1.98	1.55	49	0.17	4.29	18.0	2.6	1.0	8.0	113	-	CLAY	VERY STIFF
19.80	10.20	12.00	8.40	10.24	11.45	8.50	2.00	1.57	42	0.14	4.35	18.0	2.6	1.0	6.9	116	-	CLAY	VERY STIFF
20.00	11.40	21.00	4.60	11.05	20.45	4.70	2.01	1.59	326	0.99	4.70	19.5	2.9	1.1	56.9	129	-	SILT	VERY STIFF
20.20	10.00	15.40	4.20	9.86	14.85	4.30	2.03	1.61	173	0.60	4.07	19.5	2.4	1.0	27.3	108	-	CLAYEY SILT	VERY STIFF
20.40	11.20	13.00	8.40	11.24	12.45	8.50	2.05	1.63	42	0.13	4.70	18.0	2.9	1.1	7.2	131	-	CLAY	VERY STIFF
20.60	12.00	15.20	7.40	11.97	14.65	7.50	2.06	1.65	93	0.26	5.01	19.0	3.2	1.2	16.6	143	-	CLAY	VERY STIFF
20.80	11.00	12.20	9.20	11.07	11.65	9.30	2.08	1.67	20	0.06	4.53	17.0	2.8	1.1	3.4	127	-	CLAY	VERY STIFF
21.00	11.80	13.00	9.60	11.87	12.45	9.70	2.09	1.69	20	0.06	4.86	17.0	3.0	1.1	3.5	140	-	CLAY	VERY STIFF
21.20	9.80	11.60	8.20	9.84	11.05	8.30	2.11	1.71	42	0.15	3.86	18.0	2.3	1.0	6.4	105	-	CLAY	VERY STIFF
21.40	11.60	13.60	8.60	11.63	13.05	8.70	2.13	1.72	49	0.14	4.66	18.0	2.9	1.1	8.4	135	-	CLAY	VERY STIFF
21.60	11.00	13.60	8.00	11.00	13.05	8.10	2.14	1.74	71	0.22	4.32	18.0	2.6	1.0	11.6	123	-	CLAY	VERY STIFF
21.80	10.20	13.40	6.60	10.17	12.85	6.70	2.16	1.76	93	0.32	3.89	18.0	2.3	1.0	14.2	109	-	CLAY	VERY STIFF

APPENDIX G

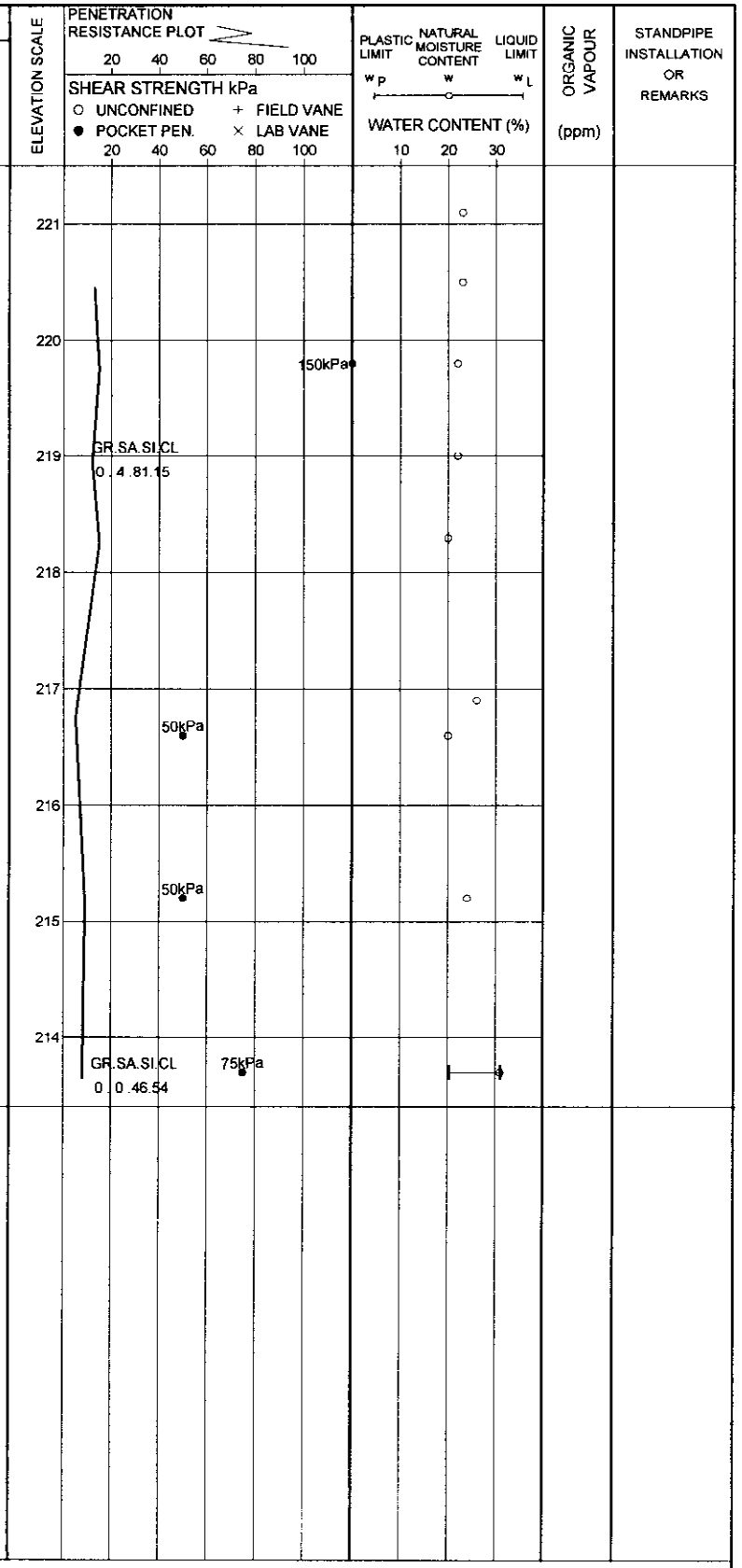
BOREHOLE LOGS BY OTHERS

Terraprobe

LOG OF BOREHOLE 1

PROJECT: Proposed Residential Subdivision
DATE: 26 February 2007
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
EQUIPMENT: Solid Stem Augers
CLIENT: First Urban Inc.
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
221.5	Ground Surface				
0.0 / 221.2	300mm TOPSOIL				
0.3 / 220.5	Weathered / Disturbed trace organics		1	AS	
1.0 / 219.2	CLAYEY SILT TO SILTY CLAY trace to some sand, stiff, brown, moist		2	SS	13
			3	SS	15
2.3 / 216.8	SILT - Dilatant, trace to some clay, trace to some sand, compact, brown, very moist to wet		4	SS	12
			5	SS	15
4.7 / 213.4	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm to stiff, brownish grey, moist to wet		6	SS	5
			7	SS	9
			8	SS	8
8.1	End of Borehole				



STANDPIPE INSTALLATION OR REMARKS

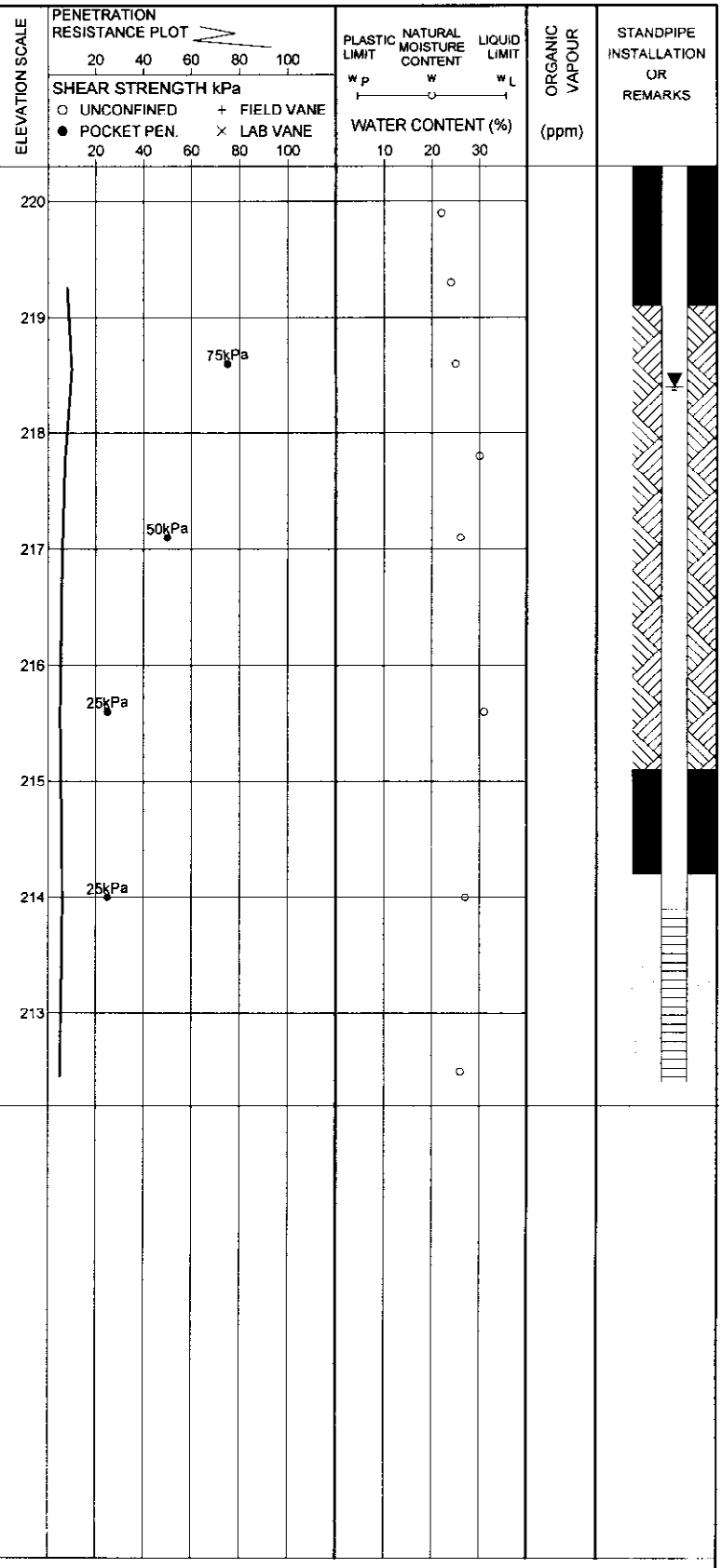
NOTES:
Borehole was open and wet at base upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 2

PROJECT: Proposed Residential Subdivision
DATE: 26 February 2007
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
EQUIPMENT: Solid Stem Augers
CLIENT: First Urban Inc.
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
220.3	Ground Surface				
0.0 / 220.0	300mm TOPSOIL				
0.3 / 219.5	Weathered / Disturbed trace organics		1	AS	
0.8	SILT some clay TO CLAYEY SILT trace to some sand, loose to compact / firm to stiff, brown, moist to very moist		2	SS	8
			3	SS	10
			4	SS	7
217.3					
3.0	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm, brownish grey, moist to very moist		5	SS	6
			6	SS	5
			7	SS	6
212.7					
7.6 / 212.2	SILT - Dilatant, trace to some clay, trace to some sand, loose, brown, wet		8	SS	5
8.1	End of Borehole				



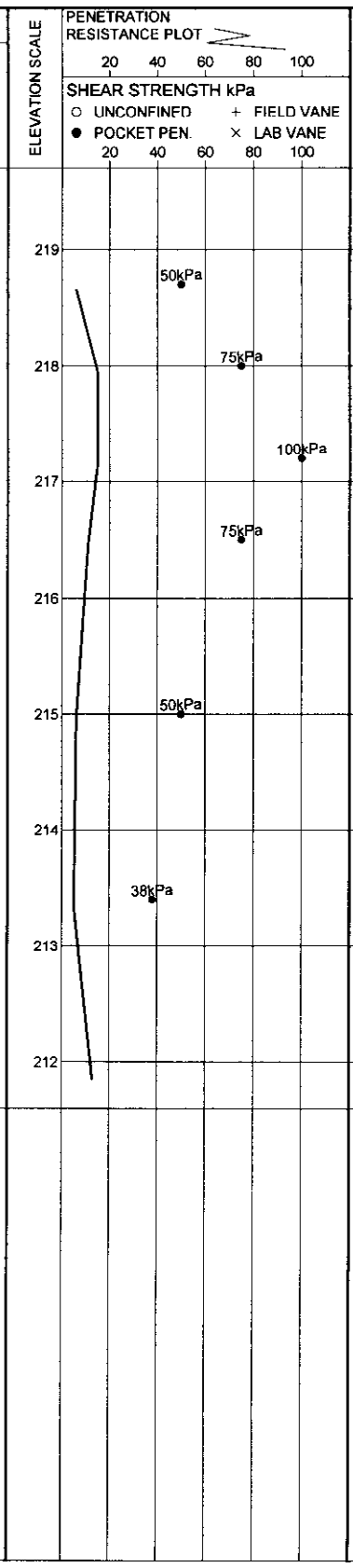
NOTES:
Borehole was open and dry upon completion of drilling. Water level in piezometer at 1.9m below grade on April 9, 2007.

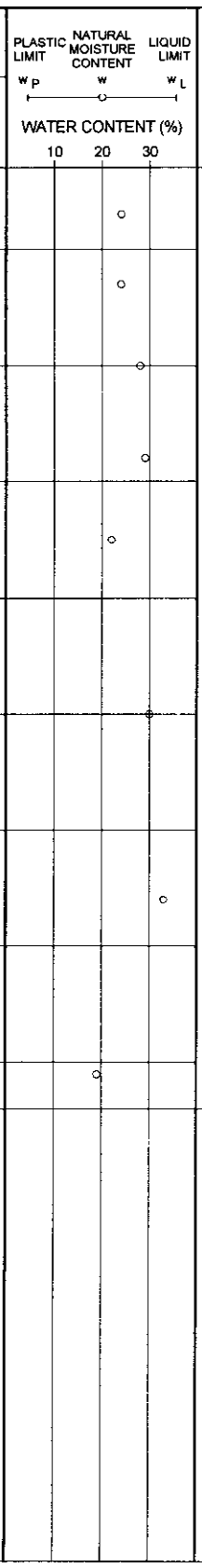
Terraprobe

LOG OF BOREHOLE 3

PROJECT: Proposed Residential Subdivision
DATE: 27 February 2007
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
EQUIPMENT: Solid Stem Augers
CLIENT: First Urban Inc.
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: 'N' VALUES
219.7	Ground Surface				
0.0 / 219.4	300mm TOPSOIL				
0.3 / 218.8	Weathered / Disturbed trace organics		1	AS	
0.9 / 216.7	SILT some clay TO CLAYEY SILT trace to some sand, loose to compact / firm to stiff, brown, moist to very moist		2	SS	6
			3	SS	15
			4	SS	15
3.0 / 212.1	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm to stiff, brownish grey, moist to wet		5	SS	11
			6	SS	6
			7	SS	5
7.6 / 211.6	SILT - Dilatant, trace to some clay, trace to some sand, compact, brown, very moist to wet		8	SS	13
8.1	End of Borehole				





ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and wet at base upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 4

PROJECT: Proposed Residential Subdivision
DATE: 26 February 2007
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
EQUIPMENT: Solid Stem Augers
CLIENT: First Urban Inc.
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES
221.0	Ground Surface			
220.8 / 0.2	200mm TOPSOIL			
	Weathered / Disturbed trace organics	1	AS	
220.2 / 0.8	SILT - Dilatant, trace to some clay, trace to some sand, loose, brown, wet	2	SS	6
		3	SS	5
218.7 / 2.3	SILT - some clay TO CLAYEY SILT trace to some sand, compact / stiff to very stiff, brown, very moist to wet	4	SS	10
		5	SS	20
216.5 / 4.5	---- sand, wet			
	SILTY CLAY trace sand, TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses) soft to stiff, brownish grey, moist to wet	6	SS	9
		7	SS	5
212.9 / 8.1	End of Borehole	8	SS	3

PENETRATION RESISTANCE PLOT
SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

GR.SA.SI.CL
0 . 3 .79.18
50kPa
38kPa
25kPa

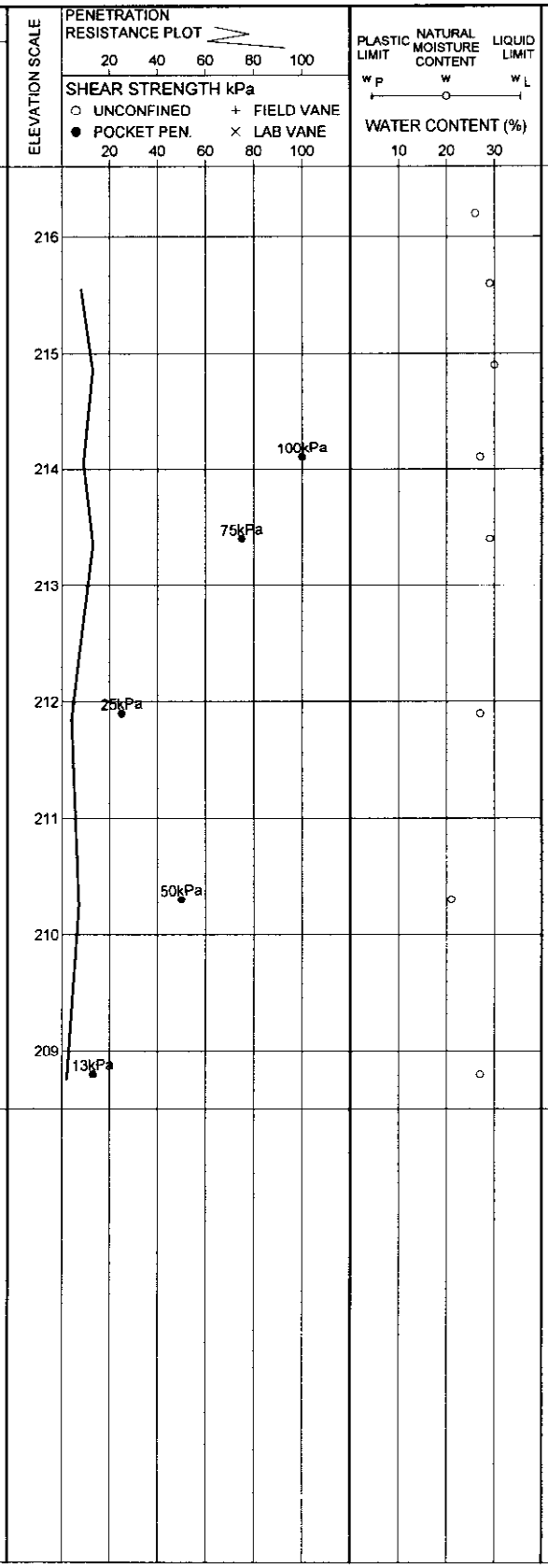
NOTES:
Borehole was open and water level at 7.8m upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 5

PROJECT: Proposed Residential Subdivision
DATE: 26 February 2007
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
EQUIPMENT: Solid Stem Augers
CLIENT: First Urban Inc.
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
216.6	Ground Surface				
0.0 / 216.3	300mm TOPSOIL				
0.3 / 215.7	Weathered / Disturbed trace organics		1	AS	
0.9 / 214.3	SILT - some clay TO CLAYEY SILT trace to some sand, (with fine sand seams), loose to compact / firm to stiff, brown, moist to wet		2	SS	8
			3	SS	13
2.3	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), very soft to stiff, brownish grey, moist to very moist		4	SS	9
			5	SS	13
	---- brownish grey at 3.0m		6	SS	4
			7	SS	7
208.5			8	SS	2
8.1	End of Borehole				



ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and wet at base upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 6

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 19 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
216.3	Ground Surface				
0.0 / 216.0	350mm TOPSOIL		1	AS	
0.4 / 215.5	Weathered / Disturbed trace organics				
0.8	CLAYEY SILT TO SILTY CLAY trace to some sand, stiff to very stiff, brown, moist to very moist		2	SS	10
			3	SS	17
			4	SS	11
			5	SS	13
211.8					
4.5	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm to stiff, brownish grey, moist to very moist		6	SS	9
	---- dilatant silt		7	SS	13
208.2			8	SS	6
8.1	End of Borehole				

ELEVATION SCALE

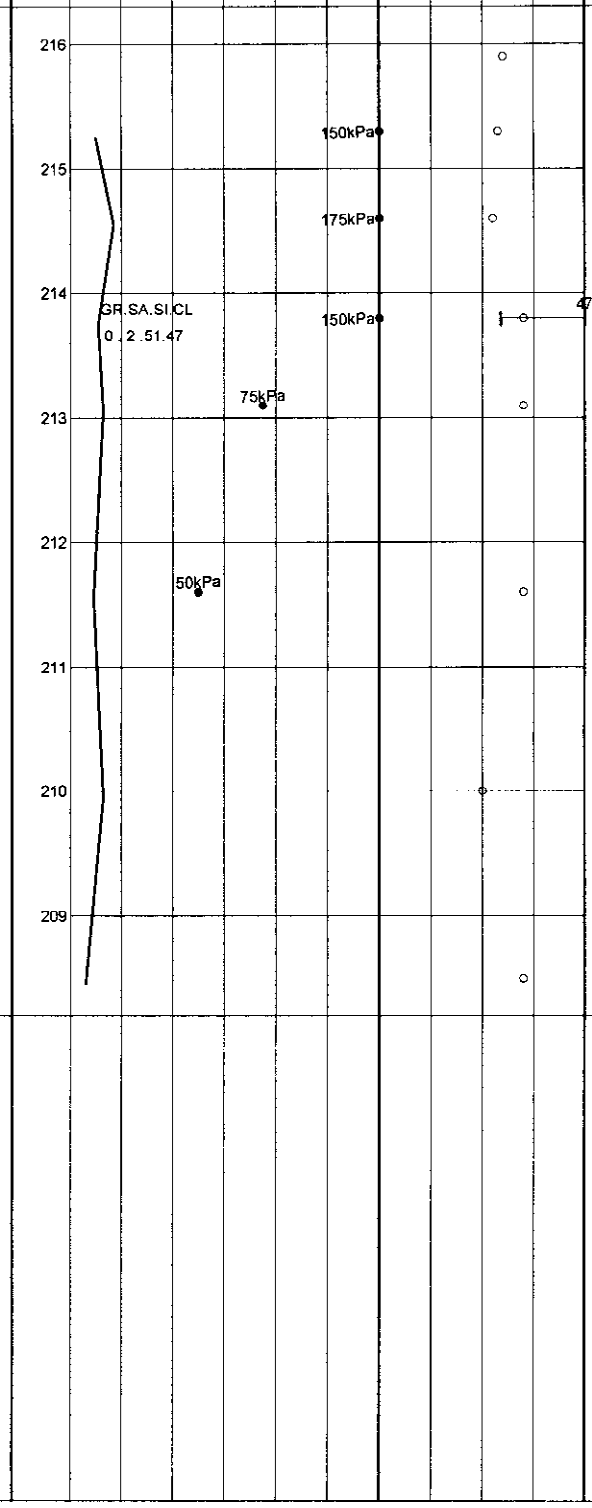
PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS



NOTES:
Borehole was open and dry upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 7

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.
DATE: 27 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
216.3	Ground Surface				
0.0 / 216.0	300mm TOPSOIL		1	AS	
0.3	SILT - Disturbed / Reworked, trace to some sand and clay, trace organics, very loose, brown, moist to wet		2	SS	3
214.8					
1.5	---- dilatant silt, wet CLAYEY SILT TO SILTY CLAY trace to some sand, firm to stiff, brown, moist to wet		3	SS	10
			4	SS	8
212.9			5	SS	5
3.4	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm, brownish grey, moist to very moist				
211.7			6	SS	7
4.6	SILT - Dilatant, trace to some clay, trace to some sand, loose, brown, wet				
210.2			7	SS	5
6.1	SILTY CLAY trace sand, TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses) firm, brownish grey, very moist				
208.2			8	SS	6
8.1	End of Borehole				

ELEVATION SCALE: 216, 215, 214, 213, 212, 211, 210, 209

PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100
150kPa
125kPa
50kPa
38kPa
25kPa
25kPa

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and dry upon completion of drilling. Water level in piezometer at 0.9m below grade on April 9, 2007.

Terraprobe

LOG OF BOREHOLE 8

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 27 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
220.8	Ground Surface				
0.0 / 220.5	300mm TOPSOIL				
0.3 / 220.0	Weathered / Disturbed trace organics		1	AS	
0.8	SILT trace to some clay, trace to some sand, compact, brown, very moist to wet		2	SS	11
			3	SS	11
	---- dilatant		4	SS	26
	---- dilatant, grey, wet		5	SS	10
216.3					
4.5	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm to stiff, brownish grey, moist to very moist		6	SS	6
			7	SS	10
212.7			8	SS	5
8.1	End of Borehole				

ELEVATION SCALE: 220, 219, 218, 217, 216, 215, 214, 213

PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100
50kPa
88kPa
38kPa

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and wet at base upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 9

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 23 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

SOIL PROFILE			SAMPLES			ELEVATION SCALE	PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT / WATER CONTENT (%)	ORGANIC VAPOUR (ppm)	STANDPIPE INSTALLATION OR REMARKS
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		○ UNCONFINED ● POCKET PEN. + FIELD VANE × LAB VANE	w_P w w_L		
221.9	Ground Surface									
0.0 / 221.6	300mm TOPSOIL		1	AS						
0.3 / 220.4	SILT - Disturbed / Reworked, trace to some sand and clay, trace organics, very loose, brown, moist to wet		2	SS	1	221				
1.5 / 217.4	SILT - Dilatant, trace to some clay, trace to some sand, compact, brown, very moist to wet ---- dilatant		3	SS	17	220				
			4	SS	15		CR.SA.SI.CL 0 : 4 .83.13			
			5	SS	15	219				
4.5	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm to stiff, brownish grey, moist to very moist		6	SS	7	218	75kPa			▽
			7	SS	9	217				
213.8			8	SS	7	216	50kPa			
8.1	End of Borehole					215				
						214	50kPa			

NOTES:
Borehole was open and water level at 4.6m upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 10

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 26 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
211.1	Ground Surface				
0.0 / 210.5	600mm TOPSOIL		1	AS	
0.6 / 209.6	SILT - Disturbed / Reworked, trace to some sand and clay, trace organics, loose, brown, very moist to wet		2	SS	9
1.5 / 208.5	SILT - some clay TO CLAYEY SILT trace to some sand, loose to compact / firm to stiff, brown, moist to wet		3	SS	12
			4	SS	7
2.6 / 205.0	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm to stiff, brownish grey, moist to very moist		5	SS	10
			6	SS	6
6.1 / 203.0	CLAYEY SILT trace sand, with dilatant silt layers, soft to stiff, grey, wet		7	SS	13
			8	SS	3
8.1	End of Borehole				

ELEVATION SCALE: 211, 210, 209, 208, 207, 206, 205, 204, 203

PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100
50kPa
50kPa
38kPa

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

GR SA SI CL
0 6 62 32

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and dry upon completion of drilling. Water level in piezometer at 0.3m above grade (frozen) on April 9, 2007.

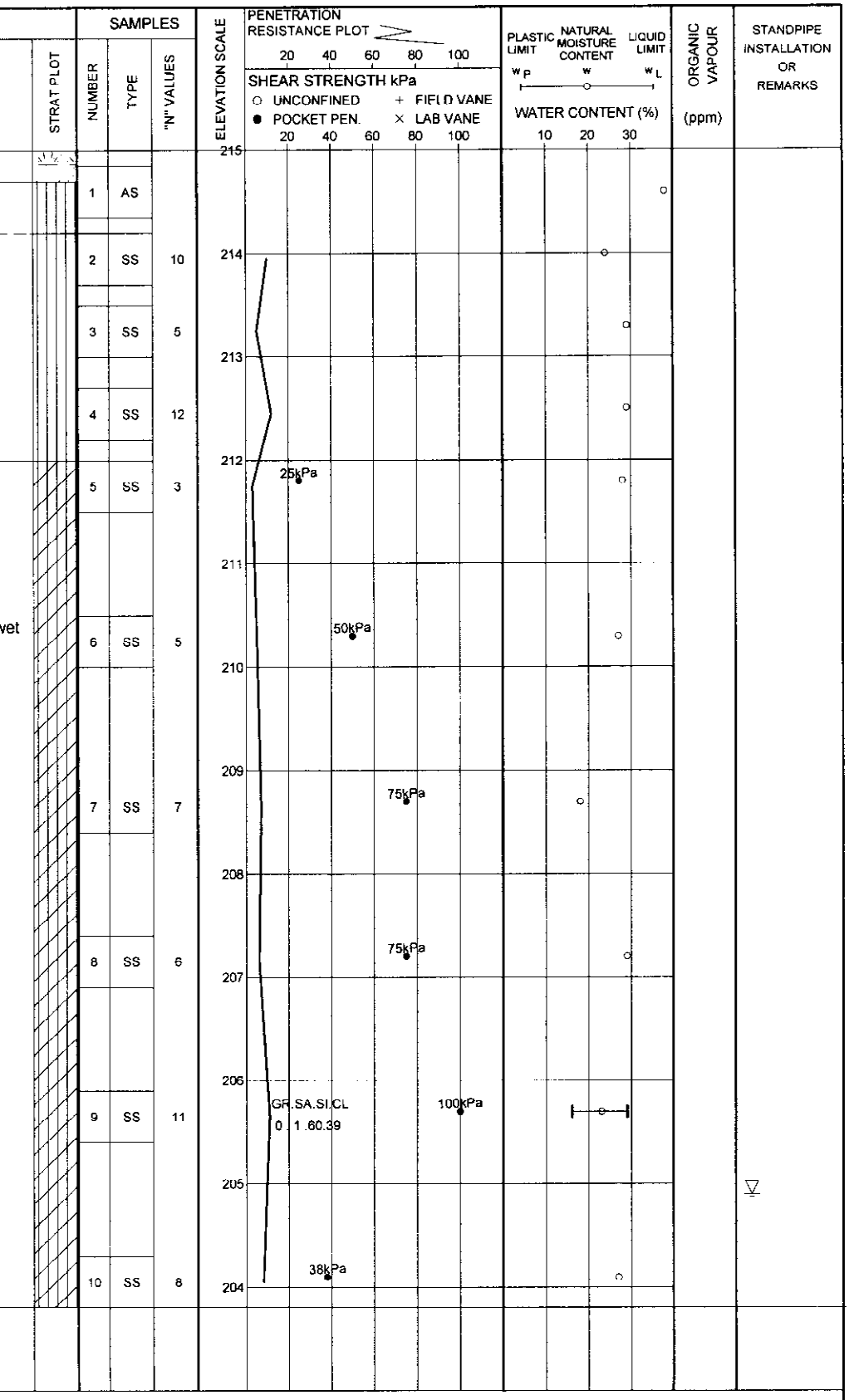
Terraprobe

LOG OF BOREHOLE 11

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 23 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES
215.0	Ground Surface			
0.0 / 214.7	300mm TOPSOIL			
0.3 / 214.2	Weathered / Disturbed trace organics	1	AS	
0.6	SILT trace to some clay, trace to some sand, loose to compact, brown, very moist to wet	2	SS	10
		3	SS	5
		4	SS	12
212.0				
3.0	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), soft to stiff, brownish grey, moist to wet	5	SS	3
		6	SS	5
		7	SS	7
		8	SS	6
		9	SS	11
203.8		10	SS	8
11.2	End of Borehole			



NOTES:
Borehole was open and water level at 10.1m upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 12

PROJECT: Proposed Residential Subdivision
DATE: 20 February 2007
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
EQUIPMENT: Solid Stem Augers
CLIENT: First Urban Inc.
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES
221.3	Ground Surface				
0.0 / 221.0	300mm TOPSOIL		1	AS	
0.3 / 220.5	Weathered / Disturbed trace organics		2	SS	8
0.8	SILT - Dilatant, trace to some clay, trace to some sand, with clay seams, loose to compact, brown, very moist to wet		3	SS	13
			4	SS	22
			5	SS	21
216.8					
4.5	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm to stiff, brownish grey, moist to wet		6	SS	9
			7	SS	8
213.2			8	SS	9
8.1	End of Borehole				

ELEVATION SCALE: 221, 220, 219, 218, 217, 216, 215, 214

PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100

50kPa
50kPa
50kPa

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L

WATER CONTENT (%)
10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and wet at base upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 13

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 20 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES
221.0	Ground Surface			
0.0 / 220.7	350mm TOPSOIL	1	AS	
0.4 / 220.2	Weathered / Disturbed trace organics			
0.8	SILT trace to some clay, trace to some sand, loose to compact, brown, moist to wet	2	SS	11
		3	SS	7
		4	SS	18
218.0				
3.0	CLAYEY SILT TO SILTY CLAY trace to some sand, stiff to very stiff, brown, moist	5	SS	16
		6	SS	12
214.9				
6.1	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), stiff, brownish grey, moist to very moist	7	SS	10
		8	SS	11
212.9				
9.1	End of Borehole			

PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● POCKET PEN. × LAB VANE
ELEVATION SCALE: 221 220 219 218 217 216 215 214 213
125kPa 63kPa 38kPa 75kPa

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%): 10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

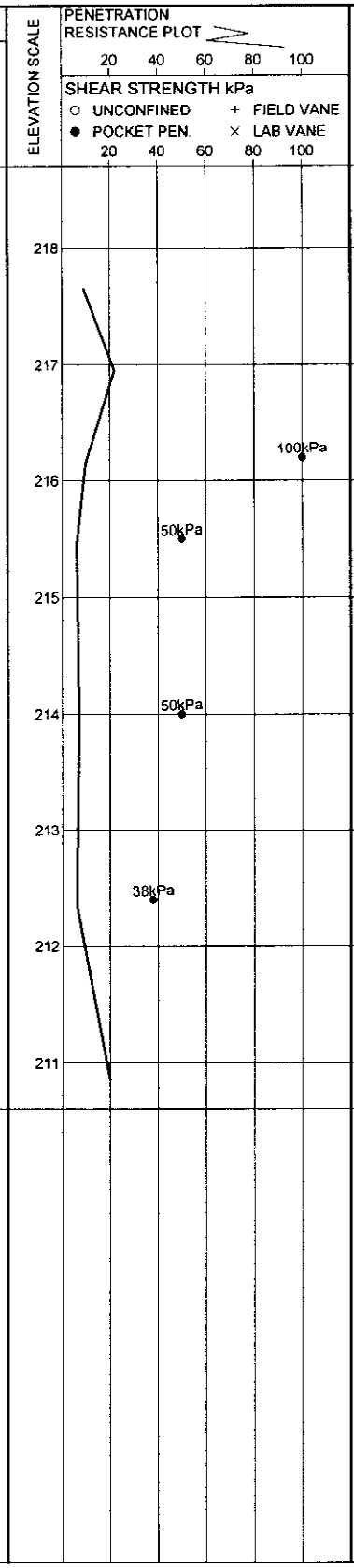
NOTES:
Borehole was open and dry upon completion of drilling. Water level in piezometer at 0.9m below grade on April 9, 2007.

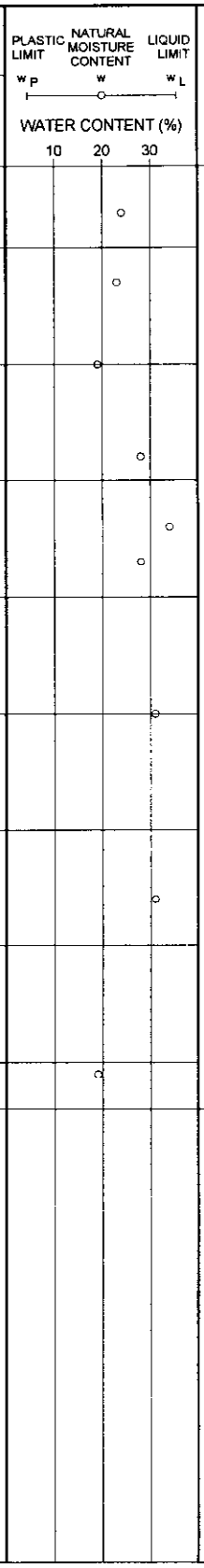
Terraprobe

LOG OF BOREHOLE 14

PROJECT: Proposed Residential Subdivision
DATE: 19 February 2007
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
EQUIPMENT: Solid Stem Augers
CLIENT: First Urban Inc.
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES
218.7	Ground Surface			
0.0 / 218.4	350mm TOPSOIL	1	AS	
0.4 / 217.8	Weathered / Disturbed trace organics	2	SS	9
0.9	SILT - trace to some clay, trace to some sand, loose to compact, brown, moist to very moist	3	SS	22
216.4				
2.3	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm to stiff, brown, moist to wet	4	SS	10
	---- brownish grey at 3.2m	5	SS	6
		6	SS	7
		7	SS	6
211.1				
7.6 / 210.6	SILT - Dilatant, trace to some clay, trace to some sand, compact, grey, wet	8	SS	20
8.1	End of Borehole			





ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and dry upon completion of drilling.

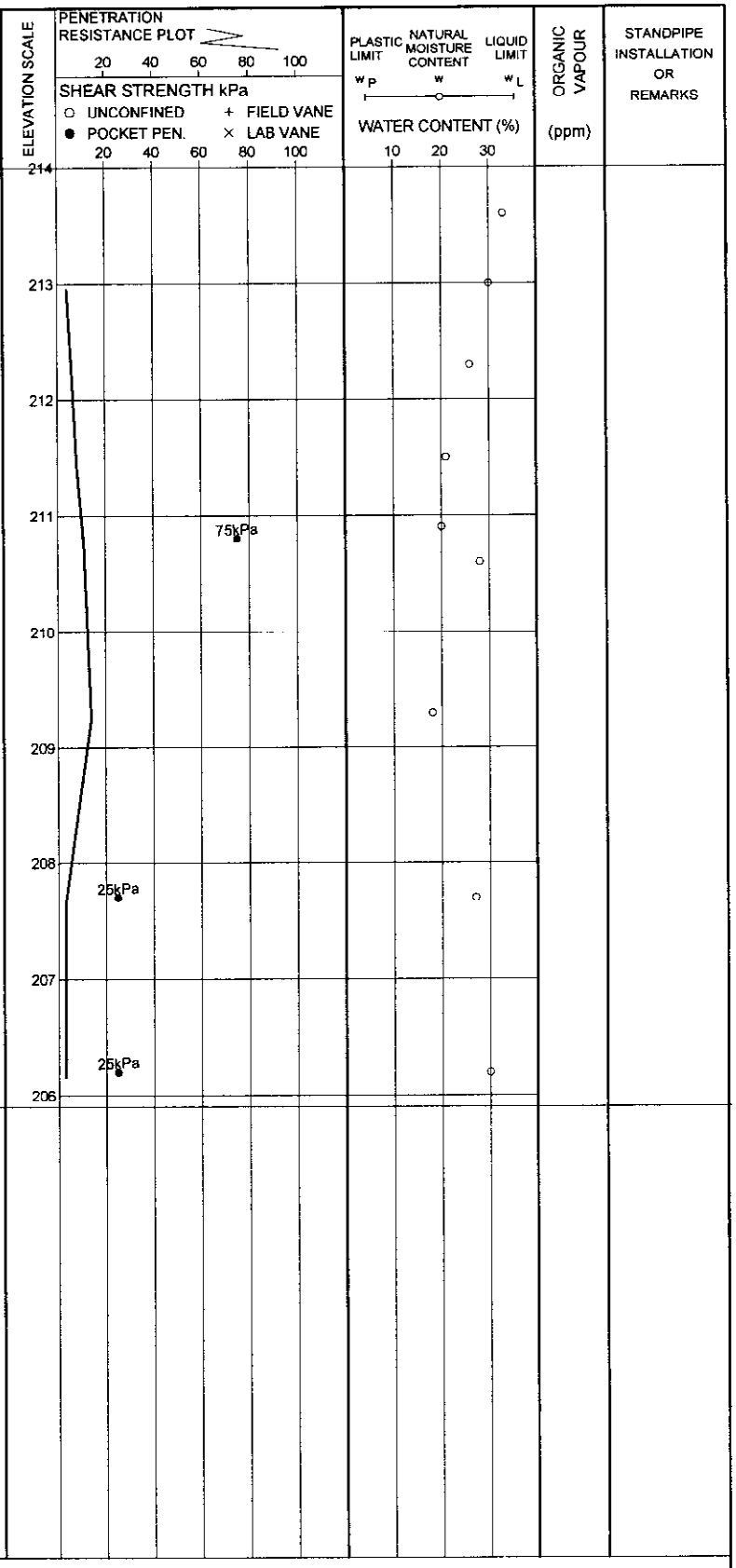
Terraprobe

LOG OF BOREHOLE 15

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 19 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
214.0	Ground Surface				
0.0 / 213.7	350mm TOPSOIL		1	AS	
0.4 / 212.4	FILL - Silt to Clayey Silt, trace to some sand, trace organics, trace topsoil, loose, brown, very moist to wet		2	SS	4
1.6 / 211.0	SILT trace to some clay, trace to some sand, loose, brown, very moist to wet		3	SS	6
			4	SS	8
3.0 / 209.5	CLAYEY SILT TO SILTY CLAY trace to some sand, stiff, brown, moist		5	SS	11
4.5 / 207.9	SILT - Dilatant, trace to some clay, trace to some sand, compact, grey, very moist to wet		6	SS	14
6.1 / 205.9	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), soft, brownish grey, moist to wet		7	SS	3
			8	SS	3
8.1	End of Borehole				



ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and wet at base upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 16

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 19 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
216.0	Ground Surface				
215.8 / 0.2	150mm FILL - Silty Sand and Gravel		1	AS	
	FILL - Clayey to Sandy Silt, trace to some gravel, trace organics, brick pieces, firm to stiff, brown, moist		2	SS	4
			3	SS	9
	---- asphalt, cinders at 2.3m		4	SS	5
212.8 / 3.2	CLAYEY SILT TO SILTY CLAY trace to some sand, firm to stiff, brown, very moist		5	SS	8
			6	SS	11
			7	SS	7
208.4 / 7.6	SILT - Dilatant, trace to some clay, trace to some sand, loose, grey, wet		8	SS	9
207.9 / 8.1	End of Borehole				

ELEVATION SCALE: 216, 215, 214, 213, 212, 211, 210, 209, 208

PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100

100kPa
125kPa
100kPa

GR SA SI CL
0 2 69 29

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L

WATER CONTENT (%)
10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and dry upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 17

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 19 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES
213.8	Ground Surface				
0.0 / 213.5	300mm TOPSOIL		1	AS	
0.3	FILL - Silt to Clayey Silt, trace to some sand, trace gravel, trace organics, trace topsoil soft to stiff, brown, moist to wet		2	SS	9
			3	SS	3
211.5					
2.3	SILT - Dilatant, trace to some clay, trace to some sand, loose, brown, very moist to wet		4	SS	8
			5	SS	9
	---- wet at 4.6m		6	SS	9
	---- brownish grey at 4.7m				
207.7					
6.1	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), soft to firm, grey, moist to very moist		7	SS	4
			8	SS	7
205.7					
8.1	End of Borehole				

ELEVATION SCALE: 213, 212, 211, 210, 209, 208, 207, 206

PENETRATION RESISTANCE PLOT
20 40 60 80 100
SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100

GR SA SI CL
0 1 82 17

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and wet at base upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 18

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 21 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES
220.4	Ground Surface			
0.0 / 220.1	300mm TOPSOIL			
0.3 / 219.6	Weathered / Disturbed trace organics	1	AS	
0.8 / 218.9	SILT - some clay TO CLAYEY SILT - trace to some sand, loose to compact / stiff, brown, very moist	2	SS	13
1.5 / 215.9	SILT trace to some clay, trace to some sand, compact, brown, very moist to wet	3	SS	22
		4	SS	25
		5	SS	13
4.5 / 212.3	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm, brownish grey, very moist	6	SS	6
		7	SS	5
		8	SS	4
8.1	End of Borehole			

PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
100kPa
50kPa
38kPa
25kPa

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%): 10 20 30

ELEVATION SCALE: 220 219 218 217 216 215 214 213

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and wet at base upon completion of drilling. Water level in piezometer at 1.3m below grade on April 9, 2007.

Terraprobe

LOG OF BOREHOLE 19

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 20 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES
220.9	Ground Surface				
0.0 / 220.6	300mm TOPSOIL		1	AS	
0.3 / 220.1	Weathered / Disturbed trace organics				
0.8 / 219.4	CLAYEY SILT TO SILTY CLAY trace to some sand, very stiff, brown, moist		2	SS	12
1.5	SILT trace to some clay, trace to some sand, compact, brown, very moist to wet		3	SS	13
			4	SS	17
217.6	---- dilatant at 3.0m		5	SS	12
3.3	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm, brown, moist to wet		6	SS	5
	---- brownish grey at 4.6m		7	SS	7
212.8			8	SS	6
8.1	End of Borehole				

ELEVATION SCALE: 220, 219, 218, 217, 216, 215, 214, 213

PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100
100kPa
38kPa
38kPa

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

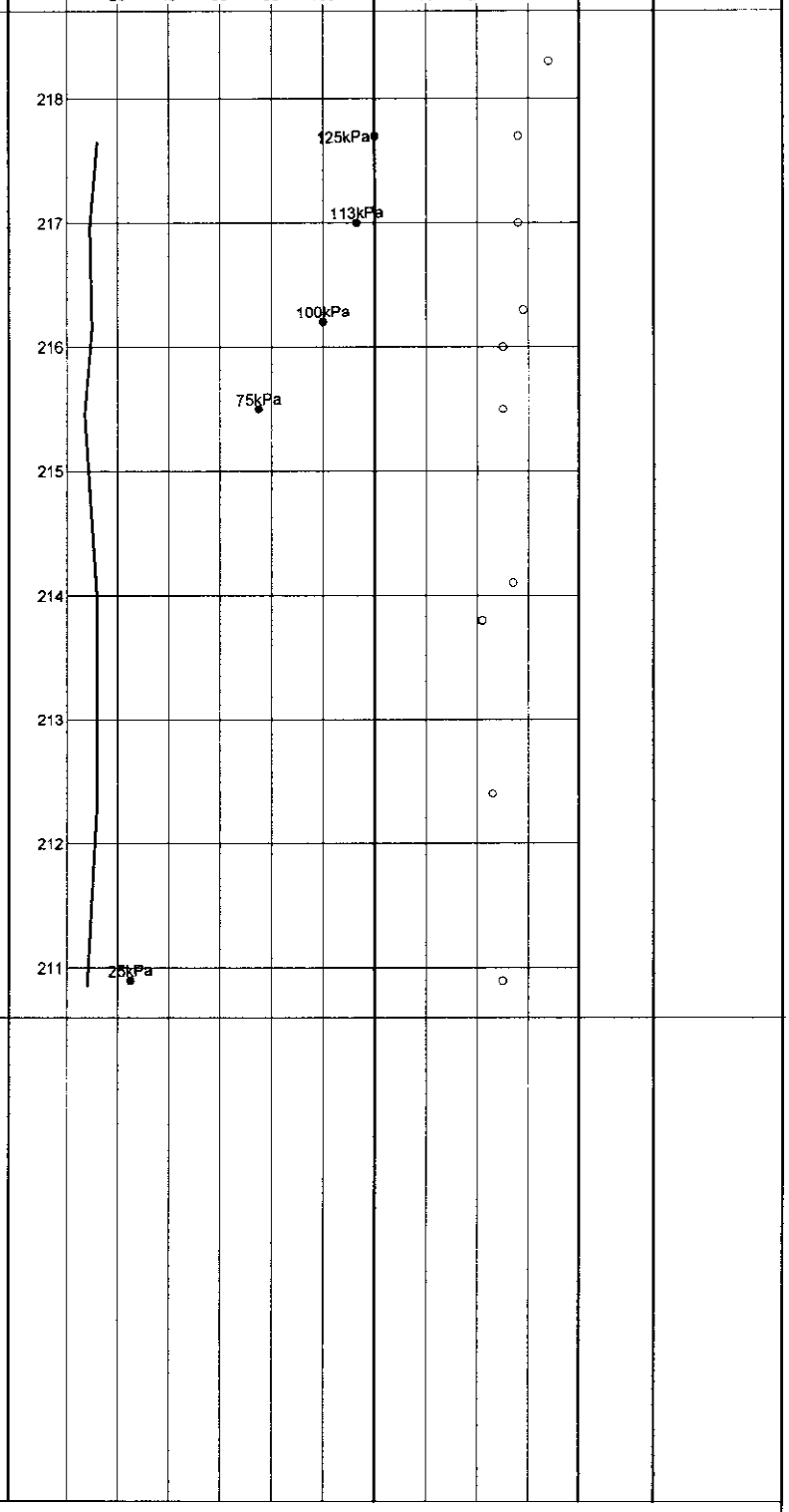
NOTES:
Borehole was open and wet at base upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 20

PROJECT: Proposed Residential Subdivision
DATE: 20 February 2007
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
EQUIPMENT: Solid Stem Augers
CLIENT: First Urban Inc.
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES
218.7	Ground Surface				
0.0 / 218.4	300mm TOPSOIL				
0.3 / 217.9	Weathered / Disturbed trace organics		1	AS	
0.8	CLAYEY SILT TO SILTY CLAY trace to some sand, firm to stiff, brown, moist		2	SS	12
			3	SS	9
			4	SS	10
			5	SS	7
214.2					
4.5	SILT - Dilatant, trace to some clay, trace to some sand, compact, grey, wet		6	SS	12
			7	SS	12
211.1					
7.6 / 210.6	SILTY CLAY-trace sand, TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm, brownish grey, very moist to wet		8	SS	8
8.1	End of Borehole				



NOTES:
Borehole was open and wet at base upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 21

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 23 February 2007
EQUIPMENT: Hollow Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	'N' VALUES
219.1	Ground Surface			
0.0 / 218.9	250mm TOPSOIL			
0.3 / 218.1	Weathered / Disturbed trace organics	1	AS	
		2	SS	5
1.0 / 214.6	CLAYEY SILT TO SILTY CLAY trace to some sand, very stiff, brown, moist	3	SS	7
		4	SS	12
		5	SS	11
4.5 / 207.9	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm to very stiff, brownish grey, moist to very moist	6	SS	6
	---- dilatant silt, wet	7	SS	16
		8	SS	7
		9	SS	9
	---- dilatant silt, wet	10	SS	11
11.2	End of Borehole			

PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%): 10 20 30

ELEVATION SCALE: 219 218 217 216 215 214 213 212 211 210 209 208

38kPa
GR.SA.SI.CL
0 2 49 49
150kPa
100kPa
38kPa
38kPa
38kPa
GR.SA.SI.CL
0 9 65 26

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and wet at base upon completion of drilling. Water level in piezometer at 2.5m below grade on April 9, 2007.

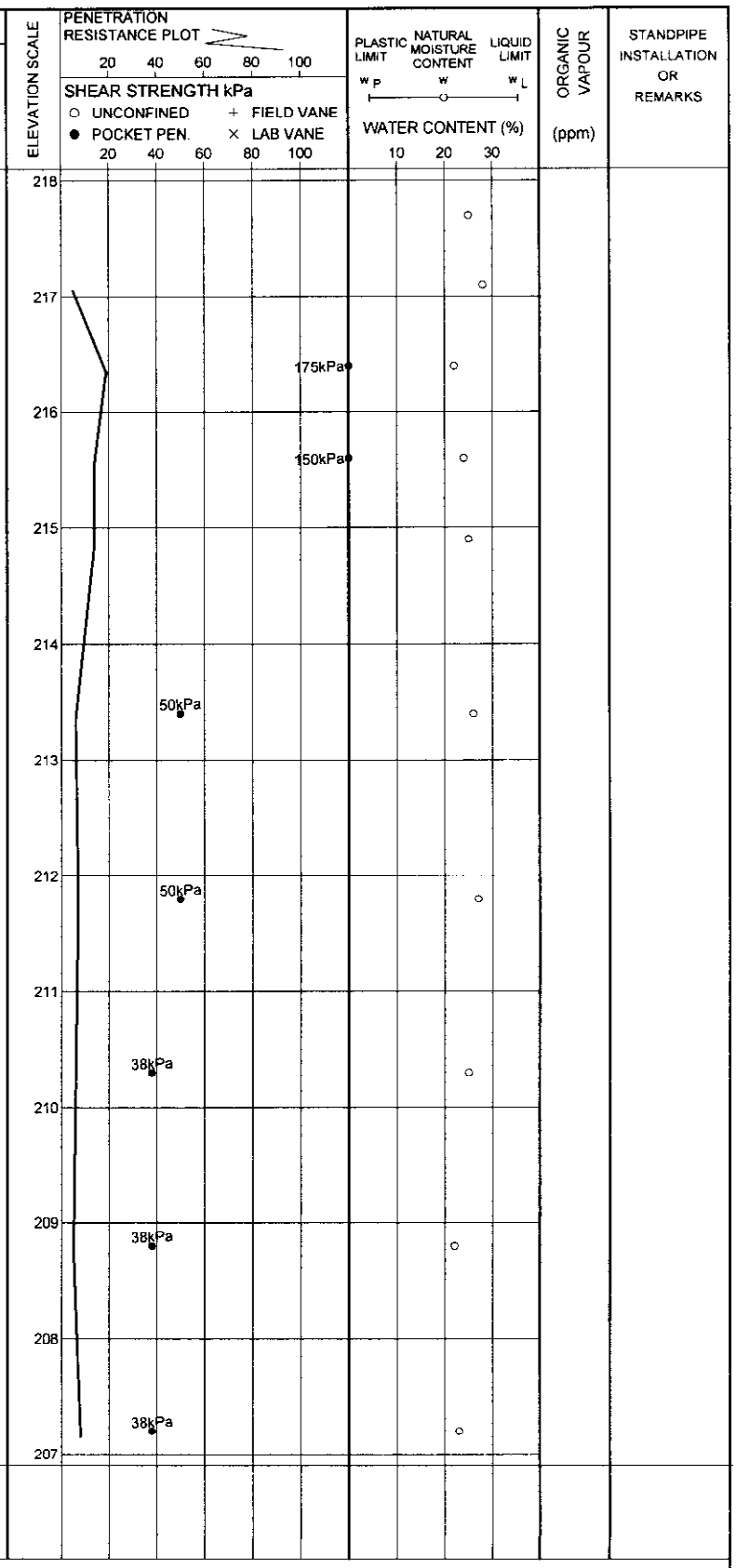
Terraprobe

LOG OF BOREHOLE 22

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 22 February 2007
EQUIPMENT: Hollow Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES 'N' VALUES
218.1	Ground Surface				
0.0 / 217.8	300mm TOPSOIL				
0.3 / 217.3	Weathered / Disturbed trace organics		1	AS	
0.8	CLAYEY SILT TO SILTY CLAY trace to some sand, firm to very stiff, brown, moist		2	SS	5
			3	SS	19
			4	SS	14
	---- silt, some clay, compact		5	SS	14
213.6					
4.5	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses / particles), firm, brownish grey, moist to very moist		6	SS	6
	---- silt, wet		7	SS	7
			8	SS	6
			9	SS	5
206.9			10	SS	8
11.2	End of Borehole				



ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and wet at base upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 23

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 22 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES
212.9	Ground Surface				
0.0 / 212.6	300mm TOPSOIL		1	AS	
0.3	Weathered / Disturbed trace organics				
211.9			2	SS	3
1.0	CLAYEY SILT TO SILTY CLAY trace to some sand, soft to firm, brown, moist to very moist		3	SS	4
			4	SS	6
			5	SS	6
208.4					
4.5	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm, brownish grey, moist to wet		6	SS	6
	---- wet		7	SS	4
204.8			8	SS	8
8.1	End of Borehole				

ELEVATION SCALE: 212, 211, 210, 209, 208, 207, 206, 205

PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100

50kPa
50kPa
63kPa
38kPa
63kPa

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and wet at base upon completion of drilling. Water level in piezometer at 0.5m above grade (frozen) on April 9, 2007.

Terraprobe

LOG OF BOREHOLE 24

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 21 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES
215.9	Ground Surface				
0.0 / 215.6	300mm TOPSOIL		1	AS	
0.3 / 215.1	Weathered / Disturbed trace organics				
0.8	CLAYEY SILT TO SILTY CLAY trace to some sand, stiff, brown, moist to very moist		2	SS	10
			3	SS	9
213.6					
2.3	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), very soft to firm, brownish grey, very moist to wet		4	SS	6
			5	SS	5
	---- dilatant silt, grey, wet		6	SS	5
	---- wet		7	SS	5
207.8			8	SS	2
8.1	End of Borehole				

ELEVATION SCALE: 215, 214, 213, 212, 211, 210, 209, 208

PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100
150kPa
150kPa
50kPa
38kPa
50kPa

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and wet at base upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 25

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 21 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
220.8	Ground Surface				
0.0 / 220.5	300mm TOPSOIL				
0.3 / 219.8	Weathered / Disturbed trace organics		1	AS	
			2	SS	6
1.0 / 218.5	CLAYEY SILT TO SILTY CLAY trace to some sand, firm to stiff, brown, moist		3	SS	13
2.3 / 216.3	SILT - Dilatant, trace to some clay, trace to some sand, compact, brown, very moist to wet		4	SS	11
			5	SS	15
4.5 / 212.7	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm to stiff, brownish grey, moist to very moist		6	SS	7
			7	SS	8
			8	SS	9
8.1	End of Borehole				

ELEVATION SCALE: 220, 219, 218, 217, 216, 215, 214, 213

PENETRATION RESISTANCE PLOT
20 40 60 80 100
SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100
150kPa
75kPa
50kPa
50kPa

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and wet at base upon completion of drilling. Water level in piezometer at 1.2m below grade on April 9, 2007.

Terraprobe

LOG OF BOREHOLE 26

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 21 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
215.7	Ground Surface				
0.0 / 215.4	300mm TOPSOIL				
0.3 / 214.7	Weathered / Disturbed trace organics		1	AS	
			2	SS	8
1.0	CLAYEY SILT TO SILTY CLAY trace to some sand, stiff to very stiff, brown, moist to very moist		3	SS	16
			4	SS	10
			5	SS	13
211.2					
4.5	SILT - Dilatant, trace to some clay, trace to some sand, compact, brown, wet		6	SS	15
209.6					
6.1	SILTY CLAY trace sand TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm, brownish grey, moist to very moist		7	SS	8
			8	SS	4
207.6					
8.1	End of Borehole				

ELEVATION SCALE

PENETRATION RESISTANCE PLOT
20 40 60 80 100
SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100

215 214 213 212 211 210 209 208

>225kPa
150kPa
188kPa
38kPa
38kPa

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and wet at base upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 27

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.
DATE: 21 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES
208.1	Ground Surface				
0.0 / 207.8	300mm TOPSOIL		1	AS	
0.3 / 207.3	Weathered / Disturbed trace organics		2	SS	6
0.8	CLAYEY SILT TO SILTY CLAY trace to some sand, firm, brown, very moist		3	SS	6
205.8			4	SS	5
2.3 / 205.1	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm, brownish grey, very moist		5	SS	8
3.0	SILT - Dilatant, trace to some clay, trace to some sand, loose, grey, wet		6	SS	9
200.5			7	SS	8
7.6 / 200.0	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), firm, brownish grey, very moist		8	SS	4
8.1	End of Borehole				

ELEVATION SCALE: 208, 207, 206, 205, 204, 203, 202, 201, 200

PENETRATION RESISTANCE PLOT
20 40 60 80 100
SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100
175kPa
113kPa
50kPa

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and wet at base upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 28

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 22 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
209.2	Ground Surface				
0.0 / 208.9	300mm TOPSOIL				
0.3 / 208.2	Weathered / Disturbed trace organics		1	AS	
1.0	CLAYEY SILT TO SILTY CLAY trace to some sand, firm to stiff, brown, moist		2	SS	4
			3	SS	9
			4	SS	10
			5	SS	5
204.3			6	SS	11
4.9	SILTY CLAY trace sand, TO CLAY some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses) firm, brownish grey, moist to very moist		7	SS	7
201.6					
7.6 / 201.1	SILT - trace to some clay, trace to some sand, compact, grey, very moist to wet		8	SS	12
8.1	End of Borehole				

ELEVATION SCALE: 209, 208, 207, 206, 205, 204, 203, 202

PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100

125kPa
100kPa
38kPa
GR.SA.SI.CL
0 4 57 39
100kPa
38kPa

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L

WATER CONTENT (%)
10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

▽

NOTES:
Borehole was open and water level at 7.6m upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 29

PROJECT: Proposed Residential Subdivision
DATE: 22 February 2007
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
EQUIPMENT: Solid Stem Augers
CLIENT: First Urban Inc.
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
205.1	Ground Surface				
0.0 / 204.8	300mm TOPSOIL				
0.3 / 204.3	Weathered / Disturbed trace organics		1	AS	
0.8 / 202.8	SILT trace to some clay, trace to some sand, loose to compact, brown, very moist to wet		2	SS	10
			3	SS	9
2.3	CLAYEY SILT TO SILTY CLAY trace to some sand, firm, brown, very moist to wet		4	SS	7
	---- grey		5	SS	5
			6	SS	7
			7	SS	5
197.0			8	SS	5
8.1	End of Borehole				

ELEVATION SCALE: 205, 204, 203, 202, 201, 200, 199, 198, 197

PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● POCKET PEN. × LAB VANE
20 40 60 80 100
75kPa
25kPa

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and water level at 5.8m upon completion of drilling.

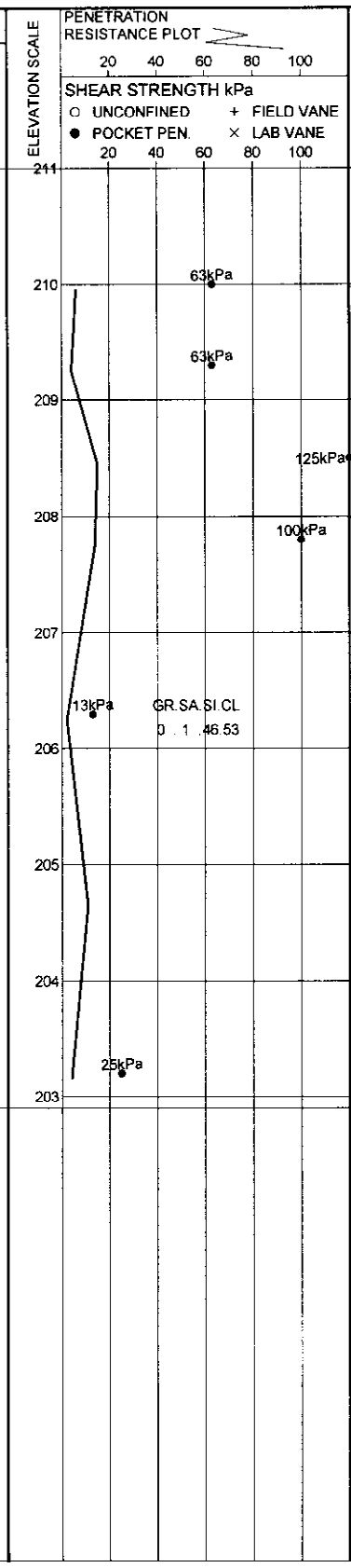
Terraprobe

LOG OF BOREHOLE 30

PROJECT: Proposed Residential Subdivision
LOCATION: Highway 403 / Lynden Road, Brantford, Ontario
CLIENT: First Urban Inc.

DATE: 22 February 2007
EQUIPMENT: Solid Stem Augers
ELEVATION DATUM: Geodetic
FILE: 1-06-1397

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES
211.0	Ground Surface				
0.0 / 210.7	300mm TOPSOIL		1	AS	
0.3 / 210.2	Weathered / Disturbed trace organics				
0.8	CLAYEY SILT TO SILTY CLAY trace to some sand, firm to stiff, brown, moist to wet		2	SS	6
			3	SS	4
			4	SS	15
			5	SS	14
206.5					
4.5	SILTY CLAY - trace sand TO CLAY - some silt, trace sand, (with intermittent wet dilatant fine sand / silt lenses), soft to stiff, brownish grey, moist to wet		6	SS	2
	---- silt dilatant, grey		7	SS	11
202.9			8	SS	4
8.1	End of Borehole				



ORGANIC VAPOUR (ppm)

STANDPIPE INSTALLATION OR REMARKS

NOTES:
Borehole was open and dry upon completion of drilling. Water level in piezometer at 1.0m below grade on April 9, 2007.

APPENDIX H

SLOPE STABILITY ANLAYSIS OF STORMWATER MANAGEMENT POND SIDE SLOPES

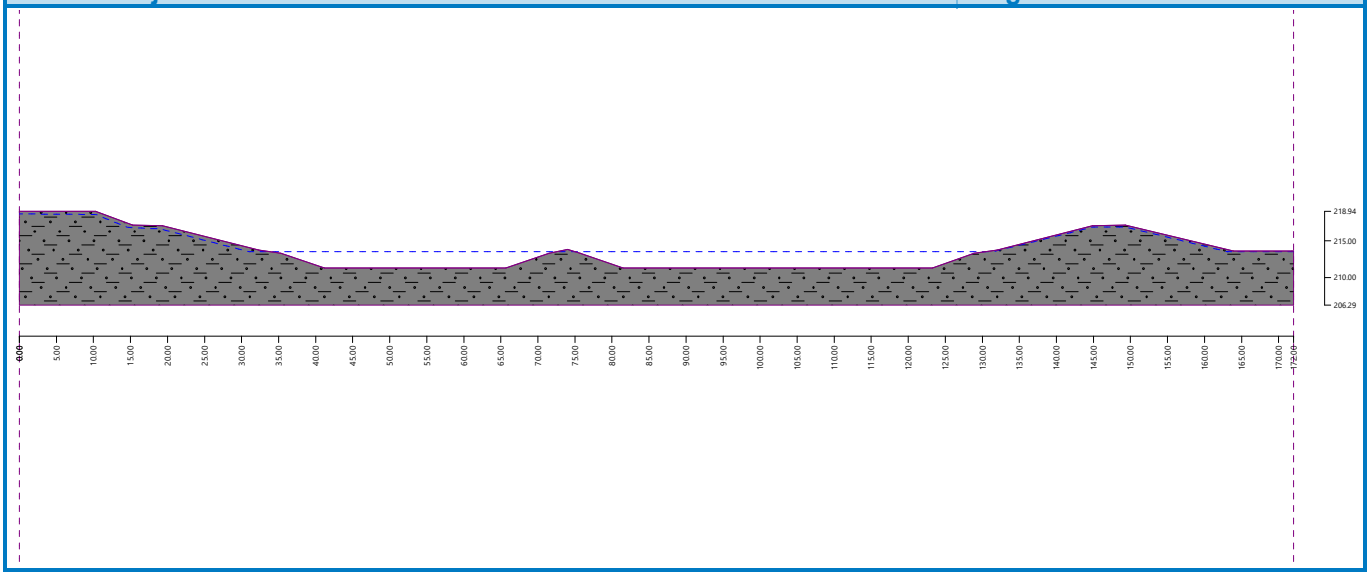
Slope stability analysis

Input data

Project

Task : Slope Stability Cross Section 1
Author : EMZ/KC
Date : 2022-08-30
Project ID : 299 Lynden Road, Brantford
Project number : CT3087.02

Name : Project	Stage : 1



Settings

(input for current task)

Stability analysis

Verification methodology : Safety factors (ASD)
Earthquake analysis : Standard

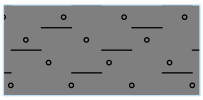
Safety factors			
Permanent design situation			
Safety factor :	SF_s =	1.50	[–]

Safety factors			
Transient design situation			
Safety factor :	SF_s =	1.30	[–]

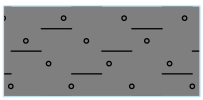
Interface

No.	Interface location	Coordinates of interface points [m]					
		x	z	x	z	x	z
1		0.00	218.94	10.30	218.94	15.30	217.10
		19.30	217.00	32.30	213.72	35.30	213.29
		41.20	211.29	65.70	211.29	71.50	213.29
		74.00	213.80	75.70	213.29	81.50	211.29
		123.30	211.29	128.90	213.29	132.00	213.72
		144.90	217.00	149.30	217.10	163.90	213.60
		171.80	213.60	172.00	213.60		

Soil parameters - effective stress state

No.	Name	Pattern	φ_{ef} [°]	c_{ef} [kPa]	γ [kN/m^3]
1	Stiff to v.Stiff Clayey Silt and Compact Silt		30.00	2.00	18.00

Soil parameters - uplift

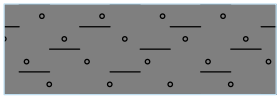
No.	Name	Pattern	γ_{sat} [kN/m^3]	γ_s [kN/m^3]	n [–]
1	Stiff to v.Stiff Clayey Silt and Compact Silt		19.50		

Soil parameters

Stiff to v.Stiff Clayey Silt and Compact Silt

Unit weight : γ = 18.00 kN/m^3
Stress-state : effective
Angle of internal friction : φ_{ef} = 30.00 °
Cohesion of soil : c_{ef} = 2.00 kPa
Saturated unit weight : γ_{sat} = 19.50 kN/m^3

Assigning and surfaces

No.	Surface position	Coordinates of surface points [m]				Assigned soil
		x	z	x	z	
1		171.80	213.60	163.90	213.60	Stiff to v.Stiff Clayey Silt and Compact Silt 
		149.30	217.10	144.90	217.00	
		132.00	213.72	128.90	213.29	
		123.30	211.29	81.50	211.29	
		75.70	213.29	74.00	213.80	
		71.50	213.29	65.70	211.29	
		41.20	211.29	35.30	213.29	
		32.30	213.72	19.30	217.00	
		15.30	217.10	10.30	218.94	
		0.00	218.94	0.00	206.29	
		172.00	206.29	172.00	213.60	

Water

Water type : GWT

No.	GWT location	Coordinates of GWT points [m]					
		x	z	x	z	x	z
1		0.00	218.61	10.33	218.53	14.55	216.80
		19.04	216.58	31.04	213.50	131.42	213.50
		144.98	216.84	149.31	216.84	163.13	213.50
		172.00	213.50				

Tensile crack

Tensile crack not input.

Earthquake

Earthquake not included.

Settings of the stage of construction

Design situation : permanent

Results (Stage of construction 1)

Analysis 1 (stage 1)

Circular slip surface

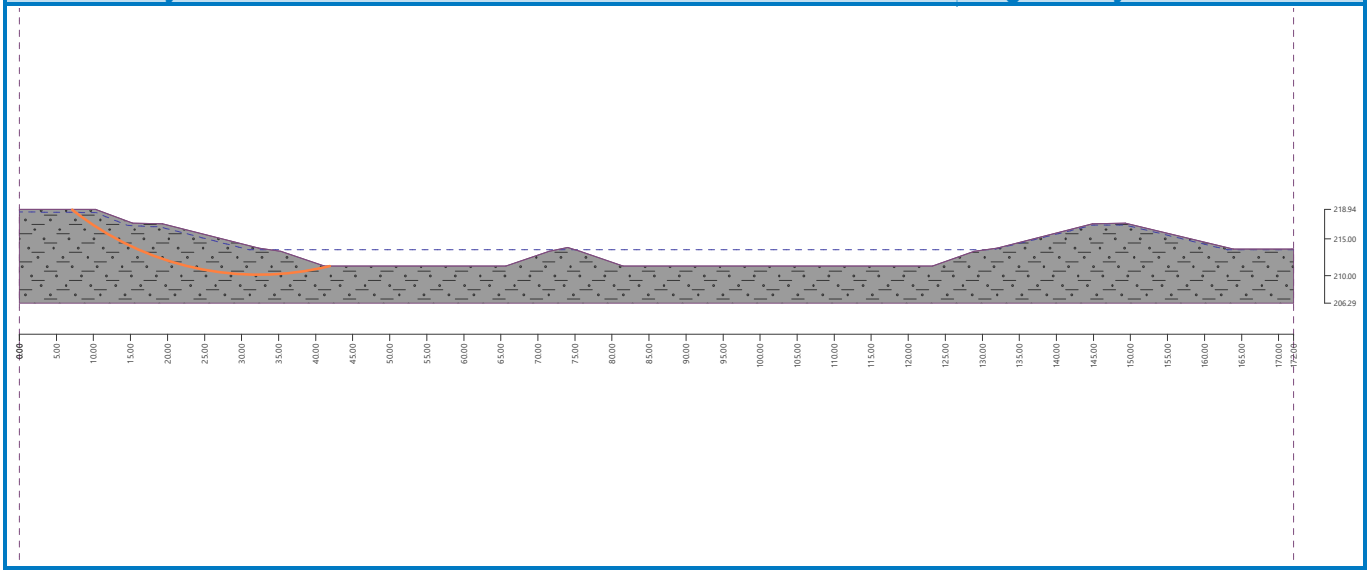
Slip surface parameters							
Center :	x =	32.35	[m]	Angles :	α_1 =	-38.53	[°]
	z =	250.55	[m]		α_2 =	13.70	[°]
Radius :	R =	40.41	[m]				
Analysis of the slip surface without optimization.							

Slope stability verification (Bishop)

Sum of active forces : F_a = 402.55 kN/m
Sum of passive forces : F_p = 750.27 kN/m

Sliding moment : M_a = 16267.09 kNm/m
Resisting moment : M_p = 30318.60 kNm/m
Factor of safety = 1.86 > 1.50
Slope stability ACCEPTABLE

Name : Analysis	Stage - analysis : 1 - 1



Analysis 2 (stage 1)

Circular slip surface

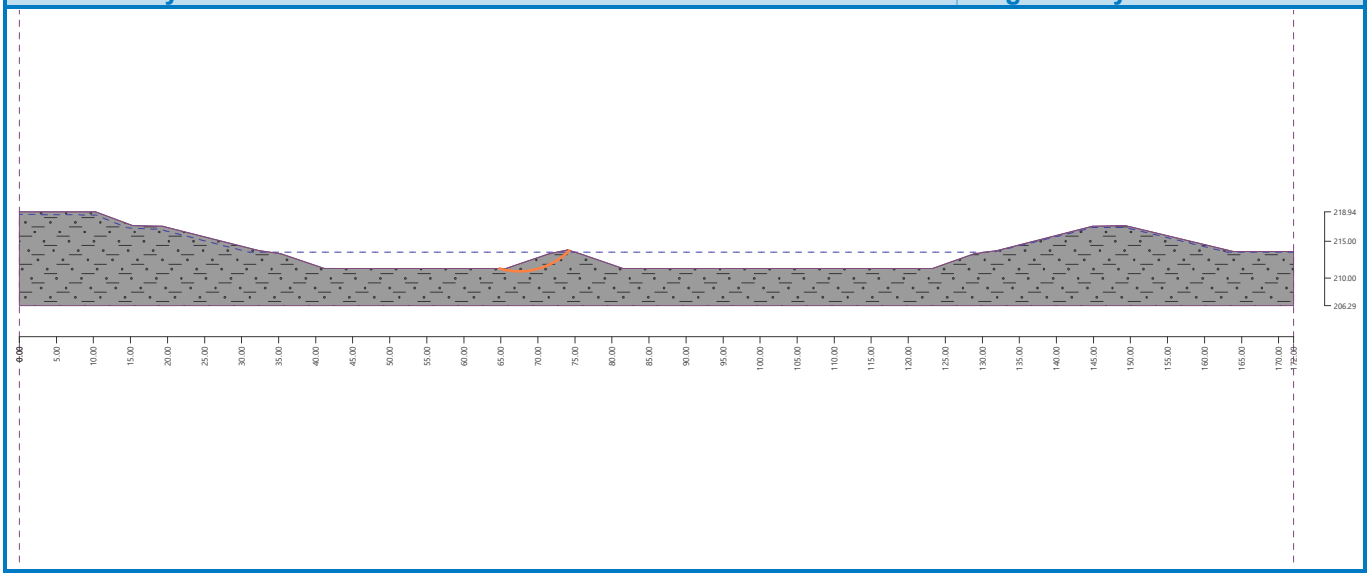
Slip surface parameters							
Center :	x =	67.49	[m]	Angles :	α_1 =	-16.54	[°]
	z =	220.33	[m]		α_2 =	45.60	[°]
Radius :	R =	9.43	[m]				
Analysis of the slip surface without optimization.							

Slope stability verification (Bishop)

Sum of active forces : F_a = 25.04 kN/m
Sum of passive forces : F_p = 72.78 kN/m

Sliding moment : M_a = 236.14 kNm/m
Resisting moment : M_p = 686.35 kNm/m
Factor of safety = 2.91 > 1.50
Slope stability ACCEPTABLE

Name : Analysis	Stage - analysis : 1 - 2



Analysis 3 (stage 1)

Circular slip surface

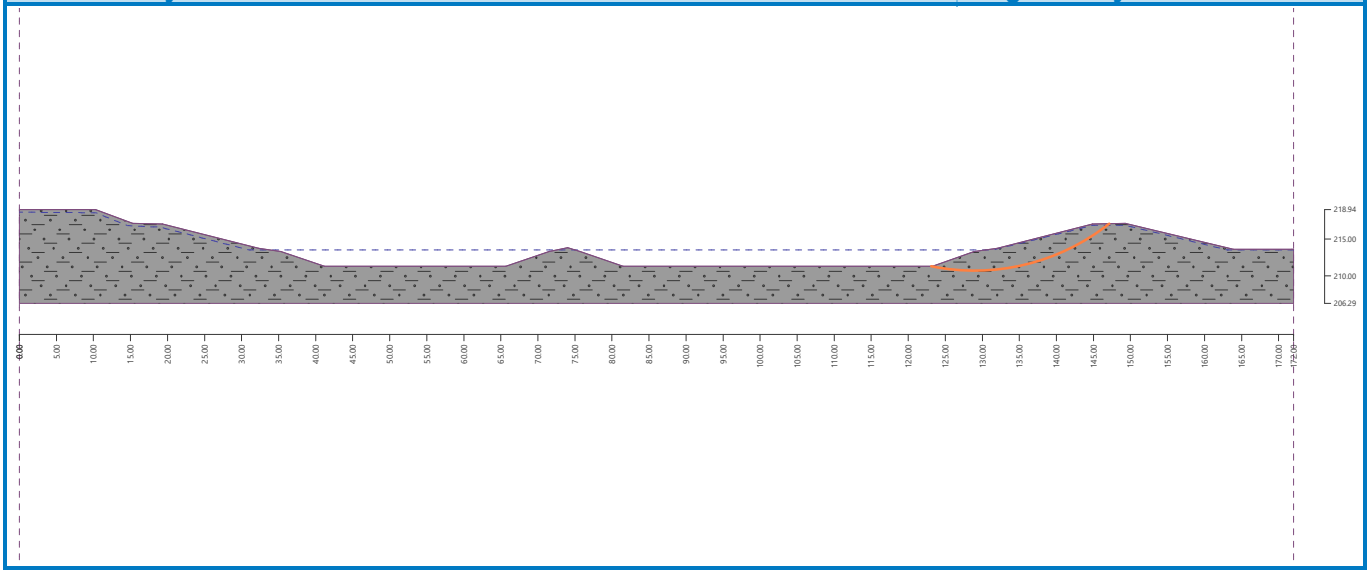
Slip surface parameters							
Center :	x =	128.92	[m]	Angles :	α_1 =	-11.41	[°]
	z =	240.07	[m]		α_2 =	38.37	[°]
Radius :	R =	29.36	[m]				
Analysis of the slip surface without optimization.							

Slope stability verification (Bishop)
Sum of active forces : F_a = 199.91 kN/m
Sum of passive forces : F_p = 356.63 kN/m

Sliding moment : M_a = 5869.34 kNm/m
Resisting moment : M_p = 10470.75 kNm/m
Factor of safety = 1.78 > 1.50
Slope stability ACCEPTABLE

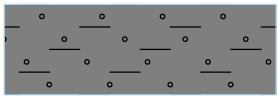
EMZ/KC

Name : Analysis	Stage - analysis : 1 - 3



Input data (Stage of construction 2)

Assigning and surfaces

No.	Surface position	Coordinates of surface points [m]				Assigned soil
		x	z	x	z	
1		171.80	213.60	163.90	213.60	Stiff to v.Stiff Clayey Silt and Compact Silt 
		149.30	217.10	144.90	217.00	
		132.00	213.72	128.90	213.29	
		123.30	211.29	81.50	211.29	
		75.70	213.29	74.00	213.80	
		71.50	213.29	65.70	211.29	
		41.20	211.29	35.30	213.29	
		32.30	213.72	19.30	217.00	
		15.30	217.10	10.30	218.94	
		0.00	218.94	0.00	206.29	
		172.00	206.29	172.00	213.60	

Water

Water type : GWT

No.	GWT location	Coordinates of GWT points [m]					
		x	z	x	z	x	z
1		0.00	218.61	10.33	218.53	14.55	216.80
		19.04	216.58	31.04	213.50	34.96	213.05
		41.23	211.08	65.67	210.98	74.05	213.58
		81.40	211.11	123.42	211.06	131.42	213.50
		144.98	216.84	149.31	216.84	163.13	213.50
		172.00	213.50				

Tensile crack

Tensile crack not input.

Earthquake

Earthquake not included.

Settings of the stage of construction

Design situation : transient

Results (Stage of construction 2)

Analysis 1 (stage 2)

Circular slip surface

Slip surface parameters							
Center :	x =	33.38	[m]	Angles :	α_1 =	-39.01	[°]
	z =	250.17	[m]		α_2 =	14.67	[°]
Radius :	R =	40.19	[m]				
Analysis of the slip surface without optimization.							

Slope stability verification (Bishop)

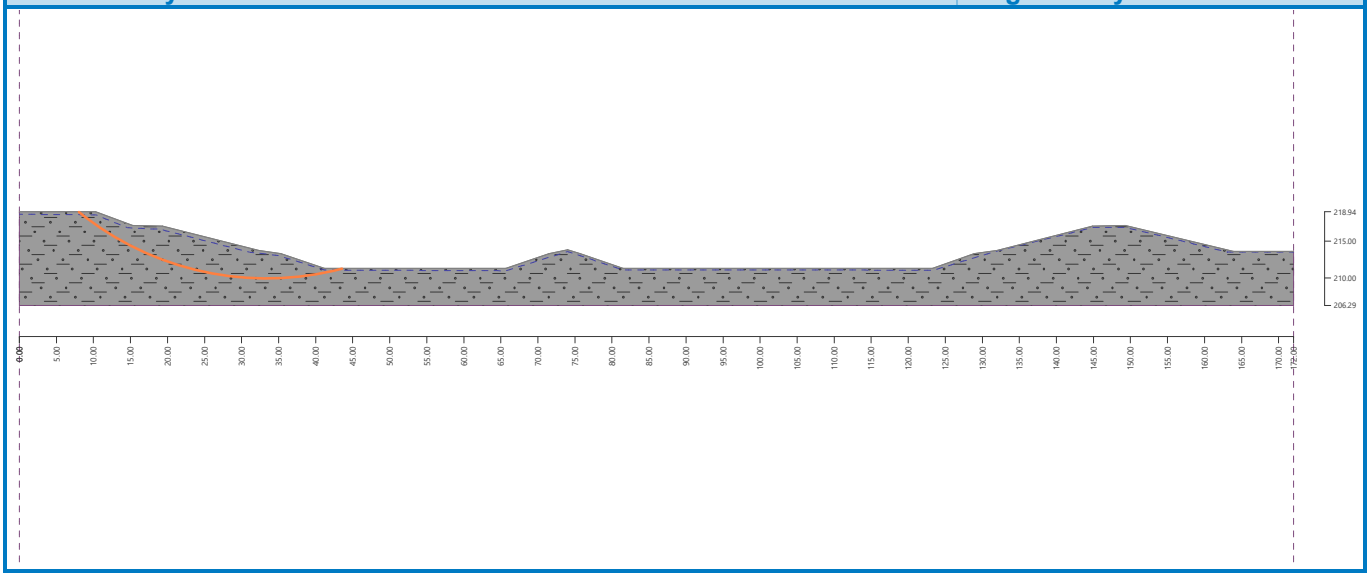
Sum of active forces : F_a = 435.52 kN/m

Sum of passive forces : F_p = 751.47 kN/m

Sliding moment : M_a = 17503.51 kNm/m

Resisting moment : M_p = 30201.75 kNm/m
Factor of safety = 1.73 > 1.30
Slope stability ACCEPTABLE

Name : Analysis	Stage - analysis : 2 - 1



Analysis 2 (stage 2)

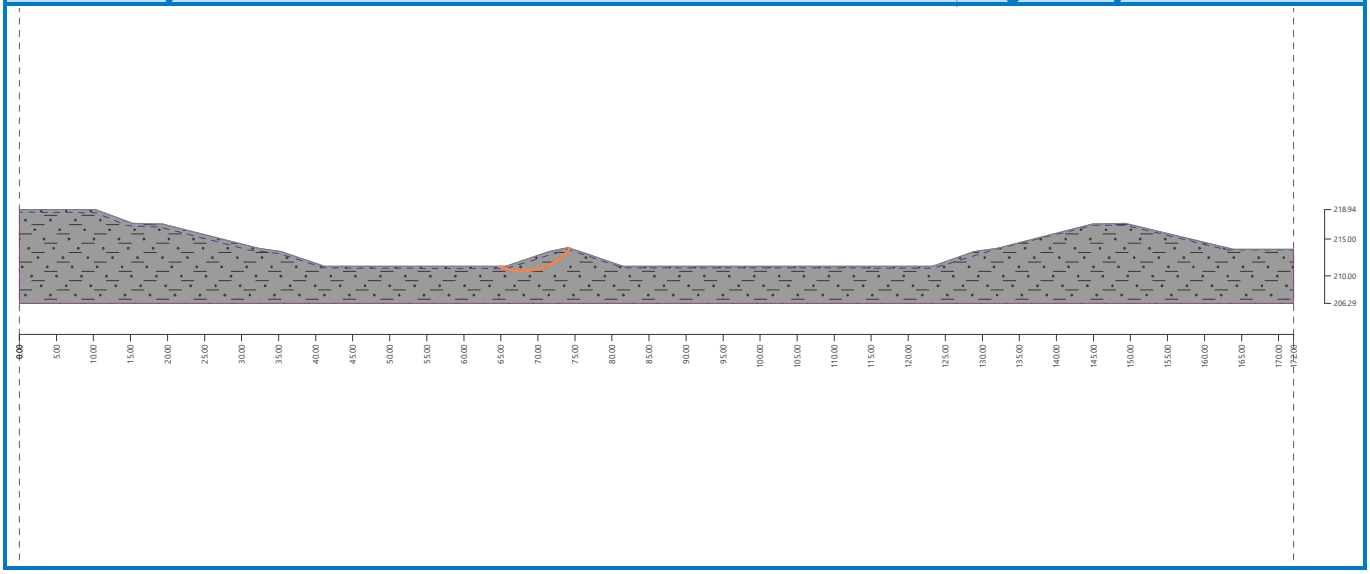
Circular slip surface

Slip surface parameters							
Center :	x =	67.95	[m]	Angles :	α_1 =	-22.12	[°]
	z =	218.97	[m]		α_2 =	50.49	[°]
Radius :	R =	8.29	[m]				
Analysis of the slip surface without optimization.							

Slope stability verification (Bishop)
Sum of active forces : F_a = 56.05 kN/m
Sum of passive forces : F_p = 103.39 kN/m

Sliding moment : M_a = 464.67 kNm/m
Resisting moment : M_p = 857.09 kNm/m
Factor of safety = 1.84 > 1.30
Slope stability ACCEPTABLE

Name : Analysis	Stage - analysis : 2 - 2



Analysis 3 (stage 2)

Circular slip surface

Slip surface parameters							
Center :	x =	128.59	[m]	Angles :	α_1 =	-13.43	[°]
	z =	237.97	[m]		α_2 =	40.24	[°]
Radius :	R =	27.43	[m]				
Analysis of the slip surface without optimization.							

Slope stability verification (Bishop)

Sum of active forces : F_a = 231.65 kN/m

Sum of passive forces : F_p = 372.14 kN/m

Sliding moment : M_a = 6354.13 kNm/m

Resisting moment : M_p = 10207.87 kNm/m

Factor of safety = 1.61 > 1.30

Slope stability ACCEPTABLE

Name : Analysis	Stage - analysis : 2 - 3