

REPORT ON
PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED DEVELOPMENT
CALEDON STATION
&
ARGO KING I & II
BOLTON, ONTARIO

Draft Plan of Subdivision and Amendment for Zoning By-Law of Caledon Station (21T-220001 & RZ 2022-0002) and Argo Humber Station (21T-22002 & RZ 2022-0003)

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1. INTRODUCTION

DS Consultants Ltd. (DS) was retained by Caledon Community Partners to prepare a preliminary geotechnical investigation report for the proposed development, Caledon Station (Argo Macville I, Argo Macville II, Robert Speirs, Argo Macville V, Argo Humberking and Argo Humberking Station lands), in connection with a Preliminary Framework Plan to establish the Macville Community Secondary plan area, located at The Gore Road and King Street in Bolton, Ontario.

It is understood that the proposed development will consist of a residential subdivision (single-family dwellings and low to mid-rise residential buildings), stormwater ponds, and a possible transit hub.

The proposed site grades and lowest finished floor elevations for the proposed structures were not known to us at the time of writing this report.

The purpose of this geotechnical investigation was to obtain information about the subsurface conditions at boreholes locations and from the findings in the boreholes to make engineering recommendations pertaining to the geotechnical design of underground utilities, roads and to comment on the foundation conditions for the building construction.

This report deals with geotechnical issues only. Findings in the hydrogeological investigation by DS are documented under separate cover.

This report is provided on the basis of the terms of reference presented above and, on the assumption, that the design will be in accordance with the applicable codes and standards. If there are any changes in the design features relevant to the geotechnical analyses, or if any questions arise concerning the geotechnical aspects of the codes and standards, this office should be contacted to review the design. It may then be necessary to carry out additional borings and reporting before the recommendations of this office can be relied upon.

The format and contents are guided by client specific needs and economics and do not conform to generalized standards for services. Laboratory testing for most part follows ASTM or CSA Standards or modifications of these standards that have become standard practice.

This report has been prepared for Caledon Community Partners and its architect and designers. Third party use of this report without DS consent is prohibited.

2. BACKGROUND INFORMATION

In 2020, DS was retained by Bolton Option 3 Landowners Group to complete a preliminary geotechnical, environmental, and hydrogeological studies for the proposed development at the Site

(Macville Community, in connection with a LOPA application to establish the Macville Community Secondary plan area, located at The Gore Road and King Street in Bolton, Ontario).

DS carried out the geotechnical investigation field work at the subject site during the period of July 27 to 31, 2020, consisting of sixteen (16) boreholes (BH20-1 to BH20-16) which were drilled to depths ranging from 6.7 to 11.3 m below the existing grade at the locations shown on the Borehole Location Plan, **Drawing 1**. The Borehole logs are attached in **Appendix A** of this report

Monitoring wells were installed in all boreholes, except Boreholes BH20-8, BH20-10, and BH20-13 to monitor long-term stabilized groundwater levels.

In addition, laboratory tests such as moisture content for all soil samples, grain size distribution (sieve and hydrometer analyses) and Atterberg Limit tests were carried out, by DS Consultants on selected samples.

Additionally, Soil Engineers Ltd. also carried out a hydrogeological assessment at the subject site, which included the advancement of eighteen boreholes (BH1 to BH18) and the findings of their investigation are documented in their report titled "Hydrogeological Assessment, Proposed Mixed Use Development King Street and Humber Station Road, Town of Caledon" dated December 2022. The borehole logs from Soil Engineers' report are appended to this report for information purposes only.

3. FIELD AND LABORATORY WORK

DS has now been retained by Caledon Community Partners to carry out a subsequent preliminary geotechnical investigation for the Macville Community Preliminary Framework Plan to establish the Macville Community Secondary plan area.

A total of forty-two (42) sampled boreholes (BH22-1 through BH22-42), see **Drawing 1** for borehole locations) were drilled by DS in 2022, to depths ranging from 8.1 to 13.6 m below the existing grade. **Additionally, three boreholes, (BH22-36A, BH22-39A and BH22-40A) were augered to depths of 4.0 to 7.6 m without soil sampling beside BH22-36, BH22-39, and BH22-40, respectively, for installation of shallow monitoring wells.**

Boreholes were drilled with solid and hollow stem continuous flight augers equipment by a drilling sub-contractor under the direction and supervision of DS personnel. Samples were retrieved at regular intervals with a 50 mm O.D. split-barrel sampler driven with a hammer weighing 624 N and dropping 760 mm in accordance with the Standard Penetration Test (SPT) method. The samples were logged in the field and returned to the DS laboratory for detailed examination by the project engineer and for laboratory testing.

As well as visual examination in the laboratory, all soil samples from geotechnical boreholes were tested for moisture contents. Grain size analyses of sixteen (16) selected soil samples were conducted and the results are presented on **Drawings 47 to 49**. Atterberg Limits testing was conducted on selected seven (7) soil sample and results are presented on the respective borehole logs and on **Drawings 50 and 51**.

Water level observations were made during and upon completion of drilling. Twenty-four (24) monitoring wells of 50mm diameter were installed in Boreholes BH22-1, BH22-3, BH22-5, BH22-10, BH22-11, BH22-13, BH22-14, BH22-15, BH22-17, BH22-20, BH22-22, BH22-25, BH22-27, BH22-28, BH22-29, BH22-32, BH22-33, BH22-35, BH22-36A, BH22-39, BH22-39A, BH22-40, BH22-40A and BH22-42, for the long-term groundwater levels monitoring. The elevation surveying of the boreholes was undertaken by DS Consultants Ltd. personnel, using the differential GPS unit.

4. SUBSURFACE CONDITIONS

4.1 Soil Conditions

The borehole location plan is shown on **Drawing 1**. General notes on sample description are provided on **Drawing 1A**. The subsurface conditions in the boreholes (BH22-1 to BH22-42) by DS were generally consistent with the findings from the 2020 investigation and are presented in the individual borehole logs presented on **Drawings 2 to 46**. Logs of the previous boreholes (BH20-1 to BH20-16) are attached in **Appendix A**.

Topsoil and Fill/(Possible Fill) Material and Weathered/Disturbed Native Material:

A surficial layer of topsoil, ranging from 200 to 550 mm in thickness, was observed at the surface of all the boreholes, except BH20-4.

Fill or weathered/disturbed native material (possible fill in BH22-9) consisting of clayey silt to silty clay and sandy silt to silty sand soils were detected in all the boreholes below the topsoil layer and extended to approximate depths ranging from 0.4 to 2.3 m below the existing ground surface. In the area of Borehole BH20-4, the fill layer was overlain by a concrete slab, approximately 300 mm in thickness. In the area of Borehole BH22-9, the weathered/disturbed clayey silt to silty clay with inclusions of gravel, organic staining, and no readily apparent structure. Hence, this layer may be possible fill. The fill and weathered/disturbed native materials were generally brown to dark brown in color and contained trace of organics, gravel, and rootlets.

SPT 'N' values measured in fill and weathered/disturbed native materials ranged from 3 to 15 blows per 300mm penetration, indicating a soft to stiff consistency or loose to compact state. The

moisture content of this moist to wet fill and weathered/disturbed native soil layer ranged from 5 to 24%.

The type/quantity and extent of the existing weathered/disturbed soil or fill, and topsoil layers must be explored by further test pit investigation prior to/during excavation.

Clayey Silt/Silty Clay Till:

Clayey silt to silty clay till deposit was encountered below the weathered/disturbed soil layer in Boreholes BH22-1 to BH22-5, BH22-8, BH22-10, BH22-11, BH22-14 to BH22-35, BH22-37 to BH22-40 and BH22-42, below a thin sandy silt to silty sand deposit in BH22-36 and BH22-41, below the fill layer in BH20-1 to BH20-3 and BH20-5 to BH20-16, and extended to approximate depths ranging from 1.5 to 12.8 m below existing ground surface, i.e., the maximum explored depth of Boreholes BH22-14, BH22-16, BH22-17, BH22-19, BH22-20, BH22-21, BH22-24, BH22-34, BH22-36, BH22-37 to BH22-41, BH20-6, BH20-7, BH20-10, BH20-14 and BH20-15. The clayey silt till was interrupted by a cohesionless silt deposit between 4.6 and 6.1 m depth in BH22-24 and by a gravelly sand deposit between 1.8 and 10.7 m depths in BH22-34. This, in general, moist to very moist clayey to silty clay till deposit was brown to grey in color and contained some sand too sandy and trace to some gravel. SPT 'N' values measured in the clayey silt to silty clay till ranged from 8 to more than 50 blows per 300 mm of penetration, indicating a stiff to hard consistency (generally very stiff to hard). The moisture content of this clayey silt to silty clay till deposit ranged from 7 to 26%.

Grain size analyses of seven (7) soil samples (BH22-1/SS3, BH22-14/SS7, BH22-21/SS5, BH22-25/SS3, BH22-36/SS3 and SS8, and BH22-41/SS6) obtained from the current drilling program, were conducted and the results are presented on **Drawings 47 and 48**. Grain size analyses of one (1) silty clay till soil sample (BH20-7/SS4) was conducted during 2020 drilling program and the results are presented on the logs in **Appendix A**. The fractions of soil particles of clayey silt to silty clay tills are presented as follows:

Clay:	20 to 37%
Silt:	38 to 51%
Sand:	11 to 31%
Gravel:	1 to 15%

Atterberg limits tests of above noted seven (7) soil samples (BH22-1/SS3, BH22-14/SS7, BH22-21/SS5, BH22-25/SS3, BH22-36/SS3 and SS8, and BH22-41/SS6) were conducted. The results are shown on the borehole logs and on **Drawings 50 and 51**. The results of BH20-7/SS4) are shown on the log in **Appendix A**. They are summarized as follows:

Liquid limit (W_L):	19 to 33%
Plastic limit (W_P):	12 to 26%

Plasticity index (PI): 7 to 16

Clayey Silt:

A thin layer of clayey silt with trace sand was encountered below the clayey silt/silty clay till deposit in BH22-18 and extended to a depth of 7.6 m below existing ground surface. SPT 'N' value measured in the clayey silty was in the order of 29 blows per 300 mm of penetration, indicating a very stiff consistency. The moisture content of this clayey silt layer was 10 %.

Sandy Silt Till:

A cohesionless sandy silt till deposit was encountered below the clayey silt to silty clay till deposit in Boreholes BH22-1, BH22-3, BH22-10, BH22-11, BH22-15, BH22-22, BH22-23, BH22-28, and BH22-33, below a sand deposit in BH22-2 and 22-42, and below the clayey silt layer in BH22-18. The sandy silt till deposit extended to depths ranging from 3.1 to 12.8 m below existing ground surface, i.e., the maximum depth explored in BH22-2, BH22-15, BH22-18, BH22-23, and BH22-42.

SPT 'N' values measured within this sandy silt till deposit ranged from 21 to more than 50 blows per 300 mm of penetration, indicating compact to very dense relative density. The moisture content of this moist to wet sandy silt till deposit ranged from 8 to 23%.

Grain size analyses of two (2) sandy silt till samples soil samples (BH22-10/SS5 and BH22-18/SS8) were obtained from the current drilling program, were conducted and the results are presented on **Drawings 47 and 49**, with the following fractions:

Clay: 11%
 Silt: 40 to 64%
 Sand: 24 to 38%
 Gravel: 1 to 11%

Cohesionless Deposits of silt, sandy Silt to Silty Sand, Sand, Sand and Gravel, and Sandy Gravel/Gravelly Sand:

Cohesionless deposits of silt, sandy silt to silty sand, sand, sand and gravel and sandy gravel/gravelly sand soils with inclusions of clay and varying amounts of gravel was encountered underlying or embedded in the clayey silt to silty clay till and/or sandy silt till deposits in Boreholes BH22-1, BH22-2, BH22-3, BH22-4, BH22-5, BH22-8, BH22-10, BH22-11, BH22-24, BH22-25, BH22-26, BH22-27, BH22-28, BH22-29 to BH22-35, BH22-42, BH20-1 to BH20-3, BH20-5, BH20-8, BH20-9, BH20-11 to BH20-13 and BH20-16, below the weathered/disturbed soils in BH22-6, BH22-7, BH22-9, BH22-12, BH22-13, BH22-36 and BH22-41, and below the fill in BH20-4. These cohesionless deposits extended to depths ranging from 0.8 to 13.6 m below existing ground surface, i.e., the maximum

depths explored in BH22-1, BH22-3, BH22-4, BH22-5, BH22-6, BH22-7, BH22-8, BH22-9, BH22-10, BH22-11, BH22-12, BH22-13, BH22-25 to BH22-33, BH22-35, BH20-1 to BH20- 3, BH20-5, BH20-8, BH20-9, BH20-11 to BH20-13 and BH20-16.

SPT 'N' values measured within these sandy, silty deposits ranged from 7 to more than 50 blows per 300 mm of penetration, indicating loose to very dense relative density. Disturbance of the split spoon samples noted at depth in BH22-27 and BH22-30 is likely attributable to heaving of the water bearing silty sand/sand. The moisture content of this moist to wet sands and silts ranged from 6 to 27%.

This moist to wet deposit was brown to grey in color and layers of sand and gravel and/or sandy gravel/gravelly sand materials were encountered in the area of Borehole BH22-33 between depths of 6.1 and 9.1 m, BH22-34 between depths of 1.8 and 10.7 m, and BH20-16, between depths of 1.5 and 3.3 m and between depths of 4.5 and 6.2 m. SPT 'N' values measured within this sand and gravel and sandy gravel/gravelly sand layers ranged from 24 to 66 blows per 300mm of penetration, indicating compact to very dense relative density.

Grain size analyses of seven (7) cohesionless, silt, sandy silt to silty sand, sand, and sandy gravel/gravelly sand soil samples (BH22-13/SS6 and SS9, BH22-25/SS9, BH22-28/SS7, BH22-32/SS10, BH22-33/SS8 and BH22-34/SS6) obtained from the current drilling program were conducted and the results are presented on **Drawings 47 to 49**. Grain size analyses of eight (8) cohesionless, silt, sandy silt to silty sand, and sand and gravel soil samples sample (BH20-5/SS8, BH20-8/SS4 and SS7, BH20-11/SS8, BH20-12/SS7, BH20-16/SS4, SS6 and SS7) was conducted during 2020 drilling program and the results are presented on the logs in **Appendix A**. The fractions of soil particles of cohesionless sands, silts and gravel are presented as follows:

Clay: 2 to 18%
Silt: 10 to 94%
Sand: 1 to 82%
Gravel: 0 to 52%

4.2 Groundwater Conditions

During drilling and upon completion of drilling, groundwater was observed at variable depths, or the bottom of boreholes was wet in some boreholes while some boreholes remained dry.

Groundwater levels in the monitoring wells installed at twenty-four (24) borehole locations from current drilling program (BH22-1, BH22-3, BH22-5, BH22-10, BH22-11, BH22-13, BH22-14, BH22-15, BH22-17, BH22-20, BH22-22, BH22-25, BH22-27, BH22-28, BH22-29, BH22-32, BH22-33, BH22-35,

BH22-36A, BH22-39, BH22-39A, BH22-40, BH22-40A) were measured on September 8 and October 18, 2022, and March 21, 2023, and in thirteen (13) borehole locations from 2020 drilling program (BH1 to BH7, BH9, BH 11, BH 12 and BH14 to BH 16) on August 6, 2020, September 8, 2020, October 22, 2020, and March 21, 2023. The groundwater level measurements are provided below on **Table 1**.

Table 1: Summary of Groundwater Level Measurements in Monitoring Wells

BH No.	Ground Surface Elevation (m)	Date of Drilling	Date of Observation	Depth of Groundwater (m)	Elevation of Groundwater (m)
BH 22- 1	279.0	Aug 31, 2022	Sept 8, 2022	3.40	275.60
			Mar. 21, 2023	2.62	276.40
BH 22-3	274.8	Aug 30, 2022	Sept 8, 2022	1.42	273.40
			Mar. 21, 2023	0.32	274.50
BH 22-5	279.7	Aug 31, 2022	Sept 8, 2022	6.53	273.20
			Mar. 21, 2023	5.82	273.90
BH 22-10	269.9	Sept 6, 2022	Sept 8, 2022	1.27	268.60
			Mar. 21, 2023	0.22	269.70
BH 22-11	272.9	Sept 6, 2022	Sept 8, 2022	2.78	269.30
			Mar. 21, 2023	3.11	269.80
BH 22-13	276.1	Sept 1, 2022	Sept 8, 2022	6.03	270.10
			Mar. 21, 2023	5.43	270.70
BH 22-14	271.4	Sept 1, 2022	Sept 8, 2022	11.9	259.50
			Mar. 21, 2023	0.33	271.10
BH 22-15	270.2	Aug 29, 2022	Sept 8, 2022	1.93	268.30
BH 22-17	269.0	Aug 29, 2022	Sept 8, 2022	2.26	266.70

			Mar. 21, 2023	-0.71	269.70
BH 22-20	269.4	Aug 29, 2022	Sept 8, 2022 Mar. 21, 2023	2.51	266.90
BH 22-22	267.8	Aug 26, 2022	Sept 8, 2022 Mar. 21, 2023	1.43 0.73	266.30 267.00
BH 22-25	270.9	Aug 25, 2022	Sept 8, 2022 Mar. 21, 2023	3.10 2.27	267.80 268.60
BH 22-27	271.2	Aug 19, 2022	Sept 8, 2022 Mar. 21, 2023	4.25 2.96	266.90 268.20
BH 22-28	270.9	Aug 19, 2022	Sept 8, 2022 Mar. 21, 2023	4.81 3.68	266.10 267.20
BH 22-29	268.9	Aug 23, 2022	Sept 8, 2022 Mar. 21, 2023	3.80 2.65	265.10 266.20
BH 22-32	265.3	Aug 23, 2022	Sept 8, 2022 Mar. 21, 2023	0.32 -0.48	265.00 265.80
BH 22-33	268.0	Aug 25, 2022	Sept 8, 2022 Mar. 21, 2023	4.29 3.17	263.70 264.80
BH 22-35	266.1	Aug 24, 2022	Sept 8, 2022 Mar. 21, 2023	2.23 1.23	263.80 264.80
BH 22-36A	261.8	Sept 7, 2022	Sept 19, 2022 Mar. 21, 2023	2.70 0.14	259.10 261.70
BH 22-39A	266.6	Sept 7, 2022	Sept 19, 2022 Mar. 21, 2023	1.92 -0.02	264.70 266.60
BH 22-40	264.0	Sept 7, 2022	Oct 18, 2022	3.03	260.90
BH 22-40A	263.9	Sept 7, 2022	Sept 19, 2022	1.92	262.00

BH22-42	266.7	Sept. 6, 2022	Oct 18, 2022 Mar. 21, 2023	2.05 0.51	264.60 266.20
BH 20- 1	279.8	July 27, 2020	Aug 6, 2020 Sept 8, 2020 Oct 22, 2020 Mar. 21, 2023	4.10 4.24 4.51 3.96	275.70 275.56 275.29 275.90
BH 20-2	278.8	July 27, 2020	Aug 6, 2020 Sept 8, 2020 Oct 22, 2020 Mar. 21, 2023	6.12 6.36 6.48 6.08	272.68 272.44 272.32 272.70
BH 20-3	278.6	July 27, 2020	Aug 6, 2020 Sept 8, 2020 Oct 22, 2020 Mar. 21, 2023	6.0 Dry Dry 5.93	272.60 Dry Dry 272.60
BH 20-4	277.1	July 27, 2020	Aug 6, 2020 Sept 8, 2020 Oct 22, 2020 Mar. 21, 2023	3.77 3.90 Not accessible 4.75	273.33 273.20 Not accessible 272.30
BH 20-5	273.0	July 29, 2020	Aug 6, 2020 Sept 8, 2020 Oct 22, 2020 Mar. 21, 2023	2.78 3.09 3.38 2.68	270.22 269.91 269.62 270.40
BH 20-6	271.0	July 28, 2020	Aug 6, 2020 Sept 8, 2020 Mar. 21, 2023	6.71 1.15 0.26	264.23 269.85 270.70

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BH 20-7	261.7	July 31, 2020	Aug 6, 2020	Dry	Dry
			Sept 8, 2020	6.52	255.18
			Oct 22, 2020	3.40	258.30
BH 20-9	274.1	July 28, 2020	Aug 6, 2020	4.43	269.67
			Sept 8, 2020	4.72	269.38
			Oct 22, 2020	4.97	269.13
			Mar. 21, 2023	4.50	269.61
BH 20-11	270.1	July 29, 2020	Aug 6, 2020	5.42	264.68
			Sept 8, 2020	5.37	264.73
			Oct 22, 2020	5.33	264.77
			Mar. 21, 2023	1.63	268.50
BH 20-12	264.9	July 31, 2020	Aug 6, 2020	0.20	264.70
			Sept 8, 2020	0.10	264.80
			Oct 22, 2020	0.14	264.76
			Mar. 21, 2023	-0.15	265.10
BH 20-14	267.7	July 30, 2020	Aug 6, 2020	3.32	264.38
			Sept 8, 2020	3.43	264.27
			Oct 22, 2020	3.59	264.11
			Mar. 21, 2023	0.19	267.50
BH 20-15	264.1	July 30, 2020	Aug 6, 2020	2.41	261.69
			Sept 8, 2020	2.33	261.77
			Oct 22, 2020	2.41	261.69
			Mar. 21, 2023	1.65	262.50
BH 20-16	265.5	July 31, 2020	Aug 6, 2020	2.12	263.38
			Sept 8, 2020	2.27	263.23

			Oct 22, 2020	2.49	263.01
			Mar. 21, 2023	1.30	264.20

It should be noted that the groundwater levels can vary and are subject to seasonal fluctuations in response to major weather events. Further groundwater level readings in the monitoring wells are recommended.

5. DISCUSSION AND RECOMMENDATIONS

5.1 SITE GRADING & ENGINEERED FILL

It is understood that the Macville Community Secondary Plan, once approved through a Local Official Plan Amendment (LOPA), will serve as a framework for future development of the Subject Lands for the purposes of accommodating residential and mixed-use development with related complimentary uses, such as open spaces, parks, trails, commercial uses, the Bolton GO Station, the Natural Heritage System (NHS), and stormwater management facilities. This report must be updated when the site plan is approved. Recommendations for different components will be provided in the updated geotechnical report.

For the residential subdivision with residential lots/buildings, underground services, roads, and driveways, it is recommended that all fill to be placed for grading purposes be constructed as engineered fill to provide competent subgrade below house foundations, roads, boulevards, etc.

Prior to placement of engineered fill, all existing surficial organic material/topsoil, fill materials, weathered/disturbed native soils and soils containing topsoil/organics should be stripped to expose the undisturbed inorganic native subgrade. The exposed subgrade should then be proof rolled with a heavy sheepsfoot roller to identify weak areas. Any weak or excessively wet zones identified during proof-rolling should be sub-excavated and replaced with compacted competent material to establish stable and uniform conditions. Prior to placement of engineered fill, the subgrade should be inspected and approved by a geotechnical engineer.

General guidelines for the placement and preparation of engineered fill are presented in **Appendix B**. Bearing capacity values of 150 kPa at SLS and 225 kPa at ULS can be used on engineered fill, provided that all requirements in **Appendix B** are adhered to. To reduce the risk of improperly placed engineered compacted fill, full-time supervision of the contractor is essential.

The following is a recommended procedure for an engineered fill:

1. Prior to site work involving engineered fill, a site meeting to discuss all aspects must be convened. The surveyor, contractor, design engineer and geotechnical engineer must attend the

meeting. At this meeting, the limits of the engineered fill will be defined. The contractor must make known where all fill material will be obtained and samples must be provided to the geotechnical engineer for review, and approval before filling begins.

2. Detailed drawings indicating the lower boundaries as well as the upper boundaries of the engineered fill must be available at the site meeting and be approved by the geotechnical engineer.

3. The building footprint and base of the pad, including basements, garages, etc. must be defined by offset stakes that remain in place until the footings and service connections are all constructed. Confirmation that the footings are within the pad, service lines are in place, and that the grade conforms to drawings, must be obtained by the owner in writing from the surveyor and DS. Without this confirmation no responsibility for the performance of the structure can be accepted by DS. Survey drawing of the pre, and post fill location and elevations will also be required.

4. The area must be stripped of all topsoil and fill materials. Subgrade must be proof-rolled. Soft spots must be dug out. The stripped native subgrade must be examined and approved by a DS engineer prior to placement of fill.

5. The approved engineered fill must be compacted to 100% Standard Proctor Maximum Dry Density throughout. Granular Fill preferred. Engineered fill should not be placed (where it will support footings) during the winter months. Engineered fill compacted to 100% SPMDD will settle under its own weight approximately 0.5% of the fill height and the structural engineer must be aware of this settlement. In addition to the settlement of the fill, additional settlement due to consolidation of the underlying soils from the structural and fill loads will occur.

6. Full-time geotechnical inspection by DS during placement of engineered fill is required. Work cannot commence or continue without the presence of the DS representative.

7. The fill must be placed such that the specified geometry is achieved. Refer to sketches for minimum requirements. Take careful note that the projection of the compacted pad beyond the footing at footing level is a minimum of 2 m. The base of the compacted pad extends 2 m plus the depth of excavation beyond the edge of the footing.

8. Bearing capacity values of 150 kPa at SLS and 225 kPa at ULS may be used provided that all conditions outlined above are adhered to. A minimum footing width of 500 mm (20 inches) is suggested, and footings should be provided with nominal steel reinforcement.

9. All excavations must be done in accordance with the Occupational Health and Safety Regulations of Ontario.

10. After completion of the pad a second contractor may be selected to install footings. All excavations must be backfilled under full time supervision by DS to the same degree as the engineered fill pad. Surface water cannot be allowed to pond in excavations or to be trapped in clear stone backfill. Clear stone backfill can only be used with the approval of DS.

11. After completion of compaction, the surface of the pad must be protected from disturbance from traffic, rain, and frost.

12. If there is a delay in construction, the engineered fill pad must be inspected and accepted by the geotechnical engineer. The location of the structure must be reconfirmed that it remains within the pad.

The native soils and any existing fill materials free from organics/topsoil and organics to be excavated from cut-areas are considered suitable for re-use as engineered fill, provided that their moisture contents at the time of construction are at or near optimum. Clayey tills are likely to be excavated in cohesive chunks or blocks and will be difficult to compact. They should be pulverized and placed in thin layers not exceeding 200 mm and compacted using heavy equipment suitable for these types of soils (e.g., heavy sheepfoot compactors).

5.2 ROADS/PAVEMENTS

The investigation has shown that the predominant subgrade soil, after stripping the topsoil and any other organic and otherwise unsuitable subsoil, will generally consist of clayey silt/silty clay till and silt to sandy silt soils.

Based on the above and assuming that traffic usage will be residential, the following minimum pavement thickness is recommended for the roads to be constructed within the development.

For Minor Local or Local Roads

- 40 mm HL3 Asphaltic Concrete
- 65 mm HL8 Asphaltic Concrete
- 150 mm Granular 'A'
- 300 mm Granular 'B'

For Collector Roads

- 40 mm HL3 Asphaltic Concrete
- 90 mm HL8 Asphaltic Concrete
- 150 mm Granular 'A'
- 450 mm Granular 'B'

Roads and driveway pavements/aprons should be constructed as per the Town of Bolton standards.

The site subgrade and weather conditions (i.e., if wet) at the time of construction may necessitate the placement of thicker granular sub-base layer and/or geogrid in order to facilitate the construction. Furthermore, heavy construction equipment may have to be kept off the newly constructed roads before the placement of asphalt and/or immediately thereafter, to avoid damaging the weak subgrade by heavy truck traffic.

5.2.1 STRIPPING, SUB-EXCAVATION AND GRADING

The site should be stripped of all organic soil/topsoil, fill materials, weathered/disturbed soils, soils containing topsoil/organics or otherwise unsuitable soils to the full depth of the roads, both in cut and fill areas. Following stripping, the site should be graded to the subgrade level and approved. The subgrade should then be proof rolled, in the presence of the Geotechnical Engineer, by at least several passes of a heavy compactor having a rated capacity of at least 8 tonnes. Any soft spots thus exposed should be removed and replaced by select fill material, similar to the existing subgrade soil and approved by the Geotechnical Engineer. The subgrade should then be re-compacted from the surface to at least 98% of its Standard Proctor Maximum Dry Density (SPMDD). The final subgrade should be cambered or otherwise shaped properly to facilitate rapid drainage and to prevent the formation of local depressions in which water could accumulate.

Owing to the clayey (i.e., impervious) nature of some subsoils at the site, proper cambering and allowing the water to escape towards the sides (where it can be removed by means of subdrains) is considered to be beneficial for this project. Otherwise, any water collected in the granular sub-base materials could be trapped thus causing problems due to softened subgrade, differential frost heave, etc. For the same reason damaging the subgrade during and after placement of the granular materials by heavy construction traffic should be avoided. If the moisture content of the local material cannot be maintained at $\pm 2\%$ of the optimum moisture content, imported granular material may need to be used.

Any fill required for re-grading the site or backfill should be select, clean material, free of topsoil, organic or other foreign and unsuitable matter. The fill should be placed in thin layers and compacted to at least 98% of its SPMDD. The compaction of the new fill should be checked by frequent field density tests.

5.2.2 CONSTRUCTION

Once the subgrade has been inspected and approved, the granular base and sub-base course materials should be placed in layers not exceeding 200 mm (uncompacted thickness) and should

be compacted to at least 100% of their respective SPMDD. The grading of the material should conform to current OPS Specifications.

The placing, spreading, and rolling of the asphalt should be in accordance with OPS Specifications or, as required by the local authorities.

Frequent field density tests should be carried out on both the asphalt and granular base and sub-base materials to ensure that the required degree of compaction is achieved.

5.2.3 DRAINAGE

The installation of full-length subdrains on all roads is recommended. The subdrains should be properly filtered to prevent the loss of (and clogging by) soil fines.

All paved surfaces should be sloped to provide satisfactory drainage towards catch-basins. As discussed in Section 5.2.1, by means of good planning any water trapped in the granular sub-base materials should be drained rapidly towards subdrains or other interceptors.

5.3 WATERMAIN/SEWERS

As a part of the site development, a network of new watermains, storm and sanitary sewers will be constructed. It is assumed that the trenches will generally be within 4 to 5 m below the existing grade.

The type of material for the pipes to be used for watermains or sewers will be the choice of civil engineer.

5.3.1 TRENCHING

The boreholes show that below the existing topsoil and fill, the trenches will be predominantly dug through the silty clay till, sand and gravel and sandy silt to silt soils. Groundwater seepage within the clayey silt/silty clay till is expected to be slow to moderate and manageable by gravity drainage and pumping from filtered sumps. Positive dewatering will be required for any excavations in cohesionless soils (sand, gravel, silt, sandy silt to silty sand and sandy silt till) below groundwater table. The groundwater table must be lowered to at least 1.0 m below the excavation base.

Excavations in fill and native soils can be carried out with heavy hydraulic backhoe.

All excavations must be carried out in accordance with the most recent Occupational Health and Safety Act (OHSA). In accordance with OHSA, fill material and weathered/disturbed native soils can be classified as Type 3 Soil above groundwater and Type 4 Soil below groundwater table or in perched water condition. The very stiff to hard clayey silt/silty clay (till) can be classified as Type 2

Soil above groundwater and Type 3 Soil below groundwater. Cohesionless soils (sand, gravel, silt, sandy silt to silty sand, sandy silt till) can be classified as Type 3 soil above groundwater and as Type 4 below groundwater.

The sides of excavations in the natural strata can be expected to be temporarily stable at relatively steep side slopes above the groundwater table for short periods of time but they should be cut back at slopes no steeper than 1V:1.5H in fill material and 1V:1H in clayey silt/silty clay till in order to comply with the safety regulations. The OHSA stipulates that any excavation deeper than 1.2m must be shored or cut back at a slope of 1V:1H or flatter, depending on the soil type.

It should be noted that the till is a non-sorted sediment and therefore contain cobble and boulders. Possible large obstructions such as buried concrete pieces are also anticipated in the fill material. Provisions must be made in the excavation contract for the removal of possible boulders in the till and obstructions in the fill material.

5.3.2 BEDDING

Subject to design grades, the sewer pipes will predominantly be laid within the native soils and/or engineered fill which will provide adequate support for the sewer pipes and allow the use of normal Class B type bedding. The bedding should conform to the current Ontario Provincial Standard specifications (OPSS 401/OPSD 802) and/or standards set by the local municipality.

The recommended minimum thickness of granular bedding below the invert of the pipes is 150 mm. The thickness of the bedding may, however, have to be increased depending on the pipe diameter or in accordance with local standards or if wet or weak subgrade conditions or fill materials are encountered at the trench base level. The bedding material should consist of well graded granular material such as Granular 'A' or equivalent.

After installing the pipe on the bedding, a granular surround of approved bedding material, which extends at least 300 mm above the obvert of the pipe, or as set out by the local Authority, should be placed.

To avoid the loss of soil fines from the subgrade, uniformly graded clear stone should not be used unless, below the granular bedding material, a suitable, approved filter fabric (geotextile) is placed. The geotextile should extend along the sides of the trench and should be wrapped all around the poorly graded bedding material.

5.3.3 BACKFILLING OF TRENCHES

Based on visual and tactile examination, the on-site excavated inorganic native soils are considered to be suitable for re-use as backfill in the service trenches provided their moisture contents at the time of construction are within 2 percent of their optimum moisture content. Significant aeration of the wet excavated soils will be required prior to their use as backfill material.

The clayey deposits especially when its consistency is hard is likely to be excavated in cohesive chunks or blocks and will be difficult to compact in confined areas. For use as backfill, the clayey material will have to be pulverized and placed in thin layers. The clayey soils will have to be compacted using heavy equipment suitable for these soils which may be difficult to operate in the narrow confines of the trenches. Unless the clayey materials are properly pulverized and compacted in sufficiently thin lifts post-construction settlements could occur. Their use in narrow trenches such as laterals (where heavy compaction equipment cannot be operated) may not be feasible.

Selected inorganic fill and the native soils free from topsoil and organics can be used as general construction backfill where it can be compacted with sheep's foot type compactors. Loose lifts of soil, which are to be compacted, should not exceed 200 mm. Depending on the time of construction and weather, some excavated material may be too wet to compact and will require aeration prior to its use.

Imported granular fill, which can be compacted with handheld equipment, should be used in confined areas.

The excavated soils are not considered to be free draining. Where free draining backfill is required, imported granular fill such as OPSS Granular B should be used.

The backfill should be placed in maximum 200 mm thick layers at or near ($\pm 2\%$) their optimum moisture content and each layer should be compacted to at least 95% SPMDD. In the upper 1.5 m of the subgrade, underneath the road base, the compaction should be increased to 98% SPMDD.

Unsuitable materials such as organic soils, boulders, cobbles, frozen soils, etc. should not be used for backfilling.

The on-site excavated soils and especially the clayey soils should not be used in confined areas (e.g., around catch-basins and laterals under roadways) where heavy compaction equipment cannot be operated. The use of imported granular fill together with an appropriate frost taper would be preferable in confined areas and around structures, such as catch-basins.

It should be noted that the excavated soils are subject to moisture content increase during wet weather which would make these materials too wet for adequate compaction. Stockpiles should be compacted at the surface or be covered with tarpaulins to minimize moisture uptake.

The topsoil encountered at the site can be used for landscaping fill area to raise the grades. Topsoil cannot be reused as foundation or trench backfill material.

5.3.4 ANTI SEEPAGE COLLARS/TRENCH PLUGS

For pipes installed under the groundwater table, seepage between the trench backfill material and the trench wall may cause erosion of the backfill materials. It is recommended that nominal anti-seepage collars (maximum spacing 50 m) be provided to prevent erosion of the backfill materials. Anti seepage collar should not be located at pipe joint.

The anti-seepage collar may consist of a clay plug surrounding the sewer pipe. A typical clay plug will be about 1 m thick and extends laterally to a minimum distance of 0.5 m from the pipe circumference with a minimum of 0.3 m embedment into the shale or native sub-grade. Typical (not to scale) anti-seepage collar conceptual detail is provided on **Drawing 52**.

The on-site native clayey soils may be suitable for such purpose subject to additional sampling and testing.

5.3.5 THRUST BLOCKS AND JOINT RESTRAINTS

An allowable (or SLS) bearing resistance of 150 kPa and factored ULS bearing resistance of 225 kPa can be used in the design of thrust blocks constructed on undisturbed native soils or engineered fill.

5.4 FOUNDATION CONDITIONS

It is understood that the Macville Community Secondary Plan, once approved through a Local Official Plan Amendment (LOPA), will serve as a framework for future development of the Subject Lands for the purposes of accommodating residential and mixed-use development with related complimentary uses, such as open spaces, parks, trails, commercial uses, the Bolton GO Station, the Natural Heritage System (NHS), and stormwater management facilities. This report must be updated when the site plan is approved. Recommendations for different components will be provided in the updated geotechnical report.

5.4.1 Proposed Houses

It is understood that the proposed subdivision will consist of single-family homes (detached, townhomes, back-to-backs, and stacked) with one level of basement.

The native soils encountered in the boreholes are competent to support the proposed houses on conventional footings.

The spread and strip footings founded on the undisturbed native soils (below any fill or weathered/disturbed native soils) can be designed for a bearing capacity of 150 kPa at SLS (Serviceability Limit State), and for a factored geotechnical resistance of 225 kPa at ULS (Ultimate Limit State).

Subject to design grades, footing founding elevations, in the area of Borehole BH20-12 (2020 investigation), must be confirmed on site due to variable soil conditions. The footings might be lowered, or less bearing capacity be used.

In addition, the locally encountered silt, sandy silt to silty sand at the base of footings can be easily disturbed by construction activities. A concrete skim coat, about 50 mm in thickness, on the founding subgrade immediately after its approval might be required, on a case by case basis, to prevent its disturbance by construction activities.

Due to the difference in ground elevations and subject to design grades, should the proposed footings be founded above the competent native soils, then the proposed houses can also be supported by spread and strip footings founded on engineered fill for a bearing capacity of 150 kPa at the serviceability limit states (SLS) and for a factored geotechnical resistance of 225 kPa at the ultimate limit states (ULS), provided all requirements in Section 5.1 and in **Appendix B** are adhered to.

5.4.2 PROPOSED LOW TO MID-RISE RESIDENTIAL BUILDINGS

It is understood that low to mid-rise residential buildings (varying from 4 to 6 storey and up to probably 15 storey) are proposed to be erected in the vicinity of the GO station, the areas of boreholes BH22-36 to BH22-42 and BH20-10, BH20-11, BH20-14, and BH20-15 (2020 investigation). The proposed buildings will also include underground parking.

The design grades and number of floors/underground parking levels are not known at this stage. Therefore, our recommendations should be considered preliminary and will be revised when the proposed Site/Foundation plan becomes available.

Based on the provided recent information, it is understood that the number of floors could range as high as 15 storey structures in some locations, however, due to the variable soil conditions and the presence of less competent soils, the available soil bearing capacity information is not yet available to define the necessary geotechnical recommendations for such structures. Therefore, further location specific deep borehole investigation is required to investigate the subsurface soil conditions at greater depths and the need to utilize deep foundation alternative (if required) and or raft foundation and confirm the soil bearing capacities, subject to design loads.

In addition, settlement analyses will be required when the foundation plan/design loads areas available to evaluate/quantify the total and differential settlements.

Subject to design grades/loads, number of floors/levels of underground parking and based on the information from the above-mentioned boreholes, the following soil bearing capacities, as presented in Table 2, are available (which must be confirmed by further borehole investigation).

Table 2: Bearing Values and Founding Levels of conventional Footings in Native Soils

BH No.	Surface Elevation At Borehole (m)	Bearing Capacity at SLS (kPa)	Factored Geotechnical Resistance at ULS (kPa)	Minimum Depth below Existing Ground (m)	Founding Level At or Below Elevation (m)
BH22-36	261.7	150	225	1.0	260.7
		200	300	2.3	259.4
BH22-37	265.1	200	300	1.2	263.9
BH22-38	262.7	150	225	1.1	261.6
		250	375	1.8	260.9
BH22-39	266.5	250	375	1.7	264.8
BH22-40	265.1	200	300	1.1	264.0
BH22-41	264.0	150	225	1.1	262.9
		200	300	2.5	261.5
BH22-42	266.7	200	300	1.1	265.6
BH20-10	268.3	200	300	2.0	266.3
BH20-11	270.1	250	375	1.2	268.9
BH20-14	267.7	150	225	1.2	266.5
		250	375	2.5	265.2
BH20-15	264.1	200	300	2.0	262.1
		150	225	5.0	259.1

5.4.3 GENERAL FOUNDATION NOTES

Foundations designed to the specified bearing capacities at the serviceability limit states (SLS) are expected to settle less than 25 mm total and 19 mm differential.

All footings exposed to seasonal freezing conditions must have at least 1.4 metres of soil cover for frost protection.

Where it is necessary to place footings at different levels, the upper footing must be founded below an imaginary 10 horizontal to 7 vertical line drawn up from the base of the lower footing. The lower footing must be installed first to help minimize the risk of undermining the upper footing.

It should be noted that the recommended bearing capacities have been calculated by DS from the borehole information for the design stage only. The investigation and comments are necessarily on-going as new information of the underground conditions becomes available. For example, more specific information is available with respect to conditions between boreholes when foundation construction is underway. The interpretation between boreholes and the recommendations of this report must therefore be checked through field inspections provided by DS to validate the information for use during the construction stage.

5.5 FLOOR SLAB

The floor slab can be supported on grade provided all organic materials/topsoil, fill, and surficial softened/disturbed native soils are removed and the base thoroughly proof rolled. The fill required to raise the grade can consist of inorganic soil, approved by this office, placed in shallow lifts, and compacted to 98 percent of Standard Proctor Maximum Dry Density (SPMDD). Where engineered fill is used to support the foundations, the floor slab can also be supported by engineered fill.

A moisture barrier consisting of at least 200 mm of 19 mm clear crushed stone should be installed under the floor slab.

A perimeter and underfloor drainage system will be required around the exterior basement walls, as shown on **Drawing 53**.

5.6 EARTH PRESSURES

The lateral earth pressures acting on retaining walls or underground structures may be calculated from the following expression:

$$p = k(\gamma h + q)$$

where, p = Lateral earth pressure in kPa acting at depth h

K	=	Earth pressure coefficient, assumed to be 0.40 for vertical walls and horizontal backfill for permanent construction
γ	=	Unit weight of backfill, a value of 21 kN/m ³ may be assumed
h	=	Depth to point of interest in metres
q	=	Equivalent value of surcharge on the ground surface in kPa

The above expression assumes that the perimeter drainage system prevents the build up of any hydrostatic pressure behind the wall.

5.7 STORMWATER MANAGEMENT PONDS

It is understood that three stormwater management ponds are proposed in the following areas closest to boreholes advanced on the site by DS: **Pond 1** will be located in the area of BHH13 to BH16 (drilled by Soil Engineers Ltd.) and BH22-33 (drilled by DS); **Pond 2A** (will be located in closest proximity to BH20-7, however BH20-7 is a significant distance away from the Pond 2A) and **Interim Pond 2** will be located in the area of BH20-6, BH20-8, BH22-13 and BH22-14.

Five boreholes (BH13 to BH16 by Soil Engineers Ltd. (Soil-Eng.) and BH22-33 by DS) were carried out in the area of **Pond 1**. Borehole BH14 by Soil-Eng. was terminated at Elev. 261.2 m, i.e., 0.2 m above the base of the proposed pond and all Soil-Eng.'s boreholes indicated the presence of a surficial topsoil and weathered zone, followed by silty clay till for the extent of the boreholes, i.e., to Elev. 259.2 to 261.2 m. The water levels in the open boreholes and/or monitoring wells were noted as dry.

For **Pond 1**, BH22-33 by DS indicated that below a surficial topsoil and weathered disturbed layer, silty clay till was encountered and extended to Elev. 265.7 m and followed by sandy silt till which extended to Elev. 261.9 m. The sandy silt till was followed by a wet sandy gravel deposit to Elev. 258.9 and then wet silty sand to sandy silt which extended to the depth investigated, i.e., depth of 11.3 m below ground surface (Elev. 256.7 m). The groundwater level measured on March 21, 2023, in the monitoring well in BH22-33 was at Elev. 264.8 m. The measured groundwater in BH22-33 was **3.8 m** above the base of the pond.

BH20-7 was carried out by DS in closest proximity to **Pond 2A**. At BH20-7, surficial topsoil and shallow fill layers were underlain by clayey silt to silty clay till deposits which extended to the depth of investigation, i.e., a depth of 11.3 m below ground surface (Elev. 250.4 m). The measured groundwater level in the monitoring well installed in BH20-7 was at Elev. 255.2 m. Additional

boreholes should be carried out within the footprint of the proposed pond to obtain more specific subsurface information for the pond.

BH20-6, BH20-8, BH22-13, and BH22-14 were drilled by DS at or near **Interim Pond 2**. At BH20-6 and BH22-14, surficial topsoil underlain by weathered/disturbed native or fill materials were contacted at the surface of the boreholes. These materials were in-turn underlain by silty clay to clayey silt till which extended to the depth of investigation, i.e., depth of 8.2 and 12.8 m (Elev. 262.8 and 258.6 m) below ground surface, in BH20-6 and BH22-14, respectively. At BH20-8 and BH22-13, the surficial topsoil and weathered/disturbed native or fill materials were underlain by a silt deposit that extended to Elev. 271.2 and 268.5 m and followed by wet sandy silt to silty sand deposit which extended to the depth of investigation, i.e., depth of 12.8 and 8.2 m (Elev. 269.0 and 263.3 m) below ground surface.

The groundwater levels measured on March 21, 2023, in the monitoring wells installed in BH20-6, BH22-13 and BH22-14 were at Elev. 270.7, 270.7 and 271.1 m, respectively. The groundwater levels were above the base of the pond.

Where the pond bottom and sides consist of cohesionless (sandy) soils, a clay liner will be required to retain water in the pond. The required thickness and uplift stability of the liner must be estimated and analyzed when the design information for the pond is available.

Dewatering system will be required for excavations below groundwater levels, subject to depth of excavations and type of soils encountered, to be confirmed during design stage.

Anti-seepage collars should be considered for outlet works that direct flow out of the SWM pond as these outlet works are subject to hydraulic heads directly from the pond. The provision of anti-seepage collars would increase the seepage path along the outlet works and therefore reduce the quantity of potential seepage.

Further preliminary detailed geotechnical discussion based on provided design details/elevations for the ponds will be issued under separate cover.

6. GENERAL COMMENTS AND LIMITATIONS OF REPORT

DS Consultants Ltd. (DS) should be retained for a general review of the final design and specifications to verify that this report has been properly interpreted and implemented. If not accorded the privilege of making this review, DS will assume no responsibility for interpretation of the recommendations in the report.

This report is intended solely for the Client named. The material in it reflects our best judgment in light of the information available to DS at the time of preparation. Unless otherwise agreed in

writing by DS, it shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. No portion of this report may be used as a separate entity, it is written to be read in its entirety.

The conclusions and recommendations given in this report are based on information determined at the test hole locations. The information contained herein in no way reflects on the environment aspects of the project, unless otherwise stated. Subsurface 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 site investigation. The benchmark and elevations used in this report are primarily to establish relative elevation differences between the test hole locations and should not be used for other purposes, such as grading, excavating, planning, development, etc.

The design recommendations given in this report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report.

The comments made in this report on potential construction problems and possible methods are intended only for the guidance of the designer. The number of test holes may not be sufficient to determine all the factors that may affect construction methods and costs. For example, the thickness of surficial organic soil/topsoil or fill layers may vary markedly and unpredictably.

The contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the subsurface conditions may affect their work. This work has been undertaken in accordance with normally accepted geotechnical engineering practices.

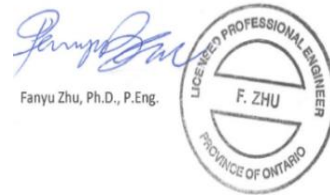
Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. DS accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.

We trust that the information contained in this report is satisfactory. Should you have any questions, please do not hesitate to contact this office.

DS CONSULTANTS LTD



Osbert (Ozzie) Benjamin, P.Eng.
Senior Geotechnical Engineer

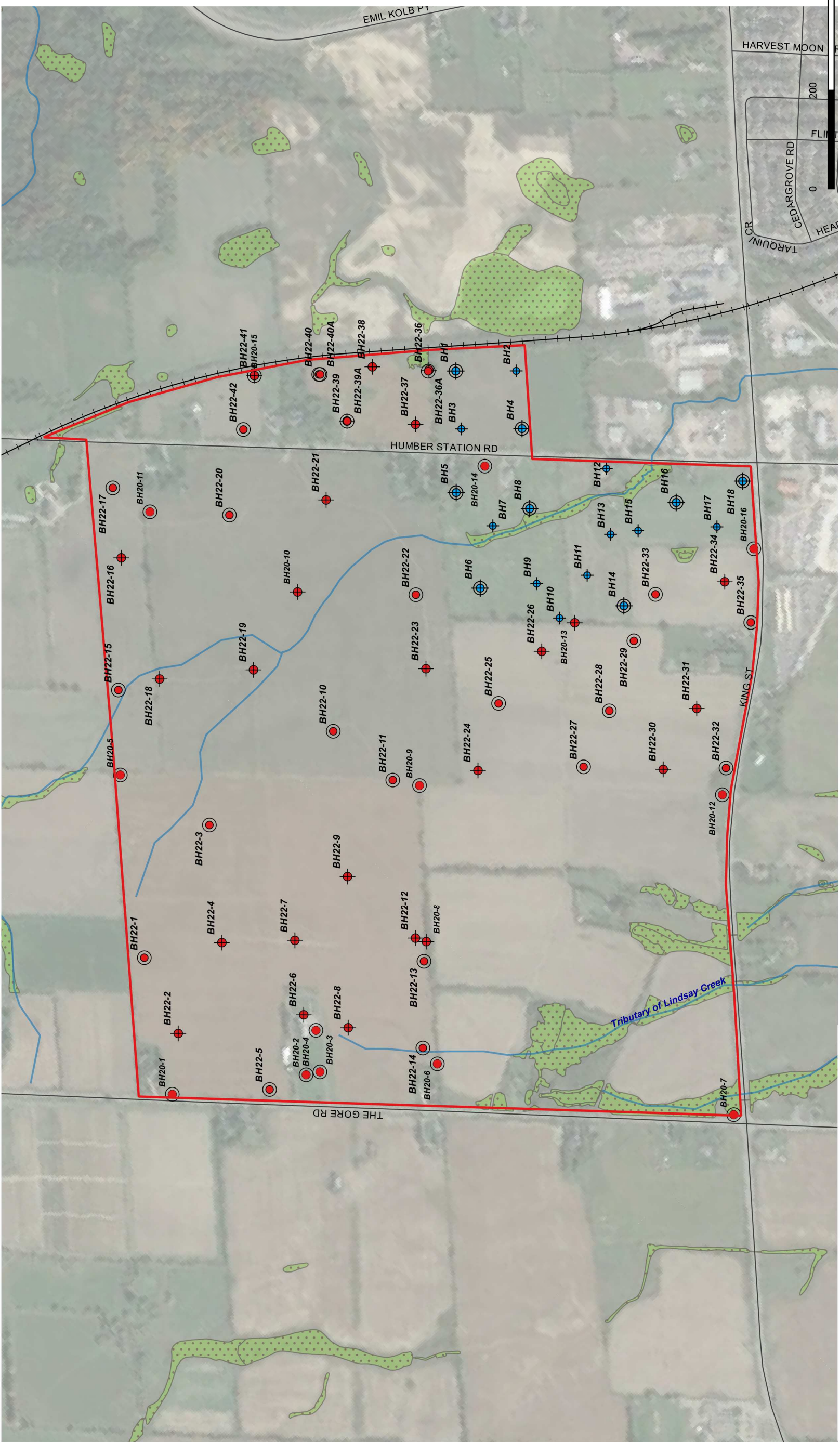


Fanyu Zhu, Ph.D., P.Eng.
Principal Engineer



Shabbir Dandukwala, M.Eng., P.Eng.
Principal Engineer

Drawings



- Legend**
- Caledon Station Property Boundary
 - Argo King I & Argo King II
 - Borehole
 - Monitoring Well
 - ⊕ Borehole (Soil Eng)
 - ⊕ Monitoring Well (Soil Eng)
 - Wetland

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Client:
 CALEDON COMMUNITY PARTNERS
 c/o GLEN SCHNARR & ASSOCIATES

Project: GEOTECHNICAL INVESTIGATION
 Caledon Station and Argo King I & Argo King II, Caledon (Bolton), ON

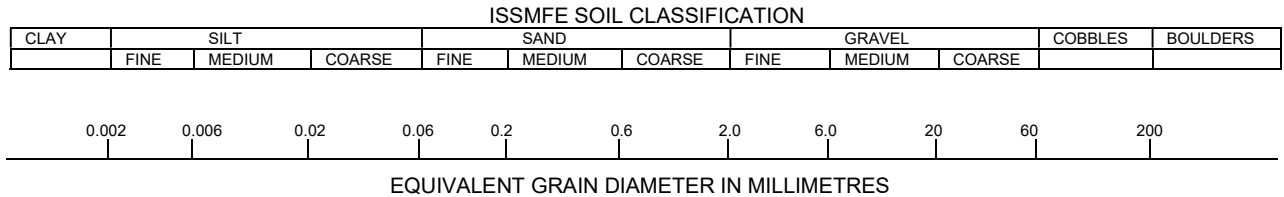
BOREHOLE AND MONITORING WELL LOCATIONS

Size:	11x17	Approved By:	O. B	Drawn By:	S. Y	Date:	May 2023
Rev:	0	Scale:	As Shown	Project No.:	20-169-104	Drawing No.:	1
Image/Map Source: Google Satellite Image							



Drawing 1A: Notes On Sample Descriptions

1. All sample descriptions included in this report generally follow the Unified Soil Classification. Laboratory grain size analyses provided by DSCL also follow the same system. Different classification systems may be used by others, such as the system by the International Society for Soil Mechanics and Foundation Engineering (ISSMFE). Please note that, with the exception of those samples where a grain size analysis and/or Atterberg Limits testing have been made, all samples are classified visually. Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems.



CLAY (PLASTIC TO)	FINE	MEDIUM	CRS.	FINE	COARSE
SILT (NONPLASTIC)	SAND			GRAVEL	

UNIFIED SOIL CLASSIFICATION

2. **Fill:** Where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc., none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional preliminary geotechnical site investigation.
3. **Till:** The term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (60 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858060.2 E 597225.82	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Aug/31/2022 REF. NO.: 20-169-104 ENCL NO.: 2
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SOIL PROFILE	SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)					
	DESCRIPTION	NUMBER	TYPE			"N" BLOWS 0.3 m	20							40	60	80	100	20
279.0																		
278.9	TOPSOIL: 300mm	1	SS	9														
0.3	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace sand, trace gravel, trace rootlets, brown, moist, stiff	2	SS	24														
278.2	SILTY CLAY TO CLAYEY SILT TILL: trace to some sand, trace gravel, brown, moist, very stiff to hard	3	SS	28														
0.8	sandy silt till layer @2.3m	4	SS	32														
		5	SS	31														
	grey below 4.6m	6	SS	34														
272.7	SANDY SILT TILL: trace clay, trace gravel, grey, very moist, very dense	7	SS	65														
6.3																		
271.4	SANDY SILT TO SILTY SAND: trace clay, trace gravel, grey, wet, very dense	8	SS	78														
7.6																		
270.8																		
8.2																		

END OF BOREHOLE:
 Notes:
 1) 50mm dia. monitoring well installed upon completion.
 2) Water Level Readings:
 Date: Water Level(mbgl):
 Sept. 8, 2022 3.4
 Mar. 21, 2023 2.62

W. L. 276.4 m
Mar 21, 2023
 W. L. 275.6 m
Sep 08, 2022

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Geotechnical Investigation
 CLIENT: Caledon Community Partners
 PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON
 DATUM: Geodetic
 BOREHOLE LOCATION: See Drawing 1 N 4857899.68 E 597174.15

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Aug/31/2022
 REF. NO.: 20-169-104
 ENCL NO.: 3

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)						
280.2	TOPSOIL: 300mm													
279.0	WEATHERED/DISTURBED		1	SS	8									
0.3	NATIVE: sandy silt, clayey, trace rootlets, trace gravel, brown, moist, loose													
279.4			2	SS	13									
0.8														
278.7	SILTY CLAY TO CLAYEY SILT													
1.5	TILL: some sand to sandy, trace rootlets, trace gravel, brown, moist, stiff		3	SS	15									
	SILTY SAND TO SANDY SILT: trace clay, brown, moist, compact to dense		4	SS	36									
			5	SS	34									
	wet, trace gravel below 4.6m		6	SS	45									
			7	SS	44									
	grey below 7.8m		8	SS	35									
	compact below 9.1m		9	SS	19									
269.5														
10.7	SAND: some silt to silty, trace clay, grey, wet, compact		10	SS	16									
268.0														
12.2	SANDY SILT TILL: some clay, trace gravel, grey, wet, very dense		11	SS	53									
267.4														
12.8	END OF BOREHOLE: Notes: 1) Water at depth of 4.5m during drilling.													

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3 , × 3 : Numbers refer to Sensitivity ○ ● = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858172.91 E 597505.29	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Aug/30/2022 REF. NO.: 20-169-104 ENCL NO.: 4
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20 40 60 80 100	20 40 60 80 100						
274.8	TOPSOIL: 250mm	1	SS	9										
274.0	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace sand, trace gravel, trace rootlets, brown, moist, stiff	2	SS	20		W. L. 274.5 m Mar 21, 2023								
274.2	SILTY CLAY TO CLAYEY SILT TILL: trace sand, trace gravel, brown, moist, very stiff	3	SS	23		W. L. 273.4 m Sep 08, 2022								
271.6	SANDY SILT TILL: some clay to clayey, trace gravel, grey, moist, compact to dense	4	SS	28		272								
271.6		5	SS	30		271								
270		6	SS	21		270								
267.2	SANDY SILT: trace clay, trace gravel, grey, wet, dense to very dense	7	SS	28		269								
267.2		8	SS	42		268								
266		9	SS	59		267								
265.1	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbgl): Sept. 08, 2022 1.42 Mar. 21, 2023 0.32					266								

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th
 Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857977.59 E 597363.66	DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Aug/30/2022 REF. NO.: 20-169-104 ENCL NO.: 5
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)							
279.8	TOPSOIL: 200mm		1	SS	9										
279.6	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace sand, trace gravel, trace rootlets, brown, moist, stiff		2	SS	26										
278.8	SILTY CLAY TO CLAYEY SILT TILL: trace sand, trace gravel, brown, moist, very stiff to hard sand pocket@1.5m		3	SS	50/ 130mm										
277.5	SAND: trace to some silt, trace gravel, brown, moist, dense		4	SS	36										
276.0			5	SS	41										
275.2	SANDY SILT TO SILT: trace clay, brown, wet, compact to dense		6	SS	25										
274.0			7	SS	39										
273.0			8	SS	19										
272.0			9	SS	41										
271.0			10	SS	45										
268.5	grey below 10.7m														
11.3	END OF BOREHOLE: Notes: 1) Water at depth of 4.6m during drilling.														

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th
 GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857690.79 E 597235.89	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Aug/31/2022 REF. NO.: 20-169-104 ENCL NO.: 6
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20 40 60 80 100	20 40 60 80 100						
279.7	TOPSOIL: 320mm	1	SS	10										
279.4	WEATHERED/DISTURBED NATIVE: clayey silt, some sand to sandy, trace rootlets, trace gravel, brown, moist, stiff	2	SS	45		279								
278.9	SILTY CLAY TO CLAYEY SILT TILL: trace sand, trace gravel, brown, moist, hard	3	SS	30		278								
		4	SS	37		277								
276.6		5	SS	82		276								
3.1		SANDY SILT: trace clay, brown, moist, dense to very dense	6	SS	46		275							
	wet below 4.6m					274								
273.6	SILT: some clay, trace sand, silty clay pockets, trace gravel, brown, wet, dense	7	SS	40		273.6								
6.1	some sand to sandy@7.6m					273.2								
271.5		8	SS	48		272								

8.2 END OF BOREHOLE:
 Notes:
 1) 50mm dia. monitoring well installed upon completion.
 2) Water Level Readings:
 Date: Water Level(mbgl):
 Sept. 08, 2022 6.53
 Mar. 21, 2023 5.82

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

PROJECT: Geotechnical Investigation
 CLIENT: Caledon Community Partners
 PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON
 DATUM: Geodetic
 BOREHOLE LOCATION: See Drawing 1 N 4857757.24 E 597389.06

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Aug/31/2022
 REF. NO.: 20-169-104
 ENCL NO.: 7

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)					
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80				100	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	GR
278.0	TOPSOIL: 380mm																		
277.8	WEATHERED/DISTURBED NATIVE: sandy silt, trace clay, trace gravel, trace rootlets, brown, moist, loose SILTY SAND TO SANDY SILT: trace clay, brown, moist, compact to dense wet below 4.6m greyish brown below 12.2m		1	SS	9														
277.2			2	SS	10														
276.8			3	SS	25														
276.4			4	SS	38														
276.0			5	SS	45														
275.6			6	SS	33														
275.2			7	SS	23														
274.8			8	SS	19														
274.4			9	SS	18														
274.0			10	SS	26														
273.6			11	SS	31														
265.2	END OF BOREHOLE: Notes: 1) Water at depth of 4.6m during drilling.																		

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ● = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857881.68 E 597477	DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Aug/30/2022 REF. NO.: 20-169-104 ENCL NO.: 8
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)									
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40							60	80	100	20	40	60	80	100	10
279.8	TOPSOIL: 300mm																							
279.0	WEATHERED/DISTURBED NATIVE: silty clay, trace sand, trace rootlets, trace gravel, brown, moist, firm		1	SS	7																			
278.3	SANDY SILT: some clay, brown, moist, compact		2	SS	10																			
278.3	SILT: some sand to sandy, trace clay, trace gravel, brown, very moist, compact to dense occasional silty clay pockets, wet below 2.3m		3	SS	24																			
278.3	occasional silty clay pockets, wet below 2.3m		4	SS	31																			
278.3	grey below 4.6m		5	SS	31																			
278.3			6	SS	39																			
278.3			7	SS	26																			
278.3			8	SS	43																			
278.3			9	SS	31																			
278.3			10	SS	32																			
278.3			11	SS	30																			

12.8	END OF BOREHOLE: Notes: 1) Water at depth of 2.3m during drilling.																							
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DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

PROJECT: Geotechnical Investigation
 CLIENT: Caledon Community Partners
 PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON
 DATUM: Geodetic
 BOREHOLE LOCATION: See Drawing 1 N 4857677.07 E 597438.67

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Sep/01/2022
 REF. NO.: 20-169-104
 ENCL NO.: 9

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
277.0	TOPSOIL: 200mm		1	SS	11										
276.8	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace sand, trace gravel, trace rootlets, brown, moist, stiff		2	SS	17										
276.2	SILTY CLAY TILL: trace sand, trace gravel, brown, moist, very stiff		3	SS	26										
274.7	SILT: some sand to sandy, trace clay, trace gravel, brown, moist, dense to very dense		4	SS	65										
			5	SS	60										
	grey, wet below 4.6m		6	SS	51										
			7	SS	38										
			8	SS	34										
267.9	SILTY SAND TO SANDY SILT: trace clay, grey to brown, wet, compact to dense		9	SS	24										
			10	SS	48										
	brown, clayey silt pocket@10.7m		11	SS	44										
264.2	END OF BOREHOLE: Notes: 1) Water at depth of 4.6m during drilling.														

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ● = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857907.13 E 597643.95	DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Sep/02/2022 REF. NO.: 20-169-104 ENCL NO.: 10
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)						
278.2	TOPSOIL: 250mm		1	SS	7									
277.9	FILL: clayey silt to silty clay, some sand to sandy, trace gravel, trace rootlets, organic staining, dark brown to brown, moist, firm to stiff (possible weathered/disturbed native)		2	SS	11									
275.9			3	SS	9									
275.9			4	SS	31									
275.9	SILT: some sand to sandy, trace clay, brown, moist, dense to very dense		5	SS	53									
			6	SS	53									
			7	SS	38									
	wet below 4.6m		8	SS	38									
272.1	SANDY SILT TO SILTY SAND: trace clay, brown, wet, dense		9	SS	38									
272.1			10	SS	43									
268.1														

10.1	END OF BOREHOLE:													
	Notes: 1) Water at depth of 4.6m during drilling.													

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ● = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858145.98 E 597819.82	DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Sep/06/2022 REF. NO.: 20-169-104 ENCL NO.: 11
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)				
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80				100	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L
269.9	TOPSOIL: 280mm																
269.0	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace to some sand, trace gravel, trace rootlets, brown, moist, stiff	1	SS	8													
269.1																	
268.4	SILTY CLAY TILL: trace to some sand, trace gravel, brown, moist, very stiff	2	SS	15													
268.4	SANDY SILT TILL: trace to some clay, trace gravel, brown, moist, compact to very dense	3	SS	29													
268.4																	
268.4		4	SS	71													
268.4		5	SS	61													
268.4		6	SS	56													
268.4	grey, wet below 4.6m																
263.8	SANDY SILT TO SILTY SAND: trace clay, trace gravel, grey, wet, compact to dense	7	SS	38													
263.8																	
263.8		8	SS	37													
263.8																	
263.8		9	SS	23													
263.8																	
263.8		10	SS	31													
263.8																	
259.6	END OF BOREHOLE:																

Notes:
 1) 50mm dia. monitoring well installed upon completion.
 2) Water Level Readings:
 Date: Water Level(mbgl):
 Sept. 08, 2022 1.27
 Mar.21, 2023 0.22

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

PROJECT: Geotechnical Investigation
 CLIENT: Caledon Community Partners
 PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON
 DATUM: Geodetic
 BOREHOLE LOCATION: See Drawing 1 N 4857991.3 E 597843.47

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Sep/06/2022
 REF. NO.: 20-169-104
 ENCL NO.: 12

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)							
272.9	TOPSOIL: 250mm		1	SS	8										
272.0	WEATHERED/DISTURBED NATIVE: silty clay, trace sand, trace gravel, trace rootlets, brown, moist, stiff		2	SS	21										
272.1	SILTY CLAY TILL: trace sand, trace gravel, brown, moist, very stiff to hard		3	SS	32										
270.2	SANDY SILT TILL: clayey, trace gravel, brown, moist, dense to very dense		4	SS	40										
270.2			5	SS	50/50mm										
268.3	SANDY SILT TO SILTY SAND: trace clay, trace gravel, brown, wet, compact to very dense		6	SS	54										
267.0			7	SS	44										
265.0			8	SS	14										
263.0			9	SS	37										
262.6			10	SS	53										

W. L. 269.8 m
 Mar 21, 2023
 W. L. 269.3 m
 Sep 08, 2022

END OF BOREHOLE:
 Notes:
 1) Monitoring well installed 1 m away from borehole.
 2) 50mm dia. monitoring well installed upon completion.
 3) Water Level Readings:
 Date: Water Level(mbg):
 Sept. 08, 2022 3.6
 Mar. 21, 2023 3.11

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

<p>PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857721.12 E 597662.19</p>	<p>DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Sep/02/2022</p> <p>REF. NO.: 20-169-104 ENCL NO.: 13</p>
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)				
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80				100	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L
277.7	TOPSOIL: 300mm		1	SS	10													
277.4	WEATHERED/DISTURBED NATIVE: sandy silt to silt, trace clay, trace gravel, trace rootlets, dark brown to brown, moist, compact SILT: some sand to sandy, trace clay, trace gravel, brown, moist, compact to very dense clayey@2.3m wet below 3.1m		2	SS	18													
276.7			3	SS	33													
276.4			4	SS	59													
276.1			5	SS	75													
275.8			6	SS	66													
275.5			7	SS	40													
275.2			8	SS	38													
270.1	SANDY SILT TO SILTY SAND: trace clay, brown, wet, compact to dense grey below 10.7m		9	SS	33													
270.4			10	SS	45													
269.7			11	SS	14													
264.9																		
12.8	END OF BOREHOLE: Notes: 1) Water at depth of 3.1m during drilling.																	

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

<p>PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857674.46 E 597643.49</p>	<p>DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Sep/01/2022</p> <p>REF. NO.: 20-169-104 ENCL NO.: 14</p>
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SOIL PROFILE	SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION	NUMBER	TYPE			"N" BLOWS 0.3 m	20						
276.1 ELEV DEPTH													
276.0 0.3	TOPSOIL: 250mm	1	SS	9	276				○				
275.2 0.9	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace rootlets, trace sand, trace gravel, brown, moist, stiff SILT: trace sand, trace clay, trace gravel, brown, moist, compact to very dense	2	SS	15	275				○				
		3	SS	19	274				○				
		4	SS	70	273				○				
		5	SS	72	272				○				
	wet below 4.6m	6	SS	52	271				○				0 3 93 4
		7	SS	34	270				○				
268.5 7.6	SANDY SILT: trace clay, brown, wet, compact to dense	8	SS	35	269				○				
	grey below 9.1m	9	SS	21	268				○				0 31 64 5
		10	SS	46	267				○				
		11	SS	37	266				○				
263.3 12.8	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbg): Sept. 08, 2022 6.03 Mar. 21, 2023 5.43												

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation	DRILLING DATA
CLIENT: Caledon Community Partners	Method: Hollow Stem Auger
PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON	Diameter: 200mm
DATUM: Geodetic	Date: Sep/01/2022
BOREHOLE LOCATION: See Drawing 1 N 4857544.96 E 597523.95	REF. NO.: 20-169-104
	ENCL NO.: 15

(m) ELEV DEPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
			NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
271.4	TOPSOIL: 300mm														
270.9	WEATHERED/DISTURBED		1	SS	7		271.1 m								
0.3	NATIVE: clayey silt, trace rootlets, trace sand, trace gravel, brown, moist, firm		2	SS	9		Mar 21, 2023								
270.4	SILTY CLAY TO CLAYEY SILT						270								
1.0	TILL: some sand to sandy, trace gravel, brown, moist, stiff to hard		3	SS	34										
	sandy below 2.3m		4	SS	42		269								
	grey below 3.4m		5	SS	48		268								
			6	SS	22		267								
			7	SS	26		266								
			8	SS	28		265								
			9	SS	19		264								
			10	SS	16		263								
			11	SS	12		262								
258.6	END OF BOREHOLE:						261								
12.8	Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbgl): Sept. 08, 2022 11.9 Mar 21, 2023 0.33						260								
							259.5 m								
							Sep 08, 2022								

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858500.39 E 597551.22	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Aug/29/2022 REF. NO.: 20-169-104 ENCL NO.: 16
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20 40 60 80 100	20 40 60 80 100						
270.2	TOPSOIL: 300mm													
269.9	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace rootlets, trace gravel, trace sand, brown, moist, stiff to firm	1	SS	10	W. L. 268.3 m Sep 08, 2022									
0.3		2	SS	6										
268.7	SILTY CLAY TO CLAYEY SILT TILL: trace sand, trace gravel, brown, moist, very stiff to hard	3	SS	25										
1.5		4	SS	38										
2		5	SS	24										
3		6	SS	22										
4		7	SS	21										
5	grey below 4.6m	8	SS	57										
6														
7.6	SANDY SILT TILL: trace to some clay, trace gravel, grey, moist, very dense													
262.0	END OF BOREHOLE:													

Notes:
 1) 50mm dia. monitoring well upon completion.
 2) Water Level Readings:
 Date: Water Level(mbgf):
 Sept. 08, 2022 1.93

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ● = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858695.96 E 597735.36	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Aug/29/2022 REF. NO.: 20-169-104 ENCL NO.: 17
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)						
						20 40 60 80 100 ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE				W _p	W	W _L	GR SA SI CL	
268.8	TOPSOIL: 250mm													
268.0	WEATHERED/DISTURBED NATIVE: clayey silt, some sand, trace gravel, brown, moist, stiff		1	SS	9									
268.0	SILTY CLAY TO CLAYEY SILT TILL: trace sand, trace gravel, brown, moist, very stiff to hard		2	SS	17									
1			3	SS	20									
2			4	SS	36									
3			5	SS	27									
4	grey below 3.5m		6	SS	27									
5			7	SS	21									
6			8	SS	25									
7														
8														
260.6	END OF BOREHOLE: Notes: 1) Borehole wet at the bottom upon completion.													

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

PROJECT: Geotechnical Investigation	DRILLING DATA
CLIENT: Caledon Community Partners	Method: Solid Stem Auger
PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON	Diameter: 150mm
DATUM: Geodetic	Date: Aug/29/2022
BOREHOLE LOCATION: See Drawing 1 N 4858813.11 E 597817.61	REF. NO.: 20-169-104 ENCL NO.: 18

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m		SHEAR STRENGTH (kPa)							
269.0	TOPSOIL: 300mm	1	SS	8	+	○							
268.9	WEATHERED/DISTURBED												
0.3	NATIVE: sandy silt, trace to some clay, trace rootlets, trace gravel, brown, moist, loose	2	SS	23									
268.2	SILTY CLAY TO CLAYEY SILT												
0.8	TILL: trace sand, trace gravel, brown, moist, very stiff to hard	3	SS	27									
1		4	SS	33									
2		5	SS	31									
3		6	SS	26									
4	grey below 4.9m												
5		7	SS	50/ 75mm									
6	possible boulder@6.1m												
7		8	SS	24									
8													
260.8													

END OF BOREHOLE:
Notes:
1) 50mm dia. monitoring well installed upon completion.
2) Water Level Readings:
Date: Water Level(mbg):
Sept. 08, 2022 2.26
Mar. 21, 2023 -0.71

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

<p>PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858460.95 E 597628.58</p>	<p>DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Aug/29/2022</p> <p style="text-align: right;">REF. NO.: 20-169-104 ENCL NO.: 19</p>
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)							
270.0															
269.0	TOPSOIL: 250mm		1	SS	3										
0.3	WEATHERED/DISTURBED														
269.2	NATIVE: clayey silt, some sand, trace rootlets, trace gravel, brown, moist, soft		2	SS	21										
0.8	SILTY CLAY TO CLAYEY SILT TILL: trace sand, trace gravel, brown, moist, very stiff to hard		3	SS	21										
			4	SS	34										
			5	SS	31										
	grey below 4.6m														
			6	SS	18										
263.9	CLAYEY SILT: trace sand, grey, moist, very stiff		7	SS	29										
6.1															
262.4	SAND AND SILT TILL: some clay, some gravel, grey, moist, dense		8	SS	31										11 38 40 11
7.6															
261.8															
8.2	END OF BOREHOLE: Notes: 1) Borehole wet at the bottom upon completion.														

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

<p>PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858347.09 E 597782.77</p>	<p>DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Aug/30/2022</p> <p style="text-align: right;">REF. NO.: 20-169-104 ENCL NO.: 20</p>
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		SHEAR STRENGTH (kPa)			PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L	10 20 30	GR SA SI CL				
269.0	TOPSOIL: 280mm																	
268.0	WEATHERED/DISTURBED		1	SS	6													
268.2	NATIVE: clayey silt, trace sand, trace rootlets, trace gravel, brown, moist, firm		2	SS	9		268											
0.8	SILTY CLAY TO CLAYEY SILT		3	SS	23		267											
	TILL: trace sand, trace gravel, brown, moist, stiff to hard trace fine rootlets above 0.9m		4	SS	31		266											
			5	SS	32		265											
	sandy, grey below 4.6m		6	SS	24		264											
			7	SS	24		263											
			8	SS	20		262											
260.8	END OF BOREHOLE:						261											

8.2	<p>END OF BOREHOLE: Notes: 1) Water at depth of 7.3 during drilling.</p>															
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DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858613.57 E 597956.89	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Aug/29/2022 REF. NO.: 20-169-104 ENCL NO.: 21
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20 40 60 80 100	20 40 60 80 100						
269.4	TOPSOIL: 250mm														
269.0	WEATHERED/DISTURBED		1	SS	7		269								
0.3	NATIVE: clayey silt, some sand to sandy, trace rootlets, trace gravel, brown, moist, firm		2	SS	24		268								
268.6	SILTY CLAY TO CLAYEY SILT TILL: trace sand, gravelly sand pocket@1.0m, brown, moist, very stiff to hard		3	SS	30		268								
0.8			4	SS	45		267								
			5	SS	39		266								
	grey below 4.6m		6	SS	19		265								
			7	SS	21		263								
			8	SS	18		262								

8.2 END OF BOREHOLE:
 Notes:
 1) 50mm dia. monitoring well installed upon completion.
 2) Water Level Readings:
 Date: Water Level(mbg):
 Sept. 08, 2022 2.51

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3 , × 3 : Numbers refer to Sensitivity ○ ● = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858504.78 E 598123.48	DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Aug/26/2022 REF. NO.: 20-169-104 ENCL NO.: 22
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)									
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40							60	80	100	20	40	60	80	100	10
267.4																								
267.0	TOPSOIL: 250mm		1	SS	6																			
0.3	WEATHERED/DISTURBED NATIVE: sandy silt, trace rootlets, trace clay, trace gravel, brown, moist, loose		2	SS	20																			
266.6	SILTY CLAY TILL: some sand, trace gravel, brown, moist, very stiff to hard		3	SS	18																			
1			4	SS	30																			
2			5	SS	33																			
3			6	SS	16																			
4			7	SS	16																			
5			8	SS	19																			
6																								
7																								
8																								
259.2																								

8.2 **END OF BOREHOLE:**
Notes:
1) Borehole wet at the bottom upon completion.

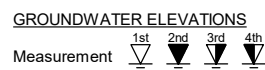
DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858239.64 E 598130.15	DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Aug/26/2022 REF. NO.: 20-169-104 ENCL NO.: 23
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)				
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80				100	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L
267.8	TOPSOIL: 250mm	1	SS	7													
267.0	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace rootlets, some sand, trace gravel, dark brown, moist, firm	2	SS	16													
267.0	CLAYEY SILT TO SILTY CLAY TILL: trace sand, trace gravel, brown, moist, very stiff to hard	3	SS	26													
		4	SS	33													
		5	SS	39													
	grey below 4.6m	6	SS	15													
		7	SS	22													
260.2	SANDY SILT TILL: some clay to clayey, trace gravel, silty sand	8	SS	68													
259.6	ockets, grey, moist, very dense																

END OF BOREHOLE:
 Notes:
 1) 50mm dia. monitoring well installed upon completion.
 2) Water Level Readings:
 Date: Water Level(mbgl):
 Sept. 08, 2022 1.43
 Mar. 21, 2023 0.73

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23



GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ● = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858114.18 E 598044.93	DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Aug/26/2022 REF. NO.: 20-169-104 ENCL NO.: 24
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SOIL PROFILE	SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION	NUMBER	TYPE			"N" BLOWS 0.3 m	SHEAR STRENGTH (kPa)					
270.6												
270.0	TOPSOIL: 250mm	1	SS	5								
269.8	WEATHERED/DISTURBED NATIVE: silty clay, trace rootlets, trace sand, trace gravel, brown, moist, firm	2	SS	23								
269.8	SILTY CLAY TILL: trace sand, trace gravel, brown, moist, very stiff to hard	3	SS	24								
		4	SS	29								
		5	SS	30								
	grey below 4.6m											
		6	SS	21								
264.5	SANDY SILT TILL: clayey, trace gravel, grey, moist, compact to very dense	7	SS	27								
262.5		8	SS	50/ 100mm								

8.1 **END OF BOREHOLE:**
Notes:
1) Borehole wet at the bottom upon completion.

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ● = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857889.88 E 597985.22	DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Aug/25/2022 REF. NO.: 20-169-104 ENCL NO.: 25
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)		
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)								
						20 40 60 80 100 ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100				PLASTIC LIMIT W _p NATURAL MOISTURE CONTENT W LIQUID LIMIT W _L WATER CONTENT (%)						
273.1	TOPSOIL: 200mm															
272.9	WEATHERED/DISTURBED NATIVE: silty clay, trace sand, trace rootlets, brown, moist, stiff SILTY CLAY TILL: trace sand, trace gravel, brown, moist, stiff to hard		1	SS	12											
272.7			2	SS	32											
272.0			3	SS	36											
271.0			4	SS	35											
270.0			5	SS	38											
268.5	SILT: some clay, some sand, trace gravel, grey, moist, dense		6	SS	30											
267.0			7	SS	20											
267.0	CLAYEY SILT TO SILTY CLAY TILL: trace sand, trace gravel, grey, moist, very stiff		8	SS	17											
266.0			9	SS	17											
264.0			10	SS	16											
262.7	sandy @9.1m															

10.4 **END OF BOREHOLE:**
Notes:
1) Borehole wet at the bottom upon completion.

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

<p>PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857963.09 E 598107.54</p>	<p>DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Aug/25/2022</p> <p>REF. NO.: 20-169-104 ENCL NO.: 26</p>
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)									
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40							60	80	100	20	40	60	80	100	10
270.9	TOPSOIL: 300mm																							
270.0	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace rootlets, trace sand, trace gravel, brown, moist, stiff		1	SS	10																			
270.1			2	SS	28																			
270.8	SILTY CLAY TILL: some sand, trace gravel, brown, moist, very stiff to hard		3	SS	29																			
			4	SS	31																			
			5	SS	30																			
			6	SS	18																			
			7	SS	34																			
	grey below 4.6m		8	SS	57																			
			9	SS	22																			
			10	SS	37																			
263.3	SILTY SAND: trace clay, silt seams, grey, wet, compact to very dense																							
259.6	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbgl): Sept. 08, 2022 3.1 Mar. 21, 2023 2.27																							

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

<p>PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857983.06 E 598243.39</p>	<p>DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Aug/24/2022</p> <p style="text-align: right;">REF. NO.: 20-169-104 ENCL NO.: 27</p>
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40							60
269.0	TOPSOIL: 200mm		1	SS	9											
268.8	WEATHERED/DISTURBED															
268.2	NATIVE: clayey silt to silty clay, trace rootlets, trace sand, brown, moist, stiff		2	SS	28											
1 0.8	SILTY CLAY TO CLAYEY SILT															
2	TILL: trace sand, trace gravel, brown, moist, stiff to hard		3	SS	22											
3			4	SS	39											
4			5	SS	34											
5	grey below 4.6m		6	SS	14											
6			7	SS	31											
7			8	SS	53											
8	silty sand pockets below 6.1m															
9 259.9			9	SS	50/30											
9.4 259.6	SILT: trace to some sand, trace clay, grey, moist to wet, very dense															
	END OF BOREHOLE: Notes: 1) Borehole wet at the bottom upon completion.															

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857751.7 E 598149.64	DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Aug/19/2022 REF. NO.: 20-169-104 ENCL NO.: 28
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)							
271.2	TOPSOIL: 230mm													
270.0	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, some sand to sandy, trace rootlets, trace gravel, brown, moist, stiff	1	SS	12										
270.4		2	SS	23										
269.5	SILTY CLAY TILL: trace sand, trace gravel, brown, moist, very stiff	3	SS	35										
269.0	SANDY SILT: trace clay, trace gravel, brown, moist, dense	4	SS	46										
	clayey seams @3.1m	5	SS	44										
266.6	grey @4.5m	6	SS	29										
266.0	SILT: some clay to clayey, some sand, grey, very moist, compact	7	SS	26										
	wet below 6.1m	8	SS	20										
263.6	SANDY SILT: trace clay, grey, wet, compact	9	SS	19										
263.0		10	SS	17										
259.0	SILTY SAND: trace clay, grey, wet, (disturbed)	11	SS	disturbed									disturbed sample	
258.4	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbgf): Sept. 08, 2022 4.25 Mar. 21, 2023 2.96													

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857801.25 E 598264.59	DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Aug/19/2022 REF. NO.: 20-169-104 ENCL NO.: 29
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
270.9	TOPSOIL: 200mm													
270.0	WEATHERED/ DISTURBED NATIVE: clayey silt, some sand to sandy, trace gravel, trace rootlets, brown, moist, stiff	1	SS	13										
270.1		2	SS	30										
270.8	SILTY CLAY TO CLAYEY SILT TILL: trace sand, trace gravel, brown, moist, hard sandy@1.5m	3	SS	55										
268.6		4	SS	44										
267.8	SANDY SILT TILL: trace clay, trace to some gravel, brown, moist, dense	5	SS	72										
265.9		6	SS	56										
263.3	SILT: some clay to clayey, trace sand, trace to some gravel, grey, very moist to wet, dense to very dense	7	SS	32										
259.6		8	SS	37										
		9	SS	29										
		10	SS	14										

11.3 END OF BOREHOLE:
 Notes:
 1) 50mm dia. monitoring well installed upon completion.
 2) Water Level Readings:
 Date: Water Level(mbg):
 Sept. 08, 2022 4.81
 Mar. 21, 2023 3.68

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857873.47 E 598396.84	DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Aug/23/2022 REF. NO.: 20-169-104 ENCL NO.: 30
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
268.9	TOPSOIL: 250mm													
268.0	WEATHERED/DISURBED NATIVE: silty clay, trace sand, trace gravel, trace rootlets, brown, moist, stiff	1	SS	10										
268.1		2	SS	26										
1 0.8	SILTY CLAY TO CLAYEY SILT TILL: trace sand, trace gravel, brown, moist, very stiff to hard	3	SS	26										
2		4	SS	34										
3	sandy silt till lenses below 2.3m													
265.7		5	SS	36										
3.2	SAND: trace silt, trace gravel, orange brown, moist to wet, compact to dense													
4		6	SS	39										
5	clayey silt pockets, grey, wet@4.6m													
6		7	SS	29										
7														
8		8	SS	32										
9														
259.8														
9.1	SILTY SAND: silt pockets, trace clay, grey, wet, dense	9	SS	43										
259.2														
9.7	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbgl): Sept. 08, 2022 3.8 Mar. 21, 2023 2.65													

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th
 Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ● = 3% Strain at Failure

PROJECT: Geotechnical Investigation
 CLIENT: Caledon Community Partners
 PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON
 DATUM: Geodetic
 BOREHOLE LOCATION: See Drawing 1 N 4857638.89 E 598267.27

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Aug/23/2022
 REF. NO.: 20-169-104
 ENCL NO.: 31

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)						
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)												
268.3	TOPSOIL: 250mm																			
268.0	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace sand, trace rootlets, brown, moist, stiff		1	SS	10															
267.5			2	SS	35															
267.0	SILTY CLAY TILL: trace sand, trace gravel, occasional cobble, brown, moist, very stiff to hard		3	SS	28															
266.0			4	SS	35															
265.0	SANDY SILT: trace clay, brown to grey, wet, dense grey below 2.6m		5	SS	32															
263.7			6	SS	23															
263.0	SILT TO SANDY SILT: some sand, trace to some clay, grey, wet, compact		7	SS	25															
262.0			8	SS	21															
259.2			9	SS	11															
259.0	SAND: some silt to silty, grey, wet, compact		10	SS	29															
255.5			11	SS	disturbed															(disturbed sample)
12.8	END OF BOREHOLE: Notes: 1) Water at depth of 2.3m during drilling.																			

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857685.22 E 598400.58	DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Aug/23/2022 REF. NO.: 20-169-104 ENCL NO.: 32
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
268.8	TOPSOIL: 200mm	1													
268.0	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace sand, trace gravel, trace organics/rootlets, brown, moist, stiff	2	SS		24										
268.0	SILTY CLAY TILL: trace sand, trace gravel, brown, moist, very stiff	3	SS		24										
266.5	SILT: some sand to sandy, trace to some clay, brown, wet, compact to dense	4	SS		37										
		5	SS		38										
	grey below 4.6m	6	SS		28										
		7													
		8	SS		37										
		9	SS		35										
258.1	SAND: some silt to silty, trace clay, brown to greyish brown, wet, dense	10	SS		30										
257.5	END OF BOREHOLE: Notes: 1) Water at depth of 2.3m during drilling.														

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ● = 3% Strain at Failure

PROJECT: Geotechnical Investigation
 CLIENT: Caledon Community Partners
 PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON
 DATUM: Geodetic
 BOREHOLE LOCATION: See Drawing 1 N 4857555.59 E 598363.99

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Aug/23/2022
 REF. NO.: 20-169-104
 ENCL NO.: 33

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE								
265.3	TOPSOIL: 200mm											
264.9	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace sand, trace gravel, trace rootlets, brown mottled, moist, stiff		1	SS	9							
264.5	SILTY CLAY TILL: trace sand, trace gravel, brown mottled, moist, stiff to very stiff		2	SS	19							
263.3	SANDY SILT: trace clay, trace to some gravel, grey, very moist, compact to dense wet below 2.3m		3	SS	14							
			4	SS	21							
			5	SS	27							
			6	SS	38							
			7	SS	27							
	with silty sand lenses below 7.6m		8	SS	33							
			9	SS	23							
254.6	SAND: some silt, trace clay, grey, wet, compact		10	SS	24							0 82 15 3
253.1	SANDY SILT: with clayey silt pockets, grey, wet, compact		11	SS	15							
12.8	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbgl): Sept. 08, 2022 0.32 Mar. 21, 2023 -0.48											

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857913.51 E 598493.46	DRILLING DATA Method: Hollow Stem Auger Diameter: 200mm Date: Aug/25/2022 REF. NO.: 20-169-104 ENCL NO.: 34
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)							
268.0	TOPSOIL: 250mm													
267.0	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace rootlets, trace sand, trace gravel, brown, moist, stiff SILTY CLAY TILL: trace sand, trace gravel, brown, moist, stiff to very stiff	1	SS	10										
267.2		2	SS	12										
265.7		3	SS	29										
265.7	SANDY SILT TILL: trace clay, trace gravel, occasional cobble, brown, moist, compact to very dense occasional wet sand seams@3.1m	4	SS	41										
264.8		5	SS	25										
263.7		6	SS	50/ 100mm										
261.9	SANDY GRAVEL: some silt, brown, wet, compact to dense	7	SS	25										
260.0		8	SS	43									52 34 11 3	
258.9	SILTY SAND TO SANDY SILT: trace clay, grey, wet, compact to dense	9	SS	27										
257.0		10	SS	35										
11.3	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbgl): Sept. 08, 2022 4.29 Mar. 21, 2023 3.17													

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation
 CLIENT: Caledon Community Partners
 PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON
 DATUM: Geodetic
 BOREHOLE LOCATION: See Drawing 1 N 4857838.45 E 598615.09

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Aug/24/2022
 REF. NO.: 20-169-104
 ENCL NO.: 35

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
267.0	TOPSOIL: 250mm														
266.8	WEATHERED/DISTURBED		1	SS	8										
0.3	NATIVE: silty clay to clayey silt,														
266.2	trace sand, trace gravel, trace rootlets, brown, moist, stiff		2	SS	13										
1 0.8	CLAYEY SILT TO SILTY CLAY TILL: trace to some sand, trace gravel, brown, moist, stiff to very stiff		3	SS	28										
265.2															
2 1.8	GRAVELLY SAND: some silt, trace clay, brown, wet, compact to very dense moist, some cobbles at 3.1m		4	SS	44										
3															
4															
5															
6															
7															
8															
9															
10															
11 10.7	CLAYEY SILT TILL: sandy, trace gravel, sand pockets, grey, moist, hard		10	SS	49									32 54 11 3	
255.7															
11.3	END OF BOREHOLE: Notes: 1) Water at depth of 1.8m during drilling.														

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Geotechnical Investigation
 CLIENT: Caledon Community Partners
 PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON
 DATUM: Geodetic
 BOREHOLE LOCATION: See Drawing 1 N 4857741.56 E 598599.11

DRILLING DATA
 Method: Hollow Stem Auger
 Diameter: 200mm
 Date: Aug/24/2022
 REF. NO.: 20-169-104
 ENCL NO.: 36

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
266.1	TOPSOIL: 250mm														
265.8	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace sand, trace gravel, trace rootlets, brown, moist, firm		1	SS	5										
265.3			2	SS	21										
264.6	SILTY CLAY TILL: trace sand, trace gravel, brown, moist, very stiff		3	SS	18										
264.0	SANDY SILT TO SILTY SAND: trace clay, brown, wet, compact to dense		4	SS	30										
			5	SS	32										
			6	SS	23										
260.0	SAND: some silt, trace silt seams, brown, wet, compact		7	SS	17										
258.5	SANDY SILT TO SILTY SAND: trace clay, grey, wet, compact to very dense		8	SS	37										
			9	SS	52										
			10	SS	37										
			11	SS	47										
			12	SS	23										
252.5	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbgl): Sept. 08, 2022 2.23 Mar. 21, 2023 1.23														

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation	DRILLING DATA
CLIENT: Caledon Community Partners	Method: Solid Stem Auger
PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON	Diameter: 150mm
DATUM: Geodetic	Date: Sep/07/2022
BOREHOLE LOCATION: See Drawing 1 N 4858560.88 E 598455.25	REF. NO.: 20-169-104
	ENCL NO.: 37

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)	
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)							
261.7															
260.9	TOPSOIL: 250mm		1	SS	7										
0.3	WEATHERED/DISTURBED														
260.9	NATIVE: silty sand, trace rootlets,														
0.8	trace gravel, brown, moist, loose		2	SS	12										
260.2	SANDY SILT: some clay, trace														
1.5	gravel, brown, very moist, compact		3	SS	10										
	SILTY CLAY TILL: some sand to														
	sandy, trace gravel, brown, moist,		4	SS	16										
	stiff to very stiff														
	grey below 2.3m		5	SS	16										
			6	SS	18										
			7	SS	19										
			8	SS	19										
			9	SS	27										
			10	SS	26										
251.2	END OF BOREHOLE:														
10.5	Notes: 1) Borehole wet at the bottom upon completion.														

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

PROJECT: Geotechnical Investigation	DRILLING DATA
CLIENT: Caledon Community Partners	Method: Solid Stem Auger
PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON	Diameter: 150mm
DATUM: Geodetic	Date: Sep/07/2022
BOREHOLE LOCATION: See Drawing 1 N 4858560.27 E 598452.63	REF. NO.: 20-169-104
	ENCL NO.: 38

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20 40 60 80 100	20 40 60 80 100						
261.8	Straight drilled to 4m to installed well						W. L. 261.7 m Mar 21, 2023								
0.0							261								
1								260							
2								W. L. 259.1 m Sep 19, 2022							
3							258								
257.8															

4.0	END OF BOREHOLE: Notes: 1) Straight drilled to 4m to install 50mm dia. monitoring well. 2) Water Level Readings: Date: Water Level(mbgl): Sept. 19, 2022 2.7 Mar. 21, 2023 0.14													
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DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858497.3 E 598361.23	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Sep/07/2022 REF. NO.: 20-169-104 ENCL NO.: 39
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40							60
265.1	TOPSOIL: 230mm															
264.0	WEATHERED/DISTURBED		1	SS	5											
0.2	NATIVE: clayey silt to silty clay, trace rootlets, trace sand, trace gravel, brown, moist, firm		2	SS	22											
264.3	SILTY CLAY TILL: trace sand, trace gravel, brown, moist, stiff to very stiff		3	SS	27											
0.8			4	SS	29											
			5	SS	22											
	grey below 3.1m		6	SS	14											
			7	SS	14											
			8	SS	16											
256.9																

8.2 **END OF BOREHOLE:**
 Notes:
 1) Borehole wet at the bottom upon completion.

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

PROJECT: Geotechnical Investigation	DRILLING DATA
CLIENT: Caledon Community Partners	Method: Solid Stem Auger
PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON	Diameter: 150mm
DATUM: Geodetic	Date: Sep/07/2022
BOREHOLE LOCATION: See Drawing 1 N 4858642.88 E 598374.23	REF. NO.: 20-169-104
	ENCL NO.: 40

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)						
						20	40	60	80	100	PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	
262.7	TOPSOIL: 250mm		1	SS	6									
262.9	WEATHERED/DISTURBED													
0.3	NATIVE: clayey silt to silty clay, trace rootlets, trace sand, trace gravel, brown to reddish brown, moist, firm		2	SS	13									
261.9														
0.8	SILTY CLAY TILL: trace sand, trace gravel, brown, moist, stiff to very stiff		3	SS	22									
			4	SS	42									
	grey below 3.1m		5	SS	24									
			6	SS	21									
			7	SS	25									
			8	SS	23									

8.2	END OF BOREHOLE: Notes: 1) Borehole wet at the bottom upon completion.													
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DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858595.53 E 598262.19	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Sep/07/2022 REF. NO.: 20-169-104 ENCL NO.: 41
--	--

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)						
266.5	TOPSOIL: 200mm		1	SS	5									
266.0	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace rootlets, brown, moist, firm silty sand lens below 0.5m		2	SS	9									
265.7														
265.0	SILTY CLAY TILL: trace sand, trace gravel, trace rootlets, brown, moist, stiff (disturbed)		3	SS	23									
1.5	SILTY CLAY TILL: trace sand, trace gravel, trace rootlets, brown, moist, very stiff to hard		4	SS	35									
			5	SS	41									
	grey below 4.6m		6	SS	34									
			7	SS	19									
			8	SS	26									

8.2 **END OF BOREHOLE:**
Notes:
1) Borehole wet at the bottom upon completion.

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ● = 3% Strain at Failure

<p>PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858595.12 E 598262.27</p>	<p>DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Sep/07/2022</p> <p style="text-align: right;">REF. NO.: 20-169-104 ENCL NO.: 42</p>
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SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20 40 60 80 100	20 40 60 80 100						
266.6	Straight drilled to 7.6m to install well.					▼	266.6								
0.0							W. L. 266.6 m Mar 21, 2023								
1															
2															
3								264.7							
4								W. L. 264.7 m Sep 19, 2022							
5															
6															
7															
259.0							259								

7.6	<p>END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbg): Sept. 19, 2022 1.92 Mar. 21, 2023 -0.02</p>													
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DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858703.05 E 598283.24	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Sep/07/2022 REF. NO.: 20-169-104 ENCL NO.: 43
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
264.0	TOPSOIL: 230mm		1	SS	8										
263.2	WEATHERED/DISTURBED NATIVE: silty clay, trace sand, trace rootlets, trace gravel, brown, moist, stiff		2	SS	27										
1 0.8	SILTY CLAY TILL: trace sand, trace gravel, brown, moist, very stiff to hard trace rootlets above 1.0m		3	SS	27										
2			4	SS	37										
3			5	SS	29										
4	grey below 3.1m		6	SS	15										
5			7	SS	20										
6			8	SS	17										
7															
8 255.8															

8.2 END OF BOREHOLE:
 Notes:
 1) 50mm dia. monitoring well installed upon completion.
 2) Water Level Readings:
 Date: Water Level(mbg):
 Oct 18, 2022 3.03

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3 , × 3 : Numbers refer to Sensitivity ○ ● = 3% Strain at Failure

<p>PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858702.2 E 598285.12</p>	<p>DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Sep/07/2022</p> <p style="text-align: right;">REF. NO.: 20-169-104 ENCL NO.: 44</p>
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SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT NUMBER	TYPE	"N" BLOWS 0.3 m	SHEAR STRENGTH (kPa)			WATER CONTENT (%)							
263.9 0.0	Straight drilled to 4.0m to install well.							20	20	30					
1 2 3 259.9								263	262	261	260				
4.0	<p>END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water Level Readings: Date: Water Level(mbg): Sept. 19, 2022 1.92</p>														

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

PROJECT: Geotechnical Investigation
 CLIENT: Caledon Community Partners
 PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON
 DATUM: Geodetic
 BOREHOLE LOCATION: See Drawing 1 N 4858790.18 E 598184.07

DRILLING DATA
 Method: Solid Stem Auger
 Diameter: 150mm
 Date: Sep/06/2022
 REF. NO.: 20-169-104
 ENCL NO.: 45

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)						
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)							WATER CONTENT (%)		GR SA SI CL			
264.0	TOPSOIL: 350mm		1	SS	9															
263.7	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace gravel, trace sand, organic staining, trace rootlets, brown, moist, stiff		2	SS	12															
263.2	SANDY SILT TO SILTY SAND: trace to some clay, trace gravel, brown, very moist, compact		3	SS	12															
261.7	SILTY CLAY TILL: trace to some sand, trace gravel, brown, moist, stiff to very stiff grey below 3.1m		4	SS	24															
2.3			5	SS	21															
			6	SS	16															
			7	SS	13															
			8	SS	20															
255.8																				
8.2	END OF BOREHOLE: Notes: 1) Borehole wet at the bottom upon completion.																			

DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

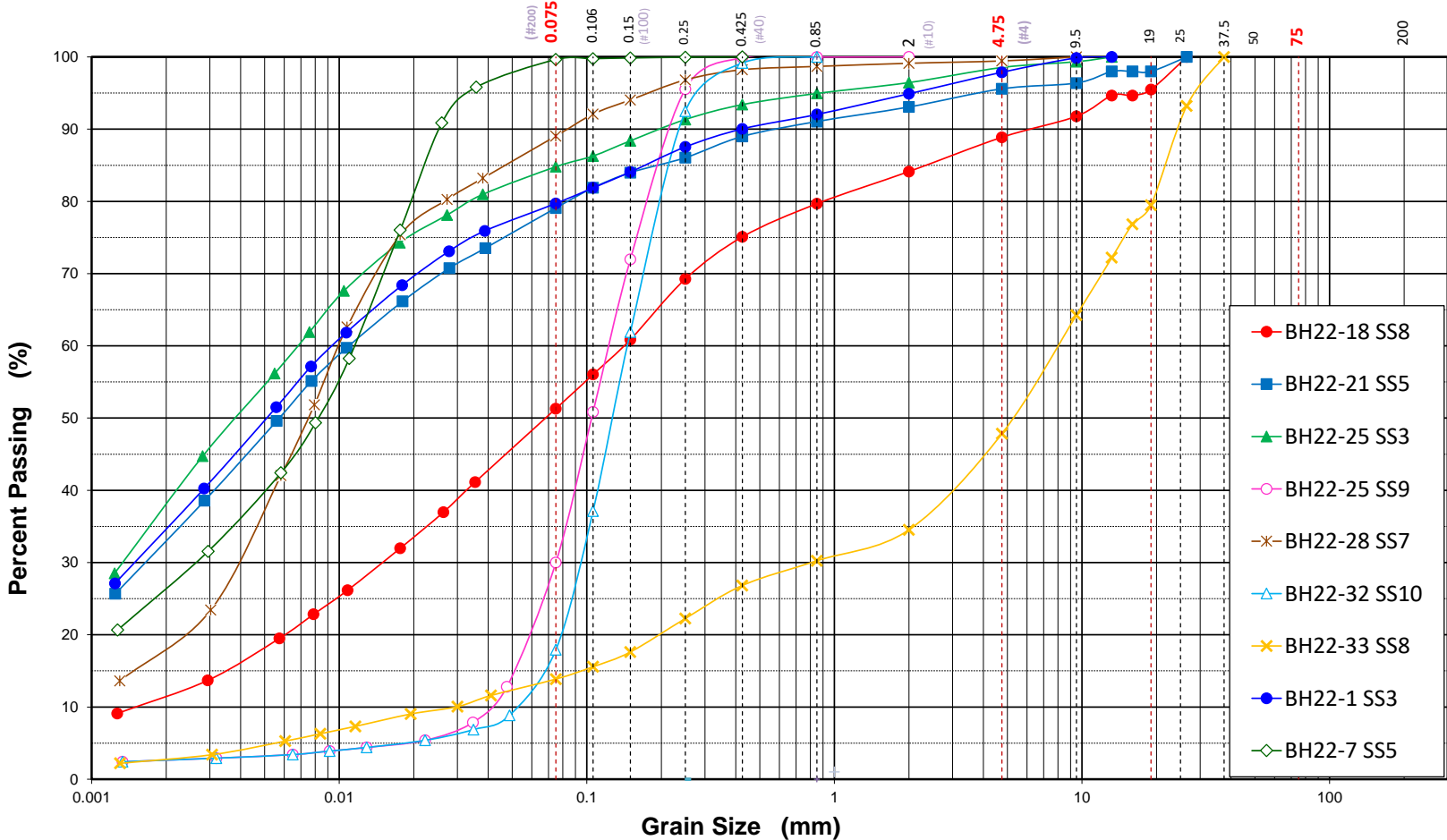
GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure


<p>PROJECT: Geotechnical Investigation CLIENT: Caledon Community Partners PROJECT LOCATION: The Gore Rd. & King St., Bolton, ON DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858723.71 E 598094.14</p>	<p>DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Sep/06/2022</p> <p>REF. NO.: 20-169-104 ENCL NO.: 46</p>
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SOIL PROFILE	SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION	NUMBER	TYPE			"N" BLOWS 0.3 m	20						
266.7 ELEV DEPTH													
266.9 0.3	TOPSOIL: 250mm	1	SS	13									
265.9 0.8	WEATHERED/DISTURBED NATIVE: clayey silt to silty clay, trace sand, trace gravel, trace rootlets, brown, moist, stiff SILTY CLAY TILL: trace sand, trace gravel, brown, moist, very stiff	2	SS	21	W. L. 266.2 m Mar 21, 2023								
		3	SS	21	265								
		4	SS	26	W. L. 264.6 m Oct 18, 2022								
		5	SS	27	264								
	grey below 4.6m	6	SS	17	263								
260.6 6.1	SAND: silt pockets, grey, wet, compact	7	SS	18	262								
259.1 7.6	SANDY SILT TILL: trace clay, trace gravel, grey, very moist, dense	8	SS	32	261								
258.5 8.2	END OF BORHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water level Readings: Date: Water Level(mbg): Oct. 18, 2022 2.05 Mar. 21, 2023 0.51				260								

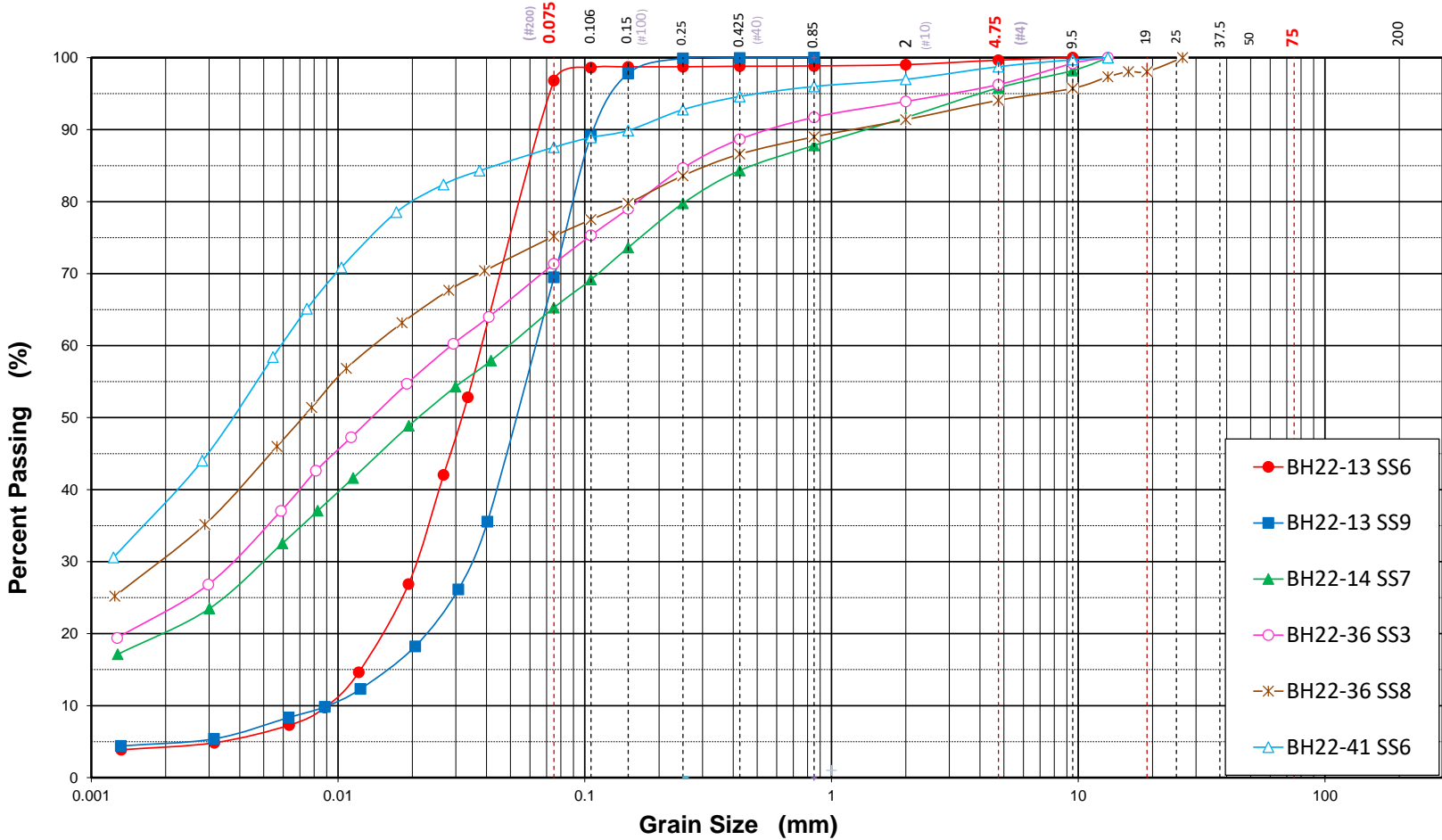
DS SOIL LOG 20-169-104 GEO COPY.GPJ DS.GDT 5/16/23


Particle Size Distribution (ASTM-D421/D422)



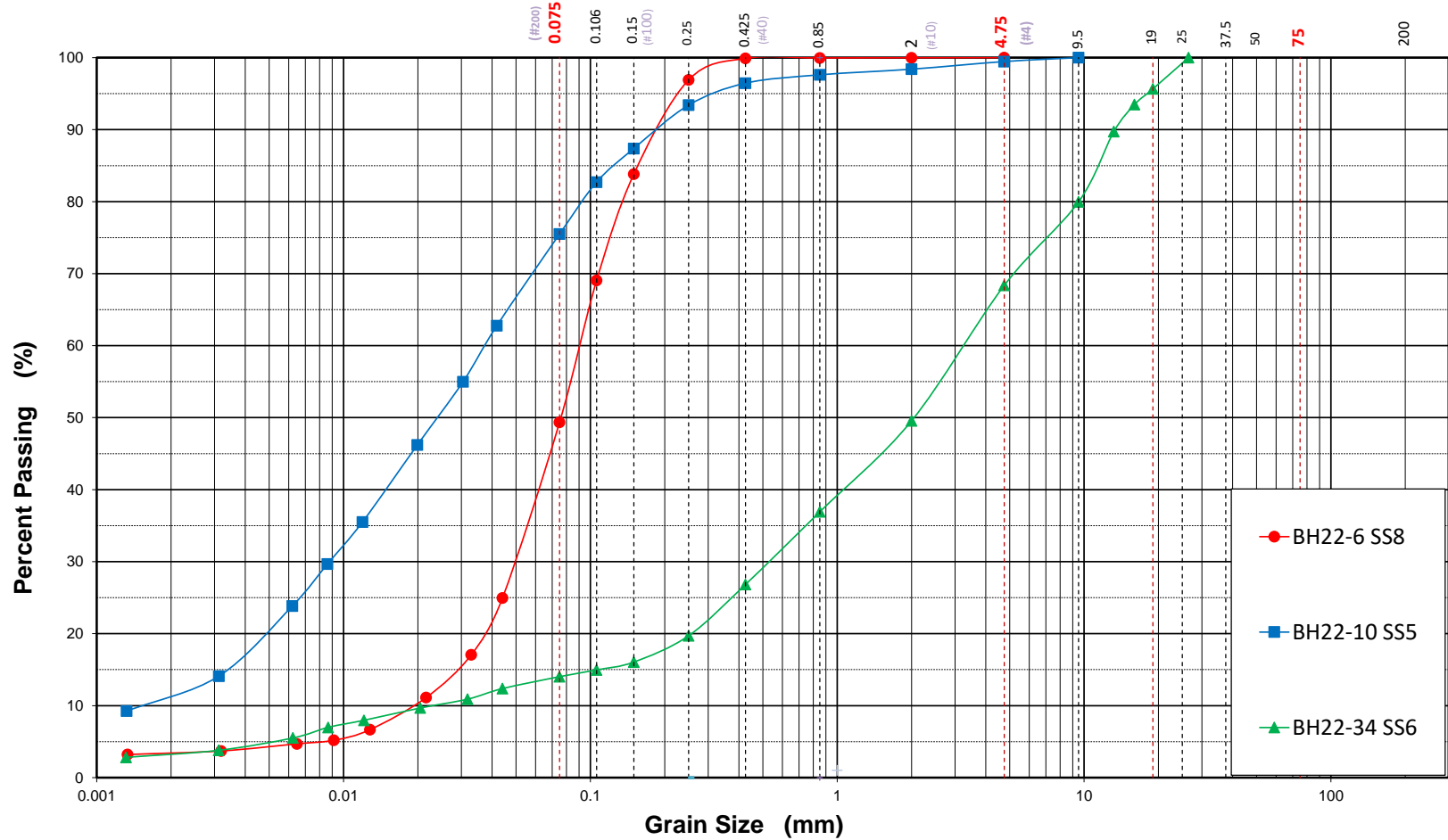
Silt and Clay		Sand			Gravel		Cobble +
Clay	Silt	Fine	Medium	Coarse	Fine	Coarse	
 <p>DS CONSULTANTS LTD. 6221 Highway 7, Unit 16 Vaughan, Ontario, L4H 0K8 Telephone: (905) 264-9393 www.dsconsultants.ca</p>	Project	Geotechnical Investigation				Project No	20-169-104
	Location	Macville Secondary Plan, Caledon, ON				Date	Aug-31-2022
	Client	Caledon Community Partners				Figure No	47


Particle Size Distribution (ASTM-D421/D422)



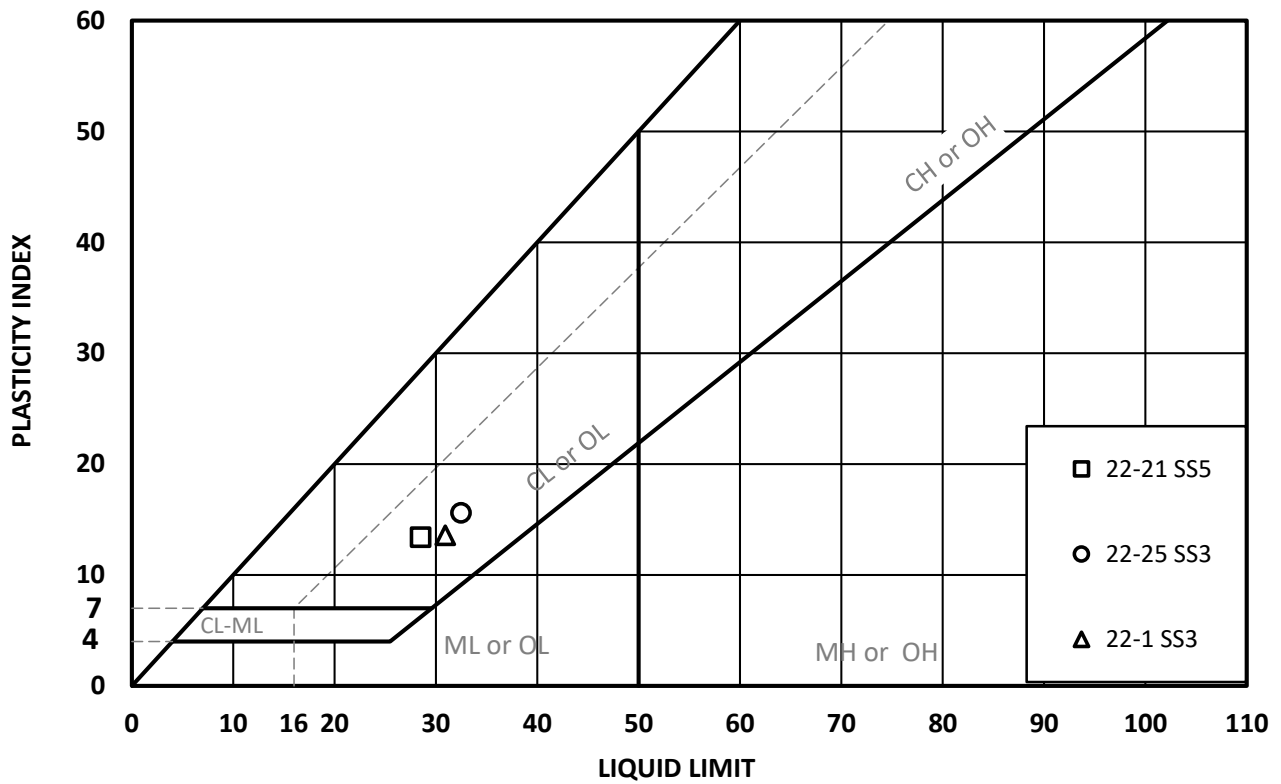
Silt and Clay		Sand			Gravel		Cobble +
Clay	Silt	Fine	Medium	Coarse	Fine	Coarse	
 <p>DS CONSULTANTS LTD. 6221 Highway 7, Unit 16 Vaughan, Ontario, L4H 0K8 Telephone: (905) 264-9393 www.dsconsultants.ca</p>	Project	Geotechnical Investigation				Project No	20-169-104
	Location	Macville Secondary Plan, Caledon, ON				Date	Sep-09-2022
	Client	Caledon Community Partners				Figure No	48

Particle Size Distribution (ASTM-D421/D422)



Silt and Clay		Sand			Gravel		Cobble +
Clay	Silt	Fine	Medium	Coarse	Fine	Coarse	
 <p>DS CONSULTANTS LTD. 6221 Highway 7, Unit 16 Vaughan, Ontario, L4H 0K8 Telephone: (905) 264-9393 www.dsconsultants.ca</p>	Project	Geotechnical Investigation				Project No	20-169-104
	Location	Macville Secondary Plan, Caledon, ON				Date	Sep-20-2022
	Client	Caledon Community Partners				Figure No	49

Atterberg Test (ASTM D-4318)



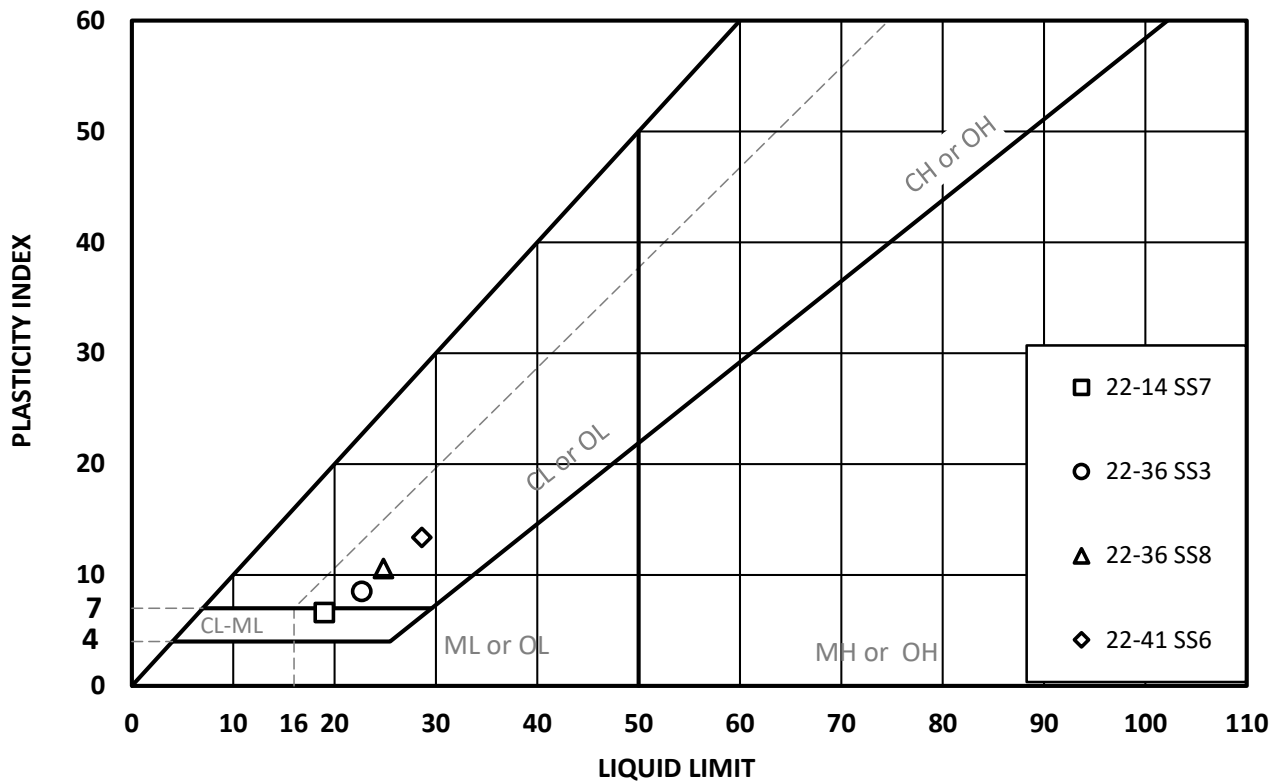
Code	Sample ID	Sample No.		Moisture Contant (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	USCS Symbol
1	□	22-21	SS5	13	28.5	15.1	13.4	CL
2	○	22-25	SS3	15	32.5	16.9	15.6	CL
3	△	22-1	SS3	14	30.9	17.3	13.6	CL



DS CONSULTANTS LTD.
 6221 Highway 7, Unit 16
 Vaughan, Ontario, L4H 0K8
 Telephone: (905) 264-9393
www.dsconsultants.ca

Project	Geotechnical Investigation	Project No	20-169-104
Location	Macville Secondary Plan, Caledon, ON	Date	Aug-31-2022
Client	Caledon Community Partners	Figure No	50

Atterberg Test (ASTM D-4318)



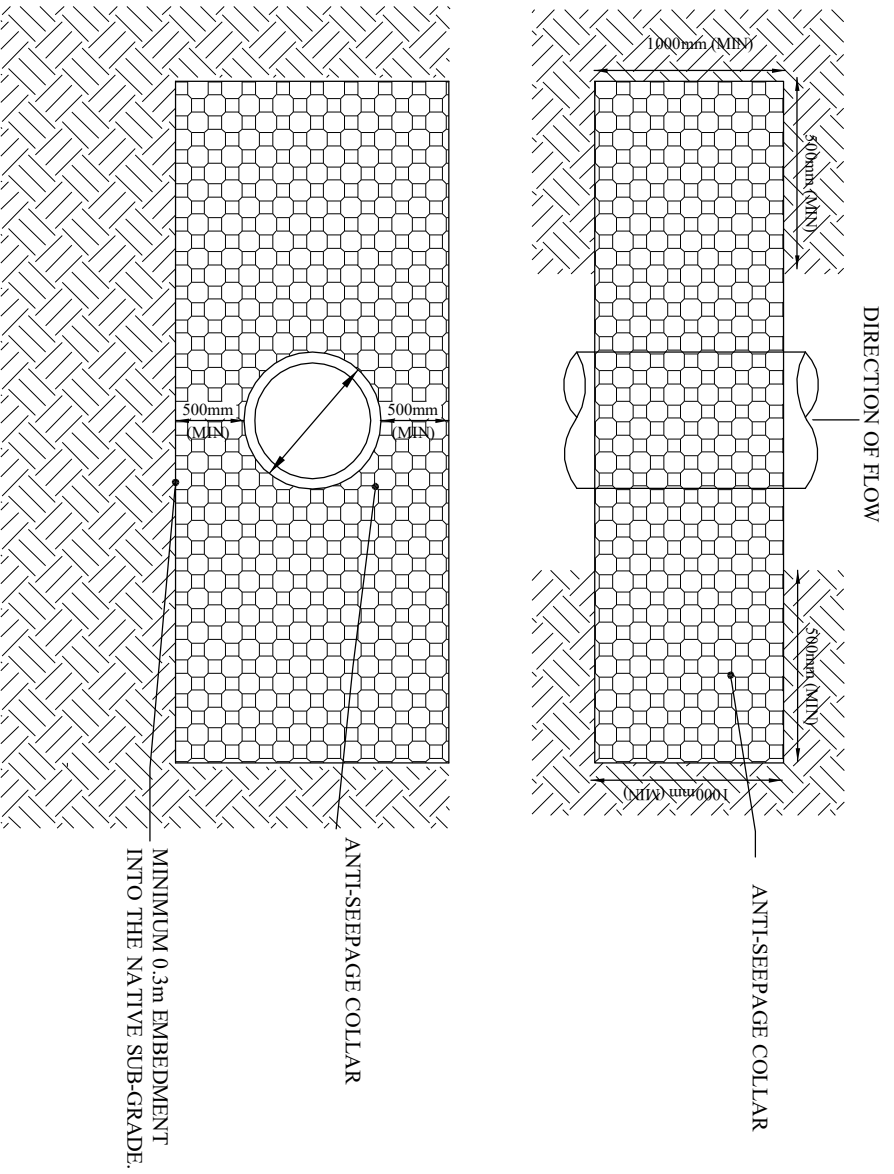
Code	Sample ID	Sample No.	Moisture Contant (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	USCS Symbol
1	□	22-14 SS7	9	19	12.4	6.6	CL-ML
2	○	22-36 SS3	17	22.7	14.2	8.5	CL
3	△	22-36 SS8	13	24.8	14.2	10.6	CL
4	◇	22-41 SS6	15	28.6	15.2	13.4	CL



DS CONSULTANTS LTD.
 6221 Highway 7, Unit 16
 Vaughan, Ontario, L4H 0K8
 Telephone: (905) 264-9393
www.dsconsultants.ca

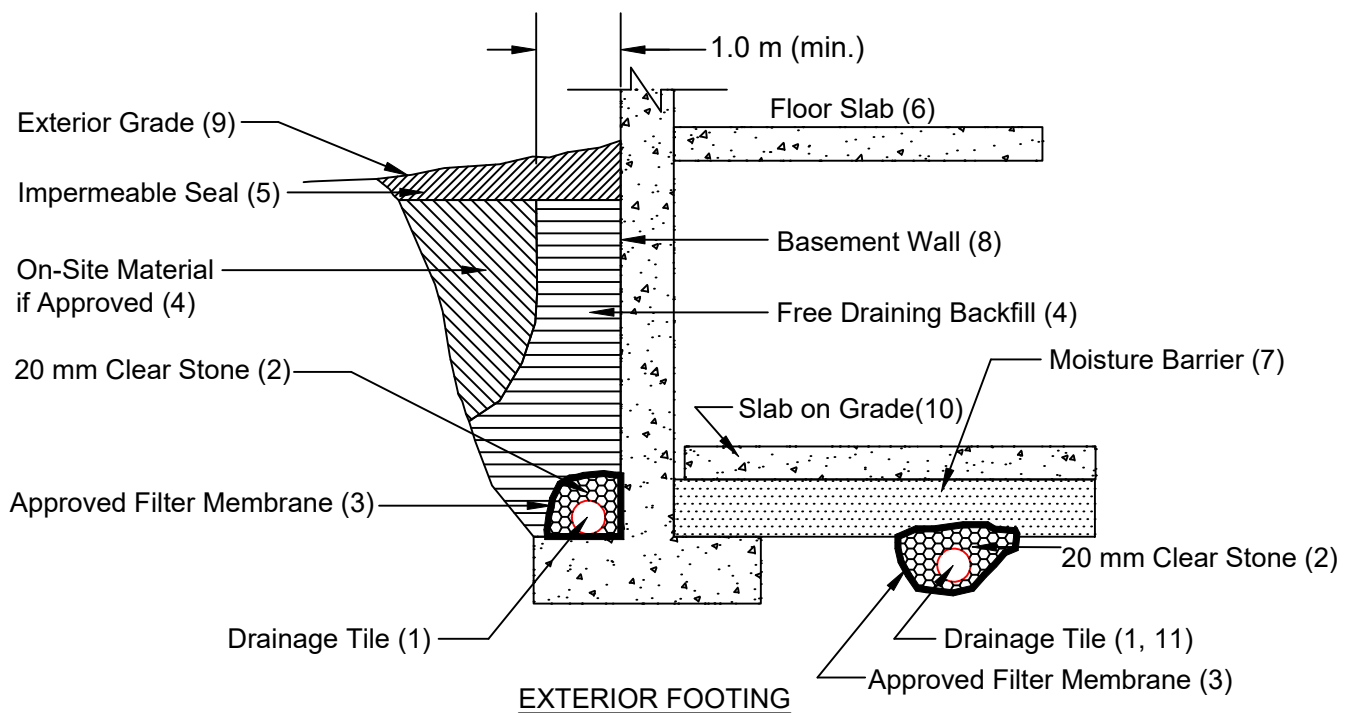
Project	Geotechnical Investigation	Project No	20-169-104
Location	Macville Secondary Plan, Caledon, ON	Date	Sep-09-2022
Client	Caledon Community Partners	Figure No	51

Drawing No. 52: TYPICAL TRENCH PLUG INSTALLATION



ANTI-SEEPAGE COLLAR DETAIL

SCALE: N.T.S.



Notes

1. Drainage tile to consist of 100 mm (4") diameter weeping tile or equivalent perforated pipe leading to a positive sump or outlet.
2. 20 mm (3/4") clear stone - 150 mm (6") top and side of drain. If drain is not on footing, place 100 mm (4 inches) of stone below drain .
3. Wrap the clear stone with an approved filter membrane (Terrafix 270R or equivalent).
4. Free Draining backfill - OPSS Granular B or equivalent compacted to the specified density. Do not use heavy compaction equipment within 450 mm (18") of the wall. Use hand controlled light compaction equipment within 1.8 m (6') of wall. The minimum width of the Granular 'B' backfill must be 1.0 m.
5. Impermeable backfill seal - compacted clay, clayey silt or equivalent. If original soil is free-draining, seal may be omitted. Maximum thickness of seal to be 0.5 m.
6. Do not backfill until wall is supported by basement and floor slabs or adequate bracing.
7. Moisture barrier to be at least 200 mm (8") of compacted clear 20 mm (3/4") stone or equivalent free draining material. A vapour barrier may be required for specialty floors.
8. Basement wall to be damp proofed /water proofed.
9. Exterior grade to slope away from building.
10. Slab on grade should not be structurally connected to the wall or footing.
11. Underfloor drain invert to be at least 300 mm (12") below underside of floor slab.
12. Drainage tile placed in parallel rows 6 to 8 m (20 to 25') centers one way. Place drain on 100 mm (4") clear stone with 150 mm (6") of clear stone on top and sides. Enclose stone with filter fabric as noted in (3).
13. The entire subgrade to be sealed with approved filter fabric (Terrafix 270R or equivalent) if non-cohesive (sandy) soils below ground water table encountered.
14. Do not connect the underfloor drains to perimeter drains.
15. Review the geotechnical report for specific details.

DRAINAGE AND BACKFILL RECOMMENDATIONS Basement with Underfloor Drainage

(not to scale)

Appendix A

Borehole Logs from DS 2020 Investigation

PROJECT: Geotechnical Investigation CLIENT: Bolton Option 3 Landowners Group PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857815.92 E 597082.44	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Jul/27/2020 REF. NO.: 20-169-100 ENCL NO.: 2
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
279.8	TOPSOIL: 300mm													
279.5	FILL: sandy silt, trace gravel, dark brown, moist, loose	1	SS	6										
279.0	CLAYEY SILT TILL: sandy, trace gravel, sand seams, brown, moist, very stiff to hard trace cobble below 2.3m	2	SS	19										
278.5		3	SS	36										
278.0		4	SS	55										
277.5		5	SS	32										
277.0														
275.3	SILTY CLAY: trace sand, grey, very moist, very stiff	6	SS	17										
273.8	SILT: trace clay, grey, wet, compact	7	SS	12										
271.6	END OF BOREHOLE: Notes: 1) Water level at 4.5m below grade during drilling. 2) 50mm dia. monitoring well installed upon completion. 3) Water level Reading: Date: Water Level (mbgl): Aug 6, 2020 4.11 Sept 8, 2020 4.24 Oct 22, 2020 4.51 Mar 21, 2023 3.96	8	SS	20										

W. L. 275.9 m
W. L. 275.7 m
Aug 06, 2020¹
W. L. 275.3 m
Oct 22, 2020

Filter Pack
Slotted Pipe

DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Bolton Option 3 Landowners Group PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857663.29 E 597311.06	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Jul/27/2020 REF. NO.: 20-169-100 ENCL NO.: 3
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SOIL PROFILE	SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	DESCRIPTION	NUMBER	TYPE			"N" BLOWS 0.3 m	20						
278.8 0.2 278.0	TOPSOIL: 200mm FILL: sandy silt, trace gravel, brown, moist, loose	1	SS	8									
0.8 1 2 276.5	CLAYEY SILT TILL: sandy, trace gravel, sand seams, brown, moist, very stiff	2	SS	16	278								
276.5 2.3 3 4 5 6 274	SANDY SILT: trace clay, brown, moist to very moist, very dense	3	SS	19	277								
		4	SS	58	276								
		5	SS	58	275								
		6	SS	66	274								
	wet below 6m	7	SS	51	273								
		8	SS	52	271								

8.2 END OF BOREHOLE:
 Notes:
 1) Water level at 6.1m below grade during drilling.
 2) 50mm dia. monitoring well installed upon completion.
 3) Water level Reading:

Date:	Water Level (mbgl):
Aug 6, 2020	6.12
Sept 8, 2020	6.36
Oct 22, 2020	6.48
Mar21, 2023	6.08

DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Bolton Option 3 Landowners Group PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857648.82 E 597335.94	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Jul/27/2020 REF. NO.: 20-169-100 ENCL NO.: 4
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)				
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80				100	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L
278.6	TOPSOIL: 300mm																
278.3	FILL: sandy silt, trace gravel, brown, moist, compact	1	SS	10							○						
277.8	SILTY CLAY TILL: sandy, trace gravel, sand seams, brown, moist, stiff	2	SS	13							○						
276.3	SILTY SAND: trace clay, grey, moist, compact to very dense	3	SS	10							○						
276.3	wet below 4.5m	4	SS	15							○						
275.0		5	SS	35							○						
273.0		6	SS	65								○					
271.9		7	SS	49								○					
272.6	Filter Pack Slotted Pipe W. L. 272.6 m Aug 06, 2020																

END OF BOREHOLE:
 Notes:
 1) Water level at 4.5m below grade during drilling.
 2) 50mm dia. monitoring well installed upon completion.
 3) Water level Reading:

Date:	Water Level (mbgl):
Aug 6, 2020	6.0
Sept 8, 2020	dry
Oct 22, 2020	dry
Mar 21, 2023	5.93

DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3 , × 3 : Numbers refer to Sensitivity ○ ● = 3% Strain at Failure

PROJECT: Geotechnical Investigation	DRILLING DATA
CLIENT: Bolton Option 3 Landowners Group	Method: Solid Stem Auger
PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario	Diameter: 150mm
DATUM: Geodetic	Date: Jul/27/2020
BOREHOLE LOCATION: See Drawing 1 N 4857717.02 E 597386.34	REF. NO.: 20-169-100
	ENCL NO.: 5

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
277.1	CONCRETE: 300mm													
276.8	FILL: clayey silt, trace gravel, grey to brown, moist, stiff	1	SS	8										
276.3														
0.8	SANDY SILT: trace clay, brown, moist, compact to very dense	2	SS	21										
		3	SS	42										
		4	SS	62										
		5	SS	56										
		6	SS	46										
		7	SS	28										

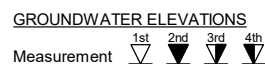
END OF BOREHOLE:
Notes:
1) Water level at 4.5m below grade during drilling.
2) 50mm dia. monitoring well installed upon completion.
3) Water level Reading:

Date: Water Level (mbgl):
Aug 6, 2020 3.77
Sept 8, 2020 3.90
Oct 22, 2020 inaccessible
Mar 23, 2023 4.75

W. L. 273.3 m
Aug 06, 2020¹
Sep 08, 2020
Slotted Pipe
W. L. 272.3 m
Mar 21, 2023

wet below 4.5m

DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ DS.GDT 5/16/23



GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation
 CLIENT: Bolton Option 3 Landowners Group
 PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario
 DATUM: Geodetic
 BOREHOLE LOCATION: See Drawing 1 N 4858369.55 E 597438.77

DRILLING DATA
 Method: Solid Stem Auger
 Diameter: 150mm
 Date: Jul/29/2020
 REF. NO.: 20-169-100
 ENCL NO.: 6

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
273.0														
272.9	TOPSOIL: 250mm													
0.3	FILL: sandy silt, trace topsoil/organics, trace gravel, trace rootlets, brown, moist, compact	1	SS	15										
272.2	SILTY CLAY TILL: sandy, trace gravel, frequent sand seams, brown, moist, hard	2	SS	35										
0.8		3	SS	31										
		4	SS	39										
270.0	CLAYEY SILT TILL: sandy, trace gravel, interbed of sandy silt layers, greyish brown, moist to very moist, hard	5	SS	35										
3.0														
	grey below 4.5m	6	SS	37										
	sand seams below 6m	7	SS	46										
265.5	SILTY SAND: trace clay, grey, moist, very dense	8	SS	74/ 280mm										0 51 47 2
7.5														
	very moist at 9m	9	SS	59										
263.3	END OF BOREHOLE: Notes: 1) Water level at 9.1m below grade during drilling. 2) 50mm dia. monitoring well installed upon completion. 3) Water level Reading: Date: Water Level (mbgl): Aug 6, 2020 2.78 Sept 8, 2020 3.09 Oct 22, 2020 3.38 Mar 21, 2023 2.68													
9.7														

DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Bolton Option 3 Landowners Group PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857501.44 E 597524.2	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Jul/28/2020 REF. NO.: 20-169-100 ENCL NO.: 7
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SOIL PROFILE	SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
	DESCRIPTION	NUMBER	TYPE			"N" BLOWS 0.3 m	20						
271.0													
270.9	TOPSOIL: 250mm												
0.3	FILL: sandy silt, trace topsoil/organics, trace gravel, trace rootlets, dark brown, moist, loose	1	SS	8									
270.2	CLAYEY SILT TILL: sandy, trace gravel, sand seams, brown, moist, stiff to hard	2	SS	12									
0.8					270								
					W. L. 269.8 m Mar 21, 2023								
					269								
	hard below 2.3m				269								
					268								
					Bentonite								
					268								
					267								
	grey below 4.5m				267								
					266								
					266								
					265								
					265								
					Filter Pack								
					W. L. 264.2 m Aug 06, 2020								
					263								
					263								
8.2	END OF BOREHOLE: Notes: 1) Borehole dry during drilling. 2) 50mm dia. monitoring well installed upon completion. 3) Water level Reading: Date: Water Level (mbgl): Aug 6, 2020 6.77 Sept 8, 2020 1.15 Mar 21, 2023 0.26												

DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Geotechnical Investigation
 CLIENT: Bolton Option 3 Landowners Group
 PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario
 DATUM: Geodetic
 BOREHOLE LOCATION: See Drawing 1 N 4857020.81 E 597903.58

DRILLING DATA
 Method: Solid Stem Auger
 Diameter: 150mm
 Date: Jul/31/2020
 REF. NO.: 20-169-100
 ENCL NO.: 8

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
261.7 0.0	TOPSOIL: 500mm	1	SS	8										
261.2 0.5	FILL: clayey silt, trace topsoil/organics, trace gravel, trace rootlets, dark brown, moist, stiff CLAYEY SILT TILL: some sand, trace gravel, brownish grey, very moist, stiff with silt and sand seams at 1.5m	2	SS	10										
260.9 0.8		3	SS	13										
259.4 2.3		SILTY CLAY TILL: some sand, some gravel, greyish brown, moist, very stiff to hard grey, very moist to wet below 3m	4	SS	39									
		5	SS	28										
		6	SS	21										
		7	SS	19										
		8	SS	25										
		9	SS	16										
		10	SS	24										
250.4 11.3	END OF BOREHOLE: Notes: 1) Borehole dry during drilling. 2) 50mm dia. monitoring well installed upon completion. 3) Water level Reading: Date: Water Level (mbgl): Aug 6, 2020 dry Sept 8, 2020 6.52 Oct 22, 2020 3.40													

DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ_DS.GDT_5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Bolton Option 3 Landowners Group PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857701.02 E 597673.81	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Jul/28/2020 REF. NO.: 20-169-100 ENCL NO.: 9
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE			"N" BLOWS 0.3 m	SHEAR STRENGTH (kPa)						
277.2														
0.0	TOPSOIL: 340mm		1	SS	8									
276.8														
0.4	FILL: sandy silt, trace topsoil/organics, trace gravel, brown, moist, loose													
276.4														
0.8	CLAYEY SILT TILL: sandy, trace gravel, brown, moist, compact		2	SS	10									
275.7														
1.5	SILT: some clay, trace sand, trace gravel, brown, very moist, compact to very dense		3	SS	19									
2														
3														
4														
5														
274			5	SS	92/ 255mm									
273														
6														
272			6	SS	74									
271														
6.0	SANDY SILT: trace clay, brown, wet, very dense		7	SS	62									
270														
8														
269.0			8	SS	54									
8.2	END OF BOREHOLE: Notes: 1) Water at depth of 6.1m during drilling.													

DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation
 CLIENT: Bolton Option 3 Landowners Group
 PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario
 DATUM: Geodetic
 BOREHOLE LOCATION: See Drawing 1 N 4857946.64 E 597876.44

DRILLING DATA
 Method: Solid Stem Auger
 Diameter: 150mm
 Date: Jul/28/2020
 REF. NO.: 20-169-100
 ENCL NO.: 10

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40							60
274.1 0.0	TOPSOIL: 550mm	1	SS	5											
273.6 0.8	FILL: sandy silt, trace topsoil/ organics, trace clay, trace gravel, trace organics, trace rootlets, dark brown, moist, loose SILTY CLAY TILL: some sand, trace gravel, brown, moist, very stiff to hard sand seams below 2.3m	2	SS	16											
		3	SS	25											
		4	SS	38											
		5	SS	72											
	grey below 4.5m	6	SS	45											
	trace cobble, very moist below 6m	7	SS	24											
266.6 7.5	SANDY SILT: trace clay, grey, wet, compact	8	SS	29											
265.9 8.2	END OF BOREHOLE: Notes: 1) Water level at 7.6m below grade during drilling. 2) 50mm dia. monitoring well installed upon completion. 3) Water level Reading: Date: Water Level (mbgl): Aug 6, 2020 4.43 Sept 8, 2020 4.72 Oct 22, 2020 4.97 Mar 21, 2023 4.5														

DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Bolton Option 3 Landowners Group PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858404.6 E 597955.26	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Jul/29/2020 REF. NO.: 20-169-100 ENCL NO.: 11
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)	
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)							
268.3	TOPSOIL: 300mm														
268.0	FILL: sandy silt, trace topsoil/organics, trace gravel, trace rootlets, brown, moist, compact SILTY CLAY TILL: some sand, trace gravel, sand seams, brown, moist to very moist, very stiff grey below 3m		1	SS	15										
0.3			2	SS	21										
267.5			3	SS	25										
1			0.8	4	SS	25									
2			5	SS	16										
3			6	SS	20										
4			7	SS	17										
5			8	SS	15										

8.2	END OF BOREHOLE: Notes: 1) Borehole dry and open upon completion.													
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DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement





GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation
 CLIENT: Bolton Option 3 Landowners Group
 PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario
 DATUM: Geodetic
 BOREHOLE LOCATION: See Drawing 1 N 4858726.5 E 597841.19

DRILLING DATA
 Method: Solid Stem Auger
 Diameter: 150mm
 Date: Jul/29/2020
 REF. NO.: 20-169-100
 ENCL NO.: 12

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
270.1	TOPSOIL: 300mm													
269.8	FILL: sandy silt, trace topsoil/organics, trace gravel, trace rootlets, brown, moist, compact	1	SS	12										
269.3	SILTY CLAY TILL: sandy, trace gravel, sand seams, brown, moist, very stiff to hard	2	SS	19										
268.8		3	SS	22										
268.5		4	SS	28										
268.0		5	SS	44										
267.5		6	SS	24										
267.0		7	SS	21										
266.5		8	SS	28										
266.0		9	SS	27										
265.5														
265.0														
264.5														
264.0														
263.5														
263.0														
262.4	SILT: some sand, trace clay, trace gravel, grey, wet, compact	8	SS	28									1 11 80 8	
262.0														
261.5														
261.0														
260.4	END OF BOREHOLE: Notes: 1) Water level at 9.1m below grade during drilling. 2) 50mm dia. monitoring well installed upon completion. 3) Water level Reading: Date: Water Level (mbgl): Aug 6, 2020 5.42 Sept 8, 2020 5.37 Oct 22, 2020 5.33 Mar 21, 2023 1.63													

DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ_DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement    

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Bolton Option 3 Landowners Group PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857520.15 E 598321.99	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Jul/31/2020 REF. NO.: 20-169-100 ENCL NO.: 13
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE		"N" BLOWS 0.3 m	SHEAR STRENGTH (kPa)						
264.9	TOPSOIL: 400mm		1	SS	8								
0.0 264.5	FILL: clayey silt, trace topsoil/organics, trace gravel, sand seams, trace rootlets, dark brown, moist, stiff		2	SS	8								
0.4 264.1	SILTY CLAY TILL: some sand, trace gravel, sand seams, brown, moist to very moist, stiff		3	SS	9								
0.8	grey below 2.3m		4	SS	10								
261.9	SANDY SILT TO SILT: trace clay, grey, very moist, dense		5	SS	32								
3.0	wet below 4.5m		6	SS	36								
258.9	SILT: trace clay, trace sand, grey, very moist, compact to loose		7	SS	25								0 1 94 5
6.0			8	SS	7								

8.2 END OF BOREHOLE:
 Notes:
 1) Water level at 3.1m below grade during drilling
 2) 50mm dia. monitoring well installed upon completion.
 3) Water level Reading:

Date:	Water Level (mbgl):
Aug 6, 2020	0.2
Sept 8, 2020	0.1
Oct 22, 2020	0.14
Mar 21, 2023	-0.15

DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ●=3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Bolton Option 3 Landowners Group PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4857981.07 E 598332.09	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Jul/30/2020 REF. NO.: 20-169-100 ENCL NO.: 14
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SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)						
268.1	TOPSOIL: 200mm													
267.9	FILL: clayey silt, trace topsoil/organics, trace gravel, trace rootlets, dark brown, moist, stiff		1	SS	12									
267.3	SILTY CLAY TILL: some sand, trace gravel, sand seams, brownish grey, moist, stiff to very stiff		2	SS	19									
267.0			3	SS	20									
266.9			4	SS	26									
266.8			5	SS	14									
266.7			6	SS	9									
266.6			7	SS	19									
266.5			8	SS	94/255mm									
260.6	SANDY SILT TO SILT: trace clay, trace gravel, grey, wet, very dense													
259.9	END OF BOREHOLE: Notes: 1) Water at 7.6m below grade during drilling													

DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
 Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation CLIENT: Bolton Option 3 Landowners Group PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario DATUM: Geodetic BOREHOLE LOCATION: See Drawing 1 N 4858339.89 E 598409.18	DRILLING DATA Method: Solid Stem Auger Diameter: 150mm Date: Jul/30/2020 REF. NO.: 20-169-100 ENCL NO.: 15
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SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40						
267.7														
0.0	TOPSOIL: 400mm	1	SS	7										
267.3														
0.4	FILL: clayey silt, trace topsoil/organics, trace gravel, trace sand, trace rootlets, brown, moist, firm	2	SS	14										
266.9														
0.8	SILTY CLAY TILL: some sand, trace gravel, frequent sand seams, brown, moist, stiff to hard	3	SS	13										
		4	SS	27										
		5	SS	28										
		6	SS	24										
		7	SS	18										
		8	SS	29										
		9	SS	22										
		10	SS	35										
256.4														
11.3	END OF BOREHOLE: Notes: 1) 50mm dia. monitoring well installed upon completion. 2) Water level Reading: Date: Water Level (mbgl): Aug 6, 2020 3.32 Sept 8, 2020 3.43 Oct 22, 2020 3.59 Mar 21, 2023 0.19													

DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ_DS.GDT_5/16/23

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation	DRILLING DATA
CLIENT: Bolton Option 3 Landowners Group	Method: Solid Stem Auger
PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario	Diameter: 150mm
DATUM: Geodetic	Date: Jul/30/2020
BOREHOLE LOCATION: See Drawing 1 N 4858789.95 E 598183.97	REF. NO.: 20-169-100
	ENCL NO.: 16

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)									
264.1	TOPSOIL: 350mm															
263.8	FILL: clayey silt, trace topsoil/organics, trace gravel, trace sand, trace rootlets, brown, moist, stiff CLAYEY SILT TILL: some sand, trace gravel, sand seams, brown, moist, stiff to very stiff grey below 4.5m wet below 9m	1	SS	12												
263.3		2	SS	18												
262.1		3	SS	22												
261.7		4	SS	27												
261.2		5	SS	27												
259.9		6	SS	17												
258.8		7	SS	14												
257.7		8	SS	16												
255.4		9	SS	12												

9.7	END OF BOREHOLE: Notes: 1) Water level at 9.1m below grade during drilling. 2) 50mm dia. monitoring well installed upon completion. 3) Water level Reading: Date: Water Level (mbgl): Aug 6, 2020 2.41 Sept 8, 2020 2.33 Oct 22, 2020 2.41 Mar 21, 2023 1.65															
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DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ_DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3 , × 3 : Numbers refer to Sensitivity ○ = 3% Strain at Failure

PROJECT: Geotechnical Investigation	DRILLING DATA
CLIENT: Bolton Option 3 Landowners Group	Method: Solid Stem Auger
PROJECT LOCATION: Bolton Option 3 Lands, Caledon, Ontario	Diameter: 150mm
DATUM: Geodetic	Date: Jul/31/2020
BOREHOLE LOCATION: See Drawing 1 N 4857848.7 E 598703.75	REF. NO.: 20-169-100
	ENCL NO.: 17

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)						
265.5	TOPSOIL: 400mm												
0.0		1	SS	9									
265.1													
0.4	FILL: clayey silt, trace topsoil/organics, trace gravel, trace rootlets, brown, moist, stiff	2	SS	33									
264.7													
0.8	SILTY CLAY TILL: some sand, trace gravel, sand seams, brown, moist, stiff to hard	3	SS	30									
264.0													
1.5	GRAVELLY SAND: some silt, trace clay, brown, very moist to wet, compact to dense	4	SS	24									
262.2													
3.3	SANDY SILT: trace clay, brown, wet, compact	5	SS	20									
261.0													
4.5	SAND AND GRAVEL: some silt, trace clay, brownish grey, wet, very dense	6	SS	66									
259.3													
6.2	SILTY SAND: some clay, trace gravel, greyish brown, wet, dense	7	SS	38									
258.0													
7.5	SANDY SILT: trace clay, grey, wet, dense	8	SS	41									
257.3													
8.2	END OF BOREHOLE: Notes: 1) Water level at 2.3m below grade during drilling. 2) 50mm dia. monitoring well installed upon completion. 3) Water level Reading: Date: Water Level (mbgl): Aug 6, 2020 2.12 Sept 8, 2020 2.27 Oct 22, 2020 2.49 Mar 21, 2023 1.30												

DS SOIL LOG 20-169-100 BOLTON OPTION 3 LANDS.GPJ DS.GDT 5/16/23

GROUNDWATER ELEVATIONS
Measurement

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ● = 3% Strain at Failure

Appendix B

Engineered Fill Guidelines

GENERAL REQUIREMENTS FOR ENGINEERED FILL

Compacted imported soil that meets specific engineering requirements and is free of organics and debris and that has been continually monitored on a full-time basis by a qualified geotechnical representative is classified as engineered fill. Engineered fill that meets these requirements and is bearing on suitable native subsoil can be used for the support of foundations.

Imported soil used as engineered fill can be removed from other portions of a site or can be brought in from other sites. In general, most of Ontario soils are too wet to achieve the 100% Standard Proctor Maximum Dry Density (SPMDD) and will require drying and careful site management if they are to be considered for engineered fill. Imported non-cohesive granular soil is preferred for all engineered fill. For engineered fill, we recommend use of OPSS Granular 'B' sand and gravel fill material.

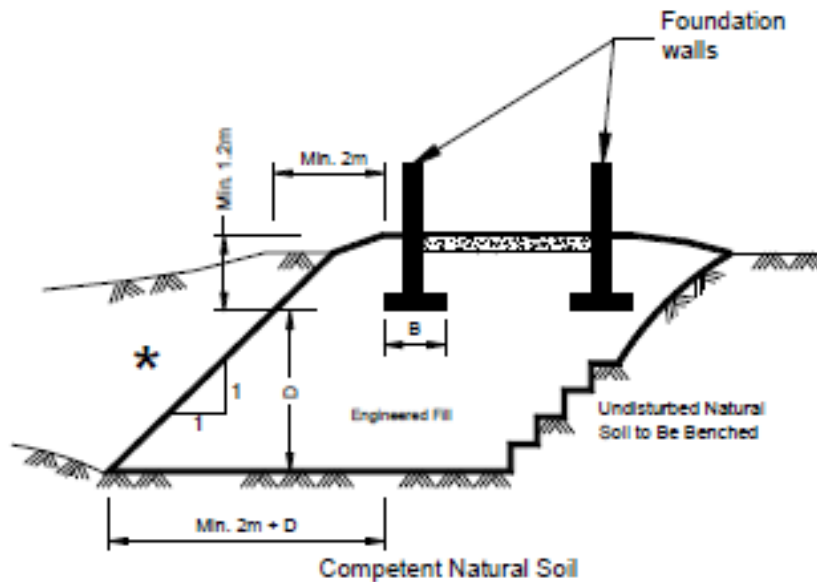
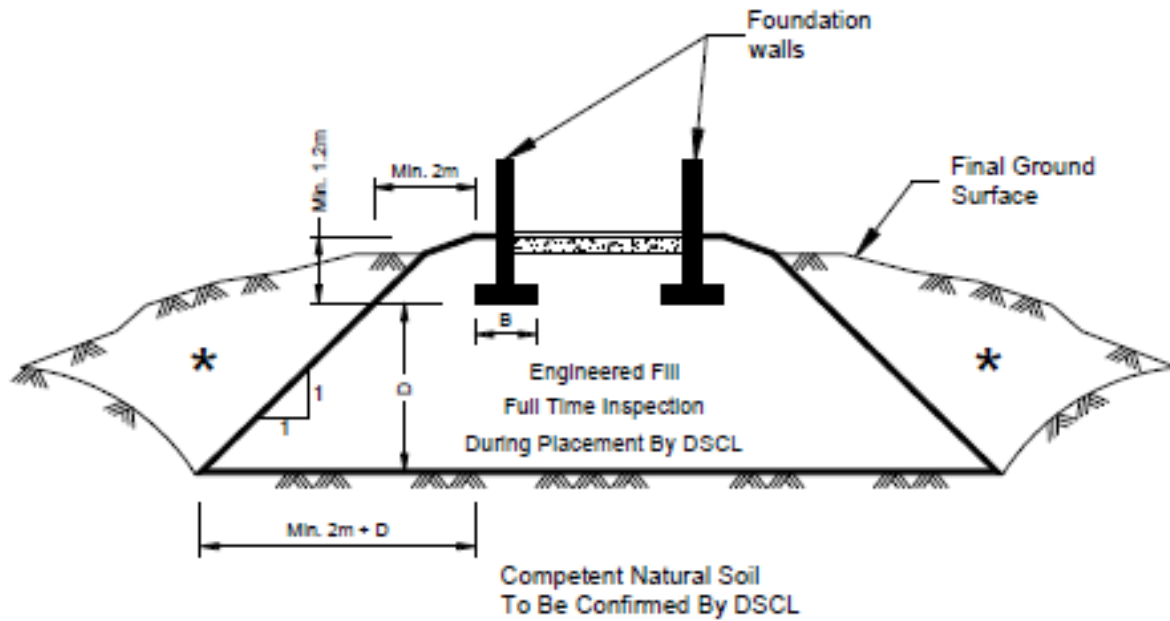
Adverse weather conditions such as rain make the placement of engineered fill to the required degree of density difficult or impossible; engineered fill cannot be placed during freezing conditions, i.e. normally not between December 15 and April 1 of each year.

The location of the foundations on the engineered fill pad is critical and certification by a qualified surveyor that the foundations are within the stipulated boundaries is mandatory. Since layout stakes are often damaged or removed during fill placement, offset stakes must be installed and maintained by the surveyors during the course of fill placement so that the contractor and engineering staff are continually aware of where the engineered fill limits lie. Excavations within the engineered fill pad must be backfilled with the same conditions and quality control as the original pad.

To perform satisfactorily, engineered fill requires the cooperation of the designers, engineers, contractors and all parties must be aware of the requirements. The minimum requirements are as follows; however, the geotechnical report must be reviewed for specific information and requirements.

1. Prior to site work involving engineered fill, a site meeting to discuss all aspects must be convened. The surveyor, contractor, design engineer and geotechnical engineer must attend the meeting. At this meeting, the limits of the engineered fill will be defined. The contractor must make known where all fill material will be obtained from and samples must be provided to the geotechnical engineer for review, and approval before filling begins.
2. Detailed drawings indicating the lower boundaries as well as the upper boundaries of the engineered fill must be available at the site meeting and be approved by the geotechnical engineer.
3. The building footprint and base of the pad, including basements, garages, etc. must be defined by offset stakes that remain in place until the footings and service connections are all constructed. Confirmation that the footings are within the pad, service lines are in place, and that the grade conforms to drawings, must be obtained by the owner in writing from the surveyor and DS Consultants Ltd (DSCL). Without this confirmation no responsibility for the performance of the structure can be accepted by DSCL. Survey drawing of the pre and post fill location and elevations will also be required.
4. The area must be stripped of all topsoil and fill materials. Subgrade must be proof-rolled. Soft spots must be dug out. The stripped native subgrade must be examined and approved by a DSCL engineer prior to placement of fill.

5. The approved engineered fill material must be compacted to 100% Standard Proctor Maximum Dry Density throughout. Engineered fill should not be placed during the winter months. Engineered fill compacted to 100% SPMDD will settle under its own weight approximately 0.5% of the fill height and the structural engineer must be aware of this settlement. In addition to the settlement of the fill, additional settlement due to consolidation of the underlying soils from the structural and fill loads will occur and should be evaluated prior to placing the fill.
6. Full-time geotechnical inspection by DSCL during placement of engineered fill is required. Work cannot commence or continue without the presence of the DSCL representative.
7. The fill must be placed such that the specified geometry is achieved. Refer to the attached sketches for minimum requirements. Take careful note that the projection of the compacted pad beyond the footing at footing level is a minimum of 2 m. The base of the compacted pad extends 2 m plus the depth of excavation beyond the edge of the footing.
8. A bearing capacity of 150 kPa at SLS (225 kPa at ULS) can be used provided that all conditions outlined above are adhered to. A minimum footing width of 500 mm (20 inches) is suggested and footings must be provided with nominal steel reinforcement.
9. All excavations must be done in accordance with the Occupational Health and Safety Regulations of Ontario.
10. After completion of the engineered fill pad a second contractor may be selected to install footings. The prepared footing bases must be evaluated by engineering staff from DSCL prior to footing concrete placements. All excavations must be backfilled under full time supervision by DSCL to the same degree as the engineered fill pad. Surface water cannot be allowed to pond in excavations or to be trapped in clear stone backfill. Clear stone backfill can only be used with the approval of DSCL.
11. After completion of compaction, the surface of the engineered fill pad must be protected from disturbance from traffic, rain and frost. During the course of fill placement, the engineered fill must be smooth-graded, proof-rolled and sloped/crowned at the end of each day, prior to weekends and any stoppage in work in order to promote rapid runoff of rainwater and to avoid any ponding surface water. Any stockpiles of fill intended for use as engineered fill must also be smooth-bladed to promote runoff and/or protected from excessive moisture take up.
12. If there is a delay in construction, the engineered fill pad must be inspected and accepted by the geotechnical engineer. The location of the structure must be reconfirmed that it remains within the pad.
13. The geometry of the engineered fill as illustrated in these General Requirements is general in nature. Each project will have its own unique requirements. For example, if perimeter sidewalks are to be constructed around the building, then the projection of the engineered fill beyond the foundation wall may need to be greater.
14. These guidelines are to be read in conjunction with DS Consultants Ltd report attached.



* Backfill in this area to be as per the DSCL report.

Appendix C

Borehole Logs from Soil Engineers Ltd. 2021 Hydrogeological Assessment

LIST OF ABBREVIATIONS AND DESCRIPTION OF TERMS

The abbreviations and terms commonly employed on the borehole logs and figures, and in the text of the report, are as follows:

SAMPLE TYPES

AS	Auger sample
CS	Chunk sample
DO	Drive open (split spoon)
DS	Denison type sample
FS	Foil sample
RC	Rock core (with size and percentage recovery)
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample

SOIL DESCRIPTION

Cohesionless Soils:

<u>'N'</u> (blows/ft)	<u>Relative Density</u>
0 to 4	very loose
4 to 10	loose
10 to 30	compact
30 to 50	dense
over 50	very dense

Cohesive Soils:

PENETRATION RESISTANCE

Dynamic Cone Penetration Resistance:

A continuous profile showing the number of blows for each foot of penetration of a 2-inch diameter, 90° point cone driven by a 140-pound hammer falling 30 inches.

Plotted as '—●—'

Undrained Shear Strength (ksf)

less than 0.25
0.25 to 0.50
0.50 to 1.0
1.0 to 2.0
2.0 to 4.0
over 4.0

'N' (blows/ft)

0 to 2	very soft
2 to 4	soft
4 to 8	firm
8 to 16	stiff
16 to 32	very stiff
over 32	hard

Consistency

Standard Penetration Resistance or 'N' Value:

The number of blows of a 140-pound hammer falling 30 inches required to advance a 2-inch O.D. drive open sampler one foot into undisturbed soil.

Plotted as '○'

WH	Sampler advanced by static weight
PH	Sampler advanced by hydraulic pressure
PM	Sampler advanced by manual pressure
NP	No penetration

Method of Determination of Undrained Shear Strength of Cohesive Soils:

x 0.0 Field vane test in borehole; the number denotes the sensitivity to remoulding

△ Laboratory vane test

□ Compression test in laboratory

For a saturated cohesive soil, the undrained shear strength is taken as one half of the undrained compressive strength

METRIC CONVERSION FACTORS

1 ft = 0.3048 metres
1lb = 0.454 kg

1 inch = 25.4 mm
1ksf = 47.88 kPa



Soil Engineers Ltd.

CONSULTING ENGINEERS

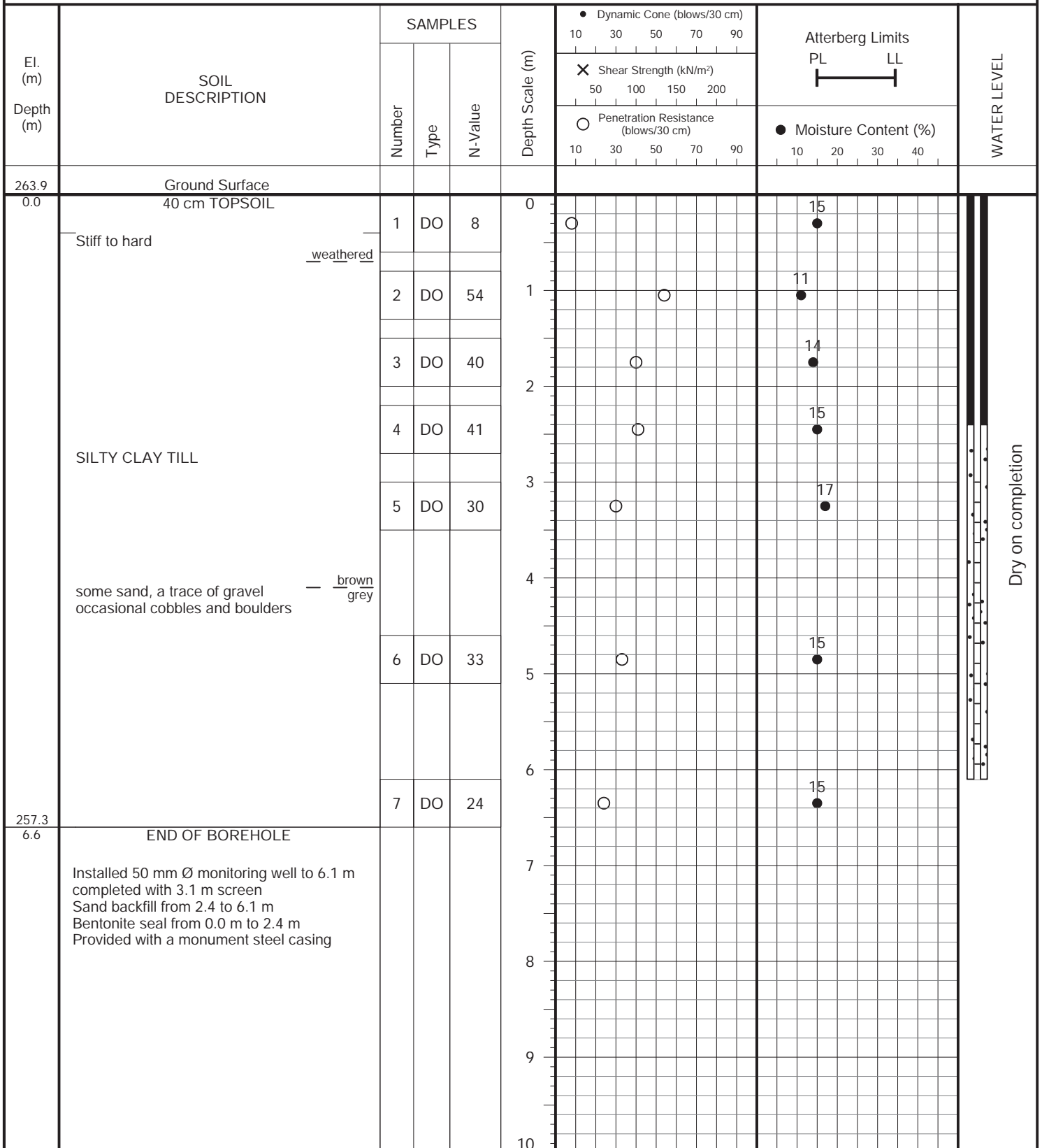
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE

PROJECT DESCRIPTION: Proposed Mixed-Use Development

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: King Street and Humber Station Road, Town of Caledon

DRILLING DATE: September 29, 2021

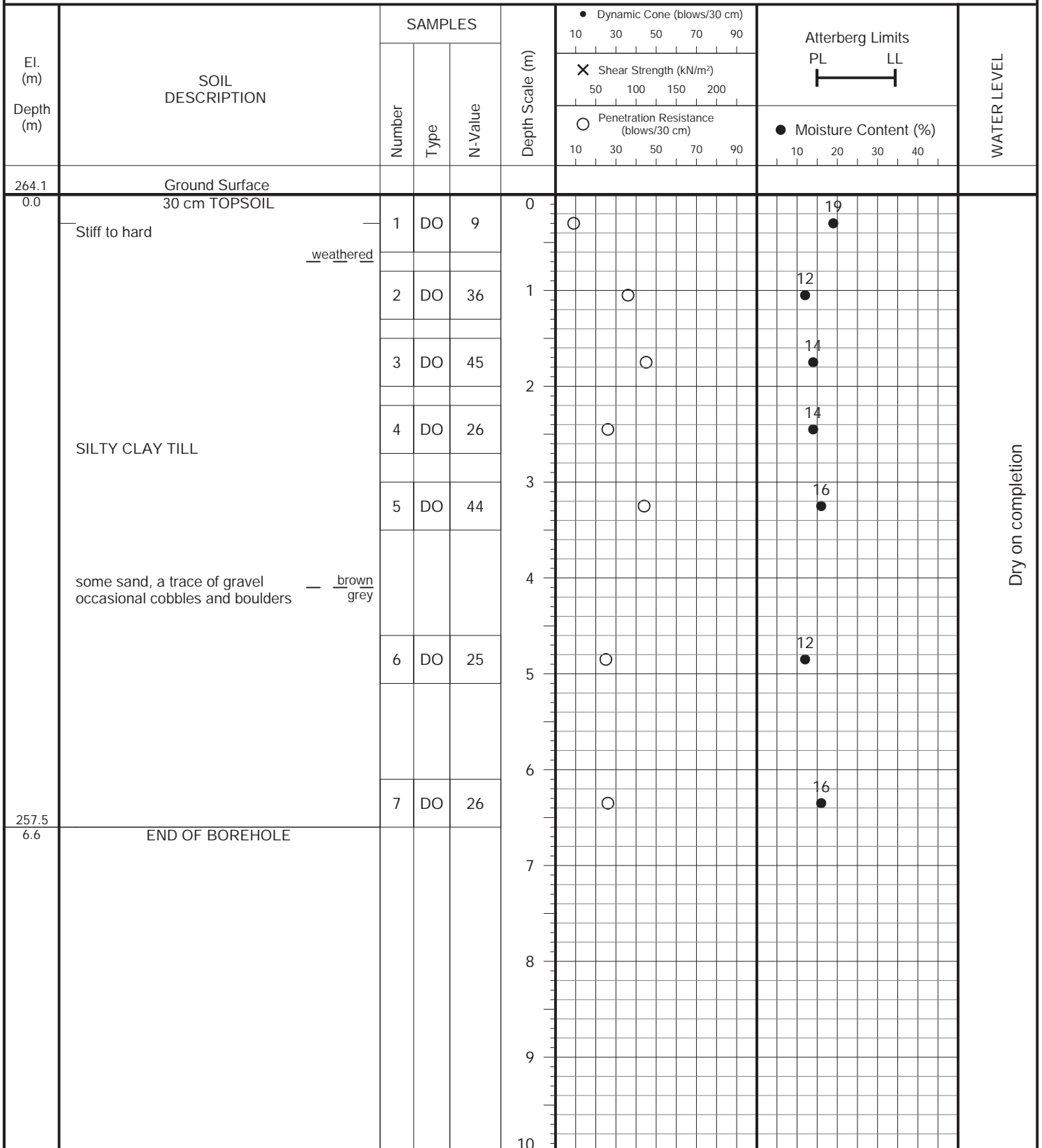


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METHOD OF BORING: Flight-Auger

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DRILLING DATE: September 28, 2021

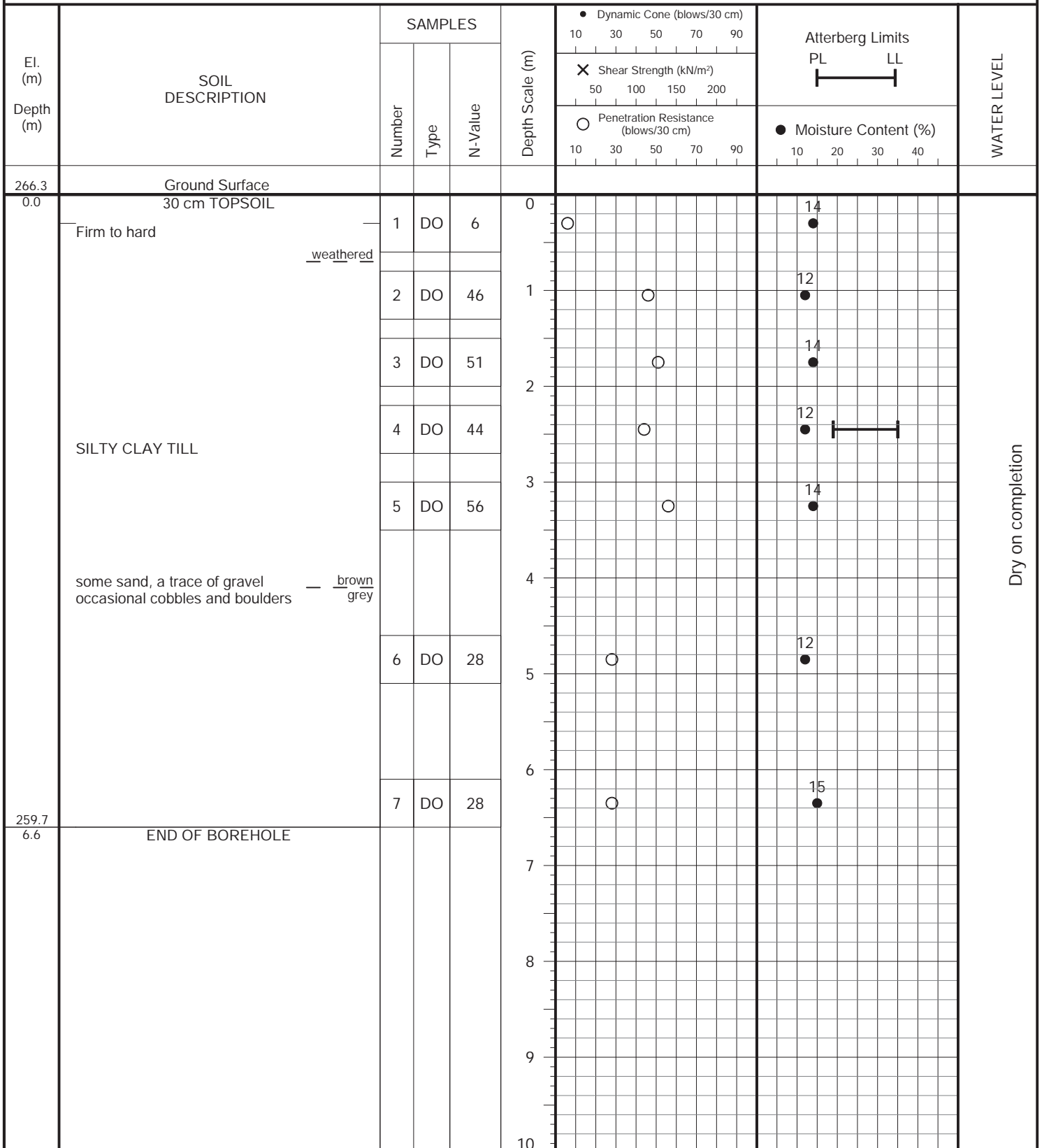


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METHOD OF BORING: Flight-Auger

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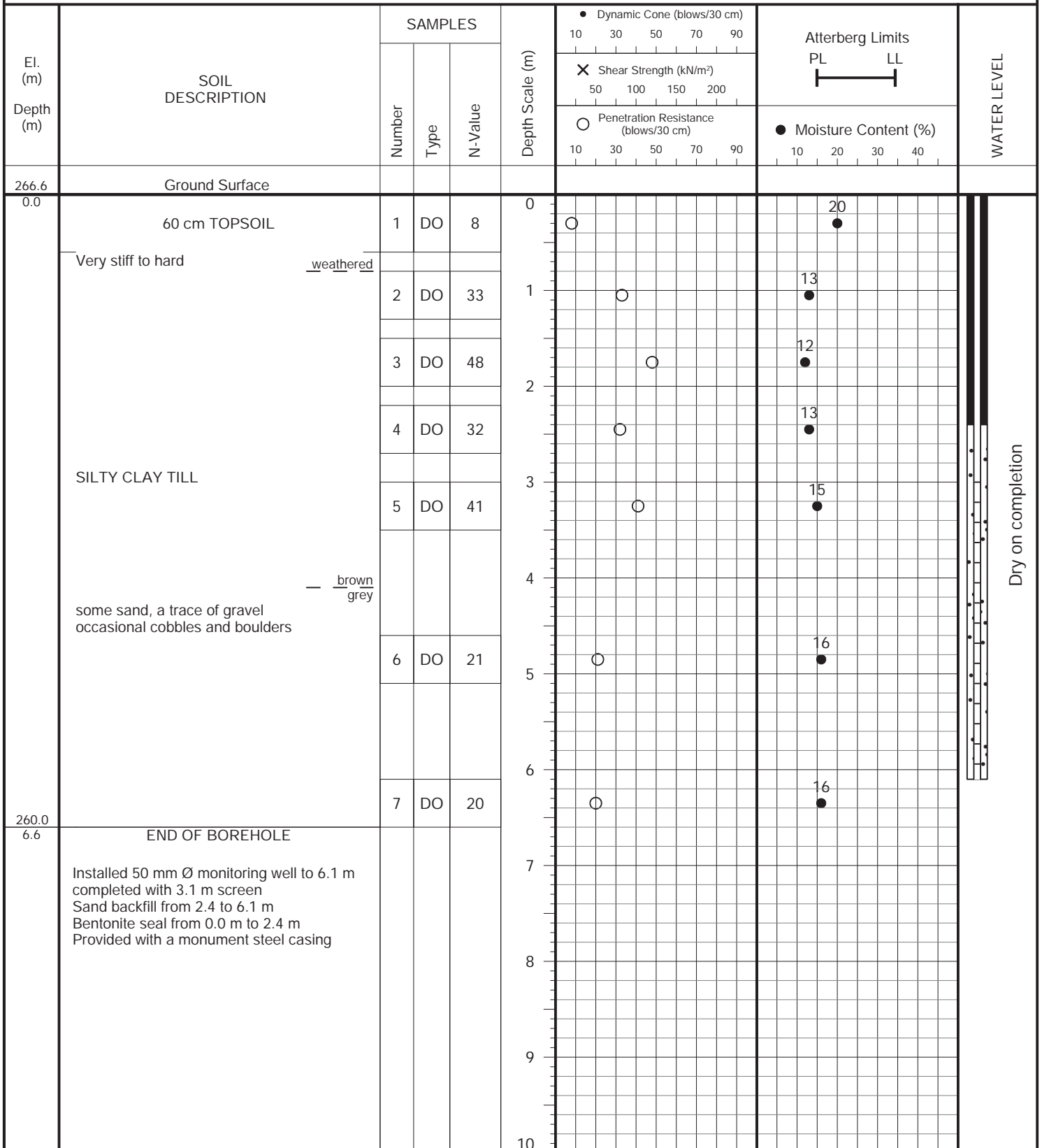


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METHOD OF BORING: Flight-Auger

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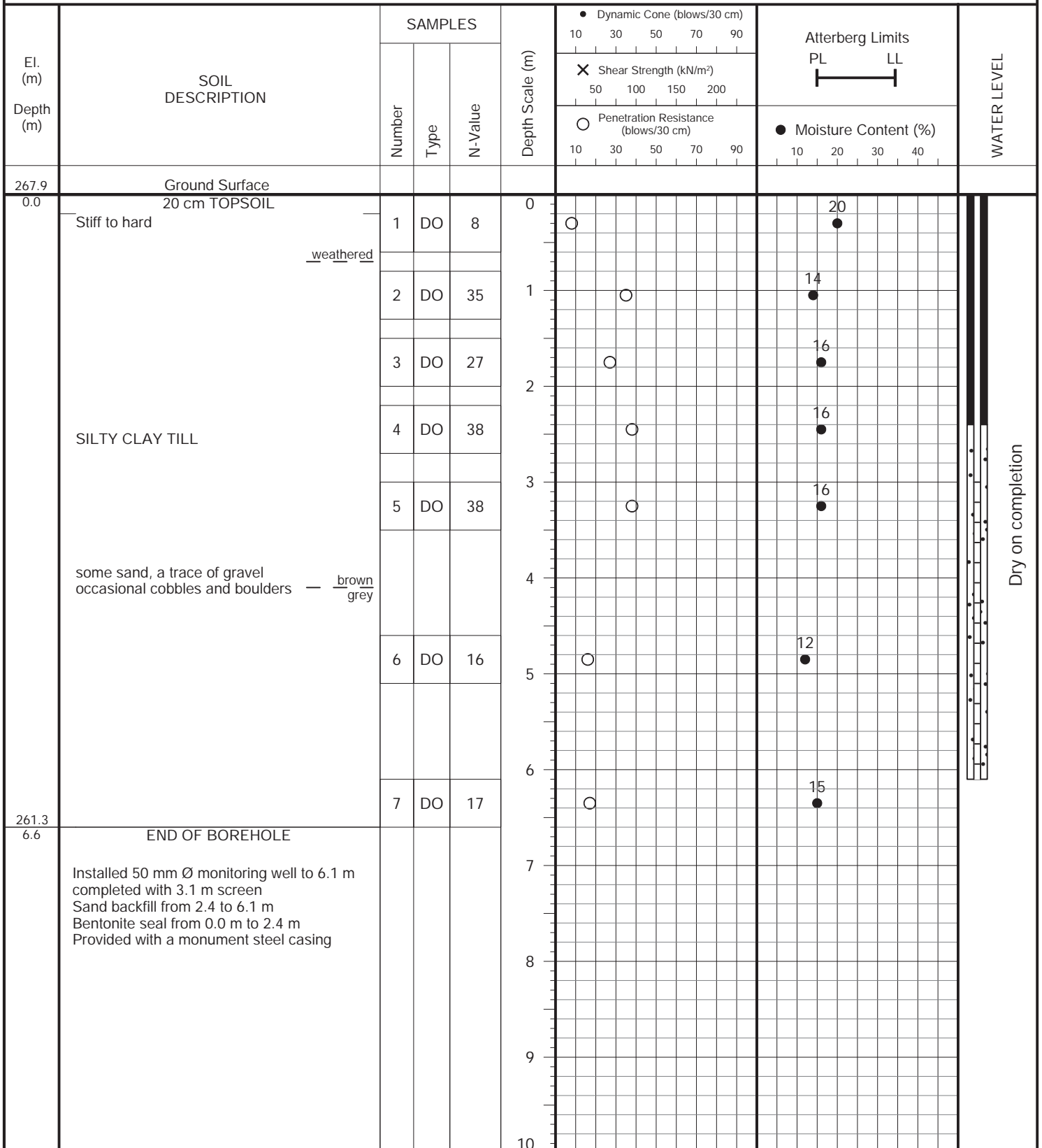


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METHOD OF BORING: Flight-Auger

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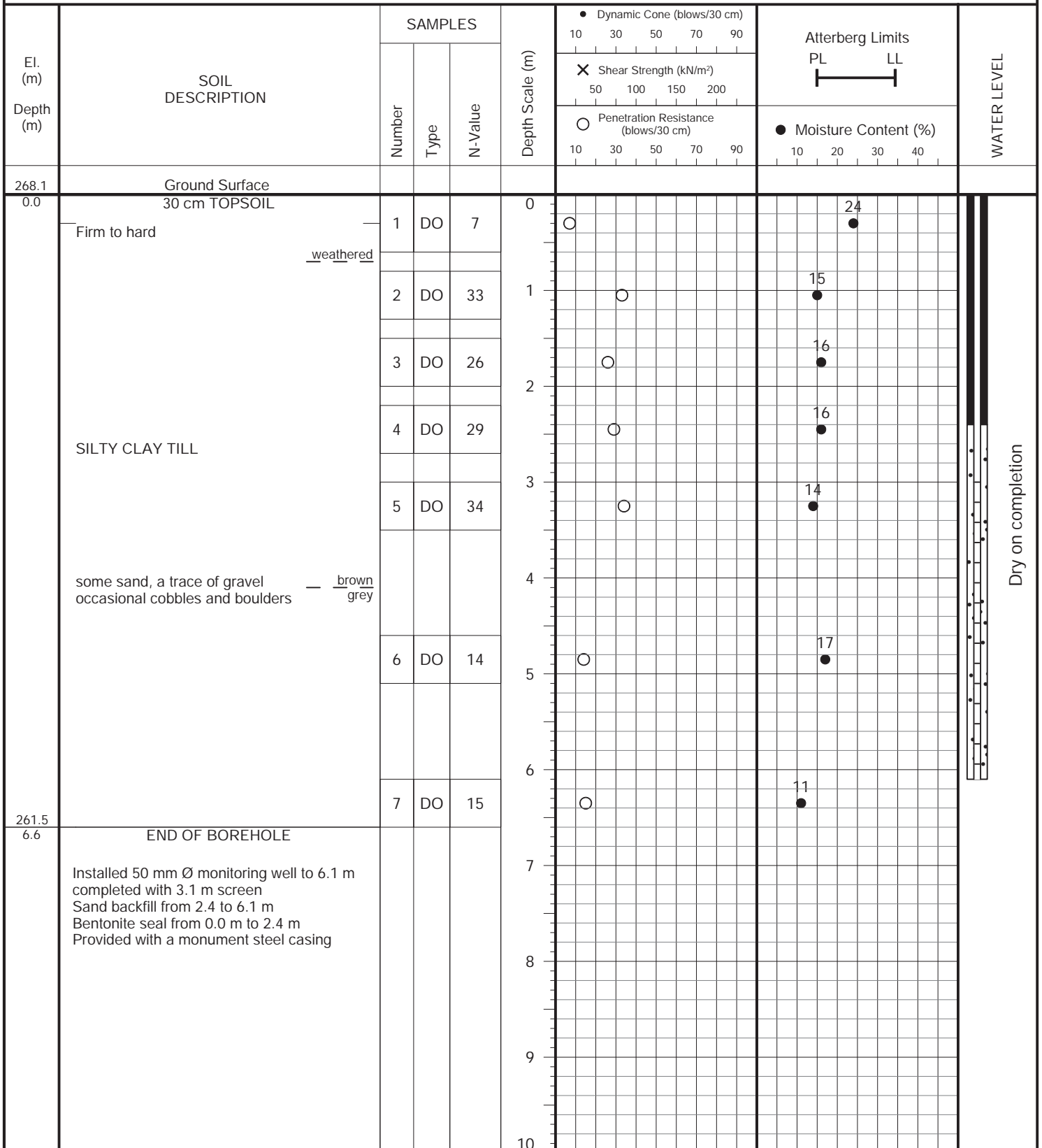


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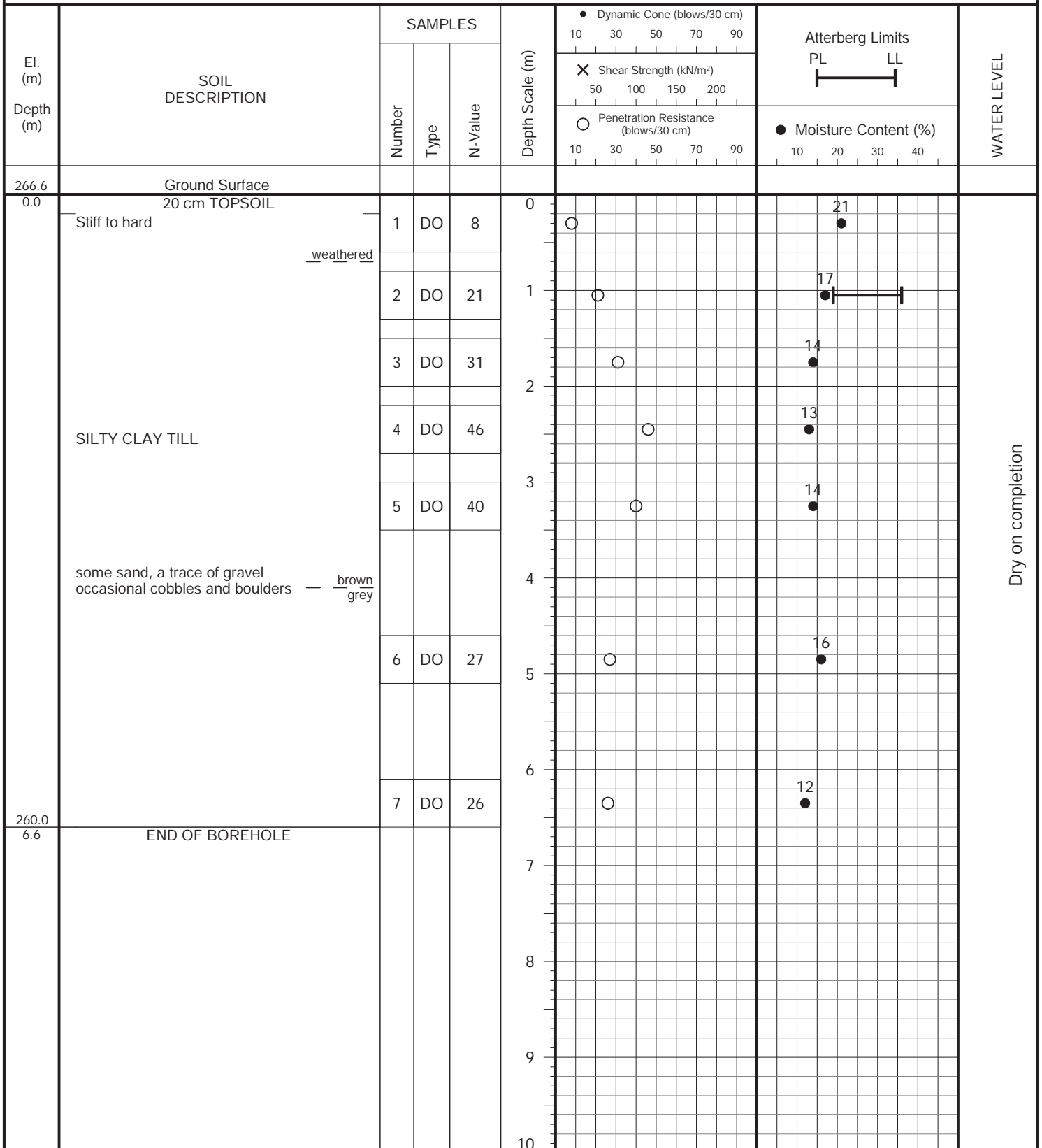


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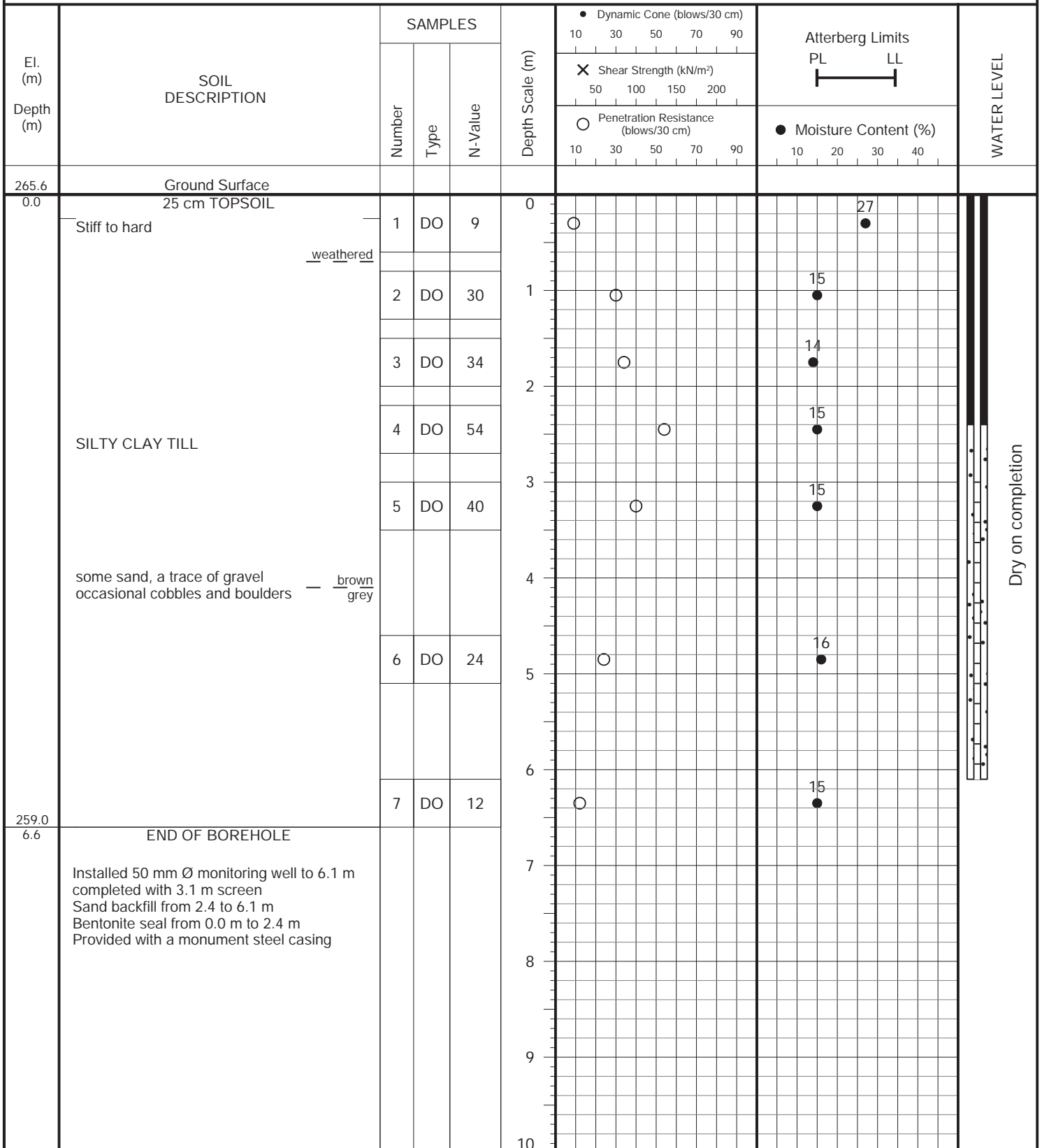


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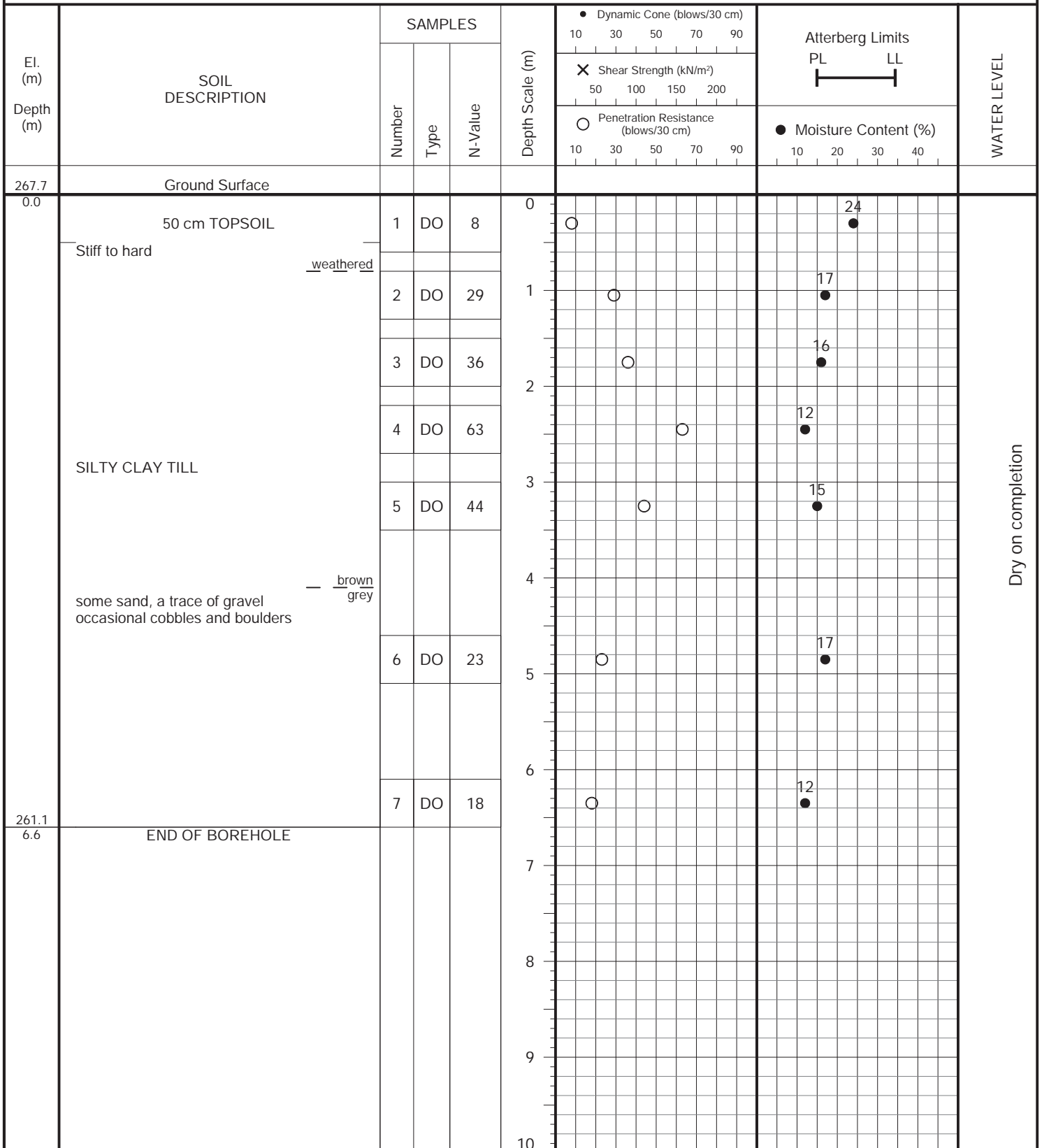


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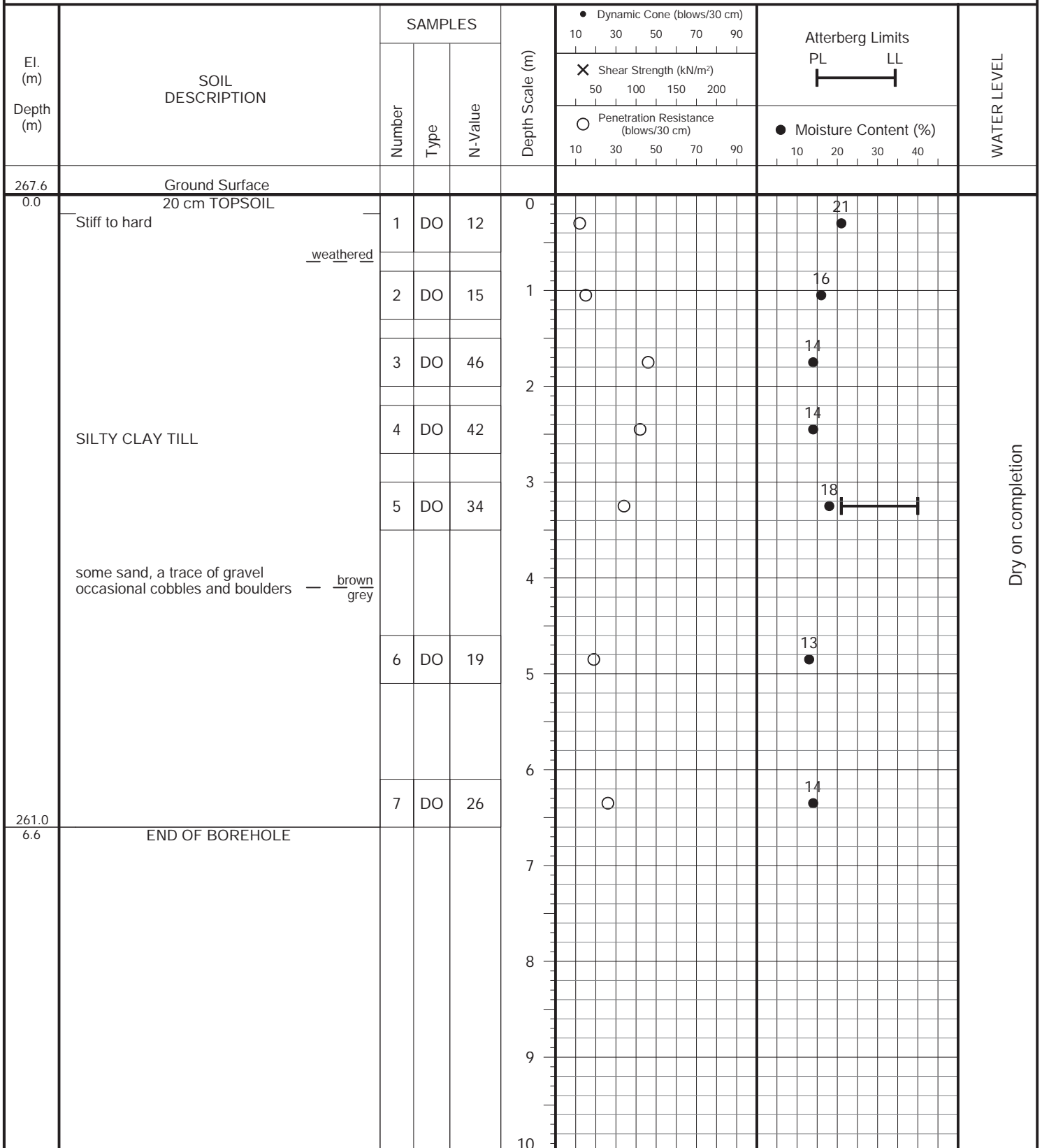


PROJECT DESCRIPTION: Proposed Mixed-Use Development

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: King Street and Humber Station Road, Town of Caledon

DRILLING DATE: October 5, 2021



Dry on completion

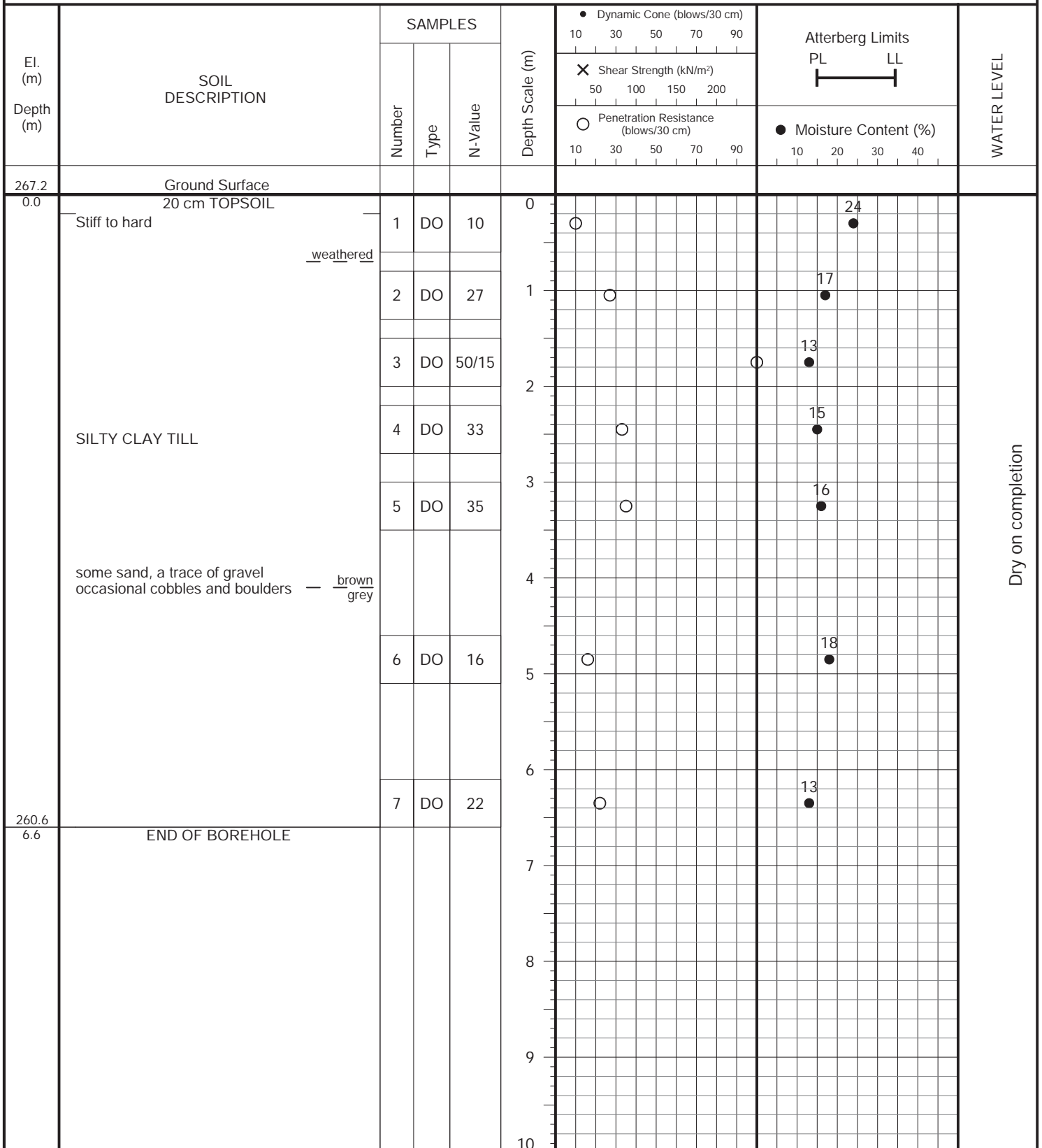


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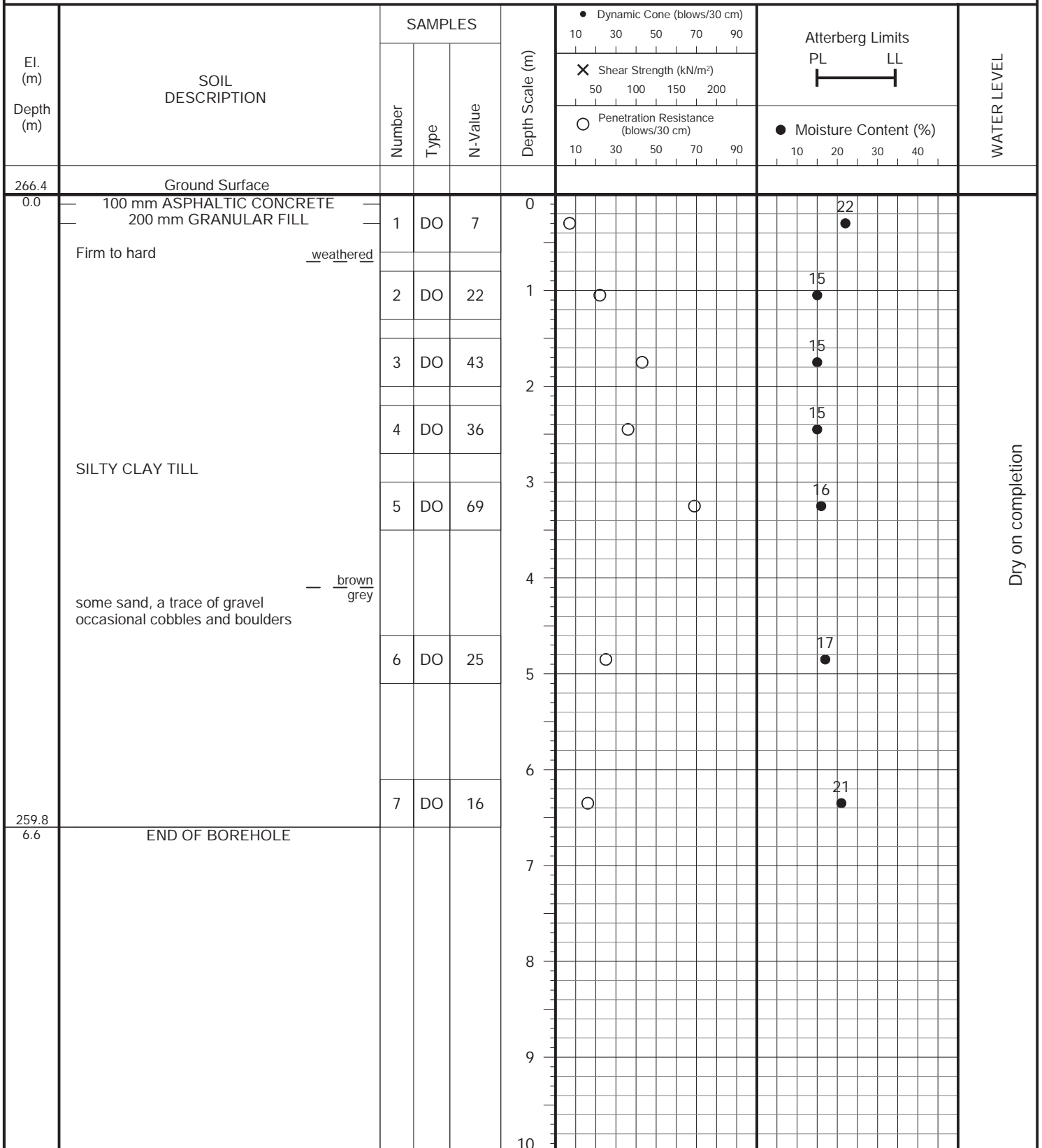


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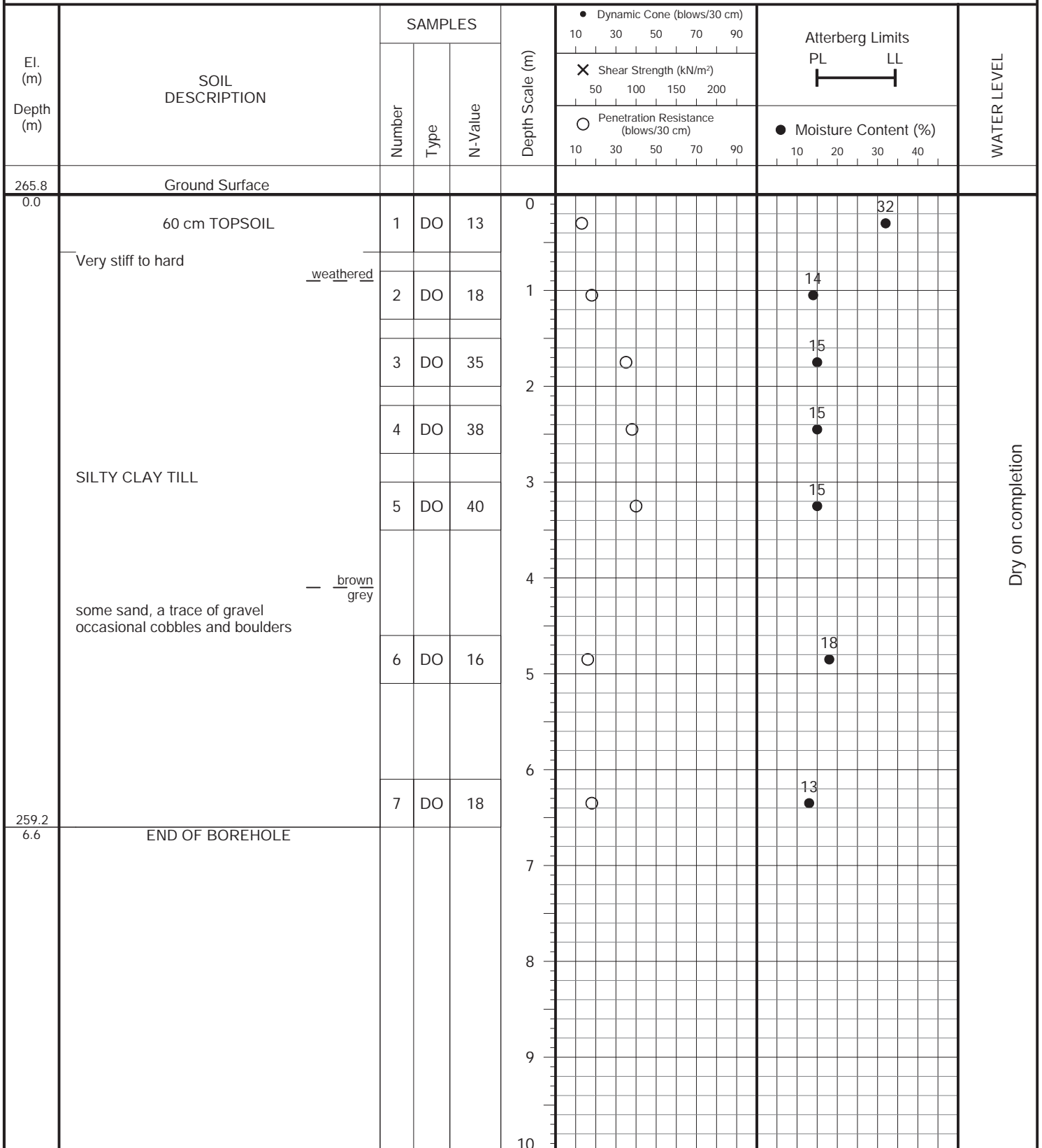


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METHOD OF BORING: Flight-Auger

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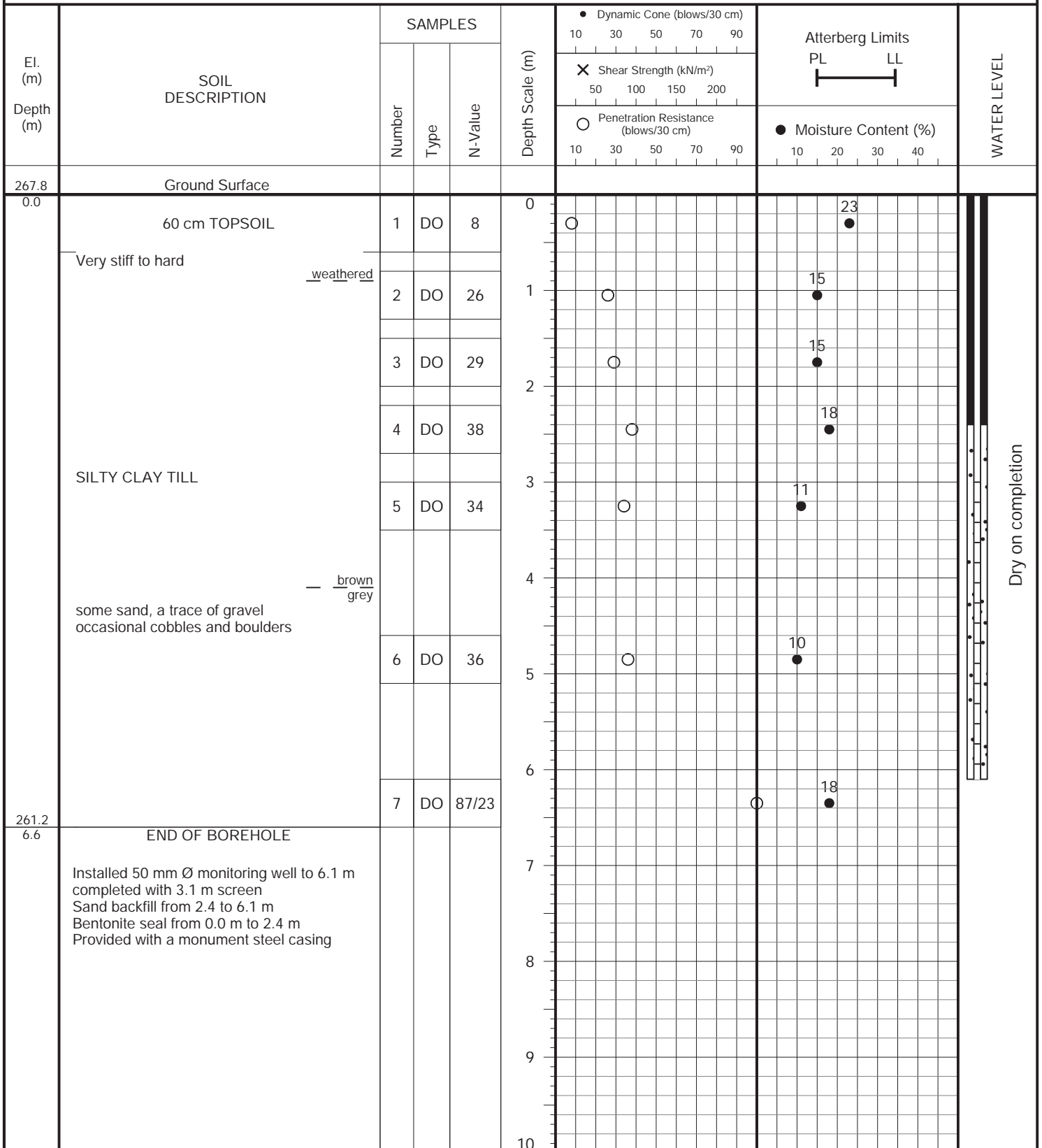


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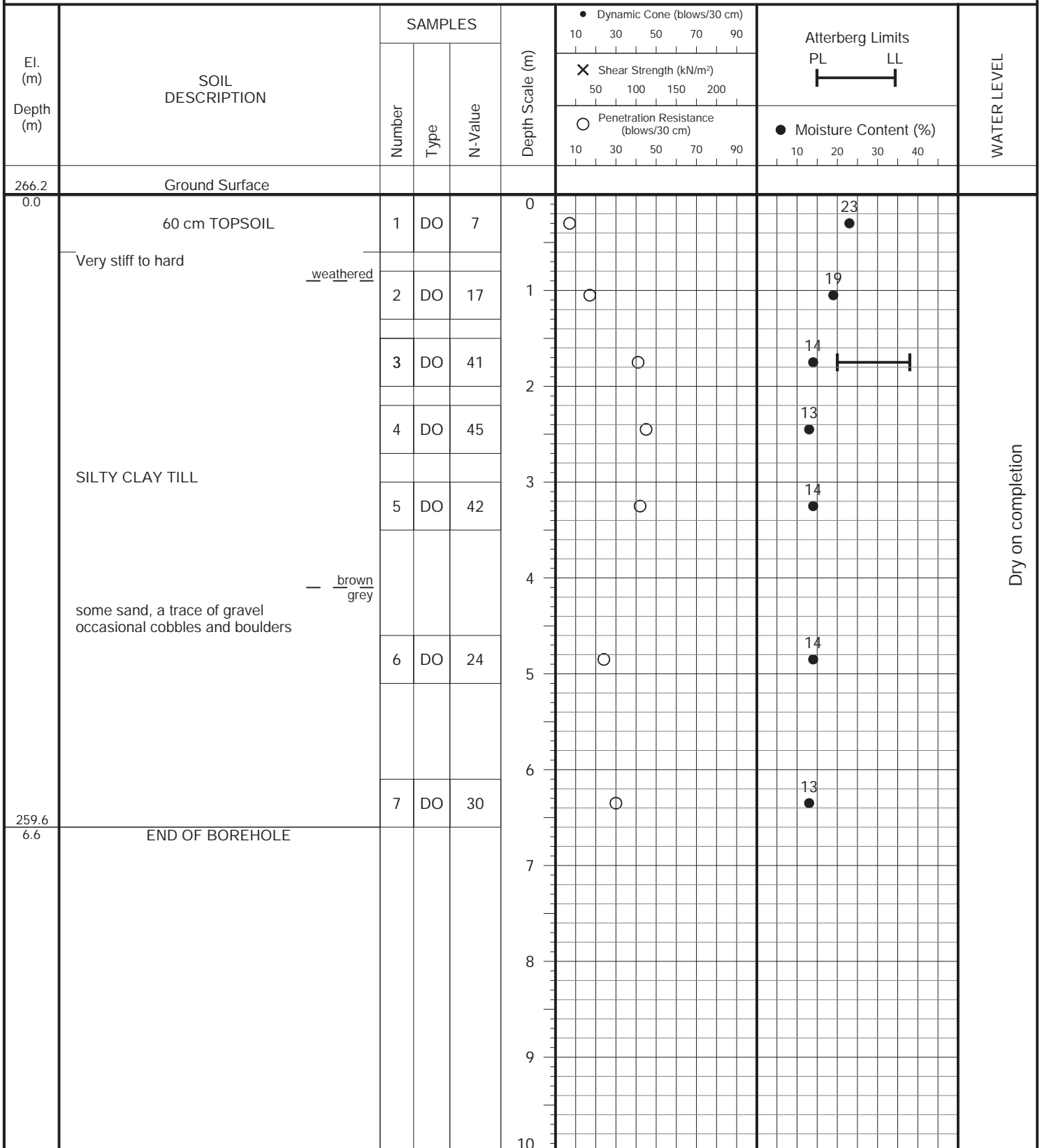


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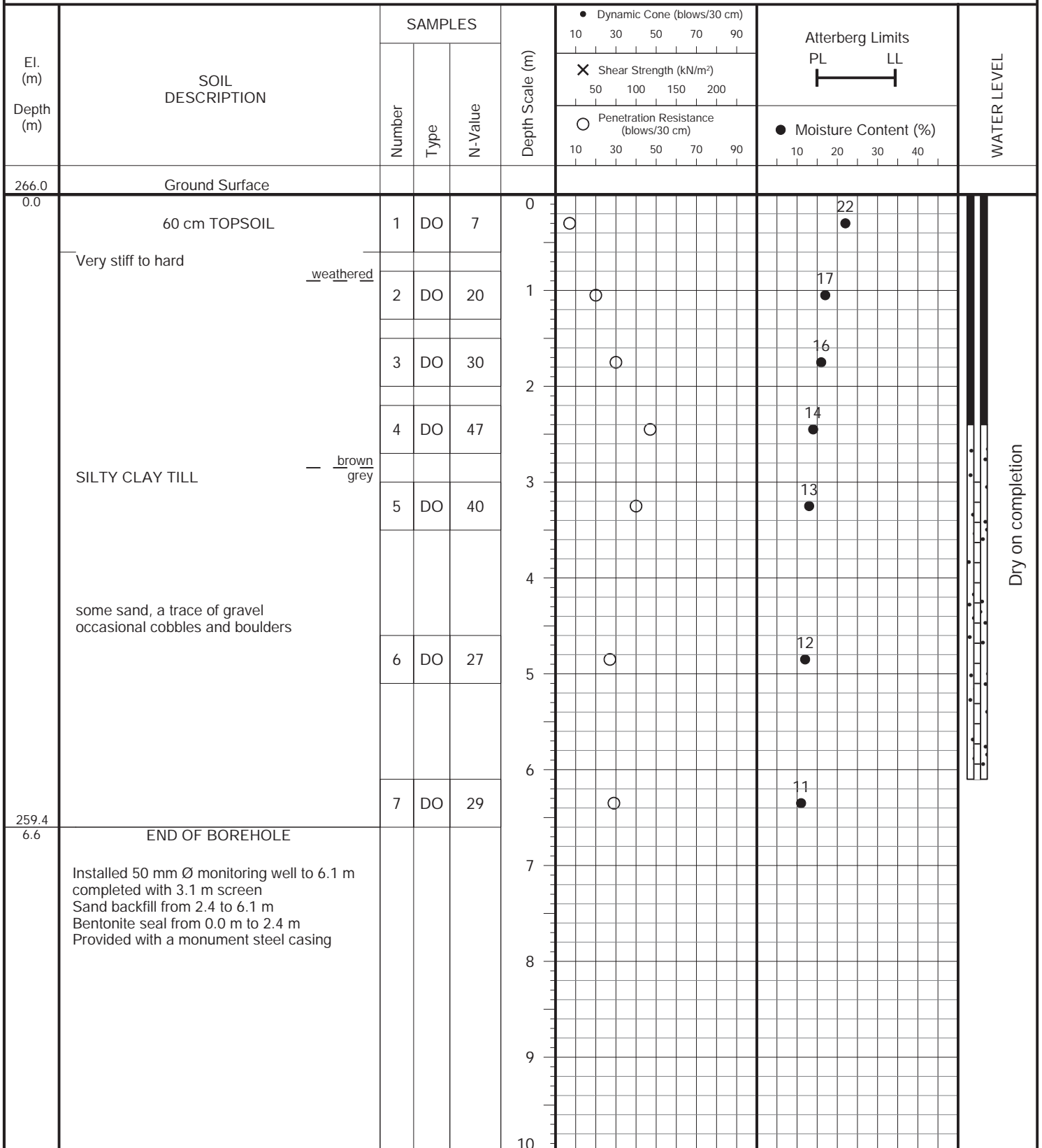


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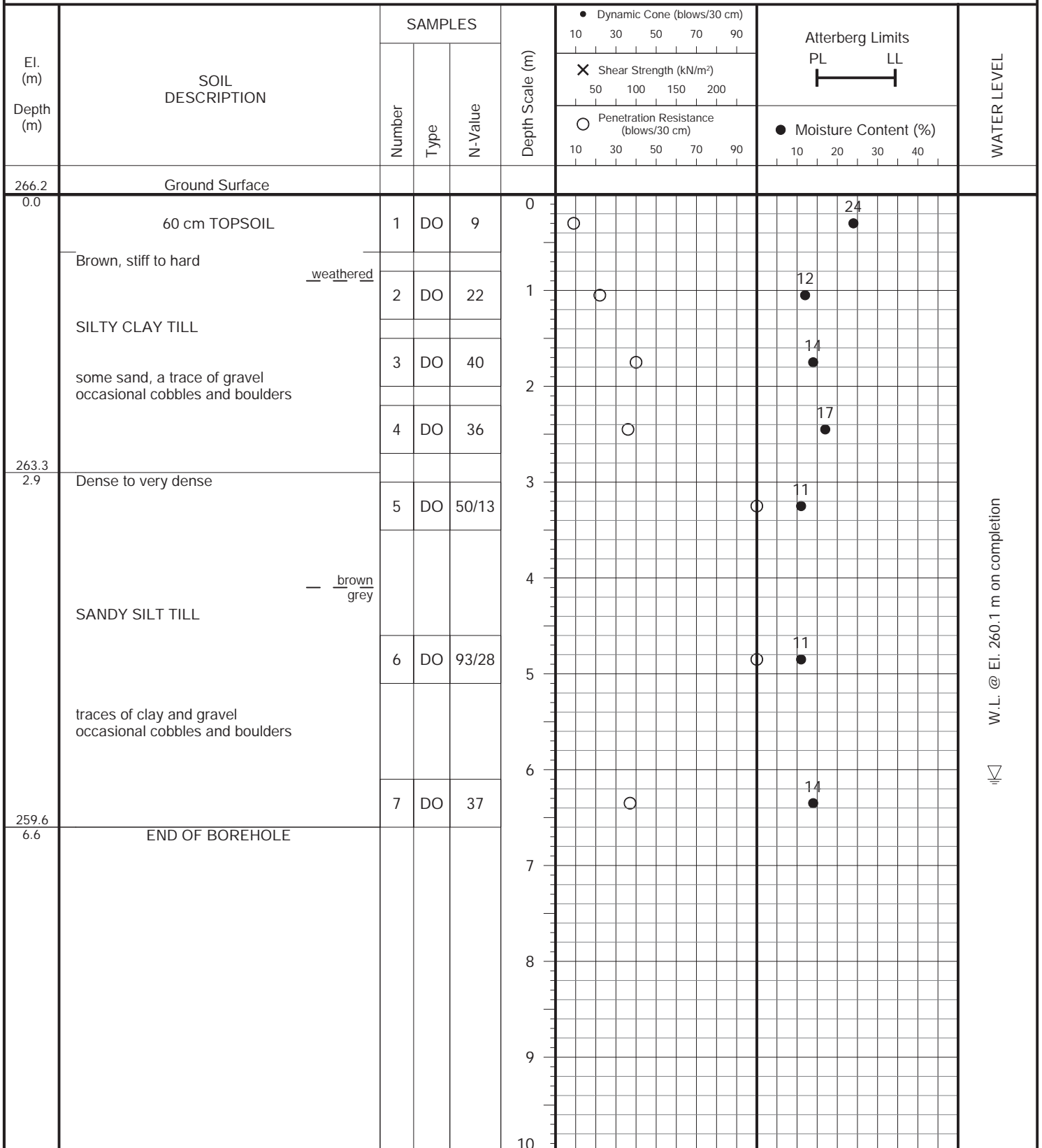


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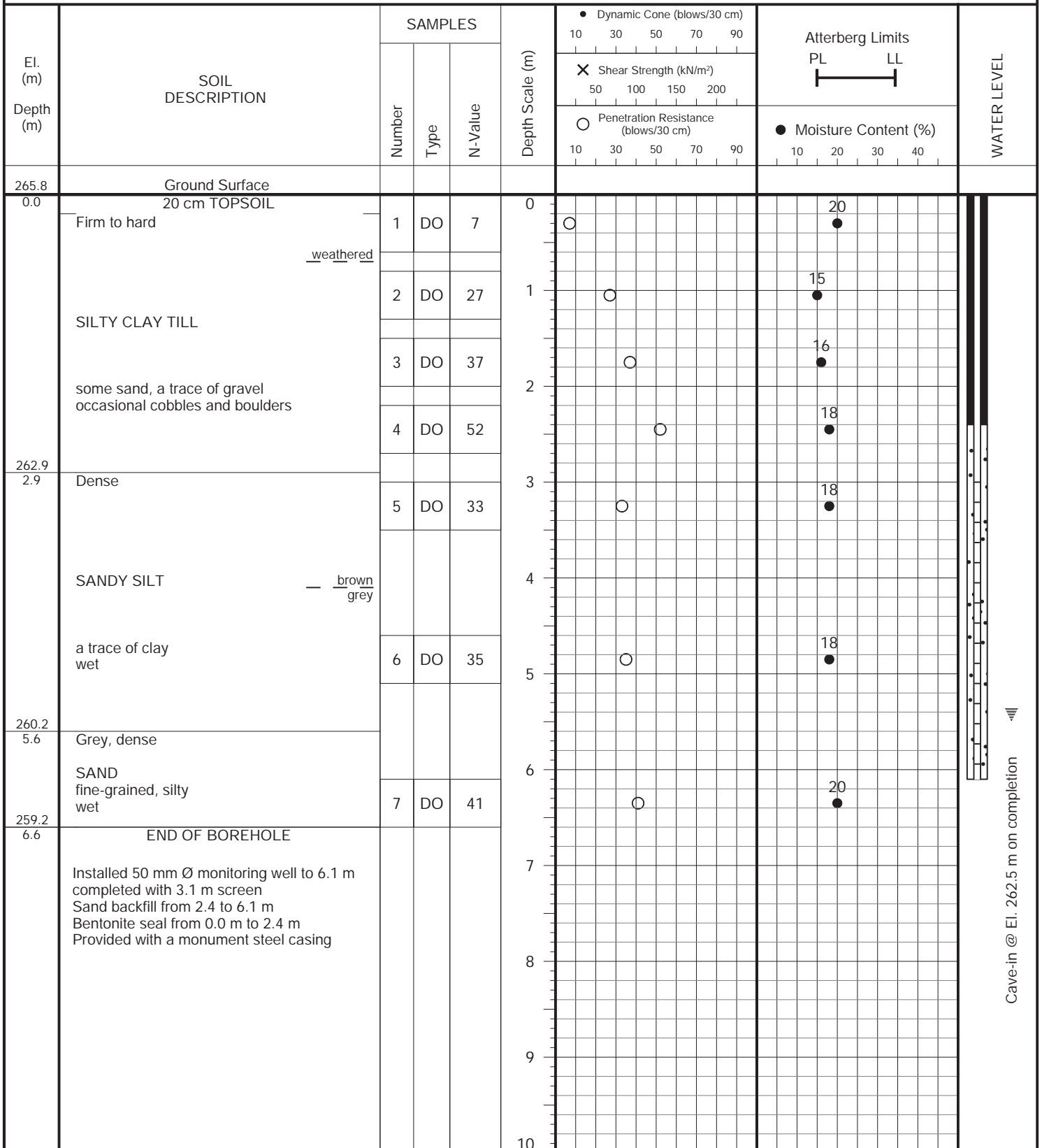


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Cave-in @ El. 262.5 m on completion

