Geotechnical Investigation and Design Report

12489 and 12861 Dixie Road, Caledon, Ontario

Caledon, ON

November 29th, 2024

Prepared for:

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Geotechnical Investigation and Design Report - 12489 and 12861 Dixie Road, Caledon, Ontario

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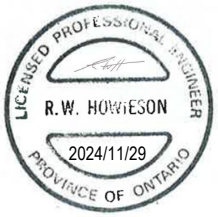

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1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by QuadReal Properties Group (Client) to provide geotechnical investigation and design services for proposed developments, located at 12489 and 12861 Dixie Road, Caledon, ON (The Site). The purpose of this investigation is to provide support and insight during the preliminary and detailed design of the proposed industrial buildings, parking lots and Stormwater Management (SWM) pond.

The project scope of work consisted of drilling geotechnical boreholes and installing monitoring wells, conducting geotechnical laboratory testing, and providing factual results obtained from geotechnical investigations including geotechnical design recommendations for the proposed development.

This report provides the results of the geotechnical component of the investigation at the proposed Site and has been prepared specifically and solely for the future development described herein.

This report does not address any environmental aspects of the project. A hydrogeological report is being prepared and will be issued under a separate cover.

Use of this report is subject to the Statement of General Conditions provided in **Appendix A**.

2.0 PREVIOUS REPORTS

The following report has been reviewed by Stantec as a part of the geotechnical investigation

- "Preliminary Geotechnical Investigation – Proposed Future Development – 12489 Dixie Road, Caledon, Ontario" issued as a draft report on November 30th, 2021, by Pinchin Limited. This report only pertains to one municipal address, which comprises of half of the site only.

All relevant information from the above-mentioned report have been reviewed and incorporated into the report where necessary.

3.0 PROJECT AND SITE DESCRIPTION

The initial concept plan was issued by Ware Malcomb on May 16th,2022, comprises two parcels with municipal addresses of 12489 and 12861 Dixie Road, respectively. The proposed development includes five (5) industrial buildings, a storm water management (SWM) ponds, loading docks, driveways, and parking lots.

Two industrial buildings, Buildings 1 and 2 are proposed to be constructed within the site limits of 12681 Dixie Road, with total footprint area of 100,758 m^2 and 87,960 m^2, respectively.

Area Geology
November 29th, 2024

Three industrial buildings are proposed to be developed within the site limits of 12489 Dixie Road. Buildings 1, 2 and 3 will have a total footprint of 42,912 m^2, 49,269 m^2 and 42,384 m^2, respectively. The concept plan is shown on **Drawing No. 2 – Borehole Location Plan in Appendix B.**

The site is located east of the intersection between Old School Road and Dixie Road in Caledon, Ontario. The site is bounded by Old School Road from its northwest, Dixie Road from the south, and agricultural lands from the east and a golf course from the northeast. The site is located within the parcel limits of municipal addresses of 12489 and 12861 Dixie Road. The site consists of two agricultural farms that are intersected by two creeks of the Humber River tributaries travelling east to west, which is considered as a natural heritage area. Both farms are developed with residential dwellings, barns with livestock and storage buildings at the western limit of the site along Dixie Road. The location of the subject site can be found in **Drawing No. 1 – Site Location Plan in Appendix B.**

4.0 AREA GEOLOGY

Based on a review of available geological records, the site is located within the physiographic region of South Slope. The South Slope spans approximately 2,400 square kilometers, extending from the Niagara Escarpment in the west to the Trent River in the east. This region is characterized by gently sloping shale and till plains, which predominantly slope southeastward.

The surficial geology within the site limits consists of Halton Till, consisting of mainly very dense sandy silt to hard clayey silt deposits, with interbeds of sand, gravel and clay throughout the strata.

The bedrock within the site is part of the Queenston formation, which consists of reddish brown shale, with frequent layers of hard, grey limestone. The bedrock surface is found between elevations of 220 masl to 245 masl, which corresponds to depths of 20 m to 45 m below ground surface (BGS). The groundwater is expected to be between elevations of 250 masl to 260 masl, which corresponds to depths between 5 m to 15 m BGS

5.0 SCOPE OF WORK

- Contact the public utility authorities to confirm the locations of major public utilities.
- Review underground utility scans completed by the public and private locators.
- Advance sixty-nine (69) geotechnical boreholes to the following depths:
  - Thirty (30) boreholes advanced to 9.6 m below ground surface (BGS) or up to refusal, whichever comes first. Fourteen (14) locations will be equipped with a monitoring wells installed with a 3 m well screen. Monitoring well screen to be backfilled with sand filter pack to ~0.3 m above screen, followed by bentonite seal to ground surface. All monitoring wells to be covered with lockable, steel monuments.
  - Twenty-eight (28) boreholes advanced to 6.6 m BGS or up to refusal, whichever comes first.
  - Eleven (11) boreholes advanced to 3.5 m BGS or up to refusal, whichever comes first. Two (2) locations will be equipped with a monitoring well installed with a 3 m well screen. Monitoring well screen to be backfilled with sand filter pack to ~0.3 m above screen, followed by bentonite seal to ground surface. All monitoring wells to be covered with lockable, steel monuments.

- Collect soil samples in each borehole at regular intervals by driving a split tube sampler in accordance with the methods and procedures described in ASTM D1586. The samples obtained were placed in moisture-proof containers and transported to our geotechnical materials testing laboratory for classification and testing.
- Record the presence and depth (where encountered) of free groundwater in the open boreholes.
- The coordinates of the boreholes were obtained by Stantec personnel using Survey Equipment.

5.1 FIELDWORK

Prior to commencing the field investigation, the various public utility companies were consulted to identify where public utilities crossed the property boundaries. In addition, a private locator was contracted to clear the boreholes of any private on-site services.

The fieldwork for the investigation commenced on January 23rd, 2023 and was completed on March 3rd, 2023. A total of sixty-nine (69) boreholes were advanced as part this geotechnical investigation. Thirty-seven (37) boreholes were advanced within the site limits of 12861 Dixie Road, and thirty-two (32) boreholes were advanced within the site of 12489 Dixie Road Borehole locations are shown on **Drawing No. 2 – Borehole location Plan in Appendix B**.

The boreholes were advanced using a track mounted Diedrich D120 drill rig equipped with solid and hollow-stem augers operated by a qualified drilling subcontractor. Stantec personnel recorded the subsoil and groundwater conditions encountered in the boreholes. The soil samples were recovered at regular 0.76 m and 1.52 m intervals using a 51 mm (outside diameter) split-tube sampler by conducting Standard Penetration Tests (SPTs) in accordance with the procedures outlined in ASTM specification D1586. All soil samples recovered from the boreholes were placed in moisture-proof bags and returned to our laboratory for detailed geotechnical classification and testing as required.

Groundwater monitoring wells were installed in sixteen (16) boreholes (BH/MW-04-23, BH/MW-09-23, BH/MW-13-23, BH/MW-15-23, BH/MW-19-23, BH/MW-25-23, BH/MW-31-23, BH/MW-33-23, BH/MW38-23, BH/MW46-23, BH/MW48-23, BH/MW49-23, BH/MW51-23, BH/MW55-23, BH/MW61-23 and BH/MW64-23) and the water levels were measured by Stantec personnel on March 10, 2023. The monitoring wells consisted of 50 mm inside diameter, Schedule 40 PVC pipe, with a No. 10 slot screen (0.01-inch slot) with a minimum screen length of 3.0 m. The annular space between the monitoring well pipe and surrounding geological formation was backfilled with sand to the top of screen, with the remainder of the annular space being filled with a granular bentonite to prevent a hydraulic connection from occurring between the soil layers along the length of the casing.

The boreholes without monitoring wells were backfilled with a low-permeability mixture of granular bentonite and auger spoils in accordance with the requirements of the Ontario Ministry of the Environment, Conservation and Parks (MECP) Regulation 903/90 as amended 128/03.

5.2 BOREHOLE LOCATION AND ELEVATION SURVEY

Stantec field personnel collected the borehole survey information using a Trimble R12 GPS unit. Ground surface elevations at the borehole locations referenced to a geodetic datum and approximate UTM coordinates (Zone 17 NAD 83) and are shown in Table 5.1 below.

Table 5.1 Borehole Location and Elevation Survey

Borehole No.	Ground Surface Elevation	Borehole Depth	UTM Coordinates (Zone 17 NAD83)	
	(m) masl	(m) BGS	Northing (m)	Easting (m)
BH 01-23	266.2	9.6	595653	4847981
BH 02-23	265.5	9.6	595705	4848058
BH 03-23	265	9.6	595769	4848006
BH/MW 04-23	265.7	9.6	595725	4847952
BH 05-23	266.2	9.6	595664	4848182
BH 06-23	265.8	6.6	595781	4848224
BH 07-23	266.7	9.6	595825	4848295
BH 08-23	266.1	6.6	595969	4848191
BH/MW 09-23	265.3	9.6	596040	4848271
BH 10-23	265.9	3.5	595944	4848270
BH 11-23	267.1	6.6	595879	4848380
BH 12-23	266.7	6.6	595762	4848400
BH/MW 13-23	266.8	9.6	595665	4848299
BH 14-23	266.1	6.6	595570	4848205
BH/MW 15-23	267.7	7.9	595429	4848202
BH 16-23	267.9	6.6	595552	4848337
BH 17-23	267	6.6	595643	4848438
BH 18-23	266.7	6.6	595783	4848526
BH/MW 19-23	267.7	9.6	595662	4848555
BH 20-23	268	6.6	595559	4848509
BH 21-23	269.5	9.6	595438	4848363
BH 22-23	268.2	6.6	595083	4848400
BH 23-23	268.5	3.5	595331	4848259
BH 24-23	268.1	6.6	595181	4848515
BH/MW 25-23	269.9	9.6	595247	4848188
BH 26-23	269.1	9.6	595210	4848274
BH 27-23	269.6	3.5	595317	4848537
BH 28-23	269.5	6.6	595194	4848421
BH 29-23	270.3	6.6	595466	4848535
BH 30-23	269.9	3.5	595329	4848401
BH/MW 31-23	269.4	9.6	595342	4848646
BH 32-23	269.6	9.6	595453	4848681
BH/MW 33-23	268.3	9.6	595344	4848749
BH 34-23	268.7	6.6	595597	4848680
BH 35-23	266.8	3.5	595533	4848785
BH 36-23	265.7	6.6	595569	4848056
BH 37-23	264.4	3.5	595368	4848127
BH/MW38-23	264.9	9.8	596080	4847389
BH39-23	265.6	9.8	595969	4847479

Borehole No.	Ground Surface Elevation	Borehole Depth	UTM Coordinates (Zone 17 NAD83)	
	(m) masl	(m) BGS	Northing (m)	Easting (m)
BH40-23	265.8	9.8	596036	4847522
BH41-23	264.6	9.6	596117	4847402
BH42-23	262.5	9.6	596196	4847415
BH43-23	263.6	6.6	596304	4847473
BH44-23	266.5	6.6	596068	4847695
BH45-23	266.2	6.6	596154	4847745
BH/MW46-23	260.7	9.6	596433	4847444
BH47-23	258.8	6.6	596531	4847474
BH/MW48-23	265.4	9.6	596181	4847842
BH/MW49-23	260.6	9.6	596626	4847513
BH50-23	265.8	9.6	596333	4847844
BH/MW51-23	266.6	9.8	595838	4847620
BH52-23	265.6	6.6	596099	4847524
BH53-23	265.8	6.6	595974	4847727
BH54-23	264.8	3.5	596261	4847548
BH/MW55-23	265.8	9.8	596186	4847566
BH56-23	267.0	3.5	595895	4847552
BH57-23	266.8	9.6	595968	4847623
BH58-23	264.8	3.5	596066	4847774
BH59-23	265.5	6.6	596251	4847633
BH60-23	266.2	6.6	596288	4847774
BH/MW61-23	263.9	9.6	596359	4847639
BH62-23	261.2	6.6	596519	4847574
BH63-23	262.1	3.5	596708	4847613
BH/MW64-23	265.2	9.6	596467	4847868
BH65-23	264.3	3.5	596574	4847743
BH66-23	264.2	9.6	596496	4847762
BH67-23	262.8	6.6	596595	4847653
BH68-23	264.3	6.6	596387	4847717
BH69-23	263.5	6.6	596343	4847530

In general, the site topography indicates that the site slopes down from west to east. The site is considered flat with an average topographic relief of approximately 5 m, with elevations ranging between 270 masl to 258 masl. The borehole locations are shown on **Drawing No.2 – Borehole Location Plan in Appendix B.2**

5.3 GEOTECHNICAL LABORATORY TESTING PROGRAM

All samples recovered from the geotechnical investigation were returned to Stantec's geotechnical and materials testing laboratory and were visually examined by a geotechnical specialist.

The scope of the geotechnical laboratory testing program is outlined below in Table 5.2.

Table 5.2: Geotechnical Laboratory Testing Program

Laboratory Test	Number of Samples Tested
ASTM D422-63 (2007) – Grain Size Distribution with Hydrometer	22
ASTM D4318-10 – Atterberg Limits	7
Soil Chemical Testing (pH, Sulphide, Chloride, Electrical Conductivity, and Soil Resistivity)	10

The results of the laboratory tests are discussed in the text of this report. The results of the moisture content tests are shown on the Borehole Records in **Appendix C**. The results of the grain size distribution tests and Atterberg Limits Tests are reported on the borehole records and are illustrated in **Appendix D**.

Samples remaining after testing were placed in storage for a period of three months after issue of the original geotechnical report. After the storage period, the samples will be discarded.

6.0 RESULTS OF INVESTIGATION

6.1 FRAME OF REFERENCE

The soils encountered in the boreholes and reported herein have been classified in accordance with the Unified Soil Classification System as defined in ASTM D2487 per Unified Soil Classification System (USCS) and D2488 per visual-manual method.

It should be noted that the internal diameter (I.D.) of the SPT sampler is 38 mm and hence the grain size test results and soil classifications may not reflect the entire gravel size fraction which extends to 75 mm diameter. The presence of cobbles (particles from 75 mm to 300 mm) and boulders (particles > 300 mm) were inferred to be present in specific stratum and are described separately from the gravel content.

It should also be noted that the stratigraphic boundaries shown on the borehole logs are inferred from non-continuous sampling and should be considered approximate only.

6.2 OVERVIEW OF CONDITIONS:

In general, the subsurface stratigraphy encountered in the boreholes advanced on the Site consisted of the following:

- Topsoil
- Common fill material (encountered only in boreholes BH41-23, BH42-23 and BH43-23)
- Cohesive till material consisting of Sandy Lean Clay (CL), Lean Clay with Sand (CL), Sandy Silty Clay (CL-ML), Sandy Silty Clay with Gravel (CL-ML)
- Groundwater levels ranged between 0.86 m to 9.6 m below ground surface (BGS), which corresponds to elevations of 266.6 masl to 251.9 masl

- Bedrock was not encountered in the boreholes advanced for this investigation, as the borehole depth for this investigation did not exceed 9.6 m BGS (maximum depth of 9.6 m below grade).

The following paragraphs provide additional information on the soil strata encountered in the boreholes. The following is intended to summarize the conditions encountered during the investigation. **Appendix C -Borehole Records** should be used as the primary source of information supplemented by the information provided in the following sections. The soil conditions shown on the records are a direct extraction from the associated boreholes.

6.3 TOPSOIL

Topsoil was encountered below the ground surface cover (i.e., roots/agricultural lands) at all borehole locations.

The thickness of the topsoil varied from approximately 300 mm to 600 mm, with an average thickness of approximately 450 mm. Given the Site is located mainly within agricultural lands, thicker topsoil is anticipated within low lying areas which may be confirmed by a test pit program.

The N-values obtained from the SPTs advanced in the topsoil ranged from 3 to 9 blows per 0.3 m penetration. Based on the N-values, the topsoil layer was assessed as loose.

6.4 COMMON FILL MATERIALS

A layer of brown silty clay fill material was encountered underlying the topsoil in three (3) of the boreholes (boreholes BH41-23, BH42-23 and BH43-23). The samples recovered from the common fill material generally contained trace sand, trace to some gravel and trace rootlets/plants debris. The thickness of the fill material varied from 0.5 m to 0.6 m.

The samples of the fill materials were characterized as moist to wet based on visual and textural examination of the samples in the field. The soil is described as silty clay fill (characterized as common fill for purposes of this report) based on visual and textural examination.

6.5 COHESIVE TILL – SANDY LEAN CLAY, LEAN CLAY WITH SAND (CL) SANDY SILTY CLAY, SANDY SILTY CLAY WITH GRAVEL (CL-ML)

A stratum of lean clay with sand (CL) till was encountered underlying the topsoil soils described in the preceding sections in all boreholes. The samples recovered from the cohesive till soils typically contained trace gravel. Generally, the thickness of the cohesive till layer ranged from approximately 0.4 m to 9.7 m. All boreholes were terminated in the cohesive till deposit.

The N-values obtained from the SPTs advanced in the cohesive till ranged from 7 to greater than 50 blows per 0.3 m penetration. Lower N-values were recorded in some boreholes in the surficial zone of this deposit within the weathered material to the depth of approximately 0.8 m below grade, however, the majority of the boreholes revealed a very stiff consistency in the surficial zone of the layer. Beyond this depth, the N-values ranged from 14 to greater than 50 blows per 0.3 m penetration. Based on the N-values, the soil was assessed to have a consistency ranging from very stiff to hard (generally hard). The layer was described to be moist to wet

A layer of brown sandy silty clay till was encountered below the topsoil in boreholes BH/MW38-23 to BH69-23, with the exception of borehole BH59-23. The Sandy silty clay was primarily observed within the 12489 Dixie Road site limits. The samples recovered from the sandy silty clay till typically contained traces of gravel, whereas higher gravel content was observed at boreholes BH39-23 and BH40-23. Trace rootlets and plant debris were encountered at shallow depths. The thickness of the layer ranges from 1.5 m to 6.1 m below ground surface, which corresponds to elevations between 265.6 masl to 258.5 masl. The layer was described to be moist to wet

The N-values obtained from the SPTs advanced in the sandy silty clay till layer ranged from 9 to 43 blows per 0.3 m penetration, which indicates a soil consistency of very stiff to hard.

Grain size analyses and Atterberg limits tests were conducted on select samples of the cohesive till. The results of the tests are summarized below in Table 6.1. The results of the gradation analyses are shown on the borehole records in **Appendix C** and are illustrated on Figure 1 in **Appendix D**.

Table 6.1 Grain Size Distribution and Atterberg Limits

Borehole	Depth	Grain Size (%)				Atterberg Limits (%)			Soil Classification
	(m BGS)	Gravel	Sand	Silt	Clay	LL	PL	PI	
BH/MW15-23	1.8	5	31	31	33	26	13	13	SANDY LEAN CLAY (CL)
BH/MW19-23	3.3	5	22	36	33	27	13	14	LEAN CLAY WITH SAND (CL)
BH/MW31-23	3.3	5	26	31	38	18	10	8	SANDY LEAN CLAY (CL)
BH18-23	3.3	6	27	34	33	-	-	-	SANDY LEAN CLAY (CL)
BH20-23	3.3	20	28	37	25	-	-	-	SANDY LEAN CLAY (CL)
BH21-23	6.3	5	38	35	22	29	13	16	SANDY LEAN CLAY (CL)
BH22-23	3.3	8	25	31	36	-	-	-	SANDY LEAN CLAY (CL)
BH26-23	2.5	6	21	29	44	-	-	-	LEAN CLAY WITH SAND (CL)
BH/MW38-23	1.8	4	26	34	36	-	-	-	SANDY LEAN CLAY(CL)
BH/MW38-23	4.1	10	26	33	31	30	12	18	SANDY LEAN CLAY(CL)
BH/MW38-23	7.9	0	4	45	51	-	-	-	LEAN CLAY (CL)
BH39-23	3.4	16	32	29	23	-	-	-	SANDY SILTY CLAY with GRAVEL(CL-ML)
BH40-23	1.8	6	35	32	27	-	-	-	SANDY SILTY CLAY(CL-ML)
BH40-23	4.9	18	30	25	27	-	-	-	SANDY SILTY CLAY with GRAVEL(CL-ML)
BH/MW46-23	3.4	7	29	32	32	26	12	14	SANDY LEAN CLAY(CL)
BH/MW51-23	1.8	6	24	33	37	28	12	16	SANDY LEAN CLAY(CL)
BH52-23	1.8	3	36	34	27	-	-	-	SANDY SILTY CLAY(CL-ML)
BH52-23	3.4	7	30	32	31	-	-	-	SANDY LEAN CLAY(CL)
BH/MW55-23	2.6	9	29	33	29	-	-	-	SANDY LEAN CLAY(CL)
BH57-23	2.6	3	22	38	37	-	-	-	LEAN CLAY with SAND(CL)
BH59-23	1.8	2	20	35	43	-	-	-	LEAN CLAY with SAND(CL)
BH67-23	2.6	5	27	36	32	-	-	-	SANDY LEAN CLAY(CL)

Notes:
1. Fines denote fraction passing the No. 200 sieve.
2. LL, PL, and PI denote Liquid Limit, Plastic Limit and Plasticity Index, respectively.
3. Soil classification in accordance with USCS (ASTM D2487)

Based on the results of the lab testing referenced above, this soil is classified as a cohesive till consisting of low plasticity Lean Clay (CL) with sand to Sandy lean Clay.

6.6 GROUNDWATER CONDTIONS

Sixteen (16) monitoring wells were installed within boreholes across the proposed site to monitor the groundwater conditions. Water levels within the monitoring wells installed were measured on March 10, 2023. The groundwater was encountered at elevations ranging from 256.1 masl to 266.6 masl . The groundwater level is subject to seasonal fluctuation and rainfall patterns and will be influenced with the water levels. Table 6.2 provide a summary of the measured groundwater levels.

Stantec is conducted a hydrogeology study for the site and the findings were provided in a separate hydrogeology assessment report for the site.

Table 6.2: Summary of Measured Groundwater Levels

Borehole Number	Water Level Depth (m)	Water Level Elevation (masl)
BH/MW04-23	8.3	257.4
BH/MW09-23	9.2	256.1
BH/MW13-23	7.4	259.4
BH/MW15-23	1.8	265.9
BH/MW19-23	3.9	263.8
BH/MW25-23	5.4	264.5
BH/MW31-23	7.8	261.6
BH/MW33-23	1.7	266.6
BH/MW38-23	8.7	256.3
BH/MW46-23	5.8	254.9
BH/MW48-23	2.4	263.0
BH/MW49-23	8.7	251.9
BH/MW51-23	1.3	265.3
BH/MW55-23	0.8	265.0
BH/MW61-23	6.1	257.8
BH/MW64-23	1.2	264.0

7.0 GEOTECHNICAL ENGINEERING DESIGN AND RECOMMENDATIONS

The site comprises agricultural land that was used for farming crops and livestock, with barns and storage buildings located within the southern area of the site, and farming lands covering the rest of the land. The site is approximately 116 hectares in area, and it is proposed to have five industrial buildings, storm water management (SWM) ponds and parking spaces surrounding the industrial facilities. Shallow foundations and grade supported floor slabs are considered technically feasible for the proposed industrial buildings. Several factors exist within the study area that could impact construction of the proposed development, including:

- Presence of surficial topsoil and surficial fills
- Presence of drainage tiles within 0.5 to 1.2 m below ground surface ,and
- Frost susceptibility of subsurface soil.

The native soil stratigraphy consisted of the following:

- Topsoil; underlain by,
- Cohesive till material consisting of Sandy Lean Clay, Lean Clay with Sand (CL) to Sandy silty Clay (CL-ML)

Geotechnical comments, discussion, and recommendations are provided in the following sections with respect to the design and construction of the planned development.

7.1 GRADING

Based on the borehole logs, it is expected that the topsoil extends to a maximum depth of 0.6 m. All the topsoil across the site must be removed to the native undisturbed subgrade. The exposed subgrade should be compacted to 100 percent of it's Standard Proctor Maximum Dry Density (SPMDD) and then proof rolled in the presence of a geotechnical specialist to verify the competency of the subgrade. Any loose or unsuitable areas should be sub-excavated as directed by the geotechnical specialist and removed.

Engineered fill material comprised of OPSS Granular B – Type II should be placed in thin unform layers up to 200 mm thick and compacted to a minimum of 100 percent of it's SPMDD, until the design subgrade level is achieved. All engineered fill operations must be carried out under full time supervision of the geotechnical speacialist.

Grade raise below proposed pavements may involve placement of approved native soils, clean, approved, on-site fill or imported granular soils such as OPSS Granular B Type I placed in maximum 300 mm thick lifts and compacted to 98 percent SPMDD.

Drainage tiles were not encountered during the geotechnical investigation. However, a map showing the size and location of the drainage tiles was provided by the client and reviewed by Stantec. The drainage tiles have a diameter that ranges between 100 mm to 250 mm. The depth of the tiles was not provided; however, it is typical for drainage tiles to be situated between 0.5 and 1.2 m below ground surface. A test pit investigation is recommended to verify the depth of the weeping tiles within the site. All weeping tile and drainpipes are to be excavated before construction or installation of fill to avoid accumulation of water below the granular subbase.

The program for grading and earthworks should be designed in advance, and carefully executed in consideration of the time of year of execution, prevailing weather conditions, construction storm-water management control, and associated issues and concerns, and the intended end-use of the subject property as described herein.

An erosion and sediment control plan should be developed and implemented prior to commencement of construction, to direct precipitation and ground surface runoff away from the areas of construction. Identification of an outfall/discharge location will be required for this purpose. All erosion sedimentation control should be conducted in accordance with the approved for construction design drawings and specifications.

7.2 FROST DEPTH

All footings subject to frost action should be provided with 1.4 m of earth cover or equivalent thermal insulation. A 25 mm thick layer of polystyrene insulation is thermally equivalent to 600 mm of soil cover.

7.3 FOUNDATION DESIGN

All topsoil, organic material and existing drainage tiles for farming must be removed from all proposed foundation areas. Spread and/or continuous foundations founded on the approved native undisturbed very stiff to hard sandy lean clay to lean clay with sand (Cohesive Till) layer throughout the site should be placed 1.4 m BGS below exterior grade for frost protection. The footings placed on or below elevations shown in Table 7.1 may be designed for soil bearing resistance Serviceability Limit State (SLS) of 240 kPa, and a factored geotechnical resistance at Ultimate Limit State (ULS) of 330 kPa, where a geotechnical resistance factor of 0.5 has been applied.

Table 7.1 Depth and Elevation to Bearing Stratum

Revised Borehole Number	Ground Surface Elevation (masl)	Depth to Bearing Stratum (m)	Elevation of Bearing Stratum (masl)
BH01-23	266.2	1.5	264.7
BH02-23	265.5	1.5	264.0
BH03-23	265.0	1.5	263.5
BH/MW04-23	265.7	1.5	264.2
BH05-23	266.2	1.5	264.7
BH06-23	265.8	1.5	264.3
BH07-23	266.7	1.5	265.2
BH08-23	266.1	1.5	264.6
BH/MW09-23	265.3	1.5	263.8
BH10-23	265.9	1.5	264.4
BH11-23	267.1	1.5	265.6
BH12-23	266.7	1.5	265.2
BH/MW13-23	266.8	1.5	265.3
BH14-23	266.1	1.5	264.6
BH/MW15-23	267.7	1.5	266.2

Revised Borehole Number	Ground Surface Elevation (masl)	Depth to Bearing Stratum (m)	Elevation of Bearing Stratum (masl)
BH16-23	267.9	1.5	266.4
BH17-23	267.0	1.5	265.5
BH18-23	266.7	1.5	265.2
BH/MW19-23	267.7	1.5	266.2
BH20-23	268.0	1.5	266.5
BH21-23	269.5	1.5	268.0
BH22-23	268.2	1.5	266.7
BH23-23	268.5	1.5	267.0
BH24-23	268.1	1.5	266.6
BH/MW25-23	269.9	1.5	268.4
BH26-23	269.1	1.5	267.6
BH27-23	269.6	1.5	268.1
BH28-23	269.5	1.5	268.0
BH29-23	270.3	1.5	268.8
BH30-23	269.9	1.5	268.4
BH/MW31-23	269.4	1.5	267.9
BH32-23	269.6	1.5	268.1
BH/MW33-23	268.3	1.5	266.8
BH34-23	268.7	1.5	267.2
BH35-23	266.8	1.5	265.3
BH36-23	265.7	1.5	264.2
BH37-23	264.4	1.5	262.9
BH/MW38-23	264.9	1.5	263.4
BH39-23	265.6	1.5	264.1
BH40-23	265.8	1.5	264.3
BH41-23	264.6	1.5	263.1
BH42-23	262.5	1.5	261.0
BH43-23	263.6	1.5	262.1
BH44-23	266.5	1.5	265.0
BH45-23	266.3	1.5	264.8
BH/MW46-23	260.7	1.5	259.2
BH47-23	258.8	1.5	257.3
BH/MW48-23	265.4	1.5	263.9
BH/MW49-23	260.6	1.5	259.1
BH50-23	265.8	1.5	264.3
BH/MW51-23	266.6	1.5	265.1

Revised Borehole Number	Ground Surface Elevation (masl)	Depth to Bearing Stratum (m)	Elevation of Bearing Stratum (masl)
BH52-23	265.6	1.5	264.1
BH53-23	265.8	1.5	264.3
BH54-23	264.8	1.5	263.3
BH/MW55-23	265.8	1.5	264.3
BH56-23	267.0	1.5	265.5
BH57-23	266.8	1.5	265.3
BH58-23	264.8	1.5	263.3
BH59-23	265.5	1.5	264.0
BH60-23	266.2	1.5	264.7
BH/MW61-23	263.9	1.5	262.4
BH62-23	261.2	1.5	259.7
BH63-23	262.1	1.5	260.6
BH/MW64-23	265.2	1.5	263.7
BH65-23	264.3	1.5	262.8
BH66-23	264.2	1.5	262.7
BH67-23	262.8	1.5	261.3
BH68-23	264.3	1.5	262.8
BH69-23	263.5	1.5	262.0

Properly constructed footings less than 2 m in width founded within the native mineral soils or engineered fill subjected to the maximum Serviceability Limit State pressures above are expected to undergo total settlements of less than 25 mm and differential settlements of less than 19 mm.

To minimize the disturbance of subgrade soils, it is recommended that foundation excavations be carried out using a smooth-blade bucket. Where required, the approved native subgrade can be raised to a higher founding level (after removing the existing topsoil layers) by placing engineered fill, consisting of OPSS1010 Granular ”A” or Granular “B” Type II, compacted to a minimum 100% Standard Proctor Maximum Dry Density (SPMDD). Engineered fill shall extend at least 1.0 m beyond the outer edges of the building foundations. The above recommended soil bearing pressures may also be used for the design of footings founded on engineered fill.

The footing areas must be checked and approved by a geotechnical engineer from Stantec to ensure that the soil conditions encountered at the time of construction are suitable to support the design pressure. Any disturbed soil identified during the inspection should be removed from the footing areas and replaced with engineered fill.

All footings are recommended to be covered with a minimum of 1.4 m of soil cover to protect foundation against frost action. A 25 mm thick layer of polystyrene insulation is thermally equivalent to 600 mm of soil cover.

7.4 SLAB-ON-GRADE FLOOR

The floor of the buildings may be constructed using conventional slab-on-grade techniques following removal of the topsoil, existing drain tiles and pre-existing fill, should be inspected, proof rolled and approved by a qualified geotechnical Engineer/Technician. Fill required to raise grades beneath the slab-on-grade floor should comprise on-site native sand placed in 200 mm thick lifts and compacted to 100% Standard Proctor Maximum Dry Density (SPMDD). A minimum 150 mm thick layer of OPSS.MUNI 1010 Granular A material compacted to 100% SPMDD should be provided directly beneath the slab for levelling and uniform support purposes. A modulus of subgrade reaction (k) of 35 MPa/m may be used for the design of the floor slabs on approved native granular soils and suitably compacted structural fill material. No special underfloor drains are required provided the exterior grades are at least 300 mm lower than the finished floor slab and positively sloped away from the structures. The concrete sidewalks may be constructed using conventional slab-on-grade techniques following removal of the topsoil, existing drain tiles and pre-existing fill. The subgrade should be proof rolled, inspected, and approved by a qualified geotechnical Engineer/Technician. A minimum 150 mm thick layer of OPSS.MUNI 1010 Granular A material compacted to 100% SPMDD should be provided directly beneath the sidewalk or levelling and uniform support purposes.

The water to cement ratio and slump of the concrete utilized in the floor slab should be strictly controlled to minimize shrinkage of the slab. Control joints should be cut into the slab at maximum 4 m spacings within 12 hours of initial concrete placement in order to pre-locate shrinkage cracks. The saw-cut depths should be ¼ of the slab thickness.

7.5 SEISMIC SITE CLASS

The Seismic Site Class value, as defined in Section 4.1.8.4 of the 2012 Ontario Building Code (OBC), contains a seismic analysis and design methodology which uses a seismic site response and site classification system defined by the average shear stiffness of the upper 30 meters of the ground below the foundation level. Based on the findings of the geotechnical investigation, a Seismic Site Class « D » (very stiff Soil to hard) can be considered for this site.

8.0 CONSTRUCTION RECOMMENDATIONS

8.1 EXCAVATIONS AND BACKFILL

8.1.1 Temporary Excavations – Soil Overburden

Temporary excavations exceeding 1.2 m in depth in which workers are expected to enter, must be carried out in accordance with the latest edition of the Occupational Health and Safety Act (OHSA). The soil classification for excavation per OHSA regulations is provided in **Table 8.1** below.

Table 8.1: Soil Types as per OHSA Regulation

Soil Type	Above groundwater	Below groundwater
Topsoil	3	4
Glacial Till	2	3

Where workers must enter a trench or excavation the soil must be suitably sloped and/or braced in accordance with the regulation requirements. The regulation stipulates safe excavation slopes by soil type as per Table 8.2.

Table 8.2: Excavation Slopes for Each Soil Type as per OHSA

Soil Type	Base of Slope	Slope inclination
1	Within 1.2 meters of bottom of excavation	1H:1V
2	Within 1.2 meters of bottom of excavation	1H:1V
3	From Bottom of excavation	1H:1V
4	From Bottom of excavation	3H:1V

Any soft/loose soils or soils encountered below the groundwater table should be classified as Type 4 soil. The maximum excavation side slope for a Type 4 soil is 3H:1V (Horizontal: Vertical) in accordance with the OHSA regulation.

Stockpiling of any materials adjacent to excavations should be avoided. Similarly, traffic should not be permitted in proximity to open excavations. For this purpose, it is recommended that all storage of materials and traffic be restricted from a 3 m wide strip around the excavations, measured from the crest of the excavation designed and constructed in accordance with the OH&S Act.

If space is restricted such that the side slope cannot be safely cut back in accordance with the OH&S Act & Regulations, if sloughing and cave-in are encountered in the excavations, or if the excavations are to remain open for a longer period, an engineered shoring system should be used for approximately up to 7 m deep bulk excavation for the proposed below grade levels.

8.1.2 Groundwater Control

An open-cut excavation for shallow footings is not expected to exceed 3 m below ground surface. As such, the groundwater may be be encountered at elevations ranging between 256.1 masl to 266.6 masl . Surface water should be directed away from open excavations. Minor groundwater or surface water inflow can be handled using filtered

conventional sump pumping techniques. Care should be taken sump pumping is not carried out for long periods of time as it could cause migration of soil fines causing the existing soil deposits to loosen from their current state of compactness, possibly rendering recommendations provided in this report redundant.

For significant dewatering in the soil overburden the reader is referred to the Stantec hydrogeology study issued under a separate cover.

8.2 SITE SERVICING

The predominant subgrade soils beneath the service pipes will consist of very stiff to hard sandy lean clay to lean clay with sand (CL), which can provide suitable support to the proposed service utility pipes. Prior to installation of the services, the subgrade should be inspected by an experienced geotechnical engineer/technician. If any very loose or soft areas are encountered during inspection, they should be excavated and replaced with compacted granular material such as OPSS.MUNI 1010 Granular A.

The pipe bedding for the services should be conventional Class B pipe bedding comprising a minimum 150 mm thick layer of OPSS.MUNI 1010 Granular 'A' aggregate below the pipe invert. The bedding course may be thickened if portions of the subgrade become wet during excavation. OPSS.MUNI 1010 Granular A type aggregate should be provided around the pipe to at least 300 mm above the top, and the bedding should be compacted to 98% SPMDD. Service lines installed outside of heated areas should be provided with a minimum 1.2 m of soil cover or equivalent insulation for frost protection.

For the new services that will be installed, design for hydrostatic uplift is not anticipated to be required, if drainage systems are installed, and the groundwater table is maintained below the elevation of the services/utilities.

Additional specific comment to the design of buried services and utilities in view of the subsurface conditions encountered in the boreholes and in consideration of good industry practice is provided as follows.

8.3 TRENCH BACKFILL

Bedding for services should consist of OPSS Granular 'A' material. In general, a minimum of 150 mm of bedding and 300 mm of cover material is recommended.

The bedding and cover material should be compacted to achieve a minimum of 100% of the material's SPMDD.

The bedding and cover on each side of the pipe should be completed simultaneously and at no time should the difference from one side of the pipe to the other exceed 200 mm.

If groundwater is encountered in the base of the trench/excavation and dewatering is not contemplated, then the use of clear stone or "High Performance Bedding" could be considered for use as the bedding and or cover materials, subject to approval. The use of these materials will require the use of a geosynthetic wrap around the bedding, pipe, and cover material. The geosynthetic should meet the requirements of a Class I Woven Geotextile in accordance with OPSD 1860.

These recommendations should be confirmed with the pipe manufacturer and care must be taken to avoid incurring damage to the services. Pipe manufactures may have additional/alternative requirements that should be reviewed by the Designer and Contractor prior to installation of the services.

The trenches above the specified pipe bedding should be backfilled with inorganic soils that are not excessively wet placed in 200 mm thick lifts and compacted to at least 98% SPMDD. Where the service trenches enter the buildings, the trench backfill must be compacted as structural fill to a minimum of 100% SPMDD. Any trench backfill below a pavement structure should be compacted to 100% SPMDD within 1 m from the top of subgrade level. Based on the results of in-situ moisture content tests carried out on the native overburden deposits, the materials may be suitable for reuse as trench backfill. Any overly wet material may require drying prior to reusing as backfill. Organic material (topsoil) is not considered suitable for reuse as trench backfill and if encountered, shall be separated.

To minimize potential problems, backfilling operations should follow closely after excavation so that only a minimal length of trench is exposed. Care should be taken to direct surface runoff away from the excavations. Should construction extend into the winter season then backfilling operations should be planned to ensure that backfill material is kept to a minimum and ensured that frozen material is not used as backfill.

The use of native sandy lean clay to lean clay with sand (CL) materials as backfill materials on this site will tend to retain a voided structure when placed as backfill. It is important to ensure that this material has a moisture content (within 2 percent of optimal) to allow it to be remolded and sufficient compaction effort is applied with a vibratory sheepsfoot roller to break down all chunks to achieve a non-voided condition, to avoid significant post-construction settlements and ensure proper compaction of the subgrade.

8.4 PARKING LOT, LOADING DOCKS AND DRIVEWAY

8.4.1 Overview

As part of the proposed development, the site will include features such as parking lots, loading docks, and driveways that require adequate pavement structures to support the anticipated service conditions. Such features require design considerations such as thickness of the pavement component, drainage, and proper construction techniques to ensure that the pavement will last or exceed its intended service life. The following sections indicate the design considerations and recommendations to support the design and construction of the pavement structure.

8.4.2 Pavement Structure Design and Recommendations

Pavement structures such as asphalt parking, concrete base pads for the loading docks within the facilities, as well as the concrete pads for truck parking will be constructed throughout the site. The preliminary layout indicates that the industrial facilities will have loading docks around the perimeter of each facility, with asphalt parking lots throughout the site. The preliminary site plans indicate that pavement structures will extend from Dixie Road.

Any existing fill and organic material should be removed from below the pavement areas and if required, grades should be raised with approved inorganic soils. The subgrade fill should be placed in 200 mm thick lifts and compacted to 100% SPMDD.

The pavement component thicknesses in Table 8.3 are recommended based on the anticipated pavement usage, the frost-susceptibility, and strength of the subgrade soils.

Table 8.3: Recommended Pavement Structures

Material	Design Pavement Structure Thicknesses (mm)	
	Light Duty (Vehicle Parking Lot)	Heavy Duty (Driveways, Loading Docks)
HL3 PG 64-28 Top course	40	40
HL8 PG 64-28 Base course	50	70
19 mm Granular 'A' Base	150	150
Granular 'B' Type I or Type II Sub-base	300	400

Concrete loading docks and dolly pads should be constructed with an equivalent granular base to the heavy-duty asphalt pavement: 150 mm Granular 'A' over 400 mm Granular 'B'. This is to achieve positive drainage at the pavement subgrade and to eliminate water accumulating at the subgrade of the concrete pads and asphalt pavement interface.

Samples of both the Granular A and Granular B Type I or Type II aggregates should be checked for conformance to OPSS.MUNI 1010 prior to utilization on site and during construction. The Granular B Type 1 subbase and Granular A base courses must be compacted to 100% SPMDD, as verified by insitu density testing by a qualified technician.

The base and sub-base materials should be compacted to a minimum of 100% SPMDD. The asphaltic concrete should be compacted to a minimum of 93-95% of Maximum Theoretical Relative Density (MRD).

The pavement subgrade and granular courses will lose their strength to support traffic loads if allowed to become saturated due to surface water or groundwater infiltration; therefore, positive drainage of the pavement and the granular courses is essential. The finished pavement surface and underlying subgrade should be free of depressions and should be sloped to provide effective drainage. Surface water should not be allowed to pond adjacent to the outside edges of pavement areas. The underlying finished sub-grade surface and the pavement (asphalt and concrete) surface should be crowned and graded to direct runoff water away from the roadway.

It is suggested that the subgrade be sloped towards catch basins/drainage facilities/ditch-lines at a minimum cross-fall of 2%. Sub-drain stubs with a minimum length of 3 m, should extend in each direction from catch basin and manhole locations in any areas of low points in the subgrade. The sub-drains should be incorporated into the design to allow for drainage of the granular materials. Drainage infrastructure should be provided at locations of changes in cross section of the pavement structure or where different pavement structures abut.

Due to the poor drainage nature of the native soils, pavement subdrains are recommended along the edges of driveway and parking lots, below the curbs. It is recommended that a 100 mm diameter perforated pipe subdrains with knitted sock geotextile be installed as per OPSD 216.021. The subdrain should be bedded in granular material and meet the requirements of OPSS 1010 (with 100% passing the 4.25 mm sieve) and be installed with the invert at

least 250 mm below the top of subgrade. The subdrain should tie into an existing frost-free outlet, such as a catchbasin or manhole where feasible, and provide sufficient slope (≥3%) to flow to discharge points. The last meter of subdrain pipe that outlets to the catch basin should be non-perforated as shown in OPSD 216.021.

These structures should provide a typical pavement service life, provided regular maintenance is carried out during the life cycle of the pavements. The above pavement structure recommendations are based on typical expected use along with anticipated subgrade conditions. The pavement life span for the above-mentioned design will be 20 years with the installation of pavement subdrains, and 10 years without the installation of pavement subdrains. It should be noted that no traffic data was provided to Stantec at the time of this design, and thus a detailed pavement design analyses was not carried out.

8.5 STORMWATER MANAGEMENT POND

The preliminary design drawings indicate that a Stormwater Management (SWM) pond is proposed at the southwest corner of the Site. At the time of issuing the report, no grading plan was provided for the proposed SWM pond. Boreholes BH-01-23, BH02-23, BH03-23, BH/MW-04-23, BH/MW38-23, BH39-23, BH40-23 and BH41-23 are located within the proposed SWM pond location. These boreholes revealed typical site stratigraphy conditions for the site, which include topsoil, underlain by cohesive very stiff to hard sandy lean clay to lean clay with sand (CL). Boreholes BH/MW04-23 and BH/MW38-23 were installed within the SWM pond limits. Groundwater level measured at boreholes BH/MW04-23 and BH/MW38-23 was 9.16 m and 8.7 m below grade, respectively, which corresponds to elevations of 257.4 masl to 256.3 masl. A hydrogeology assessment addressing SWM pond groundwater elevation will be provided separately.

The very stiff to hard native sandy lean clay to lean clay with sand (CL) till soils can provide suitable support for the berm construction.

The ground surface grades around the pond must be sloped away to minimize the potential for overland flow that could damage the sidewalls of the pond. Preliminary design of side slopes should include inclinations of 3H to 1V above and below the permanent pond level. Steeper side slopes may be available; but should be confirmed through additional geotechnical assessment once the pond locations and elevations are determined. Slope drains may be needed to ensure stability of the slopes in areas where seepage is a concern.

For berm construction, the on-site sandy lean clay to lean clay with sand (CL) till soils should be placed in 150 mm thick loose lifts. Each lift should be uniformly compacted to achieve a minimum of 100% of the material's Standard Proctor Maximum Dry Density (SPMDD) using vibratory compaction equipment. Recommendations provided in Section 7.1 are relevant and should be considered during construction.

An allowable Factor of Safety within the range of 1.5 - 2.0 is usually considered for base heave. It is noted that there will be water inside the pond following construction, which will improve the Factor of Safety.

The Contractor should determine the appropriate groundwater control/dewatering measures are commensurate with their equipment and methods and maintain the excavation in stable conditions. The Contractor's method should be provided for the Engineer's/Owner's Representative Civil Engineer's review.

The native surficial topsoil identified in the boreholes advanced in the area of the SWM Pond are subject to softening and loss of strength in the presence of excess moisture originating from precipitation and/or ground surface runoff.

8.5.1 Low Permeability Liner and Pond Surface Treatment

It is recommended that prior to construction; a test pit program be conducted to confirm the soil stratigraphy to the bottom of the pond including laboratory testing to estimate the infiltration rate (Coefficient of Permeability) of the cohesive till. Test pits may also help to infer the presence of and the potential impact of an underlying artesian layer.

From our project history on SWM Pond design and construction in Southern Ontario, the typical threshold hydraulic conductivity for a contained SWM Pond (wet pond) is considered to be 10^{-5} to 10^{-6} cm/s. It is likely that founding the base of the SWM Pond in the cohesive till soil will meet this requirement. However, given the sand and silt contents present within the clay till, the use of a low-permeability liner may be required. If an adequate quantity of material is not available from the excavation for the pond, then a suitably approved off-site source would need to be identified.

The minimum recommended industry standard for the thickness of the low-permeability soil liner is 300 mm. The soil liner material can be placed in a 300 mm thick lifts, and compacted using a pad foot compactor, to achieve a minimum compaction of 95% of the materials SPMDD.

It is recommended that the base and side slopes of the pond be protected against erosion using either vegetation or granular/rip rap materials. Specific consideration should be provided to inflow/outfall areas and zones of the pond that may be subject to potential overland flow. In areas of inflow/outfall structures, a rip rap meeting the requirement of OPSS 1004 should be used.

8.6 SITE MATERIALS REUSE

The native soils encountered in the boreholes included a series of cohesive till strata described as very stiff to hard sandy lean clay to lean clay with sand (CL).

These soils may be considered for reuse as subgrade fill, engineered fill or trench backfill consistent with the recommendations provided in the previous sections; however, the clayey materials could be difficult to work with, depending on their moisture levels, and the climatic conditions at the time of use. The results of the gradation analyses on these materials indicate that the soils consist mainly of silt and clay sized particles, with sand and trace to some gravel. The high in-situ moisture content and high percentage of clay and silt will make these soils difficult to handle, place, and compact, in any “less-than-ideal” weather conditions. Disturbance and loss of strength in the presence of excess moisture and/or construction traffic is a concern. It is recommended that reuse of this soil be limited to prevailing “dry” conditions and during favorable seasons.

The material can be blocky and will require breaking down during placement. It should be ensured that the material be placed in thin lifts and compacted using a sheepsfoot roller. If these soils are placed without being sufficiently broken down or placed in thick lifts, interlump voids could occur which will cause long term settlement.

This material should be placed with moisture contents that are within +/- 2.0% of the optimum moisture content level. It is recommended that the material be approved at the time of placement by qualified geotechnical personnel. Due to the high in-situ moisture content of the silt or clay materials, scarifying and drying may be required prior to placement.

This material should not be considered as free draining. Therefore, this soil should not be used as backfill in any application requiring the use of free draining material, such as for drainage layers, foundation wall backfill, service pipe bedding, or sub-base and base layers in pavements.

Stockpiling of this soil should be minimized, as continued exposure to the natural environment, repeated cycles of wetting/drying, possible freeze-thaw cycles, and similar, will result in loss of strength and make this material practically impossible to handle, place, and compact without reworking.

9.0 SOIL CHEMSITRY

9.1 CORROSIVITY OF DUCTILE IRON

To determine the corrosion potential of the buried and ductile iron pipe and its components, analyses were carried out on four soil samples in accordance with American National Standards Institute (ANSI)/ American Water Works Association Standard ANSI/AWWA C105/A21.5. The analyses are comprised of testing the soil samples for soil resistivity, Redox potential, pH, sulfide content and moisture content and assigning points per the guidelines provided in the standard. A sample with 10 or more points is considered to represent a soil that would be corrosive to the buried ductile iron pipe and its components. The detailed results are provided in **Appendix D** and are summarized in **Table 9.1** below.

Table 9.1: Summary of Corrosivity Analyses

Borehole	Sample	Depth (m BGS)	Resistivity Ohm-cm	Moisture	Redox Potential	pH	Sulfides
BH18-23	SS5	2.3	7750	11.1	304	7.85	0.27
Total Points		**2**	**0**	**2**	**0**	**0**	**0**
BH20-23	SS4	2.3	6130	12.9	291	7.85	<0.23
Total Points		**2**	**0**	**2**	**0**	**0**	**0**
BH26-23	SS4	2.3	5080	14.5	267	7.7	<0.23
Total Points		**2**	**0**	**2**	**0**	**0**	**0**
BH31-23	SS4	2.3	6330	14	257	7.62	0.65
Total Points		**2**	**0**	**2**	**0**	**0**	**0**
BH47-23	SS3	1.5	5810	9	276	7.87	0.65
Total Points		**2**	**0**	**2**	**0**	**0**	**0**
BH/MW55-23	SS2	1.5	5400	10.3	293	7.72	0.34
Total Points		**2**	**0**	**2**	**0**	**0**	**0**
BH57-23	SS3	2.3	5260	12	273	7.72	0.76
Total Points		**2**	**0**	**2**	**0**	**0**	**0**
BH59-23	SS3	2.3	5080	13.6	268	7.77	0.46
Total Points		**2**	**0**	**2**	**0**	**0**	**0**
BH62-23	SS3	2.3	5320	12.1	290	7.79	<0.23
Total Points		**2**	**0**	**2**	**0**	**0**	**0**

Based on the test results, the soils at the locations of all boreholes tested are non-corrosive to the buried ductile and grey-iron pipes according to AWWA C105. However, it is important to note that the resistivity parameter is a strong indicator of the corrosivity potential, where the values above indicated moderate corrosivity. Additional protection or protective coatings, or both, will be required for all new piping placed on site. The chemical results should be reviewed by the designer/pipe manufacturer to ensure that the adequate pipe protection is considered.

9.2 SULPHATE ATTACK ON CONCRETE

The potential for sulphate attack on concrete (class of exposure) is determined using Table 3 of the Canadian Standards Association (CSA) document A23.1 19/A23.2 19 'Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete', which divides the degree of exposure into the following three classes outlined in the table 9.2.

Table 9.2: Concrete Exposure Class

Degree (Class) of Exposure	Water Soluble Sulphate (SO4) in Soil Sample (%)
Very Severe (S1)	> 2.0
Severe (S2)	0.20 – 2.0
Moderate (S3)	0.10 – 0.20

The water-soluble sulphate concentrations of five tested soil samples and provided in Appendix D and are summarized in table 9.3.

Table 9.3: Summary of Sulfate Content Analyses

Borehole	Sample No.	Depth	SO_4		Severity	Cement Type
		(m BGS)	mg/kg	%		
BH18-23	SS5	2.3	<20	<0.002	Low	Portland Cement (general use)
BH20-23	SS4	2.3	30	0.0030	Low	
BH26-23	SS4	2.3	<20	<0.002	Low	
BH31-23	SS4	2.3	<20	<0.002	Low	
BH47-23	SS3	1.5	22	0.0022	Low	
BH/MW55-23	SS2	1.5	22	0.0022	Low	
BH57-23	SS3	2.3	23	0.0023	Low	
BH59-23	SS3	2.3	25	0.0025	Low	
BH62-23	SS3	2.3	23	0.0023	Low	

A review of the analytical test results provided in **Appendix D** shows that the measured soluble sulphate content in the tested soil samples ranged from undetectable limits, which is less than 20 mg/kg (0.002 percent) indicative of a 'low' degree of exposure of buried concrete to sulphate attack. As such, Normal Portland cement could be used in construction concrete mixes for below grade structures in contact with soil at the Site.

10.0 CLOSURE

Use of this report is subject to the Statement of General Conditions provided in **Appendix A**. It is the responsibility of QuadReal Properties who is identified as "the Client" within the Statement of General Conditions, and its agents to review the conditions and to notify Stantec Consulting Ltd. should any of these not be satisfied. The Statement of General Conditions addresses the following:

- Use of the report;
- Basis of the report;
- Standard of care;
- Interpretation of site conditions;
- Varying or unexpected site conditions; and,
- Planning, design or construction.

Respectfully Submitted,

STANTEC CONSULTING LTD.

APPENDICES

APPENDIX A

A.1 STATEMENT OF GENERAL CONDITIONS

STATEMENT OF GENERAL CONDITIONS

USE OF THIS REPORT: This report has been prepared for the sole benefit of the Client or its agent and may not be used by any third party without the express written consent of Stantec Consulting Ltd. and the Client. Any use which a third party makes of this report is the responsibility of such third party.

BASIS OF THE REPORT: The information, opinions, and/or recommendations made in this report are in accordance with Stantec Consulting Ltd.'s present understanding of the site specific project as described by the Client. The applicability of these is restricted to the site conditions encountered at the time of the investigation or study. If the proposed site specific project differs or is modified from what is described in this report or if the site conditions are altered, this report is no longer valid unless Stantec Consulting Ltd. is requested by the Client to review and revise the report to reflect the differing or modified project specifics and/or the altered site conditions.

STANDARD OF CARE: Preparation of this report, and all associated work, was carried out in accordance with the normally accepted standard of care in the state or province of execution for the specific professional service provided to the Client. No other warranty is made.

INTERPRETATION OF SITE CONDITIONS: Soil, rock, or other material descriptions, and statements regarding their condition, made in this report are based on site conditions encountered by Stantec Consulting Ltd. at the time of the work and at the specific testing and/or sampling locations. Classifications and statements of condition have been made in accordance with normally accepted practices which are judgmental in nature; no specific description should be considered exact, but rather reflective of the anticipated material behavior. Extrapolation of in situ conditions can only be made to some limited extent beyond the sampling or test points. The extent depends on variability of the soil, rock and groundwater conditions as influenced by geological processes, construction activity, and site use.

VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec Consulting Ltd. must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments of the report conclusions or recommendations are required. Stantec Consulting Ltd. will not be responsible to any party for damages incurred as a result of failing to notify Stantec Consulting Ltd. that differing site or sub-surface conditions are present upon becoming aware of such conditions.

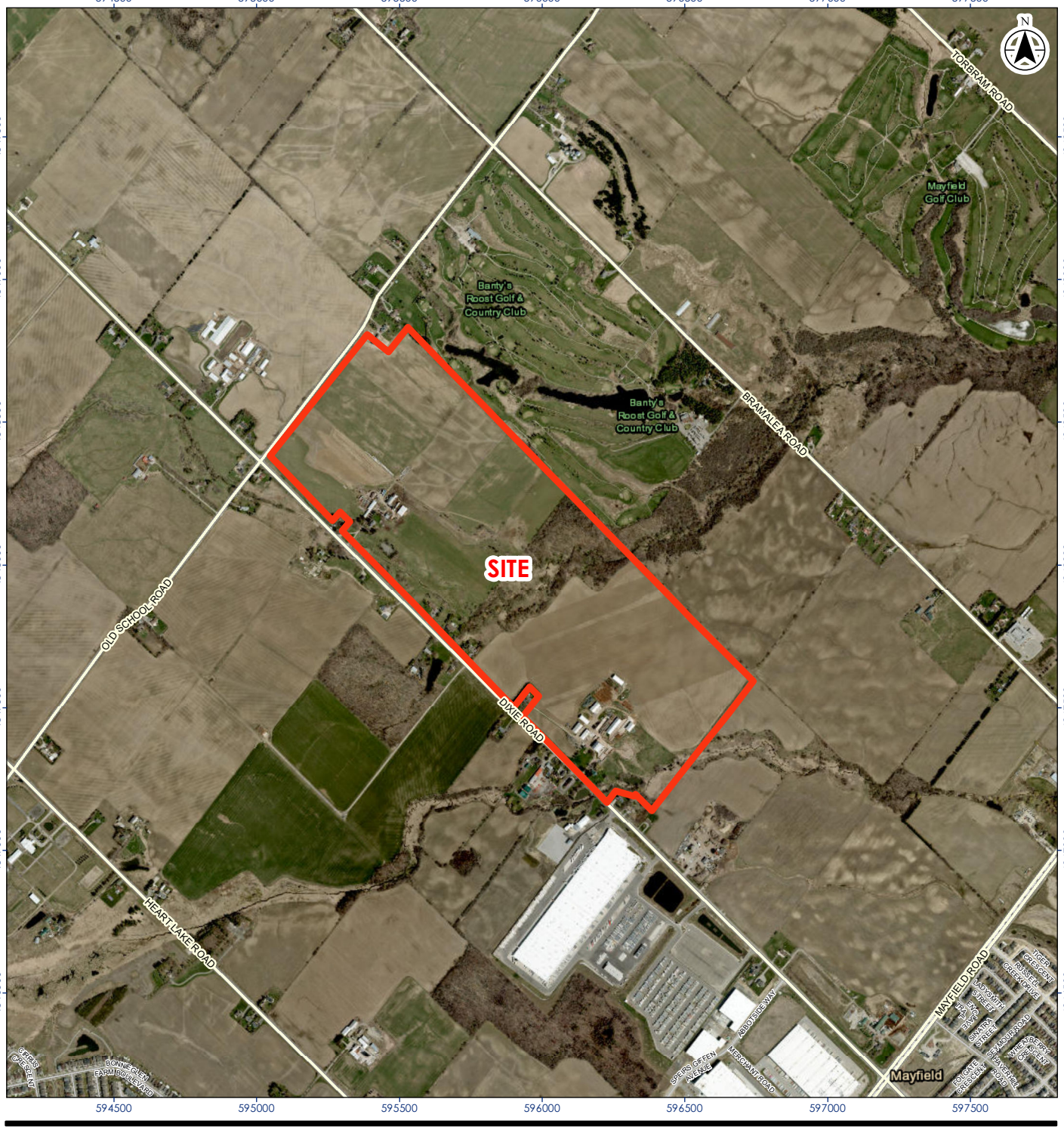
PLANNING, DESIGN, OR CONSTRUCTION: Development or design plans and specifications should be reviewed by Stantec Consulting Ltd., sufficiently ahead of initiating the next project stage (property acquisition, tender, construction, etc), to confirm that this report completely addresses the elaborated project specifics and that the contents of this report have been properly interpreted. Specialty quality assurance services (field observations and testing) during construction are a necessary part of the evaluation of sub-subsurface conditions and site preparation works. Site work relating to the recommendations included in this report should only be carried out in the presence of a qualified geotechnical engineer; Stantec Consulting Ltd. cannot be responsible for site work carried out without being present.

APPENDIX B

B.1 KEY PLAN

B.2 BOREHOLE LOCATION PLAN

T:\Autocad\Drawings\Project Drawings\2024\121624777-778\Key Plan (gis)\121624777-778_12861 & 12489 Dixie_Key Plan.mxd Revised: 2024-11-26 By: gbriones



Legend

- Railway
- Expressway / Highway
- Major Road
- Minor Road

0 200 400 600 800 metres

1:20,000 (at original document size of 8.5x11)

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Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.
3. Imagery provided by Esri ©2023.

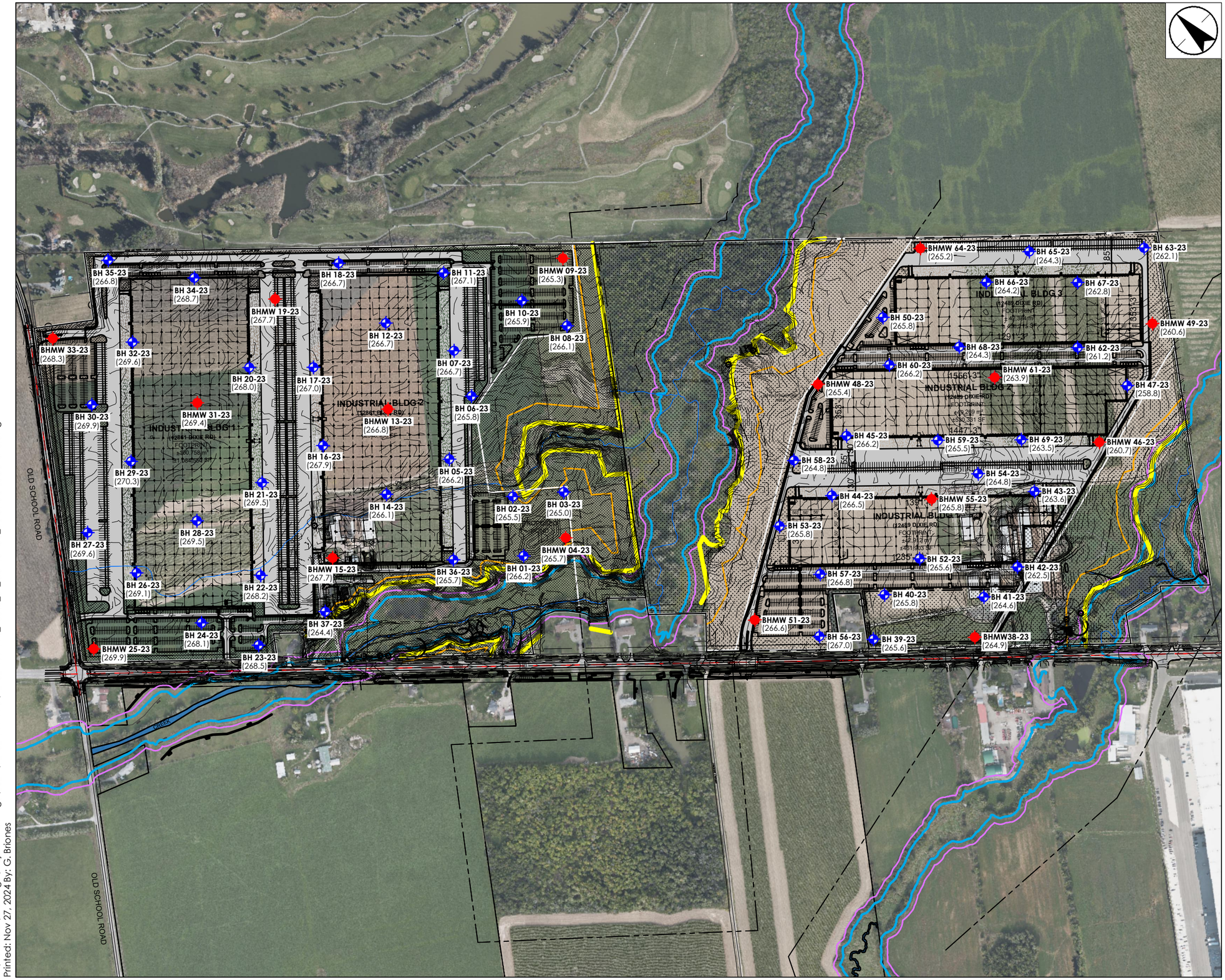
Project Location
12489 and 12861 Dixie Road, Caledon, Ontario

Project No. 121624777 & 121624778
Prepared by G. Briones on 2024-11-26

Client/Project
QUADREAL PROPERTY
GEOTECHNICAL INVESTIGATION
12489 AND 12861 DIXIE ROAD

Drawing No.
1

Title
KEY PLAN



T:\Autocad\Drawings\Project Drawings\2024\121624777-778\121624777-778_X0060_SP_Combined_Borehole Locations.dwg
Printed: Nov 27, 2024 By: G. Briones

Stantec

300 - 1331 Clyde Avenue
Ottawa, ON, Canada K2C 3G4
www.stantec.com

LEGEND

- BOREHOLE
- MONITORING WELL
- (267.1) GROUND SURFACE ELEVATION (m)

NOTES

1. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N.
2. IMAGERY: © 2022 MICROSOFT CORPORATION © 2022 MAXAR © CNES (2022) DISTRIBUTION AIRBUS DS.
3. BASE PLAN PROVIDED BY QUADREAL PROPERTY. FILENAME: X0060_SP_Combined.dwg, SHEET A100 DATED2024-11-26.

60m 0 60 120m
1 : 6000

NOVEMBER 2024
Project No. 121624778 & 121624778

Client/Project
QUADREAL PROPERTY
GEOTECHNICAL INVESTIGATION
12489 AND 12861 DIXIE ROAD, CALEDON, ONTARIO

Drawing No.
2

Title
BOREHOLE LOCATION PLAN

APPENDIX C

C.1 SYMBOLS & TERMS USED ON BOREHOLE RECORDS

C.2 BOREHOLE RECORDS

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Terminology describing common soil genesis:

Rootmat	- vegetation, roots and moss with organic matter and topsoil typically forming a mattress at the ground surface
Topsoil	- mixture of soil and humus capable of supporting vegetative growth
Peat	- mixture of visible and invisible fragments of decayed organic matter
Till	- unstratified glacial deposit which may range from clay to boulders
Fill	- material below the surface identified as placed by humans (excluding buried services)

Terminology describing soil structure:

Desiccated	- having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
Fissured	- having cracks, and hence a blocky structure
Varved	- composed of regular alternating layers of silt and clay
Stratified	- composed of alternating successions of different soil types, e.g. silt and sand
Layer	- > 75 mm in thickness
Seam	- 2 mm to 75 mm in thickness
Parting	- < 2 mm in thickness

Terminology describing soil types:
The classification of soil types are made on the basis of grain size and plasticity in accordance with the Unified Soil Classification System (USCS) (ASTM D 2487 or D 2488) which excludes particles larger than 75 mm. For particles larger than 75 mm, and for defining percent clay fraction in hydrometer results, definitions proposed by Canadian Foundation Engineering Manual, 4th Edition are used. The USCS provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification.

Terminology describing cobbles, boulders, and non-matrix materials (organic matter or debris):
Terminology describing materials outside the USCS, (e.g. particles larger than 75 mm, visible organic matter, and construction debris) is based upon the proportion of these materials present:

Trace, or occasional	Less than 10%
Some	10-20%
Frequent	> 20%

Terminology describing compactness of cohesionless soils:
The standard terminology to describe cohesionless soils includes compactness (formerly "relative density"), as determined by the Standard Penetration Test (SPT) N-Value - also known as N-Index. The SPT N-Value is described further on page 3. A relationship between compactness condition and N-Value is shown in the following table.

Compactness Condition	SPT N-Value
Very Loose	<4
Loose	4-10
Compact	10-30
Dense	30-50
Very Dense	>50

Terminology describing consistency of cohesive soils:
The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by *in situ* vane tests, penetrometer tests, or unconfined compression tests. Consistency may be crudely estimated from SPT N-Value based on the correlation shown in the following table (Terzaghi and Peck, 1967). The correlation to SPT N-Value is used with caution as it is only very approximate.

Consistency	Undrained Shear Strength		Approximate SPT N-Value
	kips/sq.ft.	kPa	
Very Soft	<0.25	<12.5	<2
Soft	0.25 - 0.5	12.5 - 25	2-4
Firm	0.5 - 1.0	25 - 50	4-8
Stiff	1.0 - 2.0	50 – 100	8-15
Very Stiff	2.0 - 4.0	100 - 200	15-30
Hard	>4.0	>200	>30

ROCK DESCRIPTION

Except where specified below, terminology for describing rock is as defined by the International Society for Rock Mechanics (ISRM) 2007 publication "The Complete ISRM Suggested Methods for Rock Characterization, Testing and Monitoring: 1974-2006"

Terminology describing rock quality:

RQD	Rock Mass Quality
0-25	*Very Poor Quality*
25-50	*Poor Quality*
50-75	*Fair Quality*
75-90	*Good Quality*
90-100	*Excellent Quality*

Alternate (Colloquial) Rock Mass Quality	
Very Severely Fractured	*Crushed*
Severely Fractured	*Shattered or Very Blocky*
Fractured	*Blocky*
Moderately Jointed	*Sound*
Intact	*Very Sound*

RQD (Rock Quality Designation) denotes the percentage of intact and sound rock retrieved from a borehole of any orientation. All pieces of intact and sound rock core equal to or greater than 100 mm (4 in.) long are summed and divided by the total length of the core run. RQD is determined in accordance with ASTM D6032.

SCR (Solid Core Recovery) denotes the percentage of solid core (cylindrical) retrieved from a borehole of any orientation. All pieces of solid (cylindrical) core are summed and divided by the total length of the core run (It excludes all portions of core pieces that are not fully cylindrical as well as crushed or rubble zones).

Fracture Index (FI) is defined as the number of naturally occurring fractures within a given length of core. The Fracture Index is reported as a simple count of natural occurring fractures.

Terminology describing rock with respect to discontinuity and bedding spacing:

Spacing (mm)	Discontinuities	Bedding
>6000	*Extremely Wide*	-
2000-6000	*Very Wide*	*Very Thick*
600-2000	*Wide*	*Thick*
200-600	*Moderate*	*Medium*
60-200	*Close*	*Thin*
20-60	*Very Close*	*Very Thin*
<20	*Extremely Close*	*Laminated*
<6	-	*Thinly Laminated*

Terminology describing rock strength:

Strength Classification	Grade	Unconfined Compressive Strength (MPa)
Extremely Weak	R0	<1
Very Weak	R1	1 – 5
Weak	R2	5 – 25
Medium Strong	R3	25 – 50
Strong	R4	50 – 100
Very Strong	R5	100 – 250
Extremely Strong	R6	>250

Terminology describing rock weathering:

Term	Symbol	Description
Fresh	W1	No visible signs of rock weathering. Slight discoloration along major discontinuities
Slightly	W2	Discoloration indicates weathering of rock on discontinuity surfaces. All the rock material may be discolored.
Moderately	W3	Less than half the rock is decomposed and/or disintegrated into soil.
Highly	W4	More than half the rock is decomposed and/or disintegrated into soil.
Completely	W5	All the rock material is decomposed and/or disintegrated into soil. The original mass structure is still largely intact.
Residual Soil	W6	All the rock converted to soil. Structure and fabric destroyed.

STRATA PLOT

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols. The dimensions within the strata symbols are not indicative of the particle size, layer thickness, etc.

Boulders Cobbles Gravel | Sand | Silt | Clay | Organics | Asphalt | Concrete | Fill | Igneous Bedrock | Meta-morphic Bedrock | Sedi-mentary Bedrock

SAMPLE TYPE

SS	Split spoon sample (obtained by performing the Standard Penetration Test)
ST	Shelby tube or thin wall tube
DP	Direct-Push sample (small diameter tube sampler hydraulically advanced)
PS	Piston sample
BS	Bulk sample
HQ, NQ, BQ, etc.	Rock core samples obtained with the use of standard size diamond coring bits.

WATER LEVEL MEASUREMENT

measured in standpipe, piezometer, or well

inferred

RECOVERY

For soil samples, the recovery is recorded as the length of the soil sample recovered. For rock core, recovery is defined as the total cumulative length of all core recovered in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

N-VALUE

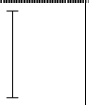
Numbers in this column are the field results of the Standard Penetration Test: the number of blows of a 140 pound (63.5 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (300 mm) into the soil. In accordance with ASTM D1586, the N-Value equals the sum of the number of blows (N) required to drive the sampler over the interval of 6 to 18 in. (150 to 450 mm). However, when a 24 in. (610 mm) sampler is used, the number of blows (N) required to drive the sampler over the interval of 12 to 24 in. (300 to 610 mm) may be reported if this value is lower. For split spoon samples where insufficient penetration was achieved and N-Values cannot be presented, the number of blows are reported over sampler penetration in millimetres (e.g. 50/75). Some design methods make use of N-values corrected for various factors such as overburden pressure, energy ratio, borehole diameter, etc. No corrections have been applied to the N-values presented on the log.

DYNAMIC CONE PENETRATION TEST (DCPT)

Dynamic cone penetration tests are performed using a standard 60 degree apex cone connected to 'A' size drill rods with the same standard fall height and weight as the Standard Penetration Test. The DCPT value is the number of blows of the hammer required to drive the cone one foot (300 mm) into the soil. The DCPT is used as a probe to assess soil variability.

OTHER TESTS

S	Sieve analysis
H	Hydrometer analysis
k	Laboratory permeability
γ	Unit weight
G_s	Specific gravity of soil particles
CD	Consolidated drained triaxial
CU	Consolidated undrained triaxial with pore pressure measurements
UU	Unconsolidated undrained triaxial
DS	Direct Shear
C	Consolidation
Q_u	Unconfined compression
I_p	Point Load Index (I_p on Borehole Record equals $I_p(50)$ in which the index is corrected to a reference diameter of 50 mm)

	Single packer permeability test; test interval from depth shown to bottom of borehole
	Double packer permeability test; test interval as indicated
	Falling head permeability test using casing
	Falling head permeability test using well point or piezometer

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BOREHOLE RECORD

N: 4 847 981 E: 595 653

BH01-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/02/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	266.2		0				
	265.8	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	300/460	5
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, hard, moist	3	SS	2	460/460	25
			6	SS	3	460/460	32
2	263.8		8	SS	4	460/460	29
		Hard to very stiff, brown, moist	11	SS	5	460/460	34
3							
4							
	261.4		16	SS	6	460/460	24
5		Traces of gravel, some silt seams Very stiff to stiff, grey, moist					
6			21	SS	7	180/460	15
7							
	258.3		26	SS	8	380/460	14
8		Stiff to very stiff, grey, moist					
9							
	256.6		31	SS	9	460/460	25
		Borehole terminated at 9.60m BGS	32				
10							
11			36				
			39				
12							

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

Hard Augering

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 058 E: 595 705

BH02-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/02/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	265.5		0				
	265.1	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	280/460	7
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, very stiff, moist	3	SS	2	460/460	22
			6	SS	3	460/460	24
2			8	SS	4	460/460	22
3	262.2		11	SS	5	460/460	30
		Hard, brown, moist					
4	260.7		16	SS	6	460/460	34
5		Traces of gravel, some silt seams Very stiff to stiff, grey, wet					
6			21	SS	7	410/460	39
7	257.9						
		very stiff, grey, moist	26	SS	8	430/460	27
8							
9	255.9		31	SS	9	460/460	18
		Borehole terminated at 9.60m BGS					
10							
11							
12							

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

Hard Augering

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 006 E: 595 769

BH03-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/02/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	265.0		0				
	264.5	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	380/460	6
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, very stiff to hard, moist	3	SS	2	460/460	28
2			6	SS	3	460/460	33
			8	SS	4	460/460	35
3	261.6		11	SS	5	430/460	45
		Hard, brown, moist					
4	260.1		16	SS	6	460/460	31
5		Traces of gravel, some silt seams Very stiff to hard , grey, moist					
6			21	SS	7	460/460	25
7	257.4		26	SS	8	300/460	31
		Hard, grey, moist					
8							
9	255.4		31	SS	9	410/460	50
		Borehole terminated at 9.60m BGS					
10							
11							
12							

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

Hard Augering

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 952 E: 595 725

BH/MW04-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/02/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	265.7		0				
	265.2	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	330/460	5
1		**SANDY LEAN CLAY (CL)** sand seams, Brown, Very stiff, moist	3	SS	2	460/460	25
			6	SS	3	460/460	29
2	262.9		8	SS	4	410/460	25
3		Hard, brown, moist	11	SS	5	460/460	33
	262.0						
4		Traces of gravel Hard, grey, moist	16	SS	6	410/460	35
5							
6	259.1		21	SS	7	460/460	31
		Very stiff, grey, moist					
7							
8	257.1		26	SS	8	460/460	21
		Very stiff, wet, moist					
9	256.1		31	SS	9	410/460	25
10		Borehole terminated at 9.60m BGS. Monitoring well installed to 9.6 m BGS.	32				
11			36				
12			39				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

Hard Augering

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 847 952 E: 595 725

Sheet 1 of 1

BH/MW04-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/02/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION
0	265.7	
	265.2	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist
1		**SANDY LEAN CLAY (CL)** sand seams, Brown, Very stiff, moist
2	262.9	
		Hard, brown, moist
3	262.0	
		Traces of gravel Hard, grey, moist
4		
5		
6	259.1	
		Very stiff, grey, moist
7		
8	257.1	
		Very stiff, wet, moist
9		
	256.1	
		Borehole terminated at 9.60m BGS. Monitoring well installed to 9.6 m BGS.
10		
11		
12		

STRATA PLOT

WATER LEVEL

DEPTH (ft): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

VAPOUR CONCENTRATIONS

● %LEL ▲ ppm

● 20 40 60 80

▲ 100 200 300 400

SAMPLES

TYPE	NUMBER	N-VALUE
SS	1	5
SS	2	25
SS	3	29
SS	4	25
SS	5	33
SS	6	35
SS	7	31
SS	8	21
SS	9	25

WELL CONSTRUCTION

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 848 182 E: 595 664

BH05-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/01/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	266.2		0				
	265.8	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	330/460	6
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, very stiff to hard, moist	3	SS	2	460/460	18
2			6	SS	3	460/460	29
	263.5		8	SS	4	460/460	24
3		Hard, brown, moist	11	SS	5	460/460	50
4							
	261.4		16	SS	6	460/460	35
5		Traces of gravel, some silt seams Very stiff , grey, moist					
6			21	SS	7	460/460	47
7							
8	258.2		26	SS	8	460/460	48
		Hard to very stiff, grey, moist					
9			31	SS	9	460/460	26
	256.6						
10		Borehole terminated at 9.60m BGS					
11							
12							

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

Hard Augering

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 224 E: 595 781

BH06-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/01/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	265.8		0				
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	230/460	5
	265.4	**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, very stiff to hard, moist	2				
1			3	SS	2	460/460	25
	264.3	Hard, brown, moist	4				
			5				
			6	SS	3	460/460	37
2			7				
			8	SS	4	460/460	50
			9				
3			10				
			11	SS	5	460/460	39
			12				
4			13				
			14				
	261.3	Traces of gravel, some silt seams Hard, grey, moist	15				
			16	SS	6	460/460	41
5			17				
			18				
			19				
6			20				
	259.4		21	SS	7	460/460	50
		Borehole terminated at 6.55 m BGS	22				
7			23				
			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

Hard Augering

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 295 E: 595 825

BH07-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/01/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	266.7		0				
	266.4	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	250/460	4
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel	3	SS	2	460/460	22
	265.2	Brown, very stiff to hard, moist	5				
2		Hard, brown, moist	6	SS	3	460/460	33
			8	SS	4	460/460	50
3			10				
			11	SS	5	280/460	48
4			12–14				
	261.8		15				
5		Traces of gravel, some silt seams Hard , grey, moist	16	SS	6	460/460	50
			17–19				
6			20				
			21	SS	7	380/460	42
7			22–24				
			25				
8	258.6		26	SS	8	410/460	44
		Hard to very stiff, grey, moist	27–29				
9			30				
	257.1		31	SS	9	460/460	42
		Borehole terminated at 9.60m BGS	32–39				
10							
11							
12							

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

Hard Augering

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 191 E: 595 969

BH08-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/01/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	266.1		0				
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	280/460	5
	265.6	**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, very stiff to hard, moist	2				
1			3	SS	2	410/460	17
			4				
			5				
			6	SS	3	460/460	30
2			7				
			8	SS	4	460/460	24
			9				
3	263.0	Hard, brown, moist	10				
			11	SS	5	460/460	39
			12				
4			13				
			14				
			15				
	261.2	Traces of gravel, some silt seams Hard, grey, wet	16	SS	6	460/460	49
5			17				
			18				
			19				
6			20				
			21	SS	7	460/460	47
	259.5	Borehole terminated at 6.55 m BGS	22				
7			23				
			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

Hard Augering

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 271 E: 596 040

BH/MW09-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/01/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	265.3		0				
0	264.8	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	360/460	5
1		**SANDY LEAN CLAY (CL)** sand seams, Brown, Very stiff, moist	3	SS	2	460/460	24
2			6	SS	3	460/460	24
2	262.5		8	SS	4	460/460	28
3		Hard, brown, moist	11	SS	5	460/460	43
4	260.7		15				
5		Traces of gravel Hard, grey, moist	16	SS	6	460/460	35
6	258.7		21	SS	7	460/460	36
7		Silt seams Hard, grey, moist	26	SS	8	460/460	43
8	256.7						
9		Traces of gravel Hard, wet, moist	31	SS	9	460/460	39
9	255.7						
10		Borehole terminated at 9.60m BGS. Monitoring well installed to 9.6 m BGS.					
11							
12							

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

Hard Augering

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 848 271 E: 596 040

BH/MW09-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/01/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE
0	265.3				
	264.8	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	SS	1	5
1		**SANDY LEAN CLAY (CL)** sand seams, Brown, Very stiff, moist	SS	2	24
2			SS	3	24
	262.5		SS	4	28
3		Hard, brown, moist	SS	5	43
4					
	260.7				
5		Traces of gravel Hard, grey, moist	SS	6	35
6					
	258.7		SS	7	36
7		Silt seams Hard, grey, moist			
8			SS	8	43
	256.7				
9		Traces of gravel Hard, wet, moist			
	255.7		SS	9	39
10		Borehole terminated at 9.60m BGS. Monitoring well installed to 9.6 m BGS.			
11					
12					

VAPOUR CONCENTRATIONS — ● %LEL ▲ ppm — ● 20 40 60 80 — ▲ 100 200 300 400

DEPTH (ft): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

WELL CONSTRUCTION

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 848 270 E: 595 944

BH10-23

CLIENT QuadReal Properties PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon DATUM NAD83

DATES: BORING 03/01/2023 WATER LEVEL TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) TCR(%) / SCR(%)	SAMPLES N-VALUE OR RQD(%)
0	265.9				0				
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist			1	SS	1	330/460	6
	265.4	**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, very stiff to hard, moist			2				
1					3	SS	2	460/460	29
					4				
					5	SS	3	460/460	38
2					6				
					7				
					8	SS	4	460/460	46
					9				
3					10	SS	5	460/460	50
	262.4				11				
		Borehole terminated at 3.55 m BGS			12				
4					13				
					14				
					15				
5					16				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 380 E: 595 879

BH11-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/03/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	267.1		0				
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	380/460	5
	266.6		2				
		SANDY LEAN CLAY (CL) Silty sand seams, traces of gravel Brown, very stiff to hard, moist	3	SS	2	430/460	30
1			4				
			5	SS	3	460/460	29
			6				
2			7				
			8	SS	4	410/460	24
	264.3		9				
		Hard, brown, moist	10				
3			11	SS	5	460/460	40
			12				
			13				
4			14				
			15				
	262.2		16	SS	6	430/460	50
5		Traces of gravel, some silt seams Very stiff , grey, moist	17				
			18				
			19				
6			20				
			21	SS	7	460/460	50
	260.5		22				
		Borehole terminated at 6.55 m BGS	23				
7			24				
			25				
			26				
8							

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

Hard Augering

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 400 E: 595 762

BH12-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/03/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	266.7		0					
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	230/460	4	
	266.3	**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, very stiff to hard, moist	2					
1			3	SS	2	410/460	25	
			4					
	264.9		5					
		Hard, brown, moist	6	SS	3	460/460	25	
2			7					
			8	SS	4	460/460	38	
			9					
			10					
3			11	SS	5	430/460	43	
			12					
			13					
4			14					
	262.2		15					
		Traces of gravel, some silt seams Hard, grey, moist	16	SS	6	380/460	50	50 For 4" Refusal
5			17					
			18					
			19					
6			20					
	260.2		21	SS	7	360/460	50	
		Borehole terminated at 6.55 m BGS	22					
7			23					
			24					
			25					
8			26					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 299 E: 595 665

BH/MW13-23

CLIENT QuadReal Properties

PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon

DATUM NAD83

DATES: BORING 03/03/2023

WATER LEVEL

TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	266.8		0				
	266.3	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	200/460	4
1		**SANDY LEAN CLAY (CL)** Sand seams, traces of gravel Brown, Very stiff to hard, moist	3	SS	2	430/460	24
2			6	SS	3	460/460	41
			8	SS	4	150/460	23
3	263.7	Hard, brown, moist	11	SS	5	460/460	50
4							
	261.9		16	SS	6	410/460	50
5		Traces of gravel Hard, grey, moist					
6	260.2		21	SS	7	430/460	49
		Silty sand seams Hard, grey, moist					
7							
8	258.2		26	SS	8	130/460	50
		Traces of gravel Hard, wet, moist					
9	257.2		31	SS	9	230/460	50
		Borehole terminated at 9.60m BGS. Monitoring well installed to 9.6 m BGS.					
10							
11							
12							

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m

STANDARD PENETRATION TEST, BLOWS/0.3m

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 848 299 E: 595 665

BH/MW13-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/03/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE
0	266.8				
	266.3	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	SS	1	4
1		**SANDY LEAN CLAY (CL)** Sand seams, traces of gravel Brown, Very stiff to hard, moist	SS	2	24
			SS	3	41
2			SS	4	23
	263.7				
3		Hard, brown, moist	SS	5	50
4					
	261.9		SS	6	50
5		Traces of gravel Hard, grey, moist			
6			SS	7	49
	260.2				
7		Silty sand seams Hard, grey, moist			
			SS	8	50
8	258.2				
		Traces of gravel Hard, wet, moist			
9	257.2		SS	9	50
		Borehole terminated at 9.60m BGS. Monitoring well installed to 9.6 m BGS.			
10					
11					
12					

VAPOUR CONCENTRATIONS — ● %LEL ▲ ppm — ● 20 40 60 80 — ▲ 100 200 300 400

DEPTH (ft): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

WELL CONSTRUCTION

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 848 205 E: 595 570

BH14-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/02/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	266.1		0					
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	380/460	7	
	265.6	**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, very stiff to hard, moist	2					
1			3	SS	2	460/460	28	
	264.9	Hard, brown, moist	4					
			5					
			6	SS	3	460/460	42	
2			7					
			8	SS	4	460/460	36	
			9					
3			10					
			11	SS	5	330/460	50	
			12					
4			13					
			14					
			15					
	261.2		16	SS	6	460/460	37	
5		Traces of gravel, some silt seams Very stiff , grey, moist	17					
			18					
			19					
6			20					
			21	SS	7	460/460	50	50 For 5" Refusal
	259.6		22					
		Borehole terminated at 6.55 m BGS	23					
7			24					
			25					
8			26					

UNDRAINED SHEAR STRENGTH (kPa)
50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 202 E: 595 429

BH/MW15-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/14/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	267.7		0				
	267.3	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	460/460	3
1		**SANDY LEAN CLAY (CL)** Sand seams, traces of gravel Brown, Very stiff to hard, moist	3	SS	2	360/460	23
			6	SS	3	460/460	26
2	265.0		8	SS	4	460/460	29
3		Hard to very stiff, brown, moist	11	SS	5	460/460	38
4	263.1						
		Traces of gravel very stiff, grey, moist	16	SS	6	460/460	25
5							
6	261.2		21	SS	7	410/460	28
		Silty sand seams Hard, grey, moist					
7							
8			26	SS	8	330/460	50
9	258.1		31	SS	9	460/460	50
		Borehole terminated at 9.6 m BGS. Monitoring well installed to 9.6 m BGS.					
10							
11							
12							

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m

STANDARD PENETRATION TEST, BLOWS/0.3m

10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

5 32 27 36

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 848 202 E: 595 429

BH/MW15-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/14/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE
0	267.7		0			
	267.3	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	3
1		**SANDY LEAN CLAY (CL)** Sand seams, traces of gravel Brown, Very stiff to hard, moist	3	SS	2	23
2			6	SS	3	26
	265.0		8	SS	4	29
3		Hard to very stiff, brown, moist	10	SS	5	38
4	263.1		13			
		Traces of gravel very stiff, grey, moist	15	SS	6	25
5			16			
6	261.2		20	SS	7	28
		Silty sand seams Hard, grey, moist	21			
7			25	SS	8	50
8			26			
9	258.1		30	SS	9	50
		Borehole terminated at 9.6 m BGS. Monitoring well installed to 9.6 m BGS.	31			
10			32			
11			36			
12			39			

VAPOUR CONCENTRATIONS ● %LEL ▲ ppm — ● 20 40 60 80 — ▲ 100 200 300 400

WELL CONSTRUCTION

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 848 337 E: 595 552

BH16-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/16/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	267.9		0				
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	460/460	3
	267.5	**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, very stiff to hard, moist	2				
1			3	SS	2	410/460	24
			4				
			5				
			6	SS	3	460/460	28
2			7				
	265.6		8	SS	4	460/460	33
		Hard, brown, moist	9				
			10				
3			11	SS	5	410/460	50
			12				
			13				
4			14				
	263.4		15				
		Traces of gravel, some silt seams Very stiff , grey, moist	16	SS	6	460/460	50
5			17				
			18				
			19				
6			20				
	261.4		21	SS	7	410/460	50
		Borehole terminated at 6.55 m BGS	22				
7			23				
			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 438 E: 595 643

BH17-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/03/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	267.0		0					
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	380/460	5	
	266.4		2					
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, hard, moist	3	SS	2	430/460	45	
			4					
			5					
			6	SS	3	460/460	41	
2	264.7		7					
		Hard, brown, moist	8	SS	4	460/460	37	
			9					
3			10					
			11	SS	5	230/460	50	50 For 3" Refusal (Rock in Way)
			12					
4			13					
			14					
	262.5		15					
		Traces of gravel, some silt seams Hard , grey, moist	16	SS	6	360/460	50	50 For 4" Refusal (Hard Augering)
5			17					
			18					
			19					
6			20					
			21	SS	7	410/460	48	
	260.5							
		Borehole terminated at 6.55 m BGS	22					
7			23					
			24					
			25					
8			26					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 526 E: 595 783

BH18-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/28/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	266.7		0					
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	460/460	3	
	266.1		2					
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, hard, moist	3	SS	2	360/460	29	
			4					
			5					
			6	SS	3	76/460	30	Rock in the way of auger
2			7					
	264.5		8	SS	4	460/460	39	
		Hard, brown, moist	9					
3			10					
			11	SS	5	460/460	38	6 27 34 33
			12					
4			13					
			14					
	262.2		15					
		Traces of gravel, some silt seams Hard, grey, moist	16	SS	6	460/460	46	
5			17					
			18					
			19					
6			20					
			21	SS	7	460/460	50	
	260.2		22					
		Borehole terminated at 6.55 m BGS	23					
7			24					
			25					
8			26					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 555 E: 595 662

BH/MW19-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/28/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	267.7		0				
	267.3	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	330/460	7
1		**LEAN CLAY WITH SAND TO SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, hard, moist	3	SS	2	460/460	33
			6	SS	3	460/460	37
2			8	SS	4	460/460	47
	265.0		9				
3		Hard, brown, moist	11	SS	5	460/460	50
	263.8		12				
4		Hard, grey, wet	13				
			16	SS	6	460/460	50
5			17				
			18				
6			19				
			21	SS	7	460/460	50
7			22				
			23				
			24				
8			26	SS	8	250/460	50
	259.2		27				
		Traces of gravel Hard, grey, wet	28				
9			29				
			30				
	258.1		31	SS	9	460/460	50
		Borehole terminated at 9.60m BGS Monitoring well installed to 9.6 m BGS.	32				
10			33				
			34				
			35				
11			36				
			37				
			38				
12			39				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

Hard Augering

5 22 36 37

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 848 555 E: 595 662

BH/MW19-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/28/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE
0	267.7				
	267.3	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	SS	1	7
1		**LEAN CLAY WITH SAND TO SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, hard, moist	SS	2	33
2			SS	3	37
	265.0		SS	4	47
3		Hard, brown, moist	SS	5	50
	263.8				
4		Hard, grey, wet			
5			SS	6	50
6			SS	7	50
7					
8			SS	8	50
	259.2				
9		Traces of gravel Hard, grey, wet			
	258.1		SS	9	50
10		Borehole terminated at 9.60m BGS Monitoring well installed to 9.6 m BGS.			
11					
12					

VAPOUR CONCENTRATIONS ● %LEL ▲ ppm — ● 20 40 60 80 ▲ 100 200 300 400

DEPTH (ft): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

WELL CONSTRUCTION

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 848 509 E: 595 559

BH20-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/28/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	268.0		0					
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	300/460	7	
	267.4		2					
		SANDY LEAN CLAY (CL) Silty sand seams, traces of gravel Brown, hard, moist	3	SS	2	460/460	31	
1			4					
			5					
			6	SS	3	460/460	36	
2	265.8		7					
		Hard, brown, moist	8	SS	4	460/460	40	
			9					
3			10					
			11	SS	5	460/460	50	10 28 37 25
			12					
4			13					
	263.5		14					
		Traces of gravel, some silt seams Hard, grey, moist	15					50 For 4" Refusal
			16	SS	6	300/460	50	
5			17					
			18					
			19					
6			20					50 For 4" Refusal
			21	SS	7	360/460	50	
	261.5		22					
		Borehole terminated at 6.55 m BGS	23					
7			24					
			25					
8			26					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 363 E: 595 438

BH21-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/16/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	269.5		0					
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1					
	268.9		2					
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, very stiff, moist	3	SS	1	360/460	21	
			4					
			5					
2			6	SS	2	460/460	22	
	267.2		7					
		Hard, brown, moist	8	SS	3	460/460	37	
			9					
3			10					
			11	SS	4	460/460	33	
			12					
			13					
4			14					
	264.9		15					
		Traces of gravel, some silt seams Hard, grey, moist	16	SS	5	460/460	42	
5			17					
			18					
			19					
6			20					
			21	SS	6	460/460	50	5 38 35 22
			22					
7			23					
			24					
			25					
8			26	SS	7	460/460	50	50 For 3" Refusal
			27					
			28					
			29					
9			30					
	259.9		31	SS	8	360/460	50	50 For 2" Refusal
		Borehole terminated at 9.6 m BGS	32					
10			33					
			34					
			35					
11			36					
			37					
			38					
12			39					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 259 E: 595 331

BH22-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/15/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	268.2		0					
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	460/460	4	
	267.5		2					
		SANDY LEAN CLAY (CL) Silty sand seams, traces of gravel Brown, very stiff, moist	3	SS	2	380/460	24	
1			4					
			5					
			6	SS	3	460/460	31	
2	265.9		7					
		Hard, brown, moist	8	SS	4	360/460	48	
			9					
			10					
3			11	SS	5	460/460	47	7 40 17 36
			12					
			13					
4			14					
	263.6		15					
		Traces of gravel, some silt seams Hard, grey, moist	16	SS	6	360/460	47	Hard Augering
			17					
5			18					
			19					
			20					
6			21	SS	7	300/460	50	
	261.6							
		Borehole terminated at 6.55 m BGS	22					
7			23					
			24					
			25					
8			26					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 188 E: 595 247

BH23-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/15/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	268.5		0				
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	460/460	5
	267.9		2				
		SANDY LEAN CLAY (CL) Silty sand seams, traces of gravel Brown, very stiff, moist	3	SS	2	410/460	23
1	266.9		4				
		Brown, very stiff to hard, moist	5	SS	3	460/460	27
2			6				
			7				
			8	SS	4	460/460	36
			9				
3			10				
			11	SS	5	460/460	41
	265.0						
		Borehole terminated at 3.55 m BGS	12				
4			13				
			14				
			15				
5			16				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 274 E: 595 210

BH24-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/15/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	268.1		0					
	267.8	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1					
		SANDY LEAN CLAY (CL) Silty sand seams, traces of gravel Brown, very stiff to hard, moist	2					
1			3	SS	1	360/460	22	
	266.6		4					
		Hard, brown, moist	5					
			6	SS	2	410/460	36	
2			7					
			8	SS	3	460/460	41	
			9					
3			10					
			11	SS	4	460/460	50	
			12					
4			13					
			14					
			15					
	263.3		16	SS	5	410/460	50	Hard Augering
5		Traces of gravel, some silt seams Hard , grey, moist	17					
			18					
			19					
6			20					
			21	SS	6	410/460	50	50 For 1" (Hard ground)
	261.6		22					
		Borehole terminated at 6.55 m BGS	23					
7			24					
			25					
8			26					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 400 E: 595 083

BH/MW25-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/15/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	269.9		0					
	269.5	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	460/460	6	
1		**SANDY LEAN CLAY (CL)** Sand seams, traces of gravel Brown, Very stiff hard, moist	3	SS	2	360/460	26	
			6	SS	3	460/460	36	
2	267.2		8	SS	4	460/460	50	
		Hard, brown, moist	11	SS	5	460/460	50	
4	265.1		15	SS	6	460/460	50	Hard Augering
5		Traces to some of gravel Hard, grey, moist						
6	263.4		21	SS	7	360/460	50	50 For 3" Refusal, Bad Rock
		Borehole terminated at 6.5 m BGS due to Auger Refusal Monitoring well installed to 6.5 m BGS						
7								
8								
9								
10								
11								
12								

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 848 400 E: 595 083

BH/MW25-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/15/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS ● %LEL ▲ ppm (● 20 40 60 80 / ▲ 100 200 300 400)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE	WELL CONSTRUCTION
0	269.9				0					
	269.5	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist			1		SS	1	6	
1		**SANDY LEAN CLAY (CL)** Sand seams, traces of gravel Brown, Very stiff hard, moist			3		SS	2	26	
2					6		SS	3	36	
	267.2				8		SS	4	50	
3		Hard, brown, moist			10		SS	5	50	
4					13					
	265.1				15		SS	6	50	
5		Traces to some of gravel Hard, grey, moist		▼	17					
6					20		SS	7	50	
	263.4				21					
		Borehole terminated at 6.5 m BGS due to Auger Refusal Monitoring well installed to 6.5 m BGS			22					
7					23					
8					26					
9					29					
10					33					
11					36					
12					39					

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 848 421 E: 595 194

BH26-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/16/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	269.1		0					
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	460/460	3	
	268.5		2					
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, very stiff, moist	3	SS	2	460/460	28	
	267.6		4					
		Hard, grey, moist	5					
2			6	SS	3	460/460	34	
			7					
			8	SS	4	460/460	40	6 21 36 37
3			9					
			10					50 For 2" Refusal
			11	SS	5	100/460	50	
4			12					
			13					
			14					
	264.5		15					
		Traces of gravel, some silt seams Hard, grey, moist	16	SS	6	330/460	50	Hard Augering
5			17					
			18					
			19					
6			20					
			21	SS	7	250/460	50	50 For 3" Refusal
			22					
7			23					
			24					
			25					
8			26	SS	8	460/460	50	50 For 5" Refusal
			27					
			28					
			29					
9			30					
	259.5		31	SS	9	410/460	50	50 For 4" Refusal
		Borehole terminated at 9.6 m BGS	32					
10			33					
			34					
			35					
11			36					
			37					
			38					
12			39					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 515 E: 595 181

BH27-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/27/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	269.6		0					
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	200/460	3	
	269.2	**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, very stiff to hard, moist	2					
1			3	SS	2	410/460	37	
	268.1		4					
		Hard, grey, moist	5	SS	3	460/460	42	
2			6					
			7					
			8	SS	4	300/460	50	50 For 5" Refusal (Hard ground)
			9					
3			10					
			11	SS	5	280/460	50	50 For 4" Refusal
	266.1							
		Borehole terminated at 3.55 m BGS	12					
4			13					
			14					
			15					
			16					
5								

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 401 E: 595 329

BH28-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/16/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	269.5		0				
	269.2	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	460/460	3
		SANDY LEAN CLAY (CL) Silty sand seams, traces of gravel Brown, very stiff to hard, moist	2				
1			3	SS	2	460/460	21
	267.9		4				
		Hard, brown, moist	5				
			6	SS	3	460/460	27
2			7				
			8	SS	4	460/460	29
			9				
3			10				
			11	SS	5	460/460	43
			12				
4			13				
			14				
			15				
	264.6		16	SS	6	330/460	50
5		Traces of gravel, some silt seams Hard, grey, moist	17				
			18				
			19				
6			20				
			21	SS	7	410/460	50
	262.9						
		Borehole terminated at 6.55 m BGS	22				
7			23				
			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 537 E: 595 317

BH29-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/27/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	270.3		0					
	270.0	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	300/460	3	
		SANDY LEAN CLAY (CL) Silty sand seams, traces of gravel Brown, very stiff to hard, moist	2					
1			3	SS	2	460/460	22	
	268.8		4					
		Hard, brown, moist	5					
			6	SS	3	180/460	36	
2			7					
			8	SS	4	460/460	50	
			9					
3			10					
			11	SS	5	460/460	50	
			12					
4			13					
			14					
			15					
	265.5		16	SS	6	460/460	50	50 For 5" (Hard Augering)
5		Traces of gravel, some silt seams Very stiff , grey, moist	17					
			18					
			19					
6			20					
			21	SS	7	410/460	50	50 For 5" Refusal
	263.8		22					
		Borehole terminated at 6.55 m BGS	23					
7			24					
			25					
8			26					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 646 E: 595 342

BH30-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/27/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	269.9				0					
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist			1	SS	1	300/460	6	
	269.5	**SANDY LEAN CLAY (CL)** sand seams, Brown, Very stiff, moist			2					
1					3	SS	2	460/460	29	
	268.7				4					
		Crushed gravels with sand , hard, brown			5					
					6	SS	3	460/460	50	
2					7					
					8	SS	4	460/460	50	50 For 5" Refusal
					9					
3					10					
					11	SS	5	150/460	50	50 For 5" Refusal
	266.4									
		Borehole terminated at 3.55 m BDS Borehole is open and dry			12					
4					13					
					14					
					15					
5					16					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 535 E: 595 466

BH/MW31-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/27/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	269.4		0				
	269.0	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	360/460	3
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, very stiff to hard, moist	3	SS	2	460/460	29
			6	SS	3	460/460	42
2	266.7		8	SS	4	460/460	38
		Hard, brown, moist	11	SS	5	460/460	50
3	265.5						
		Hard, grey, wet	16	SS	6	200/460	50
4							
5							
6			21	SS	7	180/460	50
7							
8			26	SS	8	180/460	50
	260.9						
		Traces of gravel Hard, grey, wet					
9	259.8		31	SS	9	250/460	50
		Borehole terminated at 9.60m BGS. Monitoring well installed to 9.6 m BGS.					
10							
11							
12							

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

5 26 31 38

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 848 535 E: 595 466

BH/MW31-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/27/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE
0	269.4		0			
	269.0	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	3
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, very stiff to hard, moist	3	SS	2	29
			6	SS	3	42
2			8	SS	4	38
	266.7	Hard, brown, moist	10	SS	5	50
3			11			
	265.5	Hard, grey, wet	13			
4			15	SS	6	50
5			16			
			19			
6			20	SS	7	50
			21			
7			23			
			25	SS	8	50
8			26			
	260.9	Traces of gravel Hard, grey, wet	28			
9			30			
	259.8		31	SS	9	50
		Borehole terminated at 9.60m BGS. Monitoring well installed to 9.6 m BGS.	32			
10			33			
			34			
11			36			
			37			
12			38			
			39			

VAPOUR CONCENTRATIONS ● %LEL ▲ ppm — ● 20 40 60 80 — ▲ 100 200 300 400

WELL CONSTRUCTION

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 848 681 E: 595 453

BH32-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/27/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	269.6		0					
	269.3	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	410/460	6	
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel	3	SS	2	460/460	32	
	268.1	Brown, very stiff to hard, moist	5					
2		Hard, brown, moist	6	SS	3	460/460	41	
			8	SS	4	460/460	50	
3			10	SS	5	460/460	50	50 For 4" Refusal
4			15					
	264.7		16	SS	6	460/460	50	Hard Augering
5		Traces of gravel, some silt seams Hard , grey, moist	17					
6			20					
	263.0		21	SS	7	430/460	50	50 For 5" Refusal
		Borehole terminated at 6.55 m BGS	22					
7			23					
8			26					
9			29					
10			32					
11			36					
12			39					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 749 E: 595 344

BH/MW33-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/27/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	268.3		0					
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	460/460	9	
	267.5		2					
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, stiff to hard, moist	3	SS	2	460/460	11	
			4					
			5	SS	3	460/460	50	
2			6					
			7	SS	4	460/460	40	
	265.5		8					
		Hard, brown, moist	9					
3			10	SS	5	460/460	50	Wet Spoon
			11					
			12					
4			13					
			14					
	263.4		15	SS	6	460/460	50	
5		Traces of gravel Hard, grey, wet	16					
			17					
			18					
			19					
6			20	SS	7	460/460	50	
			21					
			22					
			23					
7			24					
			25	SS	8	460/460	50	
			26					
8	259.7		27					
		Hard, grey, wet	28					
			29					
			30					
9			31	SS	9	460/460	36	Water In Spoon
	258.7							
		Borehole terminated at 9.60m BGS. Monitoring well installed to 9.6 m BGS.	32					
10			33					
			34					
			35					
11			36					
			37					
			38					
12			39					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 848 749 E: 595 344

BH/MW33-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/27/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS ● %LEL ▲ ppm (● 20 40 60 80 / ▲ 100 200 300 400)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE	WELL CONSTRUCTION
0	268.3				0					
0		**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist			0–2		SS	1	9	
	267.5									
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, stiff to hard, moist		▼	3–6		SS	2	11	
							SS	3	50	
2					7–9		SS	4	40	
	265.5									
		Hard, brown, moist			10–15		SS	5	50	
3										
4										
	263.4									
5		Traces of gravel Hard, grey, wet			16–20		SS	6	50	
6										
					21–25		SS	7	50	
7										
8							SS	8	50	
	259.7									
		Hard, grey, wet			26–30					
9										
	258.7						SS	9	36	
10		Borehole terminated at 9.60m BGS. Monitoring well installed to 9.6 m BGS.			31–39					
11										
12										

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 848 680 E: 595 597

BH34-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/27/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	268.7		0					
	268.4	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	410/460	4	
		SANDY LEAN CLAY (CL) Silty sand seams, traces of gravel Brown, very stiff to hard, moist	2					
1			3	SS	2	460/460	19	
	267.2		4					
		Hard, brown, moist	5					
			6	SS	3	460/460	41	
2			7					
			8	SS	4	460/460	41	
			9					
3			10					
			11	SS	5	460/460	47	
			12					
4			13					
			14					
			15					Hard Augering
	263.8		16	SS	6	460/460	48	
5		Traces of gravel, some silt seams Hard , grey, moist	17					
			18					
			19					
6			20					
			21	SS	7	410/460	50	50 For 5" Refusal
	262.2							
		Borehole terminated at 6.55 m BGS	22					
7			23					
			24					
			25					
8			26					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 785 E: 595 533

BH35-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/27/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	266.8				0				
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist			1	SS	1	460/460	8
	266.0				2				
1		**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, firm , moist			3	SS	2	460/460	7
	265.2				4				
		very stiff to hard, grey, moist			5				
2					6	SS	3	410/460	23
					7				
					8	SS	4	460/460	49
					9				
3					10				
					11	SS	5	460/460	44
	263.3								
		Borehole terminated at 3.55 m BGS			12				
4					13				
					14				
					15				
5					16				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 056 E: 595 569

BH36-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 03/02/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	265.7		0				
	265.4	**TOPSOIL** Clayey silt, Trace gravels Brown, loose, moist	1	SS	1	360/460	4
		SANDY LEAN CLAY (CL) Silty sand seams, traces of gravel Brown, very stiff to hard, moist	2				
1			3	SS	2	460/460	24
			4				
			5				
			6	SS	3	460/460	32
2			7				
			8	SS	4	460/460	26
			9				
3	262.6		10				
		Traces of gravel, some silt seams Very stiff , brown, moist	11	SS	5	460/460	50
			12				
4			13				
			14				
			15				
	260.8		16	SS	6	460/460	34
5		Hard, grey, moist	17				
			18				
			19				
6			20				
	259.1		21	SS	7	460/460	50
		Borehole terminated at 6.55 m BGS.	22				
7			23				
			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

Hard Augering

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 848 127 E: 595 368

BH37-23

CLIENT QuadReal Properties — PROJECT No. 121624778

LOCATION 12861 Dixie Road, Caledon — DATUM NAD83

DATES: BORING 02/17/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	264.4				0				
		TOPSOIL Clayey silt, Trace gravels Brown, loose, moist			1	SS	1	460/460	6
	263.9	**SANDY LEAN CLAY (CL)** Silty sand seams, traces of gravel Brown, stiff, moist			2				
1					3	SS	2	130/460	9
					4				
	262.9	very stiff to hard, grey, moist			5				
					6	SS	3	250/460	8
2					7				
					8	SS	4	410/460	26
					9				
3					10				
					11	SS	5	460/460	37
	260.9								
		Borehole terminated at 3.55 m BGS			12				
4					13				
					14				
					15				
5					16				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 389 E: 596 080

BH/MW38-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 01/23/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	264.9		0					
	264.6	**TOPSOIL** silty clay, trace of gravel, organics Brown, loose, moist	1	SS	01	410/610	7	
1	263.7	**SANDY SILTY CLAY (CL-ML)** sandy silty clay Very stiff, brown, DTPL	3	SS	02	200/610	22	
		SANDY LEAN CLAY (CL) trace of gravel brown, very stiff, moist	6	SS	03	610/610	16	4 26 34 36
2	262.0		8	SS	04	610/610	17	
3		Some gravel, smooth gravel within sample brown, very stiff, moist	11	SS	05	610/610	21	
4	260.4		13	SS	06	510/610	17	10 26 33 31
		grey, stiff, very moist	16	SS	07	610/610	12	
5								
6			21	SS	08	300/610	27	
7	257.3							
		LEAN CLAY (CL) Trace of sand grey, very stiff, very moist	26	SS	09	610/610	17	0 4 45 51
8								
9	255.8							
	255.2	Shale fragaments grey, hard, very moist	31	SS	10	610/610	50	
10		Borehole terminated at 9.75 m BGS Borehole dry and open						
11								
12								

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 847 389 E: 596 080

BH/MW38-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 01/23/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE
0	264.9		0			
	264.6	**TOPSOIL** silty clay, trace of gravel, organics Brown, loose, moist	1	SS	01	7
1	263.7	**SANDY SILTY CLAY (CL-ML)** sandy silty clay Very stiff, brown, DTPL	3	SS	02	22
2		**SANDY LEAN CLAY (CL)** trace of gravel brown, very stiff, moist	6	SS	03	16
	262.0		8	SS	04	17
3		Some gravel, smooth gravel within sample brown, very stiff, moist	10	SS	05	21
4			13	SS	06	17
	260.4		15	SS	07	12
5		grey, stiff, very moist	16			
6			20	SS	08	27
7	257.3		23			
		LEAN CLAY (CL) Trace of sand grey, very stiff, very moist	25	SS	09	17
8			28			
9	255.8		30			
		Shale fragaments	31	SS	10	50
	255.2	grey, hard, very moist	32			
10		Borehole terminated at 9.75 m BGS Borehole dry and open	33			
11			36			
12			39			

VAPOUR CONCENTRATIONS — ● %LEL ▲ ppm — ● 20 40 60 80 — ▲ 100 200 300 400

WELL CONSTRUCTION

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 847 479 E: 595 968

BH39-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 01/23/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	265.6		0				
		TOPSOIL silty clay, trace of gravel, organics Brown, loose, moist	1	SS	01	410/610	3
	265.0		2				
1	264.4	**SANDY SILTY CLAY (CL-ML)** sandy silty clay stiff, brown, moist	3	SS	02	610/610	13
			4				
			5				
2		**SANDY SILTY CLAY WITH GRAVEL** sandy silty clay with gravel brown, very stiff, moist	6	SS	03	610/610	20
			7				
			8	SS	04	610/610	23
			9				
3	262.3		10				
		SANDY LEAN CLAY (CL) sandy lean clay hard, brown to grey, moist	11	SS	05	610/610	36
			12				
4			13				
	261.1		14				
		grey, stiff, moist	15				
	260.4		16	SS	06	610/610	20
5		very stiff to hard, grey, moist	17				
			18				
			19				
6			20				
			21	SS	07	610/610	32
	258.9		22				
		Very stiff, grey, moist	23				
7			24				
			25				
			26	SS	08	610/610	26
8			27				
			28				
			29				
9			30				
			31	SS	09	610/610	21
	255.9		32				
10		Borehole terminated at 9.7 m BGS Borehole dry and open	33				
			34				
			35				
11			36				
			37				
			38				
12			39				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

16 32 29 23

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 522 E: 596 036

BH40-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 01/24/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	265.8		0					
		TOPSOIL silty clay, trace of gravel, organics Brown, loose, moist	1	SS	01	610/610	6	
1	265.2	**SANDY SILTY CLAY (CL-ML)** sandy silty clay Very stiff, brown, DTPL	3	SS	02	610/610	22	
2	263.7	**SANDY SILTY CLAY WITH GRAVEL (CL-ML)** sandy silty clay with gravel Very stiff, brown, DTPL	6	SS	03	610/610	20	6 35 32 27
3			8	SS	04	610/610	21	
			11	SS	05	610/610	23	
4	261.2		15					
5		**SANDY LEAN CLAY (CL)** Very stiff, Brown to grey, some rusty vanes	16	SS	06	610/610	18	18 30 25 27
6	259.7		20					
		Shale fragaments, hard	21	SS	07	610/610	26	
7			25					
8	257.6		26	SS	08	610/610	36	
		Borehole terminated at 8.22 m BGS Borehole dry and open	27					
9			30					
			31	SS	09	250/610	50	
10			32					
11			36					
12			39					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 402 E: 596 117

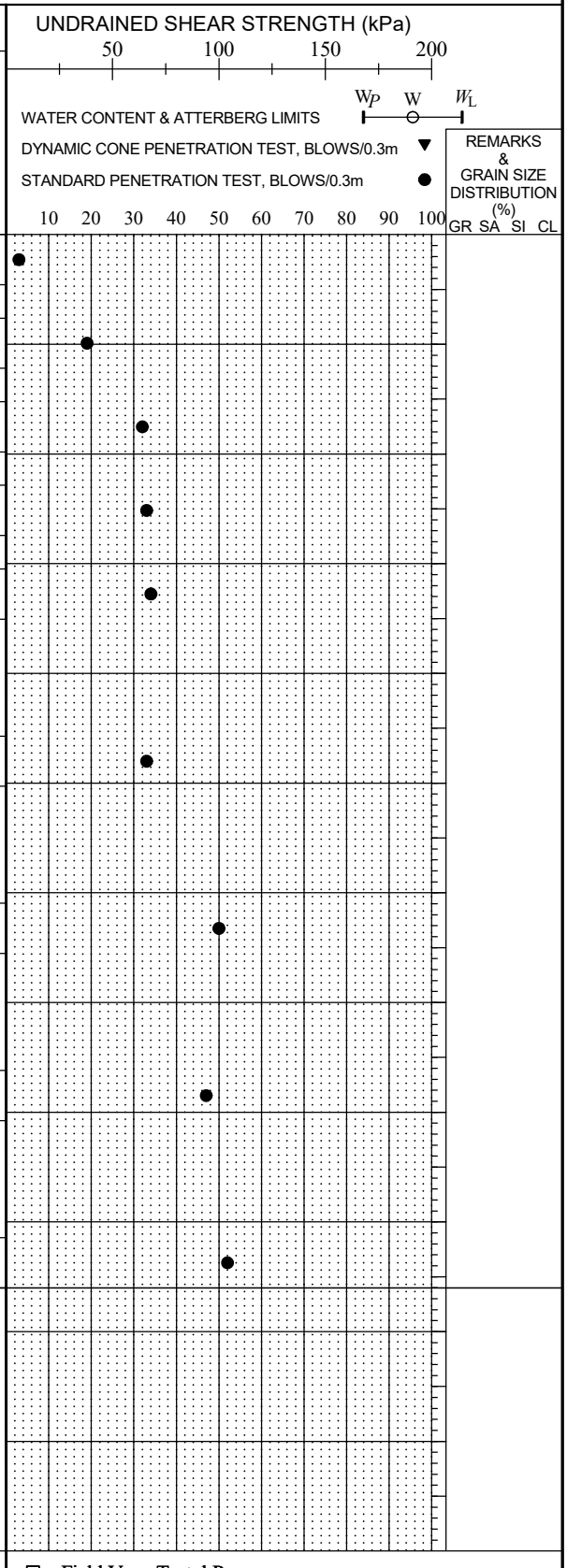
BH41-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/01/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	264.6		0				
		FILL					
		Sandy silt, with gravel	1	SS	01	300/460	3
	263.8	Brown, moist	2				
1	263.4	**SANDY SILTY CLAY (CL-ML)**	3	SS	02	200/460	19
		sandy silty clay	4				
		Very stiff, brown, DTPL	5				
		SANDY SILTY CLAY WITH GRAVEL	6	SS	03	300/460	32
2			7				
		sandy silty clay with gravel	8	SS	04	360/460	33
		Hard, brown, moist	9				
3			10				
			11	SS	05	460/460	34
			12				
4			13				
			14				
	260.0		15				
		grey, hard, moist	16	SS	06	430/460	33
5			17				
			18				
			19				
6	258.5		20				
		LEAN CLAY (CL)	21	SS	07	410/460	50
		Hard, grey, moist	22				
7			23				
			24				
			25				
8			26	SS	08	460/460	47
			27				
			28				
			29				
9			30				
	255.0		31	SS	09	460/460	52
		Borehole terminated at 9.6 m BGS	32				
10		Borehole dry and open	33				
			34				
			35				
11			36				
			37				
			38				
12			39				



□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 415 E: 596 196

BH42-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/06/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	262.5		0				
		FILL					
		Sandy silt, with gravel	1	SS	01	460/460	4
	261.9	Brown, moist	2				
1		**SANDY SILTY CLAY WITH GRAVEL (CL-ML)**	3	SS	02	250/460	17
		sandy silty clay with gravel	4				
		very stiff, brown, moist	5				
2	260.5		6	SS	03	360/460	21
		SANDY LEAN CLAY (CL)	7				
		sandy lean clay	8	SS	04	360/460	25
		very stiff, brown, moist	9				
3			10				
			11	SS	05	380/460	28
			12				
4			13				
			14				
	257.9		15				
		grey, very stiff, moist	16	SS	06	460/460	21
5			17				
			18				
			19				
6	256.4		20				
		grey, hard, moist	21	SS	07	130/460	50
	255.9		22				
		Very stiff to Hard	23				
7			24				
			25				
			26	SS	08	100/460	19
8			27				
			28				
			29				
9			30				
			31	SS	09	200/460	50
	252.9						
		Borehole terminated at 9.6 m BGS	32				
10		Borehole dry and open	33				
			34				
			35				
11			36				
			37				
			38				
12			39				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 473 E: 596 304

BH43-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 01/27/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	263.6		0				
		TOPSOIL Silty Clay, some sand, some gravel with rootlets Brown, moist	1	SS	01	460/460	3
	263.1		2				
1		**SANDY SILTY CLAY WITH GRAVEL (CL-ML)** sandy silty clay with gravel very stiff, brown, moist	3	SS	02	360/460	18
	262.0		4				
		SANDY LEAN CLAY (CL) sandy lean clay brown, stiff, moist	5				
2			6	SS	03	410/460	23
			7				
			8	SS	04	460/460	25
	260.8		9				
		brown , hard, moist	10				
3			11	SS	05	460/460	39
			12				
4			13				
			14				
			15				
	258.7		16	SS	06	460/460	33
5		grey, hard, moist	17				
			18				
			19				
6			20				
			21	SS	07	460/460	58
	257.0						
		Borehole terminated at 6.55 m BGS Borehole dry and open	22				
7			23				
			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 695 E: 596 068

BH44-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/13/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	266.5		0				
		TOPSOIL silty clay, some sand, some gravel with rootlets	1	SS	01	300/460	3
	265.9	Brown, loose, moist	2				
1		**SANDY SILTY CLAY WITH GRAVEL (CL-ML)** Brown, Very stiff, moist	3	SS	02	410/460	25
			4				
			5				
2			6	SS	03	460/460	24
			7				
			8	SS	04	360/460	21
	263.8		9				
3		**SANDY LEAN CLAY (CL)** Very stiff to Hard, brown to grey, moist	10				
			11	SS	05	460/460	27
			12				
4			13				
			14				
			15				
			16	SS	06	330/460	34
5			17				
			18				
			19				
6	260.4		20				
		Grey, very stiff, moist	21	SS	07	460/460	26
	260.0						
		Borehole terminated at 6.55 m BGS Borehole dry and open	22				
7			23				
			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 745 E: 596 154

BH45-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/13/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	266.2		0				
	265.9	**TOPSOIL** silty clay, some sand, some gravel with rootlets Brown, loose, moist	1	SS	01	230/460	4
1		**SANDY SILTY CLAY WITH GRAVEL (CL-ML)** brown, very stiff, moist	3	SS	02	410/460	18
	264.7		4				
		SANDY LEAN CLAY (CL) brown, very stiff, moist	5				
2			6	SS	03	430/460	28
			7				
			8	SS	04	460/460	25
3			9				
			10				
			11	SS	05	460/460	27
4			12				
			13				
			14				
			15				
	261.4		16	SS	06	330/460	30
5		grey, hard, moist	17				
			18				
			19				
6	260.2		20				
		grey, very stiff, moist	21	SS	07	460/460	19
	259.7						
		Borehole terminated at 6.55 m BGS Borehole dry and open	22				
7			23				
			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 444 E: 596 432

BH/MW46-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/06/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	260.7		0					
	260.2	**TOPSOIL** Silty clay, trace of gravel Brown, firm, DTPL	1	SS	01	250/460	4	
	259.8	**SANDY SILTY CLAY (CL-ML)** Trace of gravel, some rootlets Brown, stiff, moist	2					
1			3	SS	02	300/460	7	
		SANDY LEAN CLAY (CL) trace of gravel Brown, very stiff, DTPL	4					
			5					
2			6	SS	03	360/460	21	
			7					
			8	SS	04	410/460	24	7 29 32 32
	257.8		9					
3		brown to grey, hard, moist	10					
			11	SS	05	460/460	38	7 29 32 32
			12					
4			13					
			14					
			15					
5			16	SS	06	460/460	37	
			17					
			18					
			19					
6	254.6		20					
		grey, stiff, moist	21	SS	07	360/460	10	
			22					
7			23					
			24					
	253.1		25					
		grey, hard, moist	26	SS	08	460/460	32	
8			27					
			28					
			29					
9			30					
	251.1		31	SS	09	410/460	31	
		Borehole terminated at 9.6 m BGS Borehole dry and open	32					
10			33					
			34					
			35					
11			36					
			37					
			38					
12			39					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 847 444 E: 596 432

BH/MW46-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/06/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE
0	260.7		0			
	260.2	**TOPSOIL** Silty clay, trace of gravel Brown, firm, DTPL	1	SS	01	4
	259.8	**SANDY SILTY CLAY (CL-ML)** Trace of gravel, some rootlets Brown, stiff, moist	3	SS	02	7
1			4			
			5	SS	03	21
		SANDY LEAN CLAY (CL) trace of gravel Brown, very stiff, DTPL	6			
			7			
2			8	SS	04	24
	257.8		9			
		brown to grey, hard, moist	10	SS	05	38
3			11			
			12			
			13			
4			14			
			15	SS	06	37
			16			
			17			
5			18			
			19			
	254.6		20	SS	07	10
		grey, stiff, moist	21			
6			22			
			23			
			24			
7			25	SS	08	32
	253.1		26			
		grey, hard, moist	27			
			28			
8			29			
			30			
			31	SS	09	31
9	251.1		32			
		Borehole terminated at 9.6 m BGS Borehole dry and open	33			
10			34			
			35			
			36			
11			37			
			38			
			39			
12						

VAPOUR CONCENTRATIONS ● %LEL ▲ ppm — ● 20 40 60 80 — ▲ 100 200 300 400

WELL CONSTRUCTION

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 847 474 E: 596 531

BH47-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/06/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	258.8		0				
	258.5	**TOPSOIL** Silty clay, trace of gravel Brown, firm, moist	1	SS	01	250/460	4
		SANDY SILTY CLAY (CL-ML) Trace of gravel, some rootlets Brown, hard, moist	2				
1	257.6		3	SS	02	300/460	43
		SANDY LEAN CLAY (CL) trace of gravel brown, very stiff, moist	4				
			5				
2	256.5		6	SS	03	410/460	22
		brown to grey, hard, moist	7				
			8	SS	04	460/460	39
			9				
3			10				
			11	SS	05	460/460	38
			12				
4			13				
			14				
	254.2		15				
		grey, stiff to very stiff, moist	16	SS	06	460/460	12
5			17				
			18				
			19				
6			20				
	252.2		21	SS	07	460/460	15
		Borehole terminated at 6.55 m BGS Borehole dry and open	22				
7			23				
			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 842 E: 596 181

BH/MW48-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/13/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
	265.4		0				
0	265.1	**TOPSOIL** Silty clay, trace of gravel Brown, soft, DTPL	0	SS	01	250/460	4
1	264.2	**SANDY SILTY CLAY (CL-ML)** Trace of gravel, some rootlets Brown, very stiff, moist	3	SS	02	360/460	19
2	263.1	**SANDY LEAN CLAY (CL)** trace of gravel brown, very stiff, moist	6	SS	03	430/460	23
		hard to very stiff, brown, moist	8	SS	04	460/460	31
3			11	SS	05	460/460	28
4	260.9						
		very stiff, grey, moist	16	SS	06	460/460	16
5							
6			21	SS	07	410/460	27
7	257.8						
		Trace to some gravel	26	SS	08	460/460	21
8							
9			31	SS	09	430/460	26
	255.8						
10		Borehole terminated at 9.6 m BGS Borehole dry and open	32				
11			36				
12			39				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 847 842 E: 596 181

BH/MW48-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/13/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE
0	265.4		0			
	265.1	**TOPSOIL** Silty clay, trace of gravel Brown, soft, DTPL	1	SS	01	4
1	264.2	**SANDY SILTY CLAY (CL-ML)** Trace of gravel, some rootlets Brown, very stiff, moist	3	SS	02	19
			5	SS	03	23
2	263.1	**SANDY LEAN CLAY (CL)** trace of gravel brown, very stiff, moist	7	SS	04	31
		hard to very stiff, brown, moist	9			
3			10	SS	05	28
4			13			
	260.9	very stiff, grey, moist	15	SS	06	16
5			17			
6			19			
			20	SS	07	27
7			23			
	257.8	Trace to some gravel	25	SS	08	21
8			27			
9			29			
	255.8		31	SS	09	26
		Borehole terminated at 9.6 m BGS Borehole dry and open	32			
10			33			
			34			
11			36			
			37			
12			38			
			39			

VAPOUR CONCENTRATIONS ● %LEL ▲ ppm — ● 20 40 60 80 ▲ 100 200 300 400

WELL CONSTRUCTION

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 847 513 E: 596 626

BH/MW49-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/06/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	260.6		0				
		TOPSOIL	1	SS	01	250/460	4
	260.0	Silty clay, trace of gravel	2				
		Brown, firm, DTPL	3	SS	02	410/460	19
1	259.4	**SANDY SILTY CLAY (CL-ML)**	4				
		Trace of gravel, some rootlets	5				
		Brown, very stiff, moist	6	SS	03	460/460	26
2		**SANDY LEAN CLAY (CL)**	7				
	258.3	trace of gravel	8	SS	04	360/460	36
		light brown, very stiff, moist	9				
		brown, hard, moist	10				
3			11	SS	05	410/460	45
			12				
4			13				
	256.0		14				
		very stiff, grey, moist	15				
			16	SS	06	380/460	19
5			17				
			18				
			19				
6	254.5		20				
		hard, trace to some gravel, moist	21	SS	07	430/460	40
			22				
7			23				
			24				
			25				
8			26	SS	08	300/460	50
			27				
			28				
9			29				
			30				
	251.0		31	SS	09	100/460	50
		Borehole terminated at 9.6 m BGS	32				
10		Borehole dry and open	33				
			34				
			35				
11			36				
			37				
			38				
12			39				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 847 513 E: 596 626

BH/MW49-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/06/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE
0	260.6		0			
		TOPSOIL				
		Silty clay, trace of gravel				
	260.0	Brown, firm, DTPL				
1		**SANDY SILTY CLAY (CL-ML)**	3	SS	01	4
	259.4	Trace of gravel, some rootlets				
		Brown, very stiff, moist	6	SS	02	19
2		**SANDY LEAN CLAY (CL)**				
	258.3	trace of gravel				
		light brown, very stiff, moist	8	SS	03	26
		brown, hard, moist				
3			10	SS	04	36
			13	SS	05	45
4						
	256.0					
		very stiff, grey, moist	16	SS	06	19
5						
			20	SS	07	40
6	254.5					
		hard, trace to some gravel, moist				
7						
			25	SS	08	50
8						
			30	SS	09	50
9						
	251.0					
		Borehole terminated at 9.6 m BGS				
10		Borehole dry and open				
11						
12						

VAPOUR CONCENTRATIONS — ● %LEL ▲ ppm — ● 20 40 60 80 — ▲ 100 200 300 400

WELL CONSTRUCTION

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 847 844 E: 596 333

BH50-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/10/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	265.8		0				
	265.4	**TOPSOIL** Silty clay, trace of gravel Brown, firm, DTPL	1	SS	01	200/460	3
1		**SANDY SILTY CLAY (CL-ML)** Trace of gravel, some rootlets	3	SS	02	300/460	20
	264.2	Brown, very stiff, moist	5				
2		**SANDY LEAN CLAY (CL)** trace of gravel brown, very stiff, moist	6	SS	03	410/460	19
			8	SS	04	360/460	25
3			10	SS	05	410/460	27
4			14				
	261.2		15				
		very stiff, grey, moist	16	SS	06	380/460	21
5			18				
6			20				
			21	SS	07	460/460	15
7			23				
	258.1		25				
		hard, grey, moist	26	SS	08	460/460	32
8			28				
9			30				
	256.1		31	SS	09	460/460	40
		Borehole terminated at 9.6 m Borehole dry and open	32				
10			33				
			34				
11			36				
			37				
12			38				
			39				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 620 E: 595 838

BH/MW51-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 01/25/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	266.6		0					
	266.1	**TOPSOIL** Silty clay, trace of gravel Brown, firm, DTPL	1	SS	01	200/610	3	
1	265.4	**SANDY SILTY CLAY (CL-ML)** Trace of gravel, some rootlets Brown, stiff, moist	3	SS	02	150/610	9	6 24 33 37
2		**SANDY LEAN CLAY (CL)** some silt seams, some gravel Very stiff, brown, moist	6	SS	03	300/610	17	
			8	SS	04	460/610	28	
3	263.5		10					
		some to trace silt, brown to grey, very stiff moist	11	SS	05	460/610	22	
4			15					
			16	SS	06	460/610	28	
5	261.4		17					
		some gravel very stiff, grey, moist	20					
6			21	SS	07	51/610	17	
7			25					
			26	SS	08	410/610	16	
8			27					
9	257.4		30					
		Some silt pockets hard, grey, moist	31	SS	09	150/610	50	
	256.8		32					
10		Borehole terminated at 9.75 m Borehole dry and open	33					
11			36					
12			39					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 847 620 E: 595 838

BH/MW51-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 01/25/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE
0	266.6				
	266.1	**TOPSOIL** Silty clay, trace of gravel Brown, firm, DTPL	SS	01	3
1	265.4	**SANDY SILTY CLAY (CL-ML)** Trace of gravel, some rootlets Brown, stiff, moist	SS	02	9
2		**SANDY LEAN CLAY (CL)** some silt seams, some gravel Very stiff, brown, moist	SS	03	17
			SS	04	28
3	263.5	some to trace silt, brown to grey, very stiff moist	SS	05	22
4					
5	261.4	some gravel very stiff, grey, moist	SS	06	28
6					
			SS	07	17
7					
8			SS	08	16
9	257.4				
	256.8	Some silt pockets hard, grey, moist	SS	09	50
10		Borehole terminated at 9.75 m Borehole dry and open			
11					
12					

VAPOUR CONCENTRATIONS — ● %LEL ▲ ppm — ● 20 40 60 80 — ▲ 100 200 300 400

DEPTH (ft): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

WELL CONSTRUCTION

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 847 524 E: 596 099

BH52-23

CLIENT QuadReal Properties PROJECT No. 121624777

LOCATION 12489 Dixie Road DATUM NAD83

DATES: BORING 01/24/2023 WATER LEVEL TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	265.6		0					
	265.1	**TOPSOIL** Clayey silt, organics, loose, moist	1	SSSS	01	610/610	5	
		SANDY SILTY CLAY (CL-ML) Trace of gravel, some rootlets Brown, stiff, moist	2					
1			3	SSSS	02	610/610	13	
	264.0		4					
		SANDY LEAN CLAY (CL) Very stiff, brown, moist	5					3 36 34 27
2			6	SSSS	03	610/610	23	
			7					
			8	SSSS	04	410/610	25	
			9					
3			10					7 30 32 31
			11	SSSS	05	410/610	26	
			12					
4			13					
	261.0		14					
		Brown to grey, stiff to very stiff, moist	15					
			16	SSSS	06	410/610	13	
5	260.4		17					
		grey, very stiff, moist	18					
			19					
6			20					
			21	SSSS	07	410/610	16	
	258.9		22					
		Borehole terminated at 6.7 m Borehole dry and open	23					
7			24					
			25					
8			26					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 727 E: 595 974

BH53-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 01/24/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	265.8		0				
		TOPSOIL Clay, some to trace of silt Brown, loose, moist	1	SS	01	180/610	3
	265.2		2				
		SANDY SILTY CLAY (CL-ML) Trace of gravel, some rootlets Brown, very stiff, moist	3	SS	02	460/610	17
1	264.2		4				
		SANDY LEAN CLAY (CL) Trace of silt, some gravel brown, firm, moist	5	SS	03	460/610	19
2			6				
			7	SS	04	460/610	7
	263.0		8				
		Hard, brown	9				
3			10				
			11	SS	05	460/610	36
			12				
4			13				
	261.2		14				
		Very stiff	15				
			16	SS	06	460/610	33
5			17				
			18				
			19				
6			20				
			21	SS	07	460/610	25
	259.1		22				
		Borehole terminated at 6.7 m Borehole dry and open	23				
7			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 548 E: 596 261

BH54-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 01/27/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	264.8				0				
		TOPSOIL Silty Clay, brown, moist			1	SS	01	300/460	4
	264.2				2				
1		**SANDY SILTY CLAY (CL-ML)** Trace of gravel, some rootlets Brown, hard , moist			3	SS	02	360/460	33
	263.3				4				
		SANDY LEAN CLAY (CL) Some gravel Hard, brown, moist			5	SS	03	460/460	34
2	262.7				6				
		very stiff, brown, moisr			7				
	262.1				8	SS	04	460/460	27
		Hard, brown, moist			9				
3					10				
	261.3				11	SS	05	460/460	38
		Borehole terminated at 3.6 m Borehole dry and open			12				
4					13				
					14				
					15				
5					16				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 566 E: 596 186

BH/MW55-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 01/24/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	265.8		0				
		TOPSOIL Silty clay Brown, loose, moist	1	SS	01	250/610	3
1	265.2	**SANDY SILTY CLAY (CL-ML)** Trace of gravel, some rootlets Brown, very stiff, moist	3	SS	02	300/610	26
	264.3		5				
2	263.6	**SANDY LEAN CLAY (CL)** with silty sand Very stiff, brown, DTPL	6	SS	03	410/610	22
		some gravel	7				
3	262.7	very stiff, DTPL Hard	8	SS	04	460/610	29
			10				
4	261.2		11	SS	05	460/610	38
		Brown to grey, Very stiff to hard	12				
5			15				
			16	SS	06	460/610	29
6	259.7		17				
		LEAN CLAY (CL) Some to trace of silt, some gravel Very stiff, grey, DTPL	20				
			21	SS	07	460/610	28
7	258.2		22				
		hard, grey, moist	25				
8			26	SS	08	460/610	31
			27				
9			30				
			31	SS	09	460/610	39
	256.0		32				
10		Borehole terminated at 9.75 m Borehole dry and open	33				
			34				
11			36				
			37				
12			38				
			39				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

9 29 33 29

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 847 566 E: 596 186

BH/MW55-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 01/24/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE
0	265.8				
		TOPSOIL			
	265.2	Silty clay			
		Brown, loose, moist	SS	01	3
1		**SANDY SILTY CLAY (CL-ML)**			
		Trace of gravel, some rootlets	SS	02	26
	264.3	Brown, very stiff, moist			
2	263.6	**SANDY LEAN CLAY (CL)**	SS	03	22
		with silty sand			
		Very stiff, brown, DTPL	SS	04	29
		some gravel			
3	262.7	very stiff, DTPL	SS	05	38
		Hard			
4					
	261.2				
		Brown to grey, Very stiff to hard	SS	06	29
5					
6	259.7				
		LEAN CLAY (CL)			
		Some to trace of silt, some gravel	SS	07	28
		Very stiff, grey, DTPL			
7	258.2				
		hard, grey, moist	SS	08	31
8					
9					
	256.0		SS	09	39
10		Borehole terminated at 9.75 m			
		Borehole dry and open			
11					
12					

VAPOUR CONCENTRATIONS — ● %LEL ▲ ppm — ● 20 40 60 80 — ▲ 100 200 300 400

DEPTH (ft): 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

WELL CONSTRUCTION

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 847 552 E: 595 894

BH56-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 01/24/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) TCR(%) / SCR(%)	SAMPLES N-VALUE OR RQD(%)
0	267.0				0				
		TOPSOIL Silty clay, with rootlets Brown, firm, moist			1	SS	01	460/460	7
	266.6								
		SANDY SILTY CLAY (CL-ML) Trace of gravel, some rootlets brown, very stiff, moist			2				
1					3	SS	02	460/460	22
					4				
	265.5				5				
		SANDY LEAN CLAY (CL) very stiff, brown, moist			6	SS	03	460/460	22
2					7				
	264.7								
		some gravel Very stiff to hard, brown, moist			8	SS	04	460/460	22
					9				
3					10				
					11	SS	05	460/460	30
	263.5								
		Borehole terminated at 3.6 m below ground surface Borehole dry and open			12				
					13				
4					14				
					15				
					16				
5									

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 623 E: 595 968

BH57-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 01/25/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0	266.8		0					
	266.3	**TOPSOIL** silty clay, with rootlets brown, soft, moist	1	SS	01	460/460	3	
1		**SANDY SILTY CLAY (CL-ML)** brown, very stiff, moist	3	SS	02	460/460	20	
	265.2		5					
		SANDY LEAN CLAY (CL) some gravel brown, very stiff, moist	6	SS	03	460/460	23	3 22 38 37
2			8	SS	04	460/460	24	
3			11	SS	05	460/460	28	
4	262.2		14					
		brown to grey, stiff, moist	16	SS	06	460/460	15	
5			18					
6	260.7		20					
		very stiff to hard, grey, moist	21	SS	07	460/460	24	
7			23					
8	258.5		25					
		with smooth gravel hard, grey, DTPL	26	SS	08	460/460	29	
9			28					
	257.2		30					
		Borehole terminated at 9.6 m below ground surface Borehole dry and open	31	SS	09	460/460	50	
10			33					
11			36					
			38					
12			39					

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 774 E: 596 066

BH58-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/13/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	264.8				0				
		TOPSOIL Silty Clay, with rootlets Brown, very stiff, DTPL			1	SS	01	200/460	3
	264.2				2				
		SANDY SILTY CLAY (CL-ML) brown, firm, moist			3	SS	02	250/460	9
1					4				
	263.2				5				
		SANDY LEAN CLAY (CL) Some gravel brown, very stiff, moist			6	SS	03	360/460	16
2					7				
	262.3				8	SS	04	460/460	28
		Very stiff to hard, brown, moist			9				
3					10				
	261.3				11	SS	05	460/460	30
		Borehole terminated at 3.6 m below ground surface Borehole dry and open			12				
4					13				
					14				
					15				
5					16				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 633 E: 596 251

BH59-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/01/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	265.5		0				
		TOPSOIL Silty Clay Brown, moist	1	SS	01	250/610	5
	264.9		2				
		LEAN CLAY WITH SAND(CL) trace of gravel brown, very stiff, moist	3	SS	02	200/610	20
1	264.0		4				
		SANDY LEAN CLAY (CL) Brown, very stiff, DTPL	5				
			6	SS	03	300/610	26
2			7				
			8	SS	04	460/610	29
	262.8		9				
		Hard	10				
3			11	SS	05	300/610	53
	262.0		12				
		Very stiff	13				
			14				
4	261.0		15				
		Some silt, some sand Brown to grey	16	SS	06	460/610	25
			17				
			18				
5			19				
			20				
6			21	SS	07	460/610	22
	259.0		22				
		Borehole terminated at 6.7 m Borehole dry and open	23				
7			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

2 20 35 43

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 774 E: 596 288

BH60-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/10/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	266.2		0				
	265.9	**TOPSOIL** Silty Clay Brown, moist	1	SS	01	230/610	4
		SANDY SILTY CLAY (CL-ML) brown, , very stiff moist	2				
1			3	SS	02	360/610	23
	264.7		4				
		SANDY LEAN CLAY (CL) brown, very stiff to hard, moist	5				
2			6	SS	03	460/610	25
			7				
			8	SS	04	250/610	24
			9				
3			10				
	262.7		11	SS	05	460/610	39
		brown to grey, very stiff, moist	12				
			13				
4		transition to grey at 4.5 m	14				
			15				
			16	SS	06	360/610	16
5			17				
			18				
			19				
6	260.1		20				
		stiff, grey, moist	21	SS	07	460/610	11
	259.7		22				
		Borehole terminated at 6.7 m Borehole dry and open	23				
7			24				
			25				
8			26				

SAMPLES

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 639 E: 596 359

BH/MW61-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/10/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	263.9		0				
		TOPSOIL	1	SS	01	150/460	3
	263.3	Silty clay, trace of gravel	2				
		Brown, firm, DTPL	3	SS	02	360/460	28
1		**SANDY SILTY CLAY (CL-ML)**	4				
	262.4	brown, very stiff, moist	5				
		SANDY LEAN CLAY (CL)	6	SS	03	460/460	22
2		trace of gravel	7				
		brown, very stiff, moist	8	SS	04	460/460	25
	260.9		9				
3		Some gravel	10				
		Hard, brown to grey, moist	11	SS	05	430/460	33
4			12				
	259.3		13				
		With silty sand seams	14				
5		Very stiff to stiff, grey, moist	15				
			16	SS	06	380/460	20
			17				
6			18				
			19				
			20				
			21	SS	07	430/460	13
7			22				
	256.3		23				
		Hard to very stiff, grey, moist	24				
			25				
8			26	SS	08	460/460	35
			27				
			28				
			29				
9			30				
	254.3		31	SS	09	460/460	27
		Borehole terminated at 9.6 m	32				
10		Borehole dry and open	33				
			34				
			35				
			36				
11			37				
			38				
			39				
12							

SAMPLES

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 847 639 E: 596 359

BH/MW61-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/10/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS ● %LEL ▲ ppm (● 20 40 60 80 ▲ 100 200 300 400)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE	WELL CONSTRUCTION
0	263.9				0					
	263.3	**TOPSOIL** Silty clay, trace of gravel Brown, firm, DTPL			1		SS	01	3	
1		**SANDY SILTY CLAY (CL-ML)** brown, very stiff, moist			3		SS	02	28	
	262.4				4					
		SANDY LEAN CLAY (CL) trace of gravel brown, very stiff, moist			5		SS	03	22	
2					7					
					8		SS	04	25	
3	260.9				9					
		Some gravel Hard, brown to grey, moist			10		SS	05	33	
4					12					
	259.3				13					
		With silty sand seams Very stiff to stiff, grey, moist			14					
5					15		SS	06	20	
					16					
				▼	17					
6					18					
					19					
					20		SS	07	13	
7					21					
					22					
	256.3				23					
		Hard to very stiff, grey, moist			24					
8					25		SS	08	35	
					26					
					27					
9					28					
					29					
					30					
	254.3				31		SS	09	27	
		Borehole terminated at 9.6 m Borehole dry and open			32					
10					33					
					34					
					35					
11					36					
					37					
					38					
12					39					

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 847 574 E: 596 518

BH62-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/07/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	261.2		0				
		TOPSOIL Silty clay, trace of gravel Brown, firm, DTPL	1	SS	01	250/610	3
	260.8	**SANDY SILTY CLAY (CL-ML)** brown, very stiff, moist	2				
1			3	SS	02	360/610	19
	259.7		4				
		SANDY LEAN CLAY (CL) trace of gravel brown, very stiff, DTPL	5				
2	258.9		6	SS	03	460/610	23
		brown to grey, hard, moist	7				
			8	SS	04	460/610	31
3			9				
			10				
			11	SS	05	460/610	32
			12				
4			13				
			14				
	256.6		15				
		Hard augering grey, hard, moist	16	SS	06	410/610	50
5			17				
			18				
			19				
6			20				
	254.7		21	SS	07	410/610	45
		Borehole terminated at 6.55 m Borehole dry and open	22				
7			23				
			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 613 E: 596 708

BH63-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/07/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	262.1		0				
		TOPSOIL Silty Clay Brown, moist	1	SS	01	76/610	4
	261.8	**SANDY SILTY CLAY (CL-ML)** brown, very stiff, moist	2				
1			3	SS	02	200/610	21
			4				
	260.6		5				
		SANDY LEAN CLAY (CL) Some to trace gravel Hard, brown, moist	6	SS	03	200/610	34
2			7				
	259.9		8				
		With silty sand seams hard, brown, moist	9	SS	04	360/610	30
3			10				
	258.6		11	SS	05	380/610	41
		Borehole terminated at 3.6 m below ground surface Borehole dry and open	12				
4			13				
			14				
			15				
5			16				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 868 E: 596 467

BH/MW64-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/06/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	265.2		0				
		TOPSOIL Silty clay, some gravel Brown	1	SS	01	250/460	3
1	264.6	**SANDY SILTY CLAY (CL-ML)** brown, very stiff, moist	3	SS	02	360/460	21
	264.0	**SANDY LEAN CLAY (CL)** Some silty sand very stiff, brown, moist	6	SS	03	380/460	21
2	263.2	silt seams, some gravel Very stiff, brown, moist	8	SS	04	330/460	24
3	262.2	Silty Sand Seams very stiff, brown to grey, moist	11	SS	05	410/460	26
4	260.7	Some gravel grey, very stiff, moist	16	SS	06	460/460	22
5			21	SS	07	460/460	21
6							
7	257.6	hard, grey, moist	26	SS	08	250/460	38
8							
9	255.6		31	SS	09	460/460	59
10		Borehole terminated at 9.6 m Borehole dry and open	32				
11			36				
12			39				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

MONITORING WELL RECORD

N: 4 847 868 E: 596 467

BH/MW64-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/06/2023 — WATER LEVEL 03/10/2023 — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES N-VALUE
0	265.2		0			
		TOPSOIL				
	264.6	Silty clay, some gravel				
		Brown				
1	264.0	**SANDY SILTY CLAY (CL-ML)**	3	SS	01	3
		brown, very stiff, moist				
		SANDY LEAN CLAY (CL)				
2	263.2	Some silty sand	6	SS	02	21
		very stiff, brown, moist				
		silt seams, some gravel	8	SS	03	21
		Very stiff, brown, moist				
3	262.2		10	SS	04	24
		Silty Sand Seams				
		very stiff, brown to grey, moist	11	SS	05	26
4						
	260.7		15	SS	06	22
		Some gravel				
5		grey, very stiff, moist				
6			20	SS	07	21
7						
	257.6		25	SS	08	38
		hard, grey, moist				
8						
9			30	SS	09	59
	255.6					
		Borehole terminated at 9.6 m				
10		Borehole dry and open				
11						
12			39			

VAPOUR CONCENTRATIONS — ● %LEL ▲ ppm — ● 20 40 60 80 — ▲ 100 200 300 400

WELL CONSTRUCTION

LABORATORY ANALYSES:

Stantec

BOREHOLE RECORD

N: 4 847 743 E: 596 574

BH65-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/06/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	264.3		0				
		TOPSOIL Silty clay, trace of gravel Brown, firm, DTPL	1	SS	01	200/460	3
	263.8	**SANDY SILTY CLAY (CL-ML)** brown, very stiff, moist	2				
1			3	SS	02	430/460	19
	263.1	**SANDY LEAN CLAY (CL)** trace of gravel brown, very stiff, moist	4				
			5				
			6	SS	03	460/460	24
2			7				
			8	SS	04	460/460	24
	261.5		9				
		brown, hard, moist	10				
3			11	SS	05	460/460	34
	260.8	Borehole terminated at 3.5 m Borehole dry and open	12				
			13				
4			14				
			15				
			16				
5							

SAMPLES

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 762 E: 596 496

BH66-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/07/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	264.2		0				
	263.9	**TOPSOIL**					
		Silty clay, trace of gravel	1	SS	01	300/460	5
		Brown, firm, DTPL	2				
1		**SANDY SILTY CLAY (CL-ML)**	3	SS	02	410/460	18
		brown, very stiff, moist	4				
	262.7		5				
		SANDY LEAN CLAY (CL)	6	SS	03	360/460	19
2		trace of gravel	7				
		brown, very stiff, DTPL	8	SS	04	460/460	29
			9				
3	261.2		10				
		brown, hard, moist	11	SS	05	410/460	39
			12				
4			13				
	259.7		14				
		Very stiff, grey, moist	15				
			16	SS	06	460/460	16
5			17				
			18				
			19				
6			20				
			21	SS	07	380/460	26
			22				
7			23				
			24				
	256.6		25				
		hard augering	26	SS	08	460/460	38
8			27				
		hard, grey, moist	28				
			29				
9			30				
	254.6		31	SS	09	460/460	52
		Borehole terminated at 9.6 m	32				
10		Borehole dry and open	33				
			34				
			35				
11			36				
			37				
			38				
12			39				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 653 E: 596 595

BH67-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/07/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	262.8		0				
		TOPSOIL Silty clay, trace of gravel Brown, loose, DTPL	1	SS	01	250/460	4
	262.2	**SANDY SILTY CLAY (CL-ML)** brown, very stiff, moist	2				
1			3	SS	02	410/460	18
	261.3		4				
		SANDY LEAN CLAY (CL) trace of gravel brown, very stiff, DTPL	5				
			6	SS	03	410/460	27
2			7				
			8	SS	04	460/460	20
			9				
3			10				
			11	SS	05	460/460	27
			12				
4			13				
			14				
	258.2		15				
		Stiff, brown to grey, moist	16	SS	06	360/460	14
5	257.8		17				
		Very stiff, grey, moist	18				
			19				
6			20				
			21	SS	07	430/460	25
	256.3						
		Borehole terminated at 6.5 m Borehole dry and open	22				
7			23				
			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

10 20 30 40 50 60 70 80 90 100

REMARKS & GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

5 27 36 32

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 717 E: 596 386

BH68-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/10/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	SAMPLES TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	264.3		0				
		TOPSOIL Silty clay, trace of gravel Brown, firm, DTPL	1	SS	01	200/460	4
	263.9		2				
		SANDY SILTY CLAY (CL-ML) brown, very stiff, moist	3	SS	02	410/460	19
1			4				
	262.8		5				
		SANDY LEAN CLAY (CL) trace of gravel brown, very stiff, DTPL	6	SS	03	410/460	29
2			7				
			8	SS	04	460/460	22
			9				
3	261.3		10				
		brown to grey, hard, moist	11	SS	05	410/460	32
			12				
4			13				
			14				
	259.8		15				
		grey, hard, moist	16	SS	06	460/460	34
5			17				
			18				
			19				
6			20				
			21	SS	07	360/460	50
	257.8						
		Borehole terminated at 6.55	22				
7			23				
			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

Stantec

BOREHOLE RECORD

N: 4 847 530 E: 596 343

BH69-23

CLIENT QuadReal Properties — PROJECT No. 121624777

LOCATION 12489 Dixie Road — DATUM NAD83

DATES: BORING 02/06/2023 — WATER LEVEL — TPC ELEVATION

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	DEPTH (ft)	TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)
0	263.5		0				
		TOPSOIL Silty clay, trace of gravel brown, soft, moist	1	SS	01	250/460	3
	262.9	**SANDY SILTY CLAY (CL-ML)** brown, very stiff, moist	2				
1	262.3		3	SS	02	200/460	20
		SANDY LEAN CLAY (CL) trace of gravel brown, very stiff, moist	4				
			5				
			6	SS	03	300/460	26
2			7				
			8	SS	04	460/460	29
			9				
3	260.5		10				
		hard, brown to grey, moist	11	SS	05	300/460	53
	260.0		12				
		Hard to very stiff, grey, moist	13				
4			14				
			15				
			16	SS	06	460/460	25
5			17				
			18				
			19				
6			20				
			21	SS	07	460/460	22
	257.0		22				
		Borehole terminated at 6.55	23				
7			24				
			25				
8			26				

UNDRAINED SHEAR STRENGTH (kPa)

50 100 150 200

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m ▼

STANDARD PENETRATION TEST, BLOWS/0.3m ●

REMARKS & GRAIN SIZE DISTRIBUTION (%)

10 20 30 40 50 60 70 80 90 100

GR SA SI CL

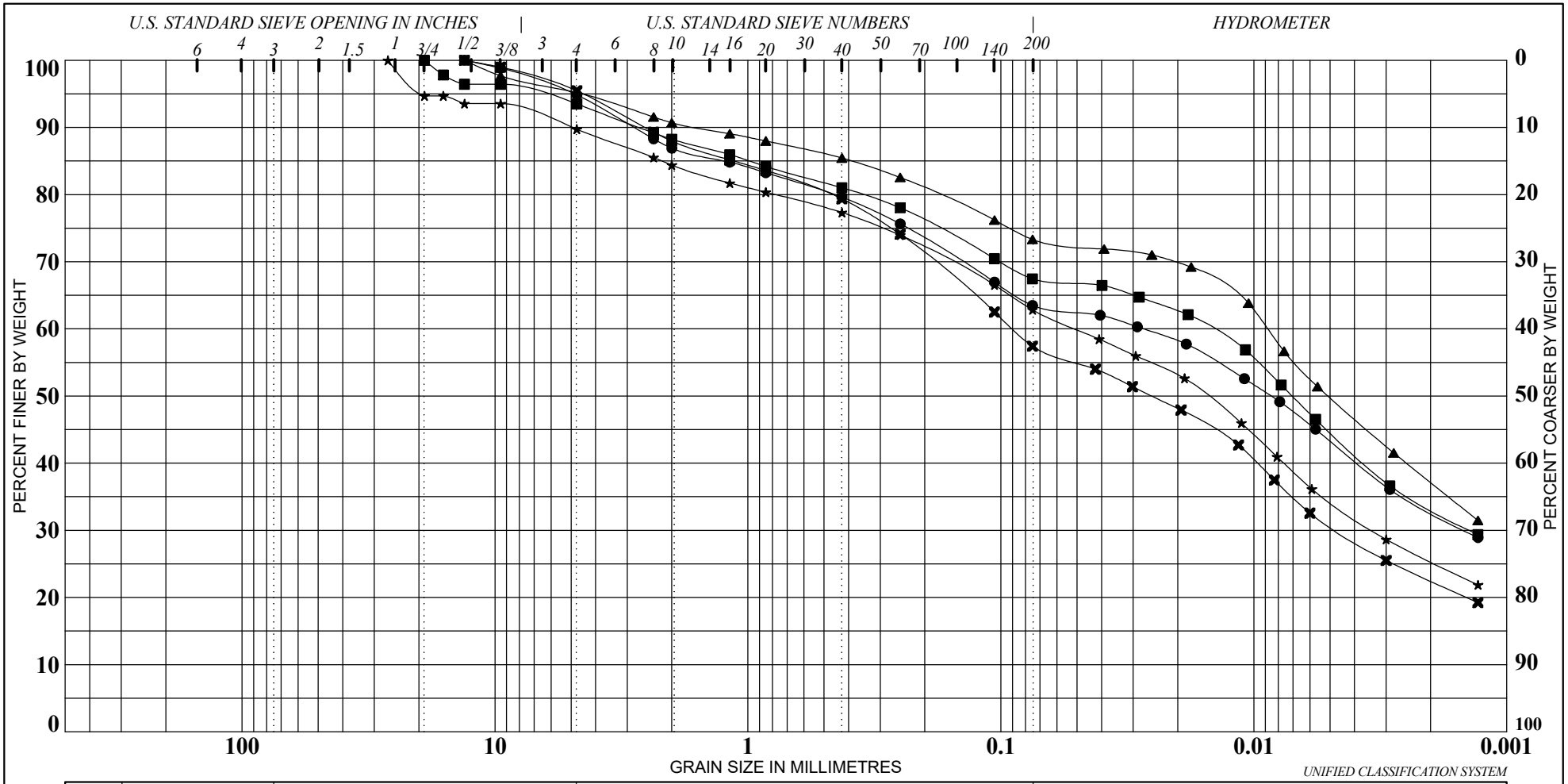
□ Field Vane Test, kPa

■ Remoulded Vane Test, kPa

△ Pocket Penetrometer Test, kPa

APPENDIX D

D.1 LABORATORY TEST RESULTS - GRADATION, ATTERBERG LIMITS AND CORROSIVITY TESTING



BLDs	COBBLES	GRAVEL		SAND			SILT & CLAY	
		coarse	fine	coarse	medium	fine	SILT	CLAY

Sample	Depth (m)	Description	W%	W_L	W_P	I_P	%Gravel	%Sand	%Silt	%Clay
● BH-15-23	1.8	SANDY LEAN CLAY(CL)		26	13	13	5	31	31	33
■ BH-18-23	3.3	SANDY LEAN CLAY(CL)					6	27	34	33
▲ BH-19-23	3.3	LEAN CLAY with SAND(CL)		27	13	14	5	22	36	37
★ BH-20-23	3.3	SANDY LEAN CLAY(CL)					10	28	37	25
✖ BH-21-23	6.3	SANDY LEAN CLAY(CL)		18	10	8	5	38	35	22

Stantec

Project: 12861 Dixie Road

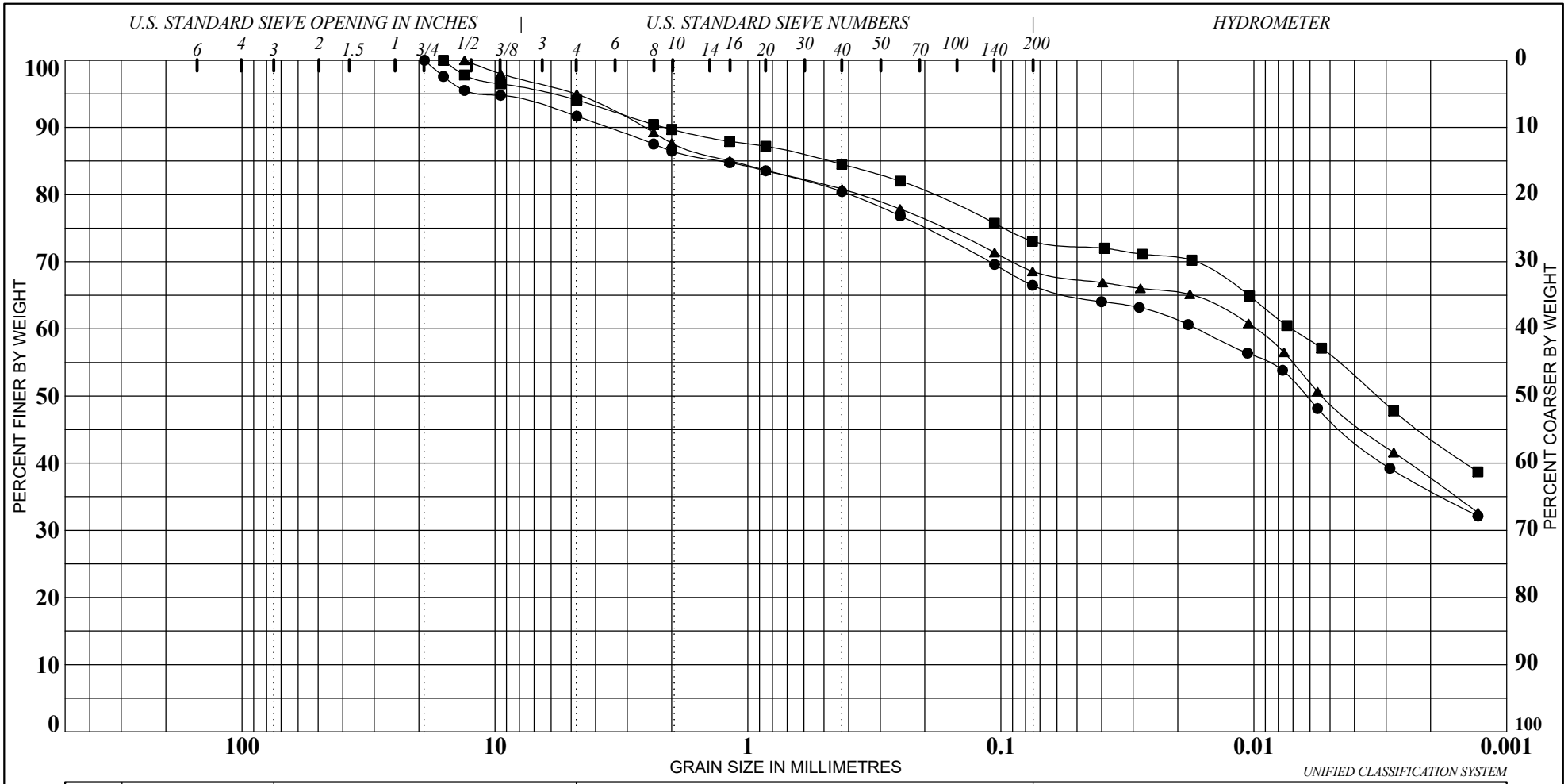
Location:

Project No.: 121624778

GRADATION CURVE (ASTM D422)

Figure: 1

Remarks:



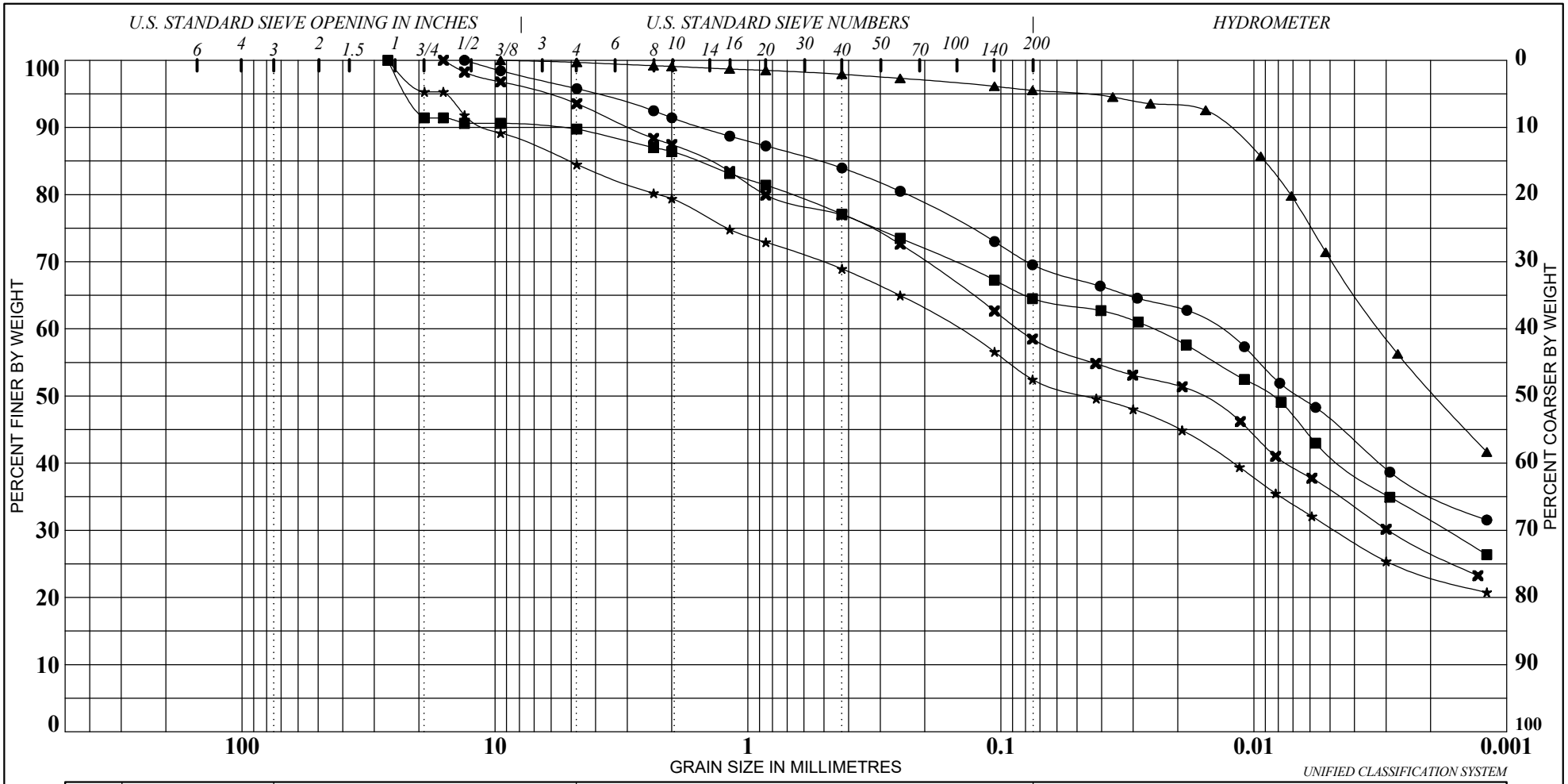
BLDs	COBBLES	GRAVEL		SAND			SILT & CLAY	
		coarse	fine	coarse	medium	fine	SILT	CLAY

Sample	Depth (m)	Description	W%	W_L	W_P	I_P	%Gravel	%Sand	%Silt	%Clay
● BH-22-23	3.3	SANDY LEAN CLAY(CL)					8	25	31	36
■ BH-26-23	2.5	LEAN CLAY with SAND(CL)					6	21	29	44
▲ BH-31-23	3.3	SANDY LEAN CLAY(CL)		29	13	16	5	26	31	38

Stantec

Project: 12861 Dixie Road
Location:
Project No.: 121624778

GRADATION CURVE (ASTM D422)
Figure: 2
Remarks:



BLDs	COBBLES	GRAVEL		SAND			SILT & CLAY	
		coarse	fine	coarse	medium	fine	SILT	CLAY

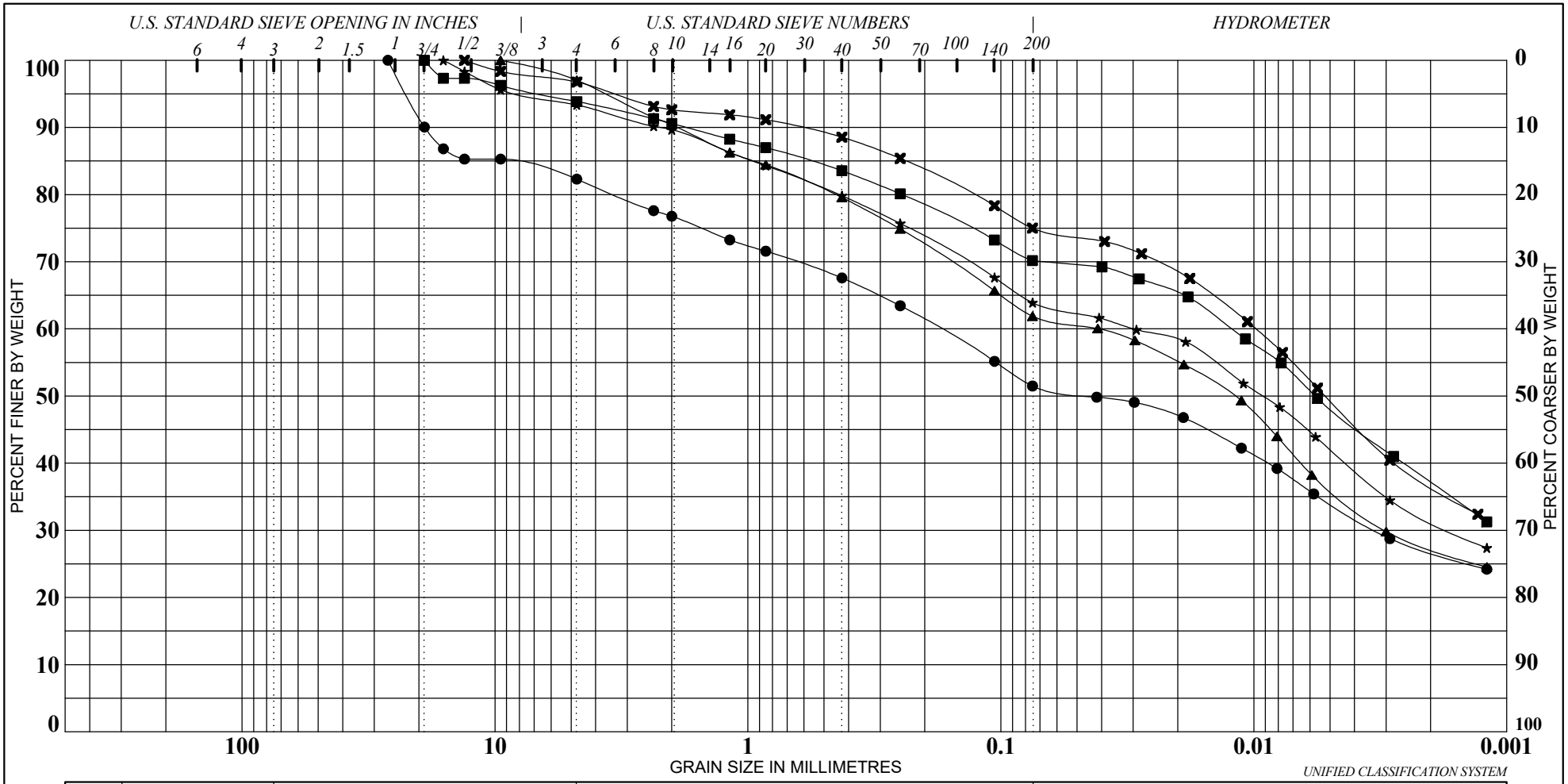
Sample	Depth (m)	Description	W%	W_L	W_P	I_P	%Gravel	%Sand	%Silt	%Clay
●	BH/MW38-23 1.8	SANDY LEAN CLAY(CL)					4	26	34	36
■	BH/MW38-23 4.1	SANDY LEAN CLAY(CL)		30	12	18	10	26	33	31
▲	BH/MW38-23 7.9	LEAN CLAY(CL)					0	4	45	51
★	BH39-23 3.4	SANDY SILTY CLAYwith GRAVEL(CL-ML)					16	32	29	23
✖	BH40-23 1.8	SANDY SILTY CLAY(CL-ML)					6	35	32	27

Stantec

Project: 12489 Dixie Road, Caledon
Location: Caledon,ON
Project No.: 121624777

GRADATION CURVE (ASTM D422)

Figure: 1
Remarks:



BLDs	COBBLES	GRAVEL		SAND			SILT & CLAY	
		coarse	fine	coarse	medium	fine	SILT	CLAY

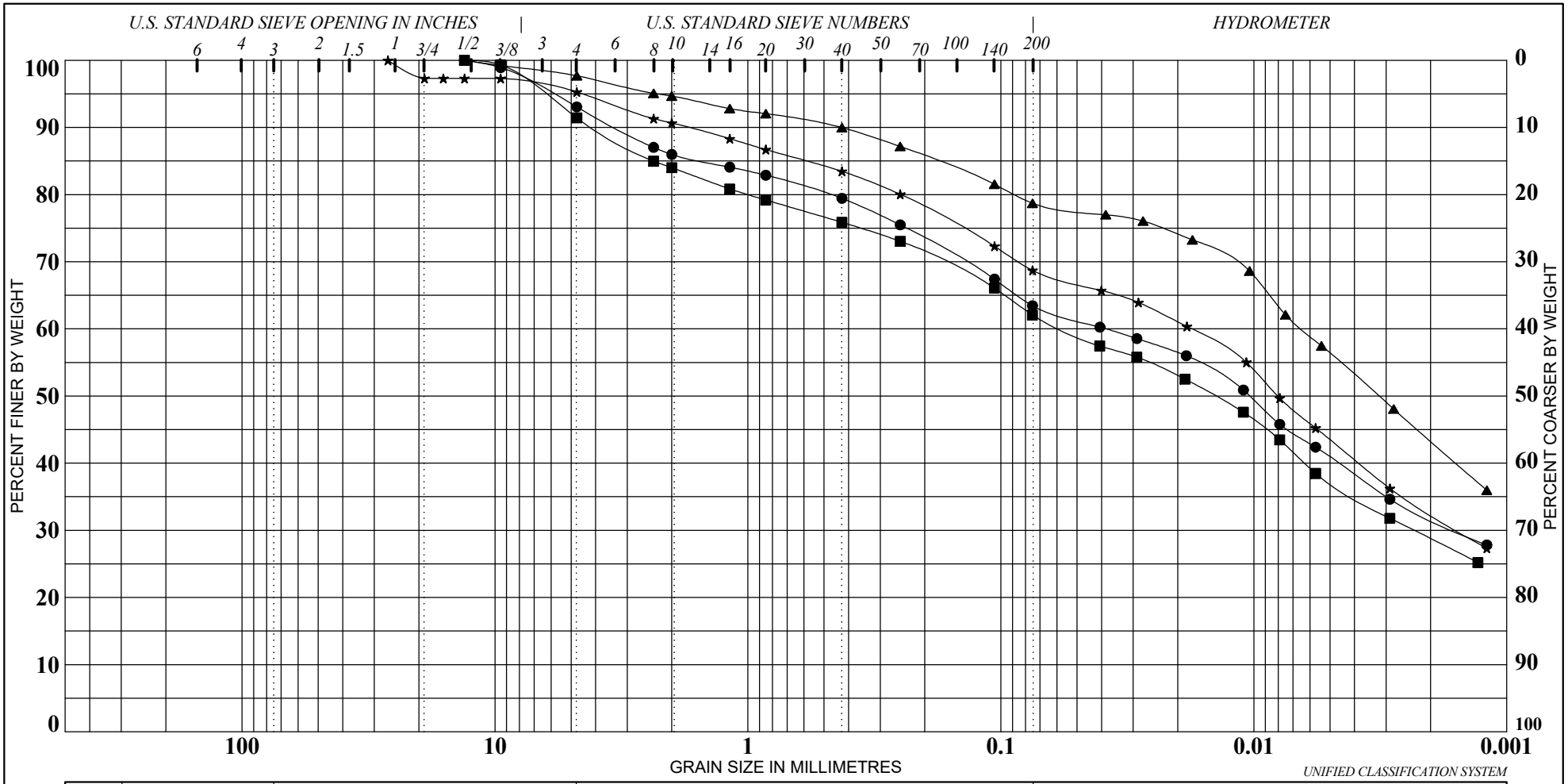
Sample	Depth (m)	Description	W%	W_L	W_P	I_P	%Gravel	%Sand	%Silt	%Clay
● BH40-23	4.9	SANDY SILTY CLAYwith GRAVEL(CL-ML)					18	30	25	27
■ BH/MW51-23	1.8	SANDY LEAN CLAY(CL)					6	24	33	37
▲ BH52-23	1.8	SANDY SILTY CLAY(CL-ML)					3	36	34	27
★ BH52-23	3.4	SANDY LEAN CLAY(CL)		28	12	16	7	30	32	31
✖ BH57-23	2.6	LEAN CLAY with SAND(CL)					3	22	38	37

Stantec

Project: 12489 Dixie Road, Caledon
Location: Caledon,ON
Project No.: 121624777

GRADATION CURVE (ASTM D422)

Figure: 2
Remarks:



BLDs	COBBLES	GRAVEL		SAND			SILT & CLAY	
		coarse	fine	coarse	medium	fine	SILT	CLAY

Sample	Depth (m)	Description	W%	W_L	W_P	I_P	%Gravel	%Sand	%Silt	%Clay
● BH/MW46-23	3.4	SANDY LEAN CLAY(CL)		26	12	14	7	29	32	32
■ BH/MW55-23	2.6	SANDY LEAN CLAY(CL)					9	29	33	29
▲ BH59-23	1.8	LEAN CLAY with SAND(CL)					2	20	35	43
★ BH67-23	2.6	SANDY LEAN CLAY(CL)					5	27	36	32

Stantec

Project: 12489 Dixie Road,Caledon

Location:

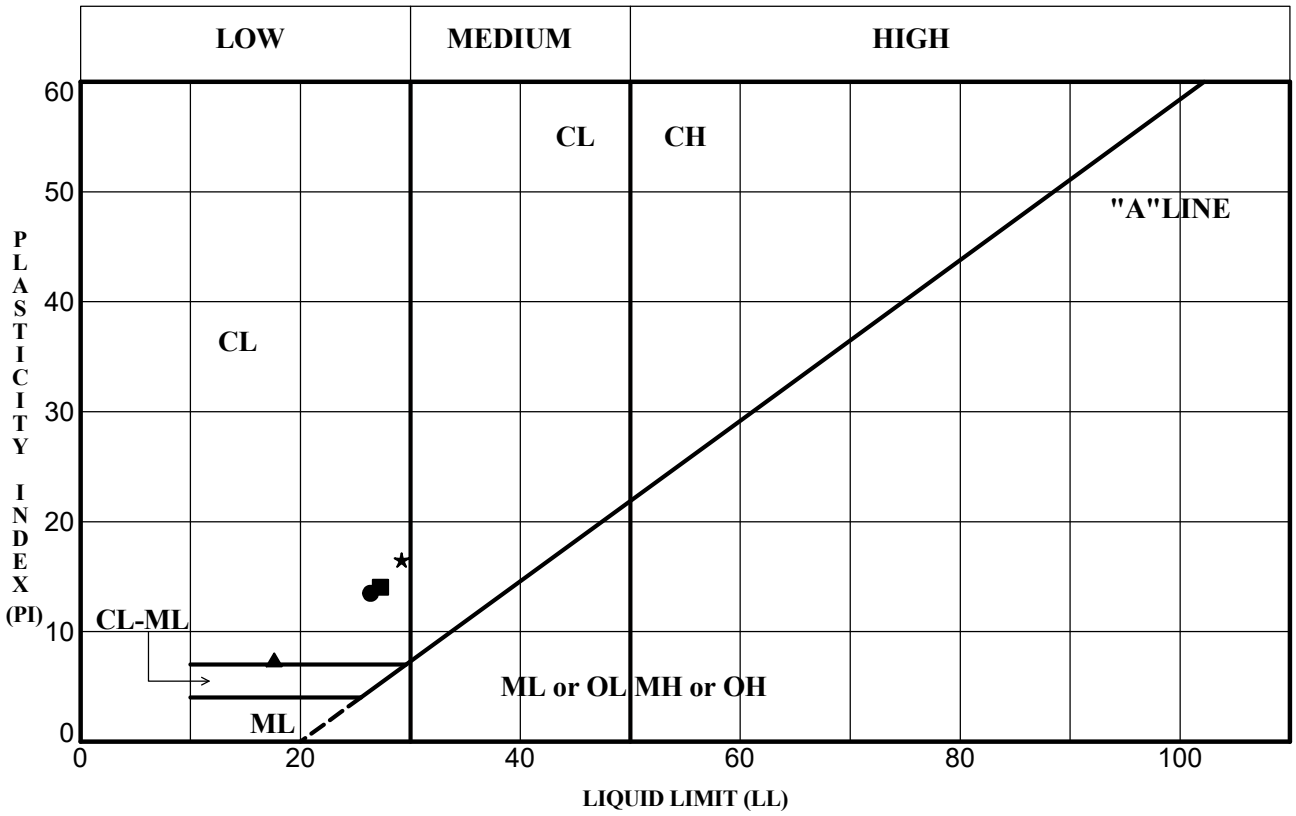
Project No.: 121624777

GRADATION CURVE (ASTM D422)

Figure: 1

Remarks:

PLASTICITY CHART



	Specimen	Depth (m)	LL	PL	PI	Fines	W%	Classification
●	BH-15-23	1.8	26	13	13	63		SANDY LEAN CLAY(CL)
■	BH-19-23	3.3	27	13	14	73		LEAN CLAY with SAND(CL)
▲	BH-21-23	6.3	18	10	8	57		SANDY LEAN CLAY(CL)
★	BH-31-23	3.3	29	13	16	69		SANDY LEAN CLAY(CL)

Stantec

Project: 12861 Dixie Road

Location:

Project No.: 121624778

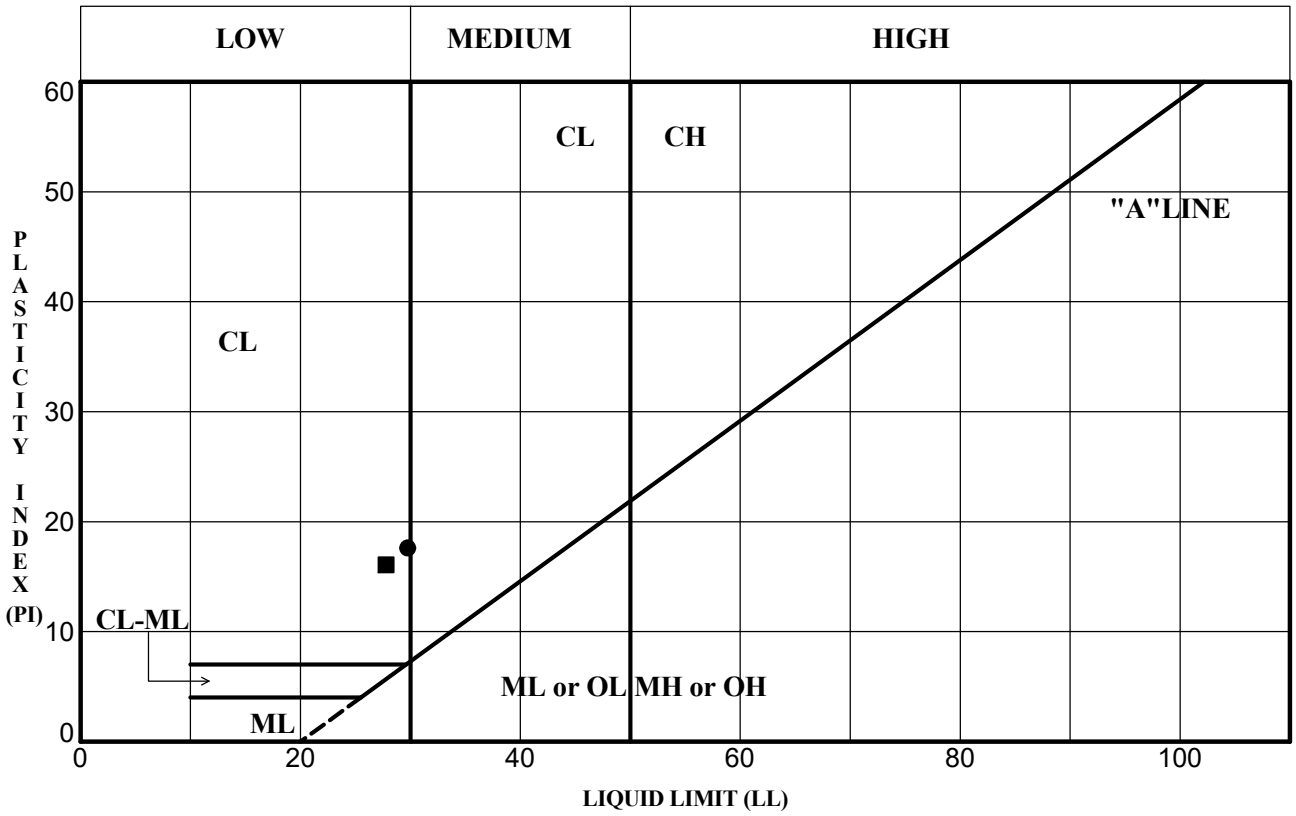
ATTERBERG LIMITS
(ASTM D4318)

Figure: 3

Remarks:

STN13-ATTERBERG 121624778.GPJ STANTEC_MARKHAM_DATA_TEMPLATE_2015-05-20.GDT 3/10/23

PLASTICITY CHART



	Specimen	Depth (m)	LL	PL	PI	Fines	W%	Classification
●	BH/MW38-23	4.1	30	12	18	65		SANDY LEAN CLAY(CL)
■	BH52-23	3.4	28	12	16	64		SANDY LEAN CLAY(CL)

Stantec

Project: 12489 Dixie Road, Caledon

Location: Caledon,ON

Project No.: 121624777

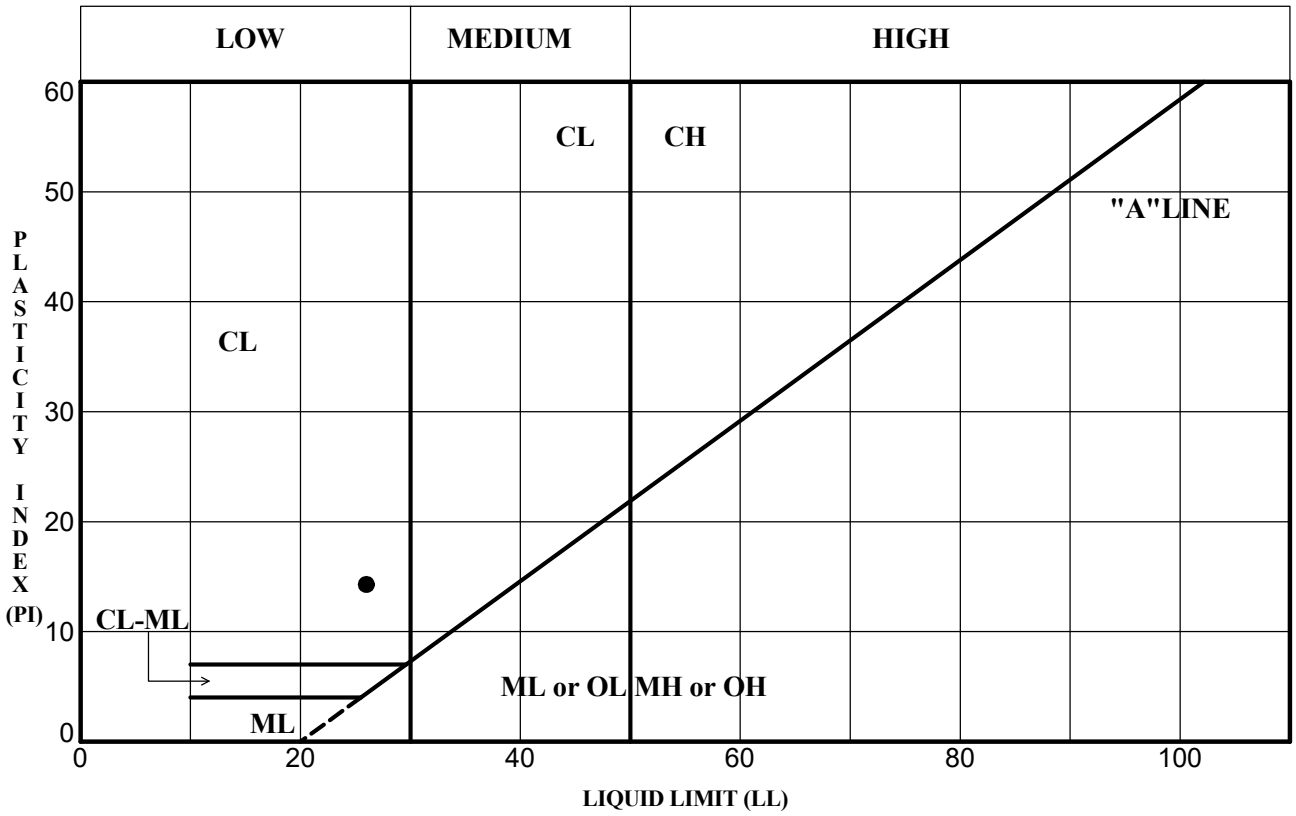
ATTERBERG LIMITS
(ASTM D4318)

Figure: 3

Remarks:

STN13-ATTERBERG 121624777.GPJ STANTEC_MARKHAM_DATA_TEMPLATE 2015-05-20.GDT 2/16/23

PLASTICITY CHART



	Specimen	Depth (m)	LL	PL	PI	Fines	W%	Classification
●	BH/MW46-23	3.4	26	12	14	63		SANDY LEAN CLAY(CL)

Stantec

Project: 12489 Dixie Road,Caledon

Location:

Project No.: 121624777

ATTERBERG LIMITS
(ASTM D4318)

Figure: 2

Remarks:

STN13-ATTERBERG 121624777.GPJ STANTEC_MARKHAM_DATA_TEMPLATE_2015-05-20.GDT 2/17/23

CERTIFICATE OF ANALYSIS

Work Order	: **WT2305175**	Page	: 1 of 3
Client	: **Stantec Consulting Ltd.**	Laboratory	: Waterloo - Environmental
Contact	: Essa Nimer	Account Manager	: Mathy Mahadeva
Address	: 100-300 Hagey Blvd. Waterloo ON Canada N2L 0A4	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 121624778	Date Samples Received	: 03-Mar-2023 10:35
PO	: ----	Date Analysis Commenced	: 03-Mar-2023
C-O-C number	: ----	Issue Date	: 09-Mar-2023 10:31
Sampler	: CLIENT		
Site	: ----		
Quote number	: Stantec 2022-2023 MSA		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Amanda Ganouri-Lumsden	Department Manager - Microbiology and Prep	Centralized Prep, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Inorganics, Waterloo, Ontario

General Comments

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

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

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

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

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

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BH-18-23-S5 7.5'-9'	BH-20-23-S4 7.5'-9'	BH-26-23-S4-7. 5'-9'	BH-31-23-S4-7. 5'-9'	----
					Client sampling date / time	28-Feb-2023 13:00	28-Feb-2023 11:00	27-Feb-2023 14:00	27-Feb-2023 08:30	----
						WT2305175-001	WT2305175-002	WT2305175-003	WT2305175-004	--------
						Result	Result	Result	Result	----
Physical Tests										
Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm		129	163	197	158	----
Moisture	----	E144	0.25	%		11.1	12.9	14.5	14.0	----
Oxidation-reduction potential [ORP]	----	E125	0.10	mV		304	291	267	257	----
pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units		7.85	7.85	7.70	7.62	----
Resistivity	----	EC100R	100	ohm cm		7750	6130	5080	6330	----
Inorganics										
Sulfides, acid volatile	----	E396-L	0.20	mg/kg		0.27	<0.23	<0.23	0.65	----
Leachable Anions & Nutrients										
Chloride, soluble ion content	16887-00-6	E236.Cl	5.0	mg/kg		<5.0	14.6	13.8	12.4	----
Sulfate, soluble ion content	14808-79-8	E236.SO4	20	mg/kg		<20	30	<20	<20	----

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2305175**	Page	: 1 of 9
Client	: **Stantec Consulting Ltd.**	Laboratory	: Waterloo - Environmental
Contact	: Essa Nimer	Account Manager	: Mathy Mahadeva
Address	: 100-300 Hagey Blvd. Waterloo ON Canada N2L 0A4	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 121624778	Date Samples Received	: 03-Mar-2023 10:35
PO	: ----	Issue Date	: 09-Mar-2023 10:31
C-O-C number	: ----		
Sampler	: CLIENT		
Site	: ----		
Quote number	: Stantec 2022-2023 MSA		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Inorganics : Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)										
Glass soil jar/Teflon lined cap [ON MECP] BH-18-23-S5 7.5'-9'	E396-L	28-Feb-2023	06-Mar-2023	14 days	6 days	✓	06-Mar-2023	7 days	0 days	✓
Inorganics : Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)										
Glass soil jar/Teflon lined cap [ON MECP] BH-20-23-S4 7.5'-9'	E396-L	28-Feb-2023	06-Mar-2023	14 days	6 days	✓	06-Mar-2023	7 days	0 days	✓
Inorganics : Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)										
Glass soil jar/Teflon lined cap [ON MECP] BH-26-23-S4-7.5'-9'	E396-L	27-Feb-2023	06-Mar-2023	14 days	7 days	✓	06-Mar-2023	7 days	0 days	✓
Inorganics : Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)										
Glass soil jar/Teflon lined cap [ON MECP] BH-31-23-S4-7.5'-9'	E396-L	27-Feb-2023	06-Mar-2023	14 days	7 days	✓	06-Mar-2023	7 days	0 days	✓
Leachable Anions & Nutrients : Water Extractable Chloride by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH-18-23-S5 7.5'-9'	E236.Cl	28-Feb-2023	06-Mar-2023	30 days	6 days	✓	07-Mar-2023	28 days	1 days	✓
Leachable Anions & Nutrients : Water Extractable Chloride by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH-20-23-S4 7.5'-9'	E236.Cl	28-Feb-2023	06-Mar-2023	30 days	6 days	✓	07-Mar-2023	28 days	1 days	✓
Leachable Anions & Nutrients : Water Extractable Chloride by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH-26-23-S4-7.5'-9'	E236.Cl	27-Feb-2023	06-Mar-2023	30 days	7 days	✓	07-Mar-2023	28 days	1 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Leachable Anions & Nutrients : Water Extractable Chloride by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH-31-23-S4-7.5'-9'	E236.Cl	27-Feb-2023	06-Mar-2023	30 days	7 days	✓	07-Mar-2023	28 days	1 days	✓
Leachable Anions & Nutrients : Water Extractable Sulfate by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH-18-23-S5 7.5'-9'	E236.SO4	28-Feb-2023	06-Mar-2023	30 days	6 days	✓	07-Mar-2023	28 days	1 days	✓
Leachable Anions & Nutrients : Water Extractable Sulfate by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH-20-23-S4 7.5'-9'	E236.SO4	28-Feb-2023	06-Mar-2023	30 days	6 days	✓	07-Mar-2023	28 days	1 days	✓
Leachable Anions & Nutrients : Water Extractable Sulfate by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH-26-23-S4-7.5'-9'	E236.SO4	27-Feb-2023	06-Mar-2023	30 days	7 days	✓	07-Mar-2023	28 days	1 days	✓
Leachable Anions & Nutrients : Water Extractable Sulfate by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH-31-23-S4-7.5'-9'	E236.SO4	27-Feb-2023	06-Mar-2023	30 days	7 days	✓	07-Mar-2023	28 days	1 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH-18-23-S5 7.5'-9'	E100-L	28-Feb-2023	06-Mar-2023	----	----		07-Mar-2023	30 days	7 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH-20-23-S4 7.5'-9'	E100-L	28-Feb-2023	06-Mar-2023	----	----		07-Mar-2023	30 days	7 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH-26-23-S4-7.5'-9'	E100-L	27-Feb-2023	06-Mar-2023	----	----		07-Mar-2023	30 days	8 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH-31-23-S4-7.5'-9'	E100-L	27-Feb-2023	06-Mar-2023	----	----		07-Mar-2023	30 days	8 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP]										
BH-18-23-S5 7.5'-9'	E144	28-Feb-2023	----	----	----		04-Mar-2023	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP]										
BH-20-23-S4 7.5'-9'	E144	28-Feb-2023	----	----	----		04-Mar-2023	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP]										
BH-26-23-S4-7.5'-9'	E144	27-Feb-2023	----	----	----		04-Mar-2023	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP]										
BH-31-23-S4-7.5'-9'	E144	27-Feb-2023	----	----	----		04-Mar-2023	----	----	
Physical Tests : ORP by Electrode										
Glass soil jar/Teflon lined cap [ON MECP]										
BH-18-23-S5 7.5'-9'	E125	28-Feb-2023	04-Mar-2023	----	----		06-Mar-2023	180 days	6 days	✓
Physical Tests : ORP by Electrode										
Glass soil jar/Teflon lined cap [ON MECP]										
BH-20-23-S4 7.5'-9'	E125	28-Feb-2023	04-Mar-2023	----	----		06-Mar-2023	180 days	6 days	✓
Physical Tests : ORP by Electrode										
Glass soil jar/Teflon lined cap [ON MECP]										
BH-26-23-S4-7.5'-9'	E125	27-Feb-2023	04-Mar-2023	----	----		06-Mar-2023	180 days	7 days	✓
Physical Tests : ORP by Electrode										
Glass soil jar/Teflon lined cap [ON MECP]										
BH-31-23-S4-7.5'-9'	E125	27-Feb-2023	04-Mar-2023	----	----		06-Mar-2023	180 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP]										
BH-18-23-S5 7.5'-9'	E108A	28-Feb-2023	03-Mar-2023	----	----		06-Mar-2023	30 days	6 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP]										
BH-20-23-S4 7.5'-9'	E108A	28-Feb-2023	03-Mar-2023	----	----		06-Mar-2023	30 days	6 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP]										
BH-26-23-S4-7.5'-9'	E108A	27-Feb-2023	03-Mar-2023	----	----		06-Mar-2023	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP]										
BH-31-23-S4-7.5'-9'	E108A	27-Feb-2023	03-Mar-2023	----	----		06-Mar-2023	30 days	7 days	✓

Legend & Qualifier Definitions

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

Quality Control Parameter Frequency Compliance

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

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)	E396-L	853722	1	10	10.0	4.7	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	851871	1	8	12.5	5.0	✓
Moisture Content by Gravimetry	E144	852777	1	20	5.0	5.0	✓
ORP by Electrode	E125	852781	1	10	10.0	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	851972	1	14	7.1	5.0	✓
Water Extractable Chloride by IC	E236.Cl	853954	1	8	12.5	5.0	✓
Water Extractable Sulfate by IC	E236.SO4	853953	1	8	12.5	5.0	✓
Laboratory Control Samples (LCS)							
Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)	E396-L	853722	1	10	10.0	4.7	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	851871	2	8	25.0	10.0	✓
Moisture Content by Gravimetry	E144	852777	1	20	5.0	5.0	✓
ORP by Electrode	E125	852781	1	10	10.0	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	851972	1	14	7.1	5.0	✓
Water Extractable Chloride by IC	E236.Cl	853954	2	8	25.0	10.0	✓
Water Extractable Sulfate by IC	E236.SO4	853953	2	8	25.0	10.0	✓
Method Blanks (MB)							
Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)	E396-L	853722	1	10	10.0	4.7	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	851871	1	8	12.5	5.0	✓
Moisture Content by Gravimetry	E144	852777	1	20	5.0	5.0	✓
Water Extractable Chloride by IC	E236.Cl	853954	1	8	12.5	5.0	✓
Water Extractable Sulfate by IC	E236.SO4	853953	1	8	12.5	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L Waterloo - Environmental	Soil/Solid	CSSS Ch. 15 (mod)/APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Conductance is measured in the fluid that is observed in the upper layer.
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A Waterloo - Environmental	Soil/Solid	MOEE E3137A	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C) and is carried out in accordance with procedures described in the Analytical Protocol (prescriptive method). A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling, or decanting and then analyzed using a pH meter and electrode.
ORP by Electrode	E125 Waterloo - Environmental	Soil/Solid	APHA 2580 (mod)	Oxidation Redution Potential (ORP) is reported as the oxidation-reduction potential of the platinum metal-reference electrode employed in the analysis, measured in mV.
Moisture Content by Gravimetry	E144 Waterloo - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Water Extractable Chloride by IC	E236.Cl Waterloo - Environmental	Soil/Solid	EPA 300.1	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection using a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Anions are measured in the fluid that is observed in the upper layer.
Water Extractable Sulfate by IC	E236.SO4 Waterloo - Environmental	Soil/Solid	EPA 300.1	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection using a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Anions are measured in the fluid that is observed in the upper layer.
Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)	E396-L Waterloo - Environmental	Soil/Solid	APHA 4500S2J	This analysis is carried out in accordance with the method described in APHA 4500 S2-J. After extraction the Acid Volatile Sulphide is determined colourimetrically.
Resistivity Calculation for Soil Using E100-L	EC100R Waterloo - Environmental	Soil/Solid	APHA 2510 B	Soil Resistivity (calculated) is determined as the inverse of the conductivity of a 2:1 water:soil leachate (dry weight). This method is intended as a rapid approximation for Soil Resistivity. Where high accuracy results are required, direct measurement of Soil Resistivity by the Wenner Four-Electrode Method (ASTM G57) is recommended.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 Waterloo - Environmental	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Leach 1:2 Soil : 0.01CaCl2 - As Received for pH	EP108A Waterloo - Environmental	Soil/Solid	MOEE E3137A	A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling or decanting and then analyzed using a pH meter and electrode.
Preparation of ORP by Electrode	EP125 Waterloo - Environmental	Soil/Solid	APHA 2580 (mod)	Field-moist sample is extracted in a 1:2 ratio with DI water and then analyzed by ORP meter.
Anions Leach 1:10 Soil:Water (Dry)	EP236 Waterloo - Environmental	Soil/Solid	EPA 300.1	5 grams of dried soil is mixed with 50 grams of distilled water for a minimum of 30 minutes. The extract is filtered and analyzed by ion chromatography.
Distillation for Acid Volatile Sulfide in Soil	EP396-L Waterloo - Environmental	Soil/Solid	APHA 4500S2J	Acid Volatile Sulfide is determined by colourimetric measurement on a sediment sample that has been treated with hydrochloric acid within a purge and trap system, where the evolved hydrogen sulfide gas is carried into a basic solution by argon gas for analysis.

QUALITY CONTROL REPORT

Work Order	: **WT2305175**	Page	: 1 of 5
Client	: Stantec Consulting Ltd.	Laboratory	: Waterloo - Environmental
Contact	: Essa Nimer	Account Manager	: Mathy Mahadeva
Address	: 100-300 Hagey Blvd. Waterloo ON Canada N2L 0A4	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	:	Telephone	: +1 519 886 6910
Project	: 121624778	Date Samples Received	: 03-Mar-2023 10:35
PO	: ----	Date Analysis Commenced	: 03-Mar-2023
C-O-C number	: ----	Issue Date	: 09-Mar-2023 10:31
Sampler	: CLIENT ----		
Site	: ----		
Quote number	: Stantec 2022-2023 MSA		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Amanda Ganouri-Lumsden	Department Manager - Microbiology and Prep	Waterloo Centralized Prep, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario

General Comments

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

Key :

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

Workorder Comments

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 851871)											
WT2305208-002	Anonymous	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	2.02 mS/cm	2030	0.494%	20%	----
Physical Tests (QC Lot: 851972)											
WT2305151-001	Anonymous	pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units	7.39	7.34	0.679%	5%	----
Physical Tests (QC Lot: 852777)											
WT2305198-002	Anonymous	Moisture	----	E144	0.25	%	19.7	19.7	0.383%	20%	----
Physical Tests (QC Lot: 852781)											
WT2305175-001	BH-18-23-S5 7.5'-9'	Oxidation-reduction potential [ORP]	----	E125	0.10	mV	304	339	10.9%	25%	----
Inorganics (QC Lot: 853722)											
WT2304678-001	Anonymous	Sulfides, acid volatile	----	E396-L	0.21	mg/kg	<0.22	<0.21	0.21	Diff <2x LOR	----
Leachable Anions & Nutrients (QC Lot: 853953)											
WT2305175-001	BH-18-23-S5 7.5'-9'	Sulfate, soluble ion content	14808-79-8	E236.SO4	20	mg/kg	<20	<20	0	Diff <2x LOR	----
Leachable Anions & Nutrients (QC Lot: 853954)											
WT2305175-001	BH-18-23-S5 7.5'-9'	Chloride, soluble ion content	16887-00-6	E236.Cl	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----

Method Blank (MB) Report

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

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 851871)						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Physical Tests (QCLot: 852777)						
Moisture	----	E144	0.25	%	<0.25	----
Inorganics (QCLot: 853722)						
Sulfides, acid volatile	----	E396-L	0.2	mg/kg	<0.20	----
Leachable Anions & Nutrients (QCLot: 853953)						
Sulfate, soluble ion content	14808-79-8	E236.SO4	20	mg/kg	<20	----
Leachable Anions & Nutrients (QCLot: 853954)						
Chloride, soluble ion content	16887-00-6	E236.Cl	5	mg/kg	<5.0	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 851871)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1409 µS/cm	99.1	90.0	110	----
Physical Tests (QCLot: 851972)									
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 852777)									
Moisture	----	E144	0.25	%	50 %	100	90.0	110	----
Inorganics (QCLot: 853722)									
Sulfides, acid volatile	----	E396-L	0.2	mg/kg	2.472 mg/kg	73.6	70.0	130	----
Leachable Anions & Nutrients (QCLot: 853953)									
Sulfate, soluble ion content	14808-79-8	E236.SO4	20	mg/kg	5000 mg/kg	99.6	80.0	120	----
Leachable Anions & Nutrients (QCLot: 853954)									
Chloride, soluble ion content	16887-00-6	E236.Cl	5	mg/kg	5000 mg/kg	101	80.0	120	----

Reference Material (RM) Report

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

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Physical Tests (QCLot: 851871)									
	RM	Conductivity (1:2 leachate)	----	E100-L	1875.8 µS/cm	95.3	70.0	130	----
Physical Tests (QCLot: 852781)									
	RM	Oxidation-reduction potential [ORP]	----	E125	475 mV	102	80.0	120	----
Leachable Anions & Nutrients (QCLot: 853953)									
	RM	Sulfate, soluble ion content	14808-79-8	E236.SO4	589 mg/kg	107	70.0	130	----
Leachable Anions & Nutrients (QCLot: 853954)									
	RM	Chloride, soluble ion content	16887-00-6	E236.Cl	466 mg/kg	102	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page 1 of 1

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Environmental Division Waterloo

Work Order Reference

WT2305175

Telephone : +1 519 886 6910

Report To	Contact and company name below will appear on the final report	Reports / Recipients	Turnaround Time (TAT) Requested
Company:	Stantec Consulting	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	☑ Routine [R] if received by 3pm M-F - no surcharges apply
Contact:	Essa Nimer	Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A	☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minir
Phone:	226-338-0812	☐ Compare Results to Criteria on Report - provide details below if box checked	☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge mini
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge mini
Street:	100-300 Hagey Blvd	Email 1 or Fax Raid.Khamis@stantec.com	☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge min
City/Province:	Waterloo, ON	Email 2 Essa.Nimer@stantec.com	☐ Same day [E2] if received by 10am M-S - 200% rush surchar
Postal Code:	N2L 0A4	Email 3	Additional fees may apply to rush requests on weeker
Invoice To	Same as Report To ☑ YES ☐ NO	**Invoice Recipients**	Date and Time Required for all E&P TATs:
	Copy of Invoice with Report ☐ YES ☐ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	For all tests with rush TATs requested, please contact your AM to confirm availability.
Company:		Email 1 or Fax Raid.Khamis@stantec.com	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#
Job #:	121624778	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (ALS use only): WT2305175 **ALS Contact:** Mathy **Sampler:**

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Corrosivity packagae	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	BH-18-23- S4 7.5'-9'	28-Feb-23	13:00	Soil		R			
	BH-20-23- S4 7.5'-9'	28-Feb-23	11:00	Soil		R			
	BH-26-23- S4 - 7.5'-9'	27-Feb-23	14:00	Soil		R			
	BH-31-23- S4 - 7.5'-9'	27-Feb-23	8:30	Soil		R			

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	
Are samples for human consumption/ use? ☐ YES ☑ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☑ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
				16.8			

SHIPMENT RELEASE (client use)				INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Essa Nimer	Date: 3-Mar	Time: #######	Received by:	Date:	Time:	Received by:	Date: 3-MAR-23	Time: 1035

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

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

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

SOL-934.

CERTIFICATE OF ANALYSIS

Work Order	: **WT2303358**		
Amendment	: **1**		
Client	: **Stantec Consulting Ltd.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Essa Nimer	Account Manager	: Mathy Mahadeva
Address	: 100-300 Hagey Blvd. Waterloo Ontario Canada N2L 0A4	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 121624777	Date Samples Received	: 13-Feb-2023 09:10
PO	: ----	Date Analysis Commenced	: 14-Feb-2023
C-O-C number	: ----	Issue Date	: 25-Nov-2024 17:12
Sampler	: CLIENT		
Site	: ----		
Quote number	: Stantec 2024-2027 Standing Offer		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Amanda Ganouri-Lumsden	Department Manager - Microbiology and Prep	Centralized Prep, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Inorganics, Waterloo, Ontario

General Comments

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

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

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

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key: CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
LOR: Limit of Reporting (detection limit).

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

<: less than.
>: greater than.
Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Workorder Comments

Amendment (25-NOV-24): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Essa Nimer on 25-NOV-24. All sample ID's updated. All analysis results are as per the previous report.

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	BH47-23-S3-5'-6.5'	BH/MW55-23-S2-5'-6.5'	BH57-23-S3-7.5'-9'	BH59-23-S3-7.5'-9'	BH62-23-S3-7.5'-9'
Client sample ID									
Client sampling date / time					31-Jan-2023 13:00	31-Jan-2023 15:00	24-Jan-2023 14:00	03-Feb-2023 10:00	03-Feb-2023 13:00
					WT2303358-001	WT2303358-002	WT2303358-003	WT2303358-004	WT2303358-005
					Result	Result	Result	Result	Result
Physical Tests									
Conductivity (1:2 leachate)	----	E100-L/WT	5.00	µS/cm	172	185	190	197	188
Moisture	----	E144/WT	0.25	%	9.04	10.3	12.0	13.6	12.1
Oxidation-reduction potential [ORP]	----	E125/WT	0.10	mV	276	293	273	268	290
pH (1:2 soil:CaCl2-aq)	----	E108A/WT	0.10	pH units	7.87	7.72	7.72	7.77	7.79
Resistivity	----	EC100R/WT	100	ohm cm	5810	5400	5260	5080	5320
Inorganics									
Sulfides, acid volatile	----	E396-L/WT	0.20	mg/kg	0.65	0.34	0.76	0.46	<0.23
Leachable Anions & Nutrients									
Chloride, soluble ion content	16887-00-6	E236.Cl/WT	5.0	mg/kg	14.8	11.3	<5.0	6.3	7.9
Sulfate, soluble ion content	14808-79-8	E236.SO4/WT	20	mg/kg	22	22	23	25	23

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

Analytical Results

Sub-Matrix: Soil/Solid (Matrix: Soil/Solid)					Client sample ID	BH66-23--S3-7.5'-9'	----	----	----	----
					Client sampling date / time	02-Feb-2023 11:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		WT2303358-006	----	----	----	----
						Result	----	----	----	----
Physical Tests										
Conductivity (1:2 leachate)	----	E100-L/WT	5.00	µS/cm		236	----	----	----	----
Moisture	----	E144/WT	0.25	%		13.7	----	----	----	----
Oxidation-reduction potential [ORP]	----	E125/WT	0.10	mV		274	----	----	----	----
pH (1:2 soil:CaCl2-aq)	----	E108A/WT	0.10	pH units		7.79	----	----	----	----
Resistivity	----	EC100R/WT	100	ohm cm		4240	----	----	----	----
Inorganics										
Sulfides, acid volatile	----	E396-L/WT	0.20	mg/kg		0.27	----	----	----	----
Leachable Anions & Nutrients										
Chloride, soluble ion content	16887-00-6	E236.Cl/WT	5.0	mg/kg		15.8	----	----	----	----
Sulfate, soluble ion content	14808-79-8	E236.SO4/WT	20	mg/kg		39	----	----	----	----

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2303358**	Page	: 1 of 10
Amendment	: **1**		
Client	: **Stantec Consulting Ltd.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Essa Nimer	Account Manager	: Mathy Mahadeva
Address	: 100-300 Hagey Blvd. Waterloo ON Canada N2L 0A4	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 121624777	Date Samples Received	: 13-Feb-2023 09:10
PO	: ----	Issue Date	: 25-Nov-2024 14:01
C-O-C number	: ----		
Sampler	: CLIENT		
Site	: ----		
Quote number	: Stantec 2024-2027 Standing Offer		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Inorganics : Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)										
Non compliant container BH59-23-S3-7.5'-9'	E396-L	03-Feb-2023	15-Feb-2023	14 days	12 days	✓	15-Feb-2023	14 days	12 days	✓
Inorganics : Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)										
Non compliant container BH62-23-S3-7.5'-9'	E396-L	03-Feb-2023	15-Feb-2023	14 days	12 days	✓	15-Feb-2023	14 days	12 days	✓
Inorganics : Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)										
Non compliant container BH66-23--S3-7.5'-9'	E396-L	02-Feb-2023	15-Feb-2023	14 days	13 days	✓	15-Feb-2023	14 days	13 days	✓
Inorganics : Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)										
Non compliant container BH/MW55-23-S2-5'-6.5'	E396-L	31-Jan-2023	14-Feb-2023	14 days	14 days	✓	14-Feb-2023	14 days	14 days	✓
Inorganics : Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)										
Non compliant container BH47-23-S3-5'-6.5'	E396-L	31-Jan-2023	14-Feb-2023	14 days	14 days	✓	14-Feb-2023	14 days	14 days	✓
Inorganics : Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)										
Non compliant container BH57-23-S3-7.5'-9'	E396-L	24-Jan-2023	14-Feb-2023	14 days	21 days	× EHTR	14-Feb-2023	14 days	21 days	✓
Leachable Anions & Nutrients : Water Extractable Chloride by IC										
Non compliant container BH59-23-S3-7.5'-9'	E236.Cl	03-Feb-2023	16-Feb-2023	30 days	13 days	✓	16-Feb-2023	30 days	13 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Leachable Anions & Nutrients : Water Extractable Chloride by IC										
Non compliant container BH62-23-S3-7.5'-9'	E236.Cl	03-Feb-2023	16-Feb-2023	30 days	13 days	✓	16-Feb-2023	30 days	13 days	✓
Leachable Anions & Nutrients : Water Extractable Chloride by IC										
Non compliant container BH66-23--S3-7.5'-9'	E236.Cl	02-Feb-2023	16-Feb-2023	30 days	14 days	✓	16-Feb-2023	30 days	14 days	✓
Leachable Anions & Nutrients : Water Extractable Chloride by IC										
Non compliant container BH/MW55-23-S2-5'-6.5'	E236.Cl	31-Jan-2023	16-Feb-2023	30 days	16 days	✓	16-Feb-2023	30 days	16 days	✓
Leachable Anions & Nutrients : Water Extractable Chloride by IC										
Non compliant container BH47-23-S3-5'-6.5'	E236.Cl	31-Jan-2023	16-Feb-2023	30 days	16 days	✓	16-Feb-2023	30 days	16 days	✓
Leachable Anions & Nutrients : Water Extractable Chloride by IC										
Non compliant container BH57-23-S3-7.5'-9'	E236.Cl	24-Jan-2023	16-Feb-2023	30 days	23 days	✓	16-Feb-2023	30 days	23 days	✓
Leachable Anions & Nutrients : Water Extractable Sulfate by IC										
Non compliant container BH59-23-S3-7.5'-9'	E236.SO4	03-Feb-2023	16-Feb-2023	30 days	13 days	✓	16-Feb-2023	30 days	13 days	✓
Leachable Anions & Nutrients : Water Extractable Sulfate by IC										
Non compliant container BH62-23-S3-7.5'-9'	E236.SO4	03-Feb-2023	16-Feb-2023	30 days	13 days	✓	16-Feb-2023	30 days	13 days	✓
Leachable Anions & Nutrients : Water Extractable Sulfate by IC										
Non compliant container BH66-23--S3-7.5'-9'	E236.SO4	02-Feb-2023	16-Feb-2023	30 days	14 days	✓	16-Feb-2023	30 days	14 days	✓
Leachable Anions & Nutrients : Water Extractable Sulfate by IC										
Non compliant container BH/MW55-23-S2-5'-6.5'	E236.SO4	31-Jan-2023	16-Feb-2023	30 days	16 days	✓	16-Feb-2023	30 days	16 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Leachable Anions & Nutrients : Water Extractable Sulfate by IC										
Non compliant container BH47-23-S3-5'-6.5'	E236.SO4	31-Jan-2023	16-Feb-2023	30 days	16 days	✓	16-Feb-2023	30 days	16 days	✓
Leachable Anions & Nutrients : Water Extractable Sulfate by IC										
Non compliant container BH57-23-S3-7.5'-9'	E236.SO4	24-Jan-2023	16-Feb-2023	30 days	23 days	✓	16-Feb-2023	30 days	23 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Non compliant container BH62-23-S3-7.5'-9'	E100-L	03-Feb-2023	15-Feb-2023	30 days	12 days	✓	16-Feb-2023	30 days	13 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Non compliant container BH59-23-S3-7.5'-9'	E100-L	03-Feb-2023	15-Feb-2023	30 days	13 days	✓	16-Feb-2023	30 days	13 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Non compliant container BH66-23--S3-7.5'-9'	E100-L	02-Feb-2023	15-Feb-2023	30 days	14 days	✓	16-Feb-2023	30 days	14 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Non compliant container BH/MW55-23-S2-5'-6.5'	E100-L	31-Jan-2023	15-Feb-2023	30 days	15 days	✓	16-Feb-2023	30 days	16 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Non compliant container BH47-23-S3-5'-6.5'	E100-L	31-Jan-2023	15-Feb-2023	30 days	15 days	✓	16-Feb-2023	30 days	16 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Non compliant container BH57-23-S3-7.5'-9'	E100-L	24-Jan-2023	15-Feb-2023	30 days	22 days	✓	16-Feb-2023	30 days	23 days	✓
Physical Tests : Moisture Content by Gravimetry										
Non compliant container BH62-23-S3-7.5'-9'	E144	03-Feb-2023	----	----	----		13-Feb-2023	----	10 days	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Moisture Content by Gravimetry										
Non compliant container BH59-23-S3-7.5'-9'	E144	03-Feb-2023	----	----	----		13-Feb-2023	----	11 days	
Physical Tests : Moisture Content by Gravimetry										
Non compliant container BH66-23--S3-7.5'-9'	E144	02-Feb-2023	----	----	----		13-Feb-2023	----	11 days	
Physical Tests : Moisture Content by Gravimetry										
Non compliant container BH/MW55-23-S2-5'-6.5'	E144	31-Jan-2023	----	----	----		13-Feb-2023	----	13 days	
Physical Tests : Moisture Content by Gravimetry										
Non compliant container BH47-23-S3-5'-6.5'	E144	31-Jan-2023	----	----	----		13-Feb-2023	----	13 days	
Physical Tests : Moisture Content by Gravimetry										
Non compliant container BH57-23-S3-7.5'-9'	E144	24-Jan-2023	----	----	----		13-Feb-2023	----	20 days	
Physical Tests : ORP by Electrode										
Non compliant container BH62-23-S3-7.5'-9'	E125	03-Feb-2023	14-Feb-2023	180 days	11 days	✓	14-Feb-2023	180 days	11 days	✓
Physical Tests : ORP by Electrode										
Non compliant container BH59-23-S3-7.5'-9'	E125	03-Feb-2023	14-Feb-2023	180 days	11 days	✓	15-Feb-2023	180 days	12 days	✓
Physical Tests : ORP by Electrode										
Non compliant container BH66-23--S3-7.5'-9'	E125	02-Feb-2023	14-Feb-2023	180 days	12 days	✓	14-Feb-2023	180 days	12 days	✓
Physical Tests : ORP by Electrode										
Non compliant container BH/MW55-23-S2-5'-6.5'	E125	31-Jan-2023	14-Feb-2023	180 days	14 days	✓	15-Feb-2023	180 days	15 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : ORP by Electrode										
Non compliant container BH47-23-S3-5'-6.5'	E125	31-Jan-2023	14-Feb-2023	180 days	14 days	✓	15-Feb-2023	180 days	15 days	✓
Physical Tests : ORP by Electrode										
Non compliant container BH57-23-S3-7.5'-9'	E125	24-Jan-2023	14-Feb-2023	180 days	21 days	✓	15-Feb-2023	180 days	22 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Non compliant container BH59-23-S3-7.5'-9'	E108A	03-Feb-2023	14-Feb-2023	30 days	11 days	✓	15-Feb-2023	30 days	12 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Non compliant container BH62-23-S3-7.5'-9'	E108A	03-Feb-2023	14-Feb-2023	30 days	11 days	✓	15-Feb-2023	30 days	12 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Non compliant container BH66-23--S3-7.5'-9'	E108A	02-Feb-2023	14-Feb-2023	30 days	12 days	✓	15-Feb-2023	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Non compliant container BH/MW55-23-S2-5'-6.5'	E108A	31-Jan-2023	14-Feb-2023	30 days	14 days	✓	15-Feb-2023	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Non compliant container BH47-23-S3-5'-6.5'	E108A	31-Jan-2023	14-Feb-2023	30 days	14 days	✓	15-Feb-2023	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Non compliant container BH57-23-S3-7.5'-9'	E108A	24-Jan-2023	14-Feb-2023	30 days	21 days	✓	15-Feb-2023	30 days	22 days	✓

Legend & Qualifier Definitions

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

Quality Control Parameter Frequency Compliance

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

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)	E396-L	835613	2	16	12.5	4.7	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	833550	1	14	7.1	5.0	✓
Moisture Content by Gravimetry	E144	833299	2	38	5.2	5.0	✓
ORP by Electrode	E125	833750	2	21	9.5	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	833382	1	20	5.0	5.0	✓
Water Extractable Chloride by IC	E236.Cl	833552	1	14	7.1	5.0	✓
Water Extractable Sulfate by IC	E236.SO4	833551	1	14	7.1	5.0	✓
Laboratory Control Samples (LCS)							
Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)	E396-L	835613	2	16	12.5	4.7	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	833550	2	14	14.2	10.0	✓
Moisture Content by Gravimetry	E144	833299	2	38	5.2	5.0	✓
ORP by Electrode	E125	833750	2	21	9.5	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	833382	1	20	5.0	5.0	✓
Water Extractable Chloride by IC	E236.Cl	833552	2	14	14.2	10.0	✓
Water Extractable Sulfate by IC	E236.SO4	833551	2	14	14.2	10.0	✓
Method Blanks (MB)							
Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)	E396-L	835613	2	16	12.5	4.7	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	833550	1	14	7.1	5.0	✓
Moisture Content by Gravimetry	E144	833299	2	38	5.2	5.0	✓
Water Extractable Chloride by IC	E236.Cl	833552	1	14	7.1	5.0	✓
Water Extractable Sulfate by IC	E236.SO4	833551	1	14	7.1	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L ALS Environmental - Waterloo	Soil/Solid	CSSS Ch. 15 (mod)/APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Conductance is measured in the fluid that is observed in the upper layer.
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A ALS Environmental - Waterloo	Soil/Solid	MECP E3530	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C) and is carried out in accordance with procedures described in the Analytical Protocol (prescriptive method). A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling, or decanting and then analyzed using a pH meter and electrode. This method is equivalent to ASTM D4972 and is acceptable for topsoil analysis.
ORP by Electrode	E125 ALS Environmental - Waterloo	Soil/Solid	APHA 2580 (mod)	Oxidation Redution Potential (ORP) is reported as the oxidation-reduction potential of the platinum metal-reference electrode employed in the analysis, measured in mV.
Moisture Content by Gravimetry	E144 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Water Extractable Chloride by IC	E236.Cl ALS Environmental - Waterloo	Soil/Solid	EPA 300.1	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection using a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Anions are measured in the fluid that is observed in the upper layer.
Water Extractable Sulfate by IC	E236.SO4 ALS Environmental - Waterloo	Soil/Solid	EPA 300.1	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection using a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Anions are measured in the fluid that is observed in the upper layer.
Acid Volatile Sulfide in Soil by Colourimetry (0.2 mg/kg)	E396-L ALS Environmental - Waterloo	Soil/Solid	APHA 4500S2J	This analysis is carried out in accordance with the method described in APHA 4500 S2-J. After extraction the Acid Volatile Sulphide is determined colourimetrically.
Resistivity Calculation for Soil Using E100-L	EC100R ALS Environmental - Waterloo	Soil/Solid	APHA 2510 B	Soil Resistivity (calculated) is determined as the inverse of the conductivity of a 2:1 water:soil leachate (dry weight). This method is intended as a rapid approximation for Soil Resistivity. Where high accuracy results are required, direct measurement of Soil Resistivity by the Wenner Four-Electrode Method (ASTM G57) is recommended.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Waterloo	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Leach 1:2 Soil : 0.01CaCl2 - As Received for pH	EP108A ALS Environmental - Waterloo	Soil/Solid	MOEE E3137A	A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling or decanting and then analyzed using a pH meter and electrode.
Preparation of ORP by Electrode	EP125 ALS Environmental - Waterloo	Soil/Solid	APHA 2580 (mod)	Field-moist sample is extracted in a 1:2 ratio with DI water and then analyzed by ORP meter.
Anions Leach 1:10 Soil:Water (Dry)	EP236 ALS Environmental - Waterloo	Soil/Solid	EPA 300.1	5 grams of dried soil is mixed with 50 grams of distilled water for a minimum of 30 minutes. The extract is filtered and analyzed by ion chromatography.
Distillation for Acid Volatile Sulfide in Soil	EP396-L ALS Environmental - Waterloo	Soil/Solid	APHA 4500S2J	Acid Volatile Sulfide is determined by colourimetric measurement on a sediment sample that has been treated with hydrochloric acid within a purge and trap system, where the evolved hydrogen sulfide gas is carried into a basic solution by argon gas for analysis.

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QUALITY CONTROL REPORT

Work Order	: **WT2303358**	Page	: 1 of 6
Amendment	: **1**		
Client	: Stantec Consulting Ltd.	Laboratory	: ALS Environmental - Waterloo
Contact	: Essa Nimer	Account Manager	: Mathy Mahadeva
Address	: 100-300 Hagey Blvd. Waterloo ON Canada N2L 0A4	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: +1 519 886 6910
Project	: 121624777	Date Samples Received	: 13-Feb-2023 09:10
PO	: ----	Date Analysis Commenced	: 13-Feb-2023
C-O-C number	: ----	Issue Date	: 25-Nov-2024 14:00
Sampler	: CLIENT		
Site	: ----		
Quote number	: Stantec 2024-2027 Standing Offer		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Amanda Ganouri-Lumsden	Department Manager - Microbiology and Prep	Waterloo Centralized Prep, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Waterloo Inorganics, Waterloo, Ontario

General Comments

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

Key :

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

Workorder Comments

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 833299)											
WT2303016-003	Anonymous	Moisture	----	E144	0.25	%	20.8	21.5	2.97%	20%	----
Physical Tests (QC Lot: 833332)											
WT2303358-004	BH59-23-S3-7.5'-9'	Moisture	----	E144	0.25	%	13.6	12.3	10.1%	20%	----
Physical Tests (QC Lot: 833382)											
WT2303016-003	Anonymous	pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units	7.40	7.53	1.74%	5%	----
Physical Tests (QC Lot: 833460)											
WT2303358-005	BH62-23-S3-7.5'-9'	Oxidation-reduction potential [ORP]	----	E125	0.10	mV	290	341	16.2%	25%	----
Physical Tests (QC Lot: 833550)											
WT2303358-001	BH47-23-S3-5'-6.5'	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	172	174	1.15%	20%	----
Physical Tests (QC Lot: 833750)											
FC2300396-002	Anonymous	Oxidation-reduction potential [ORP]	----	E125	0.10	mV	222	243	9.03%	25%	----
Inorganics (QC Lot: 834195)											
FC2300396-003	Anonymous	Sulfides, acid volatile	----	E396-L	0.22	mg/kg	<0.22	<0.22	0.22	Diff <2x LOR	----
Inorganics (QC Lot: 835613)											
WT2303358-004	BH59-23-S3-7.5'-9'	Sulfides, acid volatile	----	E396-L	0.23	mg/kg	0.46	<0.23	0.23	Diff <2x LOR	----
Leachable Anions & Nutrients (QC Lot: 833551)											
WT2303358-001	BH47-23-S3-5'-6.5'	Sulfate, soluble ion content	14808-79-8	E236.SO4	20	mg/kg	22	21	0.5	Diff <2x LOR	----
Leachable Anions & Nutrients (QC Lot: 833552)											
WT2303358-001	BH47-23-S3-5'-6.5'	Chloride, soluble ion content	16887-00-6	E236.Cl	5.0	mg/kg	14.8	15.6	0.8	Diff <2x LOR	----

Method Blank (MB) Report

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

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 833299)						
Moisture	----	E144	0.25	%	<0.25	----
Physical Tests (QCLot: 833332)						
Moisture	----	E144	0.25	%	<0.25	----
Physical Tests (QCLot: 833550)						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Inorganics (QCLot: 834195)						
Sulfides, acid volatile	----	E396-L	0.2	mg/kg	<0.20	----
Inorganics (QCLot: 835613)						
Sulfides, acid volatile	----	E396-L	0.2	mg/kg	<0.20	----
Leachable Anions & Nutrients (QCLot: 833551)						
Sulfate, soluble ion content	14808-79-8	E236.SO4	20	mg/kg	<20	----
Leachable Anions & Nutrients (QCLot: 833552)						
Chloride, soluble ion content	16887-00-6	E236.Cl	5	mg/kg	<5.0	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 833299)									
Moisture	----	E144	0.25	%	----	98.6	90.0	110	----
Physical Tests (QCLot: 833332)									
Moisture	----	E144	0.25	%	----	99.9	90.0	110	----
Physical Tests (QCLot: 833382)									
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	----	100	98.0	102	----
Physical Tests (QCLot: 833550)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	----	99.8	90.0	110	----
Inorganics (QCLot: 834195)									
Sulfides, acid volatile	----	E396-L	0.2	mg/kg	----	89.8	70.0	130	----
Inorganics (QCLot: 835613)									
Sulfides, acid volatile	----	E396-L	0.2	mg/kg	----	87.4	70.0	130	----
Leachable Anions & Nutrients (QCLot: 833551)									
Sulfate, soluble ion content	14808-79-8	E236.SO4	20	mg/kg	----	99.9	80.0	120	----
Leachable Anions & Nutrients (QCLot: 833552)									
Chloride, soluble ion content	16887-00-6	E236.Cl	5	mg/kg	----	99.2	80.0	120	----

Reference Material (RM) Report

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

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Physical Tests (QCLot: 833460)									
QC-833460-001	RM	Oxidation-reduction potential [ORP]	----	E125	----	105	80.0	120	----
Physical Tests (QCLot: 833550)									
QC-833550-003	RM	Conductivity (1:2 leachate)	----	E100-L	----	104	70.0	130	----
Physical Tests (QCLot: 833750)									
QC-833750-001	RM	Oxidation-reduction potential [ORP]	----	E125	----	104	80.0	120	----
Leachable Anions & Nutrients (QCLot: 833551)									
QC-833551-003	RM	Sulfate, soluble ion content	14808-79-8	E236.SO4	----	107	70.0	130	----
Leachable Anions & Nutrients (QCLot: 833552)									
QC-833552-003	RM	Chloride, soluble ion content	16887-00-6	E236.Cl	----	101	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page 1 of 1

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Canada Toll Free: 1 800 668 9878

Environmental Division Waterloo
Work Order Reference
WT2303358

Telephone : +1 519 886 6910

Report To	Contact and company name below will appear on the final report
Company:	Stantec Consulting
Contact:	Essa Nimer
Phone:	226-338-0812
	Company address below will appear on the final report
Street:	100-300 Hagey Blvd
City/Province:	Waterloo, ON
Postal Code:	N2L 0A4
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: Raid.Khamis@stantec.com
Email 2: Essa.Nimer@stantec.com
Email 3:

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: Raid.Khamis@stantec.com
Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges app
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharg
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge
☐ Same day [E2] if received by 10am M-S - 200% rush sur
Additional fees may apply to rush requests on we
Date and Time Required for all E&P TATs:
For all tests with rush TATs requested, pl

Project Information

ALS Account # / Quote #:
Job #: 121624777
PO / AFE:
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#
Major/Minor Code: Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (ALS use only): WT2303358

ALS Contact: Mathy Sampler:

Analysis

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Corrosivity packagae	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	BH-10-23 - S3 - 5' - 6.5'	31-Jan-23	13:00	Soil	1	R			
	BH-18-23 - S2 - 5' - 6.5'	31-Jan-23	15:00	Soil	1	R			
	BH-20-23 - S2 - 7.5' - 9'	24-Jan-23	14:00	Soil	1	R			
	BH-22-23 - S3 - 7.5' - 9'	3-Feb-23	10:00	Soil	1	R			
	BH-25-23 - S3 - 7.5' - 9'	3-Feb-23	13:00	Soil	1	R			
	BH-29-23 - S3 - 7.5' - 9'	2-Feb-23	11:00	Soil	1	R			

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System?
☐ YES ☑ NO
Are samples for human consumption/ use?
☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☑ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO
Cooler Custody Seals Intact: ☐ YES ☑ N/A Sample Custody Seals Intact: ☐ YES ☑ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
				18.1			

SHIPMENT RELEASE (client use)

Released by:	Essa Nimer	Date:	13-Feb	Time:	######

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	02/13/23	9:10

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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

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

SOI - 744