- **Triovest**

Updated Report
Geotechnical Investigation
Proposed Commercial/Industrial Complex
Coleraine Drive
Bolton, Ontario

Project Number
BRM-00603520-C0

Prepared By:

Exp Services Inc.
1595 Clark Boulevard
Brampton, ON L6T 4V1
Canada,

Date Submitted
December 15, 2017

Table of Contents

Tables

Drawings

Appendices

1 Introduction

This updated report presents the results of a geotechnical investigation carried out for the proposed commercial/industrial complex development in the Community of Bolton, Ontario. The work was authorized by Mr. Randy Gladman of Triovest. A previous report was prepared for this site (Reference BRM-00603520-A0 dated July 22, 2014) by **exp** Services Inc. (**exp**). The proposed development layout has changed since preparation of that report. This updated report reflects the proposed changes in the development layout.

The site occupies an area of approximate 81 hectares (~ 200 acres) with east frontage on Coleraine Drive extending from approximately 500 m north of George Bolton Parkway to 200 m south of Parr Boulevard. Based on the information provided by the client, it is our understanding that the proposed development will consist of nine single-storey slab-on-grade commercial/industrial buildings with footprints varying from approximately 870 to 83,180 m^2. George Bolton Parkway will be extended westerly across the property. The remainder of the site will comprise access roads, truck and trailer parking areas, and a storm water management pond.

The purpose of this investigation was to determine the subsurface conditions at the site by drilling a limited number of sampled boreholes and based on the factual borehole data, to provide geotechnical engineering guidelines for the design and construction of the proposed development. Specifically, recommendations and/or comments regarding foundation type, design geotechnical resistances/reactions, slab-on-grade construction, permanent drainage requirements, earthquake considerations, groundwater conditions, excavation and backfill, pavement structures and storm water management pond construction were to be provided.

The comments and recommendations given in this report are based on the terms of reference presented above and on the assumption that design will be in accordance with applicable codes and standards. If changes are made either in the design phase or during construction, this office must be retained to review these modifications. The result of this review may be a modification of our recommendations or the requirement of additional field or laboratory work to check whether the changes are acceptable from a geotechnical viewpoint.

2 Site Description

The site is located in a mixed rural and industrial area. Based on available aerial photography, the existing development on the site included six residences and one farm structure. The subject site is generally flat and slightly sloping from northeast to southwest.

The site is located at confluence of the physiographic regions known as the Peel Plain and South Slope, which are between Lake Ontario and the Oak Ridges Moraine. Peel Plain occupies the central portion of the Regions of York, Peel and Halton, while South Slope covers the southern slope of the Oak Ridges Moraine and the strip south of the Peel Plain. The top portion of overburden near the site is characterized by glaciolacustrine-derived clay to silt-textured till and modern alluvial clayey/silty deposits with organic remains at the existing waterbodies. The overburden soils are underlain by bedrock consisting typically of grey shale with minor fossiliferous calcareous siltstone, bioclastic limestone and storm-deposited sandstone interbeds of the Georgian Bay Formation, which belong to the Upper Ordovician Period. Ontario Groundwater records and regional drift thickness mapping indicates that the depth to bedrock in the area of the site may be greater than 27 m. The local drainage of the site is controlled by southward directed tributary streams of the Humber River.

3 Investigation Procedure

Drilling and sampling operations, carried out between June 9 and 13, 2014, were completed by a combination of solid stem continuous flight auger and split-spoon techniques using a track mounted CME-55 drill rig owned and operated by a specialist contractor.

For the current investigation, a total of forty (40) boreholes (1 through 40) were drilled to depths of 6.2 to 8.2 m below existing ground. Thirty (30) boreholes were advanced within or in close proximity to the proposed building envelopes, two (2) boreholes in the proposed roadways, three (3) boreholes along the George Bolton Parkway extension and two (2) boreholes within or in close proximity to the proposed storm water management pond area. The approximate borehole locations are shown on the attached Borehole Location Plan (Drawing No. 1).

The borehole locations were established prior to the drilling works by **exp** personnel using hand-held Global Positioning System (GPS) units – Garmin eTrex Legend H. The exploratory boreholes were also located in the field by **exp** from adjacent surface features. The top elevations of boreholes were established by Sokkia GRX2 with GNSS Receiver.

Prior to the commencement of drilling operations, underground services were cleared to minimize the risk of encountering any such services during the drilling operations.

A qualified geotechnical field engineer from **exp**'s staff was present throughout the drilling operations to monitor and direct the drill operations, and to record borehole information. Representative samples of the subsurface soils were recovered at regular intervals using conventional 50 mm O.D. split spoon sampling equipment driven in accordance with the procedures of Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils (ASTM D1586). All split spoon samples were returned to **exp**'s Brampton laboratory for further geotechnical examination and testing. The following tests were performed on selected soil samples:

- Moisture content
- Unit weight
- Grain size distribution

Groundwater levels were observed in the open boreholes during the course of the fieldwork. Subsequent water level monitoring was carried out in monitoring wells installed in Boreholes 2, 6, 10, 13, 15, 18, 25, 32, 34 and 36.

4 Subsurface Conditions

The detailed soil profiles encountered in each borehole and the results of geotechnical laboratory testing are indicated on the attached borehole logs (Drawing Nos. 2 through 41) and figure in Appendix A. It should be noted that the soil boundaries indicated on the borehole logs are inferred from non-continuous sampling and observations during drilling. These boundaries are intended to reflect approximate transition zones for the purpose of geotechnical design and should not be interpreted as exact planes of geological change.

Notes on Sample Description preceding the borehole logs form an integral part of and should be read in conjunction with this report.

The following is a brief description of the subsurface conditions encountered during the current investigation.

4.1 Soil Conditions

Topsoil

Topsoil was encountered in all boreholes. The thickness of topsoil found in the borehole locations ranged from 100 to 480 mm.

It should be noted that the topsoil quantities should not be established from the information provided at the borehole locations only. If required, a more detailed analysis which involves shallow test pits should be carried out to accurately quantify the amount of topsoil to be removed for construction purpose.

Disturbed Clayey Silt/Sandy Silt

A layer of disturbed parent material was encountered below the topsoil in all boreholes, except Boreholes 3, 4, 8, 16, 22 and 33. The disturbed parent material is likely associated with ploughing for agricultural purposes and consisted of clayey silt to sandy silt with trace contents of gravel and organic matter. This layer extended to depths varying from 0.4 to 0.8 m below the existing ground surface or to elevations ranging from 238.0 to 228.0 m. In general, this mottled brown disturbed soil layer was in a very loose to loose state of compaction as suggested by SPT N-values between 2 and 7 blows/0.3 m. The moisture contents within the disturbed parent material layer were found to range from 15 to 28 percent of dry weight, indicating generally a moist condition.

Clayey Silt Till

Underneath the topsoil in Boreholes 3, 4, 8, 16, 22 and 33 or the disturbed parent material in the remaining boreholes, a glacial till was encountered across the site. This cohesive glacial

till deposit primarily consists of clayey silt with trace to some sand and trace gravel. In most of the boreholes, this deposit contains reduced clay content in its lower portion. Frequent sand interlayers were also observed within this till. The till was found to extend to borehole termination depths between 6.2 and 8.2 m below existing grade or to elevations ranging from 231.8 to 222.2 m.

The grain size distributions of three samples from this soil unit were determined in the laboratory. Results are as follows:

Gravel:	0 - 3%
Sand:	1 – 15%
Silt:	46 – 79%
Clay:	19 – 36%

The grain size distribution results are also shown graphically in Figure 1, in Appendix A.

SPT testing in this cohesive glacial till yielded N-values ranging from 6 to in excess of 50 blows/0.3 m. Based on SPT N-values, the clayey silt till deposit is considered to have a firm to hard consistency, typically stiff to very stiff. This brown to grey deposit was moist, with natural moisture contents ranging from 7 to 22 percent of dry weight.

The presence of cobbles and boulders should always be anticipated in the glacial till deposits, owing to their mode of deposition. In fact, auger grinding was noted within this deposit during our investigation in Boreholes 3, 5, 7, 23, 25 and 36, indicating the presence of cobbles and/or boulders.

4.2 Groundwater Conditions

To monitor ground water levels over a prolonged period of time without interference from surface water, a monitoring well was installed in each of Boreholes 2, 6, 10, 13, 15, 18, 25, 32, 34 and 36. The groundwater levels observed within the monitoring wells are presented on the borehole logs and are summarized in the following table.

Table 1: Summary of Observed Groundwater Levels

Borehole No.	Depth/Elevation of the Tip of Monitoring Well (m)	Date of Water Level Measurement (mm/dd/yyyy)	Measured Water Level Depth/Elevation (m)
2	7.6 / 231.1	6/20/2014 7/8/2014	4.4 / 234.3 3.7 / 235.0
6	7.6 / 230.0	6/20/2014 7/8/2014	1.2 / 236.4 1.2 / 236.4
10	6.1 / 230.0	6/20/2014 7/8/2014	0.8 / 235.3 0.8 / 235.3
13	7.6 / 225.0	6/20/2014 7/8/2014	0.3 / 232.3 0.1 / 232.5
15	7.6 / 228.8	6/20/2014 7/8/2014	0.9 / 235.5 1.2 / 235.2
18	6.1 / 227.7	6/20/2014 7/9/2014	-0.5 / 234.3 0.4 / 233.4
25	6.1 / 226.6	6/20/2014 7/8/2014	1.8 / 230.9 0.8 / 231.9
32	6.1 / 226.9	6/20/2014 7/8/2014	Dry to 6.1 / 226.9 4.8 / 228.2
34	6.1 / 229.2	6/20/2014 7/8/2014	5.4 / 229.9 3.2 / 232.1
36	6.1 / 223.5	6/20/2014 7/8/2014	0.6 / 229.0 0.8 / 228.8

Based on the configurations of the monitoring wells and the observation of groundwater in June and July 2014, the groundwater level at the time of the investigation varied between depths from 0.0 to 6.1 m, corresponding to Elevations from 236.4 to 226.9 m.

These short-term observations may not represent the long-term groundwater table at the site, due to the short period of observation and the generally fairly low permeability of the clayey silt till. The low permeability of the till may be attributed to the high content of silt and clay particles. The long-term groundwater elevation is typically associated with the interface between brown and grey soils, below which the soil is saturated with oxygen-deficient

groundwater. At this site, this transition was noted to occur at approximate depths of 2.4 to 4.8 m below existing ground surface.

In the long term, it should be noted that the groundwater levels can vary seasonally and are subject to fluctuations in response to major weather events. Given the relatively low permeability of the clayey silt till, a perched water condition is likely to be found at the site in any layer of coarse grained soil, such as sand interlayers in the till, etc. A perched water table may also occur due to the accumulation of surface water in the fill material overlying the relatively lower permeability clayey silt till.

5 Geotechnical Recommendations

This project involves the proposed design and construction of nine single-storey slab-on-grade commercial/industrial buildings, access roads, extension to George Bolton Parkway, truck and trailer parking areas and a storm water management pond.

5.1 Site Grading

It is our understanding that the final site grades have not been established at the time of current investigation. However, given the maximum difference in ground surface elevation of approximately 10 m at the borehole locations, it is anticipated that some regrading (cut and fill operations) will be carried out at the site. The following procedures are recommended for the construction of fill sections, pavement and building slab-on-grade areas at the site, where required.

- All vegetation, topsoil, organic or deleterious materials and unsuitable existing fill should be removed from beneath the proposed building and pavement areas.

- The excavated native soils which are not mixed with topsoil or other obviously unsuitable material may be reused as backfill. Any organic or excessively wet or otherwise deleterious material should not be used for backfilling purposes. Any shortfall of suitable on-site excavated material can be made up with suitable earthfill or imported granular material, e.g. OPSS Granular B or equivalent.

- The exposed subgrade surface should be proof-rolled with a heavy vibratory roller and examined by qualified geotechnical personnel. Any soft areas detected during the proof-rolling process should be sub-excavated.

- The area can then be brought up to the final subgrade level with approved on-site or imported material placed in lifts not exceeding 200 mm and compacted to the following requirements:

    - Within the building areas - minimum of 98 percent standard Proctor maximum dry density (SPMDD) for slab-on-grade support.

    - For foundations support within building areas – minimum of 100 percent SPMDD.

    - Within the pavement areas - minimum of 95 percent SPMDD from the bottom of excavation to 600 mm below final subgrade level, and 98 percent SPMDD for the upper 600 mm.

    - General backfill including trench backfill and backfill adjacent to foundation walls - minimum of 98 percent SPMDD.

- Depending on the moisture content of the excavated material and the weather conditions at the time of construction, some adjustment in water content may be required to achieve the desired degree of compaction.

- All backfilling and compaction operations should be monitored on a full-time basis by qualified geotechnical personnel to approve material, evaluate placement operations and confirm the specified degree of compaction is achieved uniformly throughout the fill.

- In areas where substantial cutting and filling are required, the compaction of fill should be monitored full time by a representative of this office. This is particularly important within building areas where slab-on-grade will be constructed as well as in parking areas.

- Fill and cut slopes should not be steeper than 3 horizontal to 1 vertical (3H:1V) and should be protected from surface erosion.

- Where free-draining backfill is required, or in confined areas, imported granular material conforming to OPSS Granular 'B' is recommended.

5.2 Building Construction

5.2.1 *Foundation Considerations*

The use of spread and strip footings to support the proposed structures is considered feasible, based on the results of the investigation. Proposed finished floor elevations (FFE) for the various structures as provided by the Client are as follows:

- Building 1 237.5 m
- Building 2 239.0 m
- Building 3 239.0 m
- Building A 235.5 m
- Building B 235.5 m
- Building C1 235.5 m
- Building C2 235.5 m
- Building D 234.5 m
- Building E 234.5 m

The proposed structures can be supported on conventional spread and strip footings or short concrete piers founded on the undisturbed typical stiff to very stiff clayey silt till.

All short piers should be hand cleaned and the supporting soil evaluated by qualified geotechnical personnel to confirm that the required geotechnical reactions/resistances are available. A minimum length to diameter ratio of 2 is required for the short piers. Currently, the Occupational Health and Safety Act (OHSA) requires the minimum pier diameter of

760 mm to permit cleaning and inspection of the founding surface. During installation, a temporary liner would have to be installed to permit cleaning and evaluation and to seal off possible water seepage which may be perched in the more pervious zones within the fill and native soils. A 150 mm slump concrete is recommended for use to prevent the concrete from having a honeycombed structure or 'hang-up' in the liner upon its withdrawal.

The recommended highest founding levels, Serviceability Limit States (SLS) geotechnical reaction and Ultimate Limit States (ULS) factored geotechnical resistance are summarized in Table 2.

Table 2: Highest Founding Depths/Elevations and Allowable Bearing Pressures for Spread and Strip Footings

Borehole No.	Highest Founding Depth / Elevation (m)	Bearing Pressure SLS / ULS (kPa)	Soil Type
Building 1			
6	1.5 / 236.2	150 / 225	Very stiff clayey silt till
8	1.0 / 234.6	150 / 225	Very stiff clayey silt till
9	2.0 / 232.2	150 / 225	Very stiff clayey silt till
33	1.5 / 233.9	150 / 225	Very stiff clayey silt till
34	1.0 / 234.3	150 / 225	Very stiff clayey silt till
Building 2			
3	1.0 / 236.8	150 / 225	Very stiff clayey silt till
4*****	1.0 / 235.8	150 / 225	Very stiff clayey silt till
5*****	1.0 / 235.0	150 / 225	Very stiff clayey silt till
Building 3			
1	1.5 / 237.0	150 / 225	Very stiff clayey silt till
2	1.0 / 237.7	150 / 225	Very stiff clayey silt till
Building A			
14*****	1.0 / 234.1	150 / 225	Very stiff clayey silt till
16*****	1.0 / 234.1	150 / 225	Very stiff clayey silt till
Building B			
17*****	1.0 / 233.6	150 / 225	Very stiff clayey silt till
18*****	1.0 / 232.8	150 / 225	Very stiff clayey silt till

Borehole No.	Highest Founding Depth / Elevation (m)	Bearing Pressure SLS / ULS (kPa)	Soil Type
20*	1.0 / 232.3	150 / 225	Very stiff clayey silt till
Building C1			
30*	1.5 / 232.7	150 / 225	Very stiff clayey silt till
Building C2			
32	1.0 / 232.0	150 / 225	Very stiff clayey silt till
Building D			
24	1.0 / 230.9	150 / 225	Very stiff clayey silt till
25	1.0 / 231.7	150 / 225	Very stiff clayey silt till
26	1.5 / 229.6	150 / 225	Very stiff clayey silt till
27	2.0 / 226.7	150 / 225	Very stiff clayey silt till
28	1.0 / 229.3	150 / 225	Very stiff clayey silt till
29*	1.0 / 230.4	150 / 225	Very stiff clayey silt till
31*	1.0 / 230.6	150 / 225	Very stiff clayey silt till
35	1.0 / 230.3	150 / 225	Very stiff clayey silt till
39*	1.0 / 231.5	150 / 225	Very stiff clayey silt till
Building E			
13*	1.0 / 231.6	150 / 225	Very stiff clayey silt till
22*	1.0 / 232.4	150 / 225	Very stiff clayey silt till
23	1.0 / 232.1	150 / 225	Very stiff clayey silt till
36	1.0 / 228.6	150 / 225	Very stiff clayey silt till

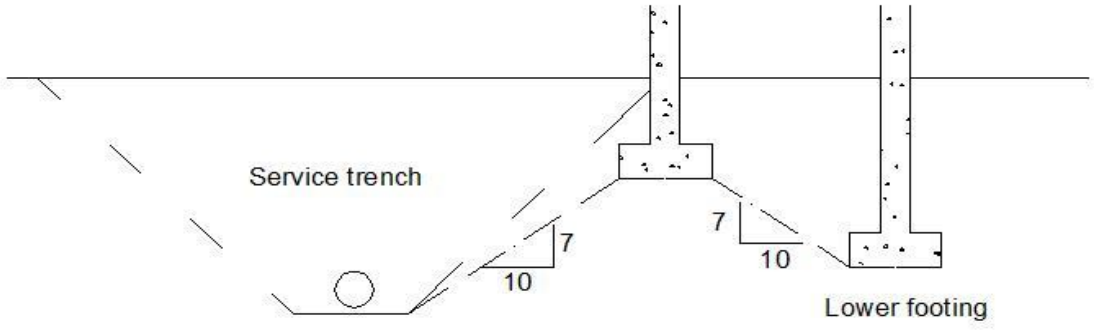
***** To avoid overstressing weaker soil below, do not extend foundation base more than 1 m below recommended elevation.

Given the differences in elevation between existing grades and proposed finished floor slab elevations at some locations, the Engineered Fill option can also be considered for foundation support. Where applicable, structures can be supported on conventional spread and strip footings or short concrete piers founded on properly constructed Engineered Fill. The footings or short piers can be designed for Geotechnical Reaction of 150 kPa at SLS and Factored Geotechnical Resistance of 225 kPa at ULS. Guidelines for construction of Engineered Fill are provided in Appendix B.

It is anticipated that the foundations of the proposed structures will to be founded on native undisturbed clayey silt till or Engineered Fill. The required geotechnical resistance/reaction values are likely well within the recommendations provided in Table 2 and for Engineered Fill.

5.2.2 *Foundation General*

Adjacent footings at different elevations should be located such that higher footings are set below a line drawn up at ten (10) Horizontal to seven (7) Vertical (10H:7V) from the near edge of the lower footing. This concept should also be applied to excavations for new foundations in relation to existing footings or underground services. This concept is illustrated in the following sketch.



FOOTINGS NEAR SERVICE TRENCHES OR AT DIFFERENT ELEVATIONS

All footing caps exposed to freezing conditions must be provided with a minimum of 1.2 m of earth cover or equivalent insulation for frost protection, depending on the final grade requirements.

The total and differential settlements of well designed and constructed footings placed in accordance with the above recommendations, are expected to be small and well within the normally tolerated limits of 25 and 19 mm, respectively.

The recommended geotechnical resistances/reactions have been calculated by **exp** from the borehole information for the design stage only. The investigation and comments are necessarily on-going as new information of underground conditions becomes available. For example, it should be appreciated that modifications to bearing levels may be required if unforeseen subsoil conditions are revealed after the excavation is exposed to full view or if final design decisions differ from those assumed in this report. For this reason, this office should be retained to review final foundation drawings and to provide field inspections during the construction stage.

5.2.3 *Floor Slab Construction and Permanent Drainage*

The native undisturbed soil encountered in the boreholes appears generally suitable for floor slab support. For normal slab-on-grade construction, all vegetation, topsoil, unsuitable fill and other deleterious material should be removed from the entire underfloor area. The subgrade should then be thoroughly proof-rolled. Any soft spots detected should be dug out and replaced with compactible fill. The site can then be filled to the required grades as outlined in Section 5.1 - Site Grading of this report.

A 19 mm clear stone layer with minimum thickness of 200 mm should be placed between the prepared subgrade and the floor slab to serve as a moisture barrier. Also, within any unheated areas and entrances to the building, Styrofoam insulation or equivalent should be provided below the floor slab and against the foundation walls to protect against frost heave.

Based on the soil and groundwater conditions at the site, underfloor drains will not be required. Around the perimeter of the building the ground surface should be sloped on a positive grade away from the structure to promote surface water run-off and reduce groundwater infiltration adjacent to the foundations. Perimeter drains are not required if the floor slab is set at least 300 mm above the exterior grade and the grade is sloped away from the structure.

For the structural design of the concrete slab-on-grade, a combined modulus of subgrade / granular base reaction coefficient of 27 MPa/m can be used on the native very stiff clayey silt or fill materials placed and compacted in accordance with Section 5.1 - Site Grading of this report.

5.2.4 *Earthquake Considerations*

The recommendations for the geotechnical aspects to determine the earthquake loading for design using the Ontario Building Code (OBC) 2012 are presented below.

Subsoil Conditions

The subsoil and groundwater information at this site have been examined in relation to Section 4.1.8.4 of the OBC. The subsoils at this subject site generally consist of disturbed clayey silt/sandy silt and clayey silt till. It is anticipated that the proposed structures will be founded on conventional spread and strip footings on the undisturbed very stiff clayey silt till.

Depth of Boreholes

Table 4.1.8.4.A Site Classification for Seismic Site Response of the OBC indicated that to determine the site classification, the average properties in the top 30 m (below the lowest basement level) are to be used. The deepest borehole advanced at this site was at about 8.2 m in depth. Therefore, the site classification recommendation would be based on the

available information as well as our interpretation of conditions below the boreholes based on our knowledge of the soil conditions in the area.

Site Classification

Based on the above assumptions, interpretations and the general understanding of soil conditions of the area, the seismic class for the proposed structures at this site is Class D, as per the Table 4.1.8.4.A of the OBC. Accordingly, the foundation factors F_a and F_v can be obtained from Tables 4.1.8.4.B and 4.1.8.4.C of the OBC, respectively, for the design of the structure.

5.3 Site Servicing

Internal access road, watermain and sewer for the proposed buildings are envisaged to be extended from the nearby existing roads.

5.3.1 *Groundwater Control*

The invert levels of the watermain and sewer will likely be less than 3.5 m below the existing grades. Where watermain and sewer inverts will be located within the native clayey silt till, it is anticipated that groundwater seepage, perched water from more pervious seam and / or interlayers, or surface runoff entering the excavation could be handled readily by conventional sump pumping.

5.3.2 *Excavation*

Excavation for the proposed pipes will generally be carried out within the very loose to loose disturbed clayey silt/sandy silt and the stiff to very stiff clayey silt till on this site.

Providing that above-mentioned groundwater control measures are implemented, installation for the proposed watermain and sewer by open cut method is considered feasible. It is considered that excavation in the disturbed native soils and till may be carried out in open cuts using conventional equipment. It should be noted that the presence of cobbles and boulders in glacial till deposits may influence the progress of excavation. Consequently, provisions should be made in the contract documents to cover any delays caused by these obstructions.

All construction work must be carried out in accordance with the latest edition of the Occupational Health and Safety Act (OHSA). In accordance with OHSA regulations, the soils can be classified as follows:

Disturbed native soils (very loose to loose)	Type 4 soil above water level
Clayey Silt (stiff to very stiff)	Type 3 soil above water level

The OSHA requires that excavation slopes be cut at predetermined inclinations, based on the soil types. According to OHSA regulations, if an excavation contains more than one type of soil, the soils shall be classified as the type with the highest number. Consequently, in accordance with the OHSA regulations, excavations into the disturbed soils and till at this site should be flatter than 3H:1V.

5.3.3 *Backfill Considerations*

Backfill used to satisfy underfloor slab requirements, in footings and service trenches, etc., should be compactible fill, i.e. inorganic soil with its moisture content close to its optimum moisture content determined in a standard Proctor test. The excavated native soils which are not mixed with topsoil or other obviously unsuitable materials may be reused as backfill. Some water content adjustment may be required for efficient compaction depending upon weather conditions at the time of construction.

Any organic or excessively wet or otherwise deleterious material should not be used for backfilling purposes. Any shortfall of suitable on-site excavated material can be made up with imported and approved materials.

In general, the overburden soils are not suitable for use in confined areas. Imported granular material conforming to Granular B (OPSS 1010) would be suitable for these purposes as well as in areas where free-draining characteristics are required.

Backfill should be placed in lifts not exceeding 200 mm and compacted following requirements as stated in the Section 5.1 - Site Grading of this report.

All backfill and compaction operations should be monitored by qualified geotechnical personnel to approve material, to evaluate placement operations, and to verify that the specified degree of compaction is being achieved throughout the filling.

5.3.4 *Parking Areas, Internal Access Roads and Neighbourhood Collector Road (George Bolton Parkway Extension)*

The anticipated subgrade material for the pavement structure will primarily consist of stiff to very stiff clayey silt. The recommended pavement structures provided in Table 3 below are based upon an estimate of the subgrade soil properties determined from visual examination and textural classification of the soil samples. Consequently, the recommended pavement structures should be considered for preliminary design purposes only. A functional design life of ten years has been used to establish the pavement recommendations. This represents the number of years to the first rehabilitation, assuming regular maintenance is carried out. If required, a more refined pavement structure design can be performed based on specific traffic data and design life requirements which will involve specific laboratory tests to determine frost susceptibility and strength characteristics of the subgrade soil, as well as specific data input from the Client.

Table 3: Recommended Pavement Structure Thicknesses (Flexible)

Pavement Layer	Compaction Requirements	Light-Duty Pavement Areas	Heavy-Duty Pavement Areas	Neighbourhood Collector Pavement Areas
Asphaltic Concrete (OPSS 310/1150)	Min. 91.5% MRD for HL8/HDBC [1,3] Min. 92.0% MRD for HL3-HS/HL3[3]	40 mm HL3 60 mm HL8	40 mm HL3 (High Stability) 80 mm HDBC[3]	40 mm HL3 90 mm HL8
19 mm Crusher Run Limestone (OPSS 1010)	100% SPMDD[2]	150 mm	150 mm	150 mm
50 mm Crusher Run Limestone (OPSS 1010)	100% SPMDD[2]	200 mm	450 mm	450 mm

Notes: 1. Denotes maximum relative density, MTO LS-264
2. Denotes standard Proctor maximum dry density, MTO LS-706 (Procedure 3)
3. Denotes Heavy Duty Binder Course (HDBC), OPSS 1150

The subgrade should be compacted to 98 percent SPMDD for at least the upper 300 mm.

The foregoing design assumes that construction is carried out during dry periods and that the subgrade is stable under the load of construction equipment. If construction is carried out during wet weather, and heaving or rolling of the subgrade is experienced, additional thickness of granular material may be required.

The long-term performance of the pavement structure is highly dependent upon the subgrade support conditions. Stringent construction control procedures should be maintained to ensure that uniform subgrade moisture and density conditions are achieved. In addition, the need for adequate drainage cannot be over-emphasized. The finished pavement surface and underlying subgrade should be free of depressions and should be sloped (preferably at a minimum gradient of two percent) to provide effective surface drainage toward catch basins. Surface water should not be allowed to pond adjacent to the outside edges of pavement areas. Subdrains should be installed to intercept excess subsurface moisture and to prevent subgrade softening. This is particularly important in heavy-duty pavement areas.

Additional comments on the construction of parking areas and access roadways are as follows:

- As part of the subgrade preparation, parking areas and access roadways should be stripped of topsoil and other obviously unsuitable material. Fill required to raise the grades to design elevations should be organic-free and at a moisture content which will permit compaction to the densities indicated. The subgrade should be properly shaped, crowned, then proof-rolled in the full-time presence of a representative of this office. Soft or spongy subgrade areas should be sub-excavated and properly replaced with suitable approved backfill compacted to 98 percent SPMDD.

- The location and extent of sub-drainage required within the paved areas should be reviewed by this office in conjunction with the proposed site grading. In view of the clayey nature of the subgrade soils, we recommend perimeter subdrains be provided on both sides of the roadway at least 300 mm below the granular subbase. In addition, subdrains extending from and between catchbasins should also be installed. This will ensure no water collects in the granular course which could result in pre-mature pavement failure during the spring thaw.

- To minimize the problems of differential movement between the pavement and catchbasins / manholes due to frost action, the backfill around the structures should consist of free-draining granular. In addition, the catchbasin should be perforated just above the drain and the holes screened with filter cloth.

- The most severe loading conditions on light-duty pavement areas and the subgrade may occur during construction. Consequently, special provisions such as restricted lanes, half-loads during paving, etc., may be required, especially if construction is carried out during unfavorable weather.

- To prevent water ponding at the lower pavement areas, it is recommended that catchbasins be provided to drain the surface run-offs.

It is recommended that **exp** be retained to review the final pavement structure design and drainage plans prior to construction to ensure that they are consistent with the recommendations of this report.

5.4 Storm Water Management Pond

Storm water management ponds are to be constructed on the west side of the subject site. The north and south ponds will occupy areas of approximately 10,850 and 20,350 m^2, respectively. The lowest pond elevations are unknown.

At the pond areas, the boreholes revealed topsoil overlying discontinuous very loose to loose disturbed clayey silt and typically very stiff to hard clayey silt till. Based on the colour change of soil from brown to grey, the long-term groundwater level is expected to be at about 3.5 m below the existing grade.

5.4.1 ***Soil Permeability***

The base and sides of the ponds will primarily consist of disturbed clayey silt and clayey silt till. The hydraulic conductivities of these cohesive soils are estimated to be in the order of 10^{-7} to 10^{-9} m/s, which is considered relatively very low. It is our opinion that a clay liner will not be required for the proposed ponds.

5.4.2 ***Pond Construction***

Excavation of the ponds should be relatively straightforward using conventional hydraulic equipment and must be carried out in accordance with the OHSA regulations.

No major groundwater control requirements are expected during pond construction. Seepage in to the excavation is expected from the wet sand interlayers in the clayey glacial till. However, it should be possible to control and remove this seepage water using conventional construction dewatering techniques, i.e. pumping from sumps.

The sides of the proposed ponds should be sloped no steeper than 3H:1V. The pond slope may be sodded with grass to prevent surface erosion. Armour stone with filter cloth backing may be considered to be placed on the slope face where extensive wet/saturated layers are encountered to prevent side sloughing and surface erosion.

If applicable, the berm around the ponds may be constructed with excavated clayey silt till material in 300 mm thick lifts compacted to 98 percent SPMDD. The berm side slope should also be constructed no steeper than 3H:1V.

6 Soil Chemistry

6.1 Sulphate Attack

One split spoon soil sample was submitted for chemical analyses of sulphate to check for potential for sulphate attack on subsurface concrete.

The soil sample was submitted to an independent analytical laboratory accredited by the Canadian Association for Laboratory Accreditation (CALA) for chemical analyses consisting of pH and Soluble Sulphate.

Sample location data is shown below and Certificate of Analysis for the selected parameters is attached in Appendix C for your reference.

Table 4: Sample and Test Performed for Sulphate Attack

Sample Identification	Sample Depth (m)	Material	Test Performed
BH 38 / SS 3	1.5 – 2.0	Clayey Silt Till	pH and soluble sulphate

The soluble sulphate concentration of the sample was compared to the Canadian Standard CAN3/CSA A23.1 Table 3, Additional Requirements for Concrete Subjected to Sulphate Attack. It is anticipated that these results would be used to determine the type of cementing materials to be used for the concrete slab. Comparison of the test results indicate that the water soluble sulphate concentration in the tested soil sample was 0.0074% and is therefore lower than 0.10%, the minimum sulphate content warranting additional requirements. Based on the results, there is a negligible potential for sulphate attack on the concrete, and Class of Exposure is S-3.

6.2 Environmental Considerations

The terms of reference included chemical testing of soil for general soil quality. Accordingly, fifteen (15) soil samples were submitted for chemical testing. The samples were submitted to an independent analytical laboratory accredited by the Canadian Association for Laboratory Accreditation (CALA). The samples were analyzed for metals and general inorganic parameters listed in the Ministry of Environment and Climate Change (MOECC) document "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act"* - April 15, 2011 (MOECC Standards) – in accordance with O.Reg. 153/04 as amended.

The chemical testing was carried out to assist in the selection of disposal options for excess material to be generated during proposed commercial/industrial development. Based on the

soil stratigraphy as revealed in the boreholes, the soil encountered is assessed to be medium to fine grained and therefore the criteria for medium to fine textured soils from the MOECC Standards were applied to the site.

Sample location data is shown below and Certificates of Analyses for the selected inorganic parameters are attached in Appendix C for your reference.

Table 5: Sample and Test Performed

Sample Identification	Sample Depth	Material	Test Performed
BH 2 / SS 4	2.3 – 2.9	Native	Metals and Inorganic Parameters
BH 4 / SS 3	1.5 – 2.1	Native	Metals and Inorganic Parameters
BH 7 / SS 2	0.8 – 1.4	Native	Metals and Inorganic Parameters
BH 9 / SS 3	1.5 – 2.0	Native	Metals and Inorganic Parameters
BH 11 / SS 3	1.5 – 2.0	Native	Metals and Inorganic Parameters
BH 15 / SS 1	0.2 – 0.6	Disturbed material underneath topsoil	Metals and Inorganic Parameters
BH 19 / SS 2	0.8 – 1.2	Native	Metals and Inorganic Parameters
BH 23 / SS 3	1.5 – 2.0	Native	Metals and Inorganic Parameters
BH 26 / SS 1	0.2 – 0.6	Disturbed material underneath topsoil	Metals and Inorganic Parameters
BH 30 / SS 3	1.5 – 2.0	Native	Metals and Inorganic Parameters
BH 31 / SS 2	0.8 – 1.2	Native	Metals and Inorganic Parameters
BH 33 / SS 4	2.3 – 2.9	Native	Metals and Inorganic Parameters
BH 34 / SS 6	4.6 – 5.0	Native	Metals and Inorganic Parameters
BH 35 / SS 4	2.3 – 2.7	Native	Metals and Inorganic Parameters
BH 36 / SS 6	4.6 – 5.0	Native	Metals and Inorganic Parameters

Comparison with criteria in Table 2 (potable groundwater) from the MOECC Standards was selected as being most appropriate for majority of the Site with the exception of the area within 30 m of a small tributary that traverses the middle of the Site running east-west. The test results for the tested samples from the boreholes located within 30 m of the tributary were compared with Table 8. The selection of Table 2 for majority of the Site was based on the following site conditions:

- The property has not been identified as a sensitive site (except for the area within 30 m of the tributary).
- The groundwater is likely in use for potable purposes in the general neighborhood of the Site.
- Full restoration of contamination (if encountered) is assumed.

Based on the proposed property use of the site (commercial/industrial development), Industrial/Commercial/Community (ICC) property use criteria under the Standards were considered to be applicable.

The results of analytical testing for inorganic parameters indicate conformance of all soil samples with the Table 2 - Industrial/Commercial/ Community property use criteria adopted for the Site. The tested sample BH 11 / SS 3 located in the vicinity of the small tributary met Table 8 Standards.

Also, all test results met more stringent Table 1 and Table 8 criteria from the MOECC Standards.

Based on the chemical test results, excess soil from the site is considered suitable for re-use on site or for off-site disposal at land based sites being developed, subject to approval of the receiving site authorities.

7 General Comments

The information presented in this report is based on a limited investigation designed to provide information to support an overall assessment of the current geotechnical conditions of the subject property. The conclusions presented in this report reflect site conditions existing at the time of the investigation.

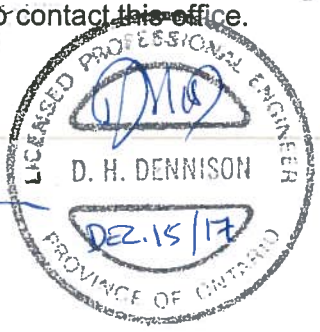
Exp Services Inc. should be retained for a general review of the final design and specifications to verify that this report has been properly interpreted and implemented. If not accorded the privilege of making this review, **exp** Services Inc. will assume no responsibility for interpretation of the recommendations in the report.

The comments given in this report are intended only for the guidance of design engineers. The number of boreholes required to determine the localized underground conditions between boreholes affecting construction costs, techniques, sequencing, equipment, scheduling, etc., would be much greater than has been carried out for design purposes. Contractors bidding on or undertaking the works should, in this light, decide on their own investigations, as well as their own interpretations of the factual borehole results, so that they may draw their own conclusions as to how the subsurface conditions may affect them.

More specific information, with respect to the conditions between samples, or the lateral and vertical extent of materials, may become apparent during excavation operations. The interpretation of the borehole information must, therefore, be validated during excavation operation. Consequently, during the future development of the property, conditions not observed during this investigation may become apparent; should this occur, **exp** Services Inc. should be contacted to assess the situation and additional testing and reporting may be required. **Exp** Services Inc. has qualified personnel to provide assistance in regards to future geotechnical and environmental issues related to this property.

We trust this report is satisfactory for your purposes. Should you have any questions, please do not hesitate to contact this office.

exp Services Inc.

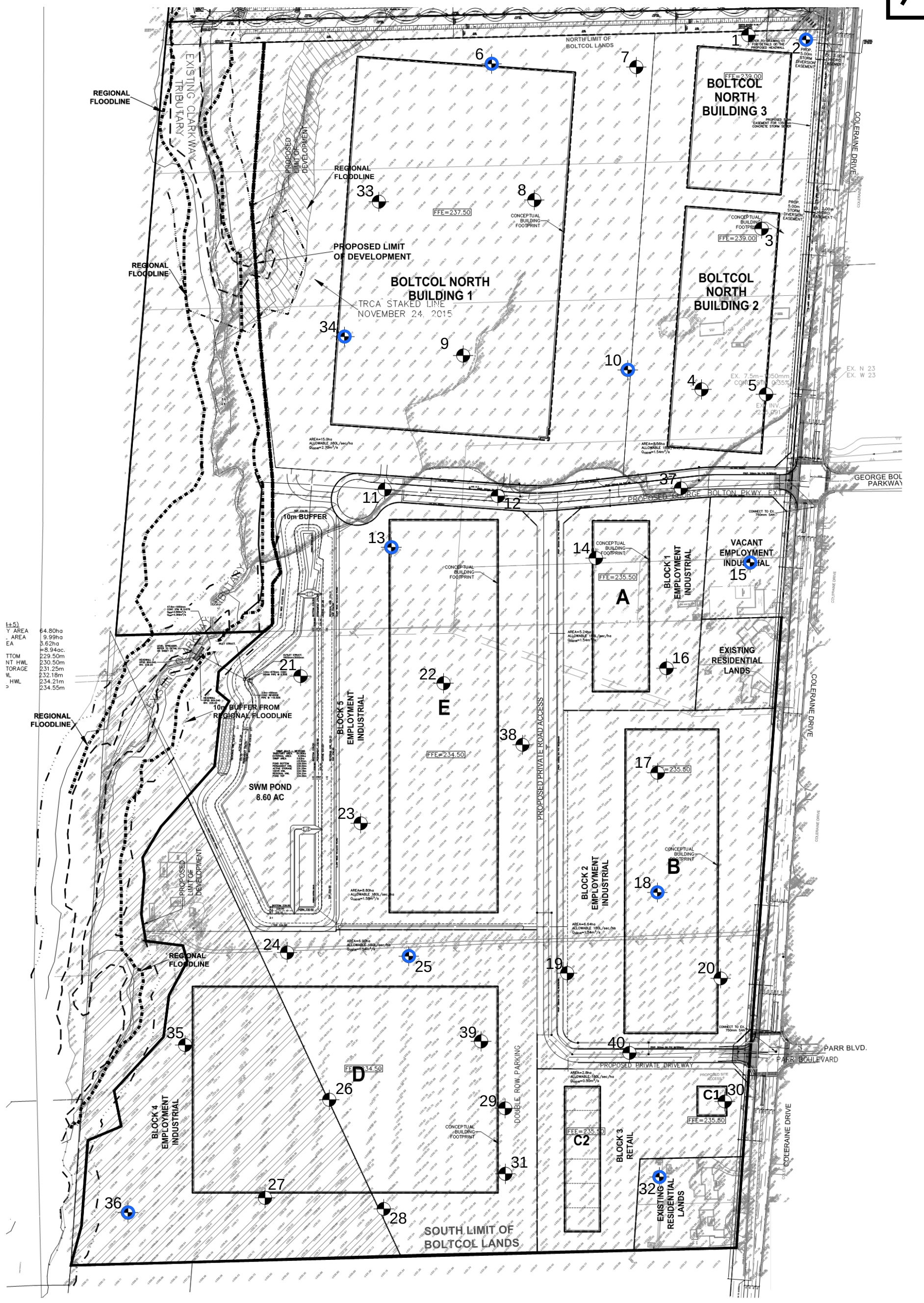


David Dennison, P.Eng.
Senior Engineer
Geotechnical Division

Stephen S.M. Cheng, P.Eng.
Discipline Manager
Geotechnical Division

HW//I:\2003-Brampton\Projects\Geotechnical Engineering\0600000\603000\603520-C0 Coleraine Dr & George Bolton Pkwy Geo Update\603520-C0 Rep.doc

Drawings



25 10 50 250 Metres

Legend

- Approximate Borehole Location
- Approximate Monitoring Well Location

exp Services Inc.
1595 Clark Boulevard
Brampton, Ontario
L6T 4V1
Telephone: (905) 793-9800
Fax: (905) 793-0641

SCALE: As shown

DATE: December 2017

DRAWN: KM

CHECKED: DD

Borehole Location Plan
Proposed Commercial / Industrial Complex
Coleraine Drive
Bolton, Ontario

PROJECT NO.: BRM-00603520-C0

DRAWING NO.: 1

Notes on Sample Descriptions and Soil Types — Drawing 1A

1. All sample descriptions included in this report follow the Canadian Foundations Engineering Manual soil classification system. This system follows the standard proposed by the International Society for Soil Mechanics and Foundation Engineering. Laboratory grain size analyses provided by **exp** also follow the same system. Others may use different classification systems; one such system is the Unified Soil Classification. Please note that, with the exception of those samples where a grain size analysis has been made, all samples are classified visually. Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems.

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE		

0.002 0.006 0.02 0.06 0.2 0.6 2.0 6.0 20 60 200

EQUIVALENT GRAIN DIAMETER IN MILLIMETERS

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

UNIFIED SOIL CLASSIFICATION

2. Fill: Where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc., none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional geotechnical site investigation.

3. Till: The term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (60 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of

till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

4. Excerpt from “OHSA Regulations for Construction Projects,” Part III, Section 226:

- **Soil Types**

Type 1 Soil

a) is hard, very dense and only able to be penetrated with difficulty by a small sharp object;
b) has a low natural moisture content and a high degree of internal strength;
c) has no signs of water seepage; and
d) can be excavated only by mechanical equipment.

Type 2 Soil

a) is very stiff, dense and can be penetrated with moderate difficulty by a small sharp object;
b) has a low to medium natural moisture content and a medium degree of internal strength; and
c) has a damp appearance after it is excavated.

Type 3 Soil

a) is stiff to firm and compact to loose in consistency or is previously excavated soil;
b) exhibits signs of surface cracking;
c) exhibits signs of water seepage;
d) if it is dry, may run easily into a well-defined conical pile; and
e) has a low degree of internal strength.

Type 4 Soil

a) is soft to very soft and very loose in consistency, very sensitive and upon disturbance is significantly reduced in natural strength;
b) runs easily or flows, unless it is completely supported before excavating procedures;
c) has almost no internal strength;
d) is wet or muddy; and
e) exerts substantial fluid pressure on its supporting system. O. Reg. 213/91, s. 226.

Log of Borehole 1

Project No. BRM-00603520-A0 | Drawing No. 2

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 9 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) 20 40 60 80 / Shear Strength 100 200 kPa	Combustible Vapour Reading (ppm) 25 50 75 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 10 20 30	Sample	Natural Unit Weight kN/m³
		TOPSOIL 480 mm	238.48	0	6	×		
			~238.0					
		CLAYEY SILT (disturbed) trace sand, trace gravel, trace organics, mottled brown, moist	~237.8					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to hard, moist		1	13	×		21.4
				2	22	×		
				3	35	×		21.6
		---------- grey ----------			27	×		21.7
		reduced clay content ----------		4				
				5	17	×		21.7
				6	24	×		
			~231.8					
		END OF BOREHOLE						

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

exp.

Log of Borehole 2

Project No. BRM-00603520-A0 | Drawing No. 3

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 9 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Natural Unit Weight kN/m³
TOPSOIL 180 mm	238.68 ~238.5	0	7		
CLAYEY SILT (disturbed) trace sand, trace gravel, trace organics, mottled brown, moist	~238.0	1	16		21.4
CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to hard, moist		2	22 26		21.4
---------- grey	~235.0	3	23		22.2
		4			
		5	14		21.3
		6	20		21.7
		7	50/150 mm		
END OF BOREHOLE	~230.9				

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open
Jun. 20, 2014	4.4	
Jul. 8, 2014	3.7	

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 3

Project No. BRM-00603520-A0 | Drawing No. 4

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 9 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 380 mm	237.77	0	7			
			~237.4					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, very stiff, moist		1	16			21.5
		sand interlayers		2	18			
		sand interlayers			20			21.3
		grey		3	26			21.5
				4				
				5	21			
				6	17			22.6
		grinding	~231.1					
		END OF BOREHOLE						

SPT (N Value): 20 40 60 80
Shear Strength: 100 200 kPa
Combustible Vapour Reading (ppm): 25 50 75
Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 4

Project No. BRM-00603520-A0 | Drawing No. 5

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 10 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 310 mm	236.77	0				
			~236.5					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to hard, moist		1	5, 21			21.2
				2	21, 27			21.5
				3	25			21.5
				4				21.2
		---------- grey		5	10			20.7
		---------- reduced clay content		6	79/280 mm			21.4
			~230.2					
		END OF BOREHOLE						

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

exp.

Log of Borehole 5

Project No. BRM-00603520-A0 | Drawing No. 6

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 10 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test ——— | Shelby Tube ■ | Field Vane Test ✚ S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit ⊢—○ | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 100 mm	236.00	0	6			
		CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~235.9					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to hard, moist	~235.5	1	17			21.7
				2	16			21.1
					19			20.8
				3	16			21.1
		---------- grey		4				
				5	10			
		---------- grinding reduced clay content		6	50/30 mm			
					50/150 mm			
			~229.1					
		END OF BOREHOLE						

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

Log of Borehole 6

Project No. BRM-00603520-A0 | Drawing No. 7

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 9 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | Combustible Vapour Reading □

SPT (N) Value ○ ▨ | Natural Moisture ×

Dynamic Cone Test — | Plastic and Liquid Limit ⊢○

Shelby Tube ■ | Undrained Triaxial at % Strain at Failure ⊕

Field Vane Test ✚ S | Penetrometer ▲

Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Natural Unit Weight kN/m³
TOPSOIL 330 mm	237.56	0	3		19.6
	~237.3				
CLAYEY SILT (disturbed) some sand, trace gravel, trace organics, mottled brown, moist	~236.9	1	14		22.1
CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to hard, moist	~236.4	2	25		
			20		21.7
		3	23		22.2
grey		4			
		5	19		22.5
reduced clay content		6	30		23.0
		7			
		8	34		
	~229.3				
END OF BOREHOLE					

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open
Jun. 20, 2014	1.2	
Jul. 8, 2014	1.2	

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 7

Project No. BRM-00603520-A0 | Drawing No. 8

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 9 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test ——— | Shelby Tube ■ | Field Vane Test ✚ S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit ⊢—○ | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 460 mm	236.71	0	4	×		
			~236.2					
		CLAYEY SILT (disturbed) trace sand, trace gravel, trace organics, mottled brown, moist	~236.0					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to hard, moist		1	16	×		21.8
		grinding		2	22	×		22.0
		sand interlayers		2	21	×		22.3
				3	21	×		21.9
		grey		4				
				5	15	×		21.9
				6	13	×		21.4
				7				
		reduced clay content	~228.6	8	84	×		23.0
		END OF BOREHOLE						

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

Log of Borehole 8

Project No. BRM-00603520-A0 | Drawing No. 9

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 9 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 330 mm	235.56	0	7			21.3
			~235.3					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, very stiff, moist		1	17			22.1
				2	21			21.5
					27			22.0
				3	24			21.9
		---------- grey		4				
				5	17			22.1
				6	17			21.3
			~228.9					
		END OF BOREHOLE						

SPT (N Value): 20 40 60 80
Shear Strength kPa: 100 200
Combustible Vapour Reading (ppm): 25 50 75
Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 9

Project No. BRM-00603520-A0 | Drawing No. 10

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 10 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | Combustible Vapour Reading □

SPT (N) Value ○ ▨ | Natural Moisture ×

Dynamic Cone Test — | Plastic and Liquid Limit ⊢○

Shelby Tube ■ | Undrained Triaxial at % Strain at Failure ⊕

Field Vane Test S | Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 200 mm	234.16	0				
			~234.0					
		CLAYEY SILT (disturbed) trace sand, trace gravel, trace organics, mottled brown, moist	~233.5					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to very stiff, moist		1	4, 9			22.7
		sand interlayers		2	13, 23			21.3, 21.9
		grey		3	21			22.0
				4				
				5	17			22.2
				6	15			22.6
			~227.6					
		END OF BOREHOLE						

SPT (N Value): 20 40 60 80 — Shear Strength: 100 200 kPa

Combustible Vapour Reading (ppm): 25 50 75 — Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 10

Project No. BRM-00603520-A0 | Drawing No. 11

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 10 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | Combustible Vapour Reading □

SPT (N) Value ○ ▨ | Natural Moisture ×

Dynamic Cone Test — | Plastic and Liquid Limit I—○

Shelby Tube ■ | Undrained Triaxial at % Strain at Failure ⊕

Field Vane Test S | Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 130 mm	236.07	0				
		CLAYEY SILT (disturbed) trace sand, trace gravel, trace organics, mottled brown, moist	~236.0					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to very stiff, moist	~235.6					
			~235.3	1	5, 16			21.4
				2	22			21.7
					17			21.3
		---------- grey		3	16			21.0
				4				
				5	11			22.0
				6	16			22.4
			~229.5					
		END OF BOREHOLE						

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open
Jun. 20, 2014	0.8	
Jul. 8, 2014	0.8	

Log of Borehole 11

Project No. BRM-00603520-A0 | Drawing No. 12

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 10 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test —
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit —○—
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 180 mm	232.25 ~232.1	0	6			
		CLAYEY SILT (disturbed) trace sand, trace gravel, trace organics, mottled brown, moist	~231.7	1	32			21.9
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to hard, moist		2	25 23			22.1 22.0
		grey		3	15			22.2
				4				
				5	16			
				6	14			22.3
			~225.7					
		END OF BOREHOLE						

SPT (N Value): 20 40 60 80
Shear Strength kPa: 100 200
Combustible Vapour Reading (ppm): 25 50 75
Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

Elapsed Time	Water Level (m)	Hole Open to (m)

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 12

Project No. BRM-00603520-A0 | Drawing No. 13

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 11 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 230 mm	233.94	0				
		SANDY SILT (disturbed) some clay, trace gravel, mottled brown, moist	~233.7					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to very stiff, moist	~233.1	1	2, 11			
				2	24, 27			21.8, 21.8
		---------- grey		3	21			21.7
				4				
				5	12			
				6	17			21.7
			~227.4					
		END OF BOREHOLE						

SPT (N Value): 20 40 60 80
Shear Strength: 100 200 kPa
Combustible Vapour Reading (ppm): 25 50 75
Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 13

Project No. BRM-00603520-A0 | Drawing No. 14

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 10 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test ——— | Shelby Tube ■ | Field Vane Test ✚ S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		232.63		0	20 40 60 80 / 100 200	25 50 75 / 10 20 30		
		TOPSOIL 150 mm	~232.5					
		CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~231.9					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to hard, moist		1	5, 18			21.7
				2	21			22.1
		---------- grey		3	15			22.3
				4	16			22.4
				5	13			23.0
		---------- reduced clay content		6	11			
				7				
				8	36			22.7
			~224.6					
		END OF BOREHOLE						

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Elapsed Time	Water Level (m)	Hole Open to (m)
Jun. 20, 2014	0.3	
Jul. 8, 2014	0.1	

Log of Borehole 14

Project No. BRM-00603520-A0 | Drawing No. 15

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 10 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit I—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 100 mm	235.11 ~235.0	0				
		CLAYEY SILT (disturbed) trace sand, trace gravel, trace organics, mottled brown, moist	~234.4		5			
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to very stiff, moist		1	19			21.6
				2	17			21.5
					25			21.6
				3	24			21.4
		---------- grey		4				
				5	13			21.6
				6	15			21.9
			~228.6					
		END OF BOREHOLE						

SPT (N Value): 20 40 60 80
Shear Strength kPa: 100 200
Combustible Vapour Reading (ppm): 25 50 75
Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 15

Project No. BRM-00603520-A0 | Drawing No. 16

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 10 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test ——— | Shelby Tube ■ | Field Vane Test ✚ S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit ⊢—○ | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲

Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Natural Unit Weight kN/m³
TOPSOIL 370 mm	236.38	0	3		
	~236.0				
CLAYEY SILT (disturbed) trace gravel, sand inclusions, mottled brown, moist	~235.7				
CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to hard, moist	~235.2	1	14		21.5
		2	19		21.5
			19		21.6
		3	18		20.9
grey		4			
		5	12		20.8
		6	10		
		7			
reduced clay content	~228.3	8	46		
END OF BOREHOLE					

SPT (N Value): 20 40 60 80 — Shear Strength: 100 200 kPa

Combustible Vapour Reading (ppm): 25 50 75 — Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

Sample

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	7.6	Open
Jun. 20, 2014	0.9	
Jul. 8, 2014	1.2	

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 16

Project No. BRM-00603520-A0 | Drawing No. 17

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 11 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) 20 40 60 80 / Shear Strength 100 200 kPa	Combustible Vapour Reading (ppm) 25 50 75 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 10 20 30	Sample	Natural Unit Weight kN/m³
		TOPSOIL 300 mm	235.12	0				
			~234.8					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to very stiff, moist		1	6, 17			22.0
				2	19, 30			21.5, 22.9
		---------- sand interlayers ----------		3	22			21.4
		---------- grey		4				
				5	14			
				6	11			21.1
			~228.6					
		END OF BOREHOLE						

Elapsed Time	Water Level (m)	Hole Open to (m)

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

exp.

Log of Borehole 17

Project No. BRM-00603520-A0 | Drawing No. 18

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 12 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test ——— | Shelby Tube ■ | Field Vane Test ✚ S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 200 mm	234.57	0				
			~234.4					
		CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~234.1					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to very stiff, moist			5			
				1	15			
					19			21.7
				2	23			21.6
		---------- sand interlayers ----------		3	17			21.1
		---------- grey		4				
				5	10			21.0
				6	9			20.9
				7				
				8	15			21.1
			~226.5					
		END OF BOREHOLE						

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 18

Project No. BRM-00603520-A0 | Drawing No. 19

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 11 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test ——— | Shelby Tube ■ | Field Vane Test ✚ S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲

Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Natural Unit Weight kN/m³
TOPSOIL 130 mm	233.78 ~233.7	0	5	×	
CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~233.4 ~233.3	1	20	×	21.6
CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to very stiff, moist		2	24	×	21.8
			26	×	21.7
---------- sand interlayers ---------- grey		3	22	×	21.5
		4			
		5	14	×	21.4
		6	13	×	21.0
	~227.2				
END OF BOREHOLE					

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open
Jun. 20, 2014	-0.5	
Jul. 9, 2014	0.4	

exp.

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 19

Project No. BRM-00603520-A0 | Drawing No. 20

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 13 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | Combustible Vapour Reading □

SPT (N) Value ○ ▨ | Natural Moisture ×

Dynamic Cone Test ——— | Plastic and Liquid Limit ⊢○

Shelby Tube ■ | Undrained Triaxial at % Strain at Failure ⊕

Field Vane Test S | Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 230 mm	232.40	0				
			~232.2					
		CLAYEY SILT (disturbed) some sand, trace gravel, mottled brown, moist	~231.9					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, firm to hard, moist			4			
				1	13			
					23			22.3
				2	27			21.7
				3	21			21.1
		grey		4				
					11			21.1
				5				
				6	7			20.9
				7				
		reduced clay content			80/280 mm			
			~224.5					
		END OF BOREHOLE						

Elapsed Time	Water Level (m)	Hole Open to (m)

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 20

Project No. BRM-00603520-A0 | Drawing No. 21

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 12 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | Combustible Vapour Reading □

SPT (N) Value ○ ▨ | Natural Moisture ×

Dynamic Cone Test ——— | Plastic and Liquid Limit ⊢○

Shelby Tube ■ | Undrained Triaxial at % Strain at Failure ⊕

Field Vane Test ✚ S | Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) 20 40 60 80 / Shear Strength kPa 100 200	Combustible Vapour Reading (ppm) 25 50 75 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 10 20 30	Sample	Natural Unit Weight kN/m³
		TOPSOIL 310 mm	233.75	0				
			~233.5					
		CLAYEY SILT (disturbed) some sand, trace gravel, mottled brown, moist	~233.1					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to hard, moist		1	3, 13			
				2	23			21.7
					32			22.2
				3	27			21.4
		---------- grey		4				
				5	14			21.0
				6	9			20.8
				7				
		---------- reduced clay content	~225.7	8	63			22.8
		END OF BOREHOLE						

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

exp.

Log of Borehole 21

Project No. BRM-00603520-A0 | Drawing No. 22

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 11 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 200 mm	233.22 ~233.0	0	4			
		CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~232.7					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to very stiff, moist		1	16			20.5
				2	19			21.6
					26			21.9
				3	26			21.9
		---------- grey		4				
				5	10			22.3
		---------- reduced clay content	~226.7	6	20			
		END OF BOREHOLE						

SPT (N Value): 20 40 60 80
Shear Strength: 100 200 kPa
Combustible Vapour Reading (ppm): 25 50 75
Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 22

Project No. BRM-00603520-A0 | Drawing No. 23

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 11 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test ——— | Shelby Tube ■ | Field Vane Test ✚ S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit ⊢—○ | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 330 mm	233.41	0				
			~233.1					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to very stiff, moist			6			
				1	18			20.8
				2	26			21.6
					27			21.6
		---------- grey		3	21			21.9
				4				
				5	15			22.1
				6	8			
				7				
				8	13			21.3
			~225.3					
		END OF BOREHOLE						

SPT (N Value): 20 40 60 80 | Shear Strength: 100 200 kPa

Combustible Vapour Reading (ppm): 25 50 75 | Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

exp.

Log of Borehole 23

Project No. BRM-00603520-A0 | Drawing No. 24

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 11 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test — | Shelby Tube ■ | Field Vane Test ✚ S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 310 mm	233.06	0	3			
			~232.8					
		CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~232.6					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, very stiff to hard, moist		1	17			21.6
				2	22			21.4
					25			21.7
		---------- grinding		3	33			21.7
		---------- grey		4				
				5	18			22.1
				6	17			21.9
			~226.5					
		END OF BOREHOLE						

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

Log of Borehole 24

Project No. BRM-00603520-A0 Drawing No. 25

Project: Proposed Commercial/Industrial Complex Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 11 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) 20 40 60 80 / Shear Strength 100 200 kPa	Combustible Vapour Reading (ppm) 25 50 75 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 10 20 30	Sample	Natural Unit Weight kN/m³
		TOPSOIL 460 mm	231.93	0				
			~231.4					
		CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~231.3					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, very stiff to hard, moist		1	2, 17			21.2
				2	19			21.4
					32			22.3
				3	31			21.9
		---------- grey		4				
				5	23			23.2
		---------- reduced clay content						
				6	90/280 mm			
			~225.6					
		END OF BOREHOLE						

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	5.9

exp.

Log of Borehole 25

Project No. BRM-00603520-A0 | Drawing No. 26

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 12 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test — | Shelby Tube ■ | Field Vane Test S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit ⊢○ | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲

Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
TOPSOIL 180 mm	232.69 ~232.5	0				
CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~232.2					
CLAYEY SILT TILL trace to some sand, trace gravel, brown, very stiff, moist	~231.9	1	4, 20			
		2	21, 22			21.6 21.7
grey		3	24			22.0
		4				
		5	18			22.3
grinding	~226.1	6	24			
END OF BOREHOLE						

SPT (N Value): 20 40 60 80 — Shear Strength: 100 200 kPa

Combustible Vapour Reading (ppm): 25 50 75 — Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open
Jun. 20, 2014	1.8	
Jul. 8, 2014	0.8	

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 26

Project No. BRM-00603520-A0 | Drawing No. 27

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 13 June 2014

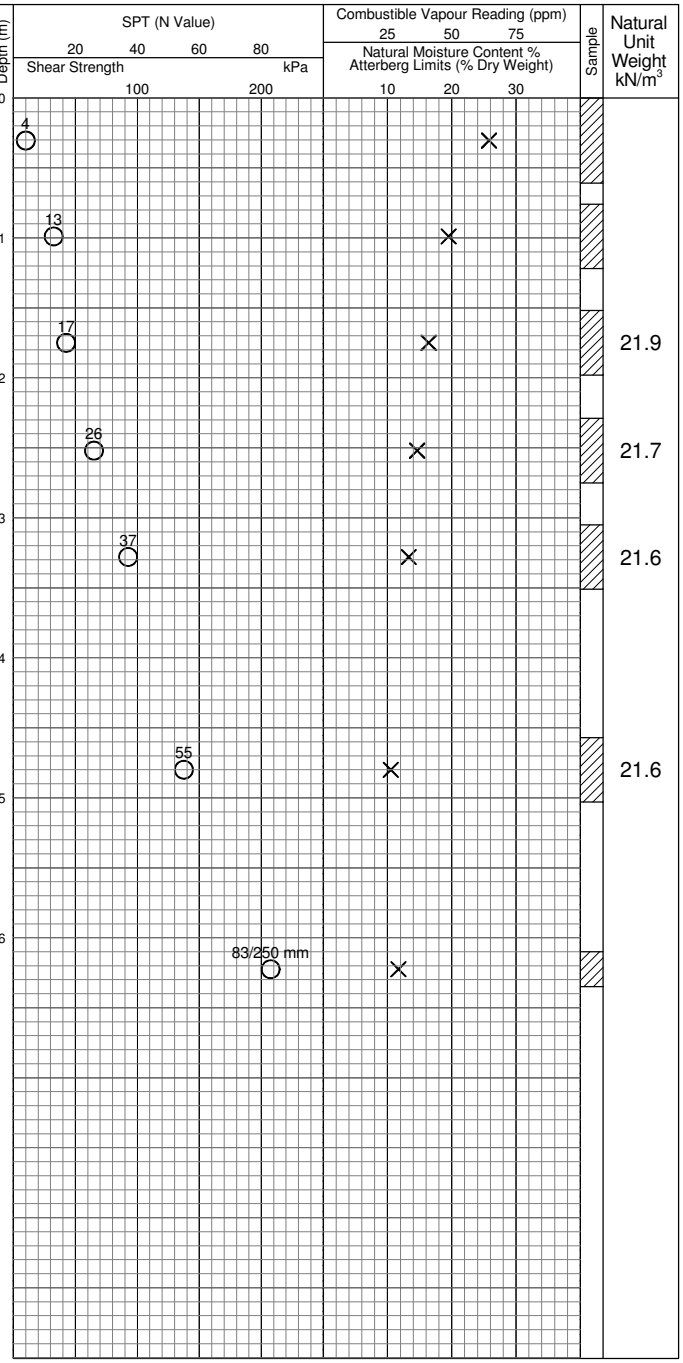
Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m
		TOPSOIL 200 mm	231.09
		CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~230.9
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to hard, moist	~230.5
		---------- sand interlayers ---------- ---------- grey	
		---------- reduced clay content	
			~224.7
		END OF BOREHOLE	



Elapsed Time	Water Level (m)	Hole Open to (m)

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 27

Project No. BRM-00603520-A0 | Drawing No. 28

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 13 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) 20 40 60 80 / Shear Strength kPa 100 200	Combustible Vapour Reading (ppm) 25 50 75 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 10 20 30	Sample	Natural Unit Weight kN/m³
		TOPSOIL 330 mm	228.72	0				
			~228.4					
		CLAYEY SILT (disturbed) some sand, trace gravel, mottled brown, moist	~228.0					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, firm to hard, moist		1	3, 6			
				2	20			21.7
					40			
		---------- grey reduced clay content		3	38			21.8
				4				
				5	39			22.0
				6	31			21.3
			~222.2					
		END OF BOREHOLE						

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	6.0	Open

exp.

Log of Borehole 28

Project No. BRM-00603520-A0 | Drawing No. 29

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 13 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | Combustible Vapour Reading □

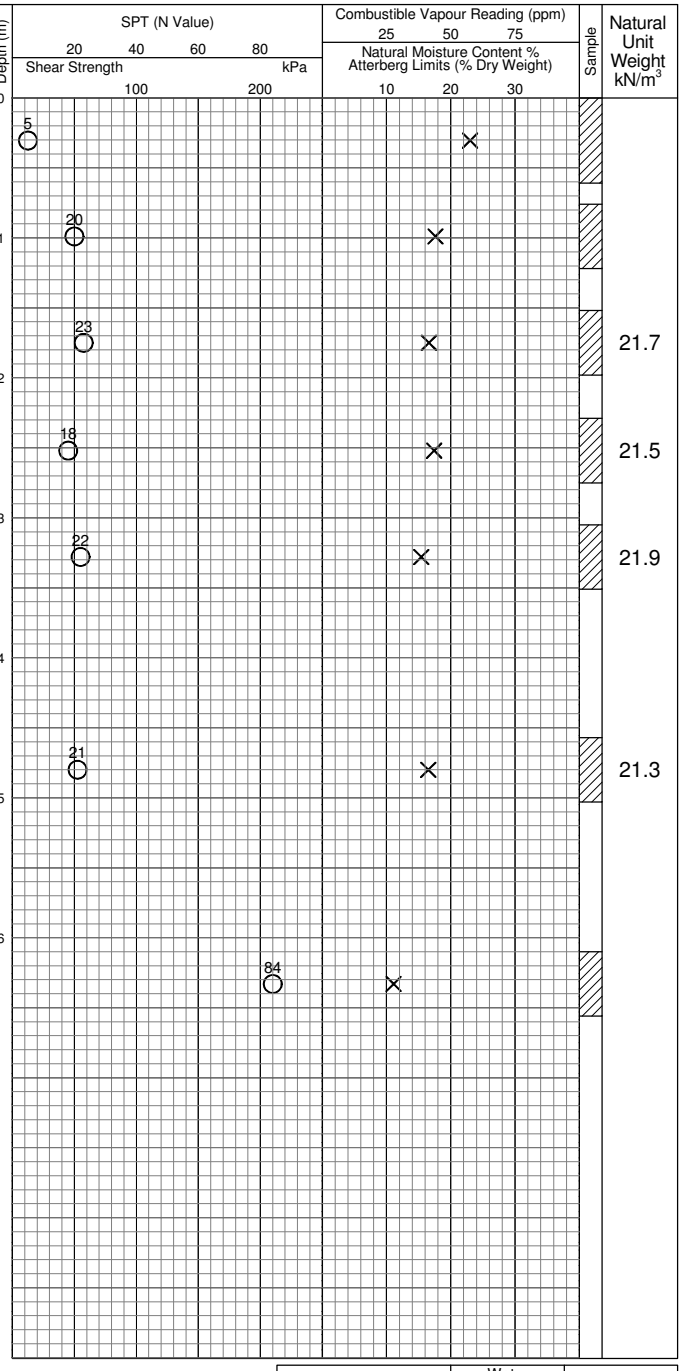
SPT (N) Value ○ ▨ | Natural Moisture ×

Dynamic Cone Test — | Plastic and Liquid Limit ⊢○

Shelby Tube ■ | Undrained Triaxial at % Strain at Failure ⊕

Field Vane Test ✚ S | Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m
		TOPSOIL 180 mm	230.31
			~230.1
		CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~229.8
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, very stiff to hard, moist	
		sand interlayers	
		grey	
		reduced clay content	
			~223.8
		END OF BOREHOLE	



Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 29

Project No. BRM-00603520-A0 | Drawing No. 30

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 13 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | Combustible Vapour Reading □

SPT (N) Value ○ ▨ | Natural Moisture ×

Dynamic Cone Test ——— | Plastic and Liquid Limit I—○

Shelby Tube ■ | Undrained Triaxial at % Strain at Failure ⊕

Field Vane Test ✚ S | Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 100 mm	231.36	0				
			~231.3					
		CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~231.0					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, firm to hard, moist						
		---------- grey		3				20.7
		---------- reduced clay content	~223.6					
		END OF BOREHOLE						

SPT (N Value): 20 40 60 80 — Shear Strength: 100 200 kPa

Combustible Vapour Reading (ppm): 25 50 75 — Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

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

SPT values: 5, 19, 21, 19, 13, 8, 7, 50/130 mm

Natural Unit Weight kN/m³: 21.4 (1.5 m), 21.2 (2.5 m), 20.7 (3.5 m), 21.4 (4.5 m)

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 30

Project No. BRM-00603520-A0 | Drawing No. 31

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 13 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | SPT (N) Value ○ ▨ | Dynamic Cone Test ——— | Shelby Tube ■ | Field Vane Test ✚ S

Combustible Vapour Reading □ | Natural Moisture × | Plastic and Liquid Limit I—○ | Undrained Triaxial at % Strain at Failure ⊕ | Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 310 mm	234.18	0	3			
			~233.9					
		SANDY SILT (disturbed) some clay, some gravel, mottled brown, moist	~233.5					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to very stiff, moist		1	12			
				2	18			21.3
		sand interlayers			28			22.4
		sand interlayers		3	23			21.8
		grey		4				
				5	11			20.8
				6	11			21.6
			~227.6					
		END OF BOREHOLE						

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

exp.

Log of Borehole 31

Project No. BRM-00603520-A0 Drawing No. 32

Project: Proposed Commercial/Industrial Complex Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 12 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) 20 40 60 80 / Shear Strength 100 200 kPa	Combustible Vapour Reading (ppm) 25 50 75 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 10 20 30	Sample	Natural Unit Weight kN/m³
		TOPSOIL 200 mm	231.57	0				
			~231.4					
		CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~231.1					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to hard, moist		1	2, 17			21.8
				2	18			21.8
					26			22.2
		---------- some sand		3	23			22.4
		---------- grey		4				
				5	10			
				6	8			
				7	85/280 mm			
		---------- reduced clay content	~223.7					
		END OF BOREHOLE						

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	6.1

exp.

Log of Borehole 32

Project No. BRM-00603520-A0 | Drawing No. 33

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 12 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
TOPSOIL 200 mm	233.04 ~232.8	0				
CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~232.5					
CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to hard, moist		1	5, 16			21.4
		2	23			21.6
			27			22.1
		3	31			22.5
grey		4				
	~228.2	5	17			21.5
		6	14			
	~226.5					
END OF BOREHOLE						

SPT (N Value): 20 40 60 80
Shear Strength: 100 200 kPa
Combustible Vapour Reading (ppm): 25 50 75
Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open
Jun. 20, 2014	Dry	
Jul. 8, 2014	4.8	

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 33

Project No. BRM-00603520-A0 | Drawing No. 34

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 9 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test —
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit —○—
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 410 mm	235.80	0	7			
			~235.4					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to very stiff, moist		1	11			
		sand interlayers						
				2	17			21.6
					23			22.0
		sand interlayers		3	25			22.0
		grey		4				
				5	18			22.8
		reduced clay content		6	29			23.2
			~229.1					
		END OF BOREHOLE						

SPT (N Value): 20 40 60 80
Shear Strength kPa: 100 200
Combustible Vapour Reading (ppm): 25 50 75
Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	6.0	Open

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

exp.

Log of Borehole 34

Project No. BRM-00603520-A0 | Drawing No. 35

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 10 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 330 mm	235.28	0	5			
			~235.0					
		CLAYEY SILT (disturbed) trace sand, trace gravel, trace organics, mottled brown, moist	~234.5					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, very stiff to hard, moist		1	16			21.7
				2	16			21.6
					32			22.4
			~232.1	3	37			22.3
		---------- grey		4				
		---------- reduced clay content		5	28			22.1
				6	28			23.3
			~228.7					
		END OF BOREHOLE						

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open
Jun. 20, 2014	5.4	
Jul. 8, 2014	3.2	

exp.

Log of Borehole 35

Project No. BRM-00603520-A0 | Drawing No. 36

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 12 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | Combustible Vapour Reading □

SPT (N) Value ○ ▨ | Natural Moisture ×

Dynamic Cone Test — | Plastic and Liquid Limit ⊢○

Shelby Tube ■ | Undrained Triaxial at % Strain at Failure ⊕

Field Vane Test S | Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m
		TOPSOIL 200 mm	231.27
		CLAYEY SILT (disturbed) some sand, trace gravel, mottled brown, moist	~231.1
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, very stiff to hard, moist	~230.8
		---------- some sand	
		---------- grey	
		---------- reduced clay content	
			~224.9
		END OF BOREHOLE	

SPT (N Value): 20 40 60 80 — Shear Strength: 100 200 kPa

Combustible Vapour Reading (ppm): 25 50 75

Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

Depth (m)	SPT (N)	Natural Unit Weight kN/m³
0	5	
1	17	21.6
2	20	21.5
3	24	21.6
4	33	22.5
5	76	
6	86/280 mm	

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 36

Project No. BRM-00603520-A0 | Drawing No. 37

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 13 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒ | Combustible Vapour Reading □

SPT (N) Value ○ ▨ | Natural Moisture ×

Dynamic Cone Test — | Plastic and Liquid Limit ⊢○

Shelby Tube ■ | Undrained Triaxial at % Strain at Failure ⊕

Field Vane Test S | Penetrometer ▲

Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Natural Unit Weight kN/m³
TOPSOIL 330 mm	229.55	0	3	×	
	~229.3				
CLAYEY SILT (disturbed) some sand, trace gravel, mottled brown, moist	~228.9				
	~228.8				
CLAYEY SILT TILL trace to some sand, trace gravel, brown, very stiff to hard, moist		1	17	×	
			23	×	21.6
---------- sand interlayers ----------		2	42	×	22.3
		3	39	×	22.5
---------- grinding					
---------- grey		4			
---------- reduced clay content			85/280 mm	×	
		5			
		6	66	×	21.5
	~223.0				
END OF BOREHOLE					

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open
Jun. 20, 2014	0.6	
Jul. 8, 2014	0.8	

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 37

Project No. BRM-00603520-A0 | Drawing No. 38

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 11 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 230 mm	234.78	0	3			
			~234.6					
		CLAYEY SILT (disturbed) trace gravel, sand inclusions, mottled brown, moist	~234.3					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to hard, moist		1	17			21.3
				2	18			
					24			
				3	22			21.4
		grey		4				
				5	14			
		reduced clay content	~228.6	6	50/130 mm			
		END OF BOREHOLE						

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 38

Project No. BRM-00603520-A0 | Drawing No. 39

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 11 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit I—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
TOPSOIL 330 mm	234.52	0	6			
	~234.2					
CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~233.9					
CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to very stiff, moist		1	18			
		2	18			21.3
			19			21.3
		3	19			21.6
---------- grey		4				
		5	12			21.7
		6	13			21.8
	~228.0					
END OF BOREHOLE						

Elapsed Time	Water Level (m)	Hole Open to (m)

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Log of Borehole 39

Project No. BRM-00603520-A0 | Drawing No. 40

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 13 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) 20 40 60 80 / Shear Strength kPa 100 200	Combustible Vapour Reading (ppm) 25 50 75 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 10 20 30	Sample	Natural Unit Weight kN/m³
		TOPSOIL 300 mm	232.54	0				
			~232.2					
		CLAYEY SILT (disturbed) some sand, trace gravel, mottled brown, moist	~232.0					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to very stiff, moist		1	3, 16			
				2	17			21.5
		---------- sand interlayers ----------			17			20.9
				3	15			20.7
		---------- grey		4				
				5	9			21.9
				6	12			21.2
			~226.0					
		END OF BOREHOLE						

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

Log of Borehole 40

Project No. BRM-00603520-A0 | Drawing No. 41

Project: Proposed Commercial/Industrial Complex | Sheet No. 1 of 1

Location: Coleraine Dr, Bolton, Ontario

Date Drilled: 13 June 2014

Drill Type: CME-55 Track, Solid Stem Auger

Datum: Geodetic

Auger Sample ☒
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test ✚ S

Combustible Vapour Reading □
Natural Moisture ×
Plastic and Liquid Limit ⊢—○
Undrained Triaxial at % Strain at Failure ⊕
Penetrometer ▲

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		TOPSOIL 200 mm	232.59	0				
			~232.4					
		CLAYEY SILT (disturbed) trace sand, trace gravel, mottled brown, moist	~232.0					
		CLAYEY SILT TILL trace to some sand, trace gravel, brown, stiff to very stiff, moist		1	4, 17			
				2	23			22.0
		---------- sand interlayers ----------			19			22.0
				3	14			20.6
		---------- grey		4				
				5	15			20.9
				6	9			21.2
			~226.0					
		END OF BOREHOLE						

EXPLOGBRAMPTON BH LOGS.GPJ NEW.GDT 7/14/14

Elapsed Time	Water Level (m)	Hole Open to (m)
On Completion	Dry	Open

Appendices

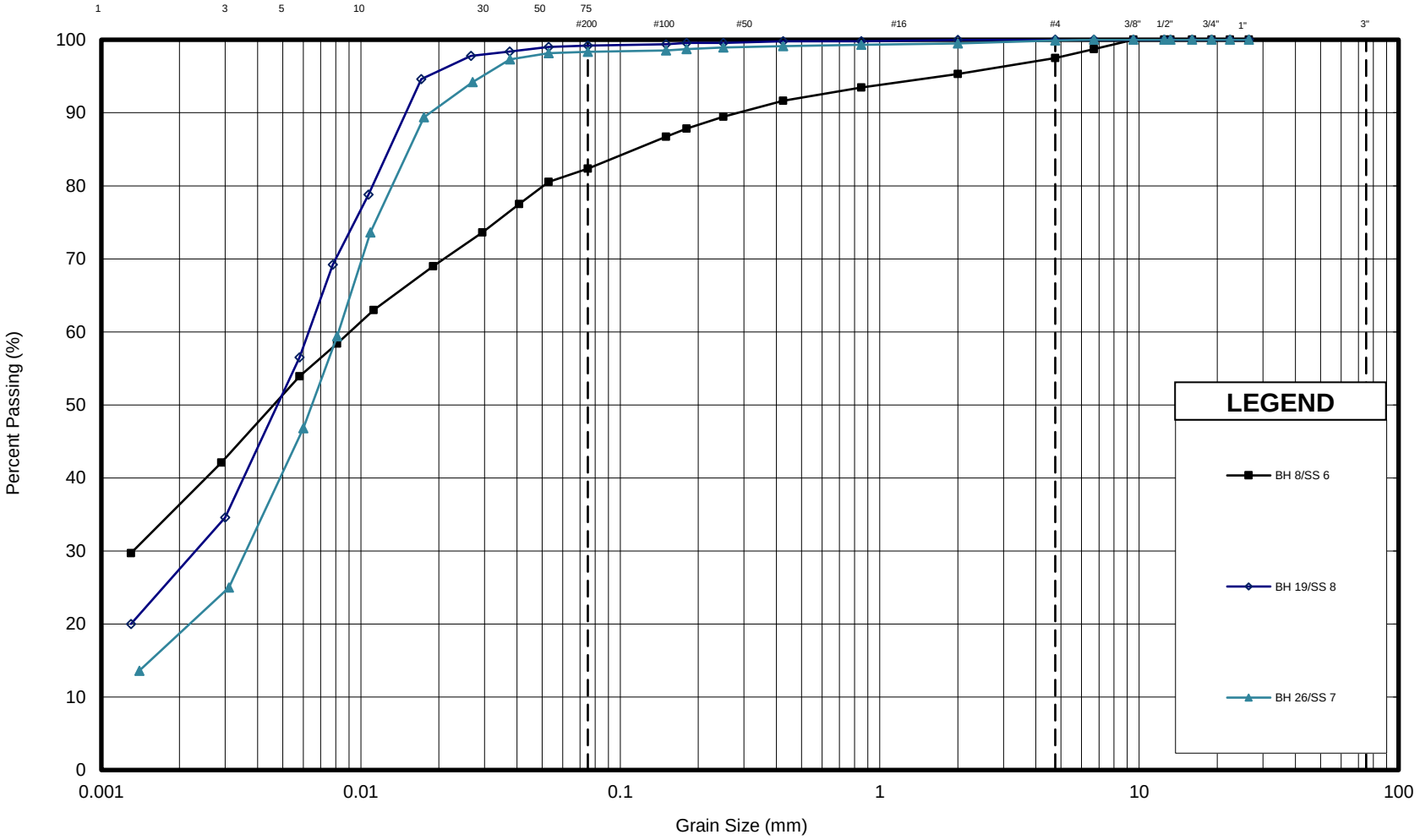
Appendix A:
Geotechnical Laboratory Test Results

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse

GRAIN SIZE IN MICROMETERS

SIEVE DESIGNATION (IMPERIAL)



I:\2003-Brampton\Projects\Geotechnical Engineering\0600000\603000\603520-C0 Coleraine Dr & George Bolton Pkwy Geo Update\Grain Size Distribution.xls

exp.

GRAIN SIZE DISTRIBUTION

CLAYEY SILT TILL

FIGURE No.	1
REF. No.	BRM-00603520-A0
DATE	December 2017

Appendix B:
Engineered Fill Construction Guidelines

Foundations placed on engineered fill comprising native soil from the site - or imported materials - may be designed for an SLS geotechnical reaction of 150 kPa (ULS factored geotechnical resistance of 225 kPa).

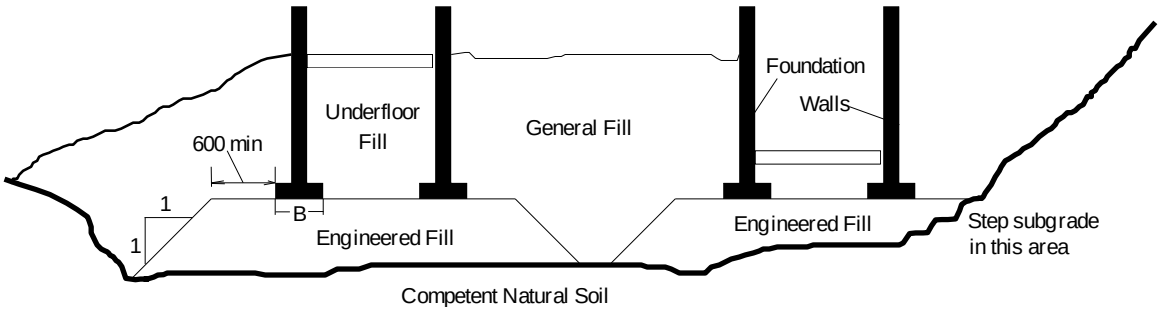
Additional comments with regard to engineered fill are as follows:

- The area must be stripped of all topsoil, existing fill material or other deleterious material and proof-rolled. Soft spots must be dug out. The stripped native subgrade must be examined and approved by a geotechnical engineer prior to placement of fill.

- The approved engineered fill must be placed in loose lifts not exceeding 200 mm and compacted to 100% Standard Proctor dry density throughout. Granular fill is preferred.

- Full time geotechnical inspection during placement of engineered fill is required.

- The fill must be placed such that the specified geometry is achieved as follows:.



Foundations on Engineered Fill (schematic)

- A minimum footing width of 500 mm (20 inches) is suggested. Steel Reinforcement should be as designed by the Structural Engineer.
- All excavations must be done in accordance with the Occupational Health and Safety Regulations of Ontario.

Appendix C:
Soil Chemistry Results

Your Project #: BRM-00603520-A0 (BRGE)
Site Location: COLERAINE DRIVE, BOLTON, ON
Your C.O.C. #: 40669, 40670

Attention:Hongliu Wang

exp Services Inc
1595 Clark Blvd
Brampton, ON
L6T 4V1

Report Date: 2014/06/25
Report #: R3069881
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B4A4694
Received: 2014/06/18, 12:53

Sample Matrix: Soil
Samples Received: 16

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Hot Water Extractable Boron	6	2014/06/23	2014/06/24	CAM SOP-00408	R153 Ana. Prot. 2011
Hot Water Extractable Boron	9	2014/06/24	2014/06/24	CAM SOP-00408	R153 Ana. Prot. 2011
Free (WAD) Cyanide	15	N/A	2014/06/23	CAM SOP-00457	Ontario MOE CN-E3015
Conductivity	15	N/A	2014/06/24	CAM SOP-00414	MOE LSB E3138 v2
Hexavalent Chromium in Soil by IC (1)	15	2014/06/24	2014/06/25	CAM SOP-00436	EPA SW846-3060/7199
Strong Acid Leachable Metals by ICPMS	15	2014/06/24	2014/06/24	CAM SOP-00447	EPA 6020
Moisture	15	N/A	2014/06/20	CAM SOP-00445	R.Carter,1993
pH CaCl2 EXTRACT	16	2014/06/24	2014/06/24	CAM SOP-00413	EPA 9045D
Sodium Adsorption Ratio (SAR)	15	2014/06/19	2014/06/25	CAM SOP-00102	EPA 6010
Sulphate (20:1 Extract)	1	N/A	2014/06/25	CAM SOP-00464	EPA 375.4

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Soils are reported on a dry weight basis unless otherwise specified.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Sara Singh, B.Sc, Senior Project Manager
Email: sarasingh@maxxam.ca
Phone# (905)817-5821

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B4A4694
Report Date: 2014/06/25

exp Services Inc
Client Project #: BRM-00603520-A0 (BRGE)
Site Location: COLERAINE DRIVE, BOLTON, ON
Sampler Initials: AA

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		003404	003404		003405		003406	003406		
Sampling Date		2014/06/09	2014/06/09		2014/06/09		2014/06/12	2014/06/12		
COC Number		40669	40669		40669		40669	40669		
	Units	**BH2 SS2**	**BH2 SS2 Lab-Dup**	**QC Batch**	**BH4 SS3**	**QC Batch**	**BH7 SS2**	**BH7 SS2 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters										
Sodium Adsorption Ratio	N/A	0.79		3647231	0.55	3647231	0.82			3647231
Inorganics										
Chromium (VI)	ug/g	<0.2		3653097	<0.2	3653097	<0.2		0.2	3653097
Conductivity	mS/cm	0.22		3652006	0.20	3652006	0.18	0.19	0.002	3652006
Free Cyanide	ug/g	<0.01	<0.01	3649694	<0.01	3649694	<0.01		0.01	3649694
Moisture	%	14		3649342	15	3649342	13		1.0	3649342
Available (CaCl2) pH	pH	7.52	7.61	3652106	7.73	3652106	7.80		N/A	3652106
Metals										
Hot Water Ext. Boron (B)	ug/g	0.079		3652107	0.084	3651441	0.053		0.050	3652107
Acid Extractable Antimony (Sb)	ug/g	<0.20		3652030	<0.20	3652030	<0.20		0.20	3652030
Acid Extractable Arsenic (As)	ug/g	4.2		3652030	4.4	3652030	4.2		1.0	3652030
Acid Extractable Barium (Ba)	ug/g	94		3652030	100	3652030	96		0.50	3652030
Acid Extractable Beryllium (Be)	ug/g	0.82		3652030	0.80	3652030	0.72		0.20	3652030
Acid Extractable Boron (B)	ug/g	8.8		3652030	9.6	3652030	8.8		5.0	3652030
Acid Extractable Cadmium (Cd)	ug/g	<0.10		3652030	<0.10	3652030	<0.10		0.10	3652030
Acid Extractable Chromium (Cr)	ug/g	25		3652030	25	3652030	23		1.0	3652030
Acid Extractable Cobalt (Co)	ug/g	12		3652030	13	3652030	11		0.10	3652030
Acid Extractable Copper (Cu)	ug/g	24		3652030	24	3652030	23		0.50	3652030
Acid Extractable Lead (Pb)	ug/g	11		3652030	12	3652030	11		1.0	3652030
Acid Extractable Molybdenum (Mo)	ug/g	<0.50		3652030	<0.50	3652030	<0.50		0.50	3652030
Acid Extractable Nickel (Ni)	ug/g	27		3652030	30	3652030	26		0.50	3652030
Acid Extractable Selenium (Se)	ug/g	<0.50		3652030	<0.50	3652030	<0.50		0.50	3652030
Acid Extractable Silver (Ag)	ug/g	<0.20		3652030	<0.20	3652030	<0.20		0.20	3652030
Acid Extractable Thallium (Tl)	ug/g	0.17		3652030	0.16	3652030	0.15		0.050	3652030
Acid Extractable Uranium (U)	ug/g	0.53		3652030	0.78	3652030	0.81		0.050	3652030
Acid Extractable Vanadium (V)	ug/g	35		3652030	33	3652030	32		5.0	3652030
Acid Extractable Zinc (Zn)	ug/g	59		3652030	59	3652030	54		5.0	3652030
Acid Extractable Mercury (Hg)	ug/g	<0.050		3652030	<0.050	3652030	<0.050		0.050	3652030

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B4A4694
Report Date: 2014/06/25

exp Services Inc
Client Project #: BRM-00603520-A0 (BRGE)
Site Location: COLERAINE DRIVE, BOLTON, ON
Sampler Initials: AA

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		003407	003408		003409	003410		003411		
Sampling Date		2014/06/12	2014/06/10		2014/06/10	2014/06/13		2014/06/11		
COC Number		40669	40669		40669	40669		40669		
	Units	**BH9 SS3**	**BH11 SS3**	**QC Batch**	**BH15 SS1**	**BH19 SS2**	**QC Batch**	**BH23 SS3**	**RDL**	**QC Batch**
Calculated Parameters										
Sodium Adsorption Ratio	N/A	0.28	0.64	3647231	0.53	0.91	3647231	0.57		3647231
Inorganics										
Chromium (VI)	ug/g	<0.2	<0.2	3653097	<0.2	<0.2	3653097	<0.2	0.2	3653097
Conductivity	mS/cm	0.19	0.17	3652006	0.16	0.33	3652006	0.20	0.002	3652006
Free Cyanide	ug/g	<0.01	<0.01	3649694	<0.01	<0.01	3649694	<0.01	0.01	3649694
Moisture	%	14	12	3649342	17	18	3649342	14	1.0	3649342
Available (CaCl2) pH	pH	7.73	7.45	3652106	7.59	7.35	3652106	7.78	N/A	3652106
Metals										
Hot Water Ext. Boron (B)	ug/g	0.080	0.14	3652107	0.062	0.090	3651441	0.13	0.050	3652107
Acid Extractable Antimony (Sb)	ug/g	<0.20	<0.20	3652030	<0.20	<0.20	3652030	<0.20	0.20	3652030
Acid Extractable Arsenic (As)	ug/g	2.7	4.1	3652030	3.7	7.5	3652030	4.4	1.0	3652030
Acid Extractable Barium (Ba)	ug/g	64	86	3652030	46	130	3652030	96	0.50	3652030
Acid Extractable Beryllium (Be)	ug/g	0.31	0.58	3652030	0.43	1.1	3652030	0.72	0.20	3652030
Acid Extractable Boron (B)	ug/g	6.4	8.8	3652030	5.7	8.4	3652030	9.5	5.0	3652030
Acid Extractable Cadmium (Cd)	ug/g	<0.10	0.12	3652030	<0.10	0.17	3652030	<0.10	0.10	3652030
Acid Extractable Chromium (Cr)	ug/g	13	20	3652030	15	32	3652030	24	1.0	3652030
Acid Extractable Cobalt (Co)	ug/g	7.2	10	3652030	8.1	18	3652030	13	0.10	3652030
Acid Extractable Copper (Cu)	ug/g	20	23	3652030	19	36	3652030	23	0.50	3652030
Acid Extractable Lead (Pb)	ug/g	7.7	10	3652030	7.9	17	3652030	11	1.0	3652030
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	<0.50	3652030	<0.50	<0.50	3652030	<0.50	0.50	3652030
Acid Extractable Nickel (Ni)	ug/g	13	21	3652030	16	45	3652030	27	0.50	3652030
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	3652030	<0.50	<0.50	3652030	<0.50	0.50	3652030
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	3652030	<0.20	<0.20	3652030	<0.20	0.20	3652030
Acid Extractable Thallium (Tl)	ug/g	0.11	0.15	3652030	0.12	0.23	3652030	0.17	0.050	3652030
Acid Extractable Uranium (U)	ug/g	0.42	0.55	3652030	0.41	0.55	3652030	0.64	0.050	3652030
Acid Extractable Vanadium (V)	ug/g	23	28	3652030	25	46	3652030	31	5.0	3652030
Acid Extractable Zinc (Zn)	ug/g	33	50	3652030	44	76	3652030	55	5.0	3652030
Acid Extractable Mercury (Hg)	ug/g	<0.050	<0.050	3652030	<0.050	<0.050	3652030	<0.050	0.050	3652030

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B4A4694
Report Date: 2014/06/25

exp Services Inc
Client Project #: BRM-00603520-A0 (BRGE)
Site Location: COLERAINE DRIVE, BOLTON, ON
Sampler Initials: AA

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		003411	003412		003413		003414	003415		
Sampling Date		2014/06/11	2014/06/13		2014/06/13		2014/06/13	2014/06/13		
COC Number		40669	40669		40669		40669	40669		
	Units	**BH23 SS3 Lab-Dup**	**BH26 SS1**	**QC Batch**	**BH30 SS3**	**QC Batch**	**BH31 SS2**	**BH33 SS4**	**RDL**	**QC Batch**
Calculated Parameters										
Sodium Adsorption Ratio	N/A		0.38	3647231	0.27	3647231	0.28	0.44		3647231
Inorganics										
Chromium (VI)	ug/g		<0.2	3653097	<0.2	3653097	<0.2	<0.2	0.2	3653097
Conductivity	mS/cm		0.22	3652006	0.15	3652006	0.15	0.22	0.002	3652006
Free Cyanide	ug/g		<0.01	3649694	<0.01	3649694	<0.01	<0.01	0.01	3649694
Moisture	%		20	3649342	14	3649342	13	13	1.0	3649342
Available (CaCl2) pH	pH		7.58	3652106	7.68	3652106	7.68	7.76	N/A	3652106
Metals										
Hot Water Ext. Boron (B)	ug/g		0.10	3652107	0.052	3651441	0.059	0.11	0.050	3652107
Acid Extractable Antimony (Sb)	ug/g	<0.20	<0.20	3652030	<0.20	3652030	<0.20	<0.20	0.20	3652030
Acid Extractable Arsenic (As)	ug/g	4.6	3.9	3652030	4.5	3652030	4.2	3.9	1.0	3652030
Acid Extractable Barium (Ba)	ug/g	97	160	3652030	83	3652030	85	97	0.50	3652030
Acid Extractable Beryllium (Be)	ug/g	0.74	0.98	3652030	0.69	3652030	0.67	0.62	0.20	3652030
Acid Extractable Boron (B)	ug/g	9.9	12	3652030	8.9	3652030	8.8	8.2	5.0	3652030
Acid Extractable Cadmium (Cd)	ug/g	0.11	0.11	3652030	<0.10	3652030	<0.10	<0.10	0.10	3652030
Acid Extractable Chromium (Cr)	ug/g	24	33	3652030	22	3652030	21	21	1.0	3652030
Acid Extractable Cobalt (Co)	ug/g	14	13	3652030	11	3652030	11	13	0.10	3652030
Acid Extractable Copper (Cu)	ug/g	24	26	3652030	22	3652030	23	23	0.50	3652030
Acid Extractable Lead (Pb)	ug/g	12	12	3652030	9.7	3652030	9.9	10	1.0	3652030
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	<0.50	3652030	<0.50	3652030	<0.50	<0.50	0.50	3652030
Acid Extractable Nickel (Ni)	ug/g	29	31	3652030	24	3652030	25	25	0.50	3652030
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	3652030	<0.50	3652030	<0.50	<0.50	0.50	3652030
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	3652030	<0.20	3652030	<0.20	<0.20	0.20	3652030
Acid Extractable Thallium (Tl)	ug/g	0.17	0.26	3652030	0.17	3652030	0.15	0.15	0.050	3652030
Acid Extractable Uranium (U)	ug/g	0.65	0.59	3652030	0.53	3652030	0.52	0.54	0.050	3652030
Acid Extractable Vanadium (V)	ug/g	32	46	3652030	30	3652030	30	29	5.0	3652030
Acid Extractable Zinc (Zn)	ug/g	58	62	3652030	54	3652030	52	54	5.0	3652030
Acid Extractable Mercury (Hg)	ug/g	<0.050	<0.050	3652030	<0.050	3652030	<0.050	<0.050	0.050	3652030

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B4A4694
Report Date: 2014/06/25

exp Services Inc
Client Project #: BRM-00603520-A0 (BRGE)
Site Location: COLERAINE DRIVE, BOLTON, ON
Sampler Initials: AA

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		003416		003417	003418	003418		
Sampling Date		2014/06/13		2014/06/13	2014/06/13	2014/06/13		
COC Number		40669		40670	40670	40670		
	Units	**BH34 SS6**	**QC Batch**	**BH35 SS4**	**BH36 SS6**	**BH36 SS6 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters								
Sodium Adsorption Ratio	N/A	0.29	3647231	0.52	0.18			3647231
Inorganics								
Chromium (VI)	ug/g	<0.2	3653097	<0.2	<0.2		0.2	3653097
Conductivity	mS/cm	0.31	3652006	0.18	0.34		0.002	3652006
Free Cyanide	ug/g	<0.01	3649694	<0.01	<0.01		0.01	3649694
Moisture	%	13	3649342	15	11		1.0	3649418
Available (CaCl2) pH	pH	7.74	3652106	7.76	7.77		N/A	3652106
Metals								
Hot Water Ext. Boron (B)	ug/g	0.17	3652107	0.12	0.11	0.10	0.050	3651441
Acid Extractable Antimony (Sb)	ug/g	<0.20	3652030	<0.20	<0.20		0.20	3652030
Acid Extractable Arsenic (As)	ug/g	3.6	3652030	3.6	3.3		1.0	3652030
Acid Extractable Barium (Ba)	ug/g	88	3652030	100	46		0.50	3652030
Acid Extractable Beryllium (Be)	ug/g	0.60	3652030	0.71	0.34		0.20	3652030
Acid Extractable Boron (B)	ug/g	8.9	3652030	9.8	6.8		5.0	3652030
Acid Extractable Cadmium (Cd)	ug/g	<0.10	3652030	<0.10	<0.10		0.10	3652030
Acid Extractable Chromium (Cr)	ug/g	22	3652030	24	14		1.0	3652030
Acid Extractable Cobalt (Co)	ug/g	9.6	3652030	14	6.2		0.10	3652030
Acid Extractable Copper (Cu)	ug/g	21	3652030	23	14		0.50	3652030
Acid Extractable Lead (Pb)	ug/g	9.0	3652030	11	5.2		1.0	3652030
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	3652030	<0.50	<0.50		0.50	3652030
Acid Extractable Nickel (Ni)	ug/g	22	3652030	29	12		0.50	3652030
Acid Extractable Selenium (Se)	ug/g	<0.50	3652030	<0.50	<0.50		0.50	3652030
Acid Extractable Silver (Ag)	ug/g	<0.20	3652030	<0.20	<0.20		0.20	3652030
Acid Extractable Thallium (Tl)	ug/g	0.12	3652030	0.16	0.082		0.050	3652030
Acid Extractable Uranium (U)	ug/g	0.66	3652030	0.62	0.58		0.050	3652030
Acid Extractable Vanadium (V)	ug/g	28	3652030	32	22		5.0	3652030
Acid Extractable Zinc (Zn)	ug/g	50	3652030	58	30		5.0	3652030
Acid Extractable Mercury (Hg)	ug/g	<0.050	3652030	<0.050	<0.050		0.050	3652030

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B4A4694
Report Date: 2014/06/25

exp Services Inc
Client Project #: BRM-00603520-A0 (BRGE)
Site Location: COLERAINE DRIVE, BOLTON, ON
Sampler Initials: AA

RESULTS OF ANALYSES OF SOIL

Maxxam ID		003419	003419		
Sampling Date		2014/06/09	2014/06/09		
COC Number		40670	40670		
	Units	**BH38 SS3**	**BH38 SS3 Lab-Dup**	**RDL**	**QC Batch**
Inorganics					
Available (CaCl2) pH	pH	7.81		N/A	3652106
Soluble (20:1) Sulphate (SO4)	ug/g	69	74	20	3651503

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B4A4694
Report Date: 2014/06/25

exp Services Inc
Client Project #: BRM-00603520-A0 (BRGE)
Site Location: COLERAINE DRIVE, BOLTON, ON
Sampler Initials: AA

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	1.7°C
Package 2	2.0°C

Sample 003407-01 : SAR Analysis: Sodium was not detected. To report SAR the sodium detection limit was used in the calculation. This value represents a maximum ratio.

Sample 003413-01 : SAR Analysis: Sodium was not detected. To report SAR the sodium detection limit was used in the calculation. This value represents a maximum ratio.

Sample 003414-01 : SAR Analysis: Sodium was not detected. To report SAR the sodium detection limit was used in the calculation. This value represents a maximum ratio.

Sample 003418-01 : SAR Analysis: Sodium was not detected. To report SAR the sodium detection limit was used in the calculation. This value represents a maximum ratio.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B4A4694
Report Date: 2014/06/25

exp Services Inc
Client Project #: BRM-00603520-A0 (BRGE)
Site Location: COLERAINE DRIVE, BOLTON, ON
Sampler Initials: AA

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
3649694	XQI	Matrix Spike [003404-01]	Free Cyanide	2014/06/23		108	%	75 - 125
3649694	XQI	Spiked Blank	Free Cyanide	2014/06/23		103	%	80 - 120
3649694	XQI	Method Blank	Free Cyanide	2014/06/23	<0.01		ug/g	
3649694	XQI	RPD [003404-01]	Free Cyanide	2014/06/23	NC		%	35
3651441	JOH	Matrix Spike [003418-01]	Hot Water Ext. Boron (B)	2014/06/24		97	%	75 - 125
3651441	JOH	Spiked Blank	Hot Water Ext. Boron (B)	2014/06/24		97	%	75 - 125
3651441	JOH	Method Blank	Hot Water Ext. Boron (B)	2014/06/24	<0.050		ug/g	
3651441	JOH	RPD [003418-01]	Hot Water Ext. Boron (B)	2014/06/24	NC		%	40
3651503	ADB	Matrix Spike [003419-01]	Soluble (20:1) Sulphate (SO4)	2014/06/25		105	%	70 - 130
3651503	ADB	Spiked Blank	Soluble (20:1) Sulphate (SO4)	2014/06/25		105	%	70 - 130
3651503	ADB	Method Blank	Soluble (20:1) Sulphate (SO4)	2014/06/25	<20		ug/g	
3651503	ADB	RPD [003419-01]	Soluble (20:1) Sulphate (SO4)	2014/06/25	NC		%	35
3652006	L_A	Spiked Blank	Conductivity	2014/06/24		100	%	90 - 110
3652006	L_A	Method Blank	Conductivity	2014/06/24	<0.002		mS/cm	
3652006	L_A	RPD [003406-01]	Conductivity	2014/06/24	2.9		%	10
3652030	VIV	Matrix Spike [003411-01]	Acid Extractable Antimony (Sb)	2014/06/24		100	%	75 - 125
			Acid Extractable Arsenic (As)	2014/06/24		104	%	75 - 125
			Acid Extractable Barium (Ba)	2014/06/24		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2014/06/24		109	%	75 - 125
			Acid Extractable Boron (B)	2014/06/24		103	%	75 - 125
			Acid Extractable Cadmium (Cd)	2014/06/24		103	%	75 - 125
			Acid Extractable Chromium (Cr)	2014/06/24		NC	%	75 - 125
			Acid Extractable Cobalt (Co)	2014/06/24		NC	%	75 - 125
			Acid Extractable Copper (Cu)	2014/06/24		NC	%	75 - 125
			Acid Extractable Lead (Pb)	2014/06/24		104	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2014/06/24		108	%	75 - 125
			Acid Extractable Nickel (Ni)	2014/06/24		NC	%	75 - 125
			Acid Extractable Selenium (Se)	2014/06/24		103	%	75 - 125
			Acid Extractable Silver (Ag)	2014/06/24		104	%	75 - 125
			Acid Extractable Thallium (Tl)	2014/06/24		93	%	75 - 125
			Acid Extractable Uranium (U)	2014/06/24		99	%	75 - 125
			Acid Extractable Vanadium (V)	2014/06/24		NC	%	75 - 125
			Acid Extractable Zinc (Zn)	2014/06/24		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2014/06/24		95	%	75 - 125
3652030	VIV	Spiked Blank	Acid Extractable Antimony (Sb)	2014/06/24		111	%	80 - 120
			Acid Extractable Arsenic (As)	2014/06/24		108	%	80 - 120
			Acid Extractable Barium (Ba)	2014/06/24		106	%	80 - 120
			Acid Extractable Beryllium (Be)	2014/06/24		105	%	80 - 120
			Acid Extractable Boron (B)	2014/06/24		99	%	80 - 120
			Acid Extractable Cadmium (Cd)	2014/06/24		106	%	80 - 120
			Acid Extractable Chromium (Cr)	2014/06/24		105	%	80 - 120
			Acid Extractable Cobalt (Co)	2014/06/24		107	%	80 - 120
			Acid Extractable Copper (Cu)	2014/06/24		106	%	80 - 120
			Acid Extractable Lead (Pb)	2014/06/24		106	%	80 - 120
			Acid Extractable Molybdenum (Mo)	2014/06/24		107	%	80 - 120
			Acid Extractable Nickel (Ni)	2014/06/24		105	%	80 - 120
			Acid Extractable Selenium (Se)	2014/06/24		107	%	80 - 120
			Acid Extractable Silver (Ag)	2014/06/24		106	%	80 - 120
			Acid Extractable Thallium (Tl)	2014/06/24		100	%	80 - 120
			Acid Extractable Uranium (U)	2014/06/24		102	%	80 - 120
			Acid Extractable Vanadium (V)	2014/06/24		105	%	80 - 120
			Acid Extractable Zinc (Zn)	2014/06/24		107	%	80 - 120

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B4A4694
Report Date: 2014/06/25

exp Services Inc
Client Project #: BRM-00603520-A0 (BRGE)
Site Location: COLERAINE DRIVE, BOLTON, ON
Sampler Initials: AA

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Acid Extractable Mercury (Hg)	2014/06/24		98	%	80 - 120
3652030	VIV	Method Blank	Acid Extractable Antimony (Sb)	2014/06/24	<0.20		ug/g	
			Acid Extractable Arsenic (As)	2014/06/24	<1.0		ug/g	
			Acid Extractable Barium (Ba)	2014/06/24	<0.50		ug/g	
			Acid Extractable Beryllium (Be)	2014/06/24	<0.20		ug/g	
			Acid Extractable Boron (B)	2014/06/24	<5.0		ug/g	
			Acid Extractable Cadmium (Cd)	2014/06/24	<0.10		ug/g	
			Acid Extractable Chromium (Cr)	2014/06/24	<1.0		ug/g	
			Acid Extractable Cobalt (Co)	2014/06/24	<0.10		ug/g	
			Acid Extractable Copper (Cu)	2014/06/24	<0.50		ug/g	
			Acid Extractable Lead (Pb)	2014/06/24	<1.0		ug/g	
			Acid Extractable Molybdenum (Mo)	2014/06/24	<0.50		ug/g	
			Acid Extractable Nickel (Ni)	2014/06/24	<0.50		ug/g	
			Acid Extractable Selenium (Se)	2014/06/24	<0.50		ug/g	
			Acid Extractable Silver (Ag)	2014/06/24	<0.20		ug/g	
			Acid Extractable Thallium (Tl)	2014/06/24	<0.050		ug/g	
			Acid Extractable Uranium (U)	2014/06/24	<0.050		ug/g	
			Acid Extractable Vanadium (V)	2014/06/24	<5.0		ug/g	
			Acid Extractable Zinc (Zn)	2014/06/24	<5.0		ug/g	
			Acid Extractable Mercury (Hg)	2014/06/24	<0.050		ug/g	
3652030	VIV	RPD [003411-01]	Acid Extractable Antimony (Sb)	2014/06/24	NC		%	30
			Acid Extractable Arsenic (As)	2014/06/24	NC		%	30
			Acid Extractable Barium (Ba)	2014/06/24	0.7		%	30
			Acid Extractable Beryllium (Be)	2014/06/24	NC		%	30
			Acid Extractable Boron (B)	2014/06/24	NC		%	30
			Acid Extractable Cadmium (Cd)	2014/06/24	NC		%	30
			Acid Extractable Chromium (Cr)	2014/06/24	3.2		%	30
			Acid Extractable Cobalt (Co)	2014/06/24	7.8		%	30
			Acid Extractable Copper (Cu)	2014/06/24	3.1		%	30
			Acid Extractable Lead (Pb)	2014/06/24	4.5		%	30
			Acid Extractable Molybdenum (Mo)	2014/06/24	NC		%	30
			Acid Extractable Nickel (Ni)	2014/06/24	6.1		%	30
			Acid Extractable Selenium (Se)	2014/06/24	NC		%	30
			Acid Extractable Silver (Ag)	2014/06/24	NC		%	30
			Acid Extractable Thallium (Tl)	2014/06/24	NC		%	30
			Acid Extractable Uranium (U)	2014/06/24	1.7		%	30
			Acid Extractable Vanadium (V)	2014/06/24	4.6		%	30
			Acid Extractable Zinc (Zn)	2014/06/24	4.4		%	30
			Acid Extractable Mercury (Hg)	2014/06/24	NC		%	30
3652107	JOH	Matrix Spike	Hot Water Ext. Boron (B)	2014/06/24		96	%	75 - 125
3652107	JOH	Spiked Blank	Hot Water Ext. Boron (B)	2014/06/24		104	%	75 - 125
3652107	JOH	Method Blank	Hot Water Ext. Boron (B)	2014/06/24	<0.050		ug/g	
3653097	MGE	Matrix Spike	Chromium (VI)	2014/06/25		93	%	80 - 120
3653097	MGE	QC Standard	Chromium (VI)	2014/06/25		107	%	80 - 120
3653097	MGE	Spiked Blank	Chromium (VI)	2014/06/25		95	%	80 - 120

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B4A4694
Report Date: 2014/06/25

exp Services Inc
Client Project #: BRM-00603520-A0 (BRGE)
Site Location: COLERAINE DRIVE, BOLTON, ON
Sampler Initials: AA

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
3653097	MGE	Method Blank	Chromium (VI)	2014/06/25	<0.2		ug/g	

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

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

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

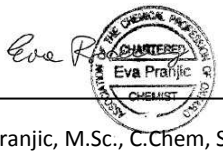
Maxxam Job #: B4A4694
Report Date: 2014/06/25

exp Services Inc
Client Project #: BRM-00603520-A0 (BRGE)
Site Location: COLERAINE DRIVE, BOLTON, ON
Sampler Initials: AA

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere, Scientific Services



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam

6740 Campobello Road, Mississauga, Ontario L5N 2L8 www.maxxam.ca
Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266

IMMEDIATE TEST

CHAIN OF CUSTODY RECORD

40669 Page 1 of 2

INVOICE INFORMATION	REPORT INFORMATION (if differs from invoice)	PROJECT INFORMATION	TURNAROUND TIME (TAT) REQUIRED
Company Name: EXP	Company Name: EXP	Quotation #:	[X] Regular TAT (5-7 days)
Contact Name: Hongliu Wang	Contact Name: Aamna Arora	P.O. #:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 1595 CLARK BRAMPTON	Address:	Project #: BRM00603520-A0 (BRGE)	Rush TAT (Applicable Surcharge)
Phone: Fax:	Phone: Fax:	Site Location: Coleraine Drive	[ ] 1 Day (100%)
Email: hongliu.wang@exp.com	Email:	Site #: BOLTON, ON	[ ] 2 Days (50%)
		Sampled By:	[ ] 3-4 Days (25%)

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

REGULATION 153 (2011)	OTHER REGULATIONS
[ ] Table 1 [X] Table 2 [ ] Table 3 [ ] Table ___	[ ] CCME [ ] MISA [ ] PWQO [ ] Other (Specify):
[X] Res/Park [ ] Ind/Comm [ ] Agri/Other	[ ] Sanitary Sewer Bylaw [ ] Storm Sewer Bylaw
[ ] Med/Fine [ ] Coarse	Municipality:
FOR RSC (PLEASE CIRCLE) YES / NO	[ ] REG 558 (MINIMUM 3 DAY TAT REQUIRED)

Include Criteria on Certificate of Analysis (Y/N)? ____

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

ANALYSIS REQUESTED

FIELD FILTERED (PLEASE CIRCLE) Metals / Hg / CrVI

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX	# OF CONT.	Metals + Inorganics (complete PG)
1	BH2 SS4	June 09		SOIL		✓
2	BH4 SS3	June 09				✓
3	BH7 SS2	June 12				✓
4	BH9 SS3	June 12				✓
5	BH11 SS3	June 10				✓
6	BH15 SS1	June 10				✓
7	BH19 SS2	June 13				✓
8	BH23 SS3	June 11				✓
9	BH26 SS1	June 13				✓
10	BH30 SS3	June 13				✓

Rush Confirmation #:

Date Required:

LABORATORY USE ONLY

CUSTODY SEAL (Y/N)		Temperature (°C) on Receipt
Present	Y	01/2/3°C
Intact	Y	
COOLING MEDIA PRESENT (Y / N)	Y	01/2/4°C

COMMENTS / TAT COMMENTS

18-Jun-14 12:53
Sara Singh
B4A4694
AAF ENV-125

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME:	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME:
[signature]	2014/06/18	12:53	FANG WANG	2014/06/18	12:53
AAMNA ARORA					

COC-1004 (11/13) - ENV. ENG.

Maxxam Analytics International Corporation o/a Maxxam Analytics

White: Maxxam ~ Yellow: Client

Maxxam

6740 Campobello Road, Mississauga, Ontario L5N 2L8 www.maxxam.ca
Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266

CHAIN OF CUSTODY RECORD

40670

Page 2 of 2

INVOICE INFORMATION	REPORT INFORMATION (if differs from invoice)	PROJECT INFORMATION	TURNAROUND TIME (TAT) REQUIRED
Company Name:	Company Name:	Quotation #:	☐ Regular TAT (5-7 days)
Contact Name: Hongliu WANG	Contact Name: Aamna Arora	P.O. #:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	Address:	Project #: BRM00603520-A0 (BRGE)	Rush TAT (Applicable Surcharge)
Phone: Fax:	Phone: Fax:	Site Location:	☐ 1 Day (100%)
Email: hongliu.wang@exp.com	Email:	Site #:	☐ 2 Days (50%)
		Sampled By:	☐ 3-4 Days (25%)

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

REGULATION 153 (2011)	OTHER REGULATIONS
☐ Table 1 ☒ Res/Park ☐ Med/Fine	☐ CCME ☐ Sanitary Sewer Bylaw
☒ Table 2 ☐ Ind/Comm ☐ Coarse	☐ MISA ☐ Storm Sewer Bylaw
☐ Table 3 ☐ Agri/Other	☐ PWQO Municipality:
☐ Table ___	☐ Other (Specify):
FOR RSC (PLEASE CIRCLE) YES / NO	☐ REG 558 (MINIMUM 3 DAY TAT REQUIRED)

Include Criteria on Certificate of Analysis (Y/N)? ____

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	MATRIX	# OF CONT.	FIELD FILTERED (PLEASE CIRCLE) Metals / Hg / CrVI	ANALYSIS REQUESTED: Metals & Inorganic Completely	ANALYSIS REQUESTED: pH and Sulphate
1	BH31 SS2	June 13		SOIL		✓		
2	BH 33 SS4	"				✓		
3	BH 34 SS6	"				✓		
4	BH 35 SS4	"				✓		
5	BH 36 SS6	"				✓		
6	BH 38 SS3	June 9						✓
7								
8								
9								
10								

Rush Confirmation #:

Date Required:

LABORATORY USE ONLY

CUSTODY SEAL (Y/N)		Temperature (°C) on Receipt
Present	Y	01/2/3°C
Intact	Y	
COOLING MEDIA PRESENT (Y / N)	Y	01/2/4°C

COMMENTS / TAT COMMENTS

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME:	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME:	# JARS USED AND NOT SUBMITTED	MAXXAM JOB #
Aamna Arora	2014/06/18	12:53	FAN WANG	2014/06/18	12:53		
AAMNA ARORA							

COC-1004 (11/13) - ENV. ENG.

Maxxam Analytics International Corporation o/a Maxxam Analytics

White: Maxxam ~ Yellow: Client