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Consolidated Preliminary Geotechnical Investigation

Kanata North Urban Expansion Area
Community Development Plan
March Road
Ottawa, Ontario

Prepared For

Novatech Engineering Consultants

October 7, 2013

Report PG2878-1R

TABLE OF CONTENTS

PAGE

APPENDICES

1.0 INTRODUCTION

Paterson Group (Paterson) was commissioned by Novatech Engineering Consultants to prepare a preliminary geotechnical report outlining the geotechnical constraints for the Kanata North Urban Expansion Area Community Design Plan (CDP) along March Road in the City of Ottawa, Ontario (refer to Figure 1 - Key Plan in Appendix 2 of this report).

The current report consolidates the existing geotechnical studies completed for the individual properties. The relevant geotechnical studies are listed below:

- ❑ Paterson Report PG2878-2 dated April 8, 2013 entitled "Preliminary Geotechnical Investigation, 936 March Road, Ottawa, Ontario".
- ❑ Paterson Report PG2878-3 dated April 8, 2013 entitled "Preliminary Geotechnical Investigation, 1075 March Road, Ottawa, Ontario".
- ❑ Paterson Letter Report PG2256-LET.01 dated February 7, 2011 entitled "Geotechnical Investigation Proposed Residential Development, Dekok Lands, March Road, Ottawa."
- ❑ Paterson Letter Report PG1823-LET.01 dated March 18, 2009 entitled "Preliminary Geotechnical Investigation, Proposed Residential Development, Burke and Maxwell Properties, March Road, Ottawa."
- ❑ Paterson Letter Report PG1716-LET.01 dated August 25, 2009 entitled "Preliminary Geotechnical Investigation Proposed Residential Development, Foley Lands, March Road, Ottawa."
- ❑ Paterson Letter Report PG1626-LET.01 dated March 12, 2008 entitled "Preliminary Geotechnical Investigation, Vacant Property, 927 March Road, Ottawa (Kanata), Ontario."
- ❑ Morey Associates Ltd. Report 012417 dated February 2013 entitled "Report on Geotechnical Investigation, Proposed Residential Development, 1020 March Road, Ottawa, Ontario."

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains our findings and includes preliminary geotechnical recommendations pertaining to the design and construction of the proposed development as they are understood at the time of writing this report.

2.0 PROPOSED DEVELOPMENT

Details of the development were not available at the time of issuance of this report. It is understood that the following properties are part of the Kanata North Urban Expansion Area Community Design Plan:

- ❑ 927 March Road - Owner: 6095186 Canada Inc.
- ❑ 936 March Road - Owner: Metcalfe Realty Company Limited
- ❑ 1020 March Road - Owner: Kanata Research Park
- ❑ 1015 March Road - Owner: Multivesco
- ❑ 1035 March Road - Owner: Multivesco
- ❑ 1070 March Road - Owner: Valecraft
- ❑ 1075 March Road - Owner: Multivesco
- ❑ 1145 March Road - Owner: 7089121 Canada Inc.

3.0 METHOD OF INVESTIGATION

3.1 Field Investigation

Field Program

Test pits excavated by a hydraulic shovel or rubber tired backhoe were completed throughout the subject properties. The test holes were distributed in a manner to provide general coverage of the subject sites. Approximate locations of the test holes are shown in Drawing PG2878-1 - Test Hole Location Plan included in Appendix 2.

Sampling and In Situ Testing

Soil samples from the test pits were recovered from the side walls of the open excavation and all soil samples were initially classified on site. All samples were transported to our laboratory for further examination and classification. The depths at which the grab samples were recovered from the test holes are shown as G on the Soil Profile and Test Data sheets in Appendix 1.

Undrained shear strength testing, using a hand held vane apparatus, was carried out at regular intervals of depth in cohesive soils.

The subsurface conditions observed in the test holes were recorded in detail in the field. The soil profiles are logged on the Soil Profile and Test Data sheets in Appendix 1 of this report.

Groundwater

Open hole groundwater infiltration levels were observed at the time of excavation at each test pit location. Our observations are presented in the Soil Profile and Test Data sheets in Appendix 1.

Sample Storage

All samples will be stored in the laboratory for a period of one month after issuance of this report. They will then be discarded unless we are otherwise directed.

3.2 Field Survey

The ground surface elevations at the test pit locations are presented on Drawing PG2878-1 - Test Hole Location Plan in Appendix 2.

3.3 Laboratory Testing

The soil samples recovered from the subject site were examined in our laboratory to review the results of the field logging.

3.4 Analytical Testing

Four (4) soil samples were submitted for analytical testing to assess the corrosion potential for exposed ferrous metals and the potential of sulphate attacks against subsurface concrete structures. The samples were submitted to determine the concentration of sulphate and chloride, the resistivity and the pH of the soil. The analytical test results are presented in Appendix 1 and discussed in Subsection 6.6 of this report.

4.0 OBSERVATIONS

4.1 Surface and Subsurface Observations

The subject site currently covers an area of approximately 194 hectares. The majority of the site is undeveloped (tilled agricultural or treed) areas. Observations at the subject properties are presented below.

927 March Road

The vacant property located at 927 March Road is relatively flat, grass covered agricultural farm land. Several mature trees follow the 1.5 to 2.5 m deep creek that meanders diagonally through the subject site. It was observed during out field investigation that the shallow creek is flowing on the bedrock surface in several locations across the site.

The subsoil conditions at the test hole locations consist of a surficial topsoil layer underlain by a very stiff silty clay deposit followed by a glacial till layer and sound bedrock encountered at all test holes on the two parcels of land located on 927 March Road.

936 March Road

The vacant property located at 936 March Road consists of mostly undeveloped land. Dense bush was noted in the northwestern portion of the site. The site is bisected by an existing rail track. The remainder of the site consists of agricultural land or an existing fam house. A significant slope was noted to exist north of the residential house, but south of the existing rail tracks.

The subsoil conditions at the test hole locations consist of topsoil, agricultural soil or fill underlain by a stiff to very stiff silty clay deposit. Glacial till was noted below the silty clay in the southern portion of the property. Practical refusal to excavation was also noted in the southern portion of the site.

1015 and 1035 March Road

1015 and 1035 March Road is currently grass covered with several large trees bordering the property. The site slopes gradually downward to the east toward to the meandering creek located within the east portion of the subject site.

Generally, the subsoil conditions at the test hole locations consist of topsoil underlain by very stiff brown silty clay or bedrock. Glacial till was encountered below the silty clay at TP 1,TP 3, TP 4, TP 5, TP 9, TP 10 and TP 11 at depths varying between 1.1 m and 2.1 m below ground surface. Practical refusal to excavation was encountered at all test hole locations between ground surface to 3.2 m depth.

1020 March Road

1020 March Road is divided into two parcels by a railway line easement. The portion of the site located to the east of the railway line easement is heavily wooded, whereas the remainder of the subject site is grass covered with some young tree growth. An approximately 9 m high slope running in a north-south direction crosses the central portion of the subject site.

The subsurface profile encountered at the test pit locations, consists of topsoil, compact silty sand, stiff silty clay and/or a glacial till layer. Practical refusal to excavation was encountered between 0.2 and 4 m depth at all test pit locations, except TP 1, TP 3, TP 4, TP 7 to TP 12.

1070 March Road

1070 March Road consists of a berry farm. The majority of the site is agricultural fields with associated outbuildings and a residential dwelling located within the central portion of the site. Based on available topographic mapping, the west portion of the site is relatively flat and approximately at grade with neighbouring properties and the east portion of the site slopes gradually downward to the east. An approximately 4 to 5 m high slope running in a north-south direction located within the central portion of the site divides the east and west portions of the subject site.

The subsurface profile encountered at the test pit locations, consists of topsoil and compact silty sand or stiff silty clay. A glacial till layer was noted at all test pit locations. Practical refusal to excavation was encountered between 0.9 and 4.6 m depth at all test pit locations, except TP 6, which extended to a 4.6 m depth.

1075 March Road

1075 March Road consists of undeveloped, agricultural land. The ground surface across the site is relatively flat and a shallow ditch was noted to bisect the subject site.

Generally, the subsoil conditions at the test hole locations consist of topsoil underlain by very stiff brown silty clay, glacial till and/or bedrock.

1145 March Road

1145 March Road is undeveloped and grass covered. The site slopes gradually downward to the east.

The subsoil conditions at the test hole locations consist of topsoil underlain by very stiff brown silty clay, silty sand/sandy silt, glacial till and/or bedrock. Practical refusal to excavation was encountered between 0.7 to 3.2 m below surface at all test hole locations.

Based on available geological mapping, the bedrock below the majority of the subject site consists of interbedded sandstone and dolomite of the March formation. Below the east portion of the site, bedrock consists of either dolomite of the Oxford formation or sandstone of the Nepean formation. The overburden thickness varies from 0 to 10 m depth throughout the proposed development area, with shallow bedrock encountered within the west portion of the site.

4.2 Groundwater

Groundwater levels (GWL) were measured in the test pits upon completion of the field program. The results are summarized in Table 1. It should be noted that groundwater levels are subject to seasonal fluctuations. Therefore, the groundwater levels could vary at the time of construction.

Table 1 - Summary of Groundwater Level Readings

Test Pit Number	Ground Surface Elevation (m)	Groundwater Level (m)	Groundwater Depth (m)	Recording Date
PG1626 - 927 March Road				
TP 1	--	1.60	--	February 25, 2008
TP 2	--	0.70	--	February 25, 2008
TP 3	--	dry	--	February 25, 2008
TP 4	--	1.00	--	February 25, 2008
TP 5	--	1.60	--	February 25, 2008
PG1716 - 1015 and 1035 March Road				
TP 1	81.70	1.75	79.95	July 9, 2008
TP 2	83.10	dry	--	July 9, 2008
TP 3	83.80	1.75	82.05	July 9, 2008
TP 4	86.20	1.20	85.00	July 9, 2008
TP 5	86.80	1.10	85.70	July 9, 2008

Table 1 - Summary of Groundwater Level Readings				
Test Pit Number	**Ground Surface Elevation (m)**	**Groundwater Level (m)**	**Groundwater Depth (m)**	**Recording Date**
PG1716 - 1015 and 1035 March Road				
TP 6	90.70	dry	--	July 9, 2008
TP 7	89.40	dry	--	July 9, 2008
TP 8	88.80	dry	--	July 9, 2008
TP 9	81.90	1.50	80.40	July 9, 2008
TP 10	88.40	2.65	85.75	July 9, 2008
TP 11	89.50	dry	--	July 9, 2008
PG1823 - 1145 March Road				
TP 1	88.10	dry	--	February 9, 2009
TP 2	88.57	1.40	87.17	February 9, 2009
TP 3	85.48	dry	--	February 9, 2009
TP 4	88.13	dry	--	February 9, 2009
TP 5	88.50	dry	--	February 9, 2009
TP 6	89.10	dry	--	February 9, 2009
TP 7	88.06	1.80	86.26	February 9, 2009
TP 8	89.86	1.10	88.76	February 9, 2009
TP 9	91.42	1.90	89.52	February 9, 2009
TP 10	90.76	2.50	88.26	February 9, 2009
TP 11	90.22	1.00	89.22	February 9, 2009
TP 12	89.26	dry	--	February 9, 2009
PG2256 - 1070 March Road				
TP 1	--	1.80	--	November 4, 2010
TP 2	--	2.40	--	November 4, 2010
TP 3	--	1.40	--	November 4, 2010
TP 4	--	1.80	--	November 4, 2010
TP 5	--	1.70	--	November 4, 2010
TP 6	--	dry	--	November 4, 2010
TP 7	--	dry	--	November 4, 2010
TP 8	--	2.10	--	November 4, 2010
TP 9	--	dry	--	November 4, 2010
TP 10	--	1.80	--	November 4, 2010

Table 1 - Summary of Groundwater Level Readings				
Test Pit Number	**Ground Surface Elevation (m)**	**Groundwater Level (m)**	**Groundwater Depth (m)**	**Recording Date**
PG2256 - 1070 March Road				
TP 11	--	1.10	--	November 4, 2010
TP 12	--	2.00	--	November 4, 2010
TP 13	--	2.20	--	November 4, 2010
PG2878 - 936 and 1075 March Road				
TP 1	78.55	dry	--	March 11, 2013
TP 2	77.89	1.70	76.19	March 11, 2013
TP 3	78.58	dry		March 11, 2013
TP 4	78.91	1.80	77.11	March 11, 2013
TP 5	78.22	1.20	77.02	March 11, 2013
TP 6	79.28	1.80	77.48	March 11, 2013
TP 7	78.81	dry	--	March 11, 2013
TP 8	78.84	dry	--	March 11, 2013
TP 9	78.71	dry	--	March 11, 2013
TP 10	70.43	0.76	69.67	March 20, 2013
TP 11	70.02	0.38	69.64	March 20, 2013
TP 12	69.71	2.30	67.41	March 20, 2013
TP 13	69.87	2.70	67.17	March 20, 2013
TP 14	69.90	dry	--	March 20, 2013
TP 15	68.82	dry	--	March 20, 2013
TP 16	69.61	3.30	66.31	March 21, 2013
TP 17	69.25	dry	--	March 21, 2013
TP 18	67.12	1.22	65.90	March 20, 2013
TP 19	66.43	1.50	64.93	March 20, 2013
TP 20	66.31	2.70	63.61	March 20, 2013
TP 21	65.90	2.10	63.80	March 20, 2013
TP 22	66.83	2.70	64.13	March 20, 2013
TP 23	66.94	1.80	65.14	March 20, 2013
TP 24	75.76	dry	--	March 21, 2013
TP 25	89.66	dry	--	March 21, 2013
TP 26	89.74	dry	--	March 21, 2013

Table 1 - Summary of Groundwater Level Readings				
Test Pit Number	**Ground Surface Elevation (m)**	**Groundwater Level (m)**	**Groundwater Depth (m)**	**Recording Date**
PG2878 - 936 and 1075 March Road				
TP 27	88.96	dry	--	March 21, 2013
TP 28	86.85	dry	--	March 21, 2013
TP 29	86.13	dry	--	March 21, 2013
TP 30	86.42	dry	--	March 21, 2013
TP 31	88.37	dry	--	March 21, 2013
TP 32	86.81	dry	--	March 21, 2013
TP 33	84.00	dry	--	March 21, 2013
TP 34	84.02	dry	--	March 21, 2013
TP 35	82.99	2.70	80.29	March 21, 2013
TP 36	84.76	2.60	82.16	March 21, 2013
Test Holes by Others - 1020 March Road				
TP 1	81.35	3.00	78.35	December 10, 2012
TP 2	79.06	1.50	77.56	December 10, 2012
TP 3	78.49	1.50	76.99	December 10, 2012
TP 4	79.62	4.10	75.52	December 10, 2012
TP 5	79.42	2.70	76.72	December 10, 2012
TP 6	78.40	1.50	76.90	December 10, 2012
TP 7	79.41	4.00	75.41	December 10, 2012
TP 8	79.41	dry	--	December 10, 2012
TP 9	79.59	dry	--	December 10, 2012
TP 10	79.21	4.00	75.21	December 10, 2012
TP 11	78.57	0.80	77.77	December 10, 2012
TP 12	80.02	3.40	76.62	December 10, 2012
TP 13	72.12	dry	--	December 10, 2012
TP 14	70.57	1.80	68.77	December 10, 2012
TP 15	70.32	3.90	66.42	December 10, 2012
TP 16	70.73	1.20	69.53	December 10, 2012
TP 17	70.77	1.20	69.57	December 10, 2012
TP 18	70.96	2.00	68.96	December 10, 2012
TP 19	70.36	dry	--	December 10, 2012

Table 1 - Summary of Groundwater Level Readings				
Test Pit Number	**Ground Surface Elevation (m)**	**Groundwater Level (m)**	**Groundwater Depth (m)**	**Recording Date**
Test Holes by Others - 1020 March Road				
TP 20	70.03	dry	--	December 10, 2012
TP 21	70.09	dry	--	December 10, 2012

5.0 DISCUSSION

5.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is adequate for the anticipated development. It is expected that low rise wood framed buildings or mid to high rise buildings could be founded on conventional shallow footings placed on an undisturbed, stiff silty clay, compact silty sand, compact glacial till or surface-sounded bedrock bearing surface.

A permissible grade raise restriction is required for the proposed residential development where the silty clay layer is present below the proposed buildings. Areas effected by a permissible grade raise restriction due to the presence of a silty clay deposit are indicated in Drawing PG2878-2 - Permissible Grade Raise Areas - Housing in Appendix 2.

The above and other considerations are discussed in the following paragraphs.

5.2 Site Grading and Preparation

Stripping Depth

Topsoil, and any deleterious fill, such as those containing organic materials, should be stripped from under any buildings and other settlement sensitive structures. Other settlement sensitive structures include, but are not limited to, underground services and paved areas.

Existing foundation walls and other construction debris should be entirely removed from within the building perimeter. Under paved areas, existing construction remnants such as foundation walls should be excavated to a minimum of 1 m below final grade.

Bedrock Removal

It is expected that line-drilling in conjunction with hoe-ramming or controlled blasting may required to remove the bedrock. In areas of weathered bedrock and where only a small quantity of bedrock is to be removed, bedrock removal may be possible by hoe-ramming.

Prior to considering blasting operations, the blasting effects on the existing services, buildings and other structures should be addressed. A pre-blast or pre-construction survey of the existing structures located in proximity of the blasting operations should be carried out prior to commencing site activities. The extent of the survey should be determined by the blasting consultant and should be sufficient to respond to any inquiries/claims related to the blasting operations.

As a general guideline, peak particle velocities (measured at the structures) should not exceed 25 mm per second during the blasting program to reduce the risks of damage to the existing structures.

The blasting operations should be planned and conducted under the supervision of a licensed professional engineer who is also an experienced blasting consultant.

Excavation side slopes in sound bedrock can be carried out using almost vertical side walls. A minimum 1 m horizontal ledge, should be left between the bottom of the overburden excavation and the top of the bedrock surface to provide an area to allow for potential sloughing or to provide a stable base for the overburden shoring system. However, should the entire area be required to accommodate the parking garage, drilled piles into the weathered portion of the bedrock can be used to support the upper levels of the excavation and can be placed at the property boundary.

Vibration Considerations

Construction operations are also the cause of vibrations, and possibly, sources of nuisance to the community. Therefore, means to reduce the vibration levels as much as possible should be incorporated in the construction operations to maintain, as much as possible, a cooperative environment with the residents.

The following construction equipments could be a source of vibrations: piling rig, hoe ram, compactor, dozer, crane, truck traffic, etc. The construction of the shoring system using soldier piles or sheet piling will require the use of this equipment. Vibrations, whether it is caused by blasting operations or by construction operations, could be the cause of the source of detrimental vibrations on the adjoining buildings and structures. Therefore, it is recommended that all vibrations be limited.

Two parameters are used to determine the permissible vibrations, namely, the maximum peak particle velocity and the frequency. For low frequency vibrations, the maximum allowable peak particle velocity is less than that for high frequency vibrations. As a guideline, the peak particle velocity should be less than 15 mm/s between frequencies of 4 to 12 Hz, and 50 mm/s above a frequency of 40 Hz (interpolate between 12 and 40 Hz). It should be noted that these guidelines are for today's construction standards. Considering that these guidelines are above perceptible human level and, in some cases, could be very disturbing to some people, it is recommended that a pre-construction survey be completed to minimize the risks of claims during or following the construction of the proposed building.

Fill Placement

Fill used for grading beneath the building areas should consist, unless otherwise specified, of clean imported granular fill, such as Ontario Provincial Standard Specifications (OPSS) Granular A or Granular B Type II material. The fill should be placed in lifts no greater than 300 mm thick and compacted using suitable compaction equipment for the lift thickness. Fill placed beneath the buildings should be compacted to at least 98% of its standard Proctor maximum dry density (SPMDD).

Non-specified existing fill along with site-excavated soil can be used as general landscaping fill where settlement of the ground surface is of minor concern. These materials should be spread in thin lifts and at least compacted by the tracks of the spreading equipment to minimize voids. If excavated stiff brown silty clay, free of organics and deleterious materials, is to be used to build up the subgrade level for areas to be paved, the silty clay, under dry conditions, should be compacted in thin lifts to a minimum density of 95% of their respective SPMDD. Non-specified existing fill and site-excavated soils are not suitable for use as backfill against foundation walls unless a composite drainage blanket connected to a perimeter drainage system is provided.

5.3 Foundation Design

Shallow Foundation

Strip footings, up to 2 m wide, and pad footings, up to 4 m wide, placed on an undisturbed, stiff silty clay bearing surface can be designed using a bearing resistance value at serviceability limit state (SLS) of **150 kPa** and a factored bearing resistance value at ultimate limit state (ULS) of **225 kPa**. Footings placed on an undisturbed, compact silty sand or compact glacial till bearing surface can be designed using a bearing resistance value at SLS of **150 kPa** and a factored bearing resistance value at ULS of **225 kPa**. Footings placed on a clean, weathered bedrock can be designed using a bearing resistance value at SLS of **500 kPa** and a factored bearing resistance value at ULS of **750 kPa**.

An undisturbed soil bearing surface consists of a surface from which all topsoil and deleterious materials, such as loose, frozen or disturbed soil, whether in situ or not, have been removed, in the dry, prior to the placement of concrete for footings.

A clean, weathered bedrock surface consists of one from which all topsoil, soils, deleterious materials and loose rock have been removed prior to concrete placement.

Footings designed using the bearing resistance value at SLS given above will be subjected to potential post construction total and differential settlements of 25 and 20 mm, respectively. A geotechnical resistance factor of 0.5 was applied to the above noted bearing resistance value at ULS.

A **permissible grade raise restriction of 2 m** is recommended for areas where building foundations are founded over a silty clay deposit. Areas effected by a permissible grade raise restriction due to the presence of a silty clay deposit are indicated in Drawing PG2878-2 - Permissible Grade Raise Areas - Housing in Appendix 2. Footings bearing on a dense glacial till are not subjected to permissible grade raise restrictions.

Lateral Support

The bearing medium under footing-supported structures is required to be provided with adequate lateral support. Adequate lateral support is provided to a stiff silty clay or compact glacial till bearing medium when a plane extending down and out from the bottom edge of the footing, at a minimum of 1.5H:1V.

5.4 Design for Earthquakes

The site class for seismic site response can be taken as **Class C** for the foundations considered within the subject site. A higher site class, such as site Class A or B may be applicable for the areas within the subject site. However, the higher site class would need to be confirmed with site specific shear wave velocity testing.

Soils underlying the subject site are not susceptible to liquefaction. Reference should be made to the latest revision of the 2006 Ontario Building Code for a full discussion of the earthquake design requirements.

5.5 Basement Slab

With the removal of all topsoil and fill, if any, within the footprint of the proposed buildings, the native soil surface will be considered to be an acceptable subgrade on which to commence backfilling for floor slab construction.

Any soft areas should be removed and backfilled with appropriate backfill material prior to placing any fill. OPSS Granular B Type II, with a maximum particle size of 50 mm, are recommended for backfilling below the floor slab. It is recommended that the upper 200 mm of sub-floor fill consists of 19 mm clear crushed stone. All backfill material within the footprint of the proposed buildings should be placed in maximum 300 mm thick loose layers and compacted to at least 98% of its SPMDD.

6.0 DESIGN AND CONSTRUCTION PRECAUTIONS

6.1 Foundation Drainage and Backfill

It is recommended that a perimeter foundation drainage system be provided for proposed structures. The system should consist of a 100 to 150 mm diameter, geotextile-wrapped, perforated, corrugated, plastic pipe, surrounded on all sides by 150 mm of 10 mm clear crushed stone, placed at the footing level around the exterior perimeter of the structure. The pipe should have a positive outlet, such as a gravity connection to the storm sewer.

Backfill against the exterior sides of the foundation walls should consist of free-draining, non frost susceptible granular materials. The site materials will be frost susceptible and, as such, are not recommended for re-use as backfill unless a composite drainage system (such as system Platon or Miradrain G100N) connected to a drainage system is provided.

6.2 Protection of Footings Against Frost Action

Perimeter footings of heated structures are required to be insulated against the deleterious effect of frost action. A minimum of 1.5 m thick soil cover (or equivalent) should be provided in this regard.

A minimum of 2.1 m thick soil cover (or equivalent) should be provided for other exterior unheated footings.

6.3 Excavation Side Slopes

The side slopes of excavations in the soil and fill overburden materials should either be cut back at acceptable slopes or should be retained by shoring systems from the start of the excavation until the structure is backfilled. It is assumed that sufficient room will be available for the greater part of the excavations to be undertaken by open-cut methods (i.e. unsupported excavations).

The excavation side slopes above the groundwater level extending to a maximum depth of 3 m should be cut back at 1H:1V or flatter. The flatter slope is required for excavation below groundwater level. The subsoil at this site is considered to be mainly a Type 2 and 3 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects.

Excavated soil should not be stockpiled directly at the top of excavations and heavy equipment should be kept away from the excavation sides.

Slopes in excess of 3 m in height should be periodically inspected by the geotechnical consultant in order to detect if the slopes are exhibiting signs of distress.

It is recommended that a trench box be used at all times to protect personnel working in trenches with steep or vertical sides. It is expected that services will be installed by "cut and cover" methods and excavations will not be left open for extended periods of time.

6.4 Groundwater Control

The contractor should be prepared to direct water away from all bearing surfaces and subgrades, regardless of the source, to prevent disturbance to the founding medium.

It is anticipated that pumping from open sumps will be sufficient to control the groundwater influx through the sides of the excavations.

Pumping of more than 50,000 L/day to an off site receptor requires a temporary Ontario Ministry of Environment (MOE) permit to take water (PTTW). During service installation for the proposed development, it is anticipated that a PTTW should be taken to avoid any delays at the time of construction. At least 4 months should be allowed for completion of the application and issuance of the permit by the MOE.

6.5 Winter Construction

Precautions must be taken if winter construction is considered for this project. The subsoil conditions at this site consist of frost susceptible materials. In the presence of water and freezing conditions, ice could form within the soil mass. Heaving and settlement upon thawing could occur.

In the event of construction during below zero temperatures, the founding stratum should be protected from freezing temperatures by the use of straw, propane heaters and tarpaulins or other suitable means. In this regard, the base of the excavations should be insulated from sub-zero temperatures immediately upon exposure and until such time as heat is adequately supplied to the building and the footings are protected with sufficient soil cover to prevent freezing at founding level.

Trench excavations and pavement construction are also difficult activities to complete during freezing conditions without introducing frost in the subgrade or in the excavation walls and bottoms. Precautions should be taken if such activities are to be carried out during freezing conditions.

6.6 Corrosion Potential and Sulphate

The results of analytical testing show that the sulphate content is less than 0.1%. This result is indicative that Type 10 Portland cement (normal cement) would be appropriate for this site. The chloride content and the pH of the sample indicate that they are not significant factors in creating a corrosive environment for exposed ferrous metals at this site, whereas the resistivity is indicative of a non-aggressive to slightly aggressive corrosive environment.

7.0 RECOMMENDATIONS

It is a requirement for the foundation design data provided herein to be applicable that a materials testing and observation services program including the following aspects be performed by the geotechnical consultant.

- ❑ A detailed geotechnical investigation should be completed to City of Ottawa standards for the subject site.
- ❑ Observation of all bearing surfaces prior to the placement of concrete.
- ❑ Sampling and testing of the concrete and fill materials used.
- ❑ Periodic observation of the condition of unsupported excavation side slopes in excess of 3 m in height, if applicable.
- ❑ Observation of all subgrades prior to backfilling
- ❑ Field density tests to determine the level of compaction achieved.
- ❑ Sampling and testing of the bituminous concrete including mix design reviews.

A report confirming that these works have been conducted in general accordance with our recommendations could be issued, upon request, following the completion of a satisfactory materials testing and observation program by the geotechnical consultant.

8.0 STATEMENT OF LIMITATIONS

The recommendations made in this report are in accordance with our present understanding of the project. We request that we be permitted to review the grading plan once available. Also, our recommendations should be reviewed when the project drawings and specifications are complete.

A soils investigation is a limited sampling of a site. Should any conditions at the site be encountered which differ from those at the test locations, we request that we be notified immediately in order to permit reassessment of our recommendations.

The present report applies only to the project described in this document. This report has been prepared for Novatech Engineering Consultants Ltd., on behalf of the Kanata North Landowner's Group and in support of the Kanata North Community Design Plan. It is hereby acknowledged that Metcalfe Realty Company Limited, J.G Rivard Limited and 8409706 Canada Inc. (Valecraft Homes), 3223701 Canada Inc. and 7089121 Canada Inc. (Junic/Multivesco) can rely upon and utilize this report for the purpose of obtaining approval of the community design plan and for their own use to seek development approval.

It is further acknowledged that future confirmed participating landowners within the Kanata North Landowner's Group, can rely upon and utilize this report for the purpose of obtaining approval of the community design plan and for their own use to seek development approval.

Paterson Group Inc.

Carlos P. Da Silva, P.Eng.

David J. Gilbert, P.Eng.

Report Distribution:

- ❑ Metcalfe Realty Company Limited (3 copies)
- ❑ Paterson Group (1 copy)

APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

ANALYTICAL TESTING RESULTS

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

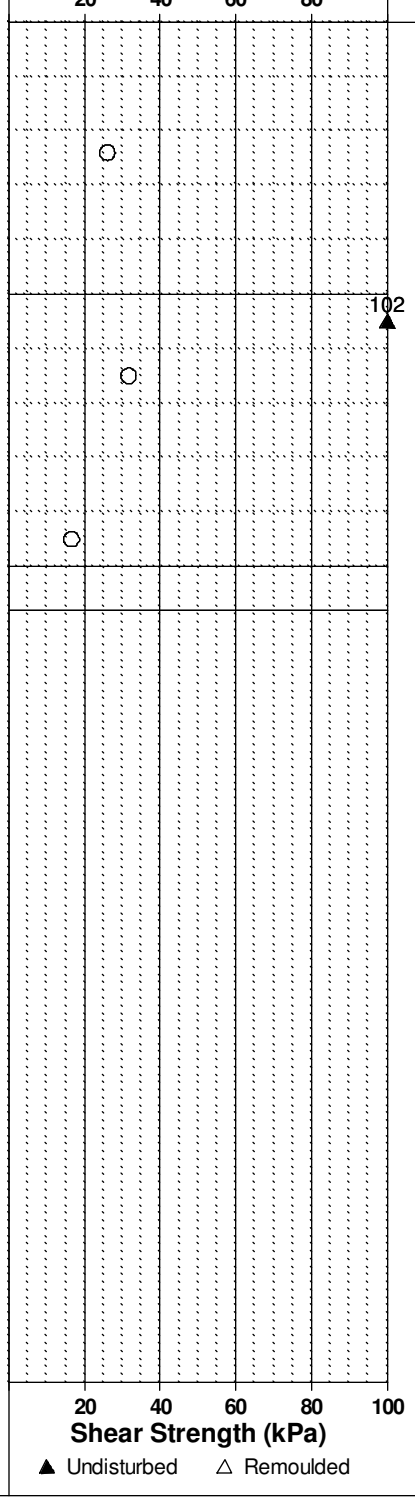
FILE NO. PG2878

REMARKS 18T 0426497; 5023431

HOLE NO. TP 1

BORINGS BY Backhoe **DATE** March 11, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	78.55
TOPSOIL							
0.36							
Brown **SILTY CLAY,** with sand, trace cobbles		G	1				
0.60						1	77.55
Very stiff, brown **SILTY CLAY**		G	2				
1.83							
GLACIAL TILL: Brown silty clay with sand, gravel, cobbles, boulders		G	3			2	76.55
2.16							
End of Test Pit							
Practical refusal to excavation on inferred bedrock surface at 2.16m depth							
(TP dry upon completion)							



Piezometer Construction

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0426480; 5023614

HOLE NO. TP 2

BORINGS BY Backhoe **DATE** March 11, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	77.89
TOPSOIL							
0.38							
Brown **SILTY SAND**		G	1				
0.79		G	2			1	76.89
Very stiff, brown **SILTY CLAY**						2	75.89
		G	3			3	74.89
3.81		G	4				
End of Test Pit							
(GWL @ 1.7m depth based on field observations)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

180

102

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

Piezometer Construction

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0426014; 5023349

HOLE NO. TP 3

BORINGS BY Backhoe **DATE** March 11, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	78.58
TOPSOIL		G	1				
0.46		G	2				
Very stiff, brown **SILTY CLAY**						1	77.58
		G	3				
1.88							
End of Test Pit Practical refusal to excavation on inferred bedrock surface at 1.88m depth (TP dry upon completion)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0426309; 5023646

HOLE NO. TP 4

BORINGS BY Backhoe **DATE** March 11, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	78.91	20 40 60 80	
TOPSOIL									
0.43									
Very stiff to stiff, brown **SILTY CLAY**		G	1			1	77.91	○	▽
						2	76.91		
2.90		G	2					○	
End of Test Pit									
Practical refusal to excavation on inferred bedrock surface at 2.90m depth									
(GWL @ 1.8m depth based on field observations)									

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0426398; 5023724

HOLE NO. TP 5

BORINGS BY Backhoe **DATE** March 11, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	78.22	20 40 60 80	
TOPSOIL									
0.36									
Brown **SILTY SAND**									
0.53									
						1	77.22		▽
Stiff, brown **SILTY CLAY**						2	76.22		
						3	75.22		
3.66									
End of Test Pit									
(GWL @ 1.2m depth based on field observations)									

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0426218; 5023755

HOLE NO. TP 6

BORINGS BY Backhoe **DATE** March 11, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	79.28		
TOPSOIL									
0.38									
Brown **SILTY SAND**		G	1						
0.60									
		G	2			1	78.28		
								127	
		G	3			2	77.28		
Very stiff to stiff, brown **SILTY CLAY**									
						3	76.28		
3.66									
End of Test Pit									

Practical refusal to excavation on inferred bedrock surface at 3.66m depth

(GWL @ 1.8m depth based on field observations)

Water Content % scale: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0426305; 5023849

HOLE NO. TP 7

BORINGS BY Backhoe **DATE** March 11, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	78.81
TOPSOIL							
0.33							
Brown **SILTY SAND**						1	77.81
1.24		G	1				
Very stiff to stiff, brown **SILTY CLAY**						2	76.81
		G	2				
						3	75.81
3.66							
End of Test Pit							
(TP dry upon completion)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

Piezometer Construction

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0426590; 5023475

HOLE NO. TP 8

BORINGS BY Backhoe **DATE** March 11, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	78.84
FILL: Brown silty clay with cobbles, asphalt, sand		G	1				
						1	77.84
1.22							
TOPSOIL							
1.52							
Stiff, brown **SILTY CLAY**		G	2			2	76.84
2.44							
GLACIAL TILL: Brown silty sand with gravel, cobbles, boulders, trace clay		G	3			3	75.84
3.66							
End of Test Pit							
Practical refusal to excavation on inferred bedrock surface at 3.66m depth							
(TP dry upon completion)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

Piezometer Construction

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

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FILE NO. PG2878

REMARKS 18T 0426599; 5023722

HOLE NO. TP 9

BORINGS BY Backhoe **DATE** March 11, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	78.71		
TOPSOIL 0.25									
Brown **SILTY SAND**		G	1			1	77.71		
1.07									
		G	2			2	76.71		
Very stiff to stiff, brown **SILTY CLAY**		G	3			3	75.71		
3.66									
End of Test Pit									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0426757; 5023823

HOLE NO. TP10

BORINGS BY Hydraulic Excavator **DATE** March 20, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	70.43
TOPSOIL 0.30							
Very stiff, brown **SILTY CLAY**		G	1			1	69.43
1.83		G	2				
End of Test Pit Practical refusal to excavation on inferred bedrock surface at 1.83m depth (GWL @ 0.8m depth based on field observations)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

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FILE NO. PG2878

REMARKS 18T 0426913; 5023651

HOLE NO. TP11

BORINGS BY Hydraulic Excavator **DATE** March 20, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	70.02		
TOPSOIL 0.38									
Very stiff, brown **SILTY CLAY**		G	1						
						1	69.02		
1.27		G	2						
End of Test Pit Practical refusal to excavation on inferred bedrock surface at 1.27m depth (GWL @ 0.4m depth based on field observations)									

Pen. Resist. Blows/0.3m: 20, 40, 60, 80

Shear Strength (kPa): 20, 40, 60, 80, 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0426831; 5024114

HOLE NO. TP12

BORINGS BY Hydraulic Excavator **DATE** March 20, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.71
TOPSOIL 0.30		G	1				
Loose to compact, brown **SILTY SAND** 1.22						1	68.71
Stiff to very stiff, brown **SILTY CLAY**		G	2			2	67.71
		G	3				
3.20						3	66.71
GLACIAL TILL: Compact to dense, grey silty sand with clay, gravel, cobbles, boulders		G	4				
3.66							
End of Test Pit							
(GWL @ 2.3m depth based on field observations)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0426963; 5023959

HOLE NO. TP13

BORINGS BY Hydraulic Excavator **DATE** March 20, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	69.87		
TOPSOIL 0.30		G	1						
Loose to compact, brown **SILTY SAND** 1.52						1	68.87		
		G	2			2	67.87		
Very stiff to stiff, brown **SILTY CLAY**									
- stiff to firm and grey by 3.2m depth		G	3			3	66.87		
3.66 End of Test Pit									
(GWL @ 2.7m depth based on field observations)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

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FILE NO. PG2878

REMARKS 18T 0427084; 5023843

HOLE NO. TP14

BORINGS BY Hydraulic Excavator **DATE** March 20, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.90
TOPSOIL							
0.41							
Loose to compact, brown **SILTY SAND**		G	1			1	68.90
1.52							
Very stiff to stiff, brown **SILTY CLAY**		G	2			2	67.90
- stiff to firm and grey by 2.7m depth							
		G	3			3	66.90
3.66							
End of Test Pit							
(TP dry upon completion)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

Piezometer Construction

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SOIL PROFILE AND TEST DATA

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FILE NO. PG2878

REMARKS 18T 0427248; 5024000

HOLE NO. TP15

BORINGS BY Hydraulic Excavator **DATE** March 20, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	68.82		
TOPSOIL									
0.40									
Loose to compact, brown **SILTY SAND**		G	1			1	67.82		
2.13						2	66.82		
Very stiff to stiff, brown **SILTY CLAY**		G	2						
		G	3			3	65.82		
4.27						4	64.82		
End of Test Pit Practical refusal to excavation at 4.27m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

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Future Development Lands - March Road
Ottawa, Ontario

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FILE NO. PG2878

REMARKS 18T 0427121; 5024097

HOLE NO. TP16

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.61
TOPSOIL							
0.46		G	1				
Loose to compact, brown **SILTY SAND**						1	68.61
1.37		G	2				
Very stiff, brown **SILTY CLAY**		G	3			2	67.61
3.35							
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles, boulders		G	4			3	66.61
3.66							
End of Test Pit							
(GWL @ 3.3m depth based on field observations)							

Pen. Resist. Blows/0.3m
50 mm Dia. Cone

Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

Piezometer Construction

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SOIL PROFILE AND TEST DATA

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Future Development Lands - March Road
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FILE NO. PG2878

REMARKS 18T 0426980; 5024232

HOLE NO. TP17

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.25
TOPSOIL							
0.41							
Loose to compact, brown **SILTY SAND**		G	1			1	68.25
1.68							
Very stiff to stiff, brown **SILTY CLAY**						2	67.25
		G	2			3	66.25
3.66							
End of Test Pit							
(TP dry upon completion)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

Piezometer Construction

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
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Ottawa, Ontario

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FILE NO. PG2878

REMARKS 18T 0427350; 5024107

HOLE NO. TP18

BORINGS BY Hydraulic Excavator **DATE** March 20, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	67.12		
TOPSOIL									
0.46									
Very stiff to stiff, brown **SILTY CLAY**		G	1			1	66.12		▽
		G	2			2	65.12		
		G	3			3	64.12		
3.66									
End of Test Pit									
(GWL @ 1.2m depth based on field observations)									

Pen. Resist. Blows/0.3m — ● 50 mm Dia. Cone / ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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FILE NO. PG2878

REMARKS 18T 0427495; 5024209

HOLE NO. TP19

BORINGS BY Hydraulic Excavator **DATE** March 20, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	66.43		
TOPSOIL									
0.46									
		G	1			1	65.43		
		G	2						▽
Very stiff to stiff, brown **SILTY CLAY**						2	64.43		
		G	3						
		G	4			3	63.43		
3.66									
End of Test Pit									
(GWL @ 1.5m depth based on field observations)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

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Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0427413; 5024301

HOLE NO. TP20

BORINGS BY Hydraulic Excavator **DATE** March 20, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	66.31		
TOPSOIL									
0.41									
Very stiff to stiff, brown **SILTY CLAY**		G	1			1	65.31		
		G	2			2	64.31		▽
						3	63.31		
3.66									
End of Test Pit									
(GWL @ 2.7m depth based on field observations)									

Shear Strength (kPa): 20, 40, 60, 80, 100

▲ Undisturbed △ Remoulded

patersongroup

Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0427255; 5024489

HOLE NO. TP21

BORINGS BY Hydraulic Excavator **DATE** March 20, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	65.90
TOPSOIL							
0.46							
Very stiff to stiff, brown **SILTY CLAY**		G	1			1	64.90
		G	2			2	63.90
3.35						3	62.90
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles, boulders		G	3				
3.66							
End of Test Pit							
(GWL @ 2.1m depth based on field observations)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup

Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0427167; 5024410

HOLE NO. TP22

BORINGS BY Hydraulic Excavator **DATE** March 20, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	66.83		
TOPSOIL 0.30									
		G	1			1	65.83		
Very stiff to stiff, brown **SILTY CLAY**						2	64.83		▽
		G	2			3	63.83		
3.66									
End of Test Pit (GWL @ 2.7m depth based on field observations)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup

Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0427276; 5024206

HOLE NO. TP23

BORINGS BY Hydraulic Excavator **DATE** March 20, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	66.94
TOPSOIL							
0.41							
Very stiff to stiff, brown **SILTY CLAY**		G	1			1	65.94
		G	2			2	64.94
2.84							
End of Test Pit Practical refusal to excavation on inferred bedrock surface at 2.84m depth (GWL @ 1.8m depth based on field observations)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0426555; 5024059

HOLE NO. TP24

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	75.76
TOPSOIL							
0.51							
Loose to compact, red to brown **SILTY SAND**		G	1			1	74.76
1.52							
Very stiff to stiff, brown **SILTY CLAY**		G	2			2	73.76
						3	72.76
3.25							
End of Test Pit Practical refusal to excavation on inferred bedrock surface at 3.25m depth (TP dry upon completion)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

Piezometer Construction

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0425287; 5023780

HOLE NO. TP25

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	89.66		
TOPSOIL 0.30									
Very stiff to stiff, brown **SILTY CLAY**		G	1					○	
0.61									
End of Test Pit Practical refusal to excavation on inferred bedrock surface at 0.61m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0425362; 5023727

HOLE NO. TP26

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	89.74		
TOPSOL									
0.60									
Very stiff to stiff, brown **SILTY CLAY**						1	88.74		
1.22									
GLACIAL TILL: Brown silty clay with sand, gravel, cobbles, boulders		G	1					○	
1.52									
End of Test Pit									
Practical refusal to excavation on inferred bedrock surface at 1.52m depth									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0425446; 5023599

HOLE NO. TP27

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.96		
TOPSOIL									
0.60									
Very stiff to stiff, brown **SILTY CLAY,** trace sand						1	87.96		
						2	86.96		
2.44									
End of Test Pit Practical refusal to excavation on inferred bedrock surface at 2.44m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0425582; 5023702

HOLE NO. TP28

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	86.85		
TOPSOIL									
0.41									
Very stiff to stiff, brown **SILTY CLAY**		G	1			1	85.85		
1.52									
End of Test Pit									
Practical refusal to excavation on inferred bedrock surface at 1.52m depth									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0425480; 5023826

HOLE NO. TP29

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	86.13		
TOPSOIL									
0.41									
Firm to stiff, brown **SILTY CLAY**						1	85.13		
1.07									
GLACIAL TILL: Brown silty clay with sand, gravel, cobbles, boulders		G	1						
1.52									
End of Test Pit									
Practical refusal to excavation on inferred bedrock surface at 1.52m depth									
(GWL @ 0.7m depth based on field observations)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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Consulting Engineers

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0425420; 5023875

HOLE NO. TP30

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	86.42		
TOPSOIL									
0.38									
Very stiff to stiff, brown **SILTY CLAY,** trace sand		G	1			1	85.42		
1.83									
End of Test Pit Practical refusal to excavation on inferred bedrock surface at 1.83m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0425562; 5023981

HOLE NO. TP31

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.37		
TOPSOIL									
0.41									
Stiff, brown **SILTY CLAY,** some sand, trace gravel									
0.81									
End of Test Pit Practical refusal to excavation on inferred bedrock surface at 0.81m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0425629; 5023917

HOLE NO. TP32

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	86.81		
TOPSOIL									
0.66									
End of Test Pit Practical refusal to excavation on inferred bedrock surface at 0.66m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0425702; 5023822

HOLE NO. TP33

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	84.00		
TOPSOIL									
0.61									
End of Test Pit Practical refusal to excavation on inferred bedrock surface at 0.61m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0425799; 5023895

HOLE NO. TP34

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	84.02		
TOPSOIL									
0.41									
Hard to very stiff, brown **SILTY CLAY**		G	1			1	83.02	○ 122	
1.52									
GLACIAL TILL: Brown silty sand with gravel, cobbles, boulder,		G	2					○	
1.92									
End of Test Pit									
Practical refusal to excavation on inferred bedrock surface at 1.92m depth									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0425826; 5024040

HOLE NO. TP35

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	82.99
TOPSOIL							
0.46							
Hard to very stiff, brown **SILTY CLAY**		G	1			1	81.99
						2	80.99
						3	79.99
						4	78.99
4.27		G	2				
End of Test Pit Practical refusal to excavation on inferred bedrock surface at 4.27m depth (GWL @ 2.7m depth based on field observations)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Future Development Lands - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Annis, O'Sullivan, Vollebekk Ltd.

FILE NO. PG2878

REMARKS 18T 0425699; 5024001

HOLE NO. TP36

BORINGS BY Hydraulic Excavator **DATE** March 21, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	84.76		
TOPSOIL									
0.41									
Hard to very stiff, brown **SILTY CLAY**		G	1			1	83.76	○ 108	
						2	82.76		
2.74									
End of Test Pit Practical refusal to excavation on inferred bedrock surface at 2.74m depth (GWL @ 2.6m depth based on field observations)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Dekok Lands
March Road, Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Backhoe **DATE** 4 November 2010

FILE NO. PG2256

HOLE NO. TP 1

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.25							
Stiff, brown **SILTY CLAY** with sand 0.56		G	1				
		G	2			1	
GLACIAL TILL: Dense, brown silty clay with sand, gravel, cobbles and boulders		G	3			2	
3.35						3	
End of Test Pit Practical refusal to excavation @ 3.35m depth (Groundwater infiltration @ 1.8m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

Piezometer Construction

▽

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Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Dekok Lands
March Road, Ottawa, Ontario

DATUM

REMARKS

FILE NO. PG2256

HOLE NO. TP 2

BORINGS BY Backhoe **DATE** 4 November 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL 0.30		G	1						
		G	2			1			
Very stiff, brown **SILTY CLAY,** some sand 2.39						2			▽
		G	3						
GLACIAL TILL: Dense to very dense, grey silty clay with sand and gravel 3.63		G	4			3			
End of Test Pit									
Practical refusal to excavation @ 3.63m depth									
(Groundwater infiltration @ 2.4m depth)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Dekok Lands
March Road, Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Backhoe **DATE** 4 November 2010

FILE NO. PG2256

HOLE NO. TP 3

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.18							
Brown **SILTY CLAY** with sand 0.33		G	1				
GLACIAL TILL: Dense, brown silty clay with sand and gravel						1	
						2	
		G	2			3	
3.66 End of Test Pit							
Practical refusal to excavation @ 3.66m depth							
(Groundwater infiltration @ 1.4m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %
20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Dekok Lands
March Road, Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Backhoe **DATE** 4 November 2010

FILE NO. PG2256

HOLE NO. TP 4

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.18							
Stiff, brown **SILTY CLAY,** some sand		G	1				
		G	2				
0.71						1	
GLACIAL TILL: Dense to very dense, grey-brown silty clay with sand, gravel and cobbles		G	3				
3.05						2	
End of Test Pit							
Practical refusal to excavation @ 3.05m depth						3	
(Groundwater infiltration @ 1.8m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Dekok Lands
March Road, Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Backhoe **DATE** 4 November 2010

FILE NO. PG2256

HOLE NO. TP 5

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.20							
Compact, brown **SILTY SAND**		G	1				
0.97		G	2			1	
GLACIAL TILL: Compact to dense, brown silty clay with sand, gravel, cobbles and boulders						2	
						3	
3.66							
End of Test Pit Practical refusal to excavation @ 3.66m depth (Groundwater infiltration @ 1.7m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Dekok Lands
March Road, Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Backhoe **DATE** 4 November 2010

FILE NO. PG2256

HOLE NO. TP 6

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL 0.10									
Compact, brown **SILTY SAND**		G	1			1			
1.22									
GLACIAL TILL: Compact to dense, grey silty clay with sand, gravel, cobbles and boulders		G	2			2			
						3			
						4			
4.55									
End of Test Pit (TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Dekok Lands
March Road, Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Backhoe **DATE** 4 November 2010

FILE NO. PG2256

HOLE NO. TP 7

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL 0.25									
GLACIAL TILL: Compact, grey silty clay with sand, gravel, cobbles and boulders 0.91									
End of Test Pit Practical refusal to excavation @ 0.91m depth (TP dry upon completion)									

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Dekok Lands
March Road, Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Backhoe **DATE** 4 November 2010

FILE NO. PG2256

HOLE NO. TP 8

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0		20 40 60 80	
TOPSOIL 0.30									
GLACIAL TILL: Compact, grey-brown silty clay with sand, gravel, cobbles and boulders						1			
2.13						2			▽
End of Test Pit Practical refusal to excavation @ 2.13m depth (Groundwater infiltration @ 2.1m depth)								20 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded	

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Dekok Lands
March Road, Ottawa, Ontario

DATUM

REMARKS

FILE NO. PG2256

HOLE NO. TP 9

BORINGS BY Backhoe **DATE** 4 November 2010

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0			
TOPSOIL 0.30									
		G	1			1			
GLACIAL TILL: Compact, grey silty clay with sand, gravel, cobbles and boulders						2			
2.44		G	2						
End of Test Pit Practical refusal to excavation @ 2.44m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Dekok Lands
March Road, Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Backhoe **DATE** 4 November 2010

FILE NO. PG2256

HOLE NO. TP10

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	
TOPSOIL 0.30		G	1				
Compact, brown **SILTY SAND,** trace clay 0.86		G	2			1	
GLACIAL TILL: Compact, grey silty clay with sand, gravel, cobbles and boulders		G	3			2	
2.44							
End of Test Pit Practical refusal to excavation @ 2.44m depth (Groundwater infiltration @ 1.8m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

Piezometer Construction

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Dekok Lands
March Road, Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Backhoe **DATE** 4 November 2010

FILE NO. PG2256

HOLE NO. TP11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0		20 40 60 80	
TOPSOIL 0.15									
Compact, brown **SILTY SAND** 0.74						1			▽
GLACIAL TILL: Compact to dense, brown silty clay with sand, gravel, cobbles and boulders 2.84						2			
End of Test Pit Practical refusal to excavation @ 2.84m depth (Groundwater infiltration @ 1.1m depth)								20 40 60 80 100 **Shear Strength (kPa)** ▲ Undisturbed △ Remoulded	

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Dekok Lands
March Road, Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Backhoe **DATE** 4 November 2010

FILE NO. PG2256

HOLE NO. TP12

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE									
TOPSOIL 0.25						0			
Compact, brown **SILTY SAND** 0.76									
GLACIAL TILL: Compact to dense, grey-brown silty clay with sand, gravel, cobbles and boulders 1.98						1			
End of Test Pit Practical refusal to excavation @ 1.98m depth (Groundwater infiltration @ bottom of test pit)									

Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Dekok Lands
March Road, Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Backhoe **DATE** 4 November 2010

FILE NO. PG2256

HOLE NO. TP13

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0		20 40 60 80	
TOPSOIL 0.30									
Compact, brown **SILTY SAND** 0.74						1			
GLACIAL TILL: Compact to dense, grey silty clay with sand, gravel, cobbles and boulders 2.49						2			▽
End of Test Pit Practical refusal to excavation @ 2.49m depth (Groundwater infiltration @ 2.2m depth)								20 40 60 80 100 **Shear Strength (kPa)** ▲ Undisturbed △ Remoulded	

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Proposed Residential Development - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

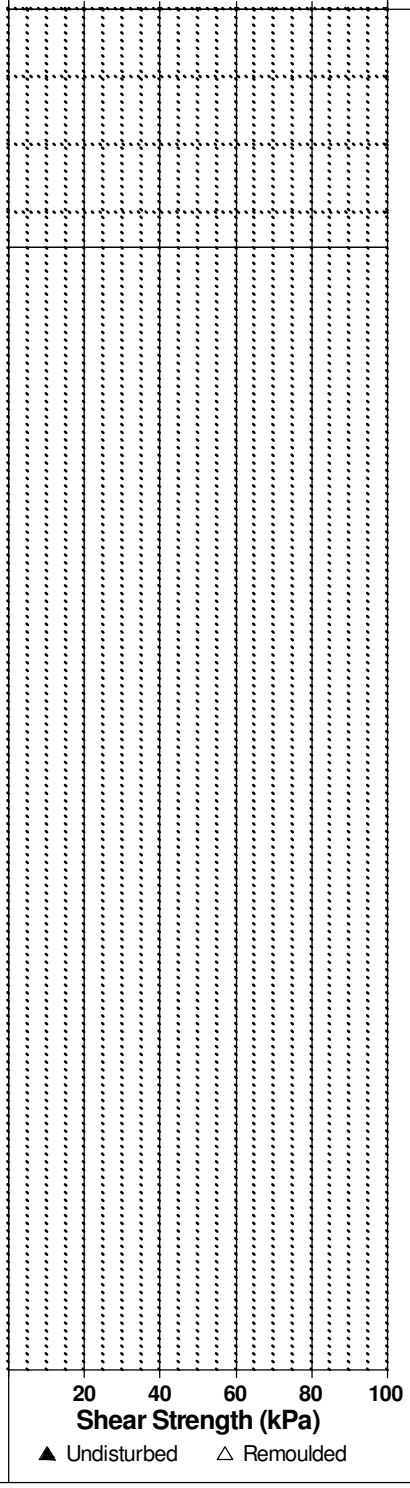
FILE NO. PG1823

REMARKS

HOLE NO. TP 1

BORINGS BY Hydraulic Shovel **DATE** 9 Feb 09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.10		
TOPSOIL 0.18									
Brown **SILTY SAND**, trace organic matter 0.55		G	1						
GLACIAL TILL: Brown silty sand with gravel, cobbles and boulders 0.70									
End of Test Pit									
Practical refusal to excavation on inferred bedrock surface @ 0.70m depth									
(TP dry upon completion)									



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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Proposed Residential Development - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

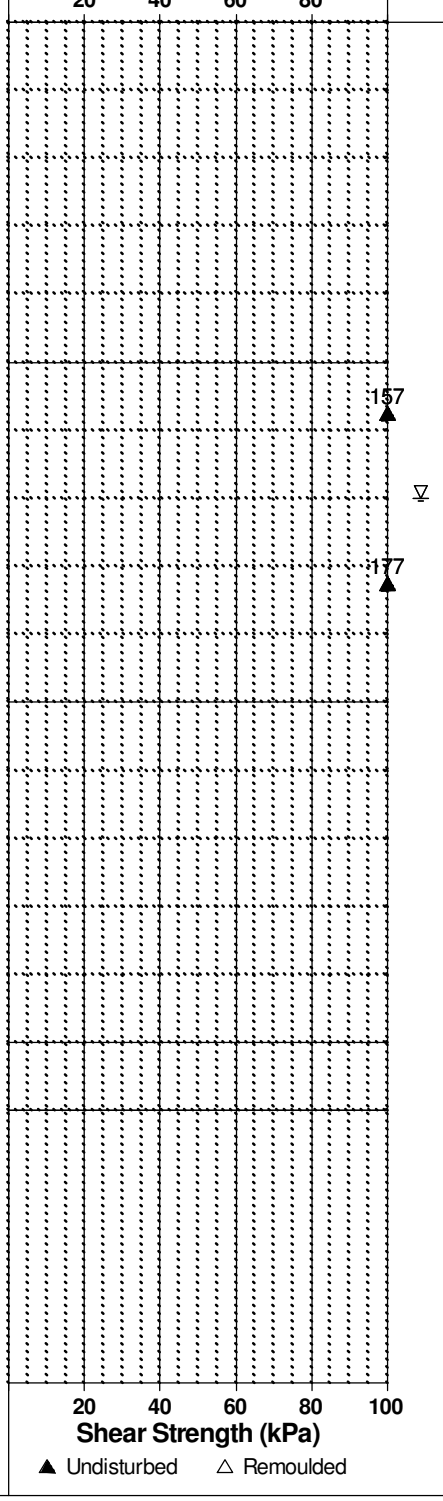
FILE NO. PG1823

REMARKS

HOLE NO. TP 2

BORINGS BY Hydraulic Shovel **DATE** 9 Feb 09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.57
TOPSOIL 0.25							
Very stiff, brown **SILTY CLAY**		G	1				
- grey by 0.75m depth		G	2			1	87.57
						2	86.57
2.90							
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles and boulders 3.20						3	85.57
End of Test Pit							
Practical refusal to excavation on inferred bedrock surface @ 3.20m depth							
(Open hole GWL @ 1.4m depth)							



Piezometer Construction

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Proposed Residential Development - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

FILE NO. PG1823

REMARKS

HOLE NO. TP 3

BORINGS BY Hydraulic Shovel **DATE** 9 Feb 09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	85.48		
TOPSOIL 0.18									
Brown **SILTY CLAY** 0.47		G	1						
		G	2						
GLACIAL TILL: Brown silty clay with sand, gravel, cobbles and boulders						1	84.48		
1.90									
End of Test Pit Practical refusal to excavation on inferred bedrock surface @ 1.90m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Proposed Residential Development - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

FILE NO. PG1823

REMARKS

HOLE NO. TP 4

BORINGS BY Hydraulic Shovel **DATE** 9 Feb 09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.13		
TOPSOIL 0.20									
Brown **SILTY SAND** 0.50		G	1						
		G	2						
GLACIAL TILL: Grey clayey silt, some gravel, trace sand, cobbles and boulders						1	87.13		
1.40									
End of Test Pit									
Practical refusal to excavation on inferred bedrock surface @ 1.40m depth									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Proposed Residential Development - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

FILE NO. PG1823

REMARKS

HOLE NO. TP 5

BORINGS BY Hydraulic Shovel **DATE** 9 Feb 09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.50
TOPSOIL							
0.26							
Brown **SANDY SILT**, trace gravel		G	1				
0.80							
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles and boulders		G	2			1	87.50
1.15							
End of Test Pit							
Practical refusal to excavation on inferred bedrock surface @ 1.15m depth							
(TP dry upon completion)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

Piezometer Construction

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Proposed Residential Development - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

FILE NO. PG1823

REMARKS

HOLE NO. TP 6

BORINGS BY Hydraulic Shovel **DATE** 9 Feb 09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	89.10		
TOPSOIL									
0.25									
Brown **SILTY CLAY**		G	1						
0.85									
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles and boulders		G	2			1	88.10		
2.20						2	87.10		
End of Test Pit Practical refusal to excavation on inferred bedrock surface @ 2.20m depth (TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Proposed Residential Development - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

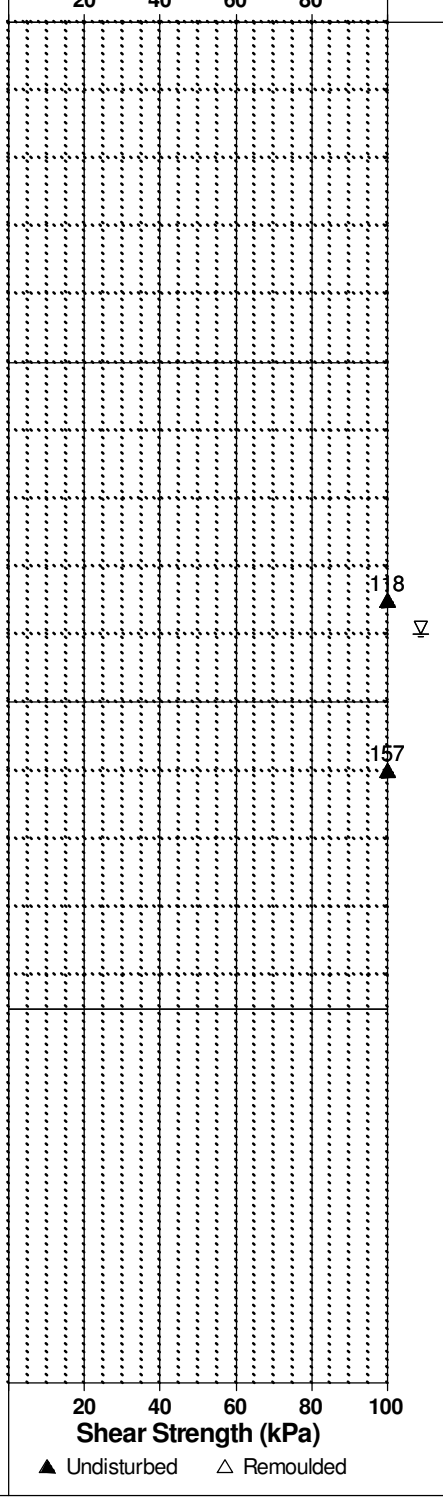
FILE NO. PG1823

REMARKS

HOLE NO. TP 7

BORINGS BY Hydraulic Shovel **DATE** 9 Feb 09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.06
TOPSOIL 0.20							
Very stiff, brown **SILTY CLAY**		G	1			1	87.06
- grey-brown by 1.4m depth		G	2			2	86.06
2.60							
GLACIAL TILL: Grey-brown silty sand with clay, gravel, cobbles and boulders		G	3				
2.90							
End of Test Pit							
Practical refusal to excavation on inferred bedrock surface @ 2.90m depth							
(Open hole GWL @ 1.8m depth)							



Piezometer Construction

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Proposed Residential Development - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

FILE NO. PG1823

REMARKS

HOLE NO. TP 8

BORINGS BY Hydraulic Shovel **DATE** 9 Feb 09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	89.86		
TOPSOIL 0.25									
Brown **SANDY SILT** , trace organic matter 0.60		G	1						
		G	2						
Brown **SILTY CLAY**						1	88.86		▽
1.40 End of Test Pit									
Practical refusal to excavation on inferred bedrock surface @ 1.40m depth									
(Open hole GWL @ 1.1m depth)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Proposed Residential Development - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

FILE NO. PG1823

REMARKS

HOLE NO. TP 9

BORINGS BY Hydraulic Shovel **DATE** 9 Feb 09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	91.42		
TOPSOIL 0.20									
Brown **SILTY CLAY**		G	1			1	90.42		
1.30									
GLACIAL TILL: Grey-brown clayey silt with gravel, cobbles and boulders, trace sand		G	2			2	89.42		▽
2.30									
End of Test Pit Practical refusal to excavation on inferred bedrock surface @ 2.30m depth (Open hole GWL @ 1.9m depth)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Proposed Residential Development - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

FILE NO. PG1823

REMARKS

HOLE NO. TP10

BORINGS BY Hydraulic Shovel **DATE** 9 Feb 09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	90.76		
TOPSOIL 0.20									
Brown **SANDY SILT** , some organic matter 0.70		G	1						
		G	2			1	89.76		
GLACAIL TILL: Grey silty sand with gravel, cobbles and boulders		G	3			2	88.76		▽
2.90									
End of Test Pit Practical refusal to excavation on inferred bedrock surface @ 2.90m depth (Open hole GWL @ 2.5m depth)									

Pen. Resist. Blows/0.3m — ● 50 mm Dia. Cone / ○ Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100 — ▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Proposed Residential Development - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

FILE NO. PG1823

REMARKS

HOLE NO. TP11

BORINGS BY Hydraulic Shovel **DATE** 9 Feb 09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	90.22		
TOPSOIL 0.25									
Brown **SILTY SAND** , some organic matter 0.90		G	1						
GLACIAL TILL: Grey-brown silty sand with clay and gravel 1.20		G	2			1	89.22		▽
End of Test Pit									
Practical refusal to excavation on inferred bedrock surface @ 1.20m depth									
(Open hole GWL @ 1.0m depth)									

Pen. Resist. Blows/0.3m — ● 50 mm Dia. Cone / ○ Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
Proposed Residential Development - March Road
Ottawa, Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

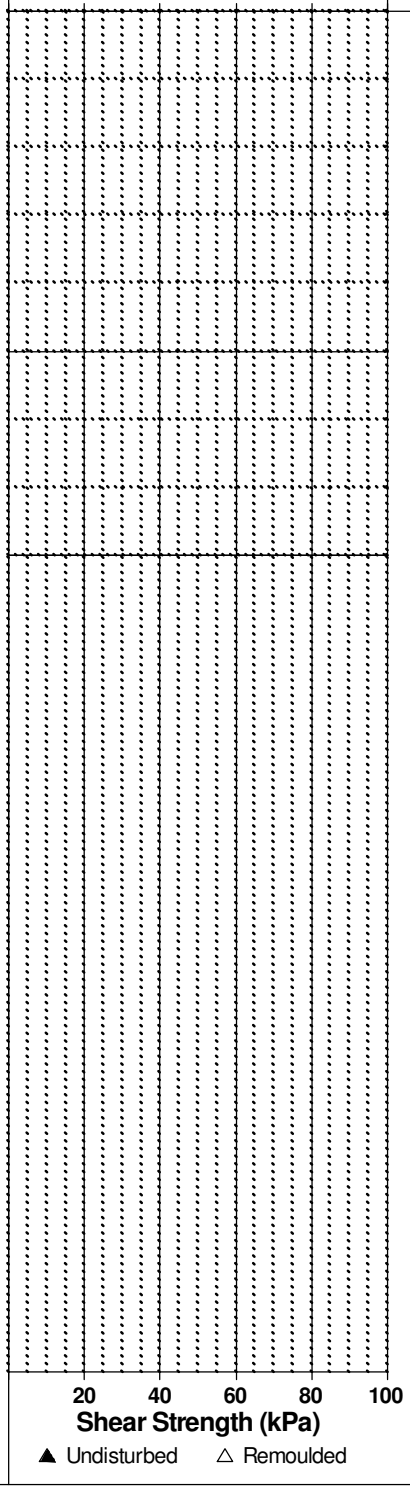
FILE NO. PG1823

REMARKS

HOLE NO. TP12

BORINGS BY Hydraulic Shovel **DATE** 9 Feb 09

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	89.26		
TOPSOIL 0.20									
Brown **SILTY SAND**						1	88.26		
1.00									
GLACIAL TILL: Grey silty sand with clay and gravel									
1.60									
End of Test Pit									
Practical refusal to excavation on inferred bedrock surface @ 1.60m depth									
(TP dry upon completion)									



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Foley Lands
Ottawa, Ontario

DATUM TBM - Centreline of March Road, adjacent to the north property limit, assumed geodetic elevation = 82.00m.

FILE NO. PG1716

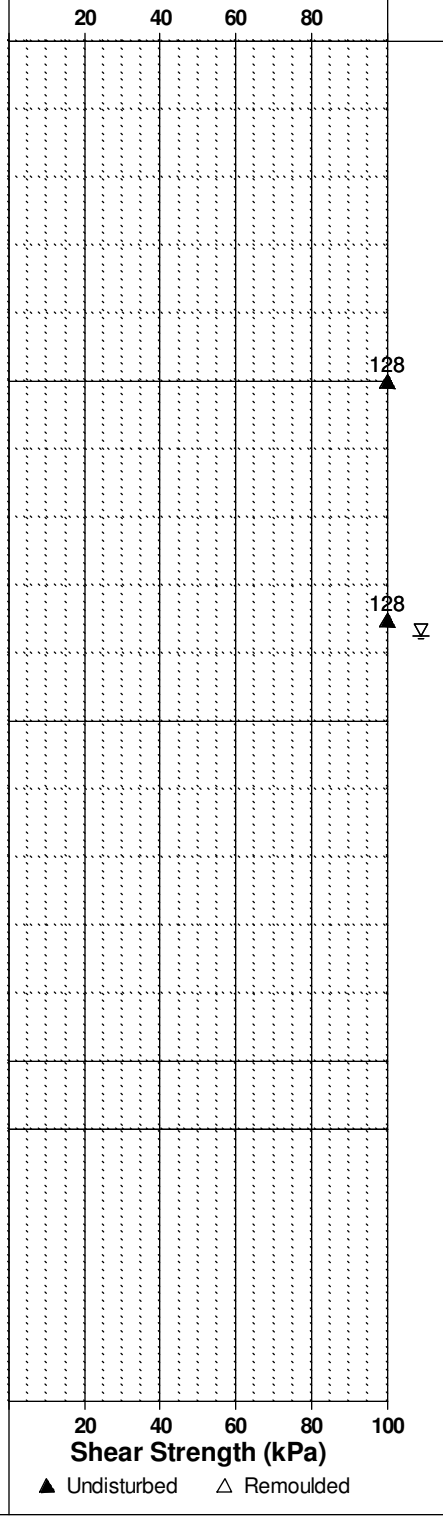
REMARKS

HOLE NO. TP 1

BORINGS BY Hydraulic Shovel **DATE** July 9, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	81.70
TOPSOIL							
0.25							
Very stiff, brown **SILTY CLAY**							
- grey by 0.5m depth						1	80.70
2.10							
GLACIAL TILL: Compact to dense grey silty clay, trace sand and gravel		G	1			2	79.70
						3	78.70
3.20							
End of Test Pit							
Practical refusal to excavation @ 3.20m depth							
(Open hole WL @ 1.75m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %



Piezometer Construction

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Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Foley Lands
Ottawa, Ontario

DATUM TBM - Centreline of March Road, adjacent to the north property limit, assumed geodetic elevation = 82.00m.

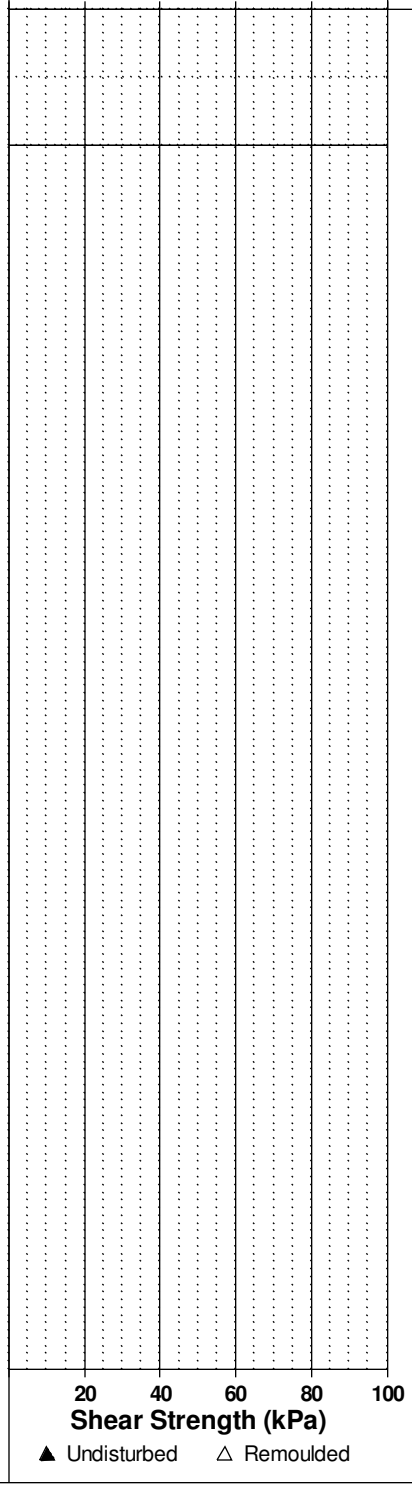
FILE NO. PG1716

REMARKS

HOLE NO. TP 2

BORINGS BY Rubber Tired Backhoe **DATE** July 9, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	83.10		
TOPSOIL		G	1						
0.40									
End of Test Pit Practical refusal to excavation @ 0.40m depth									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Foley Lands
Ottawa, Ontario

DATUM TBM - Centreline of March Road, adjacent to the north property limit, assumed geodetic elevation = 82.00m.

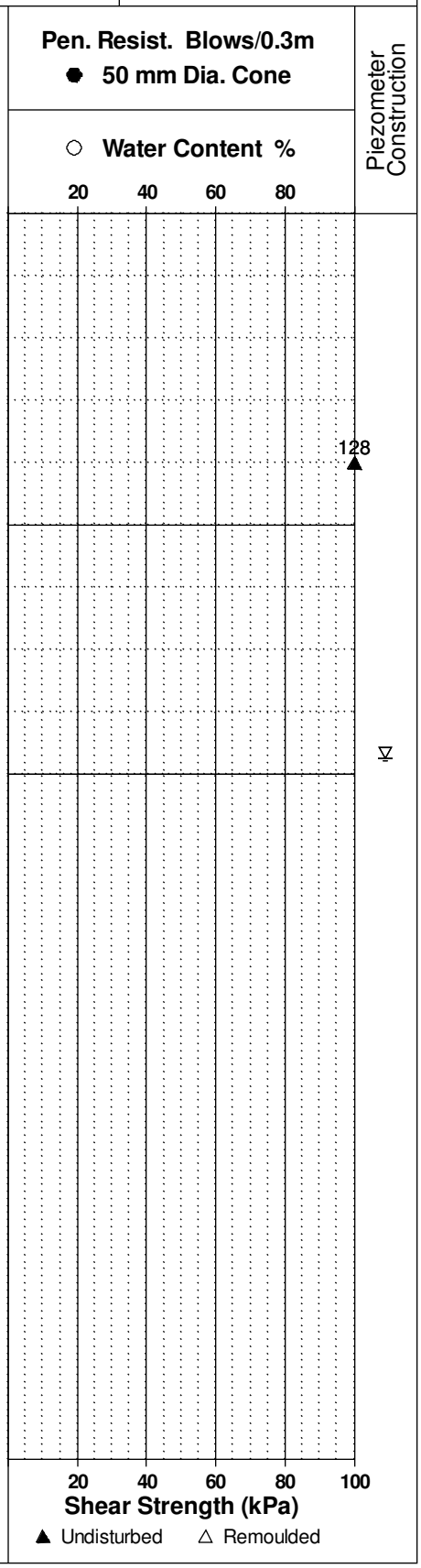
FILE NO. PG1716

REMARKS

HOLE NO. TP 3

BORINGS BY Rubber Tired Backhoe **DATE** July 9, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	83.80
TOPSOIL							
0.25							
Hard, brown **SILTY CLAY**		G	1				
1.10						1	82.80
GLACIAL TILL: Dense brown silty clay, trace gravel and cobbles		G	2				
1.80							
End of Test Pit Practical refusal to excavation on inferred bedrock surface @ 1.80m depth (Open hole WL @ 1.75m depth)							



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Foley Lands
Ottawa, Ontario

DATUM TBM - Centreline of March Road, adjacent to the north property limit, assumed geodetic elevation = 82.00m.

FILE NO. PG1716

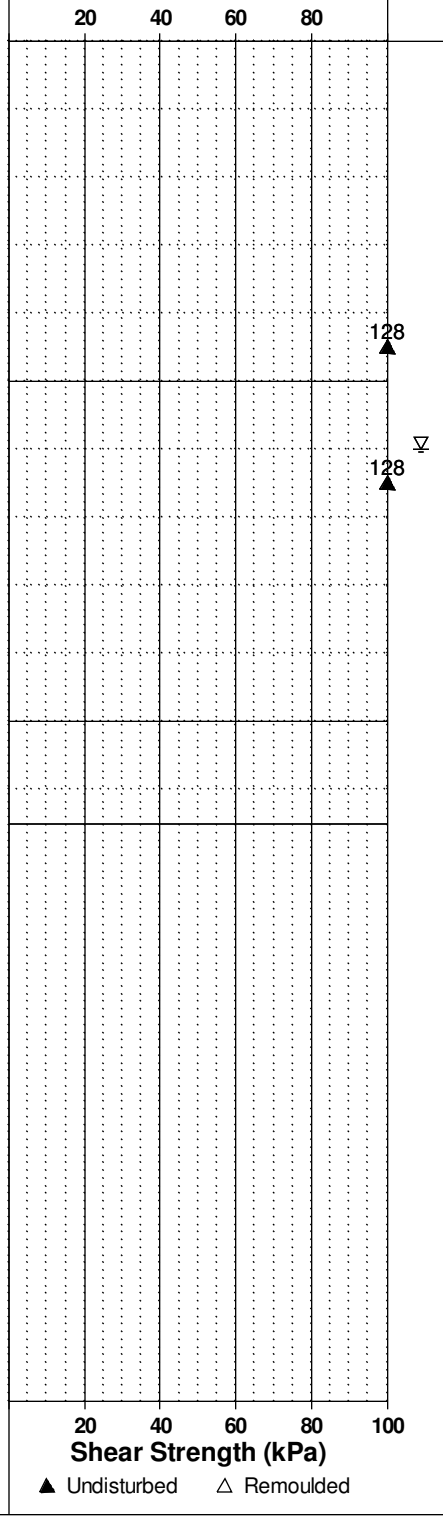
REMARKS

HOLE NO. TP 4

BORINGS BY Rubber Tired Backhoe **DATE** July 9, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	86.20
TOPSOIL							
0.30							
Hard, brown **SILTY CLAY**						1	85.20
1.55							
GLACIAL TILL: Brown-grey silty clay, some sand and cobbles		G	1			2	84.20
2.30							
End of Test Pit							
Practical refusal to excavation @ 2.30m depth							
(Open hole WL @ 1.2m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %



Piezometer Construction

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Foley Lands
Ottawa, Ontario

DATUM TBM - Centreline of March Road, adjacent to the north property limit, assumed geodetic elevation = 82.00m.

FILE NO. PG1716

REMARKS

HOLE NO. TP 5

BORINGS BY Rubber Tired Backhoe **DATE** July 9, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	86.80		
TOPSOIL									
0.23									
Very stiff, brown **SILTY CLAY**		G	1			1	85.80		▽
1.60									
GLACIAL TILL: Compact to dense grey-brown silty clay, some gravel and cobbles		G	2			2	84.80		
2.50									
End of Test Pit									
Practical refusal to excavation @ 2.50m depth									
(Open hole WL @ 1.1m depth)									

Pen. Resist. Blows/0.3m: 20 40 60 80

Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Foley Lands
Ottawa, Ontario

DATUM TBM - Centreline of March Road, adjacent to the north property limit, assumed geodetic elevation = 82.00m.

FILE NO. PG1716

REMARKS

HOLE NO. TP 6

BORINGS BY Rubber Tired Backhoe **DATE** July 9, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	90.70		
TOPSOIL 0.30									
End of Test Pit Practical refusal to excavation on bedrock surface @ 0.30m depth									

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Foley Lands
Ottawa, Ontario

DATUM TBM - Centreline of March Road, adjacent to the north property limit, assumed geodetic elevation = 82.00m.

FILE NO. PG1716

REMARKS

HOLE NO. TP 7

BORINGS BY Rubber Tired Backhoe **DATE** July 9, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	89.40		
TOPSOIL 0.15									
GLACIAL TILL: Silty sand with gravel, cobbles and boulders 0.54									
BEDROCK: Weathered limestone						1	88.40		
1.35 End of Test Pit									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Foley Lands
Ottawa, Ontario

DATUM TBM - Centreline of March Road, adjacent to the north property limit, assumed geodetic elevation = 82.00m.

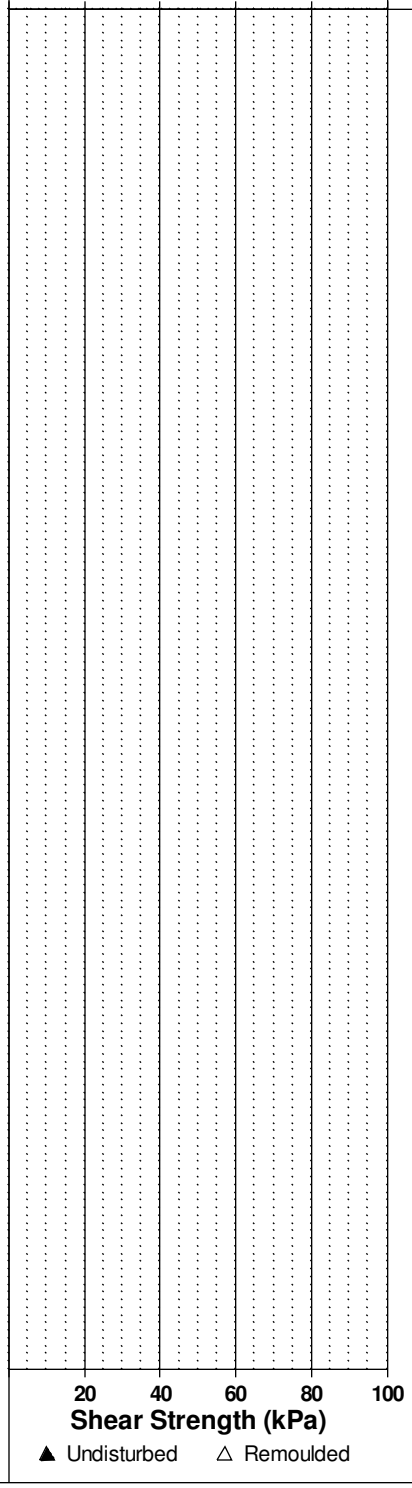
FILE NO. PG1716

REMARKS

HOLE NO. TP 8

BORINGS BY Rubber Tired Backhoe **DATE** July 9, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE									
Bedrock at surface						0	88.80		



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Foley Lands
Ottawa, Ontario

DATUM TBM - Centreline of March Road, adjacent to the north property limit, assumed geodetic elevation = 82.00m.

FILE NO. PG1716

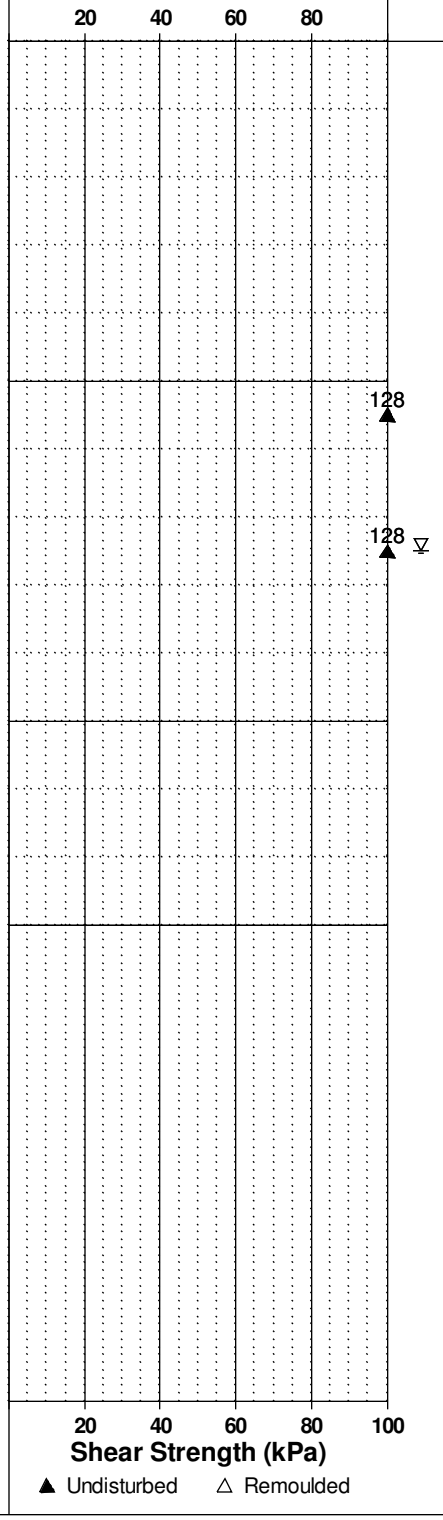
REMARKS

HOLE NO. TP 9

BORINGS BY Hydraulic Shovel **DATE** July 9, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	81.90
TOPSOIL							
0.30							
Very stiff, grey-brown **SILTY CLAY**		G	1			1	80.90
1.60							
GLACIAL TILL: Compact to dense brown-grey silty clay, trace gravel, cobbles and boulders						2	79.90
2.60		G	2				
End of Test Pit							
Practical refusal to excavation @ 2.60m depth							
(Open hole WL @ 1.5m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Foley Lands
Ottawa, Ontario

DATUM TBM - Centreline of March Road, adjacent to the north property limit, assumed geodetic elevation = 82.00m.

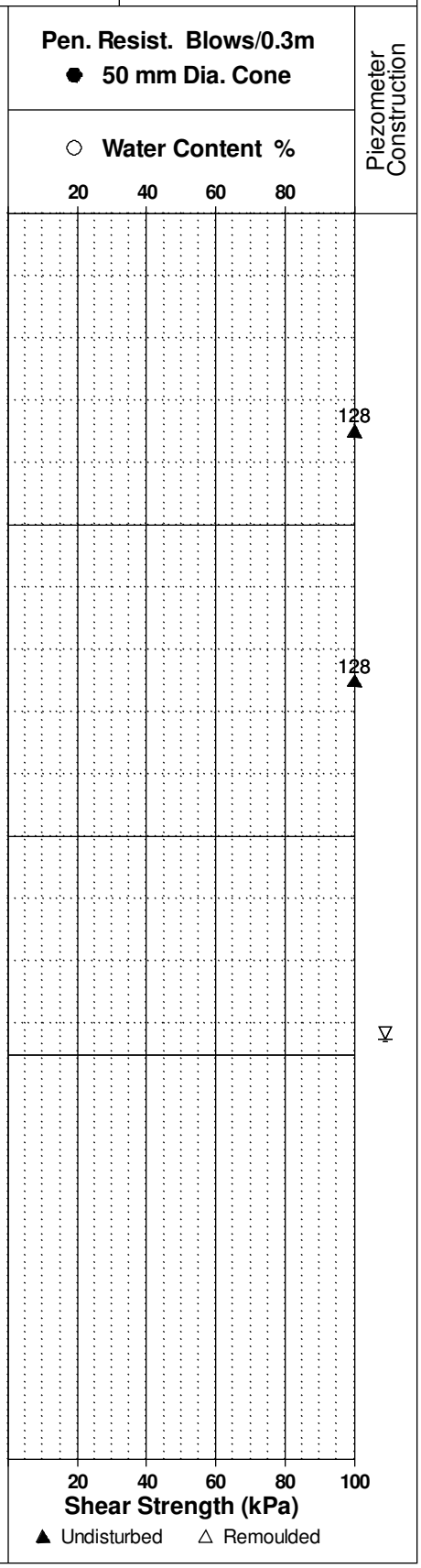
FILE NO. PG1716

REMARKS

HOLE NO. TP10

BORINGS BY Rubber Tired Backhoe **DATE** July 9, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	88.40		
TOPSOIL									
0.35									
Very stiff, brown **SILTY CLAY**						1	87.40		
1.60									
GLACIAL TILL: Brown-grey silty clay, some gravel and cobbles						2	86.40		
2.70									
End of Test Pit Practical refusal to excavation @ 2.70m depth (Open hole WL @ 2.65m depth)									



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Foley Lands
Ottawa, Ontario

DATUM TBM - Centreline of March Road, adjacent to the north property limit, assumed geodetic elevation = 82.00m.

FILE NO. PG1716

REMARKS

HOLE NO. TP11

BORINGS BY Rubber Tired Backhoe **DATE** July 9, 2008

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	89.50
TOPSOIL							
0.25							
Very stiff, brown **SILTY CLAY**						1	88.50
1.20							
GLACIAL TILL: Dense brown-grey silty clay, trace gravel and cobbles - boulders at 1.7m						2	87.50
2.00							
End of Test Pit Practical refusal to excavation @ 2.00m depth (TP dry upon completion)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

128

128

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

Piezometer Construction

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
927 March Road at Old Carp Rd.
Ottawa (Kanata), Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

FILE NO. PG1626

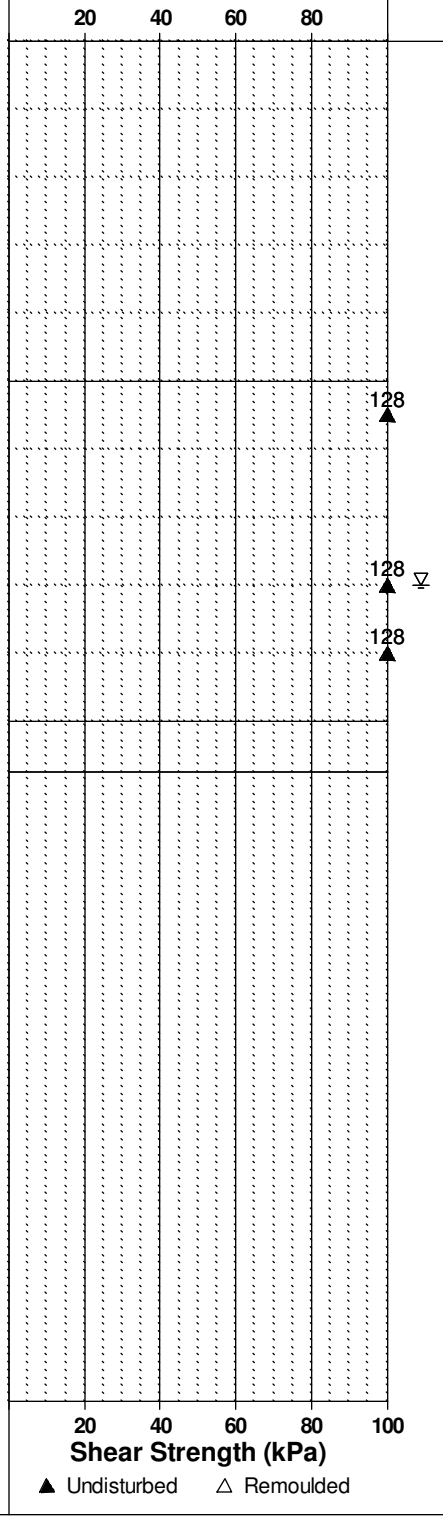
REMARKS

HOLE NO. TP 1

BORINGS BY Hydraulic Shovel **DATE** Feb 25, 08

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	81.47
TOPSOIL							
0.30							
Very stiff, brown **SILTY CLAY**		G	1			1	80.47
2.15						2	79.47
End of Test Pit TP terminated on bedrock surface @ 2.15m depth (Groundwater infiltration @ 1.6m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %



Piezometer Construction

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
927 March Road at Old Carp Rd.
Ottawa (Kanata), Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

FILE NO. PG1626

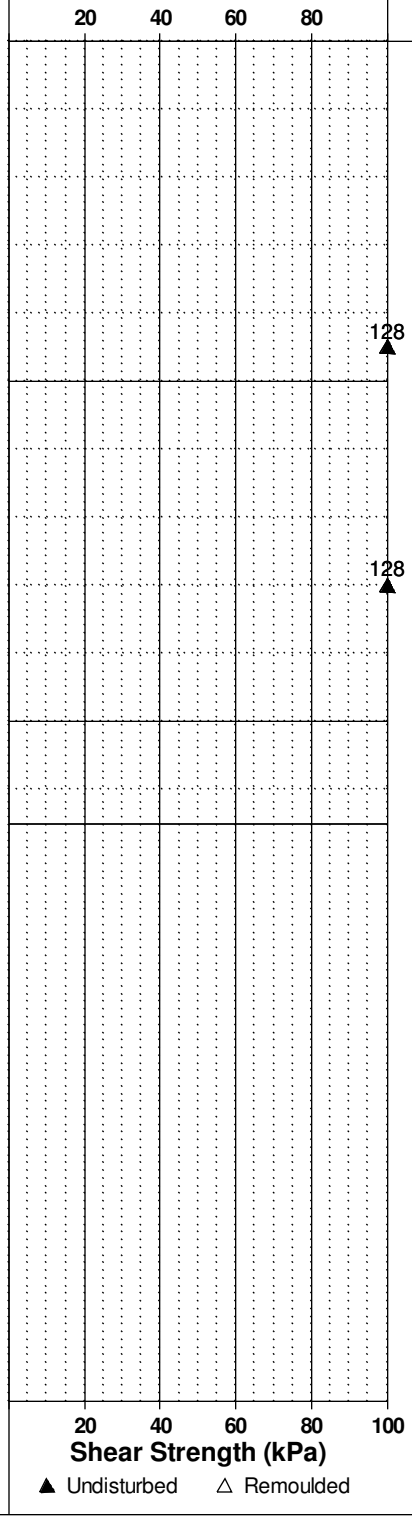
REMARKS

HOLE NO. TP 2

BORINGS BY Hydraulic Shovel **DATE** Feb 25, 08

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	83.13
TOPSOIL 0.25							
Very stiff, brown **SILTY CLAY**		G	1			1	82.13
1.80							
GLACIAL TILL: Brown silty sand with gravel, cobbles, boulders, trace clay		G	2			2	81.13
2.30							
End of Test Pit TP terminated on bedrock surface @ 2.30m depth (Groundwater infiltration @ 0.70m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %



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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
927 March Road at Old Carp Rd.
Ottawa (Kanata), Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

FILE NO. PG1626

REMARKS

HOLE NO. TP 3

BORINGS BY Hydraulic Shovel **DATE** Feb 25, 08

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
GROUND SURFACE						0	83.59		
TOPSOIL									
0.30									
Very stiff, brown **SILTY CLAY**									
0.70									
BEDROCK						1	82.59		
1.20									
End of Test Pit									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
927 March Road at Old Carp Rd.
Ottawa (Kanata), Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

FILE NO. PG1626

REMARKS

HOLE NO. TP 4

BORINGS BY Hydraulic Shovel **DATE** Feb 25, 08

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	83.80
TOPSOIL							
0.30							
Very stiff, brown **SILTY CLAY**		G	1			1	82.80
1.65							
GLACIAL TILL: Brown silty sand with gravel, cobbles and boulders		G	2			2	81.80
		G	3				
2.70							
End of Test Pit							
TP terminated on bedrock surface @ 2.70m depth							
(Groundwater infiltration @ 1.0m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

128

128

▽

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

Piezometer Construction

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SOIL PROFILE AND TEST DATA

Preliminary Geotechnical Investigation
927 March Road at Old Carp Rd.
Ottawa (Kanata), Ontario

DATUM Ground surface elevations provided by Novatech Engineering Consultants Ltd.

FILE NO. PG1626

REMARKS

HOLE NO. TP 5

BORINGS BY Hydraulic Shovel **DATE** Feb 25, 08

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	81.55
TOPSOIL 0.25							
Very stiff, brown **SILTY CLAY**		G	1			1	80.55
		G	2			2	79.55
2.80 **GLACIAL TILL**: Brown silty sand with clay, gravel, cobbles and boulders		G	3			3	78.55
3.10 End of Test Pit TP terminated on bedrock surface @ 3.10m depth (Groundwater infiltration @ 1.6m depth)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

128
128
128
128
128

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

Piezometer Construction

TABLE II

PRELIMINARY RECORD OF TEST PITS
PROPOSED RESIDENTIAL DEVELOPMENT
1020 MARCH ROAD, KANATA
CITY OF OTTAWA, ONTARIO

TEST PIT NUMBER	DEPTH (METRES)	DESCRIPTION
TP1 Elev. 81.35m	0.00 – 0.23	TOPSOIL
	0.23 – 3.66	Very stiff to stiff grey brown, becoming grey with depth SILTY CLAY
	3.66 – 3.76	Grey brown coarse sand, some silt, clay, gravel and cobbles (GLACIAL TILL)
	3.76	End of test pit

Depth (m)	Undrained Shear Strength, Cu (kPa)
1.5	>100

Groundwater seepage into test pit observed at about 3.0 metres below existing ground surface, December 10, 2012.

TP2 Elev. 79.06m	0.00 – 0.30	TOPSOIL
	0.30 – 3.51	Very stiff to stiff grey brown, becoming grey with depth SILTY CLAY
	3.51	End of test pit, refusal on large boulder or possible bedrock

Depth (m)	Undrained Shear Strength, Cu (kPa)
1.2	>100
2.4	60

Groundwater seepage into test pit observed at about 1.5 metres below existing ground surface, December 10, 2012.

TABLE II (continued)

TEST PIT NUMBER	DEPTH (METRES)	DESCRIPTION
TP3 Elev. 78.49m	0.00 – 0.23	TOPSOIL
	0.23 – 0.69	Grey brown SILTY SAND
	0.69 – 1.14	Grey medium to coarse SAND, trace silt
	1.14 – 4.27	Very stiff to stiff SILTY CLAY
	4.27 – 4.42	Grey brown coarse sand, some silt, clay, gravel and cobbles (GLACIAL TILL)
	4.42	End of test pit

Depth (m)	Undrained Shear Strength, Cu (kPa)
2.4	84
3.4	56

Groundwater seepage into test pit observed at about 1.5 metres below existing ground surface, December 10, 2012.

TP4 Elev. 79.62m	0.00 – 0.30	TOPSOIL
	0.30 – 1.45	Yellow brown becoming grey brown at 0.7 metres depth SILTY SAND
	1.45 – 4.11	Very stiff to stiff grey brown, becoming grey at about 3.0 metres depth SILTY CLAY
	4.11	End of test pit

Groundwater seepage into test pit observed at about 4.1 metres below existing ground surface, December 10, 2012.

TABLE II (continued)

TEST HOLE NUMBER	DEPTH (METRES)	DESCRIPTION
TP5 Elev. 79.42m	0.00 – 0.48	TOPSOIL
	0.48 – 2.92	Very stiff to stiff grey brown, becoming grey at about 1.1 metres depth SILTY CLAY
	2.92	End of test pit, refusal on large boulder or possible bedrock

Groundwater seepage into test pit observed at about 2.7 metres below existing ground surface, December 10, 2012.

TP6 Elev. 78.40m	0.00 – 0.30	TOPSOIL
	0.30 – 4.00	Very stiff to stiff grey brown, becoming grey with depth SILTY CLAY
	4.00	End of test pit, refusal on large boulder or possible bedrock

Depth (m)	Undrained Shear Strength, Cu (kPa)
1.4	>100
2.0	60
3.0	50
4.0	50

Groundwater seepage into test pit observed at about 1.5 metres below existing ground surface, December 10, 2012.

TABLE II (continued)

TEST HOLE NUMBER	DEPTH (METRES)	DESCRIPTION
TP7 Elev. 79.41m	0.00 – 0.30	TOPSOIL
	0.30 – 1.40	Yellow brown medium to coarse SAND, trace silt
	1.40 – 4.00	Very stiff to stiff grey brown, becoming grey with depth SILTY CLAY
	4.00	End of test pit

Depth (m)	Undrained Shear Strength, Cu (kPa)
1.6	>100
3.0	60
4.0	50

Groundwater seepage into test pit observed at about 4.0 metres below existing ground surface, December 10, 2012.

TP8 Elev. 79.41m	0.00 – 0.30	TOPSOIL
	0.30 – 1.60	Yellow brown to grey brown medium to coarse SAND, trace silt
	1.60 – 4.00	Very stiff to stiff grey brown, becoming grey with depth SILTY CLAY
	4.00	End of test pit

Depth (m)	Undrained Shear Strength, Cu (kPa)
3.0	>100
4.0	>100

No groundwater seepage observed in test pit, December 10, 2012.

TABLE II (continued)

TEST HOLE NUMBER	DEPTH (METRES)	DESCRIPTION
TP9 Elev. 79.59m	0.00 – 0.30	TOPSOIL
	0.30 – 1.60	Yellow brown to grey brown medium to coarse SAND, trace silt
	1.60 – 4.00	Very stiff to stiff grey brown, becoming grey with depth SILTY CLAY
	4.00	End of test pit

No groundwater seepage observed in test pit, December 10, 2012.

TP10 Elev. 79.21m	0.00 – 0.30	TOPSOIL
	0.30 – 1.40	Yellow brown medium to coarse SAND, trace silt
	1.40 – 4.00	Very stiff to stiff grey brown, becoming grey with depth SILTY CLAY
	4.00	End of test pit

Groundwater seepage into test pit observed at about 4.0 metres below existing ground surface, December 10, 2012.

TABLE II (continued)

TEST HOLE NUMBER	DEPTH (METRES)	DESCRIPTION
TP11 Elev. 78.57m	0.00 – 0.30	TOPSOIL
	0.30 – 3.60	Very stiff to stiff grey brown, becoming grey with depth SILTY CLAY
	3.60 – 3.90	Grey brown coarse sand, some silt, clay, gravel and cobbles (GLACIAL TILL)
	3.90	End of test pit

Depth (m)	Undrained Shear Strength, Cu (kPa)
0.8	>100
1.5	80
2.0	70
3.0	80

Groundwater seepage observed in test pit at about 0.8 metres below existing ground surface, December 10, 2012.

TP12 Elev. 80.02m	0.00 – 0.30	TOPSOIL
	0.30 – 3.80	Very stiff to stiff grey brown, becoming grey with depth SILTY CLAY
	3.80 – 4.00	Grey brown coarse sand, some silt, clay, gravel and cobbles (GLACIAL TILL)
	4.00	End of test pit

Depth (m)	Undrained Shear Strength, Cu (kPa)
1.0	>100
3.0	80

Groundwater seepage observed in test pit at about 3.4 metres below existing ground surface, December 10, 2012.

TABLE II (continued)

TEST HOLE NUMBER	DEPTH (METRES)	DESCRIPTION
TP13 Elev. 72.12m	0.00 – 0.20	TOPSOIL
	0.20	End of test pit, refusal on large boulder or possible bedrock

No groundwater seepage observed in test pit, December 10, 2012.

TP14 Elev. 70.57m	0.00 – 0.30	TOPSOIL
	0.30 – 1.20	Grey brown SILTY SAND
	1.20 – 2.00	Very stiff to stiff grey brown, becoming grey with depth SILTY CLAY
	2.00	End of test pit, refusal on large boulder or possible bedrock

Depth (m)	Undrained Shear Strength, Cu (kPa)
1.8	80

Groundwater seepage observed in test pit at about 1.8 metres below existing ground surface, December 10, 2012.

TABLE II (continued)

TEST HOLE NUMBER	DEPTH (METRES)	DESCRIPTION
TP15 Elev. 70.32m	0.00 – 0.30	TOPSOIL
	0.30 – 1.40	Grey brown SILTY SAND
	1.40 – 3.90	Very stiff to firm grey brown, becoming grey with depth SILTY CLAY
	3.90	End of test pit, refusal on large boulder or possible bedrock

Depth (m)	Undrained Shear Strength, Cu (kPa)
1.6	80
2.0	60
3.0	52
3.6	40

Groundwater seepage observed in test pit at about 3.9 metres below existing ground surface, December 10, 2012.

TP16 Elev. 70.73m	0.00 – 0.30	TOPSOIL
	0.30 – 1.00	Grey brown medium SAND
	1.00 – 2.10	Very stiff to firm grey brown, becoming grey with depth SILTY CLAY
	2.10	End of test pit, refusal on large boulder or possible bedrock

Depth (m)	Undrained Shear Strength, Cu (kPa)
1.5	>100
1.8	50
2.0	40

Groundwater seepage observed in test pit at about 1.2 metres below existing ground surface, December 10, 2012.

TABLE II (continued)

TEST HOLE NUMBER	DEPTH (METRES)	DESCRIPTION
TP17 Elev. 70.77m	0.00 – 0.30	TOPSOIL
	0.30 – 1.00	Grey brown medium SAND
	1.00 – 2.10	Very stiff to firm grey brown, becoming grey with depth SILTY CLAY
	2.10	End of test pit, refusal on large boulder or possible bedrock

Groundwater seepage observed in test pit at about 1.2 metres below existing ground surface, December 10, 2012.

TP18 Elev. 70.96m	0.00 – 0.30	TOPSOIL
	0.30 – 0.60	Grey brown fine to medium SAND
	0.60 – 2.60	Very stiff to firm grey brown, becoming grey with depth SILTY CLAY
	2.60	End of test pit, refusal on large boulder or possible bedrock

Depth (m)	Undrained Shear Strength, Cu (kPa)
1.2	>100
1.8	50
2.4	38

Groundwater seepage observed in test pit at about 2.0 metres below existing ground surface, December 10, 2012.

TABLE II (continued)

TEST HOLE NUMBER	DEPTH (METRES)	DESCRIPTION
TP19 Elev. 70.36m	0.00 – 0.30	TOPSOIL
	0.30 – 1.20	Grey brown SILTY SAND
	1.20	End of test pit, refusal on large boulder or possible bedrock

No groundwater seepage observed in test pit, December 10, 2012.

TP20 Elev. 70.03m	0.00 – 0.30	TOPSOIL
	0.30 – 0.70	Grey brown SILTY SAND
	0.70 – 2.40	Very stiff to stiff grey brown, becoming grey with depth SILTY CLAY
	2.40	End of test pit, refusal on large boulder or possible bedrock

Depth (m)	Undrained Shear Strength, Cu (kPa)
1.4	>100
1.8	80
2.2	50

No groundwater seepage observed in test pit, December 10, 2012.

TABLE II (continued)

TEST HOLE NUMBER	DEPTH (METRES)	DESCRIPTION
TP21 Elev. 70.09m	0.00 – 0.30	TOPSOIL
	0.30 – 1.10	Grey brown medium SAND
	1.10 – 3.30	Very stiff to firm grey brown, becoming grey with depth SILTY CLAY
	3.30	End of test pit, refusal on large boulder or possible bedrock

Depth (m)	Undrained Shear Strength, Cu (kPa)
1.5	>100
2.6	70
2.8	52
3.1	30

No groundwater seepage observed in test pit, December 10, 2012.

SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the strength of cohesionless soils is the relative density, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm.

Relative Density	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their “sensitivity”. The sensitivity is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NXL size core. However, it can be used on smaller core sizes, such as BX, if the bulk of the fractures caused by drilling stresses (called “mechanical breaks”) are easily distinguishable from the normal in situ fractures.

RQD %	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC%	-	Natural moisture content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic limit, % (water content above which soil behaves plastically)
PI	-	Plasticity index, % (difference between LL and PL)
Dxx	-	Grain size which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D30)^2$ / (D10 x D60)
Cu	-	Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:
Well-graded gravels have: $1 < Cc < 3$ and $Cu > 4$
Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$
Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.
Cc and Cu are not applicable for the description of soils with more than 10% silt and clay
(more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

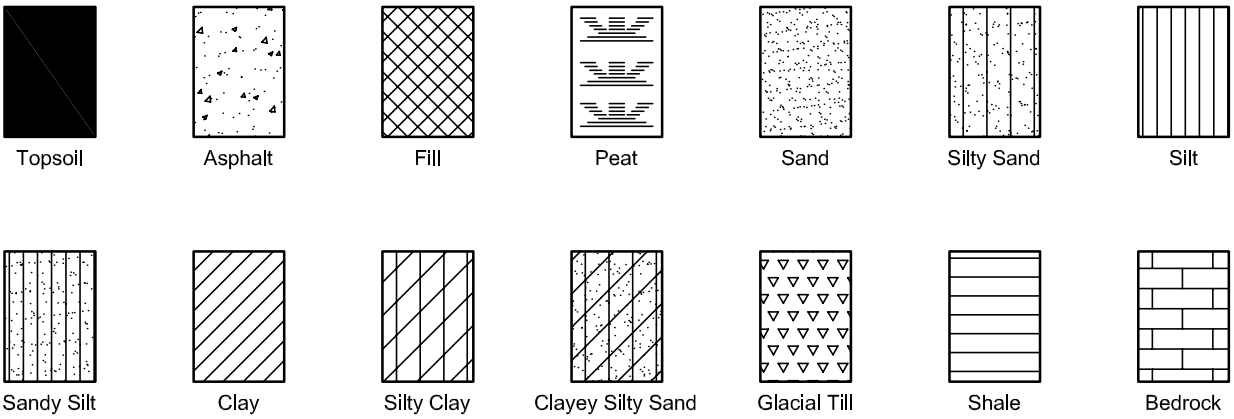
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

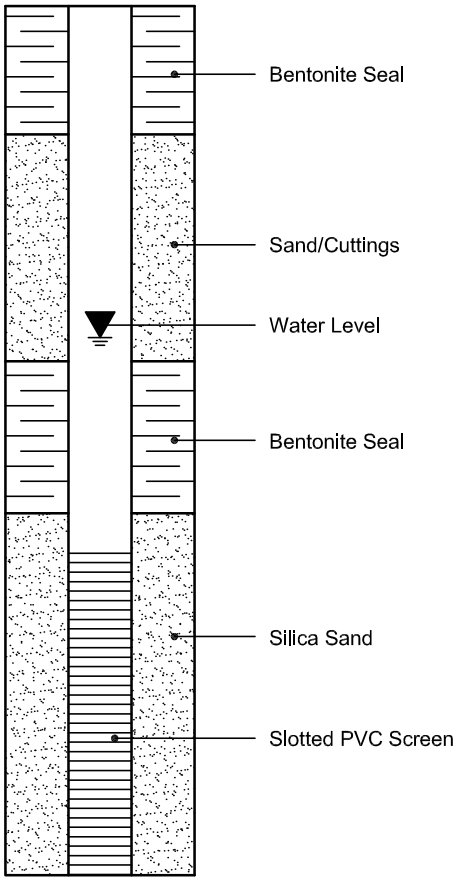
SYMBOLS AND TERMS (continued)

STRATA PLOT

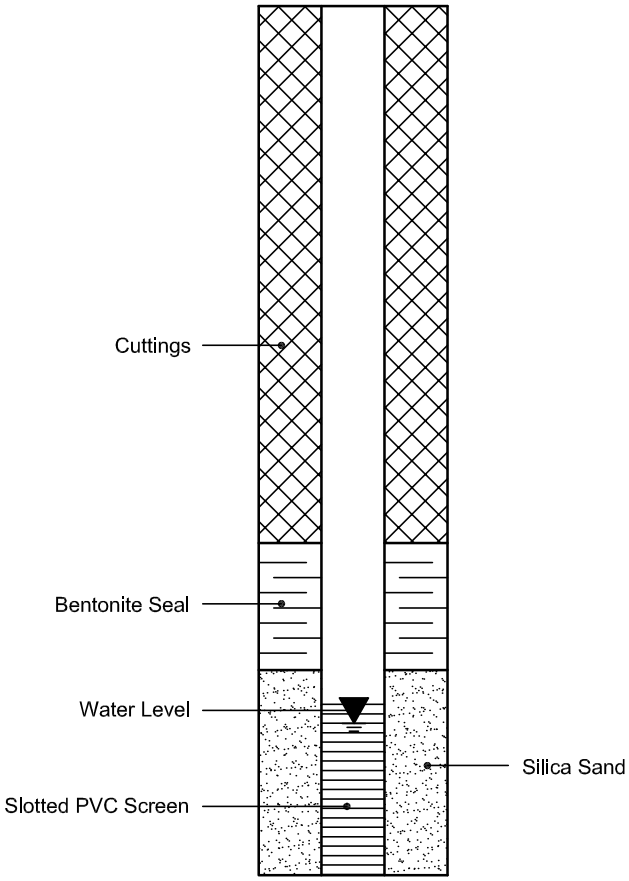


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



PARACEL LABORATORIES LTD.

Order #: 0828132

Certificate of Analysis

Report Date: 15-Jul-2008
Order Date:10-Jul-2008

Client: **Paterson Group Consulting Engineers**

Client PO: 6979

Project Description: PG1716

	Client ID:	TP5-G1	-	-	-
	Sample Date:	09-Jul-08	-	-	-
	Sample ID:	0828132-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	69.7	-	-	-
General Inorganics					
pH	0.05 pH Units	7.89	-	-	-
Resistivity	0.10 Ohm.m	112	-	-	-
Anions					
Chloride	5 ug/g dry	9	-	-	-
Sulphate	5 ug/g dry	174	-	-	-

Certificate of Analysis

Report Date: 13-Dec-2010

Client: **Paterson Group Consulting Engineers**

Order Date:7-Dec-2010

Client PO: 10364

Project Description: PG2256

	Client ID:	TP6 G2	-	-	-
	Sample Date:	04-Nov-10	-	-	-
	Sample ID:	1050073-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	72.1	-	-	-
General Inorganics					
pH	0.05 pH Units	7.23	-	-	-
Resistivity	0.10 Ohm.m	139	-	-	-
Anions					
Chloride	5 ug/g dry	22	-	-	-
Sulphate	5 ug/g dry	26	-	-	-

Certificate of Analysis

Report Date: 27-Mar-2013
Order Date:22-Mar-2013

Client: **Paterson Group Consulting Engineers**
Client PO: 13814

Project Description: PG2878

	Client ID:	TP13-G2	TP30-G1	-	-
	Sample Date:	20-Mar-13	21-Mar-13	-	-
	Sample ID:	1312271-01	1312271-02	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	64.6	62.4	-	-
General Inorganics					
pH	0.05 pH Units	7.41	7.18	-	-
Resistivity	0.10 Ohm.m	72.5	67.2	-	-
Anions					
Chloride	5 ug/g dry	9	<5	-	-
Sulphate	5 ug/g dry	52	75	-	-

APPENDIX 2

FIGURE 1 - KEY PLAN

DRAWING PG2878-1 - TEST HOLE LOCATION PLAN

DRAWING PG2878-2 - PERMISSIBLE GRADE RAISE AREAS - HOUSING

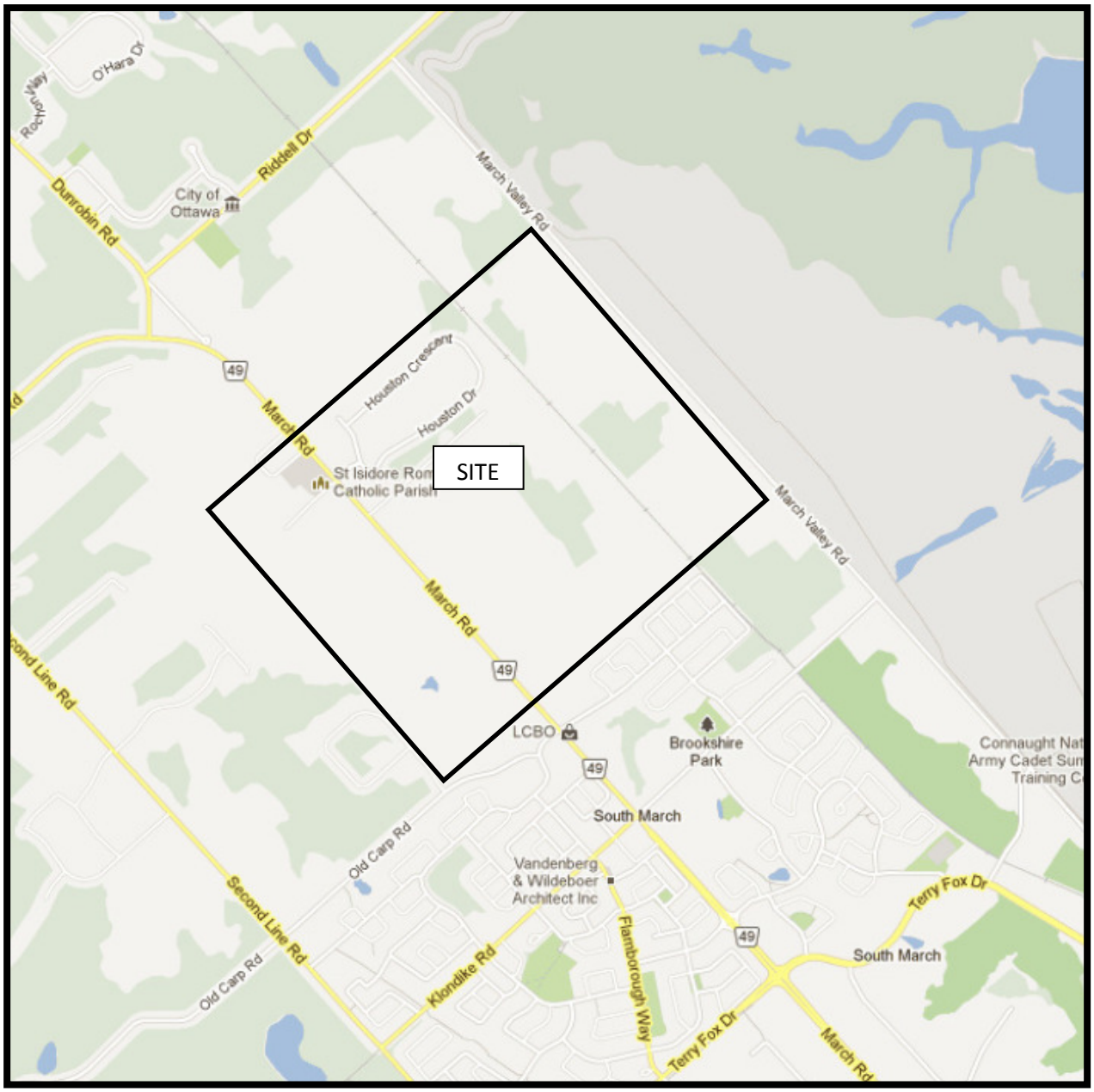
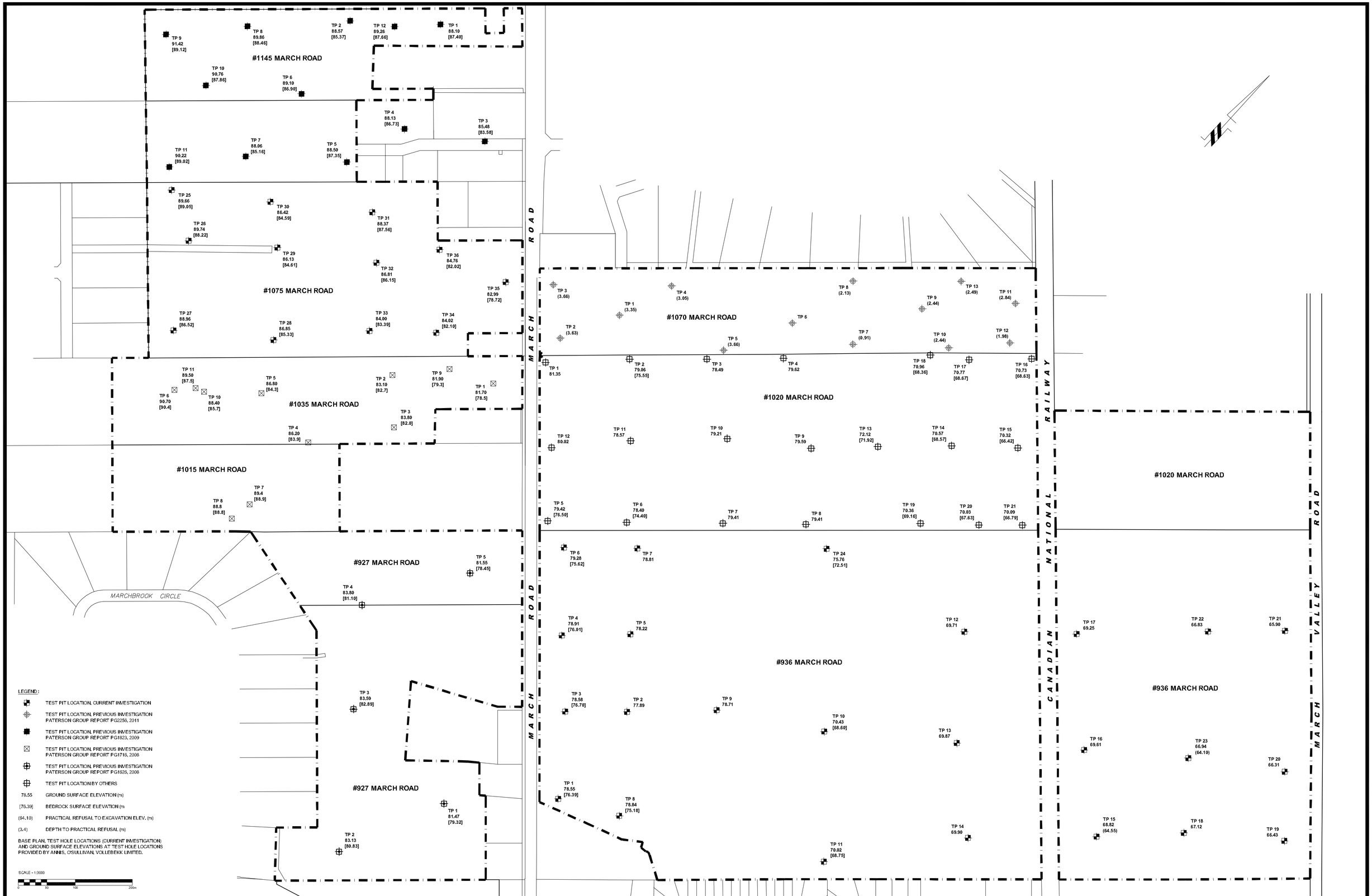


FIGURE 1

KEY PLAN



LEGEND:

- TEST PIT LOCATION, CURRENT INVESTIGATION
- TEST PIT LOCATION, PREVIOUS INVESTIGATION PATERSON GROUP REPORT PG2256, 2011
- TEST PIT LOCATION, PREVIOUS INVESTIGATION PATERSON GROUP REPORT PG1823, 2009
- TEST PIT LOCATION, PREVIOUS INVESTIGATION PATERSON GROUP REPORT PG1716, 2008
- TEST PIT LOCATION, PREVIOUS INVESTIGATION PATERSON GROUP REPORT PG1626, 2008
- TEST PIT LOCATION BY OTHERS

78.55 GROUND SURFACE ELEVATION (m)

[76.39] BEDROCK SURFACE ELEVATION (m

(64.10) PRACTICAL REFUSAL TO EXCAVATION ELEV. (m)

(3.4) DEPTH TO PRACTICAL REFUSAL (m)

BASE PLAN, TEST HOLE LOCATIONS (CURRENT INVESTIGATION) AND GROUND SURFACE ELEVATIONS AT TEST HOLE LOCATIONS PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED.

SCALE - 1:3000

0 50 100 200m

NO.	REVISIONS	DATE	INITIAL

patersongroup
consulting engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SCALE:	1:3000
DESIGN:	SB
DRAWN:	MPG
CHECKED:	DG
DATE:	04/2013

CONSOLIDATED PRELIMINARY GEOTECHNICAL INVESTIGATION
KANATA NORTH URBAN EXPANSION AREA
COMMUNITY DEVELOPMENT PLAN - MARCH ROAD
OTTAWA, ONTARIO

DWG. NO. PG2878-1

NOVATECH ENGINEERING CONSULTANTS LTD.

TEST HOLE LOCATION PLAN

A1

#1145 MARCH ROAD

TP 9 91.42 [89.12]
TP 8 89.86 [88.46]
TP 2 88.57 [85.37]
TP 12 89.26 [87.66]
TP 1 88.10 [87.40]
TP 10 90.76 [87.86]
TP 6 89.10 [86.90]
TP 4 88.13 [86.73]
TP 3 85.48 [83.58]
TP 7 88.06 [85.16]
TP 5 88.50 [87.35]
TP 11 90.22 [89.02]

#1075 MARCH ROAD

TP 25 89.66 [89.05]
TP 30 86.42 [84.59]
TP 31 88.37 [87.56]
TP 26 89.74 [88.22]
TP 29 86.13 [84.61]
TP 36 84.76 [82.02]
TP 32 86.81 [86.15]
TP 35 82.99 [78.72]
TP 27 88.96 [86.52]
TP 28 86.85 [85.33]
TP 33 84.00 [83.39]
TP 34 84.02 [82.10]

#1035 MARCH ROAD

TP 11 89.50 [87.5]
TP 5 86.80 [84.3]
TP 2 83.10 [82.7]
TP 9 81.90 [79.3]
TP 6 90.70 [90.4]
TP 10 88.40 [85.7]
TP 1 81.70 [78.5]
TP 3 83.80 [82.0]
TP 4 86.20 [83.9]

#1015 MARCH ROAD

TP 7 89.4 [88.9]
TP 8 88.8 [88.8]

#927 MARCH ROAD

TP 5 81.55 [78.45]
TP 4 83.80 [81.10]
MARCHBROOK CIRCLE
TP 3 83.59 [82.89]
TP 1 81.47 [79.32]
TP 2 83.13 [80.83]

MARCH ROAD

#1070 MARCH ROAD

TP 3 (3.66)
TP 4 (3.05)
TP 8 (2.13)
TP 13 (2.49)
TP 11 (2.84)
TP 1 (3.35)
TP 9 (2.44)
TP 6
TP 2 (3.63)
TP 7 (0.91)
TP 5 (3.66)
TP 10 (2.44)
TP 12 (1.98)
TP 1 81.35
TP 2 79.06 [75.55]
TP 3 78.49
TP 4 79.62
TP 18 70.96 [68.36]
TP 17 70.77 [68.67]
TP 16 70.73 [68.63]

#1020 MARCH ROAD

TP 12 80.02
TP 11 78.57
TP 10 79.21
TP 9 79.59
TP 13 72.12 [71.92]
TP 14 70.57 [68.57]
TP 15 70.32 [66.42]
TP 5 79.42 [76.50]
TP 6 76.40 [74.40]
TP 7 79.41
TP 8 79.41
TP 19 70.36 [69.16]
TP 20 70.03 [67.83]
TP 21 70.09 [66.79]

#936 MARCH ROAD

TP 6 79.28 [75.62]
TP 7 78.81
TP 24 75.76 [72.51]
TP 4 78.91 [76.91]
TP 5 76.22
TP 12 69.71
TP 3 78.58 [76.70]
TP 2 77.89
TP 9 78.71
TP 10 70.43 [68.60]
TP 13 69.87
TP 1 78.55 [76.39]
TP 8 78.84 [75.18]
TP 14 69.90
TP 11 70.02 [68.75]

RAILWAY

CANADIAN NATIONAL

#1020 MARCH ROAD

TP 17 69.25
TP 22 66.83
TP 21 65.90

#936 MARCH ROAD

TP 16 69.61
TP 23 66.94 [64.10]
TP 20 66.31
TP 15 68.82 [64.55]
TP 18 67.12
TP 19 66.43

MARCH VALLEY ROAD

PERMISSIBLE GRADE RAISE:

UP TO 2m

LEGEND:

- TEST PIT LOCATION, CURRENT INVESTIGATION
- TEST PIT LOCATION, PREVIOUS INVESTIGATION PATERSON GROUP REPORT PG2256, 2011
- TEST PIT LOCATION, PREVIOUS INVESTIGATION PATERSON GROUP REPORT PG1823, 2009
- TEST PIT LOCATION, PREVIOUS INVESTIGATION PATERSON GROUP REPORT PG1716, 2008
- TEST PIT LOCATION, PREVIOUS INVESTIGATION PATERSON GROUP REPORT PG1626, 2008
- TEST PIT LOCATION BY OTHERS
- 78.55 GROUND SURFACE ELEVATION (m)
- [76.39] BEDROCK SURFACE ELEVATION (m
- (64.10) PRACTICAL REFUSAL TO EXCAVATION ELEV. (m)
- (3.4) DEPTH TO PRACTICAL REFUSAL (m)

BASE PLAN, TEST HOLE LOCATIONS (CURRENT INVESTIGATION) AND GROUND SURFACE ELEVATIONS AT TEST HOLE LOCATIONS PROVIDED BY ANNIS, OSULLIVAN, VOLLEBEKK LIMITED.

SCALE - 1:3000

0 50 100 200m

NO.	REVISIONS	DATE	INITIAL

paterson group
consulting engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SCALE: 1:3000
DESIGN: SB
DRAWN: MPG
CHECKED: DG
DATE: 04/2013

CONSOLIDATED PRELIMINARY GEOTECHNICAL INVESTIGATION
KANATA NORTH URBAN EXPANSION AREA
COMMUNITY DEVELOPMENT PLAN - MARCH ROAD
OTTAWA, ONTARIO

DWG. NO. PG2878-2

NOVATECH ENGINEERING CONSULTANTS LTD.

PERMISSIBLE GRADE RAISE PLAN - HOUSING

A1