

**REPORT ON
GEOTECHNICAL INVESTIGATION
PROPOSED DWELL CITY TOWNS
2 HOLIDAY DRIVE
TORONTO, ONTARIO**

**Prepared for:
MENKES DEVELOPMENTS LTD.**

**By:
SPL CONSULTANTS LIMITED**

Project: 1934-110 Rev. 1
December 10, 2013



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PROJECT	Dwell
X-REF	

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BOREHOLE LOGS BY JACQUES WHITEFORD LIMITED

1. INTRODUCTION

SPL Consultants Limited (SPL) was retained by Menkes Developments Limited (Menkes) to undertake a geotechnical investigation for the proposed Dwell City Towns development located at 2 Holiday Drive in Toronto, Ontario.

It is understood that the proposed development will consist of blocks of three storey brick town houses with roof terrace and one level of basement (B1) or up to two levels of parking garage (P2). Finished B1 basement level floor will be at about Elev. 141.0 m. Finished P2 parking garage will be at about Elev. 138.1 m.

Previously, a preliminary geotechnical investigation was carried out at the subject site by Jacques Whiteford Limited in November 2006. The geotechnical borehole logs from this report are attached in **Appendix A**.

The purpose of this geotechnical investigation is to determine the subsurface conditions at the borehole locations and from the findings in the boreholes make engineering recommendations for the following:

1. Foundations
2. Floor slabs and permanent drainage
3. Excavations and Dewatering
4. Temporary shoring
5. Earth pressures
6. Earthquake considerations

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

The site investigation and recommendations follow generally accepted practice for geotechnical consultants in Ontario. The format and contents are guided by client specific needs and economics and do not conform to generalized standards for services. Laboratory testing for most part follows ASTM or CSA Standards or modifications of these standards that have become standard practice.

This report has been prepared for Menkes and its architect and designers. Third party use of this report without SPL consent is prohibited.

2. FIELD AND LABORATORY WORK

A total of eight (8) boreholes (BH13-1 to BH13-8) were drilled at the subject site between November 14 and November 15, 2013, see **Drawing 1** for location plan. Boreholes were drilled to depths ranging from 8.2 to 18.3 m.

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

As well as visual examination in the laboratory, all soil samples were tested for moisture contents. Grain size analyses of selected three samples were conducted and results are presented in **Drawing 10**. Three samples were subjected to Atterberg limits and results are presented on the respective borehole logs.

Three 50 mm diameter monitoring wells were installed at boreholes BH13-1, BH13-3 and BH13-6 to monitor long-term (stabilized) groundwater levels.

The surface elevations at the borehole locations were referenced to a geodetic datum and were surveyed by SPL.

3. SITE AND SUBSURFACE CONDITIONS

The area under assessment is an irregular-shaped parcel of land with an area of approximately 2.2 hectares (5.4 acres) located at 2 Holiday Drive, north of Holiday Drive, immediately west of Highway 427 in Etobicoke, Ontario. The area is covered with demolition debris, construction rubble, some paved and grass and earth covered areas. It is understood that the area was previously occupied by Ramada Hotel Toronto Airport with several one to six storey buildings.

Based on visual observation the site is generally flat and at grade with neighboring properties and roadways. A maximum grade difference of approximately 0.8m was recorded between boreholes during the ground surface elevation survey.

The borehole location plan is shown in **Drawing 1**. The subsurface conditions at the borehole locations are presented in the individual borehole logs presented in **Drawings 2 to 9** and are summarized in the following paragraphs.

3.1 Soil Conditions

Pavement: The pavement structure consisted of 125 mm of asphalt overlying 300 mm of granular base (sand and gravel, trace clay, trace silt) encountered at the borehole BH13-1.

Concrete: The 125 mm thick concrete slab was encountered at the borehole BH13-4.

Topsoil and Fill Material:

Fill material was found in all the boreholes to depths varying from ground level to up to 4.5 m below the existing grades. The fill material was heterogeneous and consisted of very loose to compact sand, sand and gravel, gravelly sand and stiff to firm clayey silt and silty clay. Trace to some gravel, some sand, trace to some organics, trace to some brick, trace construction debris, seams and pockets of silty clay, pockets of sandy silt were observed in fill material.

Clayey Silt Till to Silty Clay Till:

Underneath the fill material, upper native soil consisting of clayey silt to silty clay till was found in all the boreholes except BH13-3, extending to depths ranging from 1.8 m to 9.1 m below existing grades. The till was present in very stiff to hard consistency with measured SPT 'N' values ranging from 16 to more than 50 blows per 0.3 m of penetration. Some sand to sandy, sand seams, silt seams, trace gravel, some oxidation, pockets of silty clay and shale fragments were observed in the till deposits.

Silty Sand Till to Sandy Silt Till:

Underneath the fill material, upper native soil consisting of silty sand to sandy silt till was found in all the boreholes extending to depths ranging from 3.0 m to 10.2 m below existing grades. The till was present in compact to very dense consistency with measured SPT 'N' values ranging from 23 to more than 50 blows per 0.3 m of penetration. Some clay to clayey, trace to some gravel, some oxidation, sand seams, silt seams, shale fragments, pockets of silty clay were observed in the till deposits.

Grain size analyses of one sample of silty sand till (BH13-2/SS5) was conducted and the results are presented in **Drawing 10**, with the following fractions:

Clay: 6%
Silt: 44%
Sand: 37%
Gravel: 13%

Fractions are also shown on the borehole logs.

Atterberg limits test of one sample (BH13-2/SS5) was conducted. The results are shown on the borehole logs and are summarized as follows:

Liquid limit (W_L): 22
Plastic limit (W_P): 17
Plasticity index (PI): 5.3

The soil is classified as silty sand till.

Sandy Silt to Silty Sand:

At the lower portion of the boreholes BH13-1, 13-2, 13-3, 13-5 and 13-6 native soil consisting of sandy silt and silty sand was found extending to depths ranging from 5.6 m to 11.1 m below existing grades. The soil was present in very dense consistency with measured SPT 'N' values of more than 50 blows per 0.3 m of penetration. Trace gravel and trace to some clay were observed in the silty sand and sandy silt deposits.

Grain size analyses of one sample of silty sand till (BH13-2/SS7) was conducted and the results are presented in **Drawing 10**, with the following fractions:

Clay: 11%
Silt: 42%
Sand: 36%
Gravel: 11%

Fractions are also shown on the borehole logs.

Atterberg limits test of one sample (BH13-2/SS7) was conducted. The results are shown on the borehole logs and are summarized as follows:

Liquid limit (W_L): 16
Plastic limit (W_P): 13
Plasticity index (PI): 3.3

The soil is classified as silty sand.

Clayey Silt:

At the lower portion of the borehole BH13-3 native soil consisting of clayey silt was found extending to depths ranging from 7.2 m to 9.0 m below existing grades. The soil was present in very stiff consistency with measured SPT 'N' values of 22 blows per 0.3 m of penetration. Trace gravel and trace sand were observed in the clayey silt deposit.

Grain size analyses of one sample of clayey silt (BH13-3/SS8) was conducted and the results are presented in **Drawing 10**, with the following fractions:

Clay: 11%
Silt: 42%
Sand: 36%
Gravel: 11%

Fractions are also shown on the borehole logs.

Atterberg limits test of one sample (BH13-3/SS8) was conducted. The results are shown on the borehole logs and are summarized as follows:

Liquid limit (W_L): 25
Plastic limit (W_P): 21
Plasticity index (PI): 4.4

The soil is classified as clayey silt.

3.2 Groundwater Conditions

Short-term (unstabilized) water was found in the boreholes during drilling at depths ranging from 2.7 to 16.2 m. The groundwater table observed in the monitoring wells, screened at lower elevations, was at depths ranging from 12.5 to 13.4 m (Elevations 130.4 to 130.9 m), as listed in Table 1.

Table 1: Groundwater Levels Observed in Wells

BH No.	Date of Drilling	Date of Observation	Depth of Groundwater (m)	Elevation of Groundwater (m)	Note
BH13-1	Nov. 15/13	Nov. 21/13	12.5	130.9	well
BH13-3	Nov. 14/13	Nov. 21/13	13.4	130.4	well
BH13-6	Nov. 14/13	Nov. 21/13	dry	dry	well

It should be noted that the groundwater levels can vary and are subject to seasonal fluctuations in response to major weather events. Also, wet sand seams/layers were perched in the upper glacial till layers between 3.0 and 7.0m. Some water is expected from this strata.

4. FOUNDATIONS

It is understood that the proposed development will consist of blocks of three storey brick town houses with roof terrace and one level of basement (B1) or up to two levels of parking garage (P2). Finished B1 basement level floor will be at about Elev. 141.0 m. Finished P2 parking garage will be at about Elev. 138.1 m.

4.1 Three Storey Town Houses with Two Levels of Basements

The proposed three storey town houses with two levels of parking garage can be supported by spread and strip footings founded on the undisturbed native soils for bearing capacity values of 250 to 500 kPa at the serviceability limit states (SLS), and for factored geotechnical resistances of 400 to 750 kPa at the ultimate limit states (ULS). The bearing values and the corresponding founding elevations of SPL boreholes at the borehole locations are summarized in Table 2. The bearing values and corresponding founding elevations at the borehole locations drilled by others are summarized in Table 3.

**Table 2: Bearing Values and Founding Levels of Foundations on Native Soils
(Boreholes by SPL, 2013)**

SPL BH No.	Soil Type	Bearing Capacity at SLS (kPa)	Factored Geotechnical Resistance at ULS (kPa)	At or Below Depth below Ground (m)	At or Below Highest Founding Elevation (m)
BH13-1 (MW)	Silty Sand Till	250	400	3.2	140.2
	Clayey Silt Till	500	750	5.2	138.2
BH13-2	Clayey Silt Till	300	450	2.5	141.2
	Silty Sand Till	500	750	3.0	140.7
BH13-3 (MW)	Silty Sand Till	250	400	3.1	140.7
		500	750	4.5	139.3
BH13-4	Clayey Silt Till	300	450	2.5	141.3
		500	750	3.0	140.8
BH13-5	Sandy Silt Till	250	400	3.6	140.1
	Clayey Silt Till	500	750	4.5	139.2
BH13-6 (MW)	Clayey Silt Till	300	450	2.2	141.5
	Sandy Silt Till	500	750	6.0	137.7
BH13-7	Clayey Silt Till	500	750	4.6	139.6
BH13-8	Clayey Silt Till	300	450	2.6	141.4
		500	750	4.1	139.9

**Table 3: Bearing Values and Founding Levels of Foundations on Native Soils
(Boreholes by others, 2006)**

BH No.	Soil Type	Bearing Capacity at SLS (kPa)	Factored Geotechnical Resistance at ULS (kPa)	At or Below Depth below Ground (m)	At or Below Highest Founding Elevation (m)
BH1	Silty Clay Till / Clayey Silt Till	300	450	1.6	142.1
		500	750	3.5	140.2
BH2	Silty Clay Till / Clayey Silt Till	300	450	1.6	141.9
		500	750	3.0	140.5
BH3	Silty Clay Till / Clayey Silt Till	300	450	2.5	140.6
		500	750	3.0	140.1
BH4	Silty Clay Till / Clayey Silt Till	300	450	2.5	140.8
		500	750	3.5	139.8
BH5	Silty Clay Till / Clayey Silt Till	300	450	1.7	141.8
		500	750	3.2	140.3
BH6	Silty Clay Till / Clayey Silt Till	250	400	1.6	141.6
		500	750	3.0	140.2
BH7	Silty Clay Till / Clayey Silt Till	250	400	2.4	141.3
		500	750	3.9	139.9
BH8	Clayey Silt Till	250	400	2.4	141.1
	Clayey Silt Till	500	750	3.3	140.2

The other option is to excavate all the fill and replace with engineered fill compacted to 100 percent SPMDD. The footing founded on engineered fill can be designed for 150 kPa SLS and 225 kPa ULS.

Where the foundation bases consist of sandy deposits (sand, silt, sandy silt to silty sand, gravelly sand), the footing bases should be covered with 50 mm thick mud slab immediately after inspection and cleaning.

4.2 Townhouses with One Level of Basement

The proposed town houses with one level of basement can be supported by spread and strip footings founded on the undisturbed native soils for a bearing capacity value of 250 to 300 kPa at the serviceability limit states (SLS), and for factored geotechnical resistances of 400 to 450 kPa at the ultimate limit states (ULS). The bearing values and the corresponding founding elevations of SPL boreholes at the borehole locations are summarized in Table 2. The bearing values and the corresponding founding elevations at the borehole locations drilled by others are summarized in Table 3. The other option is to support the foundations on engineered fill for 150 kPa SLS and 225 kPa ULS. For engineered fill option, all fill must be sub-excavated and replaced with engineered fill compacted to 100% SPMDD.

4.3 General Comments on Foundations

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

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

Prior to the placement of concrete, all footing bases must be inspected by this office to confirm the design bearing values.

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

5. FLOOR SLAB AND PERMANENT DRAINAGE

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

A perimeter drainage system as illustrated on **Drawing 11** will be required around the exterior one level basement walls for the town houses for non-shored excavations system. The need for under floor drainage can be confirmed at near completion of excavation stage.

A perimeter and underfloor drainage system will be required around the exterior walls for buildings with two levels of parking garage. Typical drainage and backfill recommendations are illustrated on **Drawing 12** for shored excavation system.

6. FROST PROTECTION

All footings exposed to seasonal freezing conditions must have at least 1.2 metres of soil cover for frost protection.

There is no official rule governing the required founding depth for footings below unheated basement / parking garage floors. Certainly, it will not be greater than the 1.2 m required in Southern Ontario for exterior footings. Un-monitored experience indicates that a shallower depth ranging from 0.82 to 0.9 m for interior column footings and 0.4 m for wall footings has been successful where 2 or more basement levels apply. The 0.82 m depth is believed to be close to the minimum structural requirement for interior column footings. Adjacent to air shafts and entrance and exit doors, a footing depth of 1.2 m below floor level is required or, alternatively, insulation protection must be provided.

It is also emphasized that underfloor drainage and/or an adequate free draining gravel base is required to minimize the risk of floor dampness. Floor dampness could lead to temporary icing and the risk of accidents.

7. EXCAVATIONS AND GROUNDWATER CONTROL

SPL have been advised that the proposed buildings will include two levels of parking garage below ground with P2 level at about Elev. 138.1 m. It is expected that the general excavation will extend to about 0.5 to 1 m below the P2 garage floor, and local excavations to the underside of footings will be about 1 to 2.5 m below the P2 garage floor.

Excavations can be carried out with heavy hydraulic backhoe. No major problems with groundwater are anticipated for excavation to about Elev. 138 m \pm . Occasional layers / interbeds of water bearing silt / sand are present fill and in cohesive till deposits. Seepage from wet sandy layers/interbeds should be expected but in all likelihood water seepage should be controllable by the use of conventional pumping from collection sumps and ditches.

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

All excavations must be carried out in accordance with the most recent Occupational Health and Safety Act (OHSA). In accordance with OHSA, the fill can be classified as Type 3 soil above the groundwater table. The very stiff to hard clayey silt to silty clay till and clayey silt can be classified as Type 1 to 2 Soil. The compact to very dense silty sand and sandy silt till and sandy silt to silty sand can be classified as Type 1 to 3 Soil.

The existing fill in the boreholes is generally not suitable for re-use as backfill. The native soils free from topsoil and organics can be used as general construction backfill. Loose lifts of soil, which are to be compacted, should not exceed 200 mm. Depending on the time of construction and weather, some excavated material may be too wet to compact and will require aeration prior to its use.

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

Underfloor fill should be compacted to at least 98 percent of Standard Proctor Maximum Dry Density (SPMDD).

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

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

8. EARTH PRESSURES

The lateral earth pressures acting on basement walls may be calculated from the following expression:

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

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

K = Earth pressure coefficient equal to 0.4 for vertical walls and horizontal backfill.

γ = Unit weight of backfill, a value of 21.5 kN/m³ may be assumed

h = Depth to point of interest in metres

q = Equivalent value of surcharge on the ground surface in kPa

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

9. EARTHQUAKE CONSIDERATIONS

Based on the borehole information and according to Table 4.1.8.4.A of OBC 2006, the subject site for the proposed buildings with levels of basement can be classified as Class 'C' for seismic site response.

10. GENERAL COMMENTS AND LIMITATIONS OF REPORT

This geotechnical investigation is preliminary, based on limited number of boreholes only. Additional boreholes must be carried out when final design details of the proposed buildings are available.

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

This report is intended solely for the Client named. The material in it reflects our best judgment in light of the information available to SPL at the time of preparation. Unless otherwise agreed in writing by SPL, it shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. No portion of this report may be used as a separate entity, it is written to be read in its entirety.

The conclusions and recommendations given in this report are based on information determined at the test hole locations. The information contained herein in no way reflects on the environment aspects of the project, unless otherwise stated. Subsurface and groundwater conditions between and beyond the test holes may differ from those encountered at the test hole locations, and conditions may become apparent during construction, which could not be detected or anticipated at the time of the site investigation. The benchmark and elevations used in this report are primarily to establish relative elevation differences between the test hole locations and should not be used for other purposes, such as grading, excavating, planning, development, etc.

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

The comments made in this report on potential construction problems and possible methods are intended only for the guidance of the designer. The number of test holes may not be sufficient to determine all the factors that may affect construction methods and costs. For example, the thickness of surficial topsoil or fill layers may vary markedly and unpredictably. The contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the subsurface conditions may affect their work. This work has been undertaken in accordance with normally accepted geotechnical engineering practices.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. SPL accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.

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

SPL CONSULTANTS LIMITED



Max Prokudin, M.Sc., E.I.T.



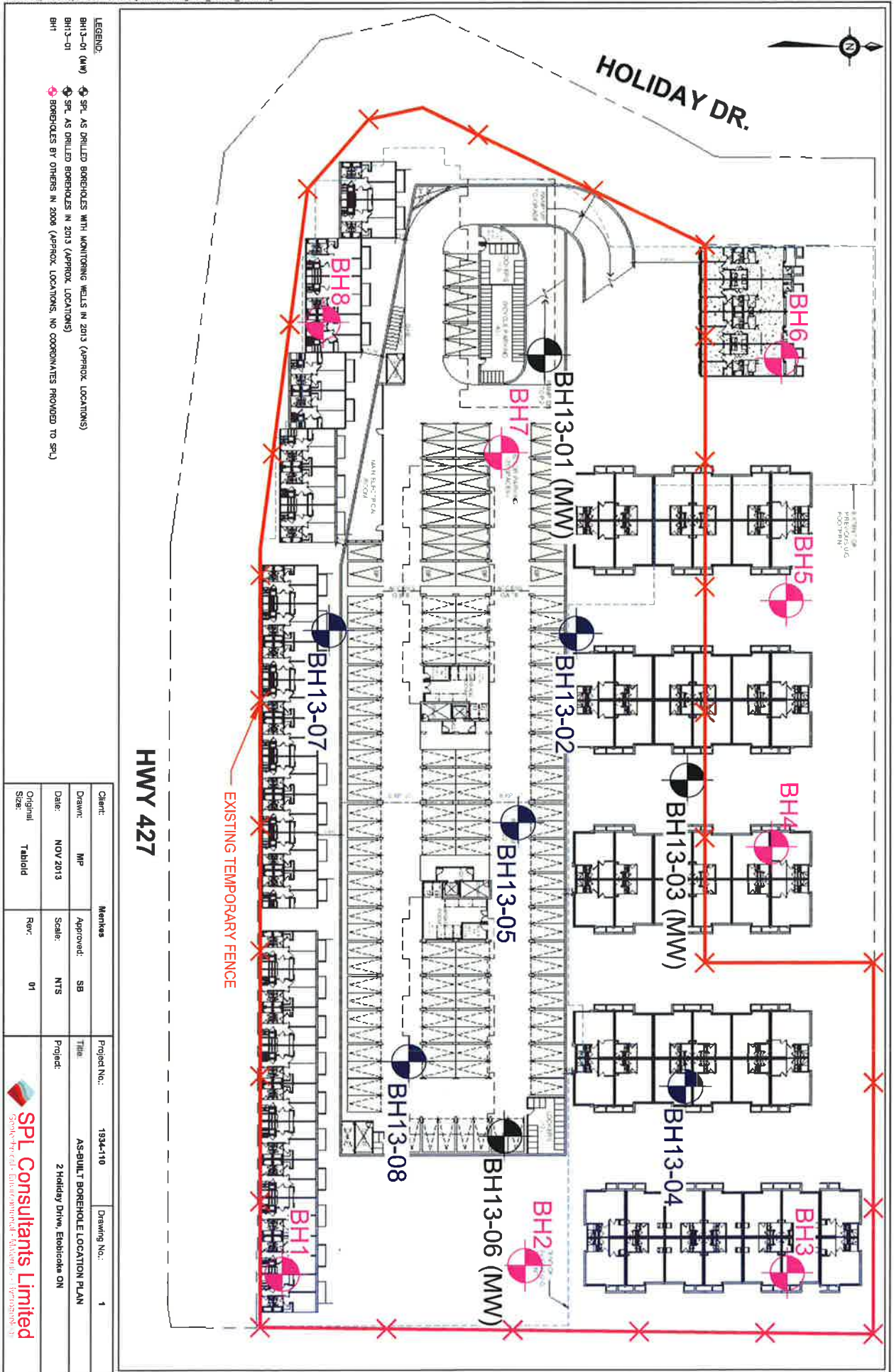
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Drawings



PROJECT: Geotechnical Investigation
CLIENT: Menkes Developments Limited
PROJECT LOCATION: 2 Holiday Drive, Toronto, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 203mm
Date: Nov/15/2013

REF. NO.: 1934-110
ENCL NO.: 2

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN (C _u) (kPa)	NATURAL UNIT WT (Mg/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m)	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m			20 40 60 80 100	100						
143.4															
143.0	ASPHALT: 125 mm														
143.0	FILL: sand and gravel, grey, wet, compact		1	SS	25		143				○				
143.0	FILL: clayey silt, trace gravel, some sand, trace organics, contains pockets of silty clay, greyish brown, most, stiff														
142.0			2	SS	10		142				○				
141.0	firm at 1.5 m														
141.0			3	SS	6		141				○				
141.0	soft at 2.3 m														
141.0			4	SS	2		141				○				
140.4	50 mm layer of grey sand and gravel at 2.9 m														
140.4	SILTY SAND TILL: some clay to clayey, some gravel, oxidized, brown, wet, compact		5	SS	25		140				○				
139.0															
139.0	grey below 4.5 m														
138.5			6	SS	69		138				○				
138.5	CLAYEY SILT TILL: some sand to sandy, trace gravel, oxidized, occasional brown sand seams, grey, moist, hard														
137.4															
137.4	SANDY SILT TILL: trace gravel, some clay, grey, moist, very dense		7	SS	50/75mm		137				○				auger grinding
136.0															
136.0			8	SS	44		136				○				
135.0	dense, wet at 7.6 m														
135.0															
134.4															
134.4	SANDY SILT: occasional gravel, trace to some clay, grey, moist, very dense		9	SS	76		134				○				

SPL SOIL LOG 1834-110 - SEP24 GPJ SPL.GDT 6/12/13

Continued Next Page

GROUNDWATER ELEVATIONS

Shallow/ Single Installation ▽ ▽ Deep/Dual Installation ▽ ▽

GRAPH NOTES

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

LOG OF BOREHOLE BH 13-1

PROJECT: Geotechnical Investigation
CLIENT: Menkes Developments Limited
PROJECT LOCATION: 2 Holiday Drive, Toronto, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 203mm
Date: Nov/15/2013

REF. NO.: 1934-110
ENCL NO.: 2

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT					POCKET PEN (Cu) (kPa)	NATURAL UNIT WT (Mg/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80	100			
								SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE							
								PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT w _p w w _L WATER CONTENT (%)							
								50	100	150	200	250	10	20	30
															GR SA SI CL
132.4	SANDY SILT: occasional gravel, trace to some clay, grey, moist, very dense(Continued)		10	SS	50/150mm		133								
11.0	AUGERED TO INSTALL MONITORING WELL;						132								
							131								
							130.9 m Nov 21, 2013								
							130								
							129								
				AS			128								
							127								
							126								
125.1	END OF BOREHOLE:														
18.3	Notes: 1) Ground water was at 16.2 m depth after completion 2) 50 mm monitoring well was installed at 18.3 m after completion														

SPL SOIL LOG 1934-110 - SEP24.GPJ SPL.GDT 6/12/13

GROUNDWATER ELEVATIONS

GRAPH
NOTES

+ 3, × 3: Numbers refer to Sensitivity


○ ε=3% Strain at Failure

Shallow/ Single Installation ▽ ▽ Deep/Dual Installation ▽ ▽

PROJECT: Geotechnical Investigation
CLIENT: Menkes Developments Limited
PROJECT LOCATION: 2 Holiday Drive, Toronto, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 203mm
Date: Nov/14/2013

REF. NO.: 1934-110
ENCL NO.: 3

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN (C _u) (kPa)	NATURAL UNIT WT (Mg/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)											WATER CONTENT (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	20							40	60	80	100	10	20	30																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
143.7	0.0	FILL: sand, some gravel, trace brick pieces, contains pockets of sandy silt, brown, wet		1	AS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

SPL SOIL LOG 1834-110 - SEP24.GPJ SPL.GDT 5/12/13

GROUNDWATER ELEVATIONS

GRAPH NOTES

+ 3, × 3: Numbers refer to Sensitivity

○ e=3% Strain at Failure

Shallow/ Single Installation ▽ ▽ Deep/Dual Installation ▽ ▽

PROJECT: Geotechnical Investigation
CLIENT: Menkes Developments Limited
PROJECT LOCATION: 2 Holiday Drive, Toronto, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 203mm
Date: Nov/14/2013

REF. NO.: 1934-110
ENCL NO.: 4

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN (C _u) (kPa)	NATURAL UNIT WT (Mg/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20 40 60 80 100	20 40 60 80 100						
143.8															
0.0	FILL: sandy gravel, trace brick pieces, wet, brown, loose		1	SS	8										
143.2															
0.6	FILL: clayey silt, trace gravel, some sand, trace organics, contains wet sand seams, contains silty clay seams, brownish grey, moist, firm		2	SS	5		143								
	grey at 1.5 m		3	SS	5		142								wet sampler
			4	SS	7		141								
140.8															
3.0	SILTY SAND TILL: some clay, trace gravel, brown, moist, compact		5	SS	26		140								
	very dense		6	SS	72		139								
	contains brown wet sand seams, grey, compact at 6.0 m		7	SS	25		138								spoon bouncing
	contains shale fragments at 6.6 m						137								
136.6															
7.2	CLAYEY SILT: trace sand, grey, moist, very stiff		8	SS	22		136								0 0 85 15
134.8							135								
9.0	SANDY SILT: trace gravel, trace to some clay, grey, moist, very dense		9	SS	50/100mm										
134.3															
9.5	AUGERED TO INSTALL MONITORING WELL;						134								

SPL SOIL LOG 1834-110 - SEP24.GPJ SPL.GDT 6/12/13

Continued Next Page

GROUNDWATER ELEVATIONS

GRAPH NOTES

+³, ×³: Numbers refer to Sensitivity

○ ε=3% Strain at Failure

Shallow/ Single Installation ▽ ▽ Deep/Dual Installation ▽ ▽

PROJECT: Geotechnical Investigation							DRILLING DATA								
CLIENT: Menkes Developments Limited							Method: Hollow Stem Auger								
PROJECT LOCATION: 2 Holiday Drive, Toronto, Ontario							Diameter: 203mm								
DATUM: Geodetic							Date: Nov/14/2013								
BH LOCATION: See Borehole Location Plan							REF. NO.: 1934-110								
							ENCL NO.: 4								
SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			POCKET PEN (C _u) (kPa)	NATURAL UNIT WT (Mg/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20 40 60 80 100	W _p	W	W _L	WATER CONTENT (%)			
	AUGERED TO INSTALL MONITORING WELL;(Continued)														
							133								
							132								
			10	AS			131								
							W. L. 130.4 m Nov 21, 2013 130								
							129								
							128								
127.0							127								
16.8	END OF BOREHOLE: Notes: 1) Ground water was at 11.6 m depth after completion 2) 50 mm monitoring well was installed at 16.8 m after completion														

GROUNDWATER ELEVATIONS

GRAPH
NOTES

+ 3, × 3: Numbers refer to Sensitivity

○ $\epsilon=3\%$ Strain at Failure

Shallow/ Single Installation Deep/Dual Installation

LOG OF BOREHOLE BH13-4

PROJECT: Geotechnical Investigation
CLIENT: Menkes Developments Limited
PROJECT LOCATION: 2 Holiday Drive, Toronto, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 203mm
Date: Nov/14/2013

REF. NO.: 1934-110
ENCL NO.: 5

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		POCKET PEN (C _u) (kPa)	NATURAL UNIT WT (Mg/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)		
(m)	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)					WATER CONTENT (%)	
ELEV DEPTH								20 40 60 80 100	PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L			GR SA SI CL
143.8	CONCRETE: 125 mm		1	AS										
143.0	FILL: sand, trace gravel, trace brick pieces, brown, moist		2	SS	4									
141.5	FILL: sand, some silt to silt, trace gravel, contains pockets of silty clay, greyish brown, wet, loose		3	SS	6									
140.0	grey at 1.5 m		4	SS	31									
139.0	CLAYEY SILT TILL: some sand to sandy, trace gravel, oxidized, contains grey wet sand and silt seams, brown, moist, hard		5	SS	43									
137.8	contains brown sand seams, grey at 4.5 m		6	SS	51/150mm									
136.0	SANDY SILT TILL: some clay to clayey, trace gravel, grey, moist, very dense		7	SS	53/150mm									
135.8			8	SS	37									
133.0	CLAYEY SILT TILL: some sand, trace gravel, contains pockets of silty clay, grey, moist, hard													
132.0	END OF BOREHOLE: Notes: 1) Borehole was open and dry after completion													

SPL SOIL LOG 1834-110 - SEP24.GPJ SPL.GDT 6/12/13

GROUNDWATER ELEVATIONS

GRAPH NOTES

+³, ×³: Numbers refer to Sensitivity








○ ε=3% Strain at Failure

Shallow/ Single Installation ▽ ▽ Deep/Dual Installation ▽ ▽

PROJECT: Geotechnical Investigation
CLIENT: Menkes Developments Limited
PROJECT LOCATION: 2 Holiday Drive, Toronto, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 203mm
Date: Nov/14/2013

REF. NO.: 1934-110
ENCL NO.: 6

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			POCKET PEN (C _u) (kPa)	NATURAL UNIT WT (Mg/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)		
(m)	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)				WATER CONTENT (%)							
ELEV								○ UNCONFINED + FIELD VANE & Sensitivity				w _p w w _L							
DEPTH								● QUICK TRIAXIAL × LAB VANE											
						20	40	60	80	100	50	100	150	200	250	10	20	30	
143.7	0.0	FILL: gravelly sand, some brick pieces, brown, wet, compact		1	SS	50/100mm													
142.7	1.0	FILL: sand, trace gravel, trace to some brick pieces, reddish brown, moist, very loose to compact		2	SS	14													
				3	SS	50/125mm													
				4	SS	2													
		wet below 3.0 m		5	SS	15													
140.3	3.4	SANDY SILT TILL: some clay to clayey, grey, moist, compact to dense																	
139.2	4.5	CLAYEY SILT TILL: some sand to sandy, trace gravel, contains wet sand seams, grey, moist, hard		6	SS	42													
138.1	5.7	SANDY SILT TILL: some clay to clayey, grey, moist, very dense																	
				7	SS	50/125mm													
136.3	7.5	CLAYEY SILT TILL: some sand to sandy, trace gravel, grey, moist, hard		8	SS	50													
		100 mm layer of silt and shale fragments at 8.1 m																	
134.6	9.1	SILTY SAND TILL: some clay, trace gravel, grey, wet, very dense		9	SS	50/125mm													

Continued Next Page

GROUNDWATER ELEVATIONS

GRAPH NOTES

+ 3, × 3. Numbers refer to Sensitivity

○ e=3% Strain at Failure

Shallow/ Single Installation ▽ ▽ Deep/Dual Installation ▽ ▽

LOG OF BOREHOLE BH13-5

PROJECT: Geotechnical Investigation

CLIENT: Menkes Developments Limited

PROJECT LOCATION: 2 Holiday Drive, Toronto, Ontario

DATUM: Geodetic

BH LOCATION: See Borehole Location Plan

DRILLING DATA

Method: Hollow Stem Auger

Diameter: 203mm

Date: Nov/14/2013

REF. NO.: 1934-110

ENCL NO.: 6

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	POCKET PEN. (C _u) (kPa)	NATURAL UNIT WT (Mg/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)										
								20	40	60	80	100						GR SA SI CL
133.5																		
10.2	SANDY SILT: trace gravel, trace to some clay, grey, moist, very dense																	
	contains wet sand seams at 10.7																	
132.6			10	SS	90/275mm		133											
11.1	END OF BOREHOLE: Notes: 1) Borehole caved in at 9.1 m and ground water was at 2.7 m after completion																	

GROUNDWATER ELEVATIONS

GRAPH NOTES

+ 3, × 3: Numbers refer to Sensitivity

○ ε=3% Strain at Failure

Shallow/Single Installation ▽ ▽ Deep/Dual Installation ▽ ▽

PROJECT: Geotechnical Investigation
CLIENT: Menkes Developments Limited
PROJECT LOCATION: 2 Holiday Drive, Toronto, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 203mm
Date: Nov/14/2013

REF. NO.: 1934-110
ENCL NO.: 7

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT		POCKET PEN (C _u) (kPa)	NATURAL UNIT WT (γ_{sat})	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20 40 60 80 100	20 40 60 80 100	W _p w W _L	WATER CONTENT (%)			
143.7														
0.0	FILL: sand, some gravel, brown, wet		1	AS										
	trace gravel, loose to compact below 0.8 m		2	SS	9		143							
141.9			3	SS	11		142							
1.8	CLAYEY SILT TILL: some sand to sandy, trace gravel, brown, moist, very stiff		4	SS	27		141							
140.8			5	SS	34		140							
3.0	SANDY SILT TILL: some clay to clayey, grey, moist, oxidized, greyish brown, dense													
139.6			6	SS	16		139							
4.1	CLAYEY SILT TILL: some sand to sandy, trace gravel, brown, moist, very stiff contains wet sand seams, sandy at 4.5 m													
138.1			7	SS	48		138							
5.7	SANDY SILT TILL: some clay to clayey, grey, moist, compact oxidized, greyish brown, dense grey below 6.0 m						137							
136.6			8	SS	46		136							
7.2	CLAYEY SILT TILL: some sand to sandy, trace gravel, brown, moist, hard													
134.7			9	SS	62		135							
9.0	SILTY SAND TILL: some clay to clayey, grey, moist, very dense						134							

SPL SOIL LOG 1934-110 - SEP24.GPJ SPL.GDT 6/12/13

Continued Next Page

GROUNDWATER ELEVATIONS

GRAPH
NOTES

+³, ×³: Numbers refer to Sensitivity

○ $\epsilon=3\%$ Strain at Failure

Shallow/ Single Installation Deep/Dual Installation

auger grinding

LOG OF BOREHOLE BH13-6

PROJECT: Geotechnical Investigation
CLIENT: Menkes Developments Limited
PROJECT LOCATION: 2 Holiday Drive, Toronto, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 203mm
Date: Nov/14/2013

REF. NO.: 1934-110
ENCL NO.: 7

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN (Cu) (kPa)	NATURAL UNIT WT (Mg/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)		
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)								
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE								
								20	40	60	80	100	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT w _p w w _L		WATER CONTENT (%) 10 20 30	
133.5																
10.2	SANDY SILT: trace gravel, trace to some clay, grey, moist, very dense															
132.7																
11.0	AUGERED TO INSTALL MONITORING WELL:		10	SS	84		133									
				AS												

GROUNDWATER ELEVATIONS

Shallow/ Single Installation  Deep/Dual Installation 

GRAPH
NOTES

+ 3, x 3. Numbers refer to Sensitivity

○ ε=3% Strain at Failure

LOG OF BOREHOLE BH13-7

PROJECT: Geotechnical Investigation
CLIENT: Menkes Developments Limited
PROJECT LOCATION: 2 Holiday Drive, Toronto, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 203mm
Date: Nov/14/2013

REF. NO.: 1934-110
ENCL NO.: 8

[illegible]

SPL SOIL LOG 1834-110 - SEP24.GPJ SPL.GDT 6/12/13

Continued Next Page

GROUNDWATER ELEVATIONS

Shallow/ Single Installation Deep/Dual Installation

GRAPH
NOTES

+³, ×³: Numbers refer to Sensitivity

○ $\epsilon=3\%$ Strain at Failure

LOG OF BOREHOLE BH13-7

PROJECT: Geotechnical Investigation
CLIENT: Menkes Developments Limited
PROJECT LOCATION: 2 Holiday Drive, Toronto, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 203mm
Date: Nov/14/2013

REF. NO.: 1934-110
ENCL NO.: 8

[illegible]

SSPL SOIL LOG 1834-110 - SEP24.GPJ SPL.GDT 6/12/13

GROUNDWATER ELEVATIONS

GRAPH
NOTES

+ 3, × 3: Numbers refer to Sensitivity

○ $\epsilon=3\%$ Strain at Failure

Shallow/ Single Installation Deep/Dual Installation

PROJECT: Geotechnical Investigation
CLIENT: Menkes Developments Limited
PROJECT LOCATION: 2 Holiday Drive, Toronto, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 203mm
Date: Nov/14/2013
REF. NO.: 1934-110
ENCL NO.: 9

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT					POCKET PEN (Cu) (kPa)	NATURAL UNIT WT (Mg/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m)	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			20	40	60	80	100			
ELEV DEPTH								SHEAR STRENGTH (kPa)							
								○ UNCONFINED + FIELD VANE & Sensitivity							
								● QUICK TRIAXIAL × LAB VANE							
								WATER CONTENT (%)							
								50	100	150	200	250			
144.0															
0.0	FILL: clayey silt, sandy, trace gravel, trace brick pieces, trace organics, brown, moist, stiff		1	SS	12										
	firm below 0.8 m		2	SS	6		143								
			3	SS	4		142								
141.7															
2.3	CLAYEY SILT TILL: sandy, contains sand seams, trace gravel, greyish brown, moist, very stiff		4	SS	28		141								
141.0															
3.0	SILTY SAND TILL: contains pockets of silty clay, trace to some clay, grey, moist, compact contains wet sand seams at 3.0 m		5	SS	23		140								
139.9															
4.1	CLAYEY SILT TILL: sandy, contains sand seams, trace gravel, greyish brown, moist, hard grey below 4.5 m		6	SS	35		139								
138.3															
5.7	SILTY SAND : trace to some clay, trace gravel, grey, moist, very dense		7	SS	56		138								
							137								
136.4															
7.6	CLAYEY SILT TILL: some sand, trace gravel, grey, moist, hard		8	SS	57		136								
135.8															
8.2	END OF BOREHOLE: Notes: 1) Borehole was open and dry after completion														

SPL SOIL LOG 1834-110 - SEP24.GPJ SPL_GDT 6/12/13

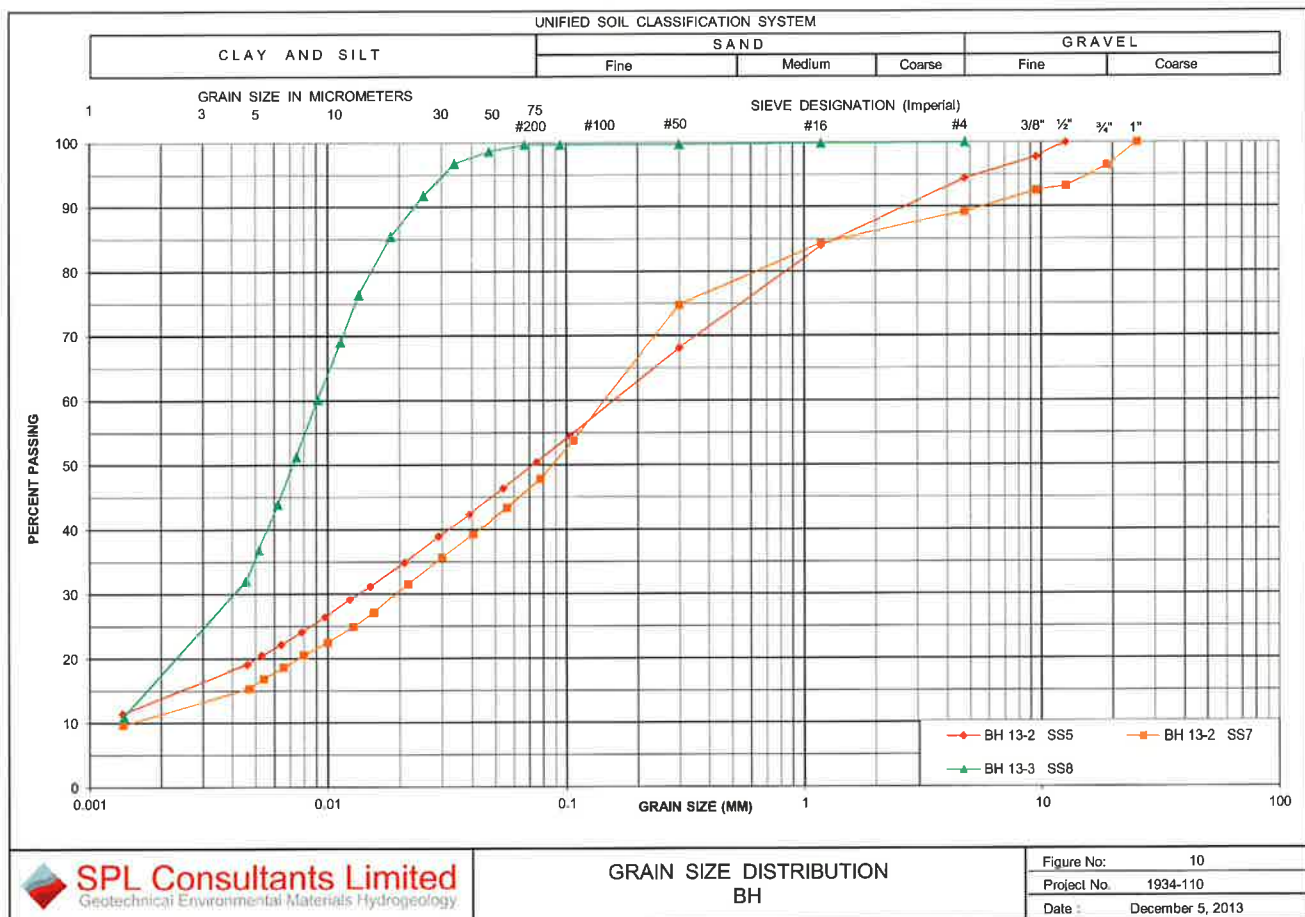
GROUNDWATER ELEVATIONS

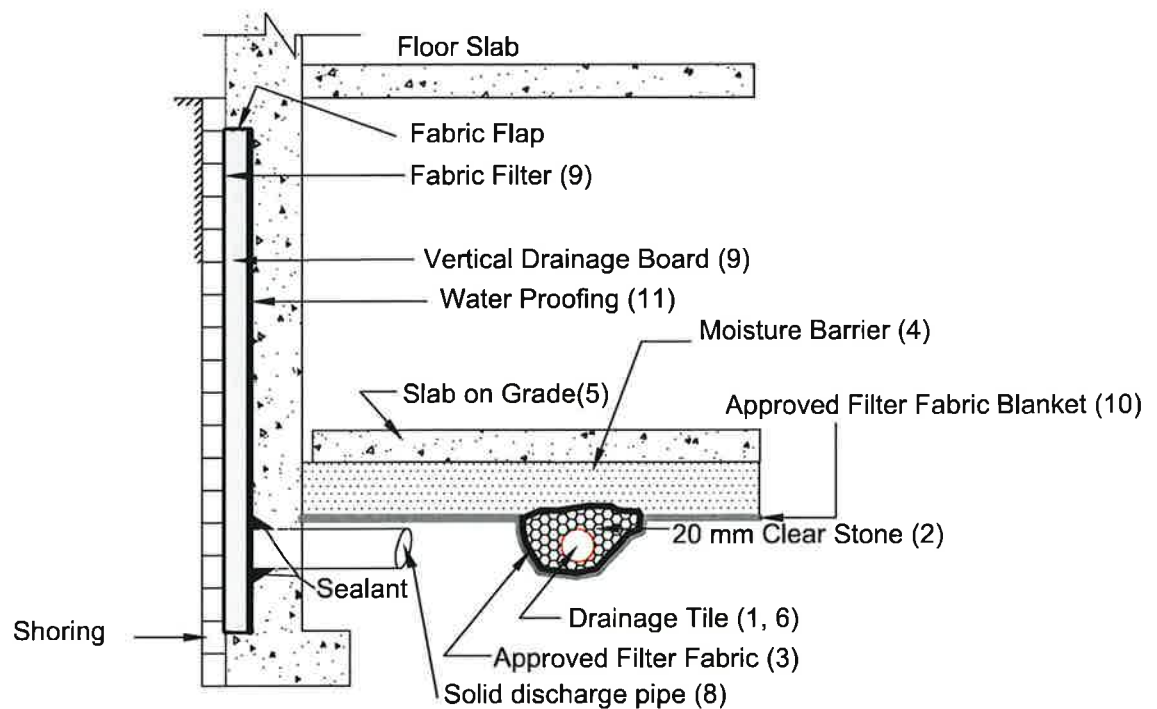
Shallow/Single Installation ▽ ▽ Deep/Dual Installation ▽ ▽

GRAPH NOTES

+ 3, × 3: Numbers refer to Sensitivity

○ ε=3% Strain at Failure





EXTERIOR FOOTING

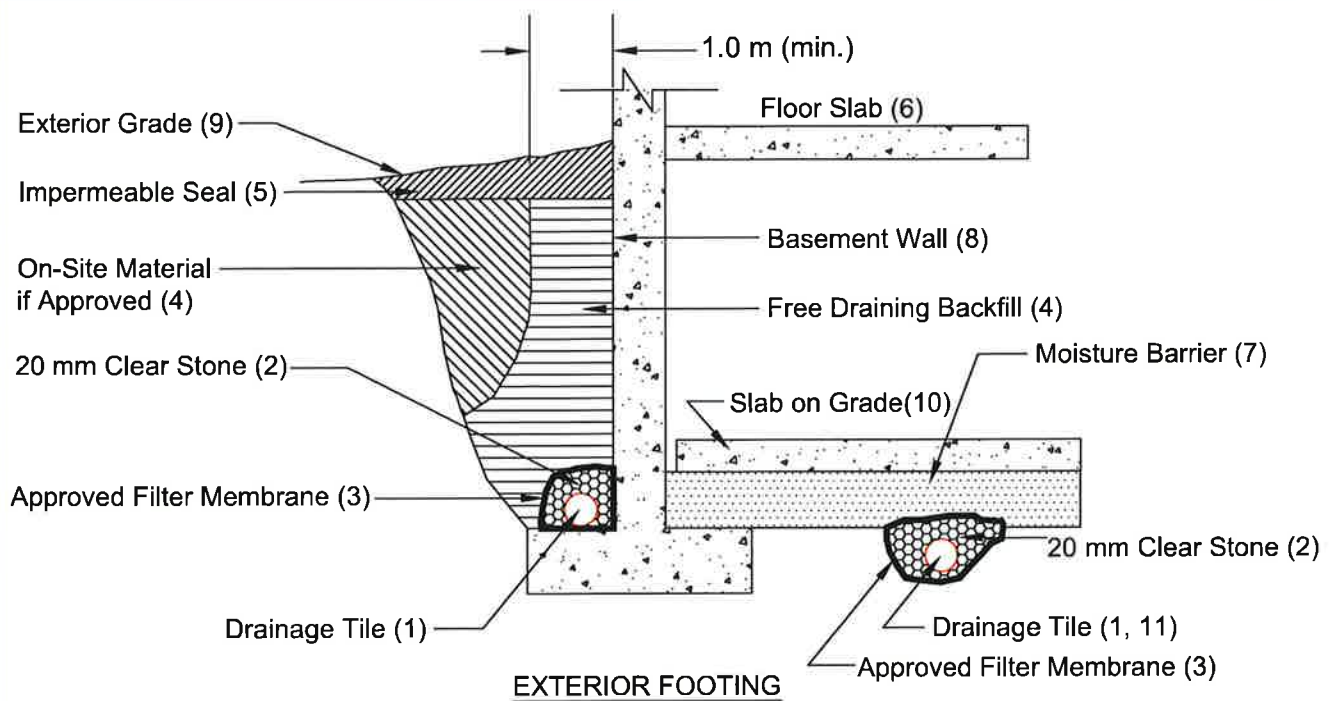
Notes

1. Drainage tile to consist of 100 mm (4") diameter weeping tile or equivalent perforated pipe leading to a positive sump or outlet, spaced between columns.
2. 20 mm (3/4") clear stone - 150 mm (6") top and side of drain. If drain is not on footing, place 100 mm (4 inches) of stone below drain.
3. Wrap the clear stone with an approved filter membrane (Terrafix 270R or equivalent).
4. Moisture barrier to be at least 200 mm (8") of compacted clear 20 mm (3/4") stone or equivalent free draining material. A vapour barrier may be required for specialty floors.
5. Slab on grade should not be structurally connected to the wall or footing.
6. Underfloor drain invert to be at least 300 mm (12") below underside of floor slab.
Drainage tile placed in parallel rows 6 to 8 m (20 to 25') centers one way. Place drain on 100 mm (4") clear stone with 150 mm (6") of clear stone on top and sides. Enclose stone with filter fabric as noted in (3).
7. Do not connect the underfloor drains to perimeter drains.
8. Solid discharge pipe located at the middle of each bay between the solid piles, approximate spacing 2.5 m, outletting into a solid pipe leading to a sump.
9. Vertical drainage board with filter cloth should be kept a minimum of 1.2 m below exterior finished grade.
10. The entire subgrade to be sealed with approved filter fabric (Terrafix 270R or equivalent) if non-cohesive (sandy) soils below ground water table encountered.
11. The basement walls should be water proofed using bentonite or equivalent water-proofing system.
12. Review the geotechnical report for specific details. Final detail must be approved before system is considered acceptable.

DRAINAGE RECOMMENDATIONS

Shored Basement wall with Underfloor Drainage System

(not to scale)



Notes

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


DRAINAGE AND BACKFILL RECOMMENDATIONS Basement with Underfloor Drainage (not to scale)

Appendix A

CLIENT Bydixer Holdings Inc. c/o Ramada Hotel Toronto AirportPROJECT No. 1018795LOCATION 2 Holiday Drive, Etobicoke, OntarioDATUM GeodeticDATES: BORING November 9, 2006WATER LEVEL -TPC ELEV. -

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES				UNDRAINED SHEAR STRENGTH (kPa)										REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
						TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR ROD(%)	50 100 150 200 WATER CONTENT & ATTERBERG LIMITS DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m STANDARD PENETRATION TEST, BLOWS/0.3m Wp W W _L											
0	143.7	100 mm of ASPHALTIC CONCRETE			0																
	143.4	Brown, loose, SAND and GRAVEL (FILL), trace silt, wet			1	SS	1	460/610	7												
		Brown, stiff, Silty CLAY (FILL), with sand, trace gravel, trace to some organic matter, moist			2																
1					3	SS	2	560/610	14												
	142.1				4																
2		Brown, very stiff to hard, Silty CLAY/Clayey SILT (TILL), with sand, trace to some gravel, moist			5																
	141.0				6	SS	3	560/610	28												
		- grey			7																
3					8																
					9	SS	4	560/610	24												
					10																
					11	SS	5	560/610	33												
					12																
4		- trace cobbles, damp			13	SS	6	430/430	78/280 mm												
					14																
					15																
5					16	SS	7	610/610	66												
					17																
					18																
					19	SS	8	610/610	37												
					20																
					21	SS	9	460/460	80												
					22																
7		- wet			23																
					24	SS	10	610/610	31												
					25																
8	135.7	Grey, dense to very dense, Sandy SILT / Silty SAND, trace gravel, trace clay, moist			26	SS	11	610/610	42												
		- auger grinding on inferred boulder or cobble			27																
					28																
9					29																
					30																
		- damp			31	SS	12	230/610	50/76 mm												
					32																
10																					

Field Vane Test (kPa)
Remoulded Vane Test (kPa)
Pocket Penetrometer Test (kPa)

 Jacques Whitford

- ☐ Field Vane Test (kPa)
☒ Remoulded Vane Test (kPa)
☐ Pocket Penetrometer Test (kPa)

TPC ELEV.

[illegible]

CLIENT Bydixer Holdings Inc. c/o Ramada Hotel Toronto AirportPROJECT No. 1018795LOCATION 2 Holiday Drive, Etobicoke, OntarioDATUM GeodeticDATES: BORING November 10, 2006.WATER LEVEL November 26, 2006.TPC ELEV. --

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES				UNDRAINED SHEAR STRENGTH (kPa)										REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
						TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	WATER CONTENT & ATTERBERG LIMITS DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m STANDARD PENETRATION TEST, BLOWS/0.3m																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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- ☐ Field Vane Test (kPa)
☒ Remoulded Vane Test (kPa)
☐ Pocket Penetrometer Test (kPa)

Jacques Whitford

CLIENT Bydixer Holdings Inc. c/o Ramada Hotel Toronto AirportPROJECT No. 1018795LOCATION 2 Holiday Drive, Etobicoke, OntarioDATUM GeodeticDATES: BORING November 10, 2006.

WATER LEVEL

November 26, 2006.TPC ELEV. --

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES				UNDRAINED SHEAR STRENGTH (kPa)										REMARKS & GRAIN SIZE DISTRIBUTION (%)				
						TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	WATER CONTENT & ATTERBERG LIMITS														
										50 100 150 200 W _p W W _L DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m STANDARD PENETRATION TEST, BLOWS/0.3m														
										10 20 30 40 50 60 70 80 90 100														
10	133.5	Grey, very dense, Sandy SILT / Silty SAND, trace gravel, trace clay, moist - auger grinding on inferred boulder or cobble - auger grinding on inferred boulder or cobble - wet			33																			
	34																							
	35																							
11	36				SS	13	360 / 360	100/200 mm																
	37																							
	38																							
	39																							
12	40				SS	14	250 / 280	50/130 mm																
	41																							
	42																							
13																								
14																								
	128.7																							
15		Grey, very dense, SAND, some silt, trace gravel, trace clay, wet			46	SS	15	560 / 560	72															
	128.0																							
		END OF BOREHOLE at approximately 15.5 m below existing grade.																						
16																								
		Groundwater monitoring well installed to a depth of approximately 15.2 m below existing grade.																						
17																								
18																								
19																								
20																								

- ☐ Field Vane Test (kPa)
☐ Remoulded Vane Test (kPa)
☐ Pocket Penetrometer Test (kPa)

JW Jacques Whitford

CLIENT Bydixier Holdings Inc. c/o Ramada Hotel Toronto AirportPROJECT No. 1018795LOCATION 2 Holiday Drive, Etobicoke, OntarioDATUM GeodeticDATES: BORING November 13, 2006.WATER LEVEL -TPC ELEV. --

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (m)	SAMPLES				UNDRAINED SHEAR STRENGTH (kPa)										REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
						TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	WATER CONTENT & ATTERBERG LIMITS DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m STANDARD PENETRATION TEST, BLOWS/0.3m 10 20 30 40 50 60 70 80 90 100											
0	143.1	75 mm of ASPHALTIC CONCRETE			0																
	142.8	Brown/grey, compact, SAND and GRAVEL (FILL), trace silt, wet			1	SS	1	360 610	26												
1		Dark brown, firm, Silty CLAY (FILL), with organic matter, wet			2																
					3	SS	2	560 610	6												
2		- stiff, some cobbles			4																
					5																
	140.7	Brown, hard, Silty CLAY / Clayey SILT (TILL), with sand, trace to some gravel, moist to wet			6	SS	3	25 610	14												
3					7																
					8	SS	4	610 610	32												
					9																
					10																
					11	SS	5	610 610	56												
4	139.0	- grey			12																
					13	SS	6	610 590	69												
					14																
5					15																
					16	SS	7	560 610	35												
					17																
					18																
					19	SS	8	610 610	85												
6					20																
					21	SS	9	610 610	75												
					22																
					23																
					24																
					25																
					26	SS	10	410 610	42												
8					27																
					28																
					29																
					30																
9	134.0	Grey, compact, SILT, trace sand, wet			31	SS	11	610 610	21												
					32																
10																					

Field Vane Test (kPa)

Remoulded Vane Test (kPa)

Pocket Penetrometer Test (kPa)

Jacques Whitford

- ☐ Field Vane Test (kPa)
☒ Remoulded Vane Test (kPa)
☐ Pocket Penetrometer Test (kPa)

CLIENT Bydixier Holdings Inc. c/o Ramada Hotel Toronto AirportPROJECT No. 1018795LOCATION 2 Holiday Drive, Etobicoke, OntarioDATUM GeodeticDATES: BORING November 13, 2006.WATER LEVEL --TPC ELEV. --

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES				UNDRAINED SHEAR STRENGTH (kPa)										REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
						TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	WATER CONTENT & ATTERBERG LIMITS DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m STANDARD PENETRATION TEST, BLOWS/0.3m																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

- ☐ Field Vane Test (kPa)
☒ Remoulded Vane Test (kPa)
☐ Pocket Penetrometer Test (kPa)

CLIENT Bydixer Holdings Inc. c/o Ramada Hotel Toronto AirportPROJECT No. 1018795LOCATION 2 Holiday Drive, Etobicoke, OntarioDATUM GeodeticDATES: BORING November 14, 2006WATER LEVEL --TPC ELEV. --

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES				UNDRAINED SHEAR STRENGTH (kPa)										REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
						TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR ROD(%)	50 100 150 200											
						WATER CONTENT & ATTERBERG LIMITS DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m STANDARD PENETRATION TEST, BLOWS/0.3m												W _p W I _L			
						10 20 30 40 50 60 70 80 90 100															
0	143.3	150 mm of ASPHALTIC			0																
	143.1	CONCRETE			1	SS	1	410 610	14												
	142.9	Brown/grey, compact, SAND and GRAVEL (FILL), trace silt, moist			2																
1		Brown, mottled grey, stiff to firm, Silty CLAY (FILL), some sand, with organic matter, moist			3	SS	2	510 610	12												
					4																
					5																
2					6	SS	3	410 610	8												
	141.0				7																
		Brown, hard, Silty CLAY / Clayey SILT (TILL), with sand, trace to some gravel, moist			8	SS	4	560 610	45												
3		- damp			9																
					10																
					11	SS	5	460 460	78												
					12																
4	139.1	- moist			13	SS	6	430 430	90/ 279 mm												
		- grey			14																
					15																
5					16	SS	7	610 610	50												
					17																
					18																
6					19																
					20																
					21	SS	8	360 410	78/ 254 mm												
					22																
7					23																
					24																
	135.6				25																
8		Grey, compact, SILT, some sand, trace gravel, moist			26	SS	9	560 610	30												
					27																
	134.6				28																
9		Grey, very dense, Sandy SILT / Silty SAND, trace gravel, trace cobbles, damp to wet			29																
					30																
					31	SS	10	250 280	50/ 130 mm												
					32																
10																					

Field Vane Test (kPa)

Remoulded Vane Test (kPa)

Pocket Penetrometer Test (kPa)

Jacques Whitford

□ Field Vane Test (kPa)

■ Remoulded Vane Test (kPa)

△ Pocket Penetrometer Test (kPa)


Jacques Whitford

TPC ELEV.



Jacques Whitford

CLIENT Bydixer Holdings Inc. c/o Ramada Hotel Toronto AirportPROJECT No. 1018795LOCATION 2 Holiday Drive, Etobicoke, OntarioDATUM GeodeticDATES: BORING November 14, 2006WATER LEVEL --TPC ELEV. --

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES				UNDRAINED SHEAR STRENGTH (kPa)										REMARKS & GRAIN SIZE DISTRIBUTION (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
						TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	50 100 150 200																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
						WATER CONTENT & ATTERBERG LIMITS										DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m										STANDARD PENETRATION TEST, BLOW/0.3m										7 28 46 19																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
						10 20 30 40 50 60 70 80 90 100																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
0	143.5	150 mm of ASPHALTIC			0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

- ☐ Field Vane Test (kPa)
☒ Remoulded Vane Test (kPa)
☐ Pocket Penetrometer Test (kPa)


TPC ELEV.

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES				UNDRAINED SHEAR STRENGTH (kPa)														
						TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR ROD(%)															
										WATER CONTENT & ATTERBERG LIMITS														
										DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m														
										STANDARD PENETRATION TEST, BLOWS/0.3m														
										10 20 30 40 50 60 70 80 90 100														
										Wp W L														
										REMARKS & GRAIN SIZE DISTRIBUTION (%)														
										GR SA SI CL														
10	133.5	Grey, very dense, Sandy SILT / Silty SAND, trace gravel, moist to wet			33																			
11								36	SS	11	430 460	85												
								37																
								38																
								39																
12								40																
								41	SS	12	250 250	50/ 100 mm												
					42																			
					43																			
					44																			
					45																			
14					46	SS	13	360 430	90/ 229 mm															
					47																			
	128.9	Brown, very dense, SAND, some silt, trace gravel, trace clay, wet			48																			
								49																
								50																
	128.0							51	SS	14	250 280	50/ 130 mm												
16		END OF BOREHOLE at approximately 15.5 m below existing grade.			52																			
		Borehole caved at a depth of approximately 13.5 m below existing grade on completion of drilling.			53																			
19					62																			
					63																			
					64																			
					65																			

Field Vane Test (kPa)

Remoulded Vane Test (kPa)

Pocket Penetrometer Test (kPa)

 Jacques Whitford

CLIENT Bydixer Holdings Inc. c/o Ramada Hotel Toronto AirportPROJECT No. 1018795LOCATION 2 Holiday Drive, Etobicoke, OntarioDATUM GeodeticDATES: BORING November 15, 2006WATER LEVEL --TPC ELEV. --

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES				UNDRAINED SHEAR STRENGTH (kPa)										
						TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	50 100 150 200 WATER CONTENT & ATTERBERG LIMITS DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m STANDARD PENETRATION TEST, BLOWS/0.3m 10 20 30 40 50 60 70 80 90 100 Wp W WL REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SL CL										
0	143.2	100 mm of ASPHALTIC CONCRETE			0															
	142.9	Brown, compact, SAND and GRAVEL (FILL), trace silt, moist	F		1	SS	1	360 460	13											
		Grey, stiff, Silty CLAY (FILL), some sand, trace to some organic matter and rootlets, wet	F		2															
1			F		3	SS	2	430 610	9											
	141.7	Brown, very stiff to hard, Silty CLAY / Clayey SILT (FILL), with sand, trace gravel, moist	F		4															
2			F		5	SS	3	560 610	20											
			F		6															
			F		7															
			F		8	SS	4	410 610	36											
			F		9															
			F		10															
			F		11	SS	5	530 390	63											
			F		12															
		- damp	F		13	SS	6	480 450	74 / 292 mm											
	138.7	- grey	F		14															
			F		15															
			F		16	SS	7	610 610	37											
			F		17															
			F		18															
			F		19															
			F		20															
		- moist	F		21	SS	8	510 610	39											
			F		22															
			F		23															
			F		24															
			F		25															
			F		26	SS	9	410 610	55											
			F		27															
			F		28															
			F		29															
			F		30															
			F		31	SS	10	280 280	50 / 130 mm											
			F		32															
10																				

- ☐ Field Vane Test (kPa)
☒ Remoulded Vane Test (kPa)
☐ Pocket Penetrometer Test (kPa)

CLIENT Bydixer Holdings Inc. c/o Ramada Hotel Toronto Airport

PROJECT No. 1018795

LOCATION 2 Holiday Drive, Etobicoke, Ontario

DATUM Geodetic

DATES: BORING November 15, 2006

WATER LEVEL _____

TPC ELEV. --

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATAPLOT	WATER LEVEL	DEPTH (ft)	SAMPLES				UNDRAINED SHEAR STRENGTH (kPa)										REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
						TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)													
										50 100 150 200												
										Wp W #L												
										WATER CONTENT & ATTERBERG LIMITS												
										DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m												
										STANDARD PENETRATION TEST, BLOWS/0.3m												
										10 20 30 40 50 60 70 80 90 100												
10	133.2	Grey, very dense, Sandy SILT / Silty SAND, trace gravel, damp to moist - auger grinding on inferred boulder or cobble - auger grinding on inferred boulder or cobble			33																	
	34																					
	35																					
11								36	SS	11	460 460	92										
								37														
								38														
								39														
12								40	SS	12	100 100	50/ 100 mm										
								41														
								42														
13					43																	
					44																	
					45	SS	13	250 250	50/ 100 mm													
14					46																	
					47																	
					48																	
					49																	
	127.8				50																	
	127.4	Grey, very dense, SAND, some silt, trace gravel, trace clay, wet			51	SS	14	560 560	61													
16		END OF BOREHOLE at approximately 15.8 m below existing grade.			52																	
					53																	
					54																	
17		Borehole caved at a depth of approximately 13.5 m below existing grade on completion of drilling.			55																	
					56																	
					57																	
					58																	
18					59																	
					60																	
					61																	
					62																	
19					63																	
					64																	
20					65																	

☐ Field Vane Test (kPa)
☐ Remoulded Vane Test (kPa)
☐ Pocket Penetrometer Test (kPa)

Jacques Whitford

CLIENT Bydixer Holdings Inc. c/o Ramada Hotel Toronto AirportPROJECT No. 1018795LOCATION 2 Holiday Drive, Etobicoke, OntarioDATUM GeodeticDATES: BORING November 16, 2006WATER LEVEL November 26, 2006TPC ELEV. --

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES				UNDRAINED SHEAR STRENGTH (kPa)											REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
						TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	WATER CONTENT & ATTERBERG LIMITS DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m STANDARD PENETRATION TEST, BLOWS/0.3m																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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☐ Field Vane Test (kPa)☐ Remoulded Vane Test (kPa)☐ Pocket Penetrometer Test (kPa)

Jacques Whitford

TPC ELEV. --

JW Jacques Whitford

CLIENT Bydixer Holdings Inc. c/o Ramada Hotel Toronto AirportPROJECT No. 1018795LOCATION 2 Holiday Drive, Etobicoke, OntarioDATUM GeodeticDATES: BORING November 16, 2006WATER LEVEL --TPC ELEV. --

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES				UNDRAINED SHEAR STRENGTH (kPa)											REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SL CL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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CLIENT Bydixer Holdings Inc. c/o Ramada Hotel Toronto AirportPROJECT No. 1018795LOCATION 2 Holiday Drive, Etobicoke, OntarioDATUM GeodeticDATES: BORING November 16, 2006WATER LEVEL --TPC ELEV. --

DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	SAMPLES				UNDRAINED SHEAR STRENGTH (kPa)										REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
						TYPE	NUMBER	RECOVERY (mm) TCR(%) / SCR(%)	N-VALUE OR RQD(%)	WATER CONTENT & ATTERBERG LIMITS DYNAMIC CONE PENETRATION TEST, BLOWS/0.3m STANDARD PENETRATION TEST, BLOWS/0.3m											
										10	20	30	40	50	60	70	80	90	100		
10	133.51	Grey, very dense, Sandy SILT / Silty SAND, moist to wet - trace gravel			33																
					34																
					35	X SS	11	280 / 280	50 / 130 mm												
11					36																
					37																
					38																
					39																
12					40	X SS	12	280 / 290	50 / 140 mm												
					41																
					42																
13				43																	
				44																	
14				45																	
				46	X SS	13	430 / 450	86 / 292 mm													
				47																	
15				48																	
				49																	
	128.0			50	X SS	14	250 / 270	50 / 110 mm													
16		END OF BOREHOLE at approximately 15.5 m below existing grade.			51																
		Borehole dry on completion of drilling.			52																
17				53																	
				54																	
				55																	
18				56																	
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