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Tel: 647-795-8153 | www.pecg.ca

Date: March 26, 2024
Project #: 2401801

To: Jack Greenburg
The Brock Zents Partnership
181 Eglington Ave E, Suite #204
Toronto, ON
M4P 1J4

From: Tanvi Patel M.Env.Sc., G.I.T. and Jason Cole, M.Sc., P. Geo.

Re: **Supplemental Hydrogeological Assessment: Short-Term Dewatering and Long-Term Seepage Estimate Updates**
2660-2680 Brock Road, Pickering, ON

1. Introduction

Palmer was retained by The Brock Zents Partnership (Brock Zents or the "client") to undertake a Supplemental Hydrogeological Assessment to provide updated short-term dewatering and long-term groundwater seepage rate estimates for the proposed development located at 2660-2680 Brock Road, Pickering Ontario (the "site"). The site is located on the southwest corner of Brock Road and Zents Road (**Figure 1**).

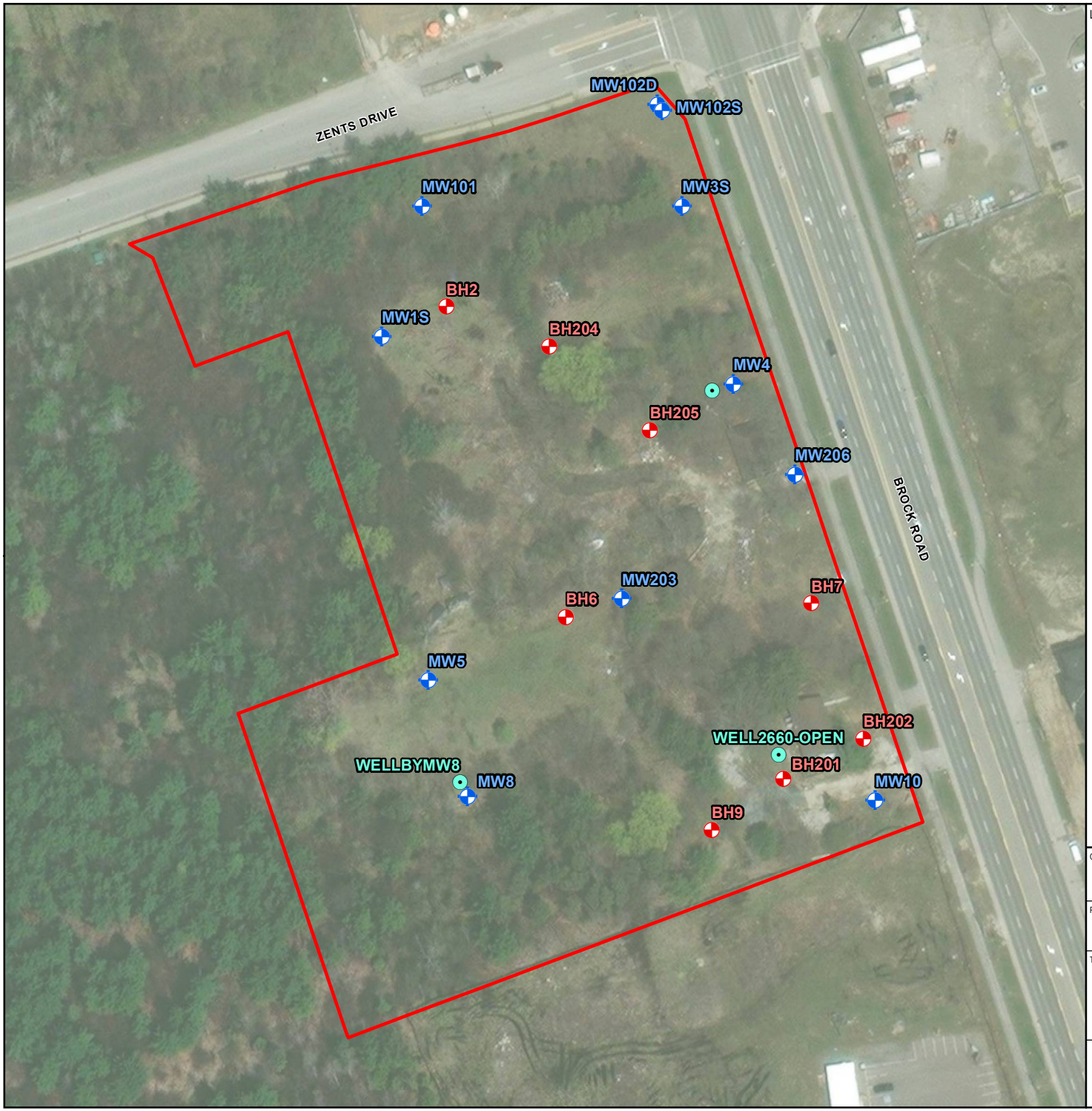
Based on the site plan provided by GMB Architecture (2023) (**Attachment A**), the proposed development will consist of 274 unit Stacked Townhouse Development with one (1) level of basement garage parking. **Table 1** summarizes the P1 depth, anticipated excavation depths and dimensions of each parking level.

Table 1. Parking Garage Elevation and Dimension

Parking Section	Ground Surface Elevation (masl)	P1 Elevation (masl)	Approx. Anticipated Excavation Elevation (masl)	Approx. Excavation Length (m)	Approx. Excavation Width (m)
Brock Road	129.9 - 130.7	128.25 – 128.95	126.8 – 127.6	159.8	17.8
Zents Drive	130.7 – 131.2	129.35 – 130.55	127.9 – 129.3	92.6	17.8

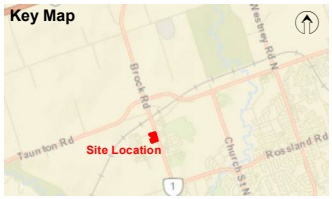
Note: metres above sea level (masl)

Based on the results of previously hydrogeological reporting by Terrapex (2022), the P1 elevations presented in **Table 1** have been raised from their original elevation of approximately 126 masl to avoid a confined aquifer identified below the site.



LEGEND

- Borehole
- Monitoring Well
- Water Well
- Subject Site



0 5 10 20 30 40 50
METRE SCALE

North American Datum 1983
Universal Transverse Mercator Projection Zone 17

Scale: 1:1,500
Page Size: Letter (8.5 x 11 inches)

Drawn: CV
Checked: TPat
Date: Mar 14, 2024

Source Notes:
Imagery (2022) provided by Esri basemap service

NORTH

CLIENT
The Brock Zents Partnership

PROJECT
2660 - 2680 Brock Road

TITLE
Site Location

Palmer | PART OF SLR

REF. NO. 2401801-1-1

Figure 1

Document Path: G:\Shared drives\Projects 2024\24018 - The Brock Zents Partnership\2401801- 2660-2680 Brock Road HydroG\GIS\1_Workspace\Task 1 - HydroG Figures\2401801-1-1-Site Location.mxd

2. Existing Conditions Summary

The site is located within the Iroquois Plain physiographic region, south of South Slope physiographic region (Chapman & Putnam, 1984). Ontario Geological Survey (OGS) Surficial Geology of Southern Ontario (2010) mapping indicated that the site is situated in an area composed of course-textured glaciolacustrine deposits overlying Newmarket Till. Based on local knowledge, it is anticipated that the Thorncliffe Aquifer may be present at shallow depths below the Newmarket Till in the vicinity of the site.

3. Site Specific Geology

3.1 Site Stratigraphy

The stratigraphy underlaying site is delineated based on boreholes and monitoring wells drilled for a previous assessment completed as part of Terrapex's Hydrogeological Review (Terrapex, 2022). Borehole logs are included for reference in **Attachment B**. The monitoring wells were constructed using environmental grade, 50 mm diameter, Schedule 40, PVC piping with machine slotted (10 slot) screens at the bottom that were open for a 1.5 m or 3.0 m length.

The observed stratigraphy on site generally comprised of topsoil and fill overlying thin coarse-textured glaciolacustrine sediments underlain by clayey, sandy silt Newmarket Till. Below the Newmarket Till, deposits of silt, sandy silt, sand, gravelly sand to sandy gravel were found below the Newmarket Till and are expected to represent the Thorncliffe Aquifer. Cross Sections from Terrapex (2024) are included in **Attachment C**, that shows the site hydrostratigraphy.

3.2 Groundwater Level and Flow

Static groundwater levels were previously measured by Terrapex between May 2018 and October 2021. Groundwater levels were measured by Palmer on March 6th, 2024. Groundwater levels measured in fourteen (14) monitoring wells ranged from 0.12 to 7.97 mbgs (123.6 to 131.0 masl). **Table 2** below summarizes groundwater level data collected by both Terrapex and Palmer to show the seasonal high, seasonal low and a comparison between the Palmer and Terrapex data. The full suite of previous groundwater level data from Terrapex is presented in **Attachment D**.

Table 2. Groundwater Level Flow Summary

MW ID	Surface Elevation (masl)	Date Ranges for Terrapex Data	GW Levels – Terrapex				GW Levels – Palmer 06-March-2024	
			mbgs		masl			
			Deep	Shallow	Deep	Shallow	mbgs	masl
MW1(S)	**132.0**	May 2018 - Oct 2021	1.1	0.19	130.93	131.84	0.45	131.6
MW1(D)	**132.0**	May 2018 - Oct 2021	5.28	3.96	126.75	128.07	5.00	127.0
MW3(D)	**130.4**	May 2018 - Oct 2021	5.34	2.23	125.04	128.14	3.56	126.8
MW3(S)	**130.3**	May 2018 - Oct 2021	> 3.10	1.2	<127.24	129.15	2.86	127.5
MW4	**129.8**	May 2018 - Oct 2021	4.88	2.07	124.9	127.7	3.13	126.6
MW5	**131.6**	May 2018 - Oct 2021	7.97	5.11	123.6	126.5	6.26	125.3
MW8(D)	**131.6**	May 2018 - Oct 2021	7.37	4.64	124.3	127.0	5.85	125.8

MW ID	Surface Elevation (masl)	Date Ranges for Terrapex Data	GW Levels – Terrapex				GW Levels – Palmer 06-March-2024	
			mbgs		masl			
			Deep	Shallow	Deep	Shallow	mbgs	masl
MW8(S)	**131.0**	Jun 2019 - Oct 2021	> 3.96	1.49	<127.07	129.6	0.67	130.4
MW10	**129.3**	May 2018 - Oct 2021	> 3.90	0.35	<125.49	128.9	0.63	128.7
MW101	**131.2**	Jun 2019 - Oct 2021	2.56	0.29	128.7	131.0	0.12	131.1
MW102(D)	**130.7**	Jun 2019 - Oct 2021	5.66	2.88	125.0	127.8	3.76	126.9
MW102(S)	**130.7**	Jun 2019 - Oct 2021	> 3.66	2.44	<127.02	128.2	3.19	127.5
MW203	**131.6**	Oct 2021	> 6.10	5.01	<125.51	125.7	3.11	128.5
MW206	**130.6**	Oct 2021	3.75	3.65	125.94	126.0	2.95	127.61

3.3 Single Well Response Testing

On March 6th, 2024, Palmer staff conducted single wells response testing at select pre-existing monitoring wells to assess the in-situ hydraulic conductivity of the screened stratigraphy. A change in head was created in each of the five (5) wells through removing a column of groundwater and the rate of recovery was measured using a datalogger installed in the well to collect groundwater level measurements during the test.

Hydraulic conductivity values (K-value) were then estimated using the displacement-time data and were analysed using the Unconfined Bouwer-Rice (1976) method using Aqtesolv™ software. The analysis results are presented in **Attachment E**, and the range of estimated K-values are summarized below in **Table 3**. The hydraulic conductivity results collected by Palmer are consistent with the hydraulic conductivity results as reported by Terrapex (2022).

Table 3. Hydraulic Conductivity Summary Table

MW ID	Screened Geology	Solution	Test Type	Hydraulic Conductivity (K) (m/s)	Geometric Mean K (m/s)	90th Percentile K (m/s)
MW1(S)	Till	Unconfined Bouwer-Rice	Rising Head	1.4×10^{-8}	1.6×10^{-8}	1.8×10^{-8}
MW101		Unconfined Bouwer-Rice	Rising Head	1.9×10^{-8}		
MW3(D)	Aquifer: Dense sandy silt / silty sand	Unconfined Bouwer-Rice	Rising Head	1.3×10^{-5}	-	-
MW4		Unconfined Bouwer-Rice	Rising Head	7.6×10^{-8}	-	-

4. Short-Term Dewatering and Long-Term Seepage Assessment

Based on our understating of the project, the proposed development includes the installation of two underground parking garages to a P1 level (**Attachment A**). The proposed dimensions and elevations of the parking garage level P1 for both the Zents Drive and Brock Road parking garages are summarized in **Table 1**.

As previously mentioned, the P1 foundation level has been raised from previous designs to avoid intercepting the Thorncliffe Aquifer (shown in cross section in **Appendix C**). Based on the borehole logs and soil permeability data reviewed by Palmer, it is interpreted that the new P1 foundation level is located entirely within the till and thin glaciolacustrine soils, sufficiently above the Thorncliffe Aquifer. Assuming that footings will need to be dug to 1.5 m below the P1 level, an area near the foundation for Block 4 (at MW4) is interpreted to intercept a small portion of the Thorncliffe Aquifer. Additional dewatering should be expected in this area and have been included in our short-term dewatering calculations. The remainder of the excavations for the P1 level are expected to terminate within the till soils.

It is important to note that all excavation dimensions and depths used in this report are presented solely for the purposes of estimating groundwater dewatering rates and are not intended to direct construction activity.

4.1 Short-Term Construction Dewatering

4.1.1 Dewatering Rate Estimate

To maintain stable and dry working conditions within till soils, the water level should be lowered to at least 0.5 m below the proposed maximum excavation depth. The excavation depth and dimension for both parking garages are outlined in **Table 1**. To account for footing depth and excavation, 1.5 m was added to the Parking Level (P1) depths for both parking garages. The spring months highest measured groundwater level during the previous monitoring period was used to account for springtime high groundwater levels.

The highest measured groundwater level during a previous monitoring event on April 23rd, 2019, is 131.8 masl (at MW1(S)). The highest measured groundwater level underlying the extent of the Brock Road parking garage during a previous monitoring event on May 17th, 2018, is 129.15 masl (MW3(S)). These values are interpreted represent a perched groundwater table within the upper till and thin glaciolacustrine soils that is perched on the low permeability till below. The true groundwater table is interpreted to be located within the Thorncliffe Aquifer as represented by water level data from MW3D, MW4, MW102D, MW106.

Dewatering rate estimate (Q) for the building foundation excavations was calculated using trench shaped unconfined solution. The calculation used the highest groundwater level measured underlying each parking garage, deepest foundation elevations, and the highest K-value calculated for dewatered soils. A dewatering rate estimate is also provided for a ~30 m section of Brock Rd parking garage where there is expected to be higher permeability soils to give a conservative value to account for the potential of encountering sandy/silty sand/sandy silt soils in the Thorncliffe Aquifer, which would result in higher

dewatering rates over this length. Dewatering calculations assume the entire parking garage extent will be constructed at the same time.

Table 4 summarizes the dewatering rate estimates (Q) calculations for the two (2) open-cut parking garages using the following equation from Powers et.al (2007) for trench-shaped excavations:

Unconfined solution:

$$Q_{open\ cut} = Q = \frac{\pi K(H^2 - h^2)}{ln\ (\frac{Ro}{r_e})} + 2\left[\frac{xK(H^2 - h^2)}{2L}\right] \quad m^3/s$$

Where K = hydraulic conductivity (m/s)
H = saturated thickness (m)
h = saturated thickness after dewatering (m)
R_0 = radius of influence estimated using the Sichardt Approximation:
R = 3000 * (H-h)*$\sqrt{K}$ (m)
r_e = equivalent well radius estimated by:
$r_e = \sqrt{\frac{a*x}{\pi}}$ (m)
Where a = excavation width (m)
x = excavation length (m)

Table 4. Dewatering Rate Assessment

Parameters	Zents Drive Parking Garage	Brock Road Parking Garage	
Parking Level 1 Base Elevation (masl)	129.35	128.25	
Approx. Excavation Elevation (masl)	127.90	126.80	
Groundwater Level Target (masl)	126.90	125.80	
Assumed High Groundwater Level (masl)	131.8	129.2	
Dewatered Medium	Till	Till	Aquifer Sand/Silty Sand / Sandy Silt
K (m/s)	$1.9x10^{-8}$	$1.9x10^{-8}$	$9.8x10^{-6}$
H (m)	4.40	2.90	14
h (m)	0	0	13
a (m)	17.8	17.8	17.8
x (m)	92.6	159.8	30.0
R_0 (m)	**24.7**	**31.3**	**22.4**

Parameters	Zents Drive Parking Garage	Brock Road Parking Garage	
Q (L/day)	1,544	1,251	193,541
$Q_{UF=1.5x}$ (L/day)	2,316	292,191	

a – trench width
x – trench length
K –hydraulic conductivity of dewatered medium
H – initial saturated thickness
h – saturated thickness after dewatering
R – radius of influence
L – line source distance
Q – dewatering rate

As summarized in **Table 4**, the groundwater dewatering rate expected for the Zents Drive parking garage is 2,316 L/day. To be conservative, the Contractor should expect a rate of approximately 5,000 L/day of groundwater seepage into the Zents Drive parking garage. A 25 mm storm event could add an additional 41,207 L to the Zents Drive parking structure excavation.

As also summarized in **Table 4**, the groundwater dewatering rate expected for the Brock Road parking garage is 292,191L/day. Excavations in the till soils are expected to be similar to those along Zents Drive, but due to an approximately 30 m long section of the Brock Road parking garage where more permeable sands are expected to bisect the excavation depth, there is expected to be a section of the excavation near Block 4 where additional dewatering effort will be required. A 25 mm storm event could add an additional 71,111 L to the Brock Road parking structure excavation.

4.2 Foundation Drainage Assessment

Following completion of the P1 foundation excavation, it is expected that the P1 invert level (shown as the P1 Driving Level in **Appendix C**) will be generally located above the groundwater table. Accounting for potentially higher spring water levels and the presence of a foundation water collection drain located at 0.3 m below the P1 level, there appears to be a potential for some minor groundwater seepage into the foundation drains. The P1 foundation collection drains are located above the Thorncliffe Aquifer and any seepage is interpreted to originate from the till and glaciolacustrine soils.

Table 5 summarises the estimated results for the rate of long-term groundwater seepage into the foundation drains of the Zents Ave and Brock Road underground parking structures. Based on this assessment, approximately 941 L/day of groundwater seepage is expected for the Zents Drive foundation and 5,280 L/day of groundwater seepage is expected for the Brock Road foundation.

Parking Section	Ground Surface Elevation (masl)	P1 Elevation (masl)	Approx. Anticipated Excavation Elevation (masl)	Approx. Excavation Length (m)	Approx. Excavation Width (m)
Brock Road	129.9 - 130.7	128.25 – 128.95	126.8 – 127.6	159.8	17.8
Zents Drive	130.7 – 131.2	129.35 – 130.55	127.9 – 129.3	92.6	17.8

Table 5. Foundation Drainage Summary

Parameters		Zents Drive Parking Garage	Brock Road Parking Garage
Horizontal Dimension	Width (m)	17.8	17.8
	Length (m)	92.6	159.8
Footing Elevation (masl)		129.2	128.1
Groundwater Level Target (masl)		128.6	127.5
Groundwater Level (masl)		131.8	129.2
Dewatered Medium		Till	Till and Glaciolacustrine Soils
K (m/s) - geomean		$1.8x10^{-8}$	$3.9x10^{-7}$
H (m)		3.2	1.7
h (m)		0	0
a (m)		17.8	17.8
x (m)		92.6	159.8
$Q_{drainage}$ (L/day)		**976**	**4,028**

a – trench width
x – trench length
K –hydraulic conductivity of dewatered medium
H – initial saturated thickness
h – saturated thickness after dewatering
R – radius of influence
L – line source distance
Q – dewatering rate

4.3 Water Taking Permit Recommendations

Construction dewatering in excess of 50,000 L/day requires a registration on the Environmental and Section Registry (EASR) with the Ministry of the Environment, Conservation and Parks (MECP). Dewatering above 400,000 L/day requires a Category 3 Permit to Take Water (PTTW).

Based on the dewatering rates provided above, the highest dewatering rate based on the assumptions provided is estimated to be 292,191 L/day Brock Road P1 Parking Garage excavation to account for the potential of encountering permeable silty sand/sandy silt soils of the Thorncliffe Aquifer. An additional 5,000 L/day of construction dewatering should be expected for the Zents Drive P1 Parking Garage excavation. Projects with overlapping groundwater drawdown cones are required to be permitted under the same EASR or PTTW.

Therefore, an EASR registration with the MECP is required for construction phase dewatering in the amount of 297,191 L/day.

As the long-term groundwater seepage is less than 50,000 L/day, no MECP permitting is required.

4.4 Sewer Discharge Permitting Recommendations

A temporary sewer discharge permit should be obtained from Durham Region for dewatering discharge into the storm sewer along Brock Road. Additional groundwater quality sampling against Durham Region

Storm Sewer Discharge By-Law Criteria will be required as part of this permit submission. A SWM Engineer should confirm that the sewer has the capacity to handle the proposed construction phase dewatering volumes.

Given the low long-term seepage rates predicted, it is expected that the storm sewer will have capacity for the volume of foundation drainage water; however, this should be confirmed with the SWM Engineer for the project and/or Durham Region.

5. Statement of Limitations

The extent of this study was limited to the specific scope of work for which we were retained and that is described in this report. Palmer has assumed that the information provided by the client, or any secondary sources of information are factual and accurate. Palmer accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations, or negligent acts from relied upon data. Judgment has been used by Palmer in the interpretation of the information provided but subsurface physical and chemical characteristics may differ from regional scale geology mapping and vary between or beyond well/borehole locations given the inherent variability in geological conditions.

Palmer is not a guarantor of the geological or groundwater conditions at the subject site but warrants only that its work was undertaken, and its report prepared in a manner consistent with the level of skill and diligence normally exercised by competent geoscience professionals practicing in the Province of Ontario. Our findings, conclusions and recommendations should be evaluated in light of the limited scope of our work.

The information and opinions expressed in the Report are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT PALMER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS PALMER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belongs to Palmer. Any use which a third party makes of the Report is the sole responsibility of such third party. Palmer accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Palmer's express written permission. Should the project design change following issuance of the Report, Palmer must be provided the opportunity to review and revise the Report in light of such alteration or variation.

6. Signatures

Thank you for the opportunity to support The Brock Zents Partnership with this interesting project. Should there be any question on this report, please contact the undersigned.

Prepared By:

Tanvi Patel, M.EnvSc., G.I.T.
Hydrogeologist-In-Training

Reviewed By & Approved By:

Jason Cole, M.Sc., P.Geo.
VP, Principal Hydrogeologist

References

Armstrong, D.K., and Dodge, J.E.P., 2007: Paleozoic Geology Map of Southern Ontario. Ontario Geological Survey, Miscellaneous Release – Data 219.

Chapman, L.J., and Putnam, D.F., 2007: The Physiography of Southern Ontario. Ontario Geological Survey, Miscellaneous Release – Data 228.

Ontario Geological Survey, 2003: Surficial Geology of Southern Ontario.

Terrapex Environmental Ltd., 2022: Hydrogeological Review. Reference CT2694.03

Terrapex Environmental Ltd., 2024: Supplementary Dewatering and infiltration Study. Reference CT2694.

Attachment A – Design Drawings (GMB Architecture, 2023)

BUILDING / SITE STATISTICS

4 STOREY STACKED: 162 UNITS
3 STOREY REAR LANE STACKED TOWNS: 82 UNITS
3 STOREY REAR LANE STANDARD TOWNS: 30 UNITS
TOTAL: 274 UNITS

PARKING STATS

4 STOREY STACKED: 162 SPACES @ 1 SPACE / UNIT
3 STOREY REAR LANE STACKED TOWNS: 164 SPACES @ 2 SPACES / UNIT
3 STOREY REAR LANE STANDARD TOWNS: 60 SPACES @ 2 SPACES / UNIT
TOTAL RESIDENT PARKING PROVIDED: 386 SPACES
TOTAL VISITOR PARKING PROVIDED: 64 SPACES @ 0.23 SPACES / UNIT
TOTAL PARKING PROPOSED: 446 SPACES

- Contractor shall check all dimensions and report any discrepancies to the Architect before proceeding with the work.
- The contractor and/or engineeer shall verify u/s footing elevations and soil bearing capacity prior to excavation and the commencement of work.
- DO NOT SCALE DRAWINGS

no.	date	revision
2	DEC 7, 2023	ISSUED FOR REVIEW
1	NOV 28, 2023	ISSUED FOR REVIEW

gmb ARCHITECTURE
770 BROWN'S LINE, TORONTO, ON M8W 3W2 - T(416) 252-5679 F(416) 252-9637

owner
BROCK -ZENTS PARTNERSHIP

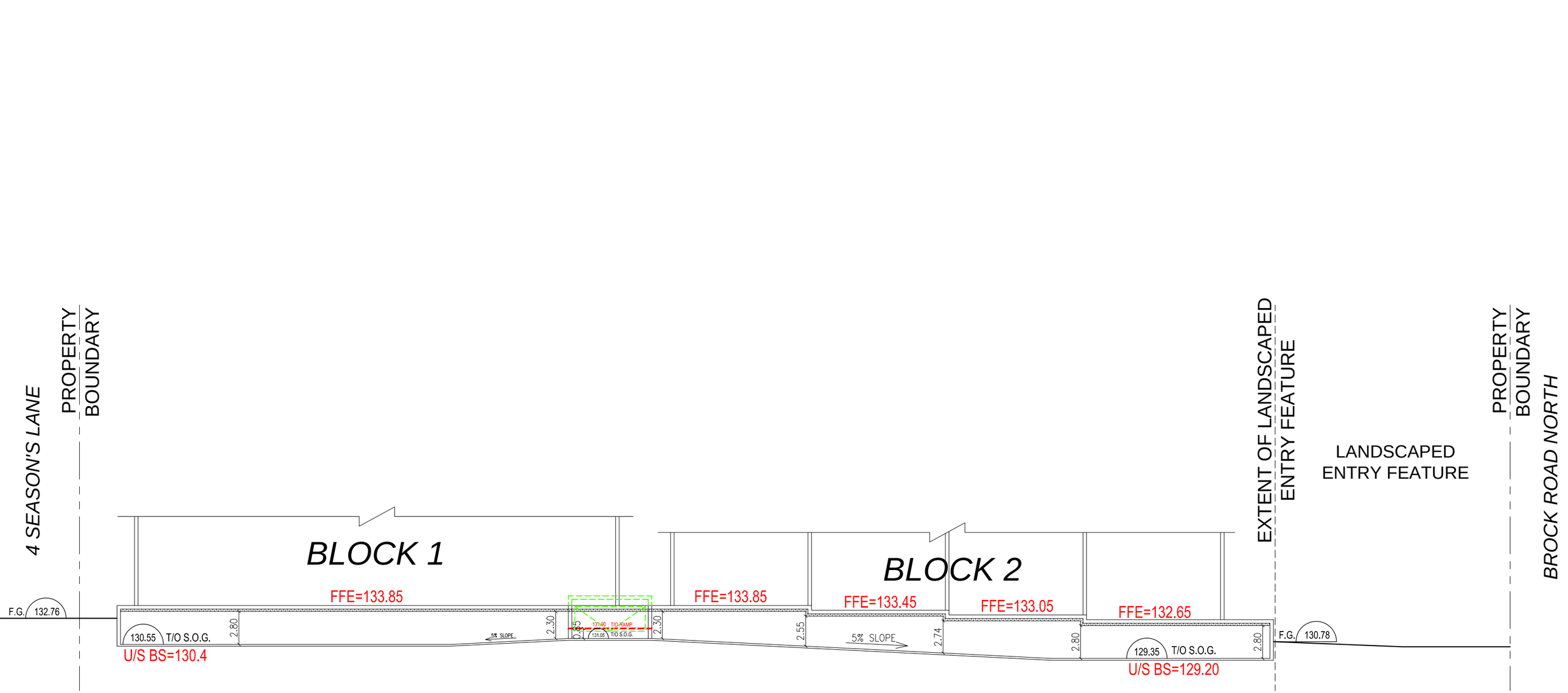
project
ZENTS - BROCK TOWNS
2680 BROCK ROAD
PICKERING, ONTARIO

drawing
SITE CONCEPT PLAN
SITE/BLOCK/UNIT STATS

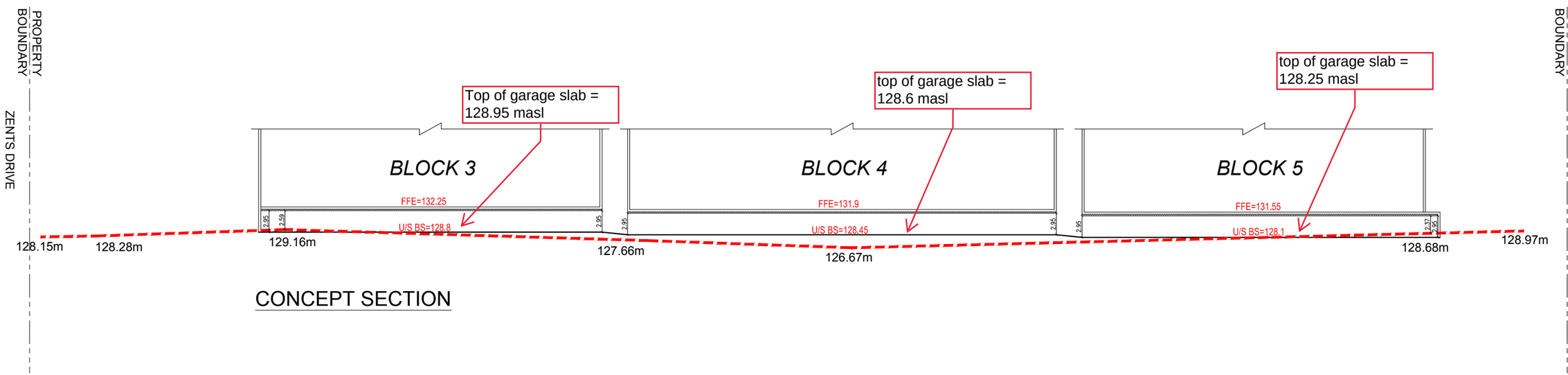
scale	1:500
date	DEC 2023
drawn	BB
chk'd	

SP-1

project number 22.185



CONCEPT SECTION



CONCEPT SECTION

Attachment B – Borehole Logs (Terrapex, 2022 & 2024)

CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW1D**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 132.03	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SAMPLE NO.	SAMPLE TYPE	SPT (N)	Well Construction	REMARKS
	Topsoil (400 mm)	0	132	1		3		Borehole cave-in at 12.1 m below ground surface (mbgs) and the groundwater measured at 7.3 mbgs on complition.
		0.5	131.5					
		1	131	2		46		Groundwater measured at 4.36 mbgs on May 23, 2018.
		1.5	130.5	3		83/275		
		2	130					
	brown damp to moist with oxidization	2.5	129.5	4		50/125		
	-----	3	129	5		50/150		
		3.5	128.5					
		4	128					
▽	grey moist	4.5	127.5					
	hard SANDY CLAYEY SILT trace gravel (TILL)	5	127	6		75		
		5.5	126.5					
		6	126					Bentonite
		6.5	125.5	7		60		
▼		7	125					sand
	with sand seams	7.5	124.5					
		8	124	8		35		sand + screen
		8.5	123.5					
		9	123					
		9.5	122.5	9		40		

Shear Strength (kPa) 40 80 120 160 ● — N-Value (Blows/300mm) ▲ 20 40 60 80

Water Content (%) PL W.C. LL 20 40 60 80

TERRAPEX

LOGGED BY: SA	DRILLING DATE: May 4, 2018
REVIEWED BY: VN	Page 1 of 2

CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon	**BH No.: MW1D**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN / ELEV. (m) 132.03	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING: / EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		very dense, wet, grey SAND AND SILT trace gravel, trace clay (TILL) with sand seams and layers	10	122							Augering through rock/ boulder
			10.5	121.5	50/150		10		50/ 150		
			11	121							
			11.5	120.5							
		very dense, wet, grey SANDY GRAVEL	12	120	50/150		11		50/ 150		
			12.5	119.5							
		hard, damp, grey CLAYEY SILT	13	119							Augering through rock/ boulder
			13.5	118.5	50/100		12		50/ 100		
		END OF BOREHOLE									

TERRAPEX

LOGGED BY: SA	DRILLING DATE: May 4, 2018
REVIEWED BY: VN	Page 2 of 2

CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon	**BH No.: MW1S**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN / ELEV. (m) 132.03	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING: / EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT (N)	Well Construction	REMARKS
▽		Straight auger to install the monitoring well	0 0.5 1 1.5 2 2.5 3 3.5 4 4.5	132 131.5 131 130.5 130 129.5 129 128.5 128 127.5						Bentonite Sand Sand + Screen	Groundwater measured at 0.81 mbgs on May 23, 2018.
		END OF BOREHOLE									

TERRAPEX

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: BH2**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 131.44	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
	Topsoil (300 mm)	0	131	24		1A				Borehole cave-in at 7.6 mbgs and the groundwater measured at 6.7 mbgs on complition.
	compact, moist, brown SANDY SILT	0.5				1B		24		
	hard, damp, brown SANDY CLAYEY SILT trace gravel (TILL)	1	130.5	60		2		60		
		1.5	130	50/150		3		50/150		
		2	129.5							
	brown damp to moist with oxidization	2.5	129	50/125		4		50/125		
		3	128.5	50/100		5		50/100		
	-----	3.5	128							
		4	127.5							
	grey moist to wet	4.5	127							
	very dense SANDY SILT trace gravel trace to some clay (TILL) with sand seams and layers	5	126.5	52		6		52		
		5.5	126							Augering through rock/ boulder
		6	125.5	50/100		7		50/100		
▼		6.5	125							
		7	124.5							
		7.5	124	50/150		8		50/150		
		8	123.5							Augering refusal due to a boulder
	END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW3D**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 130.37	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT (N)	Well Construction	REMARKS
		Topsoil (600 mm)	0	130	3		1		3		Borehole cave-in at 4.3 mbgs and the groundwater measured at 2.4 mbgs on complition.
		compact to dense, moist, brown silty sand, trace gravel, trace clay (Probable FILL)	0.5 – 1.5	129.5 – 129	25		2		25		Groundwater measured at 2.67 mbgs on May 23, 2018.
▼			1.5 – 2	129 – 128.5	42		3		42		
		very dense, brown, moist SANDY SILT with slight cohesion intermixed with TILL layers	2 – 3.5	128.5 – 127.5	52		4		52		
▽			3 – 4.5	127.5 – 126	57		5		57		
			4.5 – 5	126 – 125.5	50/125		6		50/125		Bentonite
			5 – 5.5	125.5 – 125							sand
		brown wet	5.5 – 6	125 – 124.5							sand + screen
			6 – 6.5	124.5 – 124	71/275		7		71/275		
		very dense SANDY SILT to SILTY SAND trace gravel	6.5 – 7	124 – 123.5							
		-----	7 – 7.5	123.5 – 123							Straight auger to install the monitoring well.
		grey wet	7.5 – 8	123 – 122.5	50/125		8		50/125		
			8 – 8.5	122.5 – 122							
			8.5 – 9	122 – 121.5							
			9 – 9.5	121.5 – 121	50/150		9		50/150		

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW3D**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 130.37	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		very dense, wet, grey SILTY SAND	10	120.5							
			10.5	120							
			11	119.5	96/250		10		96/250		
			11.5	119							
			12	118.5							
			12.5	118	50/125		11		50/125		
			13	117.5							
			13.5	117							
				116.5	50/125		12		50/125		
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon	**BH No.: MW3S**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN / ELEV. (m) 130.34	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING: / EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT (N)	Well Construction	REMARKS
▽		Straight auger to install the monitoring well	0 0.5 1 1.5 2 2.5 3	130 129.5 129 128.5 128 127.5						Sand Sand + Screen Bentonite	Groundwater measured at 1.62 mbgs on May 23, 2018.
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Hollow Stem Auger and Split Spoon		**BH No.: MW4**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 129.77	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		Topsoil (600 mm)	0	129.5	1		1		1		Groundwater measured at 2.58 mbgs on May 23, 2018.
		dense, moist, brown SILTY SAND	0.5	129							
			1	128.5	31		2		31		
			1.5	128	39		3A		39		
			2				3B				
			2.5	127.5	52		4		52		
		brown moist with slight cohesion	3	127							
			3.5	126.5	55		5		55		
		-----	4	126							
		very dense SANDY SILT trace to some clay	4.5	125.5							Bentonite
		grey wet	5	125	80		6		80		
			5.5	124.5							
			6	124							sand
			6.5	123.5	90/275		7		90/275		sand + screen
			7	123							
		very dense, grey, wet SILTY SAND trace gravel	7.5	122.5							
			8	122	50/125		8		50/125		
			8.5	121.5							
			9	121							
			9.5	120.5	85		9		85		
				120							

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CLIENT: The Brock Zents Partnership	METHOD: Hollow Stem Auger and Split Spoon		**BH No.: MW4**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 129.77	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		very dense, wet, grey SAND trace to some gravel trace silt	10	119.5	71		10		71		
			10.5	119							
			11	118.5							
			11.5	118			11		50/125		Augering through rock/ boulder
			12	117.5	50/125						
			12.5	117							
		hard, grey, moist CLAYEY SILT	13	116.5							
			13.5	116	50/150		12		50/150		
			14								
		END OF BOREHOLE									

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LOGGED BY: SA | DRILLING DATE: May 2 & 3, 2018

REVIEWED BY: VN |

CLIENT: The Brock Zents Partnership	METHOD: Hollow Stem Auger and Split Spoon		**BH No.: MW5**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 131.59	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
	black, moist, sand and gravel (FILL)	0	131.5	8		1		8		Groundwater measured at 5.56 mbgs on May 23, 2018.
		0.5	131							
		1	130.5	30		2		30		
		1.5	130	66		3		66		
		2	129.5							
	brown damp	2.5	129	50/150		4		50/150		
		3	128.5							
	-----	3.5	128	72		5		72		
	grey moist	4	127.5							
	very dense SAND and SILT trace gravel, trace clay (TILL)	4.5	127							
		5	126.5	52		6		52		
		5.5	126							
▽		6	125.5							Bentonite
		6.5	125	46		7		46		Augering through rock/ boulder
		7	124.5							
		7.5	124							sand
		8	123.5	50/150		8		50/150		sand + screen
		8.5	123							Augering through rock/ boulde
		9	122.5	50/125		9		50/125		
	END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: BH6**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 130.94	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		Topsoil (600 mm)	0	130.5	8		1		8		Borehole cave-in at 11.3 mbgs and the groundwater measured at 0.6 mbgs on complition.
		compact to dense	0.5	130	17		2		17		
		-----	1	129.5	40		3		40		
			1.5	129							
		brown moist	2	128.5	51		4		51		
			2.5	128	50/125		5		50/125		
		-----	3	127.5							
		grey moist to wet	3.5	127	75/275		6		75/275		
		very dense SAND AND SILT trace gravel, trace clay (TILL) with sand layers and seams	4	126.5	70		7		70		
			4.5	126							
			5	125.5							
			5.5	125	50/125		8		50/125		
			6	124.5							
			6.5	124							
			7	123.5	50/125		9		50/125		
			7.5	123							
			8	122.5							
			8.5	122							
		very dense, wet, grey GRAVELLY SAND	9	121.5	91/275		10		91/275		
			9.5								

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: BH6**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 130.94	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		very dense, wet, grey SAND AND SILT trace gravel, trace clay (TILL) with sand seams and layers	10	121							
			10.5	120.5							
			11	120	50/150		11		50/150		
			11.5	119.5							
		very dense, wet, grey SANDY GRAVEL	12	119							
			12.5	118.5	50/275		12		50/275		
			13	118							
		hard, damp, grey SAND AND SILT trace gravel, trace clay (TILL) with shale pieces	13.5	117.5							(Possible BEDROCK)
					50/20		13		50/20		
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Hollow Stem Auger and Split Spoon		**BH No.: BH7**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 129.91	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		Topsoil (150 mm)	0	129.5	7	23	1		7		Borehole cave-in at 4.5 mbgs and the groundwater measured at 1.8 mbgs on complition.
		firm, dark brown , moist clayey silt (FILL) with sandy gravell layer	0.5								
			1	129	6	18	2		6		
			1.5	128.5		15					
▼					20		3		20		The borehole moved 3 m south due to an existing concrete foundation
		compact	2	128							
		moist, brown SANDY SILT trace gravel, trace clay (TILL) with oxidization	2.5	127.5	26	10	4		26		
		----- very dense	3	127		8					
					55		5		55		
			3.5	126.5							
			4	126							
		brown moist with clayey silt seams	4.5	125.5		12					
					50/250		6		50/250		
			5	125							
			5.5	124.5							
			6	124							
					34	19	7		34		
		very dense, wet SILTY SAND	6.5	123.5							
		-----	7	123							
		grey moist to wet	7.5	122.5		18					
					50/125		8		50/125		
			8	122							
			8.5	121.5							
			9	121		16					
					50/125		9		50/125		
			9.5	120.5							

TERRAPEX

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CLIENT: The Brock Zents Partnership	METHOD: Hollow Stem Auger and Split Spoon		**BH No.: BH7**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 129.91	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		very dense, wet, grey SILTY SAND	10	120							
			10.5	119.5	50/125	13	10		50/125		
			11	119							
			11.5	118.5							
			12	118							
			12.5	117.5	78	16	11		78		
			13	117							
			13.5	116.5							
			14	116	68	17	12		68		
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW8D**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 131.64	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		Topsoil (600 mm)	0	131.5	3	30	1		3		Borehole cave-in at 12.2 mbgs and the groundwater measured at 2.7 mbgs on complition.
			0.5	131	13	11	2		13		Groundwater measured at 5.11 mbgs on May 23, 2018.
			1	130.5							
			1.5	130	39	9	3		39		
		hard, damp to moist, brown SANDY CLAYEY SILT trace gravel (TILL)	2	129.5							
▼			2.5	129	67	10	4		67		
			3	128.5	84	9	5		84		
			3.5	128							
			4	127.5							
		very dense, moist to wet, grey SAND AND SILT trace gravel, trace clay (TILL)	4.5	127	50/150	8	6		50/ 150		
▽			5	126.5							
			5.5	126							
			6	125.5	73	10	7		73		
			6.5	125							
			7	124.5							
		very dense, wet, grey SILTY SAND trace gravel	7.5	124	50/125	8	8		50/ 125		Bentonite
			8	123.5							
			8.5	123							sand
			9	122.5	50/75	12	9		50/ 75		
			9.5	122							sand + screen

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW8D**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 131.64	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		very dense, wet, grey GRAVELLY SAND	10	121.5	50/100	6	10		50/100		Sand + Screen
			10.5	121							
			11	120.5							
			11.5	120							
			12	119.5	50/150	11	11		50/150		
		very dense, wet, grey SAND AND SILT trace gravel, trace clay (TILL) with occasional sand semas and layers	12.5	119							Augering through rock/ boulder
			13	118.5							
			13.5	118							
			14	117.5	50/275	13	12		50/275		
			14.5	117							
			15	116.5	50/125	6	13		50/125		POSSIBLE BEDROCK
		END OF BOREHOLE									

TERRAPEX

LOGGED BY: SA | DRILLING DATE: May 2, 2018

REVIEWED BY: VN |

CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Augering and Split Spoon		**BH No.: MW8S**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 131.033	
LOCATION: 2660-2680 Brock Road, Pickering, ON	NORTHING:	EASTING:	PROJECT NO.: CA18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT (N)	Well Construction	REMARKS
		Straight auger to 2.28 m	0	131							Borehole open and dry on completion.
			0.5	130.5							Groundwater was measured at 2.72 m on June 26, 2019.
			1	130							
			1.5	129.5							
			2	129							Bentonite
			2.5	128.5	50/125		1		50/125		Sand
		hard, damp CLAYEY SANDY SILT trace gravel (TILL) brown	3	128							
			3.5	127.5	72		2		72		Sand and Screen
		-----									
		grey	4	127	71		3		71		
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: BH9**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 130.22	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
	Topsoil (300 mm)	0	130	3		1		3		Borehole cave-in at 3.35 mbgs and the groundwater measured at 1.5 mbgs on complition.
	soft, dark brown, moist clayey silt, trace gravel trace organics (FILL)	0.5	129.5	19		2A 2B		19		
▼	hard, damp, brown SANDY CLAYEY SILT trace gravel (TILL) with sand seams and layers	1	129							
		1.5	128.5	32		3		32		
	very dense, wet, brown SILTY SAND with occasional clay layers	2	128							
		2.5	127.5	46		4		46		
		3	127	52		5		52		
		3.5	126.5							
	hard, moist, grey SANDY CLAYEY SILT trace gravel (TILL) with wet sand seams and layers	4	126	64		6		64		
		4.5	125.5	47		7		47		
		5	125							
		5.5	124.5							
	very dense, moist to wet, grey SAND AND SILT trace gravel, trace clay (TILL)	6	124	52		8		52		
		6.5	123.5							
		7	123							
		7.5	122.5	69		9		69		
		8	122							
		8.5	121.5							
		9	121							
		9.5		78		10		78		
	END OF BOREHOLE									

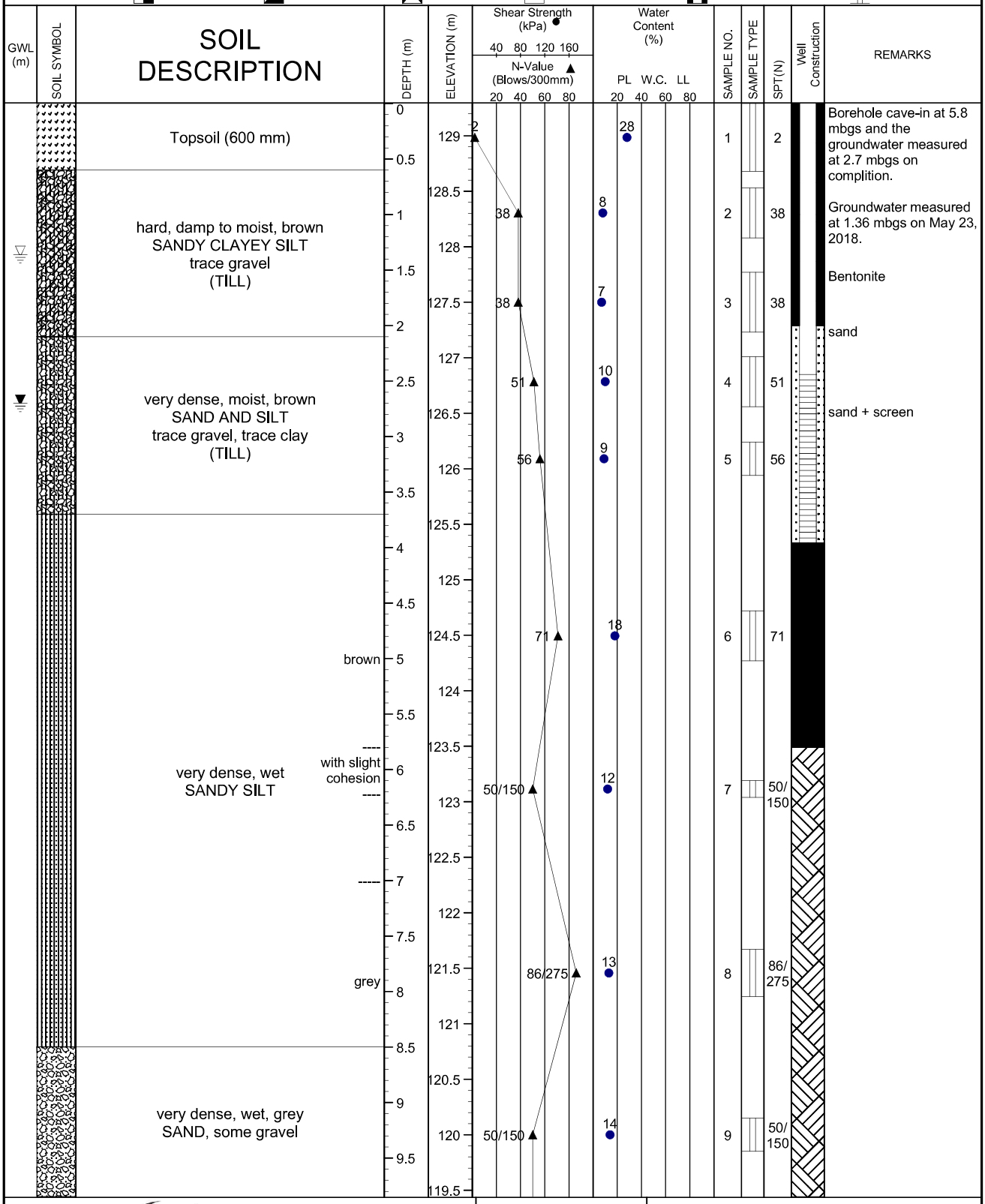
TERRAPEX

LOGGED BY: SA | DRILLING DATE: April 30, 2018

REVIEWED BY: VN | Page 1 of 1

CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW10**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 129.29	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON



TERRAPEX

LOGGED BY: SA	DRILLING DATE: May 7, 2018
REVIEWED BY: VN	Page 1 of 2

CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW10**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 129.29	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		very dense, wet, grey SANDY SILT	10	119							
			10.5								
				118.5	50/150	16	10		50/150		
			11	118							
			11.5								
				117.5							
			12								
		very dense, wet, grey SAND AND SILT trace gravel, trace clay (TILL) with sand layers		117	50/100	9	11		50/100		
			12.5								
				116.5							
			13								
				116							
			13.5								
				115.5	50/150	11	12		50/150		
		END OF BOREHOLE									

TERRAPEX

LOGGED BY: SA	DRILLING DATE: May 7, 2018
REVIEWED BY: VN	Page 2 of 2

CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Augering and Split Spoon		**BH No.: MW101**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 131.238	
LOCATION: 2660-2680 Brock Road, Pickering, ON	NORTHING:	EASTING:	PROJECT NO.: CA18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SAMPLE NO.	SPT (N)	REMARKS
	Topsoil (250 mm)	0	131	1A	32	Borehole open and groundwater measured at 1.83 mbgs on completion.
		0.5		1B		
		1	130.5	2	54	Groundwater was measured at 0.5 m on June 26, 2019.
		1.5	130			
		2	129.5	3	82/150	Bentonite
	brown	2.5	129	4	81/150	Sand
		3	128.5			
	-----	3.5	128	5	66	Sand and Screen
	grey	4	127.5	6	70	
	hard, damp to moist CLAYEY SANDY SILT trace gravel (TILL)	4.5	127			
		5	126.5	7	71	
		5.5	126			
		6	125.5			
		6.5	125	8	48	
		7	124.5			
		7.5	124			
		8	123.5	9	55	
	very dense, moist, grey SAND, trace silt	8.5	123	10	78/125	
	END OF BOREHOLE		122.5			

Shear Strength (kPa) ● 40 80 120 160
N-Value (Blows/300mm) ▲ 20 40 60 80: 32, 54, 82/150, 81/150, 66, 70, 71, 48, 55, 78/125

Water Content (%) PL W.C. LL 20 40 60 80

Well Construction

TERRAPEX

LOGGED BY: LG | DRILLING DATE: June 12, 2019

REVIEWED BY: VN | Page 1 of 1

CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Augering and Split Spoon		**BH No.: MW102D**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 130.695	
LOCATION: 2660-2680 Brock Road, Pickering, ON	NORTHING:	EASTING:	PROJECT NO.: CA18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT (N)	Well Construction	REMARKS
	Topsoil (230 mm)	0	130.5	18		1A		18		Borehole open and groundwater measured at 5.7 mbgs oncompletion.
	compact	0.5	130			1B				
	-----	1	129.5	22		2		22		Groundwater was measured at 2.94 m on June 26, 2019.
	dense moist to wet, brown SANDY SILT	1.5	129	41		3		41		
		2	128.5							
		2.5	128	47		4		47		
▽		3								Bentonite
		3.5	127.5	41		5		41		
	brown ---- grey hard, moist CLAYEY SANDY SILT	4	127							
		4.5	126.5	69		6		69		
		5	126	50/150		7		50/150		
▼		5.5	125.5							
		6	125							Sand
		6.5	124.5	85		8		85		
	very dense, wet, grey GRAVELLY SAND	7	124							Sand and Screen
		7.5	123.5							
		8	123	74		9		74		
		8.5	122.5	50/150		10A 10B		50/150		
	hard, moist, grey CLAYEY SANDY SILT, trace gravel (TILL)									
	END OF BOREHOLE									

TERRAPEX

LOGGED BY: LG	DRILLING DATE: June 12, 2019
REVIEWED BY: VN	Page 1 of 1

CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Augering and Split Spoon	**BH No.: MW102S**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN / ELEV. (m) 130.683	
LOCATION: 2660-2680 Brock Road, Pickering, ON	NORTHING: / EASTING:	PROJECT NO.: CA18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT (N)	Well Construction	REMARKS
▼		Straight auger to 3.66 m to install the monitoring well	0 0.5 1 1.5 2 2.5 3 3.5	130.5 130 129.5 129 128.5 128 127.5							Borehole open and groundwater measured at 2.53 mbgs on completion. Groundwater was measured at 2.53 m on June 26, 2019. Bentonite Sand Sand and Screen
		END OF BOREHOLE									

TERRAPEX

LOGGED BY: LG | DRILLING DATE: June 12, 2019

REVIEWED BY: VN | Page 1 of 1

CLIENT: Patheon Developers(Ontario) Inc.	PROJECT NO.: CT2694.03	**RECORD OF: BH201**
ADDRESS: 2660-2680 Brock Rd, Pickering ON		
CITY/PROVINCE: 2660-2680 Brock Rd, Pickering ON	NORTHING (m): 4860080.93	EASTING (m): 653626.84 / ELEV. (m) 129.65
CONTRACTOR: Pontil	METHOD: Solid Stem Auger and Spilt Spoon	
BOREHOLE DIAMETER (cm): 16.51 / WELL DIAMETER (cm):	SCREEN SLOT #: / SAND TYPE:	SEALANT TYPE:

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		FILL moist, brown clayey silt, trace sand trace rootlets	0 – 0.5	129.5 – 129	1		37	<5p/0p	PAHs, M&I, PHCs, VOCs		
		stiff to hard moist, brown CLAYEY SANDY SILT trace gravel (TILL)	0.5 – 3.5	129 – 126.5	2A 2B 3 4 5		100 100 100 100 100	<5p/0p <5p/0p <5p/0p <5p/0p <5p/1p	 Boron		
		very dense, wet, grey SILTY SAND	3.5 – 4.5	126.5 – 125.5	6		100	<5p/0p			
▼		very dense, wet, grey SANDY SILT	4.5 – 6.5	125.5 – 123	7 8 9		100 100 100	<5p/0p <5p/0p <5p/0p			
		END OF BOREHOLE									

SHEAR STRENGTH (kPa) ● / N-VALUE (Blows/300mm) ▲: 40 80 120 160 | 20 40 60 80
N-values: 5, 19, 13, 35, 44, 67, 75, 75, 85

WATER CONTENT (%): PL W.C. LL | 20 40 60 80

TERRAPEX

LOGGED BY: SJ	DRILLING DATE: 04-Oct-2021
INPUT BY: MW	MONITORING DATE:
REVIEWED BY: VN	PAGE 1 OF 1

CLIENT: Patheon Developers(Ontario) Inc.	PROJECT NO.: CT2694.03	**RECORD OF: BH202**
ADDRESS: 2660-2680 Brock Rd, Pickering ON		
CITY/PROVINCE: 2660-2680 Brock Rd, Pickering ON	NORTHING (m):	EASTING (m): ELEV. (m)
CONTRACTOR: Pontil	METHOD:	
BOREHOLE DIAMETER (cm): WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE:	SEALANT TYPE:

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) ● 40 80 120 160 / N-VALUE (Blows/300mm) ▲ 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		FILL moist, brown clayey silt, trace sand, trace rootlets layer of crushed limestone	0		12 ▲		1		70	<5p/0p	M&I, PAHs		
		FILL moist, light brown silty sand, trace gravel layer of crushed limestone	0.5 1		43 ▲		2		66	<5p/0p			
		hard, moist, brown CLAYEY SANDY SILT trace gravel (TILL)	1.5		42 ▲		3A		100	<5p/0p	BTEX F1-F4		
			2				3B		100	<5p/1p			
			2.5		34 ▲		4		100	<5p/0p			
			3 3.5		64 ▲		5		100	<5p/0p			
			4		44 ▲		6		100	<5p/0p	pH, VOCs, PHCs, PAHs		
▼		dense to very dense wet, brown SAND	4.5		42 ▲		7		100	<5p/0p			
			5 5.5		94/6" ▲		8		100	<5p/0p			
		very dense, wet, grey SANDY SILT	6		90/6" ▲		9		100	<5p/0p			
		END OF BOREHOLE	6.5										

TERRAPEX

LOGGED BY: SJ	DRILLING DATE: 04-Oct-2021
INPUT BY: MW	MONITORING DATE:
REVIEWED BY: VN	PAGE 1 OF 1

CLIENT: Patheon Developers(Ontario) Inc.	PROJECT NO.: CT2694.03	**RECORD OF: MW203**
ADDRESS: 2660-2680 Brock Rd, Pickering ON		
CITY/PROVINCE: 2660-2680 Brock Rd, Pickering ON	NORTHING (m): 4860130.02	EASTING (m): 653584.45 ELEV. (m) 131.61
CONTRACTOR: Pontil	METHOD: Solid Stem Auger and Spilt Spoon	
BOREHOLE DIAMETER (cm): 12.7	WELL DIAMETER (cm): 5.08	SCREEN SLOT #: 10 SAND TYPE: Silica #2 SEALANT TYPE: bentonite

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		TOPSOIL 70mm	0	131.5	13		1A		65	<5p/1p			Borehole dry at completion
		SAND AND GRAVEL 100mm											
		FILL moist, brown clayey sandy silt, trace gravel	0.5	131	13		1B		100	<5p/1p	PAHs		
		very stiff to hard moist, brown CLAYEY SANDY SILT trace gravel (TILL)	1	130.5	16		2		100	<5p/1p	M&I		
			1.5	130									
			2	129.5	35		3		100	<5p/0p			
			2.5	129	36		4		100	<5p/1p	BTEX, PHCs		
			3	128.5									
		dense to very dense moist, brown SILTY SAND	3.5	128	39		5		100	<5p/0p			
			4				6A		100	<5p/1p			
		very dense to dense moist, grey SANDY SILT trace clay, trace gravel (TILL)		127.5	87/6"		6B		100	<5p/1p			
			4.5	127									
			5		50		7		100	<5p/0p	PAHs, PHCs, VOCs, pH		
				126.5									
			5.5	126	46		8		100	<5p/1p			
			6	125.5									
			6.5	125	48		9		100	<5p/1p			
		END OF BOREHOLE											

TERRAPEX

LOGGED BY: SJ	DRILLING DATE: 05-Oct-2021
INPUT BY: MW	MONITORING DATE: 27-Oct-21
REVIEWED BY: VN	PAGE 1 OF 1

CLIENT: Patheon Developers(Ontario) Inc.	PROJECT NO.: CT2694.03	**RECORD OF: BH204**
ADDRESS: 2660-2680 Brock Rd, Pickering ON		
CITY/PROVINCE: 2660-2680 Brock Rd, Pickering ON	NORTHING (m): 4860198.21	EASTING (m): 653566.49 ELEV. (m) 131.08
CONTRACTOR: Pontil	METHOD: Solid Stem Auger and Spite Spoon	
BOREHOLE DIAMETER (cm): -	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE:

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		TOPSOIL 100mm FILL loose, moist, brown sandy silt	0	131	1		98	<5p/0p	PAHs, M&I, PHCs, VOCs		Borehole dry at completion
		very stiff to hard moist, brown CLAYEY SANDY SILT trace gravel (TILL)	0.5 1 1.5 2 2.5	130.5 130 129.5 129 128.5	2 3 4		98 98 98	<5p/1p <5p/1p <5p/1p			
		very dense, moist, grey SANDY SILT trace clay, trace gravel (TILL)	3 3.5 4 4.5 5 5.5 6	128 127.5 127 126.5 126 125.5 125	5 6 7 8		98 100 100 100	<5p/1p <5p/1p <5p/1p <5p/1p			
		END OF BOREHOLE	6.5	124.5	9		100	<5p/1p			

SHEAR STRENGTH (kPa) 40 80 120 160 N-VALUE (Blows/300mm) 20 40 60 80: 4, 27, 33, 57, 43, 77, 88/6", 85/6", 88/6"

WATER CONTENT (%) PL W.C. LL 20 40 60 80

TERRAPEX

LOGGED BY: SJ	DRILLING DATE: 05-OCt-2021
INPUT BY: MW	MONITORING DATE:
REVIEWED BY: VN	PAGE 1 OF 1

CLIENT: Patheon Developers(Ontario) Inc.	PROJECT NO.: CT2694.03	**RECORD OF: BH205**
ADDRESS: 2660-2680 Brock Rd, Pickering ON		
CITY/PROVINCE: 2660-2680 Brock Rd, Pickering ON	NORTHING (m): 4860175.78	EASTING (m): 653592.76 ELEV. (m) 130.07
CONTRACTOR: Pontil	METHOD: Solid Stem Auger and Spilt Spoon	
BOREHOLE DIAMETER (cm): 16.51 WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE:	SEALANT TYPE:

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		TOPSOIL 100mm	0	130	7								
		FILL firm, moist, dark brown sandy clayey silt	0.5	129.5			1		49	5p/0p	PHCs, VOCs		Borehole dry at completion
		FILL compact, moist, brown sand, trace gravel	1	129	16		2		65	<5p/0p	PAHs, M&I		
		hard, moist, brown CLAYEY SANDY SILT, tr. gravel (TILL)	1.5	128.5			3A		98	<5p/1p			
		dense to very dense moist, brown GRAVELLY SAND	2	128	35		3B			<5p/1p			
		very dense, moist, brown SANDY SILT trace clay, trace gravel (TILL)	2.5	127.5	76		4		92	5p/1p			
			3	127	52		5		50	5p/1p			
		hard, moist, grey CLAYEY SANDY SILT trace gravel (TILL)	3.5	126.5									
			4	126	84/6"		6		100	<5p/1p			
		dense to very dense wet, grey SANDY SILT trace clay, trace gravel (TILL)	4.5	125.5									
			5	125	92/6"		7		100	<5p/0p			
			5.5	124.5	43		8		100	<5p/0p			
			6	124									
			6.5	123.5	71		9		100	5p/1p			
		END OF BOREHOLE											

TERRAPEX	LOGGED BY: SJ	DRILLING DATE: 04/5-Oct-2021
	INPUT BY: MW	MONITORING DATE:
	REVIEWED BY: VN	PAGE 1 OF 1

CLIENT: Patheon Developers(Ontario) Inc.	PROJECT NO.: CT2694.03	**RECORD OF:**	
ADDRESS: 2660-2680 Brock Rd, Pickering ON		**MW206**	
CITY/PROVINCE: 2660-2680 Brock Rd, Pickering ON	NORTHING (m): 4860163.27	EASTING (m): 653631.28	ELEV. (m) 130.56
CONTRACTOR: Pontil	METHOD: Solid Stem Auger and Spilt Spoon		
BOREHOLE DIAMETER (cm): 12.7	WELL DIAMETER (cm): 5.08	SCREEN SLOT #: 10	SAND TYPE: Silica #2	SEALANT TYPE: Bentonite

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

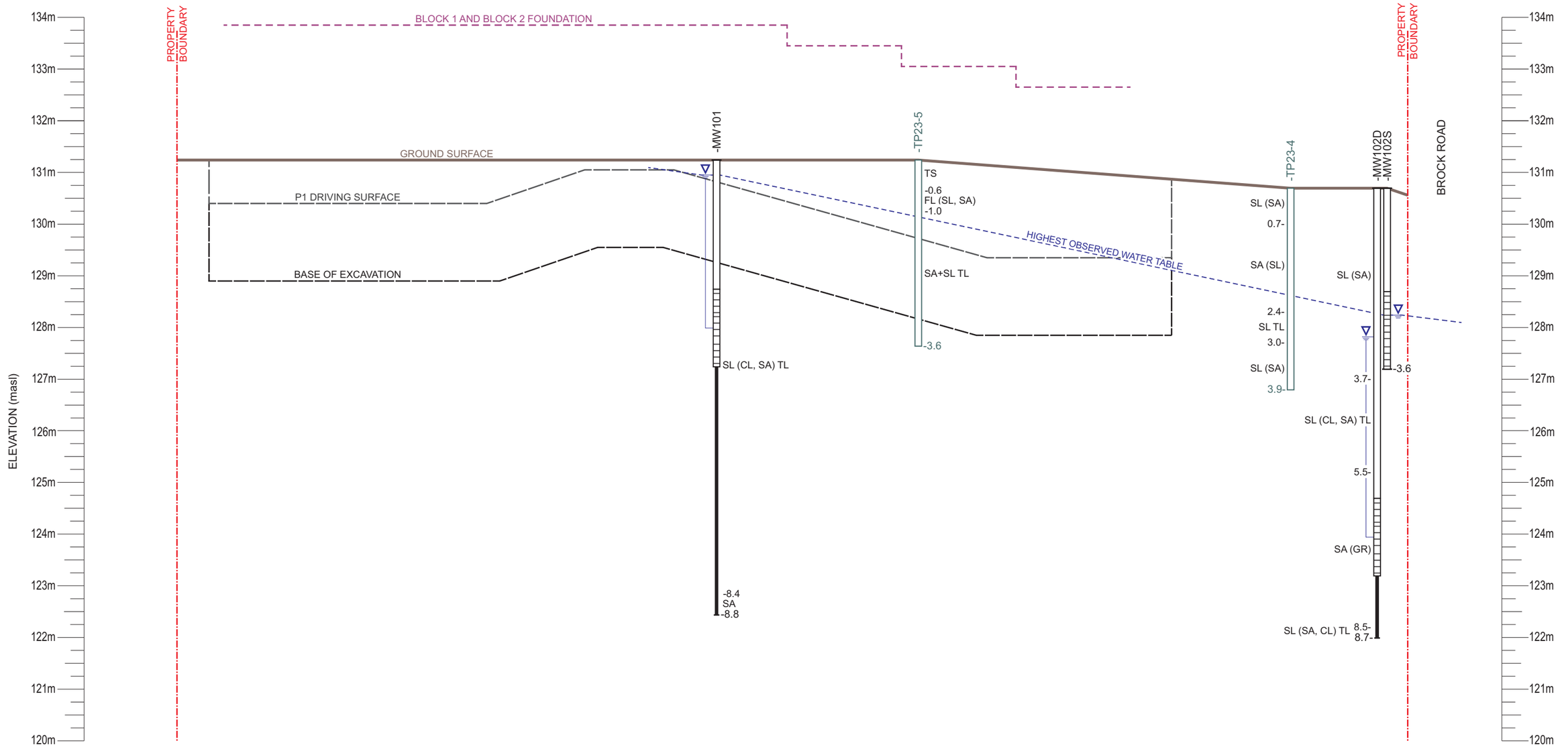
GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) ● 40 80 120 160 / N-VALUE (Blows/300mm) ▲ 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		TOPSOIL 70mm	0	130.5	12		1A		98	<5p/1p	PHCs, VOCs		
		FILL, moist, brown, sand and gravel											
		FILL, moist, brown, clayey silty sand trace rootlets	0.5	130			1B			<5p/1p	M&I, PAHs		
		compact, moist, brown SANDY SILT	1	129.5	21		2		100	<5p/1p			
			1.5	129									
					28		3		100	<5p/1p			
			2	128.5									
		very stiff, moist, brown CLAYEY SANDY SILT trace gravel (TILL)	2.5	128	21		4		66	<5p/1p			
		very dense, moist, grey SANDY SILT occasional layers of clayey silt	3	127.5									
					70/6"		5		83	<5p/1p			
			3.5	127									
			4	126.5	72		6		100	<5p/1p			
			4.5	126									
					72		7		100	<5p/1p			
			5	125.5									
			5.5	125	58		8		100	<5p/1p			
			6	124.5									
		END OF BOREHOLE											

TERRAPEX

LOGGED BY: SJ	DRILLING DATE: 05-Oct-2021
INPUT BY: MW	MONITORING DATE: 27-Oct-21
REVIEWED BY: VN	PAGE 1 OF 1

Attachment C – Hydrostratigraphic Cross Sections (Terrapex, 2024)

WEST — LOOKING NORTH, SECTION IS ALONG ZENTS DRIVE — **EAST**



LEGEND

TS	TOPSOIL
GR	GRAVEL
SA	SAND
SL	SILT
CL	CLAY
FL	FILL
TL	TILL
X(Y)	X IS A MAIN TEXTURE Y IS A SIGNIFICANT MINOR TEXTURE

MW104 - MONITORING WELL DESIGNATION

STATIC WATER LEVEL-

DEPTH OF SOIL INTERFACE(m bg)- 3.7-

- SCREENED ZONE

- BOREHOLE

TP102 - TEST PIT DESIGNATION

HORIZONTAL SCALE:

0 5 10

Metres

NOTES:
1. TOPSOIL LAYER WITH THICKNESS LESS THAN 0.4 m NOT SHOWN FOR CLARITY.
2. SOIL CONDITIONS KNOWN AT BOREHOLE AND TEST PIT LOCATIONS ONLY. CONDITIONS BETWEEN ARE INTERPRETED AS POSSIBLE
3. GROUNDWATER LEVELS ARE MAXIMUM OBSERVED.
4. GROUNDWATER CONDITIONS KNOWN ONLY AT MONITORING WELLS FOR DATES OF MEASUREMENTS.

CLIENT: ICON HOMES

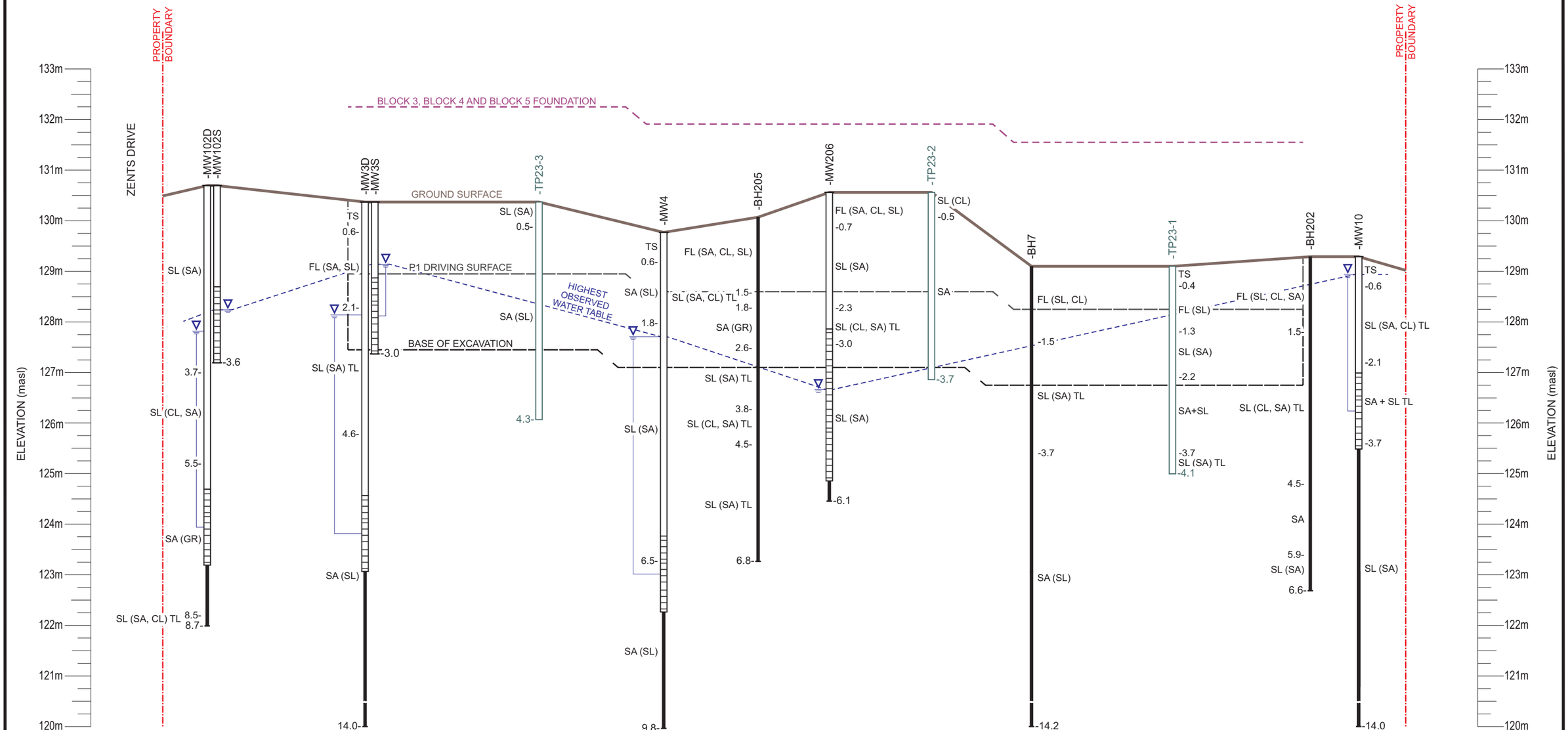
SITE LOCATION: 2660-2710 BROCK ROAD NORTH PICKERING, ONTARIO

TERRAPEX

TITLE: **CROSS SECTION A-A' (WEST TO EAST)**

DRAWN BY:	PROJECT NO.:	CHECKED BY:
SW	CT2694.05	XX
REVISION:	DATE:	FIGURE:
00	JANUARY 2024	**2**

NORTH | LOOKING EAST
SECTION IS ALONG BROCK ROAD NORTH | **SOUTH**



LEGEND

TS	TOPSOIL
GR	GRAVEL
SA	SAND
SL	SILT
CL	CLAY
FL	FILL
TL	TILL
X(Y)	X IS A MAIN TEXTURE Y IS A SIGNIFICANT MINOR TEXTURE

-MW104 - MONITORING WELL DESIGNATION

STATIC WATER LEVEL-

DEPTH OF SOIL INTERFACE(m bg)- 3.7-

- SCREENED ZONE

- BOREHOLE

-TP102 - TEST PIT DESIGNATION

HORIZONTAL SCALE:

0 10 20
Metres

NOTES:
1. TOPSOIL LAYER WITH THICKNESS LESS THAN 0.4 m NOT SHOWN FOR CLARITY.
2. SOIL CONDITIONS KNOWN AT BOREHOLE AND TEST PIT LOCATIONS ONLY. CONDITIONS BETWEEN ARE INTERPRETED AS POSSIBLE
3. GROUNDWATER LEVELS ARE MAXIMUM OBSERVED.
4. GROUNDWATER CONDITIONS KNOWN ONLY AT MONITORING WELLS FOR DATES OF MEASUREMENTS.

CLIENT: ICON HOMES

SITE LOCATION: 2660-2710 BROCK ROAD NORTH PICKERING, ONTARIO

TERRAPEX

TITLE: **CROSS SECTION B-B' (NORTH TO SOUTH)**

DRAWN BY:	PROJECT NO.:	CHECKED BY:
SW	CT2694.05	XX
REVISION:	DATE:	FIGURE:
00	JANUARY 2024	3

Attachment D – Groundwater Level Data (Terrapex, 2022)

TABLE 2
Observed Groundwater Levels
2660 to 2680 Brock Road and Part of Lot 19, Concession 3;
Part 3 and Part 4 on Plan 40R-27228, Pickering, Ontario

Well Desig.	Date	Ground Elev. (m asl)	Top Pipe Elev. (m asl)	Well Depth (m bg)	Groundwater Depth (m bmp)	Groundwater Depth (m bg)	Groundwater Elev. (m asl)
MW1(S) *Shallow*	17-May-18	132.03	133.12	4.70	1.58	0.49	131.54
	23-May-18				1.76	0.67	131.36
	29-May-18				2.06	0.96	131.06
	23-Apr-19				1.29	0.19	131.84
	16-May-19				1.34	0.25	131.78
	19-Jun-19				1.83	0.73	131.30
	26-Jun-19				1.98	0.89	131.14
	02-Jul-19				2.19	1.10	130.93
	26-Apr-21				1.74	0.65	131.38
	13-Oct-21				1.94	0.84	131.18
	18-Oct-21				2.15	1.06	130.97
	27-Oct-21				1.80	0.70	131.33
MW1(D) *Deep*	17-May-18	132.03	132.88	9.10	5.35	4.50	127.53
	23-May-18				5.19	4.34	127.69
	29-May-18				*5.36*	4.51	127.53
	23-Apr-19				4.95	4.10	127.94
	16-May-19				4.81	3.96	128.07
	19-Jun-19				5.07	4.22	127.82
	26-Jun-19				5.16	4.31	127.73
	02-Jul-19				5.23	4.38	127.65
	26-Apr-21				6.11	5.26	126.77
	13-Oct-21				6.13	5.28	126.75
	18-Oct-21				6.11	5.26	126.78
	27-Oct-21				6.13	5.28	126.75
MW3(S) *Shallow*	17-May-18	130.34	131.29	3.10	2.15	1.20	129.15
	23-May-18				2.47	1.52	128.82
	29-May-18				2.72	1.77	128.57
	23-Apr-19				not monitored		
	16-May-19				2.87	1.92	128.42
	19-Jun-19				2.73	1.78	128.56
	26-Jun-19				2.91	1.96	128.39
	02-Jul-19				3.02	2.07	128.27
	26-Apr-21				Dry	>3.10	<127.24
	13-Oct-21				Dry	>3.10	<127.24
	18-Oct-21				Dry	>3.10	<127.24
	27-Oct-21				Dry	>3.10	<127.24
MW3(D) *Deep*	17-May-18	130.37	131.38	7.40	3.53	2.52	127.85
	23-May-18				3.64	2.63	127.74
	29-May-18				3.78	2.77	127.60
	23-Apr-19				not monitored		
	16-May-19				3.24	2.23	128.14
	19-Jun-19				3.61	2.60	127.78
	26-Jun-19				3.69	2.68	127.70
	02-Jul-19				3.75	2.74	127.64
	26-Apr-21				4.02	3.01	127.36
	13-Oct-21				5.04	4.03	126.34
	18-Oct-21				6.35	5.34	125.04
	27-Oct-21				5.02	4.01	126.36

TABLE 2
Observed Groundwater Levels
2660 to 2680 Brock Road and Part of Lot 19, Concession 3;
Part 3 and Part 4 on Plan 40R-27228, Pickering, Ontario

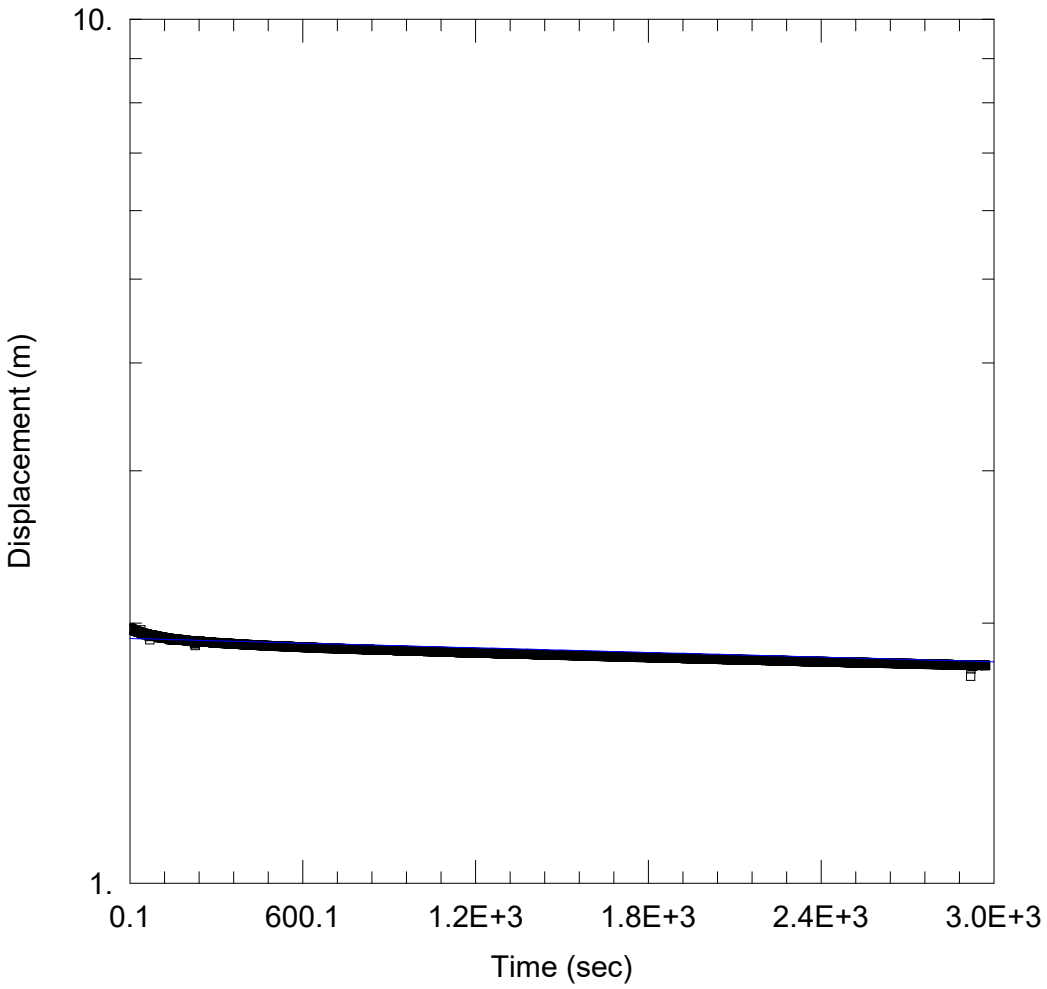
Well Desig.	Date	Ground Elev. (m asl)	Top Pipe Elev. (m asl)	Well Depth (m bg)	Groundwater Depth (m bmp)	Groundwater Depth (m bg)	Groundwater Elev. (m asl)
MW4	17-May-18	129.77	130.74	7.60	3.29	2.32	127.45
	23-May-18				3.38	2.41	127.37
	29-May-18				3.51	2.54	127.23
	23-Apr-19				3.11	2.14	127.64
	16-May-19				3.04	2.07	127.71
	19-Jun-19				3.32	2.35	127.42
	26-Jun-19				3.41	2.44	127.34
	02-Jul-19				3.48	2.51	127.27
	26-Apr-21				4.34	3.37	126.40
	13-Oct-21				4.52	3.55	126.22
	18-Oct-21				5.85	4.88	124.90
	27-Oct-21				4.51	3.54	126.23
MW5	17-May-18	131.59	132.52	9.00	6.31	5.37	126.22
	23-May-18				6.45	5.52	126.07
	29-May-18				6.69	5.76	125.83
	23-Apr-19				6.05	5.11	126.48
	16-May-19				6.20	5.26	126.33
	19-Jun-19				6.43	5.50	126.09
	26-Jun-19				6.59	5.65	125.94
	02-Jul-19				6.70	5.76	125.83
	26-Apr-21				7.52	6.59	125.00
	13-Oct-21				7.42	6.48	125.11
	18-Oct-21				8.90	7.97	123.62
	27-Oct-21				7.50	6.57	125.02
MW8(D) *Deep*	17-May-18	131.64	132.57	11.00	5.80	4.87	126.77
	23-May-18				5.94	5.01	126.63
	29-May-18				6.18	5.25	126.39
	23-Apr-19				5.58	4.64	127.00
	16-May-19				5.70	4.76	126.88
	19-Jun-19				5.93	5.00	126.64
	26-Jun-19				6.09	5.15	126.49
	02-Jul-19				6.20	5.26	126.38
	26-Apr-21				6.99	6.06	125.58
	13-Oct-21				6.93	5.99	125.65
	18-Oct-21				8.31	7.37	124.27
	27-Oct-21				6.94	6.01	125.63
MW8(S) *Shallow*	19-Jun-19	131.03	132.06	3.96	4.39	3.36	127.67
	26-Jun-19				3.74	2.72	128.32
	02-Jul-19				3.41	2.39	128.65
	26-Apr-21				Dry	>3.96	<127.07
	27-Oct-21				2.51	1.49	129.55

TABLE 2
Observed Groundwater Levels
2660 to 2680 Brock Road and Part of Lot 19, Concession 3;
Part 3 and Part 4 on Plan 40R-27228, Pickering, Ontario

Well Desig.	Date	Ground Elev. (m asl)	Top Pipe Elev. (m asl)	Well Depth (m bg)	Groundwater Depth (m bmp)	Groundwater Depth (m bg)	Groundwater Elev. (m asl)
MW10	17-May-18	129.29	130.28	3.90	2.06	1.08	128.22
	23-May-18				2.25	1.26	128.03
	29-May-18				2.50	1.51	127.79
	23-Apr-19				1.40	0.41	128.89
	16-May-19				1.34	0.35	128.94
	19-Jun-19				1.84	0.85	128.44
	26-Jun-19				1.89	0.90	128.39
	02-Jul-19				2.00	1.01	128.28
	26-Apr-21				1.86	0.87	128.42
	13-Oct-21					inaccessible	
	18-Oct-21				Dry	>3.90	<125.49
	27-Oct-21				3.37	2.38	126.91
MW101	19-Jun-19	131.24	132.23	4.11	1.35	0.36	130.88
	26-Jun-19				1.50	0.50	130.73
	02-Jul-19				1.73	0.74	130.50
	26-Apr-21				1.28	0.29	130.95
	13-Oct-21				1.93	0.94	130.30
	18-Oct-21				3.55	2.56	128.68
	27-Oct-21				1.82	0.83	130.41
MW102(D) *Deep*	19-Jun-19	130.70	131.65	7.62	3.84	2.88	127.82
	26-Jun-19				3.90	2.94	127.75
	02-Jul-19				3.97	3.01	127.69
	26-Apr-21				5.21	4.25	126.45
	13-Oct-21				5.26	4.30	126.39
	18-Oct-21				6.62	5.66	125.04
	27-Oct-21				5.24	4.28	126.41
MW102(S) *Shallow*	19-Jun-19	130.68	131.63	3.66	3.39	2.44	128.24
	26-Jun-19				3.48	2.53	128.15
	02-Jul-19				3.55	2.60	128.08
	26-Apr-21				Dry	>3.66	<127.02
	13-Oct-21				Dry	>3.66	<127.02
	18-Oct-21				Dry	>3.66	<127.02
	27-Oct-21				Dry	>3.66	<127.02
MW203	13-Oct-21	130.65	131.61	6.10	5.96	5.01	125.65
	18-Oct-21				Dry	>6.10	<125.51
	27-Oct-21				5.98	5.03	125.63
MW206	13-Oct-21	129.69	130.56	5.85	4.62	3.75	125.94
	18-Oct-21				4.52	3.65	126.04
	27-Oct-21				4.59	3.72	125.97

Notes
1. Ground elevation interpolated between points on earlier site survey
2. Tops of pipe elevation based on stick up elevation in relation to ground elevation
3. m asl = metres above sea level
4. m bmp = metres below measurement point (Top of pipe)
5. m bg = metres below ground
6. >, < values are based on screen bottom depth and elevation

Attachment E – Single Well Response Tests (Palmer, 2024)



MW1(S)

Data Set: G:\...\MW1(S).aqt
Date: 03/14/24 Time: 22:46:34

PROJECT INFORMATION

Company: Palmer
Client: The Brock Zents Partnership
Project: 2401901
Location: 2660-1680 Brock Road
Test Well: MW1(S)
Test Date: 06-March-2024

AQUIFER DATA

Saturated Thickness: 11.55 m Anisotropy Ratio (Kz/Kr): 0.1

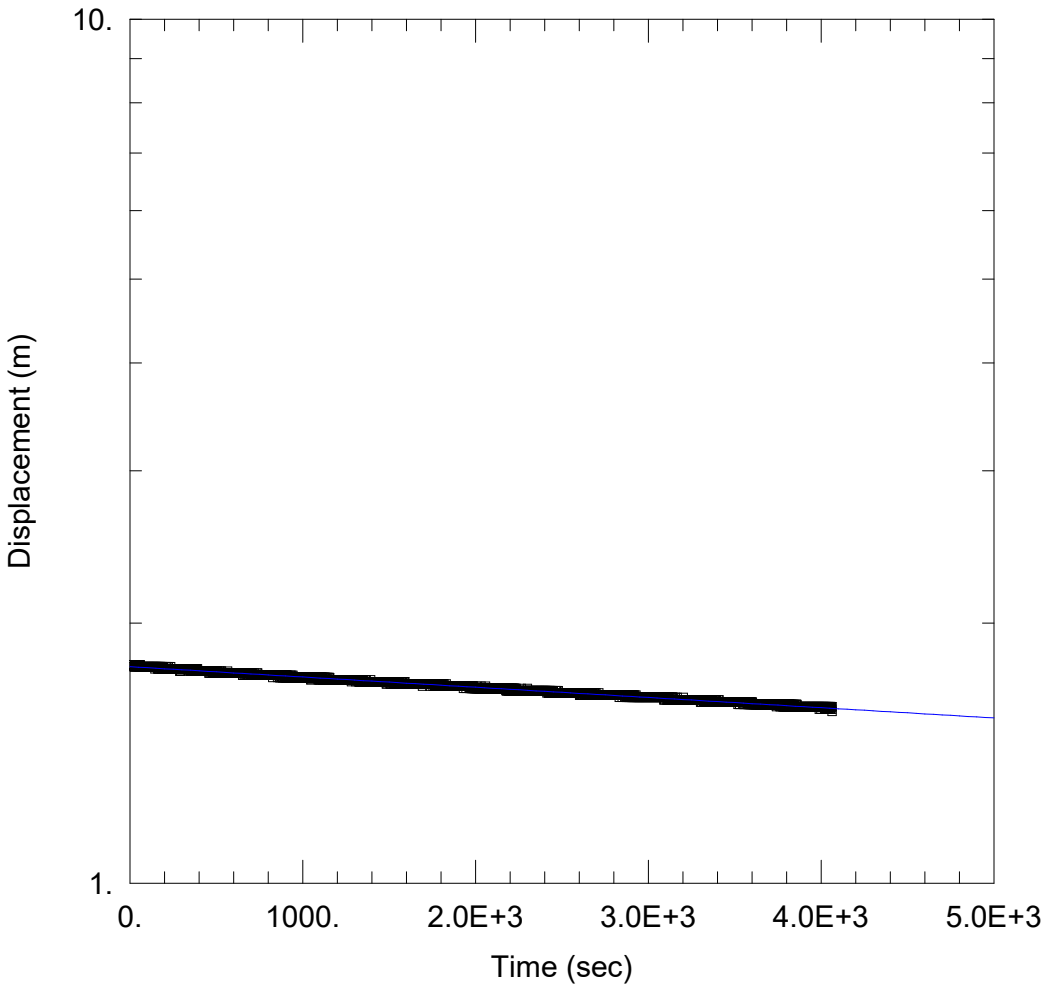
WELL DATA (MW1(S))

Initial Displacement: 1.977 m
Total Well Penetration Depth: 4.23 m
Casing Radius: 0.0254 m
Static Water Column Height: 4.25 m
Screen Length: 1.5 m
Well Radius: 0.075 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.399E-8 m/sec y0 = 1.919 m



WELL TEST ANALYSIS

Data Set: G:\...\MW101.aqt
Date: 03/14/24 Time: 22:46:42

PROJECT INFORMATION

Company: Palmer
Client: The Brock Zents Partnership
Project: 2401901
Location: 2660-1680 Brock Road
Test Well: MW101
Test Date: 06-March-2024

AQUIFER DATA

Saturated Thickness: 8.28 m Anisotropy Ratio (Kz/Kr): 0.1

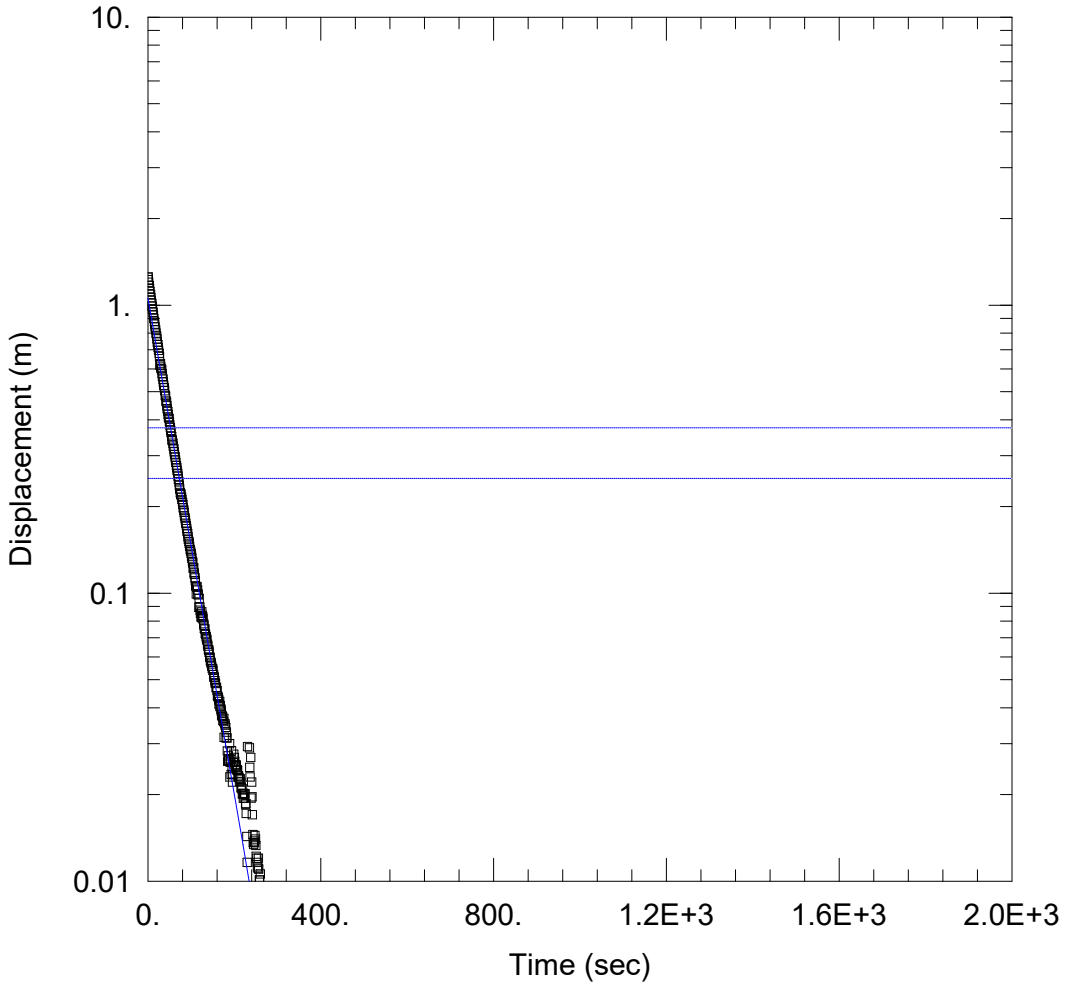
WELL DATA (MW101)

Initial Displacement: 1.79 m
Total Well Penetration Depth: 4.08 m
Casing Radius: 0.0254 m
Static Water Column Height: 4.08 m
Screen Length: 1.5 m
Well Radius: 0.075 m

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 1.872E-8 m/sec y0 = 1.78 m



MW3(D)

Data Set: G:\...\MW3(D).aqt
Date: 03/14/24 Time: 22:46:57

PROJECT INFORMATION

Company: Palmer
Client: The Brock Zents Partnership
Project: 2401901
Location: 2660-1680 Brock Road
Test Well: MW3(D)
Test Date: 06-March-2024

AQUIFER DATA

Saturated Thickness: 9.4 m Anisotropy Ratio (Kz/Kr): 0.1

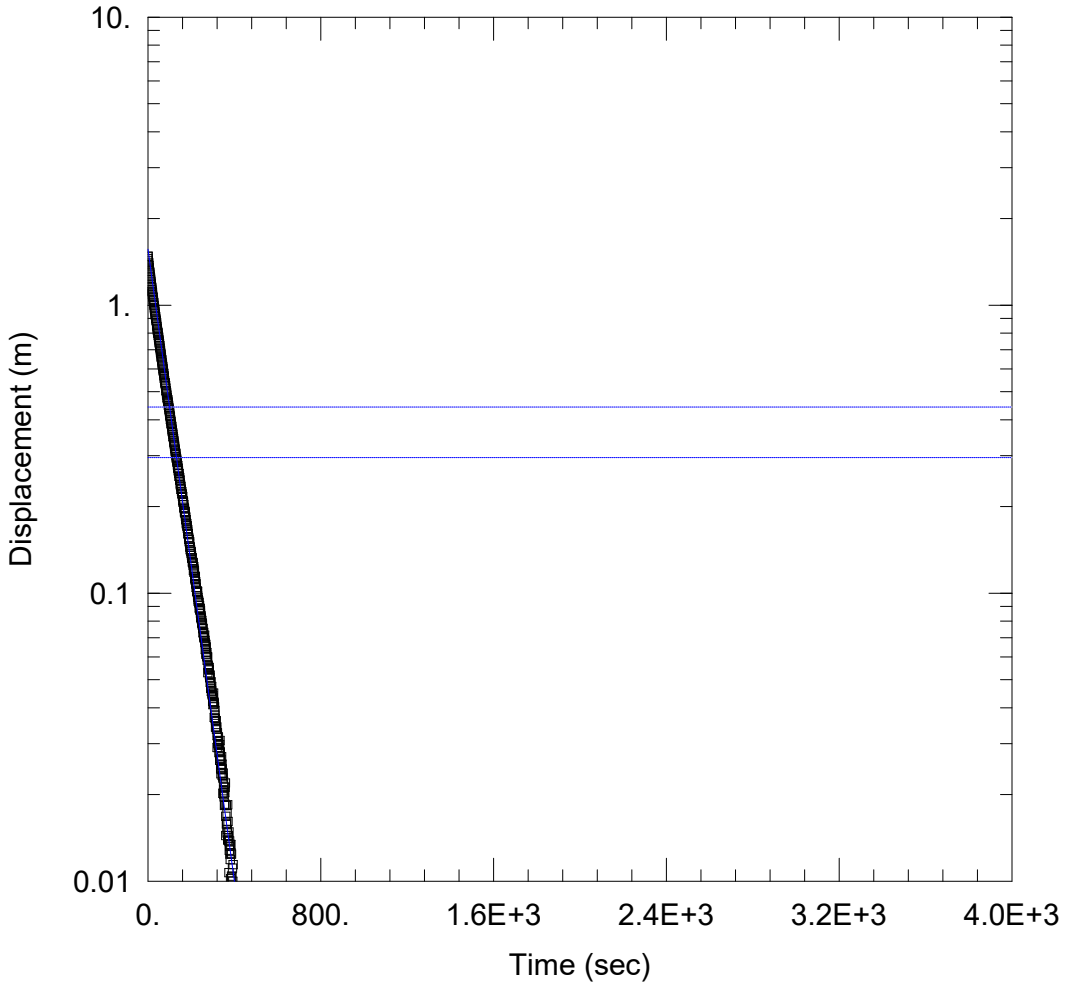
WELL DATA (MW3(D))

Initial Displacement: 1.251 m
Total Well Penetration Depth: 2.7 m
Casing Radius: 0.0254 m
Static Water Column Height: 3.74 m
Screen Length: 1.5 m
Well Radius: 0.075 m

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 1.269E-5 m/sec y0 = 1.058 m



MW4

Data Set: G:\...\MW4.aqt
Date: 03/14/24 Time: 22:46:48

PROJECT INFORMATION

Company: Palmer
Client: The Brock Zents Partnership
Project: 2401901
Location: 2660-1680 Brock Road
Test Well: MW4
Test Date: 06-March-2024

AQUIFER DATA

Saturated Thickness: 3.5 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW4)

Initial Displacement: 1.476 m
Total Well Penetration Depth: 1.5 m
Casing Radius: 0.0254 m
Static Water Column Height: 5.47 m
Screen Length: 1.5 m
Well Radius: 0.075 m
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 7.562E-6 m/sec y0 = 1.561 m