Project No. 21-3-8438

3852 Ganaraska Road

Geotechnical Report

Terraspec Engineering Inc.
Geotechnical Engineers
973 Crawford Drive
Peterborough, Ontario
K9J 3X1

TABLE OF CONTENTS

APPENDICES

terraspec engineering inc.
geotechnical engineers and materials testing

973 Crawford Drive
Peterborough, Ontario **Phone: (705) 743-7880**
K9J 3X1 **Fax: (705) 743-9592**

May 6, 2021

The Greer Galloway Group Inc.
1620 Wallbridge Loyalist Road
Belleville, Ontario
K8N 4Z5

Re: Geotechnical Report for 3852 Ganaraska Road, Garden Hill
Project No. 21-3-8438

General Site Data
The project site is located at 3852 Ganaraska Road, in the village of Garden Hill, Ontario. Development of a new residential subdivision is contemplated for the site. A schematic site plan indicating the extent of the property has been appended to this report.

Investigation
A soils investigation was conducted for the property on April 27, 2021. Twelve exploratory boreholes were placed on site using a track-mounted drill rig. Soil laboratory testing consisted of moisture content determination and grain size analysis. The borehole logs and laboratory testing data have been appended to this report. The borehole locations have been indicated on the appended schematic site plan.

Soil Conditions
The site is located within a physiographic region identified as sand plains. The bedrock in this area is identified as limestone of the Trenton Group. The project location typically contains relatively deep depths of predominantly silty subsoils.
The typical soil layers encountered on site were as follows:

silty topsoil
silty sand
sandy silt
silt with sand
clay silt

The original ground elevations of the boreholes have been summarized as follows.

Borehole	Ground Elevation	Encountered Water Elevation
1	180.7209	177.7209
2	180.4504	179.2504
3	185.2678	183.7878
4	188.0006	186.5506
5	179.7574	178.1574
6	185.6409	184.2409
7	181.0259	179.5259
8	187.2381	----------
9	178.9998	176.8998
10	176.6654	174.5654
11	177.3232	----------
12	177.7219	174.0219

The project site is currently undeveloped and is used for growing crops such as corn.
There is a forested area on the north side of the property that contains short ridges, gullies, and creeks. It is possible that this area could be retained as a green space.
The topsoil depths were generally 200mm thick.
There was often perched water within the silty sand, sandy silt, and sand with silt subsoils, hence, these soils can readily become spongey when disturbed, even when recompacted.
The soil density was typically loose to compact. The underlying clay silt subsoils were typically in a moist and compact condition. The susceptibility to frost action for all subsoils was generally rated as high.

Bedrock was not encountered in any of the boreholes.

Groundwater was typically encountered at depths of 1.0 to 2.0m below surface.
Monitoring wells were installed at Boreholes 4, 7, and 10. The water levels were significantly higher when measured after the rainfall that occurred on April 29 and May 3.
The well construction consisted of 3m of 10slot screen with sand fill, and 1.5-3m of pipe casing, sealed at the top with bentonite fill, and fitted with a lockable steel monument cap. The well pipe material consisted of 50 mm diameter flush-threaded schedule 40 PVC pipe, with rubber O-ring seals to prevent leakage.

Permeability
The percolation rates of the subsoil types have been estimated as follows:

silty sand	T = 25 min/cm
sandy silt	T = 30 min/cm
silt with sand	T = 40 min/cm
clay silt	T = 50 min/cm

OHSA Soil Types
The subsoils present on site can be classified as Type 3 soils. The Type 3 soils will behave as Type 4 collapsing soils, even with small amounts of perched water seepage, or where the groundwater elevation is contacted. The subsoils should be treated as Type 4 soils for any construction work that will take place under these conditions.

Recommendations

Foundations
Recommendations for placement of shallow foundations for new buildings are as follows. Footings must be placed such that they will be a minimum 1.5m below the finished ground elevation, for frost protection. It is suggested that spread or strip footings may be placed onto the undisturbed subsoils, beginning at a typical depth of 1.2m below existing ground surface. The following natural soil bearing capacities will typically be available at the base of the new footings:

Silty sand, sandy silt, silt with sand, clay silt subsoils:
Factored ULS bearing capacity: 180 kPa
SLS allowable bearing capacity: 120 kPa

These capacities are based on standard settlement values of 25mm maximum total settlement, and 19mm maximum differential settlement.

Encountered soft areas can be removed by over-excavation where necessary, then back-filled and compacted using 3inch minus crushed rock material.

Subgrade Inspection
Once exposed during construction, it would be advisable to have all intended bearing surfaces examined by a geotechnical firm in order to ensure that the intended bearing surface area is consistent with the conditions encountered at the test hole locations, and that the bearing capacity will be sufficient for the proposed new buildings and structures.

Reinforcing Steel
Placement of longitudinal reinforcing steel within the footings is desirable for this site.

Dewatering – Low Volume
Excavations within the subsoils are not expected to require extensive dewatering. A continuous pumping operation with sump equipment is anticipated to be sufficient for routine dewatering, which is expected to displace less than 50,000 L/day.

Where more extensive dewatering is proposed, a permit should be obtained for construction dewatering works under the Ministry of the Environment, Conservation and Parks (MECP) Environmental Activity and Sector Registry (EASR), which applies for taking of groundwater and stormwater for construction dewatering purposes that total less than 400,000 L/day. This

approach would accommodate groundwater inflows from sand lenses which can be encountered in this area. An EASR will also provide the contractor with greater flexibility in managing groundwater seepage and stormwater flows since it replaces the need for an ECA for discharge under most circumstances.

Dewatering – General Requirements
Care should be taken to prevent ponding or inundation due to rain, and to control excess run-off that could cause erosion. The construction contract should stipulate that the integrity of all natural soil surfaces and soil bearing surfaces must be preserved at all times. Therefore, all excavations on site must be protected from high moisture levels due to rainfall or accumulating groundwater, using appropriate dewatering techniques.

Seismic Parameters
The following seismic design parameters may be utilized:

Foundation on natural subsoils:
Site Class D Soil Shear Wave Average Velocity (m/s) = 180 < Vs < 360

The peak ground acceleration value for the Garden Hill area, as given by the OBC, is 0.130.

Geotechnical Parameters
For calculating vertical and lateral earth pressures and other geotechnical parameters, the following unfactored coefficients may be utilized:

<u>Existing sandy silt, silt with sand</u>
internal friction angle = 30^{o}
Ka = 0.33, Ko = 0.50, Kp = 3.00
Moist unit weight = 19.0 kN/m3
Coefficient of friction for the concrete/subsoil interface = 0.35

<u>typical imported sandy Granular B Type 1 backfill</u>
internal friction angle = 32^{o}
Ka = 0.31, Ko = 0.47, Kp = 3.25
Moist unit weight = 22.3 kN/m3

<u>typical imported gravelly Granular B Type 1 backfill</u>
internal friction angle = 35^{o}
Ka = 0.27, Ko = 0.43, Kp = 3.69
Moist unit weight = 23.0 kN/m3

Subdrains
Subdrain installations should consist of a perforated geotextile-wrapped pipe, placed at the footing depth along the outside perimeter of the footings. The subdrain pipe should have a minimum diameter of 150mm and must be graded to a positive outlet away from the foundation.

Backfill to the subdrain trenches should consist of OPSS 1004 Clear Stone. The type of back fill placed against the building over the subdrains should be a free-draining Granular B Type 1 material, placed full-depth to prevent the build-up of water pressure against the exterior walls of the building. Careful finished grading of the site should be applied to prevent the influx of storm water and surface runoff towards the foundation walls of the building.

Subdrains are required for below-grade building levels such as basements.
Individual assessments on a per lot basis will be required to determine acceptable basement floor elevations with respect to the varying water table, as well as perched water seepage above the water table.

Floor Slabs on Grade
The following minimum requirements are recommended for standard slab-on-grade floors:

Concrete Slab	127mm
OPSS 1010 Granular A or Clear Stone base	150mm
OPSS 1010 Granular B Type 1 subbase	200mm
Over compact native subgrade soil	

The subgrade soil surface to remain should undergo proof-rolling to ensure that it is acceptable for placement of the base and subbase materials. Remove all deleterious soil such as topsoil and organics, from beneath the new floor area. It is recommended that a concrete compressive strength of 20 to 25MPa be utilized for interior floor slabs.

Concrete
The frost penetration treatment depth for this site is 1.5m. Use CSA concrete classes C1 or C2, and F1 or F2, as appropriate to the various structure elements in the buildings.
Standard Type 10 concrete cement will be suitable for this project.

Pipe Installation
For new underground piping, utilize the following OPSD Standards for pipe installation:

For soil subgrade:

OPSD 802.010	Flexible Pipe	-	Type 3 Earth Excavation
OPSD 802.031	Rigid Pipe	-	Type 3 Earth Excavation, Class B

For bedrock subgrade:

OPSD 802.013	Flexible Pipe	-	Rock Excavation
OPSD 802.033	Rigid Pipe	-	Rock Excavation, Class B

Utilize the granular bedding and cover depths as specified in the applicable OPSD standards listed above. For normal subgrade conditions, OPSS Granular A may be utilized for pipe embedment and pipe cover material for new piping.

For wet subgrade conditions, a crushed rock or gravel should be utilized for pipe embedment and pipe cover material for new piping. A suitable material would be OPSS 1010 Granular B Type 2 with 100% passing the 50mm sieve, or clear stone such as OPSS 1004 19mm Clear Stone.

Frost protection for underground piping should be utilized as per the following OPSD standards, with a frost treatment depth of k = 1.5m:

OPSD 803.030	Frost Penetration Line Below Bedding Grade
OPSD 803.031	Frost Penetration Line Above Bedding Grade

Reuse of Subsoils

The natural subsoils found on site cannot be used as fill beneath structures. Any fill required beneath new structures must consist of an engineered granular fill. The minimum requirement for an engineered fill is OPSS 1010 Granular B Type 1, however, there are other options available, such as 3inch minus rock fill.

Any existing topsoil materials must be stripped from the site prior to placing new fill material. The silty subsoils on site are acceptable as general subgrade fill for the roadway and landscaping areas. Note in the contract there was typically perched water within all of the subsoil types, hence, these soils can readily become spongey when disturbed, even when recompacted. Great care is required to maintain these soils at the proper moisture content to obtain sufficient compaction.

Pavement Design

For the new roadways, remove all organic soil from the subgrade surface. Provide earth grading and cross fall as per OPSD 200.01 to prevent ponding of water on the soil subgrade, and to provide effective drainage of the new pavement structure.

Apply proof-rolling to the subgrade soil to ensure that it is acceptable for placement of the new granular subbase and base materials.

The following minimum pavement design as per OPSS 1150 specifications is recommended for placement of new pavement:

Pavement Structure

40mm	HL3 surface course
50mm	HL8 binder course
150mm	OPSS 1010 Granular A base
400mm	OPSS 1010 Granular B Type 1 subbase

Over compact native subgrade soil or approved fill

It will also be acceptable to substitute SuperPave hot mix as per OPSS 1151, such as SP12.5 over SP19.0.

The asphalt cement should have a minimum rating of PGAC 58 -34.
Tack-coat the hot mix substrate, as per OPSS.PROV 308, prior to placing the surface course lift of hot mix. Stipulate in the contract that all hot mix paving operations shall be carried out in accordance with OPSS 310 specifications.

Compaction Requirements
All natural soil and all granular fill compaction requirements for the project should conform with OPSS 501, Subsection 501.08.02 - Method A, utilizing soil placement in maximum 300mm lifts and a compaction standard of 100% of Standard Proctor Maximum Dry Density.

Statement of Limitations
This report is intended for the guidance of the project design team. From a construction standpoint, contractors must make their own assessment of the soil and groundwater conditions and how these will affect their proposed construction techniques and schedules.

The recommendations in this report are based on information determined at the test hole locations. Soils 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 that could not be detected or anticipated at the time of the soils investigation. If this occurs, we recommend that Terraspec be retained for further consultation, testing, and analysis.

We also recommend that Terraspec be retained to ensure that all subgrade preparation requirements are met, and to confirm that the soil conditions do not deviate materially from those encountered in test holes. In the case that unforseen conditions arise, or our recommendations are not followed, the company's responsibility is limited to interpreting the information from the test hole data collected for this report.

This report is applicable only to this specific project, constructed substantially in accordance with details of alignment and elevations quoted in the text. Where rock excavation is proposed, a contingency cost item should be included in the contract to allow for any unforeseen subgrade conditions. Elevations quoted in the document are approximate. Original ground elevations for project design purposes should be obtained from an experienced topographical survey consultant.

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TERRASPEC ENGINEERING INC.
GEOTECHNICAL ENGINEERS

Shane Galloway, B.A.
Manager

N.A. MacKinnon, P.Eng.
Senior Engineer

Borehole Data
April 27, 2021

Notes

1. Soil types, strata, and groundwater conditions have been established only at test hole locations.
2. Soils are described according to the MTO Soils Classification System and OPSD 100.06.
3. Dimensions are in millimetres up to 1 metre, then in metres thereafter.

Abbreviations

asph	-	asphalt	&	-	and
blds	-	boulders	w	-	with
blk	-	black	so	-	some
br	-	brown	tr	-	trace
BR	-	bedrock			
cl	-	clay(ey)	S	-	soil sample
cob	-	cobbles	Su	-	vane shear strength (kPa)
conc	-	concrete	N	-	blow counts per 0.3m
cr	-	crushed			
f	-	fine			
gr	-	gravel(ly)			
gry	-	grey			
med	-	medium			
NFP	-	no further progress			
org	-	organics			
RF	-	rock fill			
sa	-	sand(y)			
si	-	silt(y)			
tps	-	topsoil			

1

0	-	150	br si tps	
150	-	2.11	br sa si -moist, compact	S1 at 1.2m
2.11	-	4.27	br sa si -moist, compact	
at 1.5m		N=13		
-wet at 2.13m				
at 3.0m		N=11		
at 4.0m		N=15		
at 5.8m		N=20		
4.27	-	6.25	gry cl si -wet, compact	S2 at 5.79m
-water at 3.0m				

2

0	-	300	br si tps	
300	-	2.60	br sa si -moist, loose	S9 at 0.75m
at 1.5m		N=7		
2.60	-	5.0	gry/br sa si -wet, compact	
-water at 1.2m				

3

0	-	200	br si tps	
200	-	3.35	br si sa -wet, loose to compact	
at 1.5m		N=13		
3.35	-	5.0	gry/br si w sa -wet, compact	S8 at 3.35m

-water at 1.48m

4

0	-	120	br si tps	
120	-	1.51	br si sa -moist, loose to compact	
1.51	-	4.70	br sa si -wet, compact	
at 1.5m		N=10		
at 3.0m		N=13		
4.70	-	6.25	gry sa si -saturated, compact	

-water at 1.45m
Monitoring Well installed A303844
5m deep, stickup=1.3m, water at 1.34m Apr29, 2021

5

0	-	150	br si tps	
150	-	2.11	br si sa -moist to wet, compact	
at 1.5m		N=9		
2.11	-	5.0	gry sa si -wet, compact	

-water at 1.6m

6

0	-	160	br si tps	
160	-	3.30	br si sa -moist, compact	
at 1.0m		N=9		

-dense after 1.7m

3.30	-	5.0	gry/br sa si -wet, compact to dense	

-water at 1.4m

7

0	-	200	br si tps	
200	-	1.55	br si sa -moist, loose to compact	
1.55	-	6.25	gry si w sa -wet, compact	S3 at 3m
at 3.0m		N=11		

-water at 1.5m
Monitoring Well installed A303823
5m deep, stickup=1.07m, water at 0.67m Apr29, 2021

8

0	-	180	br si tps	
180	-	3.66	br si sa -dry, compact	S7 at 0.6m

-cob at 1.5m
-dense after 1.5m

3.66		NFP, dense si sa so cob

-water not encountered

9

0	-	250	br si tps	
250	-	1.45	br si sa -moist, compact	
1.45	-	2.70	br sa si -moist to wet, compact	S6 at 2.7m

-cob at 1.37m

at 1.5m	N=21	
2.70 -	5.0	gry sa si -wet, compact

-water at 2.1m

10

0	-	100	br si tps	
100	-	1.40	br si sa -moist to wet, compact	
1.40	-	2.80	br sa si -wet, compact	
at 2m		N=8		
2.80	-	6.25	gry si w sa -saturated, compact	S4 at 3m
at 3m		N=10	Su=90kPa	

-stiff after 3.66m
-water at 2.1m
Monitoring Well installed A303822
6.1m deep, stickup=1.1m, water at 0.4m Apr29, 2021

11

0	-	200	br si tps	
200	-	1.50	br sa si -moist, compact to dense	
1.50	-	4.88	br sa cl si -moist, compact to dense	S5 at 1.8m

-dense after 2.7m
-water not encountered

12

0	-	200	br si tps	
200	-	600	br si sa -moist, compact	
600	-	1.80	br sa si -moist, compact	
at 0.75m		Su=80kPa		
1.80	-	3.70	gry sa si -moist, compact	
3.70	-	4.7	gry cl si -wet, compact	S10 at 4m
at 3.7m		Su=100kPa		
-water at 3.7m				

Laboratory Test Data

Soil Sample	**1**	**2**	**3**	**4**	
Sieve	**% Passing**				
4.75mm	100	100	100	100	grain size
2.36mm	100	100	100	100	
1.18mm	99.9	100	99.9	99.9	
600um	99.5	99.9	99.8	99.8	
300um	94.6	99.2	99.1	99.3	
150um	83.8	95.2	93.5	96.3	
75um	64.8	84.0	74.2	89.9	
ASTM	ML	CL-ML	ML	ML	soil classification
frost rating	High	High	High	High	susceptibility to frost heave
W	10.9	28.7	25.8	25.9	field moisture content

Soil Sample	**5**	**6**	**7**	**8**	
Sieve	**% Passing**				
4.75mm	100	100	100	100	grain size
2.36mm	99.8	99.9	100	100	
1.18mm	99.5	99.7	100	100	
600um	99.3	99.5	99.7	99.8	
300um	98.3	97.2	98.5	99.5	
150um	88.4	81.5	85.3	95.2	
75um	65.6	53.9	47.4	82.0	
ASTM	CL-ML	ML	SM	ML	soil classification
frost rating	High	Med	Med	High	susceptibility to frost heave
W	20.0	21.3	13.2	30.9	field moisture content

Soil Sample	**9**	
Sieve	**% Passing**	
4.75mm	100	grain size
2.36mm	100	
1.18mm	99.8	
600um	99.4	
300um	97.7	
150um	88.3	
75um	66.0	
ASTM	ML	soil classification
frost rating	High	susceptibility to frost heave
W	21.8	field moisture content

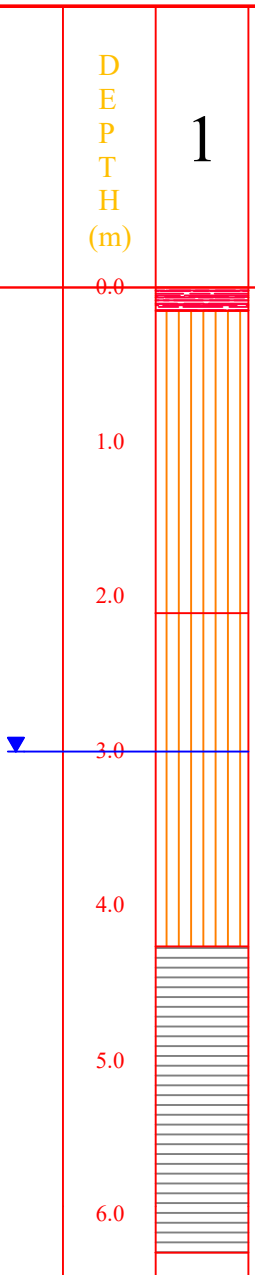
Soil Sample	**10**	
Sieve	**% Passing**	
4.75mm	100	grain size
2.00mm	100	
850um	99.8	
425um	99.8	
250um	99.8	
106um	99.8	
75um	99.6	
%gravel	0.0	
%sand	0.4	
%silt	57.4	
%clay	42.2	
ASTM	CL-ML	soil classification
frost rating	High	susceptibility to frost heave
W	25.1	field moisture content
LL	22.0	Liquid Limit
PL	16.0	Plastic Limit
PI	6.0	Plastic Index

BOREHOLE 1

PROJECT No.: 21-3-8438
CLIENT: GGG Inc.
PROJECT: 3852 Ganaraska Road
DATE: April 27, 2021

SOIL DATA
METHOD: 130mm Solid Stem Auger

▼ encountered water elevation



1	Description	sample
	Elev 180.7209	
	0 - 150 br si tps	
	150 - 2.11 br sa si -moist, compact	
	at 1.5m N=13	1
	2.11 - 4.27 br sa si -moist, compact -wet at 2.13m	
	at 3.0m N=11	
	at 4.0m N=15	
	4.27 - 6.25 gry cl si -wet, compact	
	at 5.8m N=20	2

LEGEND

- silty topsoil
- silty sand
- sandy silt
- silt with sand
- clay silt

Terraspec

BOREHOLE 2

PROJECT No.: 21-3-8438
CLIENT: GGG Inc.
PROJECT: 3852 Ganaraska Road
DATE: April 27, 2021

SOIL DATA
METHOD: 130mm Solid Stem Auger

▼ encountered water elevation

DEPTH (m)	2	Description	sample			LEGEND
0.0		Elev 180.4504				
		0 - 300 br si tps				
		300 - 2.60 br sa si -moist, loose	9			
1.0		▼ at 1.5m N=7				
2.0						
		2.60 - 5.0 gry/br sa si -wet, compact				
3.0						
4.0						
5.0						
6.0						

silty topsoil
silty sand
sandy silt
silt with sand
clay silt

Terraspec

BOREHOLE 3

PROJECT No.: 21-3-8438
CLIENT: GGG Inc.
PROJECT: 3852 Ganaraska Road
DATE: April 27, 2021

SOIL DATA
METHOD: 130mm Solid Stem Auger

▼ encountered water elevation

DEPTH (m)	3	Description	sample
		Elev 185.2678	
0.0		0 - 200 br si tps	
		200 - 3.35 br si sa -wet, loose to compact	
1.0			
		at 1.5m N=13	
2.0			
3.0			
		3.35 - 5.0 gry/br si w sa -wet, compact	8
4.0			
5.0			
6.0			

LEGEND

- silty topsoil
- silty sand
- sandy silt
- silt with sand
- clay silt

Terraspec

BOREHOLE 4

PROJECT No.: 21-3-8438
CLIENT: GGG Inc.
PROJECT: 3852 Ganaraska Road
DATE: April 27, 2021

SOIL DATA
METHOD: 130mm Solid Stem Auger

▼ encountered water elevation

DEPTH (m)	4	Description	sample
		Elev 188.0006	
0.0		0 - 120 br si tps	
		120 - 1.51 br si sa -moist, loose to compact	
1.0			
		at 1.5m N=10	
		1.51 - 4.70 br sa si -wet, compact	
2.0			
3.0		at 3.0m N=13	
4.0			
		4.70 - 6.25 gry sa si -saturated, compact	
5.0			
6.0		Monitoring Well installed A303844 5m deep, stickup=1.3m, water at 1.34m Apr29, 2021	

LEGEND

- silty topsoil
- silty sand
- sandy silt
- silt with sand
- clay silt

Terraspec

BOREHOLE 5

PROJECT No.: 21-3-8438
CLIENT: GGG Inc.
PROJECT: 3852 Ganaraska Road
DATE: April 27, 2021

SOIL DATA
METHOD: 130mm Solid Stem Auger

▼ encountered water elevation

DEPTH (m)	5	Description	sample
		Elev 179.7574	
0.0		0 - 150 br si tps	
		150 - 2.11 br si sa -moist to wet, compact	
1.0			
		at 1.5m N=9	
2.0			
		2.11 - 5.0 gry sa si -wet, compact	
3.0			
4.0			
5.0			
6.0			

LEGEND

- silty topsoil
- silty sand
- sandy silt
- silt with sand
- clay silt

Terraspec

BOREHOLE 6

PROJECT No.: 21-3-8438
CLIENT: GGG Inc.
PROJECT: 3852 Ganaraska Road
DATE: April 27, 2021

SOIL DATA
METHOD: 130mm Solid Stem Auger

▼ encountered water elevation

DEPTH (m)	6	Description	sample
		Elev 185.6409	
0.0		0 - 160 br si tps	
		160 - 3.30 br si sa -moist, compact	
1.0		at 1.0m N=9	
		-dense after 1.7m	
2.0			
3.0			
		3.30 - 5.0 gry/br sa si -wet, compact to dense	
4.0			
5.0			
6.0			

LEGEND

- silty topsoil
- silty sand
- sandy silt
- silt with sand
- clay silt

Terraspec

BOREHOLE 7

PROJECT No.: 21-3-8438
CLIENT: GGG Inc.
PROJECT: 3852 Ganaraska Road
DATE: April 27, 2021

SOIL DATA
METHOD: 130mm Solid Stem Auger

▼ encountered water elevation

DEPTH (m)	7	Description	sample
		Elev 181.0259	
0.0		0 - 200 br si tps	
		200 - 1.55 br si sa -moist, loose to compact	
1.0			
		1.55 - 6.25 gry si w sa -wet, compact	
2.0			
3.0		at 3.0m N=11	3
4.0			
5.0			
6.0		Monitoring Well installed A303823 5m deep, stickup=1.07m, water at 0.67m Apr29, 2021	

LEGEND

- silty topsoil
- silty sand
- sandy silt
- silt with sand
- clay silt

Terraspec

BOREHOLE 8

PROJECT No.: 21-3-8438
CLIENT: GGG Inc.
PROJECT: 3852 Ganaraska Road
DATE: April 27, 2021

SOIL DATA
METHOD: 130mm Solid Stem Auger

▼ encountered water elevation

DEPTH (m)	8	Description	sample
		Elev 187.2381	
0.0		0 - 180 br si tps	
		180 - 3.66 br si sa -dry, compact	7
1.0		-cob at 1.5m -dense after 1.5m	
2.0			
3.0			
		3.66 NFP, dense si sa so cob	
4.0			
5.0			
6.0		-water not encountered	

LEGEND

- silty topsoil
- silty sand
- sandy silt
- silt with sand
- clay silt

Terraspec

BOREHOLE 9

PROJECT No.: 21-3-8438
CLIENT: GGG Inc.
PROJECT: 3852 Ganaraska Road
DATE: April 27, 2021

SOIL DATA
METHOD: 130mm Solid Stem Auger

▼ encountered water elevation

DEPTH (m)	9	Description	sample
		Elev 178.9998	
0.0		0 - 250 br si tps	
		250 - 1.45 br si sa -moist, compact	
1.0		-cob at 1.37m	
		1.45 - 2.70 br sa si -moist to wet, compact at 1.5m N=21	
2.0			
		2.70 - 5.0 gry sa si -wet, compact	6
3.0			
4.0			
5.0			
6.0			

LEGEND

- silty topsoil
- silty sand
- sandy silt
- silt with sand
- clay silt

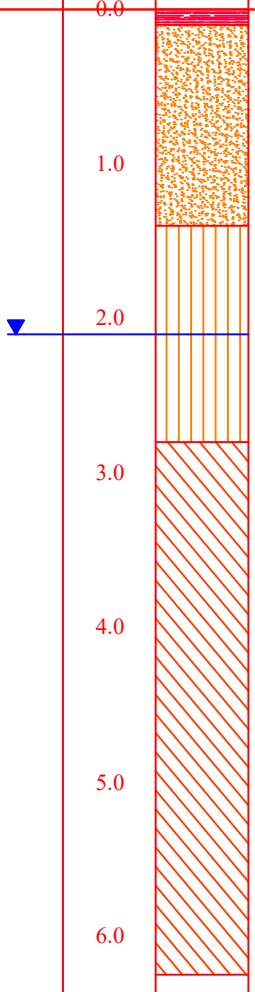
Terraspec

BOREHOLE 10

PROJECT No.: 21-3-8438
CLIENT: GGG Inc.
PROJECT: 3852 Ganaraska Road
DATE: April 27, 2021

SOIL DATA
METHOD: 130mm Solid Stem Auger

▼ encountered water elevation



10

Description

Elev 176.6654

0	-	100	br si tps
100	-	1.40	br si sa -moist to wet, compact
1.40	-	2.80	br sa si -wet, compact
at 2m		N=8	
2.80	-	6.25	gry si w sa -saturated, compact
at 3m		N=10	Su=90kPa

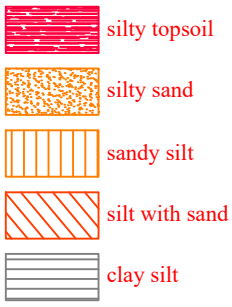
-stiff after 3.66m

Monitoring Well installed A303822
6.1m deep, stickup=1.1m, water at 0.4m Apr29, 2021

sample

4

LEGEND



Terraspec

BOREHOLE 11

PROJECT No.: 21-3-8438
CLIENT: GGG Inc.
PROJECT: 3852 Ganaraska Road
DATE: April 27, 2021

SOIL DATA
METHOD: 130mm Solid Stem Auger

▼ encountered water elevation

DEPTH (m)	11	Description	sample
0.0		Elev 177.3232	
		0 - 200 br si tps	
		200 - 1.50 br sa si -moist, compact to dense	
1.0			
		1.50 - 4.88 br sa cl si -moist, compact to dense	5
2.0			
		-dense after 2.7m	
3.0			
4.0			
5.0			
6.0		-water not encountered	

LEGEND

- silty topsoil
- silty sand
- sandy silt
- silt with sand
- clay silt

Terraspec

BOREHOLE 12

PROJECT No.: 21-3-8438
CLIENT: GGG Inc.
PROJECT: 3852 Ganaraska Road
DATE: April 27, 2021

SOIL DATA
METHOD: 130mm Solid Stem Auger

▼ encountered water elevation

DEPTH (m)	12	Description	sample
		Elev 177.7219	
0.0		0 - 200 br si tps	
		200 - 600 br si sa -moist, compact	
1.0		600 - 1.80 br sa si -moist, compact at 0.75m Su=80kPa	
2.0		1.80 - 3.70 gry sa si -moist, compact	
3.0			
4.0		3.70 - 4.7 gry cl si -wet, compact at 3.7m Su=100kPa	10
5.0			
6.0			

LEGEND

- silty topsoil
- silty sand
- sandy silt
- silt with sand
- clay silt

Terraspec

THE GREER GALLOWAY GROUP INC.
ENGINEERS & PLANNERS
PETERBOROUGH
BELLEVILLE
KINGSTON
1620 WALLBRIDGE LOYALIST ROAD
BELLEVILLE, ONTARIO, K8N 4Z5
PHONE: 613-966-3068
FAX: 613-966-3087

NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH RELEVANT CODES AND GUIDELINES.
2. ALL DRAWINGS AND ADDENDA ARE TO BE READ AS, AND IN CONJUNCTION WITH THE SPECIFICATIONS.
3. ALL EQUIPMENT SHALL BE INSTALLED AS SPECIFIED OR APPROVED EQUIVALENT.
4. CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH WORK AND BE RESPONSIBLE FOR SAME.
5. CONTRACTOR MUST REPORT ANY DISCREPANCIES TO ENGINEER FOR RESOLUTION BEFORE COMMENCING THE WORK.
6. ANY CHANGES MUST BE APPROVED BY THE ENGINEER.

A / B — A DETAIL NO. / B DRAWING NO. – WHERE DETAILED

LEGEND

NORTH

STAMP

PROJECT
GARDEN HILL
SUBDIVISION

GARDEN HILL, ONTARIO

DRAWING TITLE
SITE PLAN
BORE HOLE LOCTAIONS

REVISION		DATE
05		
04		
03		
02		
01		

DESIGNED BY

DRAWN BY
TL

REVIEWED BY

APPROVED BY

PROJECT DATE
06/05/2021
(DD/MM/YYYY)

PROJECT #
21-3-8438

SCALE
HOR: 1:200
VER: N/A

DRAWING #
SP-1

CAD OPERATOR:Taylor
CAD FILE: P:\Belleville Project\8000\21-38438 - Mysyk Cobourg Prop\Drawings\Working\Bore Hole Map.dwg
PLOT SCALE: 1:2
DATE PLOTTED: 2021-04-22
GGC-A1

(METRIC SCALE – ALL DIMS IN MILLIMETERS)

Looking North

Photo of Subgrade Soils