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August 2, 2023
File: 23122

Zest Communities Inc.
% LANDx Developments Inc.
293-1235 Fairview St
Burlington, Ontario
L7S 2K9

Attention: Mr. Tim Collins – President, LANDx Developments Inc.

Dear Mr. Collins,

Re: Limited Geotechnical Investigation Letter Report
St. Elizabeth Village Development Phase 4, 393 Rymal Road West, Hamilton, Ontario

Landtek Limited (herein "*Landtek*") is pleased to submit this Limited Geotechnical Investigation letter report for the proposed Phase 4 development of the existing St. Elizabeth Village, located at civic address 393 Rymal Road West in Hamilton, Ontario. Authorization to proceed with the work was received from LANDx Developments Inc. (herein "*LANDx*"), acting on behalf of the Zest Communities Inc.

The purpose of the limited-scope investigation is to determine groundwater levels around the Phase 4 development area relative to the proposed basements of the residential structures. As such, further, more detailed investigation will be required for the proposed development, which is understood will be undertaken at a later date.

This letter report has been prepared for the Client, their nominated engineers, designers, and project managers pertaining to the groundwater conditions relative to the proposed Phase 4 development of St. Elizabeth Village, located at civic address 393 Rymal Road West in Hamilton, Ontario. Further dissemination of this report is not permitted without Landtek's prior written approval.

Further details of the limitations of this report are presented as Enclosure A.

Background

From the conceptual site plans provided to Landtek it is understood that the property owner is intending to develop an area of the St. Elizabeth Village site, identified as "*Phase 4*". The proposed development is to comprise of:

- Five, three- to five-storey residential low-rise towers;
- A two-storey, commercial retail structure in the north; and,
- Townhouse blocks along the southern and eastern property boundaries.

The development also includes for at-grade parking and two levels of basement parking below the low-rise structures.

Site Description and Topography

The site is located in Hamilton, Ontario, and is centered at approximate grid reference 588845, 4784085 (UTM 17T coordinates). The Geodetic elevation of the ground surface at the site is approximately 224 m in the south of the site to approximately 237 m in the north of the site.

The site is located in a predominantly residential area, being bound to the south, east and west by residential properties, while Rymal Road West binds the site to the north. Majority of the site is predominately covered by grasses, with a building and associated parking areas on the east side of the site. Access and private roads are also present across the site.

Subsurface Characterization

Based on a review of an existing geological publication for the site area, Ontario Geological Survey (herein *"OGS*") Map P.993: "*Quaternary Geology of the Grimsby Area*", the site is underlain by glaciolacustrine clay and silt deposits.

According to the OGS Map 2343 "*Paleozoic Geology of the Grimsby Area*", the superficial geology is underlain by either brown or tan dolostone of the Guelph Formation or dark brown or black dolostone of the Lockport Formation at a significant depth beneath the site (in the order of approximately 15 m).

Information provided by historical borehole records from within the vicinity of the site, and held by the OGS, generally confirms the anticipated geological conditions beneath the site. Based on the data from records for Borehole ID 624027, located approximately 960 m east of the site, the superficial soil profile confirms the presence of a veneer of fill materials (approximately 0.5 m thick), overlying sand, silt and clay deposits to a depth of 8.1 m.

Fieldwork and Investigation Methodology

Fieldwork undertaken at the site by Landtek included clearance of underground services, borehole layout, borehole drilling, soil sampling, and field supervision. Four boreholes (boreholes BH1 to BH4) were drilled on May 16, 2023. The boreholes were logged using those standard symbols and terms defined in Enclosure B. The Borehole Location Plan, Drawing 23122-01, and associated borehole logs are provided in Enclosure C.

The boreholes were drilled using a Dietrich D-50 track mounted drill rig equipped with continuous flight, solid stem augers, and were advanced to depths of approximately 6.0 m below existing ground level under the full-time supervision of a representative of Landtek. Standard Penetration Tests (SPT's) and split spoon samples were taken at frequent depth intervals during drilling.

The boreholes were completed as monitoring wells to monitor groundwater levels along the proposed anticipated lowest basement excavation and were reidentified as BH/MW1, BH/MW2, BH/MW3 and BH/MW4. The borehole logs in Appendix C present the monitoring well installations at each location.

The monitoring wells consisted of new 50 mm poly-vinyl chloride (PVC) screen with No.10 slots threaded onto a matching riser. The screens and risers were pre-threaded including o-ring seals such that no glues or solvents were used to connect the pipe sections. The annular space between the PVC well and the borehole was backfilled to approximately 0.3 m above the top of the screen section with sand pack, and then with bentonite to existing ground level. A J-Plug lockable air-tight

cap was installed on the riser. Subsequent groundwater monitoring visits were undertaken by Landtek in June 2023.

All soil samples were transported to Landtek's in-house, Canadian Council of Independent Laboratories (CCIL) certified laboratory and visually examined to determine their classification. Moisture contents were carried out on all samples. No chemical laboratory testing was completed during this investigation.

Borehole locations were established on site by Landtek with reference to existing site structures and features. Depth related remarks for each borehole were made relative to the ground level at each respective borehole location.

Subsurface Conditions

Surficial Cover Material

An approximately 250 mm to 300 mm thick layer of organic soil was encountered in all boreholes except borehole BH/MW1, though this is not considered representative of the organic soil cover across the site.

Existing Pavement Materials

An approximately 75 mm thick bituminous asphaltic concrete layer was encountered at the ground surface in borehole BH/MW1. Underlying the pavement material is an approximately 600 mm thick layer of granular material consisting of crushed limestone product.

Silt

Silt deposits were encountered in all boreholes directly underlying the surface cover material and clayey silt to silty clay deposits and extends to depths of approximately 1.5 m to 7.2 m below existing ground level. The silt deposits are brown in colour, becoming grey at depth, and include variable fractions of clay, gravel and sand.

SPT ''N'' values ranging between 4 and 37 were recorded, indicating the silt deposits to be of a loose to dense, but generally compact condition. Moisture contents ranging from 14 % to 26 %, were reported which is as to be expected of a moist to wet soil with silt as the primary constituent.

The moisture content testing results are presented on the borehole logs in Enclosure C.

Clayey Silt/Silty Clay to Clay

Clayey silt/silty clay to clay deposits were encountered underlying the existing pavement structure and silt deposits in all boreholes and extends to depths of approximately 2.3 m to 7.1 m below existing ground level. The clayey silt/silty clay to clay deposits are generally brown and grey in colour and include trace fractions of gravel, silt, sand and organics.

SPT ''N'' values ranging between 6 and 37 were recorded, indicating the clayey silt/silty clay to clay deposits to be of a firm to hard, but generally stiff condition. Moisture contents ranging from 15 % to 25 %, were reported which is as to be expected of a moist to very moist soil with silt and clay as primary constituents.

The moisture content testing results are presented on the borehole logs in Enclosure C.

Sandy Silt

Sandy silt deposits were encountered in borehole BH/MW4 underlying the clayey silt deposits and extends to the maximum drill depth of approximately 7.2 m below existing ground level. The sandy silt deposits are generally brown in colour.

SPT ''N'' values 51 were recorded, indicating the sandy silt deposits to be of a very dense compactness condition. Moisture contents of 18 % were reported, which is as to be expected of a very moist soil with sand and silt as primary constituents.

The moisture content testing results are presented on the borehole logs in Enclosure C.

Bedrock

Bedrock was not encountered during this investigation.

Groundwater

Saturated soils were encountered at depths between approximately 4.3 m and 6.4 m below ground level, within the interbedded silt and silty clay deposits. These saturated soils are considered representative of the "*groundwater strike*" of a site-wide groundwater regime.

Depths to groundwater in the monitoring wells were recorded on June 20, 2023, and the water levels summarized in the following Table 1.

Table 1: Summary of Water Level Measurements

Borehole ID	Monitoring Well Data		Groundwater Monitoring Results	
	Well Depth	Water Strike	Date	Water Level
BH/MW1	6.4 m	4.3 m	June 20, 2023	1.6 m
BH/MW2	6.7 m	6.0 m		3.4 m
BH/MW3	6.7 m	6.4 m		3.7 m
BH/MW4	6.0 m	6.0 m		3.4 m

The groundwater levels recorded are considered representative of a site-wide groundwater table associated with the more permeable till deposits and the porous limestone bedrock.

It should be noted that groundwater conditions and surface water flow conditions are expected to vary according to the time of the year and seasonal precipitation levels. Water seepage is also expected from soil fissures above the water table.

Preliminary Engineering Considerations

Shallow Foundations in Native Soils

It is understood that the proposed low-rise structures located centrally to the site area will include for two levels of basement parking. In accordance with the Ontario Building Code (herein "*OBC*"), (2012) Subsection 9.12.2.2 (5), and based on local experience, the shallowing of exterior and interior footings to 0.9 m and 0.6 m depth below the basement finished floor level respectively, may be adopted for the proposed development. On this basis, it is anticipated that the foundations for these structures will be seated at depths of approximately 6.0 m to 7.0 m below ground level, with elevator shafts extending approximately 1.5 m deeper.

Based on the ground conditions observed at the borehole locations, it is anticipated that the low- to moderately-loaded, low-rise structures can be supported by the native silty and clayey soils using conventional, concrete strip or pads foundations.

Table 2 summarizes the indicative geotechnical reactions at the Serviceability Limit State (herein "*SLS*") and factored geotechnical resistances at the Ultimate Limit State (herein "*ULS*") for the native soils at the anticipated founding depths.

Table 2: Indicative Limit State Foundation Design Values

Depth Range	Founding Stratum	Foundation Design Value	
		SLS [1,2]	ULS [3,4]
±6.0 m to ±7.0 m	Silty, clayey and sandy soils	120 kPa	180 kPa

Notes:
1. The National Building Code general safety criterion for the serviceability limit states is: SLS resistance ≥ effect of service loads.
2. Recommended SLS bearing values conform to Estimated Values based on soil types given in Tables K-8 and K-9 of the National Building Codes User's Guide.
3. The ULS resistance factor for shallow foundations is 0.5, as given in Table K-1 of the National Building Code User's Guide.
4. The National Building Code general safety criterion for the ultimate limit states is: factored ULS resistance ≥ effect of factored loads.

Given the limited scope of this investigation, a further phase of deeper Geotechnical Investigation should be undertaken in accordance with the OBC (2012) Subsection 4.2.4 to confirm the subsurface soils conditions for design.

Frost Susceptibility

The fine-grained, native soils encountered at shallow depths across the site should be considered sensitive to water and frost, and their physical and mechanical properties are dependent on in-situ moisture content. As such, the founding soils at the site are considered to have a moderate to high

frost susceptibility, being classified as Frost Group "*F4*" (Table 13.1 of the "*Canadian Foundation Engineering Manual*", 4th Edition). However, the previously given foundation depth range is considered below the maximum depth for frost penetration of 1.2 m in the Hamilton area.

Should any re-grading be required as part of the proposed upgrades, it will be important to ensure that the associated exterior footings will have a minimum of 1.2 m of soil cover, or equivalent suitable insulation is applied for frost protection.

Settlement Considerations

Based on the outline information provided for the nature of the proposed development of the site, it is anticipated that the loads to be applied to the native soils will be of a generally low intensity. As such, associated settlements are not expected to be large.

Therefore, the general limiting of the total settlement to 25 mm and the differential settlement to 19 mm by the recommended geotechnical reaction at the SLS is considered appropriate.

Seismic Design Consideration

Based on the soils conditions encountered, and in accordance with Table 4.1.8.4.A. of the current OBC (2012), the site is considered to be a 'D' Site Class for foundations seated within the native soils.

The acceleration and velocity-based site coefficients, F_a and F_v, should be determined from Tables 4.1.8.4.B. and 4.1.8.4.C. respectively of the OBC for the above recommended Site Class. The seismic design data given in Table 1.2 of Supplementary Standard SB-1 in Volume 2 of the OBC, for selected Municipal locations, should be used to complete the seismic analysis.

Damp Proofing and Waterproofing Considerations

Given groundwater was encountered at depths between approximately 4.3 m and 6.4 m below ground level and the piezometric levels recorded at between approximately 1.6 m and 3.7 m depth below existing ground level, it is anticipated that subsurface structures and areas (i.e., basement walls, floor slabs etc.) will require waterproofing.

The requirement for waterproofing is usually derived from the depth either of groundwater strike (if groundwater is piezometric), or static groundwater resting level, plus the required buffer zone (nominally 1.0 m to 1.5 m above the stabilized or highest recorded groundwater level). This given and considering the groundwater depths noted, a combination of damp proofing to the first basement level and waterproofing to the lower, second basement level may be also possible.

Subsurface areas above static groundwater levels should be damp proofed and comply with the OBC requirements. As a minimum it is recommended that the damp proofing system include a Delta Drainage Board or MiraDrain 2000 series product, or an approved alternative, along with an asphalt-based spray-on wall coating.

Perimeter and Underfloor Drainage Considerations

Unless the proposed structures are to be waterproofed, perimeter drainage should be provided around all subsurface floor areas where percolating storm water may accumulate. It should be noted however, that the Corporation of the City of Hamilton (herein "*City of Hamilton*") no longer permits the discharge of groundwater into the Municipal storm system where the perimeter drainage is to be installed below the established groundwater level.

Underfloor drains may be also required depending on the provision of waterproofing, or excavation and groundwater seepage conditions, particularly if below the groundwater level. Based on the anticipated foundation elevations for the two basement levels and deeper elevator pits, and when considering the groundwater monitoring data, groundwater is to be expected within the excavation profile for the basements of the proposed low-rise structures.

Any installed drainage system should comply with the OBC and associated amendments.

Closure

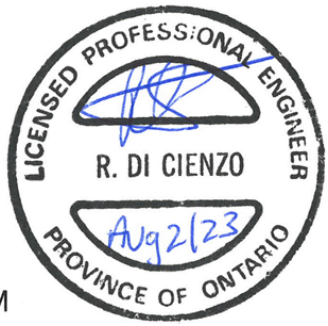
The Limitations of Report, as stated in Enclosure A, are an integral part of this report.

Soil samples will be retained and stored by Landtek for a period of three months after the issuing of this letter report. The samples will be disposed of at the end of the three-month period unless a written request from the Client to extend the storage period is received.

We trust that this letter report is satisfactory for your purposes, and please do not hesitate to contact our office if you have any questions.

Yours sincerely,

LANDTEK LIMITED



James Dann, B.Eng. (Hons.) ACSM
Manager, Geotechnical Projects

Ralph Di Cienzo, P.Eng.
Consulting Engineer

Encs.

Enclosure A: Limitations of Report
Enclosure B: Symbols and Terms Used in the Report
Classification of Soils for Engineering Purposes
Enclosure C: Drawing 23122-01 – Borehole Location Plan
Borehole Logs

ENCLOSURE A
LIMITATIONS OF REPORT

The conclusions and recommendations given in this report are based on information determined at the borehole locations. Subsurface and ground water conditions between and beyond the Boreholes may be different from those encountered at the borehole locations, and conditions may become apparent during construction that could not be detected or anticipated at the time of the geotechnical investigation. It is recommended practice that Landtek be retained during construction to confirm that the subsurface conditions throughout the site are consistent with the conditions encountered in the Boreholes.

The comments made in this report on potential construction problems and possible remedial methods are intended only for the guidance of the designer. The number of Boreholes may not be sufficient to determine all the factors that may influence construction methods and costs. For example, the thickness and quality of surficial topsoil or fill layers may vary markedly and unpredictably. Additionally, bedrock contact depths throughout the site may vary significantly from what was encountered at the exact borehole locations. Contractors bidding on the project, or undertaking construction on the site should make their own interpretation of the factual borehole information, and establish their own conclusions as to how the subsurface conditions may affect their work.

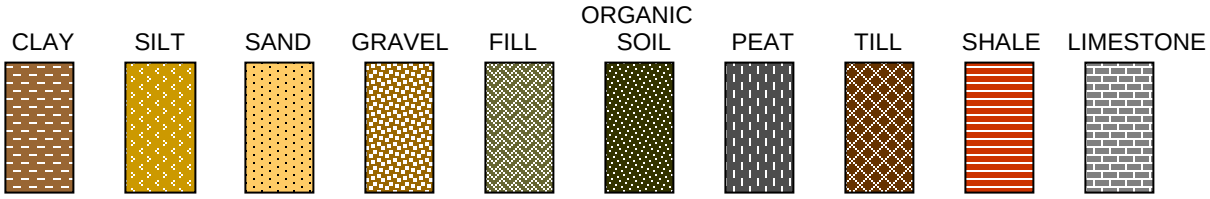
The survey elevations in the report were obtained by Landtek Limited or others, and are strictly for use by Landtek in the preparation of the geotechnical report. The elevations should not be used by any other parties for any other purpose.

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

This report does not reflect environmental issues or concerns related to the property unless otherwise stated in the report. The design recommendations given in the report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report. Since all details of the design may not be known, it is recommended that Landtek Limited be retained during the final design stage to verify that the design is consistent with the report recommendations, and that the assumptions made in the report are still valid.

ENCLOSURE B

SYMBOLS AND TERMS USED IN THE REPORT



RELATIVE PROPORTIONS

Term	Range
Trace	0 - 5%
A Little	5 – 15%
Some	15 – 30%
With	30 – 50%

CLASSIFICATION BY PARTICLE SIZE

Boulder ---------- > 200 mm
Cobble ---------- 80 mm – 200 mm
Gravel -
Coarse ---------- 19 mm – 80 mm
Fine ---------- 4.75 mm – 19 mm
Sand -
Coarse ---------- 4.75 mm – 2 mm
Medium -------- 2 mm – 0.425 mm
Fine ---------- 0.425 mm – 0.75 mm
Silt ---------- 0.075 mm – 0.002 mm
Clay ---------- < 0.002 mm

DENSITY OF NON-COHESIVE SOILS

Descriptive Term	Relative Density	Standard Penetration Test
Very Loose	0 – 15%	0 – 4 Blows Per 300 mm Penetration
Loose	15 – 35%	4 – 10 Blows Per 300 mm Penetration
Compact	35 – 65%	10 – 30 Blows Per 300 mm Penetration
Dense	65 – 85%	30 – 50 Blows Per 300 mm Penetration
Very Dense	85 – 100%	Over 50 Blows Per 300 mm Penetration

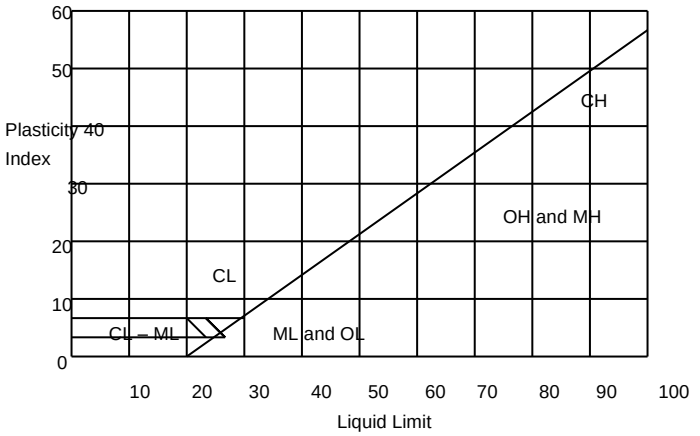
CONSISTENCY OF COHESIVE SOILS

Descriptive Term	Undrained Shear Strength kPa (psf)	N Value Standard Penetration Test	Remarks
Very Soft	< 12 (< 250)	< 2	Can penetrate with fist
Soft	12 – 25 (250 – 500)	2 – 4	Can indent with fist
Firm	25 – 50 (500 –1000)	4 – 8	Can penetrate with thumb
Stiff	50 – 100 (1000 – 2000)	8 – 15	Can indent with thumb
Very Stiff	100 – 200 (2000 – 4000)	15 – 30	Can indent with thumb-nail
Hard	> 200 (> 4000)	> 30	Can indent with thumb-nail

Notes: 1. Relative density determined by standard laboratory tests.
2. N value – blows/300 mm penetration of a 623 N (140 Lb.) hammer falling 760 mm (30 in.) on a 50 mm O.D. split spoon soil sampler. The split spoon sampler is driven 450 mm (18 in.) or 610 mm (24 in.). The “N” value is the Standard Penetration Test (SPT) value and is normally taken as the number of blows to advance the sampler the last 300 mm.

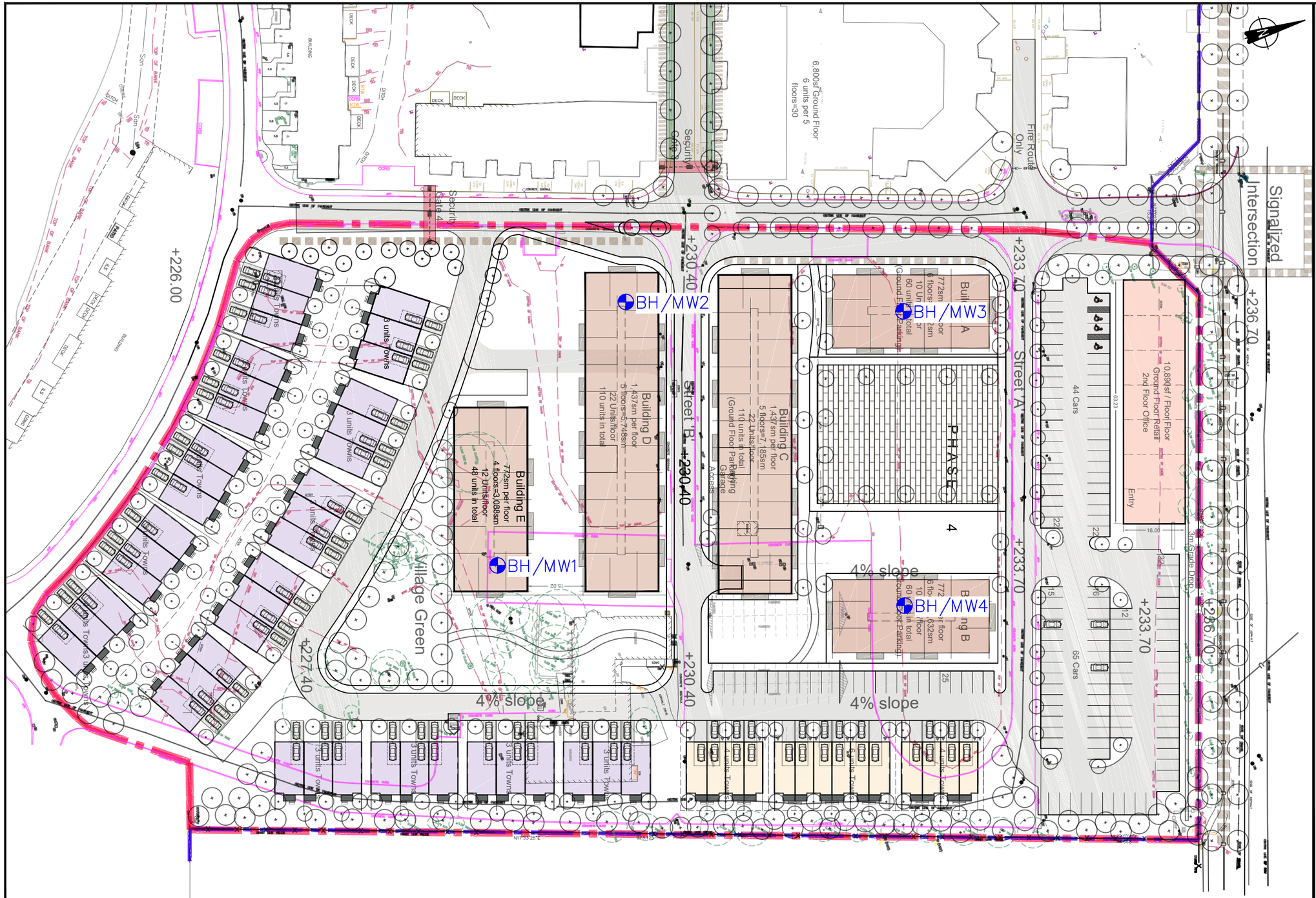
ENCLOSURE B CONTINUED
CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES
ASTM Designation: D 2487 - 69 AND D 2488 – 69
(Unified Soil Classification System)

Major Divisions			Group Symbols	Typical Names	Classification Criteria		
Coarse-grained soils More than 50% retained on No. 200 sieve *	Gravels 50% or more of coarse fraction retained on No. 4 sieve	Clean gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	Classification on basis of percentage of fines Less than 5% pass No. 200 sieve . . . . . GW, GP, SW, SP More than 12% pass No. 200 sieve . . . . . GM, GC, SM, SC 5 to 12% pass No.200 sieve . . . . . Borderline classifications requiring use of dual symbols	C_u=D60/D10 greater than 4; C_z = $(D30)^2$/(D10xD60) between 1 and 3	
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines		Not meeting both criteria for GW	
		Gravels with fines	GM	Silty gravels, gravel-sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7	
	Sands More than 50% of coarse fraction passes No. 4 sieve	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines		C_u=D60/D10 greater than 6; C_z = $(D30)^2$/ (D10xD60) between 1 and 3	
			SP	Poorly graded sands and gravelly sands, little or no fines		Not meeting both criteria for SW	
		Sands with fines	SM	Silty sands, sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7	
Fine-grained soils 50% or more passes No. 200 sieve *	Silts and clays Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	Plasticity Chart For classification of fine-grained soils and fine fraction of coarse-grained soils. Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols. Equation of A-line: PI=0.73 (LL-20)		
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silts			
			OL	Organic silts and organic silts of low plasticity			
	Silts and clays Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts			
			CH	Inorganic clays of high plasticity, fat clays			
			OH	Organic clays of medium to high plasticity			
	Highly organic soils		Pt	Peat, much and other highly organic soils	* Based on the material passing the 3 in. (76mm) sieve.		



ENCLOSURE C

DRAWING 23122-01 – BOREHOLE LOCATION PLAN
BOREHOLE LOGS



Key plan an extract from spatialsolutions.maps.arcgis.com©

Key:

- Approximate location of borehole and monitoring wells drilled by Landtek Limited on May 16th, 2023.

Notes:

Base drawing an extract from preliminary drawing "Phase 4 Concept Plan", dated March 27, 2023 as issued by MSAi - Michael Spaziani Architect Inc.

revisions/ submissions

#	date	description

client
Zest Communities Inc.
% LANDx Developments Inc.

municipality
The Corporation of the
City of Hamilton

project
Geotechnical Investigation
393 Rymal Road West

sheet
Borehole and Monitoring Well Location Plan

date: may 18, 2023
drawn: mdc
checked: jd
project #: 23122
scale: 1:1,000

23122-01

LANDTEK LIMITED
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w: www.landtek.ca

LOG OF BOREHOLE BHMW1

Project No.: 23122
Project Name: 393 Rymal Road West, Hamilton
Location: 393 Rymal Road West, Hamilton

Drill Date: 2023-05-16
Drilling Method: Solid Stem
Datum: Ground Surface

Northing: 43.203797
Easting: -79.906202
Ground Surface Elevation: 0

Depth Scale (m)	Depth/Elevation (m)	Description	Number	Type	Blow Counts/150 mm	N Value	Comments
		Asphalt ~75mm, bituminous **Granular** ~600 mm, crushed limestone					
1	-1.0	**Clayey Silt** trace organics, trace sand. Stiff, black and grey, moist. Organic odour.	1	SS	3 4 5	9	
		...grey and brown.	2	SS	2 3 3	6	
2	-2.0						
		Silt some clay. Loose, brown, very moist to wet.	3	SS	1 2 2	4	
3	-3.0	...compact, moist.	4	SS	1 4 7	11	
4	-4.0	...brown and grey.					
5	-5.0		5	SS	8 8 8	16	
6	-6.0	**Silty Clay** Firm to stiff, grey, moist.	6	SS	3 4 4	8	
		Silt some clay. Compact, grey, moist.	7	SS	2 7 8	15	
7	-7.0	End of Log					
8	-8.0						
9	-9.0						
10	-10.0						

Undrained Shear Strength Values (kPa)
40 80 120 160

Penetration Test Values (Blows / 0.3m)
20 40 60 80

Moisture / Plasticity
PL MC LL
10 20 30 40

Moisture / Plasticity: 18.5, 21.6, 25.6, 25.7, 21.9, 19.5, 20.8

Well Details
3/8" Bentonite Pellets
#10 Well Slot Sand
2" Schedule 40 PVC Slot 10 Screen

Groundwater Conditions
8" Drop-in Flushmount
June 2023

Headspace Vapor HEX/IBL (ppm) [LEL(%)]

Additional Notes:
1. Borehole open to approximately 6.7 m depth on completion.
2. Groundwater or water seepage encountered on completion at approximately 4.3 m below the ground surface.
3.
4.

LANDTEK LIMITED
205 Nebo Road, Unit 4B
Hamilton, Ontario, L8W 2E1
Ph: (905) 383-3733

LOG OF BOREHOLE BHMW2

Project No.: 23122
Project Name: 393 Rymal Road West, Hamilton
Location: 393 Rymal Road West, Hamilton

Drill Date: 2023-05-16
Drilling Method: Solid Stem
Datum: Ground Surface

Northing: 43.204296
Easting: -79.90685
Ground Surface Elevation: 0

Depth Scale (m)	Depth/Elevation (m)	Description	Number	Type	Blow Counts/150 mm	N Value	Undrained Shear Strength Values (kPa) 40 80 120 160 / Penetration Test Values (Blows / 0.3m) 20 40 60 80	Moisture / Plasticity (PL MC LL; Moisture / Plasticity 10 20 30 40)	Well Details	Groundwater Conditions	Headspace Vapor HEX/IBL (ppm) [LEL(%)]	Comments
	1.0											
0	0.0	**Organic Material** ~300 mm. Silty sand, trace clay.										
		Silt trace sand, trace gravel, trace clay. Loose, brown, moist.	1	SS	3 4 5 7	9		17.1				
1	-1.0	...compact.	2	SS	5 7 10	17		18.3				
		Clayey Silt trace sand. Firm to stiff, brown, moist.	3	SS	3 3 5	8		22.7	3/8" Bentonite Pellets			
2	-2.0	**Silt** trace clay. Compact, brown, moist.	4	SS	3 4 9	13		24.8				
3	-3.0	...dense	5	SS	6 12 19	31		18.6		June 2023		
4	-4.0											
5	-5.0	...some clay, trace sand.	6	SS	17 21 16	37		19.3	#10 Well Slot Sand	36" Locking, Water Resisyant Vault; 2" Schedule 40 PVC Slot 10 Screen		
6	-6.0	**Clay** trace silt. Firm, grey, very moist.	7	SS	2 3 4	7		21.5				
7	-7.0	**Clayey Silt** Very stiff, grey, very moist to wet.	8	SS	5 7 9	16		20.0				
		End of Log										
8	-8.0											

Additional Notes:
1. Borehole open to approximately 6.7 m depth on completion.
2. Groundwater or water seepage encountered during drilling at approximately 6.0 m below the ground surface.
3.
4.

LANDTEK LIMITED
205 Nebo Road, Unit 4B
Hamilton, Ontario, L8W 2E1
Ph: (905) 383-3733

LOG OF BOREHOLE BHMW3

Project No.: 23122
Project Name: 393 Rymal Road West, Hamilton
Location: 393 Rymal Road West, Hamilton

Drill Date: 2023-05-16
Drilling Method: Solid Stem
Datum: Ground Surface

Northing: 43.204898
Easting: -79.906476
Ground Surface Elevation: 0

Depth Scale (m)	Stratigraphic Symbol	Depth/Elevation (m)	Description	Number	Type	Blow Counts/150 mm	N Value	Undrained Shear Strength Values (kPa) 40 80 120 160 / Penetration Test Values (Blows / 0.3m) 20 40 60 80	Moisture / Plasticity (PL MC LL; Moisture / Plasticity 10 20 30 40)	Well Details	Groundwater Conditions	Headspace Vapor HEX/IBL (ppm) [LEL(%)]	Comments
		1.0											
0		0.0	**Organic Material** ~250 mm. Silty sand.										
			Silt some sand, trace clay. Loose, brown, moist.	1	SS	2 4 4 5	8		14.9				
1		-1.0	...trace sand, trace gravel. Compact.	2	SS	6 6 9	15		16.0	3/8" Bentonite Pellets	36" Locking, Water Resisyant Vault		
			Clayey Silt Stiff, brown, moist.	3	SS	4 5 8	13		20.5				
2		-2.0	...very stiff.	4	SS	4 5 11	16		19.7				
3		-3.0	**Silt** trace gravel. Dense, brown, moist.	5	SS	9 12 20	32		18.9		June 2023		
4		-4.0											
			Clayey Silt trace gravel. Very stiff, grey, moist.	6	SS	10 8 10	18		17.3	#10 Well Slot Sand	2" Schedule 40 PVC Slot 10 Screen		
5		-5.0											
6		-6.0		7	SS	12 12 13	25		16.1				
			...hard, very moist.	8	SS	8 11 20	31		15.8				
7		-7.0	End of Log										
8		-8.0											

Additional Notes:
1. Borehole open to approximately 6.7 m depth on completion.
2. Groundwater or water seepage encountered during drilling at approximately 6.45 m below the ground surface.
3.
4.

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Hamilton, Ontario, L8W 2E1
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LOG OF BOREHOLE BHMW4

Project No.: 23122
Project Name: 393 Rymal Road West, Hamilton
Location: 393 Rymal Road West, Hamilton

Drill Date: 2023-05-16
Drilling Method: Solid Stem
Datum: Ground Surface

Northing: 43.204705
Easting: -79.905664
Ground Surface Elevation: 0

Depth Scale (m)	Depth/Elevation (m)	Description	Number	Type	Blow Counts/150 mm	N Value	Undrained Shear Strength Values (kPa) 40 80 120 160 / Penetration Test Values (Blows / 0.3m) 20 40 60 80	Moisture / Plasticity (PL MC LL)	Moisture / Plasticity 10 20 30 40	Well Details	Groundwater Conditions	Headspace Vapor HEX/IBL (ppm) [LEL(%)]	Comments
0	1.0												
	0.0	**Organic Material** ~250 mm. Silty sand.											
		Silt trace sand, trace clay. Loose to compact, brown, moist.	1	SS	2 4 6	10			15.3				
1	-1.0	...compact.	2	SS	8 6 8	14			18.6				
		Clayey Silt Stiff, brown, moist.	3	SS	4 5 7	12			18.3	3/8" Bentonite Pellets			
2	-2.0	...firm.	4	SS	2 3 4	7			21.6				
3	-3.0		5	SS	3 3 4	7			24.5		June 2023		
4	-4.0	...trace gravel. Hard.	6	SS	8 15 22	37			17.9	#10 Well Slot Sand	36" Locking, Water Resisyant Vault		
5	-5.0												
6	-6.0	...very stiff, very moist to wet.	7	SS	8 11 16	27			17.9		2" Schedule 40 PVC Slot 10 Screen		
		Sandy Silt Very dense, brown, very moist.	8	SS	20 27 24	51			18.2				
7	-7.0	End of Log											
8	-8.0												

Additional Notes:
1. Borehole open to approximately 6.7 m depth on completion.
2. Groundwater or water seepage encountered during drilling at approximately 6.0 m below the ground surface.
3.
4.

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